PACIFIC NORTHWEST STRUCTURAL GROUP, LLC

A PROFESSIONAL ENGINEERING COMPANY

BASIC PERMIT PACKAGE
REVIEWED FOR CODE COMPLIANCE
WITH IRC 2015
KITSAP COUNTY BUILDING DEPARTMENT

6193 NE MALBON CT.
KINGSTON, WA 98346
360.903.2803

STRUCTURAL CALCULATIONS

19-002C RED BARN LANE - DUPLEX 1400
NW HOGAN LN & NELS NELSON RD NW
BREMERTON, WA 98311

Reviewed for code compliance
with IRC 2015
Kitsap County Building Department
lasmith@co.kitsap.wa.us
11/13/2020

ALL COMPUTATIONS AND ENGINEERING FOR THIS PROJECT HAVE BEEN PERFORMED BY MYSELF OR UNDER MY SUPERVISION.

26-JUL-19

DIGITAL SIGNATURE

Digitally signed
by David L. Starkel
Date: 2019.07.26
15:56:51 -07'00'

Established Basic Permit #

19-03646

Permit Number: 20-04894

Pacific Northwest Structural Group, LLC				
	Project	Red Barn Lane - Duplex 1400	Designer	DLS
	Location	NW Hogan Ln & Nels Nelson Rd NW, Bremerton, WA	Project No.	19-002c
	Client	Envision Northwest, LLC	*Revised*	*15-Sep-18*
	Design Live and Dead Loads, Soil Data			

DESIGN LIVE AND DEAD LOADS

ROOF LOAD :		
Asphalt Shingles	1.5	PSF
Re-Roof	1.5	PSF
Roof Shtg	1.5	PSF
Truss @ 24" oc	3.3	PSF
Insulation	1.6	PSF
Gypsum Shtg	2.2	PSF
		PSF
		PSF
SUB-TOTAL	11.6	PSF
SLOPE CORRECTION "X:12" 5.00	1.1	
MISCELLANEOUS	2.4	PSF
ROOF DEAD LOAD	15.0	PSF
ROOF SNOW LOAD	25.0	PSF
REDUCED SNOW LOAD	N/A	PSF
ROOF LIVE LOAD	16.0	PSF

EXTERIOR WALL LOAD		
Siding	4.0	PSF
Wall Shtg	1.5	PSF
2x6 @ 16" oc	1.7	PSF
Bottom & Top Plates	0.8	PSF
Insulation	0.5	PSF
Gypsum Shtg	2.2	PSF
Mech., Elec., & Misc.	0.3	PSF
EXTER. WALL DEAD LOAD	11.0	PSF

INTERIOR WALL LOAD		
Gypsum Shtg	4.4	PSF
2X4 @ 16" oc	1.1	PSF
Insulation	0.5	PSF
Bottom & Top Plates	0.8	PSF
Mech., Elec., & Misc.	1.2	PSF
INTERIOR WALL DEAD LOAD	8.0	PSF

FLOOR LOAD		
Floor Covering	1.0	PSF
Floor Shtg	2.3	PSF
Floor Joist	3.3	PSF
Insulation	1.3	PSF
Gypsum Sheathing	5.6	PSF
Mech., Elec., & Misc.	1.5	PSF
		PSF
FLOOR DEAD LOAD	15.0	PSF
FLOOR LIVE LOAD	40.0	PSF

DECK OR BALCONY DEAD LOAD		
2x Decking	4.5	PSF
Deck Joist	3.3	PSF
Mech., Elec., & Misc.	4.2	PSF
		PSF
DECK DEAD LOAD	12.0	PSF
DECK LIVE LOAD	60.0	PSF

		PSF
		PSF
		PSF
		PSF
		PSF
		PSF
		PSF
FLOOR DEAD LOAD	-	PSF
FLOOR LIVE LOAD		PSF

The soil bearing shall be 1500 PSF unless a soil analysis has been preformed. Please revise the plans or provide a soil analysis showing the 2500 PSF.

SOILS DATA

SOILS REPORT	N/A		
GEOTECHNICAL ENGINEER	N/A	DATE OF REPORT	N/A

BASIC BEARING PRESSURE		
PADS & CONT. FND	2,500	PSF
INCREASE FOR WIDTH	N/A	%
INCREASE FOR DEPTH	N/A	%
MAX. SOIL PRESSURE	2,500	PSF
ISOLATED FOUNDATIONS	N/A	PSF

ACTIVE SOIL PRESSURE		
PASSIVE PRESSURE	N/A	PCF
SOIL FRICTION	N/A	
E.F.P. (Cantilever)	N/A	PCF
E.F.P. (Restrained)	N/A	PCF

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	Client	Envision Northwest, LLC	*Revised*	*15-Sep-18*
	2015 IBC Section 1609.6 Wind Loads			

BUILDING DATA:		
Ultimate Design Wind Speed, V_{ult}	110	MPH
Exposure	B	
Roof Pitch	5.00	:12
θ=	22.62	
	Condition 1	
Building Length	37.00	ft
Building Width	37.00	ft
1st Level Plate Height	9.08	ft
2nd Level Plate Height	9.08	ft
3rd Level Plate Height	8.08	ft
Gable Height	33.95	ft
Roof Height	7.71	ft
Mean Roof Height h =	30.09	ft

Figure 1609
1609.4

Exposure		
B	C	D

1609.6 Alternate All-Heights Method		
Wind directionality factor, K_d	0.85	
Topographic Factor, K_{zt}	1.00	
Velocity pressure factor, K_z	0.70	ASCE 7-10, 27.3-1

IBC 2015 Table 1609.6.2, Net Pressure Coefficients, C_{net}

Description	+ Internal pressure	- Internal pressure
Windward Wall	0.43	0.73
Leeward Wall	(0.51)	(0.21)
Sidewall	(0.66)	(0.35)
Wind perpendicular to ridge Leeward roof or flat roof	(0.66)	(0.35)
Wind parallel to ridge and flat roofs	(1.09)	(0.79)
Windward roof slopes	0.03	0.34

Description	Pressure	
Windward Wall	21.42	psf
Leeward Wall	13.29	psf
Sidewall	18.65	psf
Wind perpendicular to ridge Leeward roof or flat roof	18.65	psf
Windward roof slopes	6.83	psf

Allowable Uniform Wind Load				
Level	Transverse		Longitudinal	
1st Level Plate	189.1	plf	101.6	plf
2nd Level Plate	178.7	plf	96.0	plf
3rd Level Plate	115.7	plf	88.3	plf

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	Client	Envision Northwest, LLC	*Revised*	*15-Sep-18*
	2015 IBC Section 1613 Earthquake Loads			

ASCE 7-10 & IBC 2015 Section 1613, EARTHQUAKE LOADS

Soil Site Class	D			ASCE 7-10 11.4.2 (Default=D)
Response Spectral Acc. (0.2 sec) S_s	1.39			ASCE 7-10 Figure(s) 22-1 through 22-18
Response Spectral Acc.(1.0 sec) S_1	0.55			
Site Coefficient F_a	1.00			ASCE 7-10 Table 11.4-1
Site Coefficient F_v	1.50			ASCE 7-10 Table 11.4-2
Max Considered Earthquake Acc. S_{MS}	1.387	$F_a.S_s$		ASCE 7-10 (11.4-1)
Max Considered Earthquake Acc. S_{M1}	0.828	$F_v.S_1$		ASCE 7-10 (11.4-2)
@ 5% Damped Design S_{DS}	0.925	$2/3.S_{MS}$		ASCE 7-10 (11.4-3)
S_{D1}	0.552	$2/3.S_{M1}$		ASCE 7-10 (11.4-4)
Risk Category			II	ASCE 7-10 Table 1-1
Design Category Consideration:				
In each of the two orthogonal directions, the approximate fundamental period of the structure, Ta, determined in accordance with Section 12.8.2.1 is less than 0.8Ts, where Ts is determined in accordance with Section 11.4.5.			Yes	ASCE 7-10 11.6
In each of two orthogonal directions, the fundamental period of the structure used to calculate the story drift is less than Ts.			Yes	
Diaphragms are rigid as defined in Section 12.3.1 or for diaphragms that are flexible, the distance between vertical elements of the seismic force-resisting system does not exceed 40 ft.			Yes	
Seismic Design Category (SDC)	-			ASCE 7-10 11.4.1
Seismic Design Category for 0.1 sec	D			ASCE 7-10 Table 11.6-1
Seismic Design Category for 1.0 sec	D			ASCE 7-10 Table 11.6-2
S1 < .75g	-			ASCE 7-10 11.6
Seismic Design Category (SDC)	D			ASCE 7-10 11.6
Seismic Force-Resisting System	**A. BEARING WALL SYSTEMS**			
	15. Light-frame (wood) walls sheathed with wood structural panels rated for shear resistance or steel sheets			
Footnotes	-	-		
	-	-		
	-	-		
ASCE 7 Section Where Detailing Requirements Are Specified	14.1 and 14.5			
Building ht. h_n	30.09	ft	Limited Building Height (ft) = 65	
C_t	0.020	x	0.75	ASCE 7-10 Table 12.8-2
C_u	1.400	for SD1 of 0.552g		ASCE 7-10 Table 12.8-1
Approximate Fundamental Period, T_a	0.257	sec	$C_t.(h_n)^x$	ASCE 7-10 (12.8-7)
T_s	0.597	sec	S_{D1}/S_{DS}	ASCE 7-10 11.4.5
T_L	6.00	sec		ASCE 7-10 11.4.5
Period for Computing Drift	0.360	sec	$C_u.T_a$	
Fundamental Period, T	0.257	sec		
$0.8T_s$	0.478	sec	$0.8(S_{D1}/S_{DS})$	ASCE 7-10 11.6
Response Modification Coef. R	6.50			ASCE 7-10 Table 12.14-1

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	2015 IBC Section 1613 Earthquake Loads			

Over Strength Factor Ω_o	3.00		ASCE 7-10 Table 12.14-1
Deflection Amplification Factor, C_{db}	4.00		ASCE 7-10 Table 12.14-1
Importance factor I_E	1.00		ASCE 7-10 Table 1.5-2, UFC 3-301-01 Table 2-2
C_s	0.142	$S_{DS}/R/I_E$	ASCE 7-10 (12.8-2)
T<=TL therefore Cs need not to exceed	0.330	$S_{D1}/(T(R/I_E))$	ASCE 7-10 (12.8-3)
T<TL therefore (12.8-4) N/A	N/A	$S_{D1}.T_L/T^2(R/I_E)$	ASCE 7-10 (12.8-4)
C_s	0.041	$0.044S_{DS}.I_E \geq 0.01$	ASCE 7-10 (12.8-5)
S1 < 0.6g (12.8-6) N/A	N/A	$0.5S_1/(R/I_E)$	ASCE 7-10 (12.8-6)
Use C_s	0.142		
Design Base Shear V	0.142 W	Control	ASCE 7-10 (12.8-1)
Design Service Level Base Shear V	0.1 W		

Seismic Load					
Level	W_x (lbs)	h_x (ft)	$W_x.h_x$	C_{vx}	F_x (lbs)
1st Level Plate	31,398	9.1	285,098	0.374	3,218
2nd Level Plate	31,398	9.1	285,098	0.374	3,218
3rd Level Plate	23,799	8.1	192,298	0.252	2,171
	86,596	$\Sigma W_x.h_x$	762,494		

Design Service Level Base Shear V	8,608	lbs		
	Transverse		Longitudinal	
Diaphragm Width	37.00	ft	37.00	ft
1st Level Plate	87.0	plf	87.0	plf
2nd Level Plate	87.0	plf	87.0	plf
3rd Level Plate	58.7	plf	58.7	plf

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	Client	Envision Northwest, LLC	*Revised*	*18-May-18*
	ASCE 7-10 Snow Loads			

ASCE 7-10 7.3 FLAT ROOF SNOW LOAD			
Ground Snow Load, p_g	30.0	PSF	ASCE 7-10 7.2
Exposure Category	B		ASCE 7-10 26.7.3 Exposure Categories
Exposure of Roof	Partially Exposed		ASCE 7-10 Table 7-2 Exposure Factor
Thermal Condition	All structures except as indicated below		
Risk Category	II		ASCE 7-10 Table 1.5-1, UFC 3-301-01 Table 2-2
Snow load importance factor, I_s	1.0		ASCE 7-10 Table 1.5-2, UFC 3-301-01 Table 2-2
Snow exposure factor, C_e	1.00		ASCE 7-10 Table 7-2 Exposure Factor
Thermal factor, C_t	1.00		ASCE 7-10 Table 7-3 Thermal Factor
Flat-roof snow load, p_f	21.0	PSF	ASCE 7-10 (7.3-1) $0.7C_eC_tI_sp_g$
Min. Design Flat Roof Snow Load, p_m	20.0	PSF	ASCE 7-10 7..4 $p_g \le 20$ PSF I_sp_g, $p_g > 20$ PSF $20I_s$
Design Flat Roof Snow Load, p_f	21.0	PSF	

ASCE 7-10 7.4 SLOPE ROOF SNOW LOAD			
Roof Pitch	5	:12	
Roof Slope, Θ	22.62	°	
Roof Surface	All Other Surfaces		
Warm Roof Slope Factor, C_s	1.00		ASCE 7-10 Section 7.4.1, 7.4.2, 7.4.3 Figure(s)
Slope Roof Design Snow Load, p_s	21.0	PSF	ASCE-7-10 (7-.4-1) C_s*p_f

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Location: WALL-3RD-1
Wall
[2015 International Building Code(2015 NDS)]
1.5 IN x 5.5 IN x 8.08 FT @ 16 O.C.
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 87.0%
Controlling Factor: Combined Stress Factor

Location: RFB1
Roof Beam
[2015 International Building Code(2015 NDS)]
(2) 1.5 IN x 5.5 IN x 3.33 FT
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 71.1%
Controlling Factor: Moment

Location: RFB2
Roof Beam
[2015 International Building Code(2015 NDS)]
(2) 1.5 IN x 5.5 IN x 5.33 FT
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 219.2%
Controlling Factor: Moment

Location: WALL-3RD-2
Wall
[2015 International Building Code(2015 NDS)]
1.5 IN x 5.5 IN x 8.08 FT @ 16 O.C.
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 87.5%
Controlling Factor: Combined Stress Factor

Location: WALL-3RD-3
Wall
[2015 International Building Code(2015 NDS)]
1.5 IN x 5.5 IN x 8.08 FT @ 16 O.C.
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 87.5%
Controlling Factor: Combined Stress Factor

Location: MLB3-1
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2015 NDS)]
1.75 IN x 11.875 IN x 6.83 FT
LSL 2360 Fb-1.55E - Louisiana Pacific
Section Adequate By: 86.2%
Controlling Factor: Moment

Location: JST3-1
Floor Joist
[2015 International Building Code(2015 NDS)]
SERIES 18 / 11.875 - Louisiana Pacific x 10.83 FT @ 16 O.C.
Section Adequate By: 123.4%
Controlling Factor: End Reaction

Location: JST3-2
Floor Joist
[2015 International Building Code(2015 NDS)]
SERIES 56 / 11.875 - Louisiana Pacific x 17.83 FT @ 16 O.C.
Section Adequate By: 80.6%
Controlling Factor: End Reaction

Location: JST3-3
Floor Joist
[2015 International Building Code(2015 NDS)]
SERIES 56 / 11.875 - Louisiana Pacific x 19.83 FT (17.8 + 2) @ 16 O.C.
Section Adequate By: 34.9%
Controlling Factor: End Reaction

Location: JST3-4
Floor Joist
[2015 International Building Code(2015 NDS)]
SERIES 56 / 11.875 - Louisiana Pacific x 19.83 FT @ 16 O.C.
Section Adequate By: 52.2%
Controlling Factor: Deflection

Location: JST3-5
Floor Joist
[2015 International Building Code(2015 NDS)]
SERIES 56 / 11.875 - Louisiana Pacific x 15.67 FT @ 16 O.C.
Section Adequate By: 105.7%
Controlling Factor: End Reaction

Location: JST3-6
Floor Joist
[2015 International Building Code(2015 NDS)]
SERIES 56 / 11.875 - Louisiana Pacific x 14.17 FT @ 16 O.C.
Section Adequate By: 127.5%
Controlling Factor: End Reaction

Location: MLB3-2
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2015 NDS)]
3.5 IN x 6.0 IN x 5.33 FT
24F-V4 - Visually Graded Western Species - Dry Use
Section Adequate By: 59.5%
Controlling Factor: Moment

Location: WALL-2ND-1
Wall
[2015 International Building Code(2015 NDS)]
1.5 IN x 5.5 IN x 8.08 FT @ 16 O.C.
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 87.5%
Controlling Factor: Combined Stress Factor

Location: WALL-2ND-2
Wall
[2015 International Building Code(2015 NDS)]
1.5 IN x 5.5 IN x 8.08 FT @ 16 O.C.
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 95.1%
Controlling Factor: Combined Stress Factor

Location: WALL-2ND-3
Wall
[2015 International Building Code(2015 NDS)]
1.5 IN x 5.5 IN x 8.08 FT @ 16 O.C.
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 95.1%
Controlling Factor: Combined Stress Factor

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Location: JST3-7
Floor Joist
[2015 International Building Code(2015 NDS)]
SERIES 18 / 11.875 - Louisiana Pacific x 10.75 FT @ 16 O.C.
Section Adequate By: 125.0%
Controlling Factor: End Reaction

Location: MLB3-3
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2015 NDS)]
1.75 IN x 11.25 IN x 6.5 FT (4.8 + 1.8)
LSL 1730 Fb-1.35E - Louisiana Pacific
Section Adequate By: 330.4%
Controlling Factor: Moment

Location: JST3-8
Floor Joist
[2015 International Building Code(2015 NDS)]
SERIES 56 / 11.875 - Louisiana Pacific x 6.33 FT (4.6 + 1.8) @ 16 O.C.
Section Adequate By: 13.7%
Controlling Factor: End Reaction

Location: MLB3-4
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2015 NDS)]
3.5 IN x 11.875 IN x 17.83 FT
LSL 2360 Fb-1.55E - Louisiana Pacific
Section Adequate By: 48.1%
Controlling Factor: Deflection

Location: WALL-2ND-4
Wall
[2015 International Building Code(2015 NDS)]
1.5 IN x 5.5 IN x 8.08 FT @ 16 O.C.
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 87.5%
Controlling Factor: Combined Stress Factor

Location: MLB3-5
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2015 NDS)]
3.5 IN x 6.0 IN x 5.33 FT
24F-V4 - Visually Graded Western Species - Dry Use
Section Adequate By: 42.7%
Controlling Factor: Moment

Location: WALL-2ND-5
Wall
[2015 International Building Code(2015 NDS)]
1.5 IN x 5.5 IN x 8.08 FT @ 16 O.C.
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 87.5%
Controlling Factor: Combined Stress Factor

Location: JST2-2
Floor Joist
[2015 International Building Code(2015 NDS)]
SERIES 56 / 11.875 - Louisiana Pacific x 12.75 FT (11 + 1.8) @ 16 O.C.
Section Adequate By: 22.4%
Controlling Factor: End Reaction

Location: JST2-1
Floor Joist
[2015 International Building Code(2015 NDS)]
SERIES 18 / 11.875 - Louisiana Pacific x 10.83 FT @ 16 O.C.
Section Adequate By: 153.3%
Controlling Factor: End Reaction

Location: JST2-3
Floor Joist
[2015 International Building Code(2015 NDS)]
SERIES 18 / 11.875 - Louisiana Pacific x 6.92 FT @ 16 O.C.
Section Adequate By: 296.5%
Controlling Factor: End Reaction

Location: JST2-4
Floor Joist
[2015 International Building Code(2015 NDS)]
SERIES 18 / 11.875 - Louisiana Pacific x 3.33 FT @ 16 O.C.
Section Adequate By: 723.9%
Controlling Factor: End Reaction

Location: MLB2-1 GLB
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2015 NDS)]
3.5 IN x 11.875 IN x 25.09 FT (12.4 + 12.7)
24F-V4 - Visually Graded Western Species - Dry Use
Section Adequate By: 45.0%
Controlling Factor: Moment

Location: MLB2-1 LSL
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2015 NDS)]
3.5 IN x 11.875 IN x 25.09 FT (12.4 + 12.7)
LSL 2360 Fb-1.55E - Louisiana Pacific
Section Adequate By: 75.7%
Controlling Factor: Moment

Location: FTG-PST-MLB2-1B
Footing
[2015 International Building Code(2015 NDS)]
Footing Size: 2.0 FT x 2.0 FT x 10.00 IN
Reinforcement: #4 Bars @ 8.00 IN. O.C. E/W / (3) min.
Section Footing Design Adequate

Location: PST-MLB2-1A
Column
[2015 International Building Code(2015 NDS)]
1.5 IN x 3.5 IN x 9.08 FT
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 16.4%

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Location: FTG-PST-MLB2-1A
Footing
[2015 International Building Code(2015 NDS)]
Footing Size: 1.0 FT x 1.0 FT x 10.00 IN
Reinforcement in Long Direction: #4 Bars @ 5.50 IN. O.C. / (2) min.
Reinforcement in Short Direction-center band (Equal to width of short side): #4 Bars @ 5.50 IN. O.C. / (2) min.
Reinforcement in Short Direction-outside bands: #4 Bars @ 0.00 IN. O.C. / () Each band.
Section Footing Design Adequate

Location: WALL-1ST-1
Wall
[2015 International Building Code(2015 NDS)]
1.5 IN x 5.5 IN x 8.08 FT @ 16 O.C.
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 87.5%
Controlling Factor: Combined Stress Factor

Location: PST-MLB2-1B
Column
[2015 International Building Code(2015 NDS)]
5.5 IN x 5.5 IN x 9.08 FT
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 60.5%

Location: FTG-WALL-1ST-1
Footing
[2015 International Building Code(2015 NDS)]
Footing Size: 18.0 IN Wide x 8.0 IN Deep Continuous Footing With 8.0 IN Thick x 12.0 IN Tall Stemwall
LongitudinalReinforcement: (2) Continuous #4 Bars
TransverseReinforcement: #4 Bars @ 13.00 IN. O.C. (unnecessary)
Section Footing Design Adequate

Location: WALL-2ND-6
Wall
[2015 International Building Code(2015 NDS)]
1.5 IN x 5.5 IN x 8.08 FT @ 16 O.C.
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 87.5%
Controlling Factor: Combined Stress Factor

Location: MLB2-2
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2015 NDS)]
1.75 IN x 11.875 IN x 6.5 FT
LSL 2360 Fb-1.55E - Louisiana Pacific
Section Adequate By: 226.3%
Controlling Factor: Moment

Location: RFB3
Roof Beam
[2015 International Building Code(2015 NDS)]
3.5 IN x 7.25 IN x 8.33 FT
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 130.0%
Controlling Factor: Moment

Location: RFB4
Roof Beam
[2015 International Building Code(2015 NDS)]
5.5 IN x 7.5 IN x 6.83 FT
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 242.3%
Controlling Factor: Moment

Location: MLB2-3
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2015 NDS)]
5.5 IN x 11.875 IN x 17.84 FT (10.9 + 6.9) / 30F - 30F-E DF2 - Dry Use
Section Adequate By: 5.9%
Controlling Factor: Shear

Location: PST-MLB2-3A
Column
[2015 International Building Code(2015 NDS)]
5.5 IN x 5.5 IN x 9.58 FT
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 36.2%

Location: PST-MLB2-3B
Column
[2015 International Building Code(2015 NDS)]
5.5 IN x 7.5 IN x 9.58 FT
#1 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 11.0%

Location: PST-MLB2-3C
Column
[2015 International Building Code(2015 NDS)]
5.5 IN x 5.5 IN x 9.58 FT
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 67.0%

Location: FTG-PST-MLB2-3A
Footing
[2015 International Building Code(2015 NDS)]
Footing Size: 2.5 FT x 2.5 FT x 10.00 IN
Reinforcement: #4 Bars @ 11.00 IN. O.C. E/W / (3) min.
Section Footing Design Adequate

Location: FTG-PST-MLB2-3C
Footing
[2015 International Building Code(2015 NDS)]
Footing Size: 2.5 FT x 2.5 FT x 12.00 IN
Reinforcement: #4 Bars @ 7.00 IN. O.C. E/W / (4) min.
Section Footing Design Adequate

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

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Location: FTG-PST-MLB2-3B
Footing
[2015 International Building Code(2015 NDS)]
Footing Size: 3.5 FT x 3.5 FT x 10.00 IN
Reinforcement: #4 Bars @ 11.00 IN. O.C. E/W / (4) min.
Section Footing Design Adequate

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: WALL-3RD-1
Wall
[2015 International Building Code(2015 NDS)]
1.5 IN x 5.5 IN x 8.08 FT @ 16 O.C.
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 87.0%
Controlling Factor: Combined Stress Factor

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page of

StruCalc Version 10.0.1.6 7/26/2019 3:54:49 PM

DEFLECTIONS

Deflection due to lateral loads only:	Defl = 0.06	IN = L/1638
Live Load Deflection Criteria:		L/180

VERTICAL REACTIONS

Live Load:	Vert-LL-Rxn =	575	lb
Dead Load:	Vert-DL-Rxn =	464	lb
Total Load:	Vert-TL-Rxn =	1039	lb

HORIZONTAL REACTIONS

Total Reaction at Top of Column:	TL-Rxn-Top =	83	lb
Total Reaction at Bottom of Column:	TL-Rxn-Bottom =	83	lb

WALL DATA

Total Stud Length:	8.08	ft
Wall Dead Weight:	11	psf
Unbraced Length (X-Axis) Lx:	8.08	ft
Unbraced Length (Y-Axis) Ly:	0	ft
Stud End Condition-K (e):	1	
Axial Load Duration Factor	1.15	
Lateral Load Duration Factor (Wind/Seismic)	1.60	

STUD PROPERTIES

#2 - Douglas-Fir-Larch

	Base Values	Adjusted
Compressive Stress:	Fc = 1350 psi	Fc' = 1254 psi
	Cd=1.60 Cf=1.10 Cp=0.53	
Bending Stress (X-X Axis):	Fbx = 900 psi	Fbx' = 2153 psi
	Cd=1.60 CF=1.30 Cr=1.15 Cl=1.00	
Bending Stress (Y-Y Axis):	Fby = 900 psi	Fby' = 2153 psi
	Cd=1.60 CF=1.30 Cr=1.15	
Modulus of Elasticity:	E = 1600 ksi	E' = 1600 ksi

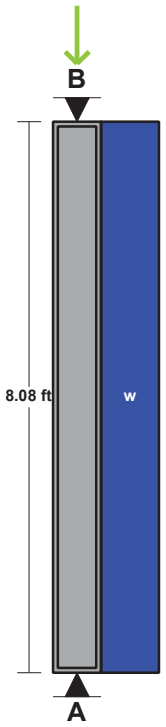
Stud Section (X-X Axis):	dx =	5.5	in
Stud Section (Y-Y Axis):	dy =	1.5	in
Area:	A =	8.25	in2
Section Modulus (X-X Axis):	Sx =	7.56	in3
Section Modulus (Y-Y Axis):	Sy =	2.06	in3
Slenderness Ratio:	Lex/dx =	17.63	
	Ley/dy =	0	

Stud Calculations (Controlling Case Only):

Controlling Load Case: Axial Dead Load and Lateral loads (D + W or E)

Actual Compressive Stress:	Fc =	56	psi
Allowable Compressive Stress:	Fc' =	1254	psi
Eccentricity Moment (X-X Axis):	Mx-ex =	0	ft-lb
Eccentricity Moment (Y-Y Axis):	My-ey =	0	ft-lb
Moment Due to Lateral Loads (X-X Axis):	Mx =	168	ft-lb
Moment Due to Lateral Loads (Y-Y Axis):	My =	0	ft-lb
Bending Stress Lateral Loads Only (X-X Axis):	Fbx =	266	psi
Allowable Bending Stress (X-X Axis):	Fbx' =	2153	psi
Bending Stress Lateral Loads Only (Y-Y Axis):	Fby =	0	psi
Allowable Bending Stress (Y-Y Axis):	Fby' =	2153	psi
Combined Stress Factor:	**CSF =**	**0.13**	

LOADING DIAGRAM



WALL LOAD CALCULATOR

	Live Load	Dead Load	Tributary Width
Load Tracker:	LL = 0 plf	DL = 0 plf	
Roof:	LL = 25 psf	DL = 15 psf	TA = 17.3 ft
Upper Floor:	LL = 40 psf	DL = 15 psf	TA = 0 ft
Upper Floor Height:	0 ft		
Middle Floor:	LL = 40 psf	DL = 15 psf	TA = 0 ft
Middle Floor Height:	0 ft		
Calculated Load:	**LL =431.3 plf**	**DL =347.6 plf**	

AXIAL LOADING

Live Load:	PL =	431	plf
Dead Load:	PD =	348	plf
Total Axial Load:	PT =	779	plf

LATERAL LOADING (Dy Face)

Uniform Lateral Load:	wL-Lat =	15	psf

NOTES

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: RFB1
Roof Beam
[2015 International Building Code(2015 NDS)]
(2) 1.5 IN x 5.5 IN x 3.33 FT
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 71.1%
Controlling Factor: Moment

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page of

StruCalc Version 10.0.1.6 7/26/2019 3:54:49 PM

DEFLECTIONS Center

Live Load	0.02	IN L/2229
Dead Load	0.01	in
Total Load	0.03	IN L/1344

Live Load Deflection Criteria: L/240 Total Load Deflection Criteria: L/180

REACTIONS

	A		B	
Live Load	718	lb	718	lb
Dead Load	473	lb	473	lb
Total Load	1191	lb	1191	lb
Bearing Length	0.64	in	0.64	in

BEAM DATA

Span Length	3.3	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	0	ft
Roof Pitch	5	:12
Roof Duration Factor	1.15	

MATERIAL PROPERTIES

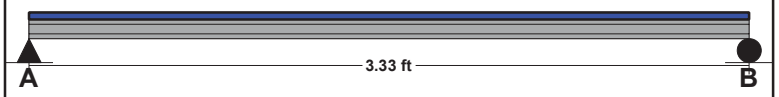
#2 - Douglas-Fir-Larch

	Base Values		Adjusted	
Bending Stress:	Fb = 900	psi	Fb' = 1346	psi
	Cd=1.15 CF=1.30			
Shear Stress:	Fv = 180	psi	Fv' = 207	psi
	Cd=1.15			
Modulus of Elasticity:	E = 1600	ksi	E' = 1600	ksi
Comp. ⊥ to Grain:	Fc - ⊥ = 625	psi	Fc - ⊥' = 625	psi

Controlling Moment: 991 ft-lb
1.665 ft from left support
Created by combining all dead and live loads.
Controlling Shear: -881 lb
At a distance d from support.
Created by combining all dead and live loads.

Comparisons with required sections:	Req'd	Provided
Section Modulus:	8.84 in3	15.13 in3
Area (Shear):	6.38 in2	16.5 in2
Moment of Inertia (deflection):	5.57 in4	41.59 in4
Moment:	991 ft-lb	1696 ft-lb
Shear:	-881 lb	2277 lb

LOADING DIAGRAM



ROOF LOADING

Side One:

Roof Live Load:	LL =	25	psf
Roof Dead Load:	DL =	15	psf
Tributary Width:	TW =	17.3	ft

Side Two:

Roof Live Load:	LL =	0	psf
Roof Dead Load:	DL =	0	psf
Tributary Width:	TW =	0	ft

Wall Load: WALL = 0 plf

SLOPE/PITCH ADJUSTED LENGTHS AND LOADS

Adjusted Beam Length:	Ladj =	3.33	ft
Beam Self Weight:	BSW =	4	plf
Beam Uniform Live Load:	wL =	431	plf
Beam Uniform Dead Load:	wD_adj =	284	plf
Total Uniform Load:	wT =	715	plf

NOTES

Established Basic Permit #

19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: RFB2
Roof Beam
[2015 International Building Code(2015 NDS)]
(2) 1.5 IN x 5.5 IN x 5.33 FT
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 219.2%
Controlling Factor: Moment

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page of

StruCalc Version 10.0.1.6 7/26/2019 3:54:49 PM

DEFLECTIONS Center

Live Load	0.01	IN L/4689
Dead Load	0.03	in
Total Load	0.04	IN L/1567

Live Load Deflection Criteria: L/240 Total Load Deflection Criteria: L/180

REACTIONS

	A	B
Live Load	133 lb	133 lb
Dead Load	266 lb	266 lb
Total Load	399 lb	399 lb
Bearing Length	0.21 in	0.21 in

BEAM DATA

Span Length	5.3	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	0	ft
Roof Pitch	8	:12
Roof Duration Factor	1.15	

MATERIAL PROPERTIES

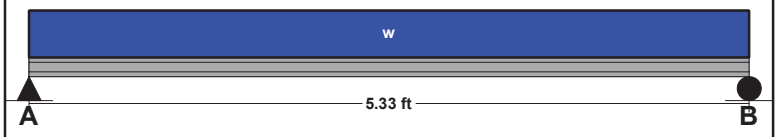
#2 - Douglas-Fir-Larch

	Base Values		Adjusted	
Bending Stress:	Fb = 900 psi	*Cd=1.15 CF=1.30*	Fb' = 1346	psi
Shear Stress:	Fv = 180 psi	*Cd=1.15*	Fv' = 207	psi
Modulus of Elasticity:	E = 1600 ksi		E' = 1600	ksi
Comp. ⊥ to Grain:	Fc - ⊥ = 625 psi		Fc - ⊥' = 625	psi

Controlling Moment: 531 ft-lb
2.665 ft from left support
Created by combining all dead and live loads.
Controlling Shear: -335 lb
At a distance d from support.
Created by combining all dead and live loads.

Comparisons with required sections:	Req'd	Provided
Section Modulus:	4.74 in3	15.13 in3
Area (Shear):	2.43 in2	16.5 in2
Moment of Inertia (deflection):	4.78 in4	41.59 in4
Moment:	531 ft-lb	1696 ft-lb
Shear:	-335 lb	2277 lb

LOADING DIAGRAM



ROOF LOADING

Side One:			
Roof Live Load:	LL =	25	psf
Roof Dead Load:	DL =	15	psf
Tributary Width:	TW =	2	ft
Side Two:			
Roof Live Load:	LL =	0	psf
Roof Dead Load:	DL =	0	psf
Tributary Width:	TW =	0	ft
Wall Load:	WALL =	60	plf

SLOPE/PITCH ADJUSTED LENGTHS AND LOADS

Adjusted Beam Length:	Ladj =	5.33	ft
Beam Self Weight:	BSW =	4	plf
Beam Uniform Live Load:	wL =	50	plf
Beam Uniform Dead Load:	wD_adj =	100	plf
Total Uniform Load:	wT =	150	plf

NOTES

Established Basic Permit #

19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: WALL-3RD-2
Wall
[2015 International Building Code(2015 NDS)]
1.5 IN x 5.5 IN x 8.08 FT @ 16 O.C.
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 87.5%
Controlling Factor: Combined Stress Factor

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page of

StruCalc Version 10.0.1.6 7/26/2019 3:54:50 PM

DEFLECTIONS

Deflection due to lateral loads only:	Defl = 0.06	IN = L/1638
Live Load Deflection Criteria:		L/180

VERTICAL REACTIONS

Live Load:	Vert-LL-Rxn =	73	lb
Dead Load:	Vert-DL-Rxn =	163	lb
Total Load:	Vert-TL-Rxn =	236	lb

HORIZONTAL REACTIONS

Total Reaction at Top of Column:	TL-Rxn-Top =	83	lb
Total Reaction at Bottom of Column:	TL-Rxn-Bottom =	83	lb

WALL DATA

Total Stud Length:	8.08	ft
Wall Dead Weight:	11	psf
Unbraced Length (X-Axis) Lx:	8.08	ft
Unbraced Length (Y-Axis) Ly:	0	ft
Stud End Condition-K (e):	1	
Axial Load Duration Factor	1.15	
Lateral Load Duration Factor (Wind/Seismic)	1.60	

STUD PROPERTIES

#2 - Douglas-Fir-Larch

	Base Values	Adjusted
Compressive Stress:	Fc = 1350 psi	Fc' = 1254 psi
	Cd=1.60 Cf=1.10 Cp=0.53	
Bending Stress (X-X Axis):	Fbx = 900 psi	Fbx' = 2153 psi
	Cd=1.60 CF=1.30 Cr=1.15 Cl=1.00	
Bending Stress (Y-Y Axis):	Fby = 900 psi	Fby' = 2153 psi
	Cd=1.60 CF=1.30 Cr=1.15	
Modulus of Elasticity:	E = 1600 ksi	E' = 1600 ksi

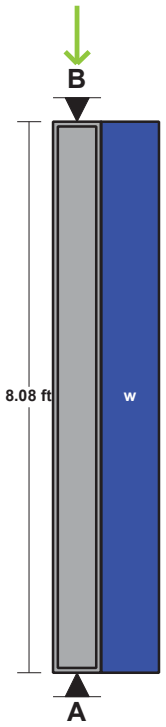
Stud Section (X-X Axis):	dx =	5.5	in
Stud Section (Y-Y Axis):	dy =	1.5	in
Area:	A =	8.25	in2
Section Modulus (X-X Axis):	Sx =	7.56	in3
Section Modulus (Y-Y Axis):	Sy =	2.06	in3
Slenderness Ratio:	Lex/dx =	17.63	
	Ley/dy =	0	

Stud Calculations (Controlling Case Only):

Controlling Load Case: Axial Dead Load and Lateral loads (D + W or E)

Actual Compressive Stress:	Fc =	20	psi
Allowable Compressive Stress:	Fc' =	1254	psi
Eccentricity Moment (X-X Axis):	Mx-ex =	0	ft-lb
Eccentricity Moment (Y-Y Axis):	My-ey =	0	ft-lb
Moment Due to Lateral Loads (X-X Axis):	Mx =	168	ft-lb
Moment Due to Lateral Loads (Y-Y Axis):	My =	0	ft-lb
Bending Stress Lateral Loads Only (X-X Axis):	Fbx =	266	psi
Allowable Bending Stress (X-X Axis):	Fbx' =	2153	psi
Bending Stress Lateral Loads Only (Y-Y Axis):	Fby =	0	psi
Allowable Bending Stress (Y-Y Axis):	Fby' =	2153	psi
Combined Stress Factor:	**CSF =**	**0.13**	

LOADING DIAGRAM



WALL LOAD CALCULATOR

	Live Load		Dead Load		Tributary Width	
Load Tracker:	LL = 0	plf	DL = 0	plf		
Roof:	LL = 25	psf	DL = 15	psf	TA = 2.2	ft
Upper Floor:	LL = 40	psf	DL = 15	psf	TA = 0	ft
Upper Floor Height:	0	ft				
Middle Floor:	LL = 40	psf	DL = 15	psf	TA = 0	ft
Middle Floor Height:	0	ft				
Calculated Load:	**LL = 55**	**plf**	**DL =121.9**	**plf**		

AXIAL LOADING

Live Load:	PL = 55	plf
Dead Load:	PD = 122	plf
Total Axial Load:	PT = 177	plf

LATERAL LOADING (Dy Face)

Uniform Lateral Load:	wL-Lat = 15	psf

NOTES

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: WALL-3RD-3
Wall
[2015 International Building Code(2015 NDS)]
1.5 IN x 5.5 IN x 8.08 FT @ 16 O.C.
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 87.5%
Controlling Factor: Combined Stress Factor

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page of

StruCalc Version 10.0.1.6 7/26/2019 3:54:50 PM

DEFLECTIONS

Deflection due to lateral loads only:	Defl = 0.06	IN = L/1638
Live Load Deflection Criteria:		L/180

VERTICAL REACTIONS

Live Load:	Vert-LL-Rxn =	73	lb
Dead Load:	Vert-DL-Rxn =	163	lb
Total Load:	Vert-TL-Rxn =	236	lb

HORIZONTAL REACTIONS

Total Reaction at Top of Column:	TL-Rxn-Top =	83	lb
Total Reaction at Bottom of Column:	TL-Rxn-Bottom =	83	lb

WALL DATA

Total Stud Length:	8.08	ft
Wall Dead Weight:	11	psf
Unbraced Length (X-Axis) Lx:	8.08	ft
Unbraced Length (Y-Axis) Ly:	0	ft
Stud End Condition-K (e):	1	
Axial Load Duration Factor	1.15	
Lateral Load Duration Factor (Wind/Seismic)	1.60	

STUD PROPERTIES

#2 - Douglas-Fir-Larch

	Base Values	Adjusted
Compressive Stress:	Fc = 1350 psi	Fc' = 1254 psi
	Cd=1.60 Cf=1.10 Cp=0.53	
Bending Stress (X-X Axis):	Fbx = 900 psi	Fbx' = 2153 psi
	Cd=1.60 CF=1.30 Cr=1.15 Cl=1.00	
Bending Stress (Y-Y Axis):	Fby = 900 psi	Fby' = 2153 psi
	Cd=1.60 CF=1.30 Cr=1.15	
Modulus of Elasticity:	E = 1600 ksi	E' = 1600 ksi

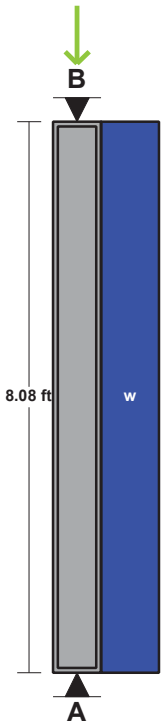
Stud Section (X-X Axis):	dx =	5.5	in
Stud Section (Y-Y Axis):	dy =	1.5	in
Area:	A =	8.25	in2
Section Modulus (X-X Axis):	Sx =	7.56	in3
Section Modulus (Y-Y Axis):	Sy =	2.06	in3
Slenderness Ratio:	Lex/dx =	17.63	
	Ley/dy =	0	

Stud Calculations (Controlling Case Only):

Controlling Load Case: Axial Dead Load and Lateral loads (D + W or E)

Actual Compressive Stress:	Fc =	20	psi
Allowable Compressive Stress:	Fc' =	1254	psi
Eccentricity Moment (X-X Axis):	Mx-ex =	0	ft-lb
Eccentricity Moment (Y-Y Axis):	My-ey =	0	ft-lb
Moment Due to Lateral Loads (X-X Axis):	Mx =	168	ft-lb
Moment Due to Lateral Loads (Y-Y Axis):	My =	0	ft-lb
Bending Stress Lateral Loads Only (X-X Axis):	Fbx =	266	psi
Allowable Bending Stress (X-X Axis):	Fbx' =	2153	psi
Bending Stress Lateral Loads Only (Y-Y Axis):	Fby =	0	psi
Allowable Bending Stress (Y-Y Axis):	Fby' =	2153	psi
Combined Stress Factor:	**CSF =**	**0.13**	

LOADING DIAGRAM



WALL LOAD CALCULATOR

	Live Load		Dead Load		Tributary Width	
Load Tracker:	LL = 0	plf	DL = 0	plf		
Roof:	LL = 25	psf	DL = 15	psf	TA = 2.2	ft
Upper Floor:	LL = 40	psf	DL = 15	psf	TA = 0	ft
Upper Floor Height:	0	ft				
Middle Floor:	LL = 40	psf	DL = 15	psf	TA = 0	ft
Middle Floor Height:	0	ft				
Calculated Load:	**LL = 55**	**plf**	**DL =121.9**	**plf**		

AXIAL LOADING

Live Load:	PL = 55	plf
Dead Load:	PD = 122	plf
Total Axial Load:	PT = 177	plf

LATERAL LOADING (Dy Face)

Uniform Lateral Load:	wL-Lat = 15	psf

NOTES

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: MLB3-1
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2015 NDS)]
1.75 IN x 11.875 IN x 6.83 FT
LSL 2360 Fb-1.55E - Louisiana Pacific
Section Adequate By: 86.2%
Controlling Factor: Moment

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DEFLECTIONS	Center	
Live Load	0.06	IN L/1309
Dead Load	0.05	in
Total Load	0.11	IN L/739

Live Load Deflection Criteria: L/360 Total Load Deflection Criteria: L/240

REACTIONS	A	B
Live Load	1653 lb	1653 lb
Dead Load	1277 lb	1277 lb
Total Load	2930 lb	2930 lb
Bearing Length	1.91 in	1.91 in

BEAM DATA	Center
Span Length	6.83 ft
Unbraced Length-Top	0 ft
Unbraced Length-Bottom	6.83 ft
Live Load Duration Factor	1.15
Notch Depth	0.00

MATERIAL PROPERTIES

LSL 2360 Fb-1.55E - Louisiana Pacific

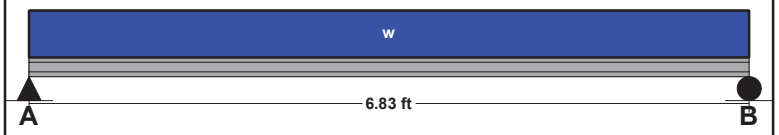
	Base Values		Adjusted	
Bending Stress:	Fb = 2360 psi	*Cd=1.15 CF=1.00*	Fb' = 2718 psi	
Shear Stress:	Fv = 410 psi	*Cd=1.15*	Fv' = 472 psi	
Modulus of Elasticity:	E = 1550 ksi		E' = 1550 ksi	
Comp. ⊥ to Grain:	Fc - ⊥ = 875 psi		Fc - ⊥' = 875 psi	

Controlling Moment: 5003 ft-lb
3.41 Ft from left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2

Controlling Shear: 2110 lb
At a distance d from left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2

Comparisons with required sections:	Req'd	Provided
Section Modulus:	22.09 in3	41.13 in3
Area (Shear):	6.71 in2	20.78 in2
Moment of Inertia (deflection):	79.36 in4	244.21 in4
Moment:	5003 ft-lb	9316 ft-lb
Shear:	2110 lb	6532 lb

LOADING DIAGRAM



UNIFORM LOADS	Center*	
Uniform Live Load	484	plf
Uniform Dead Load	368	plf
Beam Self Weight	6	plf
Total Uniform Load	858	plf

* Load obtained from Load Tracker. See Summary Report for details.

NOTES

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: JST3-1
Floor Joist
[2015 International Building Code(2015 NDS)]
SERIES 18 / 11.875 - Louisiana Pacific x 10.83 FT @ 16 O.C.
Section Adequate By: 123.4%
Controlling Factor: End Reaction

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page
of

StruCalc Version 10.0.1.6 7/26/2019 3:54:51 PM

DEFLECTIONS Center

Live Load	0.08	IN L/1606
Dead Load	0.03	in
Total Load	0.11	IN L/1168

Live Load Deflection Criteria: L/480 Total Load Deflection Criteria: L/360

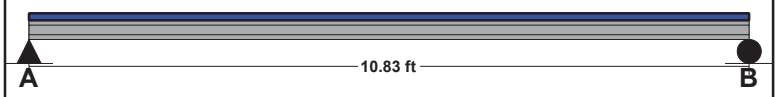
REACTIONS

	A	B
Live Load	289 lb	289 lb
Dead Load	108 lb	108 lb
Total Load	397 lb	397 lb
Bearing Length	1.75 in	3.50 in
Web Stiffeners	No	No

SUPPORT LOADS

	A	B
Live Load	217 plf	217 plf
Dead Load	81 plf	81 plf
Total Load	298 plf	298 plf

LOADING DIAGRAM



I-JOIST PROPERTIES

SERIES 18 / 11.875 - Louisiana Pacific

	Base Values	Adjusted
Moment Cap:	Mcap = 3100 ft-lb	Mcap' = 3100 ft-lb
	Cd = 1.00	
Shear Stress:	Vcap = 1335 lb	Vcap' = 1335 lb
	Cd = 1.00	
Reaction A:	Rcap = 887 lb	Rcap' = 887 lb
Reaction B:	Rcap = 1006 lb	Rcap' = 1006 lb
E.I.:	EI = 248 lb-in2	EI' = 248 lb-in2

Controlling Moment: 1075 ft-lb
5.41 Ft from left support of span 3 (Right Span)
Created by combining all dead and live loads.
Controlling Shear: 397 lb
0.0 Ft from left support of span 2 (Center Span)
Created by combining all dead and live loads.

JOIST DATA Center

Span Length	10.83	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	0	ft

Floor sheathing applied to top of joists-top of joists fully braced.
Floor Duration Factor 1.00

JOIST LOADING

Uniform Floor Loading Center

Live Load	LL =	40	psf
Dead Load	DL =	15	psf
Total Load	TL =	55	psf
TL Adj. For Joist Spacing	wT =	73.3	plf

Comparisons with required sections:

	Req'd	Provided
E.I.:	76 in2-lb E6	248 in2-lb xE6
Moment:	1075 ft-lb	3100 ft-lb
Shear:	397 lb	1335 lb

NOTES

Established Basic Permit #

19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: JST3-2
Floor Joist
[2015 International Building Code(2015 NDS)]
SERIES 56 / 11.875 - Louisiana Pacific x 17.83 FT @ 16 O.C.
Section Adequate By: 80.8%
Controlling Factor: End Reaction

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page of

StruCalc Version 10.0.1.6 7/26/2019 3:54:52 PM

DEFLECTIONS Center

Live Load	0.21	IN L/1007
Dead Load	0.08	in
Total Load	0.29	IN L/733

Live Load Deflection Criteria: L/480 Total Load Deflection Criteria: L/360

REACTIONS

	A		B	
Live Load	475	lb	475	lb
Dead Load	178	lb	178	lb
Total Load	653	lb	653	lb
Bearing Length	1.75	in	1.75	in
Web Stiffeners	No		No	

SUPPORT LOADS

	A		B	
Live Load	356	plf	356	plf
Dead Load	134	plf	134	plf
Total Load	490	plf	490	plf

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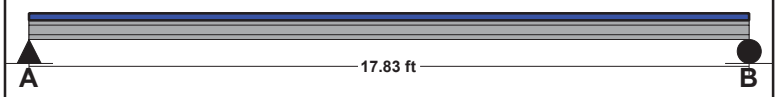

I-JOIST PROPERTIES

SERIES 56 / 11.875 - Louisiana Pacific

	Base Values		Adjusted	
Moment Cap:	Mcap = 10170	ft-lb	Mcap' = 10170	ft-lb
	Cd = 1.00			
Shear Stress:	Vcap = 2055	lb	Vcap' = 2055	lb
	Cd = 1.00			
Reaction A:	Rcap = 1182	lb	Rcap' = 1182	lb
Reaction B:	Rcap = 1182	lb	Rcap' = 1182	lb
E.I.:	EI = 668	lb-in2	EI' = 668	lb-in2

Controlling Moment: 2914 ft-lb
8.91 Ft from left support of span 3 (Right Span)
Created by combining all dead and live loads.
Controlling Shear: 654 lb
0.0 Ft from left support of span 2 (Center Span)
Created by combining all dead and live loads.

JOIST DATA Center

Span Length	17.83	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	0	ft

Floor sheathing applied to top of joists-top of joists fully braced.
Floor Duration Factor 1.00

JOIST LOADING

Uniform Floor Loading Center

Live Load	LL =	40	psf
Dead Load	DL =	15	psf
Total Load	TL =	55	psf
TL Adj. For Joist Spacing	wT =	73.3	plf

Comparisons with required sections:

	Req'd	Provided
E.I.:	328 in2-lb E6	668 in2-lb xE6
Moment:	2914 ft-lb	10170 ft-lb
Shear:	654 lb	2055 lb

NOTES

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: JST3-3
Floor Joist
[2015 International Building Code(2015 NDS)]
SERIES 56 / 11.875 - Louisiana Pacific x 19.83 FT (17.8 + 2) @ 16 O.C.
Section Adequate By: 34.9%
Controlling Factor: End Reaction

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page of

StruCalc Version 10.0.1.6 7/26/2019 3:54:52 PM

DEFLECTIONS	Center		Right	
Live Load	0.21	IN L/1007	-0.07	IN 2L/736
Dead Load	0.06	in	-0.01	in
Total Load	0.27	IN L/784	-0.08	IN 2L/610

Live Load Deflection Criteria: L/480 Total Load Deflection Criteria: L/360

REACTIONS	A		B	
Live Load	475	lb	669	lb
Dead Load	160	lb	399	lb
Total Load	635	lb	1068	lb
Bearing Length	3.50	in	3.50	in
Web Stiffeners	No		No	

SUPPORT LOADS	A		B	
Live Load	356	plf	502	plf
Dead Load	120	plf	299	plf
Total Load	476	plf	801	plf

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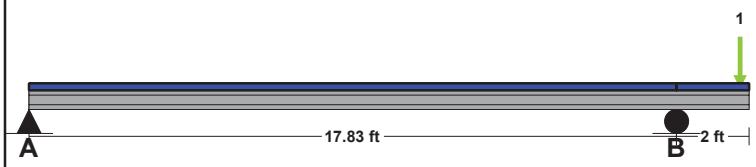

I-JOIST PROPERTIES

SERIES 56 / 11.875 - Louisiana Pacific

	Base Values		Adjusted	
Moment Cap:	Mcap = 10170	ft-lb	Mcap' = 10170	ft-lb
	Cd = 1.00			
Shear Stress:	Vcap = 2055	lb	Vcap' = 2055	lb
	Cd = 1.00			
Reaction A:	Rcap = 1441	lb	Rcap' = 1441	lb
Reaction B:	Rcap = 1441	lb	Rcap' = 1441	lb
E.I.:	EI = 668	lb-in2	EI' = 668	lb-in2

Controlling Moment: 2754 ft-lb
8.74 Ft from left support of span 3 (Right Span)
Created by combining all dead and live loads.
Controlling Shear: -685 lb
18.0 Ft from left support of span 2 (Center Span)
Created by combining all dead and live loads.

JOIST DATA	Center		Right	
Span Length	17.83	ft	2	ft
Unbraced Length-Top	0	ft	0	ft
Unbraced Length-Bottom	0	ft	0	ft

Floor sheathing applied to top of joists-top of joists fully braced.
Floor Duration Factor 1.00

JOIST LOADING

Uniform Floor Loading		Center		Right	
Live Load	LL =	40	psf	40	psf
Dead Load	DL =	15	psf	15	psf
Total Load	TL =	55	psf	55	psf
TL Adj. For Joist Spacing	wT =	73.3	plf	73.3	plf
Wall Loading					
Wall One					
Live Load (⊥ to Joists):	L1 =	0	plf	55	plf
Dead Load (⊥ to Joists)	D1 =	0	plf	122	plf
Load Location	X1 =	0	ft	1.75	ft

Comparisons with required sections:	Req'd	Provided
E.I.:	435 in2-lb E6	668 in2-lb xE6
Moment:	2754 ft-lb	10170 ft-lb
Shear:	-685 lb	2055 lb

NOTES

Established Basic Permit #

19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: JST3-4
Floor Joist
[2015 International Building Code(2015 NDS)]
SERIES 56 / 11.875 - Louisiana Pacific x 19.83 FT @ 16 O.C.
Section Adequate By: 52.2%
Controlling Factor: Deflection

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page of

StruCalc Version 10.0.1.6 7/26/2019 3:54:52 PM

DEFLECTIONS	Center	
Live Load	0.32	IN L/753
Dead Load	0.12	in
Total Load	0.43	IN L/548

Live Load Deflection Criteria: L/480 Total Load Deflection Criteria: L/360

REACTIONS	A		B	
Live Load	529	lb	529	lb
Dead Load	198	lb	198	lb
Total Load	727	lb	727	lb
Bearing Length	1.75	in	1.75	in
Web Stiffeners	No		No	

SUPPORT LOADS	A		B	
Live Load	397	plf	397	plf
Dead Load	149	plf	149	plf
Total Load	545	plf	545	plf

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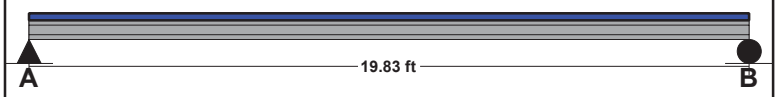

I-JOIST PROPERTIES

SERIES 56 / 11.875 - Louisiana Pacific

	Base Values		Adjusted	
Moment Cap:	Mcap = 10170	ft-lb	Mcap' = 10170	ft-lb
	Cd = 1.00			
Shear Stress:	Vcap = 2055	lb	Vcap' = 2055	lb
	Cd = 1.00			
Reaction A:	Rcap = 1182	lb	Rcap' = 1182	lb
Reaction B:	Rcap = 1182	lb	Rcap' = 1182	lb
E.I.:	EI = 668	lb-in2	EI' = 668	lb-in2

Controlling Moment: 3605 ft-lb
9.91 Ft from left support of span 3 (Right Span)
Created by combining all dead and live loads.
Controlling Shear: 727 lb
0.0 Ft from left support of span 2 (Center Span)
Created by combining all dead and live loads.

JOIST DATA	Center	
Span Length	19.83	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	0	ft

Floor sheathing applied to top of joists-top of joists fully braced.
Floor Duration Factor 1.00

JOIST LOADING

Uniform Floor Loading	Center		
Live Load	LL =	40	psf
Dead Load	DL =	15	psf
Total Load	TL =	55	psf
TL Adj. For Joist Spacing	wT =	73.3	plf

Comparisons with required sections:	Req'd	Provided
E.I.:	439 in2-lb E6	668 in2-lb xE6
Moment:	3605 ft-lb	10170 ft-lb
Shear:	727 lb	2055 lb

NOTES

Established Basic Permit #

19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: JST3-5
Floor Joist
[2015 International Building Code(2015 NDS)]
SERIES 56 / 11.875 - Louisiana Pacific x 15.67 FT @ 16 O.C.
Section Adequate By: 105.7%
Controlling Factor: End Reaction

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page of

StruCalc Version 10.0.1.6 7/26/2019 3:54:53 PM

DEFLECTIONS Center

Live Load	0.13	IN L/1423
Dead Load	0.05	in
Total Load	0.18	IN L/1035

Live Load Deflection Criteria: L/480 Total Load Deflection Criteria: L/360

REACTIONS

	A		B	
Live Load	418	lb	418	lb
Dead Load	157	lb	157	lb
Total Load	575	lb	575	lb
Bearing Length	1.75	in	1.75	in
Web Stiffeners	No		No	

SUPPORT LOADS

	A		B	
Live Load	314	plf	314	plf
Dead Load	118	plf	118	plf
Total Load	431	plf	431	plf

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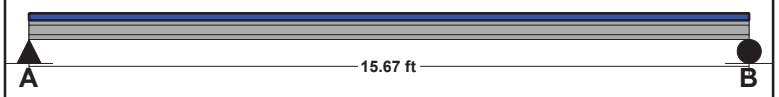

I-JOIST PROPERTIES

SERIES 56 / 11.875 - Louisiana Pacific

	Base Values		Adjusted	
Moment Cap:	Mcap = 10170	ft-lb	Mcap' = 10170	ft-lb
	Cd = 1.00			
Shear Stress:	Vcap = 2055	lb	Vcap' = 2055	lb
	Cd = 1.00			
Reaction A:	Rcap = 1182	lb	Rcap' = 1182	lb
Reaction B:	Rcap = 1182	lb	Rcap' = 1182	lb
E.I.:	EI = 668	lb-in2	EI' = 668	lb-in2

JOIST DATA Center

Span Length	15.67	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	0	ft

Floor sheathing applied to top of joists-top of joists fully braced.
Floor Duration Factor 1.00

JOIST LOADING

Uniform Floor Loading Center

Live Load	LL =	40	psf
Dead Load	DL =	15	psf
Total Load	TL =	55	psf
TL Adj. For Joist Spacing	wT =	73.3	plf

Controlling Moment: 2251 ft-lb
7.84 Ft from left support of span 3 (Right Span)
Created by combining all dead and live loads.
Controlling Shear: -575 lb
16.0 Ft from left support of span 2 (Center Span)
Created by combining all dead and live loads.

Comparisons with required sections:	Req'd		Provided	
E.I.:	232	in2-lb E6	668	in2-lb xE6
Moment:	2251	ft-lb	10170	ft-lb
Shear:	-575	lb	2055	lb

NOTES

Established Basic Permit #

19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: JST3-6
Floor Joist
[2015 International Building Code(2015 NDS)]
SERIES 56 / 11.875 - Louisiana Pacific x 14.17 FT @ 16 O.C.
Section Adequate By: 127.5%
Controlling Factor: End Reaction

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page of

StruCalc Version 10.0.1.6 7/26/2019 3:54:53 PM

DEFLECTIONS Center

Live Load	0.09	IN L/1850
Dead Load	0.03	in
Total Load	0.13	IN L/1345

Live Load Deflection Criteria: L/480 Total Load Deflection Criteria: L/360

REACTIONS

	A		B	
Live Load	378	lb	378	lb
Dead Load	142	lb	142	lb
Total Load	520	lb	520	lb
Bearing Length	1.75	in	1.75	in
Web Stiffeners	No		No	

SUPPORT LOADS

	A		B	
Live Load	284	plf	284	plf
Dead Load	107	plf	107	plf
Total Load	390	plf	390	plf

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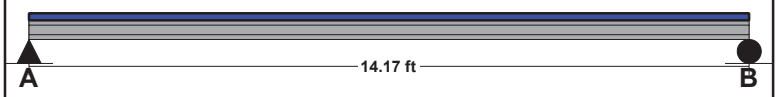

I-JOIST PROPERTIES

SERIES 56 / 11.875 - Louisiana Pacific

	Base Values		Adjusted	
Moment Cap:	Mcap = 10170	ft-lb	Mcap' = 10170	ft-lb
	Cd = 1.00			
Shear Stress:	Vcap = 2055	lb	Vcap' = 2055	lb
	Cd = 1.00			
Reaction A:	Rcap = 1182	lb	Rcap' = 1182	lb
Reaction B:	Rcap = 1182	lb	Rcap' = 1182	lb
E.I.:	EI = 668	lb-in2	EI' = 668	lb-in2

Controlling Moment: 1841 ft-lb
7.09 Ft from left support of span 3 (Right Span)
Created by combining all dead and live loads.
Controlling Shear: 520 lb
0.0 Ft from left support of span 2 (Center Span)
Created by combining all dead and live loads.

JOIST DATA Center

Span Length	14.17	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	0	ft

Floor sheathing applied to top of joists-top of joists fully braced.
Floor Duration Factor 1.00

JOIST LOADING

Uniform Floor Loading Center

Live Load	LL =	40	psf
Dead Load	DL =	15	psf
Total Load	TL =	55	psf
TL Adj. For Joist Spacing	wT =	73.3	plf

Comparisons with required sections:

	Req'd	Provided
E.I.:	179 in2-lb E6	668 in2-lb xE6
Moment:	1841 ft-lb	10170 ft-lb
Shear:	520 lb	2055 lb

NOTES

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: MLB3-2
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2015 NDS)]
3.5 IN x 6.0 IN x 5.33 FT
24F-V4 - Visually Graded Western Species - Dry Use
Section Adequate By: 59.5%
Controlling Factor: Moment

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StruCalc Version 10.0.1.6 7/26/2019 3:54:54 PM

DEFLECTIONS Center

Live Load	0.07	IN L/982
Dead Load	0.05	in
Total Load	0.12	IN L/549

Live Load Deflection Criteria: L/360 Total Load Deflection Criteria: L/240

REACTIONS A B

	A		B	
Live Load	1062	lb	1038	lb
Dead Load	809	lb	760	lb
Total Load	1871	lb	1798	lb
Bearing Length	0.82	in	0.79	in

BEAM DATA Center

Span Length	5.33	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	5.33	ft
Live Load Duration Factor	1.00	
Camber Adj. Factor	1.5	
Camber Required	0.08	
Notch Depth	0.00	

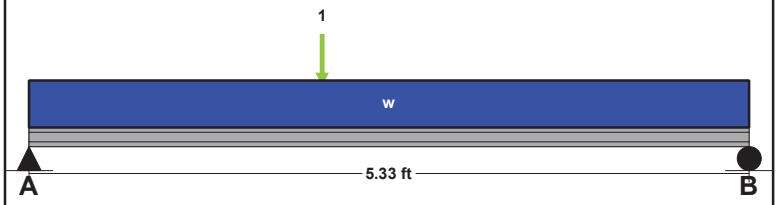
MATERIAL PROPERTIES
24F-V4 - Visually Graded Western Species

		Base Values			Adjusted	
Bending Stress:	Fb =	2400	psi	*Controlled by:*		
	Fb_cmpr =	1850	psi	Fb' =	2400	psi
	Cd=1.00					
Shear Stress:	Fv =	265	psi	Fv' =	265	psi
	Cd=1.00					
Modulus of Elasticity:	E =	1800	ksi	E' =	1800	ksi
Comp. ⊥ to Grain:	Fc - ⊥ =	650	psi	Fc - ⊥' =	650	psi

Controlling Moment: 2633 ft-lb
2.4 Ft from left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2
Controlling Shear: 1577 lb
At a distance d from left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2

Comparisons with required sections:	Req'd		Provided	
Section Modulus:	13.17	in3	21	in3
Area (Shear):	8.93	in2	21	in2
Moment of Inertia (deflection):	27.54	in4	63	in4
Moment:	2633	ft-lb	4200	ft-lb
Shear:	1577	lb	3710	lb

LOADING DIAGRAM



UNIFORM LOADS Center*

Uniform Live Load	369	plf
Uniform Dead Load	240	plf
Beam Self Weight	5	plf
Total Uniform Load	614	plf

* Load obtained from Load Tracker. See Summary Report for details.

POINT LOADS - CENTER SPAN

Load Number	One *	
Live Load	133	lb
Dead Load	266	lb
Location	2.17	ft

* Load obtained from Load Tracker. See Summary Report for details.

NOTES

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: WALL-2ND-1
Wall
[2015 International Building Code(2015 NDS)]
1.5 IN x 5.5 IN x 8.08 FT @ 16 O.C.
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 87.5%
Controlling Factor: Combined Stress Factor

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page of

StruCalc Version 10.0.1.6 7/26/2019 3:54:54 PM

DEFLECTIONS

Deflection due to lateral loads only:	Defl = 0.06	IN = L/1638
Live Load Deflection Criteria:		L/180

VERTICAL REACTIONS

Live Load:	Vert-LL-Rxn =	0	lb
Dead Load:	Vert-DL-Rxn =	119	lb
Total Load:	Vert-TL-Rxn =	119	lb

HORIZONTAL REACTIONS

Total Reaction at Top of Column:	TL-Rxn-Top =	83	lb
Total Reaction at Bottom of Column:	TL-Rxn-Bottom =	83	lb

WALL DATA

Total Stud Length:	8.08	ft
Wall Dead Weight:	11	psf
Unbraced Length (X-Axis) Lx:	8.08	ft
Unbraced Length (Y-Axis) Ly:	0	ft
Stud End Condition-K (e):	1	
Axial Load Duration Factor	1.00	
Lateral Load Duration Factor (Wind/Seismic)	1.60	

STUD PROPERTIES

#2 - Douglas-Fir-Larch

	Base Values	Adjusted
Compressive Stress:	Fc = 1350 psi	Fc' = 1254 psi
	Cd=1.60 Cf=1.10 Cp=0.53	
Bending Stress (X-X Axis):	Fbx = 900 psi	Fbx' = 2153 psi
	Cd=1.60 CF=1.30 Cr=1.15 Cl=1.00	
Bending Stress (Y-Y Axis):	Fby = 900 psi	Fby' = 2153 psi
	Cd=1.60 CF=1.30 Cr=1.15	
Modulus of Elasticity:	E = 1600 ksi	E' = 1600 ksi

Stud Section (X-X Axis):	dx =	5.5	in
Stud Section (Y-Y Axis):	dy =	1.5	in
Area:	A =	8.25	in2
Section Modulus (X-X Axis):	Sx =	7.56	in3
Section Modulus (Y-Y Axis):	Sy =	2.06	in3
Slenderness Ratio:	Lex/dx =	17.63	
	Ley/dy =	0	

Stud Calculations (Controlling Case Only):

Controlling Load Case: Axial Dead Load and Lateral loads (D + W or E)

Actual Compressive Stress:	Fc =	14	psi
Allowable Compressive Stress:	Fc' =	1254	psi
Eccentricity Moment (X-X Axis):	Mx-ex =	0	ft-lb
Eccentricity Moment (Y-Y Axis):	My-ey =	0	ft-lb
Moment Due to Lateral Loads (X-X Axis):	Mx =	168	ft-lb
Moment Due to Lateral Loads (Y-Y Axis):	My =	0	ft-lb
Bending Stress Lateral Loads Only (X-X Axis):	Fbx =	266	psi
Allowable Bending Stress (X-X Axis):	Fbx' =	2153	psi
Bending Stress Lateral Loads Only (Y-Y Axis):	Fby =	0	psi
Allowable Bending Stress (Y-Y Axis):	Fby' =	2153	psi
Combined Stress Factor:	**CSF =**	**0.12**	

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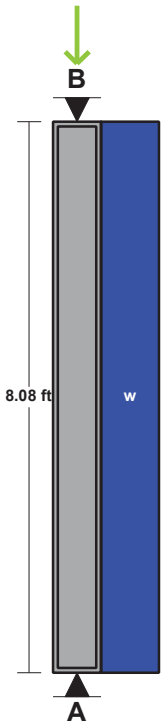

WALL LOAD CALCULATOR

	Live Load		Dead Load		Tributary Width	
Load Tracker:	LL = 0	plf	DL = 0	plf		
Roof:	LL = 25	psf	DL = 15	psf	TA = 0	ft
Upper Floor:	LL = 40	psf	DL = 15	psf	TA = 0	ft
Upper Floor Height:	0	ft				
Middle Floor:	LL = 40	psf	DL = 15	psf	TA = 0	ft
Middle Floor Height:	0	ft				
Calculated Load:	**LL = 0**	**plf**	**DL = 88.9**	**plf**		

AXIAL LOADING

Live Load:	PL =	0 plf *
Dead Load:	PD =	89 plf *
Total Axial Load:	PT =	89 plf

* Load obtained from Load Tracker. See Summary Report for details.

LATERAL LOADING (Dy Face)

Uniform Lateral Load: wL-Lat = 15 psf

NOTES

Established Basic Permit # 19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: WALL-2ND-2
Wall
[2015 International Building Code(2015 NDS)]
1.5 IN x 5.5 IN x 8.08 FT @ 16 O.C.
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 95.1%
Controlling Factor: Combined Stress Factor

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page of

StruCalc Version 10.0.1.6 7/26/2019 3:54:55 PM

DEFLECTIONS

Deflection due to lateral loads only:	Defl = 0.02	IN = L/5046
Live Load Deflection Criteria:		L/180

VERTICAL REACTIONS

Live Load:	Vert-LL-Rxn =	0	lb
Dead Load:	Vert-DL-Rxn =	119	lb
Total Load:	Vert-TL-Rxn =	119	lb

HORIZONTAL REACTIONS

Total Reaction at Top of Column:	TL-Rxn-Top =	27	lb
Total Reaction at Bottom of Column:	TL-Rxn-Bottom =	27	lb

WALL DATA

Total Stud Length:	8.08	ft
Wall Dead Weight:	11	psf
Unbraced Length (X-Axis) Lx:	8.08	ft
Unbraced Length (Y-Axis) Ly:	0	ft
Stud End Condition-K (e):	1	
Axial Load Duration Factor	1.00	
Lateral Load Duration Factor (Wind/Seismic)	1.33	

STUD PROPERTIES

#2 - Douglas-Fir-Larch

	Base Values	Adjusted
Compressive Stress:	Fc = 1350 psi	Fc' = 1182 psi
	Cd=1.33 Cf=1.10 Cp=0.60	
Bending Stress (X-X Axis):	Fbx = 900 psi	Fbx' = 1790 psi
	Cd=1.33 CF=1.30 Cr=1.15 Cl=1.00	
Bending Stress (Y-Y Axis):	Fby = 900 psi	Fby' = 1790 psi
	Cd=1.33 CF=1.30 Cr=1.15	
Modulus of Elasticity:	E = 1600 ksi	E' = 1600 ksi

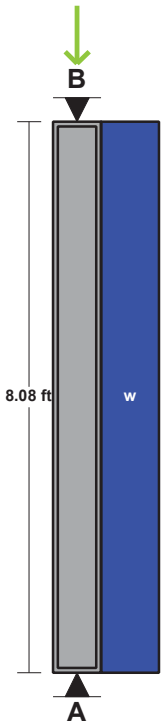
Stud Section (X-X Axis):	dx =	5.5	in
Stud Section (Y-Y Axis):	dy =	1.5	in
Area:	A =	8.25	in2
Section Modulus (X-X Axis):	Sx =	7.56	in3
Section Modulus (Y-Y Axis):	Sy =	2.06	in3
Slenderness Ratio:	Lex/dx =	17.63	
	Ley/dy =	0	

Stud Calculations (Controlling Case Only):

Controlling Load Case: Axial Dead Load and Lateral loads (D + W or E)

Actual Compressive Stress:	Fc =	14	psi
Allowable Compressive Stress:	Fc' =	1182	psi
Eccentricity Moment (X-X Axis):	Mx-ex =	0	ft-lb
Eccentricity Moment (Y-Y Axis):	My-ey =	0	ft-lb
Moment Due to Lateral Loads (X-X Axis):	Mx =	54	ft-lb
Moment Due to Lateral Loads (Y-Y Axis):	My =	0	ft-lb
Bending Stress Lateral Loads Only (X-X Axis):	Fbx =	86	psi
Allowable Bending Stress (X-X Axis):	Fbx' =	1790	psi
Bending Stress Lateral Loads Only (Y-Y Axis):	Fby =	0	psi
Allowable Bending Stress (Y-Y Axis):	Fby' =	1790	psi
Combined Stress Factor:	**CSF =**	**0.05**	

LOADING DIAGRAM



WALL LOAD CALCULATOR

	Live Load		Dead Load		Tributary Width	
Load Tracker:	LL = 0	plf	DL = 0	plf		
Roof:	LL = 25	psf	DL = 15	psf	TA = 0	ft
Upper Floor:	LL = 40	psf	DL = 15	psf	TA = 0	ft
Upper Floor Height:	0	ft				
Middle Floor:	LL = 40	psf	DL = 15	psf	TA = 0	ft
Middle Floor Height:	0	ft				
Calculated Load:	**LL = 0**	**plf**	**DL = 88.9**	**plf**		

AXIAL LOADING

Live Load:	PL =	0 plf *
Dead Load:	PD =	89 plf *
Total Axial Load:	PT =	89 plf

* Load obtained from Load Tracker. See Summary Report for details.

LATERAL LOADING (Dy Face)

Uniform Lateral Load: wL-Lat = 5 psf

NOTES

Established Basic Permit #

19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: WALL-2ND-3
Wall
[2015 International Building Code(2015 NDS)]
1.5 IN x 5.5 IN x 8.08 FT @ 16 O.C.
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 95.1%
Controlling Factor: Combined Stress Factor

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page of

StruCalc Version 10.0.1.6 7/26/2019 3:54:55 PM

DEFLECTIONS

Deflection due to lateral loads only:	Defl = 0.02	IN = L/5046
Live Load Deflection Criteria:		L/180

VERTICAL REACTIONS

Live Load:	Vert-LL-Rxn =	0	lb
Dead Load:	Vert-DL-Rxn =	108	lb
Total Load:	Vert-TL-Rxn =	108	lb

HORIZONTAL REACTIONS

Total Reaction at Top of Column:	TL-Rxn-Top =	27	lb
Total Reaction at Bottom of Column:	TL-Rxn-Bottom =	27	lb

WALL DATA

Total Stud Length:	8.08	ft
Wall Dead Weight:	10	psf
Unbraced Length (X-Axis) Lx:	8.08	ft
Unbraced Length (Y-Axis) Ly:	0	ft
Stud End Condition-K (e):	1	
Axial Load Duration Factor	1.00	
Lateral Load Duration Factor (Wind/Seismic)	1.33	

STUD PROPERTIES

#2 - Douglas-Fir-Larch

	Base Values	Adjusted
Compressive Stress:	Fc = 1350 psi	Fc' = 1182 psi
	Cd=1.33 Cf=1.10 Cp=0.60	
Bending Stress (X-X Axis):	Fbx = 900 psi	Fbx' = 1790 psi
	Cd=1.33 CF=1.30 Cr=1.15 Cl=1.00	
Bending Stress (Y-Y Axis):	Fby = 900 psi	Fby' = 1790 psi
	Cd=1.33 CF=1.30 Cr=1.15	
Modulus of Elasticity:	E = 1600 ksi	E' = 1600 ksi

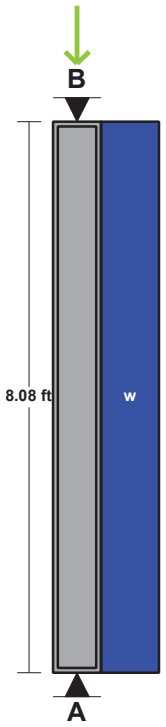
Stud Section (X-X Axis):	dx =	5.5	in
Stud Section (Y-Y Axis):	dy =	1.5	in
Area:	A =	8.25	in2
Section Modulus (X-X Axis):	Sx =	7.56	in3
Section Modulus (Y-Y Axis):	Sy =	2.06	in3
Slenderness Ratio:	Lex/dx =	17.63	
	Ley/dy =	0	

Stud Calculations (Controlling Case Only):

Controlling Load Case: Axial Dead Load and Lateral loads (D + W or E)

Actual Compressive Stress:	Fc =	13	psi
Allowable Compressive Stress:	Fc' =	1182	psi
Eccentricity Moment (X-X Axis):	Mx-ex =	0	ft-lb
Eccentricity Moment (Y-Y Axis):	My-ey =	0	ft-lb
Moment Due to Lateral Loads (X-X Axis):	Mx =	54	ft-lb
Moment Due to Lateral Loads (Y-Y Axis):	My =	0	ft-lb
Bending Stress Lateral Loads Only (X-X Axis):	Fbx =	86	psi
Allowable Bending Stress (X-X Axis):	Fbx' =	1790	psi
Bending Stress Lateral Loads Only (Y-Y Axis):	Fby =	0	psi
Allowable Bending Stress (Y-Y Axis):	Fby' =	1790	psi
Combined Stress Factor:	**CSF =**	**0.05**	

LOADING DIAGRAM



WALL LOAD CALCULATOR

	Live Load		Dead Load		Tributary Width	
Load Tracker:	LL = 0	plf	DL = 0	plf		
Roof:	LL = 25	psf	DL = 15	psf	TA = 0	ft
Upper Floor:	LL = 40	psf	DL = 15	psf	TA = 0	ft
Upper Floor Height:	0	ft				
Middle Floor:	LL = 40	psf	DL = 15	psf	TA = 0	ft
Middle Floor Height:	0	ft				
Calculated Load:	**LL = 0**	**plf**	**DL = 80.8**	**plf**		

AXIAL LOADING

Live Load:	PL =	0 plf *
Dead Load:	PD =	81 plf *
Total Axial Load:	PT =	81 plf

* Load obtained from Load Tracker. See Summary Report for details.

LATERAL LOADING (Dy Face)

Uniform Lateral Load: wL-Lat = 5 psf

NOTES

Established Basic Permit # 19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: JST3-7
Floor Joist
[2015 International Building Code(2015 NDS)]
SERIES 18 / 11.875 - Louisiana Pacific x 10.75 FT @ 16 O.C.
Section Adequate By: 125.0%
Controlling Factor: End Reaction

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page of

StruCalc Version 10.0.1.6 7/26/2019 3:54:55 PM

DEFLECTIONS Center

Live Load	0.08	IN L/1638
Dead Load	0.03	in
Total Load	0.11	IN L/1191

Live Load Deflection Criteria: L/480 Total Load Deflection Criteria: L/360

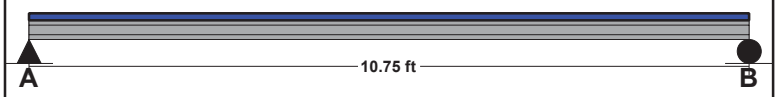
REACTIONS

	A	B
Live Load	287 lb	287 lb
Dead Load	108 lb	108 lb
Total Load	395 lb	395 lb
Bearing Length	1.75 in	1.75 in
Web Stiffeners	No	No

SUPPORT LOADS

	A	B
Live Load	215 plf	215 plf
Dead Load	81 plf	81 plf
Total Load	296 plf	296 plf

LOADING DIAGRAM



I-JOIST PROPERTIES

SERIES 18 / 11.875 - Louisiana Pacific

	Base Values	Adjusted
Moment Cap:	Mcap = 3100 ft-lb	Mcap' = 3100 ft-lb
	Cd = 1.00	
Shear Stress:	Vcap = 1335 lb	Vcap' = 1335 lb
	Cd = 1.00	
Reaction A:	Rcap = 887 lb	Rcap' = 887 lb
Reaction B:	Rcap = 887 lb	Rcap' = 887 lb
E.I.:	EI = 248 lb-in2	EI' = 248 lb-in2

Controlling Moment: 1059 ft-lb
5.38 Ft from left support of span 3 (Right Span)
Created by combining all dead and live loads.
Controlling Shear: 394 lb
0.0 Ft from left support of span 2 (Center Span)
Created by combining all dead and live loads.

JOIST DATA Center

Span Length	10.75	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	0	ft

Floor sheathing applied to top of joists-top of joists fully braced.
Floor Duration Factor 1.00

JOIST LOADING

Uniform Floor Loading Center

Live Load	LL =	40	psf
Dead Load	DL =	15	psf
Total Load	TL =	55	psf
TL Adj. For Joist Spacing	wT =	73.3	plf

Comparisons with required sections:

	Req'd	Provided
E.I.:	75 in2-lb E6	248 in2-lb xE6
Moment:	1059 ft-lb	3100 ft-lb
Shear:	394 lb	1335 lb

NOTES

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: MLB3-3
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2015 NDS)]
1.75 IN x 11.25 IN x 6.5 FT (4.8 + 1.8)
LSL 1730 Fb-1.35E - Louisiana Pacific
Section Adequate By: 330.4%
Controlling Factor: Moment

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page of

StruCalc Version 10.0.1.6 7/26/2019 3:54:56 PM

DEFLECTIONS	Center		Right	
Live Load	0.01	IN L/5695	0.01	IN 2L/3430
Dead Load	0.00	in	0.01	in
Total Load	0.01	IN L/6066	0.02	IN 2L/2132

Live Load Deflection Criteria: L/360 Total Load Deflection Criteria: L/240

REACTIONS	A		B	
Live Load	582	lb	1036	lb
Dead Load	118	lb	739	lb
Total Load	700	lb	1775	lb
Uplift (1.5 F.S)	**-33**	**lb**	0	**lb**
Bearing Length	0.53	in	1.35	in

BEAM DATA	Center		Right	
Span Length	4.75	ft	1.75	ft
Unbraced Length-Top	0	ft	0	ft
Unbraced Length-Bottom	4.75	ft	1.75	ft
Live Load Duration Factor	1.00			
Notch Depth	0.00			

MATERIAL PROPERTIES

LSL 1730 Fb-1.35E - Louisiana Pacific

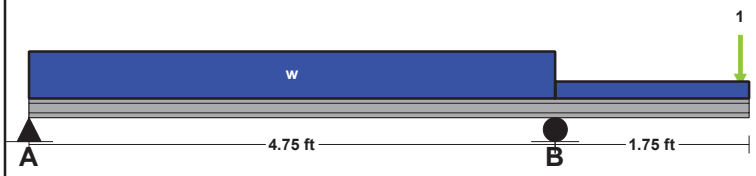
	Base Values			Adjusted	
Bending Stress:	Fb =	1730	psi	Fb' =	1485 psi
	Cd=1.00 Cl=0.85 CF=1.01				
Shear Stress:	Fv =	410	psi	Fv' =	410 psi
	Cd=1.00				
Modulus of Elasticity:	E =	1350	ksi	E' =	1350 ksi
Comp. ⊥ to Grain:	Fc - ⊥ =	750	psi	Fc - ⊥' =	750 psi

Controlling Moment: -1061 ft-lb
Over right support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 3

Controlling Shear: -727 lb
At a distance d from right support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2, 3

Comparisons with required sections:	Req'd	Provided
Section Modulus:	8.58 in3	36.91 in3
Area (Shear):	2.66 in2	19.69 in2
Moment of Inertia (deflection):	23.38 in4	207.64 in4
Moment:	-1061 ft-lb	4567 ft-lb
Shear:	-727 lb	5381 lb

LOADING DIAGRAM



UNIFORM LOADS	Center*		Right	
Uniform Live Load	245	plf	30	plf
Uniform Dead Load	91	plf	90	plf
Beam Self Weight	6	plf	6	plf
Total Uniform Load	342	plf	126	plf

* Load obtained from Load Tracker. See Summary Report for details.

POINT LOADS - RIGHT SPAN	
Load Number	One
Live Load	290 lb
Dead Load	230 lb
Location	1.67 ft

NOTES

Established Basic Permit #

19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: JST3-8
Floor Joist
[2015 International Building Code(2015 NDS)]
SERIES 56 / 11.875 - Louisiana Pacific x 6.33 FT (4.6 + 1.8) @ 16 O.C.
Section Adequate By: 13.7%
Controlling Factor: End Reaction

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page of

StruCalc Version 10.0.1.6 7/26/2019 3:54:56 PM

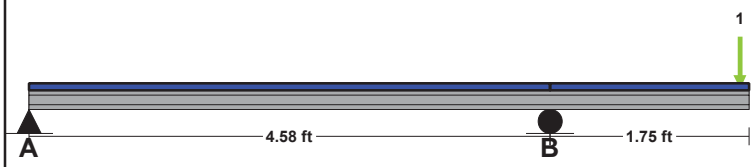
DEFLECTIONS	Center		Right	
Live Load	-0.02	IN L/3593	-0.01	IN 2L/2810
Dead Load	-0.01	in	-0.01	in
Total Load	-0.03	IN L/2040	-0.03	IN 2L/1584

Live Load Deflection Criteria: L/480 Total Load Deflection Criteria: L/360

REACTIONS	A		B	
Live Load	122	lb	1018	lb
Dead Load	-130	lb	721	lb
Total Load	-8	lb	1739	lb
Uplift (1.5 F.S)	**-357**	**lb**	0	**lb**
Bearing Length	3.50	in	3.50	in
Web Stiffeners	Yes		Yes	

SUPPORT LOADS	A		B	
Live Load	92	plf	764	plf
Dead Load	-98	plf	541	plf
Total Load	-6	plf	1304	plf

LOADING DIAGRAM



JOIST DATA	Center		Right	
Span Length	4.58	ft	1.75	ft
Unbraced Length-Top	0	ft	0	ft
Unbraced Length-Bottom	0	ft	0	ft

Floor sheathing applied to top of joists-top of joists fully braced.
Floor Duration Factor 1.00

I-JOIST PROPERTIES
SERIES 56 / 11.875 - Louisiana Pacific

	Base Values		Adjusted	
Moment Cap:	Mcap = 10170	ft-lb	Mcap' = 10170	ft-lb
	Cd = 1.00			
Shear Stress:	Vcap = 2055	lb	Vcap' = 2055	lb
	Cd = 1.00			
Reaction A:	Rcap = 1976	lb	Rcap' = 1976	lb
Reaction B:	Rcap = 1976	lb	Rcap' = 1976	lb
E.I.:	EI = 668	lb-in2	EI' = 668	lb-in2

Controlling Moment: -1847 ft-lb
4.58 Ft from left support of span 3 (Right Span)
Created by combining all dead and live loads.
Controlling Shear: 1167 lb
0.0 Ft from left support of span 3 (Right Span)
Created by combining all dead and live loads.

JOIST LOADING

Uniform Floor Loading		Center		Right	
Live Load	LL =	40	psf	40	psf
Dead Load	DL =	15	psf	15	psf
Total Load	TL =	55	psf	55	psf
TL Adj. For Joist Spacing	wT =	73.3	plf	73.3	plf
Wall Loading					
Wall One					
Live Load (⊥ to Joists):	L1 =	0	plf	431	plf
Dead Load (⊥ to Joists)	D1 =	0	plf	348	plf
Load Location	X1 =	0	ft	1.67	ft

Comparisons with required sections:	Req'd	Provided
E.I.:	152 in2-lb E6	668 in2-lb xE6
Moment:	-1847 ft-lb	10170 ft-lb
Shear:	1167 lb	2055 lb

NOTES

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: MLB3-4
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2015 NDS)]
3.5 IN x 11.875 IN x 17.83 FT
LSL 2360 Fb-1.55E - Louisiana Pacific
Section Adequate By: 48.1%
Controlling Factor: Deflection

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page of

StruCalc Version 10.0.1.6 7/26/2019 3:54:57 PM

DEFLECTIONS Center

Live Load	0.40	IN L/533
Dead Load	0.03	in
Total Load	0.43	IN L/501

Live Load Deflection Criteria: L/360 Total Load Deflection Criteria: L/240

REACTIONS

	A	B
Live Load	833 lb	1345 lb
Dead Load	195 lb	-199 lb
Total Load	1028 lb	1146 lb
Uplift (1.5 F.S)	0 **lb**	**-199 lb**
Bearing Length	0.34 in	0.37 in

BEAM DATA

	Center
Span Length	17.83 ft
Unbraced Length-Top	0 ft
Unbraced Length-Bottom	17.83 ft
Live Load Duration Factor	1.00
Notch Depth	0.00

MATERIAL PROPERTIES

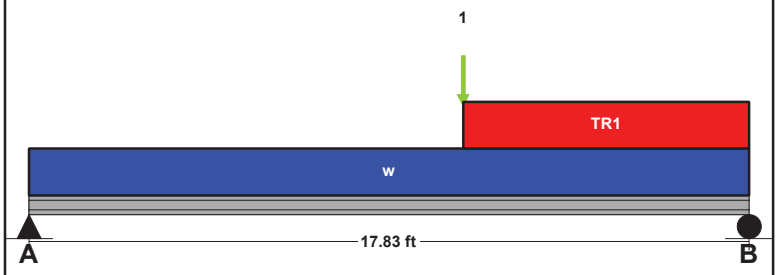
LSL 2360 Fb-1.55E - Louisiana Pacific

	Base Values	Adjusted
Bending Stress:	Fb = 2360 psi	Fb' = 2364 psi
	Cd=1.00 CF=1.00	
Shear Stress:	Fv = 410 psi	Fv' = 410 psi
	Cd=1.00	
Modulus of Elasticity:	E = 1550 ksi	E' = 1550 ksi
Comp. ⊥ to Grain:	Fc - ⊥ = 875 psi	Fc - ⊥' = 875 psi

Controlling Moment: 6131 ft-lb
10.7 Ft from left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2
Controlling Shear: -1076 lb
At a distance d from right support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2

Comparisons with required sections:	Req'd	Provided
Section Modulus:	31.13 in3	82.26 in3
Area (Shear):	3.94 in2	41.56 in2
Moment of Inertia (deflection):	329.87 in4	488.41 in4
Moment:	6131 ft-lb	16202 ft-lb
Shear:	-1076 lb	11360 lb

LOADING DIAGRAM



UNIFORM LOADS Center

Uniform Live Load	53 plf
Uniform Dead Load	20 plf
Beam Self Weight	12 plf
Total Uniform Load	85 plf

POINT LOADS - CENTER SPAN

Load Number	One *
Live Load	582 lb
Dead Load	118 lb
Location	10.75 ft

* Load obtained from Load Tracker. See Summary Report for details.

TRAPEZOIDAL LOADS - CENTER SPAN

Load Number	One *
Left Live Load	92 plf
Left Dead Load	-98 plf
Right Live Load	92 plf
Right Dead Load	-98 plf
Load Start	10.75 ft
Load End	17.83 ft
Load Length	7.08 ft

* Load obtained from Load Tracker. See Summary Report for details.

NOTES

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: WALL-2ND-4
Wall
[2015 International Building Code(2015 NDS)]
1.5 IN x 5.5 IN x 8.08 FT @ 16 O.C.
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 87.5%
Controlling Factor: Combined Stress Factor

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page of

StruCalc Version 10.0.1.6 7/26/2019 3:54:57 PM

DEFLECTIONS

Deflection due to lateral loads only:	Defl = 0.06	IN = L/1638
Live Load Deflection Criteria:		L/180

VERTICAL REACTIONS

Live Load:	Vert-LL-Rxn =	0	lb
Dead Load:	Vert-DL-Rxn =	119	lb
Total Load:	Vert-TL-Rxn =	119	lb

HORIZONTAL REACTIONS

Total Reaction at Top of Column:	TL-Rxn-Top =	83	lb
Total Reaction at Bottom of Column:	TL-Rxn-Bottom =	83	lb

WALL DATA

Total Stud Length:	8.08	ft
Wall Dead Weight:	11	psf
Unbraced Length (X-Axis) Lx:	8.08	ft
Unbraced Length (Y-Axis) Ly:	0	ft
Stud End Condition-K (e):	1	
Axial Load Duration Factor	1.00	
Lateral Load Duration Factor (Wind/Seismic)	1.60	

STUD PROPERTIES

#2 - Douglas-Fir-Larch

	Base Values	Adjusted
Compressive Stress:	Fc = 1350 psi	Fc' = 1254 psi
	Cd=1.60 Cf=1.10 Cp=0.53	
Bending Stress (X-X Axis):	Fbx = 900 psi	Fbx' = 2153 psi
	Cd=1.60 CF=1.30 Cr=1.15 Cl=1.00	
Bending Stress (Y-Y Axis):	Fby = 900 psi	Fby' = 2153 psi
	Cd=1.60 CF=1.30 Cr=1.15	
Modulus of Elasticity:	E = 1600 ksi	E' = 1600 ksi

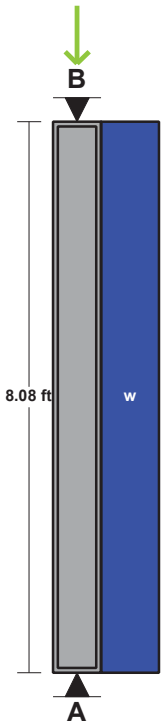
Stud Section (X-X Axis):	dx =	5.5	in
Stud Section (Y-Y Axis):	dy =	1.5	in
Area:	A =	8.25	in2
Section Modulus (X-X Axis):	Sx =	7.56	in3
Section Modulus (Y-Y Axis):	Sy =	2.06	in3
Slenderness Ratio:	Lex/dx =	17.63	
	Ley/dy =	0	

Stud Calculations (Controlling Case Only):

Controlling Load Case: Axial Dead Load and Lateral loads (D + W or E)

Actual Compressive Stress:	Fc =	14	psi
Allowable Compressive Stress:	Fc' =	1254	psi
Eccentricity Moment (X-X Axis):	Mx-ex =	0	ft-lb
Eccentricity Moment (Y-Y Axis):	My-ey =	0	ft-lb
Moment Due to Lateral Loads (X-X Axis):	Mx =	168	ft-lb
Moment Due to Lateral Loads (Y-Y Axis):	My =	0	ft-lb
Bending Stress Lateral Loads Only (X-X Axis):	Fbx =	266	psi
Allowable Bending Stress (X-X Axis):	Fbx' =	2153	psi
Bending Stress Lateral Loads Only (Y-Y Axis):	Fby =	0	psi
Allowable Bending Stress (Y-Y Axis):	Fby' =	2153	psi
Combined Stress Factor:	**CSF =**	**0.12**	

LOADING DIAGRAM



WALL LOAD CALCULATOR

	Live Load		Dead Load		Tributary Width	
Load Tracker:	LL = 0	plf	DL = 0	plf		
Roof:	LL = 25	psf	DL = 15	psf	TA = 0	ft
Upper Floor:	LL = 40	psf	DL = 15	psf	TA = 0	ft
Upper Floor Height:	0	ft				
Middle Floor:	LL = 40	psf	DL = 15	psf	TA = 0	ft
Middle Floor Height:	0	ft				
Calculated Load:	**LL = 0**	**plf**	**DL = 88.9**	**plf**		

AXIAL LOADING

Live Load:	PL =	0 plf *
Dead Load:	PD =	89 plf *
Total Axial Load:	PT =	89 plf

* Load obtained from Load Tracker. See Summary Report for details.

LATERAL LOADING (Dy Face)

Uniform Lateral Load: wL-Lat = 15 psf

NOTES

Established Basic Permit # 19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: MLB3-5
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2015 NDS)]
3.5 IN x 6.0 IN x 5.33 FT
24F-V4 - Visually Graded Western Species - Dry Use
Section Adequate By: 42.7%
Controlling Factor: Moment

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StruCalc Version 10.0.1.6 7/26/2019 3:54:58 PM

DEFLECTIONS Center

Live Load	0.09	IN L/748
Dead Load	0.04	in
Total Load	0.13	IN L/493

Live Load Deflection Criteria: L/360 Total Load Deflection Criteria: L/240

REACTIONS A B

	A		B	
Live Load	1362	lb	1157	lb
Dead Load	715	lb	679	lb
Total Load	2077	lb	1836	lb
Bearing Length	0.91	in	0.81	in

BEAM DATA Center

Span Length	5.33	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	5.33	ft
Live Load Duration Factor	1.00	
Camber Adj. Factor	1.5	
Camber Required	0.07	
Notch Depth	0.00	

MATERIAL PROPERTIES

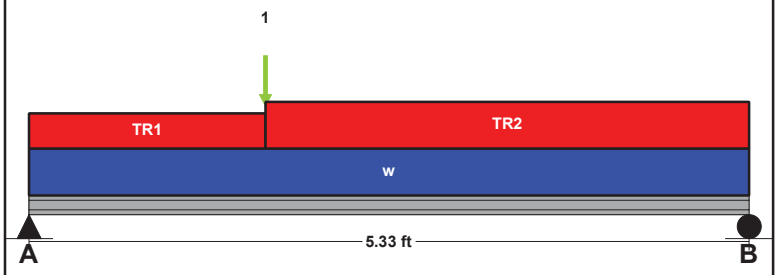
24F-V4 - Visually Graded Western Species

		Base Values		Adjusted	
Bending Stress:	Fb =	2400	psi	*Controlled by:*	
	Fb_cmpr =	1850	psi	Fb' =	2400 psi
	Cd=1.00				
Shear Stress:	Fv =	265	psi	Fv' =	265 psi
	Cd=1.00				
Modulus of Elasticity:	E =	1800	ksi	E' =	1800 ksi
Comp. ⊥ to Grain:	Fc - ⊥ =	650	psi	Fc - ⊥' =	650 psi

Controlling Moment: 2944 ft-lb
2.13 Ft from left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2
Controlling Shear: 1848 lb
At a distance d from left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2

Comparisons with required sections:	Req'd	Provided
Section Modulus:	14.72 in3	21 in3
Area (Shear):	10.46 in2	21 in2
Moment of Inertia (deflection):	30.68 in4	63 in4
Moment:	2944 ft-lb	4200 ft-lb
Shear:	1848 lb	3710 lb

LOADING DIAGRAM



UNIFORM LOADS Center*

Uniform Live Load	55	plf
Uniform Dead Load	122	plf
Beam Self Weight	5	plf
Total Uniform Load	182	plf

* Load obtained from Load Tracker. See Summary Report for details.

POINT LOADS - CENTER SPAN

Load Number	One *	
Live Load	833	lb
Dead Load	195	lb
Location	1.75	ft

* Load obtained from Load Tracker. See Summary Report for details.

TRAPEZOIDAL LOADS - CENTER SPAN

Load Number	One *		Two *	
Left Live Load	215	plf	284	plf
Left Dead Load	81	plf	107	plf
Right Live Load	215	plf	284	plf
Right Dead Load	81	plf	107	plf
Load Start	0	ft	1.75	ft
Load End	1.75	ft	5.33	ft
Load Length	1.75	ft	3.58	ft

* Load obtained from Load Tracker. See Summary Report for details.

NOTES

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: WALL-2ND-5
Wall
[2015 International Building Code(2015 NDS)]
1.5 IN x 5.5 IN x 8.08 FT @ 16 O.C.
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 87.5%
Controlling Factor: Combined Stress Factor

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page of

StruCalc Version 10.0.1.6 7/26/2019 3:54:58 PM

DEFLECTIONS

Deflection due to lateral loads only:	Defl = 0.06	IN = L/1638
Live Load Deflection Criteria:		L/180

VERTICAL REACTIONS

Live Load:	Vert-LL-Rxn =	0	lb
Dead Load:	Vert-DL-Rxn =	119	lb
Total Load:	Vert-TL-Rxn =	119	lb

HORIZONTAL REACTIONS

Total Reaction at Top of Column:	TL-Rxn-Top =	83	lb
Total Reaction at Bottom of Column:	TL-Rxn-Bottom =	83	lb

WALL DATA

Total Stud Length:	8.08	ft
Wall Dead Weight:	11	psf
Unbraced Length (X-Axis) Lx:	8.08	ft
Unbraced Length (Y-Axis) Ly:	0	ft
Stud End Condition-K (e):	1	
Axial Load Duration Factor	1.00	
Lateral Load Duration Factor (Wind/Seismic)	1.60	

STUD PROPERTIES

#2 - Douglas-Fir-Larch

	Base Values	Adjusted
Compressive Stress:	Fc = 1350 psi	Fc' = 1254 psi
	Cd=1.60 Cf=1.10 Cp=0.53	
Bending Stress (X-X Axis):	Fbx = 900 psi	Fbx' = 2153 psi
	Cd=1.60 CF=1.30 Cr=1.15 Cl=1.00	
Bending Stress (Y-Y Axis):	Fby = 900 psi	Fby' = 2153 psi
	Cd=1.60 CF=1.30 Cr=1.15	
Modulus of Elasticity:	E = 1600 ksi	E' = 1600 ksi

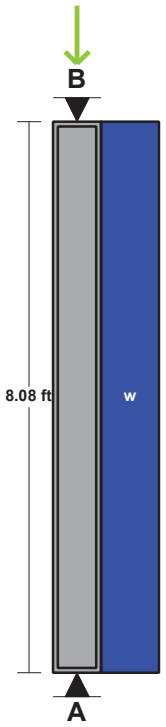
Stud Section (X-X Axis):	dx =	5.5	in
Stud Section (Y-Y Axis):	dy =	1.5	in
Area:	A =	8.25	in2
Section Modulus (X-X Axis):	Sx =	7.56	in3
Section Modulus (Y-Y Axis):	Sy =	2.06	in3
Slenderness Ratio:	Lex/dx =	17.63	
	Ley/dy =	0	

Stud Calculations (Controlling Case Only):

Controlling Load Case: Axial Dead Load and Lateral loads (D + W or E)

Actual Compressive Stress:	Fc =	14	psi
Allowable Compressive Stress:	Fc' =	1254	psi
Eccentricity Moment (X-X Axis):	Mx-ex =	0	ft-lb
Eccentricity Moment (Y-Y Axis):	My-ey =	0	ft-lb
Moment Due to Lateral Loads (X-X Axis):	Mx =	168	ft-lb
Moment Due to Lateral Loads (Y-Y Axis):	My =	0	ft-lb
Bending Stress Lateral Loads Only (X-X Axis):	Fbx =	266	psi
Allowable Bending Stress (X-X Axis):	Fbx' =	2153	psi
Bending Stress Lateral Loads Only (Y-Y Axis):	Fby =	0	psi
Allowable Bending Stress (Y-Y Axis):	Fby' =	2153	psi
Combined Stress Factor:	**CSF =**	**0.12**	

LOADING DIAGRAM



WALL LOAD CALCULATOR

	Live Load		Dead Load		Tributary Width	
Load Tracker:	LL = 0	plf	DL = 0	plf		
Roof:	LL = 25	psf	DL = 15	psf	TA = 0	ft
Upper Floor:	LL = 40	psf	DL = 15	psf	TA = 0	ft
Upper Floor Height:	0	ft				
Middle Floor:	LL = 40	psf	DL = 15	psf	TA = 0	ft
Middle Floor Height:	0	ft				
Calculated Load:	**LL = 0**	**plf**	**DL = 88.9**	**plf**		

AXIAL LOADING

Live Load:	PL =	0 plf *
Dead Load:	PD =	89 plf *
Total Axial Load:	PT =	89 plf

* Load obtained from Load Tracker. See Summary Report for details.

LATERAL LOADING (Dy Face)

Uniform Lateral Load: wL-Lat = 15 psf

NOTES

Established Basic Permit # 19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: JST2-2
Floor Joist
[2015 International Building Code(2015 NDS)]
SERIES 56 / 11.875 - Louisiana Pacific x 12.75 FT (11 + 1.8) @ 16 O.C.
Section Adequate By: 22.4%
Controlling Factor: End Reaction

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page of

StruCalc Version 10.0.1.6 7/26/2019 3:54:58 PM

DEFLECTIONS	Center		Right	
Live Load	0.04	IN L/3469	0.02	IN 2L/2432
Dead Load	-0.01	in	-0.01	in
Total Load	-0.04	IN L/3621	0.03	IN 2L/1564

Live Load Deflection Criteria: L/480 Total Load Deflection Criteria: L/360

REACTIONS	A		B	
Live Load	293	lb	961	lb
Dead Load	41	lb	653	lb
Total Load	334	lb	1614	lb
Uplift (1.5 F.S)	**-55**	**lb**	0	**lb**
Bearing Length	1.75	in	3.50	in
Web Stiffeners	Yes		Yes	

SUPPORT LOADS	A		B	
Live Load	220	plf	721	plf
Dead Load	31	plf	490	plf
Total Load	251	plf	1211	plf

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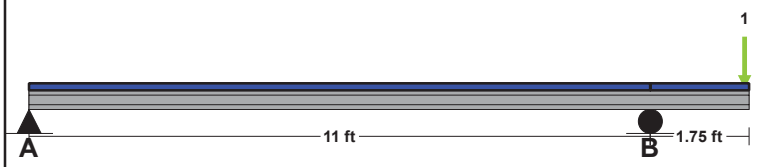

JOIST DATA	Center		Right	
Span Length	11	ft	1.75	ft
Unbraced Length-Top	0	ft	0	ft
Unbraced Length-Bottom	0	ft	0	ft

Floor sheathing applied to top of joists-top of joists fully braced.
Floor Duration Factor 1.00

I-JOIST PROPERTIES
SERIES 56 / 11.875 - Louisiana Pacific

	Base Values	Adjusted
Moment Cap:	Mcap = 10170 ft-lb	Mcap' = 10170 ft-lb
	Cd = 1.00	
Shear Stress:	Vcap = 2055 lb	Vcap' = 2055 lb
	Cd = 1.00	
Reaction A:	Rcap = 1700 lb	Rcap' = 1700 lb
Reaction B:	Rcap = 1976 lb	Rcap' = 1976 lb
E.I.:	EI = 668 lb-in2	EI' = 668 lb-in2

Controlling Moment: -1667 ft-lb
11.0 Ft from left support of span 3 (Right Span)
Created by combining all dead and live loads.
Controlling Shear: 1059 lb
0.0 Ft from left support of span 3 (Right Span)
Created by combining all dead and live loads.

JOIST LOADING

Uniform Floor Loading		Center		Right	
Live Load	LL =	40	psf	40	psf
Dead Load	DL =	15	psf	15	psf
Total Load	TL =	55	psf	55	psf
TL Adj. For Joist Spacing	wT =	73.3	plf	73.3	plf

Wall Loading
Wall One

Live Load (⊥ to Joists):	L1 =	0	plf	369	plf
Dead Load (⊥ to Joists)	D1 =	0	plf	329	plf
Load Location	X1 =	0	ft	1.67	ft

Comparisons with required sections:	Req'd	Provided
E.I.:	154 in2-lb E6	668 in2-lb xE6
Moment:	-1667 ft-lb	10170 ft-lb
Shear:	1059 lb	2055 lb

NOTES

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: JST2-1
Floor Joist
[2015 International Building Code(2015 NDS)]
SERIES 18 / 11.875 - Louisiana Pacific x 10.83 FT @ 16 O.C.
Section Adequate By: 153.3%
Controlling Factor: End Reaction

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page
of

StruCalc Version 10.0.1.6 7/26/2019 3:54:59 PM

DEFLECTIONS Center

Live Load	0.08	IN L/1606
Dead Load	0.03	in
Total Load	0.11	IN L/1168

Live Load Deflection Criteria: L/480 Total Load Deflection Criteria: L/360

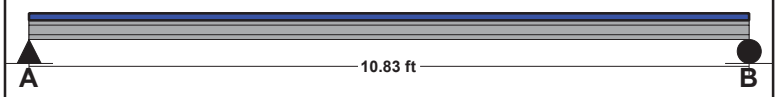
REACTIONS

	A		B	
Live Load	289	lb	289	lb
Dead Load	108	lb	108	lb
Total Load	397	lb	397	lb
Bearing Length	1.75	in	3.50	in
Web Stiffeners	Yes		No	

SUPPORT LOADS

	A		B	
Live Load	217	plf	217	plf
Dead Load	81	plf	81	plf
Total Load	298	plf	298	plf

LOADING DIAGRAM



I-JOIST PROPERTIES

SERIES 18 / 11.875 - Louisiana Pacific

	Base Values	Adjusted
Moment Cap:	Mcap = 3100 ft-lb	Mcap' = 3100 ft-lb
	Cd = 1.00	
Shear Stress:	Vcap = 1335 lb	Vcap' = 1335 lb
	Cd = 1.00	
Reaction A:	Rcap = 1164 lb	Rcap' = 1164 lb
Reaction B:	Rcap = 1006 lb	Rcap' = 1006 lb
E.I.:	EI = 248 lb-in2	EI' = 248 lb-in2

Controlling Moment: 1075 ft-lb
5.41 Ft from left support of span 3 (Right Span)
Created by combining all dead and live loads.
Controlling Shear: 397 lb
0.0 Ft from left support of span 2 (Center Span)
Created by combining all dead and live loads.

JOIST DATA Center

Span Length	10.83	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	0	ft

Floor sheathing applied to top of joists-top of joists fully braced.
Floor Duration Factor 1.00

JOIST LOADING

Uniform Floor Loading Center

Live Load	LL =	40	psf
Dead Load	DL =	15	psf
Total Load	TL =	55	psf
TL Adj. For Joist Spacing	wT =	73.3	plf

Comparisons with required sections:

	Req'd	Provided
E.I.:	76 in2-lb E6	248 in2-lb xE6
Moment:	1075 ft-lb	3100 ft-lb
Shear:	397 lb	1335 lb

NOTES

Established Basic Permit #

19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: JST2-3
Floor Joist
[2015 International Building Code(2015 NDS)]
SERIES 18 / 11.875 - Louisiana Pacific x 6.92 FT @ 16 O.C.
Section Adequate By: 296.5%
Controlling Factor: End Reaction

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page of

StruCalc Version 10.0.1.6 7/26/2019 3:54:59 PM

DEFLECTIONS Center

Live Load	0.02	IN L/4895
Dead Load	0.01	in
Total Load	0.02	IN L/3560

Live Load Deflection Criteria: L/480 Total Load Deflection Criteria: L/360

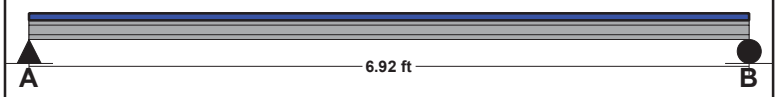
REACTIONS

	A		B	
Live Load	185	lb	185	lb
Dead Load	69	lb	69	lb
Total Load	254	lb	254	lb
Bearing Length	1.75	in	3.50	in
Web Stiffeners	Yes		No	

SUPPORT LOADS

	A		B	
Live Load	139	plf	139	plf
Dead Load	52	plf	52	plf
Total Load	191	plf	191	plf

LOADING DIAGRAM



I-JOIST PROPERTIES

SERIES 18 / 11.875 - Louisiana Pacific

	Base Values	Adjusted
Moment Cap:	Mcap = 3100 ft-lb	Mcap' = 3100 ft-lb
	Cd = 1.00	
Shear Stress:	Vcap = 1335 lb	Vcap' = 1335 lb
	Cd = 1.00	
Reaction A:	Rcap = 1164 lb	Rcap' = 1164 lb
Reaction B:	Rcap = 1006 lb	Rcap' = 1006 lb
E.I.:	EI = 248 lb-in2	EI' = 248 lb-in2

Controlling Moment: 439 ft-lb
3.46 Ft from left support of span 3 (Right Span)
Created by combining all dead and live loads.
Controlling Shear: 254 lb
0.0 Ft from left support of span 2 (Center Span)
Created by combining all dead and live loads.

JOIST DATA Center

Span Length	6.92	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	0	ft

Floor sheathing applied to top of joists-top of joists fully braced.
Floor Duration Factor 1.00

JOIST LOADING

Uniform Floor Loading		Center	
Live Load	LL =	40	psf
Dead Load	DL =	15	psf
Total Load	TL =	55	psf
TL Adj. For Joist Spacing	wT =	73.3	plf

Comparisons with required sections:

	Req'd	Provided
E.I.:	25 in2-lb E6	248 in2-lb xE6
Moment:	439 ft-lb	3100 ft-lb
Shear:	254 lb	1335 lb

NOTES

Established Basic Permit #

19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: JST2-4
Floor Joist
[2015 International Building Code(2015 NDS)]
SERIES 18 / 11.875 - Louisiana Pacific x 3.33 FT @ 16 O.C.
Section Adequate By: 723.9%
Controlling Factor: End Reaction

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page of

StruCalc Version 10.0.1.6 7/26/2019 3:55:00 PM

DEFLECTIONS Center

Live Load	0.00	IN L/MAX
Dead Load	0.00	in
Total Load	0.00	IN L/MAX

Live Load Deflection Criteria: L/480 Total Load Deflection Criteria: L/360

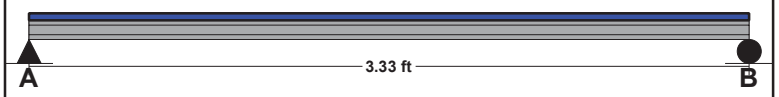
REACTIONS

	A	B
Live Load	89 lb	89 lb
Dead Load	33 lb	33 lb
Total Load	122 lb	122 lb
Bearing Length	1.75 in	3.50 in
Web Stiffeners	Yes	No

SUPPORT LOADS

	A	B
Live Load	67 plf	67 plf
Dead Load	25 plf	25 plf
Total Load	92 plf	92 plf

LOADING DIAGRAM



I-JOIST PROPERTIES

SERIES 18 / 11.875 - Louisiana Pacific

	Base Values	Adjusted
Moment Cap:	Mcap = 3100 ft-lb	Mcap' = 3100 ft-lb
	Cd = 1.00	
Shear Stress:	Vcap = 1335 lb	Vcap' = 1335 lb
	Cd = 1.00	
Reaction A:	Rcap = 1164 lb	Rcap' = 1164 lb
Reaction B:	Rcap = 1006 lb	Rcap' = 1006 lb
E.I.:	EI = 248 lb-in2	EI' = 248 lb-in2

Controlling Moment: 102 ft-lb
1.66 Ft from left support of span 3 (Right Span)
Created by combining all dead and live loads.
Controlling Shear: -122 lb
3.0 Ft from left support of span 2 (Center Span)
Created by combining all dead and live loads.

JOIST DATA Center

Span Length	3.33	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	0	ft

Floor sheathing applied to top of joists-top of joists fully braced.
Floor Duration Factor 1.00

JOIST LOADING

Uniform Floor Loading Center

Live Load	LL =	40	psf
Dead Load	DL =	15	psf
Total Load	TL =	55	psf
TL Adj. For Joist Spacing	wT =	73.3	plf

Comparisons with required sections:

	Req'd	Provided
E.I.:	6 in2-lb E6	248 in2-lb xE6
Moment:	102 ft-lb	3100 ft-lb
Shear:	-122 lb	1335 lb

NOTES

Established Basic Permit #

19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: MLB2-1 GLB
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2015 NDS)]
3.5 IN x 11.875 IN x 25.09 FT (12.4 + 12.7)
24F-V4 - Visually Graded Western Species - Dry Use
Section Adequate By: 45.0%
Controlling Factor: Moment

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DEFLECTIONS	Center		Right	
Live Load	0.12	IN L/1214	0.16	IN L/925
Dead Load	0.01	in	0.05	in
Total Load	0.13	IN L/1111	0.21	IN L/717

Live Load Deflection Criteria: L/360 Total Load Deflection Criteria: L/240

REACTIONS	A	B	C
Live Load	1551 lb	5055 lb	1971 lb
Dead Load	433 lb	1533 lb	711 lb
Total Load	1984 lb	6588 lb	2682 lb
Uplift (1.5 F.S)	**-2 lb**	**0 lb**	**0 lb**
Bearing Length	0.87 in	2.90 in	1.18 in

BEAM DATA	Center	Right
Span Length	12.42 ft	12.67 ft
Unbraced Length-Top	0 ft	0 ft
Unbraced Length-Bottom	12.42 ft	12.67 ft
Live Load Duration Factor	1.00	
Notch Depth	0.00	

MATERIAL PROPERTIES

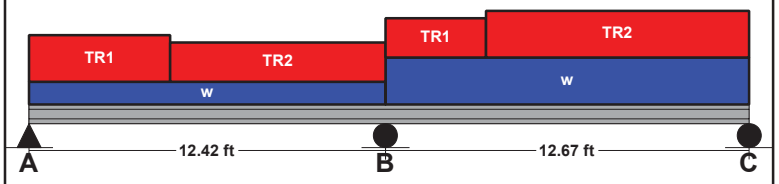
24F-V4 - Visually Graded Western Species

		Base Values		Adjusted	
Bending Stress:	Fb =	2400	psi	*Controlled by:*	
	Fb_cmpr =	1850	psi	Fb_cmpr' =	1783 psi
	Cd=1.00 Cl=0.96				
Shear Stress:	Fv =	265	psi	Fv' =	265 psi
	Cd=1.00				
Modulus of Elasticity:	E =	1800	ksi	E' =	1800 ksi
Comp. ⊥ to Grain:	Fc - ⊥ =	650	psi	Fc - ⊥' =	650 psi

Controlling Moment: -8428 ft-lb
Over left support of span 3 (Right Span)
Created by combining all dead loads and live loads on span(s) 2, 3
Controlling Shear: 3278 lb
At a distance d from left support of span 3 (Right Span)
Created by combining all dead loads and live loads on span(s) 2, 3

Comparisons with required sections:	Req'd	Provided
Section Modulus:	56.73 in3	82.26 in3
Area (Shear):	18.56 in2	41.56 in2
Moment of Inertia (deflection):	190.18 in4	488.41 in4
Moment:	-8428 ft-lb	12221 ft-lb
Shear:	3278 lb	7343 lb

LOADING DIAGRAM



UNIFORM LOADS	Center*	Right*
Uniform Live Load	67 plf	139 plf
Uniform Dead Load	25 plf	52 plf
Beam Self Weight	9 plf	9 plf
Total Uniform Load	101 plf	200 plf

* Load obtained from Load Tracker. See Summary Report for details.

TRAPEZOIDAL LOADS - CENTER SPAN

Load Number	One *	Two *
Left Live Load	217 plf	220 plf
Left Dead Load	81 plf	31 plf
Right Live Load	217 plf	220 plf
Right Dead Load	81 plf	31 plf
Load Start	0 ft	4.92 ft
Load End	4.92 ft	12.42 ft
Load Length	4.92 ft	7.5 ft

RIGHT SPAN

Load Number	One *	Two *
Left Live Load	220 plf	217 plf
Left Dead Load	31 plf	81 plf
Right Live Load	220 plf	217 plf
Right Dead Load	31 plf	81 plf
Load Start	0 ft	3.5 ft
Load End	3.5 ft	12.67 ft
Load Length	3.5 ft	9.17 ft

* Load obtained from Load Tracker. See Summary Report for details.

NOTES

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: MLB2-1 LSL
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2015 NDS)]
3.5 IN x 11.875 IN x 25.09 FT (12.4 + 12.7)
LSL 2360 Fb-1.55E - Louisiana Pacific
Section Adequate By: 75.7%
Controlling Factor: Moment

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DEFLECTIONS

	Center		Right	
Live Load	0.14	IN L/1045	0.19	IN L/796
Dead Load	0.02	in	0.06	in
Total Load	0.16	IN L/951	0.25	IN L/615

Live Load Deflection Criteria: L/360 Total Load Deflection Criteria: L/240

REACTIONS

	A	B	C
Live Load	1551 lb	5055 lb	1971 lb
Dead Load	448 lb	1582 lb	726 lb
Total Load	1999 lb	6637 lb	2697 lb
Bearing Length	0.65 in	2.17 in	0.88 in

BEAM DATA

	Center	Right
Span Length	12.42 ft	12.67 ft
Unbraced Length-Top	0 ft	0 ft
Unbraced Length-Bottom	12.42 ft	12.67 ft
Live Load Duration Factor	1.00	
Notch Depth	0.00	

MATERIAL PROPERTIES

LSL 2360 Fb-1.55E - Louisiana Pacific

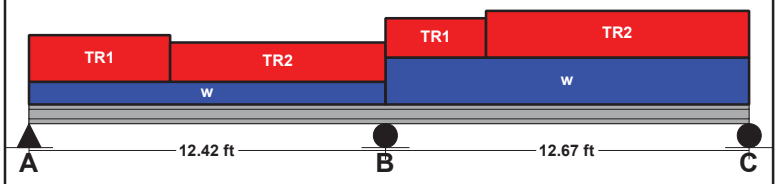
	Base Values		Adjusted	
Bending Stress:	Fb = 2360 psi		Fb' = 2176 psi	
	Cd=1.00 Cl=0.92 CF=1.00			
Shear Stress:	Fv = 410 psi		Fv' = 410 psi	
	Cd=1.00			
Modulus of Elasticity:	E = 1550 ksi		E' = 1550 ksi	
Comp. ⊥ to Grain:	Fc - ⊥ = 875 psi		Fc - ⊥' = 875 psi	

Controlling Moment: -8490 ft-lb
Over left support of span 3 (Right Span)
Created by combining all dead loads and live loads on span(s) 2, 3
Controlling Shear: 3300 lb
At a distance d from left support of span 3 (Right Span)
Created by combining all dead loads and live loads on span(s) 2, 3

Comparisons with required sections:	Req'd	Provided
Section Modulus:	46.83 in3	82.26 in3
Area (Shear):	12.07 in2	41.56 in2
Moment of Inertia (deflection):	220.86 in4	488.41 in4
Moment:	-8490 ft-lb	14914 ft-lb
Shear:	3300 lb	11360 lb

NOTES

LOADING DIAGRAM



UNIFORM LOADS

	Center*	Right*
Uniform Live Load	67 plf	139 plf
Uniform Dead Load	25 plf	52 plf
Beam Self Weight	12 plf	12 plf
Total Uniform Load	104 plf	203 plf

* Load obtained from Load Tracker. See Summary Report for details.

TRAPEZOIDAL LOADS - CENTER SPAN

Load Number	One *	Two *
Left Live Load	217 plf	220 plf
Left Dead Load	81 plf	31 plf
Right Live Load	217 plf	220 plf
Right Dead Load	81 plf	31 plf
Load Start	0 ft	4.92 ft
Load End	4.92 ft	12.42 ft
Load Length	4.92 ft	7.5 ft

RIGHT SPAN

Load Number	One *	Two *
Left Live Load	220 plf	217 plf
Left Dead Load	31 plf	81 plf
Right Live Load	220 plf	217 plf
Right Dead Load	31 plf	81 plf
Load Start	0 ft	3.5 ft
Load End	3.5 ft	12.67 ft
Load Length	3.5 ft	9.17 ft

* Load obtained from Load Tracker. See Summary Report for details.

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: FTG-PST-MLB2-1B
Footing
[2015 International Building Code(2015 NDS)]
Footing Size: 2.0 FT x 2.0 FT x 10.00 IN
Reinforcement: #4 Bars @ 8.00 IN. O.C. E/W / (3) min.
Section Footing Design Adequate

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FOOTING PROPERTIES

Allowable Soil Bearing Pressure:	Qs =	2500	psf
Concrete Compressive Strength:	F'c =	2500	psi
Reinforcing Steel Yield Strength:	Fy =	60000	psi
Concrete Reinforcement Cover:	c =	3	in

FOOTING SIZE

Width:	W =	2	ft
Length:	L =	2	ft
Depth:	Depth =	10	in
Effective Depth to Top Layer of Steel:	d =	6.25	in

COLUMN AND BASEPLATE SIZE

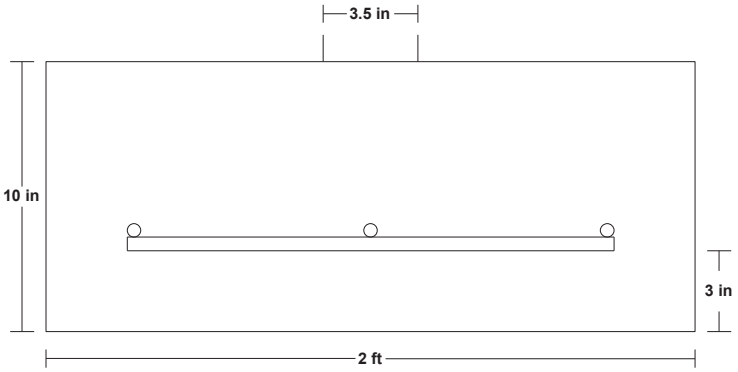
Column Type:	Wood		
Column Width:	m =	3.5	in
Column Depth:	n =	3.5	in

FOOTING CALCULATIONS

Bearing Calculations:			
Ultimate Bearing Pressure:	Qu =	1652	psf
Effective Allowable Soil Bearing Pressure:	Qe =	2375	psf
Required Footing Area:	Areq =	2.78	sf
Area Provided:	A =	4.00	sf
Baseplate Bearing:			
Bearing Required:	Bear =	9953	lb
Allowable Bearing:	Bear-A =	33841	lb
Beam Shear Calculations (One Way Shear):			
Beam Shear:	Vu1 =	2385	lb
Allowable Beam Shear:	Vc1 =	11250	lb
Punching Shear Calculations (Two Way Shear):			
Critical Perimeter:	Bo =	39	in
Punching Shear:	Vu2 =	8310	lb
Allowable Punching Shear (ACI 11-35):	vc2-a =	54844	lb
Allowable Punching Shear (ACI 11-36):	vc2-b =	76875	lb
Allowable Punching Shear (ACI 11-37):	vc2-c =	36563	lb
Controlling Allowable Punching Shear:	vc2 =	36563	lb
Bending Calculations:			
Factored Moment:	Mu =	29858	in-lb
Nominal Moment Strength:	Mn =	187693	in-lb
Reinforcement Calculations:			
Concrete Compressive Block Depth:	a =	0.69	in
Steel Required Based on Moment:	As(1) =	0.09	in2
Min. Code Req'd Reinf. Shrink./Temp. (ACI-10.5.4):	As(2) =	0.43	in2
Controlling Reinforcing Steel:	As-reqd =	0.43	in2
Selected Reinforcement:	#4's @ 8.0 in. o.c. e/w (3) Min.		
Reinforcement Area Provided:	As =	0.59	in2
Development Length Calculations:			
Development Length Required:	Ld =	15	in
Development Length Supplied:	Ld-sup =	9	in

Note: Plain concrete adequate for bending, therefore adequate development length not required.

LOADING DIAGRAM



FOOTING LOADING

Live Load:	PL =	5055	lb *
Dead Load:	PD =	1554	lb *
Total Load:	PT =	6609	lb *
Ultimate Factored Load:	Pu =	9953	lb
Footing plus soil above footing weight:	Wt =	322	lb

* Load obtained from Load Tracker. See Summary Report for details.

NOTES

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: PST-MLB2-1A
Column
[2015 International Building Code(2015 NDS)]
1.5 IN x 3.5 IN x 9.08 FT
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 16.4%

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VERTICAL REACTIONS

Live Load:	Vert-LL-Rxn =	1551	lb
Dead Load:	Vert-DL-Rxn =	443	lb
Total Load:	Vert-TL-Rxn =	1994	lb

COLUMN DATA

Total Column Length:	9.08	ft
Unbraced Length (X-Axis) Lx:	9.08	ft
Unbraced Length (Y-Axis) Ly:	0	ft
Column End Condition-K (e):	1	
Axial Load Duration Factor	1.00	

COLUMN PROPERTIES

#2 - Douglas-Fir-Larch

	Base Values	Adjusted
Compressive Stress:	Fc = 1350 psi	Fc' = 454 psi
	Cd=1.00 Cf=1.15 Cp=0.29	
Bending Stress (X-X Axis):	Fbx = 900 psi	Fbx' = 1350 psi
	Cd=1.00 CF=1.50	
Bending Stress (Y-Y Axis):	Fby = 900 psi	Fby' = 1350 psi
	Cd=1.00 CF=1.50	
Modulus of Elasticity:	E = 1600 ksi	E' = 1600 ksi

Column Section (X-X Axis):	dx =	3.5	in
Column Section (Y-Y Axis):	dy =	1.5	in
Area:	A =	5.25	in2
Section Modulus (X-X Axis):	Sx =	3.06	in3
Section Modulus (Y-Y Axis):	Sy =	1.31	in3
Slenderness Ratio:	Lex/dx =	31.13	
	Ley/dy =	0	

Column Calculations (Controlling Case Only):

Controlling Load Case: Axial Total Load Only (L + D)

Actual Compressive Stress:	Fc =	380	psi
Allowable Compressive Stress:	Fc' =	454	psi
Eccentricity Moment (X-X Axis):	Mx-ex =	0	ft-lb
Eccentricity Moment (Y-Y Axis):	My-ey =	0	ft-lb
Moment Due to Lateral Loads (X-X Axis):	Mx =	0	ft-lb
Moment Due to Lateral Loads (Y-Y Axis):	My =	0	ft-lb
Bending Stress Lateral Loads Only (X-X Axis):	Fbx =	0	psi
Allowable Bending Stress (X-X Axis):	Fbx' =	1350	psi
Bending Stress Lateral Loads Only (Y-Y Axis):	Fby =	0	psi
Allowable Bending Stress (Y-Y Axis):	Fby' =	1350	psi
Combined Stress Factor:	**CSF =**	**0.84**	

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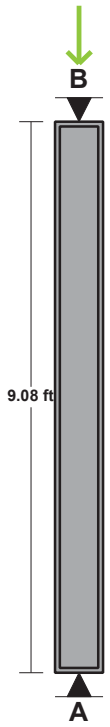

AXIAL LOADING

Live Load:	PL =	1551	lb *
Dead Load:	PD =	433	lb *
Column Self Weight:	CSW =	10	lb
Total Axial Load:	PT =	1994	lb

* Load obtained from Load Tracker. See Summary Report for details.

NOTES

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: FTG-PST-MLB2-1A
Footing
[2015 International Building Code(2015 NDS)]
Footing Size: 1.0 FT x 1.0 FT x 10.00 IN
Reinforcement in Long Direction: #4 Bars @ 5.50 IN. O.C. / (2) min.
Reinforcement in Short Direction-center band (Equal to width of short side): #4 Bars @ 5.50 IN. O.C. / (2) min.
Reinforcement in Short Direction-outside bands: #4 Bars @ 0.00 IN. O.C. / () Each band.
Section Footing Design Adequate

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FOOTING PROPERTIES

Allowable Soil Bearing Pressure:	Qs =	2500	psf
Concrete Compressive Strength:	F'c =	2500	psi
Reinforcing Steel Yield Strength:	Fy =	60000	psi
Concrete Reinforcement Cover:	c =	3	in

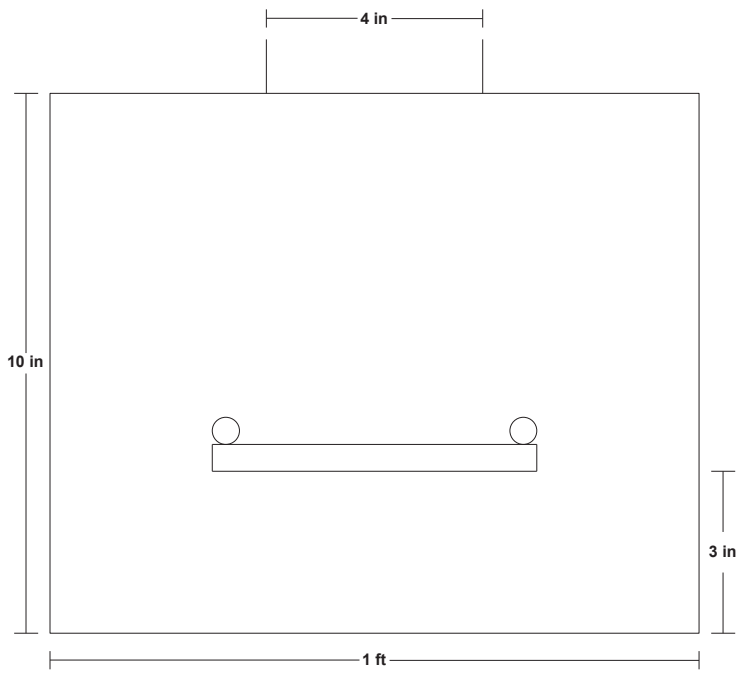
FOOTING SIZE

Width:	W =	1	ft
Length:	L =	1	ft
Depth:	Depth =	10	in
Effective Depth to Top Layer of Steel:	d =	6.25	in

COLUMN AND BASEPLATE SIZE

Column Type:	Other		
Column Width:	m =	4	in
Column Depth:	n =	4	in

LOADING DIAGRAM



FOOTING CALCULATIONS

Bearing Calculations:			
Ultimate Bearing Pressure:	Qu =	1994	psf
Effective Allowable Soil Bearing Pressure:	Qe =	2375	psf
Required Footing Area:	Areq =	0.84	sf
Area Provided:	A =	1.00	sf
Baseplate Bearing:			
Bearing Required:	Bear =	3013	lb
Allowable Bearing:	Bear-A =	44200	lb
Beam Shear Calculations (One Way Shear):			
Beam Shear:	Vu1 =	0	lb
Allowable Beam Shear:	Vc1 =	5625	lb
Punching Shear Calculations (Two Way Shear):			
Critical Perimeter:	Bo =	41	in
Punching Shear:	Vu2 =	815	lb
Allowable Punching Shear (ACI 11-35):	vc2-a =	57656	lb
Allowable Punching Shear (ACI 11-36):	vc2-b =	77813	lb
Allowable Punching Shear (ACI 11-37):	vc2-c =	38438	lb
Controlling Allowable Punching Shear:	vc2 =	38438	lb

FOOTING LOADING

Live Load:	PL =	1551	lb *
Dead Load:	PD =	443	lb *
Total Load:	PT =	1994	lb *
Ultimate Factored Load:	Pu =	3013	lb
Footing plus soil above footing weight:	Wt =	81	lb

* Load obtained from Load Tracker. See Summary Report for details.

Short Direction:

Bending Calculations:			
Factored Moment:	Mu =	4520	in-lb
Nominal Moment Strength:	Mn =	122682	in-lb
Reinforcement Calculations:			
Concrete Compressive Block Depth:	a =	0.92	in
Steel Required Based on Moment:	As(1) =	0.01	in2
Min. Code Req'd Reinf. Shrink./Temp. (ACI-10.5.4):	As(2) =	0.22	in2
Controlling Reinforcing Steel:	As-reqd =	0.22	in2
Selected Reinforcement:	Short Dir: #4's @ 5.5 in. o.c.(2) Min.		
Reinforcement Area Provided:	As =	0.39	in2
Development Length Calculations:			
Development Length Required:	Ld =	15	in
Development Length Supplied:	Ld-sup =	3	in

Long Direction:

Bending Calculations:			
Factored Moment:	Mu =	4520	in-lb
Nominal Moment Strength:	Mn =	122739	in-lb
Reinforcement Calculations:			
Concrete Compressive Block Depth:	a =	0.92	in
Steel Required Based on Moment:	As(1) =	0.01	in2
Min. Code Req'd Reinf. Shrink./Temp. (ACI-10.5.4):	As(2) =	0.22	in2
Controlling Reinforcing Steel:	As-reqd =	0.22	in2
Selected Reinforcement:	Long Dir: #4's @ 5.5 in. o.c.(2) Min.		
Reinforcement Area Provided:	As =	0.39	in2
Development Length Calculations:			
Development Length Required:	Ld =	15	in
Development Length Supplied:	Ld-sup =	3	in

Development length provided for rebar hooking, therefore adequate development length not required.

NOTES:

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: WALL-1ST-1
Wall
[2015 International Building Code(2015 NDS)]
1.5 IN x 5.5 IN x 8.08 FT @ 16 O.C.
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 87.5%
Controlling Factor: Combined Stress Factor

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page of

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DEFLECTIONS

Deflection due to lateral loads only:	Defl = 0.06	IN = L/1638
Live Load Deflection Criteria:		L/180

VERTICAL REACTIONS

Live Load:	Vert-LL-Rxn =	0	lb
Dead Load:	Vert-DL-Rxn =	119	lb
Total Load:	Vert-TL-Rxn =	119	lb

HORIZONTAL REACTIONS

Total Reaction at Top of Column:	TL-Rxn-Top =	83	lb
Total Reaction at Bottom of Column:	TL-Rxn-Bottom =	83	lb

WALL DATA

Total Stud Length:	8.08	ft
Wall Dead Weight:	11	psf
Unbraced Length (X-Axis) Lx:	8.08	ft
Unbraced Length (Y-Axis) Ly:	0	ft
Stud End Condition-K (e):	1	
Axial Load Duration Factor	1.00	
Lateral Load Duration Factor (Wind/Seismic)	1.60	

STUD PROPERTIES

#2 - Douglas-Fir-Larch

	Base Values	Adjusted
Compressive Stress:	Fc = 1350 psi	Fc' = 1254 psi
	Cd=1.60 Cf=1.10 Cp=0.53	
Bending Stress (X-X Axis):	Fbx = 900 psi	Fbx' = 2153 psi
	Cd=1.60 CF=1.30 Cr=1.15 Cl=1.00	
Bending Stress (Y-Y Axis):	Fby = 900 psi	Fby' = 2153 psi
	Cd=1.60 CF=1.30 Cr=1.15	
Modulus of Elasticity:	E = 1600 ksi	E' = 1600 ksi

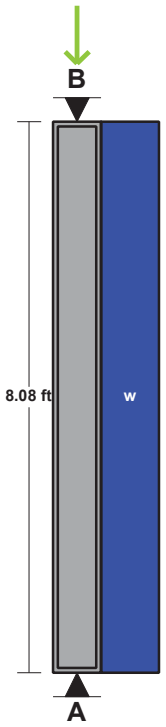
Stud Section (X-X Axis):	dx =	5.5	in
Stud Section (Y-Y Axis):	dy =	1.5	in
Area:	A =	8.25	in2
Section Modulus (X-X Axis):	Sx =	7.56	in3
Section Modulus (Y-Y Axis):	Sy =	2.06	in3
Slenderness Ratio:	Lex/dx =	17.63	
	Ley/dy =	0	

Stud Calculations (Controlling Case Only):

Controlling Load Case: Axial Dead Load and Lateral loads (D + W or E)

Actual Compressive Stress:	Fc =	14	psi
Allowable Compressive Stress:	Fc' =	1254	psi
Eccentricity Moment (X-X Axis):	Mx-ex =	0	ft-lb
Eccentricity Moment (Y-Y Axis):	My-ey =	0	ft-lb
Moment Due to Lateral Loads (X-X Axis):	Mx =	168	ft-lb
Moment Due to Lateral Loads (Y-Y Axis):	My =	0	ft-lb
Bending Stress Lateral Loads Only (X-X Axis):	Fbx =	266	psi
Allowable Bending Stress (X-X Axis):	Fbx' =	2153	psi
Bending Stress Lateral Loads Only (Y-Y Axis):	Fby =	0	psi
Allowable Bending Stress (Y-Y Axis):	Fby' =	2153	psi
Combined Stress Factor:	**CSF =**	**0.12**	

LOADING DIAGRAM



WALL LOAD CALCULATOR

	Live Load		Dead Load		Tributary Width	
Load Tracker:	LL = 0	plf	DL = 0	plf		
Roof:	LL = 25	psf	DL = 15	psf	TA = 0	ft
Upper Floor:	LL = 40	psf	DL = 15	psf	TA = 0	ft
Upper Floor Height:	0	ft				
Middle Floor:	LL = 40	psf	DL = 15	psf	TA = 0	ft
Middle Floor Height:	0	ft				
Calculated Load:	**LL = 0**	**plf**	**DL = 88.9**	**plf**		

AXIAL LOADING

Live Load:	PL =	0 plf *
Dead Load:	PD =	89 plf *
Total Axial Load:	PT =	89 plf

* Load obtained from Load Tracker. See Summary Report for details.

LATERAL LOADING (Dy Face)

Uniform Lateral Load: wL-Lat = 15 psf

NOTES

Established Basic Permit # 19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: PST-MLB2-1B
Column
[2015 International Building Code(2015 NDS)]
5.5 IN x 5.5 IN x 9.08 FT
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 60.5%

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VERTICAL REACTIONS

Live Load:	Vert-LL-Rxn =	5055	lb
Dead Load:	Vert-DL-Rxn =	1593	lb
Total Load:	Vert-TL-Rxn =	6648	lb

COLUMN DATA

Total Column Length:	9.08	ft
Unbraced Length (X-Axis) Lx:	9.08	ft
Unbraced Length (Y-Axis) Ly:	9.08	ft
Column End Condition-K (e):	1	
Axial Load Duration Factor	1.00	

COLUMN PROPERTIES

#2 - Douglas-Fir-Larch

	Base Values		Adjusted	
Compressive Stress:	Fc = 700	psi	Fc' = 556	psi
	Cd=1.00 Cp=0.79			
Bending Stress (X-X Axis):	Fbx = 750	psi	Fbx' = 750	psi
	Cd=1.00 CF=1.00			
Bending Stress (Y-Y Axis):	Fby = 750	psi	Fby' = 750	psi
	Cd=1.00 CF=1.00			
Modulus of Elasticity:	E = 1300	ksi	E' = 1300	ksi

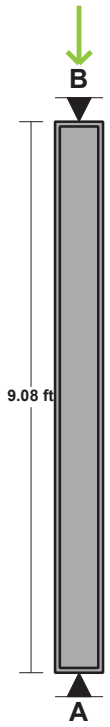
Column Section (X-X Axis):	dx =	5.5	in
Column Section (Y-Y Axis):	dy =	5.5	in
Area:	A =	30.25	in2
Section Modulus (X-X Axis):	Sx =	27.73	in3
Section Modulus (Y-Y Axis):	Sy =	27.73	in3
Slenderness Ratio:	Lex/dx =	19.81	
	Ley/dy =	19.81	

Column Calculations (Controlling Case Only):

Controlling Load Case: Axial Total Load Only (L + D)

Actual Compressive Stress:	Fc =	220	psi
Allowable Compressive Stress:	Fc' =	556	psi
Eccentricity Moment (X-X Axis):	Mx-ex =	0	ft-lb
Eccentricity Moment (Y-Y Axis):	My-ey =	0	ft-lb
Moment Due to Lateral Loads (X-X Axis):	Mx =	0	ft-lb
Moment Due to Lateral Loads (Y-Y Axis):	My =	0	ft-lb
Bending Stress Lateral Loads Only (X-X Axis):	Fbx =	0	psi
Allowable Bending Stress (X-X Axis):	Fbx' =	750	psi
Bending Stress Lateral Loads Only (Y-Y Axis):	Fby =	0	psi
Allowable Bending Stress (Y-Y Axis):	Fby' =	750	psi
Combined Stress Factor:	**CSF =**	**0.4**	

LOADING DIAGRAM



AXIAL LOADING

Live Load:	PL =	5055	lb *
Dead Load:	PD =	1533	lb *
Column Self Weight:	CSW =	60	lb
Total Axial Load:	PT =	6648	lb

* Load obtained from Load Tracker. See Summary Report for details.

NOTES

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: FTG-WALL-1ST-1
Footing
[2015 International Building Code(2015 NDS)]
Footing Size: 18.0 IN Wide x 8.0 IN Deep Continuous Footing With 8.0 IN Thick x 12.0 IN Tall Stemwall
LongitudinalReinforcement: (2) Continuous #4 Bars
TransverseReinforcement: #4 Bars @ 13.00 IN. O.C. (unnecessary)
Section Footing Design Adequate

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page of

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FOOTING PROPERTIES

Allowable Soil Bearing Pressure:	Qs =	2500	psf
Concrete Compressive Strength:	F'c =	2500	psi
Reinforcing Steel Yield Strength:	Fy =	60000	psi
Concrete Reinforcement Cover:	c =	3	in

FOOTING SIZE

Width:	W =	18	in
Depth:	Depth =	8	in
Effective Depth to Top Layer of Steel:	d =	4.25	in

STEMWALL SIZE

Stemwall Width:	8	in
Stemwall Height:	12	in
Stemwall Weight:	150	pcf

FOOTING CALCULATIONS

Bearing Calculations:

Ultimate Bearing Pressure:	Qu =	933	psf
Effective Allowable Soil Bearing Pressure:	Qe =	2400	psf
Width Required:	Wreq =	0.58	ft

Beam Shear Calculations (One Way Shear):

Beam Shear:	Vu1 =	82	lb
Allowable Beam Shear:	Vc1 =	3825	lb

Transverse Direction:

Bending Calculations:

Factored Moment:	Mu =	1367	in-lb
Nominal Moment Strength:	Mn =	0	in-lb

Reinforcement Calculations:

Concrete Compressive Block Depth:	a =	0.41	in
Steel Required Based on Moment:	As(1) =	0.01	in2
Min. Code Req'd Reinf. Shrink./Temp. (ACI-10.5.4)	As(2) =	0.17	in2
Controlling Reinforcing Steel:	As-reqd =	0.17	in2
Selected Reinforcement:	Trans: #4's @ 13.0 in. o.c.		
Reinforcement Area Provided:	As =	0.17	in2

Development Length Calculations:

Development Length Required:	Ld =	15	in
Development Length Supplied:	Ld-sup =	2	in

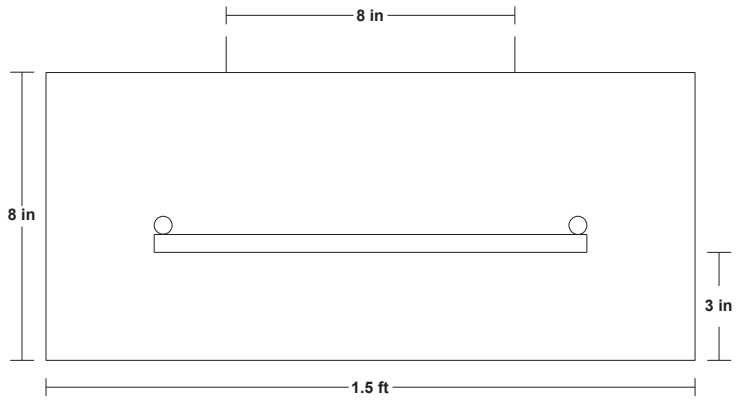
Longitudinal Direction:

Reinforcement Calculations:

Min. Code Req'd Reinf. Shrink./Temp. (ACI-10.5.4):	As(2) =	0.26	in2
Controlling Reinforcing Steel:	As-reqd =	0.26	in2
Selected Reinforcement:	Longitudinal: (2) Cont. #4 Bars		
Reinforcement Area Provided:	As =	0.39	in2

NOTES

LOADING DIAGRAM



FOOTING LOADING

Live Load:	PL =	721	plf *
Dead Load:	PD =	579	plf *
Total Load:	PT =	1400	plf *
Ultimate Factored Load:	Pu =	1968	plf

* Load obtained from Load Tracker. See Summary Report for details.

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: WALL-2ND-6
Wall
[2015 International Building Code(2015 NDS)]
1.5 IN x 5.5 IN x 8.08 FT @ 16 O.C.
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 87.5%
Controlling Factor: Combined Stress Factor

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page of

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DEFLECTIONS

Deflection due to lateral loads only:	Defl = 0.06	IN = L/1638
Live Load Deflection Criteria:		L/180

VERTICAL REACTIONS

Live Load:	Vert-LL-Rxn =	0	lb
Dead Load:	Vert-DL-Rxn =	108	lb
Total Load:	Vert-TL-Rxn =	108	lb

HORIZONTAL REACTIONS

Total Reaction at Top of Column:	TL-Rxn-Top =	83	lb
Total Reaction at Bottom of Column:	TL-Rxn-Bottom =	83	lb

WALL DATA

Total Stud Length:	8.08	ft
Wall Dead Weight:	10	psf
Unbraced Length (X-Axis) Lx:	8.08	ft
Unbraced Length (Y-Axis) Ly:	0	ft
Stud End Condition-K (e):	1	
Axial Load Duration Factor	1.00	
Lateral Load Duration Factor (Wind/Seismic)	1.60	

STUD PROPERTIES

#2 - Douglas-Fir-Larch

	Base Values	Adjusted
Compressive Stress:	Fc = 1350 psi	Fc' = 1254 psi
	Cd=1.60 Cf=1.10 Cp=0.53	
Bending Stress (X-X Axis):	Fbx = 900 psi	Fbx' = 2153 psi
	Cd=1.60 CF=1.30 Cr=1.15 Cl=1.00	
Bending Stress (Y-Y Axis):	Fby = 900 psi	Fby' = 2153 psi
	Cd=1.60 CF=1.30 Cr=1.15	
Modulus of Elasticity:	E = 1600 ksi	E' = 1600 ksi

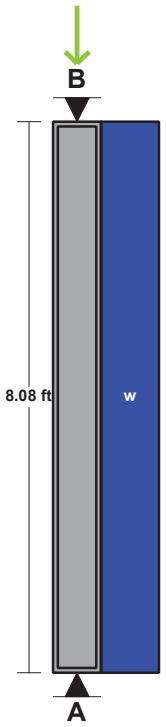
Stud Section (X-X Axis):	dx =	5.5	in
Stud Section (Y-Y Axis):	dy =	1.5	in
Area:	A =	8.25	in2
Section Modulus (X-X Axis):	Sx =	7.56	in3
Section Modulus (Y-Y Axis):	Sy =	2.06	in3
Slenderness Ratio:	Lex/dx =	17.63	
	Ley/dy =	0	

Stud Calculations (Controlling Case Only):

Controlling Load Case: Axial Dead Load and Lateral loads (D + W or E)

Actual Compressive Stress:	Fc =	13	psi
Allowable Compressive Stress:	Fc' =	1254	psi
Eccentricity Moment (X-X Axis):	Mx-ex =	0	ft-lb
Eccentricity Moment (Y-Y Axis):	My-ey =	0	ft-lb
Moment Due to Lateral Loads (X-X Axis):	Mx =	168	ft-lb
Moment Due to Lateral Loads (Y-Y Axis):	My =	0	ft-lb
Bending Stress Lateral Loads Only (X-X Axis):	Fbx =	266	psi
Allowable Bending Stress (X-X Axis):	Fbx' =	2153	psi
Bending Stress Lateral Loads Only (Y-Y Axis):	Fby =	0	psi
Allowable Bending Stress (Y-Y Axis):	Fby' =	2153	psi
Combined Stress Factor:	**CSF =**	**0.12**	

LOADING DIAGRAM



WALL LOAD CALCULATOR

	Live Load		Dead Load		Tributary Width	
Load Tracker:	LL = 0	plf	DL = 0	plf		
Roof:	LL = 25	psf	DL = 15	psf	TA = 0	ft
Upper Floor:	LL = 40	psf	DL = 15	psf	TA = 0	ft
Upper Floor Height:	0	ft				
Middle Floor:	LL = 40	psf	DL = 15	psf	TA = 0	ft
Middle Floor Height:	0	ft				
Calculated Load:	**LL = 0**	**plf**	**DL = 80.8**	**plf**		

AXIAL LOADING

Live Load:	PL =	0 plf *
Dead Load:	PD =	81 plf *
Total Axial Load:	PT =	81 plf

* Load obtained from Load Tracker. See Summary Report for details.

LATERAL LOADING (Dy Face)

Uniform Lateral Load: wL-Lat = 15 psf

NOTES

Established Basic Permit # 19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: MLB2-2
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2015 NDS)]
1.75 IN x 11.875 IN x 6.5 FT
LSL 2360 Fb-1.55E - Louisiana Pacific
Section Adequate By: 226.3%
Controlling Factor: Moment

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DEFLECTIONS	Center	
Live Load	0.02	IN L/3704
Dead Load	0.03	in
Total Load	0.05	IN L/1564

Live Load Deflection Criteria: L/360 Total Load Deflection Criteria: L/240

REACTIONS	A		B	
Live Load	645	lb	645	lb
Dead Load	883	lb	883	lb
Total Load	1528	lb	1528	lb
Bearing Length	1.00	in	1.00	in

BEAM DATA	Center	
Span Length	6.5	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	6.5	ft
Live Load Duration Factor	1.00	
Notch Depth	0.00	

MATERIAL PROPERTIES

LSL 2360 Fb-1.55E - Louisiana Pacific

	Base Values		Adjusted	
Bending Stress:	Fb = 2360	psi	Fb' = 2364	psi
	Cd=1.00 CF=1.00			
Shear Stress:	Fv = 410	psi	Fv' = 410	psi
	Cd=1.00			
Modulus of Elasticity:	E = 1550	ksi	E' = 1550	ksi
Comp. ⊥ to Grain:	Fc - ⊥ = 875	psi	Fc - ⊥' = 875	psi

Controlling Moment: 2483 ft-lb
3.25 Ft from left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2
Controlling Shear: 1069 lb
At a distance d from left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2

Comparisons with required sections:	Req'd	Provided
Section Modulus:	12.6 in3	41.13 in3
Area (Shear):	3.91 in2	20.78 in2
Moment of Inertia (deflection):	37.47 in4	244.21 in4
Moment:	2483 ft-lb	8101 ft-lb
Shear:	1069 lb	5680 lb

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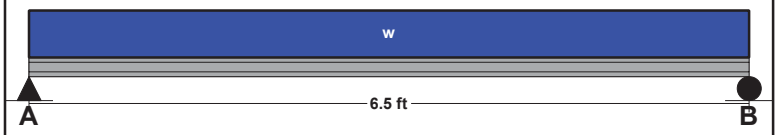

UNIFORM LOADS	Center*	
Uniform Live Load	199	plf
Uniform Dead Load	266	plf
Beam Self Weight	6	plf
Total Uniform Load	470	plf

* Load obtained from Load Tracker. See Summary Report for details.

NOTES

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: RFB3
Roof Beam
[2015 International Building Code(2015 NDS)]
3.5 IN x 7.25 IN x 8.33 FT
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 150.0%
Controlling Factor: Moment

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page of

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DEFLECTIONS Center

Live Load	0.06	IN L/1751
Dead Load	0.04	in
Total Load	0.10	IN L/1035

Live Load Deflection Criteria: L/240 Total Load Deflection Criteria: L/180

REACTIONS

	A	B
Live Load	390 lb	390 lb
Dead Load	270 lb	270 lb
Total Load	660 lb	660 lb
Bearing Length	0.30 in	0.30 in

BEAM DATA

Span Length	8.3	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	0	ft
Roof Pitch	4	:12
Roof Duration Factor	1.15	

MATERIAL PROPERTIES

#2 - Douglas-Fir-Larch

	Base Values		Adjusted	
Bending Stress:	Fb = 900	psi	Fb' = 1346	psi
	Cd=1.15 CF=1.30			
Shear Stress:	Fv = 180	psi	Fv' = 207	psi
	Cd=1.15			
Modulus of Elasticity:	E = 1600	ksi	E' = 1600	ksi
Comp. ⊥ to Grain:	Fc - ⊥ = 625	psi	Fc - ⊥' = 625	psi

Controlling Moment: 1375 ft-lb
4.165 ft from left support
Created by combining all dead and live loads.
Controlling Shear: -568 lb
At a distance d from support.
Created by combining all dead and live loads.

Comparisons with required sections:	Req'd	Provided
Section Modulus:	12.26 in3	30.66 in3
Area (Shear):	4.12 in2	25.38 in2
Moment of Inertia (deflection):	19.33 in4	111.15 in4
Moment:	1375 ft-lb	3438 ft-lb
Shear:	-568 lb	3502 lb

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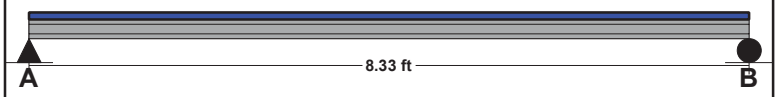

ROOF LOADING

Side One:

Roof Live Load:	LL =	25	psf
Roof Dead Load:	DL =	15	psf
Tributary Width:	TW =	3.8	ft

Side Two:

Roof Live Load:	LL =	0	psf
Roof Dead Load:	DL =	0	psf
Tributary Width:	TW =	0	ft
Wall Load:	WALL =	0	plf

SLOPE/PITCH ADJUSTED LENGTHS AND LOADS

Adjusted Beam Length:	Ladj =	8.33	ft
Beam Self Weight:	BSW =	6	plf
Beam Uniform Live Load:	wL =	94	plf
Beam Uniform Dead Load:	wD_adj =	65	plf
Total Uniform Load:	wT =	159	plf

NOTES

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: RFB4
Roof Beam
[2015 International Building Code(2015 NDS)]
5.5 IN x 7.5 IN x 6.83 FT
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 242.3%
Controlling Factor: Moment

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page of

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DEFLECTIONS Center

Live Load	0.02	IN L/3888
Dead Load	0.02	in
Total Load	0.04	IN L/2267

Live Load Deflection Criteria: L/240 Total Load Deflection Criteria: L/180

REACTIONS

	A	B
Live Load	370 lb	370 lb
Dead Load	264 lb	264 lb
Total Load	634 lb	634 lb
Bearing Length	0.18 in	0.18 in

BEAM DATA

Span Length	6.8	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	0	ft
Roof Pitch	4	:12
Roof Duration Factor	1.15	

MATERIAL PROPERTIES

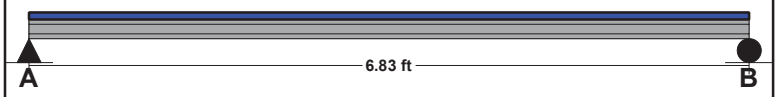
#2 - Douglas-Fir-Larch

	Base Values		Adjusted	
Bending Stress:	Fb = 750	psi	Fb' = 863	psi
	Cd=1.15 CF=1.00			
Shear Stress:	Fv = 170	psi	Fv' = 196	psi
	Cd=1.15			
Modulus of Elasticity:	E = 1300	ksi	E' = 1300	ksi
Comp. ⊥ to Grain:	Fc - ⊥ = 625	psi	Fc - ⊥' = 625	psi

Controlling Moment: 1083 ft-lb
3.415 ft from left support
Created by combining all dead and live loads.
Controlling Shear: 520 lb
At a distance d from support.
Created by combining all dead and live loads.

Comparisons with required sections:	Req'd	Provided
Section Modulus:	15.06 in3	51.56 in3
Area (Shear):	3.99 in2	41.25 in2
Moment of Inertia (deflection):	15.35 in4	193.36 in4
Moment:	1083 ft-lb	3706 ft-lb
Shear:	520 lb	5376 lb

LOADING DIAGRAM



ROOF LOADING

Side One:

Roof Live Load:	LL =	25	psf
Roof Dead Load:	DL =	15	psf
Tributary Width:	TW =	4.3	ft

Side Two:

Roof Live Load:	LL =	0	psf
Roof Dead Load:	DL =	0	psf
Tributary Width:	TW =	0	ft
Wall Load:	WALL =	0	plf

SLOPE/PITCH ADJUSTED LENGTHS AND LOADS

Adjusted Beam Length:	Ladj =	6.83	ft
Beam Self Weight:	BSW =	9	plf
Beam Uniform Live Load:	wL =	108	plf
Beam Uniform Dead Load:	wD_adj =	77	plf
Total Uniform Load:	wT =	186	plf

NOTES

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: MLB2-3
Multi-Loaded Multi-Span Beam
[2015 International Building Code(2015 NDS)]
5.5 IN x 11.875 IN x 17.84 FT (10.9 + 6.9) / 30F - 30F-E
DF2 - Dry Use
Section Adequate By: 5.9%
Controlling Factor: Shear

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DEFLECTIONS	Center		Right	
Live Load	0.16	IN L/832	-0.04	IN L/2219
Dead Load	0.11	in	-0.01	in
Total Load	0.27	IN L/488	-0.04	IN L/1849

Live Load Deflection Criteria: L/360 Total Load Deflection Criteria: L/240

REACTIONS	A		B		C	
Live Load	5757	lb	14470	lb	3890	lb
Dead Load	4510	lb	11880	lb	1846	lb
Total Load	10267	lb	26350	lb	5736	lb
Uplift (1.5 F.S)	0	**lb**	0	**lb**	**-411**	**lb**
Bearing Length	2.87	in	7.37	in	1.60	in

BEAM DATA	Center		Right	
Span Length	10.92	ft	6.92	ft
Unbraced Length-Top	0	ft	0	ft
Unbraced Length-Bottom	10.92	ft	6.92	ft
Live Load Duration Factor	1.15			
Notch Depth	0.00			

MATERIAL PROPERTIES

30F - 30F-E/DF2

	Base Values		Adjusted	
Bending Stress:	Fb = 3000	psi	*Controlled by:*	
	Fb_cmpr = 3000	psi	Fb_cmpr' = 3424	psi
	Cd=1.15 Cl=0.99			
Shear Stress:	Fv = 265	psi	Fv' = 305	psi
	Cd=1.15			
Modulus of Elasticity:	E = 2100	ksi	E' = 2100	ksi
Comp. ⊥ to Grain:	Fc - ⊥ = 650	psi	Fc - ⊥' = 650	psi

Controlling Moment: -25950 ft-lb
10.92 Ft from left support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2, 3
Controlling Shear: -12527 lb
At a distance d from right support of span 2 (Center Span)
Created by combining all dead loads and live loads on span(s) 2, 3

Comparisons with required sections:	Req'd	Provided
Section Modulus:	90.95 in3	129.26 in3
Area (Shear):	61.66 in2	65.31 in2
Moment of Inertia (deflection):	377.17 in4	767.51 in4
Moment:	-25950 ft-lb	36881 ft-lb
Shear:	-12527 lb	13269 lb

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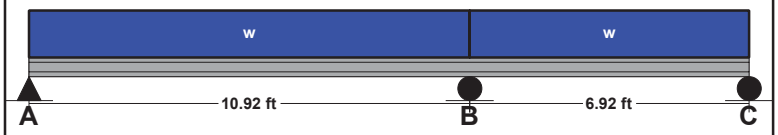

UNIFORM LOADS	Center		Right*	
Uniform Live Load	1245	plf	1245	plf
Uniform Dead Load	1008	plf	1008	plf
Beam Self Weight	14	plf	14	plf
Total Uniform Load	2267	plf	2267	plf

* Load obtained from Load Tracker. See Summary Report for details.

NOTES

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: PST-MLB2-3A
Column
[2015 International Building Code(2015 NDS)]
5.5 IN x 5.5 IN x 9.58 FT
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 36.2%

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VERTICAL REACTIONS

Live Load:	Vert-LL-Rxn =	5757	lb
Dead Load:	Vert-DL-Rxn =	4573	lb
Total Load:	Vert-TL-Rxn =	10330	lb

COLUMN DATA

Total Column Length:	9.58	ft
Unbraced Length (X-Axis) Lx:	9.58	ft
Unbraced Length (Y-Axis) Ly:	9.58	ft
Column End Condition-K (e):	1	
Axial Load Duration Factor	1.00	

COLUMN PROPERTIES

#2 - Douglas-Fir-Larch

	Base Values	Adjusted
Compressive Stress:	Fc = 700 psi	Fc' = 536 psi
	Cd=1.00 Cp=0.77	
Bending Stress (X-X Axis):	Fbx = 750 psi	Fbx' = 750 psi
	Cd=1.00 CF=1.00	
Bending Stress (Y-Y Axis):	Fby = 750 psi	Fby' = 750 psi
	Cd=1.00 CF=1.00	
Modulus of Elasticity:	E = 1300 ksi	E' = 1300 ksi

Column Section (X-X Axis):	dx =	5.5	in
Column Section (Y-Y Axis):	dy =	5.5	in
Area:	A =	30.25	in2
Section Modulus (X-X Axis):	Sx =	27.73	in3
Section Modulus (Y-Y Axis):	Sy =	27.73	in3
Slenderness Ratio:	Lex/dx =	20.9	
	Ley/dy =	20.9	

Column Calculations (Controlling Case Only):

Controlling Load Case: Axial Total Load Only (L + D)

Actual Compressive Stress:	Fc =	341	psi
Allowable Compressive Stress:	Fc' =	536	psi
Eccentricity Moment (X-X Axis):	Mx-ex =	0	ft-lb
Eccentricity Moment (Y-Y Axis):	My-ey =	0	ft-lb
Moment Due to Lateral Loads (X-X Axis):	Mx =	0	ft-lb
Moment Due to Lateral Loads (Y-Y Axis):	My =	0	ft-lb
Bending Stress Lateral Loads Only (X-X Axis):	Fbx =	0	psi
Allowable Bending Stress (X-X Axis):	Fbx' =	750	psi
Bending Stress Lateral Loads Only (Y-Y Axis):	Fby =	0	psi
Allowable Bending Stress (Y-Y Axis):	Fby' =	750	psi
Combined Stress Factor:	**CSF =**	**0.64**	

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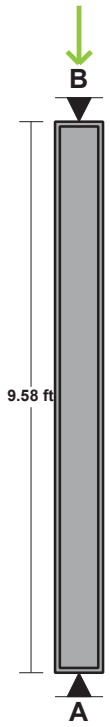

AXIAL LOADING

Live Load:	PL =	5757	lb *
Dead Load:	PD =	4510	lb *
Column Self Weight:	CSW =	63	lb
Total Axial Load:	PT =	10330	lb

* Load obtained from Load Tracker. See Summary Report for details.

NOTES

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: PST-MLB2-3B
Column
[2015 International Building Code(2015 NDS)]
5.5 IN x 7.5 IN x 9.58 FT
#1 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 11.0%

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page of

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VERTICAL REACTIONS

Live Load:	Vert-LL-Rxn =	14470	lb
Dead Load:	Vert-DL-Rxn =	11966	lb
Total Load:	Vert-TL-Rxn =	26436	lb

COLUMN DATA

Total Column Length:	9.58	ft
Unbraced Length (X-Axis) Lx:	9.58	ft
Unbraced Length (Y-Axis) Ly:	9.58	ft
Column End Condition-K (e):	1	
Axial Load Duration Factor	1.00	

COLUMN PROPERTIES

#1 - Douglas-Fir-Larch

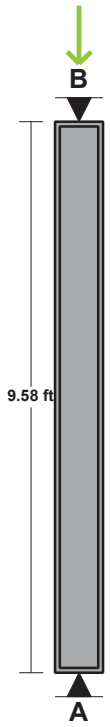
	Base Values	Adjusted
Compressive Stress:	Fc = 1000 psi	Fc' = 720 psi
	Cd=1.00 Cp=0.72	
Bending Stress (X-X Axis):	Fbx = 1200 psi	Fbx' = 1200 psi
	Cd=1.00 CF=1.00	
Bending Stress (Y-Y Axis):	Fby = 1200 psi	Fby' = 1200 psi
	Cd=1.00 CF=1.00	
Modulus of Elasticity:	E = 1600 ksi	E' = 1600 ksi

Column Section (X-X Axis):	dx =	7.5	in
Column Section (Y-Y Axis):	dy =	5.5	in
Area:	A =	41.25	in2
Section Modulus (X-X Axis):	Sx =	51.56	in3
Section Modulus (Y-Y Axis):	Sy =	37.81	in3
Slenderness Ratio:	Lex/dx =	15.33	
	Ley/dy =	20.9	

Column Calculations (Controlling Case Only):
Controlling Load Case: Axial Total Load Only (L + D)

Actual Compressive Stress:	Fc =	641	psi
Allowable Compressive Stress:	Fc' =	720	psi
Eccentricity Moment (X-X Axis):	Mx-ex =	0	ft-lb
Eccentricity Moment (Y-Y Axis):	My-ey =	0	ft-lb
Moment Due to Lateral Loads (X-X Axis):	Mx =	0	ft-lb
Moment Due to Lateral Loads (Y-Y Axis):	My =	0	ft-lb
Bending Stress Lateral Loads Only (X-X Axis):	Fbx =	0	psi
Allowable Bending Stress (X-X Axis):	Fbx' =	1200	psi
Bending Stress Lateral Loads Only (Y-Y Axis):	Fby =	0	psi
Allowable Bending Stress (Y-Y Axis):	Fby' =	1200	psi
Combined Stress Factor:	**CSF =**	**0.89**	

LOADING DIAGRAM



AXIAL LOADING

Live Load:	PL =	14470	lb *
Dead Load:	PD =	11880	lb *
Column Self Weight:	CSW =	86	lb
Total Axial Load:	PT =	26436	lb

* Load obtained from Load Tracker. See Summary Report for details.

NOTES

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: PST-MLB2-3C
Column
[2015 International Building Code(2015 NDS)]
5.5 IN x 5.5 IN x 9.58 FT
#2 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 67.0%

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VERTICAL REACTIONS

Live Load:	Vert-LL-Rxn =	3890	lb
Dead Load:	Vert-DL-Rxn =	1909	lb
Total Load:	Vert-TL-Rxn =	5799	lb

COLUMN DATA

Total Column Length:	9.58	ft
Unbraced Length (X-Axis) Lx:	9.58	ft
Unbraced Length (Y-Axis) Ly:	9.58	ft
Column End Condition-K (e):	1	
Axial Load Duration Factor	1.15	

COLUMN PROPERTIES

#2 - Douglas-Fir-Larch

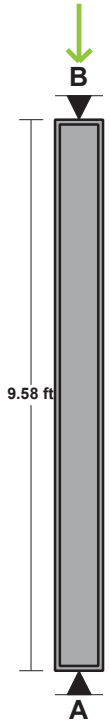
	Base Values	Adjusted
Compressive Stress:	Fc = 700 psi	Fc' = 582 psi
	Cd=1.15 Cp=0.72	
Bending Stress (X-X Axis):	Fbx = 750 psi	Fbx' = 863 psi
	Cd=1.15 CF=1.00	
Bending Stress (Y-Y Axis):	Fby = 750 psi	Fby' = 863 psi
	Cd=1.15 CF=1.00	
Modulus of Elasticity:	E = 1300 ksi	E' = 1300 ksi

Column Section (X-X Axis):	dx =	5.5	in
Column Section (Y-Y Axis):	dy =	5.5	in
Area:	A =	30.25	in2
Section Modulus (X-X Axis):	Sx =	27.73	in3
Section Modulus (Y-Y Axis):	Sy =	27.73	in3
Slenderness Ratio:	Lex/dx =	20.9	
	Ley/dy =	20.9	

Column Calculations (Controlling Case Only):
Controlling Load Case: Axial Total Load Only (L + D)

Actual Compressive Stress:	Fc =	192	psi
Allowable Compressive Stress:	Fc' =	582	psi
Eccentricity Moment (X-X Axis):	Mx-ex =	0	ft-lb
Eccentricity Moment (Y-Y Axis):	My-ey =	0	ft-lb
Moment Due to Lateral Loads (X-X Axis):	Mx =	0	ft-lb
Moment Due to Lateral Loads (Y-Y Axis):	My =	0	ft-lb
Bending Stress Lateral Loads Only (X-X Axis):	Fbx =	0	psi
Allowable Bending Stress (X-X Axis):	Fbx' =	863	psi
Bending Stress Lateral Loads Only (Y-Y Axis):	Fby =	0	psi
Allowable Bending Stress (Y-Y Axis):	Fby' =	863	psi
Combined Stress Factor:	**CSF =**	**0.33**	

LOADING DIAGRAM



AXIAL LOADING

Live Load:	PL =	3890	lb *
Dead Load:	PD =	1846	lb *
Column Self Weight:	CSW =	63	lb
Total Axial Load:	PT =	5799	lb

* Load obtained from Load Tracker. See Summary Report for details.

NOTES

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: FTG-PST-MLB2-3A
Footing
[2015 International Building Code(2015 NDS)]
Footing Size: 2.5 FT x 2.5 FT x 10.00 IN
Reinforcement: #4 Bars @ 11.00 IN. O.C. E/W / (3) min.
Section Footing Design Adequate

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FOOTING PROPERTIES

Allowable Soil Bearing Pressure:	Qs =	2500	psf
Concrete Compressive Strength:	F'c =	2500	psi
Reinforcing Steel Yield Strength:	Fy =	60000	psi
Concrete Reinforcement Cover:	c =	3	in

FOOTING SIZE

Width:	W =	2.5	ft
Length:	L =	2.5	ft
Depth:	Depth =	10	in
Effective Depth to Top Layer of Steel:	d =	6.25	in

COLUMN AND BASEPLATE SIZE

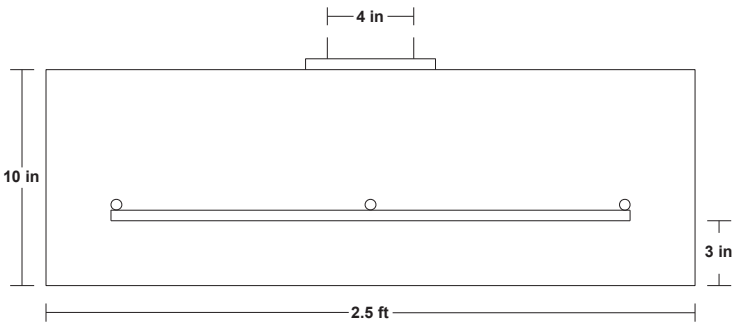
Column Type:	Steel		
Column Width:	m =	4	in
Column Depth:	n =	4	in
Baseplate Width:	bsw =	6	in
Baseplate Length:	bsl =	6	in

FOOTING CALCULATIONS

Bearing Calculations:			
Ultimate Bearing Pressure:	Qu =	1653	psf
Effective Allowable Soil Bearing Pressure:	Qe =	2375	psf
Required Footing Area:	Areq =	4.35	sf
Area Provided:	A =	6.25	sf
Baseplate Bearing:			
Bearing Required:	Bear =	14699	lb
Allowable Bearing:	Bear-A =	99450	lb
Beam Shear Calculations (One Way Shear):			
Beam Shear:	Vu1 =	3062	lb
Allowable Beam Shear:	Vc1 =	14063	lb
Punching Shear Calculations (Two Way Shear):			
Critical Perimeter:	Bo =	45	in
Punching Shear:	Vu2 =	12632	lb
Allowable Punching Shear (ACI 11-35):	vc2-a =	63281	lb
Allowable Punching Shear (ACI 11-36):	vc2-b =	79688	lb
Allowable Punching Shear (ACI 11-37):	vc2-c =	42188	lb
Controlling Allowable Punching Shear:	vc2 =	42188	lb
Bending Calculations:			
Factored Moment:	Mu =	38278	in-lb
Nominal Moment Strength:	Mn =	189895	in-lb
Reinforcement Calculations:			
Concrete Compressive Block Depth:	a =	0.55	in
Steel Required Based on Moment:	As(1) =	0.11	in2
Min. Code Req'd Reinf. Shrink./Temp. (ACI-10.5.4):	As(2) =	0.54	in2
Controlling Reinforcing Steel:	As-reqd =	0.54	in2
Selected Reinforcement:	#4's @ 11.0 in. o.c. e/w (3) Min.		
Reinforcement Area Provided:	As =	0.59	in2
Development Length Calculations:			
Development Length Required:	Ld =	15	in
Development Length Supplied:	Ld-sup =	9.5	in

Note: Plain concrete adequate for bending, therefore adequate development length not required.

LOADING DIAGRAM



FOOTING LOADING

Live Load:	PL =	5757	lb *
Dead Load:	PD =	4573	lb *
Total Load:	PT =	10330	lb *
Ultimate Factored Load:	Pu =	14699	lb
Footing plus soil above footing weight:	Wt =	503	lb

* Load obtained from Load Tracker. See Summary Report for details.

NOTES

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: FTG-PST-MLB2-3C
Footing
[2015 International Building Code(2015 NDS)]
Footing Size: 2.5 FT x 2.5 FT x 12.00 IN
Reinforcement: #4 Bars @ 7.00 IN. O.C. E/W / (4) min.
Section Footing Design Adequate

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FOOTING PROPERTIES

Allowable Soil Bearing Pressure:	Qs =	2500	psf
Concrete Compressive Strength:	F'c =	2500	psi
Reinforcing Steel Yield Strength:	Fy =	60000	psi
Concrete Reinforcement Cover:	c =	3	in

FOOTING SIZE

Width:	W =	2.5	ft
Length:	L =	2.5	ft
Depth:	Depth =	12	in
Effective Depth to Top Layer of Steel:	d =	8.25	in

COLUMN AND BASEPLATE SIZE

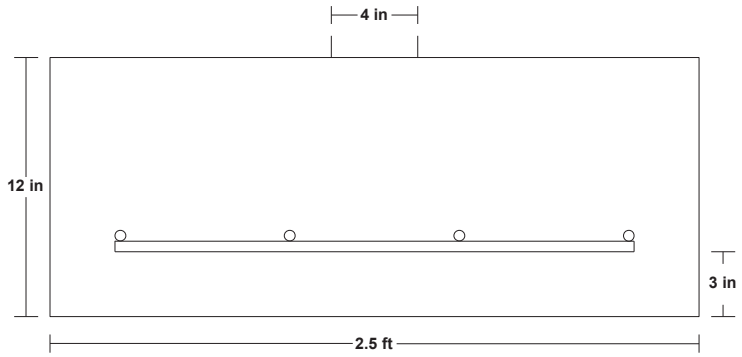
Column Type:	Concrete		
Column Width:	m =	4	in
Column Depth:	n =	4	in

FOOTING CALCULATIONS

Bearing Calculations:			
Ultimate Bearing Pressure:	Qu =	1856	psf
Effective Allowable Soil Bearing Pressure:	Qe =	2350	psf
Required Footing Area:	Areq =	4.94	sf
Area Provided:	A =	6.25	sf
Baseplate Bearing:			
Bearing Required:	Bear =	17030	lb
Allowable Bearing:	Bear-A =	44200	lb
Beam Shear Calculations (One Way Shear):			
Beam Shear:	Vu1 =	2696	lb
Allowable Beam Shear:	Vc1 =	18563	lb
Punching Shear Calculations (Two Way Shear):			
Critical Perimeter:	Bo =	49	in
Punching Shear:	Vu2 =	14190	lb
Allowable Punching Shear (ACI 11-35):	vc2-a =	90956	lb
Allowable Punching Shear (ACI 11-36):	vc2-b =	132413	lb
Allowable Punching Shear (ACI 11-37):	vc2-c =	60638	lb
Controlling Allowable Punching Shear:	vc2 =	60638	lb
Bending Calculations:			
Factored Moment:	Mu =	47967	in-lb
Nominal Moment Strength:	Mn =	334058	in-lb
Reinforcement Calculations:			
Concrete Compressive Block Depth:	a =	0.74	in
Steel Required Based on Moment:	As(1) =	0.11	in2
Min. Code Req'd Reinf. Shrink./Temp. (ACI-10.5.4):	As(2) =	0.65	in2
Controlling Reinforcing Steel:	As-reqd =	0.65	in2
Selected Reinforcement:	#4's @ 7.0 in. o.c. e/w (4) Min.		
Reinforcement Area Provided:	As =	0.79	in2
Development Length Calculations:			
Development Length Required:	Ld =	15	in
Development Length Supplied:	Ld-sup =	10	in

Note: Plain concrete adequate for bending, therefore adequate development length not required.

LOADING DIAGRAM



FOOTING LOADING

Live Load:	PL =	7780	lb *
Dead Load:	PD =	3818	lb *
Total Load:	PT =	11598	lb *
Ultimate Factored Load:	Pu =	17030	lb
Footing plus soil above footing weight:	Wt =	604	lb

* Load obtained from Load Tracker. See Summary Report for details.

NOTES

Established Basic Permit #
19-03646

Permit Number: 20-04894

Project: 19-002c Framing

Location: FTG-PST-MLB2-3B
Footing
[2015 International Building Code(2015 NDS)]
Footing Size: 3.5 FT x 3.5 FT x 10.00 IN
Reinforcement: #4 Bars @ 11.00 IN. O.C. E/W / (4) min.
Section Footing Design Adequate

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FOOTING PROPERTIES

Allowable Soil Bearing Pressure:	Qs =	2500	psf
Concrete Compressive Strength:	F'c =	2500	psi
Reinforcing Steel Yield Strength:	Fy =	60000	psi
Concrete Reinforcement Cover:	c =	3	in

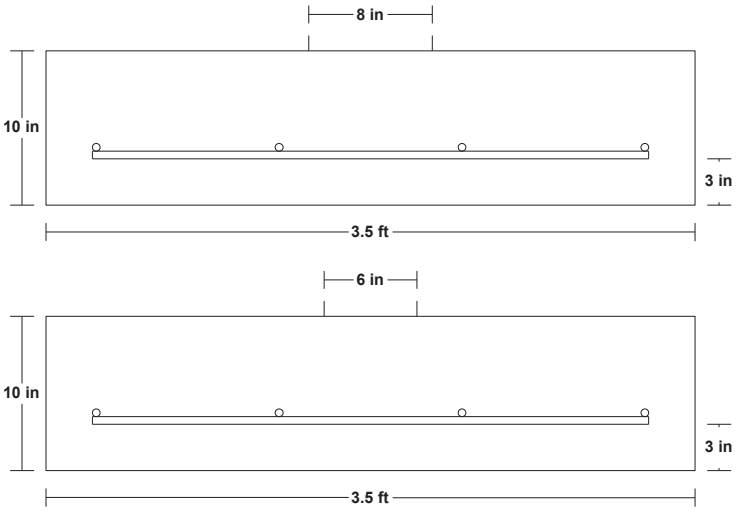
FOOTING SIZE

Width:	W =	3.5	ft
Length:	L =	3.5	ft
Depth:	Depth =	10	in
Effective Depth to Top Layer of Steel:	d =	6.25	in

COLUMN AND BASEPLATE SIZE

Column Type:	Concrete	
Column Width:	m =	6 in
Column Depth:	n =	8 in

LOADING DIAGRAM



FOOTING CALCULATIONS

Bearing Calculations:			
Ultimate Bearing Pressure:	Qu =	2158	psf
Effective Allowable Soil Bearing Pressure:	Qe =	2375	psf
Required Footing Area:	Areq =	11.13	sf
Area Provided:	A =	12.25	sf
Baseplate Bearing:			
Bearing Required:	Bear =	37511	lb
Allowable Bearing:	Bear-A =	132600	lb
Beam Shear Calculations (One Way Shear):			
Beam Shear:	Vu1 =	10494	lb
Allowable Beam Shear:	Vc1 =	19688	lb
Punching Shear Calculations (Two Way Shear):			
Critical Perimeter:	Bo =	53	in
Punching Shear:	Vu2 =	33799	lb
Allowable Punching Shear (ACI 11-35):	vc2-a =	62109	lb
Allowable Punching Shear (ACI 11-36):	vc2-b =	83438	lb
Allowable Punching Shear (ACI 11-37):	vc2-c =	49688	lb
Controlling Allowable Punching Shear:	vc2 =	49688	lb
Bending Calculations:			
Factored Moment:	Mu =	144686	in-lb
Nominal Moment Strength:	Mn =	253752	in-lb
Reinforcement Calculations:			
Concrete Compressive Block Depth:	a =	0.53	in
Steel Required Based on Moment:	As(1) =	0.44	in2
Min. Code Req'd Reinf. Shrink./Temp. (ACI-10.5.4):	As(2) =	0.76	in2
Controlling Reinforcing Steel:	As-reqd =	0.76	in2
Selected Reinforcement:	#4's @ 11.0 in. o.c. e/w (4) Min.		
Reinforcement Area Provided:	As =	0.79	in2
Development Length Calculations:			
Development Length Required:	Ld =	15	in
Development Length Supplied:	Ld-sup =	15	in

FOOTING LOADING

Live Load:	PL =	14470	lb *
Dead Load:	PD =	11966	lb *
Total Load:	PT =	26436	lb *
Ultimate Factored Load:	Pu =	37511	lb
Footing plus soil above footing weight:	Wt =	987	lb

* Load obtained from Load Tracker. See Summary Report for details.

NOTES

Established Basic Permit #
19-03646

Permit Number: 20-04894

Pacific Northwest Structural Group, LLC	Project:	Red Barn Lane - Duplex 1400	By:	DLS
	Location:	NW Hogan Ln & Nels Nelson Rd NW, Bremerton, WA 98311	Project No.:	19-002c
	Client:	Envision Northwest, LLC	*Last Update:*	
	AWC SDPWS-2008 - Wood Shear Wall Design Aid ALLOWABLE STRESS DESIGN		27-Apr-19	

Mark	Sheating Type, Nail Size, Panel Edges Fastener Spacing, & Capacity	Capacity (plf)
A	15/32" Sheathing W/ 8d @ 6" oc	365
B	15/32" Sheathing W/ 8d @ 4" oc	533
	None	#N/A
	None	#N/A
	None	#N/A
	None	#N/A

Mark	Simpson Strong-Tie Holdowns	Capacity (lb)	Holdown Deflection at Highest Load (in)	
1	HDU2-SDS2.5 W/ 3" Post	3,075	0.088	
2	HDU5-SDS2.5 W/ 3" Post	5,645	0.115	
3	HDU11-SDS2.5 W/ 5.5" Post	9,535	0.137	○ SEISMIC
	None	N/A	N/A	◉ WIND
	None	N/A	N/A	
	None	N/A	N/A	
	None	N/A	N/A	
	None	N/A	N/A	
	None	N/A	N/A	
	None	N/A	N/A	
	None	N/A	N/A	
	None	N/A	N/A	
	None	N/A	N/A	

Shear Wall Deflection		
G	90,000	psi
E	1,200,000	psi
A	8.25	in^2

Established Basic Permit #

19-03646

Permit Number: 20-04894

3rd Level

Lateral Trib. Width	ft	9.3
V from above	k	-
Uniform v this level	plf	115.7
Total Wall Length	ft	31.00
V this level	k	1.1
V accum.	k	1.1
Unit Wall Shear	plf	35
Shear Wall Capcity	plf	365
Demand vs. Capcity Ratio		0.09
Apparent Stiffness, Ga	K/in	10.00

Shearwall Type: A

Overturning Moment

		Wall 1	Wall 2	Wall 3	Wall 4	Wall 5	Wall 6
M_{OT} from above	k-ft						
Story Ht	ft	8.08	8.08	8.08	8.08	-	-
Length	ft	11.00	5.00	5.00	10.00	-	-
Diaphragm Ratio		0.73	1.62	1.62	0.81	-	-
Modified Capacity		365	365	365	365	-	-
M_{OT}	k-ft	3.1	1.4	1.4	2.8	-	-
M_{OT} accum	k-ft	3.1	1.4	1.4	2.8	-	-

Shear Wall Defection

Δ_B	in	0.016	0.035	0.035	0.018	-	-
Δ_V	in	0.246	0.246	0.246	0.246	-	-
Δ_{HD}	in	-	-	-	-	-	-
Δ_{SW}	in	0.262	0.281	0.281	0.264	-	-

Resisting Moment

M_R from above		k-ft	-	-	-	-	-	-
Distr Wall Wts.	Wall Wt	psf	10.0	10.0	10.0	10.0	-	-
	Trib above	ft	6.0	6.0	6.0	6.0	-	-
	Wt above	psf	12.0	12.0	12.0	12.0	-	-
End Wts.	Hdr. Trib	ft	-	-	-	-	-	-
	tnb to hdr	ft	-	-	-	-	-	-
	Wt to hdr	psf	-	-	-	-	-	-
Perp. Wall Wts.	Dist to wall	ft	11.00	5.00	5.00	10.00	-	-
	Wt of wall	lb	250	250	250	250	-	-
	Dist to wall	ft	-	-	-	-	-	-
	Wt of wall	lb	-	-	-	-	-	-
M_R this level		k-ft	11.99	3.16	3.16	10.14	-	-
M_R accum		k-ft	11.99	3.16	3.16	10.14	-	-

Hold Down Forces

Wt. Reduction		0.60	0.60	0.60	0.60	0.60	0.60
T_R accum	k	1.09	0.63	0.63	1.01	-	-
HD Offset	ft	-	-	-	-	-	-
HD Force	k	-	-	-	-	-	-
HD Capacity	k	-	-	-	-	-	-
Hold Down Type		-	-	-	-	-	-

2nd Level

Lateral Trib. Width	ft	9.3
V from above	k	1.1
Uniform v this level	plf	178.7
Total Wall Length	ft	26.00
V this level	k	1.7
V accum.	k	2.7
Unit Wall Shear	plf	105
Shear Wall Capcity	plf	365
Demand vs. Capcity Ratio		0.29
Apparent Stiffness, Ga	K/in	10.00

Shearwall Type: A

Overturning Moment

		Wall 1	Wall 2	Wall 3	Wall 4	Wall 5	Wall 6
M_{OT} from above	k-ft	3.1	1.4	1.4	2.8	-	-
Story Ht	ft	8.08	8.08	8.08	8.08	8.08	-
Length	ft	3.25	3.00	3.00	14.00	2.75	-
Diaphragm Ratio		2.49	2.69	2.69	0.58	2.94	-
Modified Capacity		294	271	271	365	248	-
M_{OT}	k-ft	2.8	2.5	2.5	11.9	2.3	-
M_{OT} accum	k-ft	5.8	4.0	4.0	14.7	2.3	-

Shear Wall Defection

Δ_B	in	0.166	0.179	0.179	0.038	0.196	-
Δ_V	in	0.246	0.246	0.246	0.246	0.246	-
Δ_{HD}	in	-	0.237	0.237	-	0.259	-
Δ_{SW}	in	0.411	0.662	0.662	0.284	0.700	-

Resisting Moment

M_R from above		k-ft	12.0	3.2	3.2	10.1	-	-
Distr Wall Wts.	Wall Wt	psf	10.0	10.0	10.0	10.0	10.0	-
	Trib above	ft	6.0	6.0	6.0	6.0	6.0	-
	Wt above	psf	12.0	12.0	12.0	12.0	12.0	-
End Wts.	Hdr. Trib	ft	-	-	-	-	-	-
	tnb to hdr	ft	-	-	-	-	-	-
	Wt to hdr	psf	-	-	-	-	-	-
Perp. Wall Wts.	Dist to wall	ft	3.25	3.00	3.00	14.00	2.75	-
	Wt of wall	lb	250	250	250	250	250	-
	Dist to wall	ft	-	-	-	-	-	-
	Wt of wall	lb	-	-	-	-	-	-
M_R this level		k-ft	1.62	1.44	1.44	18.47	1.27	-
M_R accum		k-ft	13.61	4.60	4.60	28.61	1.27	-

Hold Down Forces

Wt. Reduction		0.60	0.60	0.60	0.60	0.60	0.60
T_R accum	k	4.19	1.53	1.53	2.04	0.46	-
HD Offset	ft	-	-	-	4.00	-	-
HD Force	k	-	0.40	0.40	-	0.57	-
HD Capacity	k	-	3.08	3.08	-	3.08	-
Hold Down Type		-	I	I	-	I	-

1st Level

Lateral Trib. Width	ft	9.3
V from above	k	2.7
Uniform v this level	plf	178.7
Total Wall Length	ft	36.00
V this level	k	1.7
V accum.	k	4.4
Unit Wall Shear	plf	122
Shear Wall Capcity	plf	365
Demand vs. Capcity Ratio		0.33
Apparent Stiffness, Ga	K/in	10.00

Shearwall Type: A

Overturning Moment

		Wall 1	Wall 2	Wall 3	Wall 4	Wall 5	Wall 6
M_{OT} from above	k-ft	5.8	4.0	4.0	14.7	2.3	-
Story Ht	ft	9.58	9.58	-	9.58	-	-
Length	ft	11.00	11.00	-	14.00	-	-
Diaphragm Ratio		0.87	0.87	-	0.68	-	-
Modified Capacity		365	365	-	365	-	-
M_{OT}	k-ft	12.9	12.9	-	16.4	-	-
M_{OT} accum	k-ft	18.7	16.8	4.0	31.1	2.3	-

Shear Wall Defection

Δ_B	in	0.095	0.095	-	0.074	-	-
Δ_V	in	0.291	0.291	-	0.291	-	-
Δ_{HD}	in	0.077	0.077	-	-	-	-
Δ_{SW}	in	0.463	0.463	-	0.366	-	-

Resisting Moment

M_R from above		k-ft	13.6	4.6	4.6	28.6	1.3	-
Distr Wall Wts.	Wall Wt	psf	10.0	10.0	-	10.0	-	-
	Trib above	ft	6.0	6.0	-	6.0	-	-
	Wt above	psf	12.0	12.0	-	12.0	-	-
End Wts.	Hdr. Trib	ft	-	-	-	-	-	-
	tnb to hdr	ft	-	-	-	-	-	-
	Wt to hdr	psf	-	-	-	-	-	-
Perp. Wall Wts.	Dist to wall	ft	11.00	11.00	-	14.00	-	-
	Wt of wall	lb	500	500	-	500	-	-
	Dist to wall	ft	-	-	-	-	-	-
	Wt of wall	lb	-	-	-	-	-	-
M_R this level		k-ft	15.65	15.65	-	23.44	-	-
M_R accum		k-ft	29.27	20.25	4.60	52.06	1.27	-

Hold Down Forces

Wt. Reduction		0.60	0.60	0.60	0.60	0.60	0.60
T_R accum	k	2.66	1.84	-	3.72	-	-
HD Offset	ft	-	-	-	-	-	-
HD Force	k	0.10	0.42	-	-	-	-
HD Capacity	k	3.08	3.08	-	-	-	-
Hold Down Type		I	I	-	-	-	-

Project: Red Barn Lane - Duplex 1400
Location: TF-1
Client: Envision Northwest, LLC
By: DLS
Job No.: 19-002c
Last Update: 27-Apr-2019

Wood Shear Wall Design Aid

Comments: See Perforated Shear Calculations

Established Basic Permit #

19-03646

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Permit Number: 20-04894

3rd Level

Lateral Trib. Width	ft	9.3
V from above	k	-
Uniform v this level	plf	115.7
Total Wall Length	ft	16.50
V this level	k	1.1
V accum.	k	1.1
Unit Wall Shear	plf	65
Shear Wall Capcity	plf	365
Demand vs. Capcity Ratio		0.18
Apparent Stiffness, Ga	K/in	10.00

Shearwall Type: A

Overturning Moment

		Wall 1	Wall 2	Wall 3	Wall 4	Wall 5	Wall 6
M_{OT} from above	k-ft						
Story Ht	ft	8.08	8.08	-	-	-	-
Length	ft	5.25	11.25	-	-	-	-
Diaphragm Ratio		1.54	0.72	-	-	-	-
Modified Capacity		365	365	-	-	-	-
M_{OT}	k-ft	2.8	5.9	-	-	-	-
M_{OT} accum	k-ft	2.8	5.9	-	-	-	-

Shear Wall Defection

Δ_B	in	0.063	0.030	-	-	-	-
Δ_V	in	0.246	0.246	-	-	-	-
Δ_{HD}	in	-	-	-	-	-	-
Δ_{SW}	in	0.309	0.275	-	-	-	-

Resisting Moment

M_R from above		k-ft	-	-	-	-	-	-
Distr Wts.	Wall Wt	psf	10.0	10.0	-	-	-	-
	Trib above	ft	6.0	6.0	-	-	-	-
	Wt above	psf	12.0	12.0	-	-	-	-
End Wts.	Hdr. Trib	ft	-	-	-	-	-	-
	trib to hdr	ft	-	-	-	-	-	-
	Wt to hdr	psf	-	-	-	-	-	-
Perp. Wall Wts.	Dist to wall	ft	11.00	5.00	-	-	-	-
	Wt of wall	lb	250	250	-	-	-	-
	Dist to wall	ft	-	-	-	-	-	-
	Wt of wall	lb	-	-	-	-	-	-
M_R this level		k-ft	4.86	10.92	-	-	-	-
M_R accum		k-ft	4.86	10.92	-	-	-	-

Hold Down Forces

Wt. Reduction		0.60	0.60	0.60	0.60	0.60	0.60
T_R accum	k	0.92	0.97	-	-	-	-
HD Offset	ft	-	-	-	-	-	-
HD Force	k	-	-	-	-	-	-
HD Capacity	k	-	-	-	-	-	-
Hold Down Type		-	-	-	-	-	-

2nd Level

Lateral Trib. Width	ft	9.3
V from above	k	1.1
Uniform v this level	plf	178.7
Total Wall Length	ft	16.50
V this level	k	1.7
V accum.	k	2.7
Unit Wall Shear	plf	166
Shear Wall Capcity	plf	365
Demand vs. Capcity Ratio		0.45
Apparent Stiffness, Ga	K/in	10.00

Shearwall Type: A

Overturning Moment

		Wall 1	Wall 2	Wall 3	Wall 4	Wall 5	Wall 6
M_{OT} from above	k-ft	2.8	5.9	-	-	-	-
Story Ht	ft	8.08	8.08	-	-	-	-
Length	ft	5.25	11.25	-	-	-	-
Diaphragm Ratio		1.54	0.72	-	-	-	-
Modified Capacity		365	365	-	-	-	-
M_{OT}	k-ft	7.0	15.1	-	-	-	-
M_{OT} accum	k-ft	9.8	21.0	-	-	-	-

Shear Wall Defection

Δ_B	in	0.162	0.075	-	-	-	-
Δ_V	in	0.246	0.246	-	-	-	-
Δ_{HD}	in	0.135	0.063	-	-	-	-
Δ_{SW}	in	0.543	0.384	-	-	-	-

Resisting Moment

M_R from above		k-ft	4.9	10.9	-	-	-	-
Distr Wts.	Wall Wt	psf	10.0	10.0	-	-	-	-
	Trib above	ft	6.0	8.8	-	-	-	-
	Wt above	psf	12.0	12.0	-	-	-	-
End Wts.	Hdr. Trib	ft	-	-	-	-	-	-
	trib to hdr	ft	-	-	-	-	-	-
	Wt to hdr	psf	-	-	-	-	-	-
Perp. Wall Wts.	Dist to wall	ft	5.25	11.25	-	-	-	-
	Wt of wall	lb	250	250	-	-	-	-
	Dist to wall	ft	-	-	-	-	-	-
	Wt of wall	lb	-	-	-	-	-	-
M_R this level		k-ft	3.42	14.57	-	-	-	-
M_R accum		k-ft	8.27	25.49	-	-	-	-

Hold Down Forces

Wt. Reduction		0.60	0.60	0.60	0.60	0.60	0.60
T_R accum	k	1.58	2.27	-	-	-	-
HD Offset	ft	-	-	-	-	-	-
HD Force	k	0.92	0.51	-	-	-	-
HD Capacity	k	3.08	3.08	-	-	-	-
Hold Down Type		1	1	-	-	-	-

1st Level

Lateral Trib. Width	ft	9.3
V from above	k	2.7
Uniform v this level	plf	178.7
Total Wall Length	ft	20.50
V this level	k	1.7
V accum.	k	4.4
Unit Wall Shear	plf	214
Shear Wall Capcity	plf	365
Demand vs. Capcity Ratio		0.59
Apparent Stiffness, Ga	K/in	10.00

Shearwall Type: A

Overturning Moment

		Wall 1	Wall 2	Wall 3	Wall 4	Wall 5	Wall 6
M_{OT} from above	k-ft	9.8	21.0	-	-	-	-
Story Ht	ft	9.58	9.58	-	-	-	-
Length	ft	9.25	11.25	-	-	-	-
Diaphragm Ratio		1.04	0.85	-	-	-	-
Modified Capacity		365	365	-	-	-	-
M_{OT}	k-ft	19.0	23.1	-	-	-	-
M_{OT} accum	k-ft	28.8	44.1	-	-	-	-

Shear Wall Defection

Δ_B	in	0.198	0.162	-	-	-	-
Δ_V	in	0.291	0.291	-	-	-	-
Δ_{HD}	in	0.091	0.075	-	-	-	-
Δ_{SW}	in	0.580	0.529	-	-	-	-

Resisting Moment

M_R from above		k-ft	8.3	25.5	-	-	-	-
Distr Wts.	Wall Wt	psf	10.0	10.0	-	-	-	-
	Trib above	ft	6.0	6.0	-	-	-	-
	Wt above	psf	12.0	12.0	-	-	-	-
End Wts.	Hdr. Trib	ft	-	-	-	-	-	-
	trib to hdr	ft	-	-	-	-	-	-
	Wt to hdr	psf	-	-	-	-	-	-
Perp. Wall Wts.	Dist to wall	ft	9.25	11.25	-	-	-	-
	Wt of wall	lb	250	250	-	-	-	-
	Dist to wall	ft	-	-	-	-	-	-
	Wt of wall	lb	-	-	-	-	-	-
M_R this level		k-ft	9.49	13.43	-	-	-	-
M_R accum		k-ft	17.77	38.92	-	-	-	-

Hold Down Forces

Wt. Reduction		0.60	0.60	0.60	0.60	0.60	0.60
T_R accum	k	1.92	3.46	-	-	-	-
HD Offset	ft	-	-	-	-	-	-
HD Force	k	1.96	1.84	-	-	-	-
HD Capacity	k	3.08	3.08	-	-	-	-
Hold Down Type		1	1	-	-	-	-

Project:	Red Barn Lane - Duplex 1400
Location:	TF-2
Client:	Envision Northwest, LLC
By:	DLS
Job No.:	19-002c
Last Update:	27-Apr-2019

Wood Shear Wall Design Aid

Comments:

Established Basic Permit #

19-03646

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Permit Number: 20-04894

3rd Level

Lateral Trib. Width	ft	18.5
V from above	k	-
Uniform v this level	plf	86.3
Total Wall Length	ft	7.84
V this level	k	1.6
V accum.	k	1.6
Unit Wall Shear	plf	208
Shear Wall Capcity	plf	365
Demand vs. Capcity Ratio		0.57
Apparent Stiffness, Ga	K/in	10.00

Shearwall Type: A

Overturning Moment

		Wall 1	Wall 2	Wall 3	Wall 4	Wall 5	Wall 6
M_{OT} from above	k-ft						
Story Ht	ft	8.08	8.08	8.08	-	-	-
Length	ft	2.42	3.00	2.42	-	-	-
Diaphragm Ratio		3.34	2.69	3.34	-	-	-
Modified Capacity		219	271	219	-	-	-
M_{OT}	k-ft	4.1	5.1	4.1	-	-	-
M_{OT} accum	k-ft	4.1	5.1	4.1	-	-	-

Shear Wall Defection

Δ_B	in	0.440	0.355	0.440	-	-	-
Δ_V	in	0.246	0.246	0.246	-	-	-
Δ_{HD}	in	0.294	0.237	0.294	-	-	-
Δ_{SW}	in	0.980	0.838	0.980	-	-	-

Resisting Moment

M_R from above		k-ft	-	-	-	-	-	-
Distr Wall Wt		psf	10.0	10.0	10.0	-	-	-
	Trib above	ft	16.3	16.3	16.3	-	-	-
Wts.	Wt above	psf	12.0	12.0	12.0	-	-	-
End Wts.	Hdr. Trib	ft	-	-	-	-	-	-
	tnb to hdr	ft	-	-	-	-	-	-
	Wt to hdr	psf	-	-	-	-	-	-
Perp. Wall Wts.	Dist to wall	ft	-	-	-	-	-	-
	Wt of wall	lb	-	-	-	-	-	-
	Dist to wall	ft	-	-	-	-	-	-
	Wt of wall	lb	-	-	-	-	-	-
M_R this level		k-ft	0.81	1.24	0.81	-	-	-
M_R accum		k-ft	0.81	1.24	0.81	-	-	-

Hold Down Forces

Wt. Reduction		0.60	0.60	0.60	0.60	0.60	0.60
T_R accum	k	0.33	0.41	0.33	-	-	-
HD Offset	ft	-	-	-	-	-	-
HD Force	k	1.48	1.44	1.48	-	-	-
HD Capacity	k	3.08	3.08	3.08	-	-	-
Hold Down Type		1	1	1	-	-	-

2nd Level

Lateral Trib. Width	ft	18.5
V from above	k	1.6
Uniform v this level	plf	96.0
Total Wall Length	ft	13.08
V this level	k	1.8
V accum.	k	3.4
Unit Wall Shear	plf	261
Shear Wall Capcity	plf	365
Demand vs. Capcity Ratio		0.71
Apparent Stiffness, Ga	K/in	10.00

Shearwall Type: A

Overturning Moment

		Wall 1	Wall 2	Wall 3	Wall 4	Wall 5	Wall 6
M_{OT} from above	k-ft	4.1	5.1	4.1	-	-	-
Story Ht	ft	8.08	8.08	8.08	8.08	8.08	-
Length	ft	2.50	4.08	2.50	2.00	2.00	-
Diaphragm Ratio		3.23	1.98	3.23	**4.04**	**4.04**	-
Modified Capacity		226	365	226	N/A	N/A	-
M_{OT}	k-ft	5.3	8.6	5.3	4.2	4.2	-
M_{OT} accum	k-ft	9.3	13.6	9.3	4.2	4.2	-

Shear Wall Defection

Δ_B	in	0.533	0.327	0.533	0.667	0.667	-
Δ_V	in	0.246	0.246	0.246	0.246	0.246	-
Δ_{HD}	in	0.372	0.174	0.372	0.356	0.356	-
Δ_{SW}	in	1.151	0.747	1.151	1.268	1.268	-

Resisting Moment

M_R from above		k-ft	0.8	1.2	0.8	-	-	-
Distr Wall Wt		psf	10.0	10.0	10.0	10.0	10.0	-
	Trib above	ft	6.0	6.0	6.0	6.0	6.0	-
Wts.	Wt above	psf	12.0	12.0	12.0	12.0	12.0	-
End Wts.	Hdr. Trib	ft	-	-	-	-	-	-
	tnb to hdr	ft	-	-	-	-	-	-
	Wt to hdr	psf	-	-	-	-	-	-
Perp. Wall Wts.	Dist to wall	ft	-	-	-	-	-	-
	Wt of wall	lb	-	-	-	-	-	-
	Dist to wall	ft	-	-	-	-	-	-
	Wt of wall	lb	-	-	-	-	-	-
M_R this level		k-ft	0.48	1.27	0.48	0.31	0.31	-
M_R accum		k-ft	1.29	2.51	1.29	0.31	0.31	-

Hold Down Forces

Wt. Reduction		0.60	0.60	0.60	0.60	0.60	0.60
T_R accum	k	0.51	0.62	0.51	0.15	0.15	-
HD Offset	ft	-	-	-	-	-	-
HD Force	k	3.43	2.97	3.43	2.01	2.01	-
HD Capacity	k	5.65	3.08	5.65	3.08	3.08	-
Hold Down Type		2	1	2	1	1	-

1st Level

Lateral Trib. Width	ft	18.5
V from above	k	3.4
Uniform v this level	plf	101.6
Total Wall Length	ft	15.08
V this level	k	1.9
V accum.	k	5.3
Unit Wall Shear	plf	351
Shear Wall Capcity	plf	365
Demand vs. Capcity Ratio		0.96
Apparent Stiffness, Ga	K/in	10.00

Shearwall Type: A

Overturning Moment

		Wall 1	Wall 2	Wall 3	Wall 4	Wall 5	Wall 6
M_{OT} from above	k-ft	9.3	13.6	9.3	4.2	4.2	-
Story Ht	ft	9.58	9.58	9.58	9.58	9.58	-
Length	ft	1.75	7.58	1.75	2.00	2.00	-
Diaphragm Ratio		**5.47**	1.26	**5.47**	**4.79**	**4.79**	-
Modified Capacity		N/A	365	N/A	N/A	N/A	-
M_{OT}	k-ft	5.9	25.5	5.9	6.7	6.7	-
M_{OT} accum	k-ft	15.2	39.1	15.2	10.9	10.9	-

Shear Wall Defection

Δ_B	in	1.709	0.395	1.709	1.495	1.495	-
Δ_V	in	0.291	0.291	0.291	0.291	0.291	-
Δ_{HD}	in	0.750	0.145	0.750	0.551	0.551	-
Δ_{SW}	in	2.750	0.831	2.750	2.337	2.337	-

Resisting Moment

M_R from above		k-ft	1.3	2.5	1.3	0.3	0.3	-
Distr Wall Wt		psf	10.0	10.0	10.0	10.0	10.0	-
	Trib above	ft	6.0	6.0	6.0	6.0	6.0	-
Wts.	Wt above	psf	12.0	12.0	12.0	12.0	12.0	-
End Wts.	Hdr. Trib	ft	-	-	-	-	-	-
	tnb to hdr	ft	-	-	-	-	-	-
	Wt to hdr	psf	-	-	-	-	-	-
Perp. Wall Wts.	Dist to wall	ft	-	-	-	-	-	-
	Wt of wall	lb	-	-	-	-	-	-
	Dist to wall	ft	-	-	-	-	-	-
	Wt of wall	lb	-	-	-	-	-	-
M_R this level		k-ft	0.26	4.82	0.26	0.34	0.34	-
M_R accum		k-ft	1.54	7.33	1.54	0.64	0.64	-

Hold Down Forces

Wt. Reduction		0.60	0.60	0.60	0.60	0.60	0.60
T_R accum	k	0.88	0.97	0.88	0.32	0.32	-
HD Offset	ft	-	-	-	-	-	-
HD Force	k	8.17	4.58	8.17	5.27	5.27	-
HD Capacity	k	9.54	5.65	9.54	5.65	5.65	-
Hold Down Type		3	2	3	2	2	-

Project:	Red Barn Lane - Duplex 1400
Location:	LF-1
Client:	Envision Northwest, LLC
By:	DLS
Job No.:	19-002c
Last Update:	27-Apr-2019

Wood Shear Wall Design Aid

Comments: See Perforated Shear Calculations

Established Basic Permit #

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Permit Number: 20-04894

3rd Level

Lateral Trib. Width	ft	18.5
V from above	k	-
Uniform v this level	plf	88.3
Total Wall Length	ft	21.08
V this level	k	1.6
V accum.	k	1.6
Unit Wall Shear	plf	77
Shear Wall Capcity	plf	365
Demand vs. Capcity Ratio		0.21
Apparent Stiffness, Ga	K/in	10.00

Shearwall Type: A

Overturning Moment

		Wall 1	Wall 2	Wall 3	Wall 4	Wall 5	Wall 6
M_{OT} from above	k-ft						
Story Ht	ft	8.08	8.08	8.08	8.08	-	-
Length	ft	3.25	3.25	2.50	3.08	-	-
Diaphragm Ratio		2.49	2.49	3.23	2.62	-	-
Modified Capacity		294	294	226	278	-	-
M_{OT}	k-ft	2.0	2.0	1.6	1.9	-	-
M_{OT} accum	k-ft	2.0	2.0	1.6	1.9	-	-

Shear Wall Defection

Δ_B	in	0.122	0.122	0.159	0.129	-	-
Δ_V	in	0.246	0.246	0.246	0.246	-	-
Δ_{HD}	in	0.219	0.219	0.284	-	-	-
Δ_{SW}	in	0.587	0.587	0.689	0.374	-	-

Resisting Moment

M_R from above		k-ft	-	-	-	-	-	-
Distr Wall Wts.	Wall Wt	psf	10.0	10.0	10.0	10.0	-	-
	Trib above	ft	6.0	6.0	16.3	16.3	-	-
	Wt above	psf	12.0	12.0	12.0	12.0	-	-
End Wts.	Hdr. Trib	ft	-	-	-	-	-	-
	tnb to hdr	ft	-	-	-	-	-	-
	Wt to hdr	psf	-	-	-	-	-	-
Perp. Wall Wts.	Dist to wall	ft	3.25	3.25	2.50	3.08	-	-
	Wt of wall	lb	250	250	250	500	-	-
	Dist to wall	ft	-	-	-	-	-	-
	Wt of wall	lb	-	-	-	-	-	-
M_R this level		k-ft	1.62	1.62	1.49	2.85	-	-
M_R accum		k-ft	1.62	1.62	1.49	2.85	-	-

Hold Down Forces

Wt. Reduction		0.60	0.60	0.60	0.60	0.60	0.60
T_R accum	k	0.50	0.50	0.59	0.92	-	-
HD Offset	ft	-	-	-	-	-	-
HD Force	k	0.33	0.33	0.27	-	-	-
HD Capacity	k	3.08	3.08	3.08	-	-	-
Hold Down Type		1	1	1	-	-	-

2nd Level

Lateral Trib. Width	ft	18.5
V from above	k	1.6
Uniform v this level	plf	96.0
Total Wall Length	ft	31.58
V this level	k	1.8
V accum.	k	3.4
Unit Wall Shear	plf	108
Shear Wall Capcity	plf	365
Demand vs. Capcity Ratio		0.30
Apparent Stiffness, Ga	K/in	10.00

Shearwall Type: A

Overturning Moment

		Wall 1	Wall 2	Wall 3	Wall 4	Wall 5	Wall 6
M_{OT} from above	k-ft	2.0	2.0	1.6	1.9	-	-
Story Ht	ft	8.08	8.08	8.08	8.08	-	-
Length	ft	3.75	3.75	2.50	14.08	-	-
Diaphragm Ratio		2.15	2.15	3.23	0.57	-	-
Modified Capacity		339	339	226	365	-	-
M_{OT}	k-ft	3.3	3.3	2.2	12.3	-	-
M_{OT} accum	k-ft	5.3	5.3	3.7	14.2	-	-

Shear Wall Defection

Δ_B	in	0.147	0.147	0.221	0.039	-	-
Δ_V	in	0.246	0.246	0.246	0.246	-	-
Δ_{HD}	in	0.190	0.190	0.284	0.051	-	-
Δ_{SW}	in	0.583	0.583	0.751	0.335	-	-

Resisting Moment

M_R from above		k-ft	1.6	1.6	1.5	2.8	-	-
Distr Wall Wts.	Wall Wt	psf	10.0	10.0	10.0	10.0	-	-
	Trib above	ft	6.0	6.0	6.0	6.0	-	-
	Wt above	psf	12.0	12.0	12.0	12.0	-	-
End Wts.	Hdr. Trib	ft	-	-	-	-	-	-
	tnb to hdr	ft	-	-	-	-	-	-
	Wt to hdr	psf	-	-	-	-	-	-
Perp. Wall Wts.	Dist to wall	ft	-	-	-	-	-	-
	Wt of wall	lb	-	-	-	-	-	-
	Dist to wall	ft	-	-	-	-	-	-
	Wt of wall	lb	-	-	-	-	-	-
M_R this level		k-ft	1.07	1.07	0.48	15.15	-	-
M_R accum		k-ft	2.69	2.69	1.96	17.99	-	-

Hold Down Forces

Wt. Reduction		0.60	0.60	0.60	0.60	0.60	0.60
T_R accum	k	0.72	0.72	0.79	1.28	-	-
HD Offset	ft	-	-	-	7.00	-	-
HD Force	k	0.98	0.98	1.03	0.48	-	-
HD Capacity	k	3.08	3.08	3.08	3.08	-	-
Hold Down Type		1	1	1	1	-	-

1st Level

Lateral Trib. Width	ft	20.0
V from above	k	3.4
Uniform v this level	plf	101.6
Total Wall Length	ft	30.08
V this level	k	2.0
V accum.	k	5.4
Unit Wall Shear	plf	181
Shear Wall Capcity	plf	365
Demand vs. Capcity Ratio		0.50
Apparent Stiffness, Ga	K/in	10.00

Shearwall Type: A

Overturning Moment

		Wall 1	Wall 2	Wall 3	Wall 4	Wall 5	Wall 6
M_{OT} from above	k-ft	5.3	5.3	3.7	14.2	-	-
Story Ht	ft	9.58	-	-	9.58	-	-
Length	ft	11.50	-	-	7.08	-	-
Diaphragm Ratio		0.83	-	-	1.35	-	-
Modified Capacity		365	-	-	365	-	-
M_{OT}	k-ft	19.9	-	-	12.3	-	-
M_{OT} accum	k-ft	25.2	5.3	3.7	26.5	-	-

Shear Wall Defection

Δ_B	in	0.134	-	-	0.218	-	-
Δ_V	in	0.291	-	-	0.291	-	-
Δ_{HD}	in	0.073	-	-	0.119	-	-
Δ_{SW}	in	0.499	-	-	0.628	-	-

Resisting Moment

M_R from above		k-ft	2.7	2.7	2.0	18.0	-	-
Distr Wall Wts.	Wall Wt	psf	10.0	-	-	10.0	-	-
	Trib above	ft	6.0	-	-	6.0	-	-
	Wt above	psf	12.0	-	-	12.0	-	-
End Wts.	Hdr. Trib	ft	-	-	-	-	-	-
	tnb to hdr	ft	-	-	-	-	-	-
	Wt to hdr	psf	-	-	-	-	-	-
Perp. Wall Wts.	Dist to wall	ft	-	-	-	-	-	-
	Wt of wall	lb	-	-	-	-	-	-
	Dist to wall	ft	-	-	-	-	-	-
	Wt of wall	lb	-	-	-	-	-	-
M_R this level		k-ft	11.10	-	-	4.21	-	-
M_R accum		k-ft	13.79	2.69	1.96	22.20	-	-

Hold Down Forces

Wt. Reduction		0.60	0.60	0.60	0.60	0.60	0.60
T_R accum	k	1.20	-	-	3.14	-	-
HD Offset	ft	-	-	-	-	-	-
HD Force	k	1.48	-	-	1.86	-	-
HD Capacity	k	3.08	-	-	3.08	-	-
Hold Down Type		1	-	-	1	-	-

Project:	Red Barn Lane - Duplex 1400
Location:	LF-2
Client:	Envision Northwest, LLC
By:	DLS
Job No.:	19-002c
Last Update:	27-Apr-2019

Wood Shear Wall Design Aid

Comments: See Perforated Shear Calculations

Established Basic Permit #

19-03646

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Permit Number: 20-04894

	Project:	*Red Barn Lane - Duplex 1400*	*By:*	*DLS*
	Location:	*NW Hogan Ln & Nels Nelson Rd NW, Bremerton, WA 98311*	*Project No.:*	*19-002c*
	Client:	*Envision Northwest, LLC*	*Last Update:*	*27-Apr-19*

PERFORATED SHEAR WALL EFFECTIVE SHEAR CAPACITY RATIO

Wall Line	Force to Wall [P] (K)	Total Length of Wall [L] (ft)	Length of Full Height Shearwall [A1+A3+A5] (ft)	Unit Shear in Wall (plf)	Percent Full Height Sheathing	Plate Height [H] (ft)	Maximum Unrestrained Opening Height (B2+B3)		Effective Shear Capacity Ratio	Required Capacity (plf)	Shearwall Capacity (plf)	Ratio	Revised Shearwall Type	Combined Resisting Force (K)	Required Uplift Capacity (K)	Revised Holdown Type
							(ft)	(%)								
TF-1-2-WL 1 & 5	0.63	8.25	6.00	105	73%	8	5	62%	0.799	132	365	0.3608	A	4.19	(3.12)	-
TF-1-2-WL 2 & 3	0.63	11.00	6.00	105	55%	8	5	62%	0.724	145	365	0.3979	A	1.53	(0.36)	-
LF-1-2-WL 1 & 4	1.17	13.00	4.50	261	35%	8	5	62%	0.650	401	532.5	0.7529	B	0.51	2.73	1
LF-2-3-WL 1 & 2	0.50	11.50	6.50	77	57%	8	5	62%	0.732	106	365	0.2902	A	-	0.86	1
LF-2-3-WL 3-5	0.63	14.08	8.08	77	57%	8	5	62%	0.735	105	365	0.289	A	0.92	(0.07)	-
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Established Basic Permit #
19-03646

Permit Number: 20-04894