

**STRUCTURAL
CALCULATIONS**

Chen Residence
8435 SE 47th PL,
Mercer Island, WA 98040

Ectypos Architecture
4212 W Mercer Way,
Mercer Island, WA 98040

**Supplemental Calculations –
Architectural Revisions**

11/27/2024



MEMORANDUM

Date: Novmeber 20th, 2024

From: Nicholas Carter/Jane Johnson

To: Ectypos Architecture

Project: Chen Residence

4212 W. Mercer Way

Project #:

Merver Island, WA 98040

Copy to:

Attn:

Re: Building Revisions

Chen Residence – 8435 SE 47th Place, Mercer Island, WA

The structural drawings have been redesigned to address architectural revisions to the previously approved structure located at the above address. The permanent soil-nailed shoring wall (by others) and concrete foundations have already been installed in accordance with the originally approved drawings.

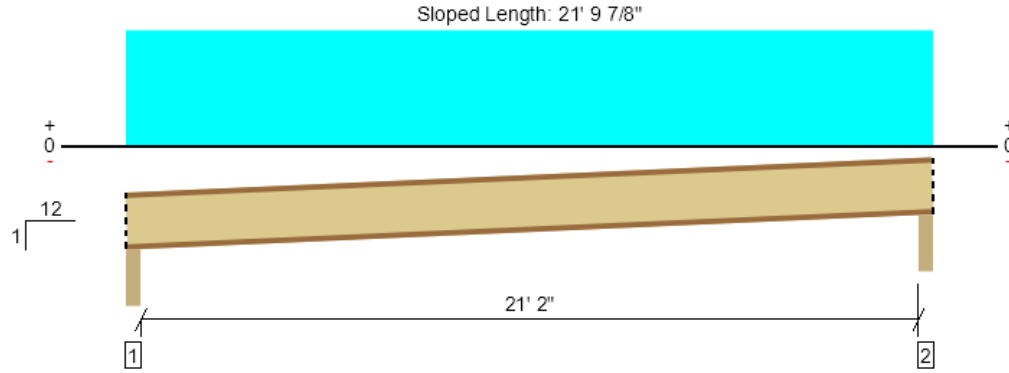
The original building design has been revised as follows:

- Rework and add framing as required due to the larger kitchen, added laundry/utility room, added guest suite, etc.
- Add framing at the upper floor opening infill and track loads/framing as required.
- Rerun framing calculations due to removal of gypcrete floor topping and reduce framing sizes where possible.
- Adjust the stair opening.
- Rerun the entire lateral system (due to the floor infill, some minor window changes and removal of gypcrete floor topping).

Calculations reflecting the changes have been provided. Existing foundation calculations are part of previously submitted structural design. Additional calculations have been provided where modifications have occurred.

Roof, Beam #1

1 piece(s) 11 7/8" TJI® 230 @ 19.2" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	784 @ 2 1/2"	1708 (3.50")	Passed (46%)	1.15	1.0 D + 1.0 S (All Spans)
Shear (lbs)	763 @ 3 1/2"	1903	Passed (40%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	4102 @ 10' 10 1/2"	4847	Passed (85%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.582 @ 10' 10 1/2"	0.714	Passed (L/442)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	1.049 @ 10' 10 1/2"	1.070	Passed (L/245)	--	1.0 D + 1.0 S (All Spans)

Member Length : 21' 10 7/8"
 System : Roof
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 1/12

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Beveled Plate - HF	3.50"	3.50"	1.75"	349	435	784	Blocking
2 - Beveled Plate - HF	3.50"	3.50"	1.75"	349	435	784	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 1" o/c	
Bottom Edge (Lu)	21' 10" o/c	

- TJI joists are only analyzed using Maximum Allowable bracing solutions.
- Maximum allowable bracing intervals based on applied load.
- Dimensions for lateral bracing intervals are measured along the length of the member for sloped conditions.

Vertical Load	Location	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 21' 9"	19.2"	20.0	25.0	Default Load

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

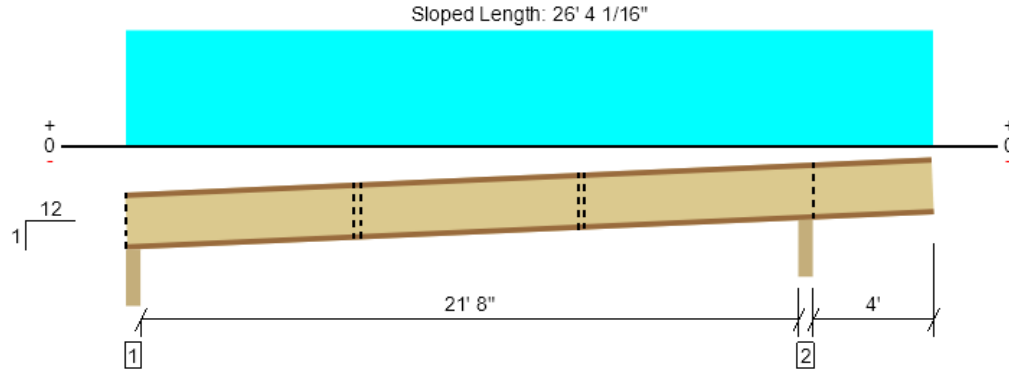
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Roof, Beam #2

1 piece(s) 11 7/8" TJI® 230 @ 19.2" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	784 @ 2 1/2"	1708 (3.50")	Passed (46%)	1.15	1.0 D + 1.0 S (Alt Spans)
Shear (lbs)	772 @ 21' 11 1/2"	1903	Passed (41%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	4100 @ 10' 10 1/2"	4847	Passed (85%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.618 @ 11' 1 1/16"	0.732	Passed (L/427)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	1.093 @ 11' 11/16"	1.099	Passed (L/241)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 26' 5 1/16"
 System : Roof
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 1/12

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- Upward deflection on right cantilever exceeds overhang deflection criteria.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Upward deflection on right cantilever exceeds 0.4".
- Permanent bracing at third points in the back span or a direct applied ceiling over the entire back span length is required at the right span of the member. See literature detail (PB1) For clarification.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Beveled Plate - HF	3.50"	3.50"	1.75"	346	438	784	Blocking
2 - Beveled Plate - HF	3.50"	3.50"	3.50"	497	619	1117	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 1" o/c	
Bottom Edge (Lu)	9' 7" o/c	

- TJI joists are only analyzed using Maximum Allowable bracing solutions.
- Maximum allowable bracing intervals based on applied load.
- Dimensions for lateral bracing intervals are measured along the length of the member for sloped conditions.

Vertical Load	Location	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 26' 3"	19.2"	20.0	25.0	Default Load

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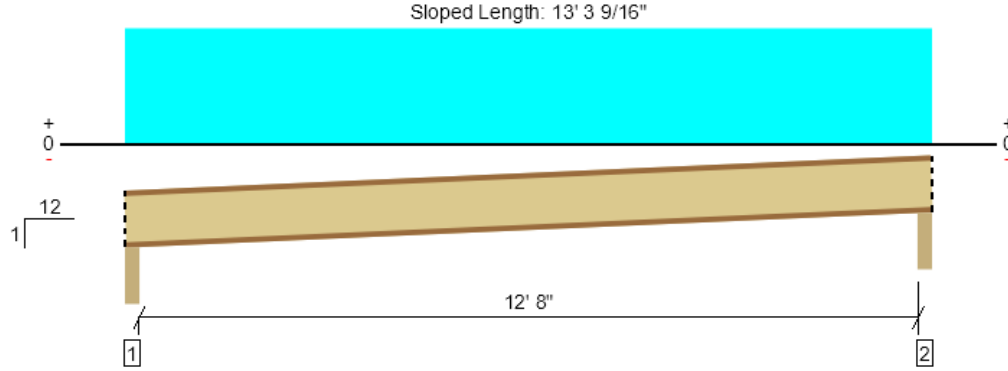
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Roof, Beam #3

1 piece(s) 11 7/8" TJI@ 110 @ 24" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	597 @ 2 1/2"	1581 (3.50")	Passed (38%)	1.15	1.0 D + 1.0 S (All Spans)
Shear (lbs)	571 @ 3 1/2"	1794	Passed (32%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1856 @ 6' 7 1/2"	3634	Passed (51%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.134 @ 6' 7 1/2"	0.429	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.241 @ 6' 7 1/2"	0.644	Passed (L/642)	--	1.0 D + 1.0 S (All Spans)

Member Length : 13' 4 9/16"
 System : Roof
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 1/12

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Beveled Plate - HF	3.50"	3.50"	1.75"	266	331	597	Blocking
2 - Beveled Plate - HF	3.50"	3.50"	1.75"	266	331	597	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 2" o/c	
Bottom Edge (Lu)	13' 4" o/c	

- TJI joists are only analyzed using Maximum Allowable bracing solutions.
- Maximum allowable bracing intervals based on applied load.
- Dimensions for lateral bracing intervals are measured along the length of the member for sloped conditions.

Vertical Load	Location	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 13' 3"	24"	20.0	25.0	Default Load

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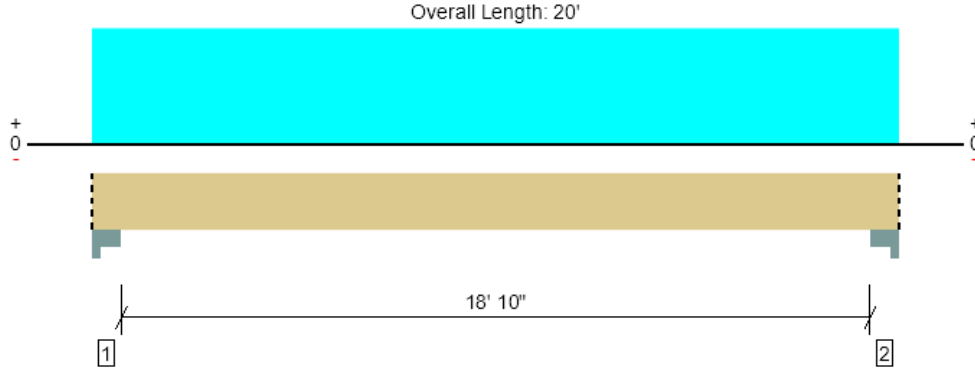
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Roof, Beam #4

1 piece(s) 5 1/4" x 20" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	10228 @ 5 1/2"	22969 (7.00")	Passed (45%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	7927 @ 2' 3"	23345	Passed (34%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	46560 @ 10'	91909	Passed (51%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.238 @ 10'	0.954	Passed (L/962)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.443 @ 10'	1.272	Passed (L/517)	--	1.0 D + 1.0 S (All Spans)

Member Length : 20'
 System : Roof
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Column Cap - steel	7.00"	7.00"	3.12"	4728	5500	10228	Blocking
2 - Column Cap - steel	7.00"	7.00"	3.12"	4728	5500	10228	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	20' o/c	
Bottom Edge (Lu)	20' o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 20'	N/A	32.8	--	
1 - Uniform (PSF)	0 to 20' (Front)	22'	20.0	25.0	Default Load

- Side loads are assumed to not induce cross-grain tension.

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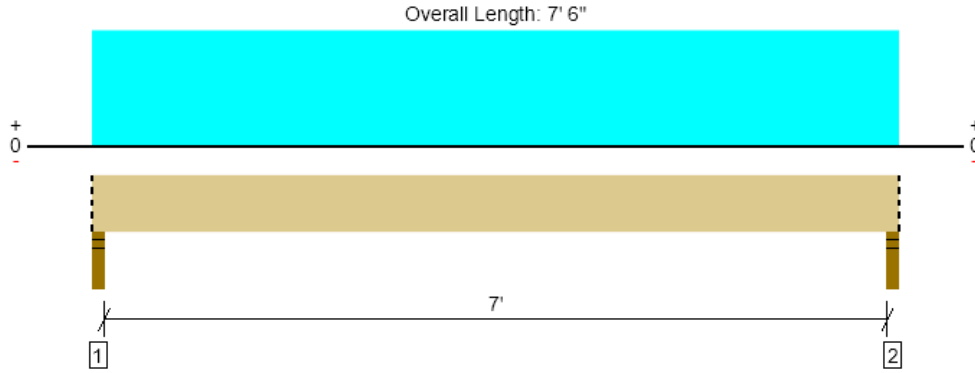
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Roof, Beam #5
2 piece(s) 1 3/4" x 7 1/4" 2.0E Microllam® LVL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2559 @ 1 1/2"	4463 (3.00")	Passed (57%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1976 @ 10 1/4"	5544	Passed (36%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	4484 @ 3' 9"	8182	Passed (55%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.116 @ 3' 9"	0.363	Passed (L/750)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.211 @ 3' 9"	0.483	Passed (L/412)	--	1.0 D + 1.0 S (All Spans)

Member Length : 7' 6"
 System : Roof
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - SPF	3.00"	3.00"	1.72"	1153	1406	2559	Blocking
2 - Stud wall - SPF	3.00"	3.00"	1.72"	1153	1406	2559	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	7' 6" o/c	
Bottom Edge (Lu)	7' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 7' 6"	N/A	7.4	--	
1 - Uniform (PSF)	0 to 7' 6" (Front)	15'	20.0	25.0	Default Load

• Side loads are assumed to not induce cross-grain tension.

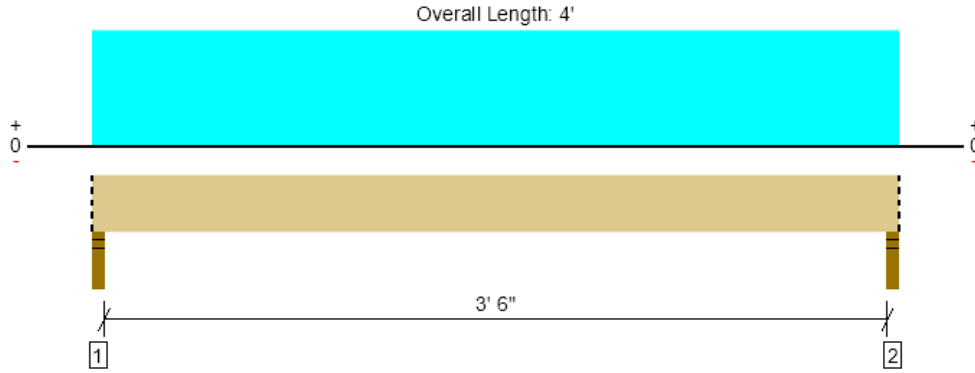
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ForteWEB Software Operator	Job Notes
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Roof, Beam #6
2 piece(s) 2 x 8 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1361 @ 1 1/2"	3645 (3.00")	Passed (37%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	780 @ 10 1/4"	2501	Passed (31%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1196 @ 2'	2569	Passed (47%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.013 @ 2'	0.188	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.024 @ 2'	0.250	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

Member Length : 4'
 System : Roof
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - SPF	3.00"	3.00"	1.50"	611	750	1361	Blocking
2 - Stud wall - SPF	3.00"	3.00"	1.50"	611	750	1361	Blocking

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

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

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 4'	N/A	5.5	--	
1 - Uniform (PSF)	0 to 4' (Front)	15'	20.0	25.0	Default Load

• Side loads are assumed to not induce cross-grain tension.

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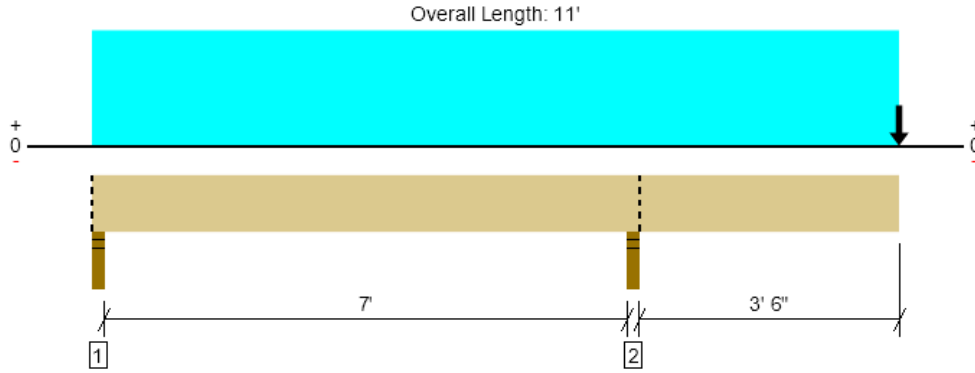
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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Roof, Beam #7

3 piece(s) 1 3/4" x 7 1/4" 2.0E Microllam® LVL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2683 @ 7' 4 1/2"	6694 (3.00")	Passed (40%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1589 @ 8' 1 1/4"	8317	Passed (19%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-5450 @ 7' 4 1/2"	12273	Passed (44%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.204 @ 11'	0.363	Passed (2L/426)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.367 @ 11'	0.483	Passed (2L/238)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 11'
 System : Roof
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- -527 lbs uplift at support located at 1 1/2". Strapping or other restraint may be required.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - SPF	3.00"	3.00"	1.50"	-189	-339	-527	Blocking
2 - Stud wall - SPF	3.00"	3.00"	1.50"	1252	1431	2683	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	11' o/c	
Bottom Edge (Lu)	11' o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 11'	N/A	11.1	--	
1 - Uniform (PSF)	0 to 11' (Front)	1' 6"	20.0	25.0	Default Load
2 - Point (lb)	11' (Top)	N/A	611	750	Linked from: Beam #6, Support 1

• Side loads are assumed to not induce cross-grain tension.

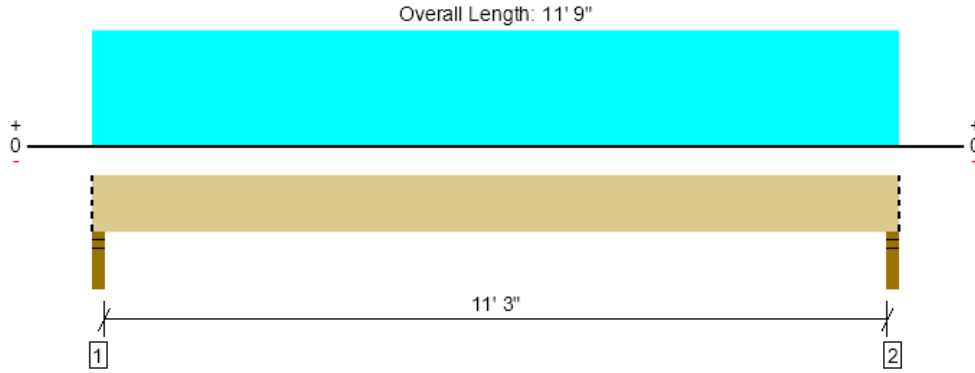
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ForteWEB Software Operator	Job Notes
Nicholas Carter Carter Quinn Norlin (206) 264-7784 nvc@cqn-se.com	



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 File Name: Chen Residence (Ectypos)

Roof, Beam #8
2 piece(s) 2 x 8 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	693 @ 1 1/2"	3645 (3.00")	Passed (19%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	593 @ 10 1/4"	2501	Passed (24%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1951 @ 5' 10 1/2"	2569	Passed (76%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.199 @ 5' 10 1/2"	0.575	Passed (L/695)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.375 @ 5' 10 1/2"	0.767	Passed (L/368)	--	1.0 D + 1.0 S (All Spans)

Member Length : 11' 9"
 System : Roof
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - SPF	3.00"	3.00"	1.50"	326	367	693	Blocking
2 - Stud wall - SPF	3.00"	3.00"	1.50"	326	367	693	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	11' 9" o/c	
Bottom Edge (Lu)	11' 9" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 11' 9"	N/A	5.5	--	
1 - Uniform (PSF)	0 to 11' 9" (Front)	2' 6"	20.0	25.0	Default Load

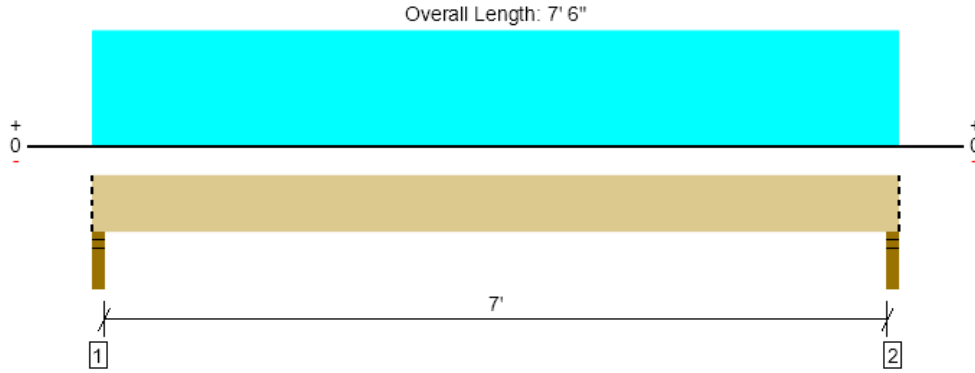
• Side loads are assumed to not induce cross-grain tension.

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Roof, Beam #9
2 piece(s) 2 x 10 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2178 @ 1' 1/2"	3645 (3.00")	Passed (60%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1585 @ 1' 1/4"	3191	Passed (50%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3816 @ 3' 9"	3833	Passed (100%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.077 @ 3' 9"	0.363	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.140 @ 3' 9"	0.483	Passed (L/620)	--	1.0 D + 1.0 S (All Spans)

Member Length : 7' 6"
 System : Roof
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - SPF	3.00"	3.00"	1.79"	983	1195	2178	Blocking
2 - Stud wall - SPF	3.00"	3.00"	1.79"	983	1195	2178	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	8" o/c	
Bottom Edge (Lu)	7' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 7' 6"	N/A	7.0	--	
1 - Uniform (PSF)	0 to 7' 6" (Front)	12' 9"	20.0	25.0	Default Load

• Side loads are assumed to not induce cross-grain tension.

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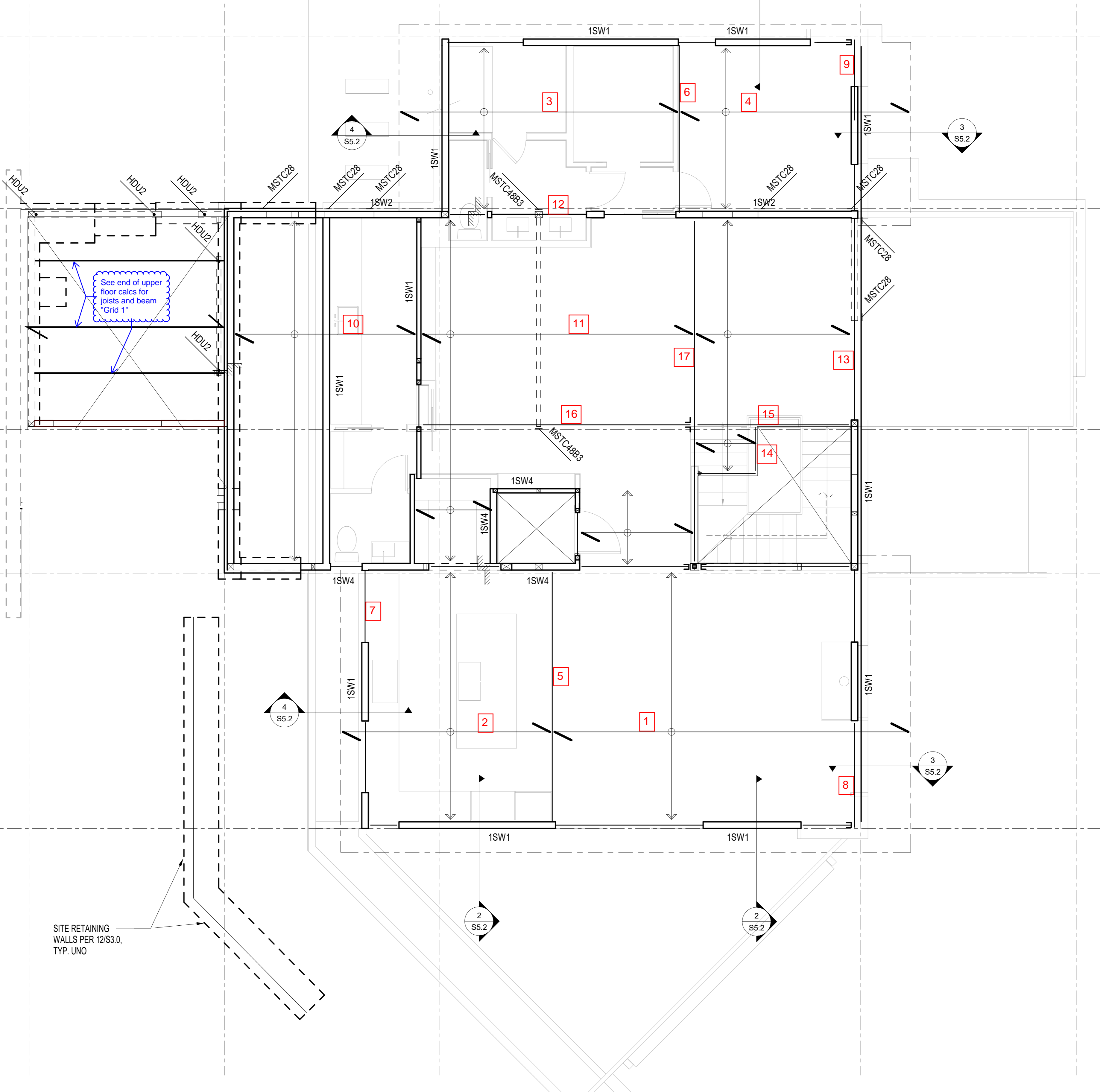
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See end of upper floor calcs for joists and beam "Grid 1"

SITE RETAINING WALLS PER 12/S3.0, TYP. UNO

4
S5.2

3
S5.2

4
S5.2

3
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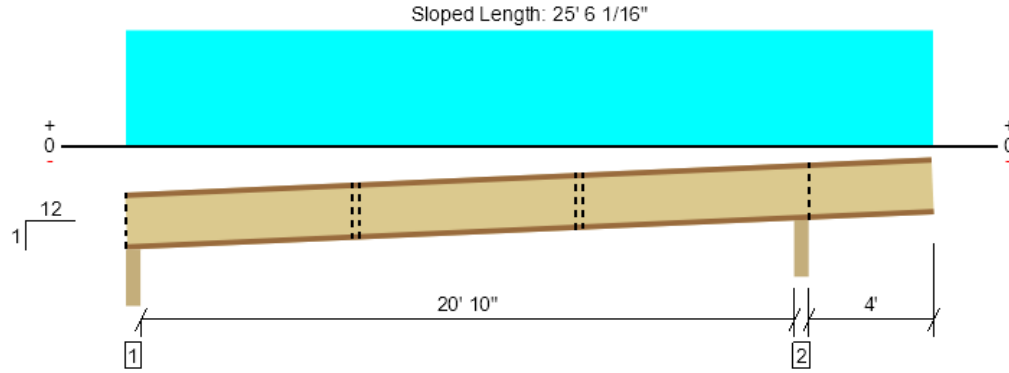
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1

8

Upper Floor, Beam #1
1 piece(s) 11 7/8" TJI@ 230 @ 24" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	941 @ 2 1/2"	1708 (3.50")	Passed (55%)	1.15	1.0 D + 1.0 S (Alt Spans)
Shear (lbs)	920 @ 21' 1 1/2"	1903	Passed (48%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	4723 @ 10' 5 5/16"	4847	Passed (97%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.662 @ 10' 8"	1.057	Passed (L/383)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	1.170 @ 10' 7 5/8"	1.409	Passed (L/217)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 25' 7 1/16"
 System : Roof
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 1/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Upward deflection on right cantilever exceeds overhang deflection criteria.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Upward deflection on right cantilever exceeds 0.4".
- Permanent bracing at third points in the back span or a direct applied ceiling over the entire back span length is required at the right span of the member. See literature detail (PB1) For clarification.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Beveled Plate - HF	3.50"	3.50"	1.75"	415	527	941	Blocking
2 - Beveled Plate - HF	3.50"	3.50"	3.50"	605	754	1360	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	3' 9" o/c	
Bottom Edge (Lu)	9' 7" o/c	

- TJI joists are only analyzed using Maximum Allowable bracing solutions.
- Maximum allowable bracing intervals based on applied load.
- Dimensions for lateral bracing intervals are measured along the length of the member for sloped conditions.

Vertical Load	Location	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 25' 5"	24"	20.0	25.0	Default Load

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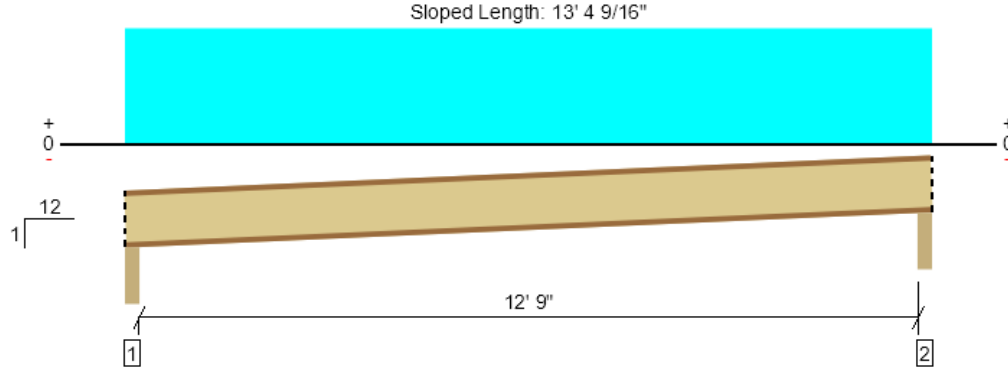
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Upper Floor, Beam #2

1 piece(s) 11 7/8" TJI@ 110 @ 24" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	601 @ 2 1/2"	1581 (3.50")	Passed (38%)	1.15	1.0 D + 1.0 S (All Spans)
Shear (lbs)	575 @ 3 1/2"	1794	Passed (32%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1880 @ 6' 8"	3634	Passed (52%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.137 @ 6' 8"	0.648	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.247 @ 6' 8"	0.864	Passed (L/631)	--	1.0 D + 1.0 S (All Spans)

Member Length : 13' 5 9/16"
 System : Roof
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 1/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Beveled Plate - HF	3.50"	3.50"	1.75"	268	333	601	Blocking
2 - Beveled Plate - HF	3.50"	3.50"	1.75"	268	333	601	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 2" o/c	
Bottom Edge (Lu)	13' 5" o/c	

- TJI joists are only analyzed using Maximum Allowable bracing solutions.
- Maximum allowable bracing intervals based on applied load.
- Dimensions for lateral bracing intervals are measured along the length of the member for sloped conditions.

Vertical Load	Location	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 13' 4"	24"	20.0	25.0	Default Load

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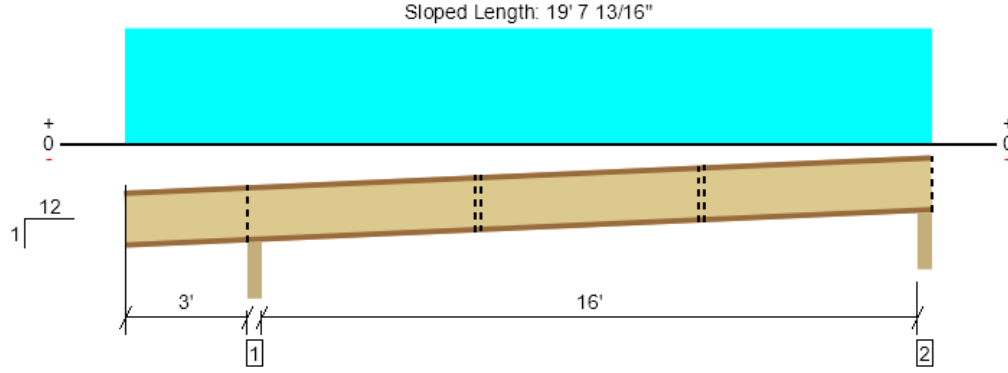
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Upper Floor, Beam #3

1 piece(s) 11 7/8" TJI@ 110 @ 24" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1042 @ 3' 1 3/4"	2233 (3.50")	Passed (47%)	1.15	1.0 D + 1.0 S (All Spans)
Shear (lbs)	704 @ 19' 3 1/2"	1794	Passed (39%)	1.15	1.0 D + 1.0 S (Alt Spans)
Moment (Ft-lbs)	2809 @ 11' 5 3/4"	3634	Passed (77%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.311 @ 11' 3 3/4"	0.814	Passed (L/629)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.549 @ 11' 4"	1.086	Passed (L/356)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 19' 8 13/16"
 System : Roof
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 1/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Permanent bracing at third points in the back span or a direct applied ceiling over the entire back span length is required at the left span of the member. See literature detail (PB1) For clarification.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Beveled Plate - HF	3.50"	3.50"	3.50"	464	578	1042	Blocking
2 - Beveled Plate - HF	3.50"	3.50"	1.75"	322	409	730	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	3' 4" o/c	
Bottom Edge (Lu)	7' 4" o/c	

- TJI joists are only analyzed using Maximum Allowable bracing solutions.
- Maximum allowable bracing intervals based on applied load.
- Dimensions for lateral bracing intervals are measured along the length of the member for sloped conditions.

Vertical Load	Location	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 19' 7"	24"	20.0	25.0	Default Load

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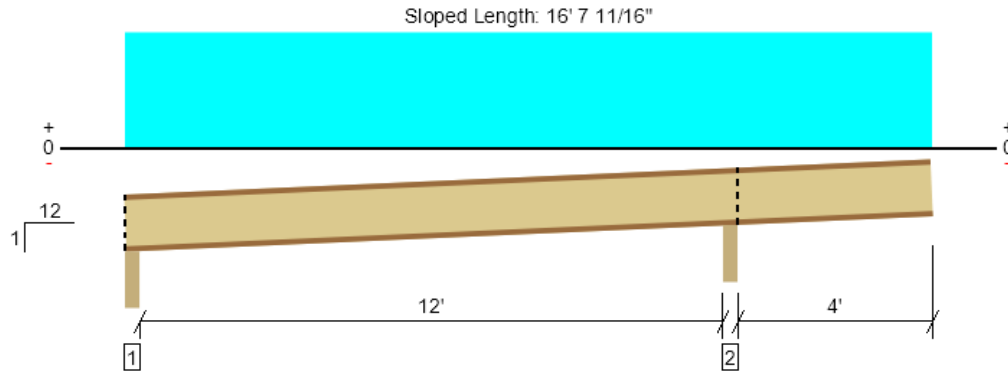
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Upper Floor, Beam #4
1 piece(s) 11 7/8" TJI@ 110 @ 24" OC

Right cantilever exceeds the maximum braced cantilever length of 4'.



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	988 @ 12' 5 1/4"	2233 (3.50")	Passed (44%)	1.15	1.0 D + 1.0 S (All Spans)
Shear (lbs)	567 @ 12' 3 1/2"	1794	Passed (32%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1417 @ 5' 9 3/4"	3634	Passed (39%)	1.15	1.0 D + 1.0 S (Alt Spans)
Live Load Defl. (in)	0.099 @ 6' 2 3/8"	0.614	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.167 @ 6' 1 9/16"	0.818	Passed (L/880)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 16' 8 11/16"
 System : Roof
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 1/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Beveled Plate - HF	3.50"	3.50"	1.75"	226	299	524	Blocking
2 - Beveled Plate - HF	3.50"	3.50"	3.50"	440	548	988	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 10" o/c	
Bottom Edge (Lu)	6' 7" o/c	

- TJI joists are only analyzed using Maximum Allowable bracing solutions.
- Maximum allowable bracing intervals based on applied load.
- Dimensions for lateral bracing intervals are measured along the length of the member for sloped conditions.

Vertical Load	Location	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 16' 7"	24"	20.0	25.0	Default Load

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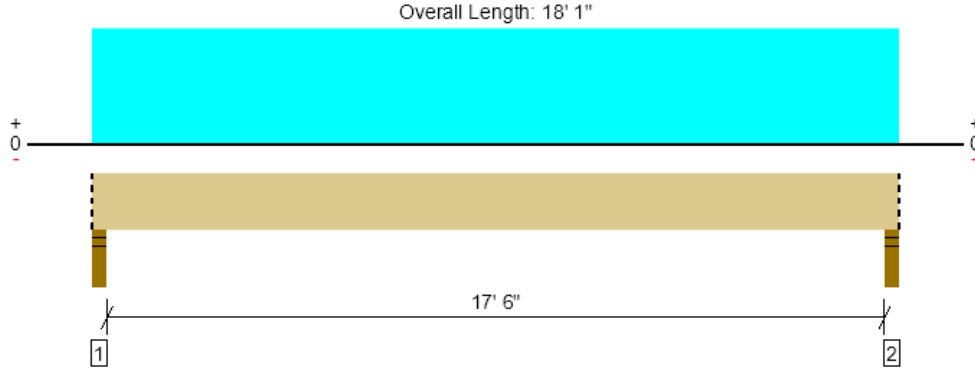
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Upper Floor, Beam #5

1 piece(s) 7" x 11 7/8" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	7920 @ 2"	9923 (3.50")	Passed (80%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	6798 @ 1' 3 3/8"	18481	Passed (37%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	34498 @ 9' 1/2"	45776	Passed (75%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.555 @ 9' 1/2"	0.887	Passed (L/384)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.954 @ 9' 1/2"	1.183	Passed (L/223)	--	1.0 D + 1.0 S (All Spans)

Member Length : 18' 1"
 System : Roof
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Member should be side-loaded from both sides of the member or braced to prevent rotation.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - HF	3.50"	3.50"	2.79"	3309	4611	7920	Blocking
2 - Stud wall - HF	3.50"	3.50"	2.79"	3309	4611	7920	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	18' 1" o/c	
Bottom Edge (Lu)	18' 1" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 18' 1"	N/A	26.0	--	
1 - Uniform (PSF)	0 to 18' 1" (Front)	17'	20.0	30.0	Default Load

• Side loads are assumed to not induce cross-grain tension.

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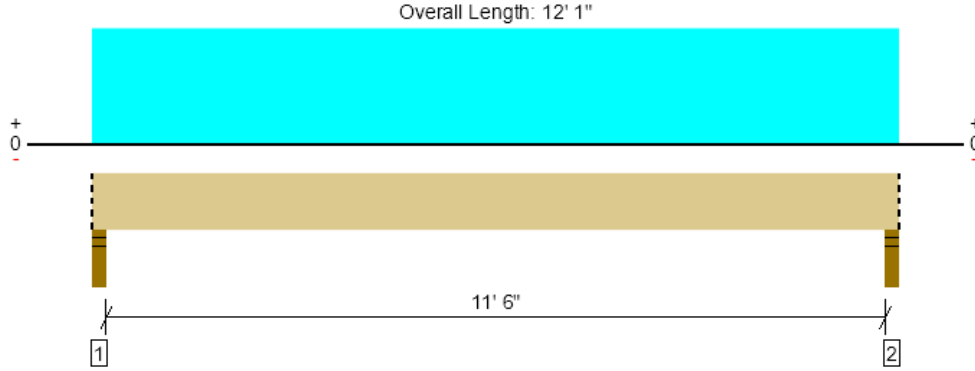
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Upper Floor, Beam #6

1 piece(s) 3 1/2" x 11 7/8" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4383 @ 2"	4961 (3.50")	Passed (88%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	3454 @ 1' 3 3/8"	9241	Passed (37%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	12520 @ 6' 1/2"	22888	Passed (55%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.189 @ 6' 1/2"	0.587	Passed (L/745)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.321 @ 6' 1/2"	0.783	Passed (L/439)	--	1.0 D + 1.0 S (All Spans)

Member Length : 12' 1"
 System : Roof
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - HF	3.50"	3.50"	3.09"	1800	2583	4383	Blocking
2 - Stud wall - HF	3.50"	3.50"	3.09"	1800	2583	4383	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	12' 1" o/c	
Bottom Edge (Lu)	12' 1" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 12' 1"	N/A	13.0	--	
1 - Uniform (PSF)	0 to 12' 1" (Front)	14' 3"	20.0	30.0	Default Load

• Side loads are assumed to not induce cross-grain tension.

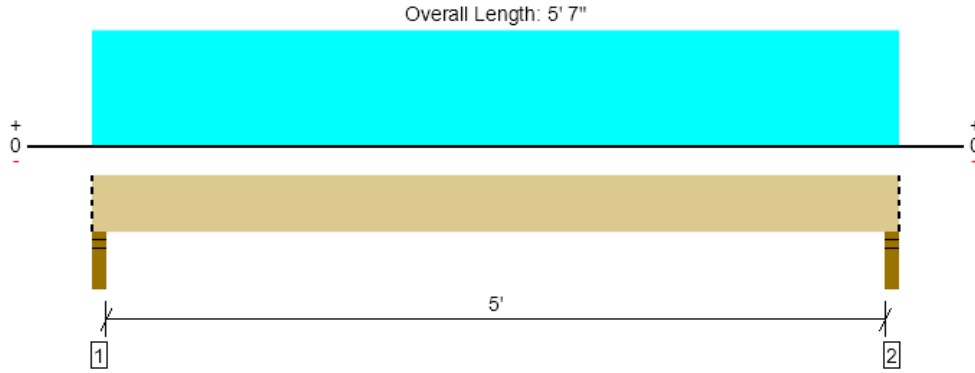
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Upper Floor, Beam #7
2 piece(s) 2 x 8 HF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1167 @ 2"	4253 (3.50")	Passed (27%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	792 @ 10 3/4"	2501	Passed (32%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	1440 @ 2' 9 1/2"	2569	Passed (56%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.034 @ 2' 9 1/2"	0.262	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.058 @ 2' 9 1/2"	0.350	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

Member Length : 5' 7"
 System : Roof
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - HF	3.50"	3.50"	1.50"	476	691	1167	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	476	691	1167	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 7" o/c	
Bottom Edge (Lu)	5' 7" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 5' 7"	N/A	5.5	--	
1 - Uniform (PSF)	0 to 5' 7" (Front)	8' 3"	20.0	30.0	Default Load

• Side loads are assumed to not induce cross-grain tension.

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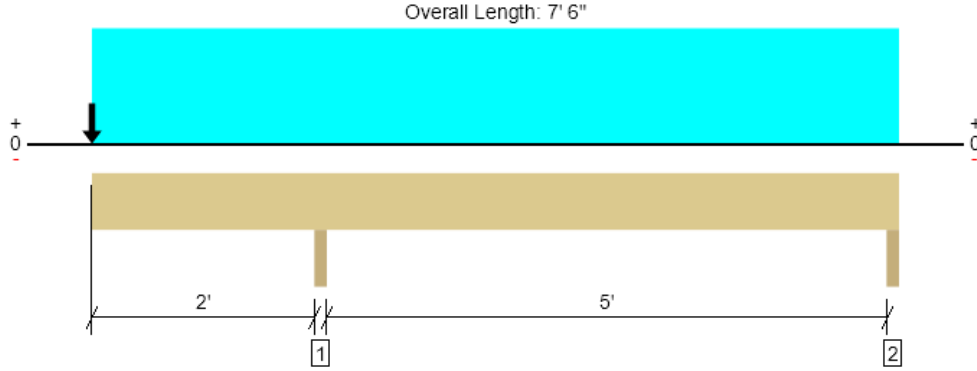
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Upper Floor, Beam #8

2 piece(s) 1 3/4" x 7 1/4" 2.0E Microllam® LVL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3798 @ 2' 1 1/2"	7613 (3.00")	Passed (50%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1644 @ 2' 10 1/4"	5544	Passed (30%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-2064 @ 2' 1 1/2"	8182	Passed (25%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.032 @ 4' 10 1/2"	0.175	Passed (L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.045 @ 0	0.213	Passed (2L/999+)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 7' 6"
 System : Wall
 Member Type : Header
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Trimmer - HF	3.00"	3.00"	1.50"	1334	2464	3798	None
2 - Trimmer - HF	3.00"	3.00"	1.50"	473	1072	1546	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	7' 6" o/c	
Bottom Edge (Lu)	7' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 7' 6"	N/A	7.4	--	
1 - Uniform (PSF)	0 to 7' 6"	14' 6"	15.0	30.0	Snow
2 - Point (lb)	0	N/A	120	150	

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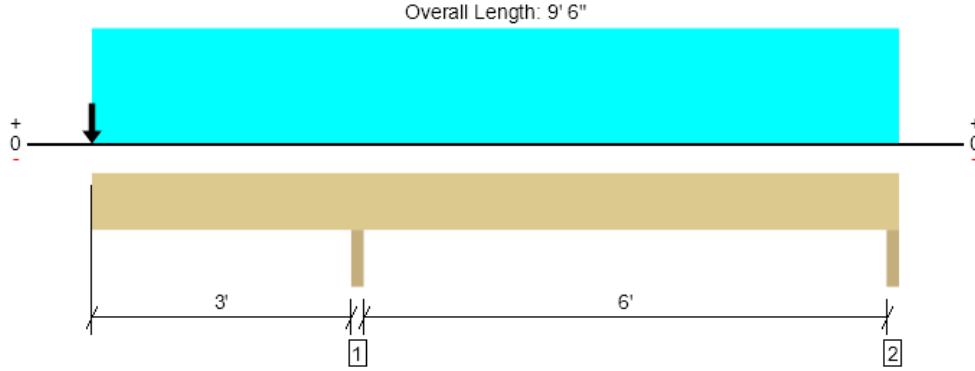
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Upper Floor, Beam #9

2 piece(s) 1 3/4" x 7 1/4" 2.0E Microllam® LVL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3621 @ 3' 1 1/2"	7613 (3.00")	Passed (48%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1588 @ 3' 10 1/4"	5544	Passed (29%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-3077 @ 3' 1 1/2"	8182	Passed (38%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.109 @ 0	0.208	Passed (2L/686)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.157 @ 0	0.313	Passed (2L/476)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 9' 6"
 System : Wall
 Member Type : Header
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Trimmer - HF	3.00"	3.00"	1.50"	1287	2334	3621	None
2 - Trimmer - HF	3.00"	3.00"	1.50"	329	820	1149	None

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	9' 6" o/c	
Bottom Edge (Lu)	9' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Tributary Width	Dead (0.90)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 9' 6"	N/A	7.4	--	
1 - Uniform (PSF)	0 to 9' 6"	10'	15.0	30.0	Snow
2 - Point (lb)	0	N/A	120	150	

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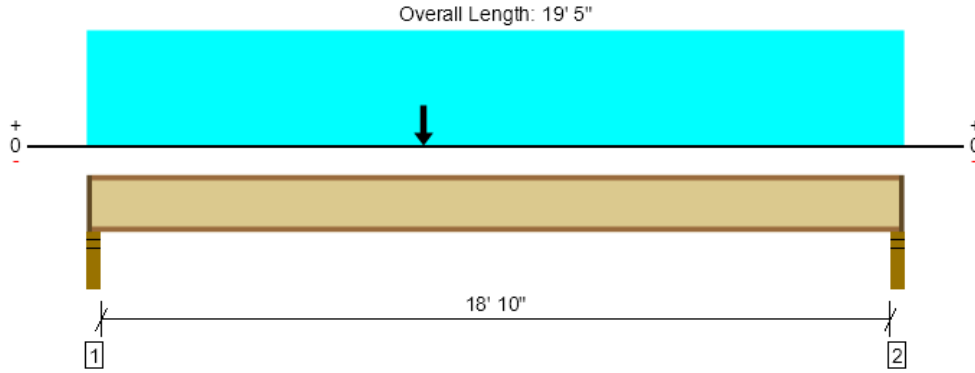
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Upper Floor, Beam #11
1 piece(s) 14" TJI® 210 @ 16" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	783 @ 2 1/2"	1134 (2.25")	Passed (69%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	769 @ 3 1/2"	1945	Passed (40%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	3849 @ 8' 11 9/16"	4490	Passed (86%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.315 @ 9' 8 1/2"	0.475	Passed (L/724)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.497 @ 9' 7 11/16"	0.950	Passed (L/459)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	52	40	Passed	--	--

Member Length : 19' 2 1/2"
 System : Floor
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: 1/2" Gypsum ceiling, Perpendicular Partitions.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - HF	3.50"	2.25"	1.75"	273	518	791	1 1/4" Rim Board
2 - Stud wall - HF	3.50"	2.25"	1.75"	249	518	767	1 1/4" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' o/c	
Bottom Edge (Lu)	19' 3" o/c	

- TJI joists are only analyzed using Maximum Allowable bracing solutions.
- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 19' 5"	16"	15.0	40.0	Default Load
2 - Point (PLF)	8'	16"	100.0	-	

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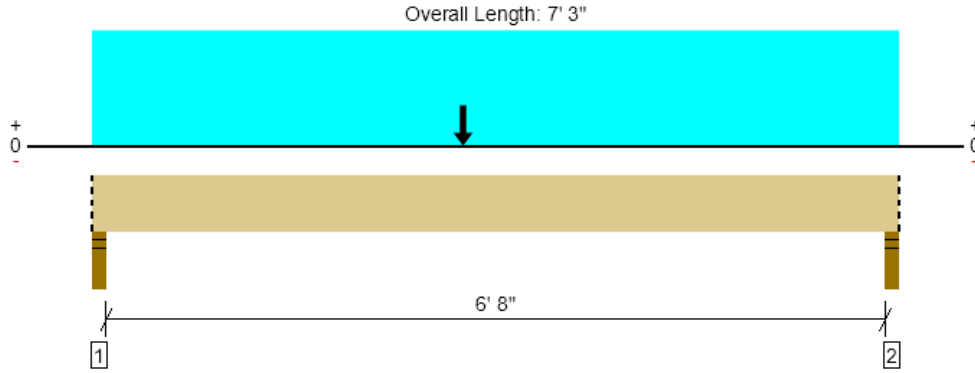
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Upper Floor, Beam #12

1 piece(s) 5 1/4" x 14" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	6598 @ 2"	7442 (3.50")	Passed (89%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	6477 @ 1' 5 1/2"	16342	Passed (40%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	20432 @ 3' 4"	46854	Passed (44%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.044 @ 3' 4"	0.231	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.082 @ 3' 4"	0.346	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

Member Length : 7' 3"
 System : Floor
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Stud wall - HF	3.50"	3.50"	3.10"	3127	145	3471	6598	Blocking
2 - Stud wall - HF	3.50"	3.50"	2.64"	2673	145	2945	5618	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	7' 3" o/c	
Bottom Edge (Lu)	7' 3" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 7' 3"	N/A	23.0	--	--	
1 - Uniform (PSF)	0 to 7' 3" (Front)	1'	15.0	40.0	-	Default Load
2 - Uniform (PSF)	0 to 7' 3" (Front)	1'	20.0	-	25.0	
3 - Point (lb)	3' 4" (Top)	N/A	4728	-	5500	Linked from: Beam #4, Support 1
4 - Point (lb)	3' 4" (Top)	N/A	326	-	367	Linked from: Beam #8, Support 1
5 - Point (lb)	3' 4" (Top)	N/A	326	-	367	Linked from: Beam #8, Support 2

- Side loads are assumed to not induce cross-grain tension.

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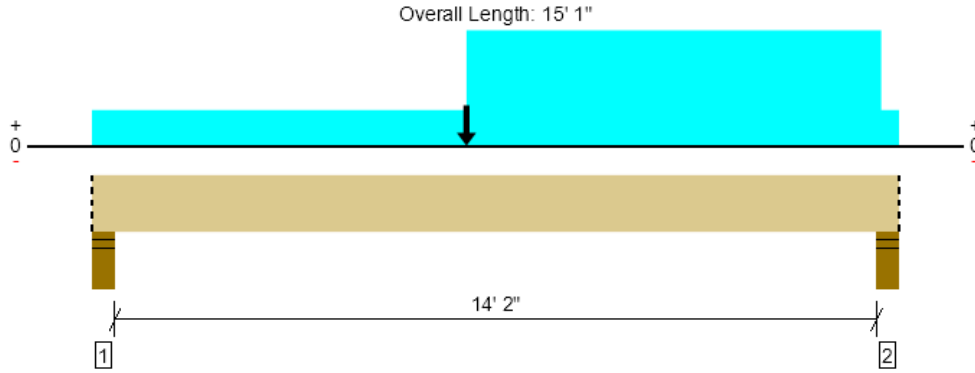
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Upper Floor, Beam #13

2 piece(s) 1 3/4" x 14" 2.OE Microllam® LVL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	6289 @ 14' 9"	7796 (5.50")	Passed (81%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	5113 @ 13' 5 1/2"	10707	Passed (48%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	22811 @ 7' 4 3/4"	27897	Passed (82%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.295 @ 7' 8 1/16"	0.481	Passed (L/587)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.558 @ 7' 8 3/16"	0.721	Passed (L/310)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 15' 1"
 System : Floor
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Stud wall - HF	5.50"	5.50"	3.08"	1975	1659	1537	4372	Blocking
2 - Stud wall - HF	5.50"	5.50"	4.44"	2963	1659	2775	6289	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 9" o/c	
Bottom Edge (Lu)	15' 1" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 15' 1"	N/A	14.3	--	--	
1 - Uniform (PSF)	0 to 15' 1" (Front)	5' 6"	15.0	40.0	-	Default Load
2 - Point (lb)	7' (Top)	N/A	1153	-	1406	Linked from: Beam #5, Support 1
3 - Uniform (PSF)	7' to 14' 9" (Front)	15'	20.0	-	25.0	

• Side loads are assumed to not induce cross-grain tension.

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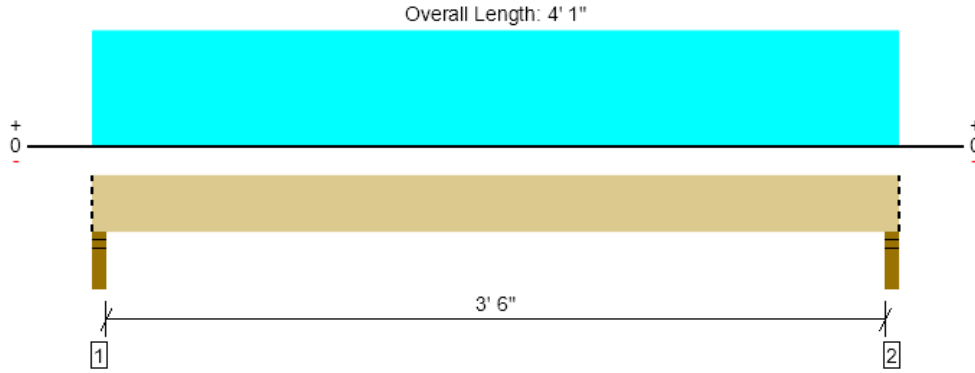
ForteWEB Software Operator	Job Notes
Nicholas Carter Carter Quinn Norlin (206) 264-7784 nvc@cqn-se.com	



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 File Name: Chen Residence (Ectypos)

Upper Floor, Beam #14

1 piece(s) 1 3/4" x 14" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	268 @ 2"	2481 (3.50")	Passed (11%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	77 @ 1' 5 1/2"	5063	Passed (2%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	231 @ 2' 1/2"	10920	Passed (2%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.002 @ 2' 1/2"	0.125	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.002 @ 2' 1/2"	0.188	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 4' 1"
 System : Floor
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - HF	3.50"	3.50"	1.50"	85	184	268	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	85	184	268	Blocking

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

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

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 4' 1"	N/A	7.7	--	
1 - Uniform (PSF)	0 to 4' 1" (Front)	2' 3"	15.0	40.0	Default Load

- Side loads are assumed to not induce cross-grain tension.

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

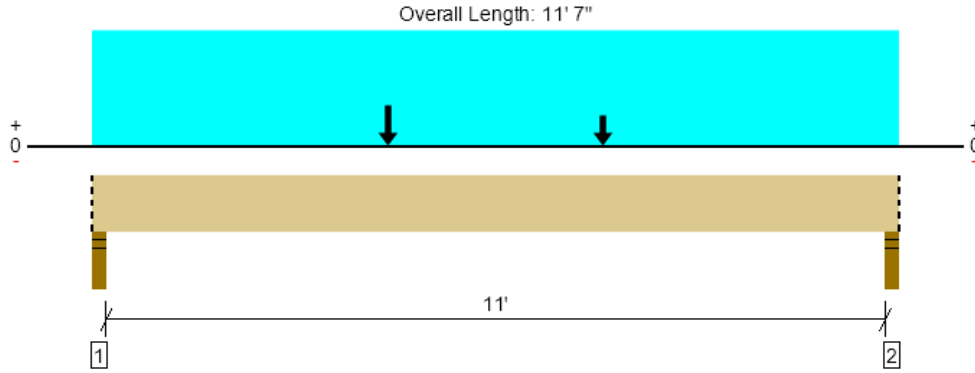
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Upper Floor, Beam #15

1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2162 @ 2"	4961 (3.50")	Passed (44%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	2118 @ 1' 5 1/2"	11646	Passed (18%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	8555 @ 4' 3"	25116	Passed (34%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.099 @ 5' 9 5/16"	0.375	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.176 @ 5' 8 7/8"	0.563	Passed (L/767)	--	1.0 D + 1.0 S (All Spans)

Member Length : 11' 7"
 System : Floor
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Stud wall - HF	3.50"	3.50"	1.53"	1001	232	1161	2162	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	883	232	1134	2017	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	11' 7" o/c	
Bottom Edge (Lu)	11' 7" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 11' 7"	N/A	15.3	--	--	
1 - Uniform (PSF)	0 to 11' 7" (Front)	1'	15.0	40.0	-	
2 - Point (lb)	4' 3" (Front)	N/A	983	-	1195	Linked from: Beam #9, Support 1
3 - Point (lb)	7' 4" (Front)	N/A	550	-	1100	Stair

• Side loads are assumed to not induce cross-grain tension.

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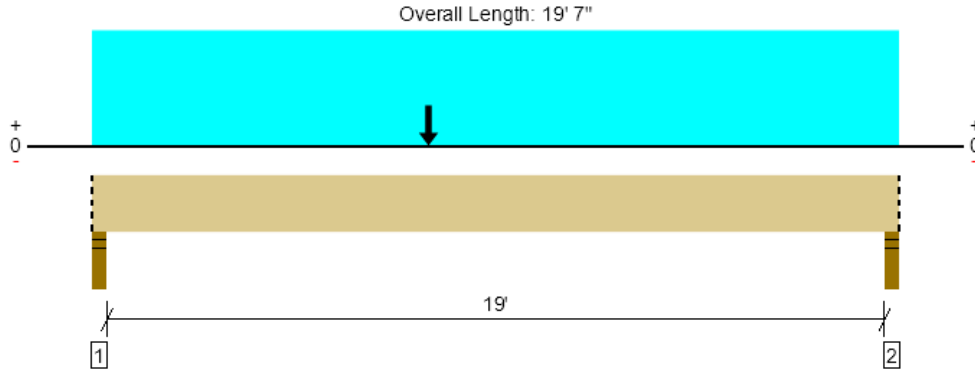
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Upper Floor, Beam #16

1 piece(s) 3 1/2" x 14" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1688 @ 2"	4961 (3.50")	Passed (34%)	--	1.0 D + 0.7 E (All Spans)
Shear (lbs)	1644 @ 1' 5 1/2"	15157	Passed (11%)	1.60	1.0 D + 0.7 E (All Spans)
Moment (Ft-lbs)	12491 @ 8' 2"	43459	Passed (29%)	1.60	1.0 D + 0.7 E (All Spans)
Live Load Defl. (in)	0.074 @ 9' 9 1/2"	0.642	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.130 @ 9' 9 1/2"	0.962	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 19' 7"
 System : Floor
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- An excessive uplift of -1213 lbs detected at support located at 2".
- -811 lbs uplift at support located at 19' 5". Strapping or other restraint may be required.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Seismic	Factored	
1 - Stud wall - HF	3.50"	3.50"	1.50"	297	392	1987/-1987	1688/-1213	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	297	392	1413/-1413	1332/-811	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	19' 7" o/c	
Bottom Edge (Lu)	19' 7" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Seismic (1.60)	Comments
0 - Self Weight (PLF)	0 to 19' 7"	N/A	15.3	--	--	
1 - Uniform (PSF)	0 to 19' 7" (Front)	1'	15.0	40.0	-	Default Load
2 - Point (lb)	8' 2" (Front)	N/A	-	-	3400	Omega x HD

• Side loads are assumed to not induce cross-grain tension.

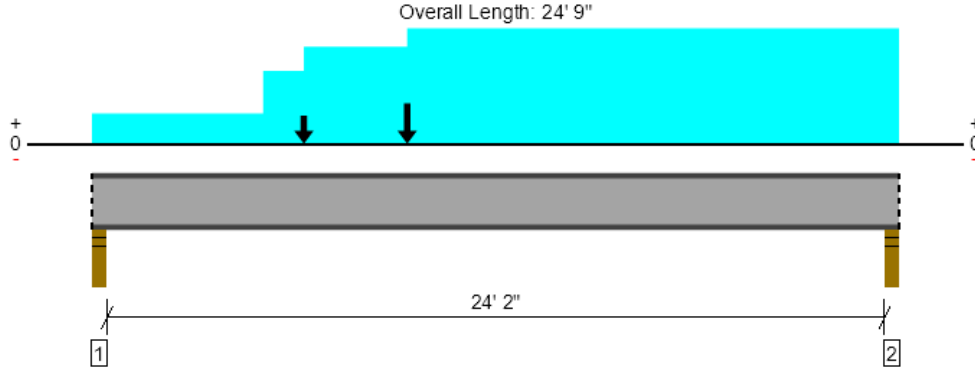
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Upper Floor, Beam #17
1 piece(s) W12X45 (A992) ASTM Steel



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	11236 @ 24' 7"	11411 (3.50")	Passed (98%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	10980 @ 24' 5 1/2"	81070	Passed (14%)	--	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	69942 @ 11' 11 5/8"	90030	Passed (78%)	--	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.474 @ 12' 5"	0.814	Passed (L/618)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.737 @ 12' 4 1/4"	1.221	Passed (L/398)	--	1.0 D + 1.0 L (All Spans)

Member Length : 24' 9"
 System : Floor
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Applicable calculations are based on ANSI/AISC 360-16.
- A lateral-torsional buckling factor (C_b) of 1.0 has been assumed.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Stud wall - HF	3.50"	3.50"	3.50"	3443	5935	709	9377	Blocking
2 - Stud wall - HF	3.50"	3.50"	3.50"	3754	7482	452	11236	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 24' 9"	N/A	45.0	--	--	
1 - Uniform (PSF)	0 to 5' 3" (Front)	4'	15.0	40.0	-	
2 - Uniform (PSF)	5' 3" to 6' 6" (Front)	9' 7"	15.0	40.0	-	
3 - Uniform (PSF)	6' 6" to 9' 8" (Front)	12' 9"	15.0	40.0	-	
4 - Uniform (PSF)	9' 8" to 24' 9" (Front)	15' 2"	15.0	40.0	-	
5 - Point (lb)	6' 6" (Front)	N/A	550	1100	-	
6 - Point (lb)	9' 8" (Front)	N/A	1001	232	1161	Linked from: Beam #15, Support 1

• Side loads are assumed to not induce cross-grain tension.

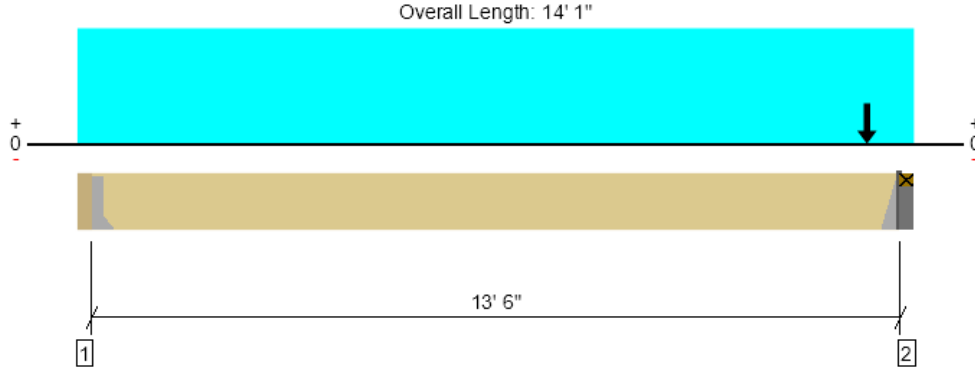
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ForteWEB Software Operator	Job Notes
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Upper Floor, Grid 1 Joist - transfer
2 piece(s) 2 x 8 HF No.2 @ 16" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1273 @ 13' 9 1/2"	1823 (1.50")	Passed (70%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	1147 @ 13' 2 1/4"	2501	Passed (46%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	1799 @ 7' 3 9/16"	2569	Passed (70%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.322 @ 7' 7 1/16"	0.338	Passed (L/503)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.483 @ 7' 1 3/8"	0.675	Passed (L/336)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	N/A	N/A	N/A	--	N/A

Member Length : 13' 6"
 System : Floor
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.
- No composite action between deck and joist was considered in analysis.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Hanger on 7 1/4" HF Ledger	3.50"	Hanger ¹	1.50"	160	376	23	535	See note ¹
2 - Hanger on Single 2X HF plate	3.50"	Hanger ¹	1.50"	589	376	561	1291	See note ¹

- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- ¹ See Connector grid below for additional information and/or requirements.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	13' 6" o/c	
Bottom Edge (Lu)	13' 6" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie							
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories	
1 - Face Mount Hanger	LUS26-2	2.00"	N/A	4-10dx1.5	3-10d		
2 - Top Mount Hanger	BA28-2	3.00"	6-10dx1.5	4-10dx1.5	2-10dx1.5		

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

Vertical Loads	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 14' 1"	16"	15.0	40.0	-	Default Load
2 - Point (PLF)	13' 3"	16"	350.0	-	438.0	Roof loads, wall above

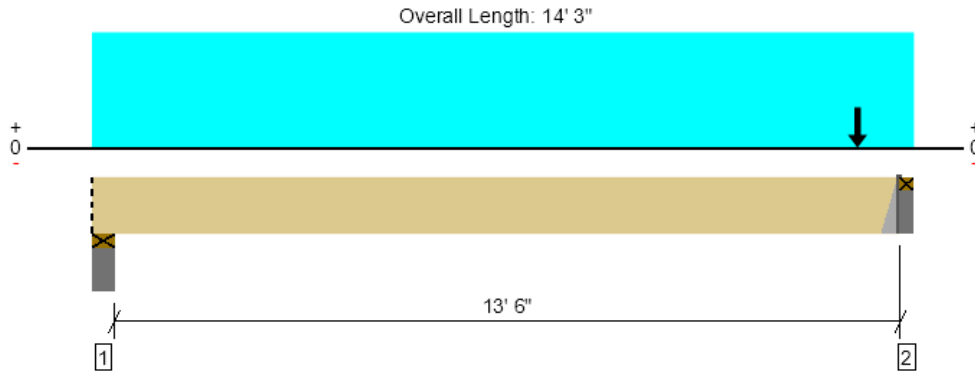
Forteweb Software Operator	Job Notes
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Upper Floor, Grid 1 beam - transfer, omega
2 piece(s) 1 3/4" x 7 1/4" 2.0E Microllam® LVL @ 16" OC

An excessive uplift of -3808 lbs at support located at 13' 11 1/2" failed this product.

OK, overstrength load. See next page for calculated uplift.



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

Design Results	Actual @ Location	Allowed	Result	LDf	Load: Combination (Pattern)
Member Reaction (lbs)	4737 @ 13' 11 1/2"	4737 (1.80")	Passed (100%)	--	1.0 D + 0.7 E (All Spans)
Shear (lbs)	4725 @ 13' 4 1/4"	7714	Passed (61%)	1.60	1.0 D + 0.7 E (All Spans)
Moment (Ft-lbs)	3350 @ 13' 3"	11839	Passed (28%)	1.60	1.0 D + 0.7 E (All Spans)
Live Load Defl. (in)	0.173 @ 7' 1 15/16"	0.340	Passed (L/941)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.266 @ 7' 3 1/8"	0.679	Passed (L/613)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	49	Any	Passed	--	--

Member Length : 13' 11 1/2"
 System : Floor
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 4% increase in the moment capacity has been added to account for repetitive member usage.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: None.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Seismic	Factored	
1 - Plate on concrete - HF	5.50"	5.50"	1.50"	168	382	30	327/-327	649/-128	Blocking
2 - Hanger on Single 2X HF plate	3.50"	Hanger ¹	1.80"	584	378	554	5941/-5941	4743/-3808	See note ¹

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	14' o/c	
Bottom Edge (Lu)	14' o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Top Mount Hanger	Connector not found	N/A	N/A	N/A	N/A	

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

Vertical Loads	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Seismic (1.60)	Comments
1 - Uniform (PSF)	0 to 14' 3"	16"	15.0	40.0	-	-	Default Load
2 - Point (PLF)	13' 3"	16"	350.0	-	438.0	-	Roof loads, wall above
3 - Point (lb)	13' 3"	N/A	-	-	-	6268	Hold-down with omega = 2.5

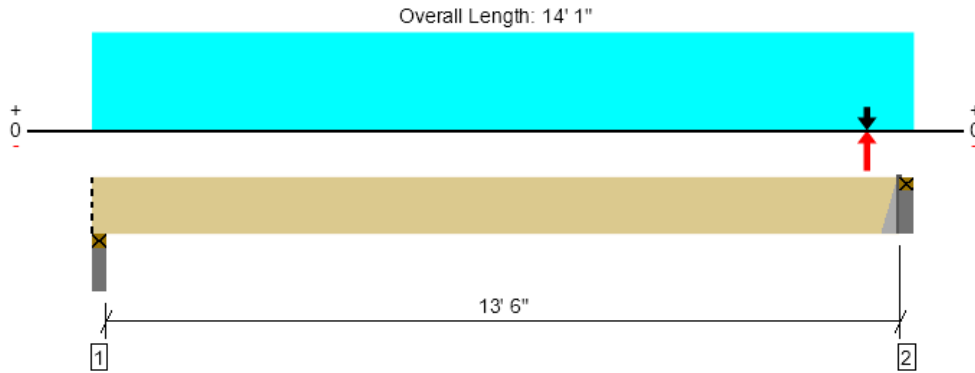
ForTEWEB Software Operator	Job Notes
Jane Johnson Carter Quinn Norlin (206) 264-7784 jjaj@cqn-se.com	



Upper Floor, Grid 1 beam - transfer, uplift
2 piece(s) 1 3/4" x 7 1/4" 2.0E Microllam® LVL @ 16" OC

An excessive uplift of -1197 lbs at support located at 13' 9 1/2" failed this product.

OK, will provide adequate uplift attachment at support concrete wall.



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

Design Results	Actual @ Location	Allowed	Result	LDf	Load: Combination (Pattern)
Member Reaction (lbs)	2439 @ 13' 9 1/2"	3938 (1.50")	Passed (62%)	--	1.0 D - 0.525 E + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2193 @ 13' 2 1/4"	7714	Passed (28%)	1.60	1.0 D - 0.525 E + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	1820 @ 7' 3 1/16"	7399	Passed (25%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.173 @ 7' 1/16"	0.340	Passed (L/941)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.259 @ 7' 15/16"	0.679	Passed (L/628)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	49	Any	Passed	--	--

Member Length : 13' 9 1/2"
 System : Floor
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 4% increase in the moment capacity has been added to account for repetitive member usage.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: None.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Seismic	Factored	
1 - Plate on concrete - HF	3.50"	3.50"	1.50"	159	373	23	92/-92	532	Blocking
2 - Hanger on Single 2X HF plate	3.50"	Hanger ¹	1.50"	590	378	561	2215/-2215	2456/-1197	See note ¹

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	13' 10" o/c	
Bottom Edge (Lu)	13' 10" o/c	

•Maximum allowable bracing intervals based on applied load.

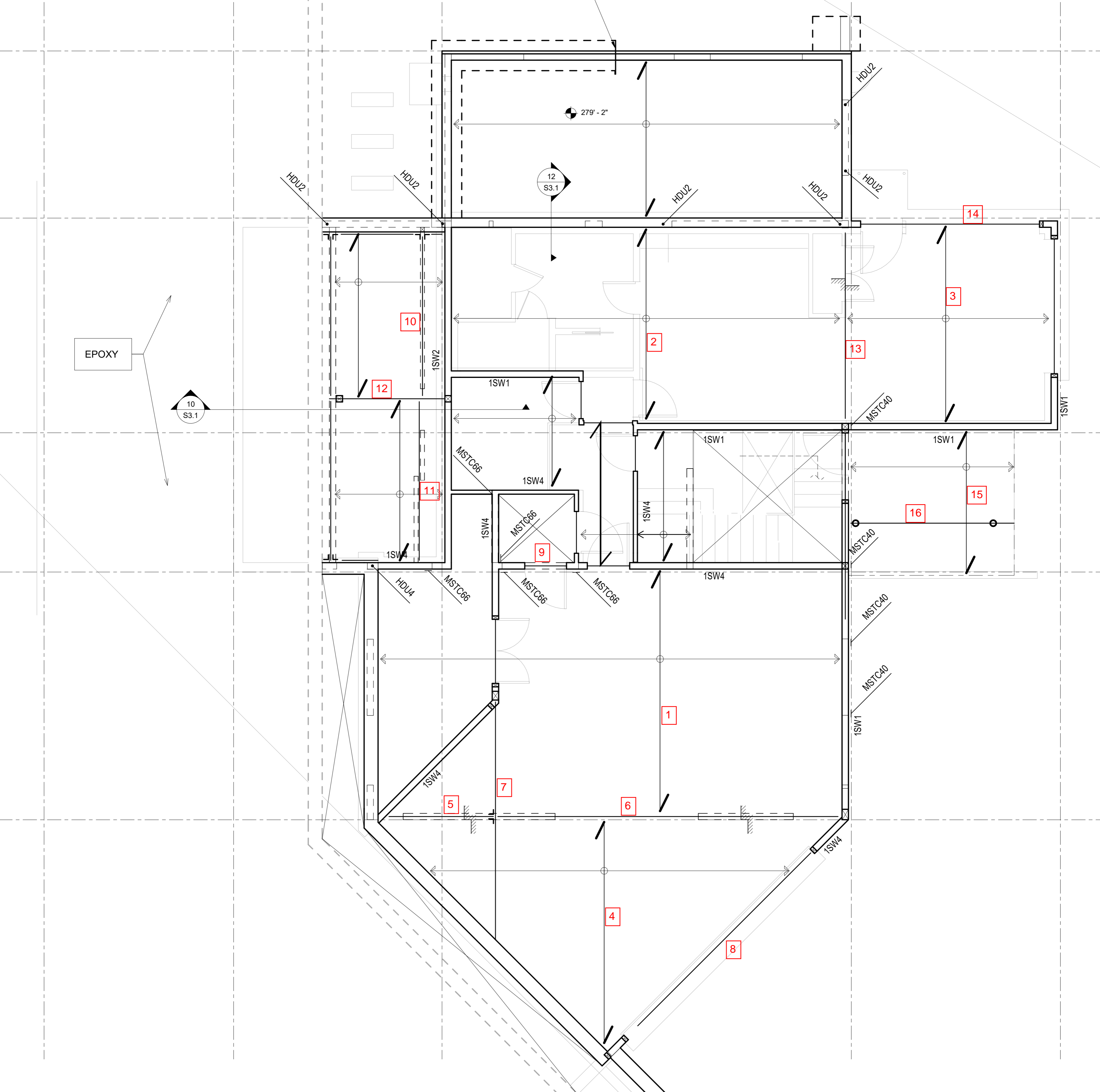
Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Top Mount Hanger	Connector not found	N/A	N/A	N/A	N/A	

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

Vertical Loads	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Seismic (1.60)	Comments
1 - Uniform (PSF)	0 to 14' 1"	16"	15.0	40.0	-	-	Default Load
2 - Point (PLF)	13' 3"	16"	350.0	-	438.0	-	Roof loads, wall above
3 - Point (lb)	13' 3"	N/A	-	-	-	-2307	Seismic, no overstrength

FortewEB Software Operator	Job Notes
Jane Johnson Carter Quinn Norlin (206) 264-7784 jaj@cqn-se.com	





279' - 2"

12
S3.1

EPOXY

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S3.1

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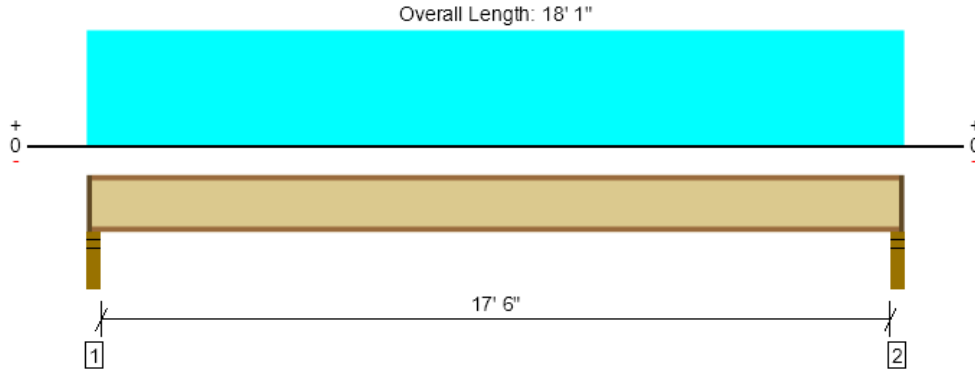
1SW4

1SW4

1SW1

Main Floor, Beam #1

1 piece(s) 14" TJI® 110 @ 16" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	655 @ 2 1/2"	1041 (2.25")	Passed (63%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	642 @ 3 1/2"	1860	Passed (34%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	2861 @ 9' 1/2"	3740	Passed (76%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.271 @ 9' 1/2"	0.442	Passed (L/781)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.373 @ 9' 1/2"	0.883	Passed (L/568)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	50	40	Passed	--	--

Member Length : 17' 10 1/2"
 System : Floor
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: 1/2" Gypsum ceiling.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - HF	3.50"	2.25"	1.75"	181	482	663	1 1/4" Rim Board
2 - Stud wall - HF	3.50"	2.25"	1.75"	181	482	663	1 1/4" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	3' 7" o/c	
Bottom Edge (Lu)	17' 11" o/c	

- TJI joists are only analyzed using Maximum Allowable bracing solutions.
- Maximum allowable bracing intervals based on applied load.

Vertical Load	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 18' 1"	16"	15.0	40.0	Default Load

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

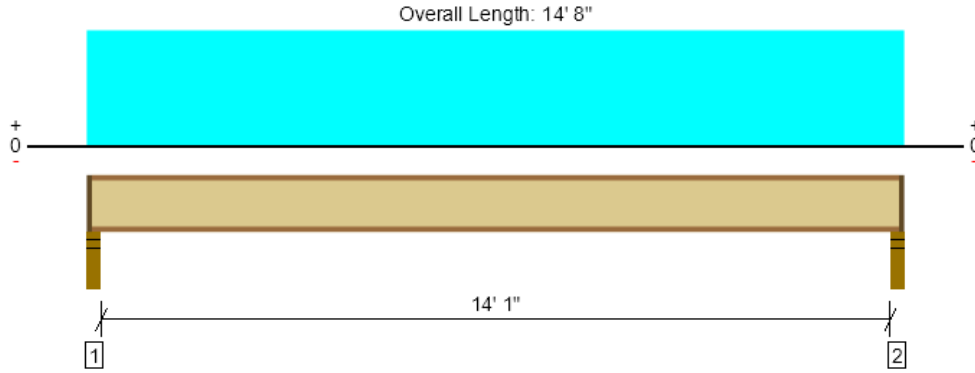
ForteWEB Software Operator	Job Notes
Nicholas Carter Carter Quinn Norlin (206) 264-7784 nvc@cqn-se.com	



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 File Name: Chen Residence (Ectypos)

Main Floor, Beam #2

1 piece(s) 14" TJI® 110 @ 16" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	530 @ 2 1/2"	1041 (2.25")	Passed (51%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	516 @ 3 1/2"	1860	Passed (28%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1861 @ 7' 4"	3740	Passed (50%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.122 @ 7' 4"	0.356	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.168 @ 7' 4"	0.712	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	58	40	Passed	--	--

Member Length : 14' 5 1/2"
 System : Floor
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: 1/2" Gypsum ceiling.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - HF	3.50"	2.25"	1.75"	147	391	538	1 1/4" Rim Board
2 - Stud wall - HF	3.50"	2.25"	1.75"	147	391	538	1 1/4" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 7" o/c	
Bottom Edge (Lu)	14' 6" o/c	

- TJI joists are only analyzed using Maximum Allowable bracing solutions.
- Maximum allowable bracing intervals based on applied load.

Vertical Load	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 14' 8"	16"	15.0	40.0	Default Load

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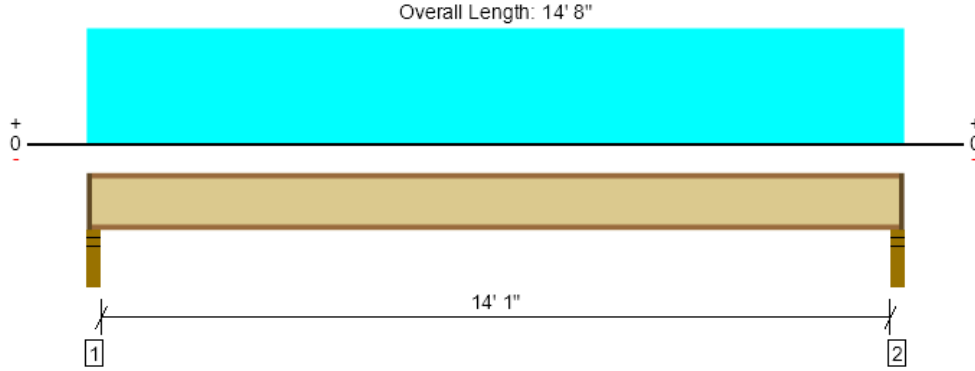
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Main Floor, Beam #3

1 piece(s) 11 7/8" TJI® 110 @ 16" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	868 @ 2 1/2"	1041 (2.25")	Passed (83%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	845 @ 3 1/2"	1560	Passed (54%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	3046 @ 7' 4"	3160	Passed (96%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.257 @ 7' 4"	0.356	Passed (L/664)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.386 @ 7' 4"	0.712	Passed (L/443)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	53	40	Passed	--	--

Member Length : 14' 5 1/2"
 System : Floor
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: 1/2" Gypsum ceiling.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - HF	3.50"	2.25"	1.75"	293	587	880	1 1/4" Rim Board
2 - Stud wall - HF	3.50"	2.25"	1.75"	293	587	880	1 1/4" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	3' 1" o/c	
Bottom Edge (Lu)	14' 6" o/c	

- TJI joists are only analyzed using Maximum Allowable bracing solutions.
- Maximum allowable bracing intervals based on applied load.

Vertical Load	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 14' 8"	16"	30.0	60.0	Default Load

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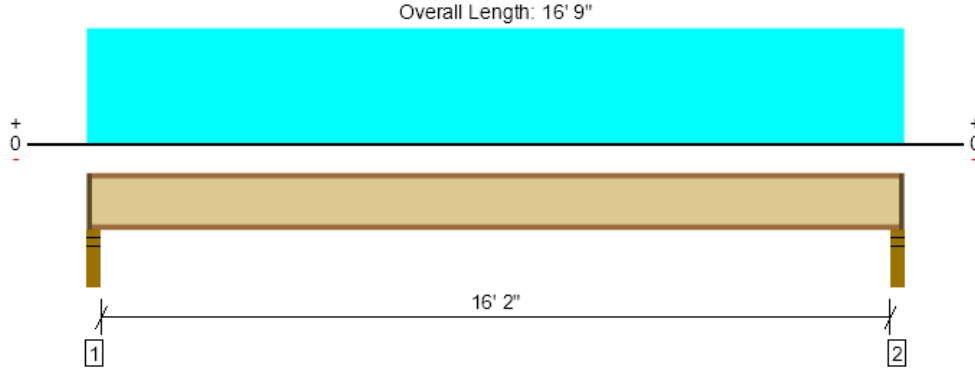
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Main Floor, Beam #4

1 piece(s) 11 7/8" TJI® 230 @ 16" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	993 @ 2 1/2"	1183 (2.25")	Passed (84%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	970 @ 3 1/2"	1655	Passed (59%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	4002 @ 8' 4 1/2"	4215	Passed (95%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.352 @ 8' 4 1/2"	0.408	Passed (L/557)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.528 @ 8' 4 1/2"	0.817	Passed (L/371)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	51	40	Passed	--	--

Member Length : 16' 6 1/2"
 System : Floor
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: 1/2" Gypsum ceiling.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - HF	3.50"	2.25"	1.75"	335	670	1005	1 1/4" Rim Board
2 - Stud wall - HF	3.50"	2.25"	1.75"	335	670	1005	1 1/4" Rim Board

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 1" o/c	
Bottom Edge (Lu)	16' 7" o/c	

- TJI joists are only analyzed using Maximum Allowable bracing solutions.
- Maximum allowable bracing intervals based on applied load.

Vertical Load	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 16' 9"	16"	30.0	60.0	Default Load

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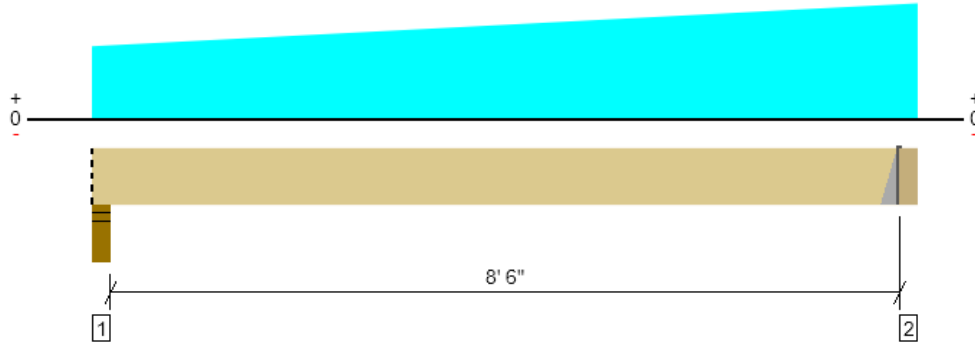


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Main Floor, Beam #5

1 piece(s) 3 1/2" x 14" 2.2E Parallam® PSL

Overall Length: 9' 3"



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3423 @ 8' 10 1/2"	3423 (1.56")	Passed (100%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	2393 @ 7' 8 1/2"	9473	Passed (25%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	6871 @ 4' 8 11/16"	26335	Passed (26%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.043 @ 4' 7 1/8"	0.216	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.067 @ 4' 7 1/8"	0.431	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 8' 10 1/2"
 System : Floor
 Member Type : Flush Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- A 4.7% decrease in the moment capacity has been added to account for lateral stability.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Stud wall - HF	4.50"	4.50"	2.17"	1089	1993	285	3082	Blocking
2 - Hanger on 14" HF beam	4.50"	Hanger ¹	1.56"	1311	2443	293	3755	See note ¹

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

Connector: Simpson Strong-Tie						
Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Top Mount Hanger	BA3.56/14	3.00"	6-10d	10-10d	8-10dx1.5	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 8' 10 1/2"	N/A	15.3	--	--	
1 - Tapered (PSF)	0 to 9' 3" (Front)	0 to 4'	30.0	60.0	-	Deck
2 - Uniform (PSF)	0 to 9' 3" (Front)	9'	15.0	40.0	-	Main Floor
3 - Uniform (PSF)	0 to 9' 3" (Front)	2' 6"	20.0	-	25.0	Roof

- Side loads are assumed to not induce cross-grain tension.

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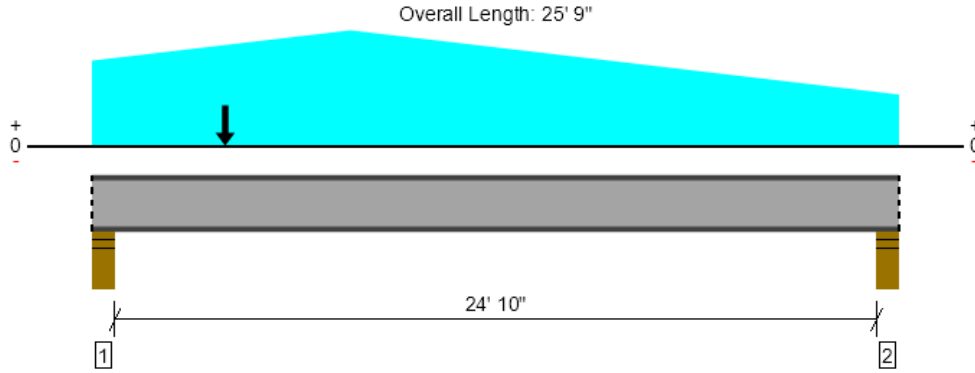
ForteWEB Software Operator	Job Notes
Nicholas Carter Carter Quinn Norlin (206) 264-7784 nvc@cqn-se.com	



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 File Name: Chen Residence (Ectypos)

Main Floor, Beam #6

1 piece(s) W12X58 (A992) ASTM Steel



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	18785 @ 4"	22275 (5.50")	Passed (84%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	18370 @ 5 1/2"	87840	Passed (21%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	95355 @ 11' 8 5/8"	154246	Passed (62%)	--	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.453 @ 12' 8 7/16"	0.627	Passed (L/665)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.782 @ 12' 7 3/16"	1.254	Passed (L/385)	--	1.0 D + 1.0 L (All Spans)

Member Length : 25' 9"
 System : Floor
 Member Type : Flush Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Applicable calculations are based on ANSI/AISC 360-16.
- A lateral-torsional buckling factor (C_b) of 1.0 has been assumed.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Stud wall - HF	5.50"	5.50"	5.50"	8267	9328	4696	18785	Blocking
2 - Stud wall - HF	5.50"	5.50"	5.50"	5139	7622	1525	12761	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 25' 9"	N/A	58.0	--	--	
1 - Uniform (PSF)	0 to 25' 9" (Back)	9'	15.0	40.0	-	Floor
2 - Tapered (PSF)	0 to 8' 3" (Front)	4' 6" to 8' 6"	30.0	60.0	-	
3 - Tapered (PSF)	8' 3" to 25' 9" (Front)	8' 6" to 0	30.0	60.0	-	
4 - Uniform (PSF)	0 to 25' 9" (Front)	2' 6"	20.0	-	25.0	
5 - Point (lb)	4' 3" (Top)	N/A	3309	-	4611	Linked from: Beam #5, Support 1

• Side loads are assumed to not induce cross-grain tension.

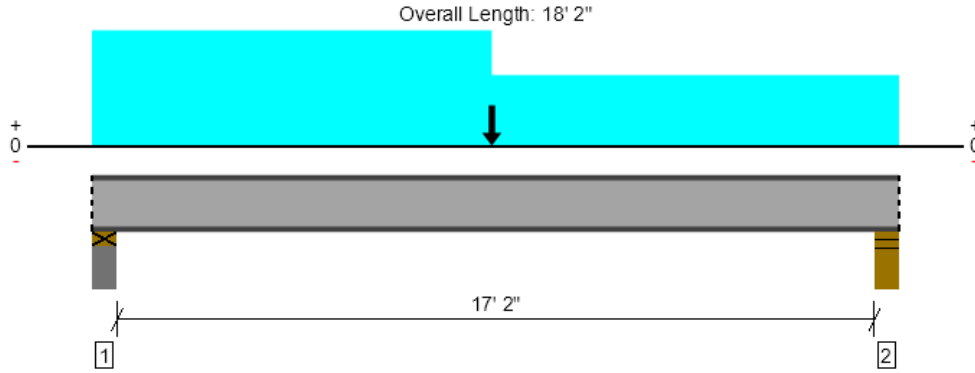
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 The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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Nicholas Carter Carter Quinn Norlin (206) 264-7784 nvc@cqn-se.com	



Main Floor, Beam #7

1 piece(s) W12X58 (A992) ASTM Steel



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	19605 @ 17' 9 1/2"	24300 (6.00")	Passed (81%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	20040 @ 6"	87840	Passed (23%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	168039 @ 9'	183236	Passed (92%)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.296 @ 9' 11/16"	0.435	Passed (L/706)	--	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.536 @ 9' 11/16"	0.871	Passed (L/390)	--	1.0 D + 0.75 L + 0.75 S (All Spans)

Member Length : 18' 2"
 System : Floor
 Member Type : Flush Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Bearing reinforcement may be required for point load located at 9'.
- Applicable calculations are based on ANSI/AISC 360-16.
- A lateral-torsional buckling factor (C_b) of 1.0 has been assumed.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Plate on concrete - SPF	6.00"	6.00"	6.00"	9112	9918	4741	20106	Blocking
2 - Stud wall - HF	6.00"	6.00"	6.00"	8883	9645	4651	19605	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 18' 2"	N/A	58.0	--	--	
1 - Uniform (PSF)	9' to 18' 2" (Front)	1'	15.0	40.0	-	
2 - Uniform (PSF)	0 to 9' (Front)	1'	30.0	60.0	-	Deck
3 - Point (lb)	9' (Front)	N/A	8267	9328	4696	Linked from: 11/ Steel Beam, Support 1
4 - Point (lb)	9' (Front)	N/A	8267	9328	4696	Linked from: Beam #6, Support 1

• Side loads are assumed to not induce cross-grain tension.

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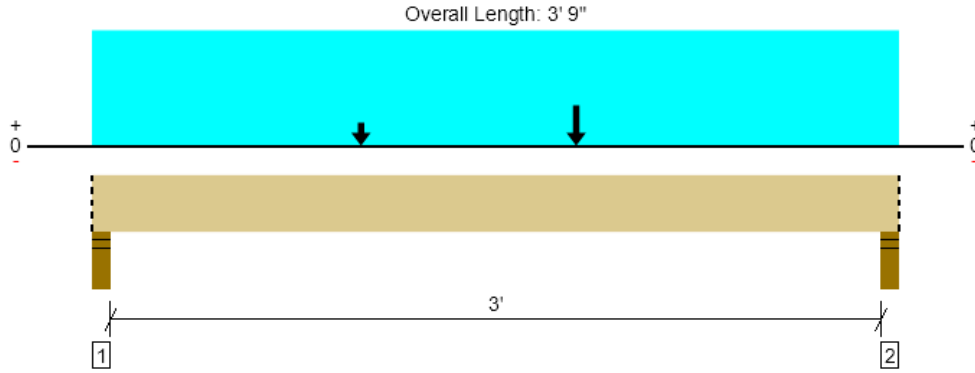
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 File Name: Chen Residence (Ectypos)

Main Floor, Beam #9

1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	6115 @ 3' 6"	6379 (4.50")	Passed (96%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	5571 @ 2' 2 1/2"	11646	Passed (48%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	7381 @ 2' 3"	25116	Passed (29%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.018 @ 2' 3"	0.108	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.032 @ 2' 3"	0.162	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)

Member Length : 3' 9"
 System : Floor
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Stud wall - HF	4.50"	4.50"	3.72"	2419	675	2857	5276	Blocking
2 - Stud wall - HF	4.50"	4.50"	4.31"	2744	675	3371	6115	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	3' 9" o/c	
Bottom Edge (Lu)	3' 9" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 3' 9"	N/A	15.3	--	--	
1 - Uniform (PSF)	0 to 3' 9" (Front)	9'	15.0	40.0	-	Floor
2 - Uniform (PSF)	0 to 3' 9" (Front)	2'	20.0	-	25.0	Roof
3 - Point (lb)	1' 3" (Front)	N/A	1140	-	1430	
4 - Point (lb)	2' 3" (Front)	N/A	3309	-	4611	Linked from: Beam #5, Support 1

• Side loads are assumed to not induce cross-grain tension.

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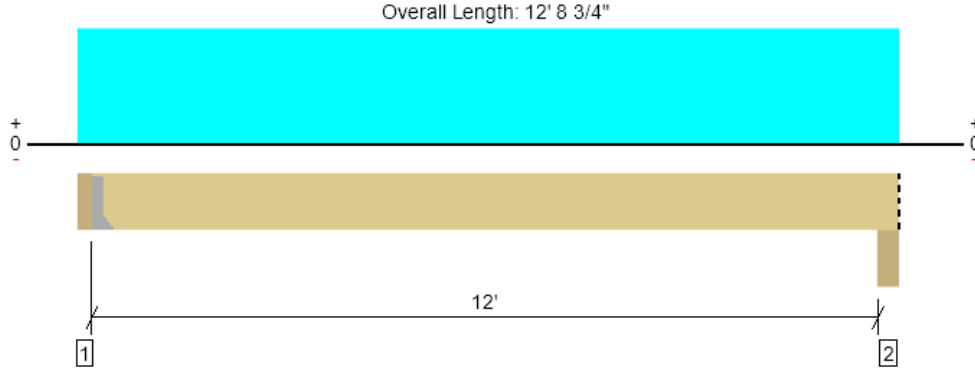
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Main Floor, Beam #10

1 piece(s) 3 1/2" x 14" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5845 @ 3 1/2"	5845 (2.67")	Passed (100%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	4720 @ 1' 5 1/2"	9473	Passed (50%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	17717 @ 6' 4 1/4"	25424	Passed (70%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.218 @ 6' 4 1/4"	0.404	Passed (L/668)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.304 @ 6' 4 1/4"	0.606	Passed (L/478)	--	1.0 D + 1.0 L (All Spans)

Member Length : 12' 5 1/4"
 System : Floor
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- A 8% decrease in the moment capacity has been added to account for lateral stability.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Hanger on 14" HF Ledger	3.50"	Hanger ¹	2.67"	1737	4384	6121	See note ¹
2 - Beam - HF	5.25"	5.25"	4.34"	1747	4399	6146	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

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

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	3 1/2" to 12' 8 3/4"	N/A	15.3	--	
1 - Uniform (PSF)	0 to 12' 8 3/4" (Top)	16' 3"	15.0	40.0	Upper Floor
2 - Uniform (PSF)	0 to 12' 8 3/4" (Front)	1'	15.0	40.0	

- Side loads are assumed to not induce cross-grain tension.

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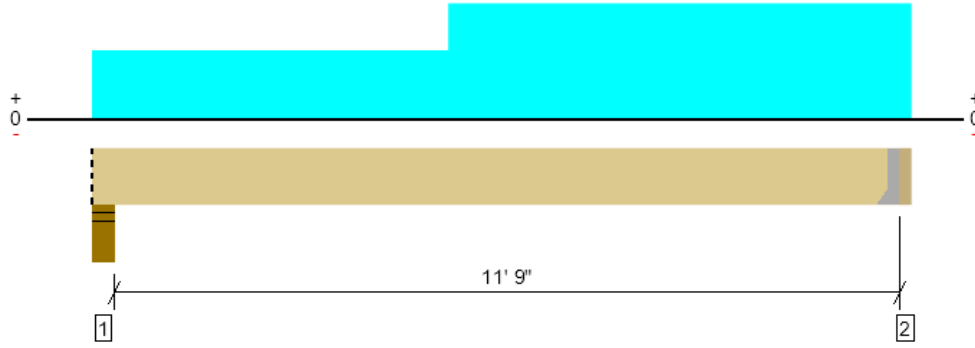


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Main Floor, Beam #11

1 piece(s) 3 1/2" x 14" 2.2E Parallam® PSL

Overall Length: 12' 5 1/2"



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5291 @ 12' 2 1/2"	5291 (2.42")	Passed (100%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	4167 @ 11' 1/2"	9473	Passed (44%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	14521 @ 6' 8 5/8"	27162	Passed (53%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.169 @ 6' 4 1/2"	0.297	Passed (L/842)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.237 @ 6' 4 7/16"	0.594	Passed (L/601)	--	1.0 D + 1.0 L (All Spans)

Member Length : 12' 2 1/2"
 System : Floor
 Member Type : Flush Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - HF	5.50"	5.50"	3.08"	1259	3102	4361	Blocking
2 - Hanger on 14" HF beam	3.00"	Hanger ¹	2.42"	1574	3955	5529	See note ¹

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	12' 3" o/c	
Bottom Edge (Lu)	12' 3" o/c	

•Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie

Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	HGUS410	4.00"	N/A	46-10d	16-10d	

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

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 12' 2 1/2"	N/A	15.3	--	
1 - Uniform (PSF)	0 to 12' 5 1/2" (Front)	1'	15.0	40.0	Default Load
2 - Uniform (PSF)	0 to 5' 6" (Front)	9' 3"	15.0	40.0	
3 - Uniform (PSF)	5' 6" to 12' 5 1/2" (Front)	16' 3"	15.0	40.0	

- Side loads are assumed to not induce cross-grain tension.

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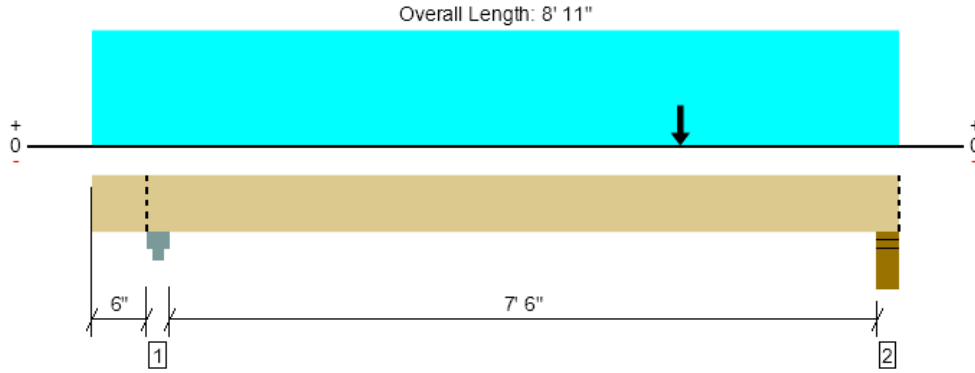
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Main Floor, Beam #12

1 piece(s) 7" x 9 1/4" 2.2E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	12110 @ 8' 7"	15593 (5.50")	Passed (78%)	--	1.0 D + 1.0 L (Alt Spans)
Shear (lbs)	11083 @ 7' 8 1/4"	12518	Passed (89%)	1.00	1.0 D + 1.0 L (Alt Spans)
Moment (Ft-lbs)	22835 @ 6' 6"	24730	Passed (92%)	1.00	1.0 D + 1.0 L (Alt Spans)
Live Load Defl. (in)	0.166 @ 4' 11 5/8"	0.262	Passed (L/568)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.247 @ 4' 11 3/8"	0.393	Passed (L/381)	--	1.0 D + 1.0 L (Alt Spans)

Member Length : 8' 11"
 System : Floor
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- A 0.4% decrease in the moment capacity has been added to account for lateral stability.
- Member should be side-loaded from both sides of the member or braced to prevent rotation.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Column Cap - steel	5.50"	5.50"	1.60"	2549	4463	7012	Blocking
2 - Stud wall - HF	5.50"	5.50"	4.27"	3938	8172/-16	12110	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	End Bearing Points	
Bottom Edge (Lu)	End Bearing Points	

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 8' 11"	N/A	20.2	--	
1 - Uniform (PSF)	0 to 8' 11" (Front)	12'	28.0	40.0	Default Load
2 - Point (lb)	6' 6" (Front)	N/A	1574	3955	Linked from: Beam #11, Support 2
3 - Point (lb)	6' 6" (Front)	N/A	1737	4384	Linked from: Beam #10, Support 1

- Side loads are assumed to not induce cross-grain tension.

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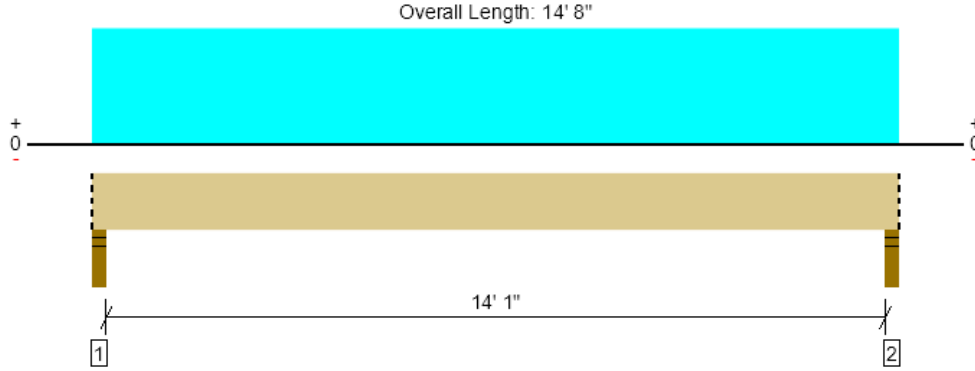
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Main Floor, Beam #13

1 piece(s) 3 1/2" x 14" 1.55E TimberStrand® LSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1176 @ 2"	4961 (3.50")	Passed (24%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	942 @ 1' 5 1/2"	10127	Passed (9%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	4117 @ 7' 4"	21840	Passed (19%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.084 @ 7' 4"	0.478	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.135 @ 7' 4"	0.717	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)

Member Length : 14' 8"
 System : Floor
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - HF	3.50"	3.50"	1.50"	442	733	1176	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	442	733	1176	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	14' 8" o/c	
Bottom Edge (Lu)	14' 8" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 14' 8"	N/A	15.3	--	
1 - Uniform (PSF)	0 to 14' 8" (Front)	1'	15.0	40.0	
2 - Uniform (PSF)	0 to 14' 8" (Front)	1'	30.0	60.0	Deck

• Side loads are assumed to not induce cross-grain tension.

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

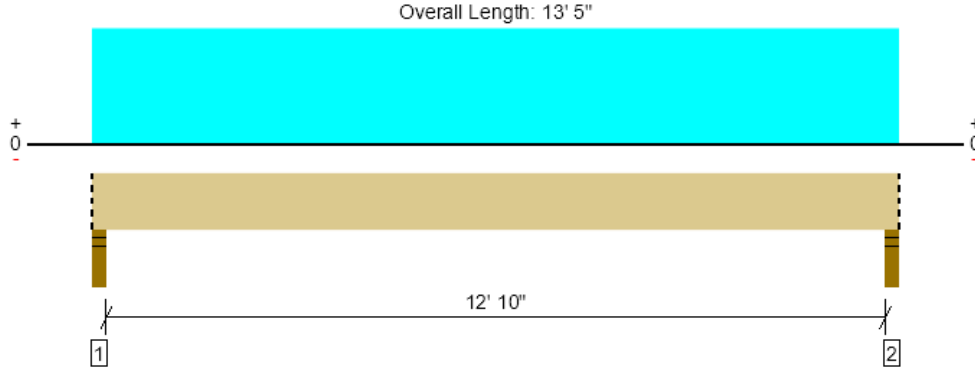
ForteWEB Software Operator	Job Notes
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11/11/2024 10:20:04 PM UTC
 ForteWEB v3.8, Engine: V8.4.1.24, Data: V8.1.6.3
 File Name: Chen Residence (Ectypos)

Main Floor, Beam #14

1 piece(s) 3 1/2" x 11 7/8" 2.0E Parallam® PSL



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4313 @ 2"	4961 (3.50")	Passed (87%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	3489 @ 1' 3 3/8"	8035	Passed (43%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	13757 @ 6' 8 1/2"	19902	Passed (69%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.308 @ 6' 8 1/2"	0.436	Passed (L/509)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.472 @ 6' 8 1/2"	0.654	Passed (L/333)	--	1.0 D + 1.0 L (All Spans)

Member Length : 13' 5"
 System : Floor
 Member Type : Drop Beam
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Stud wall - HF	3.50"	3.50"	3.04"	1496	2818	4313	Blocking
2 - Stud wall - HF	3.50"	3.50"	3.04"	1496	2818	4313	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	13' 5" o/c	
Bottom Edge (Lu)	13' 5" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
0 - Self Weight (PLF)	0 to 13' 5"	N/A	13.0	--	
1 - Uniform (PSF)	0 to 13' 5" (Front)	7'	30.0	60.0	

• Side loads are assumed to not induce cross-grain tension.

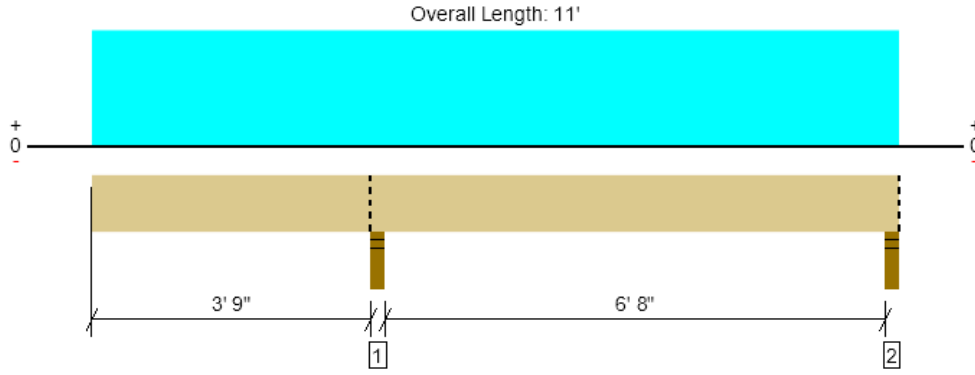
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 The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
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11/26/2024 10:15:18 PM UTC
 ForteWEB v3.8, Engine: V8.4.1.24, Data: V8.1.6.3
 File Name: Chen Residence (Ectypos)

Main Floor, Beam #15
1 piece(s) 2 x 6 HF No.2 @ 24" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	676 @ 3' 10 3/4"	2126 (3.50")	Passed (32%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	316 @ 4' 6"	949	Passed (33%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-607 @ 3' 10 3/4"	921	Passed (66%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.224 @ 0	0.390	Passed (2L/418)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.308 @ 0	0.519	Passed (2L/304)	--	1.0 D + 1.0 S (Alt Spans)

Member Length : 11'
 System : Roof
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Left cantilever length exceeds 1/3 member length or 1/2 back span length. Additional bracing should be considered.
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Factored	
1 - Stud wall - HF	3.50"	3.50"	1.50"	253	422	676	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	77	155	232	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	11' o/c	
Bottom Edge (Lu)	9' 11" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 11'	24"	15.0	25.0	Default Load

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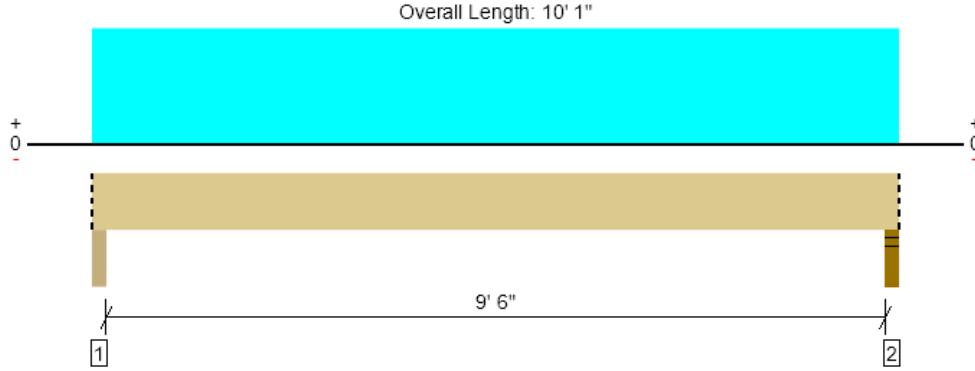
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
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11/11/2024 10:20:04 PM UTC
 ForteWEB v3.8, Engine: V8.4.1.24, Data: V8.1.6.3
 File Name: Chen Residence (Ectypos)

Main Floor, Stair Landing joist - 8" depth
1 piece(s) 2 x 8 HF No.2 @ 16" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	370 @ 2 1/2"	2126 (3.50")	Passed (17%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	304 @ 10 3/4"	1088	Passed (28%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	857 @ 5' 1/2"	1284	Passed (67%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.169 @ 5' 1/2"	0.242	Passed (L/686)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.233 @ 5' 1/2"	0.483	Passed (L/499)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	N/A	N/A	N/A	--	N/A

Member Length : 10' 1"
 System : Floor
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2018
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.
- No composite action between deck and joist was considered in analysis.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Factored	
1 - Beam - HF	3.50"	3.50"	1.50"	101	269	370	Blocking
2 - Stud wall - HF	3.50"	3.50"	1.50"	101	269	370	Blocking

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

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	9' 3" o/c	
Bottom Edge (Lu)	10' 1" o/c	

•Maximum allowable bracing intervals based on applied load.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 10' 1"	16"	15.0	40.0	Default Load

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ForteWEB Software Operator	Job Notes
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MASSING		Uniform Loads (PSF)		Area (SF)	Σw (k)			
ROOF	Misc	Partitions						
	15	6.5		1645			35.4	
		Uniform Loads (PSF)		Area (SF)	Σw (k)	Additional for deck pavers:		
FLOORS	Misc	Partitions				psf	Area	w (k)
	UPPER	15	13	1926	53.9			
	MAIN	15	13	2461	68.9	13	513	6.67

SEISMIC DESIGN PARAMETERS

Site Class = D $S_s = 1.439$
Risk Cat. = II $S_1 = 0.500$
 $S_{DS} = 0.959$ $f_p = 1.00$
R = 6.50 $f_v = 1.80$
Cs = 0.148 k = 1.0

ASCE 7-16 Equivalent Lateral Force Procedure, 12.8

Level	Area (SF)	Unit DL (PSF)	w (k)	h ^s (ft)	(w)(h ^s)	C _{vx}	F _x (k)	ASD 0.7E (k)	
ROOF	1645	21.5	35.4	29.8	1052	36%	8.7	6.1	
UPPER	1926	28.0	53.9	21.0	1132	38%	9.3	6.5	
MAIN	1926	28.0	75.6	10.3	775	26%	6.4	4.5	
Σ			164.9	24.3	2959	100%			
Base Shear								24.3	

WIND DESIGN PARAMETERS

V (mph) = 97 G = 0.85 L/B = 0.44 L/B = 2.27
Exposure Cat. = C Gcpi = 0.18 Cp = Windward Wall 0.80 Cp = Windward Wall 0.80
K_{zt} = 1.60 K_c = 0.98 Leeward Wall -0.50 Cp = Leeward Wall -0.25
K_d = 0.85 q_t = 32.1 Side Wall -0.70 Cp = Side Wall -0.70
Roof Slope (in/ft) = 1:12 h/L = 1.24 h/L = 0.55
Roof -1.30 -0.18 Roof -0.90 -0.18

ASCE 7-16 MWFRS Directional Procedure 27.3.1

Level	h (ft)	Direction	Wall Area	K _h	q _h	Wall (PSF)	Roof (PSF)	Roof (k)	F _x (k)	06W (k)
ROOF	29.8	PARALLEL TO WL-A	112	0.98	32.1	35.5	30.6	2.9	4.0	2.4
		PARALLEL TO WL-1	254	0.98	32.1	28.5	19.6	4.3	7.3	4.4
UPPER	21.0	PARALLEL TO WL-A	546	0.90	29.5	34.4			18.8	11.3
		PARALLEL TO WL-1	429	0.90	29.5	28.0			12.0	7.2
MAIN	10.3	PARALLEL TO WL-A	759	0.85	27.8	33.7			25.6	15.3
		PARALLEL TO WL-1	557	0.85	27.8	27.6			15.4	9.2
Base Shear - Parallel to Wall Line A									48.4	
Base Shear - Parallel to Wall Line 1									34.7	

LEVEL	0.6W	0.7E
ROOF	2.4	6.1
UPPER	11.3	6.5
MAIN	15.3	4.5

SW Height	
ROOF	8.1
UPPER	10.1
MAIN	9.6

0.6-0.14Sds=	0.47
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1. Shear wall demands have been increased where seismic controls design and h/L is greater than 2:1 per SDPWS Table 4.3.4. Where wind controls design, shearwall demands have been decreased 40% per IBC 2306.3.

WALL LINE A

UPPER		WIND TRIB = 11%		ΣL = 19.00								
		0.6W (k) = 1.24										
		SEISMIC TRIB = 11%										
		0.7E (k) = 0.72										
Segment Count	HT (ft)	LENGTH (ft)	h/L	2/(h/L) ¹	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	Wall weight [0.6-0.14Sds]D (k)	Net T (k)
1	10.1	10.5	0.96	1.00	47	38	SW 1	240	0.5	0.47	0.5	0.2
1	10.1	8.5	1.19	1.00	47	38	SW 1	240	0.5	0.47	0.4	0.3
Concrete												

WALL LINE B

ROOF		WIND TRIB = 50%		ΣL = 22.50								
		0.6W (k) = 1.21										
		SEISMIC TRIB = 50%										
		0.7E (k) = 3.03										
Segment Count	HT (ft)	LENGTH (ft)	h/L	2/(h/L) ¹	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	Wall weight [0.6-0.14Sds]D (k)	Net T (k)
1	8.1	8.0	1.02	1.00	39	135	SW 1	240	1.1	0.47	0.3	0.9
1	8.1	4.5	1.81	1.00	39	135	SW 1	240	1.1	0.47	0.2	1.0
1	8.1	3.3	2.50	0.80	39	168	SW 1	240	1.1	0.47	0.1	1.0
UPPER		WIND TRIB = 33%		ΣL = 21.00								
		0.6W (k) = 4.93										
		SEISMIC TRIB = 33%										
		0.7E (k) = 5.18										
Segment Count	HT (ft)	LENGTH (ft)	h/L	2/(h/L) ¹	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	Wall weight [0.6-0.14Sds]D (k)	Net T (k)
1	10.1	12.0	0.84	1.00	168	247	SW 2	355	2.5	0.47	0.6	2.2
1	10.1	9.0	1.13	1.00	168	247	SW 2	355	2.5	0.47	0.4	2.3
Concrete												

WALL LINE C

MAIN		WIND TRIB = 18%										
		0.6W (k) = 2.76										
		SEISMIC TRIB = 23%										
		0.7E (k) = 1.03										
Segment Count	HT (ft)	LENGTH (ft)	h/L	2/(h/L) ¹	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	Wall weight [0.6-0.14Sds]D (k)	Net T (k)
2	10.1	15.0	0.68	1.00	66	34	SW 1	240	0.7	0.47	0.7	0.3
Concrete												

WALL LINE D

ROOF		WIND TRIB = 50%		ΣL = 24.00								
		0.6W (k) = 1.21										
		SEISMIC TRIB = 50%										
		0.7E (k) = 3.03										
<i>Wall weight</i>												
Segment Count	HT (ft)	LENGTH (ft)	h/L	2/(h/L) ¹	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	[0.6-0.14Sds]D (k)	Net T (k)
1	8.1	6.0	1.35	1.00	36	126	SW 1	240	1.0	0.47	0.2	0.9
1	8.1	10.5	0.77	1.00	36	126	SW 1	240	1.0	0.47	0.4	0.8
1	8.1	7.5	1.08	1.00	36	126	SW 1	240	1.0	0.47	0.3	0.9
UPPER		WIND TRIB = 39%		ΣL = 14.50								
		0.6W (k) = 5.60										
		SEISMIC TRIB = 39%										
		0.7E (k) = 5.57										
<i>Wall weight</i>												
Segment Count	HT (ft)	LENGTH (ft)	h/L	2/(h/L) ¹	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	[0.6-0.14Sds]D (k)	Net T (k)
1	10.1	4.5	2.25	0.89	276	432	SW 4	595	3.9	0.47	0.2	3.8
2	10.1	5.0	2.03	0.99	276	389	SW 4	595	3.9	0.47	0.2	3.8
MAIN		WIND TRIB = 25%		ΣL = 29.50								
		0.6W (k) = 9.44										
		SEISMIC TRIB = 26%										
		0.7E (k) = 6.73										
<i>Wall weight</i>												
Segment Count	HT (ft)	LENGTH (ft)	h/L	2/(h/L) ¹	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	[0.6-0.14Sds]D (k)	Net T (k)
1	10.1	15.5	0.65	1.00	229	228	SW 4	595	2.3	0.47	0.7	1.9
1	10.1	9.0	1.13	1.00	229	228	SW 4	595	2.3	0.47	0.4	2.1
1	10.1	5.0	2.03	0.99	229	231	SW 4	595	2.3	0.47	0.2	2.2
Concrete												

WALL LINE E

UPPER		WIND TRIB = 17%		ΣL = 17.25								
		0.6W (k) = 1.91										
		SEISMIC TRIB = 17%										
		0.7E (k) = 1.11										
<i>Wall weight</i>												
Segment Count	HT (ft)	LENGTH (ft)	h/L	2/(h/L) ¹	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	[0.6-0.14Sds]D (k)	Net T (k)
1	10.1	10.8	0.94	1.00	79	64	SW 1	240	0.8	0.47	0.5	0.5
1	10.1	6.5	1.56	1.00	79	64	SW 1	240	0.8	0.47	0.3	0.6
MAIN		WIND TRIB = 38%		ΣL = 11.75								
		0.6W (k) = 7.74										
		SEISMIC TRIB = 35%										
		0.7E (k) = 2.67										
<i>Wall weight</i>												
Segment Count	HT (ft)	LENGTH (ft)	h/L	2/(h/L) ¹	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	[0.6-0.14Sds]D (k)	Net T (k)
1	11.4	8.5	1.34	1.00	471	227	SW 4	595	5.4	0.47	0.5	5.1
1	11.4	3.3	3.50	0.57	471	397	SW 4	595	5.4	0.47	0.2	5.3
Concrete												

LEVEL	0.6W	0.7E
ROOF	4.4	6.1
UPPER	7.2	6.5

SW Height	
ROOF	8.1
UPPER	10.1

0.6-0.14Sds=	0.47
--------------	------

1. Shear wall demands have been increased where seismic controls design and h/L is greater than 2:1 per SDPWS Table 4.3.4. Where wind controls design, shearwall demands have been decreased 40% per IBC 2306.3.

WALL LINE 1

ROOF		WIND TRIB = 12%		$\Sigma L = 14.00$								
		0.6W (k) = 0.53										
		SEISMIC TRIB = 8%										
		0.7E (k) = 0.48										
Segment Count	HT (ft)	LENGTH (ft)	h/L	$2/(h/L)^1$	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	Wall weight [0.6-0.14Sds]D (k)	Net T (k)
1	8.1	14.0	0.58	1.00	27	35	SW 1	240	0.3	0.47	0.5	0.0
Concrete												

WALL LINE 2

ROOF		WIND TRIB = 31%		$\Sigma L = 8.25$								
		0.6W (k) = 1.36										
		SEISMIC TRIB = 31%										
		0.7E (k) = 1.88										
Segment Count	HT (ft)	LENGTH (ft)	h/L	$2/(h/L)^1$	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	Wall weight [0.6-0.14Sds]D (k)	Net T (k)
1	7.8	8.3	0.94	1.00	118	228	SW 1	240	1.8	0.47	0.3	1.6
Concrete												

WALL LINE 2.5

UPPER		WIND TRIB = 12%		$\Sigma L = 29.50$								
		0.6W (k) = 0.86										
		SEISMIC TRIB = 12%										
		0.7E (k) = 0.78										
Segment Count	HT (ft)	LENGTH (ft)	h/L	$2/(h/L)^1$	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	Wall weight [0.6-0.14Sds]D (k)	Net T (k)
1	10.1	24.0	0.42	1.00	21	27	SW 1	240	0.3	0.47	1.1	0.0
1	10.1	5.5	1.84	1.00	21	27	SW 1	240	0.3	0.47	0.3	0.1
Transfers to Wall Line 3												

WALL LINE 3

UPPER		WIND TRIB = 19%		$\Sigma L = 23.00$								
		0.6W (k) = 1.37										
		SEISMIC TRIB = 19%										
		0.7E (k) = 1.24										
Segment Count	HT (ft)	LENGTH (ft)	h/L	$2/(h/L)^1$	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	Wall weight [0.6-0.14Sds]D (k)	Net T (k)
2	10.1	11.5	0.88	1.00	42	54	SW 1	240	0.5	0.47	0.5	0.3
MAIN		WIND TRIB = 14%		$\Sigma L = 49.00$								
		0.6W (k) = 3.52										
		SEISMIC TRIB = 16%										
		0.7E (k) = 2.74										
Segment Count	HT (ft)	LENGTH (ft)	h/L	$2/(h/L)^1$	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	Wall weight [0.6-0.14Sds]D (k)	Net T (k)
2	9.6	24.5	0.39	1.00	51	56	SW 1	240	0.5	0.47	1.1	0.0
Concrete												

WALL LINE 3.5

ROOF		WIND TRIB = 38%	ΣL = 15.00									
		0.6W (k) = 1.67										
		SEISMIC TRIB = 39%										
		0.7E (k) = 2.36										
		<i>Wall weight</i>										
Segment Count	HT (ft)	LENGTH (ft)	h/L	2/(h/L) ¹	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	[0.6-0.14Sds]D (k)	Net T (k)
1	8.1	15.0	0.54	1.00	79	157	SW 1	240	1.3	0.47	0.6	1.0
UPPER		WIND TRIB = 39%	ΣL = 11.00									
		0.6W (k) = 4.48										
		SEISMIC TRIB = 39%										
		0.7E (k) = 4.90										
		<i>Wall weight</i>										
Segment Count	HT (ft)	LENGTH (ft)	h/L	2/(h/L) ¹	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	[0.6-0.14Sds]D (k)	Net T (k)
2	10.1	5.5	1.84	1.00	291	446	SW 4	595	4.5	0.47	0.3	4.4
MAIN		WIND TRIB = 28%	ΣL = 16.00									
		0.6W (k) = 7.05										
		SEISMIC TRIB = 37%										
		0.7E (k) = 6.56										
		<i>Wall weight</i>										
Segment Count	HT (ft)	LENGTH (ft)	h/L	2/(h/L) ¹	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	[0.6-0.14Sds]D (k)	Net T (k)
1	9.6	9.0	1.07	1.00	315	410	SW 3	455	3.9	0.47	0.4	3.7
1	9.6	7.0	1.38	1.00	315	410	SW 3	455	3.9	0.47	0.3	3.8
Concrete												

WALL LINE 4

ROOF		WIND TRIB = 19%	ΣL = 7.00									
		0.6W (k) = 0.83										
		SEISMIC TRIB = 22%										
		0.7E (k) = 1.33										
		<i>Wall weight</i>										
Segment Count	HT (ft)	LENGTH (ft)	h/L	2/(h/L) ¹	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	[0.6-0.14Sds]D (k)	Net T (k)
1	8.1	7.0	1.16	1.00	85	190	SW 1	240	1.5	0.47	0.3	1.4
UPPER		WIND TRIB = 30%	ΣL = 20.50									
		0.6W (k) = 2.99										
		SEISMIC TRIB = 30%										
		0.7E (k) = 3.29										
		<i>Wall weight</i>										
Segment Count	HT (ft)	LENGTH (ft)	h/L	2/(h/L) ¹	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	[0.6-0.14Sds]D (k)	Net T (k)
1	10.1	5.0	2.03	0.99	104	162	SW 1	240	1.6	0.47	0.2	1.5
1	10.1	10.0	1.01	1.00	104	160	SW 1	240	1.6	0.47	0.5	1.4
1	10.1	5.5	1.84	1.00	104	160	SW 1	240	1.6	0.47	0.3	1.5
MAIN		WIND TRIB = 36%	ΣL = 22.50									
		0.6W (k) = 6.32										
		SEISMIC TRIB = 34%										
		0.7E (k) = 4.80										
		<i>Wall weight</i>										
Segment Count	HT (ft)	LENGTH (ft)	h/L	2/(h/L) ¹	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	[0.6-0.14Sds]D (k)	Net T (k)
1	9.6	22.5	0.43	1.00	201	213	SW 1	240	2.1	0.47	1.0	1.5
Concrete												

WALL LINE 5

MAIN		WIND TRIB = 14%	ΣL = 3.75									
		0.6W (k) = 1.33										
		SEISMIC TRIB = 5%										
		0.7E (k) = 0.22										
		<i>Wall weight</i>										
Segment Count	HT (ft)	LENGTH (ft)	h/L	2/(h/L) ¹	0.6W (plf)	0.7E (plf)	SW	SW Cap (plf)	Tension (k)	0.6-0.14Sds	[0.6-0.14Sds]D (k)	Net T (k)
1	9.6	3.8	2.57	0.78	253	75	SW 1	240	2.4	0.47	0.2	2.4
Concrete												



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1. Project information

Customer company:
Customer contact name:
Customer e-mail:
Comment:

Project description:
Location:
Fastening description:

2. Input Data & Anchor Parameters

General

Design method: ACI 318-14
Units: Imperial units

Anchor Information:

Anchor type: Bonded anchor
Material: F1554 Grade 36
Diameter (inch): 0.625
Effective Embedment depth, h_{ef} (inch): 5.000
Code report: ICC-ES ESR-4057
Anchor category: -
Anchor ductility: Yes
 h_{min} (inch): 6.38
 c_{ac} (inch): 10.57
 C_{min} (inch): 1.75
 S_{min} (inch): 3.00

Base Material

Concrete: Normal-weight
Concrete thickness, h (inch): 8.00
State: Cracked
Compressive strength, f'_c (psi): 2500
 $\Psi_{c,v}$: 1.0
Reinforcement condition: A tension, A shear
Supplemental reinforcement: Not applicable
Reinforcement provided at corners: Yes
Ignore concrete breakout in tension: No
Ignore concrete breakout in shear: No
Hole condition: Dry concrete
Inspection: Continuous
Temperature range, Short/Long: 150/110°F
Ignore 6do requirement: Not applicable
Build-up grout pad: No

Base Plate

Length x Width x Thickness (inch): 8.00 x 8.00 x 0.25

Recommended Anchor

Anchor Name: SET-3G - SET-3G w/ 5/8"Ø F1554 Gr. 36
Code Report: ICC-ES ESR-4057





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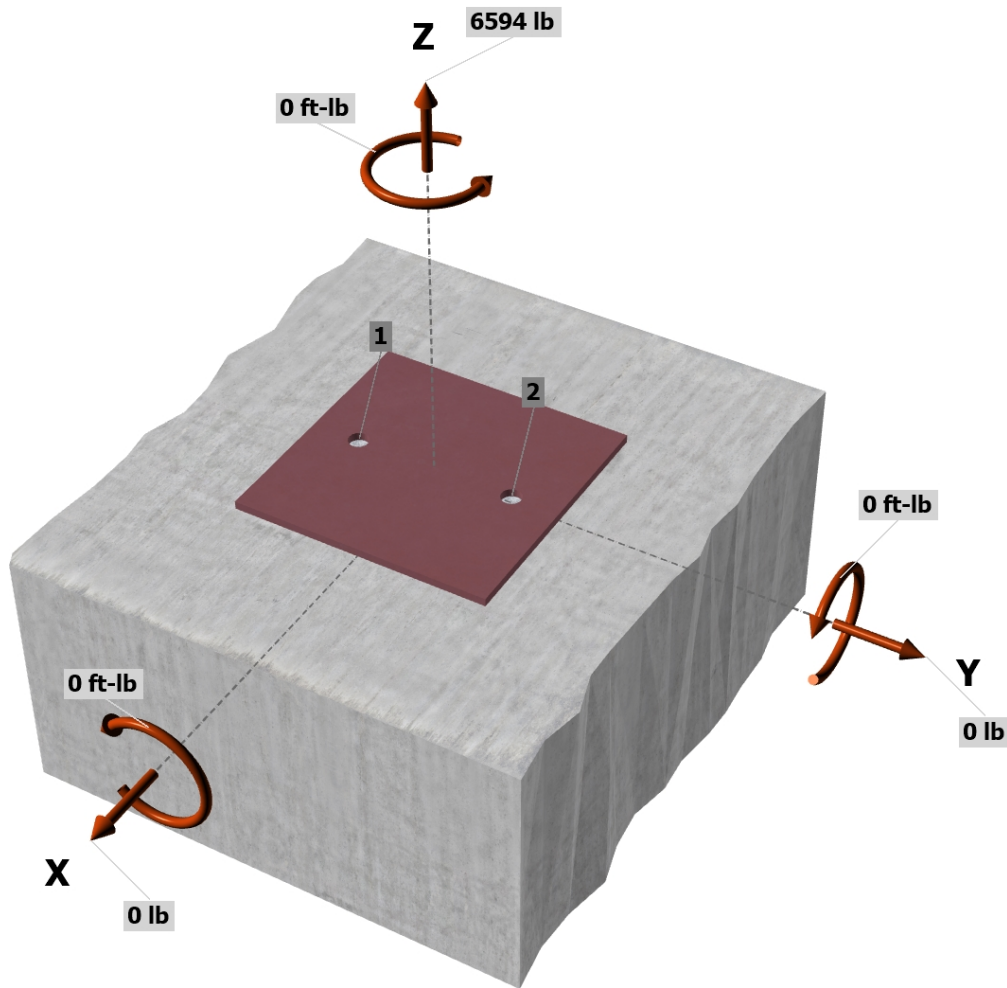
Load and Geometry

Load factor source: ACI 318 Section 5.3
Load combination: not set
Seismic design: Yes
Anchors subjected to sustained tension: No
Ductility section for tension: 17.2.3.4.2 not applicable
Ductility section for shear: 17.2.3.5.2 not applicable
 Ω_0 factor: not set
Apply entire shear load at front row: No
Anchors only resisting wind and/or seismic loads: Yes

Strength level loads:

N_{ua} [lb]: 6594
 V_{uax} [lb]: 0
 V_{uay} [lb]: 0
 M_{ux} [ft-lb]: 0
 M_{uy} [ft-lb]: 0
 M_{uz} [ft-lb]: 0

<Figure 1>

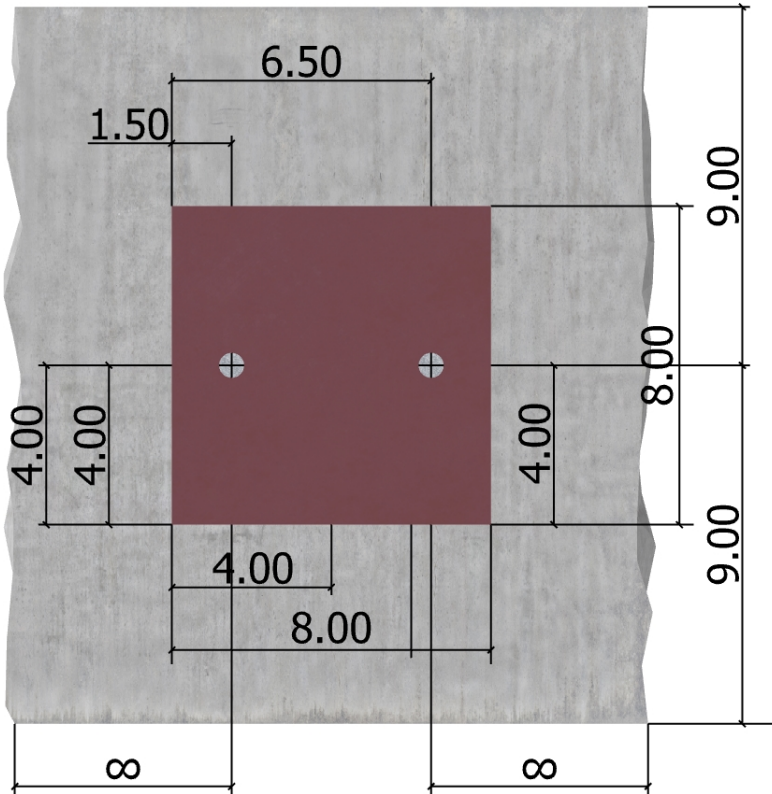


Input data and results must be checked for agreement with the existing circumstances, the standards and guidelines must be checked for plausibility.



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<Figure 2>





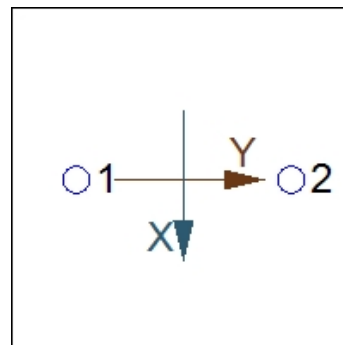
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3. Resulting Anchor Forces

Anchor	Tension load, N_{ua} (lb)	Shear load x, V_{uax} (lb)	Shear load y, V_{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2 + (V_{uay})^2}$ (lb)
1	3297.0	0.0	0.0	0.0
2	3297.0	0.0	0.0	0.0
Sum	6594.0	0.0	0.0	0.0

Maximum concrete compression strain (%): 0.00
 Maximum concrete compression stress (psi): 0
 Resultant tension force (lb): 6594
 Resultant compression force (lb): 0
 Eccentricity of resultant tension forces in x-axis, e'_{Nx} (inch): 0.00
 Eccentricity of resultant tension forces in y-axis, e'_{Ny} (inch): 0.00

<Figure 3>



4. Steel Strength of Anchor in Tension (Sec. 17.4.1)

N_{sa} (lb)	ϕ	ϕN_{sa} (lb)
13110	0.75	9833

5. Concrete Breakout Strength of Anchor in Tension (Sec. 17.4.2)

$$N_b = k_c \lambda_a \sqrt{f'_c} h_{ef}^{1.5} \text{ (Eq. 17.4.2.2a)}$$

k_c	λ_a	f'_c (psi)	h_{ef} (in)	N_b (lb)
17.0	1.00	2500	5.000	9503

$$0.75 \phi N_{cbg} = 0.75 \phi (A_{Nc} / A_{Nco}) \Psi_{ec,N} \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b \text{ (Sec. 17.3.1 \& Eq. 17.4.2.1b)}$$

A_{Nc} (in ²)	A_{Nco} (in ²)	$c_{a,min}$ (in)	$\Psi_{ec,N}$	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	N_b (lb)	ϕ	$0.75 \phi N_{cbg}$ (lb)
300.02	225.00	9.00	1.000	1.000	1.00	1.000	9503	0.75	7128

6. Adhesive Strength of Anchor in Tension (Sec. 17.4.5)

$$\tau_{k,cr} = \tau_{k,cr,short-term} K_{sat} (f'_c / 2,500)^n \alpha_{N,seis}$$

$\tau_{k,cr}$ (psi)	$f_{short-term}$	K_{sat}	$\alpha_{N,seis}$	f'_c (psi)	n	$\tau_{k,cr}$ (psi)
1356	1.00	1.00	1.00	2500	0.24	1356

$$N_{ba} = \lambda_a \tau_{cr} \pi d_a h_{ef} \text{ (Eq. 17.4.5.2)}$$

λ_a	τ_{cr} (psi)	d_a (in)	h_{ef} (in)	N_{ba} (lb)
1.00	1356	0.63	5.000	13312

$$0.75 \phi N_{ag} = 0.75 \phi (A_{Na} / A_{Na0}) \Psi_{ec,Na} \Psi_{ed,Na} \Psi_{cp,Na} N_{ba} \text{ (Sec. 17.3.1 \& Eq. 17.4.5.1b)}$$

A_{Na} (in ²)	A_{Na0} (in ²)	c_{Na} (in)	$c_{a,min}$ (in)	$\Psi_{ec,Na}$	$\Psi_{ed,Na}$	$\Psi_{cp,Na}$	N_{ba} (lb)	ϕ	$0.75 \phi N_{ag}$ (lb)
394.75	307.10	8.76	9.00	1.000	1.000	1.000	13312	0.65	8342

Input data and results must be checked for agreement with the existing circumstances, the standards and guidelines must be checked for plausibility.



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11. Results

11. Interaction of Tensile and Shear Forces (Sec. D.7)?

Tension	Factored Load, N_{ua} (lb)	Design Strength, ϕN_n (lb)	Ratio	Status
Steel	3297	9833	0.34	Pass
Concrete breakout	6594	7128	0.93	Pass (Governs)
Adhesive	6594	8342	0.79	Pass

SET-3G w/ 5/8"Ø F1554 Gr. 36 with hef = 5.000 inch meets the selected design criteria.

12. Warnings

- Per designer input, the tensile component of the strength-level earthquake force applied to anchors does not exceed 20 percent of the total factored anchor tensile force associated with the same load combination. Therefore the ductility requirements of ACI 318 17.2.3.4.2 for tension need not be satisfied – designer to verify.
- Per designer input, the shear component of the strength-level earthquake force applied to anchors does not exceed 20 percent of the total factored anchor shear force associated with the same load combination. Therefore the ductility requirements of ACI 318 17.2.3.5.2 for shear need not be satisfied – designer to verify.
- Designer must exercise own judgement to determine if this design is suitable.
- Refer to manufacturer's product literature for hole cleaning and installation instructions.