AGilmore Services, LLC
K. Andrew Gilmore, PE
913-660-3778
andy.gilmore22@gmail.com

October 11, 2021

Mr. Mark Deaton, RA
4409 SE Secretariat Dr.
Lee's Summit, MO 64082

Mr. Deaton,

Thank you for contacting me regarding the exterior wood framed ramp for which you needed a structural review. It was a pleasure to meet you on site, August 20 to see what was constructed and understand your needs.

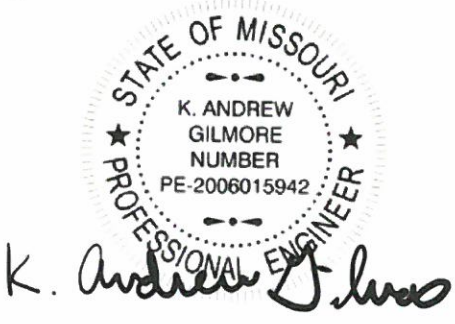
Attached are my mark-ups for the plan you sent. I've also attached some sketches to clarify the structural remediation needed. These mark-up and sketches, along with the list below will hopefully allow this project to pass the City of Lee's Summit inspection.

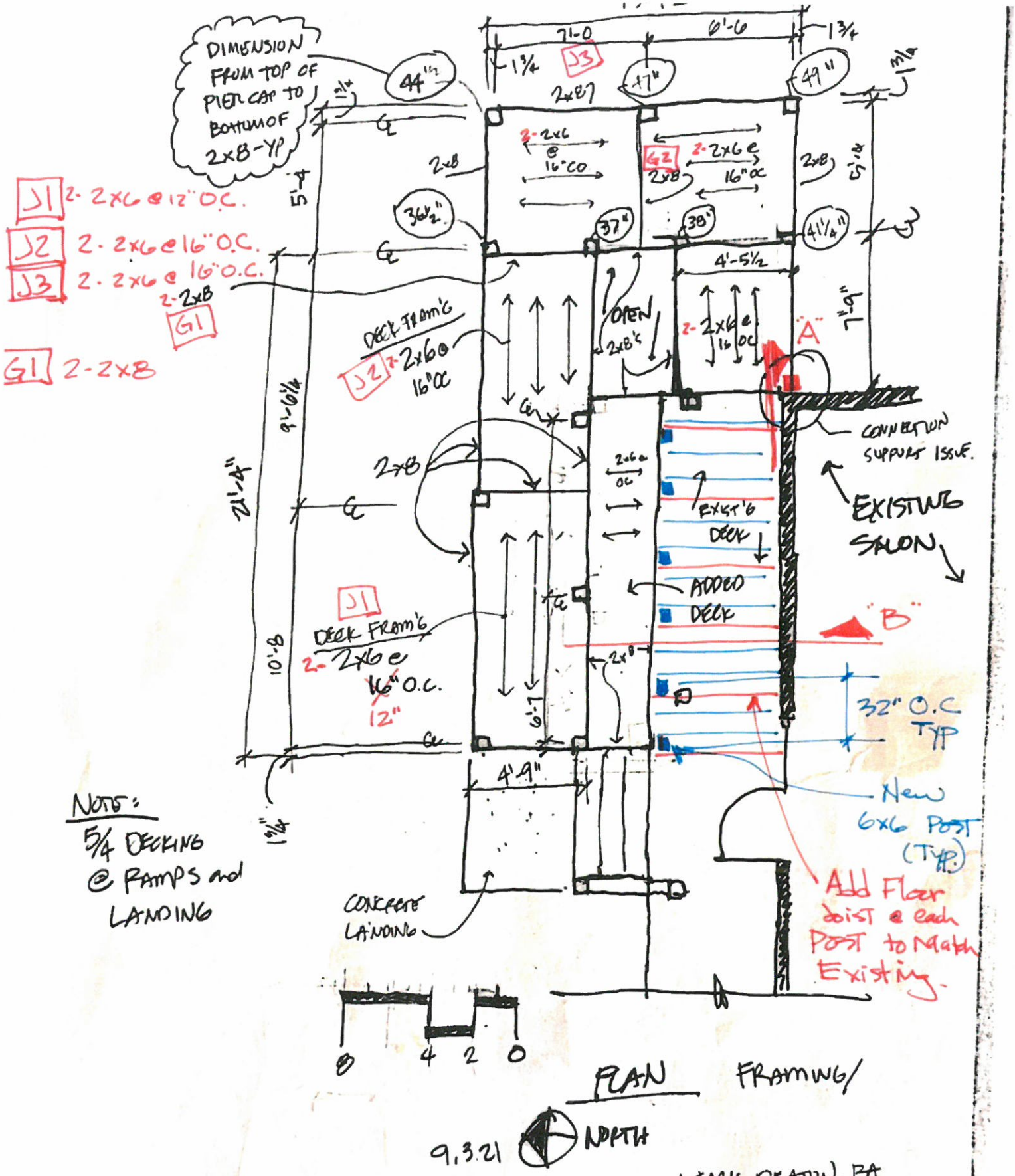
1. The review of the existing structure is based on a dead load of 5 pounds per square foot (psf) and a live load of 100psf. It is believed that based a live loading of 100psf is appropriate for this exterior ramp being utilized as a means of egress from the building per the International Building Code (IBC). Subsequent comments are relative to this loading.
2. The existing 2x6 floor joists at the bottom of the ramp that span 10'-8" need to be doubled up and spaced 12" on center (O.C.) maximum. All other floor joists need to be doubled and spaced not more than 16" O.C. This may be accomplished by adding floor joists that are spaced at 6" and 8" O.C. respectively. While this may seem excessive, the needed capacity is being controlled by the application of the previously mentioned 100psf floor live load. See the mark ups indicating J1, J2 & J3 on the plan.
3. The 2x8 floor girders that support the floor joists should be doubled to be two 2x8s.
4. Attachment of all girders is to be made with two ½" diameter x 6" lag screws. See the attached hand sketch for spacing requirements.
5. The hand sketch indicates that there is a connection support issue at the south-east corner of the existing building. Please see the attached hand sketch labeled 'Section A' for clarification on how to attach a new post to the existing concrete foundation wall.
6. It is my understanding that there is a question about the ability of the existing wood deck to support the new wood construction. Based on my review, the existing wood deck can support the new construction provided that a new cantilevered floor joist is added at each post. See the mark-ups on the plan and Section 'B' for additional clarity of this matter.
7. When I visited the ramps, it was observed that some of the floor joists are attached to a nailer that is then attached to the 2x8 girder support members. I advised that ½" diameter x 3" lag screws be added to ensure adequate attachment of the nailers to the 2x8 girders.
8. Attached are design calculations. The calculations will show some of the members as "failed". These indicators are relative to the live load deflection. Based on my engineering judgement and the application of 100psf live load, I believe the calculated deflection to be acceptable even though they are slightly outside the boundaries of floor live load deflection limits in the IBC.

If you have questions or need further assistance, please let me know.

Thank you,

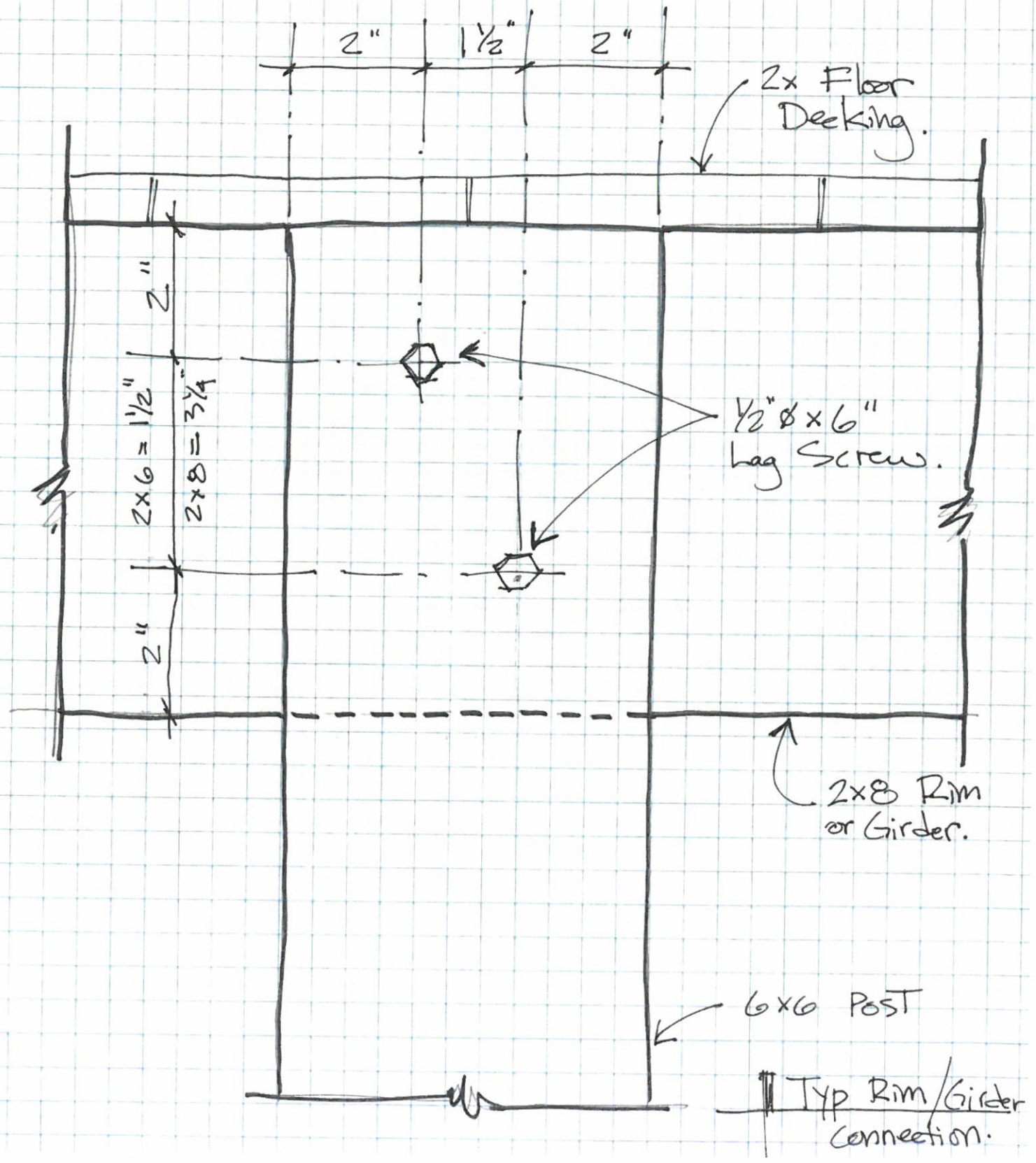
K. Andrew Gilmore, PE





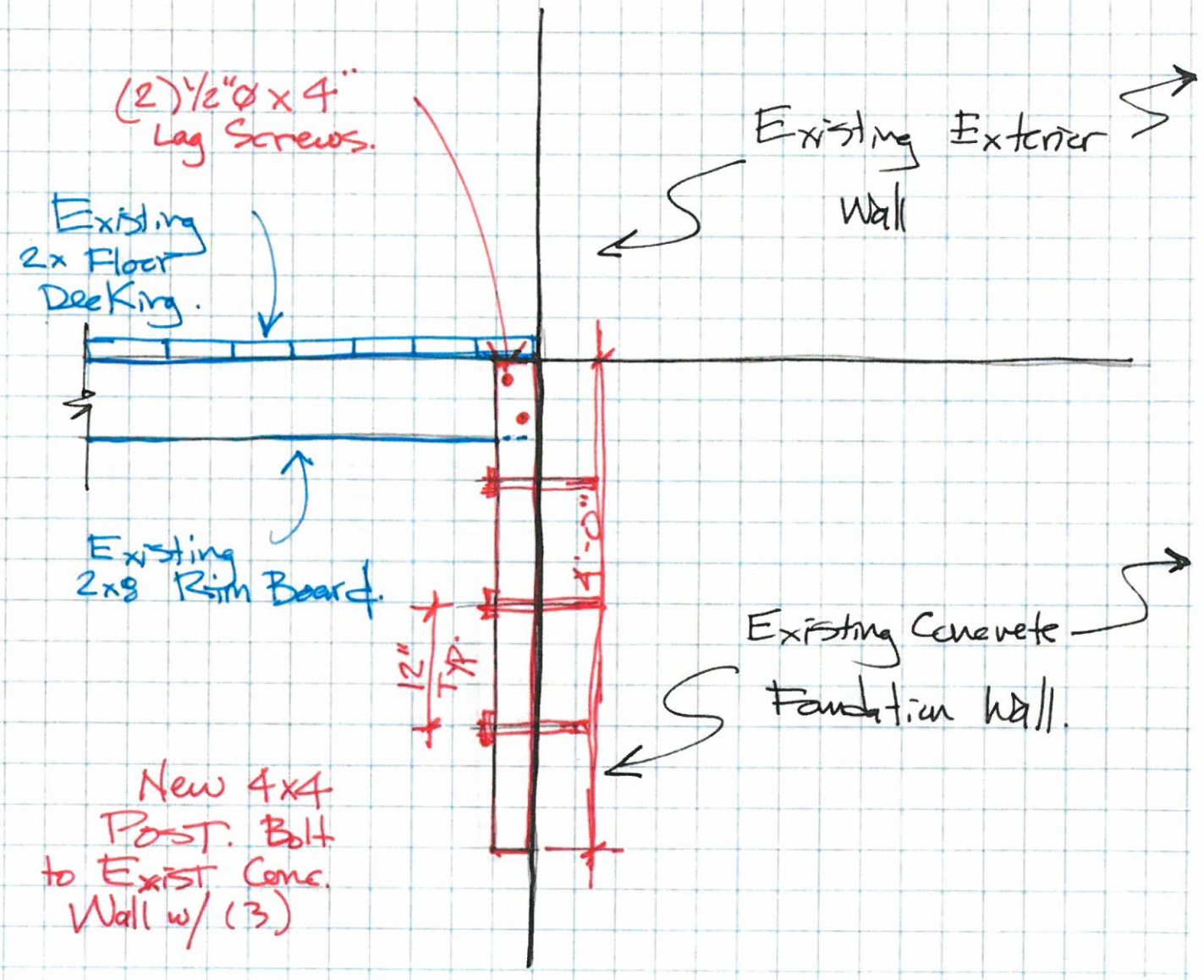
Mark Deaton.

10/7/21



Mark Deaton.

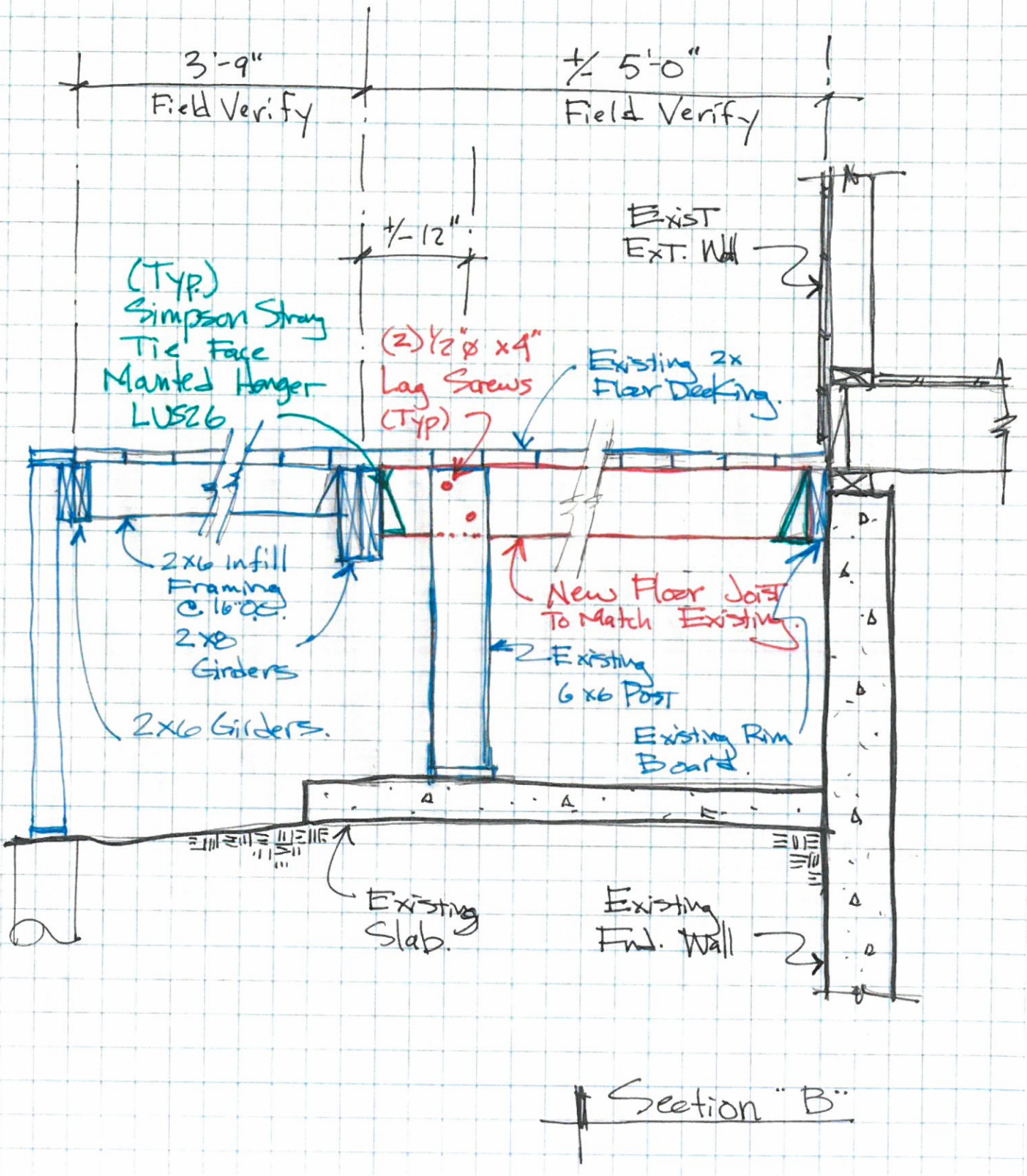
10/7/21



Section "A"

Mark Deeton.

10/7/21.



Section "B"

Mark Deeter. 10/7/21.

Reaction from Existing 2x6 infill (3'-9" Span)

$w = 105\,psf\left(\frac{1}{2}\right)(3.75') = 197\,plf.$

Reaction to 6x6 Post $= 197\,plf\left(\frac{16}{12}\right) = 262\,lbs.$

$\frac{1}{2}$" ø Lag Screw Capacity $= 220\,lbs/screw.$

Face Mounted Joist Hanger.

$R = 262\,lbs.$ (Gravity)

Simpson Strong Tie. **LUS26.** Capacity = 835#

10/7/21

Mark Deaton

4x4 Post to Wall

$R_u = 1.7(262\text{ lbs}) = \pm 450\text{ lbs.}$

$$\text{Tension on Anchor} = \frac{450\text{ lbs}\ (3\frac{1}{2}")}{24"}$$

$$= 66\text{ lbs./Top anchor.}$$

$$\text{Shear (Ultimate)} = \frac{450\text{ lbs}}{3} = 150\text{ lbs/anchor.}$$

½ø Titen HD w/ 4" embedment

Allowable: Shear Capacity = 1605 lbs. 2¾" embedment

Tension = 1155 lbs. 2¾" embedment

by inspection - OK.

Gravity Load Information

Engineer: KAG
Date: October 7, 2021
Project: Mark Deaton

Live Loads

Floor Live Load (FLL): 100 psf - Egress

Dead Loads

Floor Dead Load (FDL):

Flooring 2x:	2.5	psf
Floor Joists - 2x8 @ 16" O.C.:	2.5	psf
Total:	5	psf

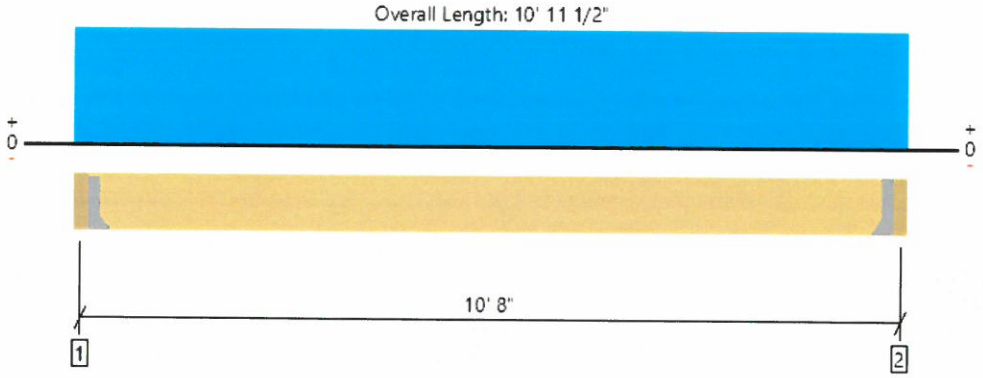
FORTE WEB

MEMBER REPORT

PASSED

Floor, Floor: Joist1

2 piece(s) 2 x 6 DF No.2 @ 8" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	363 @ 3 1/2"	2813 (1.50")	Passed (13%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	331 @ 9"	1980	Passed (17%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	942 @ 5' 5 3/4"	1696	Passed (56%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.261 @ 5' 5 3/4"	0.346	Passed (L/477)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.274 @ 5' 5 3/4"	0.519	Passed (L/454)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	N/A	N/A	N/A	--	N/A

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

- Deflection criteria: LL (L/360) 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	Total	
1 - Hanger on 5 1/2" DF beam	3.50"	Hanger[1]	1.50"	18	365	383	See note [1]
2 - Hanger on 5 1/2" DF beam	3.50"	Hanger[1]	1.50"	18	365	383	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)	10' 5" o/c	
Bottom Edge (Lu)	10' 5" o/c	

•Maximum allowable bracing intervals based on applied load.

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

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

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 10' 11 1/2"	8"	5.0	100.0	Default Load

Member Notes
J1

ForteWEB Software Operator	Job Notes
Andy Gilmore AGilmore Services, LLC (913) 660-3778	

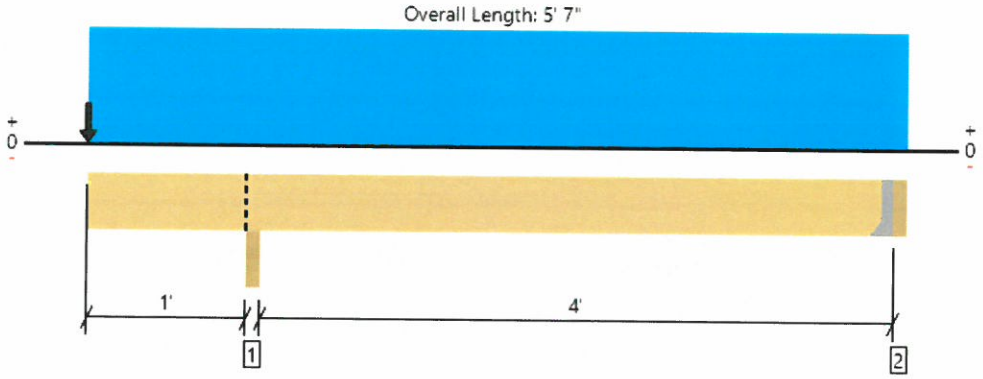
FORTE WEB

MEMBER REPORT

PASSED

Floor, Floor: Cantilever Joist

2 piece(s) 2 x 8 DF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1806 @ 1' 1 3/4"	6563 (3.50")	Passed (28%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1088 @ 4 3/4"	2610	Passed (42%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	-1276 @ 1' 1 3/4"	2365	Passed (54%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.028 @ 0	0.200	Passed (2L/976)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.029 @ 0	0.200	Passed (2L/960)	--	1.0 D + 1.0 L (Alt Spans)

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

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/0.2") and TL (2L/0.2").
- Allowed moment does not reflect the adjustment for the beam stability factor.
- -242 lbs uplift at support located at 5' 3 1/2". Strapping or other restraint may be required.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Column - DF	3.50"	3.50"	1.50"	79	1727	1806	Blocking
2 - Hanger on 7 1/4" DF beam	3.50"	Hanger[1]	1.50"	17	315/-259	332/-259	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)	5' 4" o/c	
Bottom Edge (Lu)	5' 4" 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	LUS26-2	2.00"	N/A	4-10dx1.5	3-10d	

- 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 5' 3 1/2"	N/A	5.5	--	
1 - Uniform (PSF)	0 to 5' 7" (Front)	1' 4"	5.0	100.0	Default Load
2 - Point (lb)	0 (Front)	N/A	30	1000	

Member Notes

Added Cantilever Joist

ForteWEB Software Operator	Job Notes
Andy Gilmore AGilmore Services, LLC (913) 660-3778	

10/7/2021 10:41:04 PM UTC
ForteWEB v3.2, Engine: V8.2.0.17, Data: V8.1.0.16

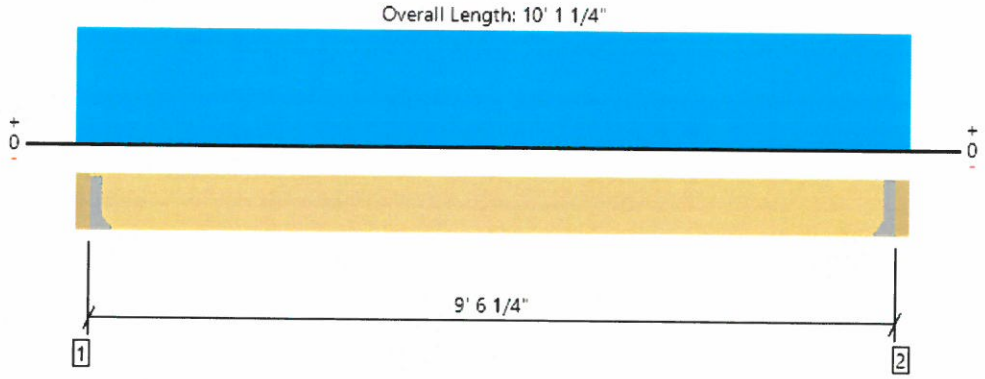
FORTE WEB

MEMBER REPORT

FAILED

Floor, Floor: Joist3

2 piece(s) 2 x 6 DF No.2 @ 16" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	679 @ 3 1/2"	2813 (1.50")	Passed (24%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	614 @ 9"	1980	Passed (31%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1617 @ 5' 5/8"	1696	Passed (95%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.370 @ 5' 5/8"	0.317	Failed (L/308)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.396 @ 5' 5/8"	0.476	Passed (L/288)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	N/A	N/A	N/A	--	N/A

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

- Deflection criteria: LL (L/360) 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	Total	
1 - Hanger on 5 1/2" DF beam	3.50"	Hanger[1]	1.50"	47	674	721	See note [1]
2 - Hanger on 5 1/2" DF beam	3.50"	Hanger[1]	1.50"	47	674	721	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)	7' 11" o/c	
Bottom Edge (Lu)	9' 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	4-10d	
2 - Face Mount Hanger	LUS26-2	2.00"	N/A	4-10dx1.5	4-10d	

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

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 10' 1 1/4"	16"	7.0	100.0	Default Load

Member Notes
J2

ForteWEB Software Operator	Job Notes
Andy Gilmore AGilmore Services, LLC (913) 660-3778	

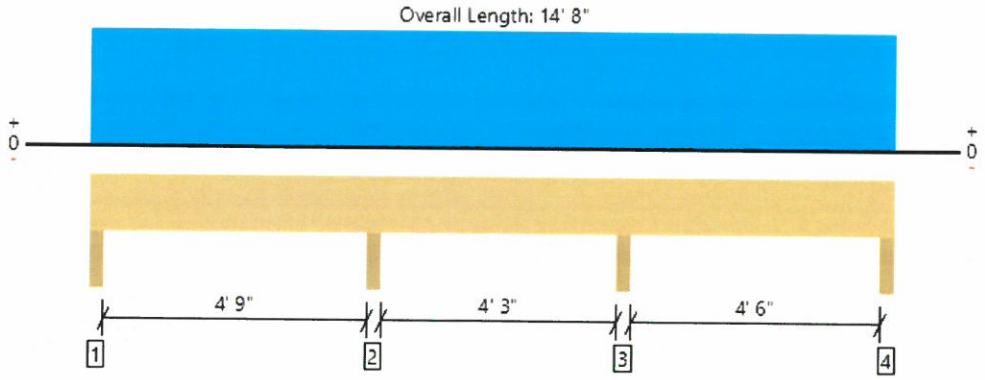
FORTE WEB

MEMBER REPORT

PASSED

Floor, Floor: Girder1

2 piece(s) 2 x 8 DF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3365 @ 5' 2 1/4"	6563 (3.50")	Passed (51%)	--	1.0 D + 1.0 L (Adj Spans)
Shear (lbs)	1342 @ 4' 5 1/4"	2610	Passed (51%)	1.00	1.0 D + 1.0 L (Adj Spans)
Moment (Ft-lbs)	-1585 @ 5' 2 1/4"	2365	Passed (67%)	1.00	1.0 D + 1.0 L (Adj Spans)
Live Load Defl. (in)	0.038 @ 2' 6 5/8"	0.167	Passed (L/999+)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.040 @ 2' 6 9/16"	0.251	Passed (L/999+)	--	1.0 D + 1.0 L (Alt Spans)

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

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

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Column - DF	3.50"	3.50"	1.50"	73	1320/-108	1393/-108	None
2 - Column - DF	3.50"	3.50"	1.79"	175	3190	3365	None
3 - Column - DF	3.50"	3.50"	1.74"	167	3093	3260	None
4 - Column - DF	3.50"	3.50"	1.50"	69	1275/-117	1344/-117	None

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	5.5	--	
1 - Uniform (PSF)	0 to 14' 8" (Front)	5' 6"	5.0	100.0	Default Load

Member Notes

Girder at landing

Weyerhaeuser Notes

Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional as determined by the authority having jurisdiction. The designer of record, builder or framer is responsible to assure that this calculation is compatible with the overall project. Accessories (Rim Board, Blocking Panels and Squash Blocks) are not designed by this software. Products manufactured at Weyerhaeuser facilities are third-party certified to sustainable forestry standards. Weyerhaeuser Engineered Lumber Products have been evaluated by ICC-ES under evaluation reports ESR-1153 and ESR-1387 and/or tested in accordance with applicable ASTM standards. For current code evaluation reports, Weyerhaeuser product literature and installation details refer to www.weyerhaeuser.com/woodproducts/document-library.

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

ForteWEB Software Operator	Job Notes
Andy Gilmore AGilmore Services, LLC (913) 660-3778	

10/7/2021 6:56:49 PM UTC
ForteWEB v3.2, Engine: V8.2.0.17, Data: V8.1.0.16

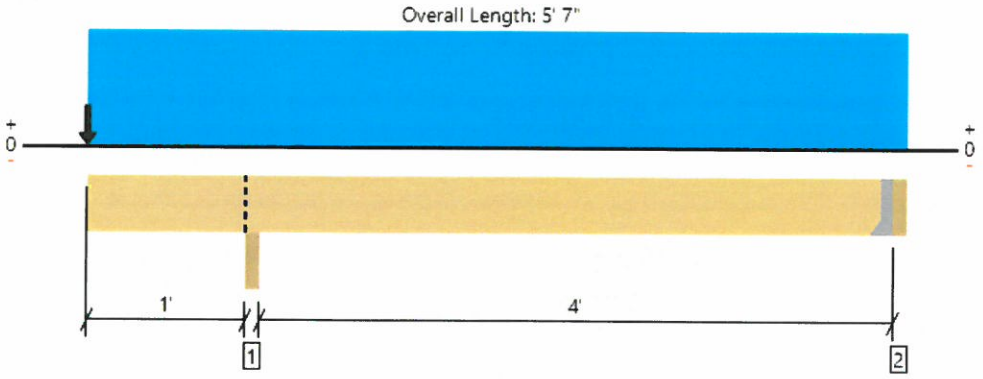
FORTE WEB

MEMBER REPORT

PASSED

Floor, Floor: Cantilever Joist

2 piece(s) 2 x 8 DF No.2



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1806 @ 1' 1 3/4"	6563 (3.50")	Passed (28%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1088 @ 4 3/4"	2610	Passed (42%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	-1276 @ 1' 1 3/4"	2365	Passed (54%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.028 @ 0	0.200	Passed (2L/976)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.029 @ 0	0.200	Passed (2L/960)	--	1.0 D + 1.0 L (Alt Spans)

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

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/0.2") and TL (2L/0.2").
- Allowed moment does not reflect the adjustment for the beam stability factor.
- -242 lbs uplift at support located at 5' 3 1/2". Strapping or other restraint may be required.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Column - DF	3.50"	3.50"	1.50"	79	1727	1806	Blocking
2 - Hanger on 7 1/4" DF beam	3.50"	Hanger[1]	1.50"	17	315/-259	332/-259	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)	5' 4" o/c	
Bottom Edge (Lu)	5' 4" 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	LUS26-2	2.00"	N/A	4-10dx1.5	3-10d	

- 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 5' 3 1/2"	N/A	5.5	--	
1 - Uniform (PSF)	0 to 5' 7" (Front)	1' 4"	5.0	100.0	Default Load
2 - Point (lb)	0 (Front)	N/A	30	1000	

Member Notes

Added Cantilever Joist

ForteWEB Software Operator	Job Notes
Andy Gilmore AGilmore Services, LLC (913) 660-3778	

Wood-to-Wood Single Shear Connections

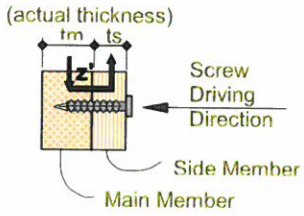
Version: 1.0 D

October 7, 2021

wwpa.org

Developed by: Forum Engineers

How to Enter Data | Home | Print | Order Pro Version



Main Member Species	Douglas Fir-Larch
*Main Member Thickness (**tm**")*	5 1/2
Side Member Species	Douglas Fir-Larch
*Side Member Thickness (**ts**")*	1 1/2
Loading Type	Normal Load
End Grain Condition?	No

(degree) 0 = Angle of Load to Grain of Main Member

(degree) 90 = Angle of Load to Grain of Side Member

Mode

Open Detailed Calculation Sheet

Type of Connector

- ☐ Box Nail
- ☐ Common Wire Nail
- ☐ Sinker Nail
- ☐ Bolt
- ☐ Wood Screw
- ☑ **Lag Screw**

Connector Size	Length (in)	Shear Capacity	Controlling Mode
1/2 x	4 =	220 lb each	MODE IIIs

Face-Mount Hangers – Solid Sawn Lumber (DF/SP)

SIMPSON Strong-Tie®

The Joist Hanger Selector software enables you the most optimum product for your project. The software takes into consideration all the characteristics seen in this catalog. Visit **strongtie.com/jhs**.

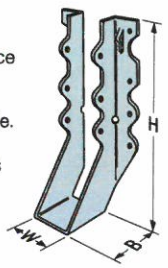
These products are available with additional corrosion protection. For more information, see p. 18.

These products are approved for installation with the Strong-Drive® SD Connector screw. See pp. 39–40 for more information.

Joist Size	Model No.	Ga.	Dimensions (in.) W	H	B	Min./ Max.	Fasteners Header	Joist	DF/SP Allowable Loads Uplift (160)	Floor (100)	Snow (115)	Roof (125)	Installed Cost Index (ICI)	Code Ref.
Sawn Lumber Sizes														
2X4	LU24	20	1⁹⁄₁₆	3⅛	1½	—	(4) 16d	(2) 10d x 1½"	265	555	635	685	Lowest	I7, I27, FL, L5, L17
2X4	LUS24	18	1⁹⁄₁₆	3⅛	1¾	—	(4) 10d	(2) 10d	490	670	765	825	+3%	
2X4	U24	16	1⁹⁄₁₆	3⅛	1½	—	(4) 16d	(2) 10d x 1½"	265	575	655	705	+67%	I7, FL, L17
2X4	HU26	14	1⁹⁄₁₆	3¹⁄₁₆	2¼	—	(4) 16d	(2) 10d x 1½"	335	595	670	720	+295%	
DBL 2X4	LUS24-2	18	3⅛	3⅛	2	—	(4) 16d	(2) 16d	440	800	910	985	Lowest	I7, I27, FL, L5, L17
DBL 2X4	U24-2	16	3⅛	3	2	—	(4) 16d	(2) 10d	370	575	655	705	+33%	I7, FL, L17
DBL 2X4	HU24-2 / HUC24-2	14	3⅛	3¹⁄₁₆	2½	—	(4) 16d	(2) 10d	380	380	595	720	+240%	
2x6	LUS26	18	1⁹⁄₁₆	4¾	1¾	—	(4) 10d	(4) 10d	1,165	865	990	1,070	Lowest	I7, I27, FL, L5, L17
2x6	LU26	20	1⁹⁄₁₆	4¾	1½	—	(6) 16d	(4) 10d x 1½"	565	835	950	1,030	+6%	
2x6	U26	16	1⁹⁄₁₆	4¾	2	—	(6) 16d	(4) 10d x 1½"	585	865	980	1,055	+43%	
2x6	LUC26Z	18	1⁹⁄₁₆	4¾	1¾	—	(6) 16d	(4) 10d x 1½"	730	845	965	1,040	+160%	I7, FL, L17
2x6	HU26	14	1⁹⁄₁₆	3¹⁄₁₆	2¼	—	(4) 16d	(2) 10d x 1½"	335	595	670	720	+179%	
2x6	HUS26	16	1⅝	5⅜	3	—	(14) 16d	(6) 16d	1,550	2,720	3,095	3,335	+276%	I7, I27, FL, L5, L17
DBL 2X6	LUS26-2	18	3⅛	4⅞	2	—	(4) 16d	(4) 16d	1,165	1,030	1,180	1,275	Lowest	
DBL 2X6	U26-2	16	3⅛	5	2	—	(8) 16d	(4) 10d	740	1,150	1,305	1,410	+65%	I7, FL, L17
DBL 2X6	HUS26-2 / HUSC26-2	14	3⅛	5¹⁄₁₆	2	—	(4) 16d	(4) 16d	1,235	1,065	1,210	1,305	+172%	
DBL 2X6	HU26-2 / HUC26-2	14	3⅛	5⅜	2½	Min.	(8) 16d	(4) 10d	760	1,190	1,345	1,445	+233%	I7, I27, FL, L5, L17
DBL 2X6	HU26-2 / HUC26-2	14	3⅛	5⅜	2½	Max.	(12) 16d	(6) 10d	1,135	1,785	2,015	2,165	+254%	I7, FL, L17
TPL 2x6	LUS26-3	18	4⅝	4⅛	2		(4) 16d	(4) 16d	1,165	1,030	1,180	1,280	*	I7, FL
TPL 2x6	U26-3	16	4⅝	4¼	2		(8) 16d	(4) 10d	740	1,150	1,305	1,410	*	
TPL 2x6	HU26-3 / HUC26-3	14	4¹¹⁄₁₆	4⅝	2½	Min.	(8) 16d	(4) 10d	760	1,190	1,345	1,445	*	
TPL 2x6	HU26-3 / HUC26-3	14	4¹¹⁄₁₆	4⅝	2½	Max.	(12) 16d	(6) 10d	1,135	1,785	2,015	2,165	*	
2x8	LUS26	18	1⁹⁄₁₆	4¾	1¾	—	(4) 10d	(4) 10d	1,165	865	990	1,070	Lowest	I7, I27, FL, L5, L17
2x8	LU26	20	1⁹⁄₁₆	4¾	1½	—	(6) 16d	(4) 10d x 1½"	565	835	950	1,030	+6%	
2x8	LUS28	18	1⁹⁄₁₆	6⅝	1¾	—	(6) 10d	(4) 10d	1,165	1,105	1,260	1,365	+23%	
2x8	LU28	20	1⁹⁄₁₆	6⅝	1½	—	(8) 16d	(6) 10d x 1½"	850	1,110	1,270	1,335	+39%	
2x8	U26	16	1⁹⁄₁₆	4¾	2	—	(6) 16d	(4) 10d x 1½"	585	865	980	1,055	+43%	
2x8	LUC26Z	18	1⁹⁄₁₆	4¾	1¾	—	(6) 16d	(4) 10d x 1½"	730	845	965	1,040	+160%	I7, FL, L17
2x8	HU28	14	1⁹⁄₁₆	5¼	2¼	—	(6) 16d	(4) 10d x 1½"	610	895	1,005	1,085	+251%	
2x8	HUS26	16	1⅝	5⅜	3	—	(14) 16d	(6) 16d	1,550	2,720	3,095	3,335	+276%	
2x8	HUS28	16	1⅝	7	3	—	(22) 16d	(8) 16d	2,000	3,965	4,120	4,220	+409%	I7, I27, FL, L5, L17
DBL 2x8	LUS26-2	18	3⅛	4⅞	2	—	(4) 16d	(4) 16d	1,165	1,030	1,180	1,280	Lowest	
DBL 2x8	LUS28-2	18	3⅛	7	2	—	(6) 16d	(4) 16d	1,165	1,315	1,500	1,625	+8%	
DBL 2x8	U26-2	16	3⅛	5	2	—	(8) 16d	(4) 10d	740	1,150	1,305	1,410	+65%	
DBL 2x8	HUS28-2	14	3⅛	7³⁄₁₆	2	—	(6) 16d	(6) 16d	1,550	1,595	1,815	1,960	+188%	I7, FL, L17
DBL 2x8	HU28-2 / HUC28-2	14	3⅛	7	2½	Min.	(10) 16d	(4) 10d	760	1,490	1,680	1,805	+397%	
DBL 2x8	HU28-2 / HUC28-2	14	3⅛	7	2½	Max.	(14) 16d	(6) 10d	1,135	2,085	2,350	2,530	+418%	

1. Uplift loads apply to 10d and 16d header fasteners. Uplift loads have been increased for wind or earthquake loading with no further increase allowed. Reduce where other loads govern.
2. 10d commons or 16d sinkers may be used instead of the specified 16d at 0.84 of the table load value.
3. 16d sinkers may be used instead of the specified 10d commons with no load reduction. (16d sinkers are not acceptable for HDG applications.)
4. Min. nailing quantity and load values — fill all round holes; Max. nailing quantity and load values — fill all round and triangle holes.
5. DF/SP loads can be used for SCL that has fastener holding capacity of Doug Fir.
6. Truss chord cross-grain tension may limit allowable loads in accordance with ANSI/TPI 1-2014. Simpson Strong-Tie® Connector Selector™ software includes the evaluation of cross-grain tension in its hanger allowable loads. For additional information, contact Simpson Strong-Tie.
7. **Nails:** 16d = 0.162" dia. x 3½" long, 10d = 0.148" dia. x 3" long, 10d x 1½" = 0.148" dia. x 1½" long. See pp. 26–27 for other nail sizes and information.

**Hangers do not have an Installed Cost Index.*



Codes: See p. 14 for Code Reference Key Chart

Titen® Concrete and Masonry Screw

Blue Titen® Product Data (3/16" diameter)

Size (in.)	Model No.[1]	Drill Bit Diameter (in.)	Quantity	
			Box[2]	Carton
3/16 x 1 1/4	TTN18114H	5/32	100	1600
3/16 x 1 3/4	TTN18134H			500
3/16 x 2 1/4	TTN18214H			500
3/16 x 2 3/4	TTN18234H			500
3/16 x 3 1/4	TTN18314H			400
3/16 x 3 3/4	TTN18334H			400
3/16 x 4	TTN18400H			400
3/16 x 1 1/4	TTN18114PF	5/32	100	1600
3/16 x 1 3/4	TTN18134PF			500
3/16 x 2 1/4	TTN18214PF			500
3/16 x 2 3/4	TTN18234PF			500
3/16 x 3 1/4	TTN18314PF			400
3/16 x 3 3/4	TTN18334PF			400
3/16 x 4	TTN18400PF			400

1. H Suffix: Hex-Head, PF Suffix: Phillips Flat-Head.

Blue Titen® Product Data (1/4" diameter)

Size (in.)	Model No.[1]	Drill Bit Diameter (in.)	Quantity	
			Box[2]	Carton
1/4 x 1 1/4	TTN25114H	3/16	100	1600
1/4 x 1 3/4	TTN25134H			500
1/4 x 2 1/4	TTN25214H			500
1/4 x 2 3/4	TTN25234H			500
1/4 x 3 1/4	TTN25314H			400
1/4 x 3 3/4	TTN25334H			400
1/4 x 4	TTN25400H			400
1/4 x 5	TTN25500H			400
1/4 x 6	TTN25600H			400
1/4 x 1 1/4	TTN25114PF	3/16	100	1600
1/4 x 1 3/4	TTN25134PF			500
1/4 x 2 1/4	TTN25214PF			500
1/4 x 2 3/4	TTN25234PF			500
1/4 x 3 1/4	TTN25314PF			400
1/4 x 3 3/4	TTN25334PF			400
1/4 x 4	TTN25400PF			400
1/4 x 5	TTN25500PF			400
1/4 x 6	TTN25600PF			400

1. H Suffix: Hex-Head, PF Suffix: Phillips Flat-Head.

White Titen® Product Data (Phillips Flat-Head)

Size (in.)	Model No.	Drill Bit Diameter (in.)	Quantity	
			Box[1]	Carton
3/16 x 1 1/4	TTNW18114PF	5/32	100	1600
3/16 x 1 3/4	TTNW18134PF			500
3/16 x 2 1/4	TTNW18214PF			500
3/16 x 2 3/4	TTNW18234PF			500
3/16 x 3 1/4	TTNW18314PF			400
3/16 x 3 3/4	TTNW18334PF			400
1/4 x 1 1/4	TTNW25114PF	3/16	100	1600
1/4 x 1 3/4	TTNW25134PF			500
1/4 x 2 1/4	TTNW25214PF			500
1/4 x 2 3/4	TTNW25234PF			500
1/4 x 3 1/4	TTNW25314PF			400
1/4 x 3 3/4	TTNW25334PF			400

Titen® Allowable Tension and Shear Loads in Face Shell of Hollow and Grout-Filled CMU

IBC

Dia. in. (mm)	Drill Bit Dia. in.	Embed. Depth in. (mm)	Critical Spacing in. (mm)	Critical Edge Dist. in. (mm)	Values for 6" or 8" Lightweight, Medium-Weight or Normal-Weight CMU			
					Tension Load		Shear Load	
					Avg. Ult. lb. (kN)	Allow. lb. (kN)	Avg. Ult. lb. (kN)	Allow. lb. (kN)
3/16 (4.8)	5/32	1 (25.4)	2 1/4 (57.2)	1 1/8 (28.6)	**542** (2.4)	**110** (0.5)	**1,016** (4.5)	**205** (0.9)
1/4 (6.4)	3/16	1 (25.4)	3 (76.2)	1 1/2 (38.1)	**740** (3.3)	**150** (0.7)	**1,242** (5.5)	**250** (1.1)

1. The tabulated allowable loads are based on a safety factor of 5.0.
2. Maximum anchor embedment is 1 1/2" (38.1 mm).

Titen® Allowable Tension and Shear Loads in Normal-Weight Concrete

IPC

Dia. in. (mm)	Drill Bit Dia. in.	Embed. Depth in. (mm)	Critical Spacing in. (mm)	Critical Edge Dist. in. (mm)	Tension Load				Shear Load	
					$f'_c \geq 2{,}000$ psi (13.8 MPa) Concrete		$f'_c \geq 4{,}000$ psi (27.6 MPa) Concrete		$f'_c \geq 2{,}000$ psi (13.8 MPa) Concrete	
					Ultimate lb. (kN)	Allowable lb. (kN)	Ultimate lb. (kN)	Allowable lb. (kN)	Ultimate lb. (kN)	Allowable lb. (kN)
3/16 (4.8)	5/32	1 (25.4)	2 1/4 (57.2)	1 1/8 (28.6)	**500** (2.2)	**125** (0.6)	**640** (2.8)	**160** (0.7)	**1,020** (4.5)	**255** (1.1)
3/16 (4.8)	5/32	1 1/2 (38.1)	2 1/4 (57.2)	1 1/8 (28.6)	**1,220** (5.4)	**305** (1.4)	**1,850** (8.2)	**460** (2.0)	**1,670** (7.4)	**400** (1.8)
1/4 (6.4)	3/16	1 (25.4)	3 (76.2)	1 1/2 (38.1)	**580** (2.6)	**145** (0.6)	**726** (3.2)	**180** (0.8)	**900** (4.0)	**225** (1.0)
1/4 (6.4)	3/16	1 1/2 (38.1)	3 (76.2)	1 1/2 (38.1)	**1,460** (6.5)	**365** (1.6)	**2,006** (8.9)	**500** (2.2)	**1,600** (7.1)	**400** (1.8)

1. Maximum anchor embedment is 1 1/2" (38.1 mm).
2. Concrete must be minimum 1.5 x embedment.

* See page 12 for an explanation of the load table icons.

Titen HD® *Heavy Duty Screw Anchor for Cracked and Uncracked Concrete*

SIMPSON Strong-Tie®

Tension Loads in Normal-Weight Concrete

Size in. (mm)	Drill Bit Dia. in.	Embed. Depth in. (mm)	Critical Edge Dist. in. (mm)	Critical Spacing Dist. in. (mm)	Tension Load						
					$f'_c \geq 2000$ psi (13.8 MPa) Concrete			$f'_c \geq 3000$ psi (20.7 MPa) Concrete	$f'_c \geq 4000$ psi (27.6 MPa) Concrete		
					Ultimate lbs. (kN)	Std. Dev. lbs. (kN)	Allowable lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Std. Dev. lbs. (kN)	Allowable lbs. (kN)
⅜ (9.5)	⅜	2¾ (70)	3 (76)	6 (152)	4,297 (19.1)	—	1,075 (4.8)	1,315 (5.8)	6,204 (27.6)	—	1,550 (6.9)
		3¾ (95)			7,087 (31.5)	347 (1.5)	1,770 (7.9)	2,115 (9.4)	9,820 (43.7)	1,434 (6.4)	2,455 (10.9)
½ (12.7)	½	2¾ (70)	4 (102)	8 (203)	4,610 (20.5)	—	1,155 (5.1)	1,400 (6.2)	6,580 (29.3)	—	1,645 (7.3)
		3⅝ (92)			7,413 (33.0)	412 (1.8)	1,855 (8.3)	2,270 (10.1)	10,742 (47.8)	600 (2.7)	2,685 (11.9)
		5¾ (146)			10,278 (45.7)	297 (1.3)	2,570 (11.4)	3,240 (14.4)	15,640 (69.6)	2,341 (10.4)	3,910 (17.4)
⅝ (15.9)	⅝	2¾ (70)	5 (127)	10 (254)	4,610 (20.5)	—	1,155 (5.1)	1,400 (6.2)	6,580 (29.3)	—	1,645 (7.3)
		4⅛ (105)			8,742 (38.9)	615 (2.7)	2,185 (9.7)	2,630 (11.7)	12,286 (54.7)	1,604 (7.1)	3,070 (13.7)
		5¾ (146)			12,953 (57.6)	1,764 (7.8)	3,240 (14.4)	3,955 (17.6)	18,680 (83.1)	—	4,670 (20.8)
¾ (19.1)	¾	2¾ (70)	6 (152)	12 (305)	4,674 (20.8)	—	1,170 (5.2)	1,405 (6.3)	6,580 (29.3)	—	1,645 (7.3)
		4⅝ (117)			10,340 (46.0)	1,096 (4.9)	2,585 (11.5)	3,470 (15.4)	17,426 (77.5)	1,591 (7.1)	4,355 (19.4)
		5¾ (146)			13,765 (61.2)	1,016 (4.5)	3,440 (15.3)	4,055 (18.0)	18,680 (83.1)	1,743 (7.8)	4,670 (20.8)

See Notes Below

*See page 13 for an explanation of the load table icons

Shear Loads in Normal-Weight Concrete

Size in. (mm)	Drill Bit Dia. in.	Embed. Depth in. (mm)	Critical Edge Dist. in. (mm)	Critical Spacing Dist. in. (mm)	Shear Load						
					$f'_c \geq 2000$ psi (13.8 MPa) Concrete			$f'_c \geq 3000$ psi (20.7 MPa) Concrete	$f'_c \geq 4000$ psi (27.6 MPa) Concrete		
					Ultimate lbs. (kN)	Std. Dev. lbs. (kN)	Allowable lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Std. Dev. lbs. (kN)	Allowable lbs. (kN)
⅜ (9.5)	⅜	2¾ (70)	4½ (114)	6 (152)	6,353 (28.3)	—	1,585 (7.1)	1,665 (7.4)	—	—	1,740 (7.7)
		3¾ (95)			6,377 (28.4)	1,006 (4.5)	1,595 (7.1)	1,670 (7.4)	—	—	1,740 (7.7)
½ (12.7)	½	2¾ (70)	6 (152)	8 (203)	6,435 (28.6)	—	1,605 (7.1)	2,050 (9.1)	9,987 (44.4)	—	2,495 (7.8)
		3⅝ (92)			9,324 (41.5)	1,285 (5.7)	2,330 (10.4)	2,795 (12.4)	13,027 (57.9)	597 (2.7)	3,255 (14.5)
		5¾ (146)			11,319 (50.3)	1,245 (5.5)	2,830 (12.6)	3,045 (13.5)	—	—	3,255 (14.5)
⅝ (15.9)	⅝	2¾ (70)	7½ (191)	10 (254)	7,745 (34.5)	—	1,940 (8.6)	2,220 (9.9)	9,987 (44.4)	—	2,495 (11.1)
		4⅛ (105)			8,706 (38.7)	1,830 (8.1)	2,175 (9.7)	3,415 (15.2)	18,607 (82.8)	1,650 (7.3)	4,650 (20.7)
		5¾ (146)			12,498 (55.6)	2,227 (9.9)	3,125 (13.9)	3,890 (17.3)	—	—	4,650 (20.7)
¾ (19.1)	¾	2¾ (70)	9 (229)	12 (305)	7,832 (34.8)	—	1,960 (8.7)	2,415 (10.7)	11,460 (51.0)	—	2,865 (12.7)
		4⅝ (117)			11,222 (49.9)	2,900 (12.9)	2,805 (12.5)	4,490 (20.0)	24,680 (109.8)	2,368 (10.5)	6,170 (27.4)
		5¾ (146)			19,793 (88.0)	3,547 (15.8)	4,950 (22.0)	5,560 (24.7)	24,680 (109.8)	795 (3.5)	6,170 (27.4)

1. The allowable loads listed are based on a safety factor of 4.0.
2. Refer to allowable load-adjustment factors for spacing and edge distance on pages 119–120.
3. The minimum concrete thickness is 1½ times the embedment depth.
4. Tension and Shear loads for the Titen HD anchor may be combined using the elliptical interaction equation (n=⅔). Allowable load may be interpolated for concrete compressive strengths between 2000 psi and 4000 psi.

Mark Deaton

To: Mark Deaton
Subject: FW: FW: Salon Structural Report

From: Andy Gilmore <andy.gilmore22@gmail.com>
Sent: Monday, October 25, 2021 1:32 PM
To: Mark Deaton <mdeaton@HNTB.com>
Cc: Malorie Deaton <mallysue@gmail.com>
Subject: Re: FW: Salon Structural Report

Adding the 2x6 i.e. doubling up and adding the 2x8 will adequately support the 100psf code required live load.

On Mon, Oct 25, 2021 at 1:08 PM Mark Deaton <mdeaton@hntb.com> wrote:

ok..

what if we add the 2x6 (double up the existing) and Add a 2x 8 in the middle... between the double up 2x6s.

what we are trying to NOT do is take up all the decking for the ramp.

thanks

Mark

From: Andy Gilmore <andy.gilmore22@gmail.com>
Sent: Monday, October 25, 2021 12:14 PM
To: Mark Deaton <mdeaton@HNTB.com>
Cc: Malorie Deaton <mallysue@gmail.com>
Subject: Re: FW: Salon Structural Report

Mark,

Got you voicemail. Thanks for the email. Following are my answers:

1. No. A double 2x6 is not needed here. I was continuing the thought of doubling the floor joists at that location, but there is half the tributary load to the edge joist, so the double is not needed.

2. If a 2x8 is added between the existing 2x6 floor joists, that would make the spacing of the floor joists 8" O.C. right? I double checked my calculations, and unfortunately, with the 100psf live load, a 2x6 spaced at 8" O.C. for a 10'-8" span is 11% overstressed. Technically, the 2x6 still needs to be doubled to satisfy code loads. This would be in addition to adding the single 2x8 in between the existing 2x6s. Again - this all be driven by satisfying 100psf live load.

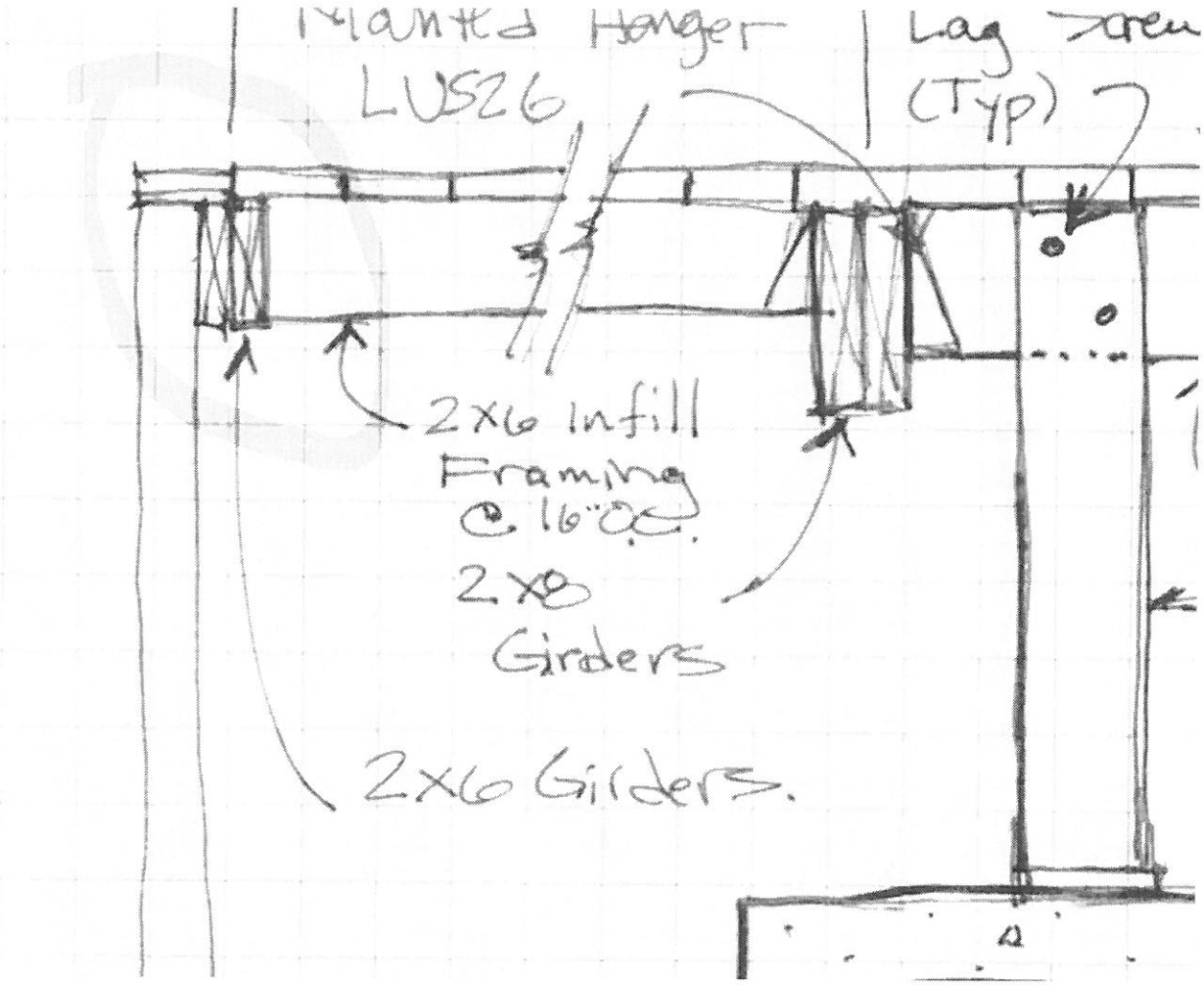
-Andy

On Mon, Oct 25, 2021 at 8:32 AM Mark Deaton <mdeaton@hntb.com> wrote:

I called and left a message..

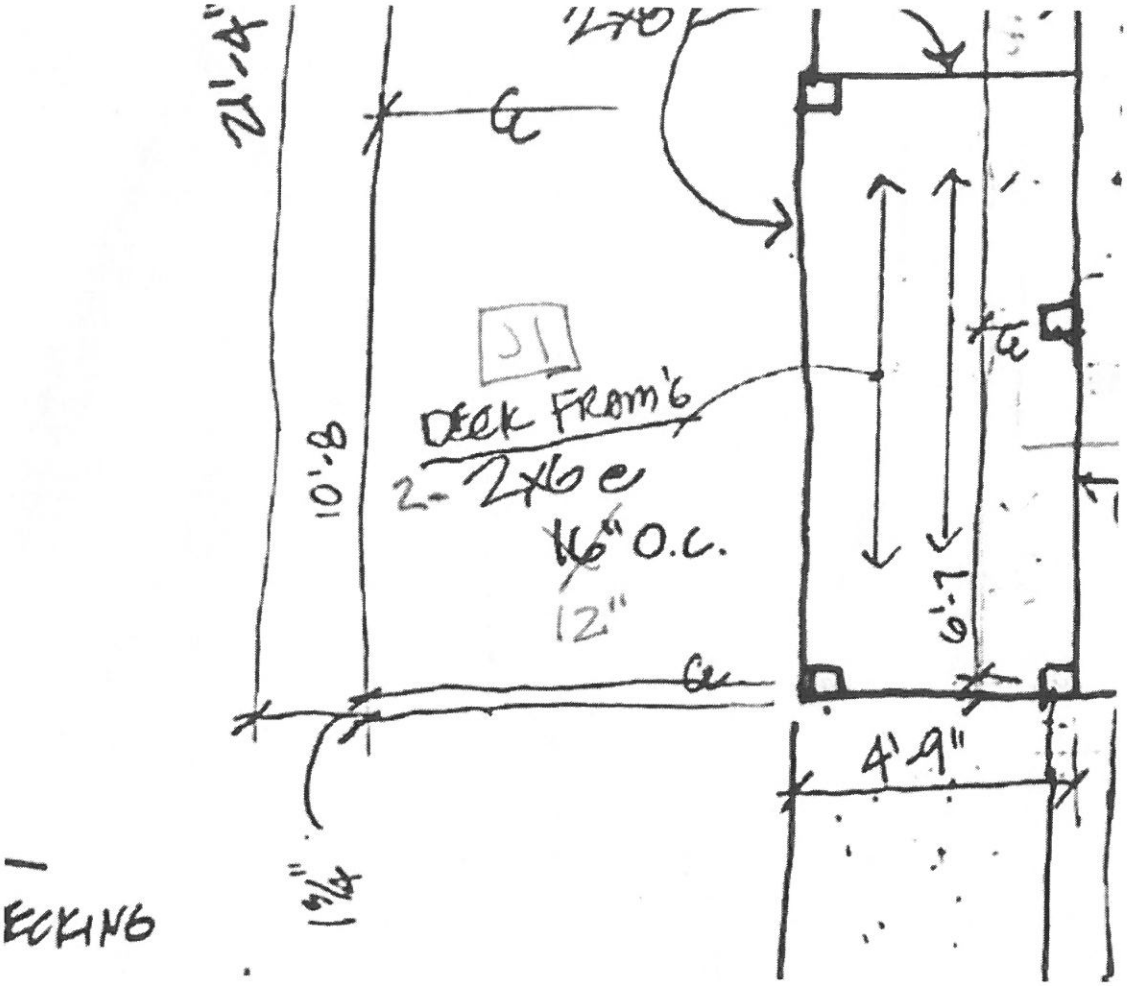
here are my additional questions .. based on trying to implement the fixed proposed in your letter..

1.is a double end plate required at the cantilevered deck extension.. currently there is only 1 (2x6)



2.Can we leave the 2 x 6 ramp deck framing as installed (@ 16"OC) and just add a single 2x8 between them (at the lower run of the ramp)?

if this works, can the spacing be 16" or does it need to be 12".?



thanks

Mark Deaton

From: Andy Gilmore <andy.gilmore22@gmail.com>
Sent: Tuesday, October 12, 2021 2:39 PM
To: Mark Deaton <mdeaton@HNTB.com>
Subject: Re: FW: Salon Structural Report

Sorry Mark. Saw the question, but didn't get back to you.

No - not double and respace. The option is either/or - double up or make spacing 6" O.C. or 8" O.C. whichever is appropriate.

-Andy

On Tue, Oct 12, 2021 at 2:37 PM Mark Deaton <mdeaton@hntb.com> wrote:

can you answer the question below

From: Mark Deaton
Sent: Monday, October 11, 2021 3:20 PM

To: 'Andy Gilmore' <andy.gilmore22@gmail.com>
Subject: RE: Salon Structural Report

check is in the mail

one more question..

the letter states (in #2) the existing 2x6 floor joists need to be double up and spaced 12"OC.

then It says .. this may be accomplished by adding joists that are 6" (and 8") OC ...

do we need to double up the 2x6 joist AND space them on 6" OC... or is it an either or ????

but not both..

double up and spaced at 6"oc.

From: Andy Gilmore <andy.gilmore22@gmail.com>
Sent: Monday, October 11, 2021 2:40 PM
To: Mark Deaton <mdeaton@HNTB.com>
Subject: Re: Salon Structural Report

I understand.

On Mon, Oct 11, 2021 at 2:37 PM Mark Deaton <mdeaton@hntb.com> wrote:

THANKS

I figured, just wanted to be able to answer the question if I got it from the inspector.

Mark

From: Andy Gilmore <andy.gilmore22@gmail.com>
Sent: Monday, October 11, 2021 2:05 PM
To: Mark Deaton <mdeaton@HNTB.com>
Subject: Re: Salon Structural Report

I ran a calc on the cantilevered floor joists. Once they are doubled, yes, it meets the code. I can tell that the posts are okay by inspection. They are short enough not to be a concern.

-Andy

On Mon, Oct 11, 2021 at 1:57 PM Mark Deaton <mdeaton@hntb.com> wrote:

one question

does the "added" deck (between the original porch/deck and the new ramp) now meet code by adding the posts and the cantilevered floor joists (section b)?

I think the answer is yes.

I will send check in the mail..

it is easier for my record keeping.

thanks

Mark Deaton

From: Andy Gilmore <andy.gilmore22@gmail.com>
Sent: Monday, October 11, 2021 1:52 PM
To: Mark Deaton <mdeaton@HNTB.com>
Subject: Re: Salon Structural Report

Here is my invoice for $500.00 I take check, cash and Venmo (@AGilmore Services, LLC)

Thanks,

-Andy

On Mon, Oct 11, 2021 at 1:28 PM Mark Deaton <mdeaton@hntb.com> wrote:

thanks

I'll look at the report and let you know if I have questions.

I believe we talked around $500 for the report. (it might have been more, I am not sure either)

but I want to be fair, so you let me know what you feel is appropriate.

Mark Deaton

From: Andy Gilmore <andy.gilmore22@gmail.com>
Sent: Monday, October 11, 2021 1:14 PM
To: Mark Deaton <mdeaton@HNTB.com>
Subject: Salon Structural Report

Mark,

Attached is my report for your salon. Let me know if you have any questions.

-Andy Gilmore

This e-mail and any files transmitted with it are confidential and are intended solely for the use of the individual or entity to whom they are addressed. If you are NOT the intended recipient and receive this communication, please delete this message and any attachments. Thank you.

This e-mail and any files transmitted with it are confidential and are intended solely for the use of the individual or entity to whom they are addressed. If you are NOT the intended recipient and receive this communication, please delete this message and any attachments. Thank you.

This e-mail and any files transmitted with it are confidential and are intended solely for the use of the individual or entity to whom they are addressed. If you are NOT the intended recipient and receive this communication, please delete this message and any attachments. Thank you.

This e-mail and any files transmitted with it are confidential and are intended solely for the use of the individual or entity to whom they are addressed. If you are NOT the intended recipient and receive this communication, please delete this message and any attachments. Thank you.

This e-mail and any files transmitted with it are confidential and are intended solely for the use of the individual or entity to whom they are addressed. If you are NOT the intended recipient and receive this communication, please delete this message and any attachments. Thank you.