

LORAC DESIGN GROUP, LLC
Structural Engineers

November 21, 2021

Mr. Khanh Nguyen, Inspector
City of Lee's Summit, Development Services Department
220 SE Green Street
Lee's Summit, Mo. 64063

Re: 4808 NE Jamestown Drive, Lee's Summit, Missouri – Structural Review
Lee's Summit, Permit # PRRES2021XXXX

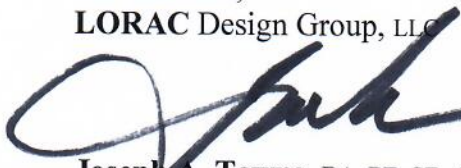
Mr. Khanh,

This letter is to certify that I have personally inspected and verified through calculation the framing alteration noted in your review. We agree with those comments that unauthorized changes changed the load paths and created strength issues. Those have been addressed in the attachments

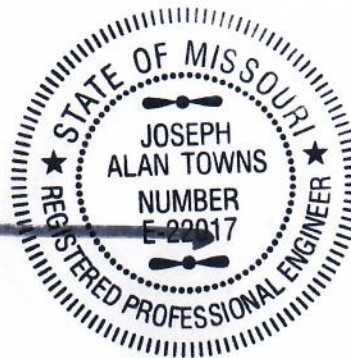
In short, we are asking for 1 additional framing stud on each side of the Dining Room Window Framing, and 2 additional sill plates at the expanded raised window.

Thank you for your attention to this matter.

For the Firm,
LORAC Design Group, LLC



Joseph A. Towns, RA, PE, SE, AIA, NCARB, LEED AP, BD+C
Managing Principal
Missouri Professional Engineer, #E-22017 (Structural)



Offices: 3933 NE Grant Lee's Summit Missouri 64064 Office 816-529-4019
Practice Licensed in Missouri-Kansas-COLORADO-Minnesota-Florida-Arkansas, and Oklahoma, Architecture Missouri-Oklahoma
Mo. COA. #E-2005032846-D, Ks. COA. #1883, Ok. COA. #E-6355, Fl. COA. #31516, Ark. COA. #3114

Y/K

Today
9:01 AM

Edit

Khanh Nguyen

Failed

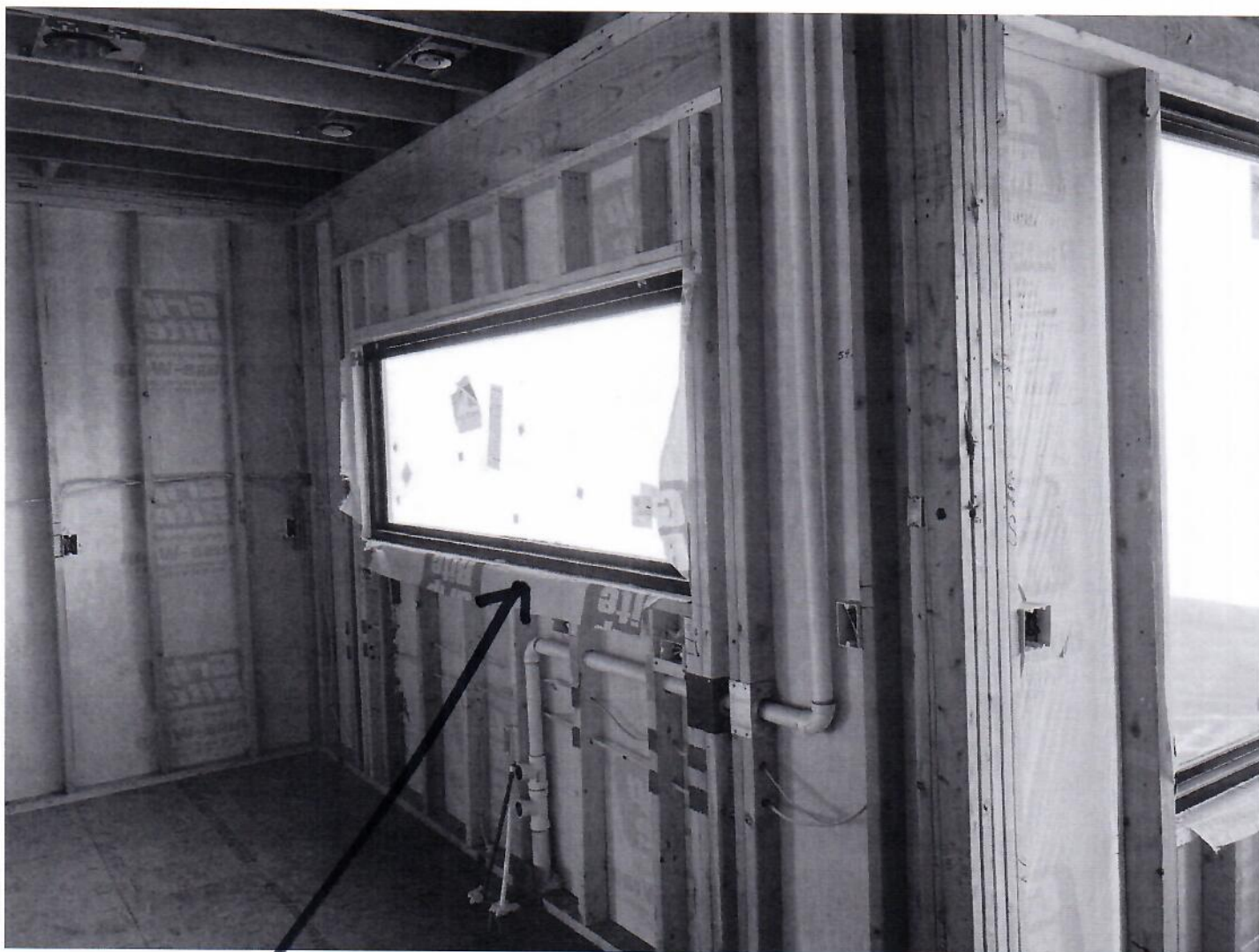
Monday, November
15, 2021

- Nail exterior siding per code
- Install trimmings and flashings per code
- Install all windows and doors
- Support front porch roof
- Garage PFH walls: nail straps, install 2"x2" washers
- Anchor garage sill plates per code
- Nail corner studs per code.
- How are the wall corners insulated?
- Complete gas piping to fireplace and retest. Fix leakage first. Pressure less than 10
- Support all hip rafters at ridge
- Fb all wall plates penetrations ; fb floor penetrations
- Protect refrigerator line
- Install hanger for triple joist connection above pantry
- Support (4)2x10 joist at I beam connection at rear dining/great room corner
- Have engineer address exterior wall bracing requirement at rear dining walls where windows and doors are changed from the approved plan
- Have engineer address address non-full-height 2x6 studs at rear great room walls
- Toe nail all joists to wall top plates
- Vent all bathroom fans

- Dryer duct exceeds max length allowed
- Pan off parallel electrical in return air space across from stair

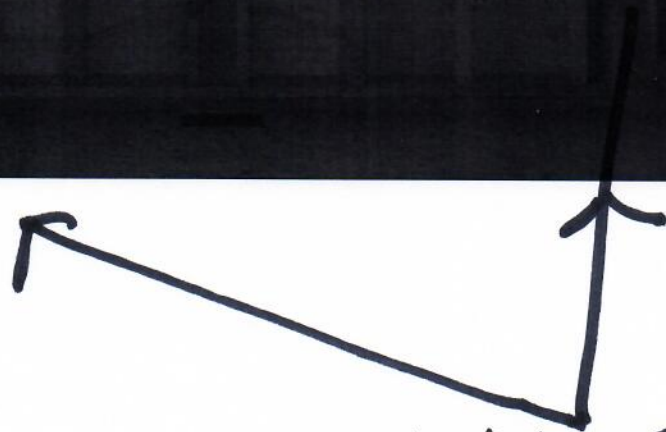


3/16

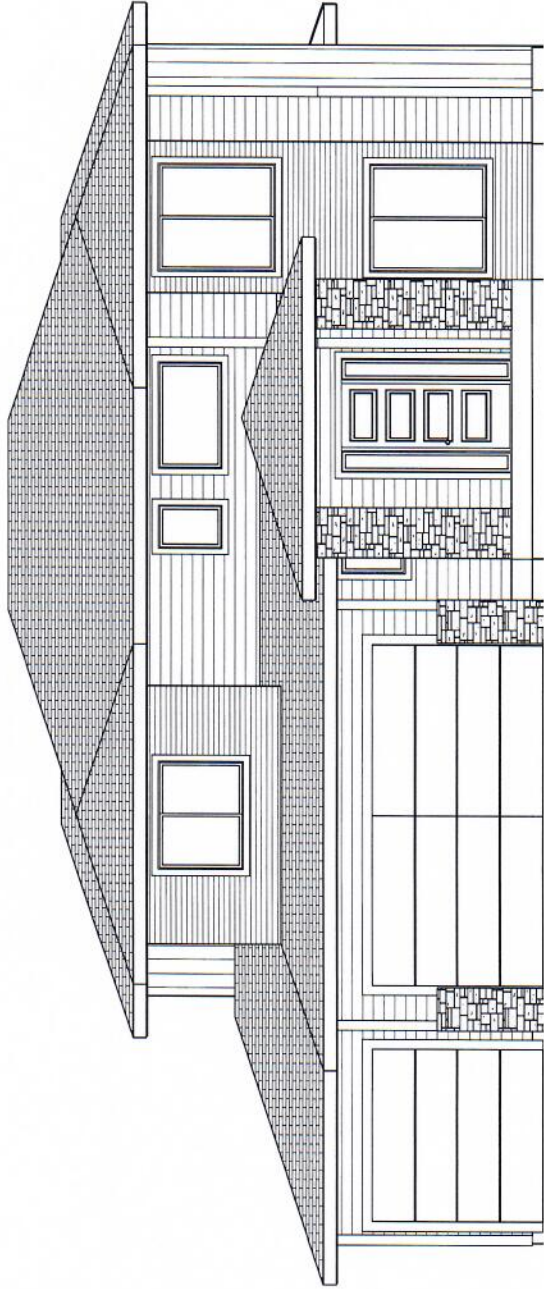


2-2x6 sill plates added to
existing Plate.

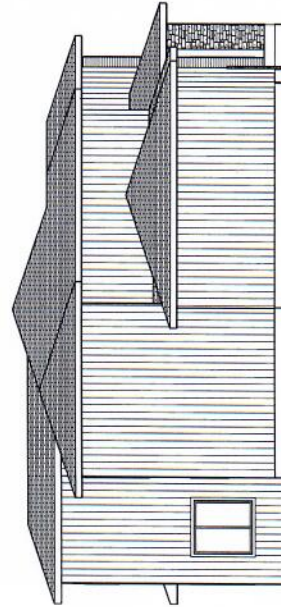
3/16



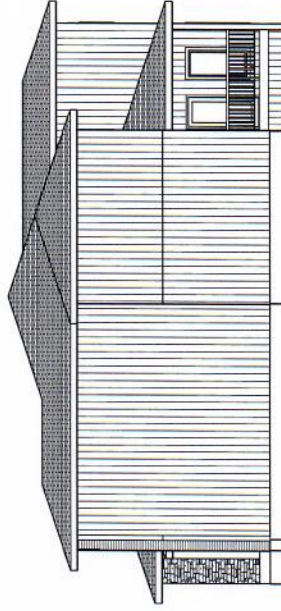
Add 2-2x6's
ea. side. 4/16



FRONT EL.
STONE AND LAP

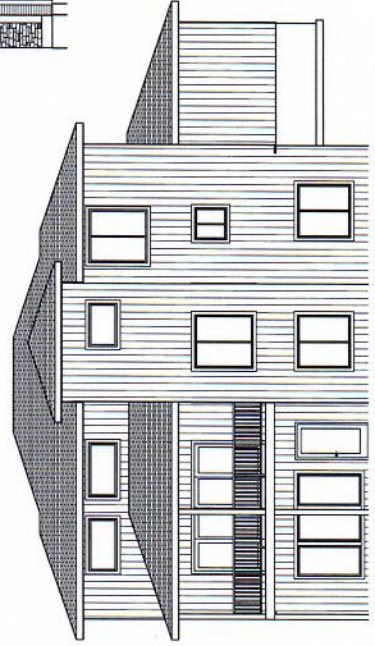


LEFT EL.
1/8" = 1'-0"



RIGHT EL.
1/8" = 1'-0"

3 SIDES LP PANEL SIDING



REAR EL.
1/8" = 1'-0"

JOSEPH A. TOWNS P.E.
MO. LIC. E 22017
PROFESSIONAL SEAL
APPLIES TO STRUCTURAL
ELEMENTS ONLY

BUILD IN ACCORDANCE WITH
2018 INTERNATIONAL
RESIDENTIAL CODE AND
LOCAL CODES.

NICK ZVACEK HOMES
LOT 126 MONTICELLO
4808 NE JAMESTOWN DRIVE
LEE SUMMIT MO

SCALE
1/4" = 1'-0"

DATE
3-9-21

PLAN NO.

3397

SHEET NO.

1 OF 6

5/16

BUILD IN ACCORDANCE WITH
2018 INTERNATIONAL
RESIDENTIAL CODE AND
LOCAL CODES.

NICK ZVACEK HOMES
LOT 126 MONTICELLO
4808 NE JAMESTOWN DRIVE
LEE SUMMIT MO

SCALE
1/4" = 1'-0"

DATE
3-9-21

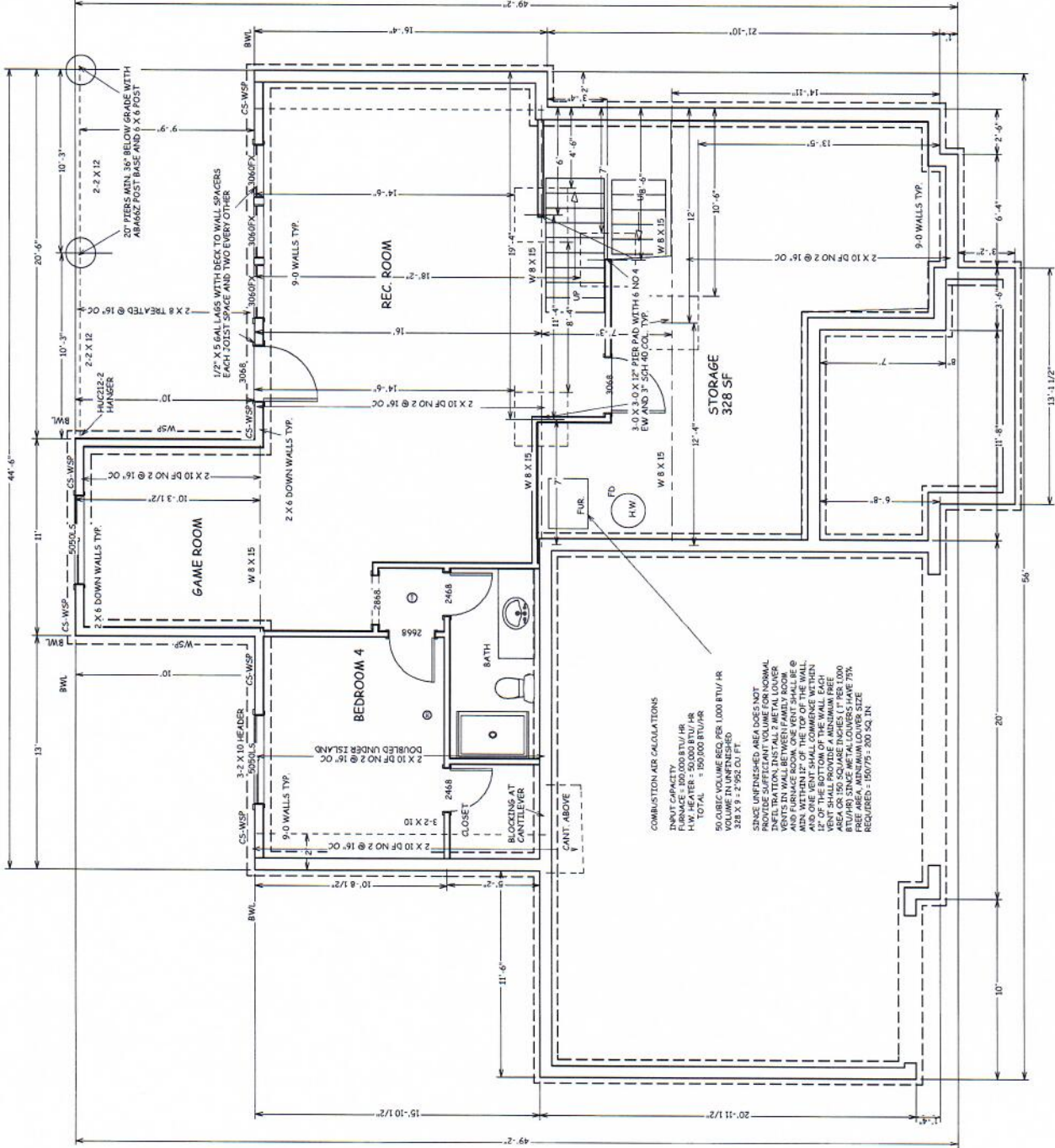
PLAN NO.

3397

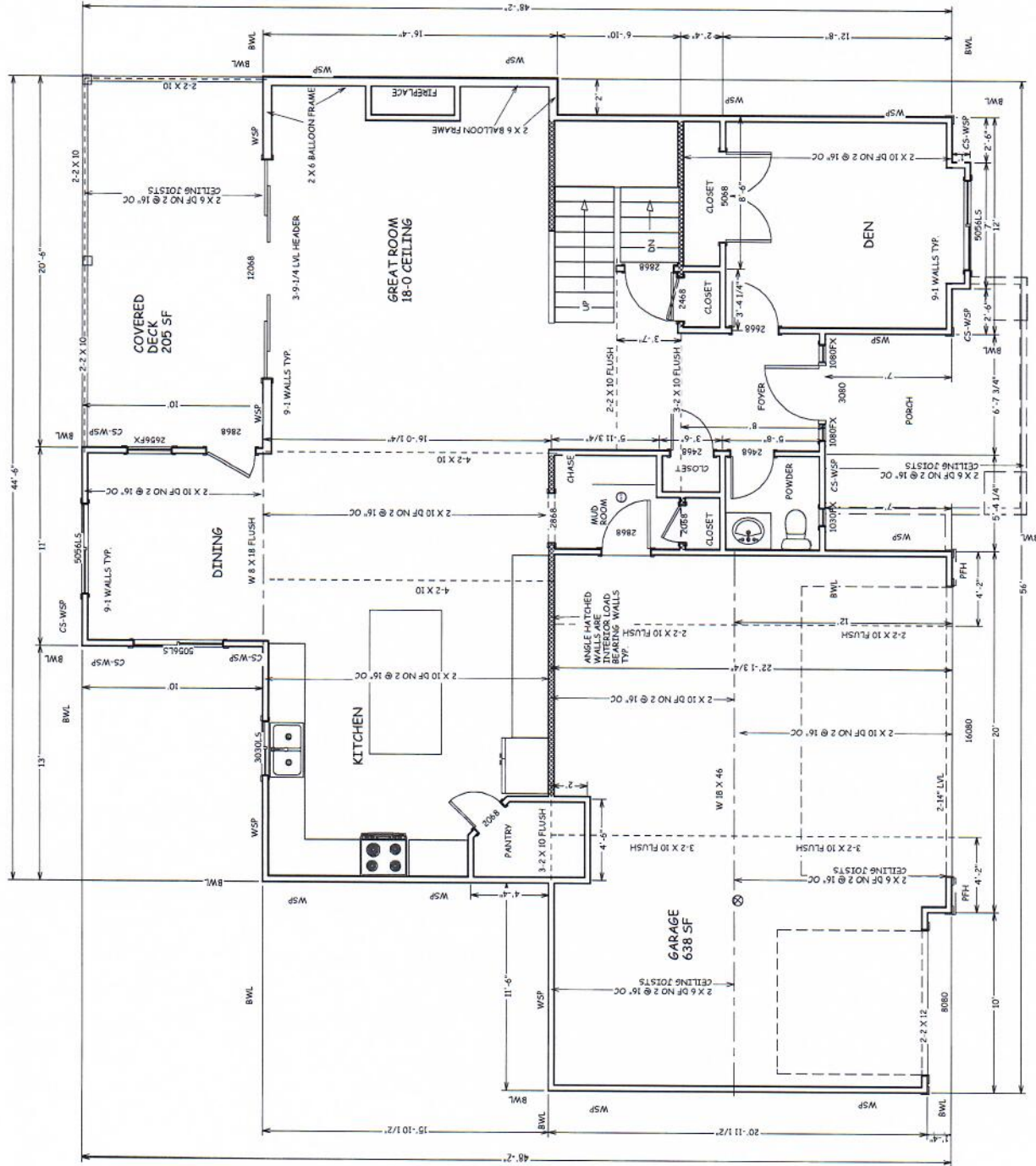
SHEET NO.

2 OF 6

JOSEPH A. TOWNS P.E.
MO. LIC # 22017
PROFESSIONAL SEAL
APPLIES TO STRUCTURAL
ELEMENTS ONLY

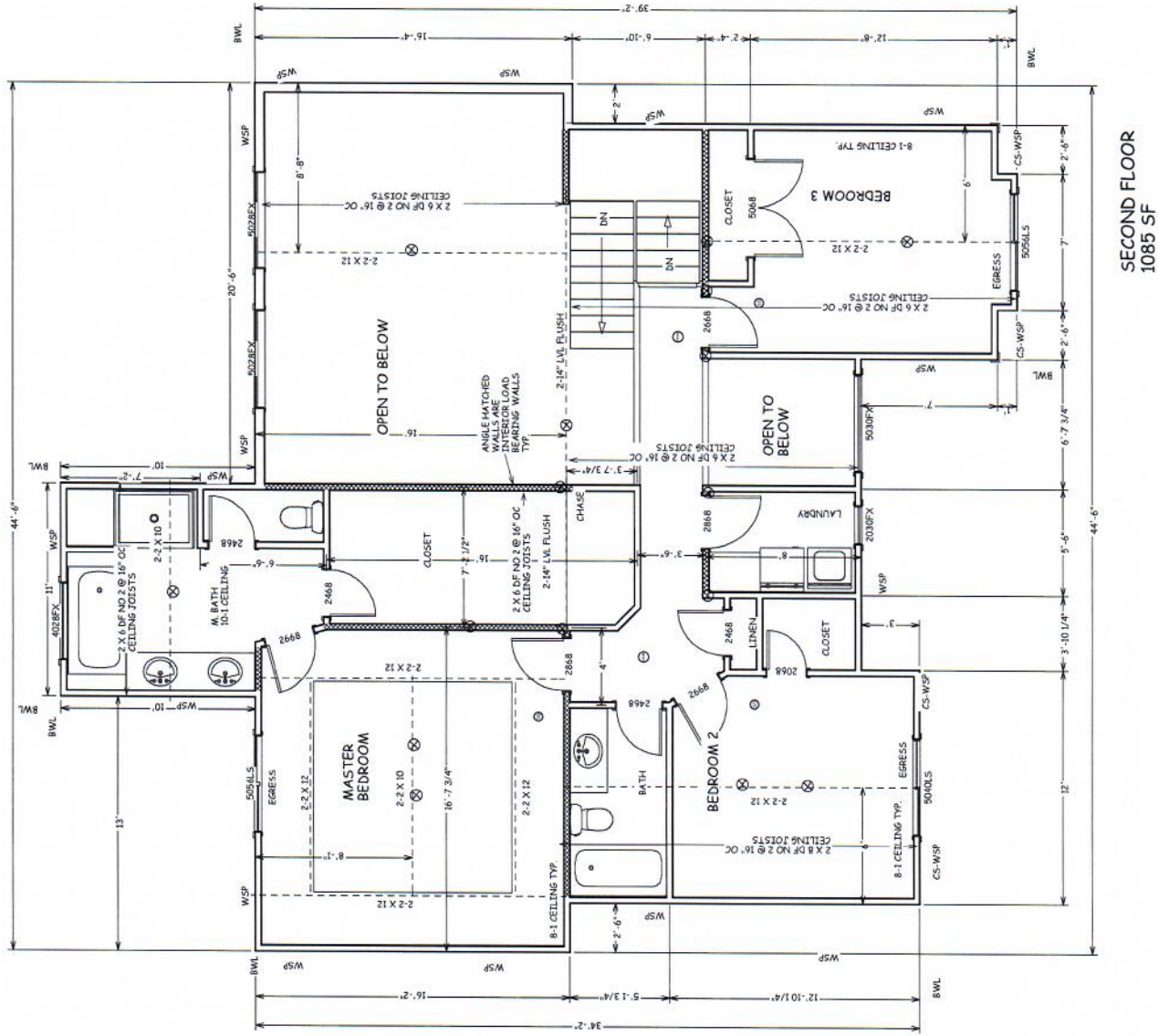


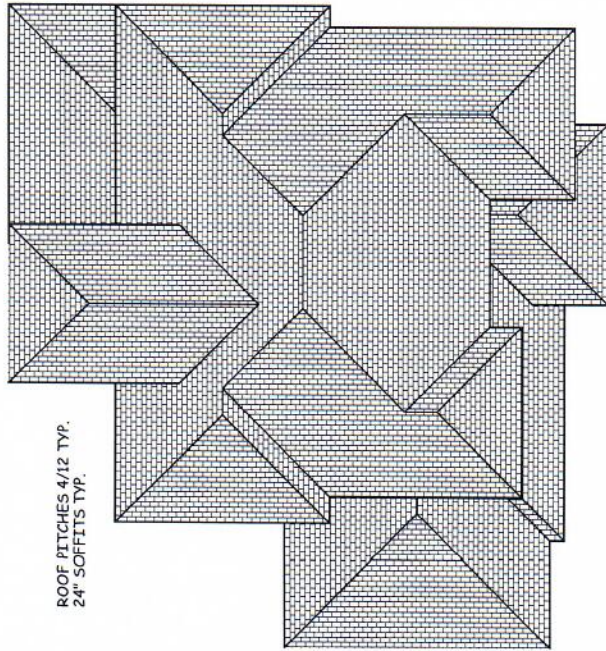
JOSEPH A. TOWNS P.E.
MO. LICE 22017
PROFESSIONAL SEAL
APPLIES TO STRUCTURAL
ELEMENTS ONLY



MAIN FLOOR
1287 SF

 $\frac{2}{16}$



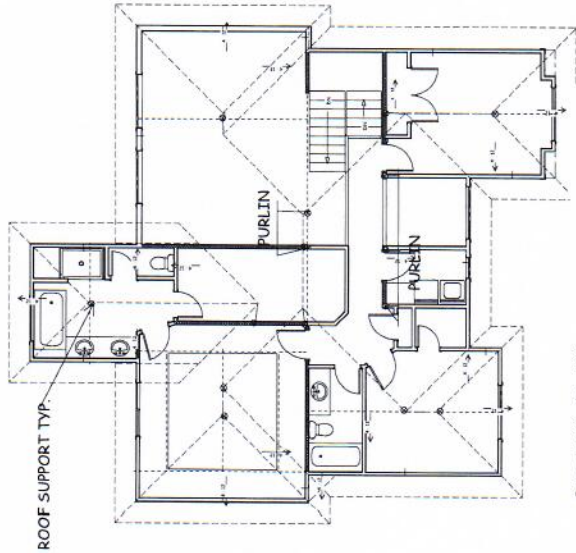


ROOF PITCHES 4/12 TYP.
24" SOFFITS TYP.

ROOF PLAN

1/8 = 1'-0"

ROOF PITCHES 4/12 TYP.
RAFTERS 2 X 6 DF NO 2 @ 16" O.C.
HIPS AND RIDGES 2 X 8 DF NO 2



PURLIN PLAN

1/8 = 1'-0"

NO PURLINS ON MAIN FLOOR

ENERGY CONSERVATION CODE

THE FOLLOWING VALUES ARE NEEDED.

R-15 IN WALLS

R-49 IN ATTICS

R-38 IN VAULTS

R-30 REDUCTION FOR VAULTS IS ONLY FOR 500 SF

PF AREA

R-19 IN FLOORS OVER UNCONDITIONED SPACES

R-10 IN CRAWL SPACE WALLS

BASEMENT WALLS R-13 CAVITY OR R-10 CONTINUOUS

SLABS SHALL BE R-10 FOR A DEPTH OF 2 FOOT

A WINDOW U FACTOR OF .35 OR BETTER

DUCTWORK NEEDS TO HAVE AN R-8 VALUE

ROOF IS DESIGNED FOR 25

P.S.F. SNOW LOAD WITH 10%

COMP. SHEDGLES OVER

15W FELT

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

1/2 6P. BOND

1/2 6P. BOND

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

2 X 6 DF NO 2

TABLE 10.1.1.1 BRACING REQUIREMENTS BASED ON WIND SPEED			
BRACING CATEGORY & BRACKET WALL TYPE	Bracing Location	Minimum LRP	Minimum LRP
Category 1: Single Wall	End of Wall	10	10
Category 2: Double Wall	End of Wall	10	10
Category 3: Single Wall	End of Wall	10	10
Category 4: Double Wall	End of Wall	10	10
Category 5: Single Wall	End of Wall	10	10
Category 6: Double Wall	End of Wall	10	10
Category 7: Single Wall	End of Wall	10	10
Category 8: Double Wall	End of Wall	10	10
Category 9: Single Wall	End of Wall	10	10
Category 10: Double Wall	End of Wall	10	10
Category 11: Single Wall	End of Wall	10	10
Category 12: Double Wall	End of Wall	10	10
Category 13: Single Wall	End of Wall	10	10
Category 14: Double Wall	End of Wall	10	10
Category 15: Single Wall	End of Wall	10	10
Category 16: Double Wall	End of Wall	10	10
Category 17: Single Wall	End of Wall	10	10
Category 18: Double Wall	End of Wall	10	10
Category 19: Single Wall	End of Wall	10	10
Category 20: Double Wall	End of Wall	10	10

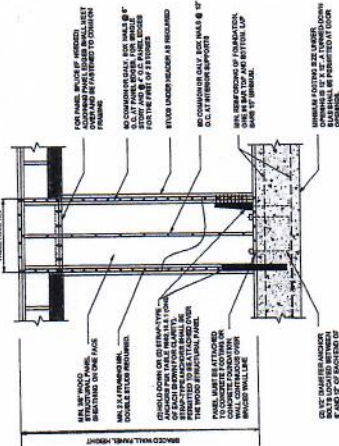


FIGURE 10.2.1.1
METHOD ABW—ALTERNATE BRACED WALL PANEL

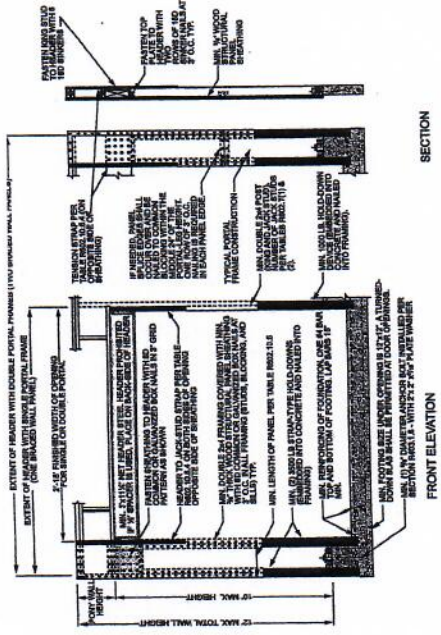


FIGURE 10.2.1.2
METHOD PFH—PORTAL FRAME WITH HOLD-DOWNS

TABLE 10.2.1.1 BRACING METHODS			
METHOD, MATERIAL	MEMBER THICKNESS	FIGURE	CONNECTIONS/DETAILS
1. LBR LBR in bracing	1.44 wood or approved steel members 16" to 48" or 40" angles for and gusking		Weld: 3/8d groove ends 3/8d (2") long @ 0.113" radii Isol steel plate per manufacturer Per stud
2. DWPB DWPB in bracing	V_{br} or V_{br} (maximal) for and gusking		3/8d (2") long @ 0.113" radii 2, V_{br} long spans Isolator mounting per manufacturer Table R602.3.1) or R602.3.2)
3. Wood bracing	V_{br}		6" edge 12" field Vehicle by beam 14" or parallel gusset 12" at intermediate parallel to beam
4. SFB SFB in bracing	V_{br} or V_{br} for maximum 16" and gusking		3" edge 6" field For all braced wall panel locations 1" top and bottom plates 2" top and bottom plates 1" top

TABLE 10.2.1.2 MINIMUM LENGTH OF BRACED WALL PANELS			
BRACING METHOD	WIND SPEED (mph)	WIND HEIGHT (ft)	CONNECTION LENGTH (ft)
1. LBR	40	40	40
2. LBR	40	40	40
3. LBR	40	40	40
4. LBR	40	40	40
5. LBR	40	40	40
6. LBR	40	40	40
7. LBR	40	40	40
8. LBR	40	40	40
9. LBR	40	40	40
10. LBR	40	40	40
11. LBR	40	40	40
12. LBR	40	40	40
13. LBR	40	40	40
14. LBR	40	40	40
15. LBR	40	40	40
16. LBR	40	40	40
17. LBR	40	40	40
18. LBR	40	40	40
19. LBR	40	40	40
20. LBR	40	40	40

FIGURE 10.2.1.3
METHOD ABW—ALTERNATE BRACED WALL PANEL

BRACING METHODS			
METHOD, MATERIAL	MEMBER THICKNESS	FIGURE	CONNECTIONS/DETAILS
1. LBR LBR in bracing LBR in bracing	1.44 wood or approved steel members 10"		See Section B602.10.6.2 See Section B602.10.6.3
2. LBR LBR in bracing LBR in bracing	1.44 wood or approved steel members 10"		See Section B602.10.6.2 See Section B602.10.6.3
3. LBR LBR in bracing LBR in bracing	1.44 wood or approved steel members 10"		See Section B602.10.6.2 See Section B602.10.6.3
4. LBR LBR in bracing LBR in bracing	1.44 wood or approved steel members 10"		See Section B602.10.6.2 See Section B602.10.6.3
5. LBR LBR in bracing LBR in bracing	1.44 wood or approved steel members 10"		See Section B602.10.6.2 See Section B602.10.6.3
6. LBR LBR in bracing LBR in bracing	1.44 wood or approved steel members 10"		See Section B602.10.6.2 See Section B602.10.6.3
7. LBR LBR in bracing LBR in bracing	1.44 wood or approved steel members 10"		See Section B602.10.6.2 See Section B602.10.6.3
8. LBR LBR in bracing LBR in bracing	1.44 wood or approved steel members 10"		See Section B602.10.6.2 See Section B602.10.6.3

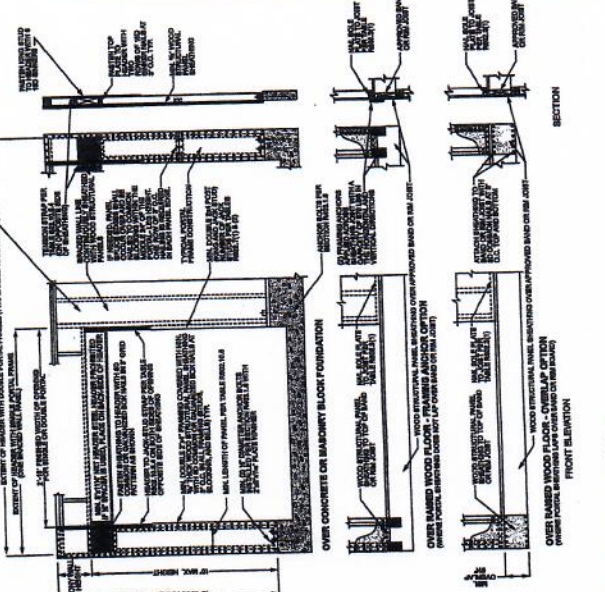


FIGURE 10.2.1.4
METHOD PFH—CONTINUOUSLY BRACED PORTAL FRAME PANEL CONSTRUCTION

BRACE WALL DETAILS
WIND SPEED 115 MPH
WIND EXPOSURE A
SEISMIC DESIGN CATEGORY A

4 mm, 1 foot = 304.8 mm.

10/16

BUILD IN ACCORDANCE WITH
2018 INTERNATIONAL
RESIDENTIAL CODE AND
LOCAL CODES.

NICK ZVACEK HOMES
LOT 126 MONTICELLO
4808 NE JAMESTOWN DRIVE
LEE SUMMIT MO

SCALE
1/4" = 1'-0"

DATE
3-9-21

PLAN NO.
3397

SHEET NO.
6 OF 6

JOSEPH A. TOWNS P.E.
MO. LIC # 22017
PROFESSIONAL SEAL
APPLIES TO STRUCTURAL
ELEMENTS ONLY

Design Calculations

Nick Zvacek Builders

4808 NE Jamestown Drive, Lee's Summit, Mo.

Misc. Calcs - Window Sill Check (Wind Controls)

Supporting - Lateral Loading = 15 psf, IBC Chapter 16
Lateral Loading = 20 psf, IBC Chapter 16 Controls

Beam Designation None

Beam Span	6.5 feet	Re: Plan Drawings
Uniform Load Width	4.50 feet	Re: Plan Drawings
Uniform Load (total load 4ft*17psf *1.7)	0.116 ksf	Load & Codes
Beam Loading	0.52 klf	By Calculation
Point Load 1	0.0 kips	By Design
Point Load 1 Location	3.3 feet	
Point Load 2	0.0 kips	
Point Load 2 Location	3.3 feet	
Point Load 3	0.0 kips	
Point Load 3 Location	3.3 feet	

For Conservatism All Moments Consider at Midspan !!
All beams considered continually braced at top flange !!

Moments	Uniform Load	2.747 k-ft	By Calculation
	Point Load 1	0.00 k-ft	By Calculation
	Point Load 2	0.00 k-ft	By Calculation
	Point Load 2	0.00 k-ft	By Calculation
	Total	2.75 k-ft	By Calculation
Allow Deflection	L 360	0.217 inches	By Calculation
Reaction		1.69 kips	By Calculation

11/16

Size Beam

Check 2x6

MINOR AXIS BENDING, ROTATED

By Design

b = 4.5 inches
d = 5.5 inches

I_{xx} = 62.4 inches⁴
E = 1800 ksi

Deflection, Uniform 0.1860 inches
Deflection, PL 1 0.0000 inches
Deflection, PL 2 0.0000 inches
Deflection, PL 3 0.0000 inches

Deflection Total 0.1860 inches

OK SAY OK, < 1/16inch

Shear Stress 0.068 ksi

Check Bending Stresses

S_{xx}= 22.7 inches³

Adjustment Factors

Cd 0.95 Section 2.3.2 Duration
Cm 1.00 ASD Wood Design Manual
Ct 1.00 ASD Wood Design Manual
Ci **Braced** Section 4.4.1 Stability
Cf 1.00 ASD Wood Design Manual
Cv 1.11 Table 5A Wood Supplement page 57
Adjusted Cv 1.00 Max Value from Suppl. page 57
Cfu 1.00 ASD Wood Design Manual
Cr 1.15 ASD Rep Factor, NDS Section 4.3.9
Ref: Page 30
Fb= 1800 **Southern Pine**

F'b= 2182.35 psi

Actual fb= 1453.12 psi

OK

12/16

Design Calculations

Nick Zvacek Builders

4808 NE Jamestown Drive, Lee's Summit, Mo.

Misc. Calcs - Window Sill Check (Wind Controls)

Supporting - Lateral Loading = 15 psf, IBC Chapter 16
Lateral Loading = 20 psf, IBC Chapter 16 Controls

Beam Designation None

Beam Span	6.5 feet	Re: Plan Drawings
Uniform Load Width	4.50 feet	Re: Plan Drawings
Uniform Load (total load 4ft*17psf *1.7)	0.116 ksf	Load & Codes
Beam Loading	0.52 klf	By Calculation
Point Load 1	0.0 kips	
Point Load 1 Location	3.3 feet	
Point Load 2	0.0 kips	By Design
Point Load 2 Location	3.3 feet	
Point Load 3	0.0 kips	
Point Load 3 Location	3.3 feet	

For Conservatism All Moments Consider at Midspan !!
All beams considered continually braced at top flange !!

Moments	Uniform Load	2.747 k-ft	By Calculation
	Point Load 1	0.00 k-ft	By Calculation
	Point Load 2	0.00 k-ft	By Calculation
	Point Load 2	0.00 k-ft	By Calculation
	Total	2.75 k-ft	By Calculation
Allow Deflection	L 360	0.217 inches	By Calculation
Reaction		1.69 kips	By Calculation

13/16

Size Beam

Check 2x6

MINOR AXIS BENDING, ROTATED

By Design

b = 4.5 inches
d = 5.5 inches

I_{xx} = 62.4 inches⁴
E = 1800 ksi

Deflection, Uniform 0.1860 inches
Deflection, PL 1 0.0000 inches
Deflection, PL 2 0.0000 inches
Deflection, PL 3 0.0000 inches

Deflection Total 0.1860 inches

OK SAY OK, < 1/16inch

Shear Stress 0.068 ksi

Check Bending Stresses

S_{xx}= 22.7 inches³

Adjustment Factors

Cd 0.95 Section 2.3.2 Duration
Cm 1.00 ASD Wood Design Manual
Ct 1.00 ASD Wood Design Manual
Ci **Braced** Section 4.4.1 Stability
Cf 1.00 ASD Wood Design Manual
Cv 1.11 Table 5A Wood Supplement page 57
Adjusted Cv 1.00 Max Value from Suppl. page 57
Cfu 1.00 ASD Wood Design Manual
Cr 1.15 ASD Rep Factor, NDS Section 4.3.9
Ref: Page 30
Fb= 1800 **Southern Pine**

F'b= 2182.35 psi

Actual fb= 1453.12 psi

OK

14/16

Design Calculations

Nick Zvacek Homes

4808 NE Jamestown Drive, Lee's Summit, Mo

Misc. Calcs - Studs at Window Framing

Column Capacity - 2x6 Studs

Column Design None

BLOCKING REQ'D

*	Column Length	unbraced length	6.0 feet	Re: Plan Drawings
*	Trib Width		1.3 feet	Re: Plan Drawings
	Trib Length		1.0 feet	Re: Plan Drawings
*	Uniform Load	Loads (LL + DL)	1.0 ksf	Load & Codes
		Additional Load (xxx)	0.0 kips	

	Column Loading		1.3 kips	Sum(Loads above)
*	Column "d"	4-2x6's	6.0 inches	Re: Plan Drawings
*	Column "b"		5.5 inches	Re: Plan Drawings

Wind Loading	Considered in Other Calcs	0 kips	By Design & Drawings
		0 kips	By Design & Drawings
		0 kips	By Design & Drawings
		0 kips	By Design & Drawings
		0 kips	By Design & Drawings

For Conservatism Column Consider Unbraced !!

15/16

Total Design Load **1.33 kips** **Sum (Loads above)**

Adjustment Factors

Cd 0.9 Table 2.3.2, pg. 9
 Cm 1 Table 4B, NDS Sup, pg 36, **
 Ct 1 Table 2.3.3, pg. 9
 Cf 1 ASD Wood Design Manual
 Bearing Stress = 825 Bearing Stress Unfactored
 Fc= 742.5 H.2, pg 157, See definition

*

$l = l_e$
 $l/d \text{ Ratio} = 12 \text{ H.2, pg 157, NDS}$
 OK

*

Kce = 0.3 Equation H3, pg 157, NDS
 $E = E' = 2E+06 \text{ psi}$
 $F_{ce} = 3125 \text{ Equation H2, pg 157, NDS}$
 $F'_{c} = 701.84 \text{ Equation H1, pg 157, NDS}$

*

Logic Statemer **Design Stress** **701.84 psi** **Lesser Value of F'_c or F_{ce}**

*

$c = 0.80 \text{ Equation H2, pg 157, NDS}$
 $C_p = 0.67 \text{ Equation 3.7-1, pg 19, NDS}$

Capacity **$P' = 16.45 \text{ kips}$** **$= ((F_c * C_p) * (d * b)) / 1000$**

Capacity Check **OK**

16/16