ACUTE ENGINEERING

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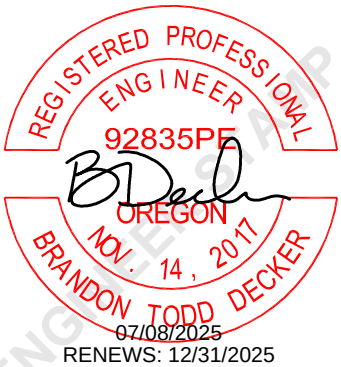
Structural Calculations

Project Name:	**Faster Permits Innes Remodel (Portland) 5620525**
Project Location:	**4503 NE 28th Ave Portland, Oregon 97211**
Project Number:	**5620525**
Date:	**6/30/2025**

Issues / Revisions

Date	Number	Comment
6/10/2025	2860625	Rimboard
6/30/2025	10200625	City feedback



07/08/2025
RENEWS: 12/31/2025

SUBMITTED 07/08/2025

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Project information

Address / location *	=	4503 NE 28th Ave
Area / subdivision		
Area / subdiv. No. 1	=	Other
City, county	=	Portland (Multnomah county)
State, Zip Code	=	Oregon 97211

* The structural calculations report and corresponding construction documents are valid for a single use at the project location and shall not be reused, copied, or reproduced without written consent.

Jurisdiction / occupancy information

Jurisdiction	=	Portland	
Building code	=	2023 ORSC	
Model building code	=	2021 IRC / 2021 IBC	2021 IBC 101.2 & IRC R301.1.3
Use and occupancy classification	=	Residential - 1-unit dwelling (R)	
Risk category	=	Not occupancy categories I, III, IV (II)	

** Building code compliance of non-structural issues is not addressed. Refer to the architect or designer for compliance.

Environmental load parameters

Earthquake

Latitude, longitude	=	45.5556, -122.6372	
Mapped short period	Ss =	0.869	2021 IBC Figure 1613.2.1(1)
Mapped 1-sec. period	S1 =	0.385	2021 IBC Figure 1613.2.1(2)

Wind

Basic design wind speed	V =	98 mph	2021 IBC Figure 1609.3(1), 1609.3(2), 1609.3(3)
Exposure category	=	B	2021 IBC 1609.4.3

Soil

Geotechnical design basis †

Area / subdiv. No. 1	=	Presumptive values, 2021 IBC Table 1806.2	
Minimum frost cover	=	12 in.	2021 IBC 1809.5
Site class	=	D-Default	
Special requirements	=	None	
Lateral active press.	=	30 psf/ft	
Lateral at-rest press.	=	60 psf/ft	
Lateral passive press.	=	150 psf/ft	
Coeff. of friction	=	0.25	
Allow. vert. bearing	Qa =	1500 psf	
Min. cont. footing	=	18 in.	
Min. spot footing	=	20 in.	

† It is recommended that a geotechnical investigation be conducted unless satisfactory data from adjacent areas is available that demonstrates an investigation is not necessary for any of the conditions in 2021 IBC 1803.5 (1-12). The structural calculations report and corresponding construction documents are only valid for the soil parameters listed herein. The design professional in responsible charge shall be notified if observations or field conditions differ.

Snow

Elevation (max)	=	240 ft	
Flat roof snow load	Pf =	25 psf	Jurisdiction

Rain

15-min. rainfall intensity	=	in/hr	
60-min. rainfall intensity	=	in/hr	

Deferred submittals

None

LOAD SETS

Roof dead loads

(2021 IBC 1606, ASCE 7-16 Table C3.1-1a)

Asphalt shingles	= 2 psf	ASCE 7-16 Table C3.1-1a
Felt or ready roofing, roof sheathing	= 3 psf	ASCE 7-16 Table C3.1-1a
Wood trusses, misc	= 5 psf	Estimated
Insulation, gypsum sheathing	= 5 psf	ASCE 7-16 Table C3.1-1a
Misc.	= 2 psf	Estimated
Roof DL No. 1	**Total = 17 psf**	

Floor dead loads

(2021 IBC 1606, ASCE 7-16 Table C3.1-1a)

Floor sheathing	= 2 psf	ASCE 7-16 Table C3.1-1a
Wood joists/trusses, MEP, misc	= 6 psf	ASCE 7-16 Table C3.1-1a
Gypsum sheathing	= 2 psf	ASCE 7-16 Table C3.1-1a
Interior Walls	= 2 psf	Estimated
Floor DL No. 1	**Total = 12 psf**	
Floor sheathing	= 2 psf	ASCE 7-16 Table C3.1-1a
Wood joists/trusses, MEP, misc	= 6 psf	ASCE 7-16 Table C3.1-1a
Gypsum sheathing	= 2 psf	ASCE 7-16 Table C3.1-1a
3"-4" Concrete Slab	= 50 psf	Estimated
Floor DL No. 2	**Total = 60 psf**	
6" suspended concrete slab	= 75 psf	Estimated
Floor DL No. 3	**Total = 75 psf**	

Wall dead loads

(2021 IBC 1606, ASCE 7-16 Table C3.1-1a)

Interior stud walls	= 10 psf	ASCE 7-16 12.14.8.1
Exterior 2x6@16"o.c.,5/8" gyp, insul., 7/16" sheathi	= 12 psf	ASCE 7-16 Table C3.1-1a

Roof live loads

(2021 IBC 1607)

Occupancy or use		Unif. (psf)	Conc. (lb)	Ref.
Roofs (ordinary construction)	=	20	300	2021 IBC Table 1607.1 No. 27

Floor live loads

(2021 IBC 1607)

Occupancy or use		Unif. (psf)	Conc. (lb)	Ref.
Residential (1-2 unit dwelling)	=	40	0	2021 IBC Table 1607.1 No. 26
Stairs and exits (residential 1-2 unit dwelling)	=	40	300	2021 IBC Table 1607.1 No. 31
Decks	=	60	0	2021 IBC Table 1607.1 No. 5
Garages (passenger vehicles)	=	50	3000	

Load sets

Live load (occupancy or use)	(psf)	Dead load	(psf)	Abbrev.
Flat roof snow load	25	Roof DL No. 1	17	S 25 17
Residential (1-2 unit dwelling)	40	Floor DL No. 1	12	L 40 12
Stairs and exits (residential 1-2 unit dwelling)	40	Floor DL No. 1	12	Ex 40 12
Decks	60	Floor DL No. 1	12	D 60 12
Residential (1-2 unit dwelling)	40	Floor DL No. 3	75	C 40 75
Garages (passenger vehicles)	50	Floor DL No. 2	60	G 50 60

Deflection limits (L/limit)

(2021 IBC 1604.3.1)

Construction		L	S or W	D+L
Roof members (supporting plaster ceiling)	=	360	360	240
Floor members (joists)	=	480		240
Floor members (beams/headers)	=	360		240
Exterior walls and interior partitions (with other britt	=		240	

SNOW CALCULATIONS

Ground snow loads
(ASCE 7-16 Chap. 7.2)

Basis	=	Jurisdiction defined	
County	=	Multnomah	
Elevation	=	240 ft	
Ground snow load	Pg =	30 psf	

Flat roof snow loads
(ASCE 7-16 Chap. 7.3)

Basis	=	Jurisdiction	
Roof exposure definition	=	Not fully exposed or sheltered (ASCE 7-16 Table 7.3-1, Notes a and b).	
Roof exposure	=	Partial	ASCE 7-16 Table 7.3-1 (notes a,b)
Terrain category (wind)	=	B	
Exposure factor	Ce =	1	ASCE 7-16 Table 7.3-1
Roof thermal condition	=	Cold, ventilated roofs exceeing R-25 between ventilated and heated space.	
Thermal factor	Ct =	1.1	ASCE 7-16 Table 7.3-2
Risk category	=	II	
Snow importance factor	Is =	1	ASCE 7-16 Table 1.5-2
Flat roof snow load	Pf =	25 psf	Jurisdiction

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JOISTS

FJ 01	2 X 10 @ 16" O.C.

Summary

Mark	=	FJ 01
Center span	=	2.5 ft
Section	=	2 X 10 @ 16" O.C.
Result	=	Section adequate by 95%.

Uniform Load

				Partition DL (psf)	
Label	Class	LL (psf)	DL (psf)	Center	Cantilever
L 40 12	Floor	40	12	0	0

Beam Adjustment Factors

Cd	=	1
CF / CV	=	1.1
Cr	=	1

Reference Allowable Loads

Moment	=	2029 lb-ft
Shear	=	1665 lb
R1	=	1640.625 lb
R2	=	1640.625 lb

Support

	Left	Right
Left (in.)	1.75	1.75
Web stiffener	0	No WS

Section and Material Properties

Flange		
d	=	0 in.
b	=	0 in.
Web		
h	=	0 in.
Panel		
t	=	0.75 in.
C. Factor	=	0.45

Reactions

	Left	Right
Roof LL (lb)	0	0
Floor LL (lb)	67	67
DL (lb)	20	20
Total load (lb)	**87**	**87**

Joist Properties

Joist K	=	738.46154
Joist EI	=	183415116 in.2-lb
Comp. EI	=	276497731 in.2-lb
Effec. EI	=	211483823 in.2-lb

Uplift

	Left
Roof LL (lb)	0
Floor LL (lb)	0
DL (lb)	0
Total uplift (lb)	**0**

Ledger
2018 NDS Table 12

	Members		Fastener			Summary		
Mark	Main	Side	Rows	Type	Spacing in.	Result	TL lbs/fast.	Z' lbs/fast.
FJ 01	RIM BRD	2 X 10	2	SDS 25312	16	OK84%	43	268

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Summary

MB 01	2 X 10 [DF #2]

Mark = MB 01
Section = 2 X 10 [DF #2]
Span = 3.5 ft
Result = Section adequate by 69 % - Load Combo. No.2 DL + FLL - Flexure

Distributed Loads

			Load Start		Load End	
Class	LL (psf)	DL (psf)	Trib (ft)	x1 (ft)	Trib (ft)	x2 (ft)
Floor	40	12	6.75	0.00	6.75	3.50

Dead Loads

Self Weight BSW = 3 plf

Allowable Stress

Shear Stress Fv = 180 psi
Bending Stress Fb = 900 psi

Beam Adjustment Factors

Load Duration Cd = 1.00
Form CF = 1.10
Repetitive Cr / Cv = 1.00

Load Reduction Factors

Live Load LLRF = 1.00

Beam Section Properties

Width b = 1.5 in.
Depth d = 9.25 in.
Area A = 14 in.2
Shear Area As = 9 in.2
Moment of Inertia I = 99 in.4
Section Modulus S = 21 in.3

Beam Material Properties

Modulus of Elasticity E = 1600000 psi
Flexure Stiffness EI = 158000000 lb-in.2

Req'd bearing length = 0.66" 0.66"

Deflection Criteria

Span	DLD (in.)	LLD (in.)	Result	TLD (in.)	Result
Center	0.00	0.01	95 %	0.01	96 %

Support Reactions

	Left	Right
RLL (lb)	0	0
FLL (lb)	473	473
DL (lb)	148	148
Total (lb)	620	620

Post	Capacity

Strength Criteria

Condition	Maximum	Allowable	Result
Shear (lb)	347	1,665	79 %
Moment (lb-ft)	543	1,765	69 %

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Summary

JT 01	(2) 2 X 10 [DF #2]

Mark = JT 01
Section = (2) 2 X 10 [DF #2]
Span = 13.67 ft
Result = Section adequate by 25 % - Load Combo. No.2 DL + FLL - Flexure

Distributed Loads

			Load Start		Load End	
Class	LL (psf)	DL (psf)	Trib (ft)	x1 (ft)	Trib (ft)	x2 (ft)
Floor	40	12	1.33	0.00	1.33	13.67

Point Loads

Ref.	a (ft)	RLL (lb)	FLL (lb)	DL (lb)	Total (lb)
MB 01-R	2.58	0	473	148	620

Dead Loads

Self Weight BSW = 7 plf

Allowable Stress

Shear Stress Fv = 180 psi
Bending Stress Fb = 900 psi

Beam Adjustment Factors

Load Duration Cd = 1.00
Form CF = 1.10
Repetitive Cr / Cv = 1.00

Load Reduction Factors

Live Load LLRF = 1.00

Beam Section Properties

Width b = 3 in.
Depth d = 9.25 in.
Area A = 28 in.2
Shear Area As = 19 in.2
Moment of Inertia I = 198 in.4
Section Modulus S = 43 in.3

Beam Material Properties

Modulus of Elasticity E = 1600000 psi
Flexure Stiffness EI = 317000000 lb-in.2

Req'd bearing length = 0.54" 0.34"

Deflection Criteria

Span	DLD (in.)	LLD (in.)	Result	TLD (in.)	Result
Center	0.00	0.21	55 %	0.29	58 %

Support Reactions

	Left	Right
RLL (lb)	0	0
FLL (lb)	747	453
DL (lb)	274	182
Total (lb)	1,021	635

Post	Capacity

Strength Criteria

Condition	Maximum	Allowable	Result
Shear (lb)	962	3,330	71 %
Moment (lb-ft)	2,660	3,529	25 %