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SURVEYING • LAND USE PLANNING
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SSW Engineers Inc.	SHEET NO.	**COVER**
Junction City Dental	PROJECT NO.	**21-7918**
Junction City, OR	BY	**JSM**
Wind/Seismic	DATE	**11/15/21**

STRUCTURAL DESIGN

Design is governed by: 2019 State of Oregon Structural Specialty Code (2018 International Buildin Code)

Seismic - Equivalent Lateral Force Procedure Ss = **0.785** S_1 = **0.436**

Wind - Method 2 - Analytical Procedure Mph **98** Exp. **B**

Soil report by; Report No. Dated

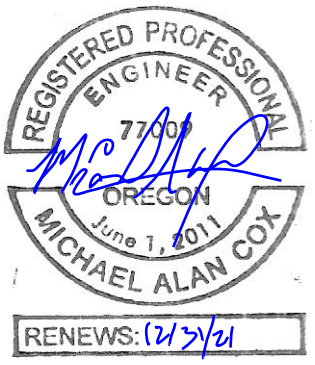
Allowable soil load ---	**1500** psf
Active soil pressure --	**30** pcf
Passive soil pressure --	**100** pcf

Loading;

Roof live load (snow)	**25** psf
Roof dead load	**15** psf
Floor live load (office)	**50** psf
Floor (lobby)	**100** psf
Floor dead load	**15** psf

Material Spec Includes:

Concrete --- Tilt-Up Panels ---- F'c = **4,000/5,000** psi in 28 days,
Concrete --- Footings --- F'c = **3,000** psi in 28 days,
Concrete --- Slabs on grade --- F'c = **3,500** psi in 28 days,
Rebar --- ASTM A-615, Grade 60, **60,000** psi,
Lumber --- Beams -- Doug Fir No. 1, 6x and Larger,
Lumber --- Joist and Studs -- Doug Fir No. 2 and Better, 2x and 4x lumber,
Structural Steel --- ASTM A-36, or A-572, Grade 50,
(Wide Flange; A992 Gr. 50),
Anchor Bolts --- ASTM F-1554 Grade 36, (A-307),



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SSW Engineers Inc	SHEET NO.	**1**	OF
Junction City Dental	PROJECT NO.		**21-7918**
Junction City, OR	BY		**JSM**
Remodel	DATE		**11/15/21**

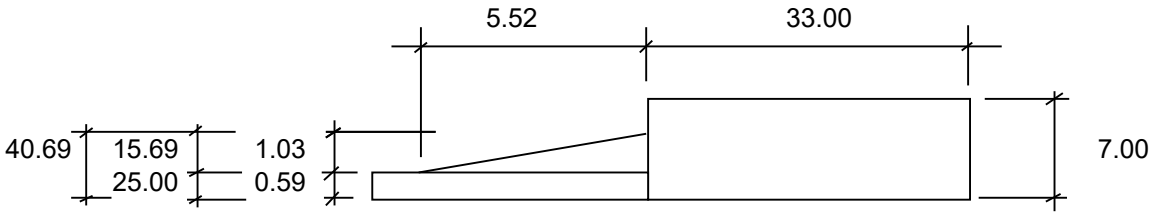
Snow Drift

PER I.B.C. (ASCE 7-16)

Pg(psf)	Ce	Ct	I	Lu (ft)	Ll (ft)	Hr (ft)
9.00	0.90	1.0	1.00	33.00	15.00	7.00

Pf (psf)	γ (pcf)	Hb (ft)	Hd_{upper} (ft)	Hd_{lower} (ft)	Hc (ft)	Parapet
9.00	15.17	0.59	1.38	1.13	6.41	Yes

Use Hd	Wd	Wdmax	Use Wd	Pd (psf)
1.03	5.52	51.25	5.52	15.69

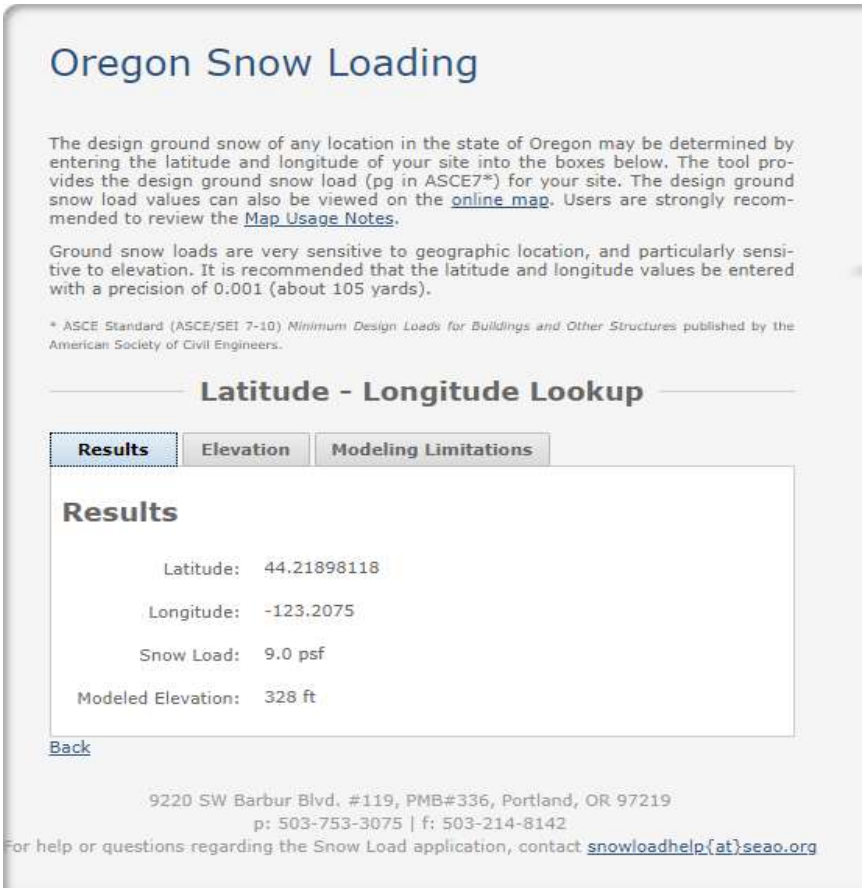


IF Wd EXCEEDS WIDTH OF LOWER ROOF, DRIFT SHALL BE TRUNCATED

ROC = 2.84

Equivlant load at 1.84 ft. P = 43 lb. per ft.

Snow loadinf per SEAO http://snowload.seao.org/lookup.html



Oregon Snow Loading

The design ground snow of any location in the state of Oregon may be determined by entering the latitude and longitude of your site into the boxes below. The tool provides the design ground snow load (pg in ASCE7*) for your site. The design ground snow load values can also be viewed on the online map. Users are strongly recommended to review the Map Usage Notes.

Ground snow loads are very sensitive to geographic location, and particularly sensitive to elevation. It is recommended that the latitude and longitude values be entered with a precision of 0.001 (about 105 yards).

* ASCE Standard (ASCE/SEI 7-10) *Minimum Design Loads for Buildings and Other Structures* published by the American Society of Civil Engineers.

Latitude - Longitude Lookup

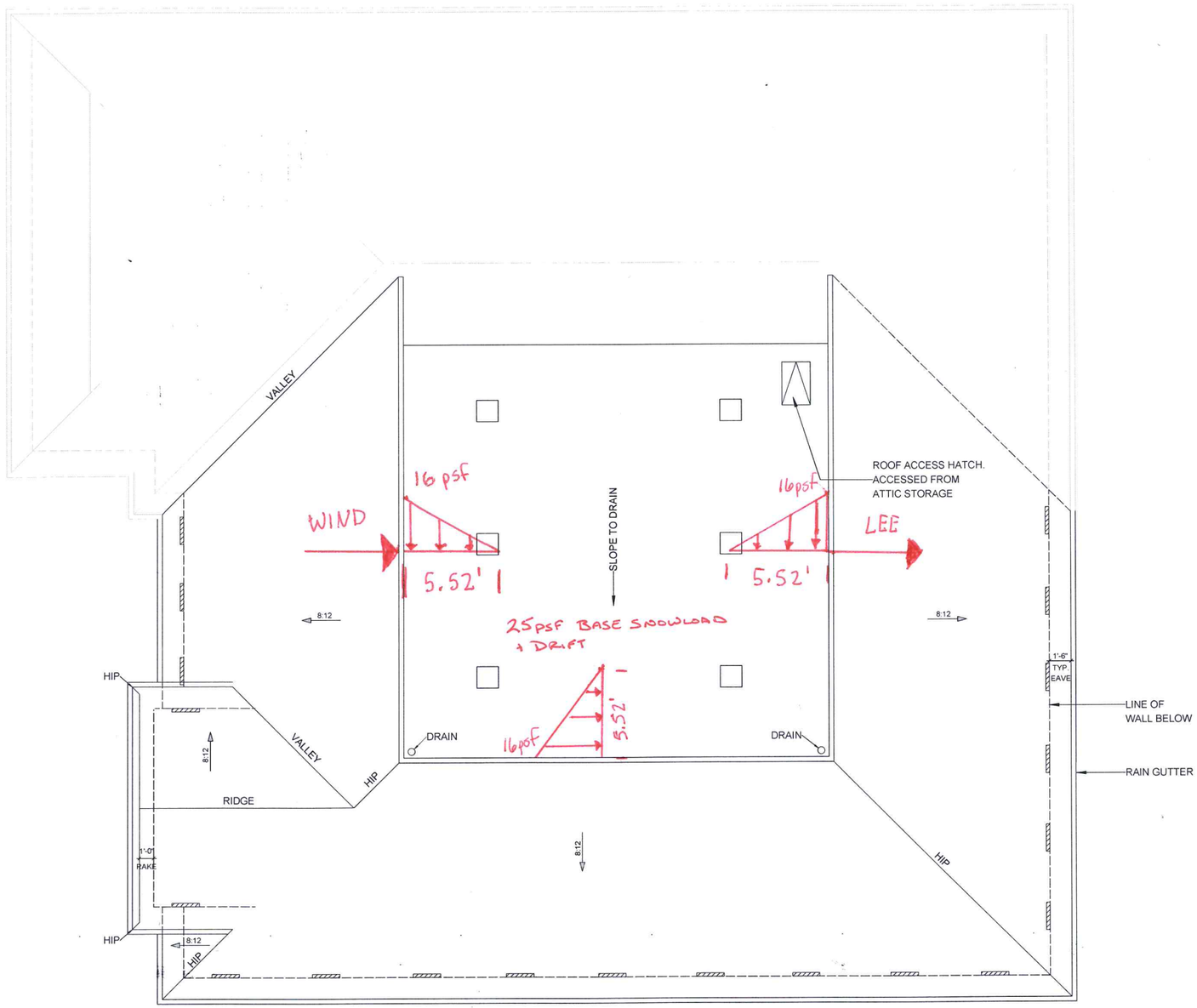
Results | Elevation | Modeling Limitations

Results

Latitude: 44.21898118
Longitude: -123.2075
Snow Load: 9.0 psf
Modeled Elevation: 328 ft

Back

9220 SW Barbur Blvd. #119, PMB#336, Portland, OR 97219
p: 503-753-3075 | f: 503-214-8142
For help or questions regarding the Snow Load application, contact snowloadhelp{at}seao.org



1 ROOF PLAN
1/4"=1'-0"

ATTIC VENTILATION

ROOF AREA (SQ.FT)	RULE APPLIED	NFVA REQUIRED (SQ.IN.)	VENTS PROVIDED		NFVA PROVIDED (SQ.IN.)
			HIGH	LOW	
2628	1/150	2522	6	20	2902

BOX VENT (247 SQ.IN. NFVA)

EAVE FREEZE VENT (71 SQ.IN. NFVA)

N

WILLAMETTE | ARCHITECTURE 360
800 WILLAMETTE ST., SUITE 600
EUGENE, OR 97401
(541) 636-4385
WA360USA.COM

STAMP

PROJECT NAME

POWELL & FREDRICKSON FAMILY DENTAL
582 LAUREL ST, JUNCTION CITY, OR 97448

REVISIONS

DRAWING TITLE

ROOF PLAN

SHEET ID

A108

DATE

10/11/2021

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SSW Engineers Inc.	SHEET NO.	**2**
Junction City Dental	PROJECT NO.	**21-7918**
Junction City, OR	BY	**JSM**
Wind/Seismic	DATE	**11/15/21**

Latitude = 44.21898 **Longitude =** -123.208

State of Oregon 2019 Structural Specialty Code
Based on the 2018 International Building Code
ASCE 07-16

Risk Category = II (tbl. 1.5-2)

0.2 Sec. Spectral Resp. Accel. Ss, (Fig. 1613.5(1)) =	0.785	Seismic Design Category =	D
Fa, (tbl. 1613.5.3(1)) =	1.186	(tbl 11.6-1&-2)	
1.0 Sec. Spectral Resp. Accel. S1, (Fig. 1613.5(2)) =	0.436	Site Class =	D
Fv, (tbl. 1613.5.3(2)) =	1.902	(Per ASCE 7-16, Chapter 20)	

SMS = FaSs =	0.931	To = .2SD1/SDS =	0.18
SM1 = FvS1 =	0.829	Ts = SD1/SDS =	0.89
SDS = 2/3SMS =	0.621	Ta = Ct hn^x =	0.20
SD1 = 2/3SM1 =	0.553	Cu, (tbl 12.8-1)=	1.4
		T = CuTa =	0.27
Ct, (tbl 12.8-2) =	0.020	Sa = SDS*(0.4+0.6*T/To) =	0.82
x, (tbl 12.8-2) =	0.750	Sa = SD1/T =	2.01
hn, height in feet above base	**21.00**	Sa = SDS*TL/T^2=	131.62
		I,(tbl 1.5-2) =	1.00
15. Light-frame (wood) walls sheathed with wood structural panels rated for shear resistance or steel sheets		R, (tbl 12.2-1) =	6.50
		TL (Fig 22-14) =	16

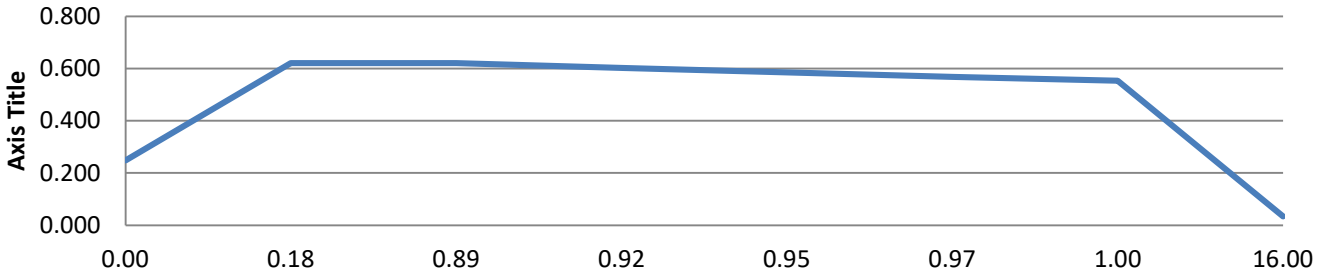
Seismic Design Requirements for Building Structures ASCE 7-16 Chapter 12
Equivalent Lateral Force Procedure (ASCE 12.8)

Seismic Base Shear, V = CsW **V = 0.1W**

Cs= SDS/(R/I)	SDS/(R/I) =	**0.10**	
Cs(max) = SD1/T(R/I)	SD1/T(R/I) =	0.31	
Cs(min) = 0.01	0.01=	0.01	

Connections (12.1.3)	Fp = 0.133SDSWp =	0.08	Fp = 0.08Wp
	or Fp = .05*Wp =	0.05	
	Category CDEF (12.11.2.1), Fp= 0.8SdsIWp =	0.50	Fp = 0.5Wp
Diaphragms (12.10.1.1)	Fp(max) = 0.4*I*SDS*Wp + Vpx =	0.25	Fp = 0.25 Wp+Vpx
	Fp(min) = 0.2*I*SDS*Wp + Vpx =	0.12	Fp = 0.12 Wp+Vpx
Out-of-Plane Structural Walls (12.11.1)			
	Fp = .4*I*SDSWW =	0.25	Fp = 0.25WW

DESIGN RESPONSE SPECTRUM



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Seismic-Vertical Distrbution of Forces (ASCE 7-16, 12.8.3)

North-South Direction

	Load(psf)	Area/Length		Height	
Roof	15	4082	sq ft		
Ext. Walls	8	126	ft	9.1	ft
Int. Walls	6	229	ft	9.1	ft

	Weight			
Roof	61,230	lb.	k =	1
Ext. Wall 1st Flr.	9,173	lb.	V =	0.10
Int. Wall 1st Flr.	12,503	lb.	ρ =	1.00
Total	82,906	lb.	ρV =	0.10 W
				8,291 lb.

Seismic-Vertical Distrbution of Forces (ASCE 7-16, 12.8.3)

East-West Direction

	Load(psf)	Area/Length		Height	
Roof	15	4082	sq ft		
Ext. Walls	8	156	ft	9.1	ft
Int. Walls	6	216	ft	9.1	ft

	Weight			
Roof	61,230	lb.	k =	1
Ext. Wall 1st Flr.	11,357	lb.	V =	0.10
Int. Wall 1st Flr.	11,794	lb.	ρ =	1.00
Total	84,380	lb.	ρV =	0.10 W
				8,438 lb.

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SSW Engineers Inc.	SHEET NO.	**4** OF
Junction City Dental	PROJECT NO.	**21-7918**
Junction City, OR	BY	**JSM**
Wind/Seismic	DATE	**11/15/21**

Wind Loads: MWFRS Directional Procedure, SEI/ASCE 7-16

Rigid Building of All Heights (27.4.1)

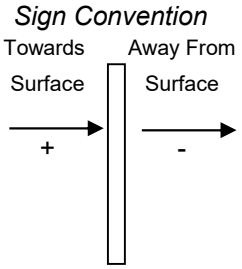
Exposure: **B** Wind load: **98** mph

Enclosure: **Enclosed** Risk: **II**

Non-Hurricane Prone Regions

B = 67 ft
L = 66 ft
G = 0.85
Kzt = (26.8-1)) 1.00
Kd = (tbl 26.6-1) 0.85
Ke = (26.9) 1.00

0.985 Wind



qh = .00256 Kz Kzt Kd Ke V^2 = **Kz * 20.9**

p = qGCp-qi(Gcpi), (27.3-1)

External Wall Pressures: Windward Wall					Internal Wall Pressure (Positive Internal Pressure)			Total Wind Pressure	Factored Pressure
Height (ft)	Kz (tbl 26.10-1	qh	Cp	qhGCp	qh	GCpi	qhGCpi	P (psf)	.6*P (psf)
9	0.57	12.01	0.8	8.17	12.50	0.18	2.25	5.92	3.55
17.25	0.60	12.50	0.8	8.50	12.50	0.18	2.25	6.25	3.75
	0.00	0.00	0.8	0.00	12.50	0.18	2.25	-2.25	-1.35
	0.00	0.00	0.8	0.00	12.50	0.18	2.25	-2.25	-1.35
	0.00	0.00	0.8	0.00	12.50	0.18	2.25	-2.25	-1.35
Leeward Wall		12.50	-0.50	-5.31	12.50	0.18	2.25	-7.56	-4.54
Side Wall		12.50	-0.7	-7.44	12.50	0.18	2.25	-9.69	-5.81

External Wall Pressures: Windward Wall					Internal Wall Pressure (Negative Internal Pressure)			Total Wind Pressure	Factored Pressure
Height (ft)	Kz (tbl 6-3)	qh	Cp	qhGCp	qh	GCpi	qhGCpi	P (psf)	.6*P (psf)
9	0.57	12.01	0.8	8.17	12.50	-0.18	-2.25	10.42	6.25
17.25	0.60	12.50	0.8	8.50	12.50	-0.18	-2.25	10.75	6.45
0	0.00	0.00	0.8	0.00	12.50	-0.18	-2.25	2.25	1.35
0	0.00	0.00	0.8	0.00	12.50	-0.18	-2.25	2.25	1.35
0	0.00	0.00	0.8	0.00	12.50	-0.18	-2.25	2.25	1.35
Leeward Wall		12.50	-0.50	-5.31	12.50	-0.18	-2.25	-3.06	-1.84
Side Wall		12.50	-0.7	-7.44	12.50	-0.18	-2.25	-5.19	-3.11

Wind Pressure @ Roof

h = 17.25 ft h/L = 0.26

Roof Pitch = 8 :12 Θ = 33.69

Uplift Force		Windward Roof				Factored
Height (ft)	qp (psf)	Cp	P = qhGCp	P = qhGCpi	P (psf)	.6P (psf)
17.25	12.50	-0.2	-2.50	-2.25	4.75	2.85
		Leeward Roof				Factored
		Cp	P = qhGCp	P = qhGCpi	P (psf)	.6P (psf)
		-0.6	-6.37	0.00	6.37	3.82
Downward Force		Windward Roof				Factored
Height (ft)	qp (psf)	Cp	P = qhGCp	P = qhGCpi	P (psf)	.6P (psf)
20	12.01	0.30	3.60	-2.25	5.85	3.51

Wind Pressure @ Parapet

pp = qp(GCpn), (27.3-3)

	Factored
Height (ft)	qp (psf)
21	13.22
Windward Parapet	
GCpn	P = qhGCpn
1.5	11.90
Leeward Parapet	
GCpn	P = qhGCpn
-1.0	-7.93

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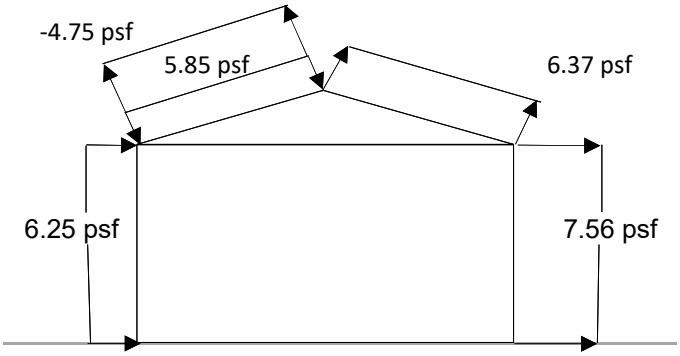
SSW Engineers Inc.	SHEET NO.	**5** OF
Junction City Dental	PROJECT NO.	**21-7918**
Junction City, OR	BY	**JSM**
Wind/Seismic	DATE	**11/15/21**

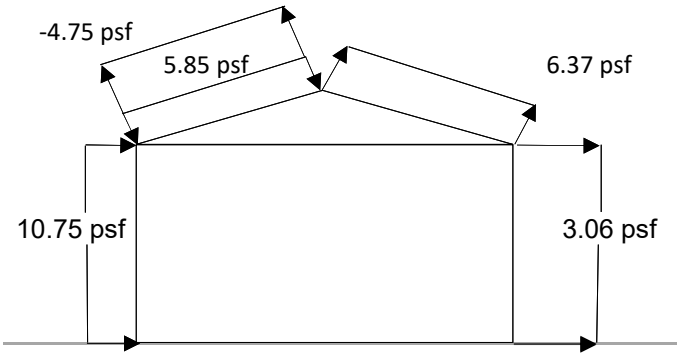
Load From Wind

Direction 1

Wind w/ Positive Interior Pressure				
	Pressure	Height	Length	Shear
Windward	6.2	4.540	67	1,901
Leeward	7.6	4.540	67	2,300
Ww Roof	-4.7	11.8	67	(2,074)
Lw Roof	6.4	11.8	67	2,784
Down Force	5.9	11.8	67	2,556
			Unfactored Sum:	7467

Wind w/ Negative Interior Pressure				
	Pressure	Height	Length	Shear
Windward	10.7	4.540	67	3,270
Leeward	3.1	4.540	67	932
Ww Roof	-4.7	11.8	67	(2,074)
Lw Roof	6.4	11.8	67	2,784
Down Force	5.9	11.8	67	2,556
			Unfactored Sum:	7467

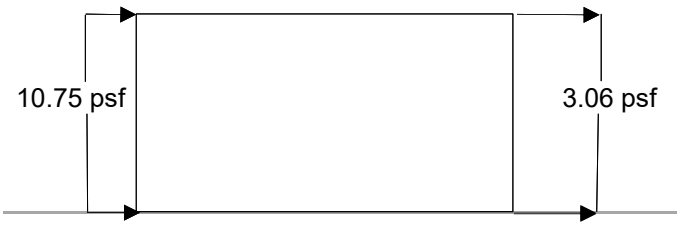




Direction 2

Wind w/ Positive Interior Pressure				
	Pressure	Height	Length	Shear
Windward	6.2	16.35	66	6,744
Leeward	7.6	16.35	66	8,161
Ww Roof	0.0	1.0	66	-
Lw Roof	0.0	1.0	66	-
Down Force	0.0	1.0	66	-
			Unfactored Sum:	14905

Wind w/ Negative Interior Pressure				
	Pressure	Height	Length	Shear
Windward	10.7	16.35	66	11,600
Leeward	3.1	16.35	66	3,305
Ww Roof	0.0	1.0	66	-
Lw Roof	0.0	1.0	66	-
Down Force	0.0	1.0	66	-
			Unfactored Sum:	14905



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SSW Engineers Inc.	SHEET NO.	**6**	OF
Junction City Dental	PROJECT NO.		**21-7918**
Junction City, OR	BY		**JSM**
Wind/Seismic	DATE		**11/15/21**

Shear Wall Design

NDS Wind and Seismic Table 4.3A

Stud Spacing = 16 in. O.C. Maximum Wall Height to Base Ratio = 3.5:1
Wall Height= 9.1 ft. Minimum Shear Wall Width = 2.60 ft.
Blocking = Yes
Panel Type = 15/32" Sheathing Spacing (Edges) = 6 in.
Fastener Type = 10d Nails Spacing (Field) = 12 in.

Roof N-S

	Vtotal (lb.)	# of Walls	V per Wall	m V Cap. (plf)	Ω	V Cap (plf)	Ft Req'd
Seismic	2,902	4	725	620	2	310	2.34
Wind	2,240	4	560	870	2	435	1.29

Feet of Shear Wall Provided

Wall Seg1	7.00 ft	>	2.34 ft	**okay**	
Wall Seg2	5.00 ft	>	2.34 ft	**okay**	
Wall Seg3	5.00 ft	>	2.34 ft	**okay**	
Wall Seg4	5.00 ft	>	2.34 ft	**okay**	

Panel Type = 15/32" Sheathing Spacing (Edges) = 6 in.
Fastener Type = 10d Nails Spacing (Field) = 12 in.

Roof N-S

	Vtotal (lb.)	# of Walls	V per Wall	m V Cap. (plf)	Ω	V Cap (plf)	Ft Req'd
Seismic	2,902	2	1,451	620	2	310	4.68
Wind	2,240	2	1,120	870	2	435	2.57

Feet of Shear Wall Provided

Wall Seg5	12.00 ft	>	4.68 ft	**okay**	
Wall Seg6	9.00 ft	>	4.68 ft	**okay**	

Panel Type = 15/32" Sheathing Spacing (Edges) = 6 in.
Fastener Type = 10d Nails Spacing (Field) = 12 in.

Roof E-W

	Vtotal (lb.)	# of Walls	V per Wall	m V Cap. (plf)	Ω	V Cap (plf)	Ft Req'd
Seismic	2,953	3	984	620	2	310	3.18
Wind	4,472	3	1,491	870	2	435	3.43

Feet of Shear Wall Provided

Wall Seg7	13.0 ft	>	3.43 ft	**okay**	
Wall Seg8	4.0 ft	>	3.43 ft	**okay**	
Wall Seg9	18.0 ft	>	3.43 ft	**okay**	

Panel Type = 15/32" Sheathing Spacing (Edges) = 6 in.
Fastener Type = 10d Nails Spacing (Field) = 12 in.

Roof E-W

	Vtotal (lb.)	# of Walls	V per Wall	m V Cap. (plf)	Ω	V Cap (plf)	Ft Req'd
Seismic	1,477	2	738	620	2	310	2.38
Wind	2,236	2	1,118	870	2	435	2.57

Feet of Shear Wall Provided

Wall Seg10	7.5 ft	>	2.57 ft	**okay**	
Wall Seg11	7.5 ft	>	2.57 ft	**okay**	

Panel Type = 15/32" Sheathing Spacing (Edges) = 6 in.
Fastener Type = 10d Nails Spacing (Field) = 12 in.

Roof E-W

	Vtotal (lb.)	# of Walls	V per Wall	m V Cap. (plf)	Ω	V Cap (plf)	Ft Req'd
Seismic	1,477	1	1,477	620	2	310	4.76
Wind	2,236	1	2,236	870	2	435	5.14

Feet of Shear Wall Provided

Wall Seg12	11.7 ft	>	5.14 ft	**okay**	

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SSW Engineers Inc.	SHEET NO.	**7** OF
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Junction City, OR	BY	**JSM**
Wind/Seismic	DATE	**11/15/21**

Uplift Loads

	Wind Load	Length	Height	Down	Uplift
Wall 1	713 lbs	7.00 ft	9.10 ft	457 lbs	698 lbs
Wall 2	509 lbs	5.00 ft	9.10 ft	370 lbs	742 lbs
Wall 3	509 lbs	5.00 ft	9.10 ft	370 lbs	742 lbs
Wall 4	509 lbs	5.00 ft	9.10 ft	370 lbs	742 lbs
Wall 5	1,280 lbs	12.00 ft	9.10 ft	675 lbs	633 lbs
Wall 6	960 lbs	9.00 ft	9.10 ft	663 lbs	639 lbs
Wall 7	1,661 lbs	13.00 ft	9.10 ft	838 lbs	744 lbs
Wall 8	511 lbs	4.00 ft	9.10 ft	445 lbs	940 lbs
Wall 9	2,300 lbs	18.00 ft	9.10 ft	1,056 lbs	634 lbs
Wall 10	1,118 lbs	7.50 ft	9.10 ft	479 lbs	1,117 lbs
Wall 11	1,118 lbs	7.50 ft	9.10 ft	479 lbs	1,117 lbs
Wall 12	2,236 lbs	11.70 ft	9.10 ft	662 lbs	1,408 lbs
	Seismic	**Length**	**Height**	**Down**	**Uplift**
Wall 1	923 lbs	7.00 ft	9.10 ft	457 lbs	972 lbs
Wall 2	659 lbs	5.00 ft	9.10 ft	370 lbs	1,015 lbs
Wall 3	659 lbs	5.00 ft	9.10 ft	370 lbs	1,015 lbs
Wall 4	659 lbs	5.00 ft	9.10 ft	370 lbs	1,015 lbs
Wall 5	1,658 lbs	12.00 ft	9.10 ft	675 lbs	920 lbs
Wall 6	1,244 lbs	9.00 ft	9.10 ft	663 lbs	926 lbs
Wall 7	1,097 lbs	13.00 ft	9.10 ft	838 lbs	349 lbs
Wall 8	338 lbs	4.00 ft	9.10 ft	445 lbs	546 lbs
Wall 9	1,519 lbs	18.00 ft	9.10 ft	1,056 lbs	240 lbs
Wall 10	738 lbs	7.50 ft	9.10 ft	479 lbs	656 lbs
Wall 11	738 lbs	7.50 ft	9.10 ft	479 lbs	656 lbs
Wall 12	1,477 lbs	11.70 ft	9.10 ft	662 lbs	817 lbs

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SSW Engineers Inc.	SHEET NO.	**8**	OF
Junction City Dental	PROJECT NO.		**21-7918**
Junction City, OR	BY		**JSM**
Wind/Seismic	DATE		**11/15/21**

CIP Use Simpson 5/8" Heavy Bolt, F1554 Gr. 36
PI Use Simpson SET-3G w/ 5/8" Φ F1554 Gr. 36 Ω= 3

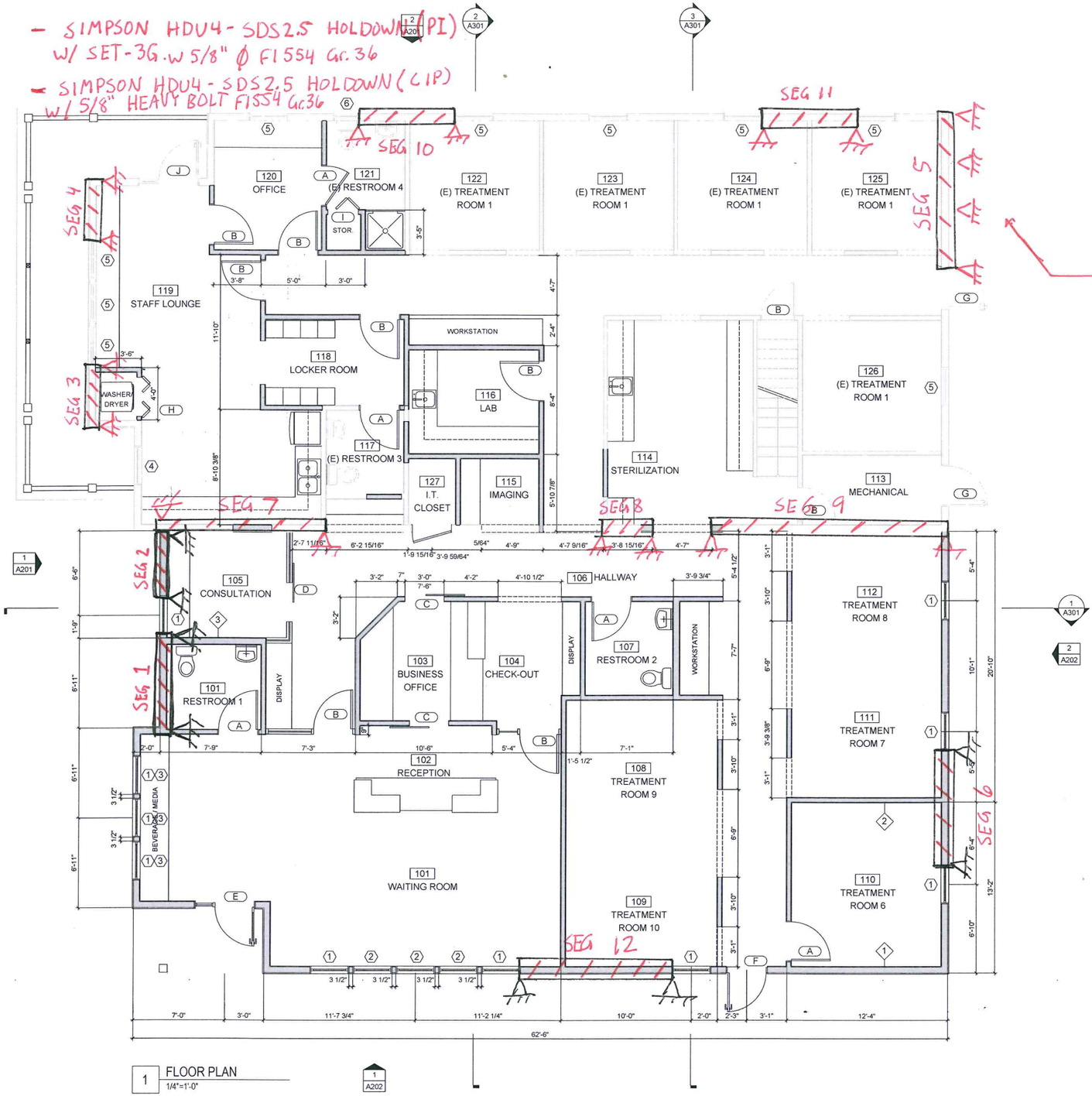
						Anchor Force	Shear Force
CIP	**Wall 1**	Use Simpson HDU4-SDS2.5					
	Allow		Applied			3372.287 lbs	1384.91 lbs
	4,565 lbs	>	972 lbs	**okay**			
CIP	PI+AS10:B	Use Simpson HDU4-SDS2.5					
	Allow		Applied			3415.967 lbs	989.2217 lbs
	4,565 lbs	>	1,015 lbs	**okay**			
PI	**Wall 3**	Use Simpson HDU4-SDS2.5					
	Allow		Applied			3415.967 lbs	989.2217 lbs
	4,565 lbs	>	1,015 lbs	**okay**			
PI	**Wall 4**	Use Simpson HDU4-SDS2.5					
	Allow		Applied			3415.967 lbs	989.2217 lbs
	4,565 lbs	>	1,015 lbs	**okay**			
PI	**Wall 5**	Use Simpson HDU4-SDS2.5					
	Allow		Applied			3434.552 lbs	2487.186 lbs**
	4,566 lbs	>	920 lbs	**okay**			
CIP	**Wall 6**	Use Simpson HDU4-SDS2.5					
	Allow		Applied			3440.672 lbs	1865.39 lbs
	4,565 lbs	>	926 lbs	**okay**			
PI	**Wall 7**	Use Simpson HDU4-SDS2.5					
	Allow		Applied			1884.665 lbs	1645.418 lbs
	4,565 lbs	>	744 lbs	**okay**			
PI	**Wall 8**	Use Simpson HDU4-SDS2.5					
	Allow		Applied			2081.225 lbs	506.2824 lbs
	4,566 lbs	>	940 lbs	**okay**			
PI	**Wall 9**	Use Simpson HDU4-SDS2.5					
	Allow		Applied			1775.465 lbs	2278.271 lbs
	4,566 lbs	>	634 lbs	**okay**			
PI	**Wall 10**	Use Simpson HDU4-SDS2.5					
	Allow		Applied			2448.116 lbs	1107.493 lbs
	4,567 lbs	>	1,117 lbs	**okay**			
PI	**Wall 11**	Use Simpson HDU4-SDS2.5					
	Allow		Applied			2448.116 lbs	1676.818 lbs
	4,568 lbs	>	1,117 lbs	**okay**			
CIP	**Wall 12**	Use Simpson HDU4-SDS2.5					
	Allow		Applied			3114.405 lbs	2214.986 lbs
	4,569 lbs	>	1,408 lbs	**okay**			

** Wall has additional anchor bolts to reduce shear (see callout)

- SHEARWALL

- SIMPSON HDU4-SDS2.5 HOLDOWN (PI) W/ SET-3G.W 5/8" ϕ F1554 Gr.36

- SIMPSON HDU4-SDS2.5 HOLDOWN (CIP) W/ 5/8" HEAVY BOLT F1554 Gr.36



1 FLOOR PLAN
1/4"=1'-0"

TWICE THE ANCHOR BOLTS

WALL TYPE LEGEND	
1	5-1/2" WOOD STUD @ 16" O.C. 5/8" GYP. WALLBOARD INTERIOR, 6" HOR. LAP SIDING EXTERIOR.
2	3-5/8" WOOD STUD @ 16" O.C. 5/8" GYP. WALLBOARD BOTH SIDES
3	5-1/2" WOOD STUD @ 16" O.C. 5/8" GYP. WALLBOARD BOTH SIDES

PLAN LEGEND

- EXISTING BUILDING CONSTRUCTION TO REMAIN
- NEW BUILDING CONSTRUCTION
- X — WALL TYPE TAG
- (X) — DOOR TYPE TAG
- X — WINDOW TYPE TAG

GENERAL NOTES - FLOOR PLAN

1. WALL DIMENSIONS FROM EXISTING WALLS ARE FROM EXISTING FACE OF FINISH. DIMENSIONS TO NEW WALLS ARE FROM FACE OF STUD.
2. PROVIDE AND COORDINATE BLOCKING/STRAPPING FOR ALL WALL MOUNTED CASEWORK, EQUIPMENT, SIGNAGE, FURNITURE, ETC AS REQUIRED. SEE DENTAL CONSULTANT DRAWINGS FOR LOCATIONS.
3. FLOOR TRANSITION WITH 0" - 1/2" HEIGHT DIFFERENTIAL TO HAVE TRANSITION STRIP WITH 1:2 SLOPE. BEYOND 1/2", TRANSITION STRIP TO TO SLOPE 1:12

DOOR NOTES

1. ALL LOCKSETS SHALL HAVE STANDARD 2 3/4" BACKSET AND 1 1/8" x 2 1/4" STRIKE PLATES. DEAD BOLTS SHALL BE 1" THROW. ALL ENTRY DOORS SHALL HAVE LOCK CYLINDERS W/ THUMB LATCH ON INSIDE, PROVIDED AND INSTALLED BY G.C
2. SIGNS SHALL BE INSTALLED ON WALL ADJACENT TO TOILET ROOM DOOR COMPLYING WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, INCLUDING USE (SEX), AS WELL AS SYMBOL OF ACCESSIBLITY.
3. G.C. TO PROVIDE READILY VISIBLE DURABLE SIGN POSTED ON EGRESS SIDE ON OR ADJACENT TO DOOR STATING, "THIS DOOR TO REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED". SIGN SHALL BE IN LETTERS 1 INCH HIGH ON CONTRASTING BACKGROUND AT ENTRANCE.
4. INTERIOR HOLLOW METAL DOOR FRAMES SHALL BE 18 GA. COLD ROLLED STEEL, KNOCK DOWN TYPE WITH RESILIENT BUMPERS. FRAME SHALL BE FACTORY PRIMED THEN PAINTED TO MATCH ADJACENT WALL FINISH (ALKYD). WELD TO EACH FRAME. 'C' SERIES FRAME W/ SNAP ON ALUM. CASING, BY TIMELY OR EQ.
5. ALL DOORS SHALL COMPLY TO ANSI A117.1.4.13.9, LATEST ED.
6. DOOR CLOSERS SHALL NOT REQUIRE GREATER THAN 5 LBS OF FORCE TO OPERATE. DOOR CLOSERS SHALL TAKE AT LEAST 5 SECONDS TO MOVE FROM 90° TO 12°.

WINDOW SCHEDULE

MARK	OPENING WIDTH	OPENING HEIGHT	OPERATION	NOTES
1	3'-0"	5'-0"	SINGLE HUNG	
2	3'-0"	5'-0"	FIXED	
3	3'-0"	2'-6"	FIXED	
4	3'-0"	4'-0"	SINGLE HUNG	
5	3'-0"	5'-0"	SINGLE HUNG	
6	2'-0"	4'-0"	SINGLE HUNG	
7	1'-4"	2'-4"	FIXED	GABLE WINDOWS

DOOR SCHEDULE

MARK	OPENING WIDTH	OPENING HEIGHT	DOOR MATL	FRAME MATL	HDW SET	NOTES
A	3'-0"	7'-0"	HM	HM	PRIVACY	
B	3'-0"	7'-0"	HM	HM	PASSAGE	
C	3'-0"	7'-0"	HM	HM	PASSAGE	SLIDING BARN DOOR
D	3'-0"	7'-0"	HM	HM	PASSAGE	SLIDING GLASS
E	3'-0"	7'-0"	HM	HM	ENTRY	FRENCH W/ 1'-4" SIDE LIGHT
F	3'-0"	7'-0"	HM	HM	ENTRY	EXTERIOR
(E) G	3'-0"	7'-0"	HM	HM	ENTRY	EXTERIOR
H	3'-0"	7'-0"	HM	HM	PULL	BI-FOLD
I	2'-6"	7'-0"	HM	HM	PULL	BI-FOLD
(E) J	3'-0"	7'-0"	HM	HM	ENTRY	EXTERIOR, 1/2 GLASS
(E) B	2'-8"	7'-0"	HM	HM	PASSAGE	

N

WILLAMETTE ARCHITECTURE 360
800 WILLAMETTE ST., SUITE 600
EUGENE, OR 97401
(541) 636-4385
WA360USA.COM

STAMP

PROJECT NAME

POWELL & FREDRICKSON FAMILY DENTAL
582 LAUREL ST, JUNCTION CITY, OR 97448

REVISIONS

DRAWING TITLE

FLOOR PLAN

SHEET ID

A104

DATE

10/11/2021

SSW ENGINEERS INC
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(541) 485-8383 Fax (541) 485-8384

SIMPLE BEAM DESIGN, UNIFORM LOAD

Header

	Roof	Floor				
Dead load	15 psf		Doug Fir	Fb =	1350	psi
Live load	25 psf		No. 1	E =	1,600,000	psi
Trib.Area	5.00 ft.		Single	Fv =	170	psi
Span	10.00 ft.		Lat. Supported	Cd =	1.15	
				Cl =	1.00	
				Cv =	1.12	
				Fb' =	1,350	psi
				Emin =	580,000	psi
Def. = L/	360			Def =	0.33	in.
Reaction =	1,050 lb.			Weight =	210.0	plf
Moment =	2,625 ft. lb.					
Shear =	33.41 psi	OK				

Beam Size	**6x8**				
b =	5.50 in.	1.36			
d =	7.50 in.				
Sx =	51.56 in.3		Sx Req'd =	20.29 in.3	OK
Ix =	193.36 in.4		Ix Req'd =	88.60 in.4	OK
A =	41.25 in.2		Def =	0.15	
Wt =	10.03 plf		L/	786	

SIMPLE BEAM DESIGN, UNIFORM LOAD

Joists

	Roof	Floor				
Dead load	15 psf		Doug Fir	Fb =	1035	psi
Live load	100 psf		No. 2	E =	1,600,000	psi
Trib.Area	1.33 ft.		Repetetive	Fv =	180	psi
Span	11.33 ft.		Lat. Supported	Cd =	1.15	
				Cl =	1.00	
				Cv =	1.21	
				Fb' =	1,035	psi
				Emin =	580,000	psi
Def. = L/	360			Def =	0.38	in.
Reaction =	890 lb.			Weight =	157.1	plf
Moment =	2,520 ft. lb.					
Shear =	66.00 psi	OK				

Beam Size	**2x12**				
b =	1.50 in.	7.50			
d =	11.25 in.				
Sx =	31.64 in.3		Sx Req'd =	25.41 in.3	OK
Ix =	177.98 in.4		Ix Req'd =	96.36 in.4	OK
A =	16.88 in.2		Def =	0.20	
Wt =	4.10 plf		L/	665	

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SIMPLE BEAM DESIGN, UNIFORM LOAD

Floor Beams

	Roof		Floor				
Dead load	15	psf		Doug Fir	Fb =	1350	psi
Live load	100	psf		No. 1	E =	1,600,000	psi
Trib.Area	5.50	ft.		Single	Fv =	170	psi
Span	10.00	ft.		Lat. Supported	Cd =	1.15	
					Cl =	1.00	
					Cv =	1.09	
					Fb' =	1,350	psi
					Emin =	580,000	psi
Def. = L/	360				Def =	0.33	in.
Reaction =	3,226	lb.			Weight =	645.2	plf
Moment =	8,065	ft. lb.					
Shear =	77.95	psi	OK				

Beam Size	**6x10**					
b =	5.50	in.	1.73			
d =	9.50	in.				
Sx =	82.73	in.3	Sx Req'd =	62.34	in.3	OK
Ix =	392.96	in.4	Ix Req'd =	272.19	in.4	OK
A =	52.25	in.2	Def =	0.23		
Wt =	12.70	plf	L/	520		

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SSW Engineers Inc.	SHEET NO.	**11**
Junction City Dental	PROJECT NO.	**21-7918**
Junction City, OR	BY	**JSM**
Foundation Design	DATE	**11/15/21**

Square Footing

Fy=	60,000	psi	p min=	0.0033				
f'c=	3,000	psi	p max=	0.0160		**Ftg Thk=**		
ASL=	1,500	psf	Load=	6,452	lb	**1.00**	**Ft**	
DL=	15	psf	DL=	842	lb	d=		
LL=	100	psf	LL=	5,610	lb	8.50	in	
				6451.997				

Square Footing

Wdth/Lnth=	2.07	Ft	m=	23.53	Rebar	# 5
use	**2.50**	**Ft Square**	p=	0.0003	Qty	4
P net=	1,598	psf	As Reqd=	0.08	As=	0.31
M u=	3,121	ft kips	As 4/3*p=	0.11		1.23 OK
R u=	19	psi	As p min=	0.85	Spacing	8.67"on ctr
			As max=	4.09		

USE (4) #5 each way

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SSW Engineers Inc.	SHEET NO.	**12**
Junction City Dental	PROJECT NO.	**21-7918**
Junction City, OR	BY	**JSM**
Foundation Design	DATE	**11/15/21**

Continuous Footing

North and South Building Section

Roof Weight		Trib. Area		Weight Per Ft. at Wall
DL #	LL #	Length Ft.	Width Ft.	plf
15	25	12	1	**480.00**
2nd Floor		Trib. Area		Weight Per Ft. at Wall
DL #	LL #	Length Ft.	Width Ft.	plf
15	100	5.5	1	**632.50**
Wall Weight				
Height Ft.	Width Ft.	Thick In.	8 psf	Weight Per Ft. of Wall
9.1	1	5.5	8	**72.80**
			Total =	**1,185 plf**

Allowable Soil Load = 1500 psf

Required Width = 0.79 Ft. Min.Width 2'-0"

Use 2.00 Ft.

Continuous Footing

East and West Building Section

Roof Weight		Trib. Area		Weight Per Ft. at Wall
DL #	LL #	Length Ft.	Width Ft.	plf
10	25	4	1	**140.00**
1st Floor		Trib. Area		Weight Per Ft. at Wall
DL #	LL #	Length Ft.	Width Ft.	plf
15	100	1	1	**115.00**
Wall Weight				
Height Ft.	Width Ft.	Thick In.	8 psf	Weight Per Ft. of Wall
9.1	1	5.5	8	**72.80**
			Total =	**328 plf**

Allowable Soil Load = 1500 psf

Required Width = 0.22 Ft. Min.Width = 2'-0"

Use 2.00 Ft.

Company:	SSW Engineers Inc	Date:	11/23/2021
Engineer:	Jacob Mills	Page:	1/6
Project:			
Address:			
Phone:			
E-mail:			

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: Cast-in-place
Material: F1554 Grade 36
Diameter (inch): 0.625
Effective Embedment depth, h_{ef} (inch): 3.438
Anchor category: -
Anchor ductility: Yes
h_{min} (inch): 4.81
C_{min} (inch): 3.75
S_{min} (inch): 3.75

Base Material
Concrete: Normal-weight
Concrete thickness, h (inch): 18.00
State: Cracked
Compressive strength, f'_c (psi): 3000
$\Psi_{c,V}$: 1.0
Reinforcement condition: B tension, B shear
Supplemental reinforcement: Not applicable
Reinforcement provided at corners: Yes
Ignore concrete breakout in tension: Yes
Ignore concrete breakout in shear: No
Ignore 6do requirement: No
Build-up grout pad: No

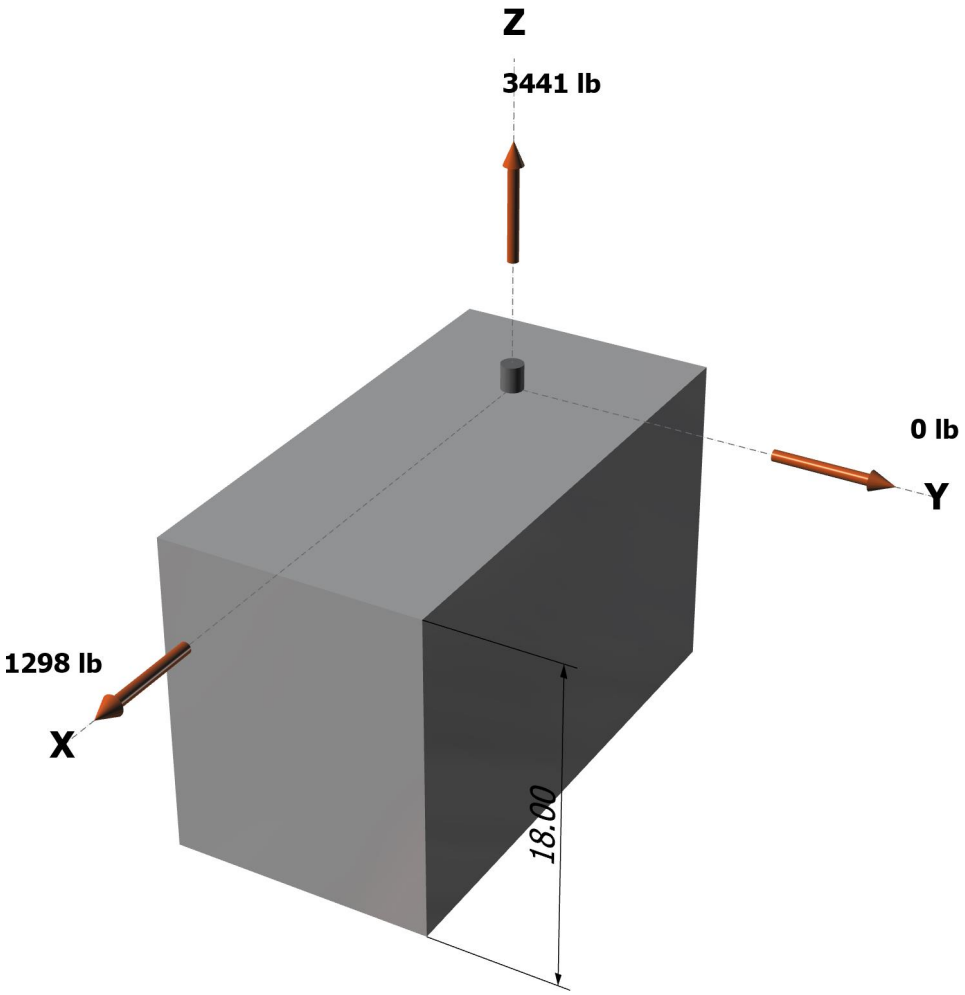
Recommended Anchor
Anchor Name: Heavy Hex Bolt - 5/8"Ø Heavy Hex Bolt, F1554 Gr. 36

Load and Geometry
Load factor source: ACI 318 Section 5.3
Load combination: not set
Seismic design: Yes
Anchors subjected to sustained tension: Not applicable
Ductility section for tension: 17.2.3.4.3 (d) is satisfied
Ductility section for shear: 17.2.3.5.3 (c) is satisfied
Ω_0 factor: not set
Apply entire shear load at front row: No
Anchors only resisting wind and/or seismic loads: Yes

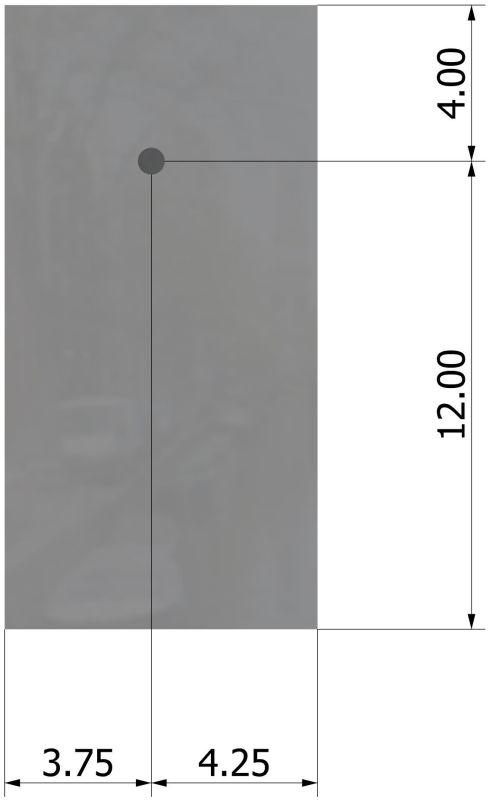
Strength level loads:

N_{ua} [lb]: 3441
V_{uax} [lb]: 1298
V_{uay} [lb]: 0

<Figure 1>



<Figure 2>



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	3441.0	1298.0	0.0	1298.0
Sum	3441.0	1298.0	0.0	1298.0

Maximum concrete compression strain (‰): 0.00
Maximum concrete compression stress (psi): 0
Resultant tension force (lb): 0
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
Eccentricity of resultant shear forces in x-axis, e'_{Vx} (inch): 0.00
Eccentricity of resultant shear forces in y-axis, e'_{Vy} (inch): 0.00

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

N_{sa} (lb)	ϕ	ϕN_{sa} (lb)
13100	0.75	9825

6. Pullout Strength of Anchor in Tension (Sec. 17.4.3)

$0.75\phi N_{pn} = 0.75\phi\Psi_{c,P}N_p = 0.75\phi\Psi_{c,P}8A_{brg}f'_c$ (Sec. 17.3.1, Eq. 17.4.3.1 & 17.4.3.4)

$\Psi_{c,P}$	A_{brg} (in^2)	f'_c (psi)	ϕ	$0.75\phi N_{pn}$ (lb)
1.0	0.67	3000	0.70	8455

8. Steel Strength of Anchor in Shear (Sec. 17.5.1)

V_{sa} (lb)	ϕ_{grout}	ϕ	$\phi_{grout}\phi V_{sa}$ (lb)
7865	1.0	0.65	5112

9. Concrete Breakout Strength of Anchor in Shear (Sec. 17.5.2)

Shear perpendicular to edge in x-direction:

$V_{bx} = \min|7(l_e / d_a)^{0.2}\sqrt{d_a}\lambda_a\sqrt{f'_c}c_{a1}^{1.5};\ 9\lambda_a\sqrt{f'_c}c_{a1}^{1.5}|$ (Eq. 17.5.2.2a & Eq. 17.5.2.2b)

l_e (in)	d_a (in)	λ_a	f'_c (psi)	c_{a1} (in)	V_{bx} (lb)
3.44	0.625	1.00	3000	12.00	17719

$\phi V_{cbx} = \phi\,(A_{Vc} / A_{Vco})\,\Psi_{ed,V}\,\Psi_{c,V}\,\Psi_{h,V}\,V_{bx}$ (Sec. 17.3.1 & Eq. 17.5.2.1a)

A_{Vc} (in^2)	A_{Vco} (in^2)	$\Psi_{ed,V}$	$\Psi_{c,V}$	$\Psi_{h,V}$	V_{bx} (lb)	ϕ	ϕV_{cbx} (lb)
144.00	648.00	0.763	1.000	1.000	17719	0.70	2102

Shear parallel to edge in x-direction:

$V_{by} = \min|7(l_e / d_a)^{0.2}\sqrt{d_a}\lambda_a\sqrt{f'_c}c_{a1}^{1.5};\ 9\lambda_a\sqrt{f'_c}c_{a1}^{1.5}|$ (Eq. 17.5.2.2a & Eq. 17.5.2.2b)

l_e (in)	d_a (in)	λ_a	f'_c (psi)	c_{a1} (in)	V_{by} (lb)
3.44	0.625	1.00	3000	3.75	3095

$\phi V_{cbx} = \phi\,(2)(A_{Vc} / A_{Vco})\,\Psi_{ed,V}\,\Psi_{c,V}\,\Psi_{h,V}\,V_{by}$ (Sec. 17.3.1, 17.5.2.1(c) & Eq. 17.5.2.1a)

A_{Vc} (in^2)	A_{Vco} (in^2)	$\Psi_{ed,V}$	$\Psi_{c,V}$	$\Psi_{h,V}$	V_{by} (lb)	ϕ	ϕV_{cbx} (lb)
54.14	63.28	1.000	1.000	1.000	3095	0.70	3708

10. Concrete Pryout Strength of Anchor in Shear (Sec. 17.5.3)

$\phi V_{cp} = \phi k_{cp} N_{cb} = \phi k_{cp}(A_{Nc} / A_{Nco})\,\Psi_{ed,N}\,\Psi_{c,N}\,\Psi_{cp,N} N_b$ (Sec. 17.3.1 & Eq. 17.5.3.1a)

k_{cp}	A_{Nc} (in^2)	A_{Nco} (in^2)	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	N_b (lb)	ϕ	ϕV_{cp} (lb)
2.0	66.00	72.25	0.965	1.000	1.000	6269	0.70	7735

11. Results

Interaction of Tensile and Shear Forces (Sec. R17.6)

Tension	Factored Load, N_{ua} (lb)	Design Strength, øN_n (lb)	Ratio	Status
Steel	3441	9825	0.35	Pass
Pullout	**3441**	**8455**	**0.41**	**Pass (Governs)**

Shear	Factored Load, V_{ua} (lb)	Design Strength, øV_n (lb)	Ratio	Status
Steel	1298	5112	0.25	Pass
T Concrete breakout x+	**1298**	**2102**	**0.62**	**Pass (Governs)**
|| Concrete breakout y-	**1298**	**3708**	**0.35**	**Pass (Governs)**
Pryout	1298	7735	0.17	Pass

Interaction check	$(N_{ua}/\phi N_{ua})^{5/3}$	$(V_{ua}/\phi V_{ua})^{5/3}$	Combined Ratio	Permissible	Status
Sec. R17.6	0.22	0.45	67.1 %	1.0	Pass

5/8"Ø Heavy Hex Bolt, F1554 Gr. 36 with hef = 3.438 inch meets the selected design criteria.

12. Warnings

- Concrete breakout strength in tension has not been evaluated against applied tension load(s) per designer option. Refer to ACI 318 Section 17.3.2.1 for conditions where calculations of the concrete breakout strength may not be required.

- Per designer input, ductility requirements for tension have been determined to be satisfied – designer to verify.

- Per designer input, ductility requirements for shear have been determined to be satisfied – designer to verify.

- Designer must exercise own judgement to determine if this design is suitable.

Company:	SSW Engineers Inc	Date:	11/23/2021
Engineer:	Jacob Mills	Page:	1/6
Project:			
Address:			
Phone:			
E-mail:			

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): 12.250
Code report: ICC-ES ESR-4057
Anchor category: -
Anchor ductility: Yes
h_{min} (inch): 13.63
c_{ac} (inch): 32.55
C_{min} (inch): 1.75
S_{min} (inch): 3.00

Base Material
Concrete: Normal-weight
Concrete thickness, h (inch): 18.00
State: Cracked
Compressive strength, f'_c (psi): 3000
$\Psi_{c,V}$: 1.0
Reinforcement condition: B tension, B shear
Supplemental reinforcement: Not applicable
Reinforcement provided at corners: Yes
Ignore concrete breakout in tension: Yes
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

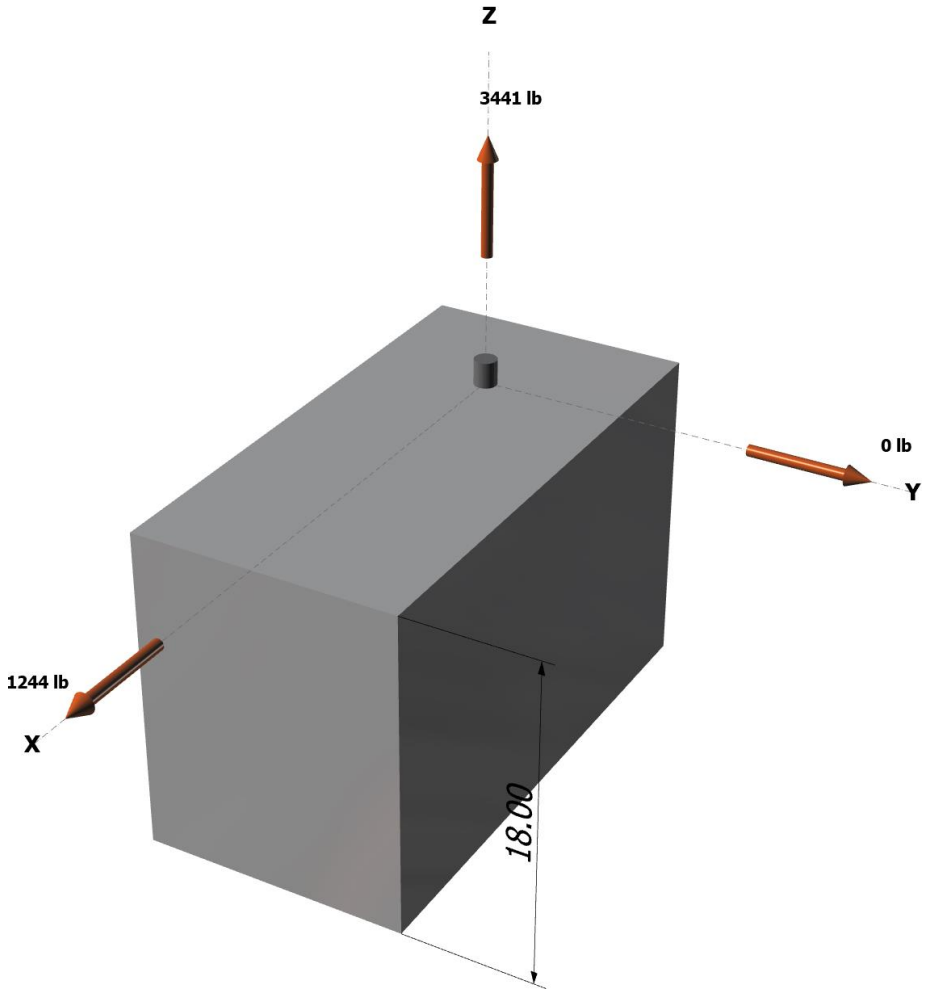
Recommended Anchor
Anchor Name: SET-3G - SET-3G w/ 5/8"Ø F1554 Gr. 36
Code Report: ICC-ES ESR-4057

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: 17.2.3.4.3 (d) is satisfied
Ductility section for shear: 17.2.3.5.3 (c) is satisfied
Ω_0 factor: not set
Apply entire shear load at front row: No
Anchors only resisting wind and/or seismic loads: Yes

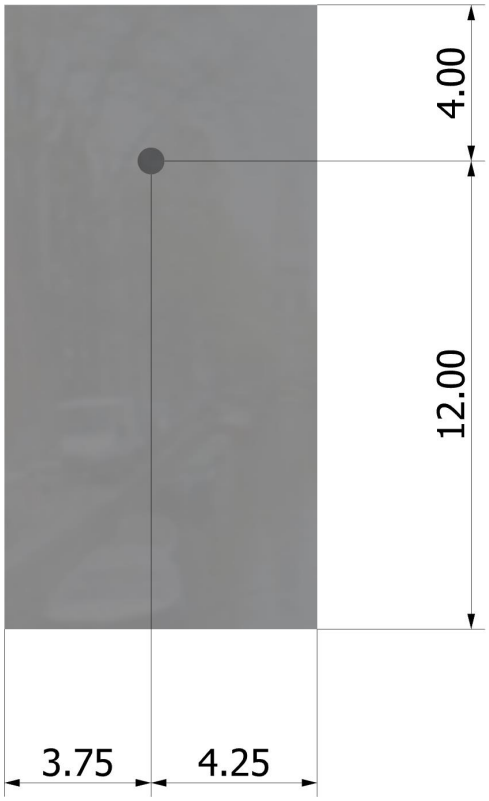
Strength level loads:

N_{ua} [lb]: 3441
V_{uax} [lb]: 1244
V_{uay} [lb]: 0

<Figure 1>



<Figure 2>



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	3441.0	1244.0	0.0	1244.0
Sum	3441.0	1244.0	0.0	1244.0

Maximum concrete compression strain (‰): 0.00
Maximum concrete compression stress (psi): 0
Resultant tension force (lb): 0
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
Eccentricity of resultant shear forces in x-axis, e'_{Vx} (inch): 0.00
Eccentricity of resultant shear forces in y-axis, e'_{Vy} (inch): 0.00

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

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

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

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

$\tau_{k,cr}$ (psi)	$f_{short\text{-}term}$	K_{sat}	$\alpha_{N.seis}$	f'_c (psi)	n	$\tau_{k,cr}$ (psi)
1356	1.00	1.00	1.00	3000	0.24	1417

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

λ_a	τ_{cr} (psi)	d_a (in)	h_{ef} (in)	N_{ba} (lb)
1.00	1417	0.63	12.250	34074

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

A_{Na} (in^2)	A_{Na0} (in^2)	c_{Na} (in)	$c_{a,min}$ (in)	$\Psi_{ed,Na}$	$\Psi_{p,Na}$	N_{a0} (lb)	ϕ	$0.75\phi N_a$ (lb)
102.10	307.10	8.76	3.75	0.828	1.000	34074	0.65	4575

8. Steel Strength of Anchor in Shear (Sec. 17.5.1)

V_{sa} (lb)	ϕ_{grout}	ϕ	$\alpha_{V,seis}$	$\phi_{grout}\alpha_{V,seis}\phi V_{sa}$ (lb)
7865	1.0	0.65	0.75	3834

9. Concrete Breakout Strength of Anchor in Shear (Sec. 17.5.2)

Shear perpendicular to edge in x-direction:

$V_{bx} = \min|7(l_e / d_a)^{0.2}\sqrt{d_a}\lambda_a\sqrt{f'_c}c_{a1}^{1.5};\ 9\lambda_a\sqrt{f'_c}c_{a1}^{1.5}|$ (Eq. 17.5.2.2a & Eq. 17.5.2.2b)

l_e (in)	d_a (in)	λ_a	f'_c (psi)	c_{a1} (in)	V_{bx} (lb)
5.00	0.625	1.00	3000	12.00	19098

$\phi V_{cbx} = \phi\,(A_{Vc} / A_{Vco})\,\Psi_{ed,V}\,\Psi_{c,V}\,\Psi_{h,V}V_{bx}$ (Sec. 17.3.1 & Eq. 17.5.2.1a)

A_{Vc} (in^2)	A_{Vco} (in^2)	$\Psi_{ed,V}$	$\Psi_{c,V}$	$\Psi_{h,V}$	V_{bx} (lb)	ϕ	ϕV_{cbx} (lb)
144.00	648.00	0.763	1.000	1.000	19098	0.70	2265

Shear parallel to edge in x-direction:

$V_{by} = \min|7(l_e / d_a)^{0.2}\sqrt{d_a}\lambda_a\sqrt{f'_c}c_{a1}^{1.5};\ 9\lambda_a\sqrt{f'_c}c_{a1}^{1.5}|$ (Eq. 17.5.2.2a & Eq. 17.5.2.2b)

l_e (in)	d_a (in)	λ_a	f'_c (psi)	c_{a1} (in)	V_{by} (lb)
5.00	0.625	1.00	3000	3.75	3336

$\phi V_{cbx} = \phi\,(2)(A_{Vc} / A_{Vco})\,\Psi_{ed,V}\,\Psi_{c,V}\,\Psi_{h,V}V_{by}$ (Sec. 17.3.1, 17.5.2.1(c) & Eq. 17.5.2.1a)

A_{Vc} (in^2)	A_{Vco} (in^2)	$\Psi_{ed,V}$	$\Psi_{c,V}$	$\Psi_{h,V}$	V_{by} (lb)	ϕ	ϕV_{cbx} (lb)
54.14	63.28	1.000	1.000	1.000	3336	0.70	3996

10. Concrete Pryout Strength of Anchor in Shear (Sec. 17.5.3)

$\phi V_{cp} = \phi \min|k_{cp}N_a\ ;\ k_{cp}N_{cb}| = \phi \min|k_{cp}(A_{Na} / A_{Na0})\,\Psi_{ed,Na}\,\Psi_{cp,Na}N_{ba}\ ;\ k_{cp}(A_{Nc} / A_{Nco})\,\Psi_{ed,N}\,\Psi_{c,N}\,\Psi_{cp,N}N_b|$ (Sec. 17.3.1 & Eq. 17.5.3.1a)

k_{cp}	A_{Na} (in^2)	A_{Na0} (in^2)	$\Psi_{ed,Na}$	$\Psi_{cp,Na}$	N_{ba} (lb)	N_a (lb)
2.0	102.10	307.10	0.828	1.000	34074	9384

A_{Nc} (in^2)	A_{Nco} (in^2)	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	N_b (lb)	N_{cb} (lb)	ϕ	ϕV_{cp} (lb)
128.00	576.00	0.794	1.000	1.000	21069	3716	0.70	5203

11. Results

Interaction of Tensile and Shear Forces (Sec. R17.6)

Tension	Factored Load, N_{ua} (lb)	Design Strength, øN_n (lb)	Ratio	Status
Steel	3441	9833	0.35	Pass
Adhesive	**3441**	**4575**	**0.75**	**Pass (Governs)**

Shear	Factored Load, V_{ua} (lb)	Design Strength, øV_n (lb)	Ratio	Status
Steel	1244	3834	0.32	Pass
T Concrete breakout x+	**1244**	**2265**	**0.55**	**Pass (Governs)**
|| Concrete breakout y-	**1244**	**3996**	**0.31**	**Pass (Governs)**
Pryout	1244	5203	0.24	Pass

Interaction check	$(N_{ua}/\phi N_{ua})^{5/3}$	$(V_{ua}/\phi V_{ua})^{5/3}$	Combined Ratio	Permissible	Status

Sec. R17.6	0.62	0.37	99.0 %	1.0	Pass

SET-3G w/ 5/8"Ø F1554 Gr. 36 with hef = 12.250 inch meets the selected design criteria.

12. Warnings

- Concrete breakout strength in tension has not been evaluated against applied tension load(s) per designer option. Refer to ACI 318 Section 17.3.2.1 for conditions where calculations of the concrete breakout strength may not be required.

- Per designer input, ductility requirements for tension have been determined to be satisfied – designer to verify.

- Per designer input, ductility requirements for shear have been determined to 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.