hi 5 WEED HOUSING

CALIFORNIA POLYTECHNIC STATE UNIVERSITY, SAN LUIS OBISPO

DECEMBER 2017

PROJECT BY

PAUL PONCIANO

IN ASSOCIATION WITH

QUINN WALSH, BONNIE CASTRO, RIWANE KRIMAT, TESS RADISCH

About the Project

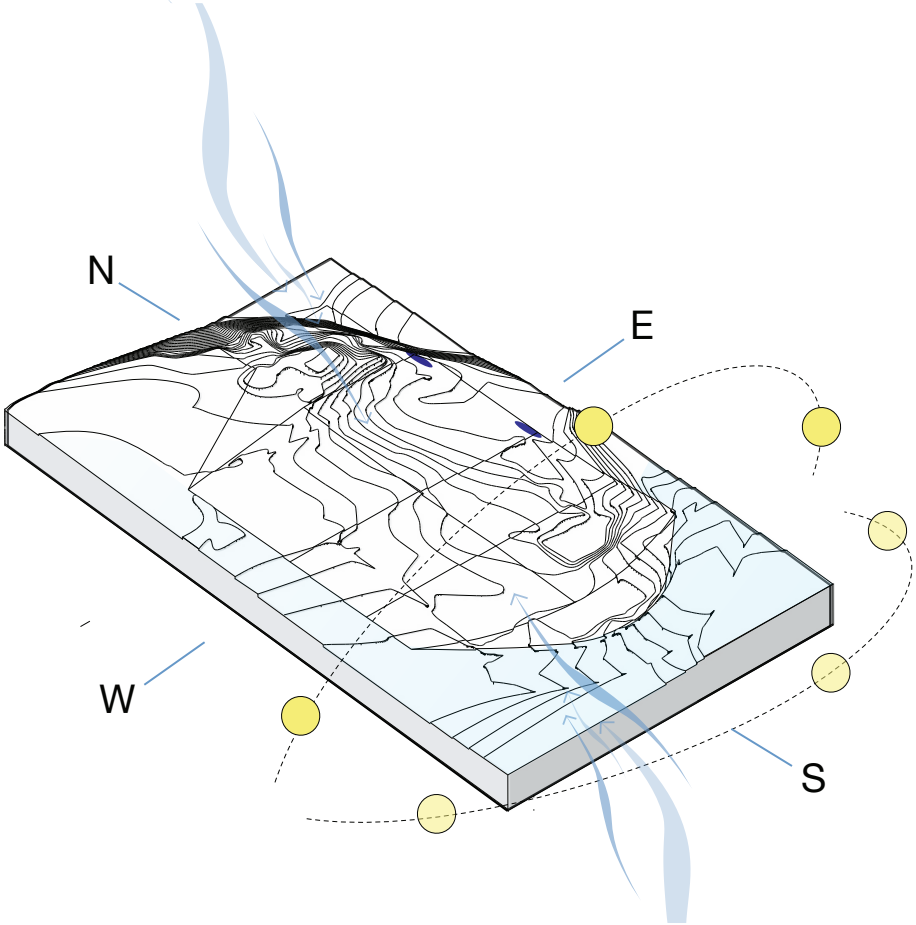
In 2014, the Boles Fire left parts of the city of Weed, California destroyed in it's wake. Where a building once stood before the fire, Great Northern Services is seeking to develop single-family homes to reinvigorate growth in the area. GNS is a non-profit organization committed to the growth and development of the local areas through various methods.

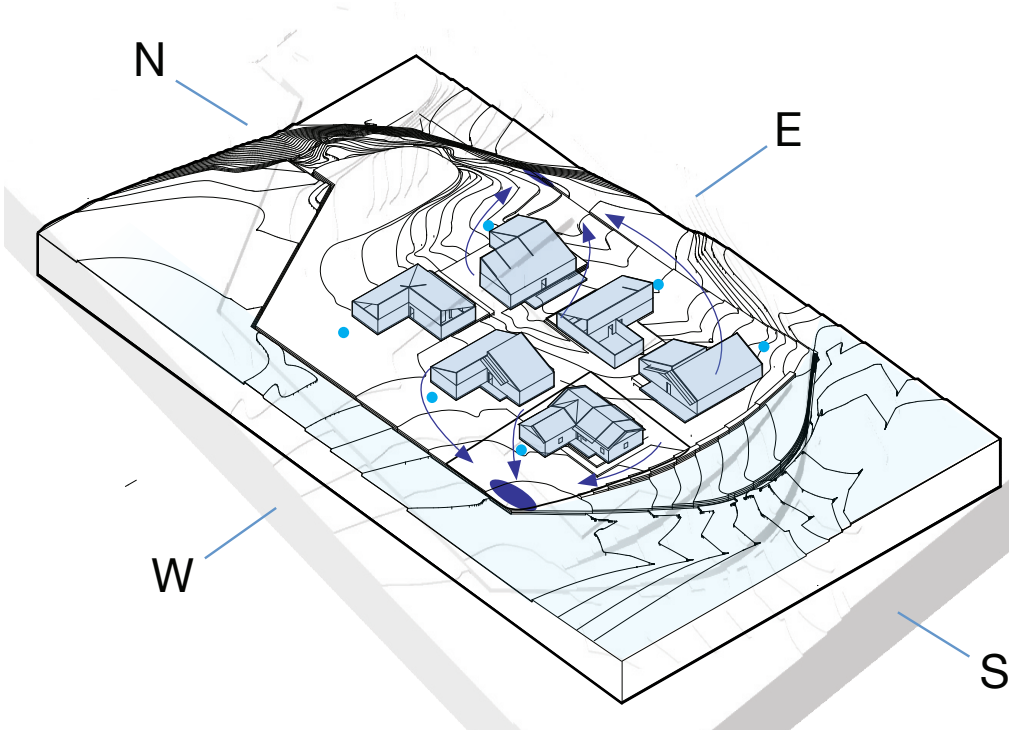
Our Role

In the spirit of growth and development, Cal Poly's 2017 IPD Studio worked in conjunction with GNS to design the single family homes. The designs were mainly driven with resiliency, comfort, and affordability in mind. Approaching the task with an integrated project delivery method cultivates meaningful collaboration that ultimately improves deliverable quality.

The Process

After a long road trip to Weed, a visit to our site and meeting GNS, our team began design development in our own fields. Our team met consistently to bounce ideas off of each other to avoid future pitfalls. Over the course of 10 weeks our team developed our design with feedback from various check-ins. This project is my contribution as the engineering party in the IPD process.





SITE CONSIDERATIONS

11’-0” 8’-0” 17’-0” 11’-0”

8’-0” 4’-0” 4’-0” 8’-0” 22’-0”

Bedroom
132 sqft.

Bath Room
64 sqft.

Book Shelf

Closet

Closet

Kitchen / Living Room
408 sqft.

Master Bed Room
176 sqft.

Closet

Master Bath Room
77 sqft.

Bedroom
132 sqft.

Storage

Mud Room
64 sqft.

Pantry

Garage
440 sqft.

A1 B1 C1 C2 C3 C4

N

1/4”=1’0” Floor Plan

TOTAL SQUARE FOOTAGE:

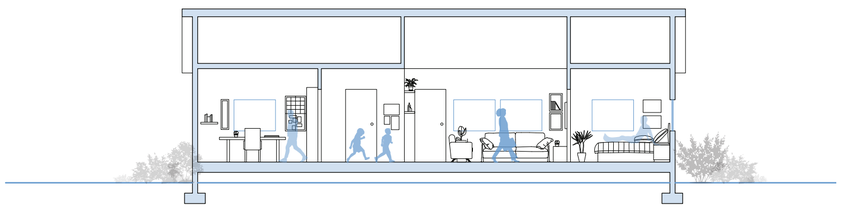
1,053 sqft. w/o garage
1,493 sqft. w/ garage

COST PER SQUARE FOOT:

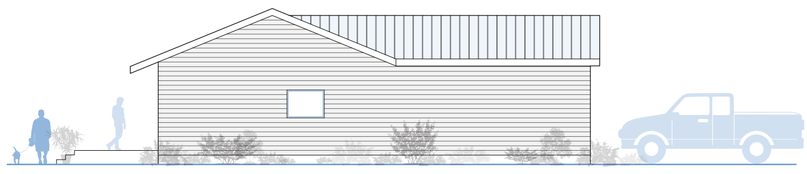
$121.35 / sqft
(optimistic: $115.28)

TOTAL UNIT COST:

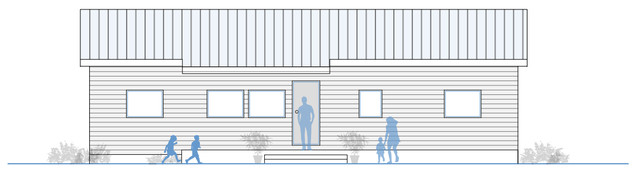
$172,113.04



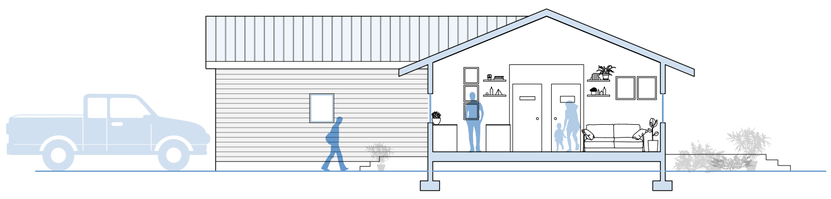
North/South Section A1



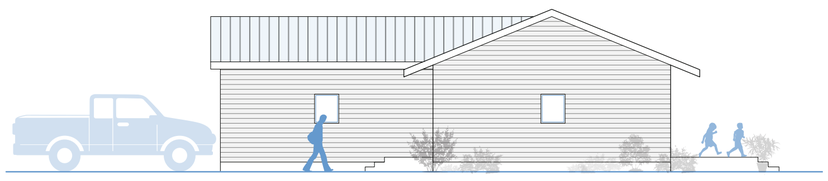
North Elevation



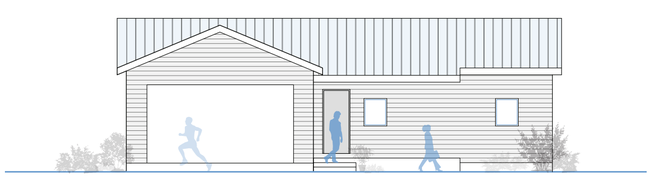
East Elevation



East/West Section B1



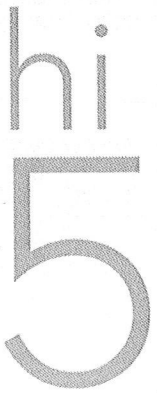
South Elevation



West Elevation

Calculation Package

Cal Poly IPD Studio
Prepared by
Paul Ponciano



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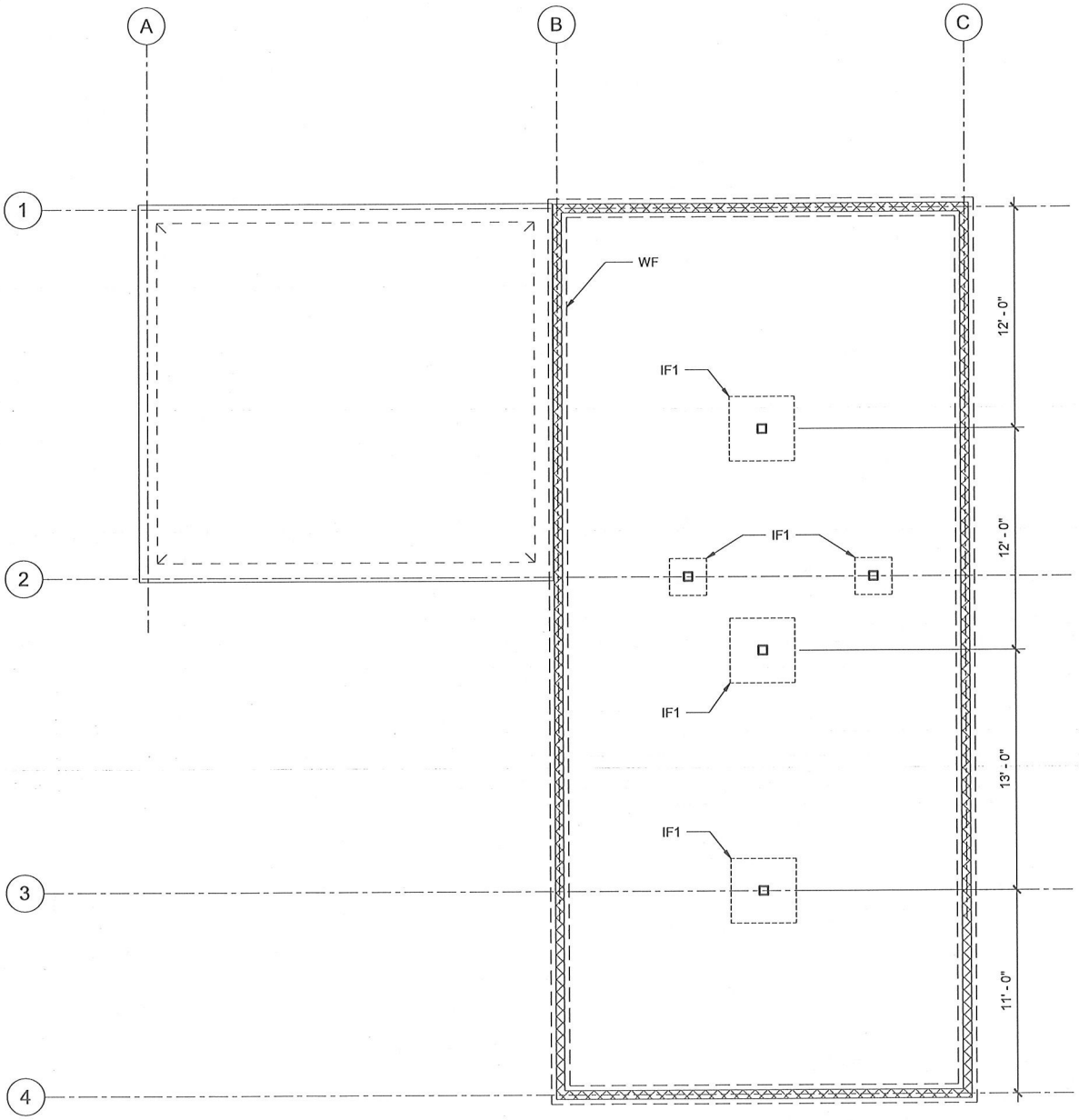
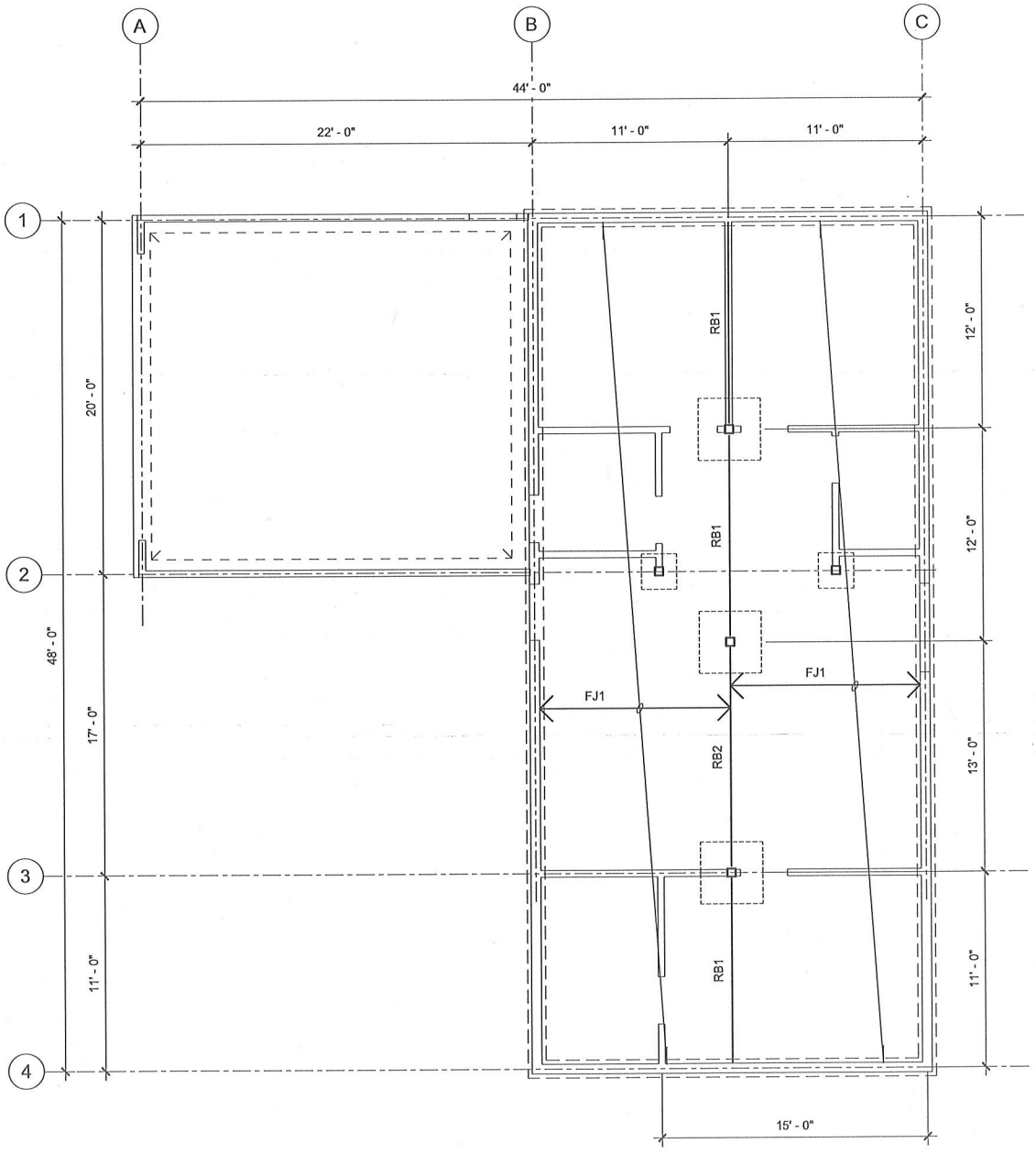
PROJECT DATA

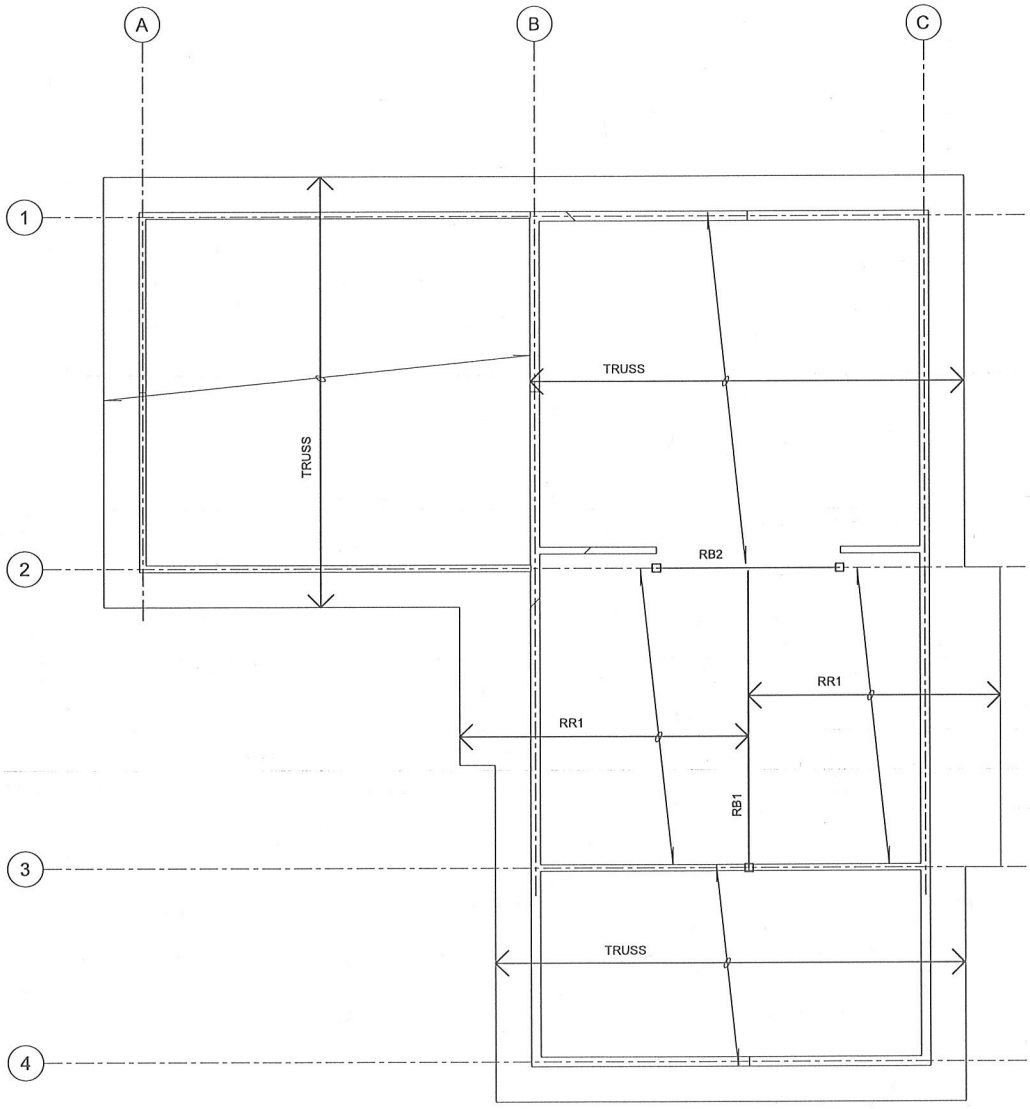
Location:	780 S. Davis Street, Weed, Ca
Owner:	Great Northern Services
Architect:	Hi 5
Codes:	2015 IBC ASCE 7-10 NDS 2015
Materials:	Wooden: Roof, floors, walls Concrete Footings CMU stem wall



FOUNDATION KEY PLAN



FLOOR KEY PLAN



ROOF KEY PLAN

SNOW LOAD

FLAT ROOF SNOW LOAD $P_f = 60$ psf ∴ PER MT. SHASTA DESIGN CRITERIA

C_s (PER ASCE 7-10, SEC 7.4)

→ C_s FOR TRUSS ROOFS

$C_t > 1.0$ → FIG 7-2b → ANGLE = 22.6° (5 TO 12)

$C_s = 1.0$ (SOLID LINE, NON-SLIPPERY ROOF)

→ C_s FOR RAFTERS

$C_t \leq 1.0$ → FIG 7-2a → ANGLE = 22.6° (5 TO 12)

$C_s = 1.0$ (SOLID LINE, NON-SLIPPERY ROOF)

$P_s = C_s P_f$ (EQ 7.4-1)

→ FOR TRUSSES & RAFTERS

$P_s = 1.0\,(60\text{psf}) = 60$ psf (ACTS ON HORIZONTAL PROJECTION)

hi 5	PROJECT: IPD	PREPARED BY: PAUL PONCIANO	
	SUBJECT: LOADS	DATE:	SHEET: L-2
	GNS WEED HOUSING PROJECT		

ROOF DEAD LOAD TAKE OFF

Roofing	2.0 psf
Sheathing (1/2" Plywood)	2.0 psf
Insulation (6" Fiberglass Batting)	1.0 psf
1/2" Gyp Board ceiling	1.6 psf
MEP & Misc. (Sprinklers)	2.0 psf
Joists/Trusses	3.0 psf
	11.6 psf (Joists, Trusses)
Beam	1.0 psf
	12.6 psf (Beam)
Column	1.0 psf

Total Roof Dead Load	**13.6 psf**
Roof Live Load	**20.0 psf**
Roof Snow Load	**60.0 psf**
Roof Area	**2034.0 ft^2**
Roof Weight	**27662.4 lbs**

FLOOR DEAD LOAD TAKE OFF

Partition Walls	3.1 psf	(Verified below)
Flooring (Vinyl tile)	2.0 psf	
Sheathing	2.5 psf	
MEP & Misc.	3.0 psf	
Joists	3.0 psf	
	13.6 psf (Joists)	
Beams	1.4 psf	

Total Floor Dead Load	**15.0 psf**
Residential Live Load	**40.0 psf**
Floor Area	**1592.0 ft^2**
Floor Weight	**23880.0 lbs**

hi 5	PROJECT: IPD	PREPARED BY: PAUL PONCIANO	
	SUBJECT: LOADS	DATE:	SHEET: L-3
	GNS WEED HOUSING PROJECT		

WALL WEIGHT TAKE OFF

6-inch Masonry Wall	57.0 psf

EXTERIOR WOOD WALLS

1/2" Gypsum Board	2.5 psf
1/2" PLYWOOD	1.5 psf
2x6 STUDS @ 16" o.c.	1.6 psf
HardiePlank	2.3 psf
MEP & Misc.	1.0 psf
Total Unit Weight	**9 psf**
Wall Space (Roof)	**696 ft^2**
Total Weight (@Roof)	**6264 lb**
Wall Space (Floor)	**576 ft^2**
Total Weight (@Floor)	**5184 lb**

INTERIOR WOOD WALLS

1/2" Gypsum Board (x2)	3.2 psf
MEP & Misc.	1.0 psf
2x4 STUDS @ 16" o.c.	1.1 psf
Total Unit Weight	**6 psf**
Seismic Wall Space (Roof)	**416 ft^2**
Seismicl Weight (@Roof)	**2496 lb**
Weight Wall Space (Floor)	**832 ft^2**
Total Weight (@Floor)	**4992 lb** →

3.1 psf (Partition wall load)

WEIGHT AT ROOF (SEISMIC)

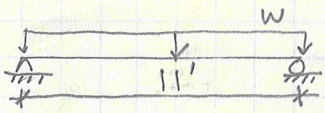
Roof Weight	27662.4 lbs
Exterior Wall Weight	6264.0 lbs
Interior Wall Weight	2496.0 lbs
Total Weight at Roof	**36422.4** lbs

WEIGHT AT FLOOR (SEISMIC)

Floor Weight	23880.0 lbs
Exterior Wall Weight	5184.0 lbs
Interior Wall Weight	2496.0 lbs
Total Weight at Floor	**31560.0** lbs
Total Weight	67982.4 lbs

MEMBER LOADING – SEE Pg. ____ FOR SIZING

RR1



SPACING = 16"
L_r = 20 psf
D = 12 psf
S = 60 psf

$D + L_r$ = 32 psf, w = 42.67 plf, C_D = 1.25

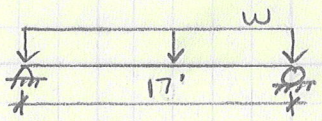
w/C_D = 34.13 plf

D+S = 72 psf, w = 96 plf, C_D = 1.15

w/C_D = 83.5 plf * D+S GOVERNS FOR F_b

MEMBER SIZE: 2×8 @ 16" O/C DF#1, SEE Pg. C-4

RB1



TRIB WIDTH = 12'
L_r = 20 psf
D = 13 psf
S = 60 psf

$D + L_r$ = 33 psf, w = 363 plf, C_D = 1.25

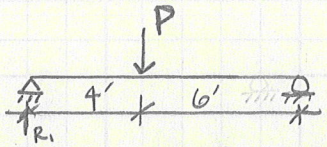
w/C_D = 290.4 plf

D+S = 73 psf, w = 803 plf, C_D = 1.15

w/C_D = 698.3 plf *GOVERNS FOR F_b

MEMBER SIZE: 6×16 SELECT STRUCTURAL, SEE Pg. C-5

RB2



$R_1 = \frac{P(6)}{10} = 3559.8$ lbs

P = REACTION FROM RB1

$= \frac{wl}{2} = \frac{698\,plf\,(17')}{2}$

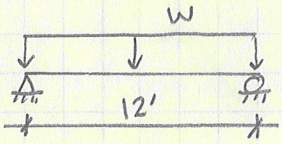
$M_u = 14239$ lbft

↑ INPUT DIRECTLY INTO EXCEL

P = 5933 lbs (D+S, $C_D = 1.15$)

MEMBER SIZE: 6×12 DF #1, SEE Pg. C-6

FJ1

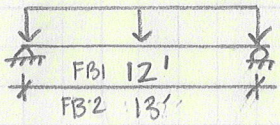


SPACING = 16"
L = 40 psf
D = 14 psf

D+L = 55 psf, w = 55 plf

MEMBER SIZE: 2×8 DF #1, SEE Pg. C-7

FB1
FB2



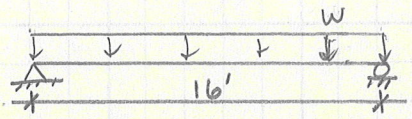
TRIB WIDTH = 11'
L = 40 psf
D = 15 psf

D+L = 55 psf, w = 605 plf

MEMBER SIZE: FB1 6×12 DF #1, SEE Pg. C-8

FB2 6×12 DF #1, SEE Pg. C-9

RH1 - GARAGE HEADER



TRUSS SPACING = 16"

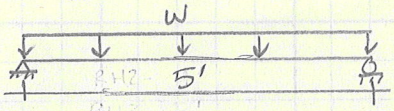
L_r = 20 psf
D = 14 psf , 6 psf for walls
S = 60 psf

$w = 74\,psf\left(\frac{8'-4''}{12}\right) + 6\,psf\,(4') = \underline{147.3\ PLF}$ ← INPUT INTO EXCEL, w(D+L)

(8'-4" = SPACING OF TRUSSES + OVERHANG)

MEMBER SIZE : 6x8 DF#1 , SEE Pg. G-10

RH2 - TYPICAL HEADER, WORST CASE



T_w = 5.5'

L_r = 20 psf
D = 14 psf , 6 psf for Walls
S = 60 psf

$w = 74\,psf\,(5.5') + 6\,psf\,(3') = \underline{425\ plf}$ ← INPUT INTO EXCEL, w(D+L)

MEMBER SIZE : 6x6 DF#1 , SEE Pg. G-11

hi 5	PROJECT: IPD	PREPARED BY: PAUL PONCIANO	
	SUBJECT: GRAVITY	DATE:	SHEET: G-4
	GNS WEED HOUSING PROJECT		

Indicates User Input

Member: RR1 - Roof Rafter

STEP 1 - General Information

D	=	12 psf
L (Snow governs)	=	60 psf
Span	=	11 ft
Spacing	=	1.33 ft
Δ max (L)	=	0.55 in
Δ max (D+L)	=	0.7333333 in
w (L)	=	79.8 plf
w (0.5D+L)	=	87.78 plf
w (D+L)	=	95.76 plf
w (L)/ Δ (L)	=	1741.0909 *
w (0.5D+L)/ Δ (D +L)	=	1436.4
Species and Type:		*DF #1*
Fb	=	1000 psi
Fv	=	180 psi
E	=	1700000 psi
* This case governs for deflection		

STEP 2 - Trial Size (Δ Driven)

E' = E * Cm * Ct * Ci			
Cm	=	1.00	
Ct	=	1.00	
Ci	=	1.00	
E'	=	1700000 psi	
Trial Member			
I req	=	28.12	in4
Member Size:		*2 x 8*	
Actual		1.5 in	7.25 in
Ixx	=	47.6 in4	
S	=	13.1 in3	
A	=	10.9 in2	

Ixx > Ireq? YES

STEP 3 - Moment Capacity

F'b = Fb * Cd * Cm * Ct * CL * CF * Cfu * Ci * Cr								fb = (Mu * 12)/S	
Cd =	1.15	CL =	1.00	Ci =	1.00			Mu =	1448 lbft
Cm =	1.00	CF =	1.20	Cr =	1.15			S =	13.1 in3
Ct =	1.00	Cfu =	1.00	F'b =	1587	psi		fb =	1323 psi

F'b > fb? YES

STEP 4 - Shear Capacity

F'v = Fv * Cd * Cm * Ct *Ci						fv = 1.5 * (V/A)	
Cd =	1.15	Ct =	1.00			Vu =	526.7 lbs
Cm =	1.00	Ci =	1.00			A =	10.9 in2
		F'v =	207 psi			fv =	72.6 psi

F'v > fv? YES

hi 5	PROJECT: IPD	PREPARED BY: PAUL PONCIANO	
	SUBJECT: GRAVITY	DATE:	SHEET: C-5
	GNS WEED HOUSING PROJECT		

Indicates User Input

Member: RB1 - Roof Beam

STEP 1 - General Information

D	=	13 psf
L (Snow governs)	=	60 psf
Span	=	17 ft
Spacing	=	11 ft
Δ max (L)	=	0.85 in
Δ max (D+L)	=	1.1333333 in
w (L)	=	660 plf
w (0.5D+L)	=	731.5 plf
w (D+L)	=	803 plf
w (L)/ Δ (L)	=	9317.6471 *
w (0.5D+L)/ Δ (D +L)	=	7745.2941
Species and Type:		*Select Struct*
Fb	=	1600 psi
Fv	=	170 psi
E	=	1600000 psi
* This case governs for deflection		

STEP 2 - Trial Size (Δ Driven)

E' = E * Cm * Ct * Ci			
Cm	=	1.00	
Ct	=	1.00	
Ci	=	1.00	
E'	=	1600000 psi	
Trial Member			
I req	=	911.98	in4
Member Size:		*6 x 16*	
Actual		5.5 in	15.5 in
Ixx	=	1706.8	in4
S	=	220.2	in3
A	=	85.3	in2

Ixx > Ireq? YES

STEP 3 - Moment Capacity

F'b = Fb * Cd * Cm * Ct * CL * CF * Cfu * Ci * Cr								fb = (Mu * 12)/S		
Cd =	1.15	CL =	1.00	Ci =	1.00			Mu =	29008	lbft
Cm =	1.00	CF =	1.00	Cr =	1.00			S =	220.2	in3
Ct =	1.00	Cfu =	1.00	F'b =	1840	psi		fb =	1581	psi

F'b > fb? YES

STEP 4 - Shear Capacity

F'v = Fv * Cd * Cm * Ct *Ci						fv = 1.5 * (V/A)	
Cd =	1.15	Ct =	1.00			Vu =	6825.5 lbs
Cm =	1.00	Ci =	1.00			A =	85.3 in2
		F'v =	196 psi			fv =	120.1 psi

F'v > fv? YES

hi 5	PROJECT: IPD	PREPARED BY: PAUL PONCIANO	
	SUBJECT: GRAVITY	DATE:	SHEET: C-6
	GNS WEED HOUSING PROJECT		

Indicates User Input

Member: RB2 - Roof Beam 2

STEP 1 - General Information

D	=	13.0 psf
L (Nonreducible)	=	60 psf
Span	=	10 ft
Spacing	=	8.5 ft
Δ max (L)	=	0.5 in
Δ max (D+L)	=	0.6666667 in
P (L)	=	5100 lb
P (0.5D+L)	=	5652.5 lb
w (D+L)	=	6205 lb
w (L)/ Δ (L)	=	122400 *
w (0.5D+L)/ Δ (D +L)	=	101745
Species and Type:		*DF #1*
Fb	=	1350 psi
Fv	=	170 psi
E	=	1700000 psi
* This case governs for deflection		

STEP 2 - Trial Size (Δ Driven)

E' = E * Cm * Ct * Ci			
Cm	=	1.00	
Ct	=	1.00	
Ci	=	1.00	
E'	=	1700000 psi	
Trial Member			
I req	=	135.00	in4
Member Size:		*6 x 12*	
Actual		5.5 in	11.5 in
Ixx	=	697.1 in4	
S	=	121.2 in3	
A	=	63.3 in2	

Ixx > Ireq? YES

STEP 3 - Moment Capacity

F'b = Fb * Cd * Cm * Ct * CL * CF * Cfu * Ci * Cr								fb = (Mu * 12)/S		
Cd =	1.15	CL =	1.00	Ci =	1.00			Mu =	14239	lbft
Cm =	1.00	CF =	1.00	Cr =	1.00			S =	121.2	in3
Ct =	1.00	Cfu =	1.00	F'b =	1553	psi		fb =	1409	psi

F'b > fb? YES

STEP 4 - Shear Capacity

F'v = Fv * Cd * Cm * Ct *Ci						fv = 1.5 * (V/A)	
Cd =	1.15	Ct =	1.00			Vu =	3102.5 lbs
Cm =	1.00	Ci =	1.00			A =	63.3 in2
		F'v =	196 psi			fv =	73.6 psi

F'v > fv? YES

hi 5	PROJECT: IPD	PREPARED BY: PAUL PONCIANO	
	SUBJECT: GRAVITY	DATE:	SHEET: C-7
	GNS WEED HOUSING PROJECT		

Indicates User Input

Member: FJ1 - Floor Joist 1

STEP 1 - General Information

D	=	14 psf
L	=	40 psf
Span	=	12 ft
Spacing	=	1.33 ft
Δ max (L)	=	0.6 in
Δ max (D+L)	=	0.8 in
w (L)	=	53.2 plf
w (0.5D+L)	=	62.51 plf
w (D+L)	=	71.82 plf
w (L)/ Δ (L)	=	1064 *
w (0.5D+L)/ Δ (D +L)	=	937.65
Species and Type:		*DF #1*
Fb	=	1000 psi
Fv	=	180 psi
E	=	1700000 psi
* This case governs for deflection		

STEP 2 - Trial Size (Δ Driven)

E' = E * Cm * Ct * Ci			
Cm	=	1.00	
Ct	=	1.00	
Ci	=	1.00	
E'	=	1700000 psi	
Trial Member			
I req	=	24.33	in4
Member Size:		*2 x 8*	
Actual		1.5 in	7.25 in
Ixx	=	47.6 in4	
S	=	13.1 in3	
A	=	10.9 in2	

Ixx > Ireq? YES

STEP 3 - Moment Capacity

F'b = Fb * Cd * Cm * Ct * CL * CF * Cfu * Ci * Cr								fb = (Mu * 12)/S	
Cd =	1.00	CL =	1.00	Ci =	1.00			Mu =	1293 lbft
Cm =	1.00	CF =	1.30	Cr =	1.15			S =	13.1 in3
Ct =	1.00	Cfu =	1.15	F'b =	1719	psi		fb =	1181 psi

F'b > fb? YES

STEP 4 - Shear Capacity

F'v = Fv * Cd * Cm * Ct *Ci						fv = 1.5 * (V/A)	
Cd =	1.00	Ct =	1.00			Vu =	430.9 lbs
Cm =	1.00	Ci =	1.00			A =	10.9 in2
		F'v =	180 psi			fv =	59.4 psi

F'v > fv? YES

hi 5	PROJECT: IPD	PREPARED BY: PAUL PONCIANO	
	SUBJECT: GRAVITY	DATE:	SHEET: C-8
	GNS WEED HOUSING PROJECT		

Indicates User Input

Member: FB1 - Floor Beam 1

STEP 1 - General Information

D	=	15 psf
L	=	40 psf
Span	=	12 ft
Spacing	=	11 ft
Δ max (L)	=	0.6 in
Δ max (D+L)	=	0.8 in
w (L)	=	440 plf
w (0.5D+L)	=	522.5 plf
w (D+L)	=	605 plf
w (L)/ Δ (L)	=	8800 *
w (0.5D+L)/ Δ (D +L)	=	7837.5
Species and Type:		DF #1
Fb	=	1350 psi
Fv	=	170 psi
E	=	1600000 psi
* This case governs for deflection		

STEP 2 - Trial Size (Δ Driven)

E' = E * Cm * Ct * Ci			
Cm	=	1.00	
Ct	=	1.00	
Ci	=	1.00	
E'	=	1600000 psi	
Trial Member			
I req	=	213.84	in4
Member Size:		6 x 12	
Actual		5.5 in	11.5 in
Ixx	=	697.1 in4	
S	=	121.2 in3	
A	=	63.3 in2	

Ixx > Ireq? YES

STEP 3 - Moment Capacity

F'b = Fb * Cd * Cm * Ct * CL * CF * Cfu * Ci * Cr								fb = (Mu * 12)/S
Cd =	1.00	CL =	1.00	Ci =	1.00			Mu = 10890 lbft
Cm =	1.00	CF =	1.00	Cr =	1.00			S = 121.2 in3
Ct =	1.00	Cfu =	1.00	F'b =	1350	psi		fb = 1078 psi

F'b > fb? YES

STEP 4 - Shear Capacity

F'v = Fv * Cd * Cm * Ct *Ci						fv = 1.5 * (V/A)	
Cd =	1.00	Ct =	1.00			Vu =	3630.0 lbs
Cm =	1.00	Ci =	1.00			A =	63.3 in2
		F'v =	170 psi			fv =	86.1 psi

F'v > fv? YES

hi 5	PROJECT: IPD	PREPARED BY: PAUL PONCIANO	
	SUBJECT: GRAVITY	DATE:	SHEET: C-9
	GNS WEED HOUSING PROJECT		

Indicates User Input

Member: FB2 - Floor Beam 2

STEP 1 - General Information

D	=	15 psf
L	=	40 psf
Span	=	13 ft
Spacing	=	11 ft
Δ max (L)	=	0.65 in
Δ max (D+L)	=	0.8666667 in
w (L)	=	440 plf
w (0.5D+L)	=	522.5 plf
w (D+L)	=	605 plf
w (L)/ Δ (L)	=	8123.0769 *
w (0.5D+L)/ Δ (D +L)	=	7234.6154
Species and Type:		*DF #1*
Fb	=	1350 psi
Fv	=	170 psi
E	=	1600000 psi
* This case governs for deflection		

STEP 2 - Trial Size (Δ Driven)

E' = E * Cm * Ct * Ci			
Cm	=	1.00	
Ct	=	1.00	
Ci	=	1.00	
E'	=	1600000 psi	
Trial Member			
I req	=	271.88	in4
Member Size:		*6 x 12*	
Actual		5.5 in	11.5 in
Ixx	=	697.1 in4	
S	=	121.2 in3	
A	=	63.3 in2	

Ixx > Ireq? YES

STEP 3 - Moment Capacity

F'b = Fb * Cd * Cm * Ct * CL * CF * Cfu * Ci * Cr								fb = (Mu * 12)/S	
Cd =	1.00	CL =	1.00	Ci =	1.00			Mu =	12781 lbft
Cm =	1.00	CF =	1.00	Cr =	1.00			S =	121.2 in3
Ct =	1.00	Cfu =	1.00	F'b =	1350	psi		fb =	1265 psi

F'b > fb? YES

STEP 4 - Shear Capacity

F'v = Fv * Cd * Cm * Ct *Ci						fv = 1.5 * (V/A)	
Cd =	1.00	Ct =	1.00			Vu =	3932.5 lbs
Cm =	1.00	Ci =	1.00			A =	63.3 in2
		F'v =	170 psi			fv =	93.3 psi

F'v > fv? YES

hi 5	PROJECT: IPD	PREPARED BY: PAUL PONCIANO	
	SUBJECT: GRAVITY	DATE:	SHEET: C-10
	GNS WEED HOUSING PROJECT		

Indicates User Input

Member: RH1 - Garage Header

STEP 1 - General Information

D	=	14 psf
L (Snow governs)	=	60 psf
Span	=	16 ft
Spacing	=	1.66 ft
Δ max (L)	=	0.8 in
Δ max (D+L)	=	1.0666667 in
w (L)	=	99.6 plf
w (0.5D+L)	=	111.22 plf
w (D+L)	=	147.3 plf
w (L)/ Δ (L)	=	1494 *
w (0.5D+L)/ Δ (D +L)	=	1251.225
Species and Type:		*DF #1*
Fb	=	1350 psi
Fv	=	170 psi
E	=	1600000 psi
* This case governs for deflection		

STEP 2 - Trial Size (Δ Driven)

E' = E * Cm * Ct * Ci			
Cm	=	1.00	
Ct	=	1.00	
Ci	=	1.00	
E'	=	1600000 psi	
Trial Member			
I req	=	114.74	in4
Member Size:		*6 x 8*	
Actual		5.5 in	7.5 in
Ixx	=	193.4	in4
S	=	51.6	in3
A	=	41.3	in2

Ixx > Ireq? YES

STEP 3 - Moment Capacity

F'b = Fb * Cd * Cm * Ct * CL * CF * Cfu * Ci * Cr								fb = (Mu * 12)/S		
Cd =	1.15	CL =	1.00	Ci =	1.00			Mu =	4714	lbft
Cm =	1.00	CF =	1.00	Cr =	1.00			S =	51.6	in3
Ct =	1.00	Cfu =	1.00	F'b =	1553	psi		fb =	1097	psi

F'b > fb? YES

STEP 4 - Shear Capacity

F'v = Fv * Cd * Cm * Ct *Ci							fv = 1.5 * (V/A)		
Cd =	1.15	Ct =	1.00				Vu =	1178.4	lbs
Cm =	1.00	Ci =	1.00				A =	41.3	in2
		F'v =	196	psi			fv =	42.9	psi

F'v > fv? YES

hi 5	PROJECT: IPD	PREPARED BY: PAUL PONCIANO	
	SUBJECT: GRAVITY	DATE:	SHEET: G-11
	GNS WEED HOUSING PROJECT		

Indicates User Input

Member: RH2 - Typical Header

STEP 1 - General Information

D	=	14 psf
L (Snow governs)	=	60 psf
Span	=	5 ft
Spacing	=	5.5 ft
Δ max (L)	=	0.25 in
Δ max (D+L)	=	0.3333333 in
w (L)	=	330 plf
w (0.5D+L)	=	368.5 plf
w (D+L)	=	425 plf
w (L)/ Δ (L)	=	15840 *
w (0.5D+L)/ Δ (D +L)	=	13266
Species and Type:		*DF #1*
Fb	=	1350 psi
Fv	=	170 psi
E	=	1600000 psi
* This case governs for deflection		

STEP 2 - Trial Size (Δ Driven)

E' = E * Cm * Ct * Ci			
Cm	=	1.00	
Ct	=	1.00	
Ci	=	1.00	
E'	=	1600000 psi	
Trial Member			
I req	=	11.60	in4
Member Size:		*6 x 6*	
Actual		5.5 in	5.5 in
Ixx	=	76.3 in4	
S	=	27.7 in3	
A	=	30.3 in2	

Ixx > Ireq? YES

STEP 3 - Moment Capacity

F'b = Fb * Cd * Cm * Ct * CL * CF * Cfu * Ci * Cr								fb = (Mu * 12)/S	
Cd =	1.15	CL =	1.00	Ci =	1.00			Mu =	1328 lbft
Cm =	1.00	CF =	1.00	Cr =	1.00			S =	27.7 in3
Ct =	1.00	Cfu =	1.00	F'b =	1553	psi		fb =	574.8 psi

F'b > fb? YES

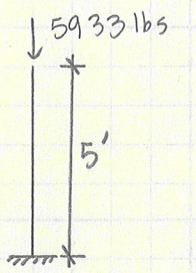
STEP 4 - Shear Capacity

F'v = Fv * Cd * Cm * Ct *Ci						fv = 1.5 * (V/A)	
Cd =	1.15	Ct =	1.00			Vu =	1062.5 lbs
Cm =	1.00	Ci =	1.00			A =	30.3 in2
		F'v =	196 psi			fv =	52.7 psi

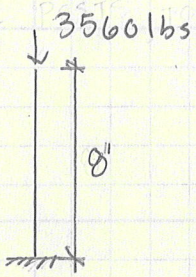
F'v > fv? YES

COLUMNS / POSTS

[C-1]



[C-2]



ALL POSTS TO BE 6×6, 2 COLUMNS SHOWN GOVERN.

$$F'_c = F_c \cdot C_D \cdot C_M \cdot C_t \cdot C_F \cdot C_i \cdot C_p \rightarrow F_c^* = 1500\ psi$$

(1500)

$$[C\text{-}1]\ F_{cE} = \frac{0.822\, E'_{MIN}}{(l_e/d)^2} = \frac{0.822\,(580{,}000)}{(5.12/5.5)^2} = 4006\ psi \qquad \frac{F_{cE}}{F_c^*} = 2.67$$

$$[C\text{-}2]\ F_{cE} = \frac{0.822(580{,}000)}{(8.12/5.5)^2} = 1565\ psi \qquad \frac{F_{cE}}{F_c^*} = 1.04$$

$$C_p = \frac{1+(F_{cE}/F_c^*)}{2c} - \sqrt{\left[\frac{1+(F_{cE}/F_c^*)}{2c}\right]^2 - \frac{(F_{cE}/F_c^*)}{c}}$$

$$[C\text{-}1]\ C_p = \frac{1+(2.67)}{2(0.8)} - \sqrt{\left[\frac{1+2.67}{2(0.8)}\right]^2 - \frac{(2.67)}{0.8}} = 0.91$$

$$[C\text{-}2]\ C_p = \frac{1+(1.04)}{2(0.8)} - \sqrt{\left[\frac{1+1.04}{2(0.8)}\right]^2 - \frac{(1.04)}{0.8}} = 0.70$$

$$[C\text{-}1]\ F'_c = 1500\,psi\,(0.91) = 1365\ psi$$

$$[C\text{-}2]\ F'_c = 1500\,psi\,(0.70) = 1050\ psi$$

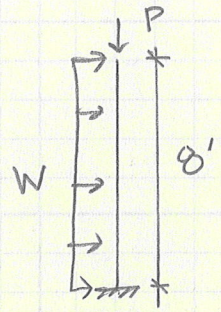
$$[C\text{-}1]\ f_c = \frac{5933\,lb}{(5.5\,in)^2} = 196\ psi < 1365\,psi\ \checkmark$$

$$[C\text{-}2]\ f_c = \frac{3560\,lb}{(5.5\,in)^2} = 118\ psi < 1050\ psi\ \checkmark$$

USE 6×6 DF #1 FOR POSTS

STANDARD STUD WALL CHECK

ASSUME 2×6 DF #2



$W = 23\ psf\ (1.33') = 31\ plf$

$P = (14\ psf + 60\ psf)(5.5')(1.33') = 541\ lbs$

BENDING:

$$M_u = \frac{WL^2}{8} = \frac{31\ plf\ (8')^2}{8} = 248\ lb\ ft$$

$$F'_{B1} = F_B^{900psi} \cdot C_D^{1.15\ SNOW} \cdot C_M^{1} \cdot C_L^{1} \cdot C_F^{1.3} \cdot C_{fu}^{1} \cdot C_i^{1} \cdot C_r^{1.15} = 1547\ psi$$

$$f_b = f_{b1} = \frac{M}{S_{xx}} = \frac{1547\ psi}{7.56\ in^3} = 205\ psi < 1547\ psi \checkmark$$

COMPRESSION:

$$F'_c = F_c^{1350} \cdot C_D^{1.15} \cdot C_m^{1} \cdot C_t^{1} \cdot C_F^{1.3} \cdot C_i^{1} \cdot C_P^{1} = 2018\ psi$$

$$f_c = \frac{541\ lb}{8.25\ in^2} = 65.6\ psi < 2018\ psi \checkmark$$

COMBINED BENDING & COMPRESSION

$$F_{CE1} = \frac{0.822(580{,}000)}{(8.12/5.5)^2} = 1565\ psi$$

$$\left[\frac{f_c}{F'_c}\right]^2 + \frac{f_{b1}}{F'_{b1}\left[1-(f_c/F_{CE1})\right]} = \left[\frac{66}{2018}\right]^2 + \frac{205}{1547\left[1-65.6/1565\right]} = 0.14 \le 1.0 \checkmark$$

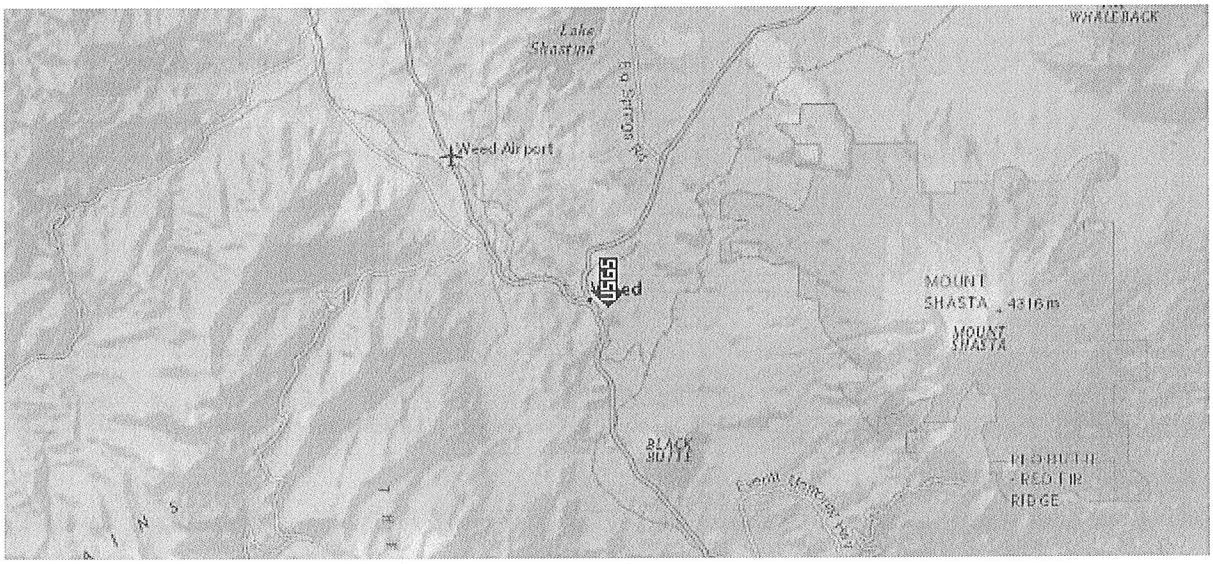
2×6 DF #2 WORKS

LF-1

USGS Design Maps Summary Report

User–Specified Input

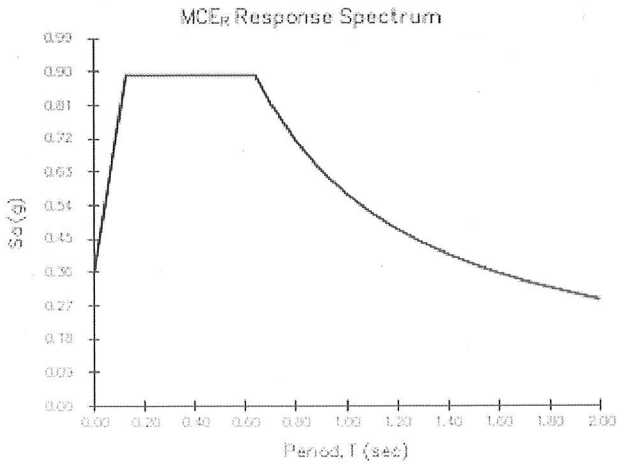
Report Title	Weed Housing Wed October 4, 2017 22:25:57 UTC
Building Code Reference Document	ASCE 7-10 Standard (which utilizes USGS hazard data available in 2008)
Site Coordinates	41.42876°N, 122.3781°W
Site Soil Classification	Site Class D – "Stiff Soil"
Risk Category	I/II/III

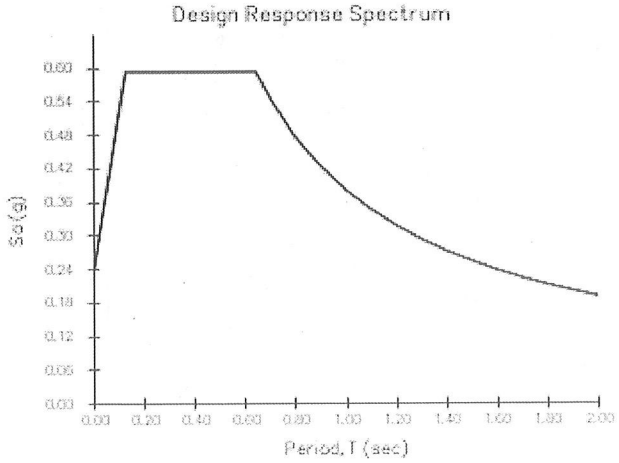


USGS–Provided Output

S_S =	0.736 g	S_{MS} =	0.892 g	S_{DS} =	0.594 g
S_1 =	0.328 g	S_{M1} =	0.572 g	S_{D1} =	0.381 g

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.





For PGA_M, T_L, C_{RS}, and C_{R1} values, please view the detailed report.

SEISMIC (ASCE 7-10, Ch 12)

$V = C_S W$ (12.8-1)

@ ROOF

$W = 36.4k$, SEE PG. L-3

$C_S = \frac{S_{DS}}{\left(\frac{R}{I}\right)}$ (12.8-2)

$S_{DS} = 0.594g$, SEE PG. LF-1

$R = 6\frac{1}{2}$ (T 12.2-1)

$I = 1$

$C_S = 0.091g$

$V = 3.3k$, APPLIED @ ROOF LEVEL (WIND GOVERNS)

WIND (ASCE 7-10)

RISK CATEGORY II
V = 110 MPH (FIG 26.5-1A)
EXPOSURE CATEGORY C (CONSERVATIVE)
K_{zt} = 1.0 (FIG. 26.8-1)

P_{S30}: A = 26.6 psf D = −3.9 psf
C = 17.7 psf B = −7.0 psf

$P_S = \lambda K_{zt} P_{S30} = 1 \cdot P_{S30} = P_{S30}$

$P_S = P_{S30}$: A = 26.6 psf D = −3.9 psf
C = 17.7 psf B = −7.0 psf

NORTH - SOUTH

$$V = \Sigma p_s A$$

A: V = 26.6 psf (6′ × 8′ + 3′ × 8′) = 1915 lb
B V = 7.0 psf (3′ × 5′) = 105 lb
C V = 17.7 psf (6′ × 16′ + 228 ft²) = 5735 lb
D V = 3.9 psf (16′ × 5′) = 312 lb
V_{NS} = 8.07 k

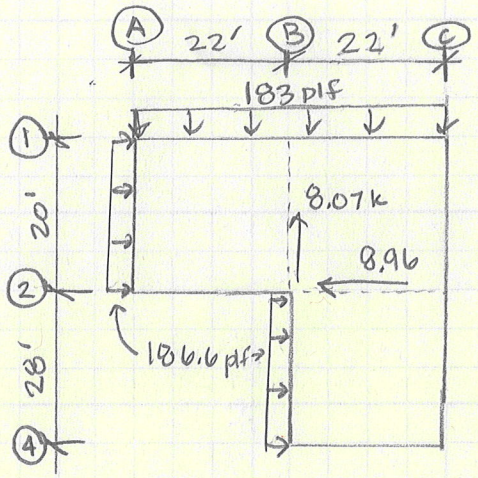
EAST - WEST

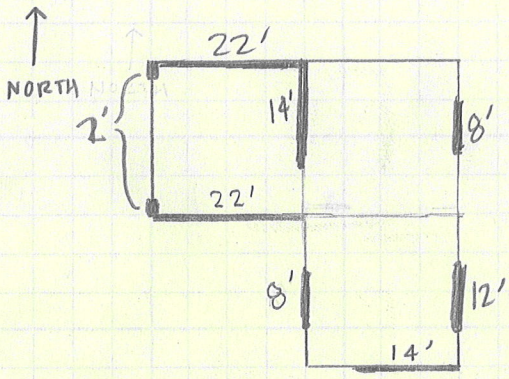
$$V = \Sigma p_s A$$

A V = 26.6 psf (3′ × 8′ + 6′ × 8′) = 1915 lb
B V = 7.0 psf (6′ × 5′) = 210 lb
C V = 17.7 psf (186 ft² + 22′ × 8′) = 6407 lb
D V = 3.9 psf (22′ × 5′) = 429 lb
V_{EW} = 8.96 k

V_{WIND} = 8.96k > 3.3k = $V_{SEISMIC}$ ∴ WIND GOVERNS

WIND SHEAR - SHEAR WALL DESIGN





SHEAR WALL LENGTHS : ROUGH LOCATION

NORTH - SOUTH

LINE A: 183 plf (11') = 2013 lb — 2013 lb / 4 ft = 503 plf
LINE B: 183 plf (11' + 12') = 4209 lb — 4209 lb / 22 ft = 191 plf
LINE C: 183 plf (12') = 2196 lb — 2196 lb / 20 ft = 110 plf

EAST - WEST

LINE 1: 186.6 plf (10') = 1866 lb — 1866 lb / 22 ft = 85 plf
LINE 2: 186.6 plf (10' + 14') = 4478 lb — 4478 lb / 22 ft = 204 plf
LINE 4: 186.6 plf (14') = 2612 lb — 2612 lb / 14 ft = 187 plf

SHEARWALL @ GARAGE

V = 503 plf (2') = 1006 lbs

SW24x8 SIMPSON STRONG-WALL

CAPACITY = 2010 lbs > 1006 lbs ✓

TYPICAL SHEARWALLS

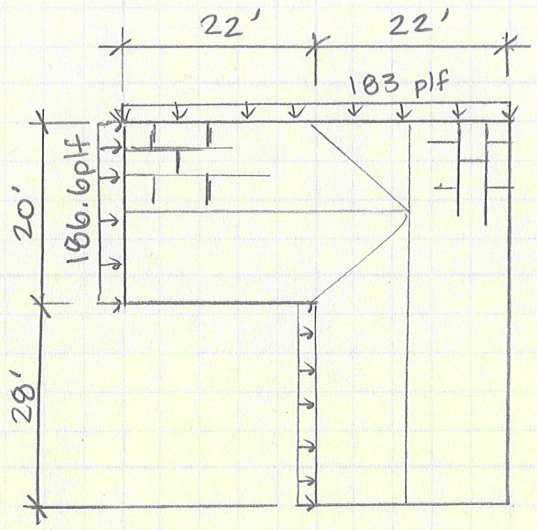
$V_{w,max}$ = 204 plf → SPDWS DESIGN TABLES: V_w > 408 plf

USE 1/2" STRUCTURAL 1 PLYWOOD w/ 6d @ 6" EDGE NAILING, BLOCKED

CAPACITY = 280 plf > 204 plf ✓

WORST CASE ASPECT RATIO: 8':8', MEETS 3.5:1 MIN ✓.

ROOF DIAPHRAGM DESIGN



ASPECT RATIO CHECK

RATIO: 48':22' = 2.18:1
ALLOWABLE: 4:1 > 2.18:1 ✓

SPDWS TABLE 4.2A

USE 1/2" STRUCTURAL I PLYWOOD W/ 6d @ 6" EDGE NAILING, BLOCKED

CAPACITY = 260plf > 187plf ✓

FOUNDATION DESIGN

CONTINUOUS WALL FOUNDATION (WF)

MAX P = D + L = (14 psf (ROOF D) + 15 psf (FLOOR D) + 40 psf (FLOOR L) + 60 psf (SNOW)) 5.5 ft + 57 psf (3') (CMU) + 9 psf (8') (EXT WALL) + 2 ft² (155 pcf) (SELF WEIGHT) = 1262.5 plf

1500 psf SOIL BEARING (MIN)

$$W = \frac{1262.5\ plf}{1500\ psf} = 0.842' \longrightarrow \boxed{12"\ \text{MIN WIDTH}}$$

DEPTH: 12" BELOW 12" FROST LINE = **24" TOTAL DEPTH**

ISOLATED FOUNDATION (IF1)

MAX P = (12' x 11') (14 psf + 15 psf + 40 psf + 60 psf) = 17.03 k (CONSERVATIVE)

$$\frac{17.0\ k}{1.5\ ksf} = 11.4\ ft^2 \longrightarrow \boxed{3.5\ ft\ \text{SQUARE FTG.}}$$

1 ft DEEP (FROST LINE NOT AN ISSUE UNDER HOUSE)

REINFORCING $\rho = 0.0018$

WALL FOUNDATION

LONG: $0.0018(24")(12") = 0.5184\ in^2$

$\boxed{2\ \#5}$: $A_s = 0.62\ in^2 > 0.5184\ in^2$ ✓

ISO FOUNDATION

BOTH WAYS: $0.0018(42")(12") = 0.91\ in^2$

$\boxed{3\ \#5\ \text{E.W.}}$: $A_s = 0.93\ in^2 > 0.91\ in^2$ ✓

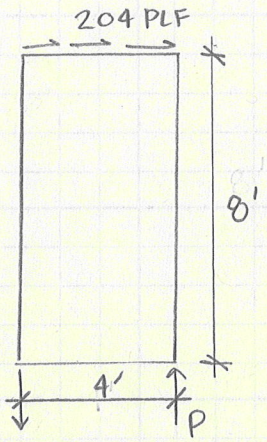
ISOLATED FOOTINGS FOR ROOF BEAM COLUMNS (IF2)

$P_J = 6k$

$$A = \frac{6k}{1.5\ ksf} = 4\ ft^2 \longrightarrow 2'\ \text{SQUARE FOOTING}$$

SHEAR WALL CONNECTIONS

WORST CASE PANEL:



$$P = \frac{(204)(4)(8)}{4} = 1632 \text{ lbs}$$

HOLD DOWNS: **USE HDU2-SDS2.5**

CAPACITY = 3075 lbs > 1632 lbs

ANCHOR BOLTS:

1/2" DIA. ANCHOR BOLTS, CAPACITY = 650#

$\frac{650\#}{204 \text{ plf}} = 3.2' \rightarrow$ spacing = 3' o/c

USE 1/2" DIA. A.B. @ 3'o/c

NAILING BETWEEN PANELS:

10d COMMON NAILS, CAPACITY = 115#

$\frac{1632 \text{ lbs}}{115 \text{ lbs/NAIL}} = 14.2 \rightarrow \frac{8 \cdot 12}{14.2} = 6.8" \rightarrow$ spacing = 6"

USE 10d NAILS @ 6" o/c

CONNECTIONS

FJ1 - 2×8, DEMAND = $\frac{55\text{ plf}(12')}{2}$ = 330 lbs

USE SIMPSON LUS28 HANGER 1100 lbs > 330 lbs ✓

RR1 - 2×8, DEMAND = $\frac{96\text{ plf}(11')}{2}$ = 528 lbs

USE SIMPSON LRU26Z HANGER 855 lbs > 528 lbs ✓

GENERAL STRUCTURAL NOTES

(The following apply unless shown otherwise on the plans)

CRITERIA

1. ALL MATERIALS, WORKMANSHIP, DESIGN, AND CONSTRUCTION SHALL CONFORM TO THE DRAWINGS, SPECIFICATIONS, 2016 CALIFORNIA BUILDING CODE.

2. DESIGN LOADING CRITERIA

DEAD LOADS	
ROOF	14 PSF
FLOOR	15 PSF
LIVE LOADS	
ROOF LIVE LOAD	20 PSF
ROOF SNOW LOAD	60 PSF
FLOOR LIVE LOAD (RESIDENTIAL)	40+15 PSF
WIND	Vs=110 MPH, Iw=1.0, EXPOSURE C

EARTHQUAKE (EQUIVALENT LATERAL FORCE PROCEDURE) RISK CATEGORY II,
Ss=0.736g, S1=0.328g, Sds=0.594g, Sd1=0.381g
Ie=1.0, SITE CLASS D
SEISMIC DESIGN CATEGORY=D
R=5 (SPECIAL REINFORCED MASONRY WALL)

SEE PLANS FOR ADDITIONAL LOADING CRITERIA

3. STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH ARCHITECTURAL DRAWINGS FOR BIDDING AND CONSTRUCTION. CONTRACTOR SHALL VERIFY DIMENSIONS AND CONDITIONS FOR COMPATIBILITY AND SHALL NOTIFY ARCHITECT OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.

4. CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS, MEMBER SIZES, AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS ARE INTENDED AS GUIDELINES ONLY AND MUST BE VERIFIED.

5. CONTRACTOR SHALL PROVIDE TEMPORARY BRACING FOR THE STRUCTURE AND STRUCTURAL COMPENENTS UNTIL ALL FINAL CONNECTIONS HAVE BEEN COMPLETED IN ACCORDANCE WITH THE PLANS.

6. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SAFETY PRECAUTIONS AND THE METHODS, TECHNIQUES, SEQUENCES, OR PROCEDURES REQUIRED TO PERFORM HIS WORK. THE STRUCTURAL ENGINEER HAS NO OVERALL SUPERVISORY AUTHORITY OR ACTUAL AND/OR DIRECT RESPONSIBILITY FOR THE SPECIFIC WORKING CONDITIONS AT THE SITE AND/OR FOR ANY HAZARDS RESULTING FROM THE ACTIONS OF ANY TRADE CONTRACTOR. THE STRUCTURAL ENGINEER HAS NO DUTY TO INSPECT, SUPERVISE, NOTE, CORRECT, OR REPORT ANY HEALTH OR SAFETY DEFICIENCIES OF THE OWNER, CONTRACTORS, OR OTHER ENTITIES OR PERSONS AT THE PROJECT SITE.

7. CONTRACTOR-INITIATED CHANGES SHALL BE SUBMITTED IN WRITING TO THE ARCHITECT AND STRUCTURAL ENGINEER FOR APPROVAL PRIOR TO FABRICATION OR CONSTRUCTION. CHANGES SHOWN ON SHOP DRAWINGS ONLY WILL NOT SATISFY THIS REQUIREMENT.

8. DRAWINGS INDICATE GENERAL AND TYPICAL DETAILS OF CONSTRUCTION. WHERE CONDITIONS ARE NOT SPECIFICALLY INDICATED, BUT ARE OF SIMILAR CHARACTER TO DETAILS SHOWN, SIMILAR DETAILS OF CONSTRUCTION SHALL BE USED, SUBJECT TO REVIEW AND APPROVAL BY THE ARCHITECT AND THE STRUCTURAL ENGINEER.

9. ALL STRUCTURAL SYSTEMS WHICH ARE TO BE COMPOSED OF COMPONENTS TO BE FIELD ERECTED SHALL BE SUPERVISED BY THE SUPPLIER DURING MANUFACTURING, DELIVERY, HANDLING, STORAGE, AND ERECTION IN ACCORDANCE WITH INSTRUCTIONS PREPARED BY THE SUPPLIER.

10. SHOP DRAWINGS FOR
REINFORCING STEEL (FOR BOTH CONCRETE AND MASONRY CONSTRUCTION),
PLYWOOD WEB JOISTS
STRUCTURAL COMPOSITE LUMBER
SHALL BE SUBMITTED TO THE ARCHITECT AND STRUCTURAL ENGINEER FOR REVIEW PRIOR TO FABRICATION OF THESE ITEMS.

CONTRACTOR SHALL SUBMIT WALL ELEVATION DRAWINGS OF AT LEAST 1/8" = 1'-0" SCALE INDICATING LOCATIONS OF CONNECTION EMBEDMENTS AND WALL OPENINGS FOR REVIEW PRIOR TO CONSTRUCTION. CONTRACTOR SHALL COORDINATE WITH REINFORCEMENT SHOP DRAWINGS.

ALL SHOP DRAWINGS (EXCEPT REINFORCING STEEL) SHALL ALSO BE SUBMITTED TO THE SAN LUIS OBISPO DEPARTMENT OF PLANNING AND DEVEOPMENT.

11. SHOP DRAWING REVIEW: DIMENSIONS AND QUANTITIES ARE NOT REVIEWED BY THE ENGINEER OF RECORD, THEREFORE, MUST BE VERIFIED BY THE CONTRACTOR. CONTRACTOR SHALL REVIEW AND STAMP DRAWINGS PRIOR TO REVIEW BY ENGINEER OF RECORD. CONTRACTOR SHALL REVIEW DRAWINGS FOR CONFORMANCE WITH THE MEANS, METHODS, TECHNIQUES, SEQUENCES, AND OPERATIONS OF CONSTRUCTION, AND ALL SAFETY PRECAUTIONS AND PROGRAMS INCIDENTAL, THERETO, SUBMITTALS SHALL INCLUDE A REPRODUCIBLE AND ONE COPY; REPRODUCIBLE WILL BE MARKED AND RETURNED.

SHOP DRAWINGS SUBMITTALS PROCESSED BY THE ENGINEER ARE NOT CHANGE ORDERS. THE PURPOSE OF SHOP DRAWING SUBMITTALS BY THE CONTRACTOR IS TO DEMONSTRATE TO THE ENGINEER THAT THE CONTRACTOR UNDERSTANDS THE DESIGN CONCEPT, BY INDICATING WHICH MATERIAL IS INTENDED TO BE FURNISHED AND INSTLLED AND BY DETAILING THE INTENDED FABRICATION AND INSTALLATION METHODS. IF DEVIATIONS, DISCREPANCIES, OR CONFLICTS BETWEEN SHOP DRAWING SUBMITTALS AND THE CONTRACT DOCUMENTS ARE DISCOVERED EITHER PRIOR TO OR AFTER SHOP DRAWING SUBMITTALS ARE PROCESSED BY THE ENGINEER, THE DESIGN DRAWINGS AND SPECIFICATIONS SHALL CONTROL AND SHALL BE FOLLOWED.

SHOP DRAWINGS OF DESIGN BUILDING COMPONENTS INCLUDING STAIRS AND EXTERIOR CLADDING SHALL INCLUDE THE DESIGNING PROFESSIONAL ENGINEER'S STAMP, STATE OF CALIFORNIA AND SHALL BE APPROVED BY THE COMPONENT DESIGNER PRIOR TO CURSORY REVIEW BY THE ENGINEER OF RECORD FOR LOADS IMPOSED ON THE BASIC STRUCTURE. THE COMPONENT DESIGNER IS RESPONSIBLE FOR CODE CONFORMANCE AND ALL NECESSARY CONNECTIONS NOT SPECIFICALLY CALLED OUT ON ARCHITECTURAL OR STRUCTURAL DRAWINGS. SHOP DRAWINGS SHALL INDICATE MAGNITUDE AND DIRECTION OF ALL LOADS IMPOSED ON BASIC STRUCTURE. DESIGN CALCULATIONS SHALL BE MADE AVAILABLE UPON REQUEST.

12. STRUCTURAL OBSERVATION: AS NOTED IN SECTION 1709 OF THE 2015 INTERNATIONAL BUILDING CODE, STRUCTURAL OBSERVATION IS REQUIRED FOR THIS PROJECT. STRUCTURAL OBSERVATION MEANS THE VISUAL OBSERVATION OF THE STRUCTURAL SYSTEM, INCLUDING BUT NOT LIMITED TO, THE ELEMENTS AND CONNECTIONS AT SIGNIFICANT CONSTRUCTION STAGES AND THE COMPLETED STRUCTURE FOR GENERAL CONFORMANCE TO THE APPROVED PLANS AND SPECIFICATIONS. STRUCTURAL OBSERVATION DOES NOT INCLUDE OR WAIVE THE RESPONSIBILITY OF THE INSPECTIONS REQUIRED BY SECTIONS 108 AND CHAPTER 17 OF THE INTERNATIONAL BUILDING CODE.

IN OUR STRUCTURAL OBSERVATION, WE WILL SELECT PORTIONS OF WORK TO REVIEW CLOSELY AS WELL AS OBSERVE THE STRUCTURAL SYSTEM FOR GENERAL CONFORMANCE TO THE APPROVED PLANS AND SPECIFICATIONS. SUCH REVIEW PROCEDURES WILL BE CONDUCTED IN ACCORDANCE WITH COMMONLY ACCEPTED STANDARDS OF PRACTICE. THE BUILDING OFFICIAL UNDERSTANDS THAT SUCH PROCEDURES INDICATE ACTUAL CONDITIONS ONLY WHERE THE REVIEW IS PERFORMED AND THAT THE RESULTS WILL BE INFERRED TO EXIST IN OTHER AREAS NOT REVIEWED.

THE BUILDING OFFICIAL ALSO RECOGNIZES THAT STRUCTURAL REVIEW IS A TECHNIQUE EMPLOYED TO MINIMIZE THE RISK OF PROBLEMS ARISING DURING CONSTRUCTION. STRUCTURAL OBSERVATION BY THE DESIGN PROFESSIONAL DOES NOT CONSTITUTE WARRANTY OR GUARANTEE OF ANY TYPE. IN ALL CASES, THE CONTRACTOR SHALL RETAIN RESPONSIBILITY FOR THE QUALITY OF WORK AND FOR ADHERENCE OT THE APPROVED PLANS AND SPECIFICATIONS.

GEOTECHNICAL

13. FOUNDATION NOTES: SUBGRADE PREPARATION INCLUDING DRAINAGE, EXCAVATION, COMPACTION, AND FILLING REQUIREMENTS, SHALL CONFORM STRICTLY WITH RECOMMENDATIONS GIVEN IN THE SOILS REPORT OR AS DIRECTED BY THE SOILS ENGINEER. FOOTINGS SHALL BEAR ON SOLID UNDISTRIBUTED EARTH (CONTROLLED, COMPACTED STRUCTURAL FILL OR BOTH) AT LEAST 18" BELOW LOWEST ADJACENT FINISHED GRADE. FOOTING DEPTHS/ELEVATIONS SHOWN ON PLANS (OR IN DETAILS) ARE MINIMUM AND FOR GUIDANCE ONLY; THE ACTUAL ELEVATIONS OF FOOTINGS MUST BE ESTABLISHED BY THE CONTRACTOR IN THE FILED WORKING WITH THE TESTING LAB AND SOILS ENGINEER. BACKFILL BEHIND ALL RETAINING WALLS WITH FREE DRAINING GRANULAR FILL AND PROVIDE FOR SUBSURFACE DRAINAGE AS NOTED IN THE SOILS REPORT.

ALLOWABLE SOIL PRESSURE	1,500 PSF
LATERAL EARTH PRESSURE (RESTRAINED/UNRESTRAINED)	60 PCF/35 PCF

CONCRETE

14. CONCRETE SHALL BE MIXED, PROPORTIONED, CONVEYED, AND PLACED IN ACCORDANCE WITH IBC SECTION 1905 AND ACI 318-14. CONCRETE SHALL ATTAIN A 28-DAY STRENGTH OF f'c = 2,000 PSI AND MIX SHALL CONTAIN NOT LESS THAN 5-1/2 SACKS OF CEMENT PER CUBIC YARD AND SHALL BE PROPORTIONED TO PRODUCE A SLUMP OF 5" OR LESS.

THE MINIMUM AMOUNTS OF CEMENT AND MAXIMUM AMOUNTS OF WATER MAY BE CHANGED IF A CONCRETE PERFORMANCE MIX IS SUBMITTED TO THE STRUCTURAL ENGINEER AND THE SAN LUIS OBISPO DEPARTMENT OF PLANNING AND DEVELOPMENT FOR APPROVAL TWO WEEKS PRIOR TO PLACING ANY CONCRETE. THE CONCRETE PERFORMANCE MIX SHALL INCLUDE THE AMOUNTS OF CEMENT, FINE AND COARSE AGGREGATE, WATER AND ADMIXTURES AS WELL AS THE WATER CEMENT RATIO, SLUMP, CONCRETE YIELD, AND SUSTANTIATING STRENGTH DATA IN ACCORDANCE WITH IBC 1905.3. THE USE OF A PERFORMANCE MIX REQUIRES BATCH PLANT INSPECTION, THE COST OF WHICH SHALL BE PAID BY THE GENERAL CONTRACTOR. REVIEW OF MIX SUBMITTALS BY THE ENGINEER OF RECORD INDICATES ONLY THAT INFORMATION PRESENTED CONFORMS GENERALLY WITH CONTRACT DOCUMENTS. CONTRACTOR OR SUPPLIER MAINTAINS FULL RESPONSIBILITY FOR SPECIFIED PERFORMANCE.

ALL CONCRETE WITH SURFACES EXPOSED TO STANDING WATER SHALL BE AIR-ENTRAINED WITH AN AIR-ENTRAINING AGENT CONFORMING TO ASTM C260, C494M, AND C618. TOTAL AIR CONTENT FOR FROST-RESISTENT CONCRETE SHALL BE IN ACCORDANCE WITH TABLE 1904.2.1 OF THE INTERNATIONAL BUILDING CODE.

15. REINFORCING STEEL SHALL CONFORM TO ASTM A615 (INCLUDING SUPPLEMENTS S1), GRADE 60, fy = 60,000 PSI. EXCEPTIONS: ANY BARS SPECIFICALLY SO NOTED ON THE DRAWINGS SHALL BE GRADE 40, fy = 40,000 PSI. GRADE 60 REINFORCING BARS INDICATED ON DRAWINGS TO BE WELDED SHALL CONFORM TO A706. REINFORCING COMPLYING WITH ASTM A615 (S1) MAY BE WELDED ONLY IF MATERIAL PROPERTY REPORTS INDICATING CONFORMANCE WITH WELDING PROCEDURES SPECIFIED IN A.W.S. D1.4 ARE SUBMITTED.

16. REINFORCING STEEL SHALL BE DETAILED (INCLUDING HOOKS AND BENDS) IN ACCORDANCE WITH ACI SP66-94 AND 318-02. LAP ALL CONTINUOUS REINFORCEMENT #5 AND SMALLER 40 BAR DIAMETERS OR 2'-0" MINIMUM, PROVIDE CORNER BARS AT ALL WALL AND FOOTING INTERSECTIONS. LAP CORNER BARS #5 AND SMALLER 40 BAR DIAMETERS OR 2'-0" MINIMUM. LAPS OF LARGER BARS SHALL BE MADE IN ACCORDANCE WITH ACI 318-02, CLASS B. LAP ADJACENT MATS OF WELDED WIRE FABRIC A MINIMUM OF 8" AT SIDES AND ENDS.

NO BARS PARTIALLY EMBEDDED IN HARDENED CONCRETE SHALL BE FIELD BENT UNLESS SPECIFICALLY SO DETAILED OR APPROVED BY THE STRUCTURAL ENGINEER.

17. CONCRETE PROTECTION (COVER) FOR REINFORCING STEEL SHALL BE AS FOLLOWS:

FOOTINGS AND OTHER UNFORMED SURFACES CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH				3"
FORMED SURFACES EXPOSED TO EARTH (i.e., WALLS BELOW GROUND) OR WEATHER (#6 BARS OR LARGER)				2"
(#5 BARS OR SMALLER)				1-1/2"
SLABS AND WALLS (INTERIOR FACE)	GREATER OF	(BAR DIAMETER PLUS 1/8")	OR	3/4"

ANCHORAGE

18. MIN 7" EMBED. FOR ALL ANCHORS TO FOUNDATION.

MASONRY

19. CONCRETE MASONRY UNIT WALLS SHALL BE CONSTRUCTED OF GRADE N, TYPE I UNITS, CONFORMING TO ASTM C90, LAID IN A RUNNING BOND. MORTAR SHALL BE TYPE "S" PER TABLE 2103.7 OF THE IBC. GROUT SHALL CONFORM TO IBC REQUIREMENTS AND ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 2,000 PSI AT 28 DAYS, DESIGN F'_m = 1,500 PSI. STRENGTH SHALL BE VERIFIED BY THE UNIT STRENGTH METHOD IN ACCORDANCE WITH IBC SECTION 2105.2. FULL STRESSES ARE REQUIRED. ALL MASONRY SHOULD BE SOLID GROUTED.

UNLESS NOTED OTHERWISE, PROVIDE THE FOLLOWING REINFORCEMENT:

4" WALLS	#4 @ 48" O.C. VERT.	3/16 dia. WIRE JOINT REINFORCING AT 8" O.C. HORIZ.
6" WALLS	#4 @ 48" O.C. VERT.	(2) #4 @ 48" O.C. HORIZ.
8" WALLS	#5 @ 48" O.C. VERT.	(2) #4 @ 48" O.C. HORZ.
10" WALLS	#5 @ 40" O.C. VERT.	(2) #5 @ 48" O.C. HORZ.
12" WALLS	#5 @ 32" O.C. VERT.	(2) #5 @ 40" O.C. HORZ.

CONCRETE MASONRY UNITS TO BE FULLY GROUTED.

IN ADDITION, PROVIDE (1) #5 (#4 @ 6" AND 4" WALLS) VERT. AT EACH SIDE OF OPENINGS. AT WALL CORNERS AND INTERSECTIONS AND AT FREE ENDS OF WALLS AND (2) # 4 HORIZ. AT ELEVATED FLOOR AND ROOF LEVELS, AT TOPS OF WALLS AND ABOVE AND BELOW ALL OPENINGS. ALL HORIZONTAL REINFORCEMENT SHALL BE PLACED IN BOND BEAMS. EXTEND REINFORCEMENT AROUND OPENINGS 2'-0" BEYOND FACE OF OPENING. IF 2'-0" IS UNAVAILABLE EXTEND AS FAR AS POSSIBLE AND HOOK. PROVIDE CORNER BARS TO LAP HORIZONTAL REINFORCING AT CORNERS AND INTERSECTIONS.

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GENERAL NOTES

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Scale:

Sheet: S1.0

WOOD

23. FRAMING LUMBER SHALL BE KILN DRIED OR MC-19, AND GRADED AND MARKED IN CONFORMANCE WITH W.C.L.I.B. STANDARD GRADING RULES FOR WEST COAST LUMBER NO. 17, LATEST EDITION. FURNISH TO THE FOLLOWING MINIMUM STANDARDS.

JOISTS: DOUGLAS FIR NO. 2
(2X, 3X, AND 4X MEMBERS) MINIMUM BASE VALUE, F_b = 900 PSI

BEAM AND STRINGERS: DOUGLAS FIR NO. 1
(INCLUDING 6 X AND LARGER MEMBERS) MINIMUM BASIC DESIGN STRESS, F_b = 1,350 PSI

POSTS AND TIMBERS: DOUGLAS FIR NO. 1
MINIMUM BASIC DESIGN STRESS, F_C = 1,000 PSI

STUDS PLATES & MISCELLANEOUS LIGHT FRAMING DOUGLAS FIR NO. 2

2X AND 3X TONGUE AND GROOVE DECKING HEM-FIR COMMERCIAL DEX, F_b = 1,350 PSI

24. GLUED LAMINATED MEMBERS SHALL BE FABRICATED IN CONFORMANCE WITH ASTM AND AITC STANDARDS IN A CITY OF WEED CERTIFIED PLANT. EACH MEMBER SHALL BEAR AN A.I.T.C. IDENTIFICATION MARK AND SHALL BE ACCOMPANIED BY AN A.I.T.C. CERTIFICATE OF CONFORMANCE. CERTIFICATES OF CONFORMANCE MUST BE MADE AVAILABLE TO BUILDING INSPECTORS. CITY INSPECTION IS REQUIRED PRIOR TO COVERING GLUED LAMINATED MEMBERS. ALL SIMPLE SPAN BEAMS SHALL BE DOUGLAS FIR COMBINATION 24F-V4 OR 24F-1.8E, F_b = 2,400 PSI, Ft = 1100 PSI. ALL CANTILEVERED BEAMS SHALL BE DOUGLAS FIR COMBINATION 24F-V8, Fb = 2,400 PSI, Fv = 240 PSI.

25. LAMINATED STRAND LUMBER (LSL) SHALL BE MANUFACTURED UNDER A PROCESS APPROVED BY THE NATIONAL RESEARCH BOARD. EACH PIECE SHALL BEAR A STAMP OR STAMPS NOTING THE NAME AND PLANT NUMBER OF THE MANUFACTURER, THE GRADE, THE NATIONAL RESEARCH BOARD NUMBER, AND THE QUALITY CONTROL AGENCY. ALL LSL LUMBER SHALL BE MANUFACTURED IN ACCORDANCE WITH NER-126 USING DOUGLAS FIR VENEER GLUED WITH A WATERPROOF ADHESIVE MEETING THE REQUIREMENTS OF ASTM D2559 WITH ALL GRAIN PARALLEL WITH THE LENGTH OF THE MEMBER. F_b = 2600 PSI, E = 1.8 x 10^6 PSI, Fv = 285 PSI (FOR 1.8E MEMBERS)

DESIGN SHOWN ON PLANS IS BASED ON LUMBER MANUFACTURED BY THE TRUS-JOIST CORPORATION. ALTERNATE MANUFACTURERS MAY BE USED SUBJECT TO REVIEW AND APPROVAL BY THE ARCHITECT AND STRUCTURAL ENGINEER, ALTERNATE JOIST HANGERS AND OTHER HARDWARE MAY BE SUBSTITUTED FOR ITEMS SHOWN PROVIDED THEY HAVE I.C.B.O. APPROVAL FOR EQUAL OR GREATER LOAD CAPACITIES. ALL JOIST HANGERS AND OTHER HARDWARE SHALL BE COMPATIBLE IN SIZE WITH MEMBERS PROVIDED.

26. PREFABRICATED PLYWOOD WEB JOIST DESIGN SHOWN ON PLANS IS BASED ON JOIST MANUFACTURED BY THE TRUS-JOIST CORPORATION. ALTERNATE PLYWOOD WEB JOIST MANUFACTURERS MAY BE USED SUBJECT TO REVIEW AND APPROVAL BY THE ARCHITECT AND STRUCTURAL ENGINEER. ALTERNATE JOIST HANGERS AND OTHER HARDWARE MAY BE SUBSTITUTED FOR ITEMS SHOWN PROVIDED THEY HAVE I.C.B.O. APPROVAL FOR EQUAL OR GREATER LOAD CAPACITIES. ALL JOIST HANGERS AND OTHER HARDWARE SHALL BE COMPATIBLE IN SIZE WITH PLYWOOD WEB JOIST PROVIDED.

TRUSS SUPPLIERS NOTE: THE TRUSS CONFIGURATIONS, INCLUDING DEPTHS AND MEMBER SIZES SHOWN ON THE DRAWINGS, INDICATE THE DESIRED TRUSS CONFIGURATION AND ARE TO BE COMPLIED WITH WHEREVER POSSIBLE. IF A TRUSS MANUFACTURER IS UNABLE TO MEET THE LOAD REQUIREMENTS SPECIFIED WITH THE TRUSS CONFIGURATION INDICATED. THE MANUFACTURER IS TO SUBMIT WRITTEN NOTICE TO THAT AFFECT TO THE ARCHITECT PRIOR TO SUBMITTING A COST PROPOSAL OR BID.

IF A DIFFERENT SYSTEM IS PROPOSED THAT REQUIRES REVISIONS TO PRESENT STRUCTURAL FRAMING OR DETAILS, SUCH SYSTEM SHALL BE CONSIDERED SUBJECT TO THE APPROVAL OF THE OWNER, ARCHITECT, AND STRUCTURAL ENGINEER.

IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND TRUSS MANUFACTURER TO VERIFY THE WEIGHT AND LOCATIONS OF ALL MECHANICAL EQUIPMENT PRIOR TO SUBMITTING SHOP DRAWINGS. IT SHALL BE NOTED IN THE TRUSS MANUFACTURER'S BID WHETHER OR NOT AN ALLOWANCE HAS BEEN MADE FOR MECHANICAL UNITS.
TRUSS SHOP DRAWINGS WILL NOT BE REVIEWED WITHOUT CALCULATIONS STAMPED BY A LICENSED STRUCTURAL ENGINEER.

27. PLYWOOD SHEATHING SHALL BE STRUCTURAL I. ORIENTED STRAND BOARD OF EQUIVALENT THICKNESS, EXPOSURE RATING AND PANEL INDEX MAY BE USED IN LIEU OF PLYWOOD. SEE PLANS FOR THICKNESS, PANEL IDENTIFICATION INDEX AND NAILING REQUIREMENTS.

28. ALL WOOD PLATES IN DIRECT CONTACT WITH CONCRETE OR MASONRY SHALL BE PRESSURE-TREATED WITH AN APPROVED PRESERVATIVE, PROVIDE 2 LAYERS OF ASPHALT IMPREGNATED BUILDING PAPER BETWEEN UNTREATED LEDGERS, BLOCKING, ETC. AND CONCRETE OR MASONRY.

29. TIMBER CONNECTORS CALLED OUT BY LETTERS AND NUMBERS SHALL BE "STRONG-TIE" BY SIMPSON COMPANY, AS SPECIFIED IN THEIR CATALOG NO. C-C-2015 EQUIVALENT DEVICES BY OTHER MANUFACTURERS MAY BE SUBSTITUTED, PROVIDED THEY HAVE ICBO APPROVAL FOR EQUAL OR GREATER LOAD CAPACITIES. PROVIDE NUMBER AND SIZE OF FASTENERS AS SPECIFIED BY MANUFACTURER. CONNECTORS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. WHERE CONNECTOR STRAPS CONNECT TWO MEMBERS, PLACE ONE-HALF OF THE NAILS OR BOLTS IN EACH MEMBER. ALL BOLTS IN WOOD MEMBERS SHALL CONFORM TO ASTM A307. PROVIDE WASHERS UNDER THE HEADS AND NUTS OF ALL BOLTS AND LAG SCREWS BEARING ON WOOD. UNLESS NOTED OTHERWISE, ALL NAILS SHALL BE COMMON. ALL SHIMS SHALL BE SEASONED AND DRIED AND THE SAME GRADE (MINIMUM) AS MEMBERS CONNECTED. ALL JOISTS SHALL BE CONNECTED TO FLUSH BEAMS WITH "LUS" SERIES JOIST HANGERS.

ALL CONNECTIONS IN CONTACT WITH PRESSURE TREATED WOOD, SHALL BE OF HOT DIPPED GALVANIZED STEEL OR STAINLESS STEEL. HOT DIPPED GALVANIZED FASTENERS SHOULD CONFORM TO ASTM STANDARD 153, AND HOT DIPPED GALVANIZED CONNECTORS SHOULD CONFORM TO ASTM STANDARD A653 (CLASS G-185). STAINLESS STEEL FASTENERS AND CONNECTORS SHOULD BE TYPE 304 OR 316. NOTE: ELECTROPLATED GALZANIZED FASTENERS AND CONNECTORS ARE NOT TO BE USED WITH PRESSURE TREATED WOOD. SIMPSON PRODUCT FINISHES CORRESPONDING TO THE ABOVE REQUIREMENTS ARE ZMAX (HOT DIPPED GALVANIZED) AND SST300 (STAINLESS STEEL).

30. WOOD FASTENERS:

A. NAIL SIZES SPECIFIED ON DRAWINGS ARE BASED ON THE FOLLOWING SPECIFICATIONS:

SIZE	LENGTH	DIAMETER
6d	2"	0.113"
8d	2-1/2"	0.131"
10d	3"	0.148"
12d	3-1/4"	0.148"
16d	3-1/2"	0.162"

IF CONTRACTOR PROPOSES THE USE OF ALTERNATE NAILS, THEY SHALL SUBMIT NAIL SPECIFICATIONS TO THE STRUCTURAL ENGINEER (PRIOR TO CONSTRUCTION) FOR REVIEW AND APPROVAL.

B. STAPLES – THE FOLLOWING STAPLES MAY BE SUBSTITUTED FOR NAILING OF PLYWOOD (APA RATED SHEATHING):

NAIL SIZE	EQUIVALENT STAPLE	MINIMUM LENGTH
6d	16 GA.	1-3/4"
8d	15 GA.	1-3/4"
10d	13 GA	1-3/4"

IF CONTRACTOR PROPOSES THE USE OF ALTERNATE STAPLES, THEY SHALL SUBMIT STAPLE SPECIFICATIONS TO THE STRUCTURAL ENGINEER (PRIOR TO CONSTRUCTION) FOR REVIEW AND APPROVAL.

C. NAILS AND STAPLES – PLYWOOD (APA RATED SHEATHING) FASTENERS TO FRAMING SHALL BE DRIVEN FLUSH TO FACE OF SHEATHING WITH NO COUNTERSINKING PERMITTED.

31. WOOD FRAMING NOTES – THE FOLLOWING APPLY UNLESS OTHERWISE SHOWN ON THE PLANS:

A. ALL WOOD FRAMING DETAILS NOT SHOWN OTHERWISE SHALL BE CONSTRUCTED TO THE MINIMUM STANDARDS OF THE UNIFORM BUILDING CODE. MINIMUM NAILING, UNLESS OTHERWISE NOTED, SHALL CONFORM TO TABLE 2304.10.1 OF THE INTERNATIONAL BUILDING CODE. UNLESS NOTED OTHERWISE, ALL NAILS SHALL BE AS SPECIFIED ABOVE. COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS WITH MECHANICAL AND ARCHITECTURAL DRAWINGS. PROVIDE WASHERS UNDER THE HEADS AND NUTS OF ALL BOLTS AND LAG SCREWS BEARING ON WOOD.

B. WALL FRAMING: ALL STUD WALLS SHOWN AND NOT OTHERWISE NOTED SHALL BE 16" O.C. TWO STUDS MINIMUM SHALL BE PROVIDED AT THE END OF ALL WALLS AND AT EACH SIDE OF ALL OPENINGS. TWO 2 x 8 HEADERS SHALL BE PROVIDED OVER ALL OPENINGS NOT OTHERWISE NOTED. SOLID BLOCKING FOR WOOD COLUMNS SHALL BE PROVIDED THROUGH FLOORS TO SUPPORTS BELOW. PROVIDE SOLID BLOCKING BETWEEN STUDS AT MID-HEIGHT OF ALL STUD WALLS OVER 10' IN HEIGHT.

WALLS SHALL HAVE A SINGLE BOTTOM PLATE AND A DOUBLE TOP PLATE. END NAIL TOP PLATE TO EACH STUD WITH TWO 16d NAILS, AND TOENAIL OR END NAIL EACH STUD TO BOTTOM PLATE WITH TWO 16d NAILS. FACE NAIL DOUBLE TOP PLATE WITH 16d AT 12" O.C. AND LAP MINIMUM 4'-0" AT JOINTS AND PROVIDE SIX 16d NAILS AT 4" O.C. EACH SIDE OF JOINT.

ALL STUD WALLS SHALL HAVE THEIR LOWER WOOD PLATES ATTACHED TO WOOD FRAMING BELOW WITH 16d NAILS AT 12" O.C. STAGGERED OR BOLTED TO CONCRETE WITH 5/8" DIAMETER ANCHOR BOLTS (WITH 7" MINIMUM EMBEDMENT)@ 4'-0" O.C. UNLESS INDICATED OTHERWISE. PROVIDE 2" x 2" x 3/16" PLATE WASHERS AT ALL ANCHOR BOLTS. INDIVIDUAL MEMBERS OF BUILT-UP POSTS SHALL BE NAILED TO EACH OTHER WITH 16d @ 12" O.C. STAGGERED. REFER TO THE PLANS AND SHEAR WALL SCHEDULE FOR REQUIRED SHEATHING AND NAILING. WHEN NOT OTHERWISE NOTED, PROVIDE GYPSUM WALLBOARD ON INTERIOR SURFACES NAILED TO ALL STUDS, TOP AND BOTTOM PLATES AND BLOCKING WITH NAILS AT 7" O.C. USE 5d COOLER NAILS FOR 1/2" GWB AND 6d COOLER NAILS FOR 5/8" GWB. PROVIDE 1/2" (NOM.) APA RATED SHEATHING (SPAN RATING 24/0) ON EXTERIOR SURFACES NAILED AT ALL PANEL EDGES (BLOCK UNSUPPORTED EDGES), TOP AND BOTTOM PLATES WITH NAILS @ 6" O.C. AND TO ALL INTERMEDIATE STUDS AND BLOCKING WITH NAILS @ 12" O.C. ALLOW 1/8" SPACING AT ALL PANEL EDGES AND ENDS.

C. FLOOR AND ROOF FRAMING: PROVIDE DOUBLE JOISTS UNDER ALL PARALLEL PARTITIONS THAT EXTEND OVER MORE THAN HALF THE JOIST LENGTH AND AROUND ALL OPENINGS IN FLOORS OR ROOFS UNLESS OTHERWISE NOTED. PROVIDE SOLID BLOCKING AT ALL BEARING POINTS.

TOENAIL JOISTS TO SUPPORTS WITH TWO 16d NAILS. ATTACH TIMBER JOISTS TO FLUSH HEADERS OR BEAMS WITH SIMPSON METAL JOIST HANGERS IN ACCORDANCE WITH NOTES ABOVE. NAIL ALL MULTI-JOIST BEAMS TOGETHER WITH 16d @ 12" O.C. STAGGERED. ATTACH RAFTERS AT BEARING LINES WITH H2.5 @ 48" O.C. UNLESS OTHER METAL CONNECTIONS ARE PROVIDED.

UNLESS OTHERWISE NOTED ON THE PLANS, APA RATED ROOF AND FLOOR SHEATHING SHALL BE LAID UP WITH STRENGTH AXIS PERPENDICULAR TO SUPPORTS AND NAILED WITH NAILS @ 6" O.C. TO FRAMED PANEL EDGES AND OVER STUD WALLS AS SHOWN ON PLANS AND @ 12" O.C. TO INTERMEDIATE SUPPORTS. PROVIDE APPROVED PLYWOOD EDGE CLIPS CENTERED BETWEEN JOISTS/TRUSSES AT UNBLOCKED ROOF SHEATHING EDGES. ALL FLOOR SHEATHING EDGES SHALL HAVE APPROVED TONGUE-AND-GROOVE JOINTS OR SHALL BE SUPPORTED WITH SOLID BLOCKING. ALLOW 1/8" SPACING AT ALL PANEL EDGES AND ENDS OF ALL ROOF AND FLOOR SHEATHING. TOENAIL BLOCKING TO SUPPORTS WITH 16d @ 12" O.C. UNLESS OTHERWISE NOTED. AT BLOCKED FLOOR AND ROOF DIAPHRAGMS PROVIDE FLAT 2X BLOCKING AT ALL UNFRAMED PLYWOOD PANEL EDGES AND NAIL WITH EDGE NAILING SPECIFIED.

TONGUE AND GROOVE STUCTURAL ROOF AND FLOOR DECKING SHALL BE INSTALLED AS FOLLOWS:

2X DECKING SHALL BE TOENAILED THORUGH THE TONGUE AND FACENAILED WITH ONE 16d NAIL PER PIECE PER SUPPORT.

3X AND 4X DECKING SHALL BE TOENAILED WITH ONE 40d NAIL AND FACENAILED WITH ONE 60d NAIL PER SUPPORT. COURSES SHALL BE SPIKED TO

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GENERAL NOTES

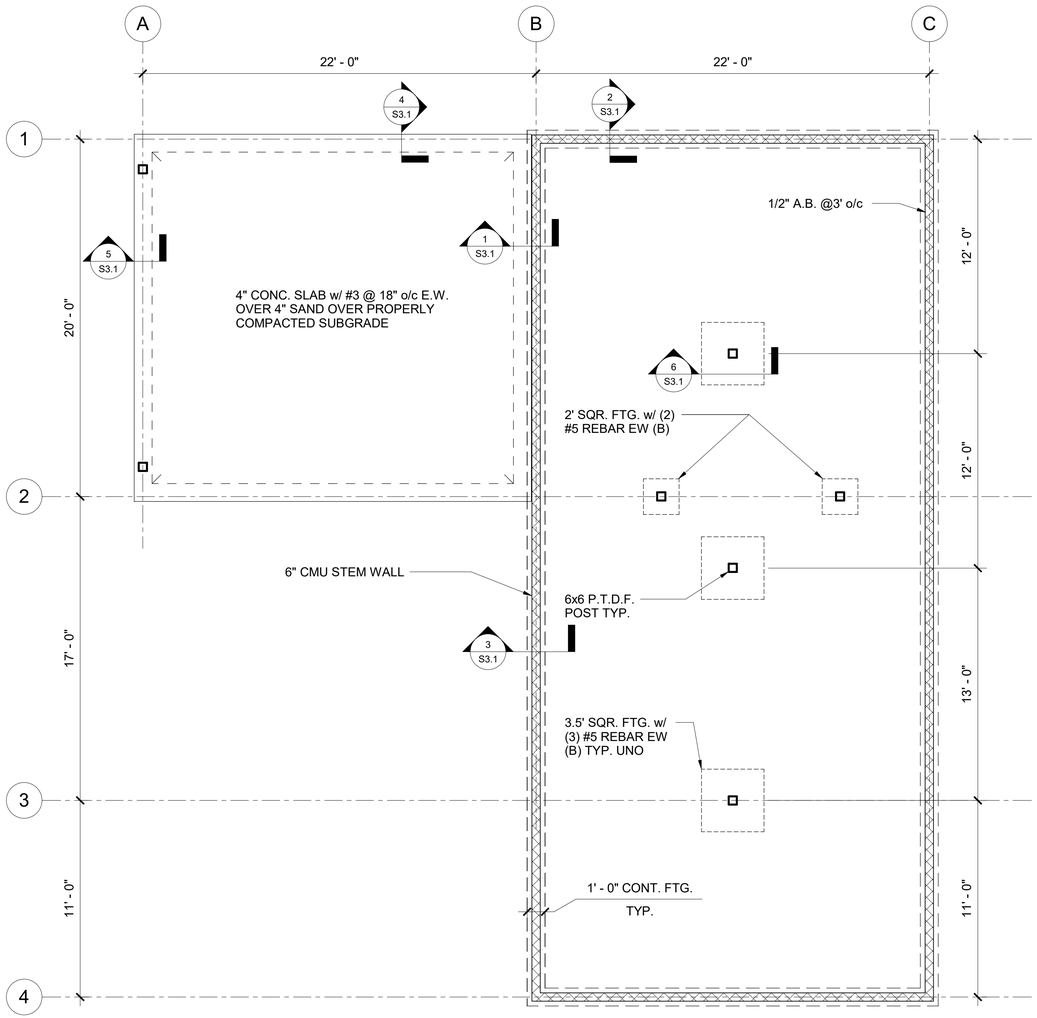
Drawn by: PAUL

Checked by: PJ

Date: 11/29/17

Scale:

Sheet: S1.1



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

NOTES:
1. SEE GENERAL NOTES (S1.0)

hi 5

hi 5 homes
Cal Poly
IPD Studio

REV.	INFO	DATE

WEED HOUSING

FOUNDATION PLAN

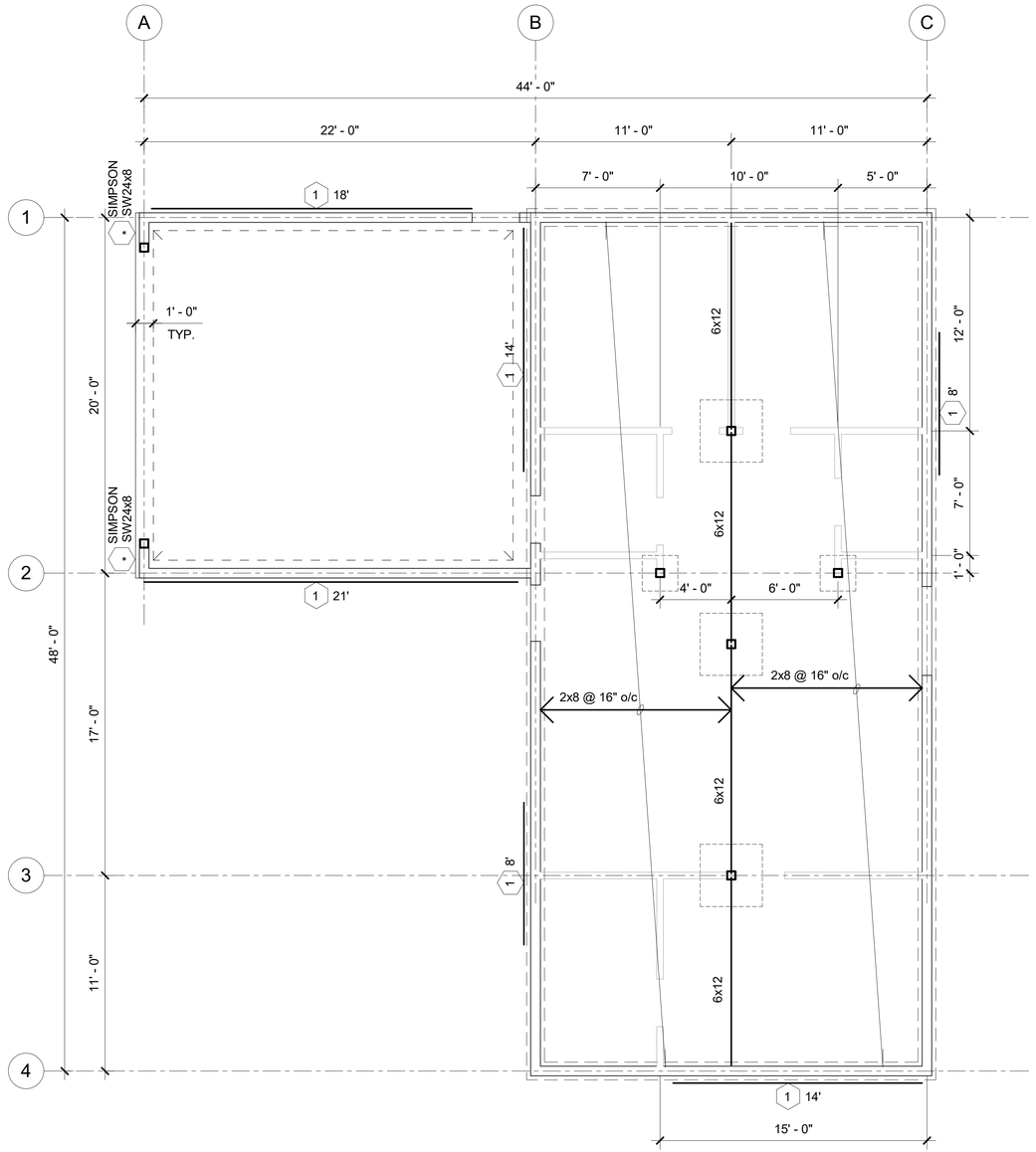
Drawn by: PAUL

Checked by: PJ

Date: 11/29/17

Scale: 1/4" = 1'-0"

Sheet: S2.1



1 Floor Framing
1/4" = 1'-0"

NOTES:
1. SEE GENERAL NOTES (S1.0)
2. FOR SHEAR WALLS, SEE SCHEDULE
3. FLOOR DIAPGHRAGM TO BE 5/8" STRUCTURAL 1 PLYWOOD w/ 10d NAILS @6" EVERYWHERE

SHEAR WALL SCHEDULE

WALL	PANEL	EDGE NAILING
1	1/2" STRUCTURAL 1	6d @ 6" o.c.

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FLOOR PLAN

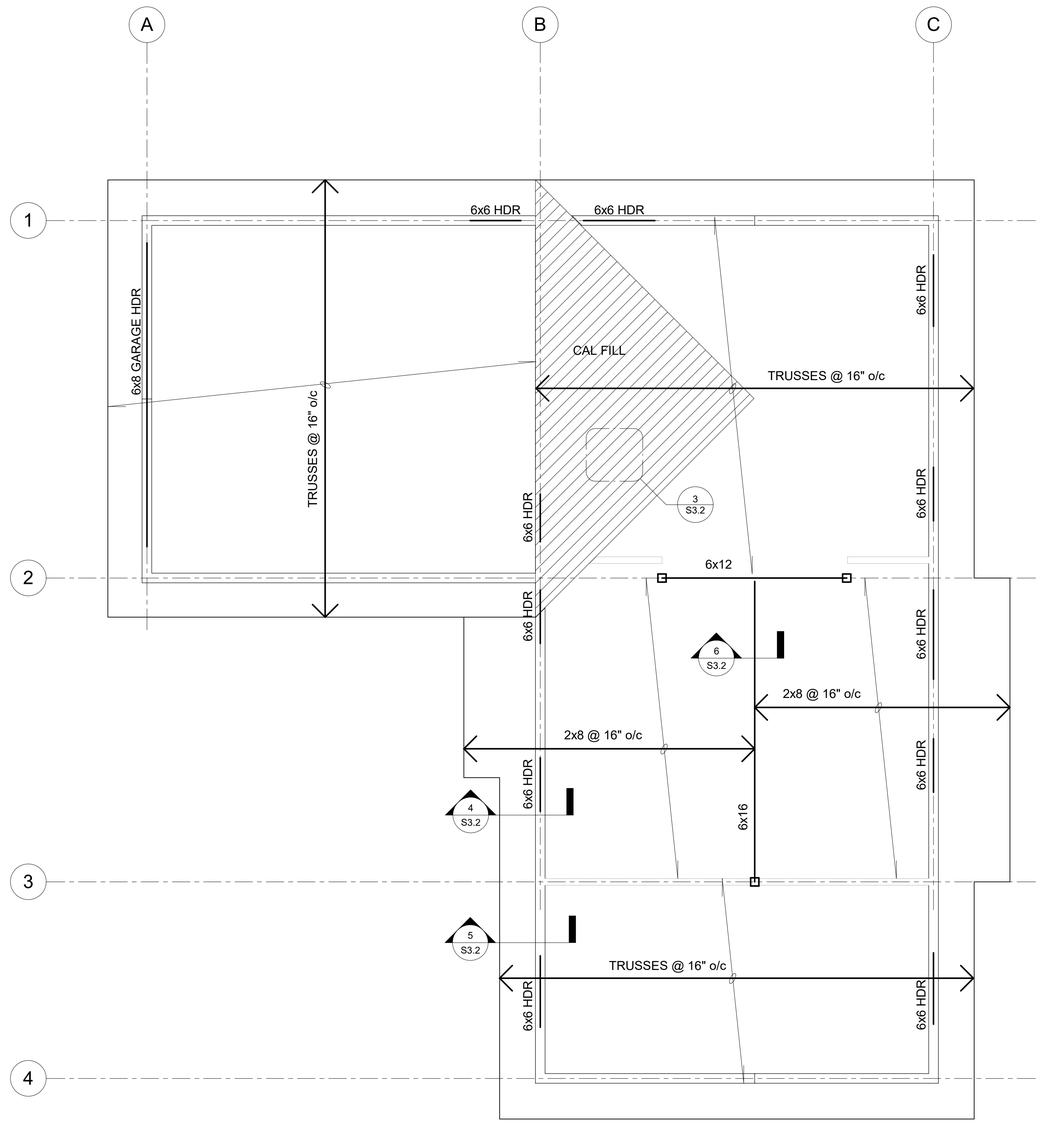
Drawn by: PAUL

Checked by: PJ

Date: 11/29/17

Scale: As indicated

Sheet: S2.2



3 Roof Framing Plan
1/4" = 1'-0"

NOTES:
1. SEE GENERAL NOTES (S1.0)
2. TRUSSES TO BE DIESIGNED BY MANUFACTURER. DL = 12 PSF , LL = 60 PSF
2. ROOF DIAPGHRAGM TO BE 5/8" STRUCTURAL 1 PLYWOOD w/ 6d NAILS @ 6" EVERYWHERE

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ROOF PLAN

Drawn by: PAUL

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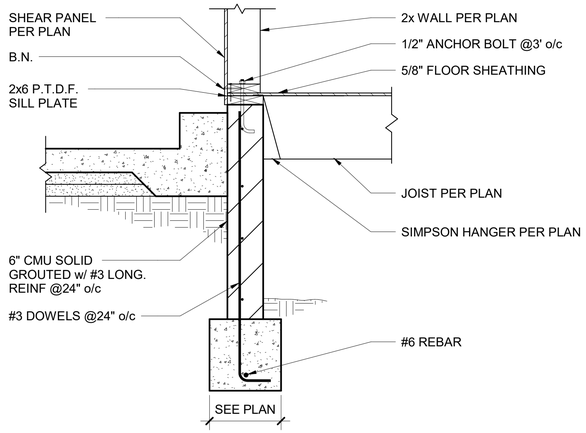
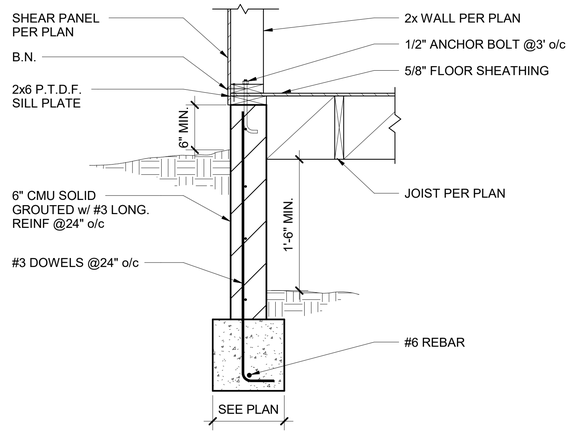
Scale: 1/4" = 1'-0"

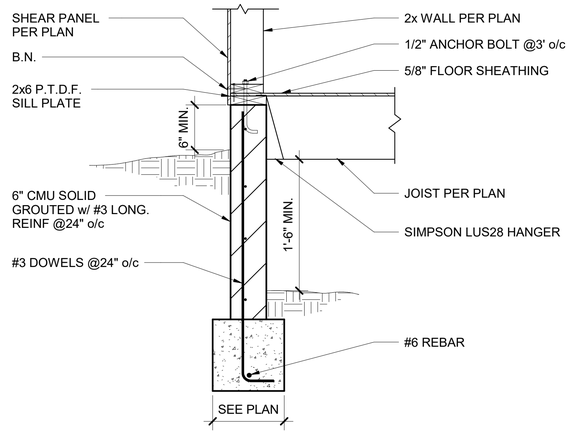
Sheet: S2.3



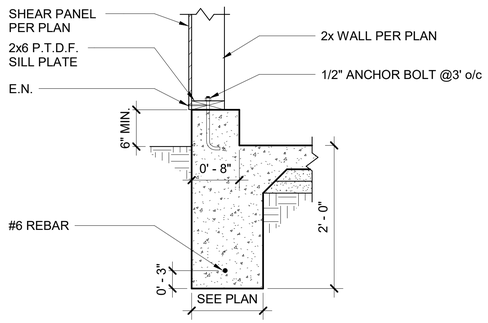
1 INTERIOR GARAGE
1" = 1'-0"



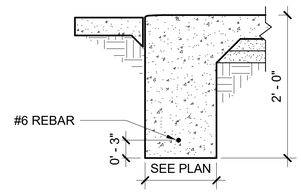
2 EXTERIOR FOOTING BEAM
1" = 1'-0"



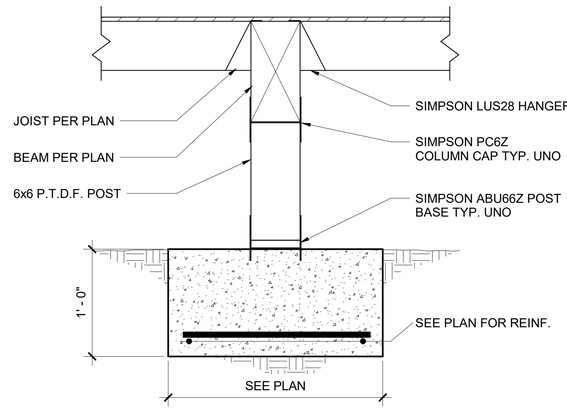
3 EXTERIOR FOOTING JOIST
1" = 1'-0"



4 EXTERIOR GARAGE
1" = 1'-0"



5 GARAGE OPENNING
1" = 1'-0"



6 INTERIOR FOUNDATION
1 1/2" = 1'-0"

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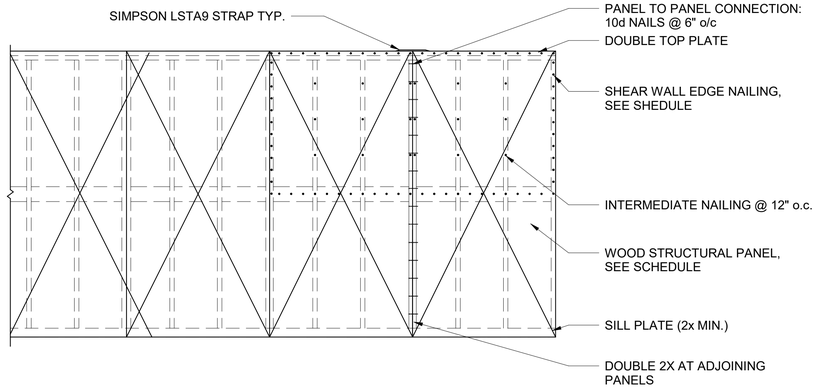
Scale: As indicated

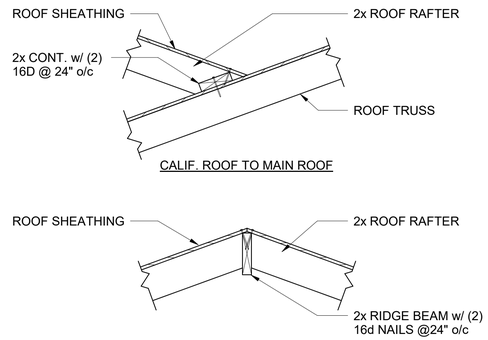
Sheet: S3.1



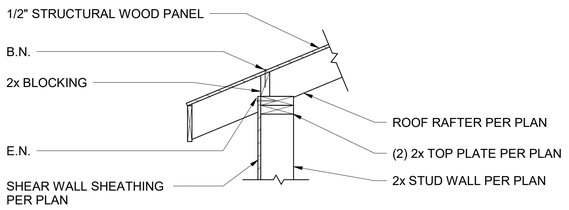
SHEAR WALL SCHEDULE

WALL	PANEL	EDGE NAILING
1	1/2" STRUCTURAL 1	6d @ 6" o.c.

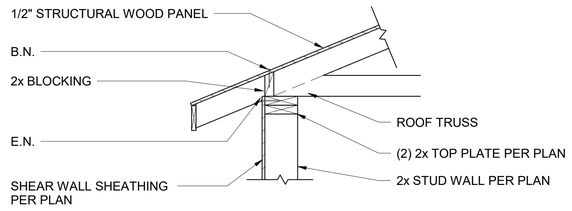
1 Typical Shear Wall Framing
1/2" = 1'-0"



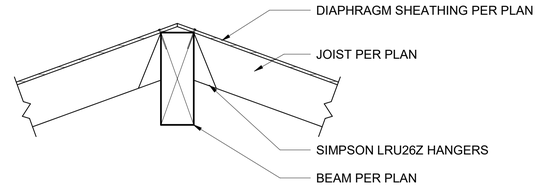
3 CALIF ROOF DETAILS
1" = 1'-0"



4 RAFTER TO WALL
1" = 1'-0"



5 TRUSS TO WALL
1" = 1'-0"



6 RAFTER TO BEAM
1" = 1'-0"

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WEED HOUSING

DETAILS

Drawn by: PAUL

Checked by: PJ

Date: 11/29/17

Scale: As indicated

Sheet: S3.2