Community Park Restroom Building

Structural Calculations

Engineer's seal applies to this entire calculation packet.

- A Utah Corporation -

CIVIL

STRUCTURAL

SURVEY

3302 N. Main Street
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LEI Project #:

2025-2365

Location:

Bullhead City, AZ

Date:

9/8/2025

Engineered by:

E. DeWitt

Reviewed by:

Registered Professional Engineer
CERTIFICATE
6[illegible]95
ERIC B. MURRAY
Signed 10/02/2025
(CIVIL)
ARIZONA U. S. A.

For Bid Only

Applies to pages 1-15

Structural Review for: Community Park Restroom Building
Location: Bullhead City, AZ
Job #: 2025-2365
Engineered by: E. DeWitt
Code: 2018 IBC

Loadings

Risk Category: II

Ground Snow Load:

Elevation = 525 ft
p_g = 20.0 psf

Roof Snow Load:

C_t = 1.0
Roof Exposure C_e = 1.0 Partially
I_s = 1.0
p_f = 20.0 psf

Roof Dead Load:

DL = 15 psf

Floor Loadings:

Live Load = 40 psf
Dead Load = 25 psf

Wind Loading:

Roofing Material = Shingle/Tile
Roof Pitch = 6 /12
Roof Angle = 26.6 degrees
Exposure Category = **C**
Mean Roof Height = 15
Wind Speed V = 99
Height & Exposure Factor λ = 1.21

p_{s30} Horizontal Pressures				p_{net30}	
zone A	zone B	zone C	zone D	zone 4	zone 5
18.88	5.90	14.06	5.23	16.48	22.06

p_s Horizontal Pressures				p_{net}	
zone A	zone B	zone C	zone D	zone 4	zone 5
22.8	**7.1**	**17.0**	**6.3**	**19.9**	**26.7**

Seismic Loading:

Number of Stories = 1
Roof diaphragm height h_r = 15 ft
I_e = 1.00
Fundamental Period T_a = 0.152 sec.
F = 1
Site Class = D **(Assumed)**
R factor = 6.5 Structural Sheathing
R factor = 6.5 Simpson Strong Wall
R factor = 6.5 Portal Frame
R factor = 2 Gypsum Sheathing
R factor = 5 Masonry Shear Wall
R factor = 4 Concrete Shear Wall
R factor = 2.5 Cantilever Steel Post
R factor = 4.5 Steel Moment Frame
S_S = 0.255
S_1 = 0.118
F_a = 1.596
F_v = 2.364
S_{MS} = 0.40698
S_{M1} = 0.278952
S_{DS} = 0.271
S_{D1} = 0.186
T_o = 0.137084 sec.
T_s = 0.685419 sec.
Seismic Design Category = **C**

Soil Bearing Capacity: 1500 psf **(Assumed)**

ASCE Hazards Report

Address:
1251 South Highway 95
Bullhead City, Arizona
86442

Standard:	ASCE/SEI 7-16	**Latitude:**	35.140361
Risk Category:	II	**Longitude:**	-114.570863
Soil Class:	D - Default (see Section 11.4.3)	**Elevation:**	524.9424599247986 ft (NAVD 88)

Wind

Results:

Wind Speed	99 Vmph
10-year MRI	69 Vmph
25-year MRI	75 Vmph
50-year MRI	80 Vmph
100-year MRI	85 Vmph

Data Source:	ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed:	Fri Sep 05 2025

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

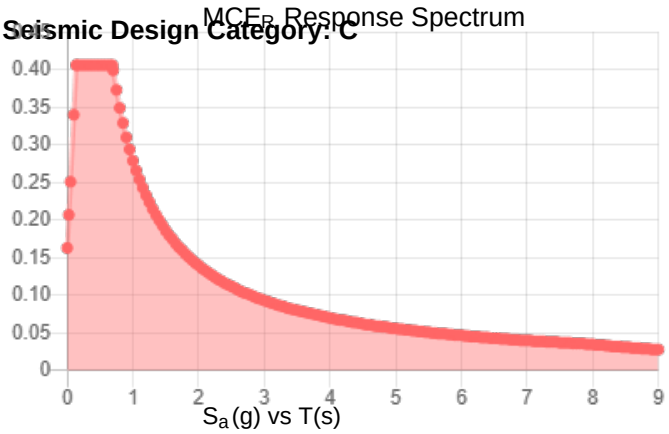
Seismic

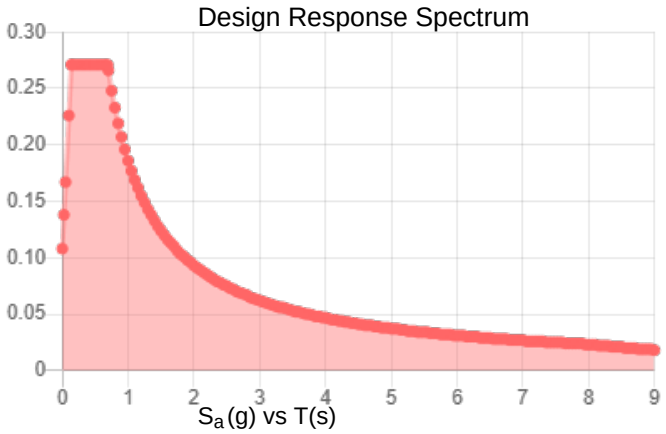
Site Soil Class: D - Default (see Section 11.4.3)

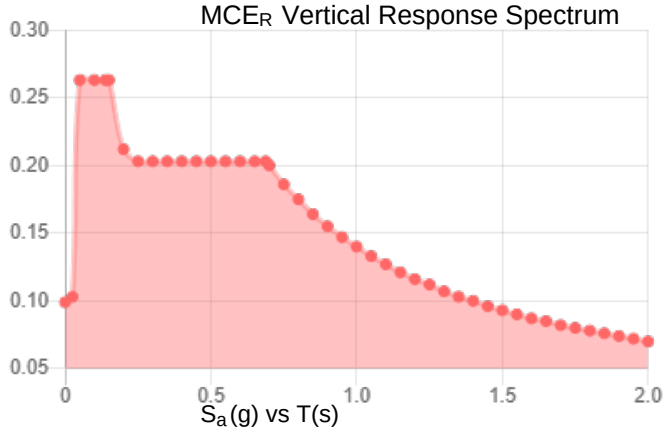
Results:

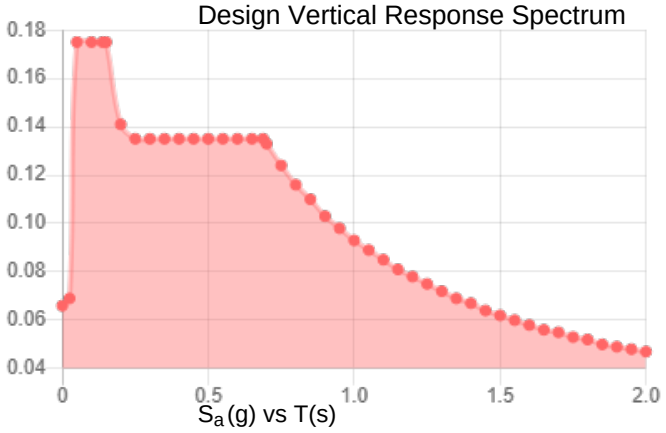
S_S :	0.255	S_{D1} :	0.186
S_1 :	0.118	T_L :	8
F_a :	1.596	PGA :	0.112
F_v :	2.364	PGA_M :	0.176
S_{MS} :	0.406	F_{PGA} :	1.576
S_{M1} :	0.279	I_e :	1
S_{DS} :	0.271	C_v :	0.809

Seismic Design Category: C









Data Accessed: **Fri Sep 05 2025**

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Preface & Structural Notes

This engineering report is valid only for the following plan and location:

Community Park Restroom Building
1251 Highway 95, Bullhead City, Arizona

NOTE TO PLAN CHECKER AND BUILDING INSPECTOR:

If the above address does not match the intended building address, notify LEI immediately @ 801-798-0555. This engineering packet is to be used only once for the above mentioned location and is not to be copied or reproduced without written consent of LEI Consulting Engineers and Surveyors, Inc.

Structural Notes:

General Notes

1 If values and assumptions stated in this report are incorrect, or if changes in the field are noticed which are different from those stated in this report, the engineer must be notified in order for the necessary corrections to be made.
2 If there are any discrepancies between the calculations and the drawings, these calculations shall govern.
3 This engineering report deals only with the structural parts of the building and does not apply to the non-structural parts.
4 If drawings are stamped in conjunction with this engineering report, certification pertains only to the structural elements of the drawings.
5 The general contractor is responsible for the method, means, and sequence of all structural erection except when specifically noted otherwise on the drawings. General contractor shall provide temporary shoring and bracing as his method of erection requires to provide adequate vertical and lateral support during erection. This shoring and bracing shall remain in place until all permanent members are placed and all final connections are completed including all roof and floor attachments.

Site Preparation

1 Do not place footings or foundations on disturbed soils, undocumented fill, debris, frozen soil, or in ponded water.
2 All slabs on grade shall be underlain by 4 in. of free-draining granular material such as "pea" gravel or 3/4 - 1 in. minus clean gravel.
3 Footings, foundations, excavations, grading and fill shall comply with the geotechnical report.

Concrete

1 All concrete footings and slabs on grade shall have a 28 day minimum strength = 2500 psi.
2 All concrete foundation walls and retaining walls shall have a 28 day minimum strength = 3000 psi.
3 Concrete shall be thoroughly consolidated by suitable means during placement.
4 Footings shall be centered below the wall and/or column above, typical unless noted otherwise.
5 Exterior footings shall bear below the effects of frost.
6 Stagger footing construction joints from wall construction joints above by at least 6 feet.
7 Reinforcing in continuous footings shall be continuous at corners and/or intersections by providing proper lap lengths and/or corner bars.
8 Interior slabs on grade shall be a min. of 4" thick.
9 Place vertical reinforcing in the center of the wall (except for retaining walls or when each face is specified).
10 Vertical reinforcing shall be dowelled to footing or structure below and to structure above with the same size bar and spacing, typical U.N.O.
11 Provide corner bars at all intersections and corners. Use same size bar and spacing as the horizontal reinforcing.
12 Horizontal reinforcing shall terminate at the ends of the walls and at openings with a standard hook.
13 Provide drainage at the base of retaining walls.

Reinforcing Steel

1 Reinforcing steel shall be new stock deformed bars and shall conform to ASTM A615, grade 60, with a design yield strength = 60 ksi.
2 Reinforcing steel shall be free of loose, flaky rust, scale, grease, oil, dirt, and other materials which might affect or impair bond.
3 Splices in continuous reinforcing shall be made on areas of compression and/or at points of minimum stress, typical U.N.O.
4 Lap splices shall be 40 bar diameters or 24" long in concrete. Dowels shall have a minimum of 30 bar diameters embedment.
5 Bends shall be made cold; do not use heat. Do not un-bend or re-bend a previously bent bar.
6 Reinforcing steel in concrete shall be securely anchored and tied in place prior to placing concrete and shall be positioned with the following minimum cover:
concrete cast against and permanently exposed to earth = 3"
concrete exposed to earth or weather = 1 1/2"
slabs on grade = center of slab

Structural Steel

1 Structural steel W-shapes shall conform to ASTM A992 grade 50 enhanced steel. Structural steel plates shall conform to ASTM A36.
2 Structural steel HSS-shapes shall conform to ASTM A500, grade B, with a min. yield strength Fy = 46 ksi (rectangular) or Fy = 42 ksi (round).
3 Structural pipe shall conform to ASTM A53, with a min. yield strength Fy = 36 ksi.
4 High strength bolts shall conform to ASTM A325, all other bolts shall conform to ASTM A307 or better.
5 Welded anchor studs and deformed bar anchors shall conform to the manufacturer's specs.
6 Fabrication shall be done in an approved fabricator's shop.
7 Use high strength (8000 psi min. at 28 days), non shrink, liquid epoxy grout beneath all steel base plates and bearing plates.
8 Bolt shall be bearing type connections U.N.O.
9 Steel to steel bolted connections shall be made with ASTM A325 high strength bolts and nuts, U.N.O.
10 All other bolted connections shall be made with bolts and nuts conforming to ASTM A307 U.N.O., including anchor bolts.
11 Bolted connections shall be tightened and shall have washers as required by AISC U.N.O.
12 Enlarging of holes shall be accomplished by means of reaming. Do not use a torch on any bolt holes.
13 Welded connections shall be made using low hydrogen matching filler material electrodes, U.N.O.
14 Welders shall be currently certified according to AWS within the last year. All welding procedures shall be pre-qualified. Welders shall follow welding procedures.
15 Welding and gas cutting shall be done per AWS.
16 Welds shall have the slag removed.

Structural Notes (cont):

Masonry Veneer Anchor Ties

1 Masonry veneer ties shall be one of the following:
   a. Dovetail anchors
   b. DX-10 seismic clip interlock system by Hohmann & Barnard
   c. Engineer approved 2 piece adjustable hot-dipped galvanized ties.
2 Maximum spacing shall be 16" o.c. horizontal and vertical.
3 Provide continuous horizontal galvanized #9 wire in center third of mortar joints at 16" o.c. Engage #9 wire with all anchor ties in seismic zone category E.

Wood Truss

1 Bottom chords of trusses, acting as ceiling members must be able to support a 10 psf live load per IBC requirements.
2 The truss manufacturer shall be responsible for the design and fabrication of the pre-engineered trusses.
3 The trusses shall be designed as per the attached engineering specs.
4 The trusses shall be designed to carry any additional loads due to mechanical units, overhead doors, roof overbuilds, etc.
5 The trusses shall be designed per the IBC and local ordinances.
6 All members shall be designed for combined stresses based on the worst loading condition.
7 The truss manufacturer shall indicate proper bracing of compression chord members @ 6' long (or longer), as well as bracing for truss erection.
8 All dimensions shall be field verified prior to fabrication.
9 General contractor shall be responsible for the installation of the trusses per the truss manufacturer's recommendations and specs.
10 No web or chord members shall be modified in the field without approval from the truss engineer.
11 The engineer is not responsible for the pre-engineered trusses, nor for the installation of the trusses.
12 General contractor is to verify truss layout is consistent with these plans and notify engineer of any deviations.

General Framing

1 All joists, rafters, posts and headers shall be DF-L #2 or equal U.N.O. If TJI's or equal are used, they must be installed per manufacturer's specs.
2 All joists and rafters shall have solid blocking at their bearing points.
3 All wood/lumber placed onto concrete shall be pressure treated or redwood.
4 Verify all beam sizes on the drawings with this report.
5 All beams and headers over 6'-0" shall be supported by double trimmer studs U.N.O.
6 All headers over 8'-0" shall shall have double king studs at each end U.N.O.
7 All over frame areas are to have full roof sheathing below.
8 Provide solid blocking and continuous bearing to foundation at all bearing point loads from above.
9 Provide double floor joists below all parallel bearing walls above.
10 Glulam beams shall be 24F-V4 DF/DF for single spans and 24F-V8 DF/DF for multiple spans and cantilevered spans.
11 Microllam beams shall be Laminated Veneer Lumber (LVL) with the following minimum design values: E=1,900,000 psi, Fb=2,600 psi, Fv=285 psi.
12 Parallam beams shall be Parallel Strand Lumber (PSL) with the following minimum design values: E=2,000,000 psi, Fb=2,900 psi, Fv=290 psi.
13 TimberStrand beams shall be Laminated Strand Lumber (LSL) w/ the following minimum design values:
   - 1-1/4" wide (rim board): E=1,300,000 psi, Fb=1,700 psi, Fv=425 psi.
   - 1-3/4" wide: E=1,550,000 psi, Fb=2,325 psi, Fv=310 psi.
14 All rafters and joists over 3 ft long shall be hangered if not supported by bottom bearing.
15 All hangers and other wood connections must be designed to carry the capacity of the member that they are supporting.
16 No structural member shall be cut or notched unless specifically shown, noted or approved by engineer.
17 Lag screws shall be inserted in a drilled pilot hole 60 - 75% of the shank diameter by turning with a wrench, not by driving with a hammer.
18 Nails are to be common wire U.N.O.
19 All bolt holes shall be drilled with a bit 1/32" to 1/16" larger than the nominal bolt diameter.
20 All joints in wall sheathing shall occur in the middle of a plate or block and nailed on each side of the joint w/ edge nailing per the shearwall schedul
21 All over built roof rafters shall be braced vertically to the trusses below at 4' o.c. max.
22 Double top plates are to have a minimum 48" lap splice w/ (8) 16d nails U.N.O.
23 All fasteners and connectors in contact with treated lumber shall be galvanized G90 or better.

Summary

Roof:

RR1: 2x10 DF-L#2 @ 16" o.c. as noted on plans
Trusses by others
Use 7/16" APA rated OSB sheathing w/ 8d nails @ 6" o.c. edge, 12" o.c. field
Overbuild to be 2" x 6" Timber @ 24" o.c.

Other:

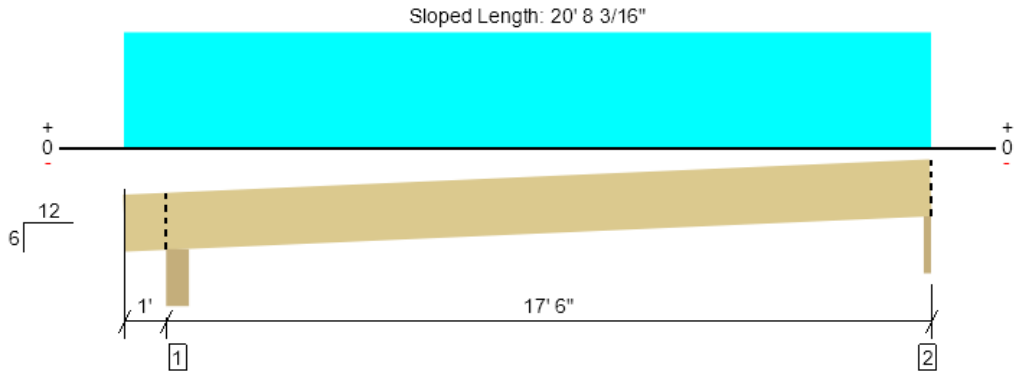
All bearing headers to be (2) 2x10 (DF L #2 or better) unless noted otherwise
All exterior sheathing to be Shear Wall #1 unless noted otherwise
All glulam beams are to be 24F-V4 unless noted otherwise
Strap end lengths for shear walls (see also Simpson Coiled strap specs.):
CS16 = 14" CMST14 = 34" CMSTC16 = 25"

Beam Schedule

Desig.	Qty.	Size	Type
RB1	1	4 x 6	DF-L#2
RB2	1	4 x 12	DF-L#2
RB3	1	6 x 12	DF-L#2
RB4	1	4 x 8	DF-L#2

Level, RR1

1 piece(s) 2 x 10 DF No.2 @ 16" OC



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

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	423 @ 18' 5 1/4"	1641 (1.75")	Passed (26%)	--	1.0 D + 1.0 Lr (Alt Spans)
Shear (lbs)	382 @ 17' 8"	2081	Passed (18%)	1.25	1.0 D + 1.0 Lr (Alt Spans)
Moment (Ft-lbs)	1801 @ 9' 10 3/8"	2537	Passed (71%)	1.25	1.0 D + 1.0 Lr (Alt Spans)
Live Load Defl. (in)	0.413 @ 9' 10 1/16"	0.641	Passed (L/559)	--	1.0 D + 1.0 Lr (Alt Spans)
Total Load Defl. (in)	0.757 @ 9' 10 1/8"	0.962	Passed (L/305)	--	1.0 D + 1.0 Lr (Alt Spans)

Member Length : 21' 13/16"
System : Roof
Member Type : Joist
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD
Member Pitch : 6/12

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Roof Live	Factored	
1 - Beveled Plate - HF	5.50"	5.50"	1.50"	221	263	484	Blocking
2 - Beveled Plate - DF	1.75"	1.75"	1.50"	193	231	423	Blocking

• Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	6' 3" o/c	
Bottom Edge (Lu)	20' 8" o/c	

•Maximum allowable bracing intervals based on applied load.
•Dimensions for lateral bracing intervals are measured along the length of the member for sloped conditions.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Roof Live (1.25)	Comments
1 - Uniform (PSF)	0 to 18' 6"	16"	15.0	20.0	Roof

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

ForteWEB Software Operator	Job Notes
Elyssa DeWitt LEI Engineering (801) 798-0555 elyssadewitt@lei-eng.com	

Weyerhaeuser

9/8/2025 4:29:27 PM UTC
ForteWEB v3.9, Engine: V8.4.3.94, Data: V8.1.7.3
File Name: 2025-2365

Beams

	RB1		RB2		RB3		RB4	
Roofing material =	Shingle/Tile		Shingle/Tile		Shingle/Tile		Shingle/Tile	
Roof Pitch=	6		6		6		6	
Angle=	26.6		26.6		26.6		26.6	
C_S =	1.000		1.000		1.000		1.000	
Increase for Drift/Valley=	1.000		1.000		1.000		1.000	
Effective snow load (psf)=	20		20		20		20	
Roof dead load (psf)=	15		15		15		15	
Floor live load (psf)=	40		40		40		40	
Floor dead load (psf)=	25		25		25		25	
Length (ft)=	3.5		10.5		10.5		6.5	
Trib. Area $_{roof}$=	19		10.5		17.5		3	
Trib. Area $_{floor}$=	0		0		0		0	
w_S (plf) =	380		210		350		60	
w_L (plf) =	0		0		0		0	
w_D (plf) =	289		166		276		50	
$w_{self\ weight}$ (plf) =	4.2		8.5		13.7		5.5	
Point Load: Snow (lb)=								
Live (lb)=								
Dead (lb)=								
a (ft)=	1.75		5.25		5.25		3.25	
b (ft)=	1.75		5.25		5.25		3.25	
Add. uniform load (plf)=								
Allowable Live Deflection =	L/240		L/240		L/240		L/240	
Allowable Total Deflection =	L/180		L/180		L/180		L/180	
Left/Right Reaction: Factored (lb)=	**1171**	**1171**	**1974**	**1974**	**3288**	**3288**	**359**	**359**
Snow (lb)=	665	665	1103	1103	1838	1838	195	195
Live (lb)=	0	0	0	0	0	0	0	0
Dead (lb)=	506	506	872	872	1450	1450	164	164
V Redution Allowed (uniform load)=	No		No		No		No	
V Redution Allowed (point load)=	No		No		No		No	
V_{max} (lb)=	1171		1974		3288		359	
Location of M_{max} (ft)=	1.75		5.25		5.25		3.25	
M_{max} (ftlb)=	1025		5182		8630		584	
Size Factor (C_F)=	1.30		1.10		1.00		1.30	
Volume Factor (C_v)=	1.00		1.00		1.00		1.00	
Duration Factor (C_d) =	1.15		1.15		1.15		1.15	
Beam Type (t,t1,tss,g,m,p,ts,rb)	t		t		t		t	
d (in)=	5.5		11.25		11.5		7.25	
b (in)=	3.5		3.5		5.5		3.5	
$F'_{c\perp}$ =	625		625		625		625	
L/R Bearing Width (in)=	3.5	3.5	3.5	3.5	5.5	5.5	3.5	3.5
L/R Req'd Bearing Length (in)=	0.54	0.54	0.90	0.90	0.96	0.96	0.16	0.16
I (in^4)=	48.5		415.3		697.1		111.1	
F_b	900		900		900		900	
F'_b=	1346		1139		1035		1346	
S (in^3)=	17.6		73.8		121.2		30.7	
S_{req}=	9		55		100		5	
	Section OK		**Section OK**		**Section OK**		**Section OK**	
E (psi)=	1600000		1600000		1600000		1600000	
F'_v (psi)=	207		207		207		207	
f_v (psi)=	91		75		78		21	
	Shear OK		**Shear OK**		**Shear OK**		**Shear OK**	
Location of Max Deflection=	1.75		5.25		5.25		3.25	
Allowable Live Deflection (in)=	0.175		0.525		0.525		0.325	
Live Deflection (in)=	0.017		0.086		0.086		0.014	
Allowable Total Deflection (in)=	0.233		0.700		0.700		0.433	
Total Deflection (in)=	0.029		0.155		0.154		0.025	
	Deflection OK		**Deflection OK**		**Deflection OK**		**Deflection OK**	

Shear Walls

Gridline 1

Structural Sheathing

1/2" dia. anchor bolts

		Length	Inside	Ratio h:w	Ratio 2w/h	SWS Wind	SWS Seismic
	panel 1	12.666		1.1 :1	1.00	46	8
	panel 2	18.666		0.7 :1	1.00	46	8
	panel 3						
	panel 4						
	panel 5						
	panel 6						
	panel 7						
	panel 8						
	panel 9						
	panel 10						
	$ASW_{1,2}$=	31.332	**31.332**	Total=	31.33		

Wind

$TA_{Roof\text{-}end}$	$TA_{Roof\text{-}int.}$	V_s
177	60	1560
$TA_{Wall\text{-}end}$	$TA_{Wall\text{-}int}$	$V_{s\ min}$
24	24	**1448**
	$V_{additional}$ =	-150

<= to gridline 2

SW1	SW2	SW3	SW4
339 plf	495 plf	637 plf	832 plf
Total Resistance$_{wind}$			
10622	15509	19958	26068
Use SW1			

Seismic

A_i	w_i	F	ρ	R	F_x	V_{final}
840	8955	1.000	1.000	6.5	374	**262**
					$V_{additiona}$ =	

SW1	SW2	SW3	SW4
241 plf	350 plf	455 plf	595 plf
Total Resistance$_{seismic}$			
7551	10966	14256	18643
Use SW1			

Check uplift

DL	h	h'	$Uplift_w$	$Uplift_s$
100	13.5	13.5	-9	-521
100	13.5	13.5	-309	-821

Use SW1
No Uplift
Use 1/2" dia. anchor bolts @ 32" o.c.

Perforated Shearwall 1: NOT USED — $t = v$ = 0

Total Length =		V_{wind}	V_{seis}	$Uplift_w$	$Uplift_s$
Height =		0	0	0	0
Max opening height=		**Ratio**			
C_o =		h:w	2w/h		
segment 1					
segment 2					
segment 3					
segment 4					
segment 5					
		Total=	0.00		

Perforated Shearwall 2: NOT USED — $t = v$ = 0

Total Length =		V_{wind}	V_{seis}	$Uplift_w$	$Uplift_s$
Height =		0	0	0	0
Max opening height=		**Ratio**			
C_o =		h:w	2w/h		
segment 1					
segment 2					
segment 3					
		Total=	0.00		

Perforated Shearwall 3: NOT USED — $t = v$ = 0

Total Length =		V_{wind}	V_{seis}	$Uplift_w$	$Uplift_s$
Height =		0	0	0	0
Max opening height=		**Ratio**			
C_o =		h:w	2w/h		
segment 1					
segment 2					
segment 3					
		Total=	0.00		

Gridline 2

Structural Sheathing

1/2" dia. anchor bolts

		Length	Inside	Ratio h:w	Ratio 2w/h	SWS Wind	SWS Seismic
	panel 1	14		0.6 :1	1.00	44	9
	panel 2	14		0.6 :1	1.00	44	9
	panel 3						
	panel 4						
	panel 5						
	panel 6						
	panel 7						
	panel 8						
	panel 9						
	panel 10						
	$ASW_{1,2}$=	28	**28**	Total=	28.00		

Wind

$TA_{Roof\text{-}end}$	$TA_{Roof\text{-}int.}$	V_s
69	59	1093
$TA_{Wall\text{-}end}$	$TA_{Wall\text{-}int}$	$V_{s\ min}$
24	24	**1243**
	$V_{additional}$ =	150

<= from gridline 1

SW1	SW2	SW3	SW4
339 plf	495 plf	637 plf	832 plf
Total Resistance$_{wind}$			
9492	13860	17836	23296
Use SW1			

Seismic

A_i	w_i	F	ρ	R	F_x	V_{final}
840	8955	1.000	1.000	6.5	374	**262**
					$V_{additiona}$ =	

SW1	SW2	SW3	SW4
241 plf	350 plf	455 plf	595 plf
Total Resistance$_{seismic}$			
6748	9800	12740	16660
Use SW1			

Check uplift

DL	h	h'	$Uplift_w$	$Uplift_s$
100	8	8	-345	-625
100	8	8	-345	-625

Use SW1
No Uplift
Use 1/2" dia. anchor bolts @ 32" o.c.

Perforated Shearwall 1: NOT USED — $t = v$ = 0

Total Length =		V_{wind}	V_{seis}	$Uplift_w$	$Uplift_s$
Height =		0	0	0	0
Max opening height=		**Ratio**			
C_o =		h:w	2w/h		
segment 1					
segment 2					
segment 3					
segment 4					
segment 5					
		Total=	0.00		

Perforated Shearwall 2: NOT USED — $t = v$ = 0

Total Length =		V_{wind}	V_{seis}	$Uplift_w$	$Uplift_s$
Height =		0	0	0	0
Max opening height=		**Ratio**			
C_o =		h:w	2w/h		
segment 1					
segment 2					
segment 3					
		Total=	0.00		

Perforated Shearwall 3: NOT USED — $t = v$ = 0

Total Length =		V_{wind}	V_{seis}	$Uplift_w$	$Uplift_s$
Height =		0	0	0	0
Max opening height=		**Ratio**			
C_o =		h:w	2w/h		
segment 1					
segment 2					
segment 3					
		Total=	0.00		

Shear Walls

Gridline 3 & 4

Structural Sheathing

1/2" dia. anchor bolts

			Ratio		SWS		Wind			Seismic							Check uplift				
	Length	Inside	h:w	2w/h	Wind	Seismic	$TA_{Roof\text{-}end}$	$TA_{Roof\text{-}int.}$	V_s	A_i	w_i	F	ρ	R	F_x	V_{final}	DL	h	h'	$Uplift_w$	$Uplift_s$
panel 1							0	0	1803	840	8955	1.000	1.000	6.5	374	**262**					
panel 2							$TA_{Wall\text{-}end}$	$TA_{Wall\text{-}int}$	$V_{s\ min}$						$V_{additiona}$ =						
panel 3							40	123	**1803**												
panel 4								$V_{additional}$ =													
panel 5							SW1	SW2	SW3	SW4	SW1	SW2	SW3	SW4							
panel 6							339 plf	495 plf	637 plf	832 plf	241 plf	350 plf	455 plf	595 plf							
panel 7							**Total Resistance$_{wind}$**				**Total Resistance$_{seismic}$**										
panel 8							3015	4403	5665	7400	2143	3113	4047	5292							
panel 9							Use SW1				Use SW1										
panel 10																					
$ASW_{1,2}$=	0	**0**	Total=	0.00																	

Use SW1
Use LSTHD8/8RJ holdowns each side of panel as noted on plans
Use 1/2" dia. anchor bolts @ 32" o.c.

Perforated Shearwall 1:

		V_{wind}	V_{seis}	$t = v$ = 203	
Total Length =	15.333			$Uplift_w$	$Uplift_s$
Height =	8	1803	262	1622	235
Max opening height=	7	**Ratio**			
C_o =	0.741	h:w	2w/h		
segment 1	4.334	1.8 :1	1.00		
segment 2	7.6667	1.0 :1	1.00		
segment 3					
segment 4					
segment 5					
		Total=	8.89		

Perforated Shearwall 2: **NOT USED** $t = v$ = 0

		V_{wind}	V_{seis}	$Uplift_w$	$Uplift_s$
Total Length =					
Height =		0	0	0	0
Max opening height=		**Ratio**			
C_o =		h:w	2w/h		
segment 1					
segment 2					
segment 3					
		Total=	0.00		

Perforated Shearwall 3: **NOT USED** $t = v$ = 0

		V_{wind}	V_{seis}	$Uplift_w$	$Uplift_s$
Total Length =					
Height =		0	0	0	0
Max opening height=		**Ratio**			
C_o =		h:w	2w/h		
segment 1					
segment 2					
segment 3					
		Total=	0.00		

Shear Walls

Gridline 1

Structural Sheathing

1/2" dia. anchor bolts

	Length	Inside	Ratio h:w	Ratio 2w/h	SWS Wind	SWS Seismic	Wind $TA_{Roof\text{-}end}$	Wind $TA_{Roof\text{-}int.}$	Wind V_s	Seismic A_i	Seismic w_i	Seismic F	Seismic ρ	Seismic R	Seismic F_x	Seismic V_{final}	Check uplift DL	Check uplift h	Check uplift h'	Check uplift $Uplift_w$	Check uplift $Uplift_s$
panel 1	12		0.8 :1	1.00	67	11	177	60	1560	840	8955	1.000	1.000	6.5	374	**262**	100	9	9	-1	-502
panel 2	12		0.8 :1	1.00	67	11	$TA_{Wall\text{-}end}$	$TA_{Wall\text{-}int}$	$V_{s\ min}$						$V_{additional}$ =		100	9	9	-1	-502
panel 3							24	24	**1598**												
panel 4							$V_{additional}$ =														
panel 5							SW1	SW2	SW3	SW4	SW1	SW2	SW3	SW4							
panel 6							339 plf	495 plf	637 plf	832 plf	241 plf	350 plf	455 plf	595 plf							
panel 7							**Total Resistance$_{wind}$**				**Total Resistance$_{seismic}$**										
panel 8							8136	11880	15288	19968	5784	8400	10920	14280							
panel 9							Use SW1				Use SW1										
panel 10																					
$ASW_{1,2}$=	24	**24**	Total=	24.00																	

Use SW1
No Uplift
Use 1/2" dia. anchor bolts @ 32" o.c.

Perforated Shearwall 1: NOT USED — $t = v$ = 0

Total Length =		V_{wind}	V_{seis}	$Uplift_w$	$Uplift_s$
Height =		0	0	0	0
Max opening height=		**Ratio**			
C_o =		h:w	2w/h		
segment 1					
segment 2					
segment 3					
segment 4					
segment 5					
		Total=	0.00		

Perforated Shearwall 2: NOT USED — $t = v$ = 0

Total Length =		V_{wind}	V_{seis}	$Uplift_w$	$Uplift_s$
Height =		0	0	0	0
Max opening height=		**Ratio**			
C_o =		h:w	2w/h		
segment 1					
segment 2					
segment 3					
		Total=	0.00		

Perforated Shearwall 3: NOT USED — $t = v$ = 0

Total Length =		V_{wind}	V_{seis}	$Uplift_w$	$Uplift_s$
Height =		0	0	0	0
Max opening height=		**Ratio**			
C_o =		h:w	2w/h		
segment 1					
segment 2					
segment 3					
		Total=	0.00		

Gridline 2

Structural Sheathing

1/2" dia. anchor bolts

	Length	Inside	Ratio h:w	Ratio 2w/h	SWS Wind	SWS Seismic	Wind $TA_{Roof\text{-}end}$	Wind $TA_{Roof\text{-}int.}$	Wind V_s	Seismic A_i	Seismic w_i	Seismic F	Seismic ρ	Seismic R	Seismic F_x	Seismic V_{final}	Check uplift DL	Check uplift h	Check uplift h'	Check uplift $Uplift_w$	Check uplift $Uplift_s$
panel 1	12		0.8 :1	1.00	46	11	69	59	1093	840	8955	1.000	1.000	6.5	374	**262**	100	9	9	-190	-502
panel 2	12		0.8 :1	1.00	46	11	$TA_{Wall\text{-}end}$	$TA_{Wall\text{-}int}$	$V_{s\ min}$						$V_{additional}$ =		100	9	9	-190	-502
panel 3							24	24	**1093**												
panel 4							$V_{additional}$ =														
panel 5							SW1	SW2	SW3	SW4	SW1	SW2	SW3	SW4							
panel 6							339 plf	495 plf	637 plf	832 plf	241 plf	350 plf	455 plf	595 plf							
panel 7							**Total Resistance$_{wind}$**				**Total Resistance$_{seismic}$**										
panel 8							8136	11880	15288	19968	5784	8400	10920	14280							
panel 9							Use SW1				Use SW1										
panel 10																					
$ASW_{1,2}$=	24	**24**	Total=	24.00																	

Use SW1
No Uplift
Use 1/2" dia. anchor bolts @ 32" o.c.

Perforated Shearwall 1: NOT USED — $t = v$ = 0

Total Length =		V_{wind}	V_{seis}	$Uplift_w$	$Uplift_s$
Height =		0	0	0	0
Max opening height=		**Ratio**			
C_o =		h:w	2w/h		
segment 1					
segment 2					
segment 3					
segment 4					
segment 5					
		Total=	0.00		

Perforated Shearwall 2: NOT USED — $t = v$ = 0

Total Length =		V_{wind}	V_{seis}	$Uplift_w$	$Uplift_s$
Height =		0	0	0	0
Max opening height=		**Ratio**			
C_o =		h:w	2w/h		
segment 1					
segment 2					
segment 3					
		Total=	0.00		

Perforated Shearwall 3: NOT USED — $t = v$ = 0

Total Length =		V_{wind}	V_{seis}	$Uplift_w$	$Uplift_s$
Height =		0	0	0	0
Max opening height=		**Ratio**			
C_o =		h:w	2w/h		
segment 1					
segment 2					
segment 3					
		Total=	0.00		

Footing(s)

	FT1
Width of footing (in)=	12
Depth of footing (in)=	20
Height of wall (in)=	0
Width of wall (in)=	6
Roofing Material =	Shingle/Tile
Roof Pitch=	6
Angle=	26.6
C_S=	1.000
Increase for Drift/Valley=	1.000
Effective snow load (psf)=	20
Roof dead load (psf)=	15
Floor live load (psf)=	40
Floor dead load (psf)=	25
Trib. $Area_{ROOF}$=	19
Trib. $Area_{FLOOR2}$=	0
Trib. $Area_{FLOOR1}$=	0
w_S (plf)=	380
w_L (plf)=	0
w_D (plf)=	285
$w_{CONC.}$ (plf)=	250
$w_{ADDITIONAL}$ (plf)=	150
w_{TOTAL} (plf)=	1065
ecc.	2.60
	O.K.
Req.Soil Bearing (psf)=	**1065**
Footing Reinforcement:	**(2) #4 bars cont.**
Crosswise Reinforcement:	**None**

FT2 calcs:

Properties:

f_c=	2500	psi
f_y=	40000	psi
q_u=	1500	psf
H_p=	0.001	in
d=	12	in

Loadings:

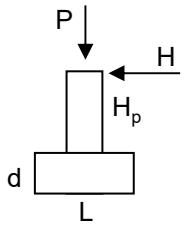
P=	6	kip
H=	0	kip
M=	0.1	kft
Uplift=	0.1	kip

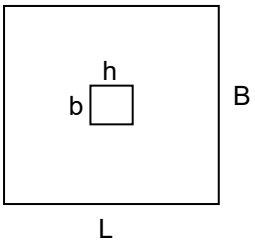
Moment:

M_1=	0.1	kft
M_u=	0.16	kft

Factored Loadings:

P_u=	9.6	kip
H_u=	0	kip





Footing Design:

B=	2	
L=	2	ft

Footing Weight:

$w_{footing}$=	0.60	kip
w_{soil}=	0.26	kip
w_{other}=	0	kip
w_{total}=	0.86	kip
P_{total}=	6.86	kip

Stability Ratios:

M_{OT}=	0.1	kft
M_{resist}=	6.9	kft
SF=	68.6	**OKAY**
Uplift SF=	8.6	**OKAY**

Eccentricity:

e=	0.01	**Inside Third**
L/6=	0.333	

Inside Third:

d_{eff}=	8.5	in
a=	0.25	ft
q_{min}=	1.43	ksf
q_{max}=	1.57	ksf
q_{allow}=	2.00	ksf

Soil Bearing Okay

One Way Shear:

q_{crit}=	1.55	ksf
V_{u1}=	0.78	kip
ϕV_{c1}=	17.3	kip

One Way Shear Okay

Two Way Shear:

q_1=	1.451	ksf
V_{u2}=	2.63	kip
b_o=	6.00	ft
ϕV_{c2}=	104.04	kip

Two Way Shear Okay

Footing Reinforcement:

q_f=	1.50273183	ksf
M_{max}=	0.79	kft
m=	18.82	
R_n=	10.9079826	
ρ =	0.0033	
A_s=	0.337	in^2

Use (3) #4 bars each way

Post Calculations

	Timber HF#2				
	2"-4" Thick	5"x5"and Larger	Parallam	Glulam Comb #4	
F_c	1300	575	2500	2100	psi
F_{bx}	850	575	2400	1900	psi
F_{by}	850	575	2400	2200	psi
E_x	1300000	1100000	1800000	1900000	psi
E_y	1300000	1100000	1800000	1900000	psi

Example Calculations:

Post	Max P (lb)	l (ft)	l_{e_x} (ft)	l_{e_y} (ft)	e_x (in)	e_y (in)	C_d	$(le/d)_x$	$(le/d)_y$	A	S_x	S_y	f_c	F'c	F'_{bx}	F'_{by}	Comb.	Check
(2) 2x4	3165	8	8	1	0.61	0.00	1.15	27.4	4.0	10.5	6	5	301	481	1465	1613	0.6	**OK**
(2) 2x6	8185	8	8	1	0.96	0.00	1.15	17.5	4.0	16.5	15	8	496	973	1269	1461	0.7	**OK**
(3) 2x4	4920	8	8	1	0.61	0.00	1.15	27.4	2.7	15.75	9	12	312	481	1686	1855	0.6	**OK**
(3) 2x6	13015	8	8	1	0.96	0.00	1.15	17.5	2.7	24.75	23	19	526	981	1461	1681	0.7	**OK**
(4) 2x4	6565	8	8	1	0.61	0.00	1.15	27.4	2.0	21	12	21	313	481	1686	1855	0.6	**OK**
(4) 2x6	17375	8	8	1	0.96	0.00	1.15	17.5	2.0	33	30	33	527	983	1461	1681	0.7	**OK**
(5) 2x4	8205	8	8	1	0.61	0.00	1.15	27.4	1.6	26.25	15	33	313	481	1686	1855	0.6	**OK**
(5) 2x6	21725	8	8	1	0.96	0.00	1.15	17.5	1.6	41.25	38	52	527	985	1461	1681	0.7	**OK**
4x4	3685	8	8	1	0.61	0.00	1.15	27.4	3.4	12.25	7	7	301	474	977	978	0.7	**OK**
6x6	9025	8	8	1	0.96	0.00	1.15	17.5	2.2	30.25	28	28	298	549	661	661	0.8	**OK**
3 1/2" x 3 1/2" PLP	7440	8	1	8	0.00	0.61	1.15	3.4	27.4	12.25	7	7	607	953	3171	3174	1.0	**OK**
3 1/2" x 5 1/4" PLP	11035	8	1	8	0.00	0.61	1.15	2.3	27.4	18.375	16	11	601	953	3032	3036	1.0	**OK**
5 1/4" x 5 1/4" PLP	27915	8	1	8	0.00	0.92	1.15	2.3	18.3	27.5625	24	24	1013	1889	3034	3036	1.0	**OK**
3 1/8" x 7 1/2" GLP	11495	8	1	8	0.00	0.55	1.15	1.6	30.7	23.4375	29	12	490	802	2181	2935	0.9	**OK**
3 1/8" x 9" GLP	13790	8	1	8	0.00	0.55	1.15	1.3	30.7	28.125	42	15	490	802	2180	2935	0.9	**OK**
5 1/8" x 6" GLP	26595	8	1	8	0.00	0.90	1.15	2.0	18.7	30.75	31	26	865	1773	2184	2783	0.8	**OK**
5 1/8" x 7 1/2" GLP	33240	8	1	8	0.00	0.90	1.15	1.6	18.7	38.4375	48	33	865	1773	2184	2783	0.8	**OK**
5 1/8" x 9" GLP	39890	8	1	8	0.00	0.90	1.15	1.3	18.7	46.125	69	39	865	1773	2183	2783	0.8	**OK**
Additional Post Calculations:																		
	0	8	8	8	0.61	0.61	1.15	27.4	27.4	12.25	7	7	0	474	973	978	0.0	**OK**
	0	8	8	8	0.61	0.61	1.15	27.4	27.4	12.25	7	7	0	474	973	978	0.0	**OK**
	0	8	8	8	0.61	0.61	1.15	27.4	27.4	12.25	7	7	0	474	973	978	0.0	**OK**

Notes: 1. Example calculations show posts braced in one direction.
2. Loads have been adjusted to accommodate for the worst case of the following eccentric conditions: 0.175 of column thickness or 0.175 of column width.

Load Charts (HF#2):

Default Desig. (may vary)	Post Size	Roof Loads (C_D=1.15) 7 ft	8 ft	9 ft	10 ft	11 ft	12 ft	13 ft	14 ft	16 ft	18 ft	20 ft	22 ft	Floor Loads (C_D=1.0) 7 ft	8 ft	9 ft	10 ft	11 ft	12 ft	13 ft	14 ft	16 ft	18 ft	20 ft	22 ft	
P1	(1) 2 x 4	1895	1575	1325	1125	965	835	730	640	-	-	-	-	1805	1510	1275	1090	935	815	710	625	-	-	-	-	**Braced in One Direction (In Wall)**
	(1) 2 x 6	4600	4080	3610	3195	2835	2525	2260	2030	1655	1370	1150	975	4220	3790	3380	3015	2690	2410	2165	1950	1600	1330	1120	910	
P2	(2) 2 x 4	3810	3165	2660	2260	1940	1680	1470	1290	-	-	-	-	3630	3035	2565	2190	1885	1635	1435	1260	-	-	-	-	
	(2) 2 x 6	8780	8185	7265	6430	5710	5085	4545	4080	3330	2760	2310	1960	7870	7400	6805	6065	5415	4845	4350	3920	3215	2675	2250	1910	
P3	(3) 2 x 4	5950	4920	4120	3490	2990	2585	2250	1980	-	-	-	-	5680	4730	3980	3385	2905	2520	2200	1935	-	-	-	-	
	(3) 2 x 6	13980	13015	11475	10115	8940	7935	7075	6335	5150	4250	3555	3005	12525	11775	10775	9565	8505	7585	6790	6100	4985	4130	3465	2940	
P4	(4) 2 x 4	7935	6565	5495	4655	3985	3445	3005	2640	-	-	-	-	7575	6305	5310	4515	3875	3360	2935	2580	-	-	-	-	
	(4) 2 x 6	18665	17375	15305	13490	11925	10585	9435	8450	6870	5670	4740	4010	16720	15720	14370	12760	11345	10120	9055	8140	6645	5505	4620	3920	
P5	(5) 2 x 4	9920	8205	6870	5820	4985	4310	3755	3300	-	-	-	-	9470	7885	6635	5645	4845	4200	3670	3230	-	-	-	-	
	(5) 2 x 6	23345	21725	19135	16860	14905	13230	11795	10565	8585	7085	5925	5015	20910	19660	17965	15950	14180	12650	11320	10175	8310	6885	5775	4900	
P2	(2) 2 x 4	2440	1960	1600	1325	1110	945	-	-	-	-	-	-	2365	1910	1565	1300	1095	930	-	-	-	-	-	-	**Unbraced in Both Directions**
	(2) 2 x 6	3920	3145	2560	2120	1775	1505	-	-	-	-	-	-	3800	3070	2515	2085	1750	1485	-	-	-	-	-	-	
P3	(3) 2 x 4	5700	4765	4020	3420	2935	2540	2220	1950	-	-	-	-	5395	4555	3865	3305	2850	2475	2165	1905	-	-	-	-	
	(3) 2 x 6	10120	8590	7290	6220	5345	4625	4025	3530	2760	2205	-	-	9485	8160	6995	6010	5190	4510	3940	3465	2720	2180	-	-	
P4	(4) 2 x 4	7935	6565	5495	4655	3985	3445	3005	2640	-	-	-	-	7575	6305	5310	4515	3875	3360	2935	2580	-	-	-	-	
	(4) 2 x 6	16395	14650	12975	11455	10115	8955	7960	7100	5725	4685	3885	3265	14950	13550	12145	10825	9630	8580	7660	6860	5560	4570	3805	3200	
P5	(5) 2 x 4	9920	8205	6870	5820	4985	4310	3755	3300	-	-	-	-	9470	7885	6635	5645	4845	4200	3670	3230	-	-	-	-	
	(5) 2 x 6	21880	20035	18165	16365	14695	13190	11795	10565	8585	7085	5925	5015	19745	18285	16765	15260	13825	12500	11300	10175	8310	6885	5775	4900	
P6	4 x 4	4435	3685	3095	2630	2260	1955	1710	1500	-	-	-	-	4225	3535	2985	2545	2190	1905	1665	1470	-	-	-	-	
P7	6 x 6	9670	9025	8355	7680	7030	6420	5855	5340	4465	3765	3195	2735	8655	8145	7610	7060	6520	5995	5505	5050	4260	3610	3080	2645	
P8	3 1/2" x 5 1/4" PLP	13330	11035	9245	7840	6720	5810	5070	4455	-	-	-	-	12720	10600	8930	7600	6530	5665	4955	4360	-	-	-	-	
P9	5 1/4" x 5 1/4" PLP	31850	27915	24355	21295	18690	16495	14635	13055	10540	8660	7220	-	29340	26080	23000	20250	17880	15845	14110	12625	10240	8440	7055	-	
Additional Sizes																										
Parallam	3 1/2" x 3 1/2" PLP	9000	7440	6225	5270	4515	3905	3405	2990	-	-	-	-	8595	7155	6015	5115	4390	3805	3325	2925	-	-	-	-	
	3 1/2" x 7" PLP	17615	14595	12240	10385	8905	7710	6730	5915	-	-	-	-	16795	14015	11815	10065	8655	7510	6570	5790	-	-	-	-	
	5 1/4" x 7" PLP	41920	36785	32135	28115	24705	21815	19370	17285	13970	11485	9580	-	38600	34345	30315	26725	23610	20945	18660	16705	13565	11190	9355	-	
Glulam	3 1/8" x 7 1/2" GLP	13795	11495	9680	8245	7090	6155	5385	-	-	-	-	-	13115	11005	9320	7970	6880	5985	5250	-	-	-	-	-	
	3 1/8" x 9" GLP	16555	13790	11620	9895	8510	7385	6465	-	-	-	-	-	15735	13205	11185	9565	8255	7185	6300	-	-	-	-	-	
	5 1/8" x 6" GLP	29565	26595	23720	21095	18780	16765	15025	13515	11070	9195	7740	-	26900	24510	22110	19840	17785	15965	14365	12970	10680	8910	7525	-	
	5 1/8" x 7 1/2" GLP	36955	33240	29650	26370	23475	20960	18780	16895	13835	11495	9675	-	33625	30640	27640	24805	22230	19955	17955	16215	13350	11140	9405	-	
	5 1/8" x 9" GLP	44350	39890	35580	31645	28170	25150	22540	20275	16605	13795	11610	-	40350	36765	33170	29765	26680	23945	21550	19455	16020	13370	11290	-	

POST / SHEAR WALL / FOOTING / FOUNDATION WALL SCHEDULE

(not all are necessarily used)

Post Schedule

Designation	Post Size
P1	(1) 2x
P2	(2) 2x
P3	(3) 2x
P4	(4) 2x
P5	(5) 2x
P6	4x4
P7	6x6

Notes:
1. Posts indicate number of trimmer studs when specified at headers. All other post designations refer to full height king studs U.N.O.
2. Install (1) trimmer stud and (1) king stud each side of each opening U.N.O.
3. Install (2) trimmer studs each side of openings greater than 6'-0" U.N.O.
4. Install (2) king studs each side of openings greater than 8'-0" U.N.O.
5. 2x built-up posts shall be the same width of the wall in which they are framed U.N.O.
6. Nail each ply of 2x built-up posts w/ 16d nails @ 6" o.c. staggered U.N.O.
7. Posts that are not framed within a stud wall shall be braced with BC or AC post cap and PB or ABA post base U.N.O.

Shear Wall Schedule[1,3]

Designation	Material	1 1/2" 16 Gage Staples		8d Nails		Capacity		1/2" Anchor Bolt Spacing	Note
		Edge	Field	Edge	Field	Wind	Seismic		
1	3/8" OSB or CDX plywood	3 1/2"	12"	6"	12"	339	241	32" o.c.	2,4,5

Notes:
1. Wall studs are to be spaced at 16" o.c. U.N.O.
2. Sheath above and below openings in perforated shear walls as per the adjacent shear wall designation on each side of the opening.
3. Use (2) king studs at each end of shear panels (Shear Wall Chords) U.N.O.
4. All panel edges shall be blocked with 2x or wider framing with edge nailing at all supports and panel edges U.N.O.
5. Where panels are applied on both faces of a wall and nail spacing is less than 6" o.c. on either side, panel joints shall be offset to fall on different framing members.

Footing Schedule

Designation	Length	Width	Depth	Lengthwise Reinforcement				Crosswise Reinforcement				Capacity	Note
				Qty.	Size	Length	Spacing	Qty.	Size	Length	Spacing		
FT1	Cont.	12"	20"	2	#4	Cont.	EQ.	-	-	-	-	1250 PLF	(1) top, (1) bottom
FT2	24"	24"	12"	3	#4	18"	EQ.	3	#4	18"	EQ.	5400 LBS	

Notes:
1. f'c= 2,500 psi, fy= 60,000 psi. No special inspection required.
2. Footings shall bear on undisturbed native soils or structural compacted fill (95% compaction), specified and tested by a registered geotechnical engineer.
3. All footings shall bear a minimum of 12" below grade or below the frost line of the locality, whichever is deeper.