	Company Name _____		DESIGNED	H.M.	JOB NO.	40022
	PROJECT University Park SF		CHECKED	A.D.	SHT	OF
	SUBJECT Plan 1		DATE	08/27/2014		

### Building Information

No. of stories 2

Building height for lateral calculations (ft) 20.38

Building weight (lbs) 180647

Redundancy Factor:

N-S: 1

E-W: 1

### Floor Information

Floor\_ID 1st

Floor net area (sf) 2340

Floor opening area (sf) 0

Average height (ft) 9.00

#### Diaphragms

Floor diaphragms for 1st									
Diaphragm name	Area (sf)	Effective seismic weight (psf)						Type	Remarks
		DL	Walls	Snow	Storage	Partitions	Total		
D1	1170	23.00	15.00	0.00	0.00	0.00	38.00	Floor	
D2	1170	23.00	15.00	0.00	0.00	0.00	38.00	Floor	

Floor\_ID 2nd


Floor net area (sf) 2621

Floor opening area (sf) 0

Average height (ft) 9.00

#### Diaphragms

Floor diaphragms for 2nd									
Diaphragm name	Area (sf)	Effective seismic weight (psf)						Type	Remarks
		DL	Walls	Snow	Storage	Partitions	Total		
D1	1311	20.00	15.00	0.00	0.00	0.00	35.00	Roof	Ignore opening in weight calculations
D2	1310	20.00	15.00	0.00	0.00	0.00	35.00	Roof	Ignore opening in weight calculations

	Company Name _____		DESIGNED	H.M. _____	JOB NO.	40022
	PROJECT	University Park SF	CHECKED	A.D. _____	SHT	OF
	SUBJECT	Plan 1	DATE	08/27/2014		

### Seismic Loads


Design code 2012 IBC (ASCE 7-10)  
 Lateral force calculation method Equivalent Lateral Force Procedure

#### Seismic data:

Building occupancy category	II. Standard	Table 1-1
Importance factor I	1.00	Table 11.5-1
Soil site class	D. Stiff soil profile	Table 20-3-1
Response Spectral Acc. (0.2 sec) ( $S_S$ )	2.38	Fig 22-1 through 22-14
Design Response Spectral Acc. (0.2 sec) ( $S_S$ )	2.38	Fig 22-1 through 22-14
Response Spectral Acc. (1.0 sec) ( $S_1$ )	1.17	Fig 22-1 through 22-14
$T_L$ (sec)	8.00	Fig 22-15 through 22-20
$F_a$	1.00	Table 11.4-1
$F_v$	1.50	Table 11.4-2
Max. Considered earthquake acc. $S_{MS}$	2.38	(11.4-1)
Max. Considered earthquake acc. $S_{M1}$	1.76	(11.4-2)
Design spectral acc. at short period $S_{DS}$	1.58	(11.4-3)
Design spectral acc. at 1 s period $S_{D1}$	1.17	(11.4-4)
Seismic design category based on short period	D	Table 11.6-1
Seismic design category based on 1 S period	D	Table 11.6-2
Is $S_1 > 0.75$	True	Sec 11.6
Project seismic design category	E	
Seismic force resisting system	13. Light-framed walls sheathed with wood structural panels rated for shear resistance or steel sheets	Table 12.2-1
Response modification coefficient R	6.50	Table 12.2-1
System overstrength coefficient $\Omega_0$	3.00	
Approximate fundamental period parameters	$C_t = 0.02$ $x = 0.75$	Table 12.8-2
Building height (ft)	20.38	
Building period $T = T_a$ (sec)	0.19	(12.8-7)
Regular structure and 5 stories or less?	True	
Maximum $S_{ss} = 1.50$	False	Sec 12.8.1.3
Base Shear Adjustment Factor	1	
Minimum $C_s$	0.09	12.8.6
Seismic response coefficient $C_s$	0.24	(12.8-2)
Adjusted $C_s$	0.24	

**Seismic load:  $V = C_s W = 0.24 W$**

For allowable stress design  $0.7 E = 0.7 * 0.24 = 0.1706 W$

	Company Name _____		DESIGNED H.M. _____	JOB NO. 40022
	PROJECT University Park SF		CHECKED A.D. _____	SHT _____ OF _____
	SUBJECT Plan 1		DATE 08/27/2014	

Total effective weight (lbs) = 180647

Total seismic force (ASD) (lbs) = 30816

**Vertical seismic load distribution:**

$$F_x = C_{vx} V$$

$$C_{vx} = \frac{w_x h_x^k}{\sum_{i=1}^n w_i h_i^k} \quad (12.8-11)$$

$$T = 0.19$$

$$K = 1.00$$

Sec 12.8.3

Floor	Wx (lbs)	hx (ft)	Wx * hx lb.ft	$\frac{Wx * hx}{\sum(W_i * h_i)}$	Fx (lbs)
1st	88920	10.55	938292	0.3342	10300
2nd	91727	20.38	1868930	0.6658	20516

Sum(W)= 180647

Sum(W\*h)= 2807222

**Diaphragm design force:**

$$F_{px} = \frac{\sum_{i=x}^n F_i}{\sum_{i=x}^n w_i} w_{px} \quad 12.10.1$$

Minimum value =  $0.2 S_{SD} W_{px}$

Sec 12.10.1


Needn't to exceed =  $0.4 S_{SD} W_{px}$

**Diaphragm seismic forces:**

Floor	Sum(Fi) (lbs)	Sum(Wi) (lbs)	Wpx (lbs)	$\frac{\text{Sum(Fi)}}{\text{Sum(Wi)}} W_{px}$	Min. Value	Max. Value	Fpx (lbs)
1st	30816	180647	88920	15168	28170	56340	28170
2nd	20516	91727	91727	20516	29059	58118	29059

**Seismic force verification:**

Direction	Base Seismic Forces (lbs)							Sum Wall Forces (lbs)	% Difference
	Masses			Forces		Point Seismic	Total Base Shear		
	Sum of diaphragm masses	Sum point mass	Total mass	Seismic factor	Seismic force from mass				
N-S	180647	0	180647	0.1706	30816	0	30816	30816	0.002
E-W	180647	0	180647	0.1706	30816	0	30816	30816	0.001

	Company Name _____		DESIGNED	H.M.	JOB NO.	40022
	PROJECT	University Park SF	CHECKED	A.D.	SHT	OF
	SUBJECT	Plan 1	DATE	08/27/2014		

## Wind Loads

**Design Code:** California Building Code 2013

**Wind Standard:** ASCE7-10 (Method 2 - All Heights)

### Wind Data

**Exposure** C

**Enclosure** Enclosed Building

**Category** II

**Wind Speed** 122 MPH

**Mean Roof Height** 23.88 ft

**Importance Factor**  $I_w$  1

**Hill Shape:** No Topographic Obstructions

**Velocity Coefficient**  $q_z$   $0.00256 K_z K_{zt} K_d V^2 I_w$  (6-15)

**Velocity Coefficient**  $q_h$   $0.00256 K_h K_{zt} K_d V^2 I_w$  (6-15)

**Directionality Factor**  $K_d$  0.85 Table 6-4

**Gust Effect Factor**  $G$  0.85 6.5.8.1

**Pressures for MWFRS**  $p$   $qGC_p$  (6-17)

$K_h$  0.94

**North/South  $C_p$  :**

**Windward Wall  $C_p$**  0.80

**Leeward Wall  $C_p$**  -0.50


**(L/B)** 0.16

**East/West  $C_p$  :**

**Windward Wall  $C_p$**  0.80

**Leeward Wall  $C_p$**  -0.20

**(L/B)** 6.22

	Company Name _____		DESIGNED	H.M.	JOB NO. 40022 SHT _____ OF _____
	PROJECT University Park SF		CHECKED	A.D.	
	SUBJECT Plan 1		DATE	08/27/2014	

### Wind Load Distribution (North/South)

Elev. Z (ft)	K <sub>z</sub>	K <sub>zt</sub>	q <sub>z</sub> (psf)	p (Wall-Windward) (psf)
0-15	0.85	1.00	16.67	11.34
20.00	0.90	1.00	17.71	12.04
23.88	0.94	1.00	18.38	12.50

p (Wall-Leeward) (psf) -7.81

p (Roof Windward) (psf) 0.98

p (Roof Leeward) (psf) -9.38


### Wind Load Distribution (East/West)

Elev. Z (ft)	K <sub>z</sub>	K <sub>zt</sub>	q <sub>z</sub> (psf)	p (Wall-Windward) (psf)
0-15	0.85	1.00	16.67	11.34
20.00	0.90	1.00	17.71	12.04
23.88	0.94	1.00	18.38	12.50

p (Wall-Leeward) (psf) -3.13

p (Roof Windward) (psf) 4.69

p (Roof Leeward) (psf) -9.38

	Company Name _____		DESIGNED H.M. _____	JOB NO. 40022
	PROJECT University Park SF		CHECKED A.D. _____	SHT _____ OF _____
	SUBJECT Plan 1		DATE 08/27/2014	


### Shear line reactions and shear wall forces


Floor ID: 1st

Shear line ID	Reaction (lbs)		Shear wall ID	Shear wall forces (lbs)		R*	Wall type
	Seismic	Wind		Seismic	Wind		
1	5279	6959	1-1	2639	3479	6.50	Segmented
			1-2	2639	3479	6.50	Segmented
2	7414	10067	2-1	3821	5188	6.50	Segmented
			2-2	3593	4879	6.50	Segmented
4	2717	3890	4-1	2717	3890	6.50	Segmented
5	5265	6934	5-1	5265	6934	6.50	Not Designed
6	7343	10003	6-1	3838	5228	6.50	Not Designed
			6-2	3505	4775	6.50	Not Designed
8	2798	3981	8-1	1399	1991	6.50	Pre-manufactured
			8-2	1399	1991	6.50	Pre-manufactured
a	15656	3231	a-1	7827	2096	6.50	Segmented
			a-2	7829	2096	6.50	Not Designed
b	15160	3231	b-1	4166	1152	6.50	Shear wall with opening
			b-2	1535	424	6.50	Shear wall with opening
			b-3	932	258	6.50	Shear wall with opening
			b-4	950	263	6.50	Shear wall with opening
			b-5	4114	1138	6.50	Segmented
			b-6	3464	958	6.50	Segmented

Floor ID: 2nd

Shear line ID	Reaction (lbs)		Shear wall ID	Shear wall forces (lbs)		R*	Wall type
	Seismic	Wind		Seismic	Wind		
1	3599	3324	1-1	1804	1667	6.50	Shear wall with opening
			1-2	1794	1658	6.50	Shear wall with opening
3	5057	4698	3-1	5057	4698	6.50	Segmented
4	1604	1752	4-1	799	872	6.50	Shear wall with opening
			4-2	806	880	6.50	Shear wall with opening
5	3598	3327	5-1	1804	1668	6.50	Shear wall with opening
			5-2	1794	1659	6.50	Shear wall with opening
7	5054	4698	7-1	5054	4698	6.50	Not Designed
8	1604	1752	8-1	798	872	6.50	Shear wall with opening
			8-2	806	880	6.50	Shear wall with opening
a	10506	1792	a-1	5252	968	6.50	Segmented
			a-2	5254	968	6.50	Not Designed
b	10010	1792	b-1	5008	968	6.50	Segmented
			b-2	5002	968	6.50	Not Designed

	Company Name _____	DESIGNED H.M. _____	JOB NO. 40022 _____
	PROJECT University Park SF _____	CHECKED A.D. _____	SHT _____ OF _____
	SUBJECT Plan 1 _____	DATE 08/27/2014 _____	


	Company Name _____		DESIGNED	H.M. _____	JOB NO.	40022 _____
	PROJECT University Park SF _____		CHECKED	A.D. _____	SHT	_____ OF _____
	SUBJECT Plan 1 _____		DATE	08/27/2014 _____		

### Shear Wall Schedule

Mark	Sheathing	No. of sides	Edge Nail	Field Nail	Plate Nail	Shear Clip	Mudsill Anchors		Allowable Shear (plf)	Material	Remarks
							2X Mudsill	3X Mudsill			
1	3/8" Sheathing, plywood siding except Group 5 Species	Single	8d @ 6"	8d @ 12"	16d NAILS @ 0'-6"	A35 @ 2'-0"	5/8" x 10" @ 4'-0"	5/8" x 12" @ 4'-0"	260	DF	1
2	3/8" Sheathing, plywood siding except Group 5 Species	Single	8d @ 4"	8d @ 12"	16d NAILS @ 0'-4"	A35 @ 1'-8"	5/8" x 10" @ 3'-6"	5/8" x 12" @ 4'-0"	380	DF	1,2
3	3/8" Sheathing, plywood siding except Group 5 Species	Single	8d @ 3"	8d @ 12"	16d NAILS @ 0'-3"	A35 @ 0'-8"	5/8" x 10" @ 3'-0"	5/8" x 12" @ 3'-8"	490	DF	1,2
4	3/8" Sheathing, plywood siding except Group 5 Species	Single	8d @ 2"	8d @ 12"	16d NAILS @ 0'-2"	A35 @ 0'-8"	5/8" x 10" @ 2'-0"	5/8" x 12" @ 2'-8"	640	DF	1,2
5	15/32" Structural I Sheathing	Single	10d @ 2"	10d @ 12"	16d NAILS @ 0'-2"	A35 @ 0'-6"	5/8" x 10" @ 1'-6"	5/8" x 12" @ 2'-0"	870	DF	1,2
3D	3/8" Sheathing, plywood siding except Group 5 Species	Double	8d @ 3"	8d @ 12"	SDS1/4x6" @ 0'-3"	A35 @ 0'-4"	5/8" x 10" @ 1'-6"	5/8" x 12" @ 1'-10"	980	DF	1,2
4D	3/8" Sheathing, plywood siding except Group 5 Species	Double	8d @ 2"	8d @ 12"	SDS1/4x6" @ 0'-3"	A35 @ 0'-4"	5/8" x 10" @ 1'-0"	5/8" x 12" @ 1'-4"	1,280	DF	1,2

- 1 WALL SHALL BE FRAMED WITH STUDS AT 16" O.C. OR PANELS ARE APPLIED WITH LONG DIMENSION ACROSS STUDS.
- 2 ALL FRAMING MEMBERS RECEIVING EDGE NAILING FROM ABUTTING PANELS SHALL NOT BE LESS THAN A SINGLE 3-INCH NOMINAL MEMBER OR TWO 2-INCH NOMINAL MEMBERS FASTEND IN ACCORDANCE WITH SECTION 2306.1 TO TRANSFER THE DESIGN SHEAR VALUE BETWEEN FRAMING MEMBERS. WOOD STRUCTURAL PANEL JOINT AND SILL PLATE NAILING SHALL BE STAGGERED IN ALL CASES.
- 3 ALL HARDWARE SHALL BE USP STRUCTURAL CONNECTORS U.O.N.




	Company Name _____	DESIGNED H.M. _____	JOB NO. 40022 _____
	PROJECT University Park SF _____	CHECKED A.D. _____	SHT _____ OF _____
	SUBJECT Plan 1 _____	DATE 08/27/2014 _____	

### Shear Wall Design

#### 1st walls

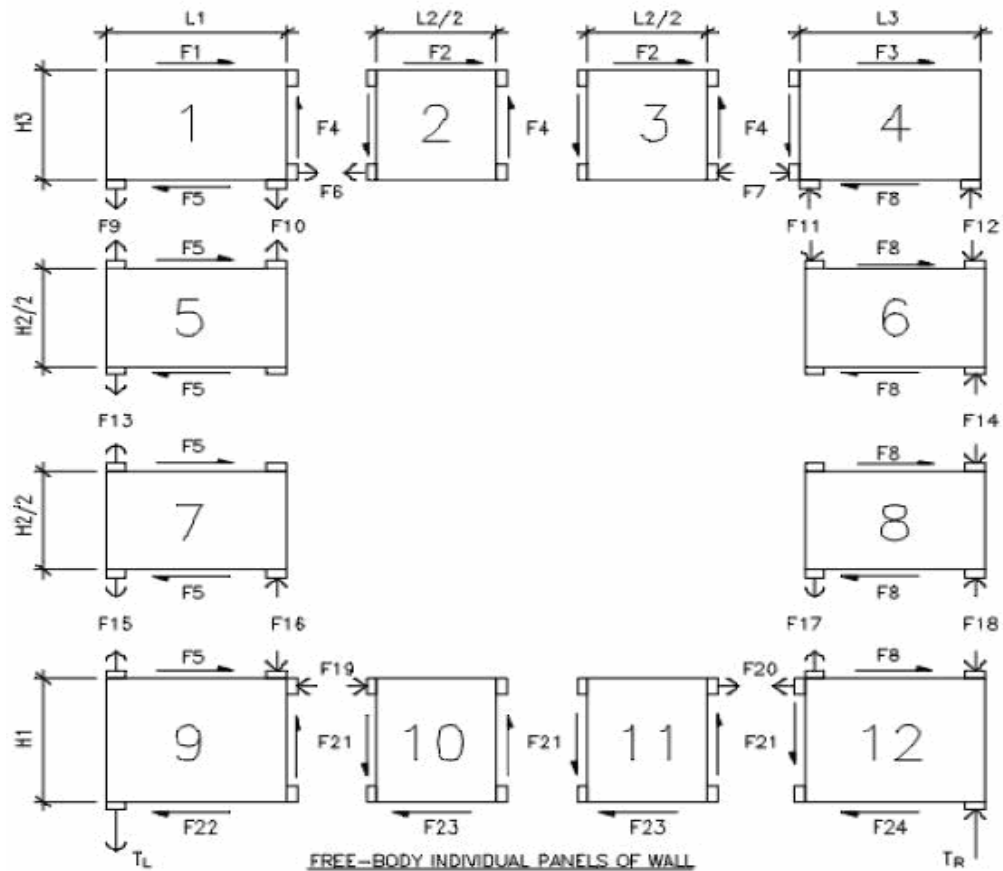
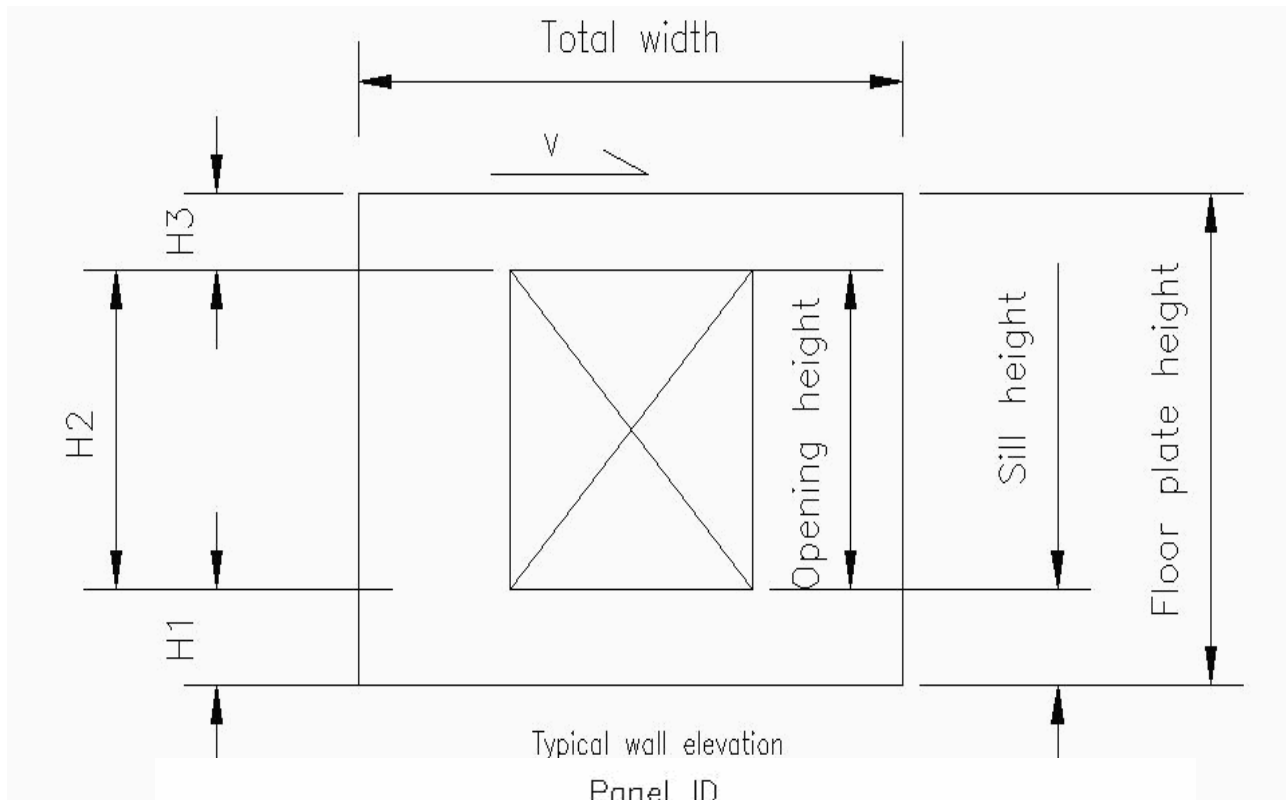
Wall ID	Length (ft)	Net Height (ft)	H / W	Shear (plf)		Wall type	Allowable shear (plf)	Adjusted allowable shear (plf)		Wall Drift (in)	Hold-Down		Remarks
				Wind	Seismic			Wind	Seismic		End I	End J	
1-1	4'-0"	9'-0"	2.25	870	660	5	870	1218	773	2.33	HDU8-H	HDU11-H	
1-2	4'-0"	9'-0"	2.25	870	660	5	870	1218	773	2.33	HDU11-L	HDU8-L	
2-1	8'-0"	9'-0"	1.12	643	474	3	490	686	490	1.56	STHD10	HDU8-L	
2-2	7'-6"	9'-0"	1.19	643	474	4	640	896	640	1.33	HDU8-L	HDU8-M	
4-1	13'-0"	9'-0"	0.69	299	209	1	260	364	260	0.96	STHD10	STHD10	
8-1													1
8-2													1
a-1	16'-0"	9'-0"	0.56	131	488	3	490	686	490	1.15	STHD10	STHD10	
b-1													2
b-2													2
b-3													2
b-4													2
b-5	9'-6"	9'-0"	0.95	120	433	3	490	686	490	1.21	STHD14	STHD10	
b-6	8'-0"	9'-0"	1.12	120	433	3	490	686	490	1.28	HDU8-L	STHD10	


	Company Name _____		DESIGNED	H.M. _____	JOB NO.	40022 _____
	PROJECT University Park SF _____		CHECKED	A.D. _____	SHT	_____ OF _____
	SUBJECT Plan 1 _____		DATE	08/27/2014 _____		

## 2nd walls

Wall ID	Length (ft)	Net Height (ft)	H / W	Shear (plf)		Wall type	Allowable shear (plf)	Adjusted allowable shear (plf)		Wall Drift (in)	Hold-Down		Remarks
				Wind	Seismic			Wind	Seismic		End I	End J	
1-1													2
1-2													2
3-1	9'-9"	9'-0"	0.92	482	519	4	640	896	640	1.05	(2)CS14	(2)CS14	
4-1													2
4-2													2
5-1													2
5-2													2
8-1													2
8-2													2
a-1	16'-0"	9'-0"	0.56	60	328	2	380	532	380	1.02	(2)CS16	(2)CS16	
b-1	16'-0"	9'-0"	0.56	60	313	2	380	532	380	0.92	(2)CS16	(2)CS16	

- 1 See pre-manufactured walls report  
2 See shear wall with opening report



	Company Name _____	DESIGNED H.M. _____	JOB NO. 40022
	PROJECT University Park SF	CHECKED A.D. _____	SHT _____ OF _____
	SUBJECT Plan 1	DATE 08/27/2014	

Floor ID: 1st

Design of shear wall with opening WallWithOpening 1 PASSED

Seismic Force (plf) = 368

Wind Force (plf) = 102

Total wall width = 15.50 ft

Plate height = 9.00 ft

Overall wall h/w ( $\leq 2$ ) = 0.58

Selected wall type = 5

Allowable shear ( $h/w \leq 2$ ) = 870 plf

**Panel forces:**

ID	Wind Force (lbs)	Seismic Force (lbs)	ID	Wind Force (lbs)	Force Seismic (lbs)
F1	807	2917	F13	440	1592
F2	236	854	F14	440	1592
F3	297	1075	F15	683	2469
F4	440	1592	F16	242	877
F5	1152	4166	F17	242	877
F6	236	854	F18	683	2469
F7	236	854	F19	234	847
F8	424	1535	F20	234	847
F9	198	715	F21	500	1810
F10	242	877	F22	918	3319
F11	242	877	F23	234	847
F12	198	715	F24	190	687

**Panels shear check:**


Panel ID	w (ft)	h (ft)	h/w	Maximum seismic seismic shear (plf)	Adjusted seismic allowable shear (plf)	Maximum wind shear (plf)	Allowable wind shear (plf)
1	9.50	2.33	0.25	307	870	85	1218
2	1.25	2.33	0.93	683	870	189	1218
3	1.25	2.33	0.93	683	870	189	1218
4	3.50	2.33	0.67	307	870	85	1218
5	9.50	2.00	0.42	438	870	121	1218
6	3.50	2.00	1.14	438	870	121	1218
7	9.50	2.00	0.42	438	870	121	1218
8	3.50	2.00	1.14	438	870	121	1218
9	9.50	2.67	0.28	349	870	97	1218
10	1.25	2.67	1.07	678	870	187	1218
11	1.25	2.67	1.07	678	870	187	1218
12	3.50	2.67	0.76	349	870	97	1218

**Strap design**

Maximum strap force (F6/F7/F19/F20) = 854 lbs

Selected strap = CS16

Allowable strap force = 3410 lbs

	Company Name _____	DESIGNED H.M. _____	JOB NO. 40022
	PROJECT University Park SF	CHECKED A.D. _____	SHT _____ OF _____
	SUBJECT Plan 1	DATE 08/27/2014	

Floor ID: 1st

Design of shear wall with opening WallWithOpening 2 PASSED

Seismic Force (plf) = 91  
 Wind Force (plf) = 25  
 Total wall width = 20.62 ft  
 Plate height = 9.00 ft  
 Overall wall h/w ( $\leq 2$ ) = 0.44  
 Selected wall type = 5  
 Allowable shear ( $h/w \leq 2$ ) = 870 plf

**Panel forces:**


ID	Wind Force (lbs)	Seismic Force (lbs)	ID	Wind Force (lbs)	Force Seismic (lbs)
F1	-303	-1097	F13	139	502
F2	567	2049	F14	139	502
F3	-309	-1119	F15	563	2037
F4	139	502	F16	424	1535
F5	258	932	F17	424	1535
F6	567	2049	F18	563	2037
F7	567	2049	F19	0	0
F8	263	950	F20	0	0
F9	-286	-1033	F21	0	0
F10	424	1535	F22	0	0
F11	424	1535	F23	0	0
F12	-286	-1033	F24	0	0

**Panels shear check:**

Panel ID	w (ft)	h (ft)	h/w	Maximum seismic shear (plf)	Adjusted seismic allowable shear (plf)	Maximum wind shear (plf)	Allowable wind shear (plf)
1	2.12	2.00	0.94	516	870	143	1218
2	8.17	2.00	0.12	251	870	69	1218
3	8.17	2.00	0.12	251	870	69	1218
4	2.17	2.00	0.92	516	870	143	1218
5	2.12	3.50	3.29	438	528	121	1218
6	2.17	3.50	3.23	438	539	121	1218
7	2.12	3.50	3.29	438	528	121	1218
8	2.17	3.50	3.23	438	539	121	1218
9	2.12	0.00	0.00	0	870	0	1218
10	8.17	0.00	0.00	0	870	0	1218
11	8.17	0.00	0.00	0	870	0	1218
12	2.17	0.00	0.00	0	870	0	1218

**Strap design**

Maximum strap force (F6/F7/F19/F20) = 2049 lbs  
 Selected strap = CS16  
 Allowable strap force = 3410 lbs

	Company Name _____	DESIGNED H.M. _____	JOB NO. 40022
	PROJECT University Park SF	CHECKED A.D. _____	SHT _____ OF _____
	SUBJECT Plan 1	DATE 08/27/2014	

Floor ID: 2nd

Design of shear wall with opening WallWithOpening 2 PASSED

Seismic Force (plf) = 120

Wind Force (plf) = 131

Total wall width = 12.96 ft

Plate height = 9.00 ft

Overall wall h/w ( $\leq 2$ ) = 0.69

Selected wall type = 1

Allowable shear ( $h/w \leq 2$ ) = 260 plf

**Panel forces:**

ID	Wind Force (lbs)	Seismic Force (lbs)	ID	Wind Force (lbs)	Force Seismic (lbs)
F1	363	332	F13	566	519
F2	486	445	F14	566	519
F3	360	329	F15	945	865
F4	566	519	F16	378	347
F5	851	780	F17	378	347
F6	486	445	F18	945	865
F7	486	445	F19	458	420
F8	843	773	F20	458	420
F9	188	172	F21	612	560
F10	378	347	F22	393	360
F11	378	347	F23	458	420
F12	188	172	F24	385	353

**Panels shear check:**


Panel ID	w (ft)	h (ft)	h/w	Maximum seismic shear (plf)	Adjusted seismic allowable shear (plf)	Maximum wind shear (plf)	Allowable wind shear (plf)
1	4.50	2.33	0.52	74	260	81	364
2	2.00	2.33	0.58	223	260	243	364
3	2.00	2.33	0.58	223	260	243	364
4	4.46	2.33	0.52	74	260	81	364
5	4.50	2.00	0.89	173	260	189	364
6	4.46	2.00	0.90	173	260	189	364
7	4.50	2.00	0.89	173	260	189	364
8	4.46	2.00	0.90	173	260	189	364
9	4.50	2.67	0.59	80	260	87	364
10	2.00	2.67	0.67	210	260	229	364
11	2.00	2.67	0.67	210	260	229	364
12	4.46	2.67	0.60	80	260	87	364

**Strap design**

Maximum strap force (F6/F7/F19/F20) = 486 lbs

Selected strap = CS16

Allowable strap force = 3410 lbs

	Company Name _____	DESIGNED H.M. _____	JOB NO. 40022
	PROJECT University Park SF	CHECKED A.D. _____	SHT _____ OF _____
	SUBJECT Plan 1	DATE 08/27/2014	

Floor ID: 2nd

Design of shear wall with opening WallWithOpening 1 PASSED

Seismic Force (plf) = 261

Wind Force (plf) = 241

Total wall width = 12.87 ft

Plate height = 9.00 ft

Overall wall h/w ( $\leq 2$ ) = 0.70

Selected wall type = 3

Allowable shear ( $h/w \leq 2$ ) = 490 plf

**Panel forces:**

ID	Wind Force (lbs)	Seismic Force (lbs)	ID	Wind Force (lbs)	Force Seismic (lbs)
F1	658	713	F13	1045	1131
F2	893	967	F14	1045	1131
F3	662	717	F15	1743	1887
F4	1045	1131	F16	699	756
F5	1549	1677	F17	699	756
F6	893	967	F18	1743	1887
F7	893	967	F19	840	909
F8	1557	1686	F20	840	909
F9	346	375	F21	1126	1219
F10	699	756	F22	709	768
F11	699	756	F23	840	909
F12	346	375	F24	718	777

**Panels shear check:**


Panel ID	w (ft)	h (ft)	h/w	Maximum seismic shear (plf)	Adjusted seismic allowable shear (plf)	Maximum wind shear (plf)	Allowable wind shear (plf)
1	4.43	2.33	0.53	161	490	149	686
2	1.99	2.33	0.59	485	490	448	686
3	1.99	2.33	0.59	485	490	448	686
4	4.46	2.33	0.52	161	490	149	686
5	4.43	2.00	0.90	378	490	349	686
6	4.46	2.00	0.90	378	490	349	686
7	4.43	2.00	0.90	378	490	349	686
8	4.46	2.00	0.90	378	490	349	686
9	4.43	2.67	0.60	173	490	160	686
10	1.99	2.67	0.67	456	490	422	686
11	1.99	2.67	0.67	456	490	422	686
12	4.46	2.67	0.60	174	490	161	686

**Strap design**

Maximum strap force (F6/F7/F19/F20) = 967 lbs

Selected strap = CS16

Allowable strap force = 3410 lbs

	Company Name _____	DESIGNED H.M. _____	JOB NO. 40022
	PROJECT University Park SF	CHECKED A.D. _____	SHT _____ OF _____
	SUBJECT Plan 1	DATE 08/27/2014	

Floor ID: 2nd

Design of shear wall with opening WallWithOpening 4 PASSED

Seismic Force (plf) = 261

Wind Force (plf) = 241

Total wall width = 12.88 ft

Plate height = 9.00 ft

Overall wall h/w ( $\leq 2$ ) = 0.70

Selected wall type = 3

Allowable shear ( $h/w \leq 2$ ) = 490 plf

**Panel forces:**

ID	Wind Force (lbs)	Seismic Force (lbs)	ID	Wind Force (lbs)	Force Seismic (lbs)
F1	602	651	F13	1043	1128
F2	948	1025	F14	1043	1128
F3	605	654	F15	1761	1905
F4	1043	1128	F16	718	776
F5	1547	1673	F17	718	776
F6	948	1025	F18	1761	1905
F7	948	1025	F19	891	964
F8	1555	1682	F20	891	964
F9	325	352	F21	1124	1216
F10	718	776	F22	656	709
F11	718	776	F23	891	964
F12	325	352	F24	664	719

**Panels shear check:**

Panel ID	w (ft)	h (ft)	h/w	Maximum seismic shear (plf)	Adjusted seismic allowable shear (plf)	Maximum wind shear (plf)	Allowable wind shear (plf)
1	4.31	2.33	0.54	151	490	140	686
2	2.12	2.33	0.55	484	490	448	686
3	2.12	2.33	0.55	484	490	448	686
4	4.33	2.33	0.54	152	490	140	686
5	4.31	2.00	0.93	388	490	359	686
6	4.33	2.00	0.92	388	490	359	686
7	4.31	2.00	0.93	388	490	359	686
8	4.33	2.00	0.92	388	490	359	686
9	4.31	2.67	0.62	165	490	152	686
10	2.12	2.67	0.63	455	490	421	686
11	2.12	2.67	0.63	455	490	421	686
12	4.33	2.67	0.62	166	490	153	686


**Strap design**

Maximum strap force (F6/F7/F19/F20) = 1025 lbs

Selected strap = CS16

Allowable strap force = 3410 lbs



	Company Name _____		DESIGNED	H.M. _____	JOB NO.	40022
	PROJECT University Park SF		CHECKED	A.D. _____	SHT	OF
	SUBJECT Plan 1		DATE	08/27/2014		


### Premanufactured Shear Panels

Manufacturer: HardyFrame002

Floor ID: 1st

Wall ID	Load (lbs)		Model	Base Floor Type	Dimensions (in)			Anchors			R	Seismic		Wind		Allowable vertical load		Code Check
	Seismic	Wind			Width	Height	Th.	Sill anchors	Top plates Screws	Hold Down		Allowable load (lbs)	Drift (in)	Allowable load (lbs)	Drift (in)	Seismic	Wind	
8-1	1399	1991	HFX-18x78 HS	F	18	78	-	-	-	1 1/8	6.50	3740	0.2300	3885	0.2400	6500	6500	Passed
8-2	1399	1991	HFX-18x78 HS	F	18	78	-	-	-	1 1/8	6.50	3740	0.2300	3885	0.2400	6500	6500	Passed

F - Foundation


	Company Name _____	DESIGNED H.M. _____	JOB NO. 40022
	PROJECT University Park SF	CHECKED A.D. _____	SHT _____ OF _____
	SUBJECT Plan 1	DATE 08/27/2014	

#### HOLD-DOWN SCHEDULE

Mark	Fastener	Minimum Wood Member	Anchor Bolt	Capacity (lbs)	Remarks
STHD10	(28)- 16d NAILS	(2) 2 x 6	N/A	3730	
STHD14	(38)- 16d NAILS	(2) 2 x 4	N/A	5025	
HDU8-L	(20)- SDS1/4x2 1/2"	(2) 2 x 4	7/8"	5980	
HDU8-M	(20)- SDS1/4x2 1/2"	4 x 4	7/8"	6970	
HDU8-H	(20)- SDS1/4x2 1/2"	6 x 6	7/8"	7870	
HDU11-L	(30)- SDS1/4x2 1/2"	6 x 6	1"	9535	
HDU11-H	(30)- SDS1/4x2 1/2"	6 x 8	1"	11175	

#### HOLD-DOWN STRAP SCHEDULE

Mark	Fastener	Minimum Wood Member Thickness	Clear Span	Capacity (lbs)	Remarks
MST48	32-16d	(2) 2 x 4	16"	0	
(3)CS14	26-10d	4 x 6	18"	0	
CS16	20-10d	4 x 4	15"	1705	
(2)CS16	20-10d	(2) 2 x 4	18"	3410	
(2)CS14	26-10d	4 x 4	18"	4980	

	Company Name _____	DESIGNED H.M. _____	JOB NO. 40022
	PROJECT University Park SF	CHECKED A.D. _____	SHT _____ OF _____
	SUBJECT Plan 1	DATE 08/27/2014	

### Uplift Calculations


**Load Cases:**

0.6D + W

(0.6 - 0.14S<sub>DS</sub>)D + 0.7pQ<sub>E</sub>


**1st Walls**

Post ID	Shear Wall	Reactions (lbs)			Wall Height (ft)	Net Uplift (lbs)	Hold Down
		DL	W	0.7E			
P3	w-14	94	-594	-3220	10.05	-3185	
UP24	b-1	3085	-1022	-3697	10.05	-2530	STHD10
UP35	4-1	4352	-4319	-3303	10.05	-1708	STHD10
UP38	1-1	1005	-11226	-9320	10.05	-10623	HDU11-H
UP17	b-2	5562	-553	-3697	10.05	-1593	STHD10
P21	b-1	511	-594	-3072	10.05	-2878	STHD10
UP52	a-1	5915	-1314	-4905	10.05	-2667	STHD10
UP1	2-2	987	-6467	-4763	10.05	-5875	HDU8-L
UP54	2-2	2286	-8194	-6622	10.05	-6822	HDU8-M
UP55	2-1	3948	-3633	-1712	10.05	-1264	STHD10
UP63	6-2	1958	-8025	-6561	10.05	-6850	
UP64	6-1	3470	-3465	-1656	10.05	-1383	
UP67	5-1	2251	-4300	-3265	10.05	-2949	
UP68	5-1	2731	-6779	-5947	10.05	-5140	
UP70	a-2	3771	-516	-3564	10.05	-2137	
P86	w-21	3458	-794	-713	10.05	594	
UP87	8-2	4941	-12289	-8697	9	-9325	PP
UP85	6-1	1730	-6063	-4451	10.05	-5025	
UP88	a-2	3701	-954	-3564	10.05	-2164	
UP5	a-1	4501	-711	-4905	10.05	-3202	STHD10
UP19	1-2	464	-8744	-6633	10.05	-8465	HDU11-L
UP28	1-2	3618	-6262	-3946	10.05	-4091	HDU8-L

	Company Name _____		DESIGNED	H.M. _____	JOB NO.	40022
	PROJECT University Park SF		CHECKED	A.D. _____	SHT	OF _____
	SUBJECT Plan 1		DATE	08/27/2014		

1st Walls


UP20	1-1	2611	-8744	-6633	10.05	-7177	HDU8-H
UP37	4-1	3947	-4319	-3303	10.05	-1951	STHD10
UP79	b-5	1206	-652	-4352	10.05	-3896	STHD14
UP81	b-5	1754	-607	-1265	10.05	-602	STHD10
UP56	b-6	3111	-652	-4352	10.05	-3176	HDU8-L
	6-2	772	-6063	-4451	10.05	-5600	
UP41	b-6	2839	-1204	-4352	10.05	-3278	STHD10
UP8	2-1	2129	-6467	-4763	10.05	-5189	HDU8-L
UP13	b-3	8156	-254	-917	10.05	2168	NR
UP14	b-4	5980	-137	-917	10.05	1345	NR
P30	a-1	49	-505	-3220	10.05	-3202	
P40	5-1	31	-2479	-2681	10.05	-2669	
P42	w-22	0	-1314	-1204	10.05	-1314	
P43	w-24	0	-505	-3072	10.05	-3072	
P44		0	-4733	-5094	0	-5094	
P46		0	-4733	-5092	0	-5092	
P47	w-28	0	-598	-3087	10.05	-3087	
P48	a-2	0	-986	-5350	10.05	-5350	

	Company Name _____		DESIGNED H.M. _____	JOB NO. 40022
	PROJECT University Park SF		CHECKED A.D. _____	SHT _____ OF _____
	SUBJECT Plan 1		DATE 08/27/2014	

## 2nd Walls

Post ID	Shear Wall	Reactions (lbs)			Wall Height (ft)	Net Uplift (lbs)	Hold Down
		DL	W	0.7E			
UP37	4-1	1515	-1314	-1204	9.82	-631	CS16
UP38	4-2	1521	-1314	-1204	9.82	-629	
UP4	1-2	1474	-2482	-2687	9.82	-2130	
UP24	a-1	3356	-505	-3220	9.82	-1951	(2)CS16
UP17	a-1	2930	-594	-3220	9.82	-2112	(2)CS16
UP50	b-2	1416	-508	-3087	9.82	-2552	
UP97	8-2	1521	-1314	-1204	9.82	-628	
UP98	8-1	1515	-1314	-1204	9.82	-631	CS16
UP99	5-2	1006	-2479	-2681	9.82	-2301	
UP100	5-1	1007	-2479	-2681	9.82	-2300	
UP55	a-2	800	-986	-5350	9.82	-5047	
UP56	b-2	1361	-598	-3087	9.82	-2573	
UP101	7-1	834	-4733	-5092	9.82	-4776	
UP85	7-1	834	-4733	-5092	9.82	-4776	
UP103	3-1	896	-4733	-5094	9.82	-4756	
UP102	3-1	896	-4733	-5094	9.82	-4756	(2)CS14
UP104	b-1	2642	-594	-3072	9.82	-2072	(2)CS16
UP12	b-1	2911	-505	-3072	9.82	-1970	(2)CS16

- NR indicates that no hold-down is required because there is no net uplift.
- No Selection indicates that uplift value is larger than available hold-down capacities defined in database.
- PP indicates hold-down attached to a pre-manufactured shear wall panel.

	Company Name _____		DESIGNED	H.M.	JOB NO.	40022
	PROJECT University Park SF		CHECKED	A.D.	SHT	_____ OF _____
	SUBJECT Plan 1		DATE	08/27/2014		

### Diaphragm Design

Floor\_ID: 1st

Diaphragm\_ID: D1

Code Check

Diaphragm Shear: Passed


### Nailing

Load Direction: E-W

Span	Sheathing		Nailing		Min. member thickness (in)	Diaphragm type	Case ID	Effective depth (ft)		Seismic shear (plf)		Wind shear (plf)		Chord force (lbs)		Check
	Grade	Thickness (in)	Boundary	Other edges				For shear	For bending	Applied shear	Allowable shear	Applied shear	Allowable shear	Seismic	Wind	
a-b	Sheathing and Single-Floor	19/32	10d@6	10d@6	2	Blocked	4	58.50	58.50	120	320	19	447.5	602	96	P

Load Direction: N-S

Span	Sheathing		Nailing		Min. member thickness (in)	Diaphragm type	Case ID	Effective depth (ft)		Seismic shear (plf)		Wind shear (plf)		Chord force (lbs)		Check
	Grade	Thickness (in)	Boundary	Other edges				For shear	For bending	Applied shear	Allowable shear	Applied shear	Allowable shear	Seismic	Wind	
1-2	Sheathing and Single-Floor	19/32	10d@6	10d@6	2	Blocked	2	20.00	20.00	230	320	182	447.5	2192	1734	P
2-4	Sheathing and Single-Floor	19/32	10d@4	10d@6	2	Blocked	2	20.00	20.00	364	425	322	595	739	600	P

	Company Name _____		DESIGNED	H.M.	JOB NO.	40022
	PROJECT University Park SF		CHECKED	A.D.	SHT	_____ OF _____
	SUBJECT Plan 1		DATE	08/27/2014		

Floor\_ID: 1st

Diaphragm\_ID: D2

Code Check

Diaphragm Shear: Passed


### Nailing

Load Direction: E-W

Span	Sheathing		Nailing		Min. member thickness (in)	Diaphragm type	Case ID	Effective depth (ft)		Seismic shear (plf)		Wind shear (plf)		Chord force (lbs)		Check
	Grade	Thickness (in)	Boundary	Other edges				For shear	For bending	Applied shear	Allowable shear	Applied shear	Allowable shear	Seismic	Wind	
a-b	Sheathing and Single-Floor	19/32	10d@6	10d@6	2	Blocked	4	58.50	58.50	120	320	19	447.5	602	96	P

Load Direction: N-S

Span	Sheathing		Nailing		Min. member thickness (in)	Diaphragm type	Case ID	Effective depth (ft)		Seismic shear (plf)		Wind shear (plf)		Chord force (lbs)		Check
	Grade	Thickness (in)	Boundary	Other edges				For shear	For bending	Applied shear	Allowable shear	Applied shear	Allowable shear	Seismic	Wind	
5-6	Sheathing and Single-Floor	19/32	10d@6	10d@6	2	Blocked	2	20.00	20.00	228	320	180	447.5	2159	1708	P
6-8	Sheathing and Single-Floor	19/32	10d@4	10d@6	2	Blocked	2	20.00	20.00	363	425	320	595	797	653	P

	Company Name _____		DESIGNED	H.M.	JOB NO.	40022
	PROJECT University Park SF		CHECKED	A.D.	SHT	_____ OF _____
	SUBJECT Plan 1		DATE	08/27/2014		

Floor\_ID: 2nd

Diaphragm\_ID: D1

Code Check

Diaphragm Shear: Passed

### Nailing


Load Direction: E-W

Span	Sheathing		Nailing		Min. member thickness (in)	Diaphragm type	Case ID	Effective depth (ft)		Seismic shear (plf)		Wind shear (plf)		Chord force (lbs)		Check
	Grade	Thickness (in)	Boundary	Other edges				For shear	For bending	Applied shear	Allowable shear	Applied shear	Allowable shear	Seismic	Wind	
a-b	Sheathing and Single-Floor	15/32	8d@6	8d@6	2	Blocked	4	54.92	60.75	117	270	16	377.5	596	71	P

Load Direction: N-S

Span	Sheathing		Nailing		Min. member thickness (in)	Diaphragm type	Case ID	Effective depth (ft)		Seismic shear (plf)		Wind shear (plf)		Chord force (lbs)		Check
	Grade	Thickness (in)	Boundary	Other edges				For shear	For bending	Applied shear	Allowable shear	Applied shear	Allowable shear	Seismic	Wind	
1-3	Sheathing and Single-Floor	15/32	8d@6	8d@6	2	Blocked	2	22.25	22.25	217	270	141	377.5	2109	1375	P
3-4	Sheathing and Single-Floor	15/32	8d@6	8d@6	2	Blocked	2	15.21	15.21	137	270	103	377.5	510	357	P



	Company Name _____		DESIGNED	H.M.	JOB NO.	40022
	PROJECT University Park SF		CHECKED	A.D.	SHT	_____ OF _____
	SUBJECT Plan 1		DATE	08/27/2014		

Floor\_ID: 2nd

Diaphragm\_ID: D2

Code Check

Diaphragm Shear: Passed

### Nailing

Load Direction: E-W

Span	Sheathing		Nailing		Min. member thickness (in)	Diaphragm type	Case ID	Effective depth (ft)		Seismic shear (plf)		Wind shear (plf)		Chord force (lbs)		Check
	Grade	Thickness (in)	Boundary	Other edges				For shear	For bending	Applied shear	Allowable shear	Applied shear	Allowable shear	Seismic	Wind	
a-b	Sheathing and Single-Floor	15/32	8d@6	8d@6	2	Blocked	4	54.93	60.76	117	270	16	377.5	596	71	P

Load Direction: N-S

Span	Sheathing		Nailing		Min. member thickness (in)	Diaphragm type	Case ID	Effective depth (ft)		Seismic shear (plf)		Wind shear (plf)		Chord force (lbs)		Check
	Grade	Thickness (in)	Boundary	Other edges				For shear	For bending	Applied shear	Allowable shear	Applied shear	Allowable shear	Seismic	Wind	
5-7	Sheathing and Single-Floor	15/32	8d@6	8d@6	2	Blocked	2	22.22	22.23	217	270	141	377.5	2110	1376	P
7-8	Sheathing and Single-Floor	15/32	8d@6	8d@6	2	Blocked	2	15.21	15.21	137	270	103	377.5	510	357	P