ANUIT Hotel

Calculations

Job: Framemax China – ANUIT Hotel Job # 109048.06

Address: Wuhan, China

(These calculations apply to the job at this address only)

Client: FrameMax

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kpff Consulting Engineers
San Diego, California

August, 2009

Framemax China – ANUIT Hotel

KPFF Job # 109048.06

DESIGN CRITERIA AND LOADS

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STRUCTURAL DESIGN AND SYSTEMS SUMMARY

This project consists of a six story structure erected from 5-stories of prefabricated steel modules supported by a podium slab elevated one level above grade.

The modules will consist of cold formed steel wall and floor panels that will stack on top of each other. The wind and seismic loads will be resisted by concrete shear walls or steel braced frames at the stair and elevator cores.

The foundation will be designed by local engineers and will consist of standard slab on grade and spread footings.

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DESIGN CRITERIA AND LOADS

CODES AND REFERENCES

Chinese Codes

- GB 50009-2001: Load Code for the Design of Buildings Structures
- GB 50017-2003: Code for Design of Steel Structures
- GB 50001-2001: Code for Seismic Design of Buildings
- GB 50018-2002: Technical Code for Cold-Formed Thin-Wall Structures
- GB 50352-2005: Code for Design of Civil Buildings
- GB 50016-2006: Code of Design on Building Fire Protection and Prevention

US & International References

- 2006 IBC (International Building Code)
- ASCE 7-05 Minimum Design Loads for Buildings (American Society of Civil Engineers)
- AISI 2001 with 2004 Supplements (American Iron and Steel Institute)
- AISC ASD/LRFD - Thirteenth Edition (2005) – (American Institute of Steel Construction)
- AWS D1.1-06, D1.4-05 (American Welding Society)
- ACI 318-05 (American Concrete Institute)
- Steel Deck Institute Diaphragm Design Manual, 3rd Edition
- Steel Stud Manufacturer's Association Catalog - ICC No. 4943P

COMPUTER PROGRAMS USED

- EXCEL
- AISI Win
- RISA 3-D
- Enercalc
- CFS

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MATERIALS SPECIFICATIONS AND STRENGTHS

Structural Steel - (Unless Noted Otherwise in Drawings)

Steel Grade	Yield Strength f_y (N/mm^2 = MPA)	Thickness or Diameter (mm)	Tension, Compression & Bending f (N/mm^2 = MPA)	Shear f_v (N/mm^2 = MPA)	End Bearing (planed & closely fitted) f_{ce} (N/mm^2 = MPA)
Q235	235 (30-ksi)	≤16	215	125	325
		>16~40	205	120	
		>40~60	200	115	
		>60-100	190	110	
Q345	345 (50-ksi)	≤16	310	180	400
		>16~40	295	170	
		>40~60	265	155	
		>60-100	250	145	
Q390	390 (56-ksi)	≤16	350	205	415
		>16~40	335	190	
		>40~60	315	180	
		>60-100	295	170	
Q420	420 (61-ksi)	≤16	380	220	440
		>16~40	360	210	
		>40~60	340	185	
		>60-100	325	185	

Cold Formed Steel (Thin-Wall)

Steel Grade	Yield Strength f_y (N/mm^2 = MPA)	Tension, Compression & Bending f (N/mm^2 = MPA)	Shear f_v (N/mm^2 = MPA)	End Bearing (polished & closely fitted) f_{ce} (N/mm^2 = MPA)
Q235	235 (30-ksi)	205	120	310
Q345	345 (50-ksi)	300	175	400

Punched studs and joists acceptable U.N.O.

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MATERIALS SPECIFICATIONS AND STRENGTHS (cont.)

Metal Decking

Framemax 9/16 X 3" Floor Deck Q345

Foundations and Soils - Designed by Local Engineers

DEFLECTION AND CAMBER

Steel Beam Deflection Criteria

L/240 Total Load on beams not supporting plaster ceilings
L/240 Roof Live Load on beams not supporting plaster ceilings
L/360 Live Load on floor beams – U.N.O.

Light Framing Deflection Criteria

L/360 Total Load on floor joists
L/480 Live Load on floor joists

L/240 Total Load on floor beams
L/360 Live Load on floor beams

L/240 Total Load on roof joists
L/360 Live Load on roof joists

LIVE LOADS

2000 N/m^2 (42-psf) Roofs with Stair Access
2000 N/m^2 (42-psf) Floors of Hotels

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DEAD LOADS

Dead Loads

Roof Assembly	Weight	Weight	Comment
Roofing	240 N/m2	(5.0 psf)	
22-Ga sheet metal	72 N/m2	(1.5 psf)	
LG Ceiling Joists	96 N/m2	(2.0 psf)	
5/8" Magnesium Board	134 N/m2	(2.8 psf)	
Misc.	34 N/m2	(0.7 psf)	
	575 N/m2	(12.0 psf)	

Floor Assembly	Weight	Weight	Comment
Ceramic tile	312 N/m2	(6.5 psf)	(equiv to 1/2" conc)
1.5" LW conc over 9/16 deck	790 N/m2	(16.5 psf)	
LG Floor Joists	144 N/m2	(3.0 psf)	
5/8" Magnesium Board	134 N/m2	(2.8 psf)	
Partition Walls	240 N/m2	(5.0 psf)	
Misc.	58 N/m2	(1.2 psf)	
	1675 N/m2	(35.0 psf)	

Interior Wall	Weight	Weight	Comment
5/8" Magnesium Board	134 N/m2	(2.8 psf)	
CFS Studs @ 24"	120 N/m2	(2.5 psf)	
5/8" Magnesium Board	134 N/m2	(2.8 psf)	
Insullation/Misc.	91 N/m2	(1.9 psf)	
	479 N/m2	(10.0 psf)	

Exterior Wall	Weight	Weight	Comment
5/8" Magnesium Board	134 N/m2	(2.8 psf)	
CFS Studs @ 24"	120 N/m2	(2.5 psf)	
5/8" Magnesium Board	134 N/m2	(2.8 psf)	
EIFS Finish	240 N/m2	(5.0 psf)	
Misc.	91 N/m2	(1.9 psf)	
	718 N/m2	(15.0 psf)	

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LATERAL LOADS - WIND

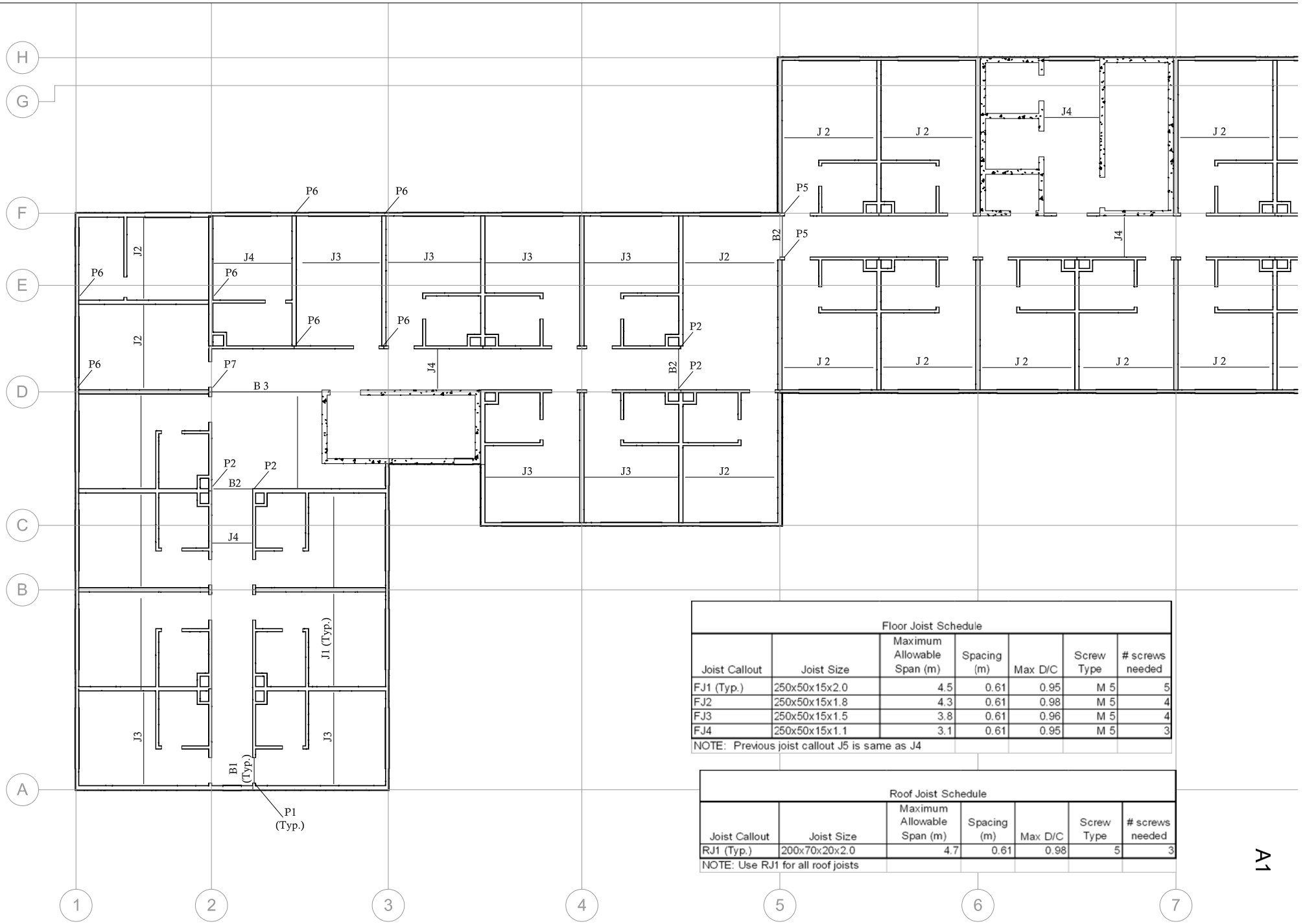
Wind Design For Primary Frames And Systems (Based on Chinese Code)

β_z = 1.00
μ_z = 1.23
μ_s = 1.30
ω_0 = 0.35-kN/m^2 = 7.31-psf
$\omega_k = \beta_z \mu_s \mu_z \omega_0$ = 0.56-kN/m^2 = 11.7-psf

Minimum wind pressure to use = 12-psf

LATERAL LOADS - Seismic

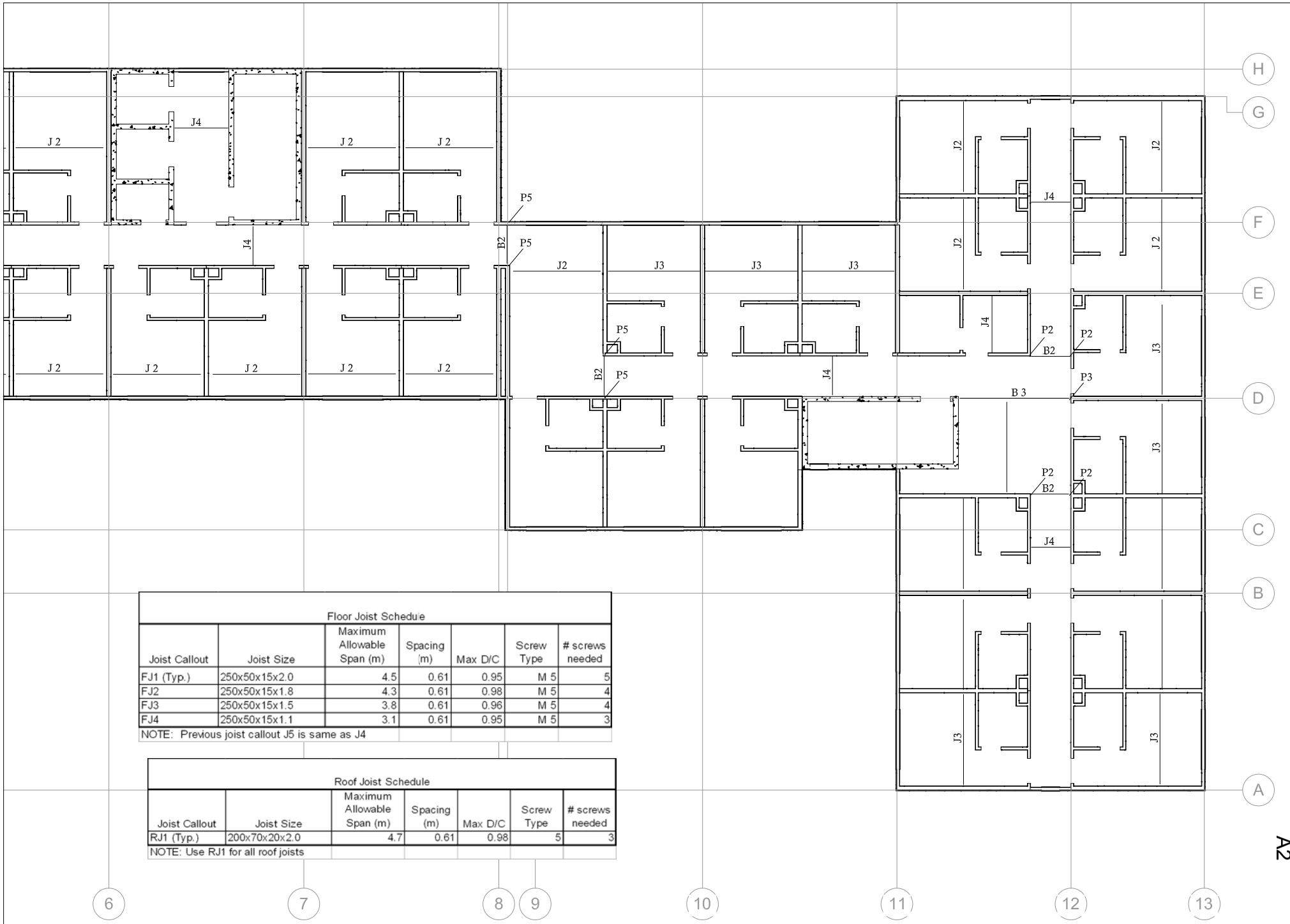
Chinese Seismic Zone 6 in Wuhan = very low → Wind Controls (similar to US Zone 1)



Floor Joist Schedule						
Joist Callout	Joist Size	Maximum Allowable Span (m)	Spacing (m)	Max D/C	Screw Type	# screws needed
FJ1 (Typ.)	250x50x15x2.0	4.5	0.61	0.95	M 5	5
FJ2	250x50x15x1.8	4.3	0.61	0.98	M 5	4
FJ3	250x50x15x1.5	3.8	0.61	0.96	M 5	4
FJ4	250x50x15x1.1	3.1	0.61	0.95	M 5	3
NOTE: Previous joist callout J5 is same as J4						

Roof Joist Schedule						
Joist Callout	Joist Size	Maximum Allowable Span (m)	Spacing (m)	Max D/C	Screw Type	# screws needed
RJ1 (Typ.)	200x70x20x2.0	4.7	0.61	0.98	5	3
NOTE: Use RJ1 for all roof joists						

A1



Floor Joist Schedule

Joist Callout	Joist Size	Maximum Allowable Span (m)	Spacing (m)	Max D/C	Screw Type	# screws needed
FJ1 (Typ.)	250x50x15x2.0	4.5	0.61	0.95	M 5	5
FJ2	250x50x15x1.8	4.3	0.61	0.98	M 5	4
FJ3	250x50x15x1.5	3.8	0.61	0.96	M 5	4
FJ4	250x50x15x1.1	3.1	0.61	0.95	M 5	3
NOTE: Previous joist callout J5 is same as J4						

Roof Joist Schedule

Joist Callout	Joist Size	Maximum Allowable Span (m)	Spacing (m)	Max D/C	Screw Type	# screws needed
RJ1 (Typ.)	200x70x20x2.0	4.7	0.61	0.98	5	3
NOTE: Use RJ1 for all roof joists						

Floor Joist Chart						Line Loads			Shear				Floor Joist Chart
Joist Size	Span	DL **	LL	Self Weight	Trib Width	DL + LL	1.2DL+1.4LL	1.35DL+(0.7*1.4)LL	V_{max}	S_x / I_x*t	τ_{max}	Shear D/C	Joist Size
	(mm)	(N/m²)	(N/m²)	(N/m)	(mm)	(N/m)	(N/m)	(N/m)	(N)	(1/cm²)	(MPa)		
250x50x15x1.1	3100	2410	2000	31.4	610	2721	3510	3223	5440	0.47	25.69	21%	250x50x15x1.1
250x50x15x1.2	3300	2410	2000	34.2	610	2724	3513	3226	5797	0.43	24.91	21%	250x50x15x1.2
250x50x15x1.25	3400	2410	2000	35.6	610	2726	3515	3228	5975	0.41	24.60	21%	250x50x15x1.25
250x50x15x1.5	3800	2410	2000	44.0	610	2734	3525	3240	6697	0.32	21.76	18%	250x50x15x1.5
250x50x15x1.5-kpff	3900	2410	2000	42.5	610	2733	3523	3238	6870	0.34	23.18	19%	250x50x15x1.5-kpff
250x50x15x1.8	4300	2410	2000	50.6	610	2741	3533	3249	7596	0.28	21.07	18%	250x50x15x1.8
250x50x15x2.0	4500	2410	2000	56.0	610	2746	3539	3256	7963	0.25	19.86	17%	250x50x15x2.0
250x50x20x2.0	5400	2410	2000	57.5	305	1403	1805	1668	4874	0.25	12.24	10%	250x50x20x2.0

Roof Joist Chart						Line Loads			Shear				Roof Joist Chart
Joist Size	Span	DL	LL	Self Weight	Trib Width	DL + LL	1.2DL+1.4LL	1.35DL+(0.7*1.4)LL	V_{max}	S_x / I_x*t	τ_{max}	Shear D/C	Joist Size
	(mm)	(N/m²)	(N/m²)	(N/m)	(mm)	(N/m)	(N/m)	(N/m)	(N)	(1/cm²)	(MPa)		
150x50x15x1.0	2800	910	2000	20.9	610	1796	2399	1973	3359	0.79	26.38	22%	150x50x15x1.0
150x50x15x1.2	2900	910	2000	25.0	610	1800	2404	1979	3486	0.66	22.90	19%	150x50x15x1.2
150x50x20x1.0	2800	910	2000	21.8	610	1797	2400	1974	3360	0.79	26.65	22%	150x50x20x1.0
150x50x20x1.5	3200	910	2000	32.0	610	1807	2412	1988	3860	0.53	20.44	17%	150x50x20x1.5
200x70x20x2.0	4700	910	2000	56.0	610	1831	2441	2021	5737	0.30	16.97	14%	200x70x20x2.0
200x70x20x2.2	4800	910	2000	61.3	610	1836	2448	2028	5874	0.27	15.84	13%	200x70x20x2.2
200x70x20x2.5	5000	910	2000	69.2	610	1844	2457	2038	6143	0.24	14.63	12%	200x70x20x2.5

DL = 2010 N/m² + 400N/m² = 2410 N/m²
**Additional 400 N/m² is partition loads and tiling in bathrooms

V_{max} & M_{max} Based on Factored Loads
Δ_{max} Based on Un-Factored Loads
$\tau_{max} = V_{max} * S_x / I_x*t$
$\sigma_{max} = M_{max} / W_x$
$\Delta = 5/384 * qL^4 / EI$

f_y =	225	MPa
f =	205	MPa
f_v =	120	MPa
E =	206,000	MPa
$\Delta_{permitted}$ =	L/ 360	

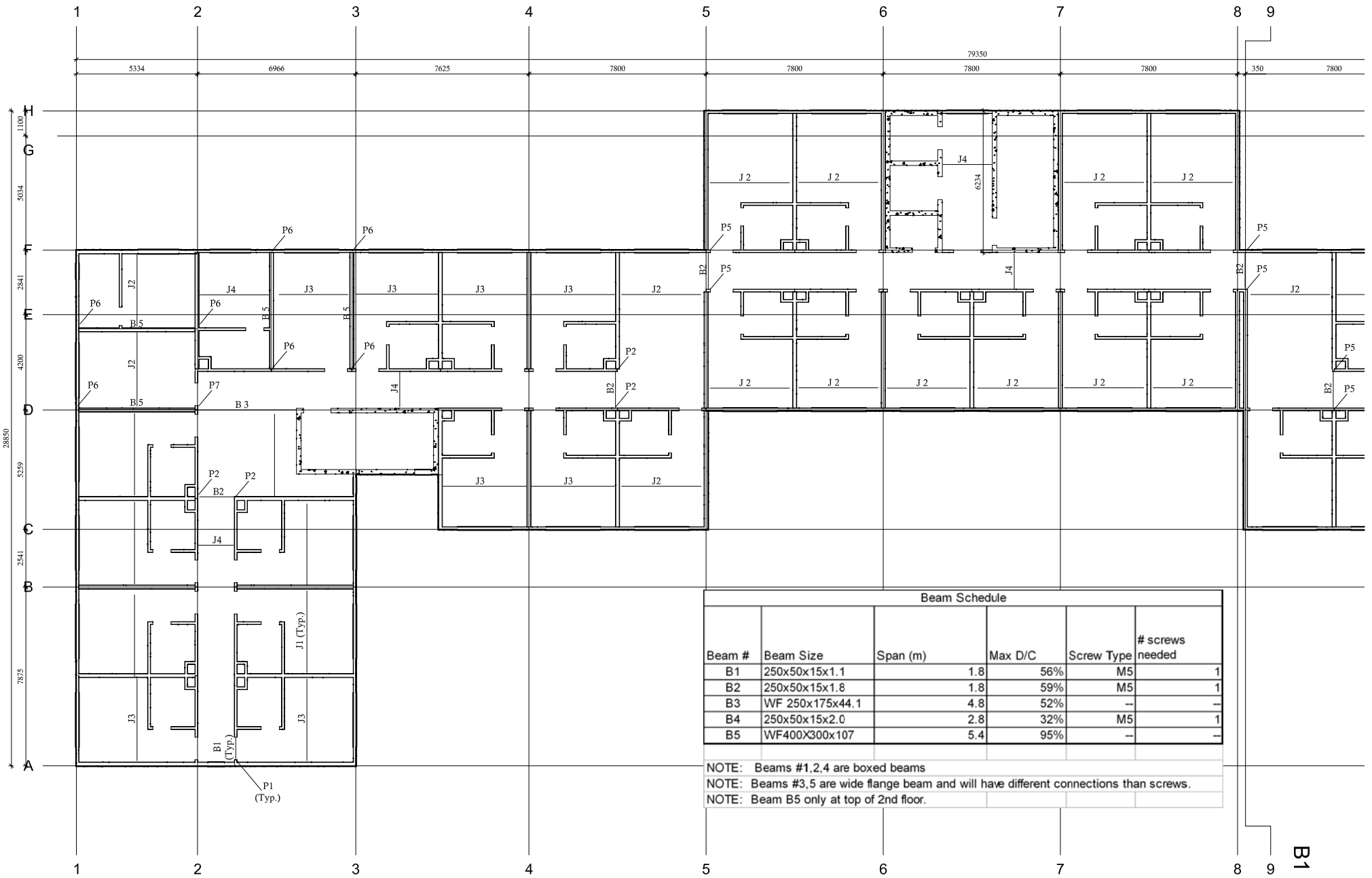
A3

Flexure				Deflection				Connection				
M_{max}	W_x Section Modulus	σ_{max}	Flexure D/C	I_x	Δ_{max}	$\Delta_{permitted}$	Deflection D/C	Min Material Connected	Screw Type	Screw Capacity	# screws needed	
(N*m)	(cm^3)	(Mpa)		(cm^4)	(mm)	(mm)		(1.1-mm post)		(N)		
4216	21.57	195	95%	325	4.89	8.61	57%	1.1	M5	1957	3	check post thickness
4782	24.20	198	96%	356	5.74	9.17	63%	1.1	M5	1957	3	
5079	25.90	196	96%	371	6.21	9.44	66%	1.1	M5	1957	4	
6363	32.47	196	96%	475	7.58	10.56	72%	1.1	M5	1957	4	
6698	32.82	204	100%	450	8.89	10.83	82%	1.1	M5	1957	4	
8165	40.60	201	98%	542	10.93	11.94	91%	1.1	M5	1957	4	
8959	45.88	195	95%	599	11.87	12.50	95%	1.1	M5	1957	5	
6579	47.70	138	67%	622	12.12	15.00	81%	1.1	M5	1957	3	

Flexure				Deflection				Connection			
M_{max}	W_x Section Modulus	σ_{max}	Flexure D/C	I_x	Δ_{max}	$\Delta_{permitted}$	Deflection D/C	Min Material Connected	Screw Type	Screw Capacity	# screws needed
(N*m)	(cm^3)	(Mpa)		(cm^4)	(mm)	(mm)		(1.1-mm post)		(N)	
2351	11.74	200	98%	93	7.53	7.78	97%	1	M5	1696	2
2527	14.19	178	87%	110	7.32	8.06	91%	1.1	M5	1957	2
2352	11.78	200	97%	96	7.27	7.78	93%	1	M5	1696	2
3088	18.67	165	81%	140	8.56	8.89	96%	1.1	M5	1957	2
6741	44.00	153	75%	440	12.83	13.06	98%	1.1	M5	1957	3
7049	47.99	147	72%	480	12.84	13.33	96%	1.1	M5	1957	4
7678	53.82	143	70%	538	13.54	13.89	97%	1.1	M5	1957	4

Floor Joist Summary					
Floor Joist	Maximum Allowable Span (m)	Spacing (m)	Max D/C	Screw Type	# screws needed
250x50x15	3.1	0.61	95%	M5	3
250x50x15	3.3	0.61	96%	M5	3
250x50x15	3.4	0.61	96%	M5	4
250x50x15	3.8	0.61	96%	M5	4
250x50x15	3.9	0.61	100%	M5	4
250x50x15	4.3	0.61	98%	M5	4
250x50x15	4.5	0.61	95%	M5	5
250x50x20	5.4	0.305	81%	M5	3

Roof Joist Summary					
Roof Joist	Maximum Allowable Span (m)	Spacing (m)	Max D/C	Screw Type	# screws needed
150x50x15	2.8	0.61	98%	M5	2
150x50x15	2.9	0.61	91%	M5	2
150x50x20	2.8	0.61	97%	M5	2
150x50x20	3.2	0.61	96%	M5	2
200x70x20	4.7	0.61	98%	M5	3
200x70x20	4.8	0.61	96%	M5	4
200x70x20	5	0.61	97%	M5	4



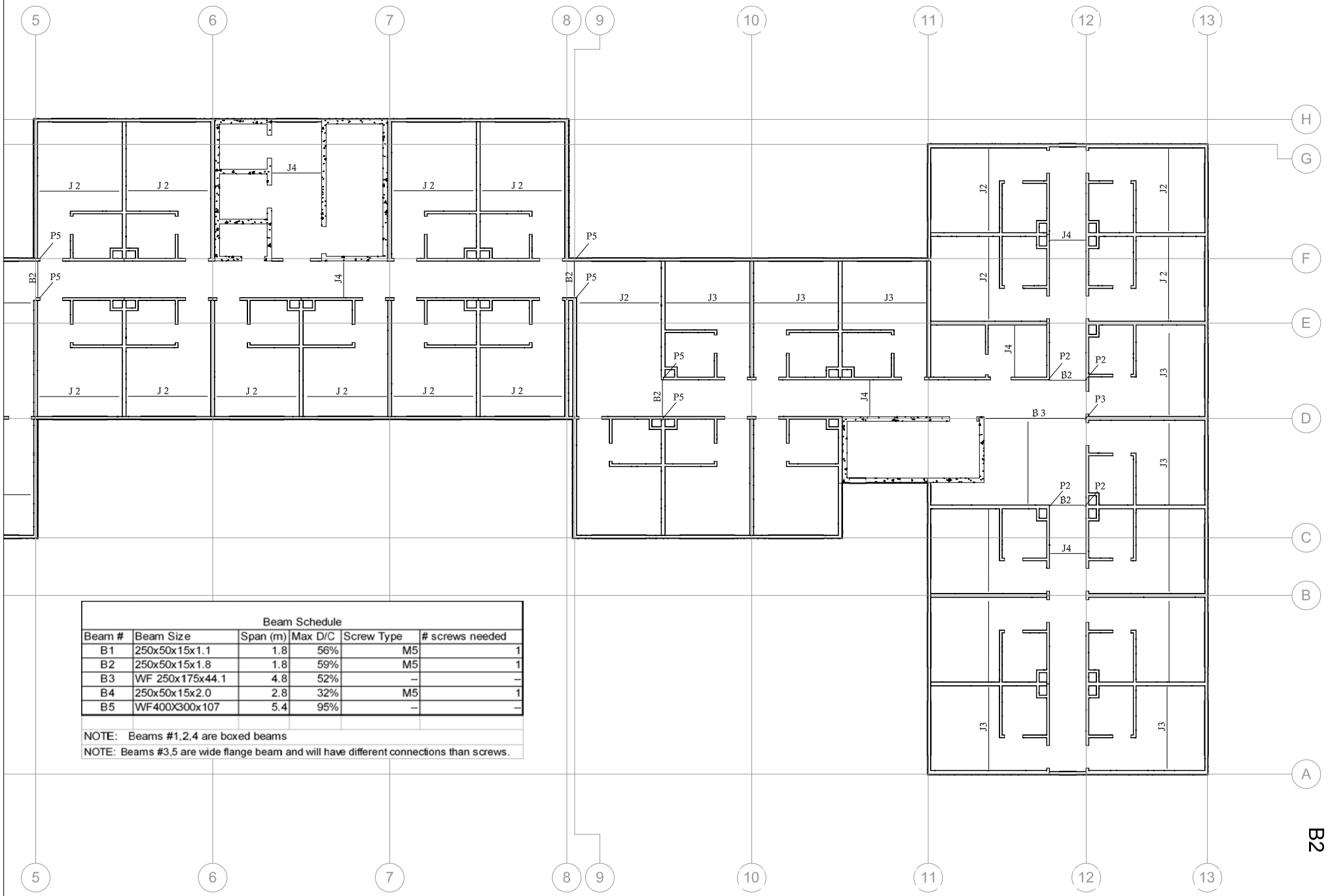
Beam Schedule					
Beam #	Beam Size	Span (m)	Max D/C	Screw Type	# screws needed
B1	250x50x15x1.1	1.8	56%	M5	1
B2	250x50x15x1.8	1.8	59%	M5	1
B3	WF 250x175x44.1	4.8	52%	--	--
B4	250x50x15x2.0	2.8	32%	M5	1
B5	WF400X300x107	5.4	95%	--	--

NOTE: Beams #1,2,4 are boxed beams

NOTE: Beams #3,5 are wide flange beam and will have different connections than screws.

NOTE: Beam B5 only at top of 2nd floor.

B1



Beam Schedule					
Beam #	Beam Size	Span (m)	Max D/C	Screw Type	# screws needed
B1	250x50x15x1.1	1.8	56%	M5	1
B2	250x50x15x1.8	1.8	59%	M5	1
B3	WF 250x175x44.1	4.8	52%	–	–
B4	250x50x15x2.0	2.8	32%	M5	1
B5	WF400X300x107	5.4	95%	–	–

NOTE: Beams #1,2,4 are boxed beams

NOTE: Beams #3,5 are wide flange beam and will have different connections than screws.

B2

V_{max} & M_{max} Based on Factored Loads

Δ_{max} Based on Un-Factored Loads

$\tau_{max} = V_{max} * S_x / I_x * t$

$\sigma_{max} = M_{max} / W_x$

$\Delta = 5/384 * qL^4 / EI$

f_y =	225	MPa
f =	205	MPa
f_v =	120	MPa
E =	206,000	MPa
$\Delta_{permitted}$ =	L/ 360	

Beam Chart						Line Loads			Shear			
Beam Size ***boxed beam***	Span	DL	LL	Self Weight	Trib Width*	DL + LL	1.2DL+1.4LL	1.35DL+(0.7*1.4)LL	V_{max}	$S_x / I_x * t$	τ_{max}	Shear D/C
	(mm)	(N/m²)	(N/m²)	(N/m)	(mm)	(N/m)	(N/m)	(N/m)	(N)	(1/cm²)	(MPa)	
250x50x15x1.1	1800	2010	2000	31.4	1167.5	4713	6123	5499	5510	0.47	26.02	22%
250x50x15x1.8	1800	2010	2000	50.6	2305	9294	12074	10841	10867	0.28	30.15	25%
WF 250x175x44.1	4800	2010	2000	432.6	2862.5	12717	16405	15050	39373	0.01	4.61	4%
250x50x15x2.0	2800	2010	2000	56.0	1167.5	4747	6163	5545	8629	0.12	10.76	9%
WF400X300x107	5400	5631	10010	1049.7	4801	80132	105770	90397	285579	0.01	14.61	12%

Beam Chart	Flexure				Deflection				Connection			
Beam Size ***boxed beam***	M_{max}	W_x Section Modulus	σ_{max}	Flexure D/C	I_x	Δ_{max}	$\Delta_{permitted}$	Deflection D/C	Min Material Connected	Screw Type	Screw Capacity	# screws needed
	(N*m)	(cm³)	(Mpa)		(cm^4)	(mm)	(mm)		(1.1-mm post)		(N)	
250x50x15x1.1	2480	21.57	115	56%	325	0.96	5.00	19%	1.1	M5	1957	1
250x50x15x1.8	4890	40.60	120	59%	542	1.14	5.00	23%	1.1	M5	1957	1
WF 250x175x44.1	47248	502.00	94.12	46%	6120	6.97	13.33	52%	--	M6	--	--
250x50x15x2.0	6040	91.75	65.83	32%	1199	1.54	7.78	20%	2	M5	4797	1
WF400X300x107	385531	1980.00	194.71	95%	38700	11.13	15.00	74%	--	M6	--	--

Header Beams - Boxed Beam					Line Loads	Shear				Flexure				Deflection			
Top and Bottom Tracks	Studs	Span	Wind Load	Trib Width	WL	V_{max}	S_x / I_x*t	τ_{max}	Shear D/C	M_{max}	W_x Section Modulus	σ_{max}	Flexure D/C	I_x	Δ_{max}	$\Delta_{permitted}$	Deflection D/C
		(mm)	(N/m²)	(mm)	(N/m)	(N)	(1/cm²)	(MPa)		(N*m)	(cm³)	(Mpa)		(cm^4)	(mm)	(mm)	
150x50x1.1	250x50x15x1.1	750	810	1200	973	365	0.72	2.61	2%	68	23.76	3	1%	89	0.02	2.08	1%
150x50x1.1	250x50x15x1.1	1800	810	1200	973	876	0.72	6.27	5%	394	23.76	17	8%	89	0.72	5.00	14%
150x50x1.1	250x50x15x1.5	2400	810	1200	973	1168	0.72	8.36	7%	701	23.76	29	14%	89	2.29	6.67	34%

							Line Loads	Shear				Flexure				Deflection			
Span	Dead Load Wall	Trib Height	Dead Load Floor	Live Load Floor	Tributary Floor		DL + LL	V_{max}	S_x / I_x*t	τ_{max}	Shear D/C	M_{max}	W_x Section Modulus	σ_{max}	D/C	I_x	Δ_{max}	$\Delta_{permitted}$	Deflection D/C
(mm)	(N/m²)	(mm)	(N/m²)	(N/m²)	(mm)		(N/m)	(N)	(1/cm²)	(MPa)		(N*m)	(cm³)	(Mpa)		(cm^4)	(mm)	(mm)	
750	800	1500	1800	2000	3900		16020	6008	0.30	18.12	15%	1126	43.14	26	13%	325	0.10	2.08	5%
1800	800	1500	1800	2000	3900		16020	14418	0.30	43.50	36%	6488	43.14	150	73%	325	3.27	5.00	65%
2400	800	1500	1800	2000	3900		16020	19224	0.23	43.79	36%	11534	64.95	178	87%	475	7.07	6.67	106%

Notes:

+ Boxed beam configuration
+ Top and bottom track resist out of plane wind load
+ Center studs resist in plane gravity load

Member Summary:

	Max Span (m)		
Box Section	0.75	1.8	2.4
Top & Bottom Tracks	150x50x1.1	150x50x1.1	150x50x1.1
Center Studs	250x50x15x1.1	250x50x15x1.1	250x50x15x1.5

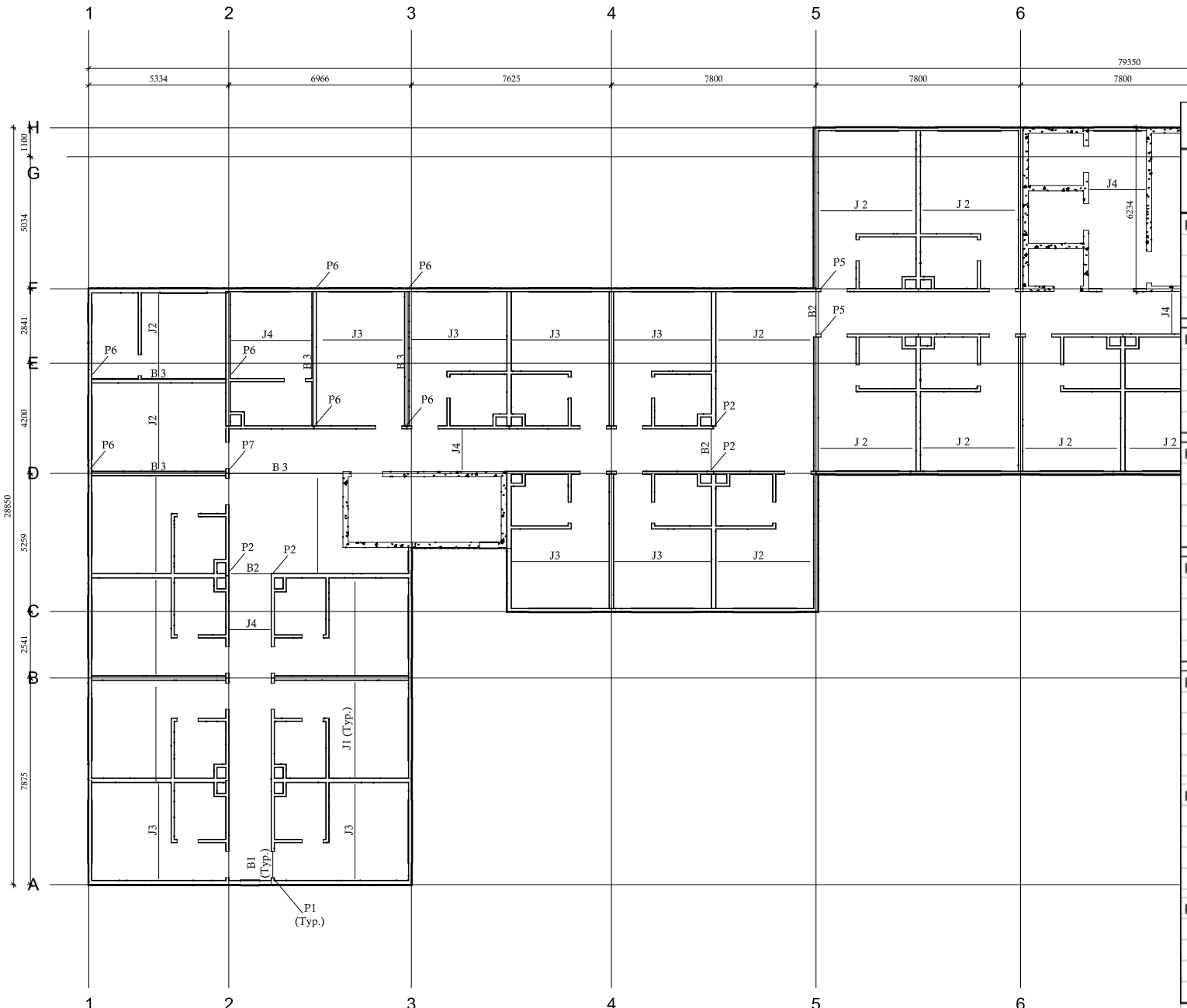
B4

Window Sill & Headers					Line Loads	Shear				Flexure				Deflection			
Joist Size	Extra stud	Span	Wind Load	Trib Width	WL	V_{max}	$S_x / I_x * t$	τ_{max}	Shear D/C	M_{max}	W_x Section Modulus	σ_{max}	Flexure D/C	I_x	Δ_{max}	$\Delta_{permitted}$	Deflection D/C
		(mm)	(N/m²)	(mm)	(N/m)	(N)	(1/cm²)	(MPa)		(N*m)	(cm³)	(Mpa)		(cm^4)	(mm)	(mm)	
150x50x1.0	none	750	810	1200	972	365	0.77	2.80	2%	68	6.72	10	5%	66	0.03	2.08	1%
150x50x2.0	none	1800	810	1200	972	875	0.40	3.48	3%	394	20.88	19	9%	157	0.41	5.00	8%
150x50x1.0	150x50x20x1.5	2400	810	1200	972	1166	0.77	8.96	7%	700	25.39	28	13%	206	0.99	6.67	15%
150x50x1.0	none	750	810	750	608	228	0.77	1.75	1%	43	6.72	6	3%	66	0.02	2.08	1%
150x50x1.5	none	1800	810	750	608	547	0.60	3.26	3%	246	12.16	20	10%	106	0.38	5.00	8%
150x50x1.5	none	2400	810	750	608	729	0.60	4.34	4%	437	12.16	36	18%	106	1.20	6.67	18%

Span	Dead Load Wall	Trib Height	DL	M_{max}	W_y Section Modulus	σ_{max}	Flexure D/C	Interaction D/C	I_y	Δ_{max}	$\Delta_{permitted}$	Deflection D/C
(mm)	(N/m²)	(mm)	(N/m)	(N*m)	(cm^3)	(Mpa)		Flexure	(cm^4)	(mm)	(mm)	
750	800	1500	1200	84	1.43	59	29%	34%	6	0.43	2.08	20%
1800	800	1500	1200	486	2.80	174	85%	94%	11	7.29	5.00	146%
2400	800	1500	1200	864	5.74	151	73%	87%	21	12.24	6.67	184%
750	800	600	480	34	1.43	24	12%	15%	6	0.17	2.08	8%
1800	800	600	480	194	2.12	92	45%	55%	8	3.83	5.00	77%
2400	800	600	480	346	2.12	163	80%	97%	8	12.10	6.67	181%

Member Summary:

	Max Span (m)		
Level	0.75	1.8	2.4
2nd Floor	150x50x1.0	150x50x2.0	150x50x1.0 & 150x50x20x1.5 (nested)
3rd Floor - Roof	150x50x1.0	150x50x1.5	150x50x1.5



Post Schedule

Location	Story	Story Height (m)	100mm (4") Post Size
P1	6-R	2.8	100x50x15x0.7
	5-6	2.8	100x50x15x0.8
	4-5	2.8	100x50x15x0.9
	3-4	2.8	100x50x15x1.1
	2-3	3.7	100x50x15x1.3
P2	6-R	2.8	100x50x15x0.7
	5-6	2.8	100x50x15x0.9
	4-5	2.8	100x50x15x1.0
	3-4	2.8	100x50x15x1.2
	2-3	3.7	100x50x15x1.5
P3	6-R	2.8	100x100x2.3
	5-6	2.8	100x100x2.3
	4-5	2.8	100x100x2.3
	3-4	2.8	100x100x2.3
	2-3	3.7	100x100x4.0
P4	6-R	2.8	100x50x15x0.7
	5-6	2.8	100x50x15x0.7
	4-5	2.8	100x50x15x0.7
	3-4	2.8	100x50x15x0.7
	2-3	3.7	100x50x15x1.0
P5	6-R	2.8	100x50x15x0.9
	5-6	2.8	100x50x15x1.4
	4-5	2.8	(2)100x50x15x1.2
	3-4	2.8	(2)100x50x15x1.5
	2-3	3.7	(2)100x50x15x1.9
P6	6-R	2.8	-
	5-6	2.8	-
	4-5	2.8	-
	3-4	2.8	-
	2-3	3.7	100x100x9.0
P7	6-R	2.8	100x100x2.3
	5-6	2.8	100x100x2.3
	4-5	2.8	100x100x2.3
	34	2.8	100x100x2.3
	2-3	3.7	200X100X9.0

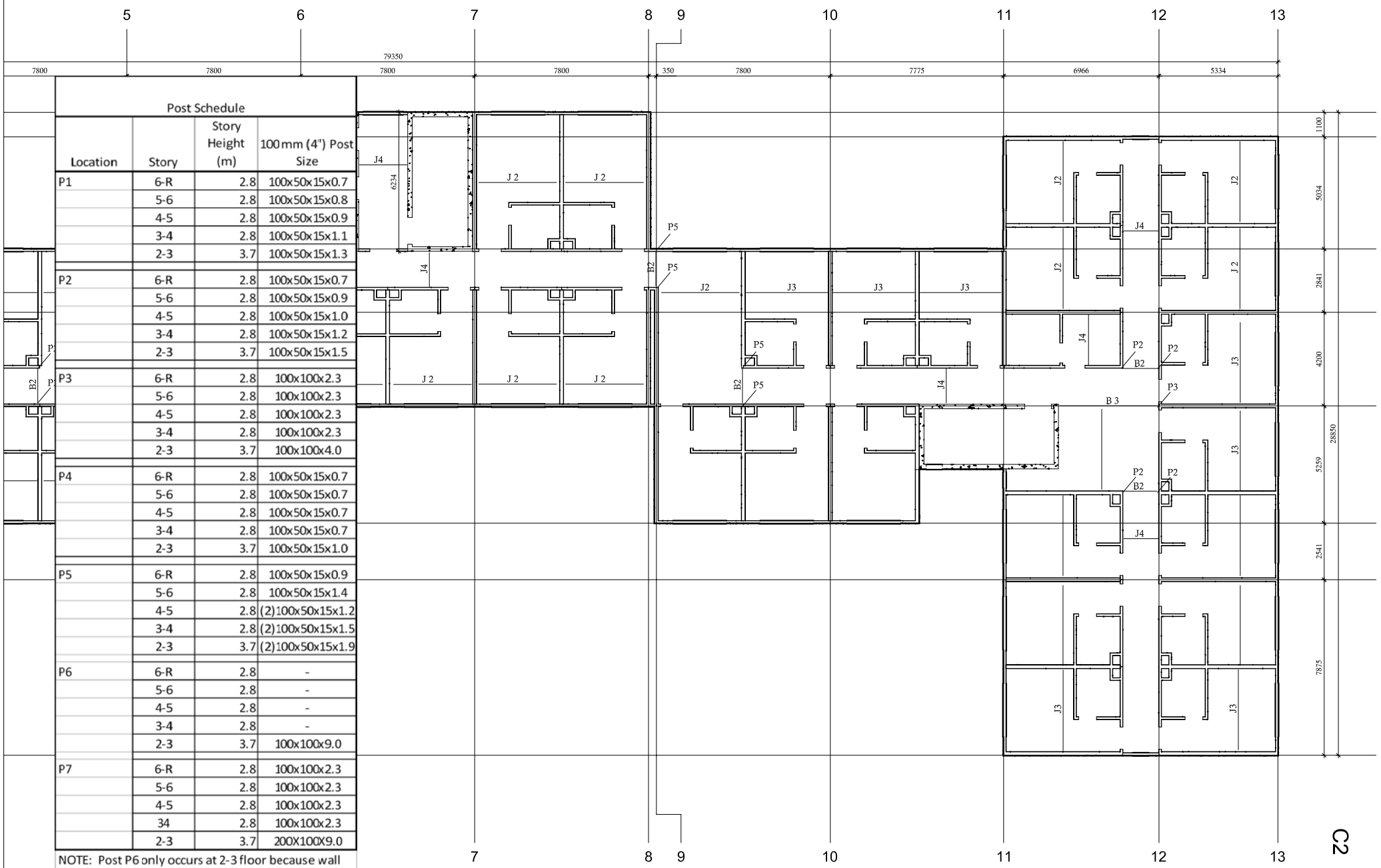
NOTE: Post P6 only occurs at 2-3 floor because wall supports the joits above

G1

Post Schedule

Location	Story	Story Height (m)	100 mm (4") Post Size
P1	6-R	2.8	100x50x15x0.7
	5-6	2.8	100x50x15x0.8
	4-5	2.8	100x50x15x0.9
	3-4	2.8	100x50x15x1.1
	2-3	3.7	100x50x15x1.3
P2	6-R	2.8	100x50x15x0.7
	5-6	2.8	100x50x15x0.9
	4-5	2.8	100x50x15x1.0
	3-4	2.8	100x50x15x1.2
	2-3	3.7	100x50x15x1.5
P3	6-R	2.8	100x100x2.3
	5-6	2.8	100x100x2.3
	4-5	2.8	100x100x2.3
	3-4	2.8	100x100x2.3
	2-3	3.7	100x100x4.0
P4	6-R	2.8	100x50x15x0.7
	5-6	2.8	100x50x15x0.7
	4-5	2.8	100x50x15x0.7
	3-4	2.8	100x50x15x0.7
	2-3	3.7	100x50x15x1.0
P5	6-R	2.8	100x50x15x0.9
	5-6	2.8	100x50x15x1.4
	4-5	2.8	(2)100x50x15x1.2
	3-4	2.8	(2)100x50x15x1.5
	2-3	3.7	(2)100x50x15x1.9
P6	6-R	2.8	-
	5-6	2.8	-
	4-5	2.8	-
	3-4	2.8	-
	2-3	3.7	100x100x9.0
P7	6-R	2.8	100x100x2.3
	5-6	2.8	100x100x2.3
	4-5	2.8	100x100x2.3
	34	2.8	100x100x2.3
	2-3	3.7	200X100X9.0

NOTE: Post P6 only occurs at 2-3 floor because wall supports the joits above



C2

Design Assumptions

fy (Mpa)	235
f (MPa)	205
E (Mpa)	206000
Stud Spacing (m)	0.61
Web Punchout Size (mm)	65

Stud Bracing Third Point

Lists
Floor Heights
3.70
2.80

Max Allowable D/C ratio
99%

Location	Story	Tributary Area (m^2)	Story Height (m)	Floor Loads (N/m^2) Dead	Floor Loads (N/m^2) Live	Post Demand Axial Load N (kN)	Post Size 100 mm (4")	Post Size 150 mm (6")	Axial Capacity (kN) 100 mm (4")	Axial Capacity (kN) 150 mm (6")	Demand/Capacity Ratio 100 mm	Demand/Capacity Ratio 150 mm
P1	6-R	0.9	2.8	575	2000	3.14	100x50x15x0.7	150x50x15x0.7	7.50	9.27	0.42	0.34
	5-6	0.9	2.8	1800	2000	7.61	100x50x15x0.8	150x50x15x0.7	10.15	9.27	0.75	0.82
	4-5	0.9	2.8	1800	2000	12.07	100x50x15x0.9	150x50x15x0.9	13.07	13.96	0.92	0.86
	3-4	0.9	2.8	1800	2000	16.53	100x50x15x1.1	150x50x15x1.0	19.53	18.06	0.85	0.92
	2-3	0.9	3.7	1800	2000	21.00	100x50x15x1.3	150x50x15x1.2	21.67	23.05	0.97	0.91
P2	6-R	1.2	2.8	575	2000	4.19	100x50x15x0.7	150x50x15x0.7	7.50	9.27	0.56	0.45
	5-6	1.2	2.8	1800	2000	10.14	100x50x15x0.9	150x50x15x0.8	13.07	11.58	0.78	0.88
	4-5	1.2	2.8	1800	2000	16.09	100x50x15x1.0	150x50x15x1.0	16.25	18.06	0.99	0.89
	3-4	1.2	2.8	1800	2000	22.04	100x50x15x1.2	150x50x15x1.2	22.44	23.41	0.98	0.94
	2-3	1.2	3.7	1800	2000	28.00	100x50x15x1.5	150x50x15x1.4	29.20	29.04	0.96	0.96
P3	6-R	7.4	2.8	575	2000	25.83	100x100x2.3	150x50x15x1.3	193.69	26.13	0.13	0.99
	5-6	7.4	2.8	1800	2000	62.53	100x100x2.3	(2)150x50x15x1.5	193.69	64.12	0.32	0.98
	4-5	7.4	2.8	1800	2000	99.23	100x100x2.3	(2)150x50x15x1.8	193.69	106.79	0.51	0.93
	3-4	7.4	2.8	1800	2000	135.94	100x100x2.3	-	193.69	-	0.70	-
	2-3	7.4	3.7	1800	2000	172.64	100x100x4.0	-	179.86	-	0.96	-
P4	6-R	0.4	2.8	575	2000	1.40	100x50x15x0.7	150x50x15x0.7	7.50	9.27	0.19	0.15
	5-6	0.4	2.8	1800	2000	3.38	100x50x15x0.7	150x50x15x0.7	7.50	9.27	0.45	0.36
	4-5	0.4	2.8	1800	2000	5.36	100x50x15x0.7	150x50x15x0.7	7.50	9.27	0.72	0.58
	3-4	0.4	2.8	1800	2000	7.35	100x50x15x0.7	150x50x15x0.7	7.50	9.27	0.98	0.79
	2-3	0.4	3.7	1800	2000	9.33	100x50x15x1.0	150x50x15x0.8	12.09	10.82	0.77	0.86
P5	6-R	3.2	2.8	575	2000	11.17	100x50x15x0.9	150x50x15x0.8	13.07	11.58	0.85	0.96
	5-6	3.2	2.8	1800	2000	27.04	100x50x15x1.4	150x50x15x1.4	27.94	29.07	0.97	0.93
	4-5	3.2	2.8	1800	2000	42.91	(2)100x50x15x1.2	150x50x15x1.7	44.87	49.82	0.96	0.86
	3-4	3.2	2.8	1800	2000	58.78	(2)100x50x15x1.5	150x50x15x2.0	62.21	60.52	0.94	0.97
	2-3	3.2	3.7	1800	2000	74.66	(2)100x50x15x1.9	(2)150x50x15x1.7	78.07	77.13	0.96	0.97
P6	6-R	12.8	2.8	575	2000	44.67	-	-	-	-	-	-
	5-6	12.8	2.8	1975	2000	110.85	-	-	-	-	-	-
	4-5	12.8	2.8	1975	2000	177.02	-	-	-	-	-	-
	3-4	12.8	2.8	1975	2000	243.20	-	-	-	-	-	-
	2-3	12.8	3.7	1800	2000	306.69	100x100x9.0	-	324.86	-	0.94	-
P7	6-R	7.4	2.8	575	2000	25.83	100x100x2.3	150x50x15x1.3	193.69	26.13	0.13	0.99
	5-6	7.4	2.8	1800	2000	62.53	100x100x2.3	(2)150x50x15x1.5	193.69	64.12	0.32	0.98
	4-5	7.4	2.8	1800	2000	99.23	100x100x2.3	(2)150x50x15x1.8	193.69	106.79	0.51	0.93
	3-4	7.4	2.8	1800	2000	135.94	100x100x2.3	-	193.69	-	0.70	-
	2-3	-	3.7	-	-	479.33	200X100X9.0	-	622.23	-	0.77	-

P6 Tributary Areas and Floor Loads
T.A = (5.4/2)*(9.4/2) = 12.8
Roof DL = 575*12.8 = 7360
Roof LL = 2000*12.8 = 25600
Floor DL = 1800*12.8 =23040
Floor LL = 2000*12.8 = 25600
Wall DL = 800*2.8m = 2240
Input Typ. Floor DL = (23040+2240)/12.8 = 1975
Input 2-3 Floor DL = 23040/12.8 = 1800
Total Load to P6 at 2-3 Floor = 1.2(7360+(23040*4)+(2240*4))+ 1.4(25600+(25600*4)) = 308

P7 Tributary Areas and Floor Loads
*For floors 3-4 to 6-R, same as P3
*For floor 2-3, P7 takes load for P6 AND loading from P3
At 2-3 Floor, Factored DL + LL = 172.64 + 306.7 = 480

Post Capacities

E	210	Gpa													
Fy	235	Mpa													
4.71sqrt(E/Fy)	141														
4.71sqrt(E/Fy)	42					2.8 m					3.7 m				
	wall thickness	wall length	b/t	Area (cm2)	r (cm)	KL/r	Fe (MPa)	Fcr (MPa)	Pn (kN)	Pa (kN)	KL/r	Fe (MPa)	Fcr (MPa)	Pn (kN)	Pa (kN)
										0					0
100x100x2.3	2.3	100	41.48	8.85	3.97	70.53	416.66	365.41	323.46	193.69	93.20	238.61	209.26	185.24	110.92
100x100x3.2	3.2	100	29.25	12.13	3.93	71.25	408.31	358.09	434.36	260.09	94.15	233.83	205.07	248.75	148.95
100x100x4.0	4.0	100	23.00	14.95	3.89	71.98	400.04	350.83	524.50	314.07	95.12	229.09	200.92	300.37	179.86
100x100x4.5	4.5	100	20.22	16.67	3.87	72.35	395.94	347.24	578.84	346.61	95.61	226.74	198.86	331.49	198.50
100x100x6.0	6.0	100	14.67	21.63	3.79	73.88	379.74	333.03	720.34	431.34	97.63	217.47	190.72	412.52	247.02
100x100x9.0	9.0	100	9.11	30.67	3.65	76.71	352.20	308.88	947.33	567.26	101.37	201.70	176.89	542.52	324.86
100x100x12.0	12	100	6.33	38.53	3.50	80.00	323.85	284.01	1094.30	655.27	105.71	185.46	162.65	626.69	375.26
150X100X3.2	3.2	100	29.25	39.67	3.87	72.35	395.94	347.24	1377.48	824.84	95.61	226.74	198.86	788.86	472.37
200X100X9.0	9.0	100	9.11	48.67	4.01	69.83	425.10	372.81	1814.48	1086.52	92.27	243.45	213.50	1039.12	622.23

h1= 2.8 m (10.84 ft)
h1= 3.7 m (13.53 ft)

Design Assumptions

fy (Mpa)	235
f (MPa)	205
E (Mpa)	206000
Stud Spacing (m)	0.61
Web Punchout Size (mm)	65
Stud Bracing	Third Point

Lists

Floor Heights	Location	Wind	Weight (N/m^2)
3.70	Interior	240	500
2.80	Exterior	810	800

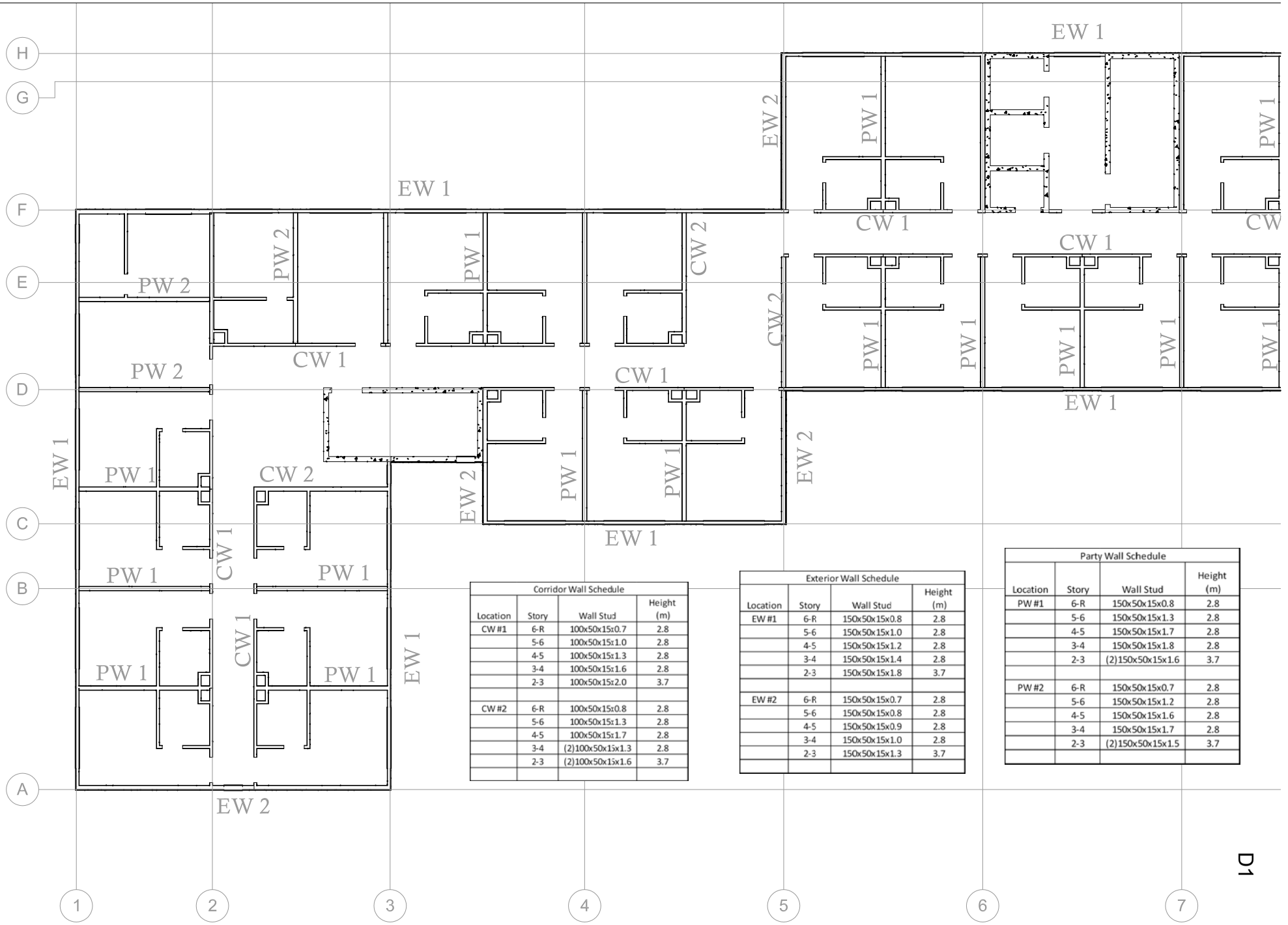
Max Allowable D/C ratio: 99%

Location	Story	Tributary Width (m)	Story Height (m)		Window Opening (m)	Wall Location	Floor Loads (N/m^2)		Out of Plane Load (N/m^2)	Wall Stud Demand		Stud		Axial Capacity (kN)		Demand/Capacity Ratio	
							Dead	Live		Axial Load N (kN)	Moment M (kN-m)	100 mm (4")	150 mm (6")	100 mm (4")	150 mm (6")	100 mm	150 mm
KS1	6-R	0.31	2.8		2.4	Exterior	575	2000	810	5.34	1.33	100x50x15x1.0	150x50x15x0.8	6.42	6.84	0.83	0.78
	5-6	0.31	2.8		2.4	Exterior	1800	2000	810	11.23	1.33	100x50x15x1.2	150x50x15x1.0	13.62	15.85	0.82	0.71
	4-5	0.31	2.8		2.4	Exterior	1800	2000	810	17.12	1.33	100x50x15x1.3	150x50x15x1.1	17.99	19.02	0.95	0.90
	3-4	0.31	2.8		2.4	Exterior	1800	2000	810	23.02	1.33	100x50x15x1.5	150x50x15x1.3	27.44	26.70	0.84	0.86
	2-3	0.31	3.7		2.4	Exterior	1800	2000	810	30.21	2.33	(2)100x50x15x1.7	150x50x15x1.6	34.74	32.43	0.87	0.93
KS2	6-R	0.31	2.8		1.8	Exterior	575	2000	810	4.21	1.00	100x50x15x1.0	150x50x15x0.8	6.42	6.84	0.66	0.62
	5-6	0.31	2.8		1.8	Exterior	1800	2000	810	8.84	1.00	100x50x15x1.1	150x50x15x0.9	9.78	11.31	0.90	0.78
	4-5	0.31	2.8		1.8	Exterior	1800	2000	810	13.46	1.00	100x50x15x1.2	150x50x15x1.0	13.62	15.85	0.99	0.85
	3-4	0.31	2.8		1.8	Exterior	1800	2000	810	18.08	1.00	100x50x15x1.4	150x50x15x1.1	22.73	19.02	0.80	0.95
	2-3	0.31	3.7		1.8	Exterior	1800	2000	810	23.75	1.75	100x50x15x2.0	150x50x15x1.4	25.71	26.03	0.92	0.91
KS3	6-R	0.31	2.8		0.75	Exterior	575	2000	810	2.23	0.42	100x50x15x0.9	150x50x15x0.7	3.46	3.30	0.65	0.68
	5-6	0.31	2.8		0.75	Exterior	1800	2000	810	4.64	0.42	100x50x15x1.0	150x50x15x0.8	6.42	6.84	0.72	0.68
	4-5	0.31	2.8		0.75	Exterior	1800	2000	810	7.04	0.42	100x50x15x1.1	150x50x15x0.9	9.78	11.31	0.72	0.62
	3-4	0.31	2.8		0.75	Exterior	1800	2000	810	9.45	0.42	100x50x15x1.1	150x50x15x0.9	9.78	11.31	0.97	0.84
	2-3	0.31	3.7		0.75	Exterior	1800	2000	810	12.44	0.73	100x50x15x1.5	150x50x15x1.2	12.88	15.06	0.97	0.83
KS4	6-R	3.8	2.8		1.8	Exterior	575	2000	810	15.17	1.00	100x50x15x1.3	150x50x15x1.0	17.99	15.85	0.84	0.96
	5-6	3.8	2.8		1.8	Exterior	1800	2000	810	35.38	1.00	100x50x15x1.9	150x50x15x1.6	38.19	37.92	0.93	0.93
	4-5	3.8	2.8		1.8	Exterior	1800	2000	810	55.58	1.00	(2)100x50x15x1.6	(2)150x50x15x1.4	56.14	60.66	0.99	0.92
	3-4	3.8	2.8		1.8	Exterior	1800	2000	810	75.78	1.00	(2)100x50x15x2.0	(2)150x50x15x1.7	84.21	83.69	0.90	0.91
	2-3	3.8	3.7		1.8	Exterior	1800	2000	810	97.02	1.75	Use triple stud	(2)150x50x15x2.0	-	98.14	#VALUE!	0.99

Member Summary:

Level	Max Span (m)			
	0.75	1.8	2.4	1.8 (w/ trib)
6-R	150x50x15x0.7	150x50x15x0.8	150x50x15x0.8	150x50x15x1.0
5-6	150x50x15x0.8	150x50x15x0.9	150x50x15x1.0	150x50x15x1.6
4-5	150x50x15x0.9	150x50x15x1.0	150x50x15x1.1	(2)150x50x15x1.4
3-4	150x50x15x0.9	150x50x15x1.1	150x50x15x1.3	(2)150x50x15x1.7
2-3	150x50x15x1.2	150x50x15x1.4	150x50x15x1.6	(2)150x50x15x2.0

Note:
+ King studs shall be at a minimum .2 mm thicker than corresponding wall studs

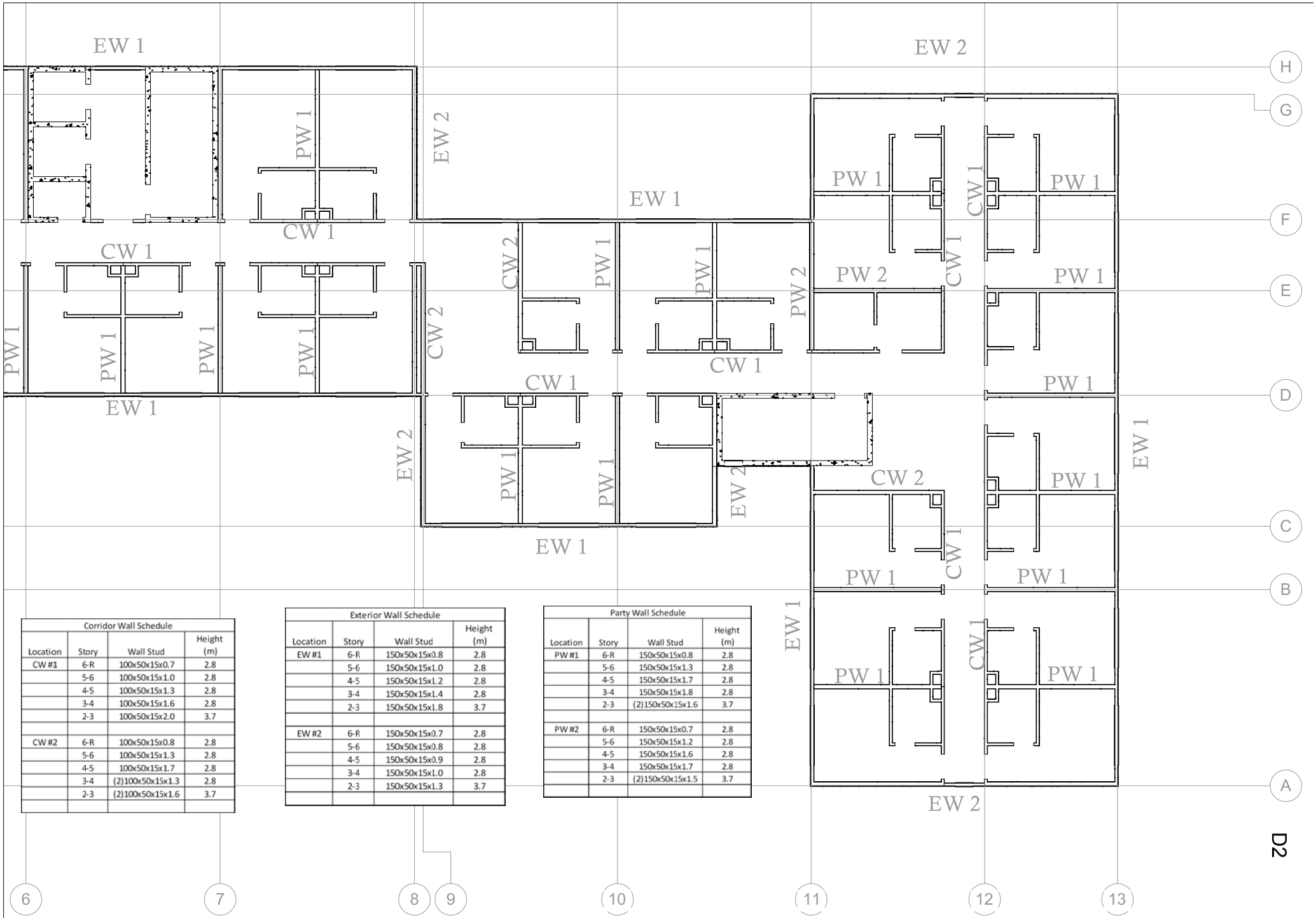


Corridor Wall Schedule			
Location	Story	Wall Stud	Height (m)
CW #1	6-R	100x50x15x0.7	2.8
	5-6	100x50x15x1.0	2.8
	4-5	100x50x15x1.3	2.8
	3-4	100x50x15x1.6	2.8
	2-3	100x50x15x2.0	3.7
CW #2	6-R	100x50x15x0.8	2.8
	5-6	100x50x15x1.3	2.8
	4-5	100x50x15x1.7	2.8
	3-4	(2)100x50x15x1.3	2.8
	2-3	(2)100x50x15x1.6	3.7

Exterior Wall Schedule			
Location	Story	Wall Stud	Height (m)
EW #1	6-R	150x50x15x0.8	2.8
	5-6	150x50x15x1.0	2.8
	4-5	150x50x15x1.2	2.8
	3-4	150x50x15x1.4	2.8
	2-3	150x50x15x1.8	3.7
EW #2	6-R	150x50x15x0.7	2.8
	5-6	150x50x15x0.8	2.8
	4-5	150x50x15x0.9	2.8
	3-4	150x50x15x1.0	2.8
	2-3	150x50x15x1.3	3.7

Party Wall Schedule			
Location	Story	Wall Stud	Height (m)
PW #1	6-R	150x50x15x0.8	2.8
	5-6	150x50x15x1.3	2.8
	4-5	150x50x15x1.7	2.8
	3-4	150x50x15x1.8	2.8
	2-3	(2)150x50x15x1.6	3.7
PW #2	6-R	150x50x15x0.7	2.8
	5-6	150x50x15x1.2	2.8
	4-5	150x50x15x1.6	2.8
	3-4	150x50x15x1.7	2.8
	2-3	(2)150x50x15x1.5	3.7

D1



Corridor Wall Schedule			
Location	Story	Wall Stud	Height (m)
CW #1	6-R	100x50x15x0.7	2.8
	5-6	100x50x15x1.0	2.8
	4-5	100x50x15x1.3	2.8
	3-4	100x50x15x1.6	2.8
	2-3	100x50x15x2.0	3.7
CW #2	6-R	100x50x15x0.8	2.8
	5-6	100x50x15x1.3	2.8
	4-5	100x50x15x1.7	2.8
	3-4	(2)100x50x15x1.3	2.8
	2-3	(2)100x50x15x1.6	3.7

Exterior Wall Schedule			
Location	Story	Wall Stud	Height (m)
EW #1	6-R	150x50x15x0.8	2.8
	5-6	150x50x15x1.0	2.8
	4-5	150x50x15x1.2	2.8
	3-4	150x50x15x1.4	2.8
	2-3	150x50x15x1.8	3.7
EW #2	6-R	150x50x15x0.7	2.8
	5-6	150x50x15x0.8	2.8
	4-5	150x50x15x0.9	2.8
	3-4	150x50x15x1.0	2.8
	2-3	150x50x15x1.3	3.7

Party Wall Schedule			
Location	Story	Wall Stud	Height (m)
PW #1	6-R	150x50x15x0.8	2.8
	5-6	150x50x15x1.3	2.8
	4-5	150x50x15x1.7	2.8
	3-4	150x50x15x1.8	2.8
	2-3	(2)150x50x15x1.6	3.7
PW #2	6-R	150x50x15x0.7	2.8
	5-6	150x50x15x1.2	2.8
	4-5	150x50x15x1.6	2.8
	3-4	150x50x15x1.7	2.8
	2-3	(2)150x50x15x1.5	3.7

D2

Design Assumptions

fy (Mpa)	235
f (MPa)	205
E (Mpa)	206000
Stud Spacing (m)	0.61
Web Punchout Size (mm)	65
Stud Bracing	Third Point

Lists

Floor Heights	Location	Wind	Weight (N/m^2)
3.70	Interior	240	500
2.80	Exterior	810	800

Max Allowable D/C ratio: 99%

Location	Story	Tributary Width (m)	Story Height (m)	Wall Location	Floor Loads (N/m^2)		Out of Plane Load (N/m^2)	Wall Stud Demand		Wall Stud		Axial Capacity (kN)		Demand/Capacity Ratio	
					Dead	Live		Axial Load N (kN)	Moment M (kN-m)	100 mm (4")	150 mm (6")	100 mm (4")	150 mm (6")	100 mm	150 mm
PW #1	6-R	4.1	2.8	Interior	575	2000	240	9.75	0.201	100x50x15x0.8	150x50x15x0.8	10.15	11.58	0.96	0.84
	5-6	4.1	2.8	Interior	1800	2000	240	23.18	0.201	100x50x15x1.3	150x50x15x1.3	25.34	26.13	0.91	0.89
	4-5	4.1	2.8	Interior	1800	2000	240	36.61	0.201	100x50x15x1.8	150x50x15x1.7	40.09	49.82	0.91	0.73
	3-4	4.1	2.8	Interior	1800	2000	240	50.04	0.201	(2)100x50x15x1.3	150x50x15x1.8	50.68	53.39	0.99	0.94
	2-3	4.1	3.7	Interior	1800	2000	240	63.80	0.351	(2)100x50x15x1.6	(2)150x50x15x1.6	64.91	70.47	0.98	0.91
PW #2	6-R	3.75	2.8	Interior	575	2000	240	9.01	0.201	100x50x15x0.8	150x50x15x0.7	10.15	9.27	0.89	0.97
	5-6	3.75	2.8	Interior	1800	2000	240	21.38	0.201	100x50x15x1.2	150x50x15x1.2	22.44	23.41	0.95	0.91
	4-5	3.75	2.8	Interior	1800	2000	240	33.75	0.201	100x50x15x1.7	150x50x15x1.6	36.96	35.11	0.91	0.96
	3-4	3.75	2.8	Interior	1800	2000	240	46.12	0.201	(2)100x50x15x1.3	150x50x15x1.7	50.68	49.82	0.91	0.93
	2-3	3.75	3.7	Interior	1800	2000	240	58.82	0.351	(2)100x50x15x1.6	(2)150x50x15x1.5	64.91	64.05	0.91	0.92

Design Assumptions

fy (Mpa)	235
f (MPa)	205
E (Mpa)	206000
Stud Spacing (m)	0.61
Web Punchout Size (mm)	65
Stud Bracing	Third Point

Lists

Floor Heights	Location	Wind	Weight (N/m^2)
3.70	Interior	240	500
2.80	Exterior	810	800

Max Allowable D/C ratio: 99%

Location	Story	Tributary Width (m)	Story Height (m)	Wall Location	Floor Loads (N/m^2)		Out of Plane Load (N/m^2)	Wall Stud Demand		Wall Stud		Axial Capacity (kN)		Demand/Capacity Ratio	
					Dead	Live		Axial Load N (kN)	Moment M (kN-m)	100 mm (4")	150 mm (6")	100 mm (4")	150 mm (6")	100 mm	150 mm
EW #1	6-R	2	2.8	Exterior	575	2000	810	5.90	0.678	100x50x15x1.0	150x50x15x0.8	6.42	6.84	0.92	0.86
	5-6	2	2.8	Exterior	1800	2000	810	13.59	0.678	100x50x15x1.3	150x50x15x1.0	17.99	15.85	0.76	0.86
	4-5	2	2.8	Exterior	1800	2000	810	21.28	0.678	100x50x15x1.4	150x50x15x1.2	22.73	22.76	0.94	0.93
	3-4	2	2.8	Exterior	1800	2000	810	28.97	0.678	100x50x15x1.7	150x50x15x1.4	31.67	30.33	0.91	0.96
	2-3	2	3.7	Exterior	1800	2000	810	37.19	1.184	(2)100x50x15x1.8	150x50x15x1.8	40.00	40.57	0.93	0.92
EW #2	6-R	0.6	2.8	Exterior	575	2000	810	2.92	0.678	100x50x15x0.9	150x50x15x0.7	3.46	3.30	0.84	0.88
	5-6	0.6	2.8	Exterior	1800	2000	810	6.37	0.678	100x50x15x1.1	150x50x15x0.8	9.78	6.84	0.65	0.93
	4-5	0.6	2.8	Exterior	1800	2000	810	9.83	0.678	100x50x15x1.2	150x50x15x0.9	13.62	11.31	0.72	0.87
	3-4	0.6	2.8	Exterior	1800	2000	810	13.28	0.678	100x50x15x1.2	150x50x15x1.0	13.62	15.85	0.97	0.84
	2-3	0.6	3.7	Exterior	1800	2000	810	17.26	1.184	100x50x15x1.8	150x50x15x1.3	20.00	20.84	0.86	0.83

Design Assumptions

fy (Mpa)	235
f (MPa)	205
E (Mpa)	206000
Stud Spacing (m)	0.61
Web Punchout Size (mm)	65
Stud Bracing	Third Point

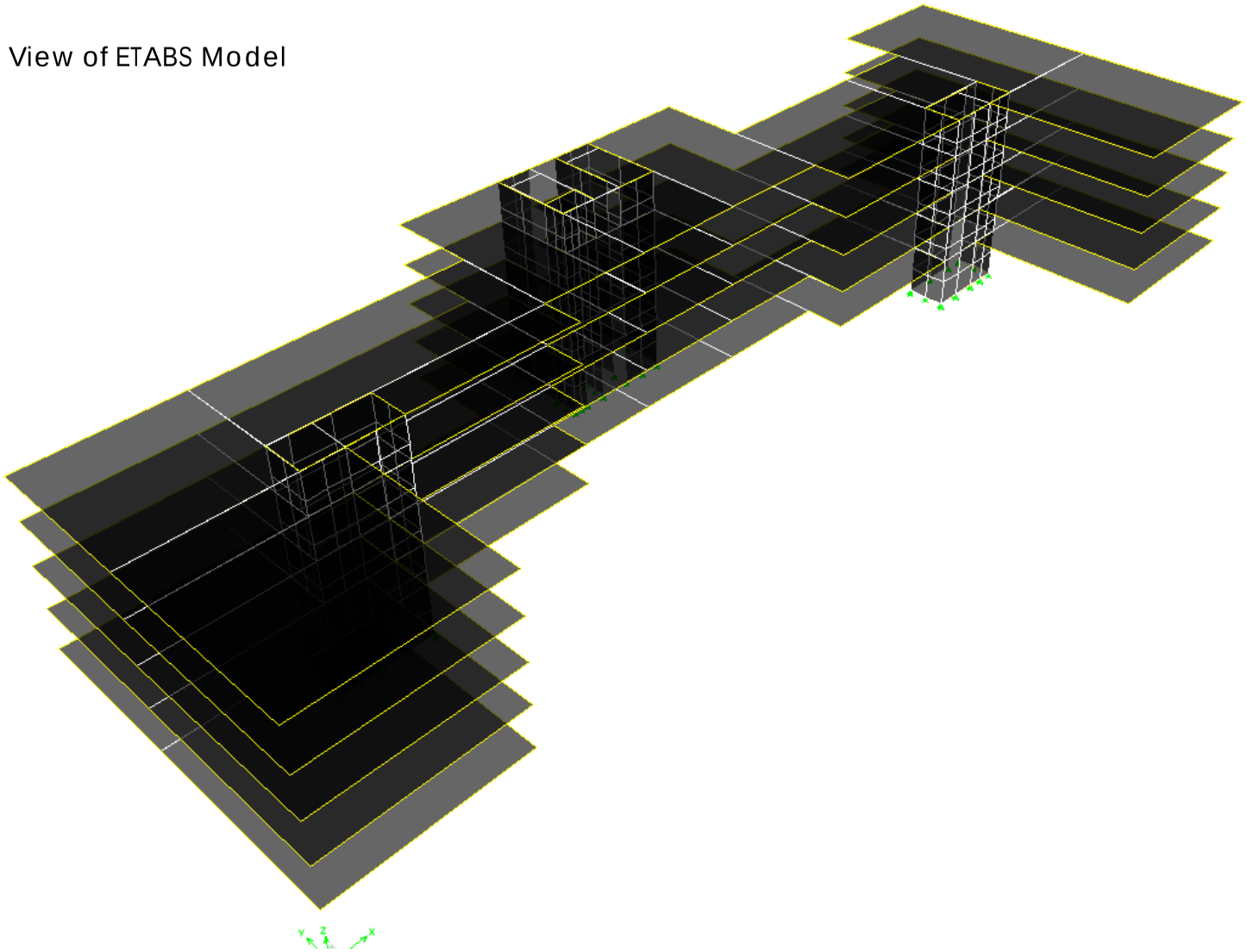
Lists

Floor Heights	Location	Wind	Weight (N/m^2)
3.70	Interior	240	500
2.80	Exterior	810	800

Max Allowable D/C ratio: 99%

Location	Story	Tributary Width (m)	Story Height (m)	Wall Location	Floor Loads (N/m^2)		Out of Plane Load (N/m^2)	Wall Stud Demand		Wall Stud		Axial Capacity (kN)		Demand/Capacity Ratio	
					Dead	Live		Axial Load N (kN)	Moment M (kN-m)	100 mm (4")	150 mm (6")	100 mm (4")	150 mm (6")	100 mm	150 mm
CW #1	6-R	2.5	2.8	Interior	575	2000	240	6.35	0.201	100x50x15x0.7	150x50x15x0.7	7.50	9.27	0.85	0.68
	5-6	2.5	2.8	Interior	1800	2000	240	14.94	0.201	100x50x15x1.0	150x50x15x1.0	16.25	18.06	0.92	0.83
	4-5	2.5	2.8	Interior	1800	2000	240	23.52	0.201	100x50x15x1.3	150x50x15x1.3	25.34	26.13	0.93	0.90
	3-4	2.5	2.8	Interior	1800	2000	240	32.11	0.201	100x50x15x1.6	150x50x15x1.6	33.89	35.11	0.95	0.91
	2-3	2.5	3.7	Interior	1800	2000	240	41.03	0.351	100x50x15x2.0	150x50x15x1.8	42.51	41.95	0.97	0.98
CW #2	6-R	4	2.8	Interior	575	2000	240	9.54	0.201	100x50x15x0.8	150x50x15x0.8	10.15	11.58	0.94	0.82
	5-6	4	2.8	Interior	1800	2000	240	22.67	0.201	100x50x15x1.3	150x50x15x1.2	25.34	23.41	0.89	0.97
	4-5	4	2.8	Interior	1800	2000	240	35.79	0.201	100x50x15x1.7	150x50x15x1.7	36.96	49.82	0.97	0.72
	3-4	4	2.8	Interior	1800	2000	240	48.92	0.201	(2)100x50x15x1.3	150x50x15x1.7	50.68	49.82	0.97	0.98
	2-3	4	3.7	Interior	1800	2000	240	62.38	0.351	(2)100x50x15x1.6	(2)150x50x15x1.5	64.91	64.05	0.96	0.97

3-D View of ETABS Model



LATERAL LOADS APPLIED

EARTHQUAKE LOADS

V = .04W

Roof DL (N/m^2)	575
Floor DL (N/m2)	2010
Interior Wall DL (N/m2)	600
Exterior Wall DL (N/m2)	900

WIND LOADS

Wind Force (N/m^2)	720

Lateral Force per Area

Floor Loading	
Interior Wall DL (N/m2)	600
Length of Int. Walls (m)	450
Height of Walls (m)	2.8
Total DL (N)	756000
Total Floor Area (m^2)	1228
DL per m^2 (N/m^2)	616
Floor DL	2010
Total DL	2626
V = .04W	105

<------Lateral Force per square meter on Floors

Roof Loading	
Roof DL	575
V = .04W	23

<------Lateral Force per square meter on Roof

Lateral Force Line Loads

Exterior Wall DL (N/m^2)	900
Height of Walls (m)	2.8
DL Line Load (N/m)	2520
V = .04W	101

<------Lateral Force per meter along exterior walls

NOTE: For Roof, take 1/2 of line load (V = 51 N/m)

Lateral Force at Core Walls

Core Wall Wt. (N/m^2)	7200
V = .04W	288

<------Lateral Force per square meter on core walls

Lateral Force Line Loads

Wind Force (N/m2)	720
Typ. Wall Height (m)	2.8
Wind Load at Roof (N/m)	1008

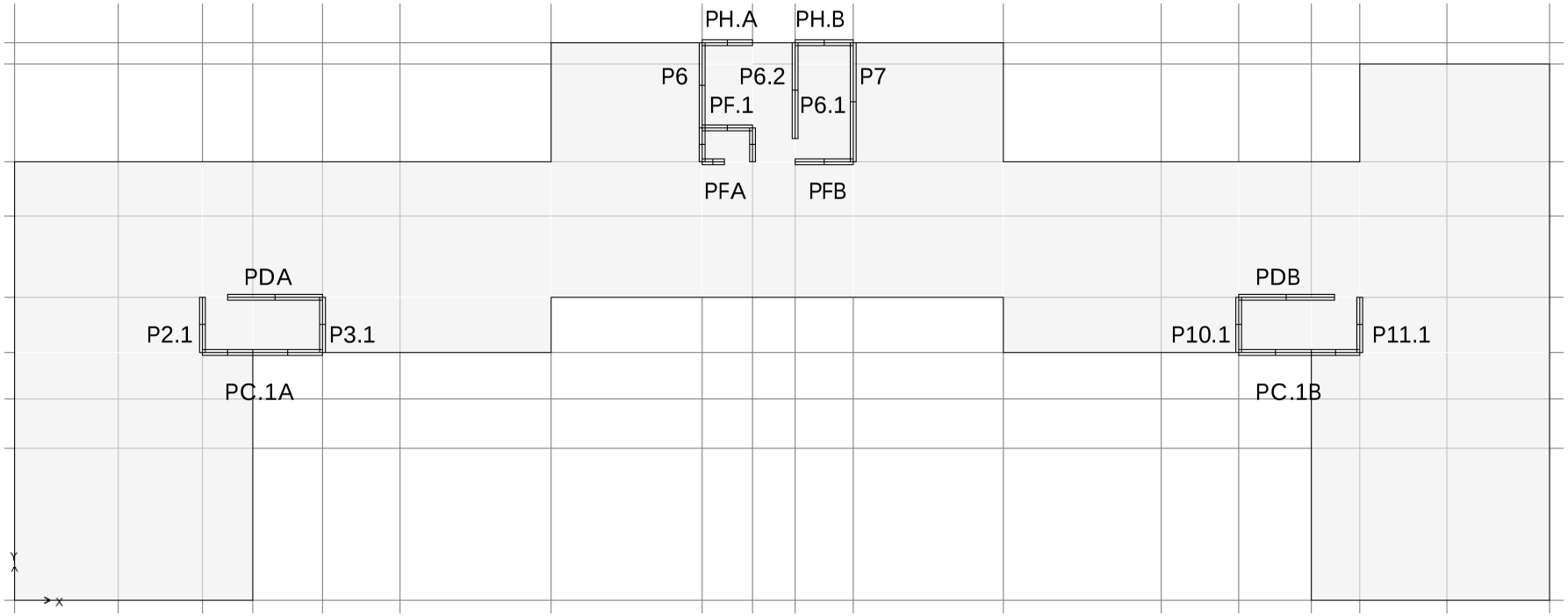
<----Lateral Force at Roof

Wind Load at Floors (N/m)	2016

<----Lateral Force at Floors 3, 4, 5

Wall ht. at 1st Floor (m)	3.7
Wind Load at 2nd Floor (N/m)	2340

<-----Lateral Force at Floor 2



Wall Pier Layout and Callouts

Wall Thickness (cm)	30.48	
Story Height (m)	2.8	floors 2, 3, 4, 5
Story Height (m)	3.7	at 1st floor (S.W. = 23544*3.7*30.48/100 = 26514 N/m)

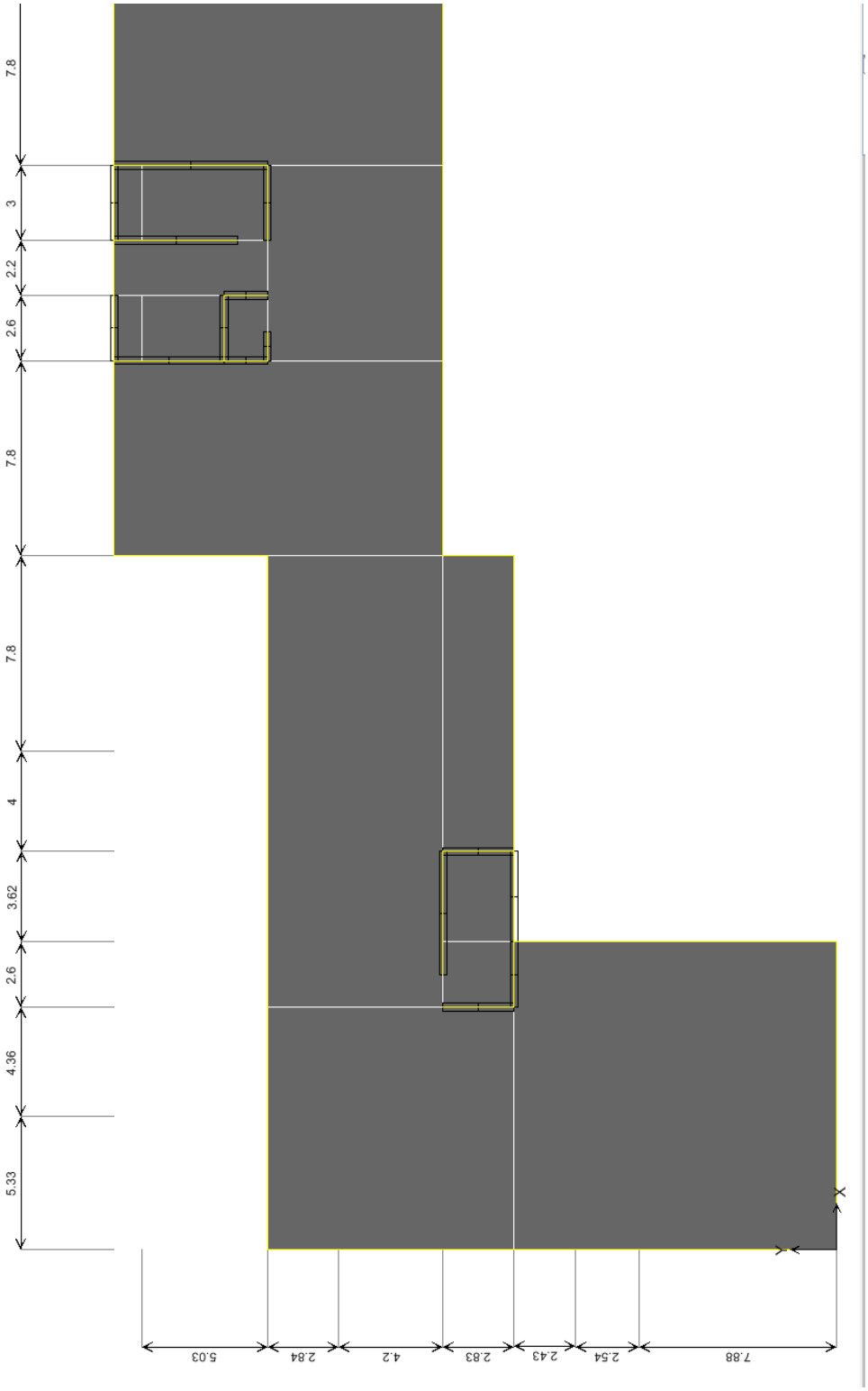
Gravity Load to Concrete Piers

		From Joists			From Stairs			Self Weight		
Wall ID	Story	DL (N/m^2)	LL (N/m^2)	TW (m)	DL (N/m^2)	LL (N/m^2)	TW (M)	DL (N/m)	Max Factored DL (N/m)	Total LL (N/m)
P2.1	ROOF	575	2000	0.61	0	0	3	0	351	1220
	5	1800	2000	0.31	2000	4800	3	20093	26651	15020
	4	1800	2000	0.31	2000	4800	3	20093	26651	15020
	3	1800	2000	0.31	2000	4800	3	20093	26651	15020
	2	1800	2000	0.31	2000	4800	3	20093	26651	15020
P3.1	Roof	575	2000	2.31	0	0	3	0	1328	4620
	5	1800	2000	2	2000	4800	3	20093	29693	18400
	4	1800	2000	2	2000	4800	3	20093	29693	18400
	3	1800	2000	2	2000	4800	3	20093	29693	18400
	2	1800	2000	2	2000	4800	3	20093	29693	18400
P6	Roof	575	2000	3.9	0	0	0	0	2243	7800
	5	1800	2000	1.95	2000	4800	0	20093	23603	3900
	4	1800	2000	1.95	2000	4800	0	20093	23603	3900
	3	1800	2000	1.95	2000	4800	0	20093	23603	3900
	2	1800	2000	1.95	2000	4800	0	20093	23603	3900
P6.1	Roof	575	2000	3.9	0	0	0	0	2243	7800
	5	1800	2000	1.95	2000	4800	0	20093	23603	3900
	4	1800	2000	1.95	2000	4800	0	20093	23603	3900
	3	1800	2000	1.95	2000	4800	0	20093	23603	3900
	2	1800	2000	1.95	2000	4800	0	20093	23603	3900
P6.2	Roof	575	2000	2.5	0	0	1.4	0	1438	5000
	5	1800	2000	1.25	2000	4800	1.4	20093	25143	9220
	4	1800	2000	1.25	2000	4800	1.4	20093	25143	9220
	3	1800	2000	1.25	2000	4800	1.4	20093	25143	9220
	2	1800	2000	1.25	2000	4800	1.4	20093	25143	9220
P7	Roof	575	2000	3.9	0	0	1.4	0	2243	7800
	5	1800	2000	1.95	2000	4800	1.4	20093	26403	10620
	4	1800	2000	1.95	2000	4800	1.4	20093	26403	10620
	3	1800	2000	1.95	2000	4800	1.4	20093	26403	10620
	2	1800	2000	1.95	2000	4800	1.4	20093	26403	10620
P10.1	Roof	575	2000	3.9	0	0	3	0	2243	7800
	5	1800	2000	1.95	2000	4800	3	20093	29603	18300
	4	1800	2000	1.95	2000	4800	3	20093	29603	18300
	3	1800	2000	1.95	2000	4800	3	20093	29603	18300
	2	1800	2000	1.95	2000	4800	3	20093	29603	18300
P11.1	Roof	575	2000	0.61	0	0	3	0	351	1220
	5	1800	2000	0.31	2000	4800	3	20093	26651	15020
	4	1800	2000	0.31	2000	4800	3	20093	26651	15020
	3	1800	2000	0.31	2000	4800	3	20093	26651	15020
	2	1800	2000	0.31	2000	4800	3	20093	26651	15020
PC.1A	Roof	575	2000	2.61	0	0	1.4	0	1501	5220
	5	1800	2000	0.61	2000	4800	1.4	20093	23991	7940
	4	1800	2000	0.61	2000	4800	1.4	20093	23991	7940
	3	1800	2000	0.61	2000	4800	1.4	20093	23991	7940
	2	1800	2000	0.61	2000	4800	1.4	20093	23991	7940
PC.1B	Roof	575	2000	2.61	0	0	1.4	0	1501	5220
	5	1800	2000	0.61	2000	4800	1.4	20093	23991	7940
	4	1800	2000	0.61	2000	4800	1.4	20093	23991	7940
	3	1800	2000	0.61	2000	4800	1.4	20093	23991	7940
	2	1800	2000	0.61	2000	4800	1.4	20093	23991	7940

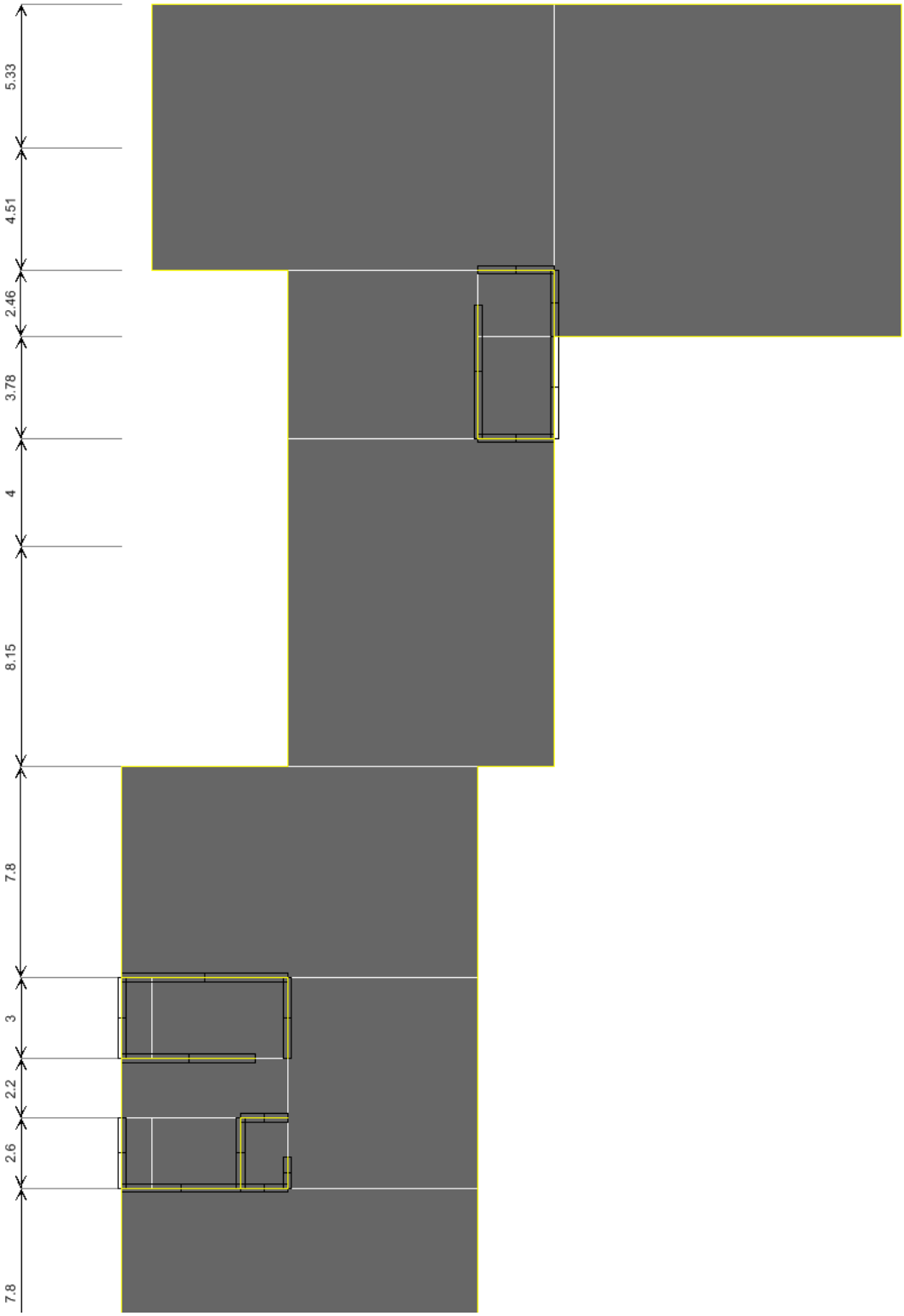
Wall Thickness (cm)	30.48	
Story Height (m)	2.8	floors 2, 3, 4, 5
Story Height (m)	3.7	at 1st floor (S.W. = 23544*3.7*30.48/100 = 26514 N/m)

Gravity Load to Concrete Piers

		From Joists			From Stairs			Self Weight		
Wall ID	Story	DL (N/m^2)	LL (N/m^2)	TW (m)	DL (N/m^2)	LL (N/m^2)	TW (M)	DL (N/m)	Max Factored DL (N/m)	Total LL (N/m)
PDA	Roof	575	2000	2.95	0	0	1.4	0	1696	5900
	5	1800	2000	0.95	2000	4800	1.4	20093	24603	8620
	4	1800	2000	0.95	2000	4800	1.4	20093	24603	8620
	3	1800	2000	0.95	2000	4800	1.4	20093	24603	8620
	2	1800	2000	0.95	2000	4800	1.4	20093	24603	8620
PDB	Roof	575	2000	2.95	0	0	1.4	0	1696	5900
	5	1800	2000	0.95	2000	4800	1.4	20093	24603	8620
	4	1800	2000	0.95	2000	4800	1.4	20093	24603	8620
	3	1800	2000	0.95	2000	4800	1.4	20093	24603	8620
	2	1800	2000	0.95	2000	4800	1.4	20093	24603	8620
PFA	Roof	575	2000	1.8	0	0	0	0	1035	3600
	5	1800	2000	1.8	2000	4800	0	20093	23333	3600
	4	1800	2000	1.8	2000	4800	0	20093	23333	3600
	3	1800	2000	1.8	2000	4800	0	20093	23333	3600
	2	1800	2000	1.8	2000	4800	0	20093	23333	3600
PFB	Roof	575	2000	2.61	0	0	3	0	1501	5220
	5	1800	2000	1.9	2000	4800	3	20093	29513	18200
	4	1800	2000	1.9	2000	4800	3	20093	29513	18200
	3	1800	2000	1.9	2000	4800	3	20093	29513	18200
	2	1800	2000	1.9	2000	4800	3	20093	29513	18200
PF.1	Roof	575	2000	1.6	0	0	0	0	920	3200
	5	1800	2000	0.85	2000	4800	0	20093	21623	1700
	4	1800	2000	0.85	2000	4800	0	20093	21623	1700
	3	1800	2000	0.85	2000	4800	0	20093	21623	1700
	2	1800	2000	0.85	2000	4800	0	20093	21623	1700
PHA	Roof	575	2000	0.31	0	0	0	0	178	620
	5	1800	2000	0	2000	4800	0	20093	20093	0
	4	1800	2000	0	2000	4800	0	20093	20093	0
	3	1800	2000	0	2000	4800	0	20093	20093	0
	2	1800	2000	0	2000	4800	0	20093	20093	0
PHB	Roof	575	2000	0.31	0	0	3	0	178	620
	5	1800	2000	0	2000	4800	3	20093	26093	14400
	4	1800	2000	0	2000	4800	3	20093	26093	14400
	3	1800	2000	0	2000	4800	3	20093	26093	14400
	2	1800	2000	0	2000	4800	3	20093	26093	14400



West Portion of Building



East Portion of building

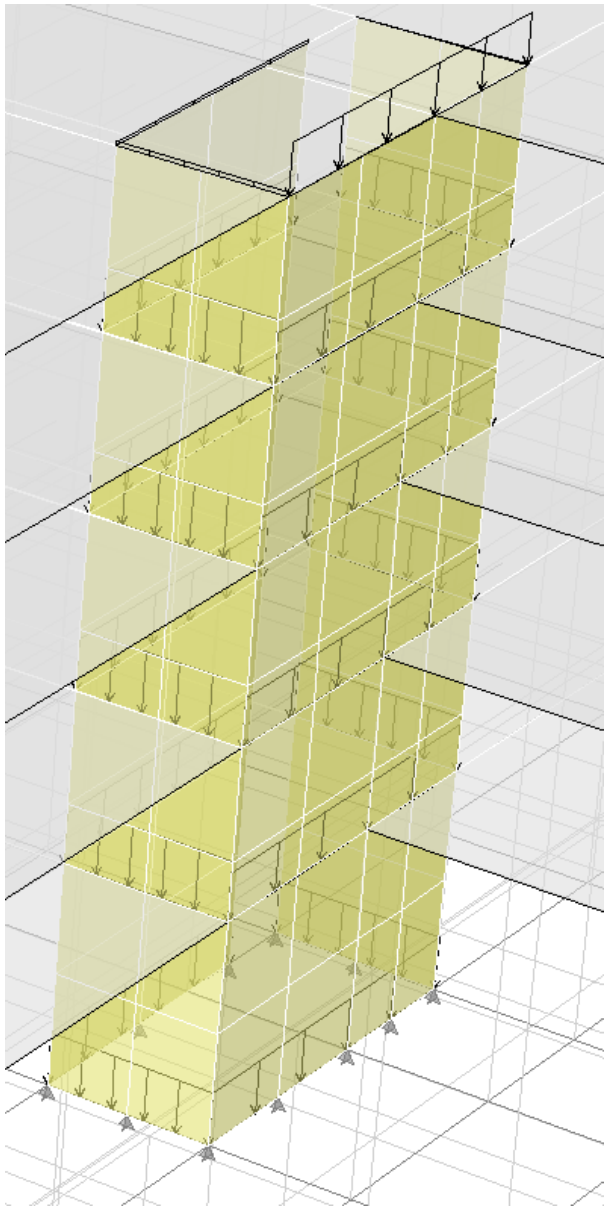
Load Combinations:

1.2D + 1.4L + 1.4(Wind or EQ)

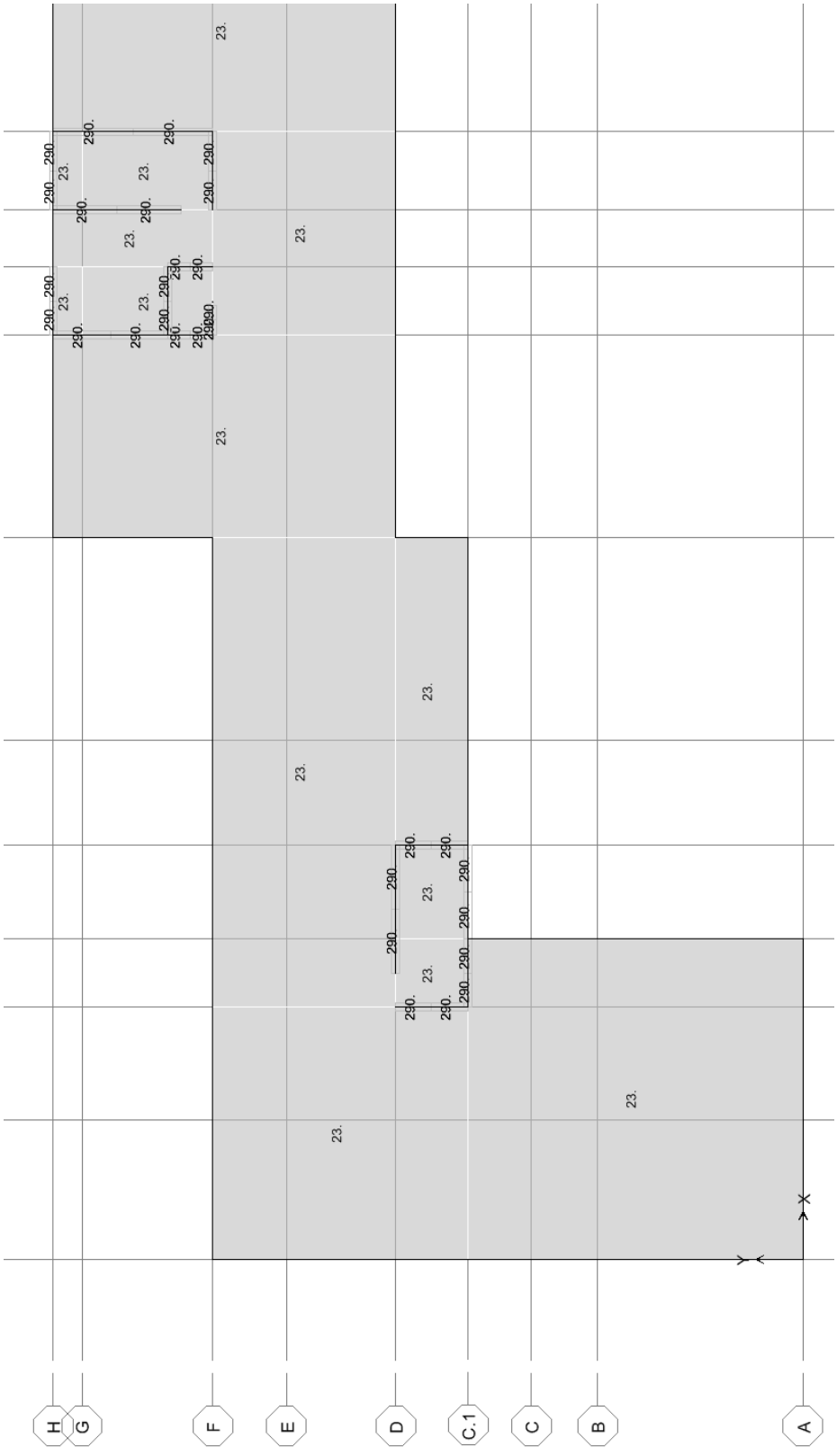
EQX – EQ in the x-direction
EQY – EQ in the y-direction
WINDX - Wind in the x-direction
WINDY – Wind in the y-direction
NWINDX – Wind in the negative x-direction
NWINDY – Wind in the negative y-direction
NEQX – EQ in the negative x-direction
NEQY – EQ in the negative y-direction

0.9D + 1.4(Wind or EQ)

EQXT – EQ in the x-direction
EQYT – EQ in the y-direction
WINDXT - Wind in the x-direction
WINDYT – Wind in the y-direction
NWINDXT – Wind in the negative x-direction
NWINDYT – Wind in the negative y-direction



Typical Dead and Live Loading at Core Walls
Refer to pages E3 and E4 for values

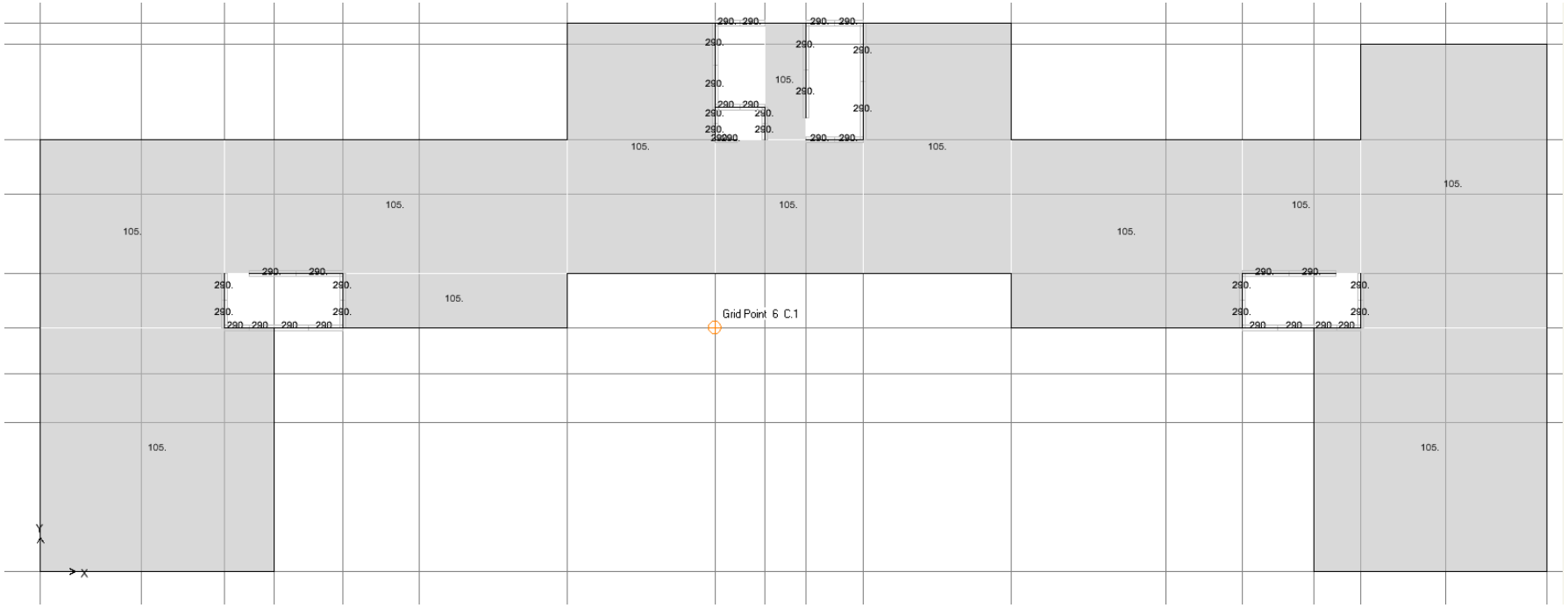


Typical Roof and Core Wall Lateral EQ Forces for both directions

P_{roof} = 23 N/m^2

$P_{2,3,4,5}$ = 105 N/m^2

P_{wall} = 288 N/m^2

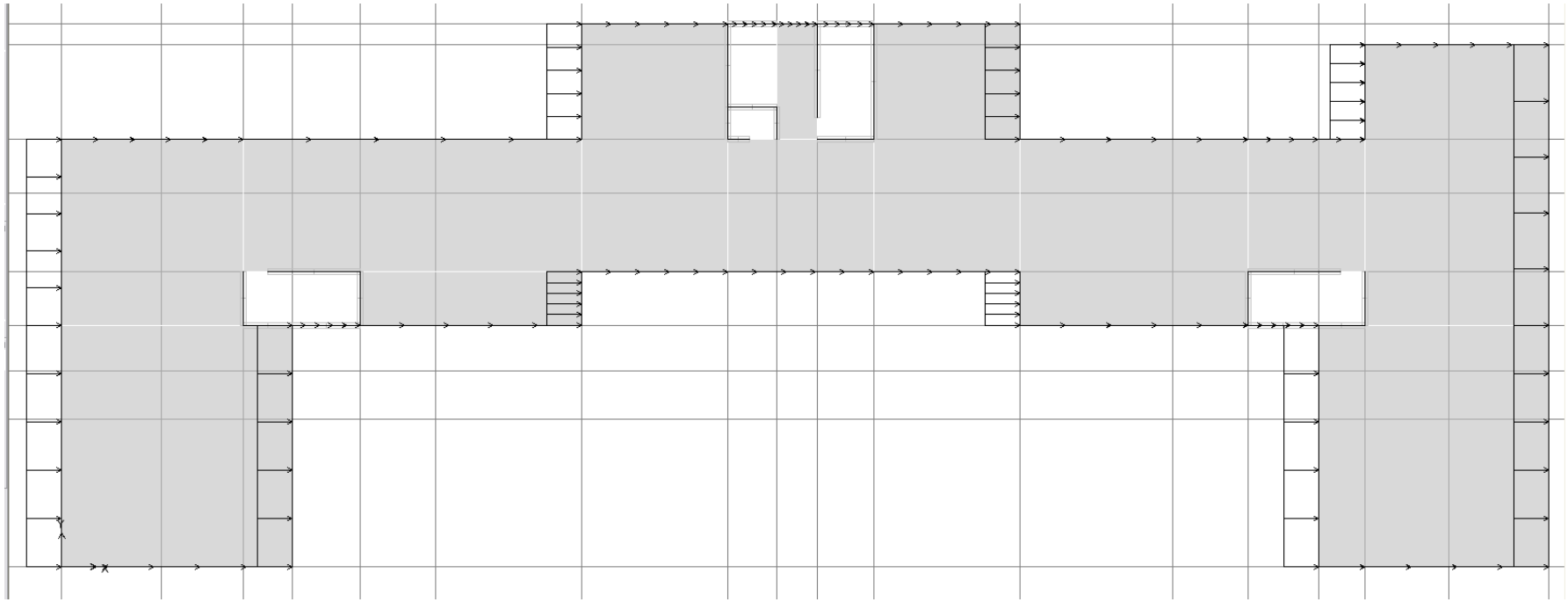


Typical Floor and Core Wall Lateral Earthquake Forces for both directions

P_{roof} = 23 N/m^2

$P_{2,3,4,5}$ = 105 N/m^2

P_{wall} = 288 N/m^2

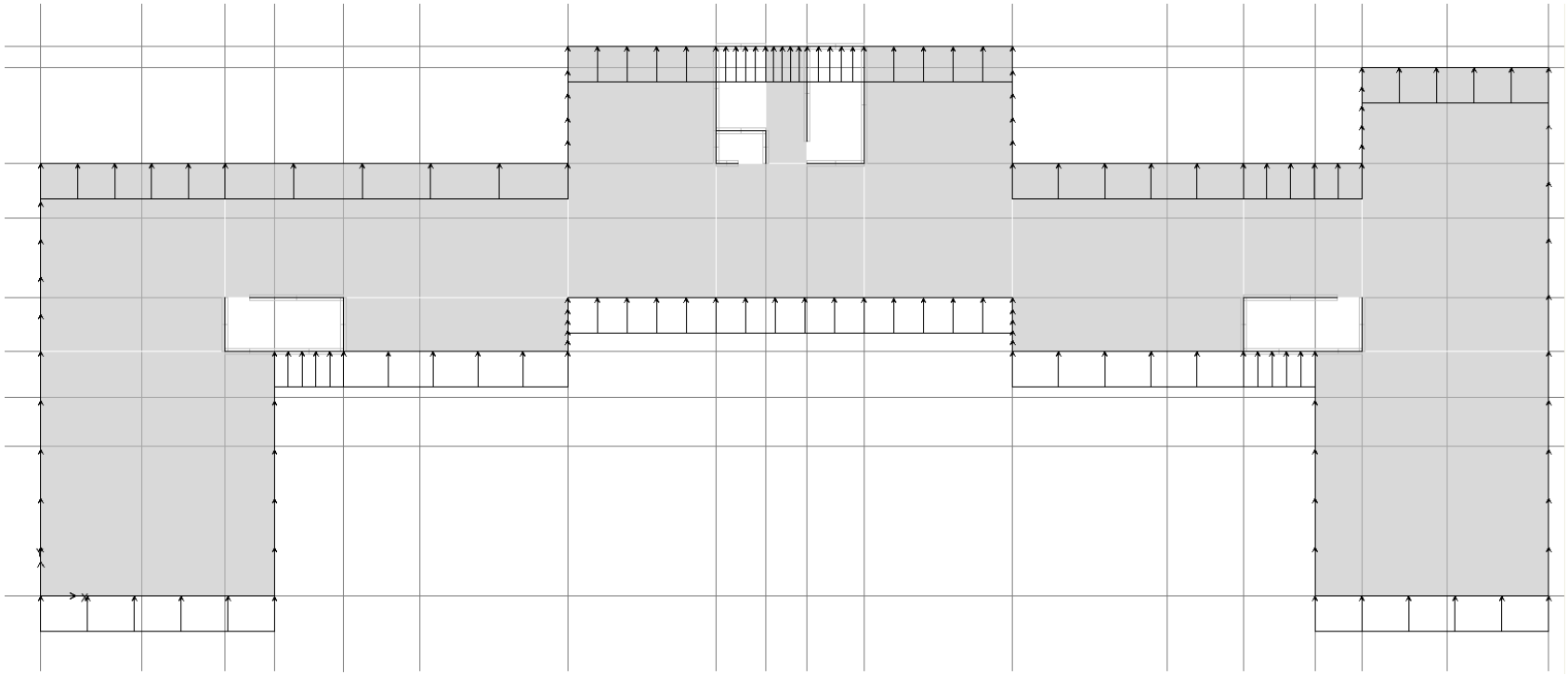


Typical Exterior Wall Earthquake Lateral Loads in the x-direction

$P_{ext.\ wall\ at\ roof}$ = 51 N/m

$P_{ext.\ wall\ at\ 3,4,5}$ = 101 N/m

$P_{ext.\ wall\ at\ 2}$ = 117 N/m

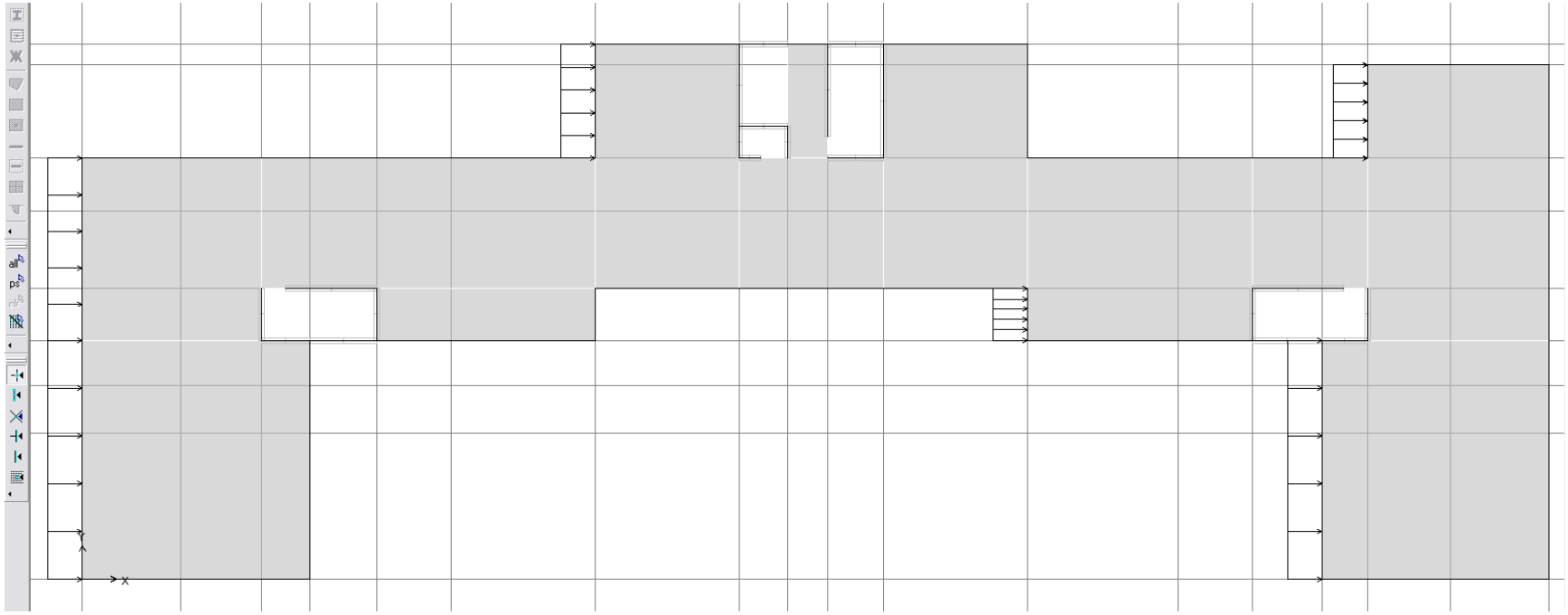


Typical Exterior Wall Earthquake Lateral Loads in the y-direction

$P_{ext.\ wall\ at\ roof}$ = 51 N/m

$P_{ext.\ wall\ at\ 3,4,5}$ = 101 N/m

$P_{ext.\ wall\ at\ 2}$ = 117 N/m

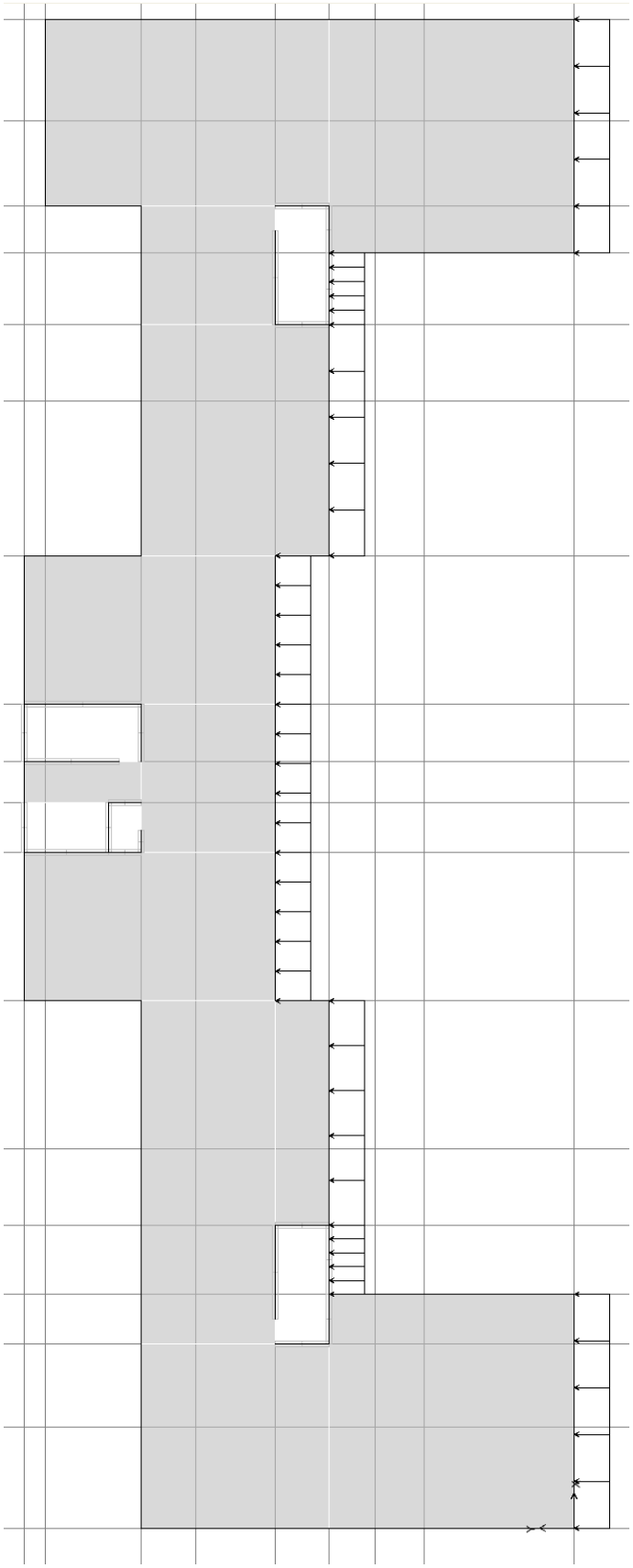


Typical Wind Lateral Loads in the x-direction

P_{roof} = 1008 N/m

$P_{3,4,5}$ = 2016 N/m

P_2 = 2340 N/m



Typical Wind Lateral Loads in the y-direction

P_{roof} = 1008 N/m

$P_{3,4,5}$ = 2016 N/m

P_2 = 2340 N/m

Wall Pier Lateral Forces Per Story

		Lateral X-Direction Combinations							
Wall ID	Story	EQX	WINDX	NWINDX	NEQX	EQXT	WINDXT	NWINDXT	Max (kN)
P2.1	ROOF	-11.0	-6.3	6.3	19.7	-11.5	-5.0	12.7	19.7
	5	-16.4	-11.1	11.1	33.6	-22.4	-15.0	16.1	33.6
	4	-22.8	-16.2	16.2	46.6	-31.7	-22.4	22.9	46.6
	3	-27.4	-20.4	20.4	55.5	-38.1	-28.2	28.8	55.5
	2	-19.7	-21.9	21.9	39.6	-27.7	-30.8	30.6	39.6
P3.1	Roof	21.2	9.1	-9.1	-40.9	31.6	14.7	-10.8	40.9
	5	25.8	8.4	-8.4	-49.4	35.7	11.4	-12.2	49.4
	4	31.3	8.1	-8.1	-59.8	42.3	9.9	-12.9	59.8
	3	32.1	5.9	-5.9	-61.6	43.4	6.6	-9.8	61.6
	2	18.0	-4.3	4.3	-35.0	24.7	-6.6	5.6	35.0
P6	Roof	1.3	-2.1	2.1	-3.0	-0.5	-5.2	0.6	5.2
	5	3.6	-2.9	2.9	-10.9	6.7	-2.5	5.8	10.9
	4	6.7	-3.6	3.6	-17.5	11.9	-2.5	7.6	17.5
	3	10.4	-3.6	3.6	-24.6	17.3	-2.3	7.8	24.6
	2	8.0	-4.4	4.4	-17.4	12.3	-5.0	7.3	17.4
P6.1	Roof	0.7	-0.1	0.1	-1.4	0.2	-0.8	-0.7	1.4
	5	-2.7	-1.5	1.5	5.5	-4.2	-2.5	1.7	5.5
	4	-6.4	-3.1	3.1	12.8	-9.7	-5.0	3.6	12.8
	3	-11.6	-5.4	5.4	23.1	-17.2	-8.4	6.6	23.1
	2	-13.0	-6.2	6.2	25.7	-18.7	-9.2	8.2	25.7
P6.2	Roof	18.0	6.6	-6.6	-28.3	21.8	6.0	-12.6	28.3
	5	28.8	10.9	-10.9	-49.3	37.9	12.9	-17.7	49.3
	4	42.7	16.5	-16.5	-76.1	56.5	19.8	-26.3	76.1
	3	52.5	20.8	-20.8	-95.5	69.2	24.9	-33.3	95.5
	2	34.0	14.3	-14.3	-63.6	45.8	18.2	-21.8	63.6
P7	Roof	-24.7	-6.3	6.3	47.5	-48.3	-22.5	-4.8	48.3
	5	-33.0	-7.7	7.7	57.3	-49.6	-14.1	7.5	57.3
	4	-44.0	-10.1	10.1	76.3	-59.7	-12.2	16.2	76.3
	3	-48.3	-10.5	10.5	84.9	-63.5	-10.7	18.7	84.9
	2	-25.6	-2.3	2.3	46.1	-34.0	-1.3	5.2	46.1
P10.1	Roof	-17.7	-7.8	7.8	33.0	-17.1	-3.2	18.6	33.0
	5	-23.3	-7.5	7.5	45.4	-29.4	-7.4	13.7	45.4
	4	-30.5	-7.9	7.9	60.2	-41.9	-10.4	11.8	60.2
	3	-33.8	-6.7	6.7	66.9	-47.5	-9.5	9.2	66.9
	2	-20.0	3.5	-3.5	39.4	-28.1	4.8	-5.0	39.4
P11.1	Roof	12.1	6.7	-6.7	-26.1	22.9	15.4	-3.4	26.1
	5	17.2	11.4	-11.4	-32.1	25.2	17.1	-14.8	32.1
	4	23.0	16.3	-16.3	-42.9	32.4	22.9	-22.6	42.9
	3	26.4	19.9	-19.9	-49.7	37.1	28.1	-27.7	49.7
	2	18.4	21.4	-21.4	-34.9	25.5	29.7	-30.3	34.9
PC.1A	Roof	55.5	30.4	-30.4	-113.3	77.1	41.9	-43.3	113.3
	5	106.2	56.0	-56.0	-210.8	148.7	78.6	-78.3	210.8
	4	160.2	83.3	-83.3	-315.7	225.3	117.7	-115.6	315.7
	3	204.8	106.7	-106.7	-403.1	288.8	151.6	-147.2	403.1
	2	218.5	117.5	-117.5	-426.6	304.0	162.6	-166.3	426.6
PC.1B	Roof	57.4	31.0	-31.0	-103.3	71.6	34.7	-52.1	103.3
	5	107.5	56.4	-56.4	-204.2	144.1	72.6	-85.4	204.2
	4	160.6	83.3	-83.3	-310.0	219.8	111.7	-121.6	310.0
	3	204.5	106.5	-106.5	-396.5	281.5	144.2	-153.9	396.5
	2	218.2	117.3	-117.3	-427.9	305.9	164.7	-163.8	427.9

Wall Pier Lateral Forces Per Story

		Lateral X-Direction Combinations							
Wall ID	Story	EQX	WINDX	NWINDX	NEQX	EQXT	WINDXT	NWINDXT	Max (kN)
PDA	Roof	-19.9	-7.0	7.0	44.0	-33.1	-15.0	4.6	44.0
	5	2.1	5.7	-5.7	3.3	-3.0	2.0	-13.9	13.9
	4	21.6	17.4	-17.4	-34.0	24.4	18.6	-30.3	34.0
	3	48.4	32.4	-32.4	-86.0	61.3	38.9	-51.9	86.0
	2	107.2	61.5	-61.5	-206.5	147.6	83.5	-88.5	206.5
PDB	Roof	-17.2	-6.0	6.0	28.8	-19.3	-3.6	13.3	28.8
	5	4.0	6.3	-6.3	-15.6	12.8	16.1	-1.6	16.1
	4	22.1	17.5	-17.5	-51.5	37.9	31.5	-17.5	51.5
	3	47.4	31.9	-31.9	-101.2	73.2	51.6	-37.8	101.2
	2	106.1	61.0	-61.0	-211.5	151.3	88.0	-82.6	211.5
PFA	Roof	0.1	-0.2	0.2	-0.8	0.6	0.1	0.7	0.8
	5	0.3	0.0	0.0	-0.8	0.6	0.2	0.1	0.8
	4	0.3	0.1	-0.1	-0.9	1.0	0.7	0.5	1.0
	3	-1.0	-0.5	0.5	1.7	-0.9	-0.2	1.3	1.7
	2	5.5	2.6	-2.6	-10.8	7.8	3.7	-3.5	10.8
PFB	Roof	-5.1	-1.8	1.8	9.5	-8.6	-3.9	1.0	9.5
	5	3.9	2.5	-2.5	-10.5	5.2	3.2	-3.9	10.5
	4	11.0	5.8	-5.8	-24.2	14.7	7.5	-8.9	24.2
	3	19.5	9.4	-9.4	-40.3	26.5	12.4	-14.0	40.3
	2	50.8	24.1	-24.1	-100.7	70.9	33.5	-33.9	100.7
PF.1	Roof	-0.8	0.3	-0.3	-0.6	2.1	3.6	2.8	3.6
	5	13.5	6.5	-6.5	-27.6	20.7	11.0	-7.3	27.6
	4	28.3	12.9	-12.9	-56.3	41.0	19.3	-16.7	56.3
	3	44.5	19.8	-19.8	-88.3	64.0	29.4	-26.0	88.3
	2	66.6	29.9	-29.9	-131.0	94.1	42.7	-40.9	131.0
PHA	Roof	-1.2	-1.4	1.4	-1.9	1.5	1.2	5.1	5.1
	5	5.7	1.2	-1.2	-14.2	10.4	4.1	0.9	14.2
	4	11.2	3.0	-3.0	-25.2	18.8	7.3	-1.0	25.2
	3	17.5	5.1	-5.1	-37.4	27.7	10.3	-3.9	37.4
	2	40.3	15.4	-15.4	-80.4	57.9	23.1	-20.1	80.4
PHB	Roof	16.3	5.0	-5.0	-28.8	26.7	10.9	-3.1	28.8
	5	36.9	12.9	-12.9	-68.5	52.7	19.1	-17.0	68.5
	4	59.1	21.3	-21.3	-111.6	81.9	28.9	-30.7	111.6
	3	77.7	28.8	-28.8	-148.7	107.4	39.0	-41.7	148.7
	2	90.6	35.8	-35.8	-175.9	126.1	49.4	-50.9	175.9

Wall Pier Lateral Forces Per Story

		Lateral Y-Direction Combinations							
Wall ID	Story	EQY	WINDY	NWINDY	NEQY	EQYT	WINDYT	NWINDYT	Max (kN)
P2.1	ROOF	-4.3	-4.5	4.5	10.8	-2.2	-2.5	10.1	10.8
	5	2.9	2.3	-2.3	-7.6	4.5	3.7	-2.7	7.6
	4	8.1	7.4	-7.4	-16.0	11.6	10.6	-10.1	16.0
	3	13.3	12.4	-12.4	-23.0	18.9	17.6	-17.1	23.0
	2	42.9	39.7	-39.7	-62.6	60.0	55.4	-55.7	62.6
P3.1	Roof	16.2	15.8	-15.4	-24.3	24.6	24.0	-19.7	24.6
	5	30.8	28.8	-28.4	-45.9	42.8	39.9	-40.1	45.9
	4	44.4	40.8	-40.4	-65.8	60.6	55.6	-58.1	65.8
	3	56.2	51.4	-50.9	-82.0	77.1	70.4	-72.9	82.0
	2	75.9	68.5	-68.3	-107.1	105.7	95.3	-96.1	107.1
P6	Roof	32.2	32.7	-32.9	-44.0	42.8	43.5	-48.3	48.3
	5	86.8	76.8	-77.1	-111.9	123.2	109.2	-106.2	123.2
	4	145.0	124.3	-124.6	-192.0	205.6	176.6	-171.8	205.6
	3	200.4	170.0	-170.3	-270.0	283.3	240.8	-235.6	283.3
	2	233.0	197.1	-197.2	-321.8	327.3	277.0	-274.9	327.3
P6.1	Roof	1.7	1.1	-1.1	-2.2	1.7	0.8	-2.2	2.2
	5	5.5	4.0	-4.1	-8.1	7.2	5.2	-6.1	8.1
	4	9.1	6.8	-6.8	-13.3	12.0	8.9	-10.3	13.3
	3	10.0	7.2	-7.2	-14.8	13.1	9.1	-10.9	14.8
	2	22.3	17.5	-17.5	-31.8	30.8	24.1	-25.0	31.8
P6.2	Roof	-20.0	-15.3	15.1	10.8	-31.3	-24.7	17.7	31.3
	5	5.3	5.3	-5.6	-25.3	5.1	5.0	-10.3	25.3
	4	28.0	24.2	-24.5	-58.2	35.9	30.6	-37.6	58.2
	3	59.1	50.0	-50.4	-100.9	78.5	65.8	-74.7	100.9
	2	125.5	105.0	-105.1	-183.3	173.9	145.2	-149.0	183.3
P7	Roof	51.0	45.6	-45.8	-69.0	57.8	50.2	-77.7	77.7
	5	110.0	90.9	-91.3	-135.3	150.6	124.0	-131.1	150.6
	4	172.7	139.5	-139.8	-216.8	243.7	197.2	-193.7	243.7
	3	229.9	184.7	-185.1	-297.8	325.9	262.7	-255.1	325.9
	2	252.2	204.9	-205.0	-342.7	355.0	288.8	-285.1	355.0
P10.1	Roof	11.2	9.9	-9.6	-11.7	23.4	21.5	-5.7	23.4
	5	31.1	24.5	-24.0	-43.1	46.7	37.4	-30.5	46.7
	4	51.2	39.0	-38.6	-73.0	72.4	55.4	-53.3	73.0
	3	69.8	52.8	-52.2	-99.1	97.6	73.7	-73.2	99.1
	2	93.6	71.1	-70.9	-131.4	130.9	99.5	-99.4	131.4
P11.1	Roof	-6.2	-5.5	5.5	14.7	-2.7	-1.7	13.6	14.7
	5	3.8	1.6	-1.6	-9.3	6.5	3.4	-1.1	9.3
	4	11.9	7.2	-7.2	-22.3	16.8	10.2	-9.9	22.3
	3	20.7	13.3	-13.3	-33.9	29.2	18.8	-18.4	33.9
	2	57.2	41.6	-41.6	-83.1	79.7	57.9	-58.5	83.1
PC.1A	Roof	-24.1	-20.8	21.0	44.7	-34.4	-29.8	28.6	44.7
	5	-28.7	-24.6	24.9	47.0	-40.1	-34.3	35.0	47.0
	4	-35.3	-29.9	30.2	53.8	-48.4	-40.8	43.3	53.8
	3	-35.3	-30.1	30.5	53.9	-47.2	-40.0	44.8	53.9
	2	-14.7	-14.3	14.4	16.8	-22.5	-21.9	18.3	22.5
PC.1B	Roof	33.0	30.3	-30.5	-69.2	37.4	33.8	-51.4	69.2
	5	35.2	31.6	-31.8	-65.3	42.8	37.8	-51.0	65.3
	4	37.0	32.4	-32.7	-63.6	46.8	40.5	-50.8	63.6
	3	31.9	27.2	-27.5	-55.8	39.8	33.2	-43.4	55.8
	2	15.1	11.0	-11.2	-20.6	21.6	15.9	-15.2	21.6

Wall Pier Lateral Forces Per Story

		Lateral Y-Direction Combinations							
Wall ID	Story	EQY	WINDY	NWINDY	NEQY	EQYT	WINDYT	NWINDYT	Max (kN)
PDA	Roof	-13.5	-14.6	14.6	6.4	-24.0	-25.6	15.3	25.6
	5	-22.8	-22.7	22.6	13.2	-37.9	-37.7	25.7	37.9
	4	-35.0	-33.3	33.2	28.2	-54.8	-52.4	40.6	54.8
	3	-47.0	-43.7	43.7	43.8	-72.3	-67.7	54.7	72.3
	2	-33.0	-30.8	30.8	37.2	-48.7	-45.6	40.6	48.7
PDB	Roof	15.1	13.3	-13.3	-8.7	25.9	23.4	-13.7	25.9
	5	26.5	21.5	-21.5	-17.8	44.4	37.4	-22.8	44.4
	4	41.2	32.3	-32.3	-36.9	64.7	52.2	-38.2	64.7
	3	53.6	41.6	-41.6	-54.2	81.9	65.1	-51.3	81.9
	2	37.7	29.1	-29.1	-44.1	55.4	43.4	-38.0	55.4
PFA	Roof	-0.1	-0.5	0.5	1.7	0.2	-0.2	1.1	1.7
	5	-2.3	-2.2	2.2	3.4	-3.1	-2.9	3.2	3.4
	4	-4.4	-3.9	3.9	7.1	-5.6	-4.9	6.1	7.1
	3	-7.1	-6.2	6.2	10.8	-9.4	-8.2	9.3	10.8
	2	-9.5	-8.1	8.1	13.4	-13.1	-11.2	11.5	13.4
PFB	Roof	11.0	10.1	-10.1	-14.1	14.0	12.7	-15.6	15.6
	5	19.5	16.9	-16.9	-20.2	26.9	23.3	-24.1	26.9
	4	30.4	25.8	-25.8	-36.0	41.9	35.4	-36.9	41.9
	3	40.6	34.3	-34.4	-51.4	56.0	47.3	-48.9	56.0
	2	28.6	25.0	-25.0	-37.1	39.8	34.7	-35.2	39.8
PF.1	Roof	-8.2	-8.5	8.5	16.8	-8.2	-8.7	15.1	16.8
	5	-16.8	-14.9	14.9	26.3	-21.8	-19.1	22.7	26.3
	4	-27.4	-22.9	22.9	40.4	-37.1	-30.7	33.4	40.4
	3	-36.7	-29.8	29.8	53.9	-49.7	-40.0	43.5	53.9
	2	-30.0	-23.6	23.6	43.4	-41.2	-32.2	33.9	43.4
PHA	Roof	8.1	8.1	-8.0	-0.5	14.5	14.5	-8.0	14.5
	5	15.1	14.1	-13.9	-13.5	23.6	22.1	-17.1	23.6
	4	24.1	21.8	-21.7	-25.7	36.9	33.6	-27.2	36.9
	3	32.1	28.7	-28.6	-37.2	48.1	43.4	-36.9	48.1
	2	24.1	22.6	-22.5	-30.1	35.2	33.0	-30.1	35.2
PHB	Roof	-21.0	-17.2	17.2	21.6	-25.5	-20.1	27.9	27.9
	5	-25.1	-19.3	19.3	25.6	-34.1	-25.9	28.0	34.1
	4	-29.5	-21.4	21.4	30.6	-42.2	-30.8	29.1	42.2
	3	-28.5	-19.4	19.4	30.8	-41.3	-28.5	25.8	41.3
	2	-17.4	-10.1	10.1	20.1	-25.0	-14.8	13.3	25.0

Reinforcement Required			
Wall ID	Story	Required Long. Reinf. (mm^2/m)	Required Shear Reinf. (mm^2/m)
P2.1	ROOF	7.62	7.62
	5	7.62	7.62
	4	7.62	7.62
	3	7.62	7.62
	2	7.62	7.62
P3.1	Roof	7.62	7.62
	5	7.62	7.62
	4	7.62	7.62
	3	7.62	7.62
	2	7.62	7.62
P6	Roof	7.62	7.62
	5	7.62	7.62
	4	7.62	7.62
	3	7.62	7.62
	2	7.62	7.62
P6.1	Roof	7.62	7.62
	5	7.62	7.62
	4	7.62	7.62
	3	7.62	7.62
	2	7.62	7.62
P6.2	Roof	7.62	7.62
	5	7.62	7.62
	4	7.62	7.62
	3	7.62	7.62
	2	7.62	7.62
P7	Roof	7.62	7.62
	5	7.62	7.62
	4	7.62	7.62
	3	7.62	7.62
	2	7.62	7.62
P10.1	Roof	7.62	7.62
	5	7.62	7.62
	4	7.62	7.62
	3	7.62	7.62
	2	7.62	7.62
P11.1	Roof	7.62	7.62
	5	7.62	7.62
	4	7.62	7.62
	3	7.62	7.62
	2	7.62	7.62

Reinforcement Required			
Wall ID	Story	Required Long. Reinf. (mm^2/m)	Required Shear Reinf. (mm^2/m)
PC.1A	Roof	7.62	7.62
	5	7.62	7.62
	4	7.62	7.62
	3	7.62	7.62
	2	7.62	7.62
PC.1B	Roof	7.62	7.62
	5	7.62	7.62
	4	7.62	7.62
	3	7.62	7.62
	2	7.62	7.62
PDA	Roof	7.62	7.62
	5	7.62	7.62
	4	7.62	7.62
	3	7.62	7.62
	2	7.62	7.62
PDB	Roof	7.62	7.62
	5	7.62	7.62
	4	7.62	7.62
	3	7.62	7.62
	2	7.62	7.62
PFA	Roof	7.62	7.62
	5	7.62	7.62
	4	7.62	7.62
	3	7.62	7.62
	2	7.62	7.62
PFB	Roof	7.62	7.62
	5	7.62	7.62
	4	7.62	7.62
	3	7.62	7.62
	2	7.62	7.62
PF.1	Roof	7.62	7.62
	5	7.62	7.62
	4	7.62	7.62
	3	7.62	7.62
	2	7.62	7.62
PHA	Roof	7.62	7.62
	5	7.62	7.62
	4	7.62	7.62
	3	7.62	7.62
	2	7.62	7.62
PHB	Roof	7.62	7.62
	5	7.62	7.62
	4	7.62	7.62
	3	7.62	7.62
	2	7.62	7.62