

ภาคผนวกที่ 2-16

การคำนวณโครงสร้างด้านทานแผ่นดินไหว

รายการคำนวณโครงสร้างด้านทานแผ่นดินไหว

โครงการ ดีคอนโด ไฮป์ รัชสิต
(อาคาร A)

ที่ตั้งโครงการ

ถนนพหลโยธิน ตำบลคลองหนึ่ง

อำเภอคลองหลวง จังหวัดปทุมธานี

แรงแผ่นดินไหวสำหรับออกแบบโครงสร้างหลัก

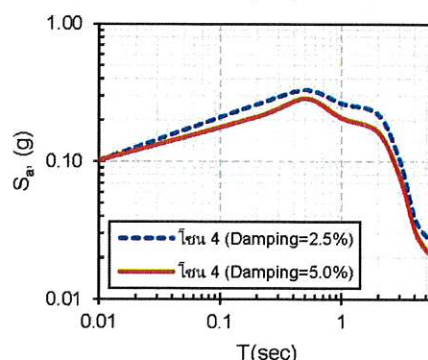
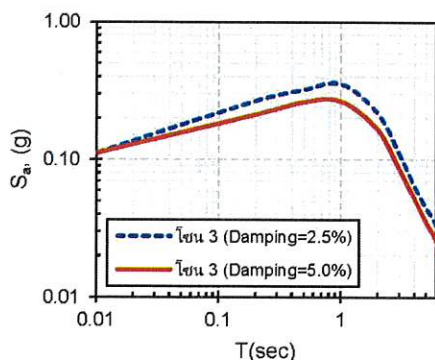
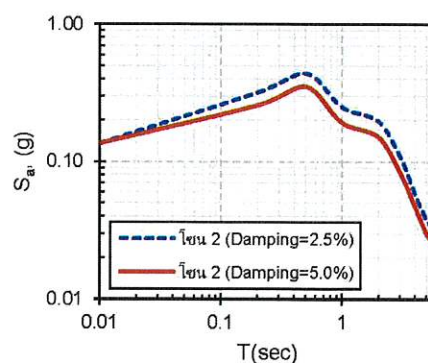
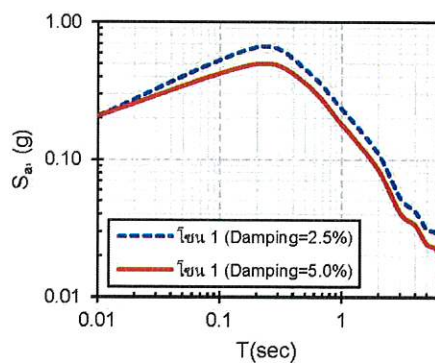
SEISMIC DESIGN CRITERIA

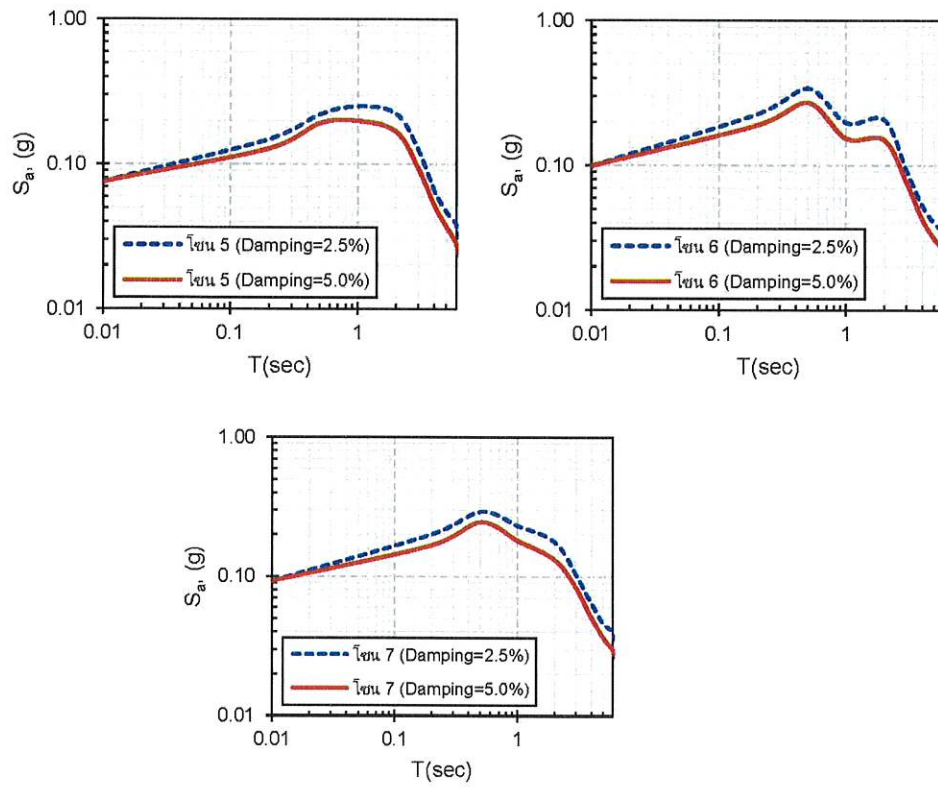
ข้อกำหนดในการออกแบบ

1. กฎกระทรวง กำหนดการรับน้ำหนัก ความต้านทาน ความคงทนของอาคารและพื้นดินที่รองรับอาคารในการต้านทานแรงสั่นสะเทือนของแผ่นดินไหว พ.ศ. 2564
2. ประกาศกระทรวงมหาดไทย เรื่องการออกแบบและคำนวณ โครงสร้างอาคารเพื่อต้านทานแรงสั่นสะเทือนของแผ่นดินไหว 9 พฤศจิกายน พ.ศ.2564
3. มาตรฐานการออกแบบต้านทานการสั่นสะเทือนของแผ่นดินไหว มยผ. 1301/1302-61 ของกรมโยธาธิการและผังเมือง กระทรวงมหาดไทย
4. มาตรฐาน ACI318-1999

แผ่นดินไหวสำหรับการออกแบบ

Spectrum สำหรับการออกแบบของพื้นที่ในแอ่งกรุงเทพฯ โซน 7 โดยที่ อาคารคอนกรีตเสริมเหล็กที่มีความสูงไม่เกิน 60 เมตร ใช้อัตราส่วนความหน่วงไม่เกินร้อยละ 5 และอาคารคอนกรีตเสริมเหล็กที่มีความสูงเกินกว่า 60 เมตร ให้ใช้อัตราส่วนความหน่วงไม่เกินร้อยละ 2.5





รูปที่ ก-7 แสดงสเปกตรัมผลตอบสนองสำหรับการออกแบบด้วยวิธีเชิงพลศาสตร์สำหรับโซนต่างๆ
ของพื้นที่ในแอ่งกรุงเทพฯ

ตารางที่ ก-6 ค่าความเร่งตอบสนองเชิงสเปกตรัมสำหรับการคำนวณแรงแผ่นดินไหวด้วยวิธีพลศาสตร์สำหรับพื้นที่ใน
โซนต่างๆ (อัตราส่วนความหน่วง 2.5%) ของพื้นที่ในแอ่งกรุงเทพ

S_a โซน	S_a (0.01s)	S_{DS} (0.2 s)	S_a (0.5 s)	S_{D1} (1.0s)	S_a (2.0 s)	S_a (3.0 s)	S_a (4.0 s)	S_a (5.0 s)	S_a (6.0 s)
1	0.208	0.654	0.451	0.233	0.110	0.053	0.042	0.031	0.029
2	0.136	0.318	0.439	0.249	0.196	0.108	0.058	0.038	0.030
3	0.111	0.266	0.320	0.353	0.217	0.109	0.064	0.044	0.034
4	0.102	0.260	0.330	0.264	0.218	0.100	0.039	0.029	0.027
5	0.075	0.148	0.220	0.250	0.223	0.126	0.067	0.047	0.038
6	0.099	0.226	0.340	0.198	0.207	0.093	0.053	0.040	0.035
7	0.093	0.200	0.291	0.231	0.177	0.103	0.064	0.046	0.040

ตารางที่ ก-7 ค่าความเร่งตอบสนองเชิงสเปกตรัมสำหรับการคำนวณแรงแผ่นดินไหวด้วยวิธีพลศาสตร์สำหรับพื้นที่ใน
โซนต่างๆ (อัตราส่วนความหน่วง 5.0%) ของพื้นที่ในแอ่งกรุงเทพ

S_a โซน	S_a (0.01s)	S_{DS} (0.2 s)	S_a (0.5 s)	S_{D1} (1.0s)	S_a (2.0 s)	S_a (3.0 s)	S_a (4.0 s)	S_a (5.0 s)	S_a (6.0 s)
1	0.208	0.495	0.360	0.181	0.085	0.041	0.034	0.024	0.022
2	0.136	0.257	0.352	0.193	0.151	0.084	0.047	0.030	0.024
3	0.111	0.212	0.262	0.265	0.166	0.085	0.052	0.035	0.026
4	0.102	0.211	0.287	0.207	0.163	0.078	0.032	0.023	0.020
5	0.075	0.128	0.191	0.199	0.168	0.094	0.053	0.037	0.028
6	0.099	0.189	0.272	0.154	0.150	0.077	0.042	0.031	0.026
7	0.093	0.167	0.246	0.181	0.132	0.084	0.051	0.036	0.030

แรงเฉือนที่ฐานอาคาร (Seismic Base Shear, V) คำนวณจาก

$$V = (C_s)(W)$$

โดยที่ C_s คือสัมประสิทธิ์ผลตอบสนองแรงแผ่นดินไหว

W คือน้ำหนักโครงสร้างประสิทธิผลของอาคาร ตามที่กำหนดในหัวข้อที่ 20(2)

สัมประสิทธิ์ผลตอบสนองแรงแผ่นดินไหว (C_s) คำนวณจาก

$$C_s = S_a (I/R)$$

โดยที่ S_a คือ ค่าความเร่งตอบสนองเชิงสเปกตรัมสำหรับการออกแบบ ตามตารางที่ ก-7(2)

R คือ ตัวประกอบปรับผลตอบสนอง ตามที่กำหนด ในผนวก ง ท้ายประกาศฯ (2)

I คือ ตัวประกอบความสำคัญของอาคาร ตามที่กำหนดในหัวข้อที่ 23(2)

และ C_s จะต้องมีความไม่น้อยกว่า 0.01

ระบบโครงสร้างโดยรวมของอาคารเป็น ระบบโครงสร้างโดยใช้กำแพงรับแรงเฉือนแบบธรรมดาเป็นระบบ
ต้านทานแรงด้านข้าง โดยที่

ประเภทความสำคัญของอาคาร; $I = 1.00$

ตัวประกอบปรับผลตอบสนอง; $R = 5.0$

ตัวประกอบกำลังส่วนเกิน; $\Omega_0 = 2.5$

ตัวประกอบขยายค่าการ โกงตัว; $C_d = 4.5$

Model Combination: CQC method

Directional Combination: SRSS

น้ำหนักบรรทุก

DL = 0.20 m Post – tensioned Slab 480 kg/sq.m

= 0.25 m RC. Flat Slab 600 kg/sq.m

SDL = 325 kg/sq.m

LL = 200 kg/sq.m

Design Load Combinations

การรวมผลของแรงสำหรับการออกแบบ

$$U = 1.2D + 1.0L + 1.0E$$

$$U = 0.9D + 1.0E$$

E = Earthquake Load จากวิเคราะห์ด้วยวิธี Elastic Response Spectrum Analysis และ Scale ให้ค่าแรงเฉือนที่ฐานมีค่าเท่ากับค่าจากวิธี Equivalent Static Force Procedure

Structural Stiffness

<i>Items</i>	<i>I_{eff}</i>
<i>Beam</i>	<i>0.35 I_g</i>
<i>Column</i>	<i>0.7 I_g</i>
<i>Wall non crack</i>	<i>0.7 I_g</i>
<i>Wall crack</i>	<i>0.35 I_g</i>
<i>Flat Slab</i>	<i>0.25 I_g</i>

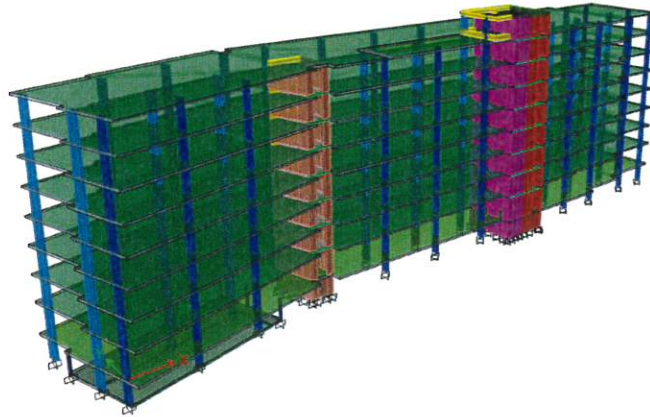
Structural Model

Method of Analysis: Finite Element Method (Frame & Shell Element)

Modeling Detail : Column & Beam > 2- nodes frame element

Walls > 4 – nodes shell element

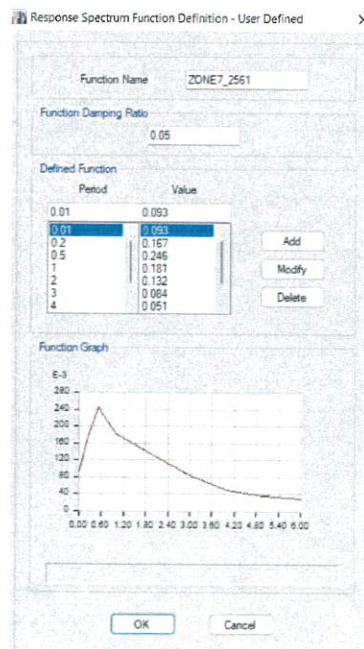
Slabs > 4 – nodes shell element



3D – Model

Mathematical Model

การวิเคราะห์โครงสร้าง ใช้แบบจำลอง Finite Element แบบสามมิติโดยใช้โปรแกรม ETABS



Response Spectrum Function Definition

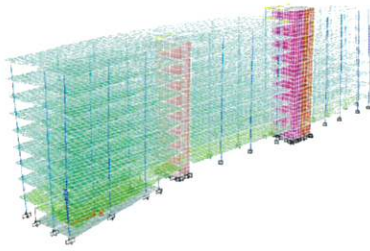
ผลการวิเคราะห์โดยวิธีพลศาสตร์และตัวคูณปรับค่า

จำนวนโหมดที่พิจารณาจะต้องเพียงพอที่จะทำให้ผลรวมของน้ำหนักประสิทธิผลเชิงโหมด(Effective Modal Weight, or Modal Weight Participation) ในแต่ละทิศทางมีค่าไม่น้อยกว่าร้อยละ 90 ของน้ำหนักประสิทธิผลทั้งหมดของอาคาร

ผลการวิเคราะห์โดยวิธีทางพลศาสตร์ ได้ค่าสำหรับ 20 โหมดแรก ดังนี้

Mode	Periods (sec.)	Model Participating Mass Ratios				
		Sum UX	SUM UY	SUM RX	SUM RY	SUM RZ
1	1.249	0.0713	0.0827	0.0427	0.0335	0.5197
2	0.843	0.6994	0.0949	0.0500	0.3364	0.5722
3	0.758	0.6997	0.6665	0.3678	0.3366	0.6859
4	0.299	0.7319	0.6824	0.3857	0.4079	0.8135
5	0.215	0.8667	0.6834	0.3865	0.6740	0.8463
6	0.170	0.8685	0.8595	0.6578	0.6766	0.8679
7	0.136	0.8831	0.8689	0.6738	0.7063	0.8997
8	0.104	0.9138	0.8692	0.6743	0.7666	0.9203
9	0.086	0.9254	0.8693	0.6745	0.7979	0.9338
10	0.077	0.9255	0.9247	0.7922	0.7981	0.9350
11	0.067	0.9345	0.9248	0.7924	0.8216	0.9519
12	0.063	0.9454	0.9252	0.7933	0.8496	0.9565
13	0.051	0.9514	0.9258	0.7950	0.8668	0.9657
14	0.049	0.9528	0.9509	0.8598	0.8706	0.9658
15	0.049	0.9612	0.9520	0.8627	0.8923	0.9733
16	0.044	0.9747	0.9521	0.8631	0.9291	0.9766
17	0.040	0.9771	0.9521	0.8632	0.9357	0.9796
18	0.039	0.9895	0.9521	0.8632	0.9702	0.9860
19	0.037	0.9905	0.9521	0.8632	0.9730	0.9860
20	0.036	0.9907	0.9696	0.9109	0.9736	0.9862

Analysis Model Period



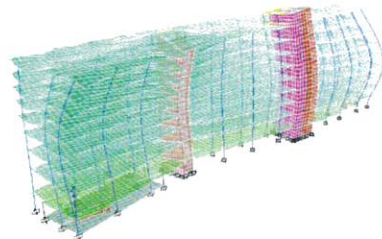
Mode 1 Period 1.249 seconds



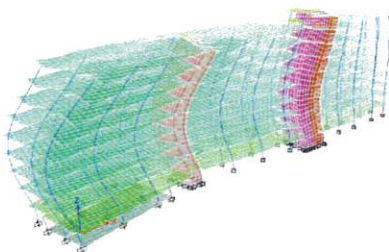
Mode 2 Period 0.843 seconds



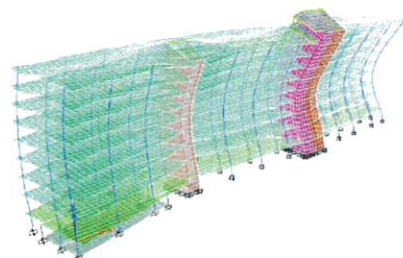
Mode 3 Period 0.758 seconds



Mode 4 Period 0.299 seconds



Mode 5 Period 0.215 seconds



Mode 6 Period 0.170 seconds



แรงเฉือนที่กระทำกับโครงสร้าง

Story	Load Case	Location	P (T)	VX (T)	VY (T)	T (T-m)	MX (T-m)	MY (T-m)
Roof	SPECX Max	Top	0.00	2.96	0.30	24.15	0.00	0.00
Roof	SPECX Max	Bottom	0.00	4.19	0.43	32.94	0.75	7.34
Roof	SPECY Max	Top	0.00	0.42	3.54	187.22	0.00	0.00
Roof	SPECY Max	Bottom	0.00	0.59	5.00	265.41	8.77	1.03
pump room	SPECX Max	Top	0.00	5.59	0.52	43.82	0.75	7.34
pump room	SPECX Max	Bottom	0.00	5.59	0.52	43.82	1.07	10.69
pump room	SPECY Max	Top	0.00	0.78	6.61	347.45	8.77	1.03
pump room	SPECY Max	Bottom	0.00	0.78	6.61	347.45	12.74	1.50
Roof top	SPECX Max	Top	0.00	62.70	10.82	678.01	1.07	10.69
Roof top	SPECX Max	Bottom	0.00	64.57	11.02	692.21	29.81	185.70
Roof top	SPECY Max	Top	0.00	10.57	66.22	3520.28	12.74	1.50
Roof top	SPECY Max	Bottom	0.00	10.80	68.13	3609.85	197.40	30.77
8th	SPECX Max	Top	0.00	113.70	19.65	1212.90	29.81	185.70
8th	SPECX Max	Bottom	0.00	115.26	19.81	1224.90	83.93	500.08
8th	SPECY Max	Top	0.00	18.68	117.15	6256.34	197.40	30.77
8th	SPECY Max	Bottom	0.00	18.85	118.70	6329.17	520.87	82.12
7th	SPECX Max	Top	0.00	155.92	26.53	1651.50	83.93	500.08
7th	SPECX Max	Bottom	0.00	157.20	26.66	1661.19	156.54	929.02
7th	SPECY Max	Top	0.00	25.17	158.04	8474.29	520.87	82.12
7th	SPECY Max	Bottom	0.00	25.31	159.28	8532.83	954.65	150.65
6th	SPECX Max	Top	0.00	190.35	31.91	2000.88	156.54	929.02
6th	SPECX Max	Bottom	0.00	191.39	32.00	2008.53	243.30	1449.95
6th	SPECY Max	Top	0.00	30.53	190.58	10250.00	954.65	150.65
6th	SPECY Max	Bottom	0.00	30.66	191.57	10296.36	1474.79	233.10
5th	SPECX Max	Top	0.00	217.86	36.05	2279.67	243.30	1449.95
5th	SPECX Max	Bottom	0.00	218.67	36.12	2285.48	340.70	2043.01
5th	SPECY Max	Top	0.00	34.85	216.08	11642.40	1474.79	233.10
5th	SPECY Max	Bottom	0.00	34.94	216.84	11678.14	2061.23	326.74
4th	SPECX Max	Top	0.00	238.99	39.18	2493.19	340.70	2043.01
4th	SPECX Max	Bottom	0.00	239.60	39.23	2497.31	445.92	2690.52
4th	SPECY Max	Top	0.00	38.17	235.30	12695.00	2061.23	326.74
4th	SPECY Max	Bottom	0.00	38.24	235.86	12721.14	2696.82	428.91
3rd	SPECX Max	Top	0.00	253.90	41.37	2645.23	445.92	2690.52
3rd	SPECX Max	Bottom	0.00	254.30	41.40	2647.86	556.61	3376.25
3rd	SPECY Max	Top	0.00	40.68	248.64	13432.68	2696.82	428.91
3rd	SPECY Max	Bottom	0.00	40.74	249.00	13449.75	3366.38	537.29

Story	Load Case	Location	P (T)	VX (T)	VY (T)	T (T-m)	MX (T-m)	MY (T-m)
2nd	SPECX Max	Top	0.00	262.70	42.61	2740.28	556.61	3376.25
2nd	SPECX Max	Bottom	0.00	262.93	42.62	2741.83	687.37	4188.85
2nd	SPECY Max	Top	0.00	42.42	256.45	13870.47	3366.38	537.29
2nd	SPECY Max	Bottom	0.00	42.46	256.66	13880.47	4157.44	666.45
1st	SPECX Max	Top	0.00	265.00	42.93	2768.28	687.37	4188.85
1st	SPECX Max	Bottom	0.00	265.04	42.94	2768.54	781.96	4775.98
1st	SPECY Max	Top	0.00	42.93	258.83	14000.73	4157.44	666.45
1st	SPECY Max	Bottom	0.00	42.94	258.86	14002.28	4729.33	760.33

ผลการวิเคราะห์โดยวิธีทางพลศาสตร์ แรงเฉือนที่ฐานมีค่า ดังนี้

สำหรับแผ่นดินไหวในทิศทาง X: $VX = 265.04 \text{ Tons}$

สำหรับแผ่นดินไหวในทิศทาง Y: $VY = 258.86 \text{ Tons}$

การคำนวณโดยวิธีสถิตย์เทียบเท่า

$$H = 22.50 \text{ m}$$

$$T \text{ ทิศทาง X} = 0.843 \text{ sec ให้ใช้ไม่เกิน } 0.02H (1.5) = 0.675 \text{ sec, ใช้ } T = 0.675 \text{ sec}$$

$$T \text{ ทิศทาง Y} = 0.758 \text{ sec ให้ใช้ไม่เกิน } 0.02H (1.5) = 0.675 \text{ sec, ใช้ } T = 0.675 \text{ sec}$$

$$I = 1.00, R = 5.0$$

$$Sa \text{ ทิศทาง X} = 0.224 \text{ (จากตาราง ก-7, } T = 0.675)$$

$$Sa \text{ ทิศทาง Y} = 0.224 \text{ (จากตาราง ก-7, } T = 0.675)$$

ประเภทการออกแบบต้านทานแรงแผ่นดินไหว เป็น “ประเภท ค”

$$Cs \text{ ทิศทาง X} = Sa(I/R) = 0.0448 > 0.01$$

$$Cs \text{ ทิศทาง Y} = Sa(I/R) = 0.0448 > 0.01$$

$$W = 10174.4153 \text{ Tons}$$

$$\text{ค่าแรงเฉือนที่ฐานในทิศทาง X เท่ากับ } V = 0.0448(10174.4153) = 455.82 \text{ Tons}$$

$$\text{ค่าแรงเฉือนที่ฐานในทิศทาง Y เท่ากับ } V = 0.0448(10174.4153) = 455.82 \text{ Tons}$$

ปรับค่าแรงภายในที่ใช้ในการออกแบบด้วยวิธีเชิงพลศาสตร์โดยคูณด้วยค่า 0.85V/Vt

$$\text{ทิศทาง X: Scale Factor} = 0.85 \times 455.82 / 265.04 = 1.46$$

$$\text{ทิศทาง Y: Scale Factor} = 0.85 \times 455.82 / 258.86 = 1.50$$

ดังนั้น แผ่นดินไหวใช้ตัวคูณปรับค่าการตอบสนอง ในการออกแบบ ดังต่อไปนี้

$$EQX = 1.46(SPX) + 0.45(SPY)$$

$$EQY = 0.44(SPX) + 1.50(SPY)$$

การรวมผลของแรง

สำหรับการออกแบบด้วยวิธีหน่วยแรงที่ยอมให้

$$WSD1 = 1.0D + 1.0L$$

$$WSD2 = 1.0D + 0.7EQX$$

$$WSD2-1 = 1.0D - 0.7EQX$$

$$WSD3 = 1.0D + 0.7EQY$$

$$WSD3-1 = 1.0D - 0.7EQY$$

$$WSD4 = 1.0D + 0.75L + 0.525EQX$$

$$WSD4-1 = 1.0D + 0.75L - 0.525EQX$$

$$WSD5 = 1.0D + 0.75L + 0.525EQY$$

$$WSD5-1 = 1.0D + 0.75L - 0.525EQY$$

$$WSD6 = 0.6D + 0.7EQX$$

$$WSD6-1 = 0.6D - 0.7EQX$$

$$WSD7 = 0.6D + 0.7EQY$$

$$WSD7-1 = 0.6D - 0.7EQY$$

$$WSD8 = 1.0D + 0.75L + 0.75W$$

$$WSD9 = 1.0D + 0.75L - 0.75W$$

$$WSD10 = 1.0D + 1.0W$$

$$\text{WSD11} = 1.0\text{D} - 1.0\text{W}$$

สำหรับการออกแบบด้วยวิธีกำลัง

$$\text{USD1} = 1.4\text{D} + 1.4\text{SD}$$

$$\text{USD2} = 1.4\text{D} + 1.4\text{SD} + 1.7\text{L}$$

$$\text{UEQ1} = 1.20\text{D} + 1.20\text{SD} + 1.00\text{L} + 1.00\text{EQX}$$

$$\text{UEQ1-1} = 1.20\text{D} + 1.20\text{SD} + 1.00\text{L} - 1.00\text{EQX}$$

$$\text{UEQ2} = 1.20\text{D} + 1.20\text{SD} + 1.00\text{L} + 1.00\text{EQY}$$

$$\text{UEQ2-1} = 1.20\text{D} + 1.20\text{SD} + 1.00\text{L} - 1.00\text{EQY}$$

$$\text{UEQ3} = 0.9\text{D} + 0.9\text{SD} + 1.00\text{EQX}$$

$$\text{UEQ3-1} = 0.9\text{D} + 0.9\text{SD} - 1.00\text{EQX}$$

$$\text{UEQ4} = 0.9\text{D} + 0.9\text{SD} + 1.00\text{EQY}$$

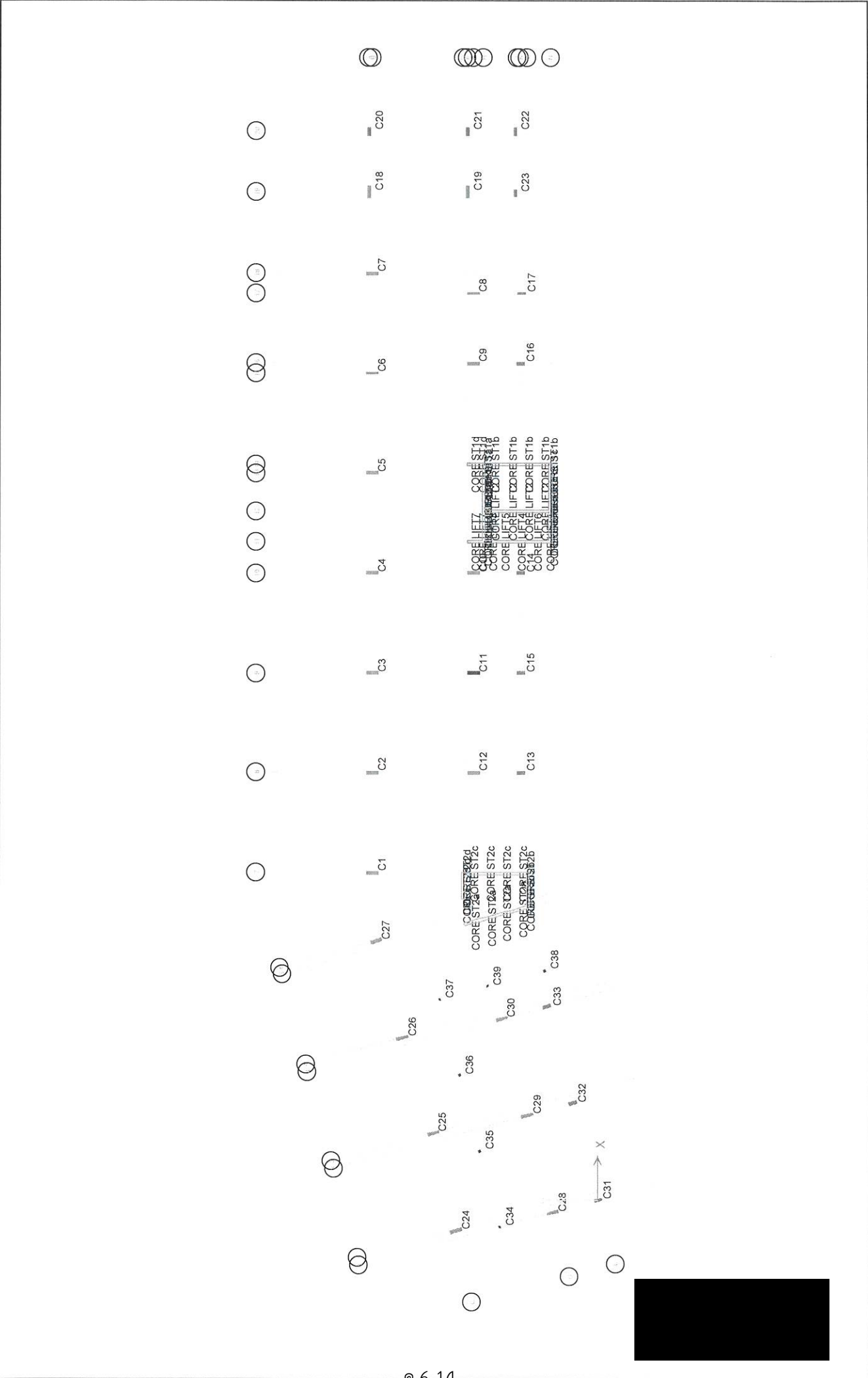
$$\text{UEQ4-1} = 0.9\text{D} + 0.9\text{SD} - 1.00\text{EQY}$$

$$\text{UWL1} = 1.05\text{D} + 1.05\text{SD} + 1.275\text{L} + 1.275\text{W}$$

$$\text{UWL2} = 1.05\text{D} + 1.05\text{SD} + 1.275\text{L} - 1.275\text{W}$$

$$\text{UWL3} = 0.9\text{D} + 0.9\text{SD} + 1.30\text{W}$$

$$\text{UWL4} = 0.9\text{D} + 0.9\text{SD} - 1.30\text{W}$$



Plan View - 1st - Z = 0.1 (m)

Load Combinations

Name	Load Case/Combo	Scale Factor	Type
WSD1	Dead	1	Linear Add
WSD1	SDL	1	
WSD1	Live	1	
WSD2	Dead	1	Linear Add
WSD2	SDL	1	
WSD2	EQXX	0.7	
WSD3	Dead	1	Linear Add
WSD3	SDL	1	
WSD3	EQYY	0.7	
WSD4	Dead	1	Linear Add
WSD4	SDL	1	
WSD4	Live	0.75	
WSD4	EQXX	0.525	
WSD5	Dead	1	Linear Add
WSD5	SDL	1	
WSD5	Live	0.75	
WSD5	EQYY	0.525	
WSD6	Dead	0.6	Linear Add
WSD6	SDL	0.6	
WSD6	EQXX	0.7	
WSD7	Dead	0.6	Linear Add
WSD7	SDL	0.6	
WSD7	EQYY	0.7	
WDEAD	Dead	1	Linear Add
WDEAD	SDL	1	
USD1	Dead	1.4	Linear Add
USD1	SDL	1.4	
USD1	Live	1.7	
UEQ1	Dead	1.2	Linear Add
UEQ1	SDL	1.2	
UEQ1	Live	1	
UEQ1	EQXX	1	
UEQ2	Dead	1.2	Linear Add
UEQ2	SDL	1.2	
UEQ2	Live	1	
UEQ2	SPECY	1	
UEQ3	Dead	0.9	Linear Add
UEQ3	SDL	0.9	
UEQ3	EQXX	1	
UEQ4	Dead	0.9	Linear Add
UEQ4	SDL	0.9	
UEQ4	EQYY	1	
USD2	Dead	1.4	Linear Add
USD2	SDL	1.4	
WSD Env	WSD1	1	Envelope
WSD Env	WSD2	1	
WSD Env	WSD3	1	
WSD Env	WSD4	1	
WSD Env	WSD5	1	

Load Combinations

Name	Load Case/Combo	Scale Factor	Type
WSD Env	WSD6	1	
WSD Env	WSD7	1	
WSD Env	WSD8	1	
WSD Env	WSD9	1	
WSD Env	WSD10	1	
WSD Env	WSD11	1	
USD ENV	USD1	1	Envelope
USD ENV	UEQ1	1	
USD ENV	UEQ2	1	
USD ENV	UEQ3	1	
USD ENV	UEQ4	1	
USD ENV	USD2	1	
USD ENV	UWL1	1	
USD ENV	UWL2	1	
USD ENV	UWL3	1	
USD ENV	UWL4	1	
EQXX	SPECX	1.46	Linear Add
EQXX	SPECY	0.45	
EQYY	SPECX	0.44	Linear Add
EQYY	SPECY	1.5	
WSD8	Dead	1	Linear Add
WSD8	SDL	1	
WSD8	Live	0.75	
WSD8	WIND	0.75	
WSD9	Dead	1	Linear Add
WSD9	SDL	1	
WSD9	Live	0.75	
WSD9	WIND	-0.75	
WSD10	Dead	1	Linear Add
WSD10	SDL	1	
WSD10	WIND	1	
WSD11	Dead	1	Linear Add
WSD11	SDL	1	
WSD11	WIND	-1	
UWL1	Dead	1.05	Linear Add
UWL1	SDL	1.05	
UWL1	Live	1.275	
UWL1	WIND	1.275	
UWL2	Dead	1.05	Linear Add
UWL2	SDL	1.05	
UWL2	Live	1.275	
UWL2	WIND	-1.275	
UWL3	Dead	0.9	Linear Add
UWL3	SDL	0.9	
UWL3	WIND	1.3	
UWL4	Dead	0.9	Linear Add
UWL4	SDL	0.9	
UWL4	WIND	-1.3	

Column Forces: Service Load Env.

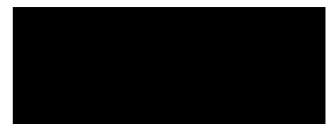
Story	Column	Load Case	P	V2	V3	T	M2	M3
			tonf	tonf	tonf	tonf-m	tonf-m	tonf-m
Roof	C10	WSD Env Min	-2.86	-0.21	-3.66	-0.02	-5.62	-0.20
Roof	C14	WSD Env Min	-2.05	0.25	-1.80	-0.01	-2.23	0.20
pump room	C10	WSD Env Min	-6.97	3.19	-9.26	-0.14	-8.15	1.96
pump room	C14	WSD Env Min	-4.45	2.58	-2.51	-0.09	-0.82	1.43
Rooftop	C1	WSD Env Min	-35.11	-3.35	1.15	-0.16	1.71	-3.92
Rooftop	C2	WSD Env Min	-46.44	-0.59	3.54	-0.16	4.22	-0.69
Rooftop	C3	WSD Env Min	-45.68	-0.69	3.74	-0.16	4.48	-0.78
Rooftop	C4	WSD Env Min	-42.95	-0.45	2.12	-0.16	2.68	-0.49
Rooftop	C5	WSD Env Min	-42.42	-0.93	1.39	-0.16	1.85	-1.07
Rooftop	C6	WSD Env Min	-46.06	-0.71	3.05	-0.16	3.67	-0.80
Rooftop	C7	WSD Env Min	-42.75	-0.02	3.67	-0.16	4.40	0.03
Rooftop	C8	WSD Env Min	-43.78	-3.09	-7.81	-0.16	-7.70	-3.63
Rooftop	C9	WSD Env Min	-41.52	0.02	-7.31	-0.16	-7.24	0.04
Rooftop	C10	WSD Env Min	-56.00	0.91	-4.34	-0.16	-4.35	1.35
Rooftop	C11	WSD Env Min	-90.17	-0.93	-7.69	-0.16	-7.09	-0.99
Rooftop	C12	WSD Env Min	-67.90	-3.95	-6.91	-0.16	-6.70	-3.25
Rooftop	C13	WSD Env Min	-54.77	-4.38	-0.46	-0.10	-0.28	-3.31
Rooftop	C14	WSD Env Min	-43.37	0.65	-0.60	-0.10	-0.30	0.95
Rooftop	C15	WSD Env Min	-86.47	-0.85	-0.69	-0.10	-0.42	-0.94
Rooftop	C16	WSD Env Min	-19.95	0.14	-1.11	-0.10	-1.01	0.18
Rooftop	C17	WSD Env Min	-19.31	-2.18	-2.49	-0.10	-2.57	-2.45
Rooftop	C18	WSD Env Min	-24.74	3.44	-1.71	-0.16	-1.87	3.99
Rooftop	C19	WSD Env Min	-42.45	-6.01	-3.53	-0.16	-3.42	-7.17
Rooftop	C20	WSD Env Min	-15.79	2.33	-0.50	-0.10	-0.32	2.71
Rooftop	C21	WSD Env Min	-24.53	-5.16	-0.86	-0.10	-0.71	-6.26
Rooftop	C22	WSD Env Min	-7.89	-2.62	-0.74	-0.10	-0.51	-3.25
Rooftop	C23	WSD Env Min	-14.72	-2.72	-4.32	-0.10	-4.25	-3.38
Rooftop	C24	WSD Env Min	-21.70	-7.78	2.03	-0.16	2.70	-8.90
Rooftop	C25	WSD Env Min	-48.34	-0.85	2.48	-0.16	3.21	-1.03
Rooftop	C26	WSD Env Min	-46.92	-0.83	2.84	-0.16	3.50	-0.92
Rooftop	C27	WSD Env Min	-31.94	1.20	1.97	-0.16	2.61	1.41
Rooftop	C28	WSD Env Min	-22.67	-7.93	-3.95	-0.16	-3.45	-9.04
Rooftop	C29	WSD Env Min	-50.32	-0.24	-6.56	-0.16	-6.50	-0.34
Rooftop	C30	WSD Env Min	-48.24	-0.57	-7.14	-0.16	-6.93	-0.62
Rooftop	C31	WSD Env Min	-13.85	-6.10	-0.60	-0.10	-0.40	-7.08
Rooftop	C32	WSD Env Min	-28.42	-0.21	-0.93	-0.10	-0.82	-0.28
Rooftop	C33	WSD Env Min	-26.40	-0.31	-0.64	-0.10	-0.53	-0.33
8th	C1	WSD Env Min	-70.86	-2.27	0.45	-0.16	1.19	-3.22
8th	C2	WSD Env Min	-93.54	-0.53	1.99	-0.16	3.34	-0.69
8th	C3	WSD Env Min	-92.70	-0.55	2.31	-0.16	3.69	-0.74
8th	C4	WSD Env Min	-86.88	-0.38	1.27	-0.16	2.18	-0.49
8th	C5	WSD Env Min	-84.92	-0.72	0.53	-0.16	1.30	-0.98
8th	C6	WSD Env Min	-92.12	-0.57	1.35	-0.16	2.65	-0.76
8th	C7	WSD Env Min	-85.38	-0.10	1.56	-0.16	3.11	-0.09
8th	C8	WSD Env Min	-87.35	-2.12	-4.73	-0.16	-6.32	-3.00
8th	C9	WSD Env Min	-83.11	-0.10	-4.40	-0.16	-5.89	-0.08
8th	C10	WSD Env Min	-84.99	0.90	-3.25	-0.16	-3.96	1.24
8th	C11	WSD Env Min	-141.58	-0.58	-4.04	-0.16	-5.42	-0.79

Column Forces: Service Load Env.

Story	Column	Load Case	P	V2	V3	T	M2	M3
			tonf	tonf	tonf	tonf-m	tonf-m	tonf-m
8th	C12	WSD Env Min	-116.84	-0.79	-4.14	-0.16	-5.56	-1.14
8th	C13	WSD Env Min	-80.98	-0.63	-0.21	-0.10	-0.21	-0.91
8th	C14	WSD Env Min	-55.99	0.61	-0.04	-0.10	-0.03	0.84
8th	C15	WSD Env Min	-112.67	-0.55	-0.13	-0.10	-0.15	-0.76
8th	C16	WSD Env Min	-39.99	0.02	-0.77	-0.10	-0.92	0.06
8th	C17	WSD Env Min	-39.07	-1.30	-1.71	-0.10	-2.21	-1.88
8th	C18	WSD Env Min	-50.22	2.02	-1.44	-0.16	-1.49	3.01
8th	C19	WSD Env Min	-83.20	-4.25	-2.42	-0.16	-2.90	-5.98
8th	C20	WSD Env Min	-31.94	1.36	-0.50	-0.10	-0.45	2.03
8th	C21	WSD Env Min	-47.55	-3.80	-0.71	-0.10	-0.76	-5.32
8th	C22	WSD Env Min	-17.23	-2.11	-0.53	-0.10	-0.52	-2.89
8th	C23	WSD Env Min	-30.77	-2.16	-2.32	-0.10	-3.28	-2.97
8th	C24	WSD Env Min	-43.79	-4.84	0.56	-0.16	1.77	-6.99
8th	C25	WSD Env Min	-96.14	-0.76	0.88	-0.16	2.15	-0.99
8th	C26	WSD Env Min	-93.77	-0.64	1.19	-0.16	2.47	-0.86
8th	C27	WSD Env Min	-64.39	0.68	0.90	-0.16	1.89	1.03
8th	C28	WSD Env Min	-45.81	-4.85	-2.87	-0.16	-3.08	-7.04
8th	C29	WSD Env Min	-100.16	-0.38	-4.52	-0.16	-5.59	-0.46
8th	C30	WSD Env Min	-96.41	-0.45	-4.36	-0.16	-5.67	-0.60
8th	C31	WSD Env Min	-28.19	-3.95	-0.62	-0.10	-0.56	-5.66
8th	C32	WSD Env Min	-56.37	-0.30	-0.81	-0.10	-0.89	-0.36
8th	C33	WSD Env Min	-52.83	-0.27	-0.59	-0.10	-0.62	-0.36
7th	C1	WSD Env Min	-106.57	-2.50	0.51	-0.16	0.93	-3.38
7th	C2	WSD Env Min	-140.65	-0.58	2.22	-0.16	3.19	-0.77
7th	C3	WSD Env Min	-139.66	-0.63	2.52	-0.16	3.57	-0.83
7th	C4	WSD Env Min	-130.79	-0.45	1.39	-0.16	2.06	-0.58
7th	C5	WSD Env Min	-127.44	-0.81	0.63	-0.16	1.10	-1.08
7th	C6	WSD Env Min	-138.16	-0.65	1.58	-0.16	2.41	-0.85
7th	C7	WSD Env Min	-128.03	-0.15	1.85	-0.16	2.79	-0.17
7th	C8	WSD Env Min	-131.05	-2.34	-5.44	-0.16	-6.89	-3.18
7th	C9	WSD Env Min	-124.81	-0.11	-5.07	-0.16	-6.40	-0.12
7th	C10	WSD Env Min	-114.66	0.76	-3.28	-0.16	-4.09	1.06
7th	C11	WSD Env Min	-192.99	-0.68	-4.60	-0.16	-5.86	-0.91
7th	C12	WSD Env Min	-165.82	-1.01	-4.74	-0.16	-5.95	-1.29
7th	C13	WSD Env Min	-107.32	-0.84	-0.30	-0.10	-0.34	-1.06
7th	C14	WSD Env Min	-70.73	0.50	-0.17	-0.10	-0.18	0.69
7th	C15	WSD Env Min	-139.23	-0.64	-0.27	-0.10	-0.30	-0.85
7th	C17	WSD Env Min	-58.77	-1.50	-1.92	-0.10	-2.45	-2.04
7th	C18	WSD Env Min	-75.45	2.26	-1.50	-0.16	-1.80	3.09
7th	C19	WSD Env Min	-124.43	-4.62	-2.69	-0.16	-3.34	-6.27
7th	C20	WSD Env Min	-48.00	1.51	-0.53	-0.10	-0.61	2.07
7th	C21	WSD Env Min	-70.95	-4.06	-0.78	-0.10	-0.93	-5.52
7th	C22	WSD Env Min	-26.28	-2.18	-0.59	-0.10	-0.68	-2.95
7th	C23	WSD Env Min	-46.64	-2.24	-2.79	-0.10	-3.63	-3.04
7th	C24	WSD Env Min	-65.76	-5.46	0.74	-0.16	1.35	-7.39
7th	C25	WSD Env Min	-144.02	-0.81	1.07	-0.16	1.78	-1.07
7th	C26	WSD Env Min	-140.60	-0.75	1.41	-0.16	2.19	-0.99
7th	C27	WSD Env Min	-96.76	0.75	1.02	-0.16	1.63	1.04

Column Forces: Service Load Env.

Story	Column	Load Case	P	V2	V3	T	M2	M3
			tonf	tonf	tonf	tonf-m	tonf-m	tonf-m
7th	C28	WSD Env Min	-68.81	-5.52	-3.25	-0.16	-3.73	-7.47
7th	C29	WSD Env Min	-150.21	-0.38	-5.06	-0.16	-6.25	-0.50
7th	C30	WSD Env Min	-144.66	-0.54	-5.05	-0.16	-6.20	-0.71
7th	C31	WSD Env Min	-42.51	-4.39	-0.70	-0.10	-0.79	-5.96
7th	C32	WSD Env Min	-84.43	-0.31	-0.92	-0.10	-1.11	-0.40
7th	C33	WSD Env Min	-79.36	-0.34	-0.68	-0.10	-0.82	-0.45
6th	C1	WSD Env Min	-142.30	-2.45	0.44	-0.16	0.52	-3.36
6th	C2	WSD Env Min	-187.71	-0.59	2.11	-0.16	2.82	-0.81
6th	C3	WSD Env Min	-186.54	-0.65	2.43	-0.16	3.26	-0.88
6th	C4	WSD Env Min	-174.70	-0.47	1.37	-0.16	1.84	-0.64
6th	C5	WSD Env Min	-170.01	-0.82	0.61	-0.16	0.80	-1.12
6th	C6	WSD Env Min	-184.18	-0.66	1.49	-0.16	1.93	-0.90
6th	C7	WSD Env Min	-170.67	-0.19	1.70	-0.16	2.15	-0.25
6th	C8	WSD Env Min	-174.86	-2.33	-5.34	-0.16	-7.14	-3.20
6th	C9	WSD Env Min	-166.68	-0.11	-4.98	-0.16	-6.60	-0.14
6th	C10	WSD Env Min	-145.09	0.67	-3.30	-0.16	-4.18	0.91
6th	C11	WSD Env Min	-244.38	-0.70	-4.57	-0.16	-6.01	-0.96
6th	C12	WSD Env Min	-214.91	-0.93	-4.71	-0.16	-6.09	-1.26
6th	C13	WSD Env Min	-133.71	-0.72	-0.30	-0.10	-0.43	-0.98
6th	C14	WSD Env Min	-86.56	0.42	-0.17	-0.10	-0.26	0.56
6th	C15	WSD Env Min	-165.84	-0.65	-0.24	-0.10	-0.36	-0.89
6th	C16	WSD Env Min	-80.10	0.01	-0.88	-0.10	-1.24	0.02
6th	C17	WSD Env Min	-78.41	-1.48	-1.86	-0.10	-2.53	-2.04
6th	C18	WSD Env Min	-100.61	2.16	-1.53	-0.16	-2.25	2.96
6th	C19	WSD Env Min	-165.83	-4.54	-2.67	-0.16	-3.67	-6.23
6th	C20	WSD Env Min	-64.05	1.45	-0.55	-0.10	-0.79	1.98
6th	C21	WSD Env Min	-94.45	-3.99	-0.78	-0.10	-1.08	-5.47
6th	C22	WSD Env Min	-35.25	-2.11	-0.59	-0.10	-0.81	-2.89
6th	C23	WSD Env Min	-62.47	-2.19	-2.68	-0.10	-3.67	-3.00
6th	C24	WSD Env Min	-87.69	-5.30	0.57	-0.16	0.58	-7.26
6th	C25	WSD Env Min	-191.87	-0.83	0.90	-0.16	1.09	-1.12
6th	C26	WSD Env Min	-187.41	-0.78	1.27	-0.16	1.62	-1.07
6th	C27	WSD Env Min	-129.09	0.71	0.93	-0.16	1.18	0.98
6th	C28	WSD Env Min	-91.78	-5.35	-3.34	-0.16	-4.42	-7.35
6th	C29	WSD Env Min	-200.35	-0.40	-5.10	-0.16	-6.82	-0.53
6th	C30	WSD Env Min	-193.03	-0.58	-5.03	-0.16	-6.65	-0.78
6th	C31	WSD Env Min	-56.90	-4.28	-0.75	-0.10	-1.07	-5.88
6th	C32	WSD Env Min	-112.44	-0.32	-0.95	-0.10	-1.34	-0.43
6th	C33	WSD Env Min	-105.95	-0.37	-0.72	-0.10	-1.01	-0.51
5th	C1	WSD Env Min	-178.03	-2.43	0.46	-0.16	0.08	-3.35
5th	C2	WSD Env Min	-234.74	-0.58	2.11	-0.16	2.44	-0.81
5th	C3	WSD Env Min	-233.31	-0.65	2.42	-0.16	2.94	-0.91
5th	C4	WSD Env Min	-218.62	-0.47	1.43	-0.16	1.65	-0.67
5th	C5	WSD Env Min	-212.64	-0.82	0.67	-0.16	0.51	-1.14
5th	C6	WSD Env Min	-230.15	-0.65	1.50	-0.16	1.46	-0.91
5th	C7	WSD Env Min	-213.31	-0.20	1.69	-0.16	1.50	-0.30
5th	C8	WSD Env Min	-218.83	-2.34	-5.33	-0.16	-7.62	-3.23
5th	C9	WSD Env Min	-208.76	-0.07	-4.98	-0.16	-6.90	-0.11



Column Forces: Service Load Env.

Story	Column	Load Case	P	V2	V3	T	M2	M3
			tonf	tonf	tonf	tonf-m	tonf-m	tonf-m
5th	C10	WSD Env Min	-176.22	0.60	-3.32	-0.16	-4.35	0.80
5th	C11	WSD Env Min	-295.83	-0.71	-4.65	-0.16	-6.27	-1.00
5th	C12	WSD Env Min	-264.15	-0.88	-4.78	-0.16	-6.41	-1.21
5th	C13	WSD Env Min	-160.17	-0.67	-0.27	-0.10	-0.51	-0.92
5th	C14	WSD Env Min	-103.21	0.36	-0.18	-0.10	-0.35	0.46
5th	C15	WSD Env Min	-192.51	-0.65	-0.21	-0.10	-0.40	-0.91
5th	C16	WSD Env Min	-100.12	0.05	-0.85	-0.10	-1.36	0.06
5th	C17	WSD Env Min	-97.91	-1.49	-1.78	-0.10	-2.59	-2.07
5th	C18	WSD Env Min	-125.61	2.17	-1.53	-0.16	-2.77	2.91
5th	C19	WSD Env Min	-207.58	-4.49	-2.68	-0.16	-4.06	-6.17
5th	C20	WSD Env Min	-80.05	1.46	-0.55	-0.10	-0.96	1.96
5th	C21	WSD Env Min	-118.15	-3.91	-0.77	-0.10	-1.21	-5.37
5th	C22	WSD Env Min	-44.00	-1.99	-0.57	-0.10	-0.93	-2.75
5th	C23	WSD Env Min	-78.13	-2.10	-2.67	-0.10	-3.76	-2.90
5th	C24	WSD Env Min	-109.55	-5.28	0.52	-0.16	-0.32	-7.25
5th	C25	WSD Env Min	-239.69	-0.81	0.88	-0.16	0.36	-1.11
5th	C26	WSD Env Min	-234.18	-0.81	1.27	-0.16	1.03	-1.13
5th	C27	WSD Env Min	-161.35	0.71	0.96	-0.16	0.73	0.96
5th	C28	WSD Env Min	-114.68	-5.36	-3.44	-0.16	-5.30	-7.36
5th	C29	WSD Env Min	-250.64	-0.38	-5.18	-0.16	-7.56	-0.53
5th	C30	WSD Env Min	-241.58	-0.61	-5.13	-0.16	-7.28	-0.86
5th	C31	WSD Env Min	-71.29	-4.27	-0.76	-0.10	-1.36	-5.86
5th	C32	WSD Env Min	-140.44	-0.31	-0.93	-0.10	-1.54	-0.42
5th	C33	WSD Env Min	-132.56	-0.40	-0.70	-0.10	-1.18	-0.56
4th	C1	WSD Env Min	-213.76	-2.37	0.52	-0.14	-0.39	-3.28
4th	C2	WSD Env Min	-281.71	-0.54	2.13	-0.14	2.02	-0.81
4th	C3	WSD Env Min	-279.95	-0.63	2.43	-0.14	2.58	-0.93
4th	C4	WSD Env Min	-262.56	-0.46	1.52	-0.14	1.46	-0.69
4th	C5	WSD Env Min	-255.36	-0.79	0.76	-0.14	0.22	-1.14
4th	C6	WSD Env Min	-276.08	-0.62	1.54	-0.14	0.92	-0.91
4th	C7	WSD Env Min	-255.95	-0.21	1.69	-0.14	0.74	-0.35
4th	C8	WSD Env Min	-263.00	-2.32	-5.22	-0.14	-8.12	-3.23
4th	C9	WSD Env Min	-251.13	-0.01	-4.91	-0.14	-7.33	-0.06
4th	C10	WSD Env Min	-208.07	0.57	-3.32	-0.14	-4.54	0.71
4th	C11	WSD Env Min	-347.37	-0.70	-4.66	-0.14	-6.44	-1.03
4th	C12	WSD Env Min	-313.59	-0.79	-4.79	-0.14	-6.70	-1.13
4th	C13	WSD Env Min	-186.70	-0.60	-0.21	-0.09	-0.57	-0.86
4th	C14	WSD Env Min	-120.72	0.32	-0.16	-0.09	-0.42	0.38
4th	C15	WSD Env Min	-219.19	-0.63	-0.14	-0.09	-0.42	-0.91
4th	C16	WSD Env Min	-120.04	0.10	-0.75	-0.09	-1.40	0.10
4th	C17	WSD Env Min	-117.17	-1.48	-1.61	-0.09	-2.56	-2.06
4th	C18	WSD Env Min	-150.43	2.16	-1.59	-0.14	-3.56	2.82
4th	C19	WSD Env Min	-249.75	-4.33	-2.71	-0.14	-4.80	-5.99
4th	C20	WSD Env Min	-96.00	1.48	-0.57	-0.09	-1.23	1.92
4th	C21	WSD Env Min	-142.09	-3.73	-0.76	-0.09	-1.43	-5.14
4th	C22	WSD Env Min	-52.42	-1.79	-0.56	-0.09	-1.14	-2.50
4th	C23	WSD Env Min	-93.56	-1.94	-2.62	-0.09	-3.86	-2.71
4th	C24	WSD Env Min	-131.32	-5.15	0.45	-0.14	-1.47	-7.04

Column Forces: Service Load Env.

Story	Column	Load Case	P	V2	V3	T	M2	M3
			tonf	tonf	tonf	tonf-m	tonf-m	tonf-m
4th	C25	WSD Env Min	-287.48	-0.76	0.80	-0.14	-0.70	-1.09
4th	C26	WSD Env Min	-280.90	-0.83	1.22	-0.14	0.16	-1.18
4th	C27	WSD Env Min	-193.54	0.71	1.01	-0.14	0.18	0.90
4th	C28	WSD Env Min	-137.49	-5.24	-3.39	-0.14	-6.15	-7.17
4th	C29	WSD Env Min	-301.13	-0.36	-5.03	-0.14	-8.06	-0.54
4th	C30	WSD Env Min	-290.35	-0.59	-5.00	-0.14	-7.65	-0.86
4th	C31	WSD Env Min	-85.65	-4.20	-0.72	-0.09	-1.65	-5.77
4th	C32	WSD Env Min	-168.42	-0.28	-0.85	-0.09	-1.72	-0.41
4th	C33	WSD Env Min	-159.14	-0.39	-0.64	-0.09	-1.34	-0.56
3rd	C1	WSD Env Min	-249.50	-2.31	0.67	-0.12	-0.84	-3.26
3rd	C2	WSD Env Min	-328.61	-0.41	2.23	-0.12	1.65	-0.64
3rd	C3	WSD Env Min	-326.43	-0.53	2.49	-0.12	2.30	-0.81
3rd	C4	WSD Env Min	-306.52	-0.35	1.70	-0.12	1.42	-0.56
3rd	C5	WSD Env Min	-298.18	-0.69	0.97	-0.12	0.06	-1.02
3rd	C6	WSD Env Min	-321.95	-0.49	1.70	-0.12	0.52	-0.75
3rd	C7	WSD Env Min	-298.58	-0.11	1.83	-0.12	0.11	-0.24
3rd	C8	WSD Env Min	-307.41	-2.30	-4.98	-0.12	-8.62	-3.25
3rd	C9	WSD Env Min	-293.84	0.22	-4.71	-0.12	-7.73	0.26
3rd	C10	WSD Env Min	-240.62	0.69	-3.24	-0.12	-4.73	0.90
3rd	C11	WSD Env Min	-399.06	-0.63	-4.70	-0.12	-6.84	-0.96
3rd	C12	WSD Env Min	-363.27	-0.61	-4.75	-0.12	-7.14	-0.89
3rd	C13	WSD Env Min	-213.30	-0.46	-0.09	-0.07	-0.56	-0.67
3rd	C14	WSD Env Min	-139.07	0.37	-0.10	-0.07	-0.43	0.46
3rd	C15	WSD Env Min	-245.84	-0.57	-0.02	-0.07	-0.37	-0.85
3rd	C16	WSD Env Min	-139.79	0.28	-0.68	-0.07	-1.57	0.37
3rd	C17	WSD Env Min	-136.11	-1.48	-1.38	-0.07	-2.51	-2.11
3rd	C18	WSD Env Min	-175.03	2.34	-1.32	-0.12	-3.77	3.08
3rd	C19	WSD Env Min	-292.42	-4.20	-2.44	-0.12	-4.89	-5.90
3rd	C20	WSD Env Min	-111.89	1.65	-0.41	-0.07	-1.21	2.17
3rd	C21	WSD Env Min	-166.31	-3.56	-0.55	-0.07	-1.29	-4.98
3rd	C22	WSD Env Min	-60.41	-1.51	-0.38	-0.07	-1.06	-2.17
3rd	C23	WSD Env Min	-108.67	-1.75	-2.47	-0.07	-3.81	-2.51
3rd	C24	WSD Env Min	-153.00	-5.29	0.63	-0.12	-2.34	-7.44
3rd	C25	WSD Env Min	-335.23	-0.60	1.28	-0.12	-0.74	-0.89
3rd	C26	WSD Env Min	-327.57	-0.83	1.74	-0.12	0.38	-1.23
3rd	C27	WSD Env Min	-225.63	0.88	1.30	-0.12	0.02	1.18
3rd	C28	WSD Env Min	-160.22	-5.42	-3.59	-0.12	-7.83	-7.65
3rd	C29	WSD Env Min	-351.85	-0.20	-5.53	-0.12	-10.02	-0.32
3rd	C30	WSD Env Min	-339.35	-0.77	-5.58	-0.12	-9.51	-1.26
3rd	C31	WSD Env Min	-99.95	-4.21	-0.61	-0.07	-1.91	-5.86
3rd	C32	WSD Env Min	-196.36	-0.13	-0.65	-0.07	-1.77	-0.20
3rd	C33	WSD Env Min	-185.61	-0.44	-0.43	-0.07	-1.29	-0.71
2nd	C1	WSD Env Min	-285.48	-1.87	0.67	-0.08	-1.54	-3.07
2nd	C2	WSD Env Min	-375.70	-0.39	2.00	-0.08	1.15	-0.83
2nd	C3	WSD Env Min	-372.98	-0.51	2.17	-0.08	1.83	-1.01
2nd	C4	WSD Env Min	-350.77	-0.35	1.47	-0.08	0.91	-0.78
2nd	C5	WSD Env Min	-341.35	-0.63	0.84	-0.08	-0.71	-1.19
2nd	C6	WSD Env Min	-368.00	-0.45	1.37	-0.08	-0.65	-0.92

Column Forces: Service Load Env.

Story	Column	Load Case	P	V2	V3	T	M2	M3
			tonf	tonf	tonf	tonf-m	tonf-m	tonf-m
2nd	C7	WSD Env Min	-341.46	-0.20	1.45	-0.08	-1.37	-0.56
2nd	C8	WSD Env Min	-352.36	-1.95	-4.59	-0.08	-9.88	-3.25
2nd	C9	WSD Env Min	-337.20	0.13	-4.45	-0.08	-8.96	-0.03
2nd	C10	WSD Env Min	-274.18	0.42	-3.17	-0.08	-5.55	0.42
2nd	C11	WSD Env Min	-451.17	-0.57	-4.08	-0.08	-6.82	-1.09
2nd	C12	WSD Env Min	-413.56	-0.49	-4.44	-0.08	-7.91	-0.98
2nd	C13	WSD Env Min	-240.16	-0.35	0.02	-0.05	-0.64	-0.70
2nd	C14	WSD Env Min	-158.56	0.24	-0.11	-0.05	-0.68	0.24
2nd	C15	WSD Env Min	-272.59	-0.50	0.09	-0.05	-0.37	-0.93
2nd	C16	WSD Env Min	-159.44	0.16	-0.19	-0.05	-1.03	0.07
2nd	C17	WSD Env Min	-154.77	-1.21	-0.90	-0.05	-2.53	-2.00
2nd	C18	WSD Env Min	-199.60	1.80	-1.79	-0.08	-6.29	2.42
2nd	C19	WSD Env Min	-336.02	-3.23	-2.82	-0.08	-7.74	-5.30
2nd	C20	WSD Env Min	-127.86	1.26	-0.61	-0.05	-2.12	1.64
2nd	C21	WSD Env Min	-191.11	-2.62	-0.76	-0.05	-2.33	-4.26
2nd	C22	WSD Env Min	-67.92	-0.94	-0.57	-0.05	-1.95	-1.66
2nd	C23	WSD Env Min	-123.48	-1.21	-2.31	-0.05	-4.58	-2.02
2nd	C24	WSD Env Min	-174.78	-3.76	-0.27	-0.08	-5.97	-5.71
2nd	C25	WSD Env Min	-383.19	-0.53	-0.64	-0.08	-6.62	-1.05
2nd	C26	WSD Env Min	-374.43	-0.66	-0.20	-0.08	-5.20	-1.15
2nd	C27	WSD Env Min	-257.87	0.44	0.71	-0.08	-2.11	0.34
2nd	C28	WSD Env Min	-183.04	-3.85	-2.33	-0.08	-7.74	-5.82
2nd	C29	WSD Env Min	-403.13	-0.27	-2.70	-0.08	-6.91	-0.66
2nd	C30	WSD Env Min	-389.01	-0.15	-2.51	-0.08	-5.79	-0.13
2nd	C31	WSD Env Min	-114.27	-3.48	-0.47	-0.05	-2.42	-5.60
2nd	C32	WSD Env Min	-224.41	-0.22	-0.51	-0.05	-2.27	-0.54
2nd	C33	WSD Env Min	-212.02	-0.02	-0.44	-0.05	-2.01	0.08
1st	C1	WSD Env Min	-327.50	-1.71	-0.41	-0.03	-5.11	-1.54
1st	C2	WSD Env Min	-430.67	-0.36	0.87	-0.03	-3.53	-0.70
1st	C3	WSD Env Min	-427.05	-0.46	1.04	-0.03	-2.91	-0.78
1st	C4	WSD Env Min	-402.44	-0.33	0.18	-0.03	-3.73	-0.68
1st	C5	WSD Env Min	-391.90	-0.57	-0.71	-0.03	-5.78	-0.83
1st	C6	WSD Env Min	-421.80	-0.41	-0.66	-0.03	-7.47	-0.74
1st	C7	WSD Env Min	-391.59	-0.21	-0.98	-0.03	-9.46	-0.60
1st	C8	WSD Env Min	-404.89	-1.86	-5.92	-0.03	-11.39	-1.63
1st	C9	WSD Env Min	-387.05	0.12	-5.66	-0.03	-9.87	-0.31
1st	C10	WSD Env Min	-312.89	0.38	-3.89	-0.03	-5.32	-0.12
1st	C11	WSD Env Min	-513.57	-0.81	-5.47	-0.05	-6.79	-1.26
1st	C12	WSD Env Min	-472.96	-0.43	-4.75	-0.03	-5.69	-0.71
1st	C13	WSD Env Min	-271.93	-0.29	-0.30	-0.02	-1.52	-0.48
1st	C14	WSD Env Min	-180.44	0.26	-0.57	-0.02	-1.63	-0.08
1st	C15	WSD Env Min	-303.90	-0.43	-0.20	-0.02	-1.28	-0.57
1st	C16	WSD Env Min	-190.30	0.12	-0.56	-0.02	-2.77	-0.19
1st	C17	WSD Env Min	-176.83	-1.09	-1.59	-0.02	-3.86	-0.98
1st	C18	WSD Env Min	-226.51	1.32	-2.15	-0.03	-8.17	0.16
1st	C19	WSD Env Min	-389.27	-3.35	-3.17	-0.03	-7.93	-3.03
1st	C20	WSD Env Min	-144.84	0.87	-0.81	-0.02	-2.84	0.02
1st	C21	WSD Env Min	-220.49	-2.63	-0.93	-0.02	-2.71	-2.37

Column Forces: Service Load Env.

Story	Column	Load Case	P	V2	V3	T	M2	M3
			tonf	tonf	tonf	tonf-m	tonf-m	tonf-m
1st	C22	WSD Env Min	-74.29	-1.01	-0.65	-0.02	-2.45	-1.35
1st	C23	WSD Env Min	-138.44	-1.26	-2.42	-0.02	-3.34	-1.45
1st	C24	WSD Env Min	-191.39	-2.98	-2.98	-0.03	-10.93	-2.45
1st	C25	WSD Env Min	-413.96	-0.53	-4.64	-0.03	-9.86	-0.83
1st	C26	WSD Env Min	-408.00	-0.51	-3.84	-0.03	-8.03	-0.82
1st	C27	WSD Env Min	-290.88	0.16	-0.84	-0.03	-5.57	-0.32
1st	C28	WSD Env Min	-201.66	-3.04	-3.10	-0.03	-11.19	-2.45
1st	C29	WSD Env Min	-437.93	-0.32	-2.31	-0.03	-9.19	-0.63
1st	C30	WSD Env Min	-409.50	0.42	-1.74	-0.03	-7.41	-0.09
1st	C31	WSD Env Min	-131.24	-3.49	-1.21	-0.02	-3.93	-2.65
1st	C32	WSD Env Min	-264.74	-0.30	-1.16	-0.02	-3.37	-0.49
1st	C33	WSD Env Min	-236.45	0.44	-1.10	-0.02	-2.84	0.06
1st	C34	WSD Env Min	-9.22	-0.39	-0.73	0.00	-0.56	-0.36
1st	C35	WSD Env Min	-37.52	-0.23	0.01	0.00	-0.03	-0.24
1st	C36	WSD Env Min	-34.08	-0.20	-0.09	0.00	-0.10	-0.21
1st	C37	WSD Env Min	-31.54	-0.08	-0.24	0.00	-0.20	-0.11
1st	C38	WSD Env Min	-14.88	-0.07	-0.15	0.00	-0.13	-0.10
1st	C39	WSD Env Min	-20.92	-0.12	-0.13	0.00	-0.12	-0.14



Column Forces: Strength Load Env.

Story	Column	Load Case	P tonf	V2 tonf	V3 tonf	T tonf-m	M2 tonf-m	M3 tonf-m
Roof	C10	USD ENV Min	-5.21	-0.18	-4.54	-0.02	-6.76	-0.18
Roof	C14	USD ENV Min	-2.88	0.48	-2.40	-0.02	-2.95	0.40
pump room	C10	USD ENV Min	-11.71	5.25	-11.76	-0.19	-9.34	3.15
pump room	C14	USD ENV Min	-6.30	4.27	-3.44	-0.12	-1.12	2.30
Rooftop	C1	USD ENV Min	-51.09	-4.49	1.84	-0.21	2.66	-5.25
Rooftop	C2	USD ENV Min	-67.67	-0.84	5.41	-0.21	6.41	-0.97
Rooftop	C3	USD ENV Min	-66.62	-0.99	5.69	-0.21	6.79	-1.13
Rooftop	C4	USD ENV Min	-62.59	-0.62	3.29	-0.21	4.12	-0.66
Rooftop	C5	USD ENV Min	-61.79	-1.43	2.19	-0.21	2.86	-1.65
Rooftop	C6	USD ENV Min	-67.13	-1.00	4.67	-0.21	5.57	-1.14
Rooftop	C7	USD ENV Min	-62.30	0.03	5.60	-0.21	6.66	0.10
Rooftop	C8	USD ENV Min	-63.80	-4.18	-9.81	-0.21	-10.18	-4.89
Rooftop	C9	USD ENV Min	-60.50	0.11	-9.46	-0.21	-9.80	0.15
Rooftop	C10	USD ENV Min	-85.08	1.45	-5.15	-0.21	-5.68	2.14
Rooftop	C11	USD ENV Min	-139.72	-1.32	-8.03	-0.21	-7.71	-1.41
Rooftop	C12	USD ENV Min	-102.80	-6.53	-7.91	-0.21	-8.20	-4.92
Rooftop	C13	USD ENV Min	-86.27	-7.33	-0.60	-0.13	-0.34	-5.52
Rooftop	C14	USD ENV Min	-71.11	1.03	-0.84	-0.13	-0.41	1.50
Rooftop	C15	USD ENV Min	-139.51	-1.20	-0.92	-0.13	-0.53	-1.31
Rooftop	C16	USD ENV Min	-29.05	0.27	-1.57	-0.13	-1.44	0.34
Rooftop	C17	USD ENV Min	-28.11	-2.93	-3.08	-0.13	-3.14	-3.28
Rooftop	C18	USD ENV Min	-36.02	5.24	-2.31	-0.21	-2.52	6.08
Rooftop	C19	USD ENV Min	-61.87	-7.33	-4.89	-0.21	-4.86	-8.74
Rooftop	C20	USD ENV Min	-22.97	3.57	-0.66	-0.13	-0.38	4.16
Rooftop	C21	USD ENV Min	-35.73	-6.37	-1.18	-0.13	-0.93	-7.72
Rooftop	C22	USD ENV Min	-10.90	-3.13	-1.01	-0.13	-0.66	-3.90
Rooftop	C23	USD ENV Min	-21.42	-3.33	-5.83	-0.13	-5.92	-4.13
Rooftop	C24	USD ENV Min	-31.57	-11.36	3.11	-0.21	4.08	-13.01
Rooftop	C25	USD ENV Min	-70.45	-1.24	3.83	-0.21	4.89	-1.55
Rooftop	C26	USD ENV Min	-68.39	-1.19	4.37	-0.21	5.34	-1.32
Rooftop	C27	USD ENV Min	-46.53	1.86	3.10	-0.21	4.04	2.18
Rooftop	C28	USD ENV Min	-32.99	-11.59	-5.44	-0.21	-4.55	-13.22
Rooftop	C29	USD ENV Min	-73.35	-0.31	-8.83	-0.21	-8.55	-0.45
Rooftop	C30	USD ENV Min	-70.31	-0.80	-9.32	-0.21	-8.88	-0.87
Rooftop	C31	USD ENV Min	-19.63	-8.87	-0.80	-0.13	-0.50	-10.31
Rooftop	C32	USD ENV Min	-41.42	-0.27	-1.27	-0.13	-1.09	-0.37
Rooftop	C33	USD ENV Min	-38.47	-0.42	-0.85	-0.13	-0.68	-0.45
8th	C1	USD ENV Min	-103.15	-3.11	0.76	-0.22	1.89	-4.38
8th	C2	USD ENV Min	-136.32	-0.75	3.06	-0.22	5.10	-0.98
8th	C3	USD ENV Min	-135.18	-0.81	3.52	-0.22	5.60	-1.08
8th	C4	USD ENV Min	-126.62	-0.52	1.97	-0.22	3.37	-0.67
8th	C5	USD ENV Min	-123.70	-1.08	0.88	-0.22	2.04	-1.48
8th	C6	USD ENV Min	-134.26	-0.81	2.11	-0.22	4.07	-1.08
8th	C7	USD ENV Min	-124.42	-0.10	2.43	-0.22	4.76	-0.07
8th	C8	USD ENV Min	-127.29	-2.91	-5.68	-0.22	-7.66	-4.11
8th	C9	USD ENV Min	-121.09	-0.09	-5.31	-0.22	-7.36	-0.04

Column Forces: Strength Load Env.

Story	Column	Load Case	P tonf	V2 tonf	V3 tonf	T tonf-m	M2 tonf-m	M3 tonf-m
8th	C10	USD ENV Min	-124.66	1.43	-4.08	-0.22	-5.03	1.99
8th	C11	USD ENV Min	-214.89	-0.96	-5.12	-0.22	-6.58	-1.28
8th	C12	USD ENV Min	-174.23	-1.06	-5.10	-0.22	-6.84	-1.51
8th	C13	USD ENV Min	-124.34	-0.87	-0.27	-0.14	-0.24	-1.23
8th	C14	USD ENV Min	-88.85	0.97	-0.03	-0.14	-0.01	1.35
8th	C15	USD ENV Min	-177.34	-0.92	-0.15	-0.14	-0.17	-1.23
8th	C16	USD ENV Min	-58.18	0.07	-1.09	-0.14	-1.31	0.16
8th	C17	USD ENV Min	-56.75	-1.78	-2.15	-0.14	-2.79	-2.56
8th	C18	USD ENV Min	-73.11	3.10	-2.03	-0.22	-1.95	4.60
8th	C19	USD ENV Min	-121.25	-5.19	-3.32	-0.22	-3.99	-7.30
8th	C20	USD ENV Min	-46.47	2.10	-0.70	-0.14	-0.58	3.12
8th	C21	USD ENV Min	-69.25	-4.69	-0.99	-0.14	-1.02	-6.57
8th	C22	USD ENV Min	-23.39	-2.51	-0.74	-0.14	-0.68	-3.43
8th	C23	USD ENV Min	-44.45	-2.64	-3.09	-0.14	-4.38	-3.63
8th	C24	USD ENV Min	-63.72	-6.95	0.93	-0.22	2.72	-10.12
8th	C25	USD ENV Min	-140.12	-1.14	1.41	-0.22	3.33	-1.49
8th	C26	USD ENV Min	-136.66	-0.91	1.88	-0.22	3.82	-1.22
8th	C27	USD ENV Min	-93.79	1.06	1.46	-0.22	2.96	1.60
8th	C28	USD ENV Min	-66.67	-7.02	-3.86	-0.22	-4.19	-10.26
8th	C29	USD ENV Min	-145.99	-0.54	-6.14	-0.22	-7.61	-0.63
8th	C30	USD ENV Min	-140.52	-0.64	-5.85	-0.22	-7.48	-0.85
8th	C31	USD ENV Min	-39.83	-5.65	-0.85	-0.14	-0.74	-8.16
8th	C32	USD ENV Min	-82.15	-0.41	-1.12	-0.14	-1.21	-0.49
8th	C33	USD ENV Min	-76.86	-0.37	-0.81	-0.14	-0.83	-0.49
7th	C1	USD ENV Min	-155.16	-3.42	0.87	-0.22	1.54	-4.63
7th	C2	USD ENV Min	-204.97	-0.82	3.40	-0.22	4.91	-1.08
7th	C3	USD ENV Min	-203.65	-0.90	3.84	-0.22	5.45	-1.20
7th	C4	USD ENV Min	-190.61	-0.62	2.17	-0.22	3.21	-0.80
7th	C5	USD ENV Min	-185.65	-1.21	1.04	-0.22	1.77	-1.61
7th	C6	USD ENV Min	-201.36	-0.92	2.47	-0.22	3.73	-1.21
7th	C7	USD ENV Min	-186.57	-0.17	2.87	-0.22	4.31	-0.20
7th	C8	USD ENV Min	-190.98	-3.23	-6.55	-0.22	-8.29	-4.38
7th	C9	USD ENV Min	-181.85	-0.10	-6.13	-0.22	-7.74	-0.10
7th	C10	USD ENV Min	-164.86	1.24	-4.09	-0.22	-4.91	1.72
7th	C11	USD ENV Min	-290.01	-1.03	-5.48	-0.22	-6.93	-1.39
7th	C12	USD ENV Min	-245.71	-1.66	-5.83	-0.22	-7.34	-2.13
7th	C13	USD ENV Min	-162.63	-1.39	-0.39	-0.14	-0.42	-1.78
7th	C14	USD ENV Min	-107.66	0.82	-0.22	-0.14	-0.22	1.13
7th	C15	USD ENV Min	-215.82	-0.95	-0.35	-0.14	-0.37	-1.29
7th	C17	USD ENV Min	-85.21	-2.06	-2.42	-0.14	-3.14	-2.78
7th	C18	USD ENV Min	-109.84	3.46	-2.14	-0.22	-2.47	4.73
7th	C19	USD ENV Min	-181.32	-5.65	-3.65	-0.22	-4.40	-7.66
7th	C20	USD ENV Min	-69.84	2.33	-0.74	-0.14	-0.82	3.20
7th	C21	USD ENV Min	-103.32	-5.02	-1.09	-0.14	-1.27	-6.84
7th	C22	USD ENV Min	-35.42	-2.58	-0.83	-0.14	-0.92	-3.50
7th	C23	USD ENV Min	-67.13	-2.74	-3.71	-0.14	-4.79	-3.71

Column Forces: Strength Load Env.

Story	Column	Load Case	P tonf	V2 tonf	V3 tonf	T tonf-m	M2 tonf-m	M3 tonf-m
7th	C24	USD ENV Min	-95.69	-7.84	1.19	-0.22	2.13	-10.64
7th	C25	USD ENV Min	-209.91	-1.17	1.70	-0.22	2.82	-1.56
7th	C26	USD ENV Min	-204.92	-1.07	2.21	-0.22	3.43	-1.41
7th	C27	USD ENV Min	-140.94	1.17	1.64	-0.22	2.61	1.63
7th	C28	USD ENV Min	-100.14	-7.98	-4.41	-0.22	-5.08	-10.83
7th	C29	USD ENV Min	-218.94	-0.53	-6.93	-0.22	-8.52	-0.68
7th	C30	USD ENV Min	-210.85	-0.77	-6.75	-0.22	-8.34	-1.01
7th	C31	USD ENV Min	-59.93	-6.27	-0.96	-0.14	-1.07	-8.53
7th	C32	USD ENV Min	-123.03	-0.41	-1.27	-0.14	-1.53	-0.54
7th	C33	USD ENV Min	-115.25	-0.47	-0.93	-0.14	-1.10	-0.61
6th	C1	USD ENV Min	-207.19	-3.38	0.77	-0.22	0.96	-4.63
6th	C2	USD ENV Min	-273.57	-0.84	3.25	-0.22	4.38	-1.14
6th	C3	USD ENV Min	-271.99	-0.93	3.71	-0.22	5.01	-1.27
6th	C4	USD ENV Min	-254.62	-0.65	2.14	-0.22	2.90	-0.89
6th	C5	USD ENV Min	-247.67	-1.22	1.00	-0.22	1.35	-1.66
6th	C6	USD ENV Min	-268.42	-0.93	2.32	-0.22	3.06	-1.27
6th	C7	USD ENV Min	-248.72	-0.23	2.64	-0.22	3.40	-0.31
6th	C8	USD ENV Min	-254.83	-3.21	-6.42	-0.22	-8.56	-4.42
6th	C9	USD ENV Min	-242.85	-0.11	-6.01	-0.22	-7.96	-0.13
6th	C10	USD ENV Min	-205.83	1.10	-4.14	-0.22	-5.03	1.49
6th	C11	USD ENV Min	-365.10	-1.06	-5.50	-0.22	-7.10	-1.46
6th	C12	USD ENV Min	-317.33	-1.43	-5.81	-0.22	-7.55	-1.97
6th	C13	USD ENV Min	-201.01	-1.16	-0.39	-0.14	-0.55	-1.59
6th	C14	USD ENV Min	-127.45	0.70	-0.22	-0.14	-0.34	0.94
6th	C15	USD ENV Min	-254.39	-0.97	-0.31	-0.14	-0.45	-1.34
6th	C16	USD ENV Min	-116.24	0.07	-1.25	-0.14	-1.76	0.11
6th	C17	USD ENV Min	-113.53	-2.03	-2.38	-0.14	-3.32	-2.80
6th	C18	USD ENV Min	-146.46	3.31	-2.18	-0.22	-3.11	4.54
6th	C19	USD ENV Min	-241.66	-5.56	-3.66	-0.22	-5.03	-7.63
6th	C20	USD ENV Min	-93.18	2.24	-0.77	-0.14	-1.08	3.06
6th	C21	USD ENV Min	-137.54	-4.94	-1.10	-0.14	-1.49	-6.77
6th	C22	USD ENV Min	-47.28	-2.52	-0.83	-0.14	-1.11	-3.47
6th	C23	USD ENV Min	-89.69	-2.67	-3.59	-0.14	-4.91	-3.63
6th	C24	USD ENV Min	-127.61	-7.57	0.94	-0.22	1.04	-10.39
6th	C25	USD ENV Min	-279.64	-1.19	1.47	-0.22	1.83	-1.60
6th	C26	USD ENV Min	-273.14	-1.12	2.01	-0.22	2.61	-1.53
6th	C27	USD ENV Min	-188.03	1.11	1.52	-0.22	1.97	1.53
6th	C28	USD ENV Min	-133.57	-7.71	-4.51	-0.22	-5.92	-10.60
6th	C29	USD ENV Min	-292.02	-0.55	-6.96	-0.22	-9.20	-0.73
6th	C30	USD ENV Min	-281.37	-0.82	-6.75	-0.22	-8.90	-1.11
6th	C31	USD ENV Min	-80.08	-6.09	-1.04	-0.14	-1.47	-8.37
6th	C32	USD ENV Min	-163.86	-0.44	-1.32	-0.14	-1.84	-0.59
6th	C33	USD ENV Min	-153.68	-0.51	-0.98	-0.14	-1.38	-0.70
5th	C1	USD ENV Min	-259.24	-3.35	0.79	-0.21	0.34	-4.63
5th	C2	USD ENV Min	-342.11	-0.82	3.25	-0.21	3.84	-1.15
5th	C3	USD ENV Min	-340.17	-0.93	3.70	-0.21	4.55	-1.31



Column Forces: Strength Load Env.

Story	Column	Load Case	P tonf	V2 tonf	V3 tonf	T tonf-m	M2 tonf-m	M3 tonf-m
5th	C4	USD ENV Min	-318.63	-0.66	2.22	-0.21	2.63	-0.93
5th	C5	USD ENV Min	-309.79	-1.21	1.09	-0.21	0.95	-1.68
5th	C6	USD ENV Min	-335.43	-0.92	2.35	-0.21	2.38	-1.29
5th	C7	USD ENV Min	-310.85	-0.25	2.63	-0.21	2.46	-0.38
5th	C8	USD ENV Min	-318.90	-3.23	-6.42	-0.21	-8.93	-4.47
5th	C9	USD ENV Min	-304.18	-0.04	-6.01	-0.21	-8.27	-0.07
5th	C10	USD ENV Min	-247.85	1.00	-4.19	-0.21	-5.20	1.33
5th	C11	USD ENV Min	-440.22	-1.06	-5.69	-0.21	-7.34	-1.50
5th	C12	USD ENV Min	-389.15	-1.37	-5.90	-0.21	-7.86	-1.88
5th	C13	USD ENV Min	-239.50	-1.09	-0.35	-0.13	-0.67	-1.49
5th	C14	USD ENV Min	-148.50	0.60	-0.24	-0.13	-0.46	0.79
5th	C15	USD ENV Min	-293.08	-0.96	-0.27	-0.13	-0.51	-1.35
5th	C16	USD ENV Min	-145.20	0.12	-1.21	-0.13	-1.92	0.16
5th	C17	USD ENV Min	-141.64	-2.04	-2.30	-0.13	-3.47	-2.84
5th	C18	USD ENV Min	-182.86	3.32	-2.19	-0.21	-3.85	4.46
5th	C19	USD ENV Min	-302.49	-5.51	-3.68	-0.21	-5.71	-7.57
5th	C20	USD ENV Min	-116.47	2.26	-0.77	-0.13	-1.32	3.03
5th	C21	USD ENV Min	-172.06	-4.85	-1.08	-0.13	-1.68	-6.67
5th	C22	USD ENV Min	-58.80	-2.40	-0.80	-0.13	-1.28	-3.34
5th	C23	USD ENV Min	-112.01	-2.56	-3.58	-0.13	-5.09	-3.50
5th	C24	USD ENV Min	-159.41	-7.55	0.87	-0.21	-0.23	-10.32
5th	C25	USD ENV Min	-349.35	-1.15	1.43	-0.21	0.79	-1.58
5th	C26	USD ENV Min	-341.31	-1.19	2.02	-0.21	1.79	-1.65
5th	C27	USD ENV Min	-235.02	1.12	1.55	-0.21	1.33	1.51
5th	C28	USD ENV Min	-166.89	-7.72	-4.64	-0.21	-7.05	-10.57
5th	C29	USD ENV Min	-365.33	-0.52	-7.07	-0.21	-10.12	-0.73
5th	C30	USD ENV Min	-352.13	-0.87	-6.88	-0.21	-9.67	-1.22
5th	C31	USD ENV Min	-100.28	-6.08	-1.05	-0.13	-1.88	-8.33
5th	C32	USD ENV Min	-204.65	-0.42	-1.30	-0.13	-2.13	-0.57
5th	C33	USD ENV Min	-192.16	-0.56	-0.96	-0.13	-1.61	-0.79
4th	C1	USD ENV Min	-311.29	-3.26	0.87	-0.19	-0.34	-4.55
4th	C2	USD ENV Min	-410.58	-0.77	3.27	-0.19	3.24	-1.14
4th	C3	USD ENV Min	-408.16	-0.91	3.69	-0.19	4.05	-1.33
4th	C4	USD ENV Min	-382.67	-0.64	2.34	-0.19	2.37	-0.96
4th	C5	USD ENV Min	-372.03	-1.16	1.22	-0.19	0.54	-1.68
4th	C6	USD ENV Min	-402.37	-0.87	2.40	-0.19	1.62	-1.28
4th	C7	USD ENV Min	-372.99	-0.26	2.64	-0.19	1.39	-0.46
4th	C8	USD ENV Min	-383.27	-3.19	-6.33	-0.19	-9.55	-4.46
4th	C9	USD ENV Min	-365.92	0.05	-5.93	-0.19	-8.60	0.00
4th	C10	USD ENV Min	-291.23	0.94	-4.26	-0.19	-5.39	1.19
4th	C11	USD ENV Min	-515.46	-1.04	-5.84	-0.19	-7.52	-1.52
4th	C12	USD ENV Min	-461.26	-1.21	-5.94	-0.19	-8.16	-1.72
4th	C13	USD ENV Min	-278.11	-0.94	-0.26	-0.12	-0.74	-1.32
4th	C14	USD ENV Min	-171.06	0.54	-0.21	-0.12	-0.56	0.67
4th	C15	USD ENV Min	-331.82	-0.94	-0.16	-0.12	-0.53	-1.35
4th	C16	USD ENV Min	-174.09	0.20	-1.06	-0.12	-1.97	0.22

Column Forces: Strength Load Env.

Story	Column	Load Case	P tonf	V2 tonf	V3 tonf	T tonf-m	M2 tonf-m	M3 tonf-m
4th	C17	USD ENV Min	-169.49	-2.02	-2.10	-0.12	-3.52	-2.83
4th	C18	USD ENV Min	-218.98	3.31	-2.28	-0.19	-5.00	4.33
4th	C19	USD ENV Min	-363.94	-5.32	-3.78	-0.19	-6.81	-7.36
4th	C20	USD ENV Min	-139.68	2.28	-0.80	-0.12	-1.71	2.97
4th	C21	USD ENV Min	-206.93	-4.63	-1.08	-0.12	-2.00	-6.39
4th	C22	USD ENV Min	-69.91	-2.17	-0.80	-0.12	-1.58	-3.08
4th	C23	USD ENV Min	-134.06	-2.37	-3.53	-0.12	-5.33	-3.27
4th	C24	USD ENV Min	-191.09	-7.37	0.77	-0.19	-1.87	-10.00
4th	C25	USD ENV Min	-419.00	-1.08	1.31	-0.19	-0.73	-1.55
4th	C26	USD ENV Min	-409.41	-1.21	1.93	-0.19	0.53	-1.73
4th	C27	USD ENV Min	-281.90	1.11	1.62	-0.19	0.55	1.42
4th	C28	USD ENV Min	-200.10	-7.56	-4.60	-0.19	-8.40	-10.28
4th	C29	USD ENV Min	-438.93	-0.49	-6.89	-0.19	-10.69	-0.74
4th	C30	USD ENV Min	-423.21	-0.85	-6.71	-0.19	-10.11	-1.22
4th	C31	USD ENV Min	-120.55	-6.00	-0.99	-0.12	-2.29	-8.19
4th	C32	USD ENV Min	-245.41	-0.37	-1.18	-0.12	-2.39	-0.55
4th	C33	USD ENV Min	-230.70	-0.54	-0.87	-0.12	-1.85	-0.78
3rd	C1	USD ENV Min	-363.34	-3.13	1.09	-0.16	-0.96	-4.44
3rd	C2	USD ENV Min	-478.94	-0.58	3.40	-0.16	2.72	-0.90
3rd	C3	USD ENV Min	-475.91	-0.77	3.79	-0.16	3.65	-1.17
3rd	C4	USD ENV Min	-446.74	-0.48	2.61	-0.16	2.33	-0.77
3rd	C5	USD ENV Min	-434.43	-1.00	1.53	-0.16	0.33	-1.49
3rd	C6	USD ENV Min	-469.22	-0.69	2.62	-0.16	1.05	-1.06
3rd	C7	USD ENV Min	-435.11	-0.13	2.83	-0.16	0.49	-0.30
3rd	C8	USD ENV Min	-447.99	-3.10	-6.10	-0.16	-10.31	-4.41
3rd	C9	USD ENV Min	-428.15	0.37	-5.72	-0.16	-9.13	0.46
3rd	C10	USD ENV Min	-336.28	1.11	-4.20	-0.16	-5.55	1.45
3rd	C11	USD ENV Min	-590.88	-0.93	-6.07	-0.16	-7.82	-1.40
3rd	C12	USD ENV Min	-533.71	-0.91	-5.99	-0.16	-8.42	-1.33
3rd	C13	USD ENV Min	-316.83	-0.68	-0.09	-0.10	-0.73	-0.97
3rd	C14	USD ENV Min	-195.41	0.62	-0.13	-0.10	-0.57	0.77
3rd	C15	USD ENV Min	-370.55	-0.84	0.02	-0.10	-0.45	-1.23
3rd	C16	USD ENV Min	-202.89	0.46	-0.96	-0.10	-2.22	0.61
3rd	C17	USD ENV Min	-197.00	-1.99	-1.81	-0.10	-3.49	-2.85
3rd	C18	USD ENV Min	-254.79	3.57	-1.81	-0.16	-5.26	4.71
3rd	C19	USD ENV Min	-426.12	-5.16	-3.23	-0.16	-6.82	-7.25
3rd	C20	USD ENV Min	-162.81	2.53	-0.58	-0.10	-1.68	3.34
3rd	C21	USD ENV Min	-242.21	-4.41	-0.77	-0.10	-1.80	-6.18
3rd	C22	USD ENV Min	-80.53	-1.85	-0.54	-0.10	-1.48	-2.71
3rd	C23	USD ENV Min	-155.78	-2.15	-3.24	-0.10	-5.19	-3.02
3rd	C24	USD ENV Min	-222.63	-7.64	1.04	-0.16	-3.08	-10.62
3rd	C25	USD ENV Min	-488.59	-0.86	2.02	-0.16	-0.70	-1.26
3rd	C26	USD ENV Min	-477.42	-1.19	2.70	-0.16	0.93	-1.79
3rd	C27	USD ENV Min	-328.64	1.36	2.05	-0.16	0.35	1.83
3rd	C28	USD ENV Min	-233.17	-7.89	-4.91	-0.16	-10.61	-11.00
3rd	C29	USD ENV Min	-512.85	-0.27	-7.47	-0.16	-13.35	-0.43

Column Forces: Strength Load Env.

Story	Column	Load Case	P tonf	V2 tonf	V3 tonf	T tonf-m	M2 tonf-m	M3 tonf-m
3rd	C30	USD ENV Min	-494.64	-1.14	-7.35	-0.16	-12.62	-1.88
3rd	C31	USD ENV Min	-140.90	-6.05	-0.84	-0.10	-2.67	-8.32
3rd	C32	USD ENV Min	-286.13	-0.16	-0.90	-0.10	-2.45	-0.24
3rd	C33	USD ENV Min	-269.34	-0.62	-0.57	-0.10	-1.76	-1.08
2nd	C1	USD ENV Min	-415.74	-2.55	1.06	-0.11	-1.98	-4.31
2nd	C2	USD ENV Min	-547.55	-0.54	3.05	-0.11	2.01	-1.17
2nd	C3	USD ENV Min	-543.74	-0.74	3.30	-0.11	2.98	-1.48
2nd	C4	USD ENV Min	-511.21	-0.49	2.26	-0.11	1.61	-1.09
2nd	C5	USD ENV Min	-497.33	-0.92	1.33	-0.11	-0.75	-1.76
2nd	C6	USD ENV Min	-536.32	-0.63	2.14	-0.11	-0.60	-1.31
2nd	C7	USD ENV Min	-497.59	-0.27	2.26	-0.11	-1.61	-0.77
2nd	C8	USD ENV Min	-513.48	-2.65	-5.56	-0.11	-12.29	-4.51
2nd	C9	USD ENV Min	-491.33	0.23	-5.63	-0.11	-10.98	0.03
2nd	C10	USD ENV Min	-383.82	0.69	-4.33	-0.11	-6.89	0.73
2nd	C11	USD ENV Min	-666.89	-0.85	-5.47	-0.11	-8.24	-1.63
2nd	C12	USD ENV Min	-607.02	-0.70	-6.12	-0.11	-10.01	-1.40
2nd	C13	USD ENV Min	-355.94	-0.50	0.06	-0.07	-0.84	-0.99
2nd	C14	USD ENV Min	-222.28	0.40	-0.14	-0.07	-0.92	0.42
2nd	C15	USD ENV Min	-409.45	-0.75	0.17	-0.07	-0.45	-1.40
2nd	C16	USD ENV Min	-231.78	0.27	-0.24	-0.07	-1.38	0.16
2nd	C17	USD ENV Min	-224.34	-1.64	-1.28	-0.07	-3.60	-2.78
2nd	C18	USD ENV Min	-290.55	2.73	-2.62	-0.11	-9.04	3.71
2nd	C19	USD ENV Min	-489.63	-4.02	-4.18	-0.11	-11.47	-6.53
2nd	C20	USD ENV Min	-186.04	1.92	-0.87	-0.07	-3.01	2.54
2nd	C21	USD ENV Min	-278.32	-3.24	-1.10	-0.07	-3.32	-5.29
2nd	C22	USD ENV Min	-90.71	-1.18	-0.81	-0.07	-2.75	-2.17
2nd	C23	USD ENV Min	-177.28	-1.48	-3.19	-0.07	-6.67	-2.48
2nd	C24	USD ENV Min	-254.30	-5.50	-0.33	-0.11	-8.42	-8.17
2nd	C25	USD ENV Min	-558.49	-0.75	-0.88	-0.11	-9.43	-1.49
2nd	C26	USD ENV Min	-545.70	-0.96	-0.22	-0.11	-7.37	-1.69
2nd	C27	USD ENV Min	-375.58	0.68	1.13	-0.11	-2.79	0.58
2nd	C28	USD ENV Min	-266.37	-5.67	-3.19	-0.11	-11.01	-8.42
2nd	C29	USD ENV Min	-587.59	-0.37	-3.70	-0.11	-9.82	-0.92
2nd	C30	USD ENV Min	-567.02	-0.19	-3.49	-0.11	-8.22	-0.12
2nd	C31	USD ENV Min	-161.61	-5.15	-0.66	-0.07	-3.40	-8.27
2nd	C32	USD ENV Min	-326.99	-0.30	-0.71	-0.07	-3.19	-0.75
2nd	C33	USD ENV Min	-308.29	-0.01	-0.61	-0.07	-2.82	0.17
1st	C1	USD ENV Min	-478.63	-2.37	-0.51	-0.04	-7.19	-2.33
1st	C2	USD ENV Min	-629.85	-0.50	1.41	-0.04	-4.89	-0.99
1st	C3	USD ENV Min	-624.71	-0.67	1.65	-0.04	-4.02	-1.11
1st	C4	USD ENV Min	-588.58	-0.46	0.38	-0.04	-5.21	-0.96
1st	C5	USD ENV Min	-573.02	-0.85	-0.90	-0.04	-8.15	-1.21
1st	C6	USD ENV Min	-616.88	-0.58	-0.79	-0.04	-10.56	-1.05
1st	C7	USD ENV Min	-572.64	-0.29	-1.24	-0.04	-13.39	-0.83
1st	C8	USD ENV Min	-592.15	-2.54	-7.10	-0.04	-15.98	-2.41
1st	C9	USD ENV Min	-565.98	0.22	-6.84	-0.04	-13.84	-0.41

Column Forces: Strength Load Env.

Story	Column	Load Case	P tonf	V2 tonf	V3 tonf	T tonf-m	M2 tonf-m	M3 tonf-m
1st	C10	USD ENV Min	-443.75	0.62	-4.81	-0.04	-7.59	-0.11
1st	C11	USD ENV Min	-760.34	-1.24	-6.71	-0.08	-9.68	-1.85
1st	C12	USD ENV Min	-696.03	-0.60	-6.03	-0.04	-8.10	-1.01
1st	C13	USD ENV Min	-403.47	-0.40	-0.40	-0.03	-2.13	-0.68
1st	C14	USD ENV Min	-256.34	0.42	-0.80	-0.03	-2.31	-0.07
1st	C15	USD ENV Min	-456.26	-0.67	-0.25	-0.03	-1.78	-0.86
1st	C16	USD ENV Min	-278.33	0.20	-0.74	-0.03	-3.90	-0.24
1st	C17	USD ENV Min	-258.36	-1.49	-2.26	-0.03	-5.49	-1.46
1st	C18	USD ENV Min	-330.74	2.03	-3.19	-0.04	-11.78	0.34
1st	C19	USD ENV Min	-569.43	-4.13	-4.51	-0.04	-11.56	-3.72
1st	C20	USD ENV Min	-211.40	1.35	-1.20	-0.03	-4.09	0.11
1st	C21	USD ENV Min	-322.32	-3.26	-1.38	-0.03	-3.89	-2.94
1st	C22	USD ENV Min	-99.74	-1.33	-0.94	-0.03	-3.50	-1.86
1st	C23	USD ENV Min	-200.49	-1.54	-3.28	-0.03	-5.03	-1.88
1st	C24	USD ENV Min	-279.11	-4.48	-4.05	-0.04	-15.56	-3.43
1st	C25	USD ENV Min	-604.64	-0.75	-6.48	-0.04	-14.08	-1.18
1st	C26	USD ENV Min	-596.02	-0.73	-5.35	-0.04	-11.45	-1.16
1st	C27	USD ENV Min	-424.97	0.28	-1.15	-0.04	-7.87	-0.42
1st	C28	USD ENV Min	-294.17	-4.59	-4.37	-0.04	-15.92	-3.39
1st	C29	USD ENV Min	-639.80	-0.44	-3.27	-0.04	-13.04	-0.89
1st	C30	USD ENV Min	-597.89	0.67	-2.45	-0.04	-10.50	-0.08
1st	C31	USD ENV Min	-187.98	-5.26	-1.71	-0.03	-5.58	-3.76
1st	C32	USD ENV Min	-387.34	-0.43	-1.65	-0.03	-4.78	-0.69
1st	C33	USD ENV Min	-345.57	0.68	-1.56	-0.03	-4.04	0.13
1st	C34	USD ENV Min	-13.78	-0.54	-1.08	0.00	-0.79	-0.51
1st	C35	USD ENV Min	-56.09	-0.32	0.02	0.00	-0.04	-0.33
1st	C36	USD ENV Min	-50.88	-0.28	-0.12	0.00	-0.14	-0.29
1st	C37	USD ENV Min	-47.18	-0.12	-0.34	0.00	-0.30	-0.16
1st	C38	USD ENV Min	-22.21	-0.10	-0.24	0.00	-0.22	-0.15
1st	C39	USD ENV Min	-31.16	-0.16	-0.21	0.00	-0.20	-0.19

Pier Forces : Strength Load Env.

Story	Pier	Load Case	Location	P tonf	V2 tonf	V3 tonf	T tonf-m	M2 tonf-m	M3 tonf-m
Roof	CORE LIFT1	USD ENV Min	Top	-6.85	-8.54	-3.81	-0.28	-0.02	-6.99
Roof	CORE LIFT1	USD ENV Min	Bottom	-28.18	-5.69	-5.31	-1.25	-2.52	-9.80
Roof	CORE LIFT2	USD ENV Min	Top	-23.49	-20.29	0.12	-1.10	-2.17	-6.28
Roof	CORE LIFT2	USD ENV Min	Bottom	-45.07	-21.39	0.27	-0.15	-0.09	-13.91
Roof	CORE LIFT3	USD ENV Min	Top	-15.50	-1.56	-0.77	-5.74	-2.21	-12.75
Roof	CORE LIFT3	USD ENV Min	Bottom	-47.43	-5.69	0.07	-4.69	-0.37	-3.18
Roof	CORE LIFT4	USD ENV Min	Top	-16.04	-4.06	-6.87	0.00	0.83	-2.82
Roof	CORE LIFT4	USD ENV Min	Bottom	-12.71	-3.52	-6.41	-0.09	-5.98	-1.01
Roof	CORE LIFT5	USD ENV Min	Top	-11.64	-1.33	-4.60	-0.16	0.52	-2.46
Roof	CORE LIFT5	USD ENV Min	Bottom	-12.03	-1.62	-4.38	-0.05	-4.10	-0.80
Roof	CORE LIFT6	USD ENV Min	Top	-12.86	-7.04	-5.95	0.01	0.72	-1.22
Roof	CORE LIFT6	USD ENV Min	Bottom	-8.70	-8.20	-5.82	0.04	-5.14	-3.59
Roof	CORE LIFT7	USD ENV Min	Top	-16.52	-9.47	-7.52	0.04	0.14	0.55
Roof	CORE LIFT7	USD ENV Min	Bottom	-4.93	-10.26	-7.93	0.21	-5.48	-6.90
Roof	CORE ST1a	USD ENV Min	Top	-13.14	-45.64	-1.46	0.08	0.28	3.52
Roof	CORE ST1a	USD ENV Min	Bottom	-31.12	-31.77	-0.92	0.08	-0.86	-16.97
Roof	CORE ST1b	USD ENV Min	Top	-7.88	-9.99	0.38	0.28	-1.83	-4.54
Roof	CORE ST1b	USD ENV Min	Bottom	-25.61	-5.25	0.71	-6.12	2.65	-17.07
Roof	CORE ST1c	USD ENV Min	Top	-10.12	-24.63	-2.19	-1.69	0.08	-0.69
Roof	CORE ST1c	USD ENV Min	Bottom	-25.74	-15.68	-0.16	-0.31	-0.03	-7.91
Roof	CORE ST1d	USD ENV Min	Top	0.64	-10.64	-0.14	0.16	-0.19	1.34
Roof	CORE ST1d	USD ENV Min	Bottom	4.26	-18.41	0.74	0.21	0.47	-12.77
pump room	CORE LIFT1	USD ENV Min	Top	-39.01	-23.01	-6.05	-4.23	-2.96	-12.94
pump room	CORE LIFT1	USD ENV Min	Bottom	-40.16	-23.01	-6.05	-4.23	-1.51	-23.57
pump room	CORE LIFT2	USD ENV Min	Top	-50.17	-19.37	0.46	0.00	-0.08	-9.58
pump room	CORE LIFT2	USD ENV Min	Bottom	-52.15	-19.37	0.46	0.00	0.20	-18.02
pump room	CORE LIFT3	USD ENV Min	Top	-58.37	-64.19	-0.58	-4.24	-3.20	-11.18
pump room	CORE LIFT3	USD ENV Min	Bottom	-59.77	-64.19	-0.58	-4.24	-2.93	-31.00
pump room	CORE LIFT4	USD ENV Min	Top	-18.80	-3.14	-19.02	-0.10	0.11	-4.22
pump room	CORE LIFT4	USD ENV Min	Bottom	-19.43	-3.14	-19.02	-0.10	-8.46	-0.20
pump room	CORE LIFT5	USD ENV Min	Top	-15.86	-3.45	-12.47	-0.23	0.02	-2.19
pump room	CORE LIFT5	USD ENV Min	Bottom	-16.37	-3.45	-12.47	-0.23	-6.05	-2.01
pump room	CORE LIFT6	USD ENV Min	Top	-12.26	-11.24	-12.99	-0.96	-0.03	-1.93
pump room	CORE LIFT6	USD ENV Min	Bottom	-12.70	-11.24	-12.99	-0.96	-5.99	-4.28
pump room	CORE LIFT7	USD ENV Min	Top	-16.55	-31.39	-11.13	-3.95	-0.55	-6.00
pump room	CORE LIFT7	USD ENV Min	Bottom	-17.06	-31.39	-11.13	-3.95	-4.91	-24.81
pump room	CORE ST1a	USD ENV Min	Top	-36.86	-23.92	-1.25	1.76	-0.82	-0.57
pump room	CORE ST1a	USD ENV Min	Bottom	-37.85	-23.92	-1.25	1.76	-1.57	-7.57
pump room	CORE ST1b	USD ENV Min	Top	-25.80	-3.02	2.34	-0.87	2.65	-16.49
pump room	CORE ST1b	USD ENV Min	Bottom	-27.33	-3.02	2.34	-0.87	4.06	-18.06
pump room	CORE ST1c	USD ENV Min	Top	-24.69	-14.45	-0.38	-0.32	-0.08	-1.96
pump room	CORE ST1c	USD ENV Min	Bottom	-25.21	-14.45	-0.38	-0.32	-0.21	-10.52
pump room	CORE ST1d	USD ENV Min	Top	2.91	-22.13	2.70	-1.80	0.44	-11.16
pump room	CORE ST1d	USD ENV Min	Bottom	2.53	-22.13	2.70	-1.80	2.07	-24.44
Roof top	CORE LIFT1	USD ENV Min	Top	-48.69	-24.12	-3.85	-3.93	-3.52	-37.04
Roof top	CORE LIFT1	USD ENV Min	Bottom	-56.96	-33.06	-10.48	-12.85	-8.01	-20.51
Roof top	CORE LIFT2	USD ENV Min	Top	-62.15	-19.07	-0.94	-1.68	0.07	-28.25
Roof top	CORE LIFT2	USD ENV Min	Bottom	-94.41	-21.83	-0.52	-2.83	-0.12	4.67
Roof top	CORE LIFT3	USD ENV Min	Top	-72.26	-14.45	-5.53	-11.89	-7.39	-48.74
Roof top	CORE LIFT3	USD ENV Min	Bottom	-107.70	-22.62	-10.01	-15.07	-8.07	-18.88
Roof top	CORE LIFT4	USD ENV Min	Top	-29.47	-4.31	-1.80	-0.19	0.26	-7.95
Roof top	CORE LIFT4	USD ENV Min	Bottom	-45.04	-17.87	-5.13	-0.20	-6.23	-16.91
Roof top	CORE LIFT5	USD ENV Min	Top	-16.97	-13.85	-4.25	-0.71	0.10	-1.32

Pier Forces : Strength Load Env.

Story	Pier	Load Case	Location	P tonf	V2 tonf	V3 tonf	T tonf-m	M2 tonf-m	M3 tonf-m
Rooftop	CORE LIFT5	USD ENV Min	Bottom	-17.56	-13.85	-4.25	-0.71	0.01	-8.95
Rooftop	CORE LIFT6	USD ENV Min	Top	-14.59	-14.19	-4.93	0.00	0.31	-0.18
Rooftop	CORE LIFT6	USD ENV Min	Bottom	-15.10	-14.19	-4.93	0.00	0.05	-9.81
Rooftop	CORE LIFT7	USD ENV Min	Top	-58.46	-23.67	-5.72	0.01	-0.45	4.36
Rooftop	CORE LIFT7	USD ENV Min	Bottom	-38.81	-21.49	-2.89	-0.16	-2.92	-20.95
Rooftop	CORE ST1a	USD ENV Min	Top	-46.39	-45.69	-4.88	2.10	2.26	-9.85
Rooftop	CORE ST1a	USD ENV Min	Bottom	-70.21	-31.80	-2.01	1.04	-2.27	-11.01
Rooftop	CORE ST1b	USD ENV Min	Top	-48.82	-49.09	4.70	-3.00	-18.94	-32.90
Rooftop	CORE ST1b	USD ENV Min	Bottom	-70.20	-55.01	2.32	-9.19	3.82	4.44
Rooftop	CORE ST1c	USD ENV Min	Top	-31.27	-47.00	-0.08	-1.16	-0.27	-9.59
Rooftop	CORE ST1c	USD ENV Min	Bottom	-29.91	-29.79	-0.14	-0.24	-0.17	-21.19
Rooftop	CORE ST1d	USD ENV Min	Top	-38.90	-33.27	1.84	-0.35	-4.99	9.63
Rooftop	CORE ST1d	USD ENV Min	Bottom	-10.90	-29.18	1.51	-0.28	1.65	-28.84
Rooftop	CORE ST2a	USD ENV Min	Top	-87.24	-1.18	9.40	-0.74	-29.52	-86.37
Rooftop	CORE ST2a	USD ENV Min	Bottom	-89.46	-2.51	7.90	-4.05	9.93	-52.24
Rooftop	CORE ST2b	USD ENV Min	Top	0.99	-12.08	1.25	-0.83	-2.08	-2.51
Rooftop	CORE ST2b	USD ENV Min	Bottom	-20.01	-9.87	-0.23	-0.40	-0.12	-2.05
Rooftop	CORE ST2c	USD ENV Min	Top	-75.64	-45.93	8.55	-2.63	-24.71	29.07
Rooftop	CORE ST2c	USD ENV Min	Bottom	-79.16	-45.02	7.05	-1.09	9.15	-29.59
8th	CORE LIFT1	USD ENV Min	Top	-52.84	-21.86	-1.78	-1.37	-1.47	-29.74
8th	CORE LIFT1	USD ENV Min	Bottom	-55.00	-34.54	-9.85	-13.52	-8.32	-18.16
8th	CORE LIFT2	USD ENV Min	Top	-107.84	-46.90	-0.26	-0.63	-0.35	-0.49
8th	CORE LIFT2	USD ENV Min	Bottom	-135.19	-49.65	-0.88	-2.77	-0.51	-17.56
8th	CORE LIFT3	USD ENV Min	Top	-108.75	-20.93	-2.54	-8.13	-0.83	-30.27
8th	CORE LIFT3	USD ENV Min	Bottom	-145.30	-35.26	-8.54	-11.60	-7.23	-21.06
8th	CORE LIFT4	USD ENV Min	Top	-39.41	-3.82	-1.64	-0.21	-0.06	-3.05
8th	CORE LIFT4	USD ENV Min	Bottom	-49.96	-17.43	-4.67	-0.19	-5.90	-16.77
8th	CORE LIFT5	USD ENV Min	Top	-12.77	-20.30	-3.80	-0.61	-0.22	-9.01
8th	CORE LIFT5	USD ENV Min	Bottom	-13.36	-20.30	-3.80	-0.61	-0.06	-8.53
8th	CORE LIFT6	USD ENV Min	Top	-9.83	-21.94	-4.25	-0.08	0.14	-6.86
8th	CORE LIFT6	USD ENV Min	Bottom	-10.34	-21.94	-4.25	-0.08	0.01	-9.49
8th	CORE LIFT7	USD ENV Min	Top	-74.75	-29.25	-3.42	-0.10	-1.00	6.64
8th	CORE LIFT7	USD ENV Min	Bottom	-57.80	-21.11	-2.93	-0.21	-2.91	-20.79
8th	CORE ST1a	USD ENV Min	Top	-82.92	-72.77	-4.61	2.50	2.04	-10.81
8th	CORE ST1a	USD ENV Min	Bottom	-109.90	-51.18	-1.84	1.03	-2.11	-22.47
8th	CORE ST1b	USD ENV Min	Top	-103.49	-71.46	3.01	-5.73	-16.65	-24.17
8th	CORE ST1b	USD ENV Min	Bottom	-135.91	-76.92	0.23	-10.76	1.79	-15.68
8th	CORE ST1c	USD ENV Min	Top	-35.01	-58.24	-0.48	-1.05	-0.47	-12.96
8th	CORE ST1c	USD ENV Min	Bottom	-32.12	-34.88	-0.18	-0.25	-0.12	-25.84
8th	CORE ST1d	USD ENV Min	Top	-59.63	-32.02	1.78	-0.44	-5.04	9.32
8th	CORE ST1d	USD ENV Min	Bottom	-34.03	-26.44	1.16	-0.33	1.37	-26.29
8th	CORE ST2a	USD ENV Min	Top	-170.45	-25.01	7.32	-3.46	-21.77	-128.12
8th	CORE ST2a	USD ENV Min	Bottom	-175.30	-26.27	5.99	-3.10	8.37	-92.05
8th	CORE ST2b	USD ENV Min	Top	-21.97	-19.27	-0.01	-0.92	-0.37	-2.16
8th	CORE ST2b	USD ENV Min	Bottom	-31.66	-16.92	-0.18	-0.36	-0.11	-3.05
8th	CORE ST2c	USD ENV Min	Top	-156.13	-36.22	7.22	-1.82	-22.63	6.70
8th	CORE ST2c	USD ENV Min	Bottom	-165.87	-36.23	5.56	-1.51	7.85	-20.82
7th	CORE LIFT1	USD ENV Min	Top	-55.31	-27.52	-2.45	-2.32	-2.08	-26.95
7th	CORE LIFT1	USD ENV Min	Bottom	-81.76	-43.24	-11.02	-15.26	-9.39	-25.94
7th	CORE LIFT2	USD ENV Min	Top	-146.88	-76.17	-0.46	-0.84	-0.20	13.41
7th	CORE LIFT2	USD ENV Min	Bottom	-170.48	-78.49	-1.23	-2.91	-0.88	-57.39
7th	CORE LIFT3	USD ENV Min	Top	-146.24	-27.90	-3.06	-9.28	0.09	-26.03
7th	CORE LIFT3	USD ENV Min	Bottom	-189.41	-51.52	-9.68	-12.37	-8.19	-29.16

Pier Forces : Strength Load Env.

Story	Pier	Load Case	Location	P tonf	V2 tonf	V3 tonf	T tonf-m	M2 tonf-m	M3 tonf-m
7th	CORE LIFT4	USD ENV Min	Top	-43.23	-3.81	-1.70	-0.23	-0.18	-2.32
7th	CORE LIFT4	USD ENV Min	Bottom	-58.04	-18.87	-4.66	-0.21	-5.87	-18.38
7th	CORE LIFT5	USD ENV Min	Top	-15.20	-22.12	-3.79	-0.62	-0.32	-9.00
7th	CORE LIFT5	USD ENV Min	Bottom	-15.80	-22.12	-3.79	-0.62	-0.08	-9.55
7th	CORE LIFT6	USD ENV Min	Top	-9.04	-23.37	-4.25	-0.10	0.02	-7.55
7th	CORE LIFT6	USD ENV Min	Bottom	-9.63	-23.37	-4.25	-0.10	-0.01	-10.26
7th	CORE LIFT7	USD ENV Min	Top	-92.74	-30.71	-3.58	-0.08	-1.12	8.01
7th	CORE LIFT7	USD ENV Min	Bottom	-82.00	-22.30	-3.02	-0.32	-2.98	-21.19
7th	CORE ST1a	USD ENV Min	Top	-125.41	-96.51	-4.83	2.46	2.17	-7.28
7th	CORE ST1a	USD ENV Min	Bottom	-156.44	-66.32	-1.81	1.00	-2.08	-34.72
7th	CORE ST1b	USD ENV Min	Top	-175.39	-91.59	2.69	-8.05	-17.21	5.46
7th	CORE ST1b	USD ENV Min	Bottom	-222.83	-97.80	-1.16	-12.28	0.30	-66.11
7th	CORE ST1c	USD ENV Min	Top	-40.81	-67.81	-0.52	-1.12	-0.45	-23.00
7th	CORE ST1c	USD ENV Min	Bottom	-50.34	-40.04	-0.29	-0.30	-0.19	-31.77
7th	CORE ST1d	USD ENV Min	Top	-84.88	-34.48	1.82	-0.47	-5.08	10.56
7th	CORE ST1d	USD ENV Min	Bottom	-68.03	-27.84	0.84	-0.37	1.11	-25.04
7th	CORE ST2a	USD ENV Min	Top	-257.01	-40.98	7.71	-4.12	-22.95	-159.73
7th	CORE ST2a	USD ENV Min	Bottom	-262.82	-42.60	5.76	-3.93	7.96	-161.53
7th	CORE ST2b	USD ENV Min	Top	-32.23	-27.01	0.05	-1.14	-0.44	-2.49
7th	CORE ST2b	USD ENV Min	Bottom	-48.83	-23.32	-0.40	-0.36	-0.23	-5.39
7th	CORE ST2c	USD ENV Min	Top	-243.12	-46.26	7.58	-2.33	-22.56	21.34
7th	CORE ST2c	USD ENV Min	Bottom	-258.27	-46.19	5.24	-1.81	7.37	-45.54
6th	CORE LIFT1	USD ENV Min	Top	-91.87	-32.74	-2.93	-3.38	-3.16	-22.27
6th	CORE LIFT1	USD ENV Min	Bottom	-129.26	-51.43	-12.06	-16.72	-11.49	-38.64
6th	CORE LIFT2	USD ENV Min	Top	-181.61	-100.49	-0.49	-1.01	-0.19	1.63
6th	CORE LIFT2	USD ENV Min	Bottom	-207.58	-102.31	-1.50	-3.01	-1.23	-109.19
6th	CORE LIFT3	USD ENV Min	Top	-192.36	-33.61	-3.43	-10.38	0.82	-20.76
6th	CORE LIFT3	USD ENV Min	Bottom	-256.70	-65.70	-10.80	-14.02	-9.78	-44.44
6th	CORE LIFT4	USD ENV Min	Top	-52.43	-3.67	-1.62	-0.25	-0.34	-2.41
6th	CORE LIFT4	USD ENV Min	Bottom	-81.21	-20.24	-4.47	-0.22	-5.64	-20.31
6th	CORE LIFT5	USD ENV Min	Top	-18.65	-24.78	-3.65	-0.60	-0.43	-9.20
6th	CORE LIFT5	USD ENV Min	Bottom	-19.16	-24.78	-3.65	-0.60	-0.11	-10.79
6th	CORE LIFT6	USD ENV Min	Top	-10.80	-25.88	-4.11	-0.11	-0.11	-8.08
6th	CORE LIFT6	USD ENV Min	Bottom	-11.31	-25.88	-4.11	-0.11	-0.03	-11.22
6th	CORE LIFT7	USD ENV Min	Top	-110.49	-31.45	-3.53	-0.06	-1.23	9.14
6th	CORE LIFT7	USD ENV Min	Bottom	-117.86	-23.15	-2.97	-0.42	-2.94	-21.57
6th	CORE ST1a	USD ENV Min	Top	-175.25	-117.92	-4.95	2.45	2.25	-5.85
6th	CORE ST1a	USD ENV Min	Bottom	-208.29	-79.61	-1.76	0.97	-2.03	-48.18
6th	CORE ST1b	USD ENV Min	Top	-268.31	-108.10	2.28	-9.87	-17.25	0.05
6th	CORE ST1b	USD ENV Min	Bottom	-330.81	-114.68	-2.38	-13.74	-1.02	-132.96
6th	CORE ST1c	USD ENV Min	Top	-63.53	-76.30	-0.51	-1.21	-0.50	-36.06
6th	CORE ST1c	USD ENV Min	Bottom	-75.46	-44.50	-0.44	-0.36	-0.29	-37.72
6th	CORE ST1d	USD ENV Min	Top	-115.33	-36.09	1.84	-0.49	-5.09	12.04
6th	CORE ST1d	USD ENV Min	Bottom	-107.58	-28.88	0.55	-0.41	0.87	-25.27
6th	CORE ST2a	USD ENV Min	Top	-340.75	-55.59	7.65	-4.86	-22.45	-211.58
6th	CORE ST2a	USD ENV Min	Bottom	-366.15	-57.45	5.23	-4.34	7.35	-262.75
6th	CORE ST2b	USD ENV Min	Top	-52.66	-33.62	0.10	-1.35	-0.51	-4.14
6th	CORE ST2b	USD ENV Min	Bottom	-75.04	-28.78	-0.69	-0.35	-0.42	-8.57
6th	CORE ST2c	USD ENV Min	Top	-330.50	-57.04	7.60	-2.99	-22.35	11.23
6th	CORE ST2c	USD ENV Min	Bottom	-358.34	-56.82	4.76	-2.19	6.79	-103.20
5th	CORE LIFT1	USD ENV Min	Top	-141.50	-37.50	-3.53	-4.51	-4.43	-17.08
5th	CORE LIFT1	USD ENV Min	Bottom	-187.22	-58.86	-12.83	-17.68	-13.81	-54.29
5th	CORE LIFT2	USD ENV Min	Top	-213.36	-120.48	-0.52	-1.17	-0.23	-34.24

Pier Forces : Strength Load Env.

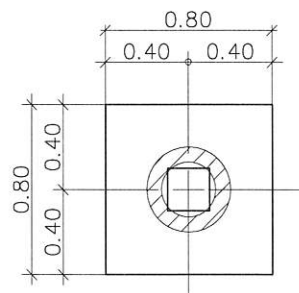
Story	Pier	Load Case	Location	P tonf	V2 tonf	V3 tonf	T tonf-m	M2 tonf-m	M3 tonf-m
5th	CORE LIFT2	USD ENV Min	Bottom	-244.10	-121.73	-1.70	-2.98	-1.53	-170.84
5th	CORE LIFT3	USD ENV Min	Top	-256.36	-38.16	-3.80	-11.34	1.22	-17.33
5th	CORE LIFT3	USD ENV Min	Bottom	-330.19	-77.34	-12.88	-15.83	-12.17	-61.71
5th	CORE LIFT4	USD ENV Min	Top	-71.94	-3.59	-1.49	-0.26	-0.46	-2.80
5th	CORE LIFT4	USD ENV Min	Bottom	-109.69	-21.18	-4.12	-0.22	-5.21	-22.07
5th	CORE LIFT5	USD ENV Min	Top	-25.08	-27.33	-3.38	-0.57	-0.51	-9.38
5th	CORE LIFT5	USD ENV Min	Bottom	-25.59	-27.33	-3.38	-0.57	-0.13	-12.03
5th	CORE LIFT6	USD ENV Min	Top	-15.52	-27.85	-3.84	-0.12	-0.19	-8.54
5th	CORE LIFT6	USD ENV Min	Bottom	-16.03	-27.85	-3.84	-0.12	-0.05	-11.97
5th	CORE LIFT7	USD ENV Min	Top	-147.87	-31.67	-3.34	-0.03	-1.28	9.85
5th	CORE LIFT7	USD ENV Min	Bottom	-158.11	-24.17	-2.78	-0.53	-2.75	-21.88
5th	CORE ST1a	USD ENV Min	Top	-228.36	-135.25	-5.09	2.39	2.38	-6.15
5th	CORE ST1a	USD ENV Min	Bottom	-260.85	-90.18	-1.73	0.97	-1.99	-62.44
5th	CORE ST1b	USD ENV Min	Top	-379.88	-121.53	1.89	-11.16	-17.34	-37.70
5th	CORE ST1b	USD ENV Min	Bottom	-453.45	-128.39	-3.25	-14.50	-2.01	-213.65
5th	CORE ST1c	USD ENV Min	Top	-94.03	-82.36	-0.54	-1.26	-0.53	-52.10
5th	CORE ST1c	USD ENV Min	Bottom	-108.46	-47.49	-0.60	-0.42	-0.42	-43.10
5th	CORE ST1d	USD ENV Min	Top	-156.20	-37.77	1.87	-0.50	-5.09	14.05
5th	CORE ST1d	USD ENV Min	Bottom	-151.17	-30.12	0.32	-0.44	0.68	-25.94
5th	CORE ST2a	USD ENV Min	Top	-430.78	-67.79	7.72	-5.43	-22.17	-307.11
5th	CORE ST2a	USD ENV Min	Bottom	-475.49	-69.79	4.89	-4.72	6.92	-386.81
5th	CORE ST2b	USD ENV Min	Top	-80.02	-38.67	0.17	-1.53	-0.59	-6.68
5th	CORE ST2b	USD ENV Min	Bottom	-106.97	-32.87	-1.03	-0.32	-0.65	-12.49
5th	CORE ST2c	USD ENV Min	Top	-418.89	-67.59	7.59	-3.56	-22.06	-43.42
5th	CORE ST2c	USD ENV Min	Bottom	-464.44	-67.14	4.45	-2.45	6.37	-182.38
4th	CORE LIFT1	USD ENV Min	Top	-200.34	-42.30	-4.20	-5.78	-5.92	-16.43
4th	CORE LIFT1	USD ENV Min	Bottom	-253.60	-65.61	-13.20	-18.14	-16.27	-73.30
4th	CORE LIFT2	USD ENV Min	Top	-249.27	-136.32	-0.48	-1.30	-0.31	-82.08
4th	CORE LIFT2	USD ENV Min	Bottom	-280.19	-136.96	-1.85	-2.78	-1.87	-241.72
4th	CORE LIFT3	USD ENV Min	Top	-325.58	-42.75	-4.15	-12.24	0.75	-17.35
4th	CORE LIFT3	USD ENV Min	Bottom	-407.54	-85.93	-15.19	-17.73	-16.35	-81.42
4th	CORE LIFT4	USD ENV Min	Top	-95.45	-3.45	-1.29	-0.27	-0.53	-3.33
4th	CORE LIFT4	USD ENV Min	Bottom	-142.75	-21.39	-3.59	-0.20	-4.55	-23.38
4th	CORE LIFT5	USD ENV Min	Top	-32.56	-29.45	-2.95	-0.52	-0.55	-9.37
4th	CORE LIFT5	USD ENV Min	Bottom	-33.07	-29.45	-2.95	-0.52	-0.14	-13.16
4th	CORE LIFT6	USD ENV Min	Top	-21.54	-28.98	-3.41	-0.11	-0.24	-8.70
4th	CORE LIFT6	USD ENV Min	Bottom	-22.05	-28.98	-3.41	-0.11	-0.06	-12.34
4th	CORE LIFT7	USD ENV Min	Top	-189.43	-31.31	-2.98	-0.01	-1.26	10.20
4th	CORE LIFT7	USD ENV Min	Bottom	-201.25	-25.04	-2.42	-0.63	-2.39	-22.02
4th	CORE ST1a	USD ENV Min	Top	-279.51	-148.57	-5.25	2.41	2.48	-9.30
4th	CORE ST1a	USD ENV Min	Bottom	-304.20	-99.22	-1.70	0.96	-1.97	-78.98
4th	CORE ST1b	USD ENV Min	Top	-505.48	-132.52	1.53	-11.85	-17.36	-101.50
4th	CORE ST1b	USD ENV Min	Bottom	-590.49	-139.89	-3.58	-14.38	-2.52	-307.75
4th	CORE ST1c	USD ENV Min	Top	-132.88	-85.16	-0.56	-1.26	-0.57	-72.78
4th	CORE ST1c	USD ENV Min	Bottom	-148.00	-48.94	-0.76	-0.50	-0.57	-47.93
4th	CORE ST1d	USD ENV Min	Top	-201.59	-39.44	1.83	-0.52	-5.07	16.17
4th	CORE ST1d	USD ENV Min	Bottom	-200.71	-32.60	0.22	-0.46	0.56	-27.77
4th	CORE ST2a	USD ENV Min	Top	-540.87	-77.61	7.65	-5.69	-21.60	-429.42
4th	CORE ST2a	USD ENV Min	Bottom	-588.99	-79.61	4.44	-4.97	6.22	-536.61
4th	CORE ST2b	USD ENV Min	Top	-113.35	-41.55	0.26	-1.65	-0.73	-10.10
4th	CORE ST2b	USD ENV Min	Bottom	-147.09	-35.03	-1.38	-0.31	-0.90	-17.03
4th	CORE ST2c	USD ENV Min	Top	-525.44	-77.16	7.42	-4.03	-21.65	-121.84
4th	CORE ST2c	USD ENV Min	Bottom	-575.80	-76.45	4.15	-2.55	5.86	-281.17

Pier Forces : Strength Load Env.

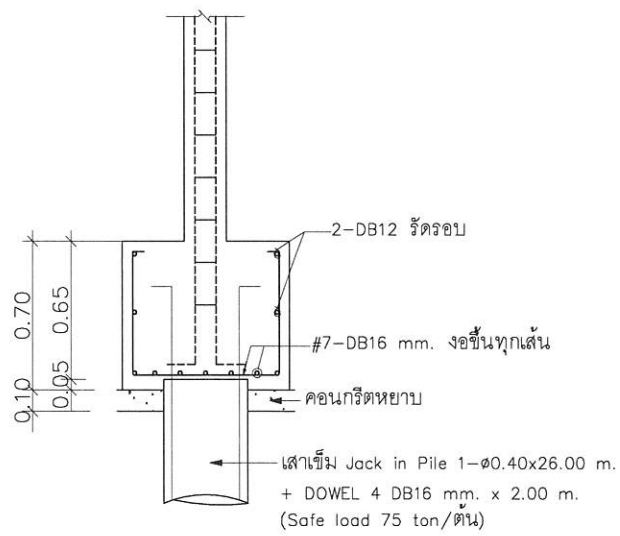
Story	Pier	Load Case	Location	P tonf	V2 tonf	V3 tonf	T tonf-m	M2 tonf-m	M3 tonf-m
3rd	CORE LIFT1	USD ENV Min	Top	-266.45	-45.32	-4.88	-6.88	-7.78	-25.88
3rd	CORE LIFT1	USD ENV Min	Bottom	-325.79	-69.56	-13.09	-17.86	-18.82	-93.70
3rd	CORE LIFT2	USD ENV Min	Top	-284.99	-148.21	-0.50	-1.26	-0.57	-139.43
3rd	CORE LIFT2	USD ENV Min	Bottom	-313.25	-148.19	-1.06	-2.26	-1.17	-323.10
3rd	CORE LIFT3	USD ENV Min	Top	-397.55	-43.41	-4.56	-13.40	-0.30	-20.64
3rd	CORE LIFT3	USD ENV Min	Bottom	-479.03	-87.95	-17.25	-19.39	-21.34	-103.05
3rd	CORE LIFT4	USD ENV Min	Top	-122.40	-3.32	-1.02	-0.27	-0.49	-3.90
3rd	CORE LIFT4	USD ENV Min	Bottom	-179.69	-20.42	-2.83	-0.18	-3.62	-23.34
3rd	CORE LIFT5	USD ENV Min	Top	-40.80	-30.74	-2.33	-0.46	-0.51	-9.06
3rd	CORE LIFT5	USD ENV Min	Bottom	-41.31	-30.74	-2.33	-0.46	-0.13	-14.00
3rd	CORE LIFT6	USD ENV Min	Top	-28.69	-29.19	-2.80	-0.11	-0.20	-8.56
3rd	CORE LIFT6	USD ENV Min	Bottom	-29.20	-29.19	-2.80	-0.11	-0.05	-12.36
3rd	CORE LIFT7	USD ENV Min	Top	-233.70	-30.72	-2.50	-0.02	-1.11	9.23
3rd	CORE LIFT7	USD ENV Min	Bottom	-247.16	-26.32	-1.89	-0.71	-1.83	-23.14
3rd	CORE ST1a	USD ENV Min	Top	-312.46	-174.42	-5.35	2.54	2.63	-15.76
3rd	CORE ST1a	USD ENV Min	Bottom	-325.15	-124.08	-1.68	0.87	-1.89	-160.80
3rd	CORE ST1b	USD ENV Min	Top	-647.03	-142.30	2.05	-12.14	-17.49	-184.25
3rd	CORE ST1b	USD ENV Min	Bottom	-753.57	-149.23	-3.91	-11.77	-3.12	-421.28
3rd	CORE ST1c	USD ENV Min	Top	-177.79	-81.64	-0.54	-1.18	-0.59	-97.98
3rd	CORE ST1c	USD ENV Min	Bottom	-193.09	-46.68	-0.92	-0.60	-0.71	-49.61
3rd	CORE ST1d	USD ENV Min	Top	-256.97	-39.28	1.41	-0.61	-4.99	16.95
3rd	CORE ST1d	USD ENV Min	Bottom	-278.89	-33.25	-0.84	-0.64	-0.59	-27.74
3rd	CORE ST2a	USD ENV Min	Top	-654.78	-82.24	8.16	-6.25	-21.69	-575.29
3rd	CORE ST2a	USD ENV Min	Bottom	-701.49	-84.00	5.25	-5.00	7.58	-707.37
3rd	CORE ST2b	USD ENV Min	Top	-155.27	-40.40	0.29	-1.68	-0.88	-14.55
3rd	CORE ST2b	USD ENV Min	Bottom	-192.86	-33.74	-1.87	-0.35	-1.28	-22.89
3rd	CORE ST2c	USD ENV Min	Top	-637.48	-85.92	7.54	-3.82	-21.59	-221.22
3rd	CORE ST2c	USD ENV Min	Bottom	-686.46	-84.86	4.69	-2.64	6.68	-402.17
2nd	CORE LIFT1	USD ENV Min	Top	-336.27	-67.03	-6.20	-9.92	-9.23	-34.36
2nd	CORE LIFT1	USD ENV Min	Bottom	-408.35	-86.16	-12.33	-17.74	-24.82	-145.41
2nd	CORE LIFT2	USD ENV Min	Top	-304.43	-151.25	-2.42	-2.04	-0.30	-213.80
2nd	CORE LIFT2	USD ENV Min	Bottom	-316.34	-148.70	-4.02	-2.92	-4.64	-387.29
2nd	CORE LIFT3	USD ENV Min	Top	-457.25	-64.21	-5.79	-19.65	-1.58	-33.88
2nd	CORE LIFT3	USD ENV Min	Bottom	-579.22	-125.45	-24.78	-21.87	-35.60	-155.13
2nd	CORE LIFT4	USD ENV Min	Top	-157.69	-4.32	-0.49	-0.28	-0.52	-4.32
2nd	CORE LIFT4	USD ENV Min	Bottom	-220.58	-17.14	-1.49	-0.11	-2.31	-30.24
2nd	CORE LIFT5	USD ENV Min	Top	-44.87	-31.32	-1.51	-0.48	-0.50	-8.98
2nd	CORE LIFT5	USD ENV Min	Bottom	-45.38	-31.32	-1.51	-0.48	-0.11	-14.89
2nd	CORE LIFT6	USD ENV Min	Top	-33.47	-27.10	-2.04	-0.09	-0.20	-9.10
2nd	CORE LIFT6	USD ENV Min	Bottom	-33.98	-27.10	-2.04	-0.09	-0.05	-10.52
2nd	CORE LIFT7	USD ENV Min	Top	-280.97	-31.47	-2.34	-0.12	-1.06	7.12
2nd	CORE LIFT7	USD ENV Min	Bottom	-297.64	-29.17	-2.35	-1.40	-2.02	-24.67
2nd	CORE ST1a	USD ENV Min	Top	-334.99	-145.75	-6.49	3.45	2.65	-59.24
2nd	CORE ST1a	USD ENV Min	Bottom	-408.71	-76.86	-2.31	-0.01	-2.44	-70.47
2nd	CORE ST1b	USD ENV Min	Top	-818.11	-156.48	0.17	-4.99	-16.72	-303.57
2nd	CORE ST1b	USD ENV Min	Bottom	-909.16	-161.28	-3.09	-6.82	-3.79	-632.42
2nd	CORE ST1c	USD ENV Min	Top	-231.12	-81.50	-0.44	-1.14	-0.62	-131.30
2nd	CORE ST1c	USD ENV Min	Bottom	-267.41	-61.01	-2.04	-0.96	-1.70	-78.28
2nd	CORE ST1d	USD ENV Min	Top	-355.29	-38.42	1.06	-0.78	-5.09	14.66
2nd	CORE ST1d	USD ENV Min	Bottom	-360.78	-29.59	-1.09	-0.24	-0.77	-30.02
2nd	CORE ST2a	USD ENV Min	Top	-767.59	-83.66	5.35	-3.77	-17.70	-742.04
2nd	CORE ST2a	USD ENV Min	Bottom	-823.38	-85.38	0.45	-5.82	-0.15	-885.79
2nd	CORE ST2b	USD ENV Min	Top	-200.04	-32.57	0.46	-2.00	-1.33	-19.65

Pier Forces : Strength Load Env.

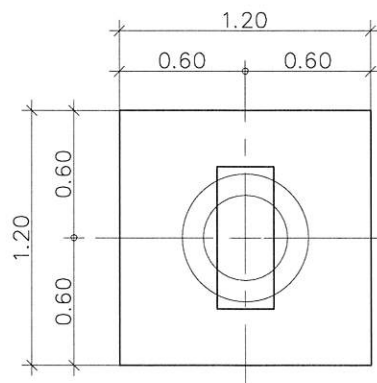
Story	Pier	Load Case	Location	P tonf	V2 tonf	V3 tonf	T tonf-m	M2 tonf-m	M3 tonf-m
2nd	CORE ST2b	USD ENV Min	Bottom	-279.11	-24.27	-3.92	-0.25	-2.38	-11.73
2nd	CORE ST2c	USD ENV Min	Top	-748.85	-97.09	5.72	-9.06	-19.59	-345.79
2nd	CORE ST2c	USD ENV Min	Bottom	-794.82	-94.87	1.91	-2.10	2.46	-539.72
1st	CORE LIFT1	USD ENV Min	Top	-400.13	-33.18	-23.36	-25.18	-11.27	-77.61
1st	CORE LIFT1	USD ENV Min	Bottom	-419.22	-42.17	-14.40	-8.65	-13.54	-91.79
1st	CORE LIFT2	USD ENV Min	Top	-326.48	-103.59	-3.84	-1.15	-1.29	-301.86
1st	CORE LIFT2	USD ENV Min	Bottom	-335.78	-99.25	-3.49	-0.95	-4.11	-407.71
1st	CORE LIFT3	USD ENV Min	Top	-546.77	-35.26	-26.49	-20.42	-1.08	-57.41
1st	CORE LIFT3	USD ENV Min	Bottom	-555.57	-55.45	-15.71	-7.62	-13.20	-86.02
1st	CORE LIFT4	USD ENV Min	Top	-153.48	-32.88	-0.95	-0.08	-0.68	-5.09
1st	CORE LIFT4	USD ENV Min	Bottom	-145.42	-25.12	-0.96	-0.03	-1.29	-14.75
1st	CORE LIFT5	USD ENV Min	Top	-105.11	-32.93	-0.84	-0.19	-0.51	-12.56
1st	CORE LIFT5	USD ENV Min	Bottom	-152.01	-20.47	-0.71	-0.08	-0.98	-10.36
1st	CORE LIFT6	USD ENV Min	Top	-86.58	-27.86	-1.01	-0.12	-0.31	-12.13
1st	CORE LIFT6	USD ENV Min	Bottom	-127.84	-20.37	-0.96	-0.24	-1.13	-10.89
1st	CORE LIFT7	USD ENV Min	Top	-331.12	-30.47	-1.12	-0.16	-0.40	5.04
1st	CORE LIFT7	USD ENV Min	Bottom	-329.71	-21.96	-1.56	-0.87	-1.35	-18.50
1st	CORE ST1a	USD ENV Min	Top	-490.23	-101.63	-4.27	0.79	1.39	-100.72
1st	CORE ST1a	USD ENV Min	Bottom	-570.62	-83.72	-2.85	-2.30	-2.91	-134.04
1st	CORE ST1b	USD ENV Min	Top	-914.79	-133.58	-1.84	-34.26	-17.18	-418.58
1st	CORE ST1b	USD ENV Min	Bottom	-923.20	-131.70	-7.45	-12.59	-5.33	-464.10
1st	CORE ST1c	USD ENV Min	Top	-346.12	-102.19	-0.97	-1.28	-1.17	-86.21
1st	CORE ST1c	USD ENV Min	Bottom	-423.62	-90.56	-5.11	-2.01	-4.02	-105.52
1st	CORE ST1d	USD ENV Min	Top	-395.49	-51.97	1.34	-2.39	-6.16	6.62
1st	CORE ST1d	USD ENV Min	Bottom	-377.61	-23.38	-1.99	-0.22	-1.30	-22.80
1st	CORE ST2a	USD ENV Min	Top	-866.76	-57.81	0.95	-4.05	-8.59	-863.03
1st	CORE ST2a	USD ENV Min	Bottom	-894.27	-57.19	-2.15	-5.10	-2.75	-926.72
1st	CORE ST2b	USD ENV Min	Top	-303.49	-53.33	1.10	-1.15	-1.55	-13.66
1st	CORE ST2b	USD ENV Min	Bottom	-371.53	-50.77	-4.98	-0.57	-3.37	-72.77
1st	CORE ST2c	USD ENV Min	Top	-786.84	-80.63	6.39	-3.13	-18.83	-430.66
1st	CORE ST2c	USD ENV Min	Bottom	-766.41	-80.81	-1.64	0.21	-2.17	-469.32
1st	CORE ST2d	USD ENV Min	Top	-139.36	-76.82	-8.33	-3.57	0.96	-9.48
1st	CORE ST2d	USD ENV Min	Bottom	-228.42	-83.54	-2.43	0.32	-2.36	-48.82



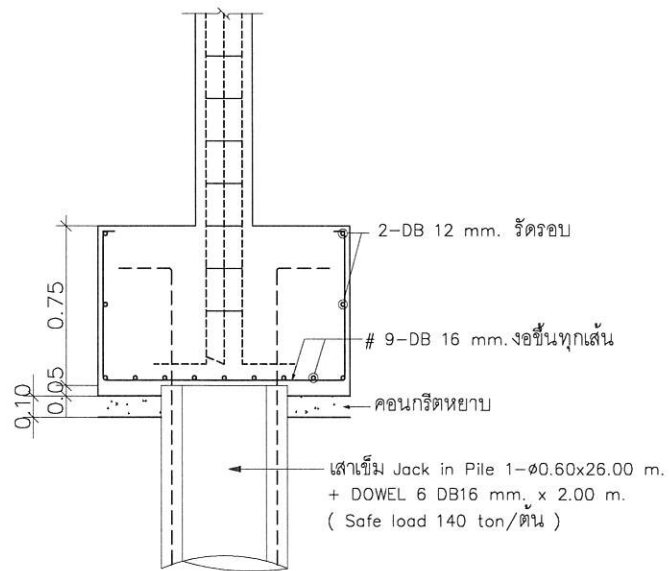
F1A-PLAN



F1A-SECTION



F1-PLAN



F1-SECTION

ออกแบบฐานราก F2

$$f_y = 4000 \text{ kg/cm}^2$$

$$f_c = 280 \text{ kg/cm}^2$$

$$\text{ขนาดฐานราก} = 1.20 \times 3.00 \times 1.10 \text{ m.}$$

น้ำหนักบรรทุก

$$DL = 180.20 \text{ T.} \quad LL = 69.42 \text{ T.}$$

$$\begin{aligned} \text{น้ำหนักบรรทุกใช้งานที่เพิ่มค่าแล้ว} &= 1.4 DL + 1.7 LL \\ &= (1.4 \times 180.2) + (1.7 \times 69.42) \\ &= 370.30 \text{ T.} \end{aligned}$$

$$\begin{aligned} \text{น้ำหนักฐานราก} &= 1.4 \times (1.20 \times 3.00 \times 1.10 \times 2.4) \\ &= 13.31 \text{ T.} \end{aligned}$$

$$\begin{aligned} \text{น้ำหนักที่เสาเข็มต้องรับในแต่ละต้น} &= \frac{383.61}{2} = 191.81 \text{ T.} \end{aligned}$$

พิจารณาแรงเฉือนแบบคานกว้างที่หน้าตัดซึ่งห่างจากขอบเสา = 100 cm.

เนื่องจากศูนย์กลางของเสาเข็มอยู่ภายใต้หน้าตัดวิกฤต ทำให้แรงต้านทานเป็นศูนย์

พิจารณาแรงเฉือนทะลุ

- ตามเส้นขอบเสา ซึ่งห่างจากขอบเสาเป็นระยะ $100/2 = 50 \text{ cm.}$

$$b_o = 494 \text{ cm.}$$

$$V_u = 2 \times 191.81 = 383.62 \text{ T.}$$

$$\begin{aligned} \phi V_c &= 1.06 \phi \sqrt{f_c} b_o d = 1.06 \times 0.85 \times \sqrt{280} \times 494 \times 100 / 1000 \\ &= 744.78 \text{ T.} > V_u \quad \text{O.K.} \end{aligned}$$

หาเหล็กเสริม

ด้านสั้น $b = 3.00 \text{ m.}$

$$A_{smin} = 0.0018 \times 300 \times 110 = 59.40 \text{ cm}^2$$

ใช้เหล็ก 20 - DB 20 m. ($A_s = 62.83 \text{ cm}^2$)

ด้านยาว $b = 1.20 \text{ m}$.

โมเมนต์ M_u ที่ขอบเสา

$$M_u = 191.81 \times 0.77 = 147.70 \text{ T-m.}$$

$$R_u = \frac{M_u}{\phi b d^2} = \frac{147.7 \times 1000 \times 100}{0.90 \times (120 \times 100^2)} = 13.68 \text{ kg/cm}^2$$

$$\rho = \frac{0.85 \times 280}{4000} \left[1 - \sqrt{1 - 2 \times \frac{13.68}{0.85 \times 280}} \right] = 0.0036 ; (\rho < \rho_{\max})$$

$$A_s = \rho b d = 0.0036 \times 120 \times 100 = 43.20 \text{ cm}^2$$

$$A_{s_{\min}} = 0.0018 \times 120 \times 110 = 23.76 \text{ cm}^2$$

ใช้เหล็ก 13 - DB 25 m. ($A_s = 63.83 \text{ cm}^2$)

ตรวจสอบหน่วยแรงยึดเหนี่ยว

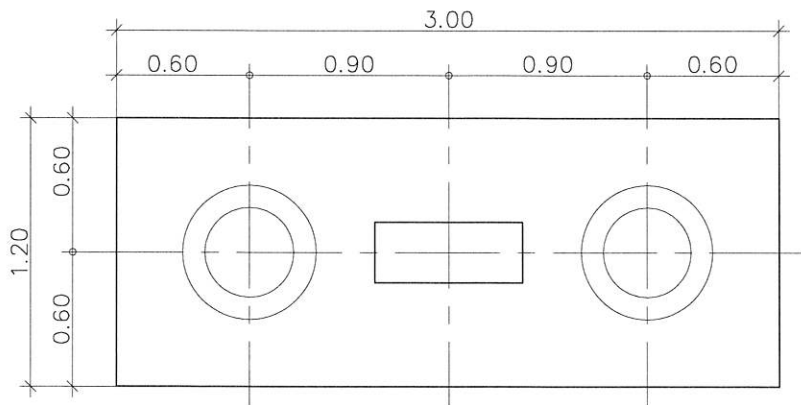
$$V_u = 191.81 \text{ T.}$$

$$\rho = \frac{A_s}{b d} = \frac{13 \times 4.91}{120 \times 100} = 0.0053$$

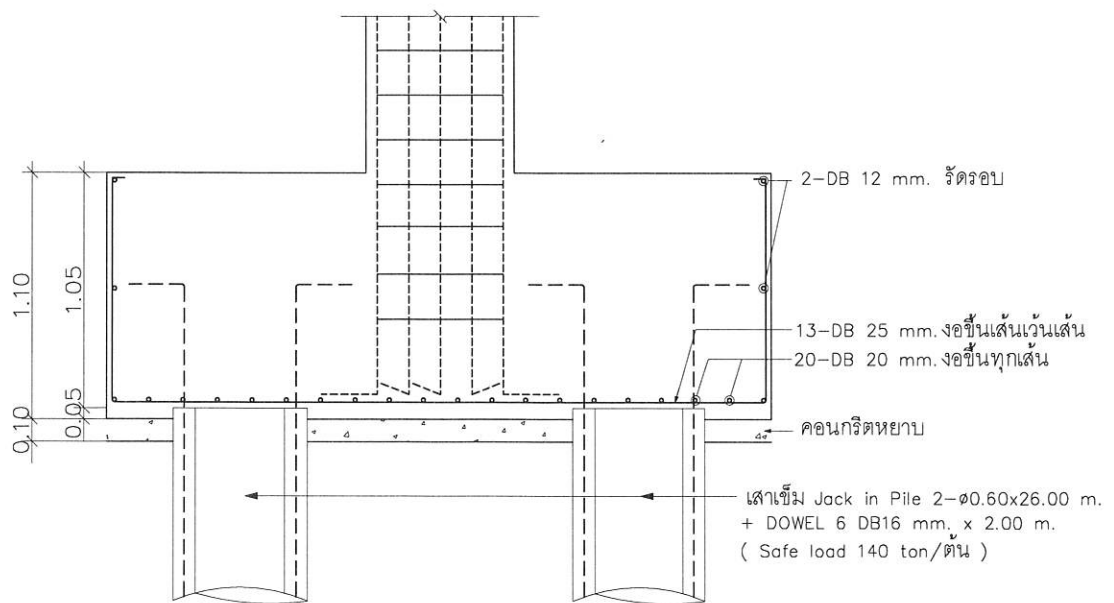
$$j = \frac{(1 - 0.59 \rho f_y)}{f_c} = \frac{(1 - 0.59 \times 0.0053 \times 4000)}{280} = 0.955$$

$$U_u = \frac{V_u}{\sum O_j d} = \frac{191.81 \times 1000}{(13 \times 7.86) \times 0.955 \times 100} = 19.67 \text{ kg/cm}^2$$

$$U_n = \frac{6.39 \sqrt{f'_c}}{d b} = \frac{6.39 \sqrt{280}}{2.5} = 42.77 > U_u \text{ OK.}$$



F2-PLAN



F2-SECTION

ออกแบบฐานราก F3

$$f_y = 4000 \text{ kg/cm}^2$$

$$f_c = 280 \text{ kg/cm}^2$$

$$\text{ขนาดฐานราก} = 5.89 \times 1.10 \text{ m}^3$$

น้ำหนักบรรทุก

$$DL = 307.78 \text{ T.} \quad LL = 81.50 \text{ T.}$$

น้ำหนักบรรทุกใช้งานที่เพิ่มค่าแล้ว

$$= 1.4 DL + 1.7 LL$$

$$= (1.4 \times 307.78) + (1.7 \times 81.5)$$

$$= 569.45 \text{ T.}$$

น้ำหนักฐานราก

$$= 1.4 \times (5.89 \times 1.10 \times 2.4)$$

$$= 21.77 \text{ T.}$$

น้ำหนักที่เสาเข็มต้องรับในแต่ละต้น

$$= \frac{591.22}{3} = 197.08 \text{ T.}$$

พิจารณาแรงเฉือนแบบคานกว้างที่หน้าตัดซึ่งห่างจากขอบเสา = 100 cm.

เนื่องจากศูนย์กลางของเสาเข็มอยู่ภายใต้หน้าตัดวิกฤต ทำให้แรงต้านทานเป็นศูนย์

พิจารณาแรงเฉือนทะลุ

- ตามเส้นขอบเสา ซึ่งห่างจากขอบเสาเป็นระยะ $100/2 = 50 \text{ cm.}$

$$b_o = 465 \text{ cm.}$$

$$V_u = 3 \times 197.08 = 591.24 \text{ T.}$$

$$\phi V_c = 1.06 \phi \sqrt{f_c} b_o d = 1.06 \times 0.85 \times \sqrt{280} \times 465 \times 100 / 1000$$

$$= 701.06 \text{ T.} > V_u \quad \text{O.K.}$$

หาเหล็กเสริม

$$b = 1.94 \text{ m.}$$

โมเมนต์ M_u ที่ข้อบเสา

$$M_u = 197.08 \times 0.8 = 157.66 \text{ T-m.}$$

$$R_u = \frac{M_u}{\phi b d^2} = \frac{157.66 \times 1000 \times 100}{0.90 \times (194 \times 100^2)} = 9.03 \text{ kg/cm}^2$$

$$\rho = \frac{0.85 \times 280}{4000} \left[1 - \sqrt{1 - 2 \times \frac{9.03}{0.85 \times 280}} \right] = 0.0023 ; (\rho < \rho_{\max})$$

$$A_s = \rho b d = 0.0023 \times 194 \times 100 = 44.62 \text{ cm}^2$$

$$A_{s_{\min}} = (0.0018 \times 194 \times 110) = 38.41 \text{ cm}^2$$

ใช้เหล็ก 12 - DB 25 m. ($A_s = 58.92 \text{ cm}^2$)

ตรวจสอบหน่วยแรงยึดเหนี่ยว

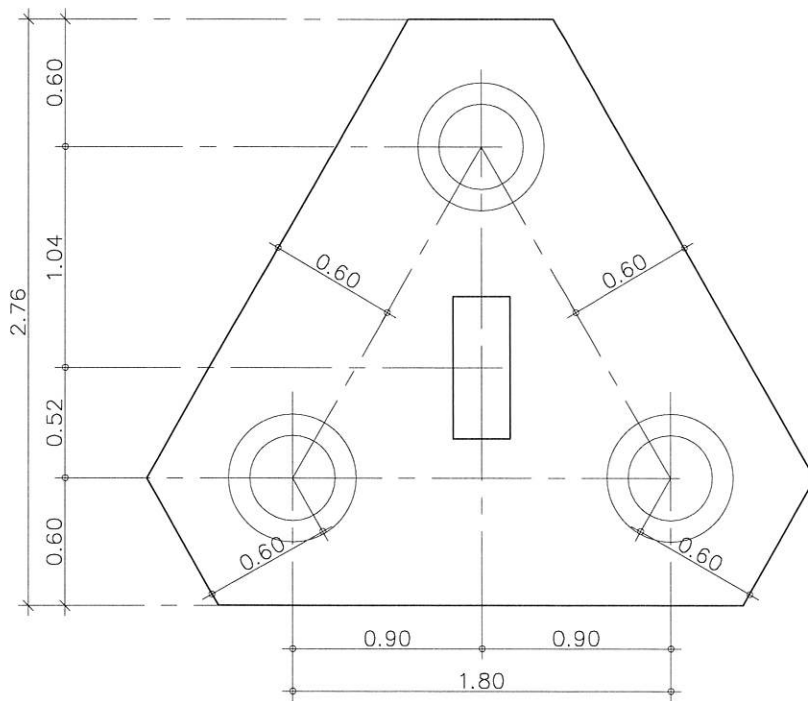
$$V_u = 197.08 \text{ T.}$$

$$\rho = \frac{A_s}{b d} = \frac{12 \times 4.91}{194 \times 100} = 0.0030$$

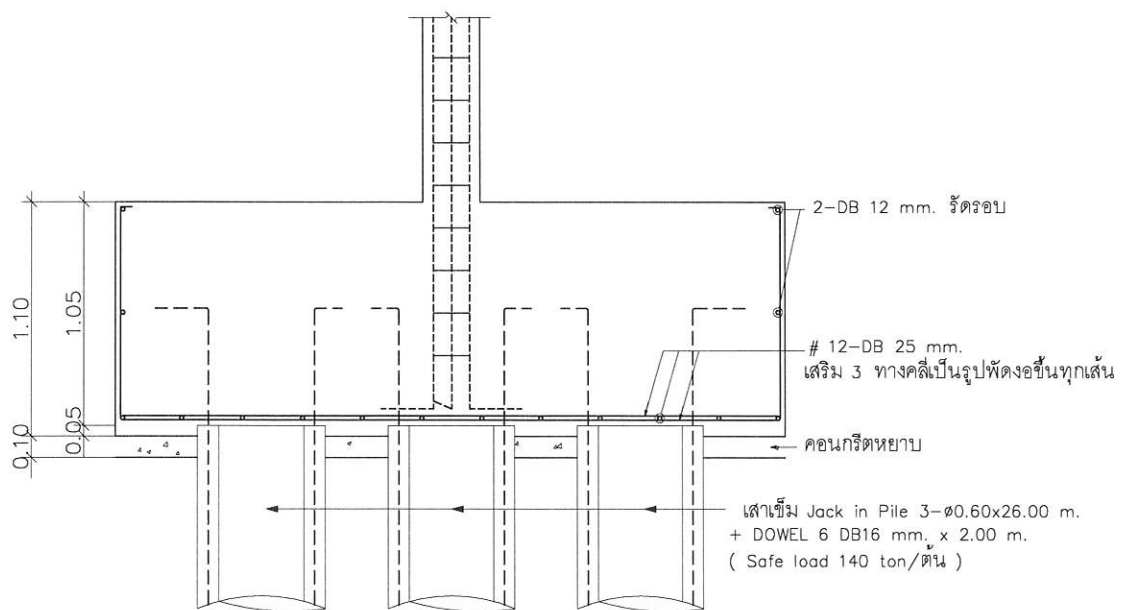
$$j = \left(1 - \frac{0.59 p f_y}{f'_c} \right) = \left(1 - \frac{0.59 \times 0.003 \times 4000}{280} \right) = 0.975$$

$$U_u = \frac{V_u}{\sum O_j d} = \frac{197.08 \times 1000}{(12 \times 7.86) \times 0.975 \times 100} = 21.45 \text{ kg/cm}^2$$

$$U_n = \frac{6.39 \sqrt{f'_c}}{d b} = \frac{6.39 \sqrt{280}}{2.5} = 42.77 > U_u \text{ OK.}$$



F3-PLAN



F3-SECTION

ออกแบบฐานราก F4

$$f_y = 4000 \text{ kg/cm}^2$$

$$f_c = 280 \text{ kg/cm}^2$$

$$\text{ขนาดฐานราก} = 3.00 \times 3.00 \times 1.10 \text{ m.}$$

น้ำหนักบรรทุก

$$DL = 378.45 \text{ T.} \quad LL = 160.00 \text{ T.}$$

$$\begin{aligned} \text{น้ำหนักบรรทุกใช้งานที่เพิ่มค่าแล้ว} &= 1.4 DL + 1.7 LL \\ &= (1.4 \times 378.45) + (1.7 \times 160) \\ &= 801.83 \text{ T.} \end{aligned}$$

$$\begin{aligned} \text{น้ำหนักฐานราก} &= 1.4 \times (3.00 \times 3.00 \times 1.10 \times 2.4) \\ &= 33.26 \text{ T.} \end{aligned}$$

$$\begin{aligned} \text{น้ำหนักที่เสาเข็มต้องรับในแต่ละต้น} &= \frac{835.09}{4} = 208.78 \text{ T.} \end{aligned}$$

พิจารณาแรงเฉือนแบบคานกว้างที่หน้าตัดซึ่งห่างจากขอบเสา = 100 cm.

เนื่องจากศูนย์กลางของเสาเข็มอยู่ภายใต้หน้าตัดวิกฤต ทำให้แรงต้านทานเป็นศูนย์

พิจารณาแรงเฉือนทะลุ

- ตามเส้นขอบเสา ซึ่งห่างจากขอบเสาเป็นระยะ $100/2 = 50 \text{ cm.}$

$$b_o = 588 \text{ cm.}$$

$$V_u = 4 \times 208.78 = 835.12 \text{ T.}$$

$$\begin{aligned} \phi V_c &= 1.06 \phi \sqrt{f_c} b_o d = 1.06 \times 0.85 \times \sqrt{280} \times 588 \times 100 / 1000 \\ &= 886.50 \text{ T.} > V_u \quad \text{O.K.} \end{aligned}$$

หาเหล็กเสริม

$$b = 3.00 \text{ m.}$$

โมเมนต์ M_u ที่ขอบเสา

$$M_u = 2 \times 208.78 \times 0.77 = 321.53 \text{ T-m.}$$

$$R_u = \frac{M_u}{\phi b d^2} = \frac{321.53 \times 1000 \times 100}{0.90 \times (300 \times 100^2)} = 11.91 \text{ kg/cm}^2$$

$$\rho = \frac{0.85 \times 280}{4000} \left[1 - \sqrt{1 - \frac{2 \times 11.91}{0.85 \times 280}} \right] = 0.0031 ; (\rho < \rho_{\max})$$

$$A_s = \rho b d = 0.0031 \times 300 \times 100 = 93.00 \text{ cm}^2$$

$$A_{s_{\min}} = 0.0018 b t = 0.0018 \times 300 \times 110 = 59.40 \text{ cm}^2$$

ใช้เหล็ก 20 - DB 25 m. ($A_s = 98.2 \text{ cm}^2$)

ตรวจสอบหน่วยแรงยึดเหนี่ยว

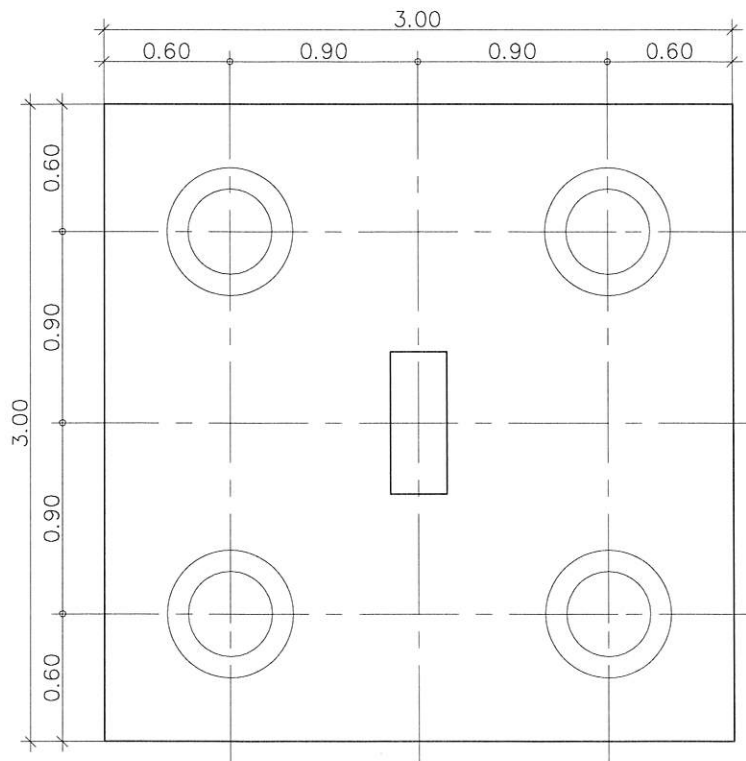
$$V_u = 2 \times 208.78 = 417.56 \text{ T.}$$

$$\rho = \frac{A_s}{b d} = \frac{20 \times 4.91}{300 \times 100} = 0.0033$$

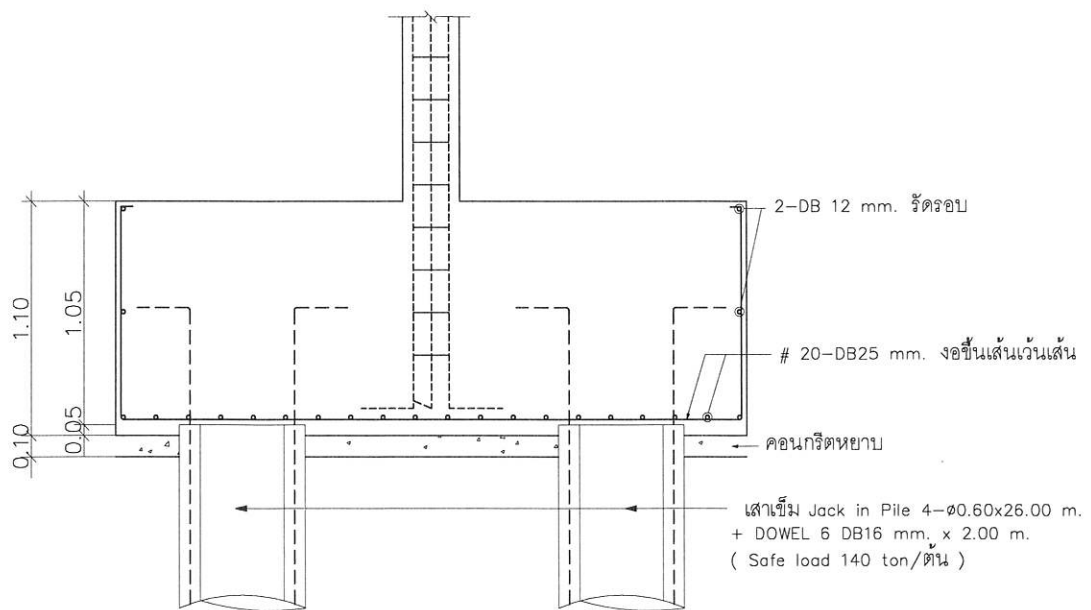
$$j = \frac{(1 - 0.59 \rho f_y)}{f_c} = \frac{(1 - 0.59 \times 0.0033 \times 4000)}{280} = 0.972$$

$$U_u = \frac{V_u}{\sum O_{jd}} = \frac{417.56 \times 1000}{(20 \times 7.86) \times 0.972 \times 100} = 27.35 \text{ kg/cm}^2$$

$$U_n = \frac{6.39 \sqrt{f'_c}}{d b} = \frac{6.39 \sqrt{280}}{2.5} = 42.77 > U_u \text{ OK.}$$



F4-PLAN



F4-SECTION

ออกแบบฐานราก F9A

$$f_y = 4,000 \text{ kg/cm}^2$$

$$f_c = 280 \text{ kg/cm}^2$$

$$\text{ขนาดฐานราก} = 5.80 \times 6.70 \times 1.20 \text{ m.}$$

$$\begin{aligned}\text{น้ำหนักบรรทุกที่เพิ่มค่าแล้ว} &= 1.4\text{DL} + 1.7\text{LL} \\ &= (1.4 \times 536.5202) + (1.7 \times 122.2713) \\ &= 958.99 \text{ T.}\end{aligned}$$

$$\begin{aligned}\text{น้ำหนักฐานราก} &= 1.4 \times (5.80 \times 6.70 \times 1.20 \times 2.40) \\ &= 156.69 \text{ T.}\end{aligned}$$

น้ำหนักที่เสาเข็มต้องรับในแต่ละต้น

$$\begin{aligned}P_1 = P_2 = P_3 &= \frac{P}{N} \pm m_x \pm n_y = 133.78 \text{ T.} \\ P_4 = P_5 = P_6 &= \frac{P}{N} \pm m_x \pm n_y = 124.59 \text{ T.} \\ P_7 = P_8 = P_9 &= \frac{P}{N} \pm m_x \pm n_y = 113.56 \text{ T.}\end{aligned}$$

$$\text{น้ำหนักต่อพื้นที่} = \frac{1115.68}{38.86} = 28.72 \text{ T./m}^2 \quad (S = 3.88 \text{ m.})$$

หาเหล็กเสริม

ด้านสั้น

$$\begin{aligned}M^+ &= \frac{1}{8} \times 28.72 \times (3.88)^2 = 54.05 \text{ T-m.} \\ R_u &= \frac{Mu}{\phi b d^2} = \frac{54.05 \times 1000 \times 100}{0.90 \times (100 \times 110^2)} = 4.97 \text{ kg/cm}^2/\text{m.}\end{aligned}$$

$$\rho = \frac{0.85 \times 280}{4000} \left[1 - \sqrt{1 - \frac{2 \times 4.97}{0.85 \times 280}} \right] = 0.0013$$

$$A_s = \rho b d = 0.0013 \times 100 \times 110 = 14.30 \text{ cm}^2/\text{m.}$$

$$A_{smin} = \frac{0.0018 \times 100 \times 110}{2} = 9.90 \text{ cm}^2/\text{m.}$$

ใช้เหล็ก DB 20 mm. @ 0.20 m. ($A_s = 15.70 \text{ cm}^2/\text{m.}$)

$$M^- = (133.78 + 124.59 + 113.56) \times 1.20 = 446.32 \text{ T-m.}$$

$$M^- = 446.32 / 6.70 = 66.62 \text{ T-m./m.}$$

$$R_u = \frac{Mu}{\phi bd^2} = \frac{66.62 \times 1000 \times 100}{0.90 \times (100 \times 110^2)} = 6.12 \text{ kg/cm}^2/\text{m.}$$

$$\rho = \frac{0.85 \times 280}{4000} \left[1 - \sqrt{1 - \frac{2 \times 6.12}{0.85 \times 280}} \right] = 0.0016$$

$$A_s = \rho bd = 0.0016 \times 100 \times 110 = 17.60 \text{ cm}^2/\text{m.}$$

$$A_{smin} = \frac{0.0018 \times 100 \times 110}{2} = 9.90 \text{ cm}^2/\text{m.}$$

ใช้เหล็ก DB 20 mm. @ 0.15 m. ($A_s = 20.93 \text{ cm}^2/\text{m.}$)

ตรวจสอบหน่วยแรงยึดเหนี่ยว

$$V_u = 133.78 + 124.59 + 113.56 = 371.93 \text{ T.}$$

$$\rho = \frac{A_s}{bd} = \frac{20.93}{100 \times 110} = 0.0019$$

$$j = \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right) = \left(1 - \frac{0.59 \times 0.0019 \times 4000}{280} \right) = 0.984$$

$$U_u = \frac{V_u}{\sum O_j d} = \frac{371.93 \times 1000}{280.65 \times 0.984 \times 110} = 12.25 \text{ kg/cm}^2$$

$$U_n = \frac{6.39 \sqrt{f'_c}}{db} = \frac{6.39 \sqrt{280}}{2.0} = 53.46 > U_u \text{ OK.}$$

ด้านยาว

$$M^+ = 0.050 \times 28.72 \times (3.88)^2 = 21.62 \text{ T-m.}$$

$$R_u = \frac{Mu}{\phi bd^2} = \frac{21.62 \times 1000 \times 100}{0.90 \times (100 \times 110^2)} = 1.99 \text{ kg/cm}^2/\text{m.}$$

$$\rho = \frac{0.85 \times 280}{4000} \left[1 - \sqrt{1 - \frac{2 \times 1.99}{0.85 \times 280}} \right] = 0.0005$$

$$A_s = \rho bd = 0.0005 \times 100 \times 110 = 5.50 \text{ cm}^2/\text{m.}$$

$$A_{smin} = \frac{0.0018 \times 100 \times 110}{2} = 9.90 \text{ cm}^2/\text{m.}$$

ใช้เหล็ก DB 20 mm. @ 0.20 m. ($A_s = 15.70 \text{ cm}^2/\text{m.}$)

$$M' = (3 \times 133.78) \times 0.57 = 228.77 \text{ T-m.}$$

$$M' = 228.77 / 5.80 = 39.45 \text{ T-m./m.}$$

$$R_u = \frac{Mu}{\phi b d^2} = \frac{39.45 \times 1000 \times 100}{0.90 \times (100 \times 110^2)} = 3.63 \text{ kg/cm}^2/\text{m.}$$

$$\rho = \frac{0.85 \times 280}{4000} \left[1 - \sqrt{1 - \frac{2 \times 3.63}{0.85 \times 280}} \right] = 0.0010$$

$$A_s = \rho b d = 0.0010 \times 100 \times 110 = 11.00 \text{ cm}^2/\text{m.}$$

$$A_{smin} = \frac{0.0018 \times 100 \times 110}{2} = 9.90 \text{ cm}^2/\text{m.}$$

ใช้เหล็ก DB 20 mm. @ 0.20 m. ($A_s = 15.70 \text{ cm}^2/\text{m.}$)

ตรวจสอบหน่วยแรงยึดเหนี่ยว

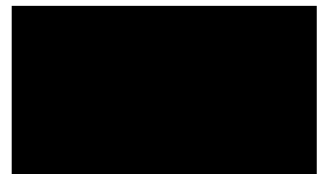
$$V_u = 3 \times 133.78 = 401.34 \text{ T.}$$

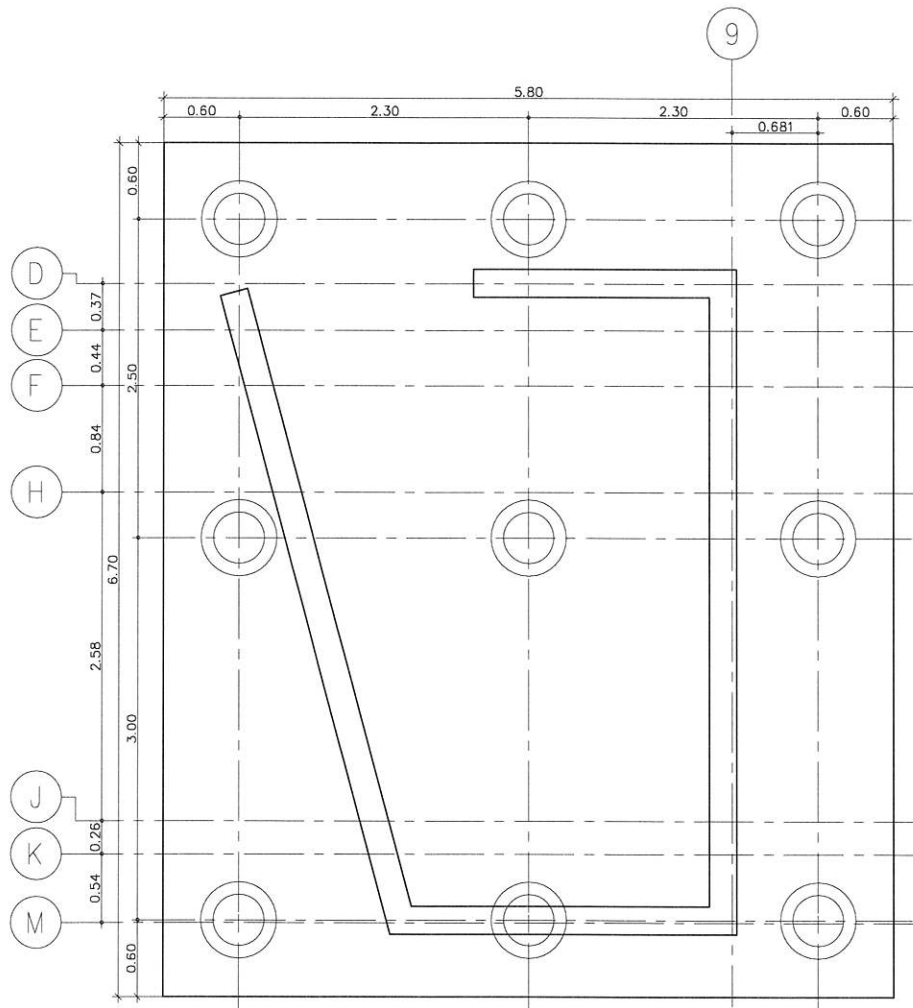
$$\rho = \frac{A_s}{b d} = \frac{15.70}{100 \times 110} = 0.0015$$

$$j = \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right) = \left(1 - \frac{0.59 \times 0.0015 \times 4000}{280} \right) = 0.988$$

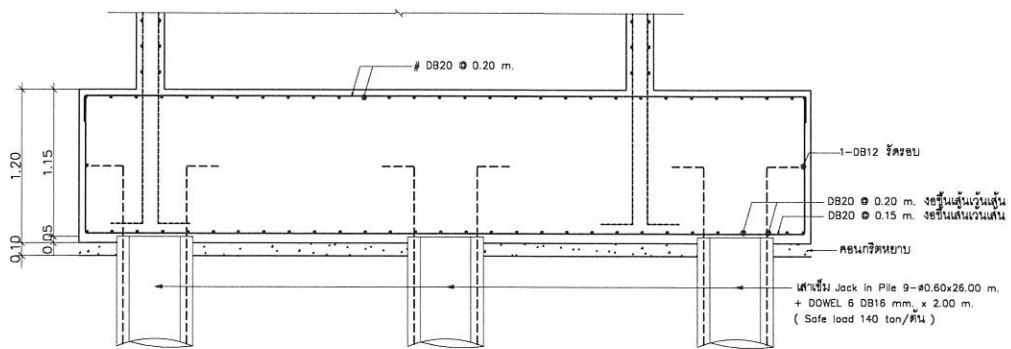
$$U_u = \frac{V_u}{\sum O_j d} = \frac{401.34 \times 1000}{182.22 \times 0.988 \times 110} = 20.27 \text{ kg/cm}^2$$

$$U_n = \frac{6.39 \sqrt{f'_c}}{d_b} = \frac{6.39 \sqrt{280}}{2.0} = 53.46 > U_u \text{ OK.}$$





F9A-PLAN



F9A-SECTION

ออกแบบฐานราก F12A

$$f_y = 4,000 \text{ kg/cm}^2$$

$$f_c = 280 \text{ kg/cm}^2$$

$$\text{ขนาดฐานราก} = 7.20 \times 8.20 \times 1.20 \text{ m.}$$

$$\begin{aligned}\text{น้ำหนักบรรทุกที่เพิ่มค่าแล้ว} &= 1.4\text{DL} + 1.7\text{LL} \\ &= (1.4 \times 856.0747) + (1.7 \times 203.8129) \\ &= 1544.99 \text{ T.}\end{aligned}$$

$$\begin{aligned}\text{น้ำหนักฐานราก} &= 1.4 \times (7.20 \times 8.20 \times 1.20 \times 2.40) \\ &= 238.05 \text{ T.}\end{aligned}$$

น้ำหนักที่เสาเข็มต้องรับในแต่ละต้น

$$P_1 = P_2 = P_3 = \frac{P}{N} \pm m_x \pm n_y = 196.97 \text{ T.}$$

$$P_4 = P_5 = P_6 = \frac{P}{N} \pm m_x \pm n_y = 167.19 \text{ T.}$$

$$P_7 = P_8 = P_9 = \frac{P}{N} \pm m_x \pm n_y = 137.42 \text{ T.}$$

$$P_{10} = P_{11} = P_{12} = \frac{P}{N} \pm m_x \pm n_y = 92.76 \text{ T.}$$

$$\text{น้ำหนักต่อพื้นที่} = \frac{1783.04}{59.04} = 30.21 \text{ T./m}^2 \quad (S = 5.97 \text{ m.})$$

หาเหล็กเสริม

ด้านสั้น

$$M^+ = \frac{1}{9} \times 30.21 \times (5.97)^2 = 119.64 \text{ T-m.}$$

$$R_u = \frac{Mu}{\phi bd^2} = \frac{119.64 \times 1000 \times 100}{0.90 \times (100 \times 110^2)} = 10.99 \text{ kg/cm}^2/\text{m.}$$

$$\rho = \frac{0.85 \times 280}{4000} \left[1 - \sqrt{1 - \frac{2 \times 10.99}{0.85 \times 280}} \right] = 0.0028$$

$$A_s = \rho bd = 0.0028 \times 100 \times 110 = 3.08 \text{ cm}^2/\text{m.}$$

$$A_{smin} = \frac{0.0018 \times 100 \times 110}{2} = 9.90 \text{ cm}^2/\text{m.}$$

ใช้เหล็ก DB 20 mm. @ 0.10 m. ($A_s = 31.40 \text{ cm}^2/\text{m.}$)

$$M^- = (196.97 + 167.19 + 137.42 + 92.76) \times 0.09 = 53.50 \text{ T-m.}$$

$$M^- = 53.50 / 8.20 = 6.53 \text{ T-m./m.}$$

$$R_u = \frac{Mu}{\phi bd^2} = \frac{6.53 \times 1000 \times 100}{0.90 \times (100 \times 110^2)} = 0.60 \text{ kg/cm}^2/\text{m.}$$

$$\rho = \frac{0.85 \times 280}{4000} \left[1 - \sqrt{1 - \frac{2 \times 0.60}{0.85 \times 280}} \right] = 0.0002$$

$$A_s = \rho bd = 0.0002 \times 100 \times 110 = 2.20 \text{ cm}^2/\text{m.}$$

$$A_{smin} = \frac{0.0018 \times 100 \times 110}{2} = 9.90 \text{ cm}^2/\text{m.}$$

ใช้เหล็ก DB 20 mm. @ 0.10 m. ($A_s = 31.40 \text{ cm}^2/\text{m.}$)

ตรวจสอบหน่วยแรงยึดเหนี่ยว

$$V_u = 196.97 + 167.19 + 137.42 + 92.76 = 594.34 \text{ T.}$$

$$\rho = \frac{A_s}{bd} = \frac{31.40}{100 \times 110} = 0.0029$$

$$j = \frac{(1 - 0.59\rho f_y)}{f_c} = \frac{(1 - 0.59 \times 0.0029 \times 4000)}{280} = 0.976$$

$$U_u = \frac{V_u}{\sum O_j d} = \frac{594.34 \times 1000}{515.22 \times 0.976 \times 110} = 10.75 \text{ kg/cm}^2$$

$$U_n = \frac{6.39 \sqrt{f_c}}{db} = \frac{6.39 \sqrt{280}}{2.0} = 53.46 > U_u \text{ OK.}$$

ด้านยาว

$$M^+ = 0.049 \times 30.21 \times (5.97)^2 = 52.76 \text{ T-m.}$$

$$R_u = \frac{Mu}{\phi bd^2} = \frac{52.76 \times 1000 \times 100}{0.90 \times (100 \times 110^2)} = 4.85 \text{ kg/cm}^2/\text{m.}$$

$$\rho = \frac{0.85 \times 280}{4000} \left[1 - \sqrt{1 - \frac{2 \times 4.85}{0.85 \times 280}} \right] = 0.0013$$

$$A_s = \rho bd = 0.0013 \times 100 \times 110 = 14.30 \text{ cm}^2/\text{m.}$$

$$A_{smin} = \frac{0.0018 \times 100 \times 110}{2} = 9.90 \text{ cm}^2/\text{m.}$$

ใช้เหล็ก DB 20 mm. @ 0.20 m. ($A_s = 15.70 \text{ cm}^2/\text{m.}$)

$$M' = (3 \times 196.97) \times 0.44 = 260.00 \text{ T-m.}$$

$$M' = 260.00 / 7.20 = 36.12 \text{ T-m./m.}$$

$$R_u = \frac{Mu}{\phi b d^2} = \frac{36.12 \times 1000 \times 100}{0.90 \times (100 \times 110^2)} = 3.32 \text{ kg/cm}^2/\text{m.}$$

$$\rho = \frac{0.85 \times 280}{4000} \left[1 - \sqrt{1 - \frac{2 \times 3.32}{0.85 \times 280}} \right] = 0.0009$$

$$A_s = \rho b d = 0.0009 \times 100 \times 110 = 9.90 \text{ cm}^2/\text{m.}$$

$$A_{smin} = \frac{0.0018 \times 100 \times 110}{2} = 9.90 \text{ cm}^2/\text{m.}$$

ใช้เหล็ก DB 20 mm. @ 0.20 m. ($A_s = 15.70 \text{ cm}^2/\text{m.}$)

ตรวจสอบหน่วยแรงยึดเหนี่ยว

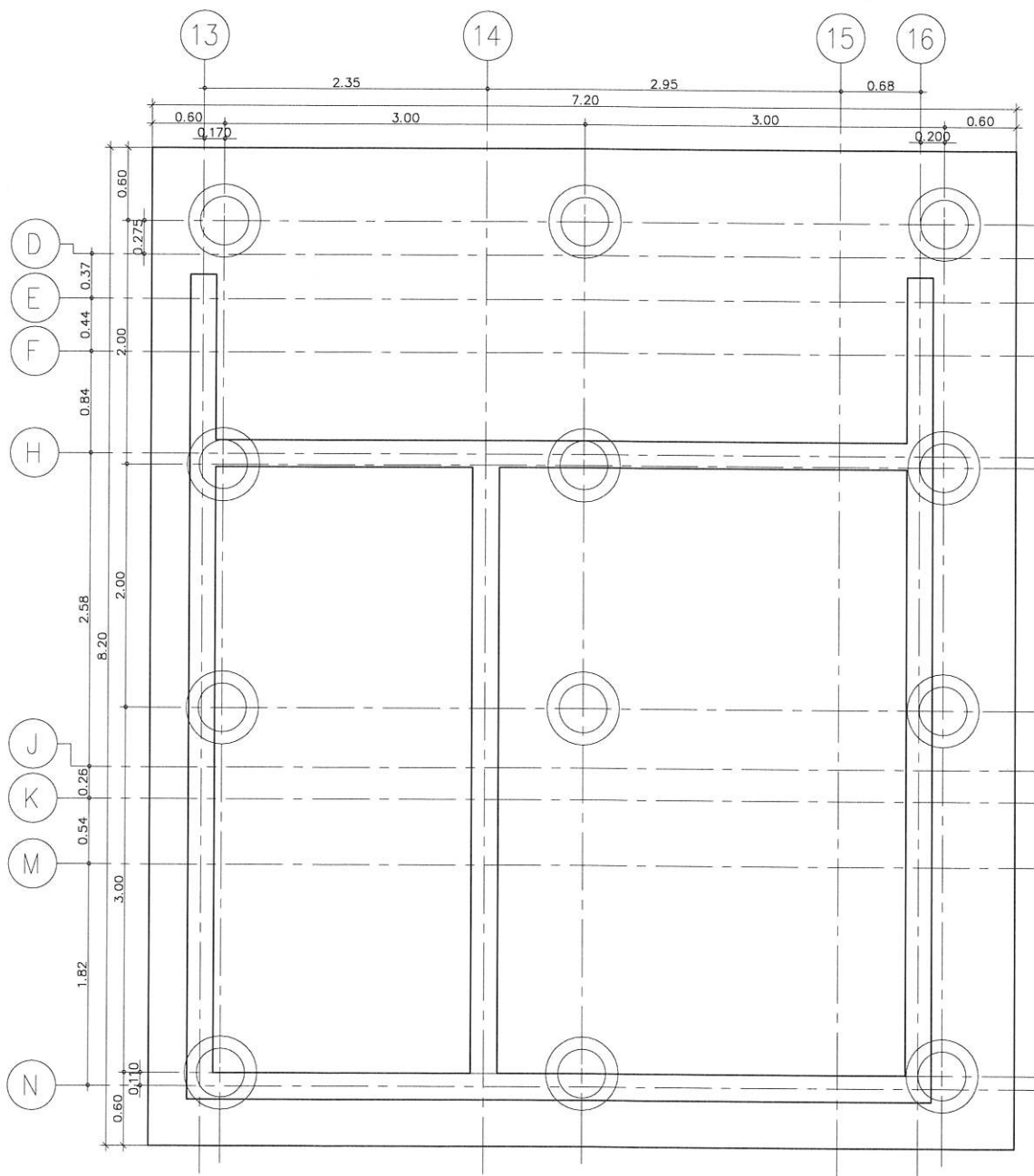
$$V_u = 3 \times 196.97 = 590.91 \text{ T.}$$

$$\rho = \frac{A_s}{b d} = \frac{15.70}{100 \times 110} = 0.0015$$

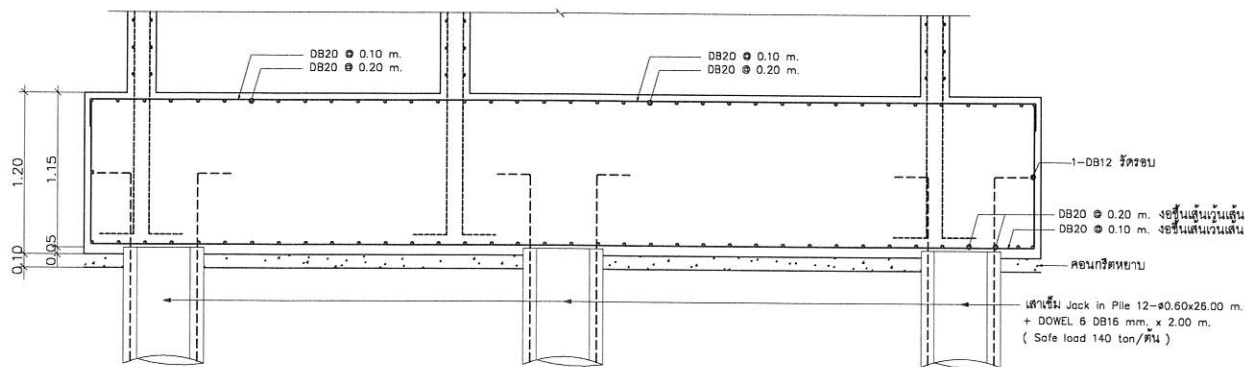
$$j = \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right) = \left(1 - \frac{0.59 \times 0.0015 \times 4000}{280} \right) = 0.988$$

$$U_u = \frac{V_u}{\sum O_{jd}} = \frac{590.91 \times 1000}{226.20 \times 0.988 \times 110} = 24.04 \text{ kg/cm}^2$$

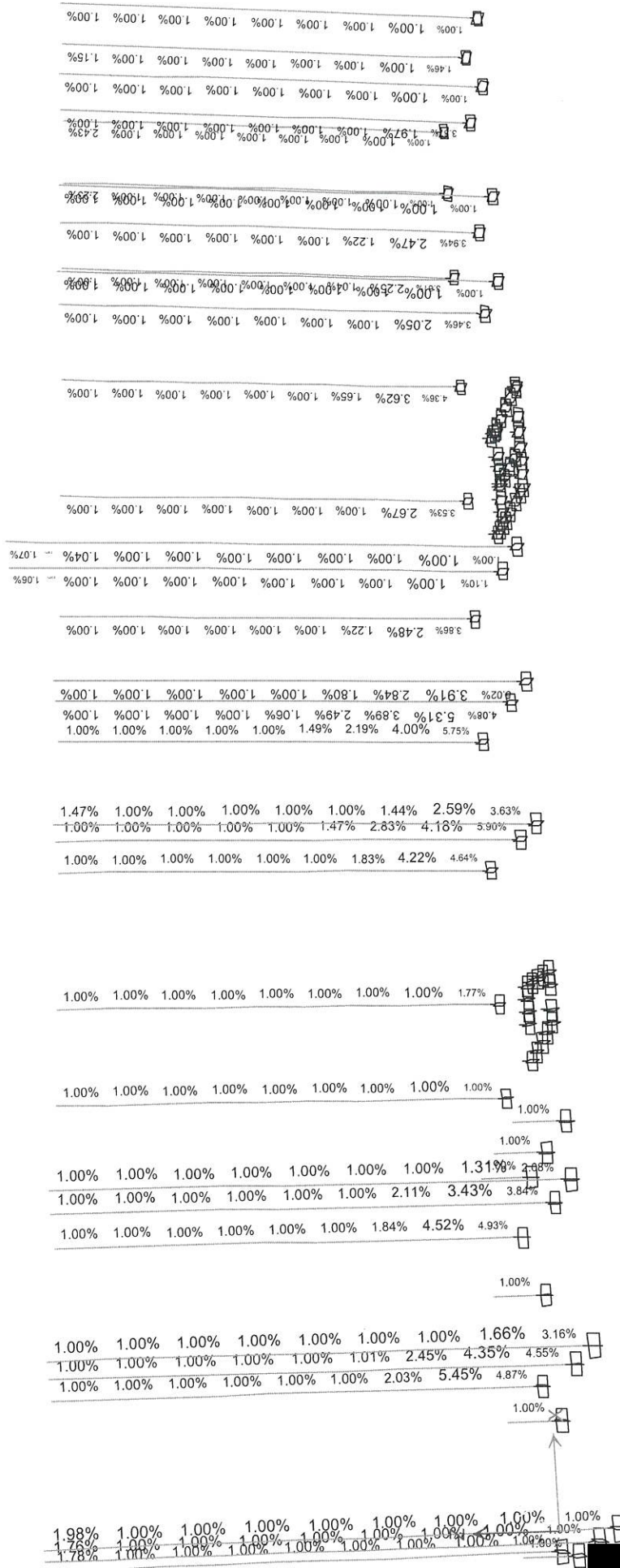
$$U_n = \frac{6.39 \sqrt{f'_c}}{d_b} = \frac{6.39 \sqrt{280}}{2.0} = 53.46 > U_u \text{ OK.}$$



F12A-PLAN



F12A-SECTION



Concrete Column Design Summary

Story	Label	Design Section	Design/Check	Status	PMM Combo	As,min m ²	As m ²
Roof	C10	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
Roof	C14	C-0.27X0.67	Design	No Message	UEQ1	0.001809	0.001933
pump room	C10	C-0.27x0.97	Design	No Message	USD1	0.002619	0.006556
pump room	C14	C-0.27X0.67	Design	No Message	USD1	0.001809	0.007110
Rooftop	C1	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
Rooftop	C2	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
Rooftop	C3	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
Rooftop	C4	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
Rooftop	C5	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
Rooftop	C6	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
Rooftop	C7	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
Rooftop	C8	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
Rooftop	C9	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
Rooftop	C10	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
Rooftop	C11	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
Rooftop	C12	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
Rooftop	C13	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
Rooftop	C14	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
Rooftop	C15	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
Rooftop	C16	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
Rooftop	C17	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
Rooftop	C18	C-0.27x0.97	Design	No Message	USD1	0.002619	0.003837
Rooftop	C19	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
Rooftop	C20	C-0.27X0.67	Design	No Message	USD1	0.001809	0.002928
Rooftop	C21	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
Rooftop	C22	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
Rooftop	C23	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
Rooftop	C24	C-0.27x0.97	Design	No Message	USD1	0.002619	0.002919
Rooftop	C25	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
Rooftop	C26	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
Rooftop	C27	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
Rooftop	C28	C-0.27x0.97	Design	No Message	USD1	0.002619	0.002799
Rooftop	C29	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
Rooftop	C30	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
Rooftop	C31	C-0.27X0.67	Design	No Message	USD1	0.001809	0.002526
Rooftop	C32	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
Rooftop	C33	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
8th	C1	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
8th	C2	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
8th	C3	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
8th	C4	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
8th	C5	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
8th	C6	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
8th	C7	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
8th	C8	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
8th	C9	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
8th	C10	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
8th	C11	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619

Concrete Column Design Summary

Story	Label	Design Section	Design/Check	Status	PMM Combo	As,min m ²	As m ²
8th	C12	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
8th	C13	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
8th	C14	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
8th	C15	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
8th	C16	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
8th	C17	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
8th	C18	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
8th	C19	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
8th	C20	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
8th	C21	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
8th	C22	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
8th	C23	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
8th	C24	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
8th	C25	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
8th	C26	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
8th	C27	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
8th	C28	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
8th	C29	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
8th	C30	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
8th	C31	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
8th	C32	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
8th	C33	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
7th	C1	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
7th	C2	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
7th	C3	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
7th	C4	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
7th	C5	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
7th	C6	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
7th	C7	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
7th	C8	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
7th	C9	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
7th	C10	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
7th	C11	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
7th	C12	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
7th	C13	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
7th	C14	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
7th	C15	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
7th	C16	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
7th	C17	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
7th	C18	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
7th	C19	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
7th	C20	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
7th	C21	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
7th	C22	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
7th	C23	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
7th	C24	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
7th	C25	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
7th	C26	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619

Concrete Column Design Summary

Story	Label	Design Section	Design/Check	Status	PMM Combo	As,min m ²	As m ²
7th	C27	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
7th	C28	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
7th	C29	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
7th	C30	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
7th	C31	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
7th	C32	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
7th	C33	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
6th	C1	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
6th	C2	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
6th	C3	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
6th	C4	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
6th	C5	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
6th	C6	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
6th	C7	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
6th	C8	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
6th	C9	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
6th	C10	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
6th	C11	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
6th	C12	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
6th	C13	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
6th	C14	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
6th	C15	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
6th	C16	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
6th	C17	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
6th	C18	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
6th	C19	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
6th	C20	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
6th	C21	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
6th	C22	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
6th	C23	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
6th	C24	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
6th	C25	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
6th	C26	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
6th	C27	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
6th	C28	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
6th	C29	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
6th	C30	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
6th	C31	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
6th	C32	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
6th	C33	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
5th	C1	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
5th	C2	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
5th	C3	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
5th	C4	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
5th	C5	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
5th	C6	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
5th	C7	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
5th	C8	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619



Concrete Column Design Summary

Story	Label	Design Section	Design/Check	Status	PMM Combo	As,min m ²	As m ²
5th	C9	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
5th	C10	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
5th	C11	C-0.27x0.97	Design	No Message	USD1	0.002619	0.002769
5th	C12	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
5th	C13	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
5th	C14	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
5th	C15	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
5th	C16	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
5th	C17	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
5th	C18	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
5th	C19	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
5th	C20	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
5th	C21	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
5th	C22	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
5th	C23	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
5th	C24	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
5th	C25	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
5th	C26	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
5th	C27	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
5th	C28	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
5th	C29	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
5th	C30	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
5th	C31	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
5th	C32	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
5th	C33	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
4th	C1	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
4th	C2	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
4th	C3	C-0.27x0.97	Design	No Message	USD1	0.002619	0.003912
4th	C4	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
4th	C5	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
4th	C6	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
4th	C7	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
4th	C8	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
4th	C9	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
4th	C10	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
4th	C11	C-0.27x0.97	Design	No Message	USD1	0.002619	0.006507
4th	C12	C-0.27x0.97	Design	No Message	USD1	0.002619	0.003849
4th	C13	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
4th	C14	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
4th	C15	C-0.27X0.67	Design	No Message	USD1	0.001809	0.003255
4th	C16	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
4th	C17	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
4th	C18	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
4th	C19	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
4th	C20	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
4th	C21	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
4th	C22	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
4th	C23	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809

Concrete Column Design Summary

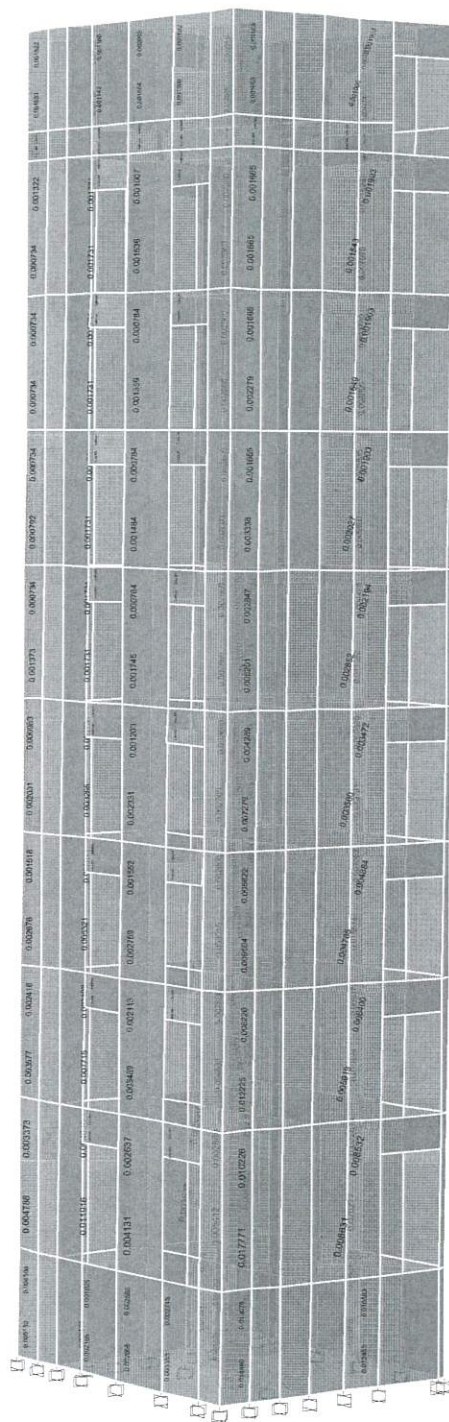
Story	Label	Design Section	Design/Check	Status	PMM Combo	As,min m ²	As m ²
4th	C24	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
4th	C25	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
4th	C26	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
4th	C27	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
4th	C28	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
4th	C29	C-0.27x0.97	Design	No Message	USD1	0.002619	0.002653
4th	C30	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
4th	C31	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
4th	C32	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
4th	C33	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
3rd	C1	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
3rd	C2	C-0.27x0.97	Design	No Message	USD1	0.002619	0.004796
3rd	C3	C-0.27x0.97	Design	No Message	USD1	0.002619	0.005748
3rd	C4	C-0.27x0.97	Design	No Message	USD1	0.002619	0.003205
3rd	C5	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
3rd	C6	C-0.27x0.97	Design	No Message	USD1	0.002619	0.004317
3rd	C7	C-0.27x0.97	Design	No Message	USD1	0.002619	0.002720
3rd	C8	C-0.27x0.97	Design	No Message	USD1	0.002619	0.003184
3rd	C9	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
3rd	C10	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
3rd	C11	C-0.27x0.97	Design	No Message	USD1	0.002619	0.010044
3rd	C12	C-0.27x0.97	Design	No Message	USD1	0.002619	0.007308
3rd	C13	C-0.27X0.67	Design	No Message	USD1	0.001809	0.002597
3rd	C14	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
3rd	C15	C-0.27X0.67	Design	No Message	USD1	0.001809	0.005143
3rd	C16	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
3rd	C17	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
3rd	C18	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
3rd	C19	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
3rd	C20	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
3rd	C21	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
3rd	C22	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
3rd	C23	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
3rd	C24	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
3rd	C25	C-0.27x0.97	Design	No Message	USD1	0.002619	0.005312
3rd	C26	C-0.27x0.97	Design	No Message	USD1	0.002619	0.004828
3rd	C27	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
3rd	C28	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
3rd	C29	C-0.27x0.97	Design	No Message	USD1	0.002619	0.006392
3rd	C30	C-0.27x0.97	Design	No Message	USD1	0.002619	0.005527
3rd	C31	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
3rd	C32	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
3rd	C33	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
2nd	C1	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
2nd	C2	C-0.27x0.97	Design	No Message	UEQ1	0.002619	0.011064
2nd	C3	C-0.27x0.97	Design	No Message	UEQ2	0.002619	0.010464
2nd	C4	C-0.27x0.97	Design	No Message	USD1	0.002619	0.006486
2nd	C5	C-0.27x0.97	Design	No Message	UEQ1	0.002619	0.007002

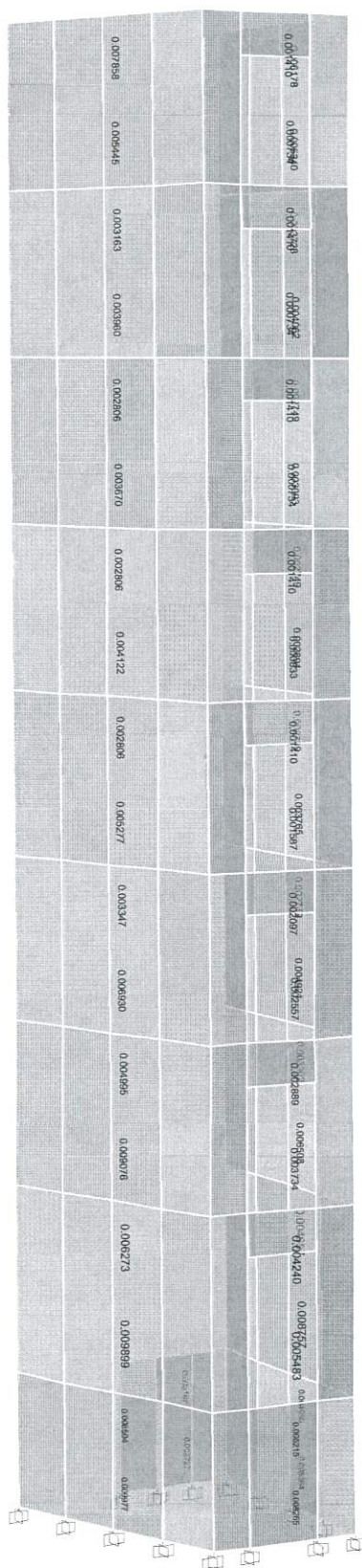
Concrete Column Design Summary

Story	Label	Design Section	Design/Check	Status	PMM Combo	As,min m ²	As m ²
2nd	C6	C-0.27x0.97	Design	No Message	UEQ1	0.002619	0.009475
2nd	C7	C-0.27x0.97	Design	No Message	USD1	0.002619	0.005897
2nd	C8	C-0.27x0.97	Design	No Message	USD1	0.002619	0.006480
2nd	C9	C-0.27x0.97	Design	No Message	USD1	0.002619	0.005374
2nd	C10	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
2nd	C11	C-0.27x0.97	Design	No Message	USD1	0.002619	0.013653
2nd	C12	C-0.27x0.97	Design	No Message	USD1	0.002619	0.010867
2nd	C13	C-0.27X0.67	Design	No Message	USD1	0.001809	0.004684
2nd	C14	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
2nd	C15	C-0.27X0.67	Design	No Message	USD1	0.001809	0.007078
2nd	C16	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
2nd	C17	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
2nd	C18	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
2nd	C19	C-0.27x0.97	Design	No Message	USD1	0.002619	0.005172
2nd	C20	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
2nd	C21	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
2nd	C22	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
2nd	C23	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
2nd	C24	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
2nd	C25	C-0.27x0.97	Design	No Message	USD1	0.002619	0.014273
2nd	C26	C-0.27x0.97	Design	No Message	USD1	0.002619	0.011846
2nd	C27	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
2nd	C28	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
2nd	C29	C-0.27x0.97	Design	No Message	UEQ1	0.002619	0.011392
2nd	C30	C-0.27x0.97	Design	No Message	USD1	0.002619	0.008416
2nd	C31	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
2nd	C32	C-0.27X0.67	Design	No Message	USD1	0.001809	0.003012
2nd	C33	C-0.27X0.67	Design	No Message	USD1	0.001809	0.002361
1st	C1	C-0.27x0.97	Design	No Message	USD1	0.002619	0.004624
1st	C2	C-0.27x0.97	Design	No Message	USD1	0.002619	0.011850
1st	C3	C-0.27x0.97	Design	No Message	USD1	0.002619	0.014793
1st	C4	C-0.27x0.97	Design	No Message	USD1	0.002619	0.009904
1st	C5	C-0.27x0.97	Design	No Message	USD1	0.002619	0.009091
1st	C6	C-0.27x0.97	Design	No Message	USD1	0.002619	0.011112
1st	C7	C-0.27x0.97	Design	No Message	USD1	0.002619	0.009170
1st	C8	C-0.27x0.97	Design	No Message	USD1	0.002619	0.009590
1st	C9	C-0.27x0.97	Design	No Message	USD1	0.002619	0.008330
1st	C10	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
1st	C11	C-0.32x1.02	Design	No Message	USD1	0.003264	0.012933
1st	C12	C-0.27x0.97	Design	No Message	USD1	0.002619	0.014915
1st	C13	C-0.27X0.67	Design	No Message	USD1	0.001809	0.006568
1st	C14	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
1st	C15	C-0.27X0.67	Design	No Message	USD1	0.001809	0.009088
1st	C16	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
1st	C17	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
1st	C18	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
1st	C19	C-0.27x0.97	Design	No Message	USD1	0.002619	0.008730
1st	C20	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809

Concrete Column Design Summary

Story	Label	Design Section	Design/Check	Status	PMM Combo	As,min m ²	As m ²
1st	C21	C-0.27X0.67	Design	No Message	USD1	0.001809	0.002649
1st	C22	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
1st	C23	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
1st	C24	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
1st	C25	C-0.27x0.97	Design	No Message	USD1	0.002619	0.012216
1st	C26	C-0.27x0.97	Design	No Message	USD1	0.002619	0.012468
1st	C27	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
1st	C28	C-0.27x0.97	Design	No Message	UWL4	0.002619	0.002619
1st	C29	C-0.27x0.97	Design	No Message	USD1	0.002619	0.011922
1st	C30	C-0.27x0.97	Design	No Message	USD1	0.002619	0.010047
1st	C31	C-0.27X0.67	Design	No Message	UWL4	0.001809	0.001809
1st	C32	C-0.27X0.67	Design	No Message	USD1	0.001809	0.005709
1st	C33	C-0.27X0.67	Design	No Message	USD1	0.001809	0.003765
1st	C34	C-0.20X0.20	Design	No Message	UWL4	0.000400	0.000400
1st	C35	C-0.20X0.20	Design	No Message	UWL4	0.000400	0.000400
1st	C36	C-0.20X0.20	Design	No Message	UWL4	0.000400	0.000400
1st	C37	C-0.20X0.20	Design	No Message	UWL4	0.000400	0.000400
1st	C38	C-0.20X0.20	Design	No Message	UWL4	0.000400	0.000400
1st	C39	C-0.20X0.20	Design	No Message	UWL4	0.000400	0.000400





Concrete Shear Wall Design Summary

Story	Pier Label	Station	Design Type	Edge Rebar	End Rebar	Rebar Spacing m	Required Reinf %	Shear Rebar m ² /m
Roof	CORE LIFT1	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
Roof	CORE LIFT1	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
Roof	CORE LIFT1	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
Roof	CORE LIFT1	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
pump room	CORE LIFT1	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
pump room	CORE LIFT1	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
pump room	CORE LIFT1	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
pump room	CORE LIFT1	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
Rooftop	CORE LIFT1	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
Rooftop	CORE LIFT1	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
Rooftop	CORE LIFT1	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
Rooftop	CORE LIFT1	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
8th	CORE LIFT1	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
8th	CORE LIFT1	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
8th	CORE LIFT1	Bottom	Uniform	DB12	DB20	0.2	0.34	0.00055
8th	CORE LIFT1	Bottom	Uniform	DB12	DB20	0.2	0.34	0.00055
7th	CORE LIFT1	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
7th	CORE LIFT1	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
7th	CORE LIFT1	Bottom	Uniform	DB12	DB20	0.2	0.5	0.00055
7th	CORE LIFT1	Bottom	Uniform	DB12	DB20	0.2	0.5	0.00055
6th	CORE LIFT1	Top	Uniform	DB12	DB20	0.2	0.43	0.00055
6th	CORE LIFT1	Top	Uniform	DB12	DB20	0.2	0.43	0.00055
6th	CORE LIFT1	Bottom	Uniform	DB12	DB20	0.2	0.78	0.00055
6th	CORE LIFT1	Bottom	Uniform	DB12	DB20	0.2	0.78	0.00055
5th	CORE LIFT1	Top	Uniform	DB12	DB20	0.2	0.64	0.00055
5th	CORE LIFT1	Top	Uniform	DB12	DB20	0.2	0.64	0.00055
5th	CORE LIFT1	Bottom	Uniform	DB12	DB20	0.2	1.09	0.00055
5th	CORE LIFT1	Bottom	Uniform	DB12	DB20	0.2	1.09	0.00055
4th	CORE LIFT1	Top	Uniform	DB12	DB20	0.2	0.87	0.00055
4th	CORE LIFT1	Top	Uniform	DB12	DB20	0.2	0.87	0.00055
4th	CORE LIFT1	Bottom	Uniform	DB12	DB20	0.2	1.43	0.00055
4th	CORE LIFT1	Bottom	Uniform	DB12	DB20	0.2	1.43	0.00079
3rd	CORE LIFT1	Top	Uniform	DB12	DB20	0.2	1.23	0.00055
3rd	CORE LIFT1	Top	Uniform	DB12	DB20	0.2	1.23	0.00055
3rd	CORE LIFT1	Bottom	Uniform	DB12	DB20	0.2	1.84	0.00067
3rd	CORE LIFT1	Bottom	Uniform	DB12	DB20	0.2	1.84	0.00077
2nd	CORE LIFT1	Top	Uniform	DB12	DB20	0.2	1.54	0.00071
2nd	CORE LIFT1	Top	Uniform	DB12	DB20	0.2	1.54	0.00055
2nd	CORE LIFT1	Bottom	Uniform	DB12	DB20	0.2	2.67	0.00102
2nd	CORE LIFT1	Bottom	Uniform	DB12	DB20	0.2	2.67	0.00072
1st	CORE LIFT1	Top	Uniform	DB12	DB20	0.2	1.96	0.00062
1st	CORE LIFT1	Top	Uniform	DB12	DB20	0.2	1.96	0.00132
1st	CORE LIFT1	Bottom	Uniform	DB12	DB20	0.2	2.17	0.00073
1st	CORE LIFT1	Bottom	Uniform	DB12	DB20	0.2	2.17	0.0006
Roof	CORE LIFT2	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
Roof	CORE LIFT2	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
pump room	CORE LIFT2	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
pump room	CORE LIFT2	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
Rooftop	CORE LIFT2	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
Rooftop	CORE LIFT2	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
8th	CORE LIFT2	Top	Uniform	DB12	DB20	0.2	0.25	0.00055

Concrete Shear Wall Design Summary

Story	Pier Label	Station	Design Type	Edge Rebar	End Rebar	Rebar Spacing m	Required Reinf %	Shear Rebar m ² /m
8th	CORE LIFT2	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
7th	CORE LIFT2	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
7th	CORE LIFT2	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
6th	CORE LIFT2	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
6th	CORE LIFT2	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
5th	CORE LIFT2	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
5th	CORE LIFT2	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
4th	CORE LIFT2	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
4th	CORE LIFT2	Bottom	Uniform	DB12	DB20	0.2	0.26	0.00055
3rd	CORE LIFT2	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
3rd	CORE LIFT2	Bottom	Uniform	DB12	DB20	0.2	0.4	0.00055
2nd	CORE LIFT2	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
2nd	CORE LIFT2	Bottom	Uniform	DB12	DB20	0.2	0.47	0.00055
1st	CORE LIFT2	Top	Uniform	DB12	DB20	0.2	0.37	0.00055
1st	CORE LIFT2	Bottom	Uniform	DB12	DB20	0.2	0.47	0.00055
Roof	CORE LIFT3	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
Roof	CORE LIFT3	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
Roof	CORE LIFT3	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
Roof	CORE LIFT3	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
pump room	CORE LIFT3	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
pump room	CORE LIFT3	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
pump room	CORE LIFT3	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
pump room	CORE LIFT3	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
Roof top	CORE LIFT3	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
Roof top	CORE LIFT3	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
Roof top	CORE LIFT3	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
Roof top	CORE LIFT3	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
8th	CORE LIFT3	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
8th	CORE LIFT3	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
8th	CORE LIFT3	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
8th	CORE LIFT3	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
7th	CORE LIFT3	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
7th	CORE LIFT3	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
7th	CORE LIFT3	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
7th	CORE LIFT3	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
6th	CORE LIFT3	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
6th	CORE LIFT3	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
6th	CORE LIFT3	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
6th	CORE LIFT3	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
5th	CORE LIFT3	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
5th	CORE LIFT3	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
5th	CORE LIFT3	Bottom	Uniform	DB12	DB20	0.2	0.47	0.00055
5th	CORE LIFT3	Bottom	Uniform	DB12	DB20	0.2	0.47	0.00055
4th	CORE LIFT3	Top	Uniform	DB12	DB20	0.2	0.33	0.00055
4th	CORE LIFT3	Top	Uniform	DB12	DB20	0.2	0.33	0.00055
4th	CORE LIFT3	Bottom	Uniform	DB12	DB20	0.2	0.77	0.00055
4th	CORE LIFT3	Bottom	Uniform	DB12	DB20	0.2	0.77	0.00055
3rd	CORE LIFT3	Top	Uniform	DB12	DB20	0.2	0.51	0.00055
3rd	CORE LIFT3	Top	Uniform	DB12	DB20	0.2	0.51	0.00055
3rd	CORE LIFT3	Bottom	Uniform	DB12	DB20	0.2	1.11	0.00064
3rd	CORE LIFT3	Bottom	Uniform	DB12	DB20	0.2	1.11	0.00055

Concrete Shear Wall Design Summary

Story	Pier Label	Station	Design Type	Edge Rebar	End Rebar	Rebar Spacing m	Required Reinf %	Shear Rebar m ² /m
2nd	CORE LIFT3	Top	Uniform	DB12	DB20	0.2	0.71	0.00072
2nd	CORE LIFT3	Top	Uniform	DB12	DB20	0.2	0.71	0.00055
2nd	CORE LIFT3	Bottom	Uniform	DB12	DB20	0.2	1.72	0.00114
2nd	CORE LIFT3	Bottom	Uniform	DB12	DB20	0.2	1.72	0.001
1st	CORE LIFT3	Top	Uniform	DB12	DB20	0.2	0.89	0.00055
1st	CORE LIFT3	Top	Uniform	DB12	DB20	0.2	0.89	0.001
1st	CORE LIFT3	Bottom	Uniform	DB12	DB20	0.2	1.24	0.00055
1st	CORE LIFT3	Bottom	Uniform	DB12	DB20	0.2	1.24	0.00055
Roof	CORE LIFT4	Top	Uniform	DB12	DB20	0.2	0.67	0.00055
Roof	CORE LIFT4	Bottom	Uniform	DB12	DB20	0.2	0.5	0.00055
pump room	CORE LIFT4	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
pump room	CORE LIFT4	Bottom	Uniform	DB12	DB20	0.2	0.78	0.00055
Roof top	CORE LIFT4	Top	Uniform	DB12	DB20	0.2	0.32	0.00055
Roof top	CORE LIFT4	Bottom	Uniform	DB12	DB20	0.2	0.49	0.00055
8th	CORE LIFT4	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
8th	CORE LIFT4	Bottom	Uniform	DB12	DB20	0.2	0.43	0.00055
7th	CORE LIFT4	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
7th	CORE LIFT4	Bottom	Uniform	DB12	DB20	0.2	0.47	0.00055
6th	CORE LIFT4	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
6th	CORE LIFT4	Bottom	Uniform	DB12	DB20	0.2	0.56	0.00055
5th	CORE LIFT4	Top	Uniform	DB12	DB20	0.2	0.38	0.00055
5th	CORE LIFT4	Bottom	Uniform	DB12	DB20	0.2	0.74	0.00055
4th	CORE LIFT4	Top	Uniform	DB12	DB20	0.2	0.49	0.00055
4th	CORE LIFT4	Bottom	Uniform	DB12	DB20	0.2	0.88	0.00055
3rd	CORE LIFT4	Top	Uniform	DB12	DB20	0.2	0.67	0.00055
3rd	CORE LIFT4	Bottom	Uniform	DB12	DB20	0.2	1.11	0.00055
2nd	CORE LIFT4	Top	Uniform	DB12	DB20	0.2	0.84	0.00055
2nd	CORE LIFT4	Bottom	Uniform	DB12	DB20	0.2	1.32	0.00055
1st	CORE LIFT4	Top	Uniform	DB12	DB20	0.2	0.82	0.00055
1st	CORE LIFT4	Bottom	Uniform	DB12	DB20	0.2	0.85	0.00055
Roof	CORE LIFT5	Top	Uniform	DB12	DB20	0.2	0.54	0.00055
Roof	CORE LIFT5	Bottom	Uniform	DB12	DB20	0.2	0.45	0.00055
pump room	CORE LIFT5	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
pump room	CORE LIFT5	Bottom	Uniform	DB12	DB20	0.2	0.72	0.00055
Roof top	CORE LIFT5	Top	Uniform	DB12	DB20	0.2	0.4	0.00055
Roof top	CORE LIFT5	Bottom	Uniform	DB12	DB20	0.2	0.29	0.00055
8th	CORE LIFT5	Top	Uniform	DB12	DB20	0.2	0.4	0.00055
8th	CORE LIFT5	Bottom	Uniform	DB12	DB20	0.2	0.29	0.00055
7th	CORE LIFT5	Top	Uniform	DB12	DB20	0.2	0.37	0.00055
7th	CORE LIFT5	Bottom	Uniform	DB12	DB20	0.2	0.31	0.00055
6th	CORE LIFT5	Top	Uniform	DB12	DB20	0.2	0.36	0.00055
6th	CORE LIFT5	Bottom	Uniform	DB12	DB20	0.2	0.36	0.00055
5th	CORE LIFT5	Top	Uniform	DB12	DB20	0.2	0.36	0.00055
5th	CORE LIFT5	Bottom	Uniform	DB12	DB20	0.2	0.41	0.00055
4th	CORE LIFT5	Top	Uniform	DB12	DB20	0.2	0.36	0.00055
4th	CORE LIFT5	Bottom	Uniform	DB12	DB20	0.2	0.46	0.00055
3rd	CORE LIFT5	Top	Uniform	DB12	DB20	0.2	0.38	0.00055
3rd	CORE LIFT5	Bottom	Uniform	DB12	DB20	0.2	0.49	0.00055
2nd	CORE LIFT5	Top	Uniform	DB12	DB20	0.2	0.42	0.00055
2nd	CORE LIFT5	Bottom	Uniform	DB12	DB20	0.2	0.5	0.00055
1st	CORE LIFT5	Top	Uniform	DB12	DB20	0.2	0.76	0.00055

Concrete Shear Wall Design Summary

Story	Pier Label	Station	Design Type	Edge Rebar	End Rebar	Rebar Spacing m	Required Reinf %	Shear Rebar m ² /m
1st	CORE LIFT5	Bottom	Uniform	DB12	DB20	0.2	0.86	0.00055
Roof	CORE LIFT6	Top	Uniform	DB12	DB20	0.2	0.66	0.00055
Roof	CORE LIFT6	Bottom	Uniform	DB12	DB20	0.2	0.63	0.00055
pump room	CORE LIFT6	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
pump room	CORE LIFT6	Bottom	Uniform	DB12	DB20	0.2	0.75	0.00055
Roof	CORE LIFT6	Top	Uniform	DB12	DB20	0.2	0.47	0.00055
Roof	CORE LIFT6	Bottom	Uniform	DB12	DB20	0.2	0.28	0.00055
8th	CORE LIFT6	Top	Uniform	DB12	DB20	0.2	0.46	0.00055
8th	CORE LIFT6	Bottom	Uniform	DB12	DB20	0.2	0.32	0.00055
7th	CORE LIFT6	Top	Uniform	DB12	DB20	0.2	0.46	0.00055
7th	CORE LIFT6	Bottom	Uniform	DB12	DB20	0.2	0.35	0.00055
6th	CORE LIFT6	Top	Uniform	DB12	DB20	0.2	0.46	0.00055
6th	CORE LIFT6	Bottom	Uniform	DB12	DB20	0.2	0.4	0.00055
5th	CORE LIFT6	Top	Uniform	DB12	DB20	0.2	0.48	0.00055
5th	CORE LIFT6	Bottom	Uniform	DB12	DB20	0.2	0.46	0.00055
4th	CORE LIFT6	Top	Uniform	DB12	DB20	0.2	0.49	0.00055
4th	CORE LIFT6	Bottom	Uniform	DB12	DB20	0.2	0.51	0.00055
3rd	CORE LIFT6	Top	Uniform	DB12	DB20	0.2	0.5	0.00055
3rd	CORE LIFT6	Bottom	Uniform	DB12	DB20	0.2	0.61	0.00055
2nd	CORE LIFT6	Top	Uniform	DB12	DB20	0.2	0.49	0.00055
2nd	CORE LIFT6	Bottom	Uniform	DB12	DB20	0.2	0.64	0.00055
1st	CORE LIFT6	Top	Uniform	DB12	DB20	0.2	1.07	0.00055
1st	CORE LIFT6	Bottom	Uniform	DB12	DB20	0.2	1.33	0.00065
Roof	CORE LIFT7	Top	Uniform	DB12	DB20	0.2	0.62	0.00055
Roof	CORE LIFT7	Bottom	Uniform	DB12	DB20	0.2	0.66	0.00055
pump room	CORE LIFT7	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
pump room	CORE LIFT7	Bottom	Uniform	DB12	DB20	0.2	0.64	0.00055
Roof	CORE LIFT7	Top	Uniform	DB12	DB20	0.2	0.45	0.00055
Roof	CORE LIFT7	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
8th	CORE LIFT7	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
8th	CORE LIFT7	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
7th	CORE LIFT7	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
7th	CORE LIFT7	Bottom	Uniform	DB12	DB20	0.2	0.27	0.00055
6th	CORE LIFT7	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
6th	CORE LIFT7	Bottom	Uniform	DB12	DB20	0.2	0.47	0.00055
5th	CORE LIFT7	Top	Uniform	DB12	DB20	0.2	0.33	0.00055
5th	CORE LIFT7	Bottom	Uniform	DB12	DB20	0.2	0.69	0.00055
4th	CORE LIFT7	Top	Uniform	DB12	DB20	0.2	0.52	0.00055
4th	CORE LIFT7	Bottom	Uniform	DB12	DB20	0.2	0.91	0.00055
3rd	CORE LIFT7	Top	Uniform	DB12	DB20	0.2	0.82	0.00055
3rd	CORE LIFT7	Bottom	Uniform	DB12	DB20	0.2	1.22	0.00055
2nd	CORE LIFT7	Top	Uniform	DB12	DB20	0.2	1.15	0.00055
2nd	CORE LIFT7	Bottom	Uniform	DB12	DB20	0.2	1.63	0.00073
1st	CORE LIFT7	Top	Uniform	DB12	DB20	0.2	1.53	0.00055
1st	CORE LIFT7	Bottom	Uniform	DB12	DB20	0.2	1.75	0.0006
Roof	CORE ST1a	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
Roof	CORE ST1a	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
Roof	CORE ST1a	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
pump room	CORE ST1a	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
pump room	CORE ST1a	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
pump room	CORE ST1a	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055

Concrete Shear Wall Design Summary

Story	Pier Label	Station	Design Type	Edge Rebar	End Rebar	Rebar Spacing m	Required Reinf %	Shear Rebar m ² /m
pump room	CORE ST1a	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
Roof	CORE ST1a	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
Roof	CORE ST1a	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
Roof	CORE ST1a	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
8th	CORE ST1a	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
8th	CORE ST1a	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
8th	CORE ST1a	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
7th	CORE ST1a	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
7th	CORE ST1a	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
7th	CORE ST1a	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
6th	CORE ST1a	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
6th	CORE ST1a	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
6th	CORE ST1a	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00059
5th	CORE ST1a	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
5th	CORE ST1a	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
5th	CORE ST1a	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00068
4th	CORE ST1a	Top	Uniform	DB12	DB20	0.2	0.25	0.00057
4th	CORE ST1a	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
4th	CORE ST1a	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00065
3rd	CORE ST1a	Top	Uniform	DB12	DB20	0.2	0.37	0.00079
3rd	CORE ST1a	Bottom	Uniform	DB12	DB20	0.2	0.45	0.00088
3rd	CORE ST1a	Bottom	Uniform	DB12	DB20	0.2	0.45	0.00059
2nd	CORE ST1a	Top	Uniform	DB12	DB20	0.2	0.34	0.00055
2nd	CORE ST1a	Bottom	Uniform	DB12	DB20	0.2	0.76	0.00055
2nd	CORE ST1a	Bottom	Uniform	DB12	DB20	0.2	0.76	0.00104
1st	CORE ST1a	Top	Uniform	DB12	DB20	0.2	0.65	0.00055
1st	CORE ST1a	Bottom	Uniform	DB12	DB20	0.2	0.68	0.00055
Roof	CORE ST1b	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
Roof	CORE ST1b	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
Roof	CORE ST1b	Bottom	Uniform	DB12	DB20	0.2	0.4	0.00055
Roof	CORE ST1b	Bottom	Uniform	DB12	DB20	0.2	0.4	0.00055
pump room	CORE ST1b	Top	Uniform	DB12	DB20	0.2	0.41	0.00055
pump room	CORE ST1b	Top	Uniform	DB12	DB20	0.2	0.41	0.00055
pump room	CORE ST1b	Bottom	Uniform	DB12	DB20	0.2	0.65	0.00055
pump room	CORE ST1b	Bottom	Uniform	DB12	DB20	0.2	0.65	0.00055
Roof	CORE ST1b	Top	Uniform	DB12	DB20	0.2	0.41	0.00055
Roof	CORE ST1b	Top	Uniform	DB12	DB20	0.2	0.41	0.00055
Roof	CORE ST1b	Bottom	Uniform	DB12	DB20	0.2	0.68	0.00055
Roof	CORE ST1b	Bottom	Uniform	DB12	DB20	0.2	0.68	0.00055
8th	CORE ST1b	Top	Uniform	DB12	DB20	0.2	0.32	0.00055
8th	CORE ST1b	Top	Uniform	DB12	DB20	0.2	0.32	0.00055
8th	CORE ST1b	Bottom	Uniform	DB12	DB20	0.2	0.72	0.00055
8th	CORE ST1b	Bottom	Uniform	DB12	DB20	0.2	0.72	0.00055
7th	CORE ST1b	Top	Uniform	DB12	DB20	0.2	0.33	0.00055
7th	CORE ST1b	Top	Uniform	DB12	DB20	0.2	0.33	0.00055
7th	CORE ST1b	Bottom	Uniform	DB12	DB20	0.2	0.81	0.00055
7th	CORE ST1b	Bottom	Uniform	DB12	DB20	0.2	0.81	0.00055
6th	CORE ST1b	Top	Uniform	DB12	DB20	0.2	0.38	0.00055
6th	CORE ST1b	Top	Uniform	DB12	DB20	0.2	0.38	0.00055
6th	CORE ST1b	Bottom	Uniform	DB12	DB20	0.2	0.97	0.00055
6th	CORE ST1b	Bottom	Uniform	DB12	DB20	0.2	0.97	0.00055



Concrete Shear Wall Design Summary

Story	Pier Label	Station	Design Type	Edge Rebar	End Rebar	Rebar Spacing m	Required Reinf %	Shear Rebar m ² /m
5th	CORE ST1b	Top	Uniform	DB12	DB20	0.2	0.46	0.00055
5th	CORE ST1b	Top	Uniform	DB12	DB20	0.2	0.46	0.00055
5th	CORE ST1b	Bottom	Uniform	DB12	DB20	0.2	1.16	0.00055
5th	CORE ST1b	Bottom	Uniform	DB12	DB20	0.2	1.16	0.00059
4th	CORE ST1b	Top	Uniform	DB12	DB20	0.2	0.6	0.00055
4th	CORE ST1b	Top	Uniform	DB12	DB20	0.2	0.6	0.00055
4th	CORE ST1b	Bottom	Uniform	DB12	DB20	0.2	1.32	0.00055
4th	CORE ST1b	Bottom	Uniform	DB12	DB20	0.2	1.32	0.00063
3rd	CORE ST1b	Top	Uniform	DB12	DB20	0.2	0.8	0.00055
3rd	CORE ST1b	Top	Uniform	DB12	DB20	0.2	0.8	0.00055
3rd	CORE ST1b	Bottom	Uniform	DB12	DB20	0.2	1.65	0.00055
3rd	CORE ST1b	Bottom	Uniform	DB12	DB20	0.2	1.65	0.00062
2nd	CORE ST1b	Top	Uniform	DB12	DB20	0.2	2.78	0.00055
2nd	CORE ST1b	Top	Uniform	DB12	DB20	0.2	2.78	0.00055
2nd	CORE ST1b	Bottom	Uniform	DB12	DB20	0.2	1.72	0.00055
2nd	CORE ST1b	Bottom	Uniform	DB12	DB20	0.2	1.72	0.00055
1st	CORE ST1b	Top	Uniform	DB12	DB20	0.2	0.97	0.00055
1st	CORE ST1b	Top	Uniform	DB12	DB20	0.2	0.97	0.00234
1st	CORE ST1b	Bottom	Uniform	DB12	DB20	0.2	1.3	0.00055
1st	CORE ST1b	Bottom	Uniform	DB12	DB20	0.2	1.3	0.001
Roof	CORE ST1c	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
Roof	CORE ST1c	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
pump room	CORE ST1c	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
pump room	CORE ST1c	Bottom	Uniform	DB12	DB20	0.2	0.27	0.00055
Roof top	CORE ST1c	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
Roof top	CORE ST1c	Bottom	Uniform	DB12	DB20	0.2	0.38	0.00055
8th	CORE ST1c	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
8th	CORE ST1c	Bottom	Uniform	DB12	DB20	0.2	0.41	0.00055
7th	CORE ST1c	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
7th	CORE ST1c	Bottom	Uniform	DB12	DB20	0.2	0.5	0.00055
6th	CORE ST1c	Top	Uniform	DB12	DB20	0.2	0.29	0.00055
6th	CORE ST1c	Bottom	Uniform	DB12	DB20	0.2	0.71	0.00055
5th	CORE ST1c	Top	Uniform	DB12	DB20	0.2	0.46	0.00055
5th	CORE ST1c	Bottom	Uniform	DB12	DB20	0.2	0.89	0.00055
4th	CORE ST1c	Top	Uniform	DB12	DB20	0.2	0.64	0.00055
4th	CORE ST1c	Bottom	Uniform	DB12	DB20	0.2	1.19	0.00055
3rd	CORE ST1c	Top	Uniform	DB12	DB20	0.2	0.84	0.00055
3rd	CORE ST1c	Bottom	Uniform	DB12	DB20	0.2	1.47	0.00055
2nd	CORE ST1c	Top	Uniform	DB12	DB20	0.2	1.12	0.00055
2nd	CORE ST1c	Bottom	Uniform	DB12	DB20	0.2	2.14	0.00129
1st	CORE ST1c	Top	Uniform	DB12	DB20	0.2	1.39	0.00078
1st	CORE ST1c	Bottom	Uniform	DB12	DB20	0.2	1.64	0.00061
Roof	CORE ST1d	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
Roof	CORE ST1d	Bottom	Uniform	DB12	DB20	0.2	0.45	0.00055
pump room	CORE ST1d	Top	Uniform	DB12	DB20	0.2	0.45	0.00055
pump room	CORE ST1d	Bottom	Uniform	DB12	DB20	0.2	0.93	0.00055
Roof top	CORE ST1d	Top	Uniform	DB12	DB20	0.2	0.46	0.00055
Roof top	CORE ST1d	Bottom	Uniform	DB12	DB20	0.2	0.63	0.00055
8th	CORE ST1d	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
8th	CORE ST1d	Bottom	Uniform	DB12	DB20	0.2	0.48	0.00055
7th	CORE ST1d	Top	Uniform	DB12	DB20	0.2	0.25	0.00055

Concrete Shear Wall Design Summary

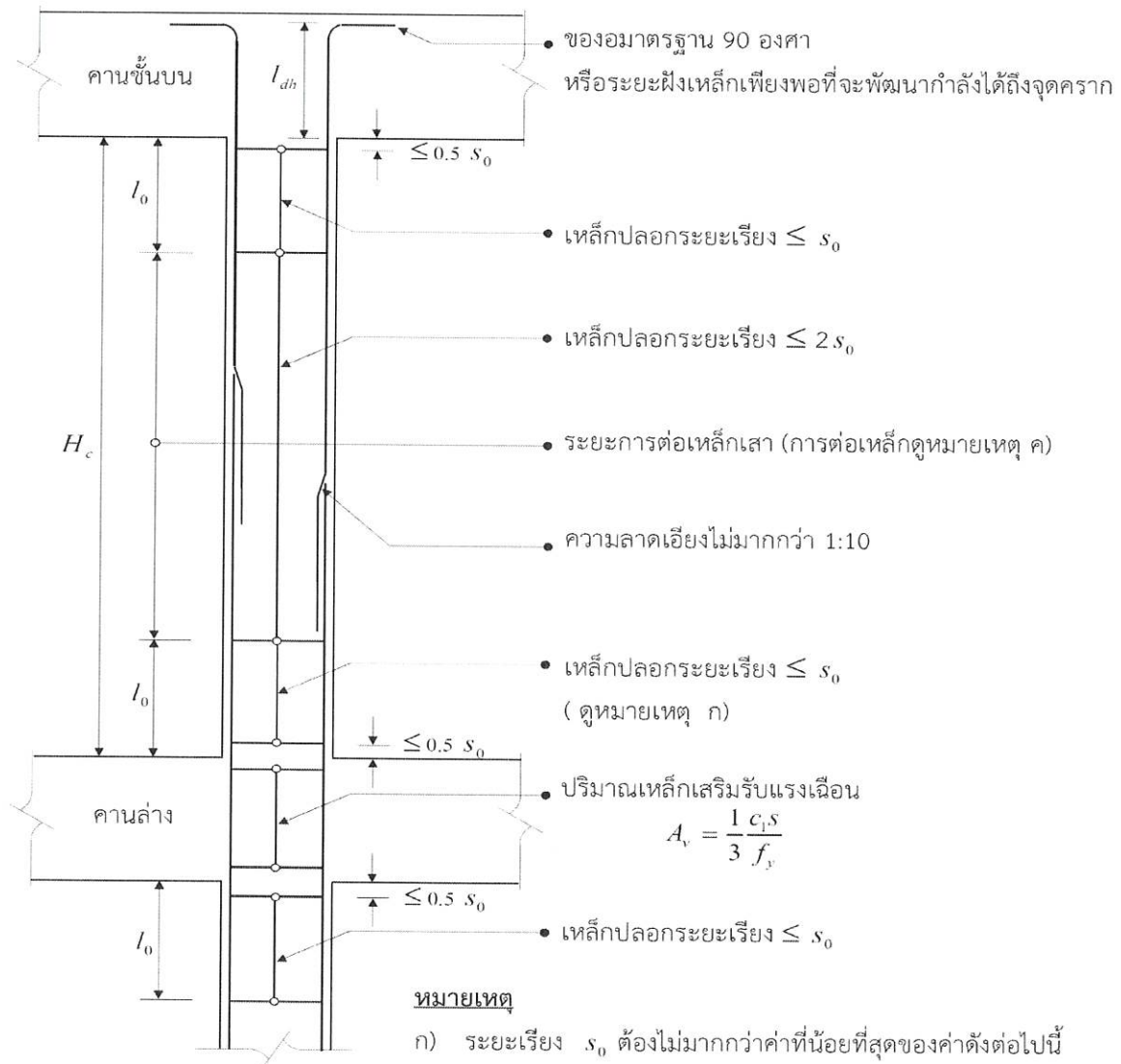
Story	Pier Label	Station	Design Type	Edge Rebar	End Rebar	Rebar Spacing m	Required Reinf %	Shear Rebar m ² /m
7th	CORE ST1d	Bottom	Uniform	DB12	DB20	0.2	0.46	0.00055
6th	CORE ST1d	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
6th	CORE ST1d	Bottom	Uniform	DB12	DB20	0.2	0.48	0.00055
5th	CORE ST1d	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
5th	CORE ST1d	Bottom	Uniform	DB12	DB20	0.2	0.65	0.00055
4th	CORE ST1d	Top	Uniform	DB12	DB20	0.2	0.44	0.00055
4th	CORE ST1d	Bottom	Uniform	DB12	DB20	0.2	0.84	0.00055
3rd	CORE ST1d	Top	Uniform	DB12	DB20	0.2	0.68	0.00055
3rd	CORE ST1d	Bottom	Uniform	DB12	DB20	0.2	1.23	0.00055
2nd	CORE ST1d	Top	Uniform	DB12	DB20	0.2	0.91	0.00055
2nd	CORE ST1d	Bottom	Uniform	DB12	DB20	0.2	1.6	0.00078
1st	CORE ST1d	Top	Uniform	DB12	DB20	0.2	1.41	0.00063
1st	CORE ST1d	Bottom	Uniform	DB12	DB20	0.2	1.62	0.00068
Roof-top	CORE ST2a	Top	Uniform	DB12	DB20	0.2	0.7	0.00055
Roof-top	CORE ST2a	Bottom	Uniform	DB12	DB20	0.2	0.49	0.00055
8th	CORE ST2a	Top	Uniform	DB12	DB20	0.2	0.28	0.00055
8th	CORE ST2a	Bottom	Uniform	DB12	DB20	0.2	0.35	0.00055
7th	CORE ST2a	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
7th	CORE ST2a	Bottom	Uniform	DB12	DB20	0.2	0.33	0.00055
6th	CORE ST2a	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
6th	CORE ST2a	Bottom	Uniform	DB12	DB20	0.2	0.37	0.00055
5th	CORE ST2a	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
5th	CORE ST2a	Bottom	Uniform	DB12	DB20	0.2	0.47	0.00055
4th	CORE ST2a	Top	Uniform	DB12	DB20	0.2	0.3	0.00055
4th	CORE ST2a	Bottom	Uniform	DB12	DB20	0.2	0.62	0.00055
3rd	CORE ST2a	Top	Uniform	DB12	DB20	0.2	0.44	0.00055
3rd	CORE ST2a	Bottom	Uniform	DB12	DB20	0.2	0.81	0.00055
2nd	CORE ST2a	Top	Uniform	DB12	DB20	0.2	0.56	0.00055
2nd	CORE ST2a	Bottom	Uniform	DB12	DB20	0.2	0.88	0.00055
1st	CORE ST2a	Top	Uniform	DB12	DB20	0.2	0.76	0.00055
1st	CORE ST2a	Bottom	Uniform	DB12	DB20	0.2	0.89	0.00055
Roof-top	CORE ST2b	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
Roof-top	CORE ST2b	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
Roof-top	CORE ST2b	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
8th	CORE ST2b	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
8th	CORE ST2b	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
8th	CORE ST2b	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
7th	CORE ST2b	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
7th	CORE ST2b	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
7th	CORE ST2b	Bottom	Uniform	DB12	DB20	0.2	0.25	0.00055
6th	CORE ST2b	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
6th	CORE ST2b	Bottom	Uniform	DB12	DB20	0.2	0.28	0.00055
6th	CORE ST2b	Bottom	Uniform	DB12	DB20	0.2	0.28	0.00055
5th	CORE ST2b	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
5th	CORE ST2b	Bottom	Uniform	DB12	DB20	0.2	0.54	0.00072
5th	CORE ST2b	Bottom	Uniform	DB12	DB20	0.2	0.54	0.00055
4th	CORE ST2b	Top	Uniform	DB12	DB20	0.2	0.37	0.00055
4th	CORE ST2b	Bottom	Uniform	DB12	DB20	0.2	0.87	0.00092
4th	CORE ST2b	Bottom	Uniform	DB12	DB20	0.2	0.87	0.00068
3rd	CORE ST2b	Top	Uniform	DB12	DB20	0.2	0.51	0.00055
3rd	CORE ST2b	Bottom	Uniform	DB12	DB20	0.2	1.27	0.00102

Concrete Shear Wall Design Summary

Story	Pier Label	Station	Design Type	Edge Rebar	End Rebar	Rebar Spacing m	Required Reinf %	Shear Rebar m ² /m
3rd	CORE ST2b	Bottom	Uniform	DB12	DB20	0.2	1.27	0.00088
2nd	CORE ST2b	Top	Uniform	DB12	DB20	0.2	0.75	0.00055
2nd	CORE ST2b	Bottom	Uniform	DB12	DB20	0.2	1.87	0.00106
2nd	CORE ST2b	Bottom	Uniform	DB12	DB20	0.2	1.87	0.00078
1st	CORE ST2b	Top	Uniform	DB12	DB20	0.2	1.1	0.00055
1st	CORE ST2b	Bottom	Uniform	DB12	DB20	0.2	1.47	0.00086
Rooftop	CORE ST2c	Top	Uniform	DB12	DB20	0.2	0.56	0.00055
Rooftop	CORE ST2c	Bottom	Uniform	DB12	DB20	0.2	0.49	0.00055
8th	CORE ST2c	Top	Uniform	DB12	DB20	0.2	0.34	0.00055
8th	CORE ST2c	Bottom	Uniform	DB12	DB20	0.2	0.37	0.00055
7th	CORE ST2c	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
7th	CORE ST2c	Bottom	Uniform	DB12	DB20	0.2	0.28	0.00055
6th	CORE ST2c	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
6th	CORE ST2c	Bottom	Uniform	DB12	DB20	0.2	0.26	0.00055
5th	CORE ST2c	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
5th	CORE ST2c	Bottom	Uniform	DB12	DB20	0.2	0.34	0.00055
4th	CORE ST2c	Top	Uniform	DB12	DB20	0.2	0.25	0.00055
4th	CORE ST2c	Bottom	Uniform	DB12	DB20	0.2	0.45	0.00055
3rd	CORE ST2c	Top	Uniform	DB12	DB20	0.2	0.3	0.00055
3rd	CORE ST2c	Bottom	Uniform	DB12	DB20	0.2	0.59	0.00055
2nd	CORE ST2c	Top	Uniform	DB12	DB20	0.2	0.42	0.00055
2nd	CORE ST2c	Bottom	Uniform	DB12	DB20	0.2	0.8	0.00055
1st	CORE ST2c	Top	Uniform	DB12	DB20	0.2	0.45	0.00055
1st	CORE ST2c	Bottom	Uniform	DB12	DB20	0.2	0.49	0.00055
1st	CORE ST2d	Top	Uniform	DB12	DB20	0.2	0.73	0.00055
1st	CORE ST2d	Bottom	Uniform	DB12	DB20	0.2	0.62	0.00056

ผลการเคลื่อนตัวสัมพัทธ์ระหว่างชั้น

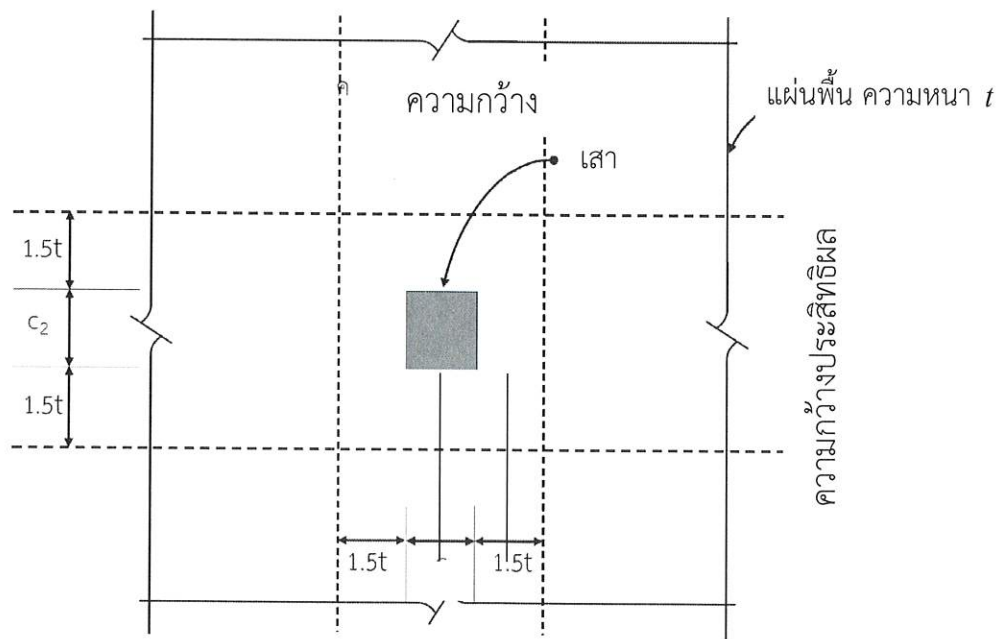
Story	Load Case/Combo	Direction	Label	X m	Y m	Z m	Drift	Cd/I	Story Drift m	Story Height hx (m)	Allowable Story drift = 0.01hx (m)	Status
Roof	SPECX Max	X	168.00	48.10	4.22	25.15	0.000395	4.50	0.00178	2.05	0.02050	OK
Roof	SPECX Max	Y	161.00	56.63	7.58	25.15	0.000055	4.50	0.00025	2.05	0.02050	OK
Roof	SPECY Max	X	169.00	48.10	10.33	25.15	0.000069	4.50	0.00031	2.05	0.02050	OK
Roof	SPECY Max	Y	54.00	56.63	10.22	25.15	0.000489	4.50	0.00220	2.05	0.02050	OK
pump room	SPECX Max	X	47.00	53.01	3.68	23.10	0.000387	4.50	0.00174	0.60	0.00600	OK
pump room	SPECX Max	Y	56.00	56.47	3.68	23.10	0.000058	4.50	0.00026	0.60	0.00600	OK
pump room	SPECY Max	X	54.00	56.63	10.22	23.10	0.000073	4.50	0.00033	0.60	0.00600	OK
pump room	SPECY Max	Y	57.00	54.84	3.68	23.10	0.000497	4.50	0.00224	0.60	0.00600	OK
Rooflop	SPECX Max	X	31.00	0.00	0.00	22.50	0.000443	4.50	0.00199	2.75	0.02750	OK
Rooflop	SPECX Max	Y	88.00	-2.99	12.50	22.50	0.000701	4.50	0.00315	2.75	0.02750	OK
Rooflop	SPECY Max	X	108.00	83.87	18.10	22.50	0.000241	4.50	0.00108	2.75	0.02750	OK
Rooflop	SPECY Max	Y	88.00	-2.99	12.50	22.50	0.000912	4.50	0.00410	2.75	0.02750	OK
8th	SPECX Max	X	31.00	0.00	0.00	19.75	0.000482	4.50	0.00217	2.75	0.02750	OK
8th	SPECX Max	Y	88.00	-2.99	12.50	19.75	0.000730	4.50	0.00329	2.75	0.02750	OK
8th	SPECY Max	X	108.00	83.87	18.10	19.75	0.000257	4.50	0.00116	2.75	0.02750	OK
8th	SPECY Max	Y	88.00	-2.99	12.50	19.75	0.000953	4.50	0.00429	2.75	0.02750	OK
7th	SPECX Max	X	31.00	0.00	0.00	17.00	0.000509	4.50	0.00229	2.75	0.02750	OK
7th	SPECX Max	Y	88.00	-2.99	12.50	17.00	0.000744	4.50	0.00335	2.75	0.02750	OK
7th	SPECY Max	X	108.00	83.87	18.10	17.00	0.000267	4.50	0.00120	2.75	0.02750	OK
7th	SPECY Max	Y	88.00	-2.99	12.50	17.00	0.000973	4.50	0.00438	2.75	0.02750	OK
6th	SPECX Max	X	31.00	0.00	0.00	14.25	0.000520	4.50	0.00234	2.75	0.02750	OK
6th	SPECX Max	Y	88.00	-2.99	12.50	14.25	0.000739	4.50	0.00333	2.75	0.02750	OK
6th	SPECY Max	X	108.00	83.87	18.10	14.25	0.000270	4.50	0.00122	2.75	0.02750	OK
6th	SPECY Max	Y	88.00	-2.99	12.50	14.25	0.000968	4.50	0.00436	2.75	0.02750	OK
5th	SPECX Max	X	31.00	0.00	0.00	11.50	0.000511	4.50	0.00230	2.75	0.02750	OK
5th	SPECX Max	Y	88.00	-2.99	12.50	11.50	0.000705	4.50	0.00317	2.75	0.02750	OK
5th	SPECY Max	X	108.00	83.87	18.10	11.50	0.000262	4.50	0.00118	2.75	0.02750	OK
5th	SPECY Max	Y	88.00	-2.99	12.50	11.50	0.000925	4.50	0.00416	2.75	0.02750	OK
4th	SPECX Max	X	31.00	0.00	0.00	8.75	0.000477	4.50	0.00215	2.75	0.02750	OK
4th	SPECX Max	Y	88.00	-2.99	12.50	8.75	0.000637	4.50	0.00287	2.75	0.02750	OK
4th	SPECY Max	X	108.00	83.87	18.10	8.75	0.000241	4.50	0.00108	2.75	0.02750	OK
4th	SPECY Max	Y	88.00	-2.99	12.50	8.75	0.000836	4.50	0.00376	2.75	0.02750	OK
3rd	SPECX Max	X	31.00	0.00	0.00	6.00	0.000408	4.50	0.00184	2.75	0.02750	OK
3rd	SPECX Max	Y	88.00	-2.99	12.50	6.00	0.000526	4.50	0.00237	2.75	0.02750	OK
3rd	SPECY Max	X	108.00	83.87	18.10	6.00	0.000204	4.50	0.00092	2.75	0.02750	OK
3rd	SPECY Max	Y	108.00	83.87	18.10	6.00	0.000701	4.50	0.00315	2.75	0.02750	OK
2nd	SPECX Max	X	31.00	0.00	0.00	3.25	0.000302	4.50	0.00136	3.15	0.03150	OK
2nd	SPECX Max	Y	88.00	-2.99	12.50	3.25	0.00035	4.50	0.00158	3.15	0.03150	OK
2nd	SPECY Max	X	20.00	82.27	17.85	3.25	0.000145	4.50	0.00065	3.15	0.03150	OK
2nd	SPECY Max	Y	22.00	82.27	6.40	3.25	0.000482	4.50	0.00217	3.15	0.03150	OK
1st	SPECX Max	X	31.00	0.00	0.00	0.10	0.000107	4.50	0.00048	2.00	0.02000	OK
1st	SPECX Max	Y	24.00	-2.36	11.11	0.10	0.000134	4.50	0.00060	2.00	0.02000	OK
1st	SPECY Max	X	20.00	82.27	17.85	0.10	0.000063	4.50	0.00028	2.00	0.02000	OK
1st	SPECY Max	Y	22.00	82.27	6.40	0.10	0.000203	4.50	0.00091	2.00	0.02000	OK



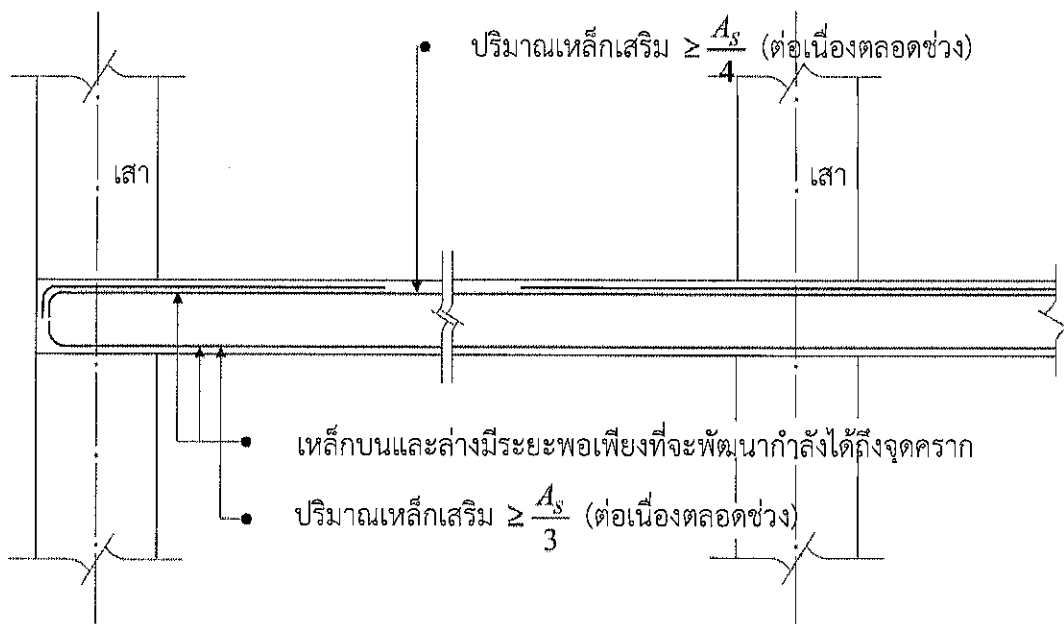
หมายเหตุ

- ก) ระยะเรียง s_0 ต้องไม่มากกว่าค่าที่น้อยที่สุดของค่าดังต่อไปนี้
- (1) 8 เท่าของเส้นผ่านศูนย์กลางเหล็กเสริมตามยาวที่มีขนาดเล็กที่สุด
 - (2) 24 เท่าของเส้นผ่านศูนย์กลางเหล็กปลอก
 - (3) $c_2 / 2$ และ (4) 300 มิลลิเมตร
- ข) ระยะ l_0 ต้องไม่น้อยกว่าค่าที่มากที่สุดของค่าดังต่อไปนี้
- (1) $H/6$ (2) c_1 และ (3) 500 มิลลิเมตร
- ค) การต่อเหล็กเสาให้ต่อบริเวณช่วงกลางความสูงเสา
- ง) อัตราส่วนพื้นที่หน้าตัด A_s / A_g ของเสา ต้องไม่น้อยกว่าร้อยละ 1 และไม่ควรมากกว่าร้อยละ 6

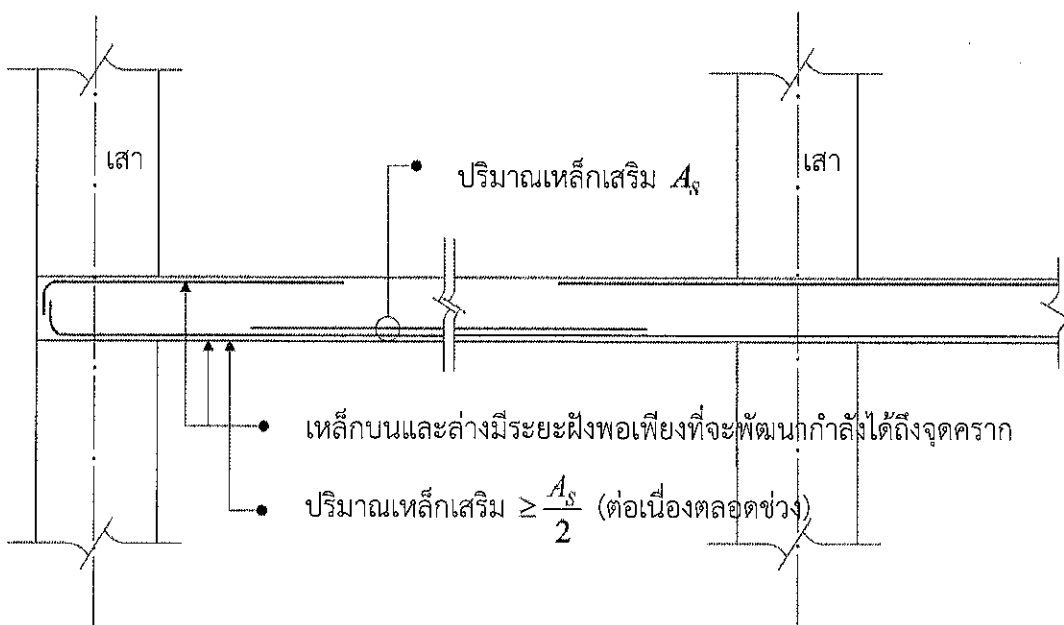
รายละเอียดการเสริมเหล็กในเสา



(ก) ความกว้างประสิทธิภาพ
รายละเอียดการเสริมเหล็กในแผ่นพื้นสองทางแบบไร้คาน



(ข) รายละเอียดการเสริมเหล็กในแถบเสา



(ค) รายละเอียดการเสริมเหล็กในแถบกลาง

รายละเอียดการเสริมเหล็กในแผ่นพื้นสองทางแบบไร้คาน (ต่อ)

รายการคำนวณโครงสร้างรองรับแผ่นดินไหว

โครงการ ดีคอนโด ไฮป์ รังสิต
(อาคาร B)

ที่ตั้งโครงการ

ถนนพหลโยธิน ตำบลคลองหนึ่ง อำเภอคลองหลวง

จังหวัดปทุมธานี

แรงแผ่นดินไหวสำหรับออกแบบโครงสร้างหลัก : มยผ. 1302-61

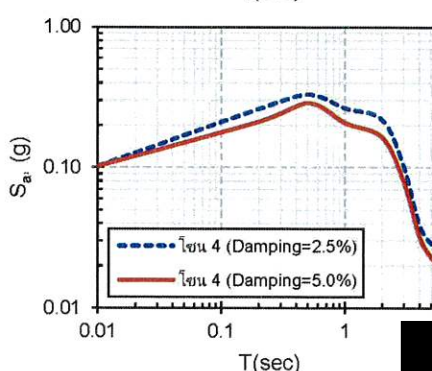
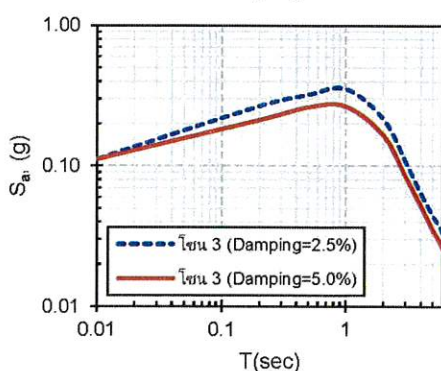
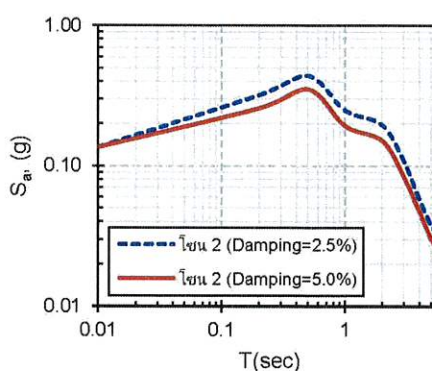
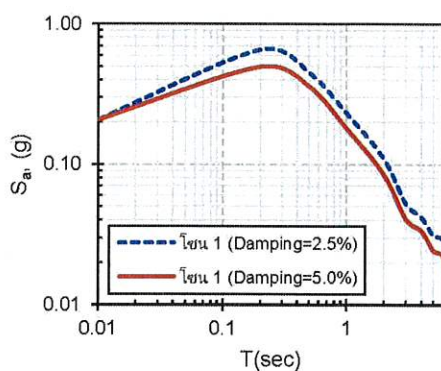
SEISMIC DESIGN CRITERIA

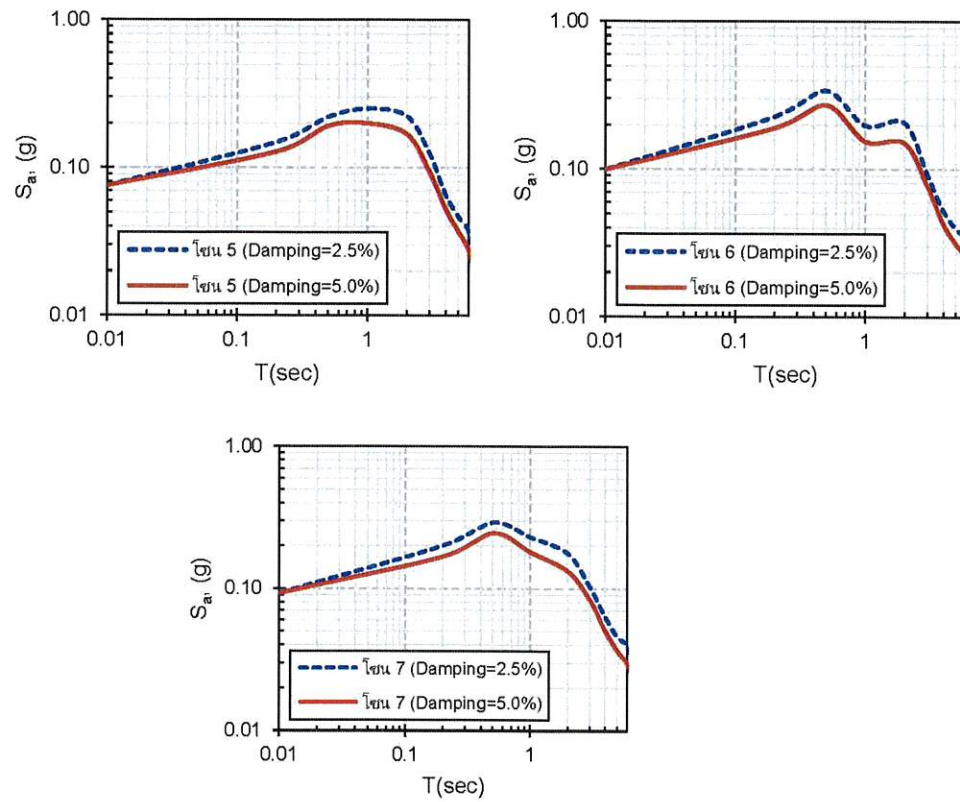
ข้อกำหนดในการออกแบบ

1. กฎกระทรวง กำหนดการรับน้ำหนัก ความต้านทาน ความคงทนของอาคารและพื้นดินที่รองรับอาคารในการต้านทานแรงสั่นสะเทือนของแผ่นดินไหว พ.ศ. 2564
2. ประกาศกระทรวงมหาดไทย เรื่องการออกแบบและคำนวณโครงสร้างอาคารเพื่อต้านทานแรงสั่นสะเทือนของแผ่นดินไหว พ.ศ. 2564
3. มาตรฐานการออกแบบต้านทานการสั่นสะเทือนของแผ่นดินไหว มยผ. 1301/1302-61 ของกรมโยธาธิการและผังเมือง กระทรวงมหาดไทย
4. มาตรฐาน ACI318-1999

แผ่นดินไหวสำหรับการออกแบบ

Spectrum สำหรับการออกแบบของพื้นที่ในแอ่งกรุงเทพฯ โซน 7 โดยที่ อาคารคอนกรีตเสริมเหล็กที่มีความสูงไม่เกิน 60 เมตร ใช้อัตราส่วนความหน่วงไม่เกินร้อยละ 5 และอาคารคอนกรีตเสริมเหล็กที่มีความสูงเกินกว่า 60 เมตร ให้ใช้อัตราส่วนความหน่วงไม่เกินร้อยละ 2.5





รูปที่ ก-7 แสดงสเปกตรัมผลตอบสนองสำหรับการออกแบบด้วยวิธีเชิงพลศาสตร์สำหรับโซนต่างๆ
ของพื้นที่ในแอ่งกรุงเทพฯ

ตารางที่ ก-6 ค่าความเร่งตอบสนองเชิงสเปกตรัมสำหรับการคำนวณแรงแผ่นดินไหวด้วยวิธีพลศาสตร์สำหรับพื้นที่
ในโซนต่างๆ (อัตราส่วนความหน่วง 2.5%) ของพื้นที่ในแอ่งกรุงเทพ

S_a โซน	S_a (0.01s)	S_{DS} (0.2 s)	S_a (0.5 s)	S_{D1} (1.0s)	S_a (2.0 s)	S_a (3.0 s)	S_a (4.0 s)	S_a (5.0 s)	S_a (6.0 s)
1	0.208	0.654	0.451	0.233	0.110	0.053	0.042	0.031	0.029
2	0.136	0.318	0.439	0.249	0.196	0.108	0.058	0.038	0.030
3	0.111	0.266	0.320	0.353	0.217	0.109	0.064	0.044	0.034
4	0.102	0.260	0.330	0.264	0.218	0.100	0.039	0.029	0.027
5	0.075	0.148	0.220	0.250	0.223	0.126	0.067	0.047	0.038
6	0.099	0.226	0.340	0.198	0.207	0.093	0.053	0.040	0.035
7	0.093	0.200	0.291	0.231	0.177	0.103	0.064	0.046	0.040

ตารางที่ ก-7 ค่าความเร่งตอบสนองเชิงสเปกตรัมสำหรับการคำนวณแรงแผ่นดินไหวด้วยวิธีพลศาสตร์สำหรับพื้นที่
ในโซนต่างๆ (อัตราส่วนความหน่วง 5.0%) ของพื้นที่ในแอ่งกรุงเทพ

S_a โซน	S_a (0.01s)	S_{DS} (0.2 s)	S_a (0.5 s)	S_{D1} (1.0s)	S_a (2.0 s)	S_a (3.0 s)	S_a (4.0 s)	S_a (5.0 s)	S_a (6.0 s)
1	0.208	0.495	0.360	0.181	0.085	0.041	0.034	0.024	0.022
2	0.136	0.257	0.352	0.193	0.151	0.084	0.047	0.030	0.024
3	0.111	0.212	0.262	0.265	0.166	0.085	0.052	0.035	0.026
4	0.102	0.211	0.287	0.207	0.163	0.078	0.032	0.023	0.020
5	0.075	0.128	0.191	0.199	0.168	0.094	0.053	0.037	0.028
6	0.099	0.189	0.272	0.154	0.150	0.077	0.042	0.031	0.026
7	0.093	0.167	0.246	0.181	0.132	0.084	0.051	0.036	0.030

แรงเฉือนที่ฐานอาคาร (Seismic Base Shear, V) คำนวณจาก

$$V = (C_s)(W)$$

โดยที่ C_s คือสัมประสิทธิ์ผลตอบสนองแรงแผ่นดินไหว

W คือน้ำหนักโครงสร้างประสิทธิผลของอาคาร ตามที่กำหนดในหัวข้อที่ 20(2)

สัมประสิทธิ์ผลตอบสนองแรงแผ่นดินไหว (C_s) คำนวณจาก

$$C_s = S_a (I/R)$$

โดยที่ S_a คือ ค่าความเร่งตอบสนองเชิงสเปกตรัมสำหรับการออกแบบ ตามตารางที่ ก-7(2)

R คือ ตัวประกอบปรับผลตอบสนอง ตามที่กำหนด ในผนวก ง ท้ายประกาศฯ (2)

I คือ ตัวประกอบความสำคัญของอาคาร ตามที่กำหนดในหัวข้อที่ 23(2)

และ C_s จะต้องมีค่าไม่น้อยกว่า 0.01

ระบบโครงสร้างโดยรวมของอาคารเป็น ระบบโครงสร้างโดยใช้กำแพงรับแรงเฉือนแบบธรรมดาเป็นระบบ
ต้านทานแรงด้านข้าง โดยที่

ประเภทความสำคัญของอาคาร; $I = 1.00$

ตัวประกอบปรับผลตอบสนอง; $R = 5.0$

ตัวประกอบกำลังส่วนเกิน; $\Omega_0 = 2.5$

ตัวประกอบขยายค่าการ โกงตัว; $C_d = 4.5$

Model Combination: CQC method

Directional Combination: SRSS

น้ำหนักบรรทุก

DL = 0.20 m Post – tensioned Slab 480 kg/sq.m

= 0.25 m RC. Flat Slab 600 kg/sq.m

SDL = 325 kg/sq.m

LL = 200 kg/sq.m

Design Load Combinations

การรวมผลของแรงสำหรับการออกแบบ

$$U = 1.2D + 1.0L + 1.0E$$

$$U = 0.9D + 1.0E$$

E = Earthquake Load จากวิเคราะห์ด้วยวิธี Elastic Response Spectrum Analysis และ Scale ให้ค่าแรงเฉือน
ที่ฐานมีค่าเท่ากับค่าจากวิธี Equivalent Static Force Procedure

Structural Stiffness

<i>Items</i>	<i>I_{eff}</i>
<i>Beam</i>	<i>0.35 I_g</i>
<i>Column</i>	<i>0.7 I_g</i>
<i>Wall non crack</i>	<i>0.7 I_g</i>
<i>Wall crack</i>	<i>0.35 I_g</i>
<i>Flat Slab</i>	<i>0.25 I_g</i>

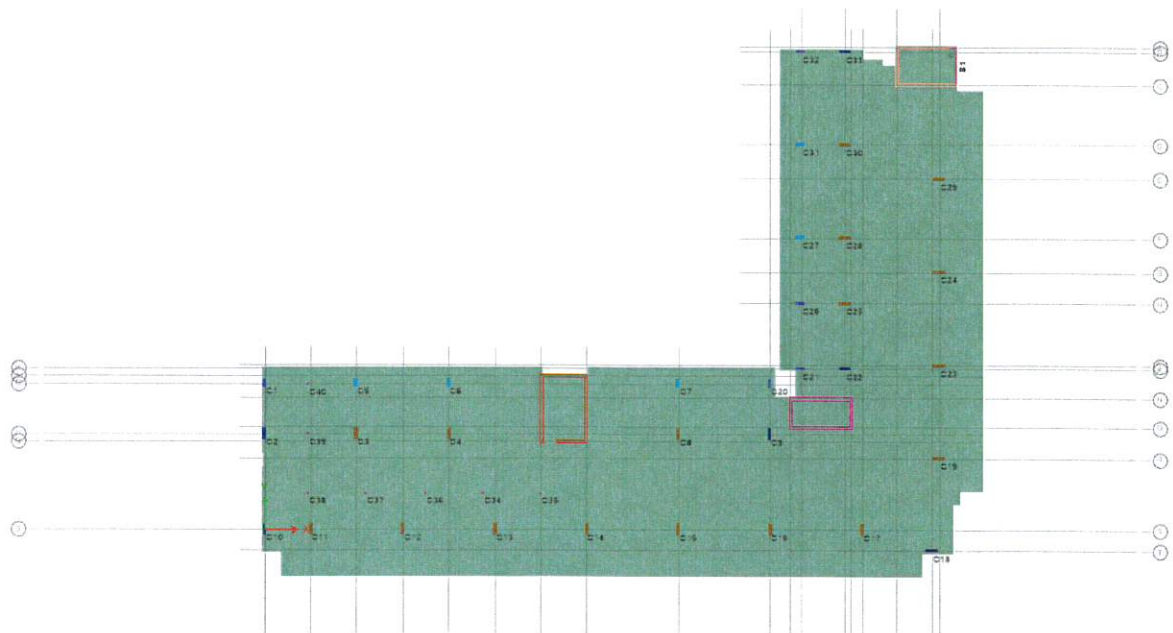
Structural Model

Method of Analysis: Finite Element Method (Frame & Shell Element)

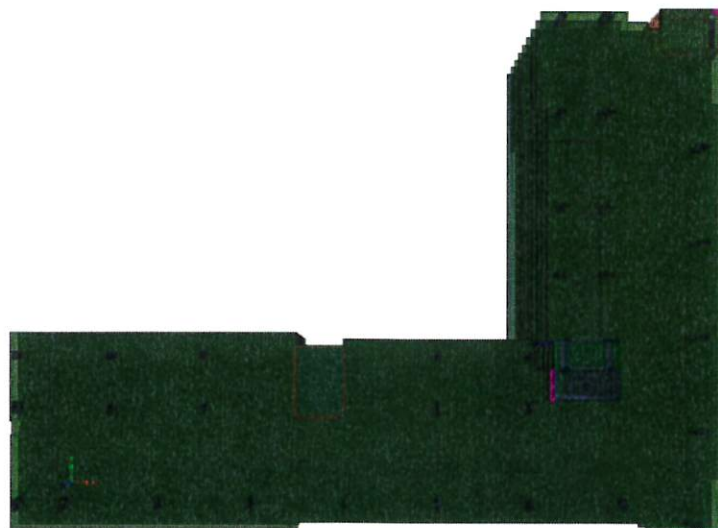
Modeling Detail : Column & Beam > 2- nodes frame element

Walls > 4 – nodes shell element

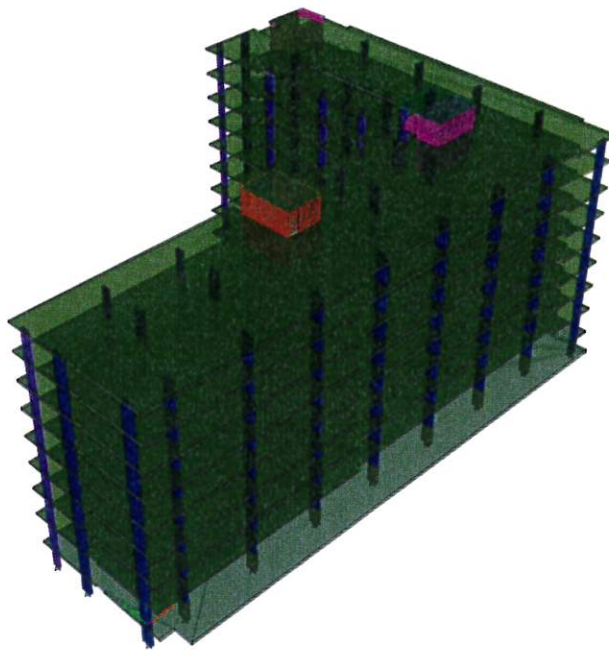
Slabs > 4 – nodes shell element



Typical Plan



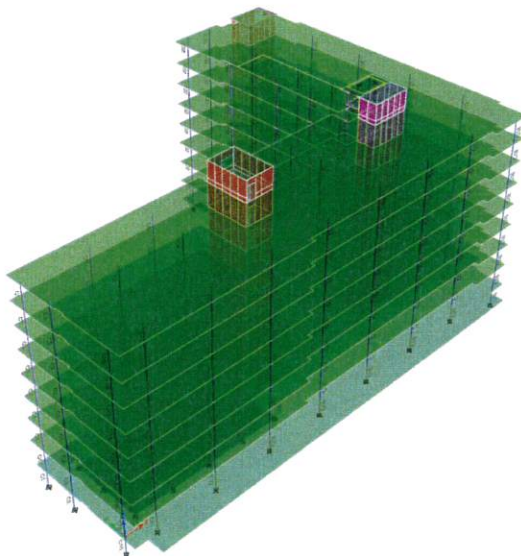
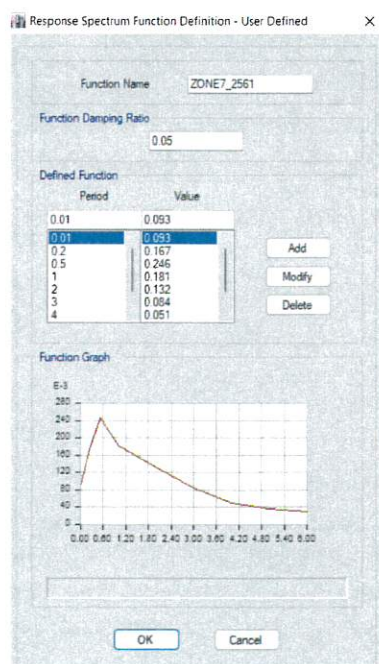
Top View



3D – Model

Mathematical Model

การวิเคราะห์โครงสร้าง ใช้แบบจำลอง Finite Element แบบสามมิติ



Response Spectrum Function Definition

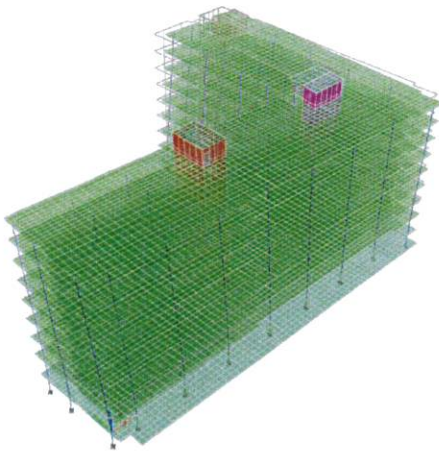
ผลการวิเคราะห์โดยวิธีพลศาสตร์และตัวคูณปรับค่า

จำนวนโหมดที่พิจารณาจะต้องเพียงพอที่จะทำให้ผลรวมของน้ำหนักประสิทธิผลเชิงโหมด(Effective Modal Weight, or Modal Weight Participation) มีค่าไม่น้อยกว่าร้อยละ 90 ของน้ำหนักประสิทธิผลทั้งหมดของอาคาร

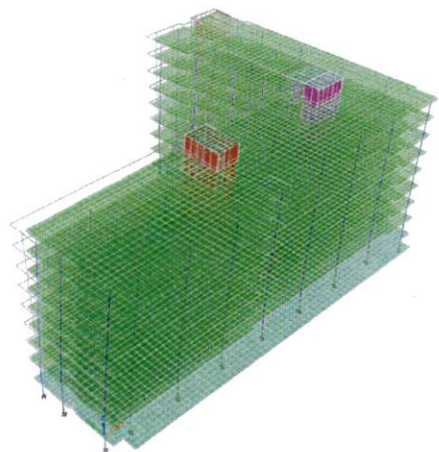
Model Participating Mass Ratios

Mode	Periods (sec.)	Model Participating Mass Ratios				
		Sum UX	SUM UY	SUM RX	SUM RY	SUM RZ
1	0.945	0.1488	0.1083	0.0563	0.0764	0.4099
2	0.853	0.2311	0.6372	0.3436	0.1188	0.4475
3	0.765	0.6551	0.6521	0.3530	0.3502	0.6589
4	0.234	0.6923	0.6812	0.3993	0.4113	0.7651
5	0.191	0.7317	0.8250	0.6085	0.4740	0.7711
6	0.167	0.8451	0.8430	0.6318	0.6326	0.8344
7	0.112	0.8570	0.8537	0.6506	0.6558	0.8737
8	0.088	0.8710	0.9013	0.7413	0.6827	0.8747
9	0.074	0.9054	0.9087	0.7563	0.7500	0.8950
10	0.072	0.9108	0.9129	0.7665	0.7637	0.9170
11	0.056	0.9174	0.9366	0.8234	0.7793	0.9172
12	0.052	0.9228	0.9395	0.8305	0.7927	0.9280
13	0.045	0.9359	0.9425	0.8379	0.8241	0.9399
14	0.042	0.9439	0.9425	0.8380	0.8448	0.9474
15	0.041	0.9454	0.9576	0.8767	0.8483	0.9480
16	0.035	0.9506	0.9585	0.8791	0.8621	0.9549
17	0.033	0.9510	0.9696	0.9094	0.8632	0.9554
18	0.032	0.9609	0.9696	0.9095	0.8884	0.9627
19	0.031	0.9650	0.9701	0.9108	0.8994	0.9664
20	0.029	0.9660	0.9702	0.9112	0.9023	0.9675
21	0.028	0.9675	0.9779	0.9326	0.9061	0.9676
22	0.026	0.9761	0.9781	0.9330	0.9291	0.9741
23	0.025	0.9767	0.9834	0.9482	0.9308	0.9741
24	0.024	0.9773	0.9853	0.9535	0.9323	0.9741
25	0.022	0.9831	0.9858	0.9550	0.9478	0.9796

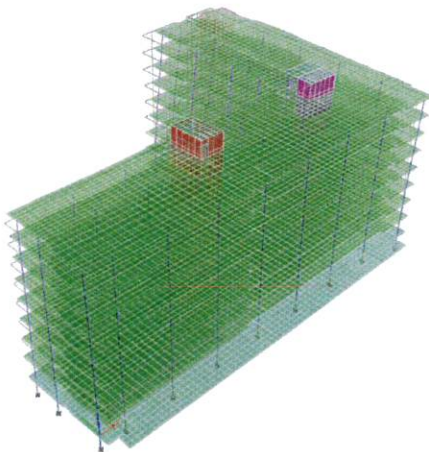
Analysis Model Period



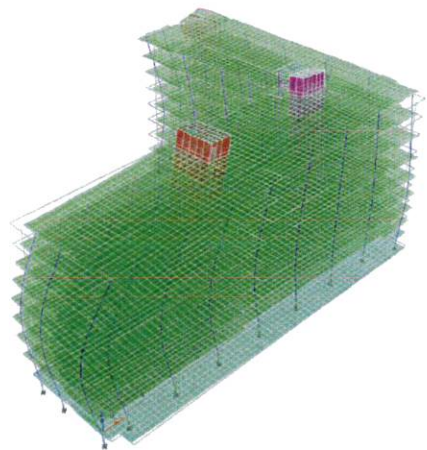
Mode 1 Period 0.945 seconds



Mode 2 Period 0.853 seconds



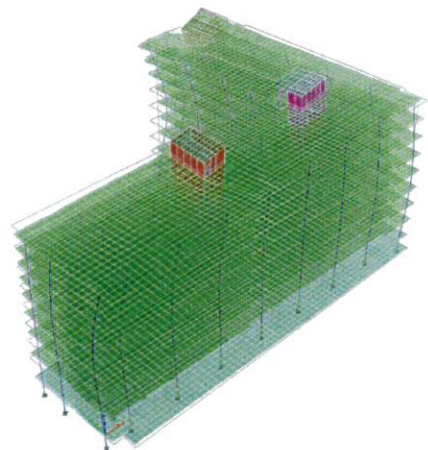
Mode 3 Period 0.765 seconds



Mode 4 Period 0.234 seconds



Mode 5 Period 0.191 seconds



Mode 6 Period 0.167 seconds

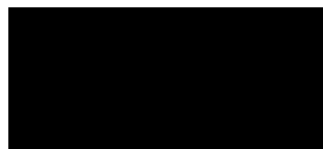


แรงเฉือนที่กระทำกับโครงสร้าง

แรงเฉือนที่ฐาน

Story	Load Case/Combo	Location	P	VX	VY	T	MX	MY
			tonf	tonf	tonf	tonf-m	tonf-m	tonf-m
ROOF TOP	SPECX Max	Top	0.00	2.91	1.14	58.33	0.00	0.00
ROOF TOP	SPECX Max	Bottom	0.00	2.91	1.14	58.33	2.27	5.82
ROOF TOP	SPECY Max	Top	0.00	1.18	3.32	132.86	0.00	0.00
ROOF TOP	SPECY Max	Bottom	0.00	1.18	3.32	132.86	6.65	2.36
RWT	SPECX Max	Top	0.00	4.60	1.75	93.30	2.27	5.82
RWT	SPECX Max	Bottom	0.00	4.60	1.75	93.30	3.15	8.12
RWT	SPECY Max	Top	0.00	1.81	5.19	209.31	6.65	2.36
RWT	SPECY Max	Bottom	0.00	1.81	5.19	209.31	9.24	3.26
ROOF	SPECX Max	Top	0.00	48.81	17.07	1283.89	3.15	8.12
ROOF	SPECX Max	Bottom	0.00	48.81	17.07	1283.89	50.87	144.75
ROOF	SPECY Max	Top	0.00	16.92	54.01	2107.01	9.24	3.26
ROOF	SPECY Max	Bottom	0.00	16.92	54.01	2107.01	160.41	50.60
Story8	SPECX Max	Top	0.00	96.42	31.85	2537.76	50.87	144.75
Story8	SPECX Max	Bottom	0.00	96.42	31.85	2537.76	139.16	414.26
Story8	SPECY Max	Top	0.00	31.51	106.01	4122.55	160.41	50.60
Story8	SPECY Max	Bottom	0.00	31.51	106.01	4122.55	456.44	138.00
Story7	SPECX Max	Top	0.00	134.81	43.04	3542.92	139.16	414.26
Story7	SPECX Max	Bottom	0.00	134.81	43.04	3542.92	257.63	790.18
Story7	SPECY Max	Top	0.00	42.53	147.84	5744.67	456.44	138.00
Story7	SPECY Max	Bottom	0.00	42.53	147.84	5744.67	867.99	255.09
Story6	SPECX Max	Top	0.00	165.24	51.72	4346.36	257.63	790.18
Story6	SPECX Max	Bottom	0.00	165.24	51.72	4346.36	398.51	1249.21
Story6	SPECY Max	Top	0.00	51.14	181.08	7037.54	867.99	255.09
Story6	SPECY Max	Bottom	0.00	51.14	181.08	7037.54	1369.99	394.26
Story5	SPECX Max	Top	0.00	188.89	58.90	4979.08	398.51	1249.21
Story5	SPECX Max	Bottom	0.00	188.89	58.90	4979.08	556.89	1771.61
Story5	SPECY Max	Top	0.00	58.34	206.94	8047.32	1369.99	394.26
Story5	SPECY Max	Bottom	0.00	58.34	206.94	8047.32	1941.07	550.82
Story4	SPECX Max	Top	0.00	206.38			89	1771.61

Story	Load Case/Combo	Location	P	VX	VY	T	MX	MY
Story	Load Case/Combo	Location	tonf	tonf	tonf	tonf-m	tonf-m	tonf-m
Story4	SPECX Max	Bottom	0.00	206.38	64.83	5458.99	729.44	2340.23
Story4	SPECY Max	Top	0.00	64.40	226.11	8800.82	1941.07	550.82
Story4	SPECY Max	Bottom	0.00	64.40	226.11	8800.82	2562.62	721.77
Story3	SPECX Max	Top	0.00	218.09	69.34	5788.04	729.44	2340.23
Story3	SPECX Max	Bottom	0.00	218.09	69.34	5788.04	913.17	2939.80
Story3	SPECY Max	Top	0.00	69.12	238.96	9308.37	2562.62	721.77
Story3	SPECY Max	Bottom	0.00	69.12	238.96	9308.37	3218.01	904.34
Story2	SPECX Max	Top	0.00	224.56	72.24	5968.81	913.17	2939.80
Story2	SPECX Max	Bottom	0.00	224.56	72.24	5968.81	1111.78	3579.20
Story2	SPECY Max	Top	0.00	72.25	245.93	9585.72	3218.01	904.34
Story2	SPECY Max	Bottom	0.00	72.25	245.93	9585.72	3916.91	1102.31
Story1	SPECX Max	Top	0.00	226.37	73.24	6019.28	1111.78	3579.20
Story1	SPECX Max	Bottom	0.00	226.37	73.24	6019.28	1262.33	4058.22
Story1	SPECY Max	Top	0.00	73.24	248.08	9672.74	3916.91	1102.31
Story1	SPECY Max	Bottom	0.00	73.24	248.08	9672.74	4440.96	1252.57



ผลการวิเคราะห์โดยวิธีทางพลศาสตร์ แรงเฉือนที่ฐานมีค่า ดังนี้

$$\text{สำหรับแผ่นดินไหวในทิศทาง X:} \quad V_X = 226.37 \text{ Tons}$$

$$\text{สำหรับแผ่นดินไหวในทิศทาง Y:} \quad V_Y = 248.08 \text{ Tons}$$

การคำนวณโดยวิธีสถิตยเทียบเท่า

$$H = 22.50 \text{ m}$$

$$T \text{ ทิศทาง X} = 0.945 \text{ sec ให้ใช้ไม่เกิน } 0.02H (1.5) = 0.675 \text{ sec, ใช้ } T = 0.675 \text{ sec}$$

$$T \text{ ทิศทาง Y} = 0.853 \text{ sec ให้ใช้ไม่เกิน } 0.02H (1.5) = 0.675 \text{ sec, ใช้ } T = 0.675 \text{ sec}$$

$$I = 1.00, R = 5$$

$$S_a \text{ ทิศทาง X} = 0.223 \text{ (จากตารางที่ 1.4-4, } T = 0.675 \text{)}$$

$$S_a \text{ ทิศทาง Y} = 0.223 \text{ (จากตารางที่ 1.4-4, } T = 0.675 \text{)}$$

$$C_s \text{ ทิศทาง X} = S_a(I/R) = 0.0447 > 0.01$$

$$C_s \text{ ทิศทาง Y} = S_a(I/R) = 0.0447 > 0.01$$

$$W = 9985.01 \text{ Tons}$$

$$\text{ค่าแรงเฉือนที่ฐานในทิศทาง X เท่ากับ } V = 0.0447 (9985.01) = 446.33 \text{ Tons}$$

$$\text{ค่าแรงเฉือนที่ฐานในทิศทาง Y เท่ากับ } V = 0.0447 (9985.01) = 446.33 \text{ Tons}$$

ปรับค่าแรงภายในที่ใช้ในการออกแบบด้วยวิธีเชิงพลศาสตร์โดยคูณด้วยค่า $0.85V/V_t$

$$\text{ทิศทาง X : Scale Factor} = 0.85 \times 446.33 / 226.37 = 1.68$$

$$\text{ทิศทาง Y : Scale Factor} = 0.85 \times 446.33 / 248.08 = 1.53$$

ดังนั้น แผ่นดินไหวใช้ตัวคูณปรับค่าการตอบสนอง ในการออกแบบ ดังต่อไปนี้

$$EQ_{XX} = 1.68 (SPECX) + 0.46 (SPECY)$$

$$EQ_{YY} = 0.5 (SPECX) + 1.53 (SPECY)$$

การรวมผลของแรง

สำหรับการออกแบบด้วยวิธีหน่วยแรงที่ยอมให้

$$\text{WSD1} = 1.0D + 1.0L$$

$$\text{WSD2} = 1.0D + 0.7EQX$$

$$\text{WSD2-1} = 1.0D - 0.7EQX$$

$$\text{WSD3} = 1.0D + 0.7EQY$$

$$\text{WSD3-1} = 1.0D - 0.7EQY$$

$$\text{WSD4} = 1.0D + 0.75L + 0.525EQX$$

$$\text{WSD4-1} = 1.0D + 0.75L - 0.525EQX$$

$$\text{WSD5} = 1.0D + 0.75L + 0.525EQY$$

$$\text{WSD5-1} = 1.0D + 0.75L - 0.525EQY$$

$$\text{WSD6} = 0.6D + 0.7EQX$$

$$\text{WSD6-1} = 0.6D - 0.7EQX$$

$$\text{WSD7} = 0.6D + 0.7EQY$$

$$\text{WSD7-1} = 0.6D - 0.7EQY$$

$$\text{WSD8} = 1.0D + 0.75L + 0.75W$$

$$\text{WSD9} = 1.0D + 0.75L - 0.75W$$

$$\text{WSD10} = 1.0D + 1.0W$$

$$\text{WSD11} = 1.0D - 1.0W$$

สำหรับการออกแบบด้วยวิธีกำลัง

$$\text{USD1} = 1.4\text{D} + 1.4\text{SD}$$

$$\text{USD2} = 1.4\text{D} + 1.4\text{SD} + 1.7\text{L}$$

$$\text{UEQ1} = 1.20\text{D} + 1.20\text{SD} + 1.00\text{L} + 1.00\text{EQX}$$

$$\text{UEQ1-1} = 1.20\text{D} + 1.20\text{SD} + 1.00\text{L} - 1.00\text{EQX}$$

$$\text{UEQ2} = 1.20\text{D} + 1.20\text{SD} + 1.00\text{L} + 1.00\text{EQY}$$

$$\text{UEQ2-1} = 1.20\text{D} + 1.20\text{SD} + 1.00\text{L} - 1.00\text{EQY}$$

$$\text{UEQ3} = 0.9\text{D} + 0.9\text{SD} + 1.00\text{EQX}$$

$$\text{UEQ3-1} = 0.9\text{D} + 0.9\text{SD} - 1.00\text{EQX}$$

$$\text{UEQ4} = 0.9\text{D} + 0.9\text{SD} + 1.00\text{EQY}$$

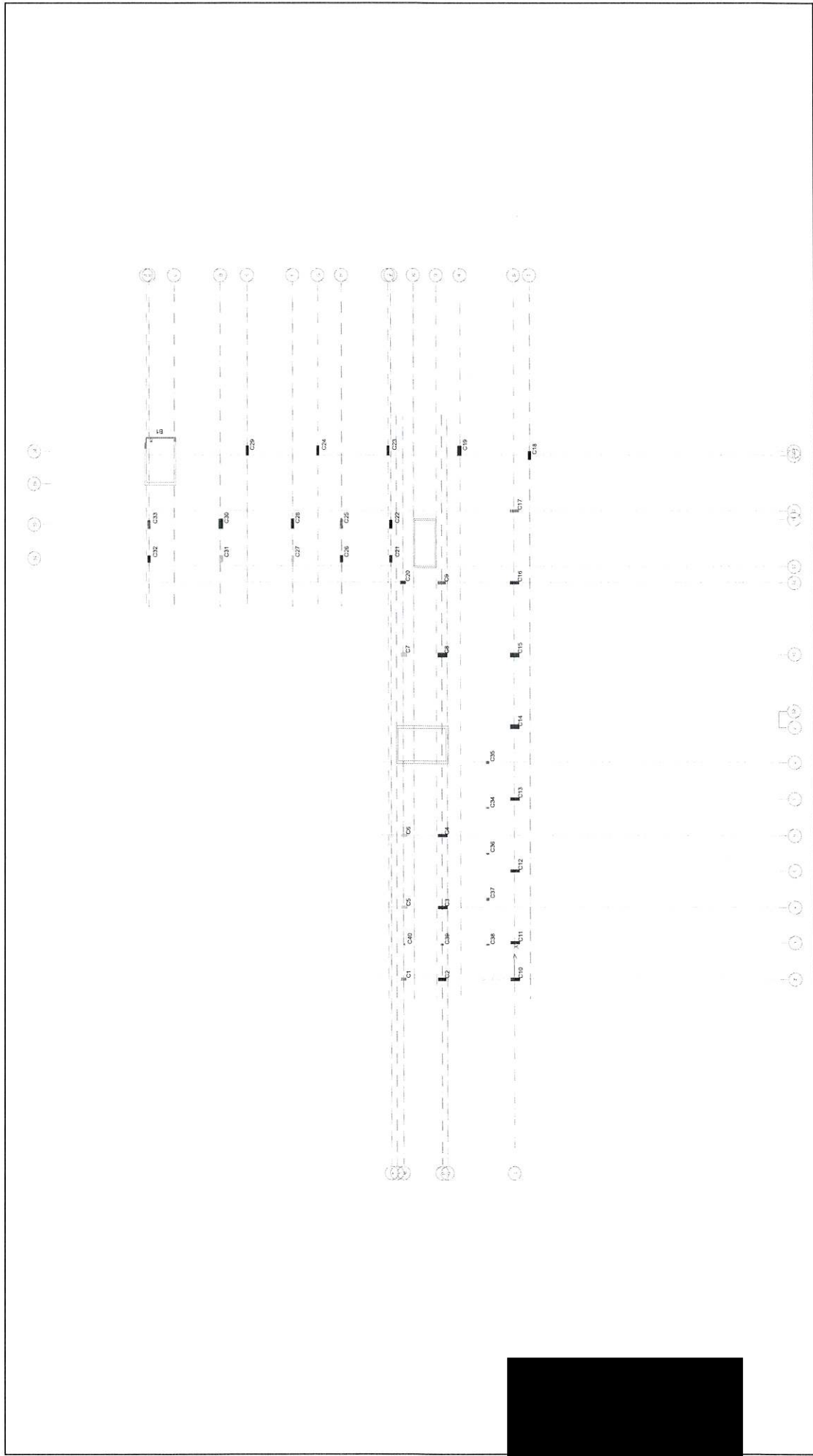
$$\text{UEQ4-1} = 0.9\text{D} + 0.9\text{SD} - 1.00\text{EQY}$$

$$\text{UWL1} = 1.05\text{D} + 1.05\text{SD} + 1.275\text{L} + 1.275\text{W}$$

$$\text{UWL2} = 1.05\text{D} + 1.05\text{SD} + 1.275\text{L} - 1.275\text{W}$$

$$\text{UWL3} = 0.9\text{D} + 0.9\text{SD} + 1.30\text{W}$$

$$\text{UWL4} = 0.9\text{D} + 0.9\text{SD} - 1.30\text{W}$$



Load Combinations

Name	Load Case/Combo	Scale Factor	Type
WSD1	Dead	1	Linear Add
WSD1	SDL	1	
WSD1	Live	1	
WSD2	Dead	1	Linear Add
WSD2	SDL	1	
WSD2	EQXX	0.7	
WSD3	Dead	1	Linear Add
WSD3	SDL	1	
WSD3	EQYY	0.7	
WSD4	Dead	1	Linear Add
WSD4	SDL	1	
WSD4	Live	0.75	
WSD4	EQXX	0.525	
WSD5	Dead	1	Linear Add
WSD5	SDL	1	
WSD5	Live	0.75	
WSD5	EQYY	0.525	
WSD6	Dead	0.6	Linear Add
WSD6	SDL	0.6	
WSD6	EQXX	0.7	
WSD7	Dead	0.6	Linear Add
WSD7	SDL	0.6	
WSD7	EQYY	0.7	
WDEAD	Dead	1	Linear Add
WDEAD	SDL	1	
USD1	Dead	1.4	Linear Add
USD1	SDL	1.4	
USD1	Live	1.7	
UEQ1	Dead	1.2	Linear Add
UEQ1	SDL	1.2	
UEQ1	Live	1	
UEQ1	EQXX	1	
UEQ2	Dead	1.2	Linear Add
UEQ2	SDL	1.2	
UEQ2	Live	1	
UEQ2	SPECY	1	
UEQ3	Dead	0.9	Linear Add
UEQ3	SDL	0.9	
UEQ3	EQXX	1	
UEQ4	Dead	0.9	Linear Add
UEQ4	SDL	0.9	
UEQ4	EQYY	1	
USD2	Dead	1.4	Linear Add
USD2	SDL	1.4	
WSD Env	WSD1	1	Envelope
WSD Env	WSD2	1	
WSD Env	WSD3	1	
WSD Env	WSD4	1	
WSD Env	WSD5	1	
WSD Env	WSD6	1	
WSD Env	WSD7	1	
USD ENV	USD1	1	Envelope
USD ENV	UEQ1	1	
USD ENV	UEQ2	1	
USD ENV	UEQ3	1	
USD ENV	UEQ4	1	
USD ENV	USD2	1	
EQXX	SPECX	1.68	Linear Add

Name	Load Case/Combo	Scale Factor	Type
WSD1	Dead	1	Linear Add
EQXX	SPECY	0.46	
EQYY	SPECY	1.53	Linear Add
EQYY	SPECX	0.5	
UWL1	Dead	1.05	Linear Add
UWL1	SDL	1.05	
UWL1	Live	1.275	
UWL1	WIND	1.275	
UWL2	Dead	1.05	Linear Add
UWL2	SDL	1.05	
UWL2	Live	1.275	
UWL2	WIND	-1.275	
UWL3	Dead	0.9	Linear Add
UWL3	SDL	0.9	
UWL3	WIND	1.3	
UWL4	Dead	0.9	Linear Add
UWL4	SDL	0.9	
UWL4	WIND	-1.3	
WSD8	Dead	1	Linear Add
WSD8	SDL	1	
WSD8	Live	0.75	
WSD8	WIND	0.75	
WSD9	Dead	1	Linear Add
WSD9	SDL	1	
WSD9	Live	0.75	
WSD9	WIND	-0.75	
WSD10	Dead	1	Linear Add
WSD10	SDL	1	
WSD10	WIND	1	
WSD11	Dead	1	Linear Add
WSD11	SDL	1	
WSD11	WIND	-1	

Column Force : Service Load Env.

Story	Column	Load Case/Combo	P	V2	V3	T	M2	M3
			tonf	tonf	tonf	tonf-m	tonf-m	tonf-m
ROOF TOP	C21	WSD Env Min	-4.1732	-6.5795	-0.3918	-0.0542	-0.2536	-6.4034
ROOF TOP	C22	WSD Env Min	-2.7039	-2.4716	-8.3785	-0.1016	-8.1898	-2.8633
ROOF TOP	C47	WSD Env Min	-2.0246	-0.2343	-4.0684	-0.025	-4.1821	-0.2381
ROOF TOP	C48	WSD Env Min	-3.5136	-0.1383	-4.2896	-0.0177	-4.3445	-0.1386
RWT	C21	WSD Env Min	-8.1859	-17.0604	-2.4173	-0.1246	-0.5837	-5.7539
RWT	C22	WSD Env Min	-5.0434	-5.001	-18.1789	-0.0632	-5.2042	-2.6285
RWT	C47	WSD Env Min	-7.1875	-1.7882	-7.0824	-0.0146	-1.1929	-0.4118
RWT	C48	WSD Env Min	-13.8082	-0.3877	-10.1916	-0.0644	-1.4873	-0.0763
ROOF	C1	WSD Env Min	-12.3568	-5.3551	-1.9334	-0.0722	-2.0173	-6.7057
ROOF	C2	WSD Env Min	-20.3614	-7.1042	-0.8139	-0.1155	-0.3388	-8.7963
ROOF	C3	WSD Env Min	-44.155	-0.7156	-0.3518	-0.1155	0.2871	-0.8469
ROOF	C4	WSD Env Min	-41.2193	-0.649	0.1111	-0.1155	0.7493	-0.7645
ROOF	C5	WSD Env Min	-26.0003	-0.4968	-2.6644	-0.0722	-2.9304	-0.6064
ROOF	C6	WSD Env Min	-23.6755	-0.6501	-2.2051	-0.0722	-2.4312	-0.7975
ROOF	C7	WSD Env Min	-21.8922	-1.3712	-0.5132	-0.0722	-0.4376	-1.6569
ROOF	C8	WSD Env Min	-42.2008	-1.6942	0.9893	-0.1155	1.691	-2.0169
ROOF	C9	WSD Env Min	-24.1253	1.0195	1.9418	-0.1155	2.8285	1.3229
ROOF	C10	WSD Env Min	-10.8582	-3.1576	-4.3098	-0.1155	-4.7114	-3.8608
ROOF	C11	WSD Env Min	-30.8294	-3.8351	-9.2885	-0.1155	-10.2511	-4.7952
ROOF	C12	WSD Env Min	-39.8627	-0.7996	-10.1654	-0.1155	-11.2739	-0.9363
ROOF	C13	WSD Env Min	-36.5683	-0.587	-8.8113	-0.1155	-9.7921	-0.6753
ROOF	C14	WSD Env Min	-31.1073	-1.0072	-6.9983	-0.1155	-7.6901	-1.2078
ROOF	C15	WSD Env Min	-35.7061	-1.011	-11.331	-0.1155	-12.6194	-1.1913
ROOF	C16	WSD Env Min	-34.3762	-0.742	-9.9457	-0.1155	-10.9375	-0.8757
ROOF	C17	WSD Env Min	-32.6784	-0.6442	-9.7655	-0.1155	-10.6542	-0.7321
ROOF	C18	WSD Env Min	-16.2411	0.1559	-7.0941	-0.1155	-8.7263	0.2949
ROOF	C19	WSD Env Min	-36.1279	1.067	-1.3373	-0.1155	-1.5986	1.8589
ROOF	C20	WSD Env Min	-10.9762	1.3409	-1.1324	-0.0722	-1.1221	1.739
ROOF	C21	WSD Env Min	-26.706	-3.2215	-0.3243	-0.0722	-0.3318	-4.1491
ROOF	C22	WSD Env Min	-24.9772	-2.7638	-3.9709	-0.1155	-5.2775	-3.7766
ROOF	C23	WSD Env Min	-34.8339	0.856	-2.0403	-0.1155	-2.553	1.364
ROOF	C24	WSD Env Min	-37.2598	2.1883	-1.603	-0.1155	-1.9073	2.9789
ROOF	C25	WSD Env Min	-41.9628	-6.5341	-1.6369	-0.1155	-1.9109	-7.3378
ROOF	C26	WSD Env Min	-44.4829	-1.3738	-0.7093	-0.0722	-0.7203	-1.6806
ROOF	C27	WSD Env Min	-54.7365	-3.7069	-0.6315	-0.0722	-0.6143	-4.0641
ROOF	C28	WSD Env Min	-52.2773	-7.4274	-3.415	-0.1155	-3.8607	-8.2739
ROOF	C29	WSD Env Min	-37.1917	2.41	-1.1922	-0.1155	-1.395	3.249
ROOF	C30	WSD Env Min	-40.7292	-5.0989	-0.7517	-0.1155	-0.852	-5.5966
ROOF	C31	WSD Env Min	-33.5051	-1.7234	-1.5139	-0.0722	-1.596	-2.1742
ROOF	C32	WSD Env Min	-11.7795	1.5357	-1.8822	-0.0722	-1.9385	2.0456
ROOF	C33	WSD Env Min	-10.8024	-1.1223	0.9778	-0.1155	1.3179	-0.8522
Story8	C1	WSD Env Min	-27.4503	-4.0626	-1.3394	-0.0773	-1.9116	-5.8238
Story8	C2	WSD Env Min	-45.1279	-5.259	-0.7853	-0.1236	-0.8626	-7.5649
Story8	C3	WSD Env Min	-96.9711	-0.5348	-0.3108	-0.1236	-0.2185	-0.74
Story8	C4	WSD Env Min	-91.1735	-0.5074	-0.0104	-0.1236	0.1983	-0.71
Story8	C5	WSD Env Min	-56.6389	-0.3892	-1.8887	-0.0773	-2.7194	-0.5377
Story8	C6	WSD Env Min	-52.3399	-0.5237	-1.6129	-0.0773	-2.3122	-0.7403
Story8	C7	WSD Env Min	-47.8259	-0.9812	-0.4587	-0.0773	-0.5729	-1.4029
Story8	C8	WSD Env Min	-93.3238	-1.1885	0.5224	-0.1236	1.045	-1.6962
Story8	C9	WSD Env Min	-55.1596	0.7015	0.9604	-0.1236	1.8934	1.0125
Story8	C10	WSD Env Min	-23.9211	-2.2789	-3.1211	-0.1236	-4.5994	-3.2414
Story8	C11	WSD Env Min	-67.4326	-2.9301	-6.4637	-0.1236	-9.4668	-4.154

Column Force : Service Load Env.

Story	Column	Load Case/Combo	P	V2	V3	T	M2	M3
			tonf	tonf	tonf	tonf-m	tonf-m	tonf-m
Story8	C12	WSD Env Min	-87.4772	-0.6123	-7.0571	-0.1236	-10.3113	-0.8457
Story8	C13	WSD Env Min	-80.6273	-0.4667	-6.2398	-0.1236	-9.0896	-0.6371
Story8	C14	WSD Env Min	-68.5777	-0.793	-5.016	-0.1236	-7.2458	-1.0991
Story8	C15	WSD Env Min	-78.4079	-0.754	-7.906	-0.1236	-11.437	-1.0523
Story8	C16	WSD Env Min	-75.6337	-0.5925	-7.1429	-0.1236	-10.0889	-0.8143
Story8	C17	WSD Env Min	-72.1868	-0.4864	-7.1024	-0.1236	-9.8839	-0.6731
Story8	C18	WSD Env Min	-35.7583	-0.218	-5.2368	-0.1236	-7.5133	0.1512
Story8	C19	WSD Env Min	-79.4788	0.7587	-1.0596	-0.1236	-1.4617	1.5022
Story8	C20	WSD Env Min	-24.2857	1.0467	-0.817	-0.0773	-1.082	1.5067
Story8	C21	WSD Env Min	-36.1968	-2.6807	-0.3465	-0.0773	-0.4504	-3.788
Story8	C22	WSD Env Min	-47.3532	-3.0876	-3.6393	-0.1236	-5.1067	-4.0406
Story8	C23	WSD Env Min	-76.7872	0.4366	-1.7325	-0.1236	-2.4167	0.9667
Story8	C24	WSD Env Min	-82.7788	1.5205	-1.231	-0.1236	-1.7186	2.4418
Story8	C25	WSD Env Min	-78.7142	-5.1209	-1.1424	-0.1236	-1.6103	-7.0626
Story8	C26	WSD Env Min	-60.0375	-1.0464	-0.5461	-0.0773	-0.7454	-1.4695
Story8	C27	WSD Env Min	-74.2218	-2.0423	-0.4959	-0.0773	-0.6617	-2.894
Story8	C28	WSD Env Min	-96.0396	-5.6132	-2.1083	-0.1236	-2.9891	-7.8102
Story8	C29	WSD Env Min	-81.9843	1.6163	-0.9239	-0.1236	-1.2826	2.6238
Story8	C30	WSD Env Min	-84.5203	-3.6967	-0.5748	-0.1236	-0.794	-5.1915
Story8	C31	WSD Env Min	-61.2049	-1.5328	-1.0648	-0.0773	-1.4669	-2.0168
Story8	C32	WSD Env Min	-27.2581	1.258	-1.2486	-0.0773	-1.7028	1.811
Story8	C33	WSD Env Min	-24.1983	-0.9757	0.758	-0.1236	1.1205	-1.076
Story7	C1	WSD Env Min	-42.5147	-4.3072	-1.4968	-0.0812	-2.2158	-5.9874
Story7	C2	WSD Env Min	-69.799	-5.6296	-0.8468	-0.1298	-1.5015	-7.8122
Story7	C3	WSD Env Min	-149.972	-0.5794	-0.3831	-0.1298	-0.8183	-0.7959
Story7	C4	WSD Env Min	-141.2559	-0.5811	-0.0452	-0.1298	-0.338	-0.8043
Story7	C5	WSD Env Min	-87.3343	-0.4097	-2.1025	-0.0812	-3.0566	-0.5671
Story7	C6	WSD Env Min	-80.9781	-0.5837	-1.7874	-0.0812	-2.6151	-0.815
Story7	C7	WSD Env Min	-73.738	-1.0585	-0.5417	-0.0812	-0.7915	-1.4628
Story7	C8	WSD Env Min	-144.7131	-1.2972	0.5434	-0.1298	0.6165	-1.7846
Story7	C9	WSD Env Min	-87.2951	0.6294	1.0075	-0.1298	1.4013	0.8644
Story7	C10	WSD Env Min	-36.7658	-2.4038	-3.3382	-0.1298	-5.203	-3.3065
Story7	C11	WSD Env Min	-104.2327	-3.0712	-6.9917	-0.1298	-10.2137	-4.2468
Story7	C12	WSD Env Min	-135.0468	-0.6884	-7.6189	-0.1298	-11.0321	-0.9403
Story7	C13	WSD Env Min	-124.7011	-0.5411	-6.7458	-0.1298	-9.7913	-0.7381
Story7	C14	WSD Env Min	-106.0581	-0.879	-5.4184	-0.1298	-7.8843	-1.2032
Story7	C15	WSD Env Min	-121.0691	-0.84	-8.5423	-0.1298	-12.1282	-1.1499
Story7	C16	WSD Env Min	-116.8811	-0.6694	-7.7275	-0.1298	-10.8321	-0.9161
Story7	C17	WSD Env Min	-111.7909	-0.5713	-7.7055	-0.1298	-10.6852	-0.78
Story7	C18	WSD Env Min	-55.1132	-0.2425	-5.6052	-0.1298	-7.7761	-0.1568
Story7	C19	WSD Env Min	-122.9738	0.7606	-1.149	-0.1298	-1.5849	1.2083
Story7	C20	WSD Env Min	-37.632	1.0657	-0.9526	-0.0812	-1.3271	1.4828
Story7	C21	WSD Env Min	-46.0951	-2.7609	-0.401	-0.0812	-0.6088	-3.8475
Story7	C22	WSD Env Min	-70.2609	-3.027	-3.7121	-0.1298	-5.1755	-4.214
Story7	C23	WSD Env Min	-118.7359	0.4831	-1.8501	-0.1298	-2.5648	0.7206
Story7	C24	WSD Env Min	-128.2699	1.6048	-1.3475	-0.1298	-1.8579	2.1948
Story7	C25	WSD Env Min	-115.3986	-5.2421	-1.2346	-0.1298	-1.7011	-7.3153
Story7	C26	WSD Env Min	-75.5174	-1.0932	-0.6473	-0.0812	-0.9392	-1.5163
Story7	C27	WSD Env Min	-93.8555	-2.1997	-0.5987	-0.0812	-0.8672	-3.0432
Story7	C28	WSD Env Min	-139.8697	-5.7859	-2.319	-0.1298	-3.2063	-8.101
Story7	C29	WSD Env Min	-126.8495	1.7071	-1.0457	-0.1298	-1.4397	2.3321
Story7	C30	WSD Env Min	-128.4837	-4.0529	-0.6596	-0.1298	-0.9094	-5.6888

Column Force : Service Load Env.

Story	Column	Load Case/Combo	P	V2	V3	T	M2	M3
			tonf	tonf	tonf	tonf-m	tonf-m	tonf-m
Story7	C31	WSD Env Min	-88.9767	-1.5172	-1.2217	-0.0812	-1.7073	-2.1181
Story7	C32	WSD Env Min	-42.6833	1.2752	-1.4234	-0.0812	-1.9474	1.7812
Story7	C33	WSD Env Min	-37.5015	-1.1037	0.7486	-0.1298	1.0496	-1.5641
Story6	C1	WSD Env Min	-57.5898	-4.22	-1.4742	-0.0825	-2.4586	-5.9072
Story6	C2	WSD Env Min	-94.4652	-5.5044	-0.8895	-0.1319	-2.2778	-7.7054
Story6	C3	WSD Env Min	-203.0808	-0.5614	-0.4074	-0.1319	-1.4994	-0.7954
Story6	C4	WSD Env Min	-191.493	-0.5954	-0.0784	-0.1319	-0.9655	-0.8527
Story6	C5	WSD Env Min	-117.9951	-0.3939	-2.0804	-0.0825	-3.2774	-0.5582
Story6	C6	WSD Env Min	-109.6428	-0.5957	-1.7802	-0.0825	-2.8313	-0.8494
Story6	C7	WSD Env Min	-99.6053	-1.0152	-0.5825	-0.0825	-1.0094	-1.4232
Story6	C8	WSD Env Min	-196.3832	-1.2449	0.4762	-0.1319	0.0795	-1.7447
Story6	C9	WSD Env Min	-120.5254	0.5204	0.8538	-0.1319	0.6969	0.6947
Story6	C10	WSD Env Min	-49.4688	-2.2857	-3.3194	-0.1319	-5.8275	-3.1747
Story6	C11	WSD Env Min	-141.1415	-2.9742	-6.8838	-0.1319	-10.7502	-4.1421
Story6	C12	WSD Env Min	-182.5404	-0.689	-7.4732	-0.1319	-11.4722	-0.9726
Story6	C13	WSD Env Min	-168.7989	-0.5567	-6.666	-0.1319	-10.2678	-0.7906
Story6	C14	WSD Env Min	-143.574	-0.8822	-5.3743	-0.1319	-8.3612	-1.2387
Story6	C15	WSD Env Min	-163.6694	-0.8314	-8.3879	-0.1319	-12.4675	-1.171
Story6	C16	WSD Env Min	-158.123	-0.6815	-7.6563	-0.1319	-11.3149	-0.9637
Story6	C17	WSD Env Min	-151.5163	-0.5838	-7.6691	-0.1319	-11.2584	-0.8301
Story6	C18	WSD Env Min	-74.3665	-0.3136	-5.466	-0.1319	-7.6726	-0.6399
Story6	C19	WSD Env Min	-166.5839	0.7527	-1.1334	-0.1319	-1.6107	0.8483
Story6	C20	WSD Env Min	-51.0825	1.0262	-0.9634	-0.0825	-1.5185	1.4189
Story6	C21	WSD Env Min	-56.2747	-2.6743	-0.4459	-0.0825	-0.7761	-3.7489
Story6	C22	WSD Env Min	-93.7019	-3.0579	-3.6194	-0.1319	-5.0742	-4.4515
Story6	C23	WSD Env Min	-160.7275	0.4659	-1.8363	-0.1319	-2.5955	0.3764
Story6	C24	WSD Env Min	-173.7301	1.5556	-1.3275	-0.1319	-1.8844	1.7928
Story6	C25	WSD Env Min	-152.141	-5.2214	-1.1714	-0.1319	-1.6641	-7.5263
Story6	C26	WSD Env Min	-91.0105	-1.0389	-0.6856	-0.0825	-1.121	-1.4683
Story6	C27	WSD Env Min	-113.4679	-2.1112	-0.6418	-0.0825	-1.0665	-2.9777
Story6	C28	WSD Env Min	-183.7098	-5.7606	-2.2398	-0.1319	-3.1699	-8.3365
Story6	C29	WSD Env Min	-171.7817	1.6312	-1.0591	-0.1319	-1.5072	1.8351
Story6	C30	WSD Env Min	-172.6042	-4.0637	-0.6663	-0.1319	-0.9631	-6.1659
Story6	C31	WSD Env Min	-116.7104	-1.5045	-1.2255	-0.0825	-1.8881	-2.1321
Story6	C32	WSD Env Min	-58.153	1.2501	-1.3889	-0.0825	-2.1146	1.7281
Story6	C33	WSD Env Min	-50.7904	-1.1798	0.7096	-0.1319	0.9618	-2.2009
Story5	C1	WSD Env Min	-72.6325	-4.1897	-1.4459	-0.0802	-2.7266	-5.8782
Story5	C2	WSD Env Min	-119.0993	-5.4743	-0.8556	-0.1282	-3.1183	-7.684
Story5	C3	WSD Env Min	-256.367	-0.5112	-0.314	-0.1282	-2.1495	-0.7475
Story5	C4	WSD Env Min	-241.952	-0.5941	-0.0024	-0.1282	-1.5593	-0.8772
Story5	C5	WSD Env Min	-148.627	-0.3474	-2.0424	-0.0802	-3.4943	-0.5061
Story5	C6	WSD Env Min	-138.3364	-0.5942	-1.759	-0.0802	-3.0475	-0.8641
Story5	C7	WSD Env Min	-125.4202	-0.9554	-0.5879	-0.0802	-1.2036	-1.35
Story5	C8	WSD Env Min	-248.4487	-1.1745	0.5151	-0.1282	-0.4343	-1.6647
Story5	C9	WSD Env Min	-155.0905	0.4488	0.8046	-0.1282	-0.0063	0.5689
Story5	C10	WSD Env Min	-61.9431	-2.1509	-3.3212	-0.1282	-6.6019	-2.9954
Story5	C11	WSD Env Min	-178.2356	-2.8609	-6.8754	-0.1282	-11.4862	-3.9958
Story5	C12	WSD Env Min	-229.9292	-0.666	-7.4455	-0.1282	-12.1232	-0.9706
Story5	C13	WSD Env Min	-212.9285	-0.5482	-6.6945	-0.1282	-10.9393	-0.8094
Story5	C14	WSD Env Min	-181.131	-0.8613	-5.4049	-0.1282	-8.9772	-1.2376
Story5	C15	WSD Env Min	-206.1813	-0.8013	-8.3606	-0.1282	-12.9555	-1.1582
Story5	C16	WSD Env Min	-199.3436	-0.669	-7.6842	-0.1282	-11.9407	-0.9768

Column Force : Service Load Env.

Story	Column	Load Case/Combo	P	V2	V3	T	M2	M3
			tonf	tonf	tonf	tonf-m	tonf-m	tonf-m
Story5	C17	WSD Env Min	-191.4039	-0.5795	-7.7175	-0.1282	-11.9629	-0.8556
Story5	C18	WSD Env Min	-93.4499	-0.3443	-5.3845	-0.1282	-7.5969	-1.1772
Story5	C19	WSD Env Min	-210.3765	0.845	-1.0706	-0.1282	-1.5643	0.5685
Story5	C20	WSD Env Min	-64.7201	1.0134	-0.9356	-0.0802	-1.6648	1.3817
Story5	C21	WSD Env Min	-66.7157	-2.5351	-0.46	-0.0802	-0.9271	-3.5672
Story5	C22	WSD Env Min	-117.7747	-3.0194	-3.4429	-0.1282	-4.851	-4.6417
Story5	C23	WSD Env Min	-202.7678	0.5337	-1.7697	-0.1282	-2.5525	0.092
Story5	C24	WSD Env Min	-219.1431	1.6167	-1.2664	-0.1282	-1.8502	1.4613
Story5	C25	WSD Env Min	-188.9764	-5.1427	-1.0736	-0.1282	-1.5716	-7.6841
Story5	C26	WSD Env Min	-106.4414	-0.9442	-0.7073	-0.0802	-1.2963	-1.362
Story5	C27	WSD Env Min	-133.0146	-2.0484	-0.6609	-0.0802	-1.2537	-2.9052
Story5	C28	WSD Env Min	-227.6469	-5.6763	-2.1879	-0.1282	-3.129	-8.523
Story5	C29	WSD Env Min	-216.8036	1.6772	-1.0326	-0.1282	-1.5197	1.3883
Story5	C30	WSD Env Min	-216.9795	-4.0356	-0.6454	-0.1282	-0.9799	-6.652
Story5	C31	WSD Env Min	-144.411	-1.4647	-1.2053	-0.0802	-2.052	-2.1052
Story5	C32	WSD Env Min	-73.6391	1.2672	-1.344	-0.0802	-2.2848	1.7226
Story5	C33	WSD Env Min	-64.0118	-1.1739	0.7183	-0.1282	0.9279	-2.874
Story4	C1	WSD Env Min	-87.6042	-4.0318	-1.33	-0.0731	-2.887	-5.6162
Story4	C2	WSD Env Min	-143.6927	-5.27	-0.7541	-0.1169	-3.9618	-7.3465
Story4	C3	WSD Env Min	-309.8801	-0.4543	-0.1681	-0.1169	-2.8782	-0.7178
Story4	C4	WSD Env Min	-292.6819	-0.5665	0.1022	-0.1169	-2.2574	-0.8751
Story4	C5	WSD Env Min	-179.2227	-0.2963	-1.8912	-0.0731	-3.5645	-0.4685
Story4	C6	WSD Env Min	-167.0705	-0.5632	-1.6412	-0.0731	-3.1357	-0.8389
Story4	C7	WSD Env Min	-151.1689	-0.8599	-0.5676	-0.0731	-1.4053	-1.2363
Story4	C8	WSD Env Min	-301.009	-1.0634	0.5417	-0.1169	-1.1285	-1.5444
Story4	C9	WSD Env Min	-191.1467	0.4009	0.6918	-0.1169	-1.0094	0.4654
Story4	C10	WSD Env Min	-74.1324	-1.9722	-3.1909	-0.1169	-7.3417	-2.7777
Story4	C11	WSD Env Min	-215.5604	-2.686	-6.5232	-0.1169	-11.592	-3.7722
Story4	C12	WSD Env Min	-277.1823	-0.6149	-6.9839	-0.1169	-11.9407	-0.9451
Story4	C13	WSD Env Min	-257.0905	-0.5165	-6.3234	-0.1169	-10.8384	-0.8126
Story4	C14	WSD Env Min	-218.7385	-0.8179	-5.1778	-0.1169	-9.1223	-1.2252
Story4	C15	WSD Env Min	-248.5765	-0.7392	-8.0554	-0.1169	-12.9515	-1.116
Story4	C16	WSD Env Min	-240.5287	-0.6312	-7.5013	-0.1169	-12.2509	-0.9709
Story4	C17	WSD Env Min	-231.4966	-0.5399	-7.637	-0.1169	-12.5681	-0.8406
Story4	C18	WSD Env Min	-112.3176	-0.4581	-5.1781	-0.1169	-7.3329	-2.0296
Story4	C19	WSD Env Min	-254.3999	0.8153	-0.9693	-0.1169	-1.5007	-0.1316
Story4	C20	WSD Env Min	-78.467	0.9995	-0.8759	-0.0731	-1.8428	1.3319
Story4	C21	WSD Env Min	-77.3492	-2.3166	-0.4534	-0.0731	-1.0832	-3.2821
Story4	C22	WSD Env Min	-142.4797	-3.0441	-3.1538	-0.1169	-4.4784	-5.1571
Story4	C23	WSD Env Min	-244.8658	0.479	-1.6285	-0.1169	-2.4231	-0.5732
Story4	C24	WSD Env Min	-264.4933	1.5225	-1.1539	-0.1169	-1.7711	0.6627
Story4	C25	WSD Env Min	-225.9573	-5.0675	-0.9261	-0.1169	-1.4328	-7.9641
Story4	C26	WSD Env Min	-121.7648	-0.8009	-0.7151	-0.0731	-1.4946	-1.2004
Story4	C27	WSD Env Min	-152.4299	-1.9244	-0.6709	-0.0731	-1.4831	-2.7592
Story4	C28	WSD Env Min	-271.742	-5.5893	-2.0744	-0.1169	-3.0194	-8.8561
Story4	C29	WSD Env Min	-261.9323	1.5531	-0.9544	-0.1169	-1.4821	0.4195
Story4	C30	WSD Env Min	-261.6888	-4.0374	-0.5884	-0.1169	-0.9637	-7.4085
Story4	C31	WSD Env Min	-172.0638	-1.3714	-1.1642	-0.0731	-2.2628	-2.0082
Story4	C32	WSD Env Min	-89.1253	1.2918	-1.2829	-0.0731	-2.5243	1.7076
Story4	C33	WSD Env Min	-77.1209	-1.2454	0.7366	-0.1169	0.8786	-3.9208
Story3	C1	WSD Env Min	-102.4705	-4.302	-1.3425	-0.0597	-3.4466	-6.2886
Story3	C2	WSD Env Min	-168.2603	-5.6352	-0.7033	-0.0955	-5.2126	-8.2585