桃園航空城-A型態(5*20-MF)

新建工程

結

構

計

算

書

中華民國　113 年 02 月 01 日

目　錄

一、建築及結構概要說明

1.1 建築概要說明

1. 本工程之工址位於桃園航空城區域內，為一標準圖說設計。本區域地震為分區屬於大園區及中壢區，本設計取地表加速度較大之中壢區設計。
2. 本工程為 5*20m 之基地，規劃為地上 4 層、地下 0 層之住宅，地上層總高度為 13.30 公尺(含 1FL 抬高 0.30 公尺)，屋突一層高為 3.0 公尺。
3. 本建物各層用途如下：地面一層為停車空間及住宅使用，二至四層皆為住宅使用。
4. 本建物一般外牆採用 T＝15cm 之 RC 牆，室內隔間採用 1/2B 磚牆。外牆面貼面磚，室內地坪貼地磚。

1.2 結構概要說明

1.2.1 結構系統概述

本工程為地上 4 層、地下 0 層之住宅，地上層總高度為 13.30 公尺(含 1FL 抬高 0.30 公尺)，屋突一層高為 3.0 公尺。結構分析時進行反應譜動力分析及靜力分析。

(a)本工程基礎開挖深為 1.30 m (含 PC 厚度 0.1m)。

(b)採用 RC 韌性抗彎矩構架系統抵禦地震力及承受垂直載重。

(c)本建築之基礎型式採用筏式基礎。

1.2.2 結構構件尺寸

(a)柱尺寸

1FL~R1F ：35x60cm，30x30cm。

(b)大梁尺寸：

1FL ：45x150，35x150cm。

2FL~PR ：35x60cm，30x60cm。

(c)小梁尺寸：

2FL~PR ：30x60cm，25x60cm，25x50cm。

(d)版尺寸：

1~PR ：t=15cm，t=20cm。

基礎版 ：t=40cm。

1.2.3　各樓層用途、樓高及設計垂直載重概述

靜載重按結構材料實際估算

活載重及各層用途如下所示

樓層別	樓層高度(M)	各樓用途	活載重 (kg/m^2)
PR	--	屋頂平台	200
R1F	3.00	梯間、屋頂平台	200
		覆土區域	500
2-4FL	3.20	住宅	200
1FL	3.40	停車空間、住宅	500

1.2.4　鄰棟間隔檢討

$\Delta x_{(PR)}$=0.6*1.4*αy*Ra*Δ=2.52*0.0206=0.0519m= 5.19cm

$\Delta y_{(RFL)}$=0.6*1.4*αy*Ra*Δ=2.52*0.0011=0.0028m=0.28cm

二、設計資料、分析模式及施工方法報告

2.1 設計規範說明

1. 營建署建築物耐震設計規範及解說（民國111年06月14日）。
2. 營建署建築物耐風設計規範及解說（民國104年01月01日）。
3. 營建署建築物混凝土結構設計規範（民國112年08月10日修訂）。
4. 營建署建築技術規則（民國111年12月29日修正）。

2.2 結構分析設計程式

1. 分析程式：CSI－ETABS (Version P9.7.2)。
2. 柱、梁、牆設計程式：CSI－CONKER，CSI－WALLER。
3. 基礎和樓版設計程式：一般RC設計程式。
4. 設計方法:強度設計法。

2.3 材料規格

1. 鋼筋：

(a)鋼筋須為竹節鋼筋，且須符合:

D13(#4含)以上，CNS 560 A2006 SD420W，fy=4200kg/cm^2。

D10(#3含)以下，CNS 560 A2006 SD280 ，fy=2800kg/cm^2。

(b)所有鋼筋之彎紮採用冷彎方式，並以鐵絲固定之。

2. 混凝土：

(a)水泥:主體結構採用『波特蘭TYPE 1』。材料須符合CNS 61 R2001 或 ASTM C150之規定。

(b)混凝土強度:

有筋混凝土，其28天材齡之指定抗壓強度為 fc'=280kg/cm^2

無筋混凝土，不得低於140kg/cm^2。

2.4 地震力設計依據：

根據內政部111.06.14修訂頒布之「建築技術規則建築構造篇耐震設計規範與解說」。

1. 桃園市中壢區，S_{DS}=0.60，S_{MS}=0.80。
2. 本工程屬第四類建築物，即一般集合住宅之建築物，用途係數 I=1.00。
3. 結構系統韌性容量R=4.0。
4. 基本振動週期Tx=0.07hn^3/4 、Ty=0.05hn^3/4
5. 本工址之反應譜係數S_{aD}、結構系統地震力折減係數Fu值，係依據基本振動週期T、及地盤類別為第一類地盤而求得。

2.5 結構分析模式：

1. 採用３Ｄ立體剛構架分析模式，分析基面位於1FL。
2. 動力分析採用振譜分析，並取有效質量達90%之振態數，依CQC組合所得地震總橫力，調整至靜態地震橫力90%。

2.6 施工方法報告：

1. 地下結構體施工方法

本案無地下室，以明挖施工法為開挖之安全措施。

2. 地上結構體施工方法

本案為地上4層，採模板支撐、現場澆注之傳統鋼筋混凝土工法施工。

P3-1

一層結構尺寸表 (UNIT:cm)

斷面 (X*Y)	柱編號
35*60	C1~C3.

斷面 (B*D)	梁編號
45*150	B1~B3,G1,G2,CG1.
35*150	G1,G2,CG1.
35*150	b1,b2.

厚度 (t)	版編號
t=15cm	S1,S2.
t=40cm	FS1,FS2.

附註1:設計活載重:(WL)=500kgf/㎡。

附註2:材料強度:

A. 混凝土材料品質須符合CNS61 R2001規定，且28天時之抗壓強度:fc'=280kg/c㎡

B. 鋼筋材料品質須符合CNS560 A2006規定，降伏強度:
#3以下(含#3) SD280 fy=2800kg/c㎡
#4以上(含#4) SD420W fy=4200kg/c㎡

C. 混凝土須依據CNS13465規定檢測含氯量，並符合CNS3090規定，不得超過0.15kg/m3。

附註3:設計容許承載力 Qa=13t/㎡，如現況基礎平版載重試驗未達設計容許承載力，須變更連續基礎設計。

附註4:本設計圖說適用第一類地盤，且設計地震力係數如下:
工址短週期水平譜加速度係數S_S =0.6
工址一秒週期水平譜加速度係數S_1 =0.3
工址短週期最大考量水平譜加速度係數S_S =0.8
工址一秒週期最大考量水平譜加速度係數S_1 =0.45

附註5:本圖說不適用合共同壁之連棟建築物。

二～四層結構尺寸表 (UNIT:cm)

斷面 (X*Y)	柱編號
35*60	C1~C3.

斷面 (B*D)	梁編號
35*60	B1~B3,G1,G2,CG1.
30*60	b1.
25*60	b2.
25*50	g1.

厚度 (t)	版編號
t=15cm	S1,S2,CS1~CS3.

註:設計活載重:(WL)=200kgf/㎡

屋突一層結構尺寸表 (UNIT:cm)

斷面 (X*Y)	柱編號
35*60	C1,C2.
35*30	C0.

斷面 (B*D)	梁編號
35*60	B1~B3,G1,G2.
30*60	b1.
25*50	g1.

厚度 (t)	版編號
t=15cm	S1,S2,CS1,CS3.
t=20cm	CS2.

註:設計活載重:(WL)=200kgf/㎡(覆土區另計)

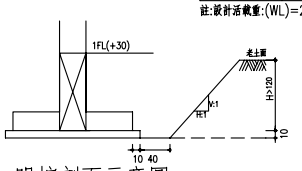
圖例：▨ 覆土，厚度為0.3m。

屋突頂層結構尺寸表 (UNIT:cm)

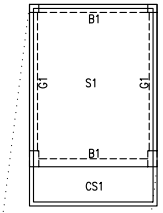
斷面 (B*D)	梁編號
30*60	B1,G1.

厚度 (t)	版編號
t=15cm	S1.
t=20cm	CS1.

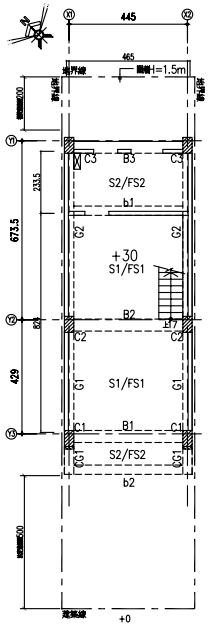
註:設計活載重:(WL)=200kgf/㎡



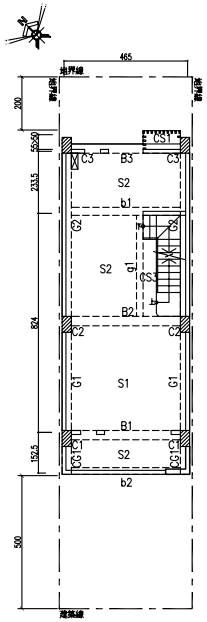
明挖剖面示意圖



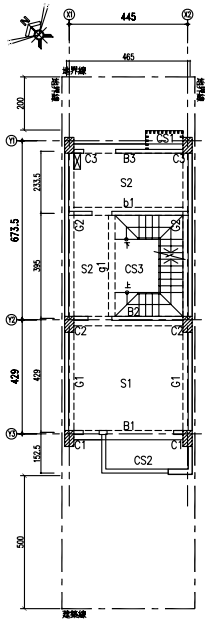
屋頂層結構平面圖 A1:1/100 A3:1/200



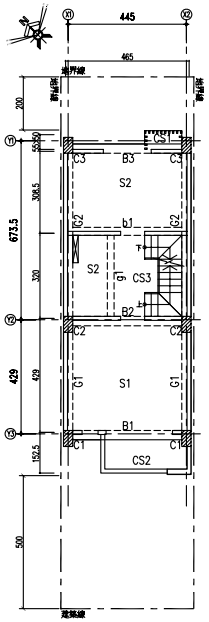
一層結構平面圖 A1:1/100 A3:1/200



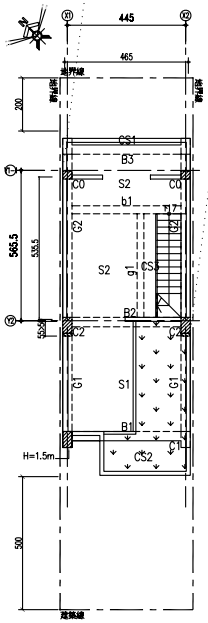
二層結構平面圖 A1:1/100 A3:1/200



三層結構平面圖 A1:1/100 A3:1/200

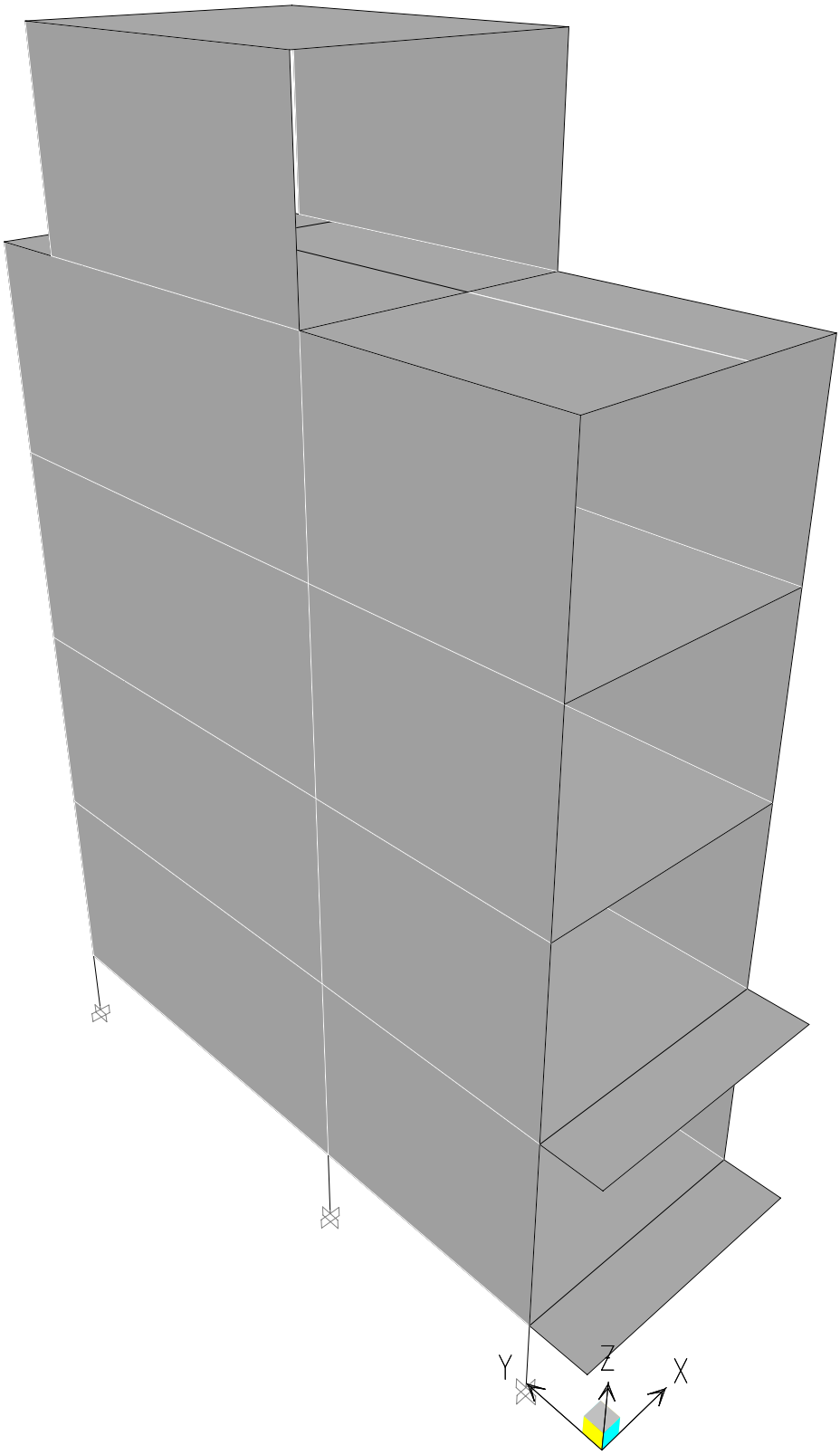


四層結構平面圖 A1:1/100 A3:1/200

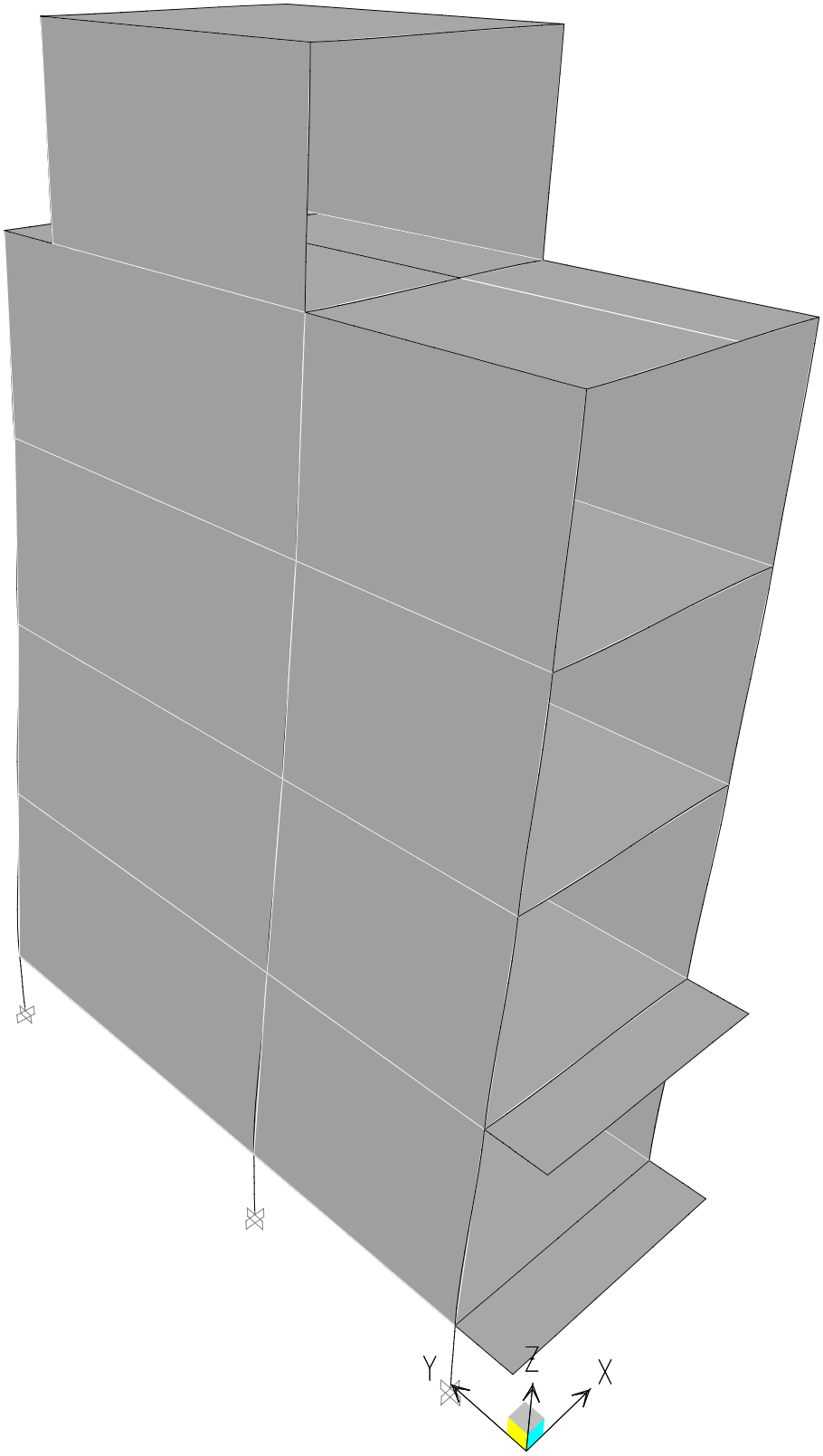


屋突一層結構平面圖 A1:1/100 A3:1/200

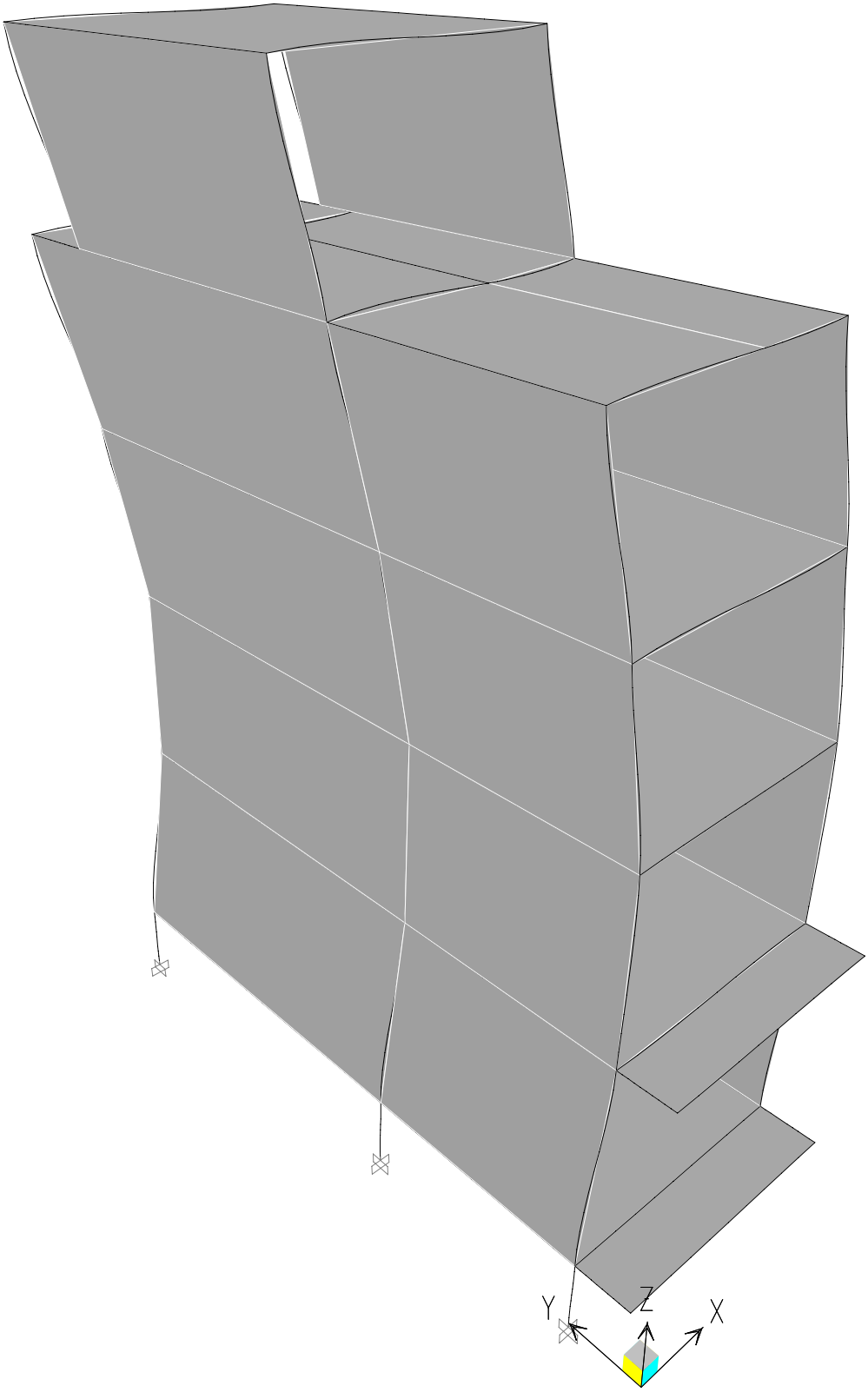
工程名稱: 航空城標準圖 (TYPE-A-5x20-MF)	桃園市政府都市發展局	圖號 DRAWING NO.	張號 SHEET NO.	業務號 JOB NO.	設計 DESIGNED BY	繪圖 DRAWN BY	簽章:	備註 DESCRIPTION	日期 DATE	修正 REVISION
圖名: 一層～屋頂層結構平面圖		S1-01		SW182	核准 APPROVED BY	核對 CHECKED BY				



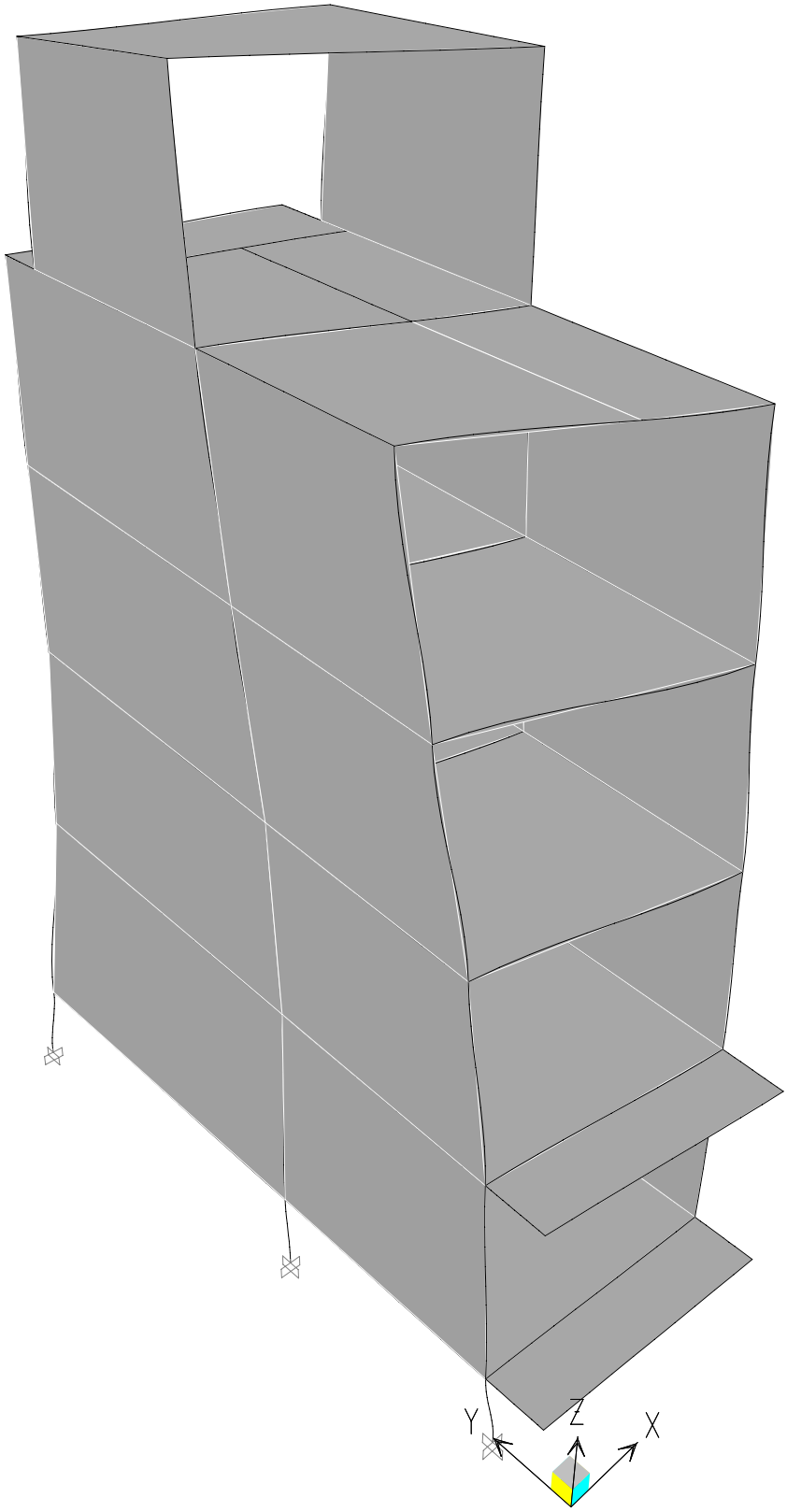
P4-1



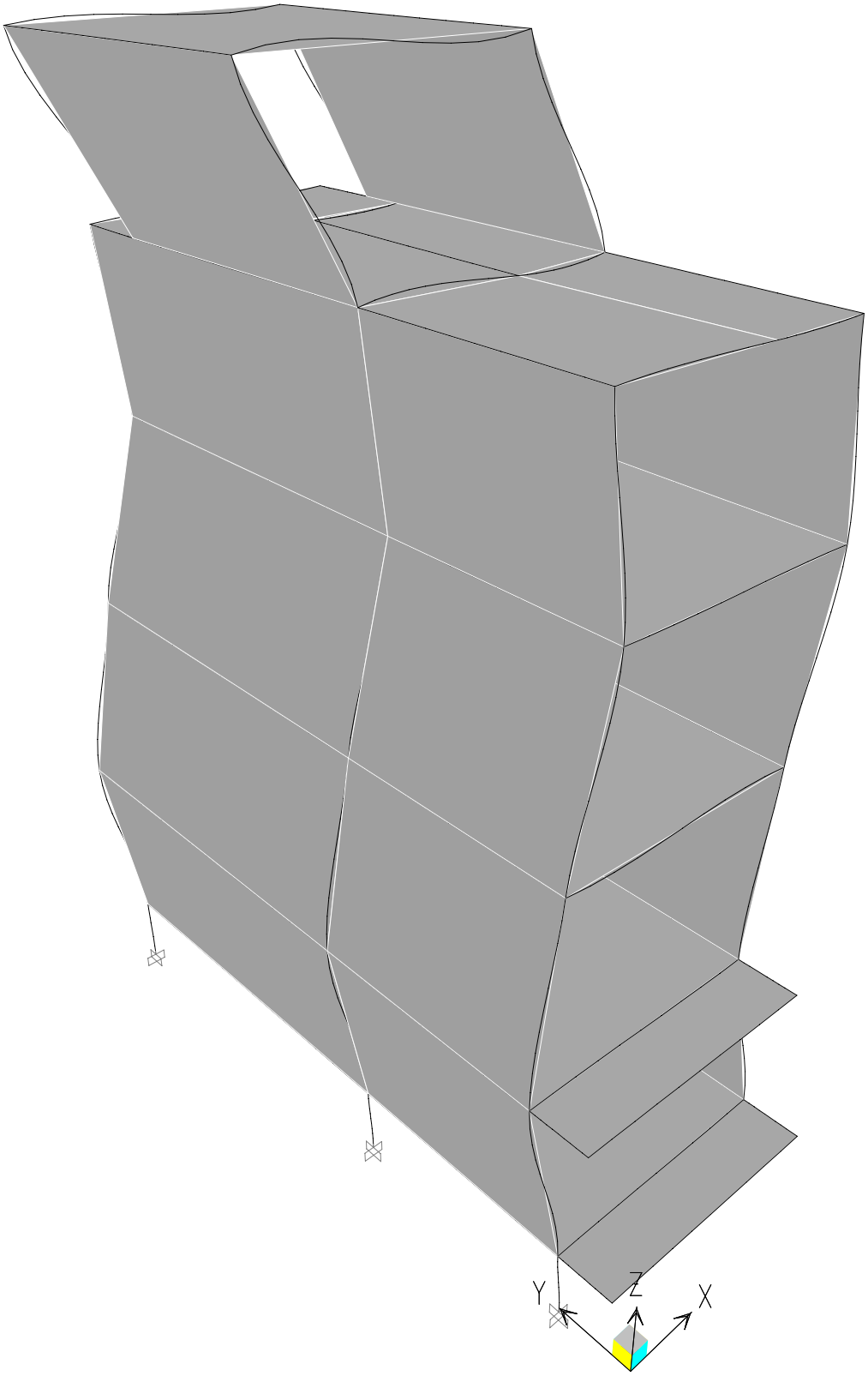
P4-2



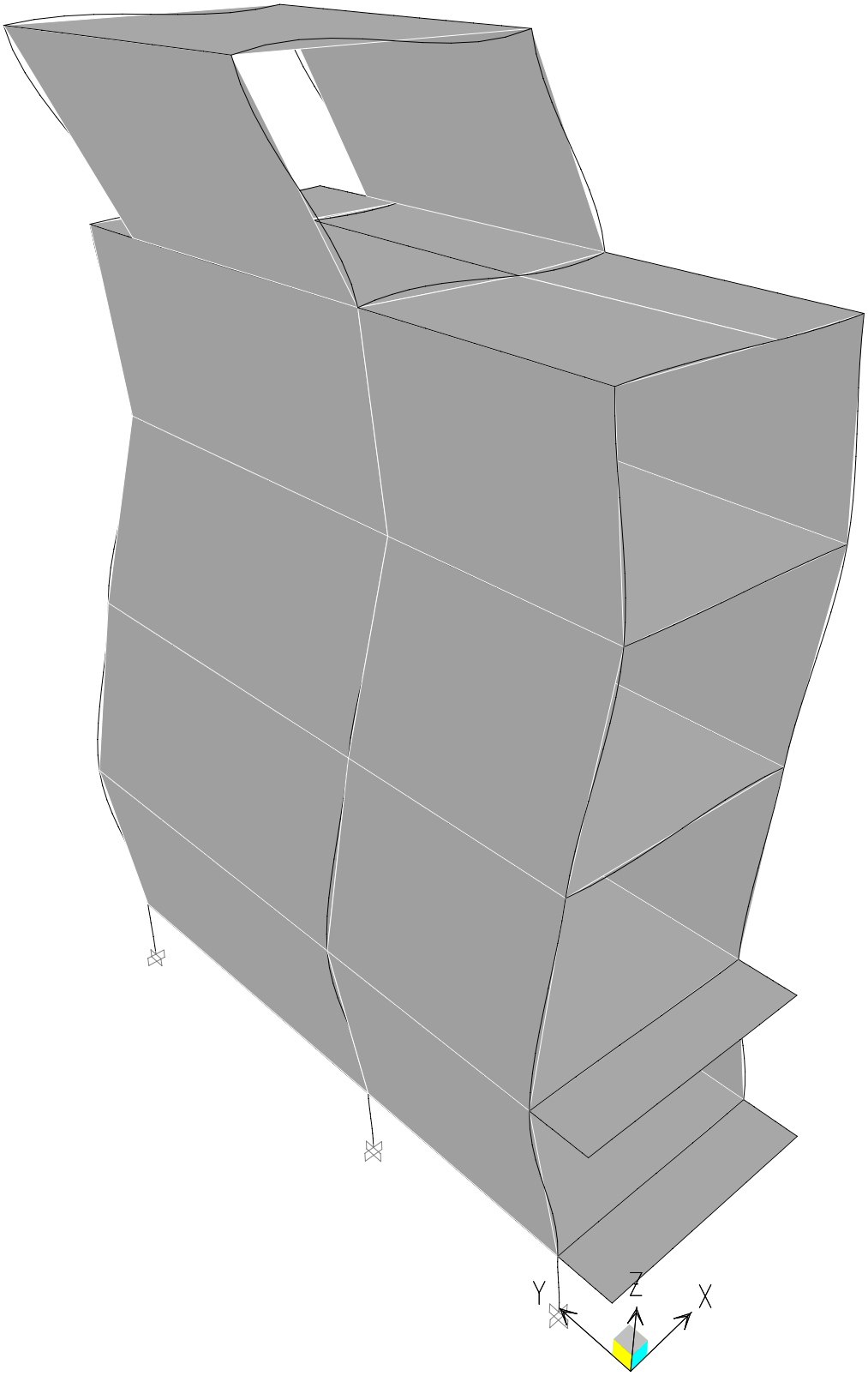
P4-3



P4-4



P4-5



P4-6

各層重量計算

A、結構桿件自重

1. 樓板淨重

1.) PR：	SLAB	T= 15 cm	0.15	*	2 =	0.36	t/m^2
	水泥砂漿鋪底,隔熱防水粉刷,天花及其他		0.02	*	5 =	0.10	t/m^2
					Σ =	0.46	t/m^2
	SLAB	T= 20 cm	0.20	*	2 =	0.48	t/m^2
	水泥砂漿鋪底,鋪面材及黏貼層,天花及其他		0.02	*	5 =	0.10	t/m^2
					Σ =	0.58	t/m^2
2.) RFL：	SLAB	T= 15 cm	0.15	*	2 =	0.36	t/m^2
	水泥砂漿鋪底,鋪面材及黏貼層,天花及其他		0.02	*	5 =	0.10	t/m^2
					Σ =	0.46	t/m^2
	SLAB	T= 20 cm	0.20	*	2 =	0.48	t/m^2
	水泥砂漿鋪底,鋪面材及黏貼層,天花及其他		0.02	*	5 =	0.10	t/m^2
					Σ =	0.58	t/m^2
3.) 1-5FL:	SLAB	T= 15 cm	0.15	*	2 =	0.36	t/m^2
	水泥砂漿鋪底,鋪面材及黏貼層,天花及其他		0.02	*	5 =	0.10	t/m^2
					Σ =	0.46	t/m^2
4.) FS	SLAB	T= 40 cm	0.40	*	2 =	0.96	t/m^2
					Σ =	0.96	t/m^2

2. 柱桿件淨重

1.)	35 x	60		0.35	x	0.60	x	2.4	=	0.50 t/m
			1.0cm水泥砂漿粉刷	(0.35 + 0.60)	x	0.02	x	2	=	0.04 t/m
									Σ =	0.54 t/m
2.)	30 x	30		0.30	x	0.30	x	2.4	=	0.22 t/m
			1.0cm水泥砂漿粉刷	(0.30 + 0.30)	x	0.02	x	2	=	0.02 t/m
									Σ =	0.24 t/m

3. 梁桿件淨重

1.)	45 x	150		0.45	x	0.95	x	2.4	=	1.03 t/m
2.)	35 x	150		0.35	x	0.95	x	2.4	=	0.80 t/m
3.)	35 x	60		0.35	x	0.45	x	2.4	=	0.38 t/m
			1.0cm水泥砂漿粉刷	(0.35 + 0.90)	x	0.02	x	1	=	0.03 t/m
									Σ =	0.40 t/m
4.)	30 x	60		0.3	x	0.45	x	2.4	=	0.32 t/m
			1.0cm水泥砂漿粉刷	(0.30 + 0.90)	x	0.02	x	1	=	0.02 t/m
									Σ =	0.35 t/m
5.)	25 x	60		0.25	x	0.45	x	2.4	=	0.27 t/m
			1.0cm水泥砂漿粉刷	(0.25 + 0.90)	x	0.02	x	1	=	0.02 t/m
									Σ =	0.29 t/m
6.)	25 x	50		0.25	x	0.35	x	2.4	=	0.21 t/m
			1.0cm水泥砂漿粉刷	(0.25 + 0.70)	x	0.02	x	1	=	0.02 t/m
									Σ =	0.23 t/m

4. 牆單位重計算

1.)	15 cm RCW			0.15	x	2.4	=	0.36	t/m2
		1.0cm水泥砂漿粉刷		0.02	x	2	=	0.04	t/m2
							Σ =	0.40	t/m2
2.)	10 cm(1/2B)磚牆						=	0.19	t/m2
		1.0cm水泥砂漿粉刷		0.02	x	2	=	0.04	t/m2
							Σ =	0.23	t/m2
	20 cm(1B)磚牆						=	0.42	t/m2
		1.0cm水泥砂漿粉刷		0.02	x	2	=	0.04	t/m2
							Σ =	0.46	t/m2

各層靜載重計算

一、A型態

1. PR

			ΣWd	ΣWd/A
1.）板：0.46*37.66+0.58*3.18	=	18.79 t		
2.）樑：0.35*18.60	=	6.51 t		
3.）柱：(0.54*2+0.24*2)*1.5	=	2.34 t		
4.）牆：0.4*14.80*0.9	=	5.33 t		
5.)水塔:1.5	=	1.50 t		
		Σ =	34.46 t	0.84

2. RFL

1.）板：0.46*54.68+0.58*5.6	=	27.73 t		
2.）樑：0.35*31.95+0.29*4.1	=	12.37 t		
3.）柱：(0.54*2+0.24*2)*1.5	=	2.34 t		
0.54*1.6*6	=	5.18 t		
4.）牆：0.4*14.80*1.5+0.4*21.33*1.50	=	21.68 t		
(0.4*30.92+0.23*3.85)*1.00	=	13.25 t		
5.)覆土:(2.15*4.14)*0.3*1.8+(3.1*1.5)*0.3*1.8	=	7.32 t		
		Σ =	89.87 t	1.49

3. 4FL

1.）板：0.46*60.28	=	27.73 t		
2.）樑：0.35*31.95+0.29*4.1	=	12.37 t		
3.）柱：0.54*1.6*6	=	5.18 t		
0.54*1.6*6	=	5.18 t		
4.）牆：(0.4*30.92+0.23*3.85)*1.60+0.40*9.55*1.2	=	25.79 t		
(0.4*31.99+0.23*4.06)*1.00	=	13.73 t		
		Σ =	89.99 t	1.49

4. 3FL

1.）板：0.46*60.28	=	27.73 t		
2.）樑：0.35*31.95+0.29*4.1	=	12.37 t		
3.）柱：0.54*1.6*6	=	5.18 t		
0.54*1.6*6	=	5.18 t		
4.）牆：(0.4*31.99+0.23*4.06)*1.60+0.40*5.78*1.2	=	24.74 t		
(0.4*27.19+0.23*2.67)*1.00	=	11.49 t		
		Σ =	86.70 t	1.44

5. 2FL

1.）板：0.46*62.16	=	28.59 t		
2.）樑：0.35*34.20+0.29*4.1	=	13.16 t		
3.）柱：0.54*1.6*6	=	5.18 t		
0.54*1.7*6	=	5.51 t		
4.）牆：(0.4*27.19+0.23*2.67)*1.60+0.40*7.27*1.2	=	21.87 t		
(0.4*25.55+0.23*1.22)*1.10	=	11.55 t		
		Σ =	85.87 t	1.38

6. 1FL

1.）板：0.46*60.28	=	27.73 t		
2.）柱：0.54*1.7*6	=	5.51 t		
3.）牆：(0.4*25.55+0.23*1.22)*1.70+0.40*1.80*1.2	=	18.72 t		
		Σ =	51.95 t	0.86

7. FOUNDATION

1.）板：0.96*60.28	=	57.87 t		
2.）樑：1.03*12.3+0.80*29.94	=	36.62 t		
		Σ =	36.62 t	0.61

合計	475.47	7.89

各層活載重計算

A型態

		WL		ΣWL	
1. PR					
	0.2*40.84 =	8.17	t	8.17	t
2. RFL					
	0.2*46.73+0.5*13.55 =	16.12	t	16.12	t
3. 4FL					
	0.2*60.28 =	12.06	t	12.06	t
4. 3FL					
	0.2*60.28 =	12.06	t	12.06	t
5. 2FL					
	0.2*62.16 =	12.43	t	12.43	t
6. 1FL					
	0.5*62.16 =	31.08	t	31.08	t
		合計		91.91	t

反應譜分析

ETABS v9.7.2 File:DES-A Units:Ton-m July 3, 2023 20:54 PAGE 8

M O D A L P E R I O D S A N D F R E Q U E N C I E S

MODE NUMBER	PERIOD (TIME)	FREQUENCY (CYCLES/TIME)	CIRCULAR FREQ (RADIANS/TIME)
Mode 1	0.60625	1.64949	10.36406
Mode 2	0.20295	4.92744	30.96003
Mode 3	0.17256	5.79506	36.41145
Mode 4	0.12619	7.92425	49.78953
Mode 5	0.11343	8.81634	55.39467
Mode 6	0.09475	10.55404	66.31296
Mode 7	0.07595	13.16682	82.72959
Mode 8	0.05640	17.72995	111.40056
Mode 9	0.03875	25.80407	162.13177
Mode 10	0.03828	26.12343	164.13837
Mode 11	0.03065	32.62144	204.96656
Mode 12	0.02415	41.40970	260.18480

ETABS v9.7.2 File:DES-A Units:Ton-m July 3, 2023 20:54 PAGE 9

M O D A L P A R T I C I P A T I N G M A S S R A T I O S

MODE NUMBER	X-TRANS %MASS <SUM>	Y-TRANS %MASS <SUM>	Z-TRANS %MASS <SUM>	RX-ROTN %MASS <SUM>	RY-ROTN %MASS <SUM>	RZ-ROTN %MASS <SUM>
Mode 1	73.52 < 74>	0.00 < 0>	0.00 < 0>	0.00 < 0>	99.35 < 99>	0.12 < 0>
Mode 2	8.60 < 82>	0.00 < 0>	0.00 < 0>	0.00 < 0>	0.19 <100>	2.15 < 2>
Mode 3	0.21 < 82>	0.00 < 0>	0.00 < 0>	0.00 < 0>	0.00 <100>	73.39 < 76>
Mode 4	2.48 < 85>	0.00 < 0>	0.00 < 0>	0.00 < 0>	0.31 <100>	1.11 < 77>
Mode 5	0.00 < 85>	85.19 < 85>	0.00 < 0>	98.30 < 98>	0.00 <100>	0.00 < 77>
Mode 6	1.11 < 86>	0.00 < 85>	0.00 < 0>	0.00 < 98>	0.01 <100>	0.14 < 77>
Mode 7	0.35 < 86>	0.00 < 85>	0.00 < 0>	0.00 < 98>	0.00 <100>	0.13 < 77>
Mode 8	0.00 < 86>	0.00 < 85>	0.00 < 0>	0.00 < 98>	0.00 <100>	18.23 < 95>
Mode 9	13.73 <100>	0.00 < 85>	0.00 < 0>	0.00 < 98>	0.13 <100>	0.09 < 95>
Mode 10	0.00 <100>	13.73 < 99>	0.00 < 0>	1.48 <100>	0.00 <100>	0.00 < 95>
Mode 11	0.00 <100>	0.00 < 99>	0.00 < 0>	0.00 <100>	0.00 <100>	2.77 < 98>
Mode 12	0.00 <100>	0.00 < 99>	0.00 < 0>	0.00 <100>	0.00 <100>	1.14 < 99>

地震橫力計算

1) 工址震區微分區　　桃園市中壢區

工址短週期水平譜加速度係數	S_S^D	=	0.60
工址一秒週期水平譜加速度係數	S_1^D	=	0.30
工址短週期最大考量水平譜加速度係數	S_S^M	=	0.80
工址一秒週期最大考量水平譜加速度係數	S_1^M	=	0.45

2) 地盤種類　第 1 種方式　　第 1 類地盤

3) 工址放大係數

工址短週期設計水平譜加速度放大係數	F_{aD}	=	1.00
工址一秒週期設計水平譜加速度放大係數	F_{vD}	=	1.00
工址短週期最大考量設計水平譜加速度放大係數	F_{aM}	=	1.00
工址一秒週期最大考量設計水平譜加速度放大係數	F_{vM}	=	1.00

4) 工址設計水平譜加速度係數

工址短週期設計水平譜加速度係數	S_{DS}	=	0.60
工址一秒週期設計水平譜加速度係數	S_{D1}	=	0.30
工址短週期最大考量設計水平譜加速度係數	S_{MS}	=	0.80
工址一秒週期最大考量設計水平譜加速度係數	S_{M1}	=	0.45

5) 短週期與中週期分界之轉角週期

設計短週期與中週期分界之轉角週期	T_0^D	=	0.5000
最大考量短週期與中週期分界之轉角週期	T_0^M	=	0.5625

6) 用途係數 (I)　　I = 1.00

7) 結構降伏放大係數 (α y)　　αy = 1.00

8) 結構系統韌性容量 (R)　　R = 4.00

結構系統容許韌性容量 (Ra)　　$Ra=1+(R-1)/1.5$ = 3.00

9) 建物總高 (Hn)　　$Hn(A)$ = 13.00 M

10) 結構系統基本振動週期 (T)

1.鋼構造建築物　　$T=0.085*Hn^{(3/4)}$

2.鋼筋混凝土、鋼骨鋼筋混凝土、鋼造偏心斜撐建築物　　$T=0.070*Hn^{(3/4)}$

3.其他建築物　　$T=0.050*Hn^{(3/4)}$

2	$T(s)x\text{-}A$	=	0.4792	sec
3	$T(s)y\text{-}A$	=	0.3423	sec

4.動力分析振動週期

$Tx(dyn\text{-}A)$	=	0.6062	sec
$Ty(dyn\text{-}A)$	=	0.1134	sec

工程名稱: 桃園航空城-A型態(5*20)-中壢區　　工程編號 ： LIU-112020-A

地震橫力計算

5.經驗公式-週期上限係數 (Cu)　　Cu = 1.40

6.設計基本振動週期

$Tx\text{-}a$	=	0.6062	sec
$Ty\text{-}a$	=	0.1134	sec

11) 結構系統設計地震力折減係數 (Fu)

${}_X F_u\text{-a}$	=	3.0000
${}_Y F_u\text{-a}$	=	2.2361

$$Fu=\begin{cases} Ra & ;\ T \ge T_0^D \\ \sqrt{2Ra-1}+(Ra-\sqrt{2Ra-1})*\dfrac{T-0.6T_0^D}{0.4T_0^D} & ;0.6T_0^D \le T \le T_0^D \\ \sqrt{2Ra-1} & ;0.2T_0^D \le T \le 0.6T_0^D \\ \sqrt{2Ra-1}+(\sqrt{2Ra-1}-1)*\dfrac{T-0.2T_0^D}{0.2T_0^D} & ;\ T \le 0.2T_0^D \end{cases}$$

12) 結構系統最大考量地震力折減係數 (F_{uM})

${}_X(F_{uM})\text{-a}$	=	4.0000
${}_Y(F_{uM})\text{-a}$	=	2.6458

$$F_{uM}=\begin{cases} R & ;\ T \ge T_0^M \\ \sqrt{2R-1}+(R-\sqrt{2R-1})*\dfrac{T-0.6T_0^M}{0.4T_0^M} & ;0.6T_0^M \le T \le T_0^M \\ \sqrt{2R-1} & ;0.2T_0^M \le T \le 0.6T_0^M \\ \sqrt{2R-1}+(\sqrt{2R-1}-1)*\dfrac{T-0.2T_0^M}{0.2T_0^M} & ;\ T \le 0.2T_0^M \end{cases}$$

13) 設計水平加速度反應譜係數

${}_X(S_{aD})\text{-a}$	=	0.4949
${}_Y(S_{aD})\text{-a}$	=	0.6000

$S_{aD} = S_{DS}(0.4+3T/T_0^D)$　　; $T \le 0.2T_0^D$

$S_{aD} = S_{DS}$　　; $0.2T_0^D \le T \le T_0^D$

$S_{aD} = S_{D1}/T$　　; $T_0^D \le T \le 2.5T_0^D$

$S_{aD} = 0.40\,S_{DS}$　　; $2.50T_0^D \le T$

14) 最大考量水平加速度反應譜係數

${}_X(S_{aM})\text{-a}$	=	0.7423
${}_Y(S_{aM})\text{-a}$	=	0.8000

$S_{aM} = S_{MS}(0.4+3T/T_0^M)$　　; $T \le 0.2T_0^M$

$S_{aM} = S_{MS}$　　; $0.2T_0^M \le T \le T_0^M$

$S_{aM} = S_{M1}/T$　　; $T_0^M \le T \le 2.5T_0^M$

$S_{aM} = 0.40\,S_{MS}$　　; $2.50T_0^M \le T$

地震橫力計算

15) 設計水平加速度反應譜阻尼修正係數

$$\left(\frac{S_{aD}}{F_u}\right)_m = \begin{cases} \frac{S_{aD}}{F_u} & ;\frac{S_{aD}}{F_u} \le 0.3 \\ 0.52\frac{S_{aD}}{F_u} + 0.144 & ;0.3 \le \frac{S_{aD}}{F_u} \le 0.8 \\ 0.70\frac{S_{aD}}{F_u} & ;\frac{S_{aD}}{F_u} \ge 0.8 \end{cases}$$

$_X\left(\frac{S_{aD}}{F_u}\right)_m$-a = 0.1650

$_Y\left(\frac{S_{aD}}{F_u}\right)_m$-a = 0.2683

16) 最大考量水平加速度反應譜阻尼修正係數

$$\left(\frac{S_{aM}}{F_{uM}}\right)_m = \begin{cases} \frac{S_{aM}}{F_{uM}} & ;\frac{S_{aM}}{F_{uM}} \le 0.3 \\ 0.52\frac{S_{aM}}{F_{uM}} + 0.144 & ;0.3 \le \frac{S_{aM}}{F_{uM}} \le 0.8 \\ 0.70\frac{S_{aM}}{F_{uM}} & ;\frac{S_{aM}}{F_{uM}} \ge 0.8 \end{cases}$$

$_Y\left(\frac{S_{aM}}{F_{uM}}\right)_m$ -a = 0.1856

$_X\left(\frac{S_{aM}}{F_{uM}}\right)_m$ -a = 0.3012

17) 建築物總重量 (W)　　*Wa* = 386.89 T

18) 設計水平總橫力 (V)

$$V_D = \frac{I}{1.4\alpha_Y}\left(\frac{S_{aD}}{Fu}\right)_m * W$$

$_XV_D$-a = 0.1178 W

$_YV_D$-a = 0.1917 W

19) 最大考量水平總橫力 (V)

$$V_M = \frac{I}{1.4\alpha_Y}\left(\frac{S_{aM}}{F_{uM}}\right)_m * W$$

$_XV_M$ -a = 0.1326 W

$_YV_M$ -a = 0.2152 W

20) 中小度地震最小設計橫力計算 (V*)

$$V^* = \frac{IFu}{4.2\alpha_Y}\left(\frac{S_{aD}}{Fu}\right)_m * W$$

$_XV^*$-a = 0.1178 W

$_YV^*$ -a = 0.1429 W

21) 結構系統設計水平總橫力 (V)

$_XV$ -a = 0.1326 W
= 51.29 T

$_YV$ -a = 0.2152 W
= 83.25 T

工程名稱: 桃園航空城-A型態(5*20)-中壢區　　工程編號 ： LIU-112020-A

地震橫力計算

22) 屋頂外加橫力計算 (Ft)

Ftx-a = 0.00 T

Fty-a = 0.00 T

Ft=0.07TV (IF T(sec)>0.7 sec)

23) 容許層間相對側向位移設計橫力計算

Tx-a = 0.6062

Ty-a = 0.3423

$_XF_u$-a = 3.0000　$_X(S_{aD})$ -a = 0.4949

$_YF_u$-a = 2.3977　$_Y(S_{aD})$ -a = 0.6000

$_X\left(\frac{S_{aD}}{F_u}\right)_m$-a = 0.1650

$_Y\left(\frac{S_{aD}}{F_u}\right)_m$-a = 0.2502

$$V_S = \frac{Fu}{4.2}\left(\frac{S_{aD}}{Fu}\right)_m * W$$

$_XV_S$ -a = 0.1178 W
= 45.59 T

$_YV_S$ -a = 0.1429 W
= 55.27 T

24) 鄰棟間隔計算

$$F = 0.6 * 1.4 * \alpha y * Ra *$$

*xRa** = 3.0000

*yRa** = 3.0000

Fa = 2.52

X向地震力豎向分配

樓層名稱	重量(Wi) (T)	樓高(Hi) (M)	Hn (M)	Wi*Hn	Fi=(V-Ft)* Wi*Hn / ΣWi*Hn	Vi (T)	ΣV	傾倒力矩 Mo(t-m)	偏心扭矩 Mt=0.05DV	Dy=
PR	34.46	3.00	16.00	551.36	6.83	6.83	6.83	20.50	2.08	6.1
R1F	89.87	3.20	13.00	1616.29	17.82	17.82	24.65	99.39	10.35	11.62
4FL	89.99	3.20	9.80	881.90	13.45	13.45	38.10	221.32	7.82	11.62
3FL	86.70	3.20	6.60	572.22	8.73	8.73	46.83	371.19	5.07	11.62
2FL	85.87	3.40	3.40	291.95	4.45	4.45	51.29	545.56	2.59	11.62
合計	386.89			3362.37						

Y向地震力豎向分配

樓層名稱	重量(Wi) (T)	樓高(Hi) (M)	Hn (M)	Wi*Hn	Fi=(V-Ft)* Wi*Hn / ΣWi*Hn	Vi (T)	ΣV	傾倒力矩 Mo(t-m)	偏心扭矩 Mt=0.05DV	Dx=
PR	34.46	3.00	16.00	551.36	11.09	11.09	11.09	33.27	2.66	4.8
R1F	89.87	3.20	13.00	1616.29	28.93	28.93	40.02	161.33	6.94	4.8
4FL	89.99	3.20	9.80	881.90	21.83	21.83	61.85	359.25	5.24	4.8
3FL	86.70	3.20	6.60	572.22	14.17	14.17	76.02	602.50	3.40	4.8
2FL	85.87	3.40	3.40	291.95	7.23	7.23	83.25	885.54	1.73	4.8
合計	386.89			3362.37						

垂直地震力計算

1) 用途係數 (I)　　I = 1.00

2) 結構降伏放大係數 (α y)　　αy = 1.00

3) 結構系統垂直韌性容量 (Rv)　　Rv = 3.00

結構系統垂直容許韌性容量 (Rva)　　$Rva=1+(Rv-1)/1.5$ = 2.33

4) 結構系統假設垂直振動週期 (Tv=Th/10)

$Th(x)$ = 0.6062 sec

$Th(y)$ = 0.1134 sec

$Tv(x)$ = 0.0606 sec

$Tv(y)$ = 0.0113 sec

5) 工址設計水平譜加速度係數

工址短週期設計水平譜加速度係數　　S_{DS} = 0.60

工址一秒週期設計水平譜加速度係數　　S_{D1} = 0.30

工址短週期最大考量設計水平譜加速度係數　　S_{MS} = 0.80

工址一秒週期最大考量設計水平譜加速度係數　　S_{M1} = 0.45

6) 短週期與中週期分界之轉角週期

設計短週期與中週期分界之轉角週期　　T_0^D = 0.5000

最大考量短週期與中週期分界之轉角週期　　T_0^M = 0.5625

7) 結構系統設計地震力折減係數 (*Fuv*)

$_xF_{uv}$ = 1.5546

$_yF_{uv}$ = 1.1037

$$Fu=\begin{cases} Ra & ;\ T \ge T_0^D \\ \sqrt{2Ra-1}+(Ra-\sqrt{2Ra-1})*\dfrac{T-0.6T_0^D}{0.4T_0^D} & ;0.6T_0^D \le T \le T_0^D \\ \sqrt{2Ra-1} & ;0.2T_0^D \le T \le 0.6T_0^D \\ \sqrt{2Ra-1}+(\sqrt{2Ra-1}-1)*\dfrac{T-0.2T_0^D}{0.2T_0^D} & ;\ T \le 0.2T_0^D \end{cases}$$

8) 結構系統最大考量地震力折減係數　$(F_{uM})_v$

$_X(F_{uM})_V$ = 1.6660

$_Y(F_{uM})_V$ = 1.1246

$$F_{uM}=\begin{cases} R & ;\ T \ge T_0^M \\ \sqrt{2R-1}+(R-\sqrt{2R-1})*\dfrac{T-0.6T_0^M}{0.4T_0^M} & ;0.6T_0^M \le T \le T_0^M \\ \sqrt{2R-1} & ;0.2T_0^M \le T \le 0.6T_0^M \\ \sqrt{2R-1}+(\sqrt{2R-1}-1)*\dfrac{T-0.2T_0^M}{0.2T_0^M} & ;\ T \le 0.2T_0^M \end{cases}$$

9) 設計垂直加速度反應譜係數　$(S_{aD})_V=\frac{1}{2}(S_{aD})_H$

$_X(S_{aD})_V$ = 0.2474

$_Y(S_{aD})_V$ = 0.3000

$S_{aD}=S_{DS}(0.4+3T/T_0^D)$　　; $T \le 0.2T_0^D$

$S_{aD}=S_{DS}$　　; $0.2T_0^D \le T \le T_0^D$

$S_{aD}=S_{D1}/T$　　; $T_0^D \le T \le 2.5T_0^D$

$S_{aD}=0.40\,S_{DS}$　　; $2.50T_0^D \le T$

10) 最大考量垂直加速度反應譜係數

$_X(S_{aM})_V$ = 0.3712

$_Y(S_{aM})_V$ = 0.4000

$S_{aM}=S_{MS}(0.4+3T/T_0^M)$　　; $T \le 0.2T_0^M$

$S_{aM}=S_{MS}$　　; $0.2T_0^M \le T \le T_0^M$

$S_{aM}=S_{M1}/T$　　; $T_0^M \le T \le 2.5T_0^M$

$S_{aM}=0.40\,S_{MS}$　　; $2.50T_0^M \le T$

11) 設計垂直加速度反應譜修正係數

$_X\left(\dfrac{S_{aD,V}}{F_{uV}}\right)_m$ = 0.1548

$_Y\left(\dfrac{S_{aD,V}}{F_{uV}}\right)_m$ = 0.2133

$$\left(\frac{S_{aD,V}}{F_{uv}}\right)_m=\begin{cases} \dfrac{S_{aD,V}}{F_{uv}} & ;\dfrac{S_{aD,V}}{F_{uv}} \le 0.15 \\ 0.52\dfrac{S_{aD,V}}{F_{uv}}+0.072 & ;0.15 \le \dfrac{S_{aD,V}}{F_{uv}} \le 0.4 \\ 0.70\dfrac{S_{aD,V}}{F_{uv}} & ;\dfrac{S_{aD,V}}{F_{uv}} \ge 0.4 \end{cases}$$

12) 最大考量垂直加速度反應譜修正係數

$_X\left(\dfrac{S_{aMV}}{F_{uMV}}\right)_m$ = 0.1878

$_Y\left(\dfrac{S_{aMV}}{F_{uMV}}\right)_m$ = 0.2570

$$\left(\frac{S_{aM,V}}{F_{uMv}}\right)_m=\begin{cases} \dfrac{S_{aM,V}}{F_{uMv}} & ;\dfrac{S_{aM,V}}{F_{uMv}} \le 0.15 \\ 0.52\dfrac{S_{aM,V}}{F_{uMv}}+0.072 & ;0.15 \le \dfrac{S_{aM,V}}{F_{uMv}} \le 0.4 \\ 0.70\dfrac{S_{aM,V}}{F_{uMv}} & ;\dfrac{S_{aM,V}}{F_{uMv}} \ge 0.4 \end{cases}$$

13) 樓版設計垂直地震力係數

$$V_{ZDV}=\frac{I}{1.4\alpha_Y}\left(\frac{S_{aD,V}}{F_{UV}}\right)_m*W$$

$_XV_{ZD,S}$ = 0.1105 W

$_YV_{ZD,S}$ = 0.1524 W

$$V_{ZMV}=\frac{I}{1.4\alpha_Y}\left(\frac{S_{aM,V}}{F_{uMV}}\right)_m*W$$

$_XV_{ZM,S}$ = 0.1342 W

$_YV_{ZM,S}$ = 0.1835 W

14) 柱設計垂直地震力係數

$$V_{ZD,C}=\frac{0.40S_{DS}*I}{2\alpha y}$$

$_XV_{ZD,C}$ = 0.1200 W

$_YV_{ZD,C}$ = 0.1200 W

$$V_{ZM,C}=\frac{0.40S_{MS}*I}{2\alpha y}$$

$_XV_{ZM,C}$ = 0.1600 W

$_XV_{ZM,C}$ = 0.1600 W

5%意外扭矩計算

EX1

樓層	樓高(Hi)	Hn	位移		扭矩放大係數	5%扭矩	意外偏心扭矩	偏心扭矩差值
名稱	(M)	(M)	MAXIMUM	AVERAGE	A_X	Mt=0.05DV		
PR	3.00	16.00	0.0206	0.0204	0.7081	2.08	2.08	0.00
R1F	3.20	13.00	0.0189	0.0186	0.7170	10.35	10.35	0.00
4FL	3.20	9.80	0.0158	0.0155	0.7216	7.82	7.82	0.00
3FL	3.20	6.60	0.0111	0.0110	0.7071	5.07	5.07	0.00
2FL	3.40	3.40	0.0057	0.0055	0.7459	2.59	2.59	0.00
合計								

EX2

樓層	樓高(Hi)	Hn	位移		扭矩放大係數	5%扭矩	意外偏心扭矩	偏心扭矩差值
名稱	(M)	(M)	MAXIMUM	AVERAGE	A_X	Mt=0.05DV		
PR	3.00	16.00	0.0204	0.0203	0.7013	2.08	2.08	0.00
R1F	3.20	13.00	0.0187	0.0186	0.7019	10.35	10.35	0.00
4FL	3.20	9.80	0.0156	0.0155	0.7034	5.24	5.24	0.00
3FL	3.20	6.60	0.0110	0.0110	0.6944	3.40	3.40	0.00
2FL	3.40	3.40	0.0056	0.0055	0.7199	1.73	1.73	0.00
合計								

EY1

樓層	樓高(Hi)	Hn	位移		扭矩放大係數	5%扭矩	意外偏心扭矩	偏心扭矩差值
名稱	(M)	(M)	MAXIMUM	AVERAGE	A_X	Mt=0.05DV		
PR	3.00	16.00	0.0013	0.0012	0.8150	2.66	2.66	0.00
R1F	3.20	13.00	0.0011	0.0010	0.8403	6.94	6.94	0.00
4FL	3.20	9.80	0.0009	0.0008	0.8789	5.24	5.24	0.00
3FL	3.20	6.60	0.0006	0.0006	0.6944	3.40	3.40	0.00
2FL	3.40	3.40	0.0004	0.0004	0.6944	1.73	1.73	0.00
合計								

EY2

樓層	樓高(Hi)	Hn	位移		扭矩放大係數	5%扭矩	意外偏心扭矩	偏心扭矩差值
名稱	(M)	(M)	MAXIMUM	AVERAGE	A_X	Mt=0.05DV		
PR	3.00	16.00	0.0013	0.0012	0.8150	2.66	2.66	0.00
R1F	3.20	13.00	0.0011	0.001	0.8403	6.94	6.94	0.00
4FL	3.20	9.80	0.0009	0.0008	0.8789	5.24	5.24	0.00
3FL	3.20	6.60	0.0006	0.0006	0.6944	3.40	3.40	0.00
2FL	3.40	3.40	0.0004	0.0004	0.6944	1.73	1.73	0.00
合計								

反應譜分析-動力分析調整係數

ETABS v9.7.2 File:DES-A Units:Ton-m July 3, 2023 20:54 PAGE 12

S T O R Y F O R C E S

STORY	LOAD	P	VX	VY	T	MX	MY
PR	EX1	5.940E-15	-6.840E+00	2.237E-14	5.896E+01	-1.217E-13	-2.052E+01
RFL	EX1	9.566E-13	-2.467E+01	-3.183E-13	1.889E+02	1.006E-11	-9.946E+01
4FL	EX1	1.144E-12	-3.813E+01	-6.404E-13	2.900E+02	1.371E-11	-2.215E+02
3FL	EX1	8.544E-13	-4.686E+01	-8.955E-13	3.555E+02	1.393E-11	-3.714E+02
2FL	EX1	8.349E-13	-5.131E+01	-8.065E-13	3.876E+02	1.594E-11	-5.459E+02
1FL	EX1	8.171E-13	-5.131E+01	-8.060E-13	3.876E+02	1.683E-11	-6.075E+02
PR	EX2	2.692E-14	-6.840E+00	-1.402E-15	5.523E+01	1.608E-13	-2.052E+01
RFL	EX2	1.095E-12	-2.467E+01	-2.512E-13	1.655E+02	1.106E-11	-9.946E+01
4FL	EX2	1.201E-12	-3.813E+01	-5.815E-13	2.517E+02	1.437E-11	-2.215E+02
3FL	EX2	8.775E-13	-4.686E+01	-8.167E-13	3.075E+02	1.353E-11	-3.714E+02
2FL	EX2	9.486E-13	**-5.131E+01**	-7.363E-13	3.342E+02	1.586E-11	-5.459E+02
1FL	EX2	9.521E-13	-5.131E+01	-7.410E-13	3.342E+02	1.671E-11	-6.075E+02
PR	EY1	7.772E-14	1.123E-14	-1.109E+01	-2.714E+01	3.327E+01	-1.759E-13
RFL	EY1	-1.607E-12	1.022E-12	-4.002E+01	-9.938E+01	1.613E+02	5.706E-12
4FL	EY1	-9.415E-13	1.002E-12	-6.185E+01	-1.526E+02	3.593E+02	7.013E-12
3FL	EY1	-4.441E-13	9.895E-13	-7.602E+01	-1.872E+02	6.025E+02	9.493E-12
2FL	EY1	-2.842E-13	9.817E-13	-8.325E+01	-2.049E+02	8.856E+02	1.285E-11
1FL	EY1	-2.913E-13	9.724E-13	-8.325E+01	-2.049E+02	9.855E+02	1.404E-11
PR	EY2	3.331E-14	-9.541E-15	-1.109E+01	-2.221E+01	3.327E+01	-1.528E-13
RFL	EY2	-1.744E-12	-8.915E-13	-4.002E+01	-8.157E+01	1.613E+02	-8.313E-13
4FL	EY2	-9.983E-13	-9.076E-13	-6.185E+01	-1.251E+02	3.593E+02	-5.294E-12
3FL	EY2	-5.151E-13	-9.212E-13	-7.602E+01	-1.533E+02	6.025E+02	-8.797E-12
2FL	EY2	-3.517E-13	-9.030E-13	**-8.325E+01**	-1.679E+02	8.856E+02	-1.198E-11
1FL	EY2	-2.842E-13	-8.947E-13	-8.325E+01	-1.679E+02	9.855E+02	-1.316E-11
PR	DYNX	1.993E-14	6.884E+00	3.891E-03	5.772E+01	1.167E-02	2.065E+01
RFL	DYNX	8.954E-13	1.986E+01	2.308E-02	1.457E+02	8.355E-02	8.300E+01
4FL	DYNX	8.595E-13	3.034E+01	2.762E-02	2.182E+02	1.716E-01	1.776E+02
3FL	DYNX	7.942E-13	3.812E+01	3.168E-02	2.706E+02	2.720E-01	2.951E+02
2FL	DYNX	5.809E-13	**4.338E+01**	3.639E-02	3.034E+02	3.950E-01	4.364E+02
1FL	DYNX	8.098E-13	4.564E+01	3.832E-02	3.171E+02	4.407E-01	4.876E+02
PR	DYNY	8.534E-15	3.155E-02	1.046E+01	2.308E+01	3.139E+01	9.464E-02
RFL	DYNY	1.439E-12	3.359E-02	3.256E+01	7.298E+01	1.354E+02	1.517E-01
4FL	DYNY	8.634E-13	3.293E-02	5.070E+01	1.125E+02	2.969E+02	1.242E-01
3FL	DYNY	3.173E-13	2.971E-02	6.437E+01	1.422E+02	5.008E+02	1.091E-01
2FL	DYNY	3.704E-13	3.418E-02	**7.544E+01**	1.669E+02	7.525E+02	8.087E-02
1FL	DYNY	2.957E-13	3.832E-02	8.157E+01	1.804E+02	8.479E+02	1.099E-01

靜態地震力 Vsx=51.29 tf
Vsy=83.25 tf

動力分析調整係數

X 向 Fx=51.29/43.38=1.182
Y 向 Fy=83.25/75.44=1.104

7.1　風力計算

2023-06-26　21:17:50

112020-A　DATA REVSION: 2007.04.02

```
EXPOSURE CATEGORY ------------------ B<suburban>
TOPOGRAPHIC FEATURE ---------------- no topographic effect
BUILDING TYPE ---------------------- enclosed
BUILDING SECTION ------------------- rectangular
V10(C)                  =     37.50 m/sec
I                       =    1.0000
Tx                      =    0.6062 sec
Ty                      =    0.1134 sec
Tt                      =    0.1726 sec
damping ratio           =    0.0500
alpha                   =    0.2500
zg                      =    400.00 m
b_bar                   =    0.6200
c                       =    0.3000
lambda                  =     98.00 m
epsilon_bar             =    0.3300
zmin                    =      9.00 m
Width in X-DIR          =      4.80 m (average of 2FL ~ RFL)
Width in Y-DIR          =     11.72 m (average of 2FL ~ RFL)
h                       =     13.30 m
fx                      =    1.6236 Hz
fy                      =    8.7336 Hz
ft                      =    5.7737 Hz
Vh                      =     26.67 m/sec
q(h)                    =     42.68 kg/m2

--------------------------------------------------------------------------------
PARAPET
--------------------------------------------------------------------------------

<CORRELATION COEFFICIENTS OF PARAPET WIND PRESSURE>
(GCpn)<windward>        =    1.8000
(GCpn)<leeward>         =   -1.1000
qp                      =     44.56 kg/m2

--------------------------------------------------------------------------------
1. WIND LOAD PARALLEL TO X DIRECTION
--------------------------------------------------------------------------------

BUILDING FLEXIBILITY --------------- non-flexible
fn                      =    1.6236 Hz
fa                      =    8.7336 Hz
ft                      =    5.7737 Hz

<CORRELATION COEFFICIENTS OF ALONG-WIND PRESSURE>
Cp<windward>            =    0.8000
Cp<leeward>             =   -0.5000
z_bar                   =      9.00 m
Iz_bar                  =    0.3053
Lz_bar                  =     94.65 m
gQ                      =    3.4000
gV                      =    3.4000
Q                       =    0.8865
```



```
G                       =    1.7874
(GCpi)                  =    0.3750

<CORRELATION COEFFICIENTS OF ACROSS-WIND FORCE>
h/sqrt(B*L)             =    1.7732 < 4.0 OK.
8.3fa*sqrt(B*L)         =    543.70 m/sec > Vh = 26.67 OK.
L/B                     =    0.4096
fa*sqrt(B*L)/Vh         =    2.4560
gL                      =    4.2811
C'L                     =    0.0788
n*                      =    3.8377
n1                      =    0.1136
beta1                   =    0.2944
k1_bar                  =    0.8500
SL(n*)                  =    0.0003
RLR                     =    0.0003

<CORRELATION COEFFICIENTS OF TORSION>
ft*sqrt(B*L)/Vh         =    1.6236
gT                      =    4.1834
C'T                     =    0.0256
U*                      =    0.6159
KT                      =    0.3061
betaT                   =    1.0403
LBL                     =     11.72 m
RTR                     =    0.0007

<LOAD CASE DEFINITION DATA>
W1,2 = {(1/1.128*G) + 0.7*[(1.128*G-1)/1.128*G]}*WD + 0.7*(WL+WT)
     = 0.849*WD + 0.7*(WL+WT)

--------------------------------------------------------------------------------
2. WIND LOAD PARALLEL TO Y DIRECTION
--------------------------------------------------------------------------------

BUILDING FLEXIBILITY --------------- non-flexible
fn                      =    8.7336 Hz
fa                      =    1.6236 Hz
ft                      =    5.7737 Hz

<CORRELATION COEFFICIENTS OF ALONG-WIND PRESSURE>
Cp<windward>            =    0.8000
Cp<leeward>             =   -0.2779
z_bar                   =      9.00 m
Iz_bar                  =    0.3053
Lz_bar                  =     94.65 m
gQ                      =    3.4000
gV                      =    3.4000
Q                       =    0.9045
G                       =    1.8096
(GCpi)                  =    0.3750

<CORRELATION COEFFICIENTS OF ACROSS-WIND FORCE>
h/sqrt(B*L)             =    1.7732 < 4.0 OK.
8.3fa*sqrt(B*L)         =    101.08 m/sec > Vh = 26.67 OK.
L/B                     =    2.4417
fa*sqrt(B*L)/Vh         =    0.4566
gL                      =    3.8682
```

```
C'L                    =     0.2332
n*                     =     0.2922
n1                     =     0.0419
beta1                  =     0.7605
k1_bar                 =     0.8500
SL(n*)                 =     0.0244
RLR                    =     0.0192

<CORRELATION COEFFICIENTS OF TORSION>
ft*sqrt(B*L)/Vh        =     1.6236
gT                     =     4.1834
C'T                    =     0.1608
U*                     =     0.6159
KT                     =     0.0187
betaT                  =     2.5128
LBL                    =      11.72 m
RTR                    =     0.0000

<LOAD CASE DEFINITION DATA>
W1,2 = {(1/1.128*G) + 0.7*[(1.128*G-1)/1.128*G]}*WD + 0.7*(WL+WT)
     = 0.847*WD + 0.7*(WL+WT)
```

```
-----------------------------------------------------------------------------
PARAPET
-----------------------------------------------------------------------------

z                          =      14.50 m
Wind pressure<windward>    =      80.21 kg/m2
Wind pressure<leeward>     =     -49.02 kg/m2

X-DIR L                    =       4.80 m
X-DIR B                    =      11.72 m
X-DIR Az                   =      14.06 m2
X-DIR Wind force<windward> =    1128.12 kg    (for single piece)
X-DIR Wind force<Leedward> =    -689.41 kg    (for single piece)
X-DIR WLz                  =     663.63 kg
X-DIR MTz                  =    1489.98 kg-m

Y-DIR L                    =      11.72 m
Y-DIR B                    =       4.80 m
Y-DIR Az                   =       5.76 m2
Y-DIR Wind force<windward> =     462.03 kg    (for single piece)
Y-DIR Wind force<Leedward> =    -282.35 kg    (for single piece)
Y-DIR WLZ                  =     853.36 kg
Y-DIR MTz                  =    1557.94 kg-m

-----------------------------------------------------------------------------
1. WIND LOAD PARALLEL TO X DIRECTION
-----------------------------------------------------------------------------

*** LAYER: GL ***
L                          =       4.80 m
B                          =      11.72 m
Az                         =       1.76 m2

z                          =       0.15 m
q(z)                       =      26.17 kg/m2
External pressure<windward> =      37.42 kg/m2
External pressure<leeward>  =     -38.14 kg/m2
Internal pressure:qi*(GCpi) =      16.00 kg/m2
WLZ/Az                     =       0.49 kg/m2
MTz/Az                     =       1.10 kg-m/m2

z                          =       0.30 m
q(z)                       =      26.17 kg/m2
External pressure<windward> =      37.42 kg/m2
External pressure<leeward>  =     -38.14 kg/m2
Internal pressure:qi*(GCpi) =      16.00 kg/m2
WLZ/Az                     =       0.98 kg/m2
MTz/Az                     =       2.19 kg-m/m2

*** LAYER: 2FL ***
L                          =       4.80 m
B                          =      11.72 m
Az                         =      19.92 m2

z                          =       2.00 m
q(z)                       =      26.17 kg/m2
External pressure<windward> =      37.42 kg/m2
External pressure<leeward>  =     -38.14 kg/m2
```

```
Internal pressure:qi*(GCpi) =      16.00 kg/m2
WLZ/Az                      =       6.51 kg/m2
MTz/Az                      =      14.61 kg-m/m2

z                           =       3.70 m
q(z)                        =      26.17 kg/m2
External pressure<windward> =      37.42 kg/m2
External pressure<leeward>  =     -38.14 kg/m2
Internal pressure:qi*(GCpi) =      16.00 kg/m2
WLZ/Az                      =      12.04 kg/m2
MTz/Az                      =      27.03 kg-m/m2

*** LAYER: 3FL ***
L                           =       4.80 m
B                           =      11.72 m
Az                          =      18.75 m2

z                           =       5.30 m
q(z)                        =      26.94 kg/m2
External pressure<windward> =      38.52 kg/m2
External pressure<leeward>  =     -38.14 kg/m2
Internal pressure:qi*(GCpi) =      16.00 kg/m2
WLZ/Az                      =      17.25 kg/m2
MTz/Az                      =      38.72 kg-m/m2

z                           =       6.90 m
q(z)                        =      30.74 kg/m2
External pressure<windward> =      43.96 kg/m2
External pressure<leeward>  =     -38.14 kg/m2
Internal pressure:qi*(GCpi) =      16.00 kg/m2
WLZ/Az                      =      22.45 kg/m2
MTz/Az                      =      50.41 kg-m/m2

*** LAYER: 4FL ***
L                           =       4.80 m
B                           =      11.72 m
Az                          =      18.75 m2

z                           =       8.50 m
q(z)                        =      34.12 kg/m2
External pressure<windward> =      48.79 kg/m2
External pressure<leeward>  =     -38.14 kg/m2
Internal pressure:qi*(GCpi) =      16.00 kg/m2
WLZ/Az                      =      27.66 kg/m2
MTz/Az                      =      62.10 kg-m/m2

z                           =      10.10 m
q(z)                        =      37.19 kg/m2
External pressure<windward> =      53.18 kg/m2
External pressure<leeward>  =     -38.14 kg/m2
Internal pressure:qi*(GCpi) =      16.00 kg/m2
WLZ/Az                      =      32.87 kg/m2
MTz/Az                      =      73.79 kg-m/m2

*** LAYER: RFL ***
L                           =       4.80 m
B                           =      11.72 m
Az                          =      18.75 m2

z                           =      11.70 m
q(z)                        =      40.03 kg/m2
External pressure<windward> =      57.24 kg/m2
External pressure<leeward>  =     -38.14 kg/m2
Internal pressure:qi*(GCpi) =      16.00 kg/m2
WLZ/Az                      =      38.07 kg/m2
MTz/Az                      =      85.48 kg-m/m2

z                           =      13.30 m
q(z)                        =      42.68 kg/m2
External pressure<windward> =      61.03 kg/m2
External pressure<leeward>  =     -38.14 kg/m2
Internal pressure:qi*(GCpi) =      16.00 kg/m2
WLZ/Az                      =      43.28 kg/m2
MTz/Az                      =      97.18 kg-m/m2

*** LAYER: PR ***
L                           =       4.80 m
B                           =       7.58 m
Az                          =      11.37 m2

z                           =      14.80 m
q(z)                        =      45.02 kg/m2
External pressure<windward> =      64.38 kg/m2
External pressure<leeward>  =     -38.14 kg/m2
Internal pressure:qi*(GCpi) =      16.00 kg/m2
WLZ/Az                      =      48.16 kg/m2
MTz/Az                      =      69.94 kg-m/m2

z                           =      16.30 m
q(z)                        =      47.25 kg/m2
External pressure<windward> =      67.56 kg/m2
External pressure<leeward>  =     -38.14 kg/m2
Internal pressure:qi*(GCpi) =      16.00 kg/m2
WLZ/Az                      =      53.04 kg/m2
MTz/Az                      =      77.03 kg-m/m2

[SUMMATION OF FRAME WIND FORCE]

*wind force = Az(i)*[PS(i) + PM(i)]/2 + Az(i+1)*[PS(i) + PM(i+1)]/2

*** LAYER: GL ***
External force<windward>    =     811.31 kg
External force<leeward>     =    -827.00 kg
Internal force              =     347.01 kg
Across-wind force           =      75.85 kg
Torsion                     =     170.30 kg-m

*** LAYER: 2FL ***
External force<windward>    =    1457.57 kg
External force<leeward>     =   -1475.19 kg
Internal force              =     619.00 kg
Across-wind force           =     459.39 kg
Torsion                     =    1031.43 kg-m

*** LAYER: 3FL ***
External force<windward>    =    1642.91 kg
```

External force<leeward> = -1430.49 kg
Internal force = 600.24 kg
Across-wind force = 842.13 kg
Torsion = 1890.73 kg-m

*** LAYER: 4FL ***
External force<windward> = 1991.37 kg
External force<leeward> = -1430.49 kg
Internal force = 600.24 kg
Across-wind force = 1232.68 kg
Torsion = 2767.59 kg-m

*** LAYER: RFL ***
External force<windward> = 1821.79 kg
External force<leeward> = -1148.92 kg
Internal force = 482.09 kg
Across-wind force = 1282.66 kg
Torsion = 2662.65 kg-m

*** LAYER: PR ***
External force<windward> = 750.07 kg
External force<leeward> = -433.68 kg
Internal force = 181.97 kg
Across-wind force = 575.36 kg
Torsion = 835.48 kg-m

/// SUMMARY TABLE (UNIT: T, M) ///

	/--- External ---/					Windward +	Windward -	Leeward -	Leeward +	Windward +
	Windward	Leeward	Internal	Across	Torsion	Internal	Internal	Internal	Internal	|Leeward|
PR	0.75	-0.43	0.18	0.58	0.84	0.93	0.57	-0.62	-0.25	1.18
RFL	1.82	-1.15	0.48	1.28	2.66	2.30	1.34	-1.63	-0.67	2.97
4FL	1.99	-1.43	0.60	1.23	2.77	2.59	1.39	-2.03	-0.83	3.42
3FL	1.64	-1.43	0.60	0.84	1.89	2.24	1.04	-2.03	-0.83	3.07
2FL	1.46	-1.48	0.62	0.46	1.03	2.08	0.84	-2.09	-0.86	2.93
GL	0.81	-0.83	0.35	0.08	0.17	1.16	0.46	-1.17	-0.48	1.64

---

2. WIND LOAD PARALLEL TO Y DIRECTION

*** LAYER: GL ***
L = 11.72 m
B = 4.80 m
Az = 0.72 m2

z = 0.15 m
q(z) = 26.17 kg/m2
External pressure<windward> = 37.88 kg/m2
External pressure<leeward> = -21.46 kg/m2
Internal pressure:qi*(GCpi) = 16.00 kg/m2
WLZ/Az = 1.53 kg/m2
MTz/Az = 2.80 kg-m/m2

z = 0.30 m
q(z) = 26.17 kg/m2
External pressure<windward> = 37.88 kg/m2
External pressure<leeward> = -21.46 kg/m2
Internal pressure:qi*(GCpi) = 16.00 kg/m2
WLZ/Az = 3.07 kg/m2
MTz/Az = 5.60 kg-m/m2

*** LAYER: 2FL ***
L = 11.72 m
B = 4.80 m
Az = 8.16 m2

z = 2.00 m
q(z) = 26.17 kg/m2
External pressure<windward> = 37.88 kg/m2
External pressure<leeward> = -21.46 kg/m2
Internal pressure:qi*(GCpi) = 16.00 kg/m2
WLZ/Az = 20.43 kg/m2
MTz/Az = 37.31 kg-m/m2

z = 3.70 m
q(z) = 26.17 kg/m2
External pressure<windward> = 37.88 kg/m2
External pressure<leeward> = -21.46 kg/m2
Internal pressure:qi*(GCpi) = 16.00 kg/m2
WLZ/Az = 37.80 kg/m2
MTz/Az = 69.02 kg-m/m2

*** LAYER: 3FL ***
L = 11.72 m
B = 4.80 m
Az = 7.68 m2

z = 5.30 m
q(z) = 26.94 kg/m2
External pressure<windward> = 39.00 kg/m2
External pressure<leeward> = -21.46 kg/m2
Internal pressure:qi*(GCpi) = 16.00 kg/m2
WLZ/Az = 54.15 kg/m2
MTz/Az = 98.86 kg-m/m2

z = 6.90 m
q(z) = 30.74 kg/m2
External pressure<windward> = 44.50 kg/m2
External pressure<leeward> = -21.46 kg/m2
Internal pressure:qi*(GCpi) = 16.00 kg/m2
WLZ/Az = 70.50 kg/m2
MTz/Az = 128.71 kg-m/m2

*** LAYER: 4FL ***
L = 11.72 m
B = 4.80 m
Az = 7.68 m2

z = 8.50 m
q(z) = 34.12 kg/m2
External pressure<windward> = 49.39 kg/m2
External pressure<leeward> = -21.46 kg/m2
Internal pressure:qi*(GCpi) = 16.00 kg/m2
WLZ/Az = 86.85 kg/m2

```
MTz/Az                        =     158.55 kg-m/m2

z                             =      10.10 m
q(z)                          =      37.19 kg/m2
External pressure<windward> =      53.84 kg/m2
External pressure<leeward>  =     -21.46 kg/m2
Internal pressure:qi*(GCpi) =      16.00 kg/m2
WLZ/Az                        =     103.20 kg/m2
MTz/Az                        =     188.40 kg-m/m2

*** LAYER: RFL ***
L                             =      11.72 m
B                             =       4.80 m
Az                            =       7.68 m2

z                             =      11.70 m
q(z)                          =      40.03 kg/m2
External pressure<windward> =      57.95 kg/m2
External pressure<leeward>  =     -21.46 kg/m2
Internal pressure:qi*(GCpi) =      16.00 kg/m2
WLZ/Az                        =     119.54 kg/m2
MTz/Az                        =     218.25 kg-m/m2

z                             =      13.30 m
q(z)                          =      42.68 kg/m2
External pressure<windward> =      61.79 kg/m2
External pressure<leeward>  =     -21.46 kg/m2
Internal pressure:qi*(GCpi) =      16.00 kg/m2
WLZ/Az                        =     135.89 kg/m2
MTz/Az                        =     248.09 kg-m/m2

*** LAYER: PR ***
L                             =       7.58 m
B                             =       4.80 m
Az                            =       7.20 m2

z                             =      14.80 m
q(z)                          =      45.02 kg/m2
External pressure<windward> =      65.18 kg/m2
External pressure<leeward>  =     -21.46 kg/m2
Internal pressure:qi*(GCpi) =      16.00 kg/m2
WLZ/Az                        =     151.22 kg/m2
MTz/Az                        =     276.07 kg-m/m2

z                             =      16.30 m
q(z)                          =      47.25 kg/m2
External pressure<windward> =      68.40 kg/m2
External pressure<leeward>  =     -21.46 kg/m2
Internal pressure:qi*(GCpi) =      16.00 kg/m2
WLZ/Az                        =     166.54 kg/m2
MTz/Az                        =     304.05 kg-m/m2

[SUMMATION OF FRAME WIND FORCE]

wind force = Az(i)*[PS(i) + PM(i)]/2 + Az(i+1)*[PS(i) + PM(i+1)]/2

*** LAYER: GL ***
External force<windward>      =     336.40 kg
```



```
External force<leeward>       =    -190.60 kg
Internal force                =     142.12 kg
Across-wind force             =      97.54 kg
Torsion                       =     178.07 kg-m

*** LAYER: 2FL ***
External force<windward>      =     604.37 kg
External force<leeward>       =    -339.99 kg
Internal force                =     253.51 kg
Across-wind force             =     590.73 kg
Torsion                       =    1078.47 kg-m

*** LAYER: 3FL ***
External force<windward>      =     681.22 kg
External force<leeward>       =    -329.69 kg
Internal force                =     245.83 kg
Across-wind force             =    1082.88 kg
Torsion                       =    1976.98 kg-m

*** LAYER: 4FL ***
External force<windward>      =     825.71 kg
External force<leeward>       =    -329.69 kg
Internal force                =     245.83 kg
Across-wind force             =    1585.09 kg
Torsion                       =    2893.83 kg-m

*** LAYER: RFL ***
External force<windward>      =     916.85 kg
External force<leeward>       =    -319.38 kg
Internal force                =     238.15 kg
Across-wind force             =    2014.47 kg
Torsion                       =    3677.73 kg-m

*** LAYER: PR ***
External force<windward>      =     480.88 kg
External force<leeward>       =    -154.54 kg
Internal force                =     115.23 kg
Across-wind force             =    1143.94 kg
Torsion                       =    2088.45 kg-m

/// SUMMARY TABLE (UNIT: T, M) ///
```

	/--- External ---/					Windward +	Windward -	Leeward -	Leeward +	Windward +
	Windward	Leeward	Internal	Across	Torsion	Internal	Internal	Internal	Internal	|Leeward|
PR	0.48	-0.15	0.12	1.14	2.09	0.60	0.37	-0.27	-0.04	0.64
RFL	0.92	-0.32	0.24	2.01	3.68	1.15	0.68	-0.56	-0.08	1.24
4FL	0.83	-0.33	0.25	1.59	2.89	1.07	0.58	-0.58	-0.08	1.16
3FL	0.68	-0.33	0.25	1.08	1.98	0.93	0.44	-0.58	-0.08	1.01
2FL	0.60	-0.34	0.25	0.59	1.08	0.86	0.35	-0.59	-0.09	0.94
GL	0.34	-0.19	0.14	0.10	0.18	0.48	0.19	-0.33	-0.05	0.53

*Unit: t, m
*Wind force of parapet is added to roof

Layer	Hi	Sum.Hi	Width.X	Width.Y
PR	3.00	16.30	4.80	7.58
RFL	3.20	13.30	4.80	11.72
4FL	3.20	10.10	4.80	11.72
3FL	3.20	6.90	4.80	11.72
2FL	3.40	3.70	4.80	11.72
GL	0.30	0.30	4.80	11.72

*** WIND LOAD PARALLEL TO X DIRECTION ***

Layer	Fx	Fy	Mt
PR	1.18	0.58	0.84
RFL	6.61	1.95	4.15
4FL	3.42	1.23	2.77
3FL	3.07	0.84	1.89
2FL	2.93	0.46	1.03
GL	1.64	0.08	0.17
Sigma	18.86	5.13	10.85

*** WIND LOAD PARALLEL TO Y DIRECTION ***

Layer	Fx	Fy	Mt
PR	1.14	0.64	2.09
RFL	2.87	2.72	5.24
4FL	1.59	1.16	2.89
3FL	1.08	1.01	1.98
2FL	0.59	0.94	1.08
GL	0.10	0.53	0.18
Sigma	7.37	7.00	13.45

地震橫力 Vex = 51.29 tf 大於 1.6 倍 X 向風力 Fwx=30.18 tf，為地震力控制。

地震橫力 Vey = 83.25 tf 大於 1.6 倍 Y 向風力 Fwy=11.2 tf，為地震力控制。

8.1 層間變位校核

ETABS v9.7.2 File:DES-A Units:Ton-m July 3, 2023 20:54 PAGE 13

STORY DRIFTS

STORY	DIRECTION	LOAD	MAX DRIFT
PR	X	EX1	1/1726
RFL	X	EX1	1/1020
4FL	X	EX1	1/693
3FL	X	EX1	1/584
2FL	X	EX1	1/647
PR	X	EX2	1/1723
RFL	X	EX2	1/1027
4FL	X	EX2	1/696
3FL	X	EX2	1/587
2FL	X	EX2	1/650
PR	Y	EY1	1/15642
RFL	Y	EY1	1/15285
4FL	Y	EY1	1/14629
3FL	Y	EY1	1/15599
2FL	Y	EY1	1/18436
PR	Y	EY2	1/15785
RFL	Y	EY2	1/15504
4FL	Y	EY2	1/14809
3FL	Y	EY2	1/15771
2FL	Y	EY2	1/18627
PR	X	DYNX	1/1936
RFL	X	DYNX	1/1290
4FL	X	DYNX	1/881
3FL	X	DYNX	1/727
2FL	X	DYNX	1/781
PR	Y	DYNY	1/19652
RFL	Y	DYNY	1/19743
4FL	Y	DYNY	1/18872
3FL	Y	DYNY	1/19911
2FL	Y	DYNY	1/22675

層間變位校核

$\delta x = 0.1179/0.1326*1/584 = 0.0015 < 0.005$ O.K.

$\delta y = 0.1429/0.2152*1/14629 = 0.00005 < 0.005$ O.K.

8.2 鄰棟間距檢核：

ETABS v9.7.2 File:DES-A Units:Ton-m July 3, 2023 20:54 PAGE 15

STORY MAXIMUM AND AVERAGE LATERAL DISPLACEMENTS

STORY	LOAD	DIR	MAXIMUM	AVERAGE	RATIO
PR	EX1	X	0.0206	0.0204	1.008
RFL	EX1	X	0.0189	0.0186	1.016
4FL	EX1	X	0.0158	0.0155	1.016
3FL	EX1	X	0.0111	0.0110	1.017
2FL	EX1	X	0.0057	0.0055	1.021
1FL	EX1	X	0.0004	0.0004	1.153
PR	EX2	X	0.0204	0.0203	1.004
RFL	EX2	X	0.0187	0.0186	1.007
4FL	EX2	X	0.0156	0.0155	1.007
3FL	EX2	X	0.0110	0.0110	1.006
2FL	EX2	X	0.0056	0.0055	1.006
1FL	EX2	X	0.0004	0.0004	1.000
PR	EY1	Y	0.0013	0.0012	1.070
RFL	EY1	Y	0.0011	0.0010	1.069
4FL	EY1	Y	0.0009	0.0008	1.067
3FL	EY1	Y	0.0006	0.0006	1.063
2FL	EY1	Y	0.0004	0.0004	1.054
1FL	EY1	Y	0.0003	0.0002	1.033
PR	EY2	Y	0.0013	0.0012	1.060
RFL	EY2	Y	0.0011	0.0010	1.059
4FL	EY2	Y	0.0009	0.0008	1.058
3FL	EY2	Y	0.0006	0.0006	1.054
2FL	EY2	Y	0.0004	0.0004	1.047
1FL	EY2	Y	0.0003	0.0002	1.029
PR	DYNX	X	0.0163	0.0163	1.003
RFL	DYNX	X	0.0149	0.0149	1.005
4FL	DYNX	X	0.0126	0.0125	1.005
3FL	DYNX	X	0.0091	0.0090	1.005
2FL	DYNX	X	0.0047	0.0046	1.007
1FL	DYNX	X	0.0003	0.0003	1.065
PR	DYNY	Y	0.0010	0.0010	1.003
RFL	DYNY	Y	0.0009	0.0009	1.002
4FL	DYNY	Y	0.0007	0.0007	1.003
3FL	DYNY	Y	0.0005	0.0005	1.003
2FL	DYNY	Y	0.0004	0.0004	1.003
1FL	DYNY	Y	0.0002	0.0002	1.002

$\Delta x_{(PR)} = 0.6*1.4*\alpha y*Ra*\Delta = 2.52*0.0206 = 0.0519m = 5.19cm$

$\Delta y_{(RFL)} = 0.6*1.4*\alpha y*Ra*\Delta = 2.52*0.0011 = 0.0028m = 0.28cm$

基礎設計

土壤承載力分析(參考90年10月基礎構造設計規範)

φ (度)	支承力因數 Nc	Nq	Nr	Nr*
0	5.3	1.0	0.0	0.0
1	5.3	1.1	0.0	0.0
2	5.3	1.1	0.0	0.0
3	5.3	1.2	0.0	0.0
4	5.3	1.3	0.0	0.0
5	5.3	1.4	0.0	0.0
6	5.3	1.5	0.0	0.0
7	5.3	1.6	0.0	0.0
8	5.3	1.7	0.0	0.0
9	5.3	1.8	0.0	0.0
10	5.3	1.9	0.0	0.0
11	5.5	2.1	0.0	0.0
12	5.8	2.2	0.0	0.0
13	6.0	2.4	0.0	0.0
14	6.2	2.5	1.1	0.9
15	6.5	2.7	1.2	1.1
16	6.7	2.9	1.3	1.4
17	7.0	3.1	1.5	1.7
18	7.3	3.4	1.6	2.0
19	7.6	3.6	1.8	2.4
20	7.9	3.9	2.0	2.9
21	8.2	4.2	2.2	3.4
22	8.6	4.5	2.4	4.1
23	9.0	4.8	2.7	4.8
24	9.4	5.2	3.0	5.7
25	9.9	5.6	3.3	6.8
26	10.4	6.0	3.6	8.0
27	10.9	6.5	4.0	9.6
28	11.4	7.1	4.4	11.2
29	13.2	8.3	5.4	13.5
30	15.3	9.8	6.6	15.7
31	17.9	11.7	8.4	18.9
32	20.9	14.1	10.6	22.0
33	24.7	17.0	13.7	25.6
34	29.3	20.8	17.8	31.1
35	35.1	25.5	23.2	37.8
36	42.2	31.6	30.5	44.4
37	51.2	39.6	41.4	54.2
38	62.5	49.8	57.6	64.0
39	77.0	63.4	80.0	78.8
>40	95.7	81.2	114.0	93.6

$q_u = CNcF_{cs}F_{cd}F_{ci} + \gamma_2 D_f NqF_{qs}F_{qd}F_{qi} + 0.5\gamma_1 BNrF_{rs}F_{rd}F_{ri}$

基礎短邊長度B= 4.8 m　（採高層區投影
基礎長邊長度L= 12.56 m　之長、寬）

基礎開挖深度D_f= 1.2 m

基礎下1B平均有效重γ_1= 1.85 t/m^3

基礎上平均有效重γ_2= 1.85 t/m^3 = $\Sigma\gamma' h/D_f$

基礎載重夾角β= 0 度

基礎下土壤凝聚力 0.5 t/m^2

基礎下土壤摩擦角φ= 26 度

支承力因數Nc= ***10.4***　埋置深度影響因數F_{cd}= 1.080
Nq= ***6.0***　F_{qd}= 1.040
Nr= ***3.6***　F_{rd}= 1.040

形狀影響因數F_{cs}= 1.196　載重傾斜影響因數F_{ci}= 1.000
F_{qs}= 1.098　F_{qi}= 1.000
F_{rs}= 1.098　F_{ri}= 1.000

得極限支承力q_u= 40.2 t/m^2

基礎底面以上荷重$\gamma_2 Df$= 2.2 t/m^2

淨極限支承力$q_u' = q_u - \gamma_2 D_f$= 38.0 t/m^2

長期載重安全係數FS= 3

容許支承力 $q_a = q_u'/FS + \gamma_2 D_f$= ***14.9*** t/m^2

短期容許支承力 $q_{ae} = 1.5q_a$= ***22.4*** t/m^2

基礎地反力計算

A:) 建物總載重計算

1) 全區建築物總重

WD(1~PR)= 475.47 T　　WL(1~PR)= 91.91 T

B:) 基礎面積性質計算

ID	IR	B	D	A=B*D	X	Y	AX	AY	Ix	Iy
1	1	4.80	12.56	60.29	2.40	6.48	144.69	390.36	792.55	115.75
			合計	60.29			144.69	390.36	792.55	115.75

Xc= 2.40　　Yc= 6.48

C:) 基礎反力計算

靜載重 Qd = DL/A: 7.89 t/m^2　　活載重 Ql = LL/A = 1.52 t/m^2

由地震力產生之傾倒力矩　　Me(x)= 545.6 T-M

Me(y)= 885.5 T-M

Qe(x)=Me(x)*x/Iy= 11.31 t/m^2

Qe(y)=Me(y)*y/Ix= 7.23 t/m^2

總地反力 maxQ1(t)= (Qd+Ql)+(eQd+eQl) = 9.41 t/m^2

maxQ2(t)= 0.75{(Qd+Ql)+(eQd+eQl)+Qe} = 12.71 t/m^2

D:) 容許地耐力計算

qu(net)= 12.71 -rw*hw = 12.71 (t/m^2) < Qa = 14.90 (t/m^2) O.K.

F) 基礎設計地反力計算:

1) FOR FSLAB

Qd = 7.89-0.4*2.4= 6.93 t/m^2

Ql = 1.52 t/m^2

2) FOR FBEAM (含梁自重)

Qd= 7.89-0.46= 7.43 t/m^2

Ql = 1.52-0.50= 1.02 t/m^2

十、版設計

```
****************
*  SLAB DESIGN *
****************
Concrete Strength    =    245.00 (kg/cm²)
Fy of Reinforcement  =   4200.00 (kg/cm²)
Cover Thickness      =      7.50 (cm)
Design is based on U.S.D.
```

```
****************
*F     -   S1  *
****************
Panel Dimension (cm)  S    =   429.0    L    =   445.0    T = 40.0
V.L. (kg/m²)          D.L. =  6930.0    L.L. =  1520.0
NO. of cont. Sides    N =    2
```

	------ Short direction ------			:	------ Long direction -------		
	continue	middle	discont.	:	continue	middle	discont.
Mom(t-m/m)	-11.80	8.89	-5.87	:	-11.32	8.53	-5.63
As (cm²/m)	10.12	7.57	6.60	:	10.12	7.56	6.59
Slab	#4@ 12.5	#4@ 16.5	#4@ 19.0	:	#4@ 12.5	#4@ 16.5	#4@ 19.0
Schedule	#4@ 12.5	#4@ 16.5	#4@ 19.0	:	#4@ 12.5	#4@ 16.5	#4@ 19.0
	4+4@ 12.5	4+4@ 16.5	4+4@ 19.0	:	4+4@ 12.5	4+4@ 16.5	4+4@ 19.0

```
****************
*F     -   S2  *
****************
Panel Dimension (cm)  S    =   240.0    L    =   445.0    T = 40.0
V.L. (kg/m²)          D.L. =  6930.0    L.L. =  1520.0
NO. of cont. Sides    N =    2
```

	------ Short direction ------			:	------ Long direction -------		
	continue	middle	discont.	:	continue	middle	discont.
Mom(t-m/m)	-6.07	4.58	-3.02	:	-3.54	2.67	-1.76
As (cm²/m)	6.83	5.13	3.37	:	4.12	3.10	2.04
Slab	#4@ 18.5	#4@ 24.5	#4@ 37.5	:	#4@ 30.5	#4@ 40.5	#4@ 62.0
Schedule	#4@ 18.5	#4@ 24.5	#4@ 37.5	:	#4@ 30.5	#4@ 40.5	#4@ 62.0
	4+4@ 18.5	4+4@ 24.5	4+4@ 37.5	:	4+4@ 30.5	4+4@ 40.5	4+4@ 62.0

```
****************
*  SLAB DESIGN *
****************
Concrete Strength    =    245.00 (kg/cm²)
Fy of Reinforcement  =   2800.00 (kg/cm²)
Cover Thickness      =      2.50 (cm)
Design is based on U.S.D.
```

```
****************
*1     -   S1  *
****************
Panel Dimension (cm)  S    =   445.0    L    =   454.0    T = 15.0
V.L. (kg/m²)          D.L. =   460.0    L.L. =   500.0
NO. of cont. Sides    N =    2
```

	------ Short direction ------			:	------ Long direction -------		
	continue	middle	discont.	:	continue	middle	discont.
Mom(t-m/m)	-1.52	1.14	-.75	:	-1.48	1.12	-.74
As (cm²/m)	5.15	3.85	2.70	:	5.49	4.10	2.70
Slab	#3@ 13.5	#3@ 18.5	#3@ 26.0	:	#3@ 12.5	#3@ 17.0	#3@ 26.0
Schedule	#3@ 13.5	#3@ 18.5	#3@ 26.0	:	#3@ 12.5	#3@ 17.0	#3@ 26.0
	3+3@ 13.5	3+3@ 18.5	3+3@ 26.0	:	3+3@ 12.5	3+3@ 17.0	3+3@ 26.0

```
****************
*1     -   S2  *
****************
Panel Dimension (cm)  S    =   280.0    L    =   440.0    T = 15.0
V.L. (kg/m²)          D.L. =   460.0    L.L. =   500.0
NO. of cont. Sides    N =    1
```

	------ Short direction ------			:	------ Long direction -------		
	continue	middle	discont.	:	continue	middle	discont.
Mom(t-m/m)	-1.02	.76	-.51	:	-.70	.52	-.35
As (cm²/m)	3.42	2.70	2.25	:	2.70	2.53	1.67
Slab	#3@ 20.5	#3@ 26.0	#3@ 31.5	:	#3@ 26.0	#3@ 28.0	#3@ 42.5
Schedule	#3@ 20.5	#3@ 26.0	#3@ 31.5	:	#3@ 26.0	#3@ 28.0	#3@ 42.5
	3+3@ 20.5	3+3@ 26.0	3+3@ 31.5	:	3+3@ 26.0	3+3@ 28.0	3+3@ 42.5

```
****************
*2-R1  -   S1  *
****************
Panel Dimension (cm)  S    =   445.0    L    =   454.0    T = 15.0
V.L. (kg/m²)          D.L. =   460.0    L.L. =   300.0
NO. of cont. Sides    N =    2
```

	------ Short direction ------			:	------ Long direction -------		
	continue	middle	discont.	:	continue	middle	discont.
Mom(t-m/m)	-1.17	.88	-.58	:	-1.14	.86	-.57
As (cm²/m)	3.95	2.96	2.59	:	4.21	3.15	2.70
Slab	#3@ 18.0	#3@ 24.0	#3@ 27.5	:	#3@ 16.5	#3@ 22.5	#3@ 26.0
Schedule	#3@ 18.0	#3@ 24.0	#3@ 27.5	:	#3@ 16.5	#3@ 22.5	#3@ 26.0
	3+3@ 18.0	3+3@ 24.0	3+3@ 27.5	:	3+3@ 16.5	3+3@ 22.5	3+3@ 26.0

```
****************
*2-R1  -   S2  *
****************
Panel Dimension (cm)  S    =   280.0    L    =   440.0    T = 15.0
V.L. (kg/m²)          D.L. =   460.0    L.L. =   300.0
NO. of cont. Sides    N =    1

           ------ Short direction ------  :  ------ Long direction -------
           continue     middle   discont. :  continue     middle   discont.
Mom(t-m/m)     -.79       .59      -.39   :     -.54       .40      -.27
As (cm²/m)     2.70      2.63      1.73   :     2.60      1.95      1.29
-----------------------------------------------------------------------------
Slab       #3@ 26.0   #3@ 27.0   #3@ 41.0 :  #3@ 27.0   #3@ 36.5   #3@ 45.0
Schedule   #3@ 26.0   #3@ 27.0   #3@ 41.0 :  #3@ 27.0   #3@ 36.5   #3@ 45.0
          3+3@ 26.0  3+3@ 27.0  3+3@ 41.0 : 3+3@ 27.0  3+3@ 36.5  3+3@ 45.0


****************
*2-R1  -   CS1 *
****************
Panel Dimension (cm)  S    =   100.0    L    =  1000.0    T = 15.0
V.L. (kg/m²)          D.L. =   460.0    L.L. =  1000.0
NO. of cont. Sides    N =    0

           ------ Short direction ------  :  ------ Long direction -------
           continue     middle   discont. :  continue     middle   discont.
Mom(t-m/m)     .00       .20      -.13   :     .00       .12      -.08
As (cm²/m)     .00       .90       .59   :     .00       .58       .38
-----------------------------------------------------------------------------
Slab       #3@ 45.0   #3@ 45.0   #3@ 45.0 :  #3@ 45.0   #3@ 45.0   #3@ 45.0
Schedule   #3@ 45.0   #3@ 45.0   #3@ 45.0 :  #3@ 45.0   #3@ 45.0   #3@ 45.0
          3+3@ 45.0  3+3@ 45.0  3+3@ 45.0 : 3+3@ 45.0  3+3@ 45.0  3+3@ 45.0


****************
*2-4   -   CS2 *
****************
Panel Dimension (cm)  S    =   270.0    L    =  1000.0    T = 15.0
V.L. (kg/m²)          D.L. =   460.0    L.L. =  1000.0
NO. of cont. Sides    N =    0

           ------ Short direction ------  :  ------ Long direction -------
           continue     middle   discont. :  continue     middle   discont.
Mom(t-m/m)     .00      1.48      -.98   :     .00       .88      -.58
As (cm²/m)     .00      5.03      3.29   :     .00      3.22      2.70
-----------------------------------------------------------------------------
Slab       #3@ 45.0   #3@ 14.0   #3@ 21.5 :  #3@ 45.0   #3@ 22.0   #3@ 26.0
Schedule   #3@ 45.0   #3@ 14.0   #3@ 21.5 :  #3@ 45.0   #3@ 22.0   #3@ 26.0
          3+3@ 45.0  3+3@ 14.0  3+3@ 21.5 : 3+3@ 45.0  3+3@ 22.0  3+3@ 26.0


****************
*R1    -   CS2 *
****************
Panel Dimension (cm)  S    =   260.0    L    =  3400.0    T = 20.0
V.L. (kg/m²)          D.L. =   580.0    L.L. =  1000.0
NO. of cont. Sides    N =    0

           ------ Short direction ------  :  ------ Long direction -------
           continue     middle   discont. :  continue     middle   discont.
Mom(t-m/m)     .00      1.47      -.97   :     .00       .87      -.58
As (cm²/m)     .00      3.60      3.05   :     .00      2.90      1.91
-----------------------------------------------------------------------------
Slab       #3@ 60.0   #3@ 19.5   #3@ 23.0 :  #3@ 60.0   #3@ 24.5   #3@ 37.0
Schedule   #3@ 60.0   #3@ 19.5   #3@ 23.0 :  #3@ 60.0   #3@ 24.5   #3@ 37.0
          3+3@ 60.0  3+3@ 19.5  3+3@ 23.0 : 3+3@ 60.0  3+3@ 24.5  3+3@ 37.0


****************
*2,R1  -   CS3 *
****************
Panel Dimension (cm)  S    =   200.0    L    =  1800.0    T = 15.0
V.L. (kg/m²)          D.L. =   460.0    L.L. =  1000.0
NO. of cont. Sides    N =    0

           ------ Short direction ------  :  ------ Long direction -------
           continue     middle   discont. :  continue     middle   discont.
Mom(t-m/m)     .00       .81      -.54   :     .00       .48      -.32
As (cm²/m)     .00      2.72      2.38   :     .00      2.33      1.53
-----------------------------------------------------------------------------
Slab       #3@ 45.0   #3@ 26.0   #3@ 29.5 :  #3@ 45.0   #3@ 30.5   #3@ 45.0
Schedule   #3@ 45.0   #3@ 26.0   #3@ 29.5 :  #3@ 45.0   #3@ 30.5   #3@ 45.0
          3+3@ 45.0  3+3@ 26.0  3+3@ 29.5 : 3+3@ 45.0  3+3@ 30.5  3+3@ 45.0


****************
*3,4   -   CS3 *
****************
Panel Dimension (cm)  S    =   350.0    L    =  3300.0    T = 15.0
V.L. (kg/m²)          D.L. =   460.0    L.L. =  1000.0
NO. of cont. Sides    N =    0

           ------ Short direction ------  :  ------ Long direction -------
           continue     middle   discont. :  continue     middle   discont.
Mom(t-m/m)     .00      2.49     -1.64   :     .00      1.48      -.98
As (cm²/m)     .00      8.62      5.60   :     .00      5.48      3.58
-----------------------------------------------------------------------------
Slab       #3@ 45.0   #3@  8.0   #3@ 12.5 :  #3@ 45.0   #3@ 13.0   #3@ 19.5
Schedule   #3@ 45.0   #3@  8.0   #3@ 12.5 :  #3@ 45.0   #3@ 13.0   #3@ 19.5
          3+3@ 45.0  3+3@  8.0  3+3@ 12.5 : 3+3@ 45.0  3+3@ 13.0  3+3@ 19.5


****************
*PR    -   S1  *
****************
Panel Dimension (cm)  S    =   445.0    L    =   580.0    T = 15.0
V.L. (kg/m²)          D.L. =   460.0    L.L. =   300.0
NO. of cont. Sides    N =    0

           ------ Short direction ------  :  ------ Long direction -------
           continue     middle   discont. :  continue     middle   discont.
Mom(t-m/m)     .00      1.50      -.99   :     .00      1.18      -.78
As (cm²/m)     .00      5.09      3.33   :     .00      4.33      2.84
-----------------------------------------------------------------------------
```

```
Slab       #3@ 45.0   #3@ 14.0   #3@ 21.0 :  #3@ 45.0   #3@ 16.0   #3@ 25.0
Schedule   #3@ 45.0   #3@ 14.0   #3@ 21.0 :  #3@ 45.0   #3@ 16.0   #3@ 25.0
          3+3@ 45.0  3+3@ 14.0  3+3@ 21.0 : 3+3@ 45.0  3+3@ 16.0  3+3@ 25.0


****************
*PR    -   CS1 *
****************
Panel Dimension (cm)  S    =   295.0    L    =  4800.0    T = 20.0
V.L. (kg/m²)          D.L. =   580.0    L.L. =  1000.0
NO. of cont. Sides    N =    0

           ------ Short direction ------  :  ------ Long direction -------
           continue     middle   discont. :  continue     middle   discont.
Mom(t-m/m)      .00      1.89     -1.25   :       .00      1.13      -.74
As (cm²/m)      .00      4.49      3.60   :       .00      3.60      2.47
-------------------------------------------------------------------------------
Slab       #3@ 60.0   #3@ 15.5   #3@ 19.5 :  #3@ 60.0   #3@ 19.5   #3@ 28.5
Schedule   #3@ 60.0   #3@ 15.5   #3@ 19.5 :  #3@ 60.0   #3@ 19.5   #3@ 28.5
          3+3@ 60.0  3+3@ 15.5  3+3@ 19.5 : 3+3@ 60.0  3+3@ 19.5  3+3@ 28.5
```

剪力牆設計

以1FL(WY1)之剪力牆為例：

剪力牆高 hw =	280	cm	fy=	4200	kg/cm^2				
剪力牆長 lw =	1172	cm	fc'=	245	kg/cm^2				
剪力牆厚 T =	15.0	cm							
Vd=	0.35	t	Vl=	0.1	t	Ve=	43.8	t-m	
Nd=	145.49	t	Nl=	19.7	t	Ne=	2.6	t-m	
Md=	16.55	t-m,	Ml=	1.4	t-m,	Me=	294.0	t-m	
Vu=	44.2	t	Nu=	206.2	t	Mu=	314.6	t-m	

(1) 斷面 Vn 之限制

有效深度 d=0.8 lw= 436 cm

斷面限制 Vn= 2.65 fc'^(1/2) b d= 271.3 t

外加作用 Vn= Vu / ϕ = 59.0 t OK.

臨界斷面距牆底距離取下二式較小值

hw / 2= 172.5 cm 由此控制

lw / 2= 272.5 cm

(2) 混凝土剪力強度計算

4-27式 Vc1 ≦ 0.87fc'^0.5bd +Nu*d/4lw= 108.2 t

4-28式 Vc2 ≦ [0.16fc'^0.5+lw(0.33fc'^0.5 +Nu/(5*lw*b))/(Mu/Vu-lw/2)] bd

= 476.7 t

Mu/Vu-lw/2 125.065 cm Vc取4-27及4-28式之小值

Vc= 108.2 t

依 Vn>1/2Vc 規定設計

A).水平剪力鋼筋 2

ρ h=Av/(t*S_2)=(Vn-Vc)/(b*fy*d)= -0.0018 , ρ h,min=0.0025

取 ρ h,req= 0.0025

最大間距Smax限制 lw/5= 234.4 cm, 3T= 45 cm, Smax= 45 cm

取小值 Smax= 45 cm

required Ah= 3.75 cm^2/m

採用 #3@ 20 Ah= 7.10 cm^2/m 實際 ρ h= 0.0047

B).垂直剪力鋼筋

ρ v=0.0025+0.5(2.5-hw/lw)(ρ h -0.0025) ≧0.0025

= 0.0050

required Av= 7.54 cm^2/m

採用 #3@ 15 Av= 9.47 cm^2/m

剪力牆設計

	單位	1WY1	1WY2	2WY1	2WY2	3WY1	3WY2	4WY1	4WY2	RWY1	RWY2
鋼筋 fy		4200	4200	4200	4200	4200	4200	4200	4200	4200	4200
混凝土 fc'		245	245	245	245	245	245	245	245	245	245
剪力牆高 hw	cm	280	280	260	260	260	260	260	260	240	240
剪力牆長 lw	cm	1172	1172	1172	1172	1172	1172	1172	1172	550	550
剪力牆厚 t	cm	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
彎矩 MD		16.5	16.8	27.2	27.5	24.1	24.3	20.6	20.6	0.2	0.3
ML		1.4	1.5	3.8	3.8	3.4	3.4	2.8	2.9	0.1	0.1
ME		294.0	294.5	204.4	204.5	126.4	126.3	59.9	59.7	12.9	12.9
剪力 VD		0.4	0.3	0.3	0.3	0.1	0.1	0.2	0.2	0.0	0.0
VL		0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
VE		43.8	43.9	39.6	39.7	31.9	31.9	19.9	19.8	5.7	5.7
軸力 ND		145.5	145.7	111.4	111.9	80.9	81.1	51.1	50.9	19.0	19.0
NL		19.7	19.7	15.5	15.5	11.9	11.9	8.4	8.4	2.7	2.7
NE		2.6	2.6	1.5	1.5	0.6	0.6	0.2	0.2	0.5	1.8
設計彎矩 Mu	t-m	314.6	315.3	238.8	239.4	157.0	157.1	86.0	85.8	13.2	13.2
設計剪力 Vu	t	44.2	44.4	39.9	40.0	32.0	32.0	20.2	20.1	5.7	5.8
設計軸力 Nu	t	187.0	187.3	142.9	143.5	103.6	103.8	65.7	65.4	24.6	26.0
有效深度d=0.8Lw	cm	937.6	1172.0	937.6	937.6	937.6	937.6	937.6	937.6	440.0	440.0
鄰界斷面距離牆底H=hw/2	cm	140.0	140.0	130.0	130.0	130.0	130.0	130.0	130.0	120.0	120.0
lw2/2	cm	586.0	586.0	586.0	586.0	586.0	586.0	586.0	586.0	275.0	275.0
1)Vn,max=2.65fc'^0.5bwd	t	583.4	729.2	583.4	583.4	583.4	583.4	583.4	583.4	273.8	273.8
Vn,req=Vu/0.75		59.0	59.2	53.2	53.3	42.6	42.7	26.9	26.8	7.7	7.7
Vn<Vn,max		OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
)混凝土剪力強度計算											
4-27式 Vc1,max	t	228.9	286.2	220.1	220.2	212.2	212.3	204.7	204.6	94.8	95.1
4-28式 Vc2,max	t	996.4	1251.4	8930.5	8942.0	-1063.5	-1062.4	-576.6	-577.2	-444.6	-454.1
Mu/Vu-lw/2	cm	125.1	124.5	12.6	12.6	-95.2	-95.3	-159.3	-159.1	-45.4	-44.7
採用Vc=min(Vc1,Vc2)	t	228.9	286.2	220.1	220.2	212.2	212.3	204.7	204.6	94.8	95.1
A)水平筋最大間距限制											
Smax,lw/5	cm	234.4	234.4	234.4	234.4	234.4	234.4	234.4	234.4	110.0	110.0
Smax,3b	cm	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
S,45	cm	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
採用Smax	cm	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
B)水平剪力筋											
ρh,req=Av/(t*S_2)		-0.0029	-0.0031	-0.0028	-0.0028	-0.0029	-0.0029	-0.0030	-0.0030	-0.0031	-0.0032
ρh,min		0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
Ah,req	cm2/m	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
採用 #3	@cm	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
採用 As	cm2/m	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10
C)垂直剪力筋											
ρv,req		0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0048	0.0048
ρv,min		0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
Av,req	cm2/m	7.54	7.54	7.57	7.57	7.57	7.57	7.57	7.57	7.21	7.21
採用 #3	@cm	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
採用 As	cm2/m	9.47	9.47	9.47	9.47	9.47	9.47	9.47	9.47	9.47	9.47

極限層剪檢討-X向(J=1剪力，RC牆韌性100%)

樓層名稱	極限層剪力V_{px}					設計層剪力V_{ex}	V_{px}/V_{ex}	$(V_{px}/V_{ex})_i$ / $(V_{px}/V_{ex})_{i+1}$
J=1	剪力牆(t)	柱(t)	15RC牆(t)	10磚牆(t)	合計			
強度比	0.85	0.65	0.85	0.95				
韌性比	1	0.05	1	0.37				
權值	0.85	0.0325	0.85	0.3515				
RFL	0.00	61.14	93.83	0.00	33.69	24.65	1.37	-
4FL	0.00	64.57	71.09	0.00	135.66	38.10	3.56	-
3FL	0.00	76.43	189.10	0.00	265.53	46.83	5.67	1.59
2FL	0.00	73.66	167.84	0.00	241.50	51.29	4.71	0.83

Rxmin= 0.83

≧ 0.8 (O.K.)

極限層剪檢討-X向(J=2磚牆韌性100%)

樓層名稱	極限層剪力V_{px}					設計層剪力V_{ex}	V_{px}/V_{ex}	$(V_{px}/V_{ex})_i$ / $(V_{px}/V_{ex})_{i+1}$
J=2	剪力牆(t)	柱(t)	15RC牆(t)	10磚牆(t)	合計			
強度比	0	0.95	0	0.85				
韌性比	0	0.58	0	1				
權值	0	0.551	0	0.85				
RFL	0.00	61.14	93.83	0.00	33.69	24.65	1.37	-
4FL	0.00	64.57	71.09	0.00	35.58	38.10	0.93	-
3FL	0.00	76.43	189.10	0.00	42.11	46.83	0.90	0.96
2FL	0.00	73.66	167.84	0.00	40.59	51.29	0.79	0.88

Rxmin= 0.88

≧ 0.8 (O.K.)

極限層剪檢討-X向(J=3構架韌性100%)

樓層名稱	極限層剪力V_{px}					設計層剪力V_{ex}	V_{px}/V_{ex}	$(V_{px}/V_{ex})_i$ / $(V_{px}/V_{ex})_{i+1}$
J=3	剪力牆(t)	柱(t)	15RC牆(t)	10磚牆(t)	合計			
強度比	0	1	0	0				
韌性比	0	1	0	0				
權值	0	1	0	0				
RFL	0.00	61.14	93.83	0.00	61.14	24.65	2.48	-
4FL	0.00	64.57	71.09	0.00	64.57	38.10	1.69	-
3FL	0.00	76.43	189.10	0.00	76.43	46.83	1.63	0.96
2FL	0.00	73.66	167.84	0.00	73.66	51.29	1.44	0.88

Rxmin= 0.88

≧ 0.8 (O.K.)

本工程X向弱層檢核無磚牆強度，取剪力牆及構架100%韌性檢核皆大於80%，無弱層問題。

極限層剪檢討-X向(J=1剪力，RC牆韌性100%)

極限層剪檢討-Y向(J=1剪力，RC牆韌性100%)

樓層名稱	極限層剪力V_{px}					設計層剪力V_{ex}	V_{px}/V_{ex}	$(V_{px}/V_{ex})_i$ / $(V_{px}/V_{ex})_{i-1}$
J=1	剪力牆(t)	柱(t)	15RC牆(t)	10磚牆(t)	合計			
強度比	0.85	0.65	0.85	0.95				
韌性比	1	0.05	1	0.37				
權值	0.85	0.0325	0.85	0.3515				
RFL	372.78	98.17	0.00	28.62	78.42	40.02	1.96	-
4FL	372.78	98.33	0.00	29.95	501.05	61.85	8.10	-
3FL	372.78	105.23	0.00	18.00	496.01	76.02	6.52	0.82
2FL	372.78	107.78	0.00	5.97	486.53	83.25	5.84	0.90
						Rxmin=	0.82	
						≧	0.8	(O.K.)

極限層剪檢討-Y向(J=2磚牆韌性100%)

樓層名稱	極限層剪力V_{px}					設計層剪力V_{ex}	V_{px}/V_{ex}	$(V_{px}/V_{ex})_i$ / $(V_{px}/V_{ex})_{i-1}$
J=2	剪力牆(t)	柱(t)	15RC牆(t)	10磚牆(t)	合計			
強度比	0	0.95	0	0.85				
韌性比	0	0.58	0	1				
權值	0	0.551	0	0.85				
RFL	372.78	98.17	0.00	28.62	78.42	40.02	1.96	-
4FL	372.78	98.33	0.00	29.95	79.63	61.85	1.20	-
3FL	372.78	105.23	0.00	18.00	73.28	76.02	0.96	0.81
2FL	372.78	107.78	0.00	5.97	64.46	83.25	0.77	0.80
						Rxmin=	0.80	
						≧	0.8	(O.K.)

極限層剪檢討-Y向(J=3構架韌性100%)

樓層名稱	極限層剪力V_{px}					設計層剪力V_{ex}	V_{px}/V_{ex}	$(V_{px}/V_{ex})_i$ / $(V_{px}/V_{ex})_{i-1}$
J=3	剪力牆(t)	柱(t)	15RC牆(t)	10磚牆(t)	合計			
強度比	0	1	0	0				
韌性比	0	1	0	0				
權值	0	1	0	0				
RFL	372.78	98.17	0.00	28.62	98.17	40.02	2.45	-
4FL	372.78	98.33	0.00	29.95	98.33	61.85	1.59	-
3FL	372.78	105.23	0.00	18.00	105.23	76.02	1.38	0.87
2FL	372.78	107.78	0.00	5.97	107.78	83.25	1.29	0.94
						Rxmin=	0.87	
						≧	0.8	(O.K.)

本工程Y向弱層檢核應忽略磚牆強度，取剪力牆及構架100%韌性檢核皆大於80%，無弱層問題。

軟層檢討

X向

樓層	剪力 V_i (tf)	樓層位移 Δi (m)	層間位移 δ_i (cm)	勁度 k_i (tf/cm)	下/上樓層勁度比 k_i/k_{i+1}<70% (軟層) k_i/k_{i+1}<60% (極軟層)	下/上三層勁度比 $k_i/k_{i+1\sim3}$<80% (軟層) $k_i/k_{i+1\sim3}$<70% (極軟層)
RFL	6.51	0.0204	-	-	-	-
4FL	22.81	0.0186	0.18	126.72	-	-
3FL	36.20	0.0155	0.31	116.77	0.921	-
2FL	44.89	0.0110	0.45	99.76	0.854	-
1FL	51.29	0.0055	0.55	93.25	0.935	0.815

Y向

樓層	剪力 V_i (tf)	樓層位移 Δi (m)	層間位移 δ_i (cm)	勁度 k_i (tf/cm)	下/上樓層勁度比 k_i/k_{i+1}<70% (軟層) k_i/k_{i+1}<60% (極軟層)	下/上三層勁度比 $k_i/k_{i+1\sim3}$<80% (軟層) $k_i/k_{i+1\sim3}$<70% (極軟層)
RFL	10.73	0.0012	-	-	-	-
4FL	37.62	0.0010	0.02	1881.00	-	-
3FL	59.70	0.0008	0.02	2985.00	1.587	-
2FL	74.04	0.0006	0.02	3702.00	1.240	-
1FL	81.35	0.0004	0.02	4067.50	1.099	1.424

本工程之下/上層勁度比皆大於70%，下/上三層勁度比皆大於80%，無軟層問題。

```
      $$$$$$$    $$$$$$$   $$$$$$    $$     $$  $$     $$  $$$$$$$$  $$$$$$$
     $$$$$$$$  $$$$$$$$  $$$$$$$$   $$     $$  $$    $$   $$$$$$$$  $$$$$$$$$
    $$    $$  $$        $$    $$  $$$    $$  $$   $$    $$        $$      $$
    $$        $$        $$    $$  $$$$   $$  $$  $$     $$        $$      $$
    $$$$$$   $$        $$    $$  $$ $$  $$  $$$$$      $$$$$$    $$$$$$$$$
        $$  $$        $$    $$  $$ $$ $$  $$  $$     $$        $$      $$
 $$    $$  $$        $$    $$  $$  $$$$  $$  $$    $$        $$      $$
$$$$$$$$  $$$$$$$$  $$$$$$$$   $$   $$$  $$   $$   $$$$$$$$  $$      $$
$$$$$$$   $$$$$$$   $$$$$$    $$    $$  $$    $$  $$$$$$$$  $$      $$ (R)
```

ACI CONCRETE DESIGN OF BUILDING SYSTEMS
VERSION 9.10PE
BY
Eugene R. Huang

THE 4.0 STORY BUILD OF 112020-A
/SPECIAL MOMENT RESISTING SPACE FRAME/ DESIGN PROGRAM HCONEKR6.EXE

```
DESIGN CODE BY 401-96 (Steel Reinforced Concrete SRC)
NUMBER OF FRAMES TO BE DESIGNED/CHECKED----     1
NUMBER OF LOAD COMBINATIONS----------------   132

ETABS DEAD LOAD CONDITION NUMBER-----------     1
ETABS LIVE LOAD CONDITION NUMBER-----------     2

NUMBER OF REDEFINED MATERIAL PROPERTIES----     1
NUMBER OF COLUMN DESIGN PROPERTY SETS------     2
NUMBER OF BEAM DESIGN PROPERTY SETS--------     6

NUMBER OF CURVES PER INTERACTION VOLUME----    21
NUMBER OF POINTS PER INTERACTION CURVE-----    21

CHECK CODE Vc FLAG FOR BEAM (0 1)  --------     0 ( 0 ->   ON       )

DESIGN CHECK FILE OUTPUT FLAG -------------     1   DCONA.LST

NUMBER OF DIR-X LOAD COMBINATIONS----------     1 --  64
NUMBER OF DIR-Y LOAD COMBINATIONS----------    65 -- 132

READ EKO FILE NAME------------------------ DES-A.EKO

READ FRM FILE NAME------------------------ DES-A.FRM
```

LOADING COMBINATION

LOAD	TYPE	D 1	D 2	E 3	E 4	E 5	E 6	E 7	E 8
1	3	1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	3	1.20	1.60	0.00	0.00	0.00	0.00	0.00	0.00
3	3	1.20	1.00	1.00	0.00	0.00	0.00	0.00	0.00
4	3	1.20	1.00	-1.00	0.00	0.00	0.00	0.00	0.00
5	3	0.90	0.00	1.00	0.00	0.00	0.00	0.00	0.00
6	3	0.90	0.00	-1.00	0.00	0.00	0.00	0.00	0.00
7	3	1.24	1.00	1.00	0.00	0.00	0.00	0.00	0.00
8	3	1.24	1.00	-1.00	0.00	0.00	0.00	0.00	0.00
9	3	0.94	0.00	1.00	0.00	0.00	0.00	0.00	0.00
10	3	0.94	0.00	-1.00	0.00	0.00	0.00	0.00	0.00
11	3	1.16	1.00	1.00	0.00	0.00	0.00	0.00	0.00
12	3	1.16	1.00	-1.00	0.00	0.00	0.00	0.00	0.00
13	3	0.86	0.00	1.00	0.00	0.00	0.00	0.00	0.00
14	3	0.86	0.00	-1.00	0.00	0.00	0.00	0.00	0.00
15	3	1.32	1.00	0.30	0.00	0.00	0.00	0.00	0.00
16	3	1.32	1.00	-0.30	0.00	0.00	0.00	0.00	0.00
17	3	1.02	0.00	0.30	0.00	0.00	0.00	0.00	0.00
18	3	1.02	0.00	-0.30	0.00	0.00	0.00	0.00	0.00
19	3	1.08	1.00	0.30	0.00	0.00	0.00	0.00	0.00
20	3	1.08	1.00	-0.30	0.00	0.00	0.00	0.00	0.00
21	3	0.78	0.00	0.30	0.00	0.00	0.00	0.00	0.00
22	3	0.78	0.00	-0.30	0.00	0.00	0.00	0.00	0.00
23	3	1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	3	1.20	1.60	0.00	0.00	0.00	0.00	0.00	0.00
25	3	1.20	1.00	0.00	1.00	0.00	0.00	0.00	0.00
26	3	1.20	1.00	0.00	-1.00	0.00	0.00	0.00	0.00
27	3	0.90	0.00	0.00	1.00	0.00	0.00	0.00	0.00
28	3	0.90	0.00	0.00	-1.00	0.00	0.00	0.00	0.00
29	3	1.24	1.00	0.00	1.00	0.00	0.00	0.00	0.00
30	3	1.24	1.00	0.00	-1.00	0.00	0.00	0.00	0.00
31	3	0.94	0.00	0.00	1.00	0.00	0.00	0.00	0.00
32	3	0.94	0.00	0.00	-1.00	0.00	0.00	0.00	0.00
33	3	1.16	1.00	0.00	1.00	0.00	0.00	0.00	0.00
34	3	1.16	1.00	0.00	-1.00	0.00	0.00	0.00	0.00
35	3	0.86	0.00	0.00	1.00	0.00	0.00	0.00	0.00
36	3	0.86	0.00	0.00	-1.00	0.00	0.00	0.00	0.00
37	3	1.32	1.00	0.00	0.30	0.00	0.00	0.00	0.00
38	3	1.32	1.00	0.00	-0.30	0.00	0.00	0.00	0.00
39	3	1.02	0.00	0.00	0.30	0.00	0.00	0.00	0.00
40	3	1.02	0.00	0.00	-0.30	0.00	0.00	0.00	0.00
41	3	1.08	1.00	0.00	0.30	0.00	0.00	0.00	0.00
42	3	1.08	1.00	0.00	-0.30	0.00	0.00	0.00	0.00
43	3	0.78	0.00	0.00	0.30	0.00	0.00	0.00	0.00
44	3	0.78	0.00	0.00	-0.30	0.00	0.00	0.00	0.00
45	3	1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
46	3	1.20	1.60	0.00	0.00	0.00	0.00	0.00	0.00
47	3	1.20	1.00	0.00	0.00	0.00	0.00	1.00	0.00
48	3	1.20	1.00	0.00	0.00	0.00	0.00	-1.00	0.00
49	3	0.90	0.00	0.00	0.00	0.00	0.00	1.00	0.00
50	3	0.90	0.00	0.00	0.00	0.00	0.00	-1.00	0.00
51	3	1.24	1.00	0.00	0.00	0.00	0.00	1.00	0.00
52	3	1.24	1.00	0.00	0.00	0.00	0.00	-1.00	0.00
53	3	0.94	0.00	0.00	0.00	0.00	0.00	1.00	0.00
54	3	0.94	0.00	0.00	0.00	0.00	0.00	-1.00	0.00
55	3	1.16	1.00	0.00	0.00	0.00	0.00	1.00	0.00
56	3	1.16	1.00	0.00	0.00	0.00	0.00	-1.00	0.00
57	3	0.86	0.00	0.00	0.00	0.00	0.00	1.00	0.00
58	3	0.86	0.00	0.00	0.00	0.00	0.00	-1.00	0.00
59	3	1.32	1.00	0.00	0.00	0.00	0.00	0.30	0.00
60	3	1.32	1.00	0.00	0.00	0.00	0.00	-0.30	0.00
61	3	1.02	0.00	0.00	0.00	0.00	0.00	0.30	0.00
62	3	1.02	0.00	0.00	0.00	0.00	0.00	-0.30	0.00
63	3	1.08	1.00	0.00	0.00	0.00	0.00	0.30	0.00
64	3	1.08	1.00	0.00	0.00	0.00	0.00	-0.30	0.00
65	3	0.78	0.00	0.00	0.00	0.00	0.00	0.30	0.00
66	3	0.78	0.00	0.00	0.00	0.00	0.00	-0.30	0.00
67	3	1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
68	3	1.20	1.60	0.00	0.00	0.00	0.00	0.00	0.00
69	3	1.20	1.00	0.00	0.00	1.00	0.00	0.00	0.00
70	3	1.20	1.00	0.00	0.00	-1.00	0.00	0.00	0.00
71	3	0.90	0.00	0.00	0.00	1.00	0.00	0.00	0.00
72	3	0.90	0.00	0.00	0.00	-1.00	0.00	0.00	0.00
73	3	1.24	1.00	0.00	0.00	1.00	0.00	0.00	0.00
74	3	1.24	1.00	0.00	0.00	-1.00	0.00	0.00	0.00
75	3	0.94	0.00	0.00	0.00	1.00	0.00	0.00	0.00
76	3	0.94	0.00	0.00	0.00	-1.00	0.00	0.00	0.00
77	3	1.16	1.00	0.00	0.00	1.00	0.00	0.00	0.00
78	3	1.16	1.00	0.00	0.00	-1.00	0.00	0.00	0.00
79	3	0.86	0.00	0.00	0.00	1.00	0.00	0.00	0.00
80	3	0.86	0.00	0.00	0.00	-1.00	0.00	0.00	0.00
81	3	1.32	1.00	0.00	0.00	0.30	0.00	0.00	0.00
82	3	1.32	1.00	0.00	0.00	-0.30	0.00	0.00	0.00
83	3	1.02	0.00	0.00	0.00	0.30	0.00	0.00	0.00
84	3	1.02	0.00	0.00	0.00	-0.30	0.00	0.00	0.00
85	3	1.08	1.00	0.00	0.00	0.30	0.00	0.00	0.00
86	3	1.08	1.00	0.00	0.00	-0.30	0.00	0.00	0.00
87	3	0.78	0.00	0.00	0.00	0.30	0.00	0.00	0.00
88	3	0.78	0.00	0.00	0.00	-0.30	0.00	0.00	0.00
89	3	1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	3	1.20	1.60	0.00	0.00	0.00	0.00	0.00	0.00
91	3	1.20	1.00	0.00	0.00	0.00	1.00	0.00	0.00
92	3	1.20	1.00	0.00	0.00	0.00	-1.00	0.00	0.00
93	3	0.90	0.00	0.00	0.00	0.00	1.00	0.00	0.00
94	3	0.90	0.00	0.00	0.00	0.00	-1.00	0.00	0.00
95	3	1.24	1.00	0.00	0.00	0.00	1.00	0.00	0.00
96	3	1.24	1.00	0.00	0.00	0.00	-1.00	0.00	0.00
97	3	0.94	0.00	0.00	0.00	0.00	1.00	0.00	0.00
98	3	0.94	0.00	0.00	0.00	0.00	-1.00	0.00	0.00
99	3	1.16	1.00	0.00	0.00	0.00	1.00	0.00	0.00
100	3	1.16	1.00	0.00	0.00	0.00	-1.00	0.00	0.00
101	3	0.86	0.00	0.00	0.00	0.00	1.00	0.00	0.00
102	3	0.86	0.00	0.00	0.00	0.00	-1.00	0.00	0.00
103	3	1.32	1.00	0.00	0.00	0.00	0.30	0.00	0.00
104	3	1.32	1.00	0.00	0.00	0.00	-0.30	0.00	0.00
105	3	1.02	0.00	0.00	0.00	0.00	0.30	0.00	0.00
106	3	1.02	0.00	0.00	0.00	0.00	-0.30	0.00	0.00
107	3	1.08	1.00	0.00	0.00	0.00	0.30	0.00	0.00
108	3	1.08	1.00	0.00	0.00	0.00	-0.30	0.00	0.00
109	3	0.78	0.00	0.00	0.00	0.00	0.30	0.00	0.00
110	3	0.78	0.00	0.00	0.00	0.00	-0.30	0.00	0.00
111	3	1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112	3	1.20	1.60	0.00	0.00	0.00	0.00	0.00	0.00

113	3	1.20	1.00	0.00	0.00	0.00	0.00	0.00	1.00
114	3	1.20	1.00	0.00	0.00	0.00	0.00	0.00	-1.00
115	3	0.90	0.00	0.00	0.00	0.00	0.00	0.00	1.00
116	3	0.90	0.00	0.00	0.00	0.00	0.00	0.00	-1.00
117	3	1.24	1.00	0.00	0.00	0.00	0.00	0.00	1.00
118	3	1.24	1.00	0.00	0.00	0.00	0.00	0.00	-1.00
119	3	0.94	0.00	0.00	0.00	0.00	0.00	0.00	1.00
120	3	0.94	0.00	0.00	0.00	0.00	0.00	0.00	-1.00
121	3	1.16	1.00	0.00	0.00	0.00	0.00	0.00	1.00
122	3	1.16	1.00	0.00	0.00	0.00	0.00	0.00	-1.00
123	3	0.86	0.00	0.00	0.00	0.00	0.00	0.00	1.00
124	3	0.86	0.00	0.00	0.00	0.00	0.00	0.00	-1.00
125	3	1.32	1.00	0.00	0.00	0.00	0.00	0.00	0.30
126	3	1.32	1.00	0.00	0.00	0.00	0.00	0.00	-0.30
127	3	1.02	0.00	0.00	0.00	0.00	0.00	0.00	0.30
128	3	1.02	0.00	0.00	0.00	0.00	0.00	0.00	-0.30
129	3	1.08	1.00	0.00	0.00	0.00	0.00	0.00	0.30
130	3	1.08	1.00	0.00	0.00	0.00	0.00	0.00	-0.30
131	3	0.78	0.00	0.00	0.00	0.00	0.00	0.00	0.30
132	3	0.78	0.00	0.00	0.00	0.00	0.00	0.00	-0.30

MATERIAL PROPERTIES

MAT ID	YIELD FY { T/sqm}	STRENGTH FC { T/sqm}	YIELD FYS { T/sqm}	STRENGTH FCS { T/sqm}	YIELD FYS { T/sqm}	CONCRETE ? 1-2-3	STATUS ? 0.0-1.0
1	42000.00	2800.00	28000.00	2800.00	0.00	0.00	0.00

SECTION PROPERTIES FOR COLUMNS

SECT ID	MAT ID	SECTION TYPE			MAJOR DIM {m}	MINOR DIM {m}	CONCRETE COVER {m}
1	1	RECT	Tied	RC	0.3500	0.6000	0.06000
2	1	RECT	Tied	RC	0.3000	0.3000	0.06000

STEEL SECT ID	SHAPE TYPE	DMAJ DIM {m}	BMIN DIM {m}	TF THICK {m}	TW THICK {m}	DMAJ DIM {m}	BMIN DIM {m}	TF THICK {m}	TW THICK {m}

SECTION PROPERTIES FOR BEAM

SECT ID	MAT ID	SECT TYPE	BMAJ WIDTH {m}	DMIN DEPTH {m}	TOP & BOT COVER {m}	TOP END-I {cm}	BOT END-I {cm}	TOP END-J {cm}	BOT END-J {cm}
1	1		0.4500	1.5000	0.0750	0.00	0.00	0.00	0.00
2	1		0.3500	1.5000	0.0750	0.00	0.00	0.00	0.00
3	1		0.3500	0.6000	0.0600	0.00	0.00	0.00	0.00
4	1		0.3000	0.6000	0.0600	0.00	0.00	0.00	0.00
5	1		0.2500	0.5000	0.0600	0.00	0.00	0.00	0.00
6	1		0.2500	0.6000	0.0600	0.00	0.00	0.00	0.00

STEEL SECT ID	WEB DIM {m}	FLANGE DIM {m}	WEB THICK {m}	FLANGE THICK {m}	ZP {cm^3}

FRAME NUMBER---------- 1

FRAMING TYPE---------- 1 (SEISMIC)

COLUMN PROPERTY REASSIGNMENT NO. ---------- 1
BEAM PROPERTY REASSIGNMENT NO. ---------- 0

YIELD OVERSTRENGTH FACTOR---------- 1.25

SEISMIC DESIGN COEFFICIENT---------- 1.00

FRAME ID NUMBER---------- 1
NUMBER OF STORY LEVELS---------- 6
NUMBER OF COLUMN LINES---------- 20
NUMBER OF BAYS---------- 18

REASSIGNED COLUMN PROPERTY ID*S

LEVEL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
PR	0	0	1	1	2	2	0	0	0	0	0	0	0	0	0
RFL	1	1	1	1	0	0	1	1	0	0	0	0	0	0	0
4FL	1	1	1	1	0	0	1	1	0	0	0	0	0	0	0
3FL	1	1	1	1	0	0	1	1	0	0	0	0	0	0	0
2FL	1	1	1	1	0	0	1	1	0	0	0	0	0	0	0
1FL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

LEVEL	16	17	18	19	20
PR	0	0	0	0	0
RFL	0	0	0	0	0
4FL	0	0	0	0	0
3FL	0	0	0	0	0
2FL	0	0	0	0	0
1FL	0	0	0	0	0

MEMORY = 3852 ,ALLOWABLE = 145000

BAY 1

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
2FL	6	3.1	3.1	3.1	4.5	4.5	4.5	4.5	4.5	4.5	25.	60.

BAY 2

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
2FL	3	4.4	4.4	4.4	6.3	6.3	6.3	6.3	6.3	6.3	35.	60.

BAY 3

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
2FL	3	4.4	4.4	4.4	6.3	6.3	6.3	6.3	6.3	6.3	35.	60.

BAY 4

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
RFL	3	13.3	8.7	15.8	6.3	6.3	6.3	6.3	6.3	6.3	35.	60.
4FL	3	14.0	9.6	14.9	9.8	6.4	6.3	6.3	9.7	6.4	35.	60.
3FL	3	16.7	12.3	17.7	12.2	9.1	6.3	6.3	12.2	9.1	35.	60.
2FL	3	15.8	12.1	15.8	11.3	9.8	6.3	6.3	11.2	9.9	35.	60.

BAY 5

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
RFL	3	10.7	8.2	10.7	6.3	6.3	6.3	6.3	6.3	6.3	35.	60.
4FL	3	10.9	8.2	10.9	6.3	6.3	6.3	6.3	6.3	6.3	35.	60.
3FL	3	10.9	8.2	10.9	6.3	6.3	6.3	6.3	6.3	6.3	35.	60.
2FL	3	10.9	8.2	10.9	6.3	6.3	6.3	6.3	6.3	6.3	35.	60.

BAY 6

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
RFL	3	10.8	8.2	10.8	6.3	6.3	6.3	6.3	6.3	6.3	35.	60.
4FL	3	10.9	8.2	10.9	6.3	6.3	6.3	6.3	6.3	6.3	35.	60.
3FL	3	10.9	8.2	10.9	6.3	6.3	6.3	6.3	6.3	6.3	35.	60.
2FL	3	10.9	8.2	10.9	6.3	6.3	6.3	6.3	6.3	6.3	35.	60.

BAY 7

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
PR	4	11.1	6.3	11.1	5.4	5.4	5.4	5.4	5.4	5.4	30.	60.
RFL	3	14.1	10.3	15.6	7.6	6.3	6.3	6.3	7.6	6.3	35.	60.
4FL	3	14.9	10.0	14.3	9.7	6.4	6.3	6.3	9.6	6.5	35.	60.
3FL	3	19.4	14.2	18.5	13.5	9.5	6.3	6.3	13.4	9.6	35.	60.
2FL	3	19.7	15.4	20.5	13.8	11.3	6.3	6.3	13.8	11.3	35.	60.

BAY 8

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
4FL	5	3.1	3.1	3.1	3.7	3.7	3.7	3.7	3.7	3.7	25.	50.

BAY 9

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
3FL	5	3.1	3.1	3.1	3.7	3.7	3.7	3.7	3.7	3.7	25.	50.

BAY 10

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
RFL	5	3.1	3.1	3.1	3.7	3.7	3.7	3.7	3.7	3.7	25.	50.
2FL	5	3.1	3.1	3.1	3.7	3.7	3.7	3.7	3.7	3.7	25.	50.

BAY 11

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
PR	4	9.1	7.7	9.0	5.4	5.4	5.4	5.4	5.4	5.4	30.	60.

BAY 12

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
PR	4	9.2	7.7	9.0	5.4	5.4	5.4	5.4	5.4	5.4	30.	60.

BAY 13

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
RFL	3	7.5	6.8	5.7	6.3	6.3	6.3	6.3	6.3	6.3	35.	60.
4FL	3	6.7	6.5	6.8	6.3	6.3	6.3	6.3	6.3	6.3	35.	60.
3FL	3	7.2	6.3	6.1	6.3	6.3	6.3	6.3	6.3	6.3	35.	60.
2FL	3	7.6	6.8	6.1	6.3	6.3	6.3	6.3	6.3	6.3	35.	60.

BAY 14

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
RFL	3	7.1	6.3	5.6	6.3	6.3	6.3	6.3	6.3	6.3	35.	60.
4FL	3	7.0	6.8	6.9	6.3	6.3	6.3	6.3	6.3	6.3	35.	60.
3FL	3	7.6	6.7	6.2	6.3	6.3	6.3	6.3	6.3	6.3	35.	60.
2FL	3	7.1	6.3	6.0	6.3	6.3	6.3	6.3	6.3	6.3	35.	60.

BAY 15

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
4FL	4	3.8	3.8	3.8	7.9	5.4	5.4	5.4	7.7	5.4	30.	60.

BAY 16

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH

MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
RFL		4	3.8	3.8	3.8	5.4	5.4	5.4	5.4	5.4	5.4	30.	60.
3FL		4	3.8	3.8	3.8	9.7	5.4	5.4	5.4	9.5	5.5	30.	60.
2FL		4	3.8	3.8	3.8	9.7	6.5	5.4	5.4	10.0	6.4	30.	60.

BAY 17

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}						
PR	4	9.1	6.3	9.1	5.4	5.4	5.4	5.4	5.4	5.4	30.	60.

BAY 18

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}						
RFL	3	9.9	7.4	9.9	6.3	6.3	6.3	6.3	6.3	6.3	35.	60.
4FL	3	11.1	8.4	11.2	7.8	6.5	6.3	6.3	7.9	6.4	35.	60.
3FL	3	12.5	10.2	12.7	9.1	8.4	6.3	6.3	9.4	8.2	35.	60.
2FL	3	13.5	11.0	13.4	9.6	9.4	6.3	6.3	9.6	9.5	35.	60.

NTC ID	SEC ID	STORY NAME	Pt(%) ASt/AG	ASe {cm^2}	ASs {cm^2}	ASt {cm^2}	VMAJ AV{cm^2/10cm}	VMIN	DMAJ {cm}	DMIN {cm}	AXIAL {T} MAXIMUM	MINIMUM
1	1	RFL	1.01	3.89	6.67	21.13	1.55	0.71	35.0	60.0		
1	1	4FL	1.28	4.96	8.50	26.91	1.50	0.47	35.0	60.0		
1	1	3FL	1.29	4.98	8.53	27.02	1.61	0.48	35.0	60.0		
1	1	2FL	1.17	4.53	7.77	24.59	1.07	0.22	35.0	60.0		
2	1	RFL	1.00	3.87	6.63	21.00	1.55	0.71	35.0	60.0		
2	1	4FL	1.27	4.89	8.39	26.57	1.49	0.47	35.0	60.0		
2	1	3FL	1.27	4.90	8.40	26.60	1.60	0.48	35.0	60.0		
2	1	2FL	1.15	4.46	7.65	24.24	1.09	0.22	35.0	60.0		
3	1	PR	1.00	3.87	6.63	21.00	1.39	0.96	35.0	60.0		
3	1	RFL	1.00	3.87	6.63	21.00	1.18	0.93	35.0	60.0		
3	1	4FL	1.41	5.47	9.37	29.68	1.57	0.95	35.0	60.0		
3	1	3FL	1.48	5.74	9.83	31.14	1.86	0.96	35.0	60.0		
3	1	2FL	1.33	5.15	8.83	27.95	1.05	0.43	35.0	60.0		
4	1	PR	1.00	3.87	6.63	21.00	1.39	0.96	35.0	60.0		
4	1	RFL	1.00	3.87	6.63	21.00	1.17	0.93	35.0	60.0		
4	1	4FL	1.40	5.40	9.26	29.31	1.55	0.95	35.0	60.0		
4	1	3FL	1.48	5.74	9.84	31.17	1.85	0.96	35.0	60.0		
4	1	2FL	1.33	5.15	8.82	27.94	1.04	0.43	35.0	60.0		
5	2	PR	1.00	2.25	2.25	9.00	0.98	0.98	30.0	30.0		
6	2	PR	1.00	2.25	2.25	9.00	0.98	0.98	30.0	30.0		
7	1	RFL	1.00	3.87	6.63	21.00	1.42	0.71	35.0	60.0		
7	1	4FL	1.00	3.87	6.63	21.00	1.17	0.47	35.0	60.0		
7	1	3FL	1.00	3.87	6.63	21.00	1.31	0.48	35.0	60.0		
7	1	2FL	1.13	4.38	7.51	23.77	1.08	0.22	35.0	60.0		
8	1	RFL	1.00	3.87	6.63	21.00	1.43	0.71	35.0	60.0		
8	1	4FL	1.00	3.87	6.63	21.00	1.19	0.47	35.0	60.0		
8	1	3FL	1.00	3.87	6.63	21.00	1.32	0.48	35.0	60.0		
8	1	2FL	1.13	4.39	7.52	23.81	1.08	0.22	35.0	60.0		

ELEV FLOOR	COL ID	MAJOR /-SHEAR	MINOR {T}-\	MAJOR AREA	MINOR {M^2}	MAJOR /-- STRESS	MINOR {T/M^2}-\	ALLOW	MAJOR /----	MINOR RATIO ----\	B/C	MAJOR As{/10cm}	MINOR	AsFs/ /Pn
RFL	1	33.1	33.1	0.21	0.21	157.5	157.5	452.3	0.348	0.348	0.000	7.73	4.02	0.0000
4FL	1	43.2	27.7	0.21	0.21	205.8	131.9	452.3	0.455	0.292	0.833	7.73	4.02	0.0000
3FL	1	54.2	27.7	0.21	0.21	257.9	131.9	452.3	0.570	0.292	0.833	7.73	4.02	0.0000
2FL	1	50.1	27.9	0.21	0.21	238.6	132.7	452.3	0.527	0.293	0.833	7.73	4.02	0.0000
RFL	2	33.1	33.1	0.21	0.21	157.5	157.5	452.3	0.348	0.348	0.000	7.73	4.02	0.0000
4FL	2	42.7	27.7	0.21	0.21	203.4	131.9	452.3	0.450	0.292	0.824	7.73	4.02	0.0000
3FL	2	53.9	27.7	0.21	0.21	256.5	131.9	452.3	0.567	0.292	0.833	7.73	4.02	0.0000
2FL	2	49.7	27.9	0.21	0.21	236.5	132.7	452.3	0.523	0.293	0.833	7.73	4.02	0.0000
PR	3	28.4	28.4	0.21	0.21	135.0	135.0	452.3	0.298	0.298	0.000	7.73	4.02	0.0000
RFL	3	33.2	55.1	0.21	0.21	158.1	262.2	566.1	0.279	0.463	0.644	7.73	4.02	0.0000
4FL	3	42.8	55.4	0.21	0.21	203.9	263.8	566.1	0.360	0.466	0.808	7.73	4.02	0.0000
3FL	3	60.0	55.4	0.21	0.21	285.5	263.8	566.1	0.504	0.466	0.833	7.73	4.02	0.0000
2FL	3	61.6	55.7	0.21	0.21	293.3	265.4	566.1	0.518	0.469	0.833	7.73	4.02	0.0000
PR	4	28.4	28.4	0.21	0.21	135.0	135.0	452.3	0.298	0.298	0.000	7.73	4.02	0.0000
RFL	4	33.2	55.1	0.21	0.21	158.1	262.2	566.1	0.279	0.463	0.644	7.73	4.02	0.0000
4FL	4	42.2	55.4	0.21	0.21	201.0	263.8	566.1	0.355	0.466	0.793	7.73	4.02	0.0000
3FL	4	59.4	55.4	0.21	0.21	282.8	263.8	566.1	0.500	0.466	0.833	7.73	4.02	0.0000
2FL	4	61.7	55.7	0.21	0.21	293.9	265.4	566.1	0.519	0.469	0.833	7.73	4.02	0.0000
PR	5	28.4	28.4	0.09	0.09	315.0	315.0	452.3	0.696	0.696	0.000	5.67	5.67	0.0000
PR	6	28.4	28.4	0.09	0.09	315.0	315.0	452.3	0.696	0.696	0.000	5.67	5.67	0.0000
RFL	7	33.1	33.1	0.21	0.21	157.5	157.5	452.3	0.348	0.348	0.000	7.73	4.02	0.0000
4FL	7	34.3	27.7	0.21	0.21	163.2	131.9	452.3	0.361	0.292	0.626	7.73	4.02	0.0000
3FL	7	40.4	27.7	0.21	0.21	192.2	131.9	452.3	0.425	0.292	0.750	7.73	4.02	0.0000
2FL	7	42.8	27.9	0.21	0.21	203.8	132.7	452.3	0.450	0.293	0.827	7.73	4.02	0.0000
RFL	8	33.1	33.1	0.21	0.21	157.5	157.5	452.3	0.348	0.348	0.000	7.73	4.02	0.0000
4FL	8	34.8	27.7	0.21	0.21	165.8	131.9	452.3	0.366	0.292	0.638	7.73	4.02	0.0000
3FL	8	41.3	27.7	0.21	0.21	196.8	131.9	452.3	0.435	0.292	0.774	7.73	4.02	0.0000
2FL	8	42.4	27.9	0.21	0.21	202.1	132.7	452.3	0.447	0.293	0.821	7.73	4.02	0.0000

MEMORY = 3852 ,ALLOWABLE = 145000

BAY 1

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
1FL	2	4.4	4.4	4.4	4.3	0.0	5.0	0.0	4.3	0.0	35.	150.

BAY 2

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
1FL	2	4.4	4.4	4.4	0.0	0.4	0.0	0.8	0.0	1.6	35.	150.

BAY 3

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
1FL	2	4.4	4.4	4.4	0.0	0.4	0.0	0.8	0.0	1.6	35.	150.

BAY 4

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
1FL	1	25.3	5.7	25.3	21.6	4.6	29.0	0.0	21.6	4.7	45.	150.

BAY 5

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
1FL	2	4.4	4.4	4.4	1.4	4.2	1.5	0.0	0.0	9.3	35.	150.

BAY 6

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
1FL	2	4.4	4.4	4.4	1.4	4.2	1.5	0.0	0.0	9.4	35.	150.

BAY 7

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
1FL	1	42.9	5.7	42.9	31.2	5.3	42.4	0.0	31.2	5.3	45.	150.

BAY 13

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
1FL	2	4.4	4.4	4.4	4.9	7.6	5.7	0.0	6.0	0.0	35.	150.

BAY 14

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
1FL	2	4.4	4.4	4.4	4.9	7.7	5.6	0.0	6.0	0.0	35.	150.

BAY 16

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
1FL	2	4.4	4.4	4.4	16.6	0.0	17.7	0.0	16.6	0.0	35.	150.

BAY 18

ELVE	ID	AvI	AvM	AvJ	AsTI	AsBI	AsTM	AsBM	AsTJ	AsBJ	BW	BH
MI/R	MM/R	MJ/R	SI/R	SM/R	SJ/R	SHR-I{T}	SHR-J{T}					
1FL	1	26.2	5.7	26.2	21.4	5.9	26.8	0.0	21.4	5.9	45.	150.

11.3-A-MF 應力分析資料

BAY 1

DIR	END-I	1/2-PT	END-J	/----- END-I -----\		/---- MIDDLE -----\		/----- END-J -----\		TORSION
ELVE	{T} LC.	{T} LC.	{T} LC.	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	{T-M} LC.
2FL	3.3< 30>	1.4< 25>	3.3< 29>	3.3< 30>	3.1< 29>	0.8< 0>	2.2< 15>	3.2< 29>	3.1< 30>	0.0< 3>
1FL	7.1< 37>	0.4< 25>	7.1< 38>	14.6< 38>	7.3< 0>	16.8< 15>	1.8< 0>	14.6< 37>	7.3< 0>	0.1< 25>

BAY 2

DIR	END-I	1/2-PT	END-J	/----- END-I -----\		/---- MIDDLE -----\		/----- END-J -----\		TORSION
ELVE	{T} LC.	{T} LC.	{T} LC.	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	{T-M} LC.
2FL	3.4< 30>	3.6< 30>	4.0< 30>	0.7< 0>	0.3< 0>	1.3< 30>	0.3< 0>	2.7< 30>	1.3< 0>	3.3< 30>
1FL	7.1< 37>	7.2< 2>	8.3< 2>	0.1< 26>	1.4< 0>	0.0< 0>	2.7< 29>	0.0< 0>	5.6< 37>	8.1< 30>

BAY 3

DIR	END-I	1/2-PT	END-J	/----- END-I -----\		/---- MIDDLE -----\		/----- END-J -----\		TORSION
ELVE	{T} LC.	{T} LC.	{T} LC.	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	{T-M} LC.
2FL	3.4< 29>	3.6< 29>	4.0< 29>	0.7< 0>	0.3< 0>	1.3< 29>	0.3< 0>	2.7< 29>	1.3< 0>	3.2< 29>
1FL	7.1< 38>	7.2< 2>	8.3< 2>	0.1< 25>	1.4< 0>	0.0< 0>	2.7< 30>	0.0< 0>	5.6< 38>	8.1< 29>

BAY 4

DIR	END-I	1/2-PT	END-J	/----- END-I -----\		/---- MIDDLE -----\		/----- END-J -----\		TORSION
ELVE	{T} LC.	{T} LC.	{T} LC.	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	{T-M} LC.
RFL	15.1< 0>	9.8< 0>	17.9< 0>	9.3< 30>	6.4< 29>	2.3< 0>	8.2< 2>	9.0< 29>	8.1< 30>	0.0< 7>
4FL	15.8< 0>	10.9< 0>	16.9< 0>	16.8< 30>	10.9< 35>	4.2< 0>	3.8< 1>	16.6< 29>	11.0< 36>	0.0< 3>
3FL	19.0< 0>	14.0< 0>	20.1< 0>	21.0< 30>	15.5< 35>	5.2< 0>	4.1< 15>	20.9< 29>	15.6< 36>	0.0< 3>
2FL	18.0< 0>	13.7< 0>	17.9< 0>	19.3< 30>	16.9< 35>	4.8< 0>	4.2< 0>	19.2< 29>	16.9< 36>	0.0< 3>
1FL	118.3< 1>	8.4< 30>	118.3< 1>	97.7< 30>	48.8< 0>	131.1< 1>	12.2< 0>	97.6< 29>	48.8< 0>	0.1< 25>

BAY 5

DIR	END-I	1/2-PT	END-J	/----- END-I -----\		/---- MIDDLE -----\		/----- END-J -----\		TORSION
ELVE	{T} LC.	{T} LC.	{T} LC.	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	{T-M} LC.
RFL	12.1< 0>	9.3< 0>	12.1< 0>	1.9<104>	0.9< 0>	0.6< 0>	1.2< 2>	2.2<103>	1.1< 0>	0.4< 30>
4FL	12.4< 0>	9.3< 0>	12.4< 0>	2.2<104>	1.1< 0>	0.6< 0>	1.4< 2>	2.3<103>	1.2< 0>	0.1< 2>
3FL	12.4< 0>	9.3< 0>	12.4< 0>	2.2< 96>	1.1< 0>	0.6< 0>	1.4< 2>	2.3<103>	1.2< 0>	0.1< 7>
2FL	12.4< 0>	9.3< 0>	12.4< 0>	2.1< 96>	1.1< 0>	0.7< 0>	1.2< 2>	2.9<103>	1.5< 0>	0.3< 7>
1FL	16.5< 95>	7.4< 96>	26.7< 96>	4.9< 96>	14.3< 95>	5.1< 96>	7.9< 0>	1.3< 0>	31.7< 96>	1.2< 30>

BAY 6

DIR	END-I	1/2-PT	END-J	/----- END-I -----\		/---- MIDDLE -----\		/----- END-J -----\		TORSION
ELVE	{T} LC.	{T} LC.	{T} LC.	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	{T-M} LC.
RFL	12.2< 0>	9.3< 0>	12.2< 0>	1.9< 2>	1.0< 0>	0.6< 0>	1.2< 2>	2.4< 2>	1.2< 0>	0.4< 29>
4FL	12.4< 0>	9.3< 0>	12.4< 0>	2.2< 82>	1.1< 0>	0.6< 0>	1.4< 2>	2.4< 81>	1.2< 0>	0.1< 2>
3FL	12.4< 0>	9.3< 0>	12.4< 0>	2.2< 74>	1.1< 0>	0.6< 0>	1.4< 2>	2.3< 73>	1.2< 0>	0.1< 9>
2FL	12.4< 0>	9.3< 0>	12.4< 0>	2.1< 74>	1.0< 0>	0.7< 0>	1.2< 2>	2.9< 81>	1.5< 0>	0.4< 8>
1FL	16.5< 73>	7.5< 74>	26.8< 74>	4.9< 74>	14.3< 73>	5.0< 74>	8.0< 0>	1.3< 0>	31.8< 74>	1.2< 29>

BAY 7

DIR	END-I	1/2-PT	END-J	/----- END-I -----\		/---- MIDDLE -----\		/----- END-J -----\		TORSION
ELVE	{T} LC.	{T} LC.	{T} LC.	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	{T-M} LC.
PR	12.6< 0>	7.2< 0>	12.6< 0>	5.8< 30>	3.8< 29>	1.5< 0>	4.2< 2>	5.7< 29>	3.8< 30>	0.0< 3>
RFL	16.0< 0>	11.7< 0>	17.7< 0>	13.0< 30>	6.5< 0>	3.3< 0>	6.0< 2>	13.0< 29>	7.6< 30>	1.1< 2>
4FL	16.9< 0>	11.4< 0>	16.3< 0>	16.6< 30>	11.0< 35>	4.2< 0>	4.6< 2>	16.4< 29>	11.1< 36>	0.8< 2>
3FL	22.0< 0>	16.1< 0>	21.0< 0>	23.2< 30>	16.3< 35>	5.8< 0>	4.9< 2>	23.0< 29>	16.4< 36>	1.8< 2>
2FL	22.3< 0>	17.4< 0>	23.2< 0>	23.7< 30>	19.4< 35>	5.9< 0>	6.4< 2>	23.7< 29>	19.4< 36>	1.1< 2>
1FL	171.1< 1>	9.5< 25>	171.1< 1>	141.1< 38>	70.6< 0>	191.9< 1>	17.6< 0>	141.1< 37>	70.6< 0>	0.1< 30>

BAY 8

DIR	END-I	1/2-PT	END-J	/----- END-I -----\		/---- MIDDLE -----\		/----- END-J -----\		TORSION
ELVE	{T} LC.	{T} LC.	{T} LC.	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	{T-M} LC.
4FL	3.3< 2>	0.1< 8>	3.1< 2>	1.4< 2>	1.1< 2>	0.4< 0>	2.2< 2>	1.0< 2>	1.4< 2>	0.0< 25>

BAY 9

DIR	END-I	1/2-PT	END-J	/----- END-I -----\		/---- MIDDLE -----\		/----- END-J -----\		TORSION
ELVE	{T} LC.	{T} LC.	{T} LC.	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	{T-M} LC.
3FL	4.8< 2>	3.1< 2>	4.5< 2>	2.9< 2>	1.9< 2>	0.7< 0>	3.8< 2>	2.2< 2>	2.3< 2>	0.1< 25>

BAY 10

DIR	END-I	1/2-PT	END-J	/----- END-I -----\		/---- MIDDLE -----\		/----- END-J -----\		TORSION
ELVE	{T} LC.	{T} LC.	{T} LC.	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	{T-M} LC.
RFL	4.8< 2>	3.1< 2>	4.5< 2>	2.9< 2>	2.0< 2>	0.7< 0>	3.9< 2>	2.2< 2>	2.3< 2>	0.0< 25>
2FL	4.8< 2>	3.1< 2>	4.5< 2>	2.8< 2>	2.0< 2>	0.7< 0>	3.9< 2>	2.2< 2>	2.3< 2>	0.1< 25>

BAY 11

DIR	END-I	1/2-PT	END-J	/----- END-I -----\		/---- MIDDLE -----\		/----- END-J -----\		TORSION
ELVE	{T} LC.	{T} LC.	{T} LC.	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	{T-M} LC.
PR	10.4< 0>	8.7< 0>	10.2< 0>	4.3< 2>	2.2< 0>	1.1< 0>	2.8< 2>	4.6< 2>	2.3< 0>	0.0< 3>

BAY 12

DIR	END-I	1/2-PT	END-J	/----- END-I -----\		/---- MIDDLE -----\		/----- END-J -----\		TORSION
ELVE	{T} LC.	{T} LC.	{T} LC.	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	{T-M} LC.
PR	10.4< 0>	8.7< 0>	10.2< 0>	4.3< 2>	2.1< 0>	1.1< 0>	2.8< 2>	4.6< 2>	2.3< 0>	0.0< 4>

BAY 13

DIR	END-I	1/2-PT	END-J	/----- END-I -----\		/---- MIDDLE -----\		/----- END-J -----\		TORSION
ELVE	{T} LC.	{T} LC.	{T} LC.	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	{T-M} LC.
RFL	8.5< 0>	7.7< 0>	6.4< 0>	2.9< 16>	1.5< 0>	0.7< 0>	0.9< 38>	0.7< 0>	0.7< 8>	0.1< 10>
4FL	7.6< 0>	7.4< 0>	7.7< 0>	1.2< 96>	0.7<103>	0.9< 15>	0.2< 0>	1.3< 95>	0.7< 96>	0.1< 7>
3FL	8.1< 0>	7.1< 0>	7.0< 0>	2.3<104>	1.1< 0>	0.6< 0>	0.6< 16>	0.6< 0>	0.3< 0>	0.2< 29>
2FL	8.6< 0>	7.7< 0>	6.9< 0>	2.8<104>	1.4< 0>	0.7< 0>	1.0< 16>	0.7< 0>	0.6< 96>	0.3< 29>
1FL	31.6<103>	11.3< 96>	5.6< 96>	16.5< 96>	25.9< 95>	19.2< 15>	6.5< 0>	20.3< 95>	10.1< 0>	1.2< 8>

BAY 14

DIR	END-I	1/2-PT	END-J	/----- END-I -----\		/---- MIDDLE -----\		/----- END-J -----\		TORSION
ELVE	{T} LC.	{T} LC.	{T} LC.	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	{T-M} LC.
RFL	8.0< 0>	7.2< 0>	6.3< 0>	2.4< 15>	1.2< 0>	0.6< 0>	0.8< 37>	0.6< 0>	0.7< 7>	0.2< 8>
4FL	7.9< 0>	7.7< 0>	7.8< 0>	1.4< 74>	0.9< 81>	1.1< 16>	0.2< 0>	1.3< 73>	0.7< 74>	0.1< 30>
3FL	8.6< 0>	7.6< 0>	7.1< 0>	2.8< 82>	1.4< 0>	0.7< 0>	0.7< 15>	0.7< 0>	0.4< 0>	0.2< 26>
2FL	8.1< 0>	7.1< 0>	6.8< 0>	2.3< 82>	1.1< 0>	0.6< 0>	0.9< 15>	0.6< 0>	0.6< 74>	0.3< 30>
1FL	31.6< 81>	11.3< 74>	5.6< 74>	16.5< 74>	26.0< 73>	19.2< 16>	6.5< 0>	20.4< 73>	10.2< 0>	1.2< 7>

BAY 15

DIR	END-I	1/2-PT	END-J	/----- END-I -----\		/---- MIDDLE -----\		/----- END-J -----\		TORSION
ELVE	{T} LC.	{T} LC.	{T} LC.	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	{T-M} LC.
4FL	10.2< 8>	4.9< 7>	9.7< 7>	13.5< 8>	6.8< 0>	3.4< 0>	4.2< 2>	13.3< 7>	6.9< 14>	0.6< 2>

BAY 16

DIR	END-I	1/2-PT	END-J	/----- END-I -----\		/---- MIDDLE -----\		/----- END-J -----\		TORSION
ELVE	{T} LC.	{T} LC.	{T} LC.	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	{T-M} LC.
RFL	7.8< 8>	3.4< 8>	8.6< 7>	8.8< 8>	4.4< 0>	2.3< 0>	4.7< 2>	9.0< 7>	4.6< 8>	0.9< 2>
3FL	11.8< 8>	6.6< 7>	10.9< 7>	16.6< 8>	9.2< 13>	4.2< 0>	4.3< 2>	16.2< 7>	9.5< 14>	1.4< 2>
2FL	11.5< 8>	7.1< 8>	12.4< 7>	16.6< 8>	11.2< 13>	4.3< 0>	5.1< 2>	17.1< 7>	10.9< 14>	0.8< 2>
1FL	41.4< 15>	2.9< 3>	41.4< 16>	63.7< 16>	31.8< 0>	80.3< 15>	8.0< 0>	63.7< 15>	31.8< 0>	0.1< 3>

BAY 17

DIR	END-I	1/2-PT	END-J	/----- END-I -----\		/---- MIDDLE -----\		/----- END-J -----\		TORSION
ELVE	{T} LC.	{T} LC.	{T} LC.	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	{T-M} LC.
PR	10.3< 0>	7.1< 0>	10.3< 0>	3.3< 8>	2.8< 7>	0.8< 0>	3.2< 2>	3.2< 7>	2.9< 8>	0.0< 25>

BAY 18

DIR	END-I	1/2-PT	END-J	/----- END-I -----\		/---- MIDDLE -----\		/----- END-J -----\		TORSION
ELVE	{T} LC.	{T} LC.	{T} LC.	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	Top {T-M}	Bot {T-M}	{T-M} LC.
RFL	11.2< 0>	8.4< 0>	11.2< 0>	6.2< 8>	5.2< 13>	1.6< 0>	2.8< 15>	6.1< 7>	5.3< 14>	0.0< 3>
4FL	12.6< 0>	9.5< 0>	12.8< 0>	13.3< 8>	11.1< 13>	3.4< 0>	2.8< 0>	13.6< 7>	11.0< 14>	0.0< 3>
3FL	14.2< 0>	11.6< 0>	14.4< 0>	15.7< 8>	14.3< 13>	4.0< 0>	3.6< 0>	16.1< 7>	14.1< 14>	0.0< 3>
2FL	15.3< 0>	12.5< 0>	15.2< 0>	16.5< 8>	16.2< 13>	4.1< 0>	4.1< 0>	16.4< 7>	16.2< 14>	0.0< 3>
1FL	121.0< 1>	8.0< 3>	121.0< 1>	89.8< 8>	44.9< 0>	121.5< 1>	11.2< 0>	89.8< 7>	44.9< 0>	0.2< 3>

COL 1

DIR	Vu Maj	Vu Min	Pu	Mu-X	Mu-Y
ELVE	{T} LC.	{T} LC.	{T} LC.	{T-M}	{T-M}
RFL	9.5< 0>	8.1< 0>	1.0< 0>	11.4	0.0
4FL	9.1< 0>	5.4< 0>	2.3< 0>	14.1	0.0
3FL	9.8< 0>	5.5< 0>	1.9< 0>	14.1	0.0
2FL	6.5< 29>	2.5< 0>	-1.6< 0>	12.7	0.0

COL 2

DIR	Vu Maj	Vu Min	Pu	Mu-X	Mu-Y
ELVE	{T} LC.	{T} LC.	{T} LC.	{T-M}	{T-M}
RFL	9.4< 0>	8.1< 0>	2.4<132>	1.2	0.1
4FL	9.0< 0>	5.4< 0>	3.0< 0>	14.1	0.0
3FL	9.8< 0>	5.5< 0>	2.9< 0>	14.1	0.0
2FL	6.6< 30>	2.5< 0>	0.3< 10>	12.7	0.3

COL 3

DIR	Vu Maj	Vu Min	Pu	Mu-X	Mu-Y
ELVE	{T} LC.	{T} LC.	{T} LC.	{T-M}	{T-M}
PR	8.5< 0>	10.8< 0>	2.4<132>	1.2	0.2
RFL	7.2< 0>	10.6< 0>	4.4<132>	1.0	0.2
4FL	9.6< 0>	10.8< 0>	4.1< 0>	15.5	0.0
3FL	11.3< 0>	10.9< 0>	5.5< 0>	16.3	0.0
2FL	6.4< 29>	4.9< 0>	9.1< 0>	15.3	0.0

COL 4

DIR	Vu Maj	Vu Min	Pu	Mu-X	Mu-Y
ELVE	{T} LC.	{T} LC.	{T} LC.	{T-M}	{T-M}
PR	8.5< 0>	10.8< 0>	2.4<132>	1.2	0.2
RFL	7.1< 0>	10.6< 0>	4.5<132>	1.0	0.2
4FL	9.5< 0>	10.8< 0>	4.3< 0>	15.4	0.0
3FL	11.3< 0>	10.9< 0>	5.7< 0>	16.3	0.0
2FL	6.3< 30>	4.9< 0>	9.4< 0>	15.4	0.0

COL 5

DIR	Vu Maj	Vu Min	Pu	Mu-X	Mu-Y
ELVE	{T} LC.	{T} LC.	{T} LC.	{T-M}	{T-M}
PR	4.9< 0>	4.9< 0>	0.9<132>	0.4	0.1

COL 6

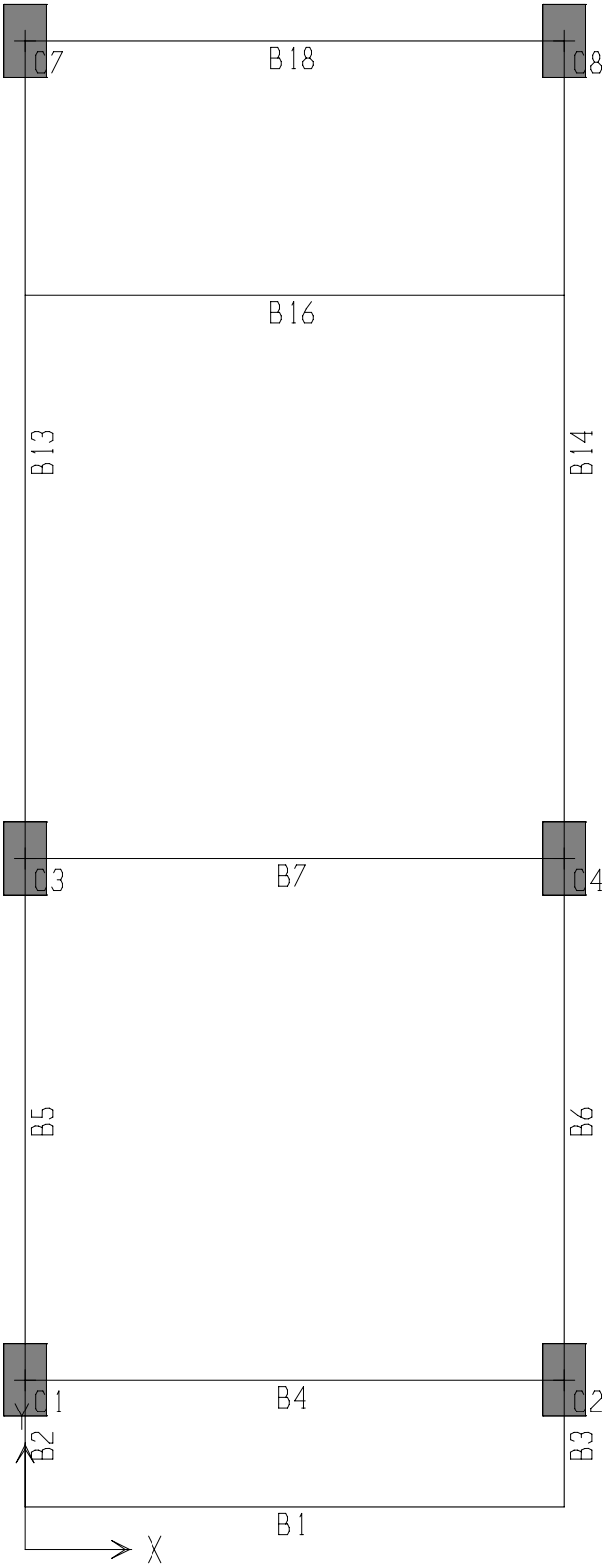
DIR	Vu Maj	Vu Min	Pu	Mu-X	Mu-Y
ELVE	{T} LC.	{T} LC.	{T} LC.	{T-M}	{T-M}
PR	4.9< 0>	4.9< 0>	0.9<132>	0.4	0.1

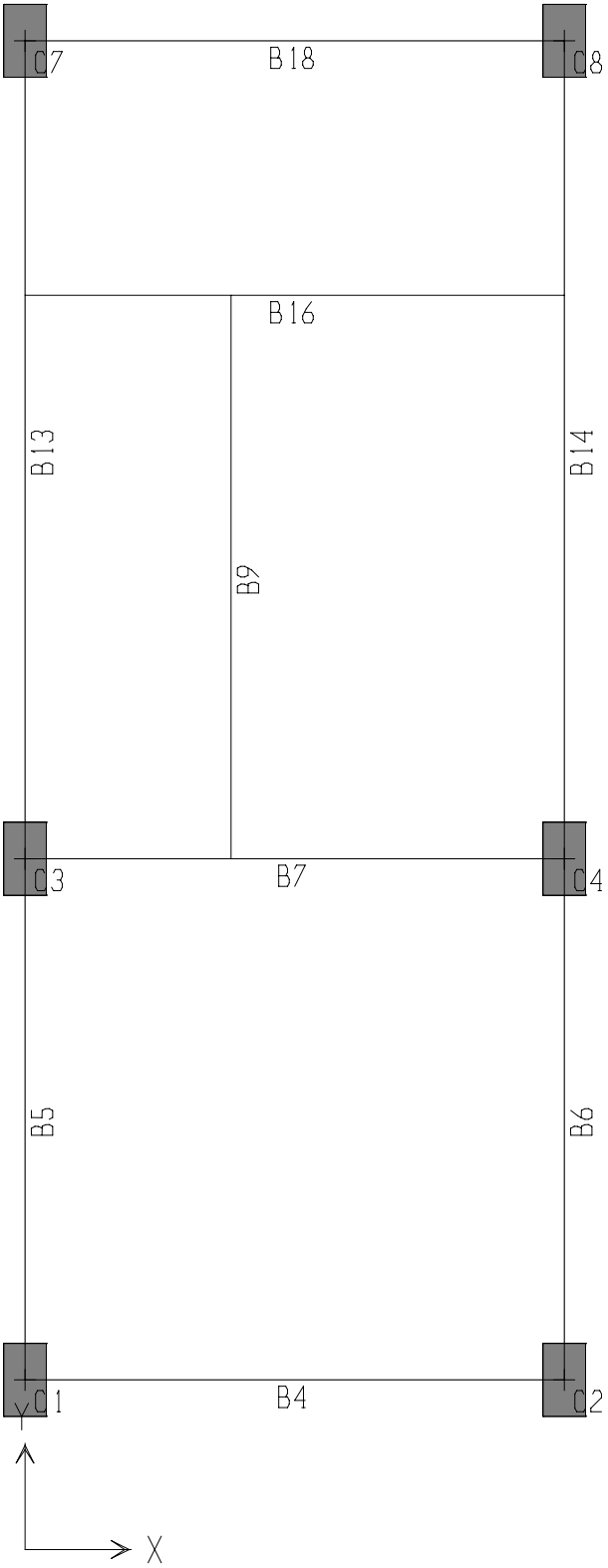
COL 7

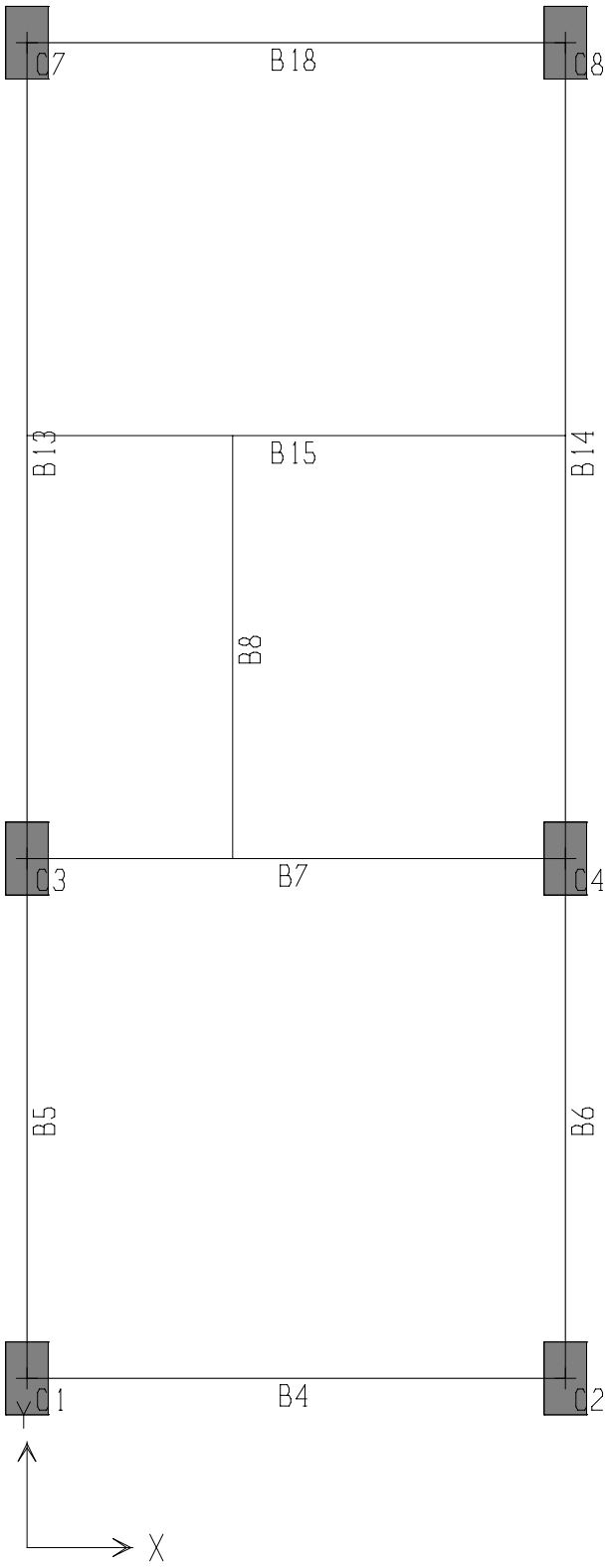
DIR	Vu Maj	Vu Min	Pu	Mu-X	Mu-Y
ELVE	{T} LC.	{T} LC.	{T} LC.	{T-M}	{T-M}
RFL	8.7< 0>	8.1< 0>	4.2<132>	0.8	0.4
4FL	7.1< 0>	5.4< 0>	7.9<132>	0.7	0.3
3FL	8.0< 0>	5.5< 0>	11.7<132>	1.1	0.9
2FL	6.6< 7>	2.5< 0>	2.1< 31>	12.6	2.1

COL 8

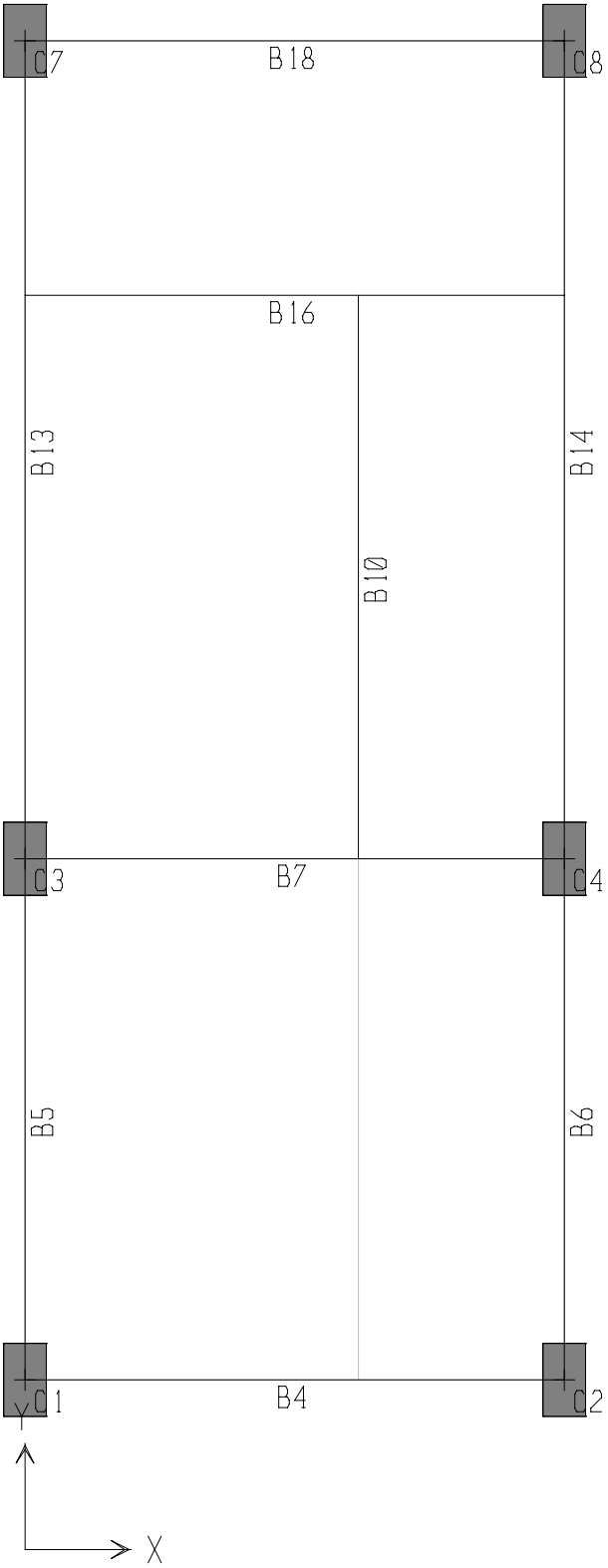
DIR ELVE	Vu Maj {T}	LC.	Vu Min {T}	LC.	Pu {T}	LC.	Mu-X {T-M}	Mu-Y {T-M}
RFL	8.7	0	8.1	0	4.2	132	0.8	0.4
4FL	7.3	0	5.4	0	7.8	132	0.7	0.3
3FL	8.0	0	5.5	0	11.5	132	1.2	0.9
2FL	6.6	8	2.5	0	1.8	32	12.6	2.1

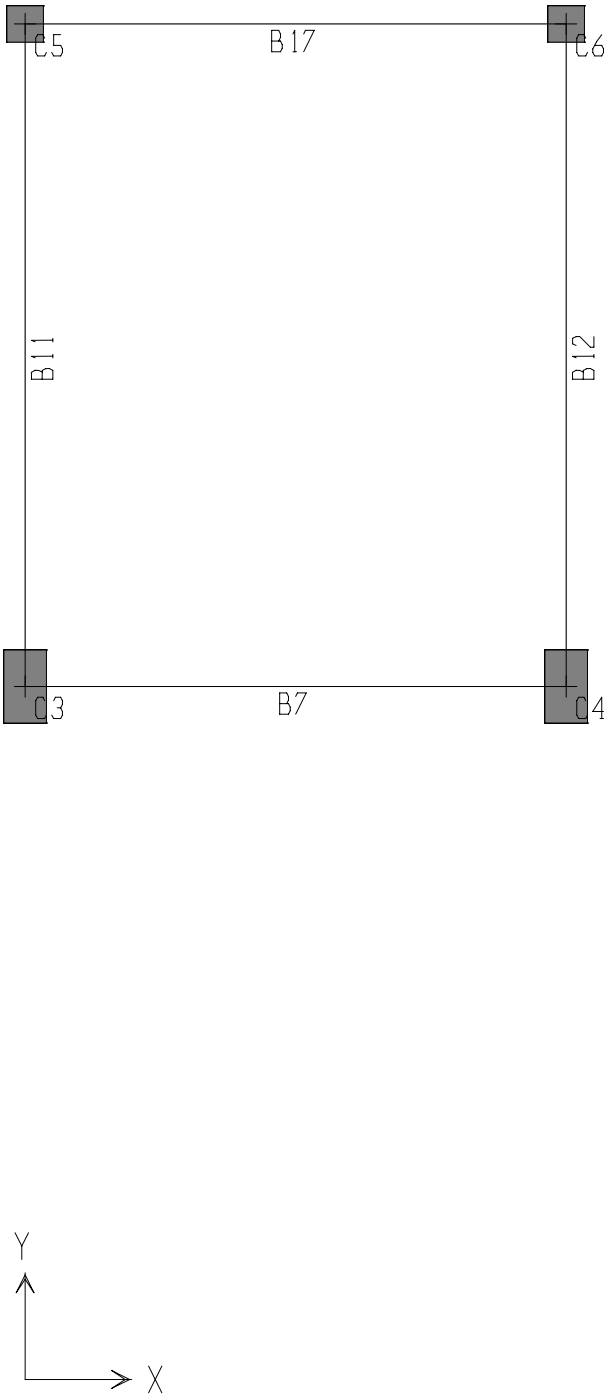

C7
B18
C8
B16
B13
B14
C3
B7
C4
B5
B6
C1
B4
C2
B2
B3
B1
X


C7
B18
C8
B16
B13
B14
B9
C3
B7
C4
B5
B6
C1
B4
C2
Y
X



P11-14


C7
B18
C8
B16
B13
B14
B10
C3
B7
C4
B5
B6
C1
B4
C2
Y
X


C5
B17
C6
B11
B12
C3
B7
C4
Y
X

12 分析輸入資料-TYPE-A(5*20-MF)

ETABS v9.7.2 File:DES-A Units:Ton-m February 3, 2024 19:20 PAGE 1

S T O R Y D A T A

STORY	SIMILAR TO	HEIGHT	ELEVATION
PR	4FL	3.000	17.200
RFL	4FL	3.200	14.200
4FL	None	3.200	11.000
3FL	4FL	3.200	7.800
2FL	4FL	3.400	4.600
1FL	4FL	1.200	1.200
BASE	None		0.000

ETABS v9.7.2 File:DES-A Units:Ton-m February 3, 2024 19:20 PAGE 2

C O O R D I N A T E S Y S T E M L O C A T I O N D A T A

NAME	TYPE	X	Y	ROTATION	BUBBLESIZE	VISIBLE
GLOBAL	Cartesian	0.000	0.000	0.00000	1.250	Yes

C O O R D I N A T E S Y S T E M G R I D D A T A

SYSTEM NAME	GRID DIR	GRID ID	GRID TYPE	GRID HIDE	BUBBLE LOC	GRID COORDINATE
GLOBAL	X	A	Primary	No	Top	0.000
GLOBAL	X	B	Primary	No	Top	4.450
GLOBAL	Y	1	Primary	No	Left	0.000
GLOBAL	Y	2	Primary	No	Left	1.400
GLOBAL	Y	3	Primary	No	Left	5.700
GLOBAL	Y	4	Primary	No	Left	13.200

ETABS v9.7.2 File:DES-A Units:Ton-m February 3, 2024 19:20 PAGE 3

P O I N T C O O R D I N A T E S

POINT	X	Y	DZ-BELOW
1	0.000	0.350	0.000
2	4.450	0.350	0.000
3	0.000	1.400	0.000
4	2.750	1.400	0.000
5	4.450	1.400	0.000
6	0.000	5.700	0.000
7	1.700	5.700	0.000
8	2.750	5.700	0.000
9	4.450	5.700	0.000
17	0.000	9.200	0.000
18	1.700	9.200	0.000
19	4.450	9.200	0.000
20	0.000	10.350	0.000
21	1.700	10.350	0.000
22	2.750	10.350	0.000
23	4.450	10.350	0.000
24	0.000	11.150	0.000
25	4.450	11.150	0.000
26	0.000	12.450	0.000
27	4.450	12.450	0.000

ETABS v9.7.2 File:DES-A Units:Ton-m February 3, 2024 19:20 PAGE 4

C O L U M N C O N N E C T I V I T Y D A T A

COLUMN	I END PT	J END PT	I END STORY
C1	3	3	Below
C2	5	5	Below
C3	6	6	Below
C4	9	9	Below
C5	24	24	Below
C6	25	25	Below
C7	26	26	Below
C8	27	27	Below

ETABS v9.7.2 File:DES-A Units:Ton-m February 3, 2024 19:20 PAGE 5

B E A M C O N N E C T I V I T Y D A T A

BEAM	I END PT	J END PT
B1	1	2
B2	1	3
B3	2	5
B4	3	5
B5	3	6
B6	5	9
B7	6	9
B8	7	18
B9	7	21
B10	8	22
B11	6	24
B12	9	25
B13	6	26
B14	9	27
B15	17	19
B16	20	23
B17	24	25
B18	26	27

ETABS v9.7.2 File:DES-A Units:Ton-m February 3, 2024 19:20 PAGE 6

W A L L C O N N E C T I V I T Y D A T A

WALL	POINT 1	POINT 2	POINT 3	POINT 4	PT1 STORY	PT2 STORY	PT3 STORY	PT4 STORY
W1	3	6	6	3	Below	Below	Same	Same
W2	5	9	9	5	Below	Below	Same	Same
W3	6	24	24	6	Below	Below	Same	Same
W4	9	25	25	9	Below	Below	Same	Same
W5	6	26	26	6	Below	Below	Same	Same

W6	9	27	27	9	Below	Below	Same	Same

F L O O R C O N N E C T I V I T Y D A T A

FLOOR	POINT	POINT	POINT	POINT
F1	3	4	8	6
F2	4	5	9	8
F3	1	2	27	26
F4	3	5	27	26
F5	6	9	25	24
F6	6	9	27	26

R I G I D D I A P H R A G M P O I N T C O N N E C T I V I T Y D A T A

STORY	DIAPHRAGM	POINT	POINT	POINT	POINT	POINT
PR	D1	6	9	24	25	
RFL	D1	3	5	6	9	26
		27	25	24	20	23
		8	22	4		
4FL	D1	3	5	6	9	26
		27	7	17	19	18
3FL	D1	3	5	6	9	26
		27	20	23	7	21
2FL	D1	3	5	6	9	26
		27	1	2	20	23
		8	22			
1FL	D1	3	5	6	9	26
		27	1	2	20	23
BASE	D1	3	5	6	9	26
		27				

M A S S S O U R C E D A T A

MASS FROM	LATERAL MASS ONLY	LUMP MASS AT STORIES
Loads	Yes	Yes

M A S S S O U R C E L O A D S

LOAD	MULTIPLIER
DEAD	1.0200

D I A P H R A G M M A S S D A T A

STORY	DIAPHRAGM	MASS-X	MASS-Y	MMI	X-M	Y-M
PR	D1	3.373E+00	3.373E+00	4.141E+01	2.225	8.111
RFL	D1	7.997E+00	7.997E+00	1.565E+02	2.268	6.805
4FL	D1	8.953E+00	8.953E+00	1.852E+02	2.248	6.644
3FL	D1	8.989E+00	8.989E+00	1.880E+02	2.246	6.682
2FL	D1	9.182E+00	9.182E+00	1.973E+02	2.233	6.600
1FL	D1	0.000E+00	0.000E+00	0.000E+00	2.225	6.050

A S S E M B L E D P O I N T M A S S E S

STORY	POINT	UX	UY	UZ	RX	RY	RZ
PR	105	3.373E+00	3.373E+00	0.000E+00	0.000E+00	0.000E+00	4.141E+01
RFL	106	7.997E+00	7.997E+00	0.000E+00	0.000E+00	0.000E+00	1.565E+02
4FL	107	8.953E+00	8.953E+00	0.000E+00	0.000E+00	0.000E+00	1.852E+02
3FL	108	8.989E+00	8.989E+00	0.000E+00	0.000E+00	0.000E+00	1.880E+02
2FL	109	9.182E+00	9.182E+00	0.000E+00	0.000E+00	0.000E+00	1.973E+02
BASE	111	1.889E-01	1.889E-01	0.000E+00	0.000E+00	0.000E+00	4.843E+00
PR	A11	3.373E+00	3.373E+00	0.000E+00	0.000E+00	0.000E+00	4.141E+01
RFL	A11	7.997E+00	7.997E+00	0.000E+00	0.000E+00	0.000E+00	1.565E+02
4FL	A11	8.953E+00	8.953E+00	0.000E+00	0.000E+00	0.000E+00	1.852E+02
3FL	A11	8.989E+00	8.989E+00	0.000E+00	0.000E+00	0.000E+00	1.880E+02
2FL	A11	9.182E+00	9.182E+00	0.000E+00	0.000E+00	0.000E+00	1.973E+02
1FL	A11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BASE	A11	1.889E-01	1.889E-01	0.000E+00	0.000E+00	0.000E+00	4.843E+00
Totals	A11	3.868E+01	3.868E+01	0.000E+00	0.000E+00	0.000E+00	7.733E+02

G R O U P M A S S D A T A

GROUP NAME	SELF MASS	SELF WEIGHT	TOTAL MASS-X	TOTAL MASS-Y	TOTAL MASS-Z
ALL	0.0000	403.345	-45.1219	-45.1219	0.0000

M A T E R I A L L I S T B Y E L E M E N T T Y P E

ELEMENT TYPE	MATERIAL	TOTAL MASS tons	NUMBER PIECES	NUMBER STUDS
Column	MP1	47.31	34	
Beam	MP1	139.99	54	0
Wall	MP1	115.32		
Floor	MP1	100.71		

M A T E R I A L L I S T B Y S E C T I O N

SECTION	ELEMENT TYPE	NUMBER PIECES	TOTAL LENGTH meters	TOTAL MASS tons	NUMBER STUDS
CP1	Column	32	91.200	46.01	
BP3	Beam	32	146.000	66.10	0
BP6	Beam	1	4.450	1.60	0
BP1	Beam	6	31.000	35.19	0
CP2	Column	2	6.000	1.30	
BP5	Beam	4	17.450	5.24	0
BP4	Beam	8	37.600	15.59	0
BP2	Beam	2	8.900	9.62	0
BP7	Beam	1	4.450	6.65	0
S15	Floor			100.71	
W15	Wall			115.32	

M A T E R I A L L I S T B Y S T O R Y

STORY	ELEMENT TYPE	MATERIAL	TOTAL WEIGHT tons	FLOOR AREA m2	UNIT WEIGHT kg/m2	NUMBER PIECES	NUMBER STUDS
PR	Column	MP1	4.32	24.253	178.3189	4	
PR	Beam	MP1	7.89	24.253	325.4321	4	0
PR	Wall	MP1	11.78	24.253	485.9191		
PR	Floor	MP1	8.74	24.253	360.3900		
RFL	Column	MP1	9.69	49.173	197.0061	6	
RFL	Beam	MP1	19.47	49.173	395.8812	9	0
RFL	Wall	MP1	25.49	49.173	518.3137		
RFL	Floor	MP1	17.72	49.173	360.3900		
4FL	Column	MP1	9.69	49.173	197.0061	6	
4FL	Beam	MP1	19.12	49.173	388.8574	9	0
4FL	Wall	MP1	25.49	49.173	518.3137		
4FL	Floor	MP1	17.72	49.173	360.3900		
3FL	Column	MP1	9.69	49.173	197.0061	6	
3FL	Beam	MP1	19.47	49.173	395.8812	9	0
3FL	Wall	MP1	25.49	49.173	518.3137		
3FL	Floor	MP1	17.72	49.173	360.3900		
2FL	Column	MP1	10.29	53.845	191.1550	6	
2FL	Beam	MP1	21.83	53.845	405.3676	12	0
2FL	Wall	MP1	27.08	53.845	502.9196		
2FL	Floor	MP1	19.41	53.845	360.3900		
1FL	Column	MP1	3.63	53.845	67.4665	6	
1FL	Beam	MP1	52.22	53.845	969.8303	11	0
1FL	Floor	MP1	19.41	53.845	360.3900		
SUM	Column	MP1	47.31	279.460	169.2979	34	
SUM	Beam	MP1	139.99	279.460	500.9450	54	0
SUM	Wall	MP1	115.32	279.460	412.6701		
SUM	Floor	MP1	100.71	279.460	360.3900		
TOTAL	All	All	403.35	279.460	1443.3031	88	0

M A T E R I A L P R O P E R T Y D A T A

MATERIAL NAME	MATERIAL TYPE	DESIGN TYPE	MATERIAL DIR/PLANE	MODULUS OF ELASTICITY	POISSON'S RATIO	THERMAL COEFF	SHEAR MODULUS
STEEL	Iso	Steel	All	20389019.158	0.3000	1.1700E-05	7841930.445
CONC	Iso	Concrete	All	2531050.654	0.2000	9.9000E-06	1054604.439
OTHER	Iso	None	All	20389019.158	0.3000	1.1700E-05	7841930.445
MP1	Iso	Concrete	All	2531050.650	0.2000	9.9000E-06	1054604.438

M A T E R I A L P R O P E R T Y M A S S A N D W E I G H T

MATERIAL NAME	MASS PER UNIT VOL	WEIGHT PER UNIT VOL
STEEL	7.9814E-01	7.8334E+00
CONC	2.4480E-01	2.4026E+00
OTHER	7.9814E-01	7.8334E+00
MP1	2.4480E-01	2.4026E+00

M A T E R I A L D E S I G N D A T A F O R S T E E L M A T E R I A L S

MATERIAL NAME	STEEL FY	STEEL FU	STEEL COST ($)
STEEL	35153.481	45699.526	27679.91

M A T E R I A L D E S I G N D A T A F O R C O N C R E T E M A T E R I A L S

MATERIAL NAME	LIGHTWEIGHT CONCRETE	CONCRETE FC	REBAR FY	REBAR FYS	LIGHTWT REDUC FACT
CONC	No	2812.279	42184.178	42184.178	N/A
MP1	No	2450.000	42000.000	42000.000	N/A

F R A M E S E C T I O N P R O P E R T Y D A T A

FRAME SECTION NAME	MATERIAL NAME	SECTION SHAPE NAME OR NAME IN SECTION DATABASE FILE	CONC COL	CONC BEAM
CP1	MP1	Rectangular	Yes	
BP3	MP1	Rectangular		Yes
BP6	MP1	Rectangular		Yes
BP1	MP1	Rectangular		Yes
CP2	MP1	Rectangular	Yes	

BP5	MP1	Rectangular	Yes
BP4	MP1	Rectangular	Yes
BP2	MP1	Rectangular	Yes
BP7	MP1	Rectangular	Yes

F R A M E S E C T I O N P R O P E R T Y D A T A

FRAME SECTION NAME	SECTION DEPTH	FLANGE WIDTH TOP	FLANGE THICK TOP	WEB THICK	FLANGE WIDTH BOT	FLANGE THICK BOT
CP1	0.3500	0.6000	0.0000	0.0000	0.0000	0.0000
BP3	0.6000	0.3500	0.0000	0.0000	0.0000	0.0000
BP6	0.6000	0.2500	0.0000	0.0000	0.0000	0.0000
BP1	1.5000	0.3500	0.0000	0.0000	0.0000	0.0000
CP2	0.3000	0.3000	0.0000	0.0000	0.0000	0.0000
BP5	0.5000	0.2500	0.0000	0.0000	0.0000	0.0000
BP4	0.6000	0.3000	0.0000	0.0000	0.0000	0.0000
BP2	1.5000	0.3000	0.0000	0.0000	0.0000	0.0000
BP7	1.5000	0.4500	0.0000	0.0000	0.0000	0.0000

F R A M E S E C T I O N P R O P E R T Y D A T A

FRAME SECTION NAME	SECTION AREA	TORSIONAL CONSTANT	MOMENTS OF INERTIA I33	I22	SHEAR AREAS A2	A3
CP1	0.2100	0.0055	0.0021	0.0063	0.1750	0.1750
BP3	0.2100	0.0055	0.0063	0.0021	0.1750	0.1750
BP6	0.1500	0.0023	0.0045	0.0008	0.1250	0.1250
BP1	0.5250	0.0183	0.0984	0.0054	0.4375	0.4375
CP2	0.0900	0.0011	0.0007	0.0007	0.0750	0.0750
BP5	0.1250	0.0018	0.0026	0.0007	0.1042	0.1042
BP4	0.1800	0.0037	0.0054	0.0014	0.1500	0.1500
BP2	0.4500	0.0118	0.0844	0.0034	0.3750	0.3750
BP7	0.6750	0.0370	0.1266	0.0114	0.5625	0.5625

F R A M E S E C T I O N P R O P E R T Y D A T A

FRAME SECTION NAME	SECTION MODULI S33	S22	PLASTIC MODULI Z33	Z22	RADIUS OF GYRATION R33	R22
CP1	0.0123	0.0210	0.0184	0.0315	0.1010	0.1732
BP3	0.0210	0.0123	0.0315	0.0184	0.1732	0.1010
BP6	0.0150	0.0063	0.0225	0.0094	0.1732	0.0722
BP1	0.1313	0.0306	0.1969	0.0459	0.4330	0.1010
CP2	0.0045	0.0045	0.0068	0.0068	0.0866	0.0866
BP5	0.0104	0.0052	0.0156	0.0078	0.1443	0.0722
BP4	0.0180	0.0090	0.0270	0.0135	0.1732	0.0866
BP2	0.1125	0.0225	0.1688	0.0338	0.4330	0.0866
BP7	0.1688	0.0506	0.2531	0.0759	0.4330	0.1299

F R A M E S E C T I O N W E I G H T S A N D M A S S E S

FRAME SECTION NAME	TOTAL WEIGHT	TOTAL MASS
CP1	46.0146	4.6884
BP3	66.0955	6.7344
BP6	1.6037	0.1634
BP1	35.1921	3.5857
CP2	1.2974	0.1322
BP5	5.2407	0.5340
BP4	15.5905	1.5885
BP2	9.6224	0.9804
BP7	6.6492	0.6775

C O N C R E T E C O L U M N D A T A

FRAME SECTION NAME	REINF CONFIGURATION LONGIT	LATERAL	REINF SIZE/TYPE	NUM BARS 3DIR/2DIR	NUM BARS CIRCULAR	BAR COVER
CP1	Rectangular	Ties	#7/Design	5/3	N/A	0.0650
CP2	Rectangular	Ties	#7/Design	3/3	N/A	0.0650

C O N C R E T E B E A M D A T A

FRAME SECTION NAME	TOP COVER	BOT COVER	TOP LEFT AREA	TOP RIGHT AREA	BOT LEFT AREA	BOT RIGHT AREA
BP3	0.0650	0.0650	0.000	0.000	0.000	0.000
BP6	0.0650	0.0650	0.000	0.000	0.000	0.000
BP1	0.0750	0.0750	0.000	0.000	0.000	0.000
BP5	0.0650	0.0650	0.000	0.000	0.000	0.000
BP4	0.0600	0.0600	0.000	0.000	0.000	0.000
BP2	0.0750	0.0750	0.000	0.000	0.000	0.000
BP7	0.0750	0.0750	0.000	0.000	0.000	0.000

S H E L L S E C T I O N P R O P E R T Y D A T A

SHELL SECTION	MATERIAL NAME	SHELL TYPE	LOAD DIST ONE WAY	MEMBRANE THICK	BENDING THICK	TOTAL WEIGHT	TOTAL MASS
S15	MP1	Membrane	No	0.1500	0.1500	100.7146	10.2618
W15	MP1	Shell-Thin	No	0.1500	0.1500	115.3248	11.7504
S40	MP1	Membrane	No	0.4000	0.4000	0.0000	0.0000

D E C K S E C T I O N P R O P E R T Y D A T A

DECK SECTION	DECK TYPE	SLAB MATERIAL	DECK MATERIAL	DECK SHEAR THICK	DECK UNIT WT
DECK1	Filled	CONC	N/A	N/A	1.1230E-02

D E C K S E C T I O N S H E A R S T U D D A T A

DECK SECTION	STUD DIAM	STUD HEIGHT	STUD FU
DECK1	0.0191	0.1524	45699.526

D E C K S E C T I O N G E O M E T R Y D A T A

DECK SECTION	SLAB DEPTH	RIB DEPTH	RIB WIDTH	RIB SPACING
DECK1	0.0889	0.0762	0.1524	0.3048

L I N K P R O P E R T Y D A T A

LINK: NLPR1
TYPE: Damper

MASS	WEIGHT	INERTIA 1	INERTIA 2	INERTIA 3	P-D M2I	P-D M2J	P-D M3I	P-D M3J
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

DOF	KE	CE	DJ	K	C	C EXP
U1	0.0000	0.0000	N/A	---	---	---

P I E R S E C T I O N P R O P E R T Y D A T A

PIER LABEL	STORY LEVEL	MATERIAL NAME	ANGLE	NUM OBJS AREA/LINE	WIDTH BOTTOM	THICK BOTTOM	WIDTH TOP	THICK TOP
WY1	PR	MP1	90.00	1/0	5.450	0.1500	5.450	0.1500
WY2	PR	MP1	90.00	1/0	5.450	0.1500	5.450	0.1500
WY1	RFL	MP1	90.00	2/0	11.050	0.1500	11.050	0.1500
WY2	RFL	MP1	90.00	2/0	11.050	0.1500	11.050	0.1500
WY1	4FL	MP1	90.00	2/0	11.050	0.1500	11.050	0.1500
WY2	4FL	MP1	90.00	2/0	11.050	0.1500	11.050	0.1500
WY1	3FL	MP1	90.00	2/0	11.050	0.1500	11.050	0.1500
WY2	3FL	MP1	90.00	2/0	11.050	0.1500	11.050	0.1500
WY1	2FL	MP1	90.00	2/0	11.050	0.1500	11.050	0.1500
WY2	2FL	MP1	90.00	2/0	11.050	0.1500	11.050	0.1500

P I E R S E C T I O N C E N T R O I D D A T A

PIER LABEL	STORY LEVEL	CENTROID BOTTOM X	CENTROID BOTTOM Y	CENTROID BOTTOM Z	CENTROID TOP X	CENTROID TOP Y	CENTROID TOP Z
WY1	PR	0.000	8.425	14.200	0.000	8.425	17.200
WY2	PR	4.450	8.425	14.200	4.450	8.425	17.200
WY1	RFL	0.000	6.925	11.000	0.000	6.925	14.200
WY2	RFL	4.450	6.925	11.000	4.450	6.925	14.200
WY1	4FL	0.000	6.925	7.800	0.000	6.925	11.000
WY2	4FL	4.450	6.925	7.800	4.450	6.925	11.000
WY1	3FL	0.000	6.925	4.600	0.000	6.925	7.800
WY2	3FL	4.450	6.925	4.600	4.450	6.925	7.800
WY1	2FL	0.000	6.925	1.200	0.000	6.925	4.600
WY2	2FL	4.450	6.925	1.200	4.450	6.925	4.600

S T A T I C L O A D C A S E S

STATIC CASE	CASE TYPE	AUTO LAT LOAD	SELF WT MULTIPLIER	NOTIONAL FACTOR	NOTIONAL DIRECTION
DEAD	DEAD	N/A	1.0000		
LIVE	LIVE	N/A	0.0000		
EX1	QUAKE	USER_LOADS	0.0000		
EX2	QUAKE	USER_LOADS	0.0000		
EY1	QUAKE	USER_LOADS	0.0000		
EY2	QUAKE	USER_LOADS	0.0000		

R E S P O N S E S P E C T R U M C A S E S

RESP SPEC CASE: DYNX

BASIC RESPONSE SPECTRUM DATA

MODAL COMBO	DIRECTION COMBO	MODAL DAMPING	SPECTRUM ANGLE	TYPICAL ECCEN
CQC	SRSS	0.0500	0.0000	0.0000

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	SPEC	7.0000
U2	----	N/A
UZ	----	N/A

RESP SPEC CASE: DYNY

BASIC RESPONSE SPECTRUM DATA

MODAL COMBO	DIRECTION COMBO	MODAL DAMPING	SPECTRUM ANGLE	TYPICAL ECCEN
CQC	SRSS	0.0500	0.0000	0.0000

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	----	N/A
U2	SPEC	7.0000
UZ	----	N/A

L O A D I N G C O M B I N A T I O N S

COMBO	COMBO TYPE	CASE	CASE TYPE	SCALE FACTOR
1	ADD	DEAD	Static	1.0000
2	ADD	LIVE	Static	1.0000
3	ADD	EX1	Static	1.0000
4	ADD	EX2	Static	1.0000
5	ADD	EY1	Static	1.0000
6	ADD	EY2	Static	1.0000
7	ADD	DYNX	Spectra	1.0000
8	ADD	DYNY	Spectra	1.0000

A U T O S E I S M I C U S E R L O A D S
Case: EX1

AUTO SEISMIC INPUT DATA

Additional Eccentricity = 5%

SPECIFIED AUTO SEISMIC LOADS AT DIAPHRAGM CENTER OF MASS

STORY	DIAPHRAGM	FX	FY	MZ
PR	D1	6.84	0.00	0.000
RFL	D1	17.83	0.00	0.000
4FL	D1	13.46	0.00	0.000
3FL	D1	8.73	0.00	0.000
2FL	D1	4.45	0.00	0.000
1FL	D1	0.00	0.00	0.000

AUTO SEISMIC CALCULATION RESULTS

AUTO SEISMIC STORY FORCES

STORY	FX	FY	FZ	MX	MY	MZ
PR	(Forces reported at X = 2.2250, Y = 8.1111, Z = 17.2000)					
	6.84	0.00	0.00	0.000	0.000	-1.864
RFL	(Forces reported at X = 2.2675, Y = 6.8046, Z = 14.2000)					
	17.83	0.00	0.00	0.000	0.000	-9.851
4FL	(Forces reported at X = 2.2480, Y = 6.6443, Z = 11.0000)					
	13.46	0.00	0.00	0.000	0.000	-7.437
3FL	(Forces reported at X = 2.2458, Y = 6.6824, Z = 7.8000)					
	8.73	0.00	0.00	0.000	0.000	-4.823
2FL	(Forces reported at X = 2.2333, Y = 6.5998, Z = 4.6000)					
	4.45	0.00	0.00	0.000	0.000	-2.692
1FL	(Forces reported at X = 0.0000, Y = 0.0000, Z = 1.2000)					
	0.00	0.00	0.00	0.000	0.000	0.000

A U T O S E I S M I C U S E R L O A D S
Case: EX2

AUTO SEISMIC INPUT DATA

Additional Eccentricity = -5%

SPECIFIED AUTO SEISMIC LOADS AT DIAPHRAGM CENTER OF MASS

STORY	DIAPHRAGM	FX	FY	MZ
PR	D1	6.84	0.00	0.000
RFL	D1	17.83	0.00	0.000
4FL	D1	13.46	0.00	0.000
3FL	D1	8.73	0.00	0.000
2FL	D1	4.45	0.00	0.000
1FL	D1	0.00	0.00	0.000

AUTO SEISMIC CALCULATION RESULTS

AUTO SEISMIC STORY FORCES

STORY	FX	FY	FZ	MX	MY	MZ
PR	(Forces reported at X = 2.2250, Y = 8.1111, Z = 17.2000)					
	6.84	0.00	0.00	0.000	0.000	1.864
RFL	(Forces reported at X = 2.2675, Y = 6.8046, Z = 14.2000)					
	17.83	0.00	0.00	0.000	0.000	9.851
4FL	(Forces reported at X = 2.2480, Y = 6.6443, Z = 11.0000)					
	13.46	0.00	0.00	0.000	0.000	7.437
3FL	(Forces reported at X = 2.2458, Y = 6.6824, Z = 7.8000)					
	8.73	0.00	0.00	0.000	0.000	4.823
2FL	(Forces reported at X = 2.2333, Y = 6.5998, Z = 4.6000)					
	4.45	0.00	0.00	0.000	0.000	2.692
1FL	(Forces reported at X = 0.0000, Y = 0.0000, Z = 1.2000)					
	0.00	0.00	0.00	0.000	0.000	0.000

A U T O S E I S M I C U S E R L O A D S
Case: EY1

AUTO SEISMIC INPUT DATA

Additional Eccentricity = 5%

SPECIFIED AUTO SEISMIC LOADS AT DIAPHRAGM CENTER OF MASS

STORY	DIAPHRAGM	FX	FY	MZ
PR	D1	0.00	11.09	0.000
RFL	D1	0.00	28.93	0.000
4FL	D1	0.00	21.83	0.000
3FL	D1	0.00	14.17	0.000
2FL	D1	0.00	7.23	0.000
1FL	D1	0.00	0.00	0.000

AUTO SEISMIC CALCULATION RESULTS

AUTO SEISMIC STORY FORCES

STORY	FX	FY	FZ	MX	MY	MZ
PR	(Forces reported at X = 2.2250, Y = 8.1111, Z = 17.2000)					
	0.00	11.09	0.00	0.000	0.000	2.468
RFL	(Forces reported at X = 2.2675, Y = 6.8046, Z = 14.2000)					
	0.00	28.93	0.00	0.000	0.000	6.437
4FL	(Forces reported at X = 2.2480, Y = 6.6443, Z = 11.0000)					
	0.00	21.83	0.00	0.000	0.000	4.857
3FL	(Forces reported at X = 2.2458, Y = 6.6824, Z = 7.8000)					
	0.00	14.17	0.00	0.000	0.000	3.153
2FL	(Forces reported at X = 2.2333, Y = 6.5998, Z = 4.6000)					
	0.00	7.23	0.00	0.000	0.000	1.609
1FL	(Forces reported at X = 0.0000, Y = 0.0000, Z = 1.2000)					
	0.00	0.00	0.00	0.000	0.000	0.000

A U T O S E I S M I C U S E R L O A D S
Case: EY2

AUTO SEISMIC INPUT DATA

Additional Eccentricity = -5%

SPECIFIED AUTO SEISMIC LOADS AT DIAPHRAGM CENTER OF MASS

STORY	DIAPHRAGM	FX	FY	MZ
PR	D1	0.00	11.09	0.000
RFL	D1	0.00	28.93	0.000
4FL	D1	0.00	21.83	0.000
3FL	D1	0.00	14.17	0.000
2FL	D1	0.00	7.23	0.000
1FL	D1	0.00	0.00	0.000

AUTO SEISMIC CALCULATION RESULTS

AUTO SEISMIC STORY FORCES

STORY	FX	FY	FZ	MX	MY	MZ
PR	(Forces reported at X = 2.2250, Y = 8.1111, Z = 17.2000)					
	0.00	11.09	0.00	0.000	0.000	-2.468
RFL	(Forces reported at X = 2.2675, Y = 6.8046, Z = 14.2000)					
	0.00	28.93	0.00	0.000	0.000	-6.437
4FL	(Forces reported at X = 2.2480, Y = 6.6443, Z = 11.0000)					
	0.00	21.83	0.00	0.000	0.000	-4.857
3FL	(Forces reported at X = 2.2458, Y = 6.6824, Z = 7.8000)					
	0.00	14.17	0.00	0.000	0.000	-3.153
2FL	(Forces reported at X = 2.2333, Y = 6.5998, Z = 4.6000)					
	0.00	7.23	0.00	0.000	0.000	-1.609
1FL	(Forces reported at X = 0.0000, Y = 0.0000, Z = 1.2000)					

0.00 0.00 0.00 0.000 0.000 0.000

R E S P O N S E S P E C T R U M F U N C T I O N - F R O M F I L E

FUNCTION NAME: SPEC

FILE NAME: d:\job-2022\str-112020-a\specx.i
DATA TYPE: Period vs Acceleration
NUMBER OF HEADER LINES = 0

PERIOD	ACCEL
0.0000	0.3104
0.0500	0.3042
0.1000	0.3016
0.1500	0.3012
0.2000	0.3012
0.2500	0.3012
0.3000	0.3012
0.3500	0.2940
0.4000	0.2647
0.4500	0.2408
0.5000	0.2208
0.5500	0.2038
0.6000	0.1875
0.6500	0.1731
0.7000	0.1607
0.7500	0.1500
0.8000	0.1406
0.8500	0.1324
0.9000	0.1250
0.9500	0.1184
1.0000	0.1125
1.0500	0.1071
1.1000	0.1023
1.1500	0.0978
1.2000	0.0938
1.2500	0.0900
1.3000	0.0865
1.3500	0.0833
1.4000	0.0804
1.4500	0.0800
1.5000	0.0800
1.5500	0.0800
1.6000	0.0800
1.6500	0.0800
1.7000	0.0800
1.7500	0.0800
1.8000	0.0800
1.8500	0.0800
1.9000	0.0800
1.9500	0.0800
2.0000	0.0800
2.0500	0.0800
2.1000	0.0800
2.1500	0.0800
2.2000	0.0800
2.2500	0.0800
2.3000	0.0800
2.3500	0.0800
2.4000	0.0800
2.4500	0.0800
2.5000	0.0800
2.5500	0.0800
2.6000	0.0800
2.6500	0.0800
2.7000	0.0800
2.7500	0.0800
2.8000	0.0800
2.8500	0.0800
2.9000	0.0800
2.9500	0.0800
3.0000	0.0800
3.0500	0.0800
3.1000	0.0800
3.1500	0.0800
3.2000	0.0800
3.2500	0.0800
3.3000	0.0800
3.3500	0.0800
3.4000	0.0800
3.4500	0.0800
3.5000	0.0800
3.5500	0.0800
3.6000	0.0800
3.6500	0.0800
3.7000	0.0800
3.7500	0.0800
3.8000	0.0800
3.8500	0.0800
3.9000	0.0800
3.9500	0.0800
5.0000	0.0800
6.0000	0.0800
10.0000	0.0800