

附件一之二

工程名稱：菇類栽培場標準圖樣 11368_M 型結構計算

工程地點：適用基本設計風速 $V_{10}(C)$ 採用 37.5 m/s 地區

結構計算書

目錄

1. 基本說明.....	1
1.1. 基地位置及現況.....	1
1.2. 建築設計基本說明.....	1
1.3. 結構系統說明.....	1
1.4. 設計載重.....	1
1.5. 設計規範及參考書目.....	2
1.6. 結構材料規格.....	2
1.7. 分析設計軟體.....	2
1.8. 結構分析模擬.....	2
1.9. 分析載重名稱定義.....	2
1.10. 設計風力計算.....	2
2. 結構設計.....	3
2.1. 設計載重組合.....	3
2.2. 標準圖耐風分析結果.....	4
2.2.1. 標準圖說分析模型.....	4
2.2.2. 載重配置.....	5
2.2.3. 結構分析結果.....	6
2.2.4. 基座錨栓及基礎檢核.....	6
2.2.5. 桁條檢核.....	7

1. 基本說明

1.1. 基地位置及現況

本案農糧署菇類栽培場結構分析，基本設計風速 $V_{10}(C)$ 採用 37.5 m/s，適用地區按建築物耐風設計規範及解說第二章第 2.4 條規定區域。

1.2. 建築設計基本說明

本案為地上一層結構，為農民栽種溫室所使用，屋頂為烤漆清板，外牆面主要為烤漆清板。

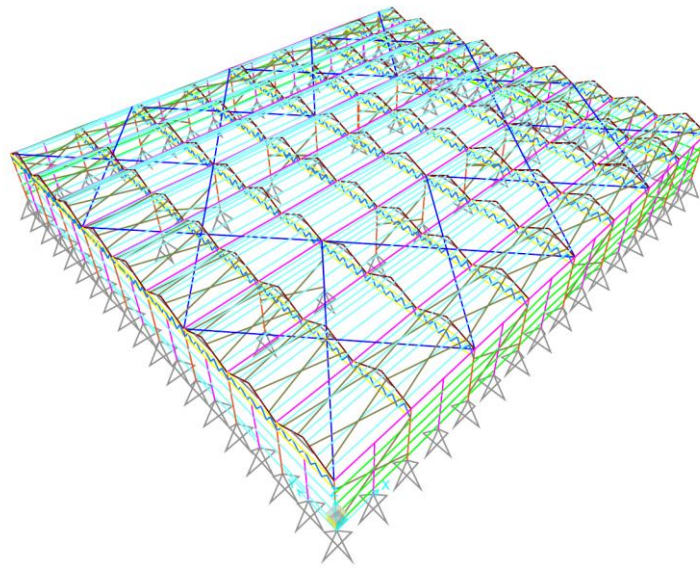


圖 1.1 菇類栽培場 3D 示意圖

1.3. 結構系統說明

本結構採用梁柱鋼架系統，脊高為 4.3 公尺，柱高為 3.5 公尺。

1.4. 設計載重

結構體之重量由程式自行計算，設計載重以面載重施加於屋頂與牆面。亦包含正立面 54" 負壓風扇。

屋面材料採用「烤漆鋼板、塑膠布、PVC 板等」輕材料，平均荷重為 $5\text{Kg}/\text{cm}^2$ 加上桁條平均荷重約 $8\sim 10\text{Kg}/\text{cm}^2$ 。本計畫在結構設計上暫不考慮設置負重較大的太陽能板之規劃，避免造成農民造價成本的增加。

載重如下：

額外靜載重		
烤漆清板重量	5	kgf/m^2
總重	5	kgf/m^2
活載重		
LL	5	kgf/m^2
總重	5	kgf/m^2

1.5. 設計規範及參考書目

設計規範及參考書目：

- (1) 最新建築技術規則，民國 110 年版
- (2) 建築物耐震設計規範及解說，內政部，民國 100 年版
- (3) 建築物耐風設計規範及解說，內政部，民國 103 年版
- (4) 鋼結構容許應力設計法規範及解說，內政部，民國 99 年版
- (5) 鋼結構極限強度設計法規範及解說，內政部，民國 99 年版
- (6) 鋼構造建築物施工規範，內政部，民國 96 年版
- (7) 冷軋型鋼構造建築物結構設計規範及解說，內政部，民國 105 年版
- (8) 建築物基礎構造設計規範，內政部，民國 90 年 10 月
- (9) 溫室安全構造手冊，台灣農業設施協會，民國 110 年 12 月
- (10) 鋼構造建築物 鋼結構施工規範 國土署 2007 年
- (11) 鋼結構廠房 結構設計手冊 TISC 2023 年

1.6. 結構材料規格

CNS 4435 一般結構用碳鋼管 STK260、STK400

CNS 7141 一般結構用正方形及矩形碳鋼鋼管 STKR400

CNS 6183 一般結構用輕型鋼 SSC400

CNS 2473 一般結構用軋鋼料 SS400、A36

CNS 13812 建築結構用軋鋼料 SN400A

CNS 4426 基礎螺栓

斷面尺寸：依附件一結構平面圖

1.7. 分析設計軟體

CSI-Sap2000 結構分析程式。

1.8. 結構分析模擬

- ◆ 分析設計軟體：CSI-Sap2000 結構分析程式。
- ◆ 梁、柱以 Frame Element 模擬。
- ◆ 外加靜載重以面載重施加於屋頂元素。

1.9. 分析載重名稱定義

DL	：靜載重
SDL	：額外靜載重(塑膠布)
LL	：活載重(雨水載重)
W _{WX}	：X 向側向風壓
W _{WY}	：Y 向側向風壓
W _{TX}	：X 向屋頂風力
W _{TY}	：Y 向屋頂風力

1.10. 設計風力計算

風力計算資料詳附件 1

設計風壓力大於地震力，故本案以風力做為設計考量。

2. 結構設計

本案採用溫室安全構造手冊設計。

2.1. 設計載重組合

本案經計算得知設計風力大於地震力，載重組合以風力做為設計考量，故載重組合不考量含地震力之組合；依據 110 年溫室安全構造手冊建議採用之載重組合如下：

採熱軋型鋼構材載重組合

- (1). $DL + LL$
- (2). $DL + 0.75 (LL \pm WL)$
- (3). $0.7 DL \pm WL$

採冷軋型鋼構材載重組合

- (1). $DL + LL$
- (2). $DL + WL$
- (3). $DL + 0.75LL + 0.75 WL$
- (4). $0.6 DL + WL$

基座錨栓檢核採 LRFD 設計

- (1). $1.4DL$
- (2). $1.2DL + 1.6LL$
- (3). $0.9DL \pm 1.3WL$
- (4). $1.2DL \pm WL$
- (5). $1.2DL + 0.5LL \pm 1.3WL$
- (6). $1.2DL + 1.0LL \pm 1.3WL$
- (7). $1.2DL \pm 0.8WL$

2.2. 標準圖耐風分析結果

2.2.1. 標準圖說分析模型

本案依據收集到之結構圖建立 3D 分析模型，如圖 2.1，如有施作獨立基腳，分析模型以固定端模擬，其他則以鉸接端方式模擬。

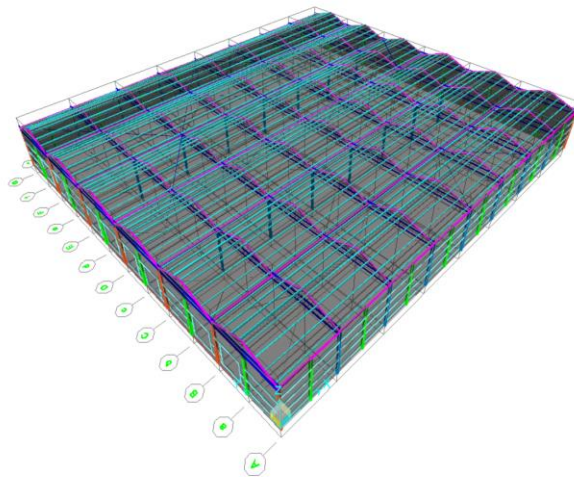


圖 2.1 分析模型 3D 圖

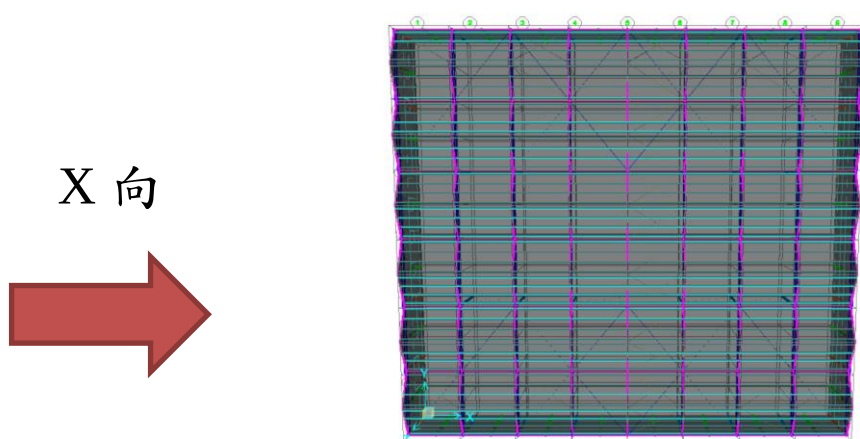
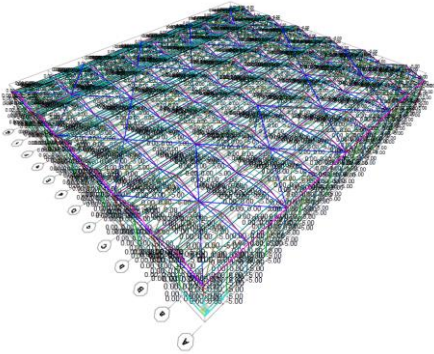
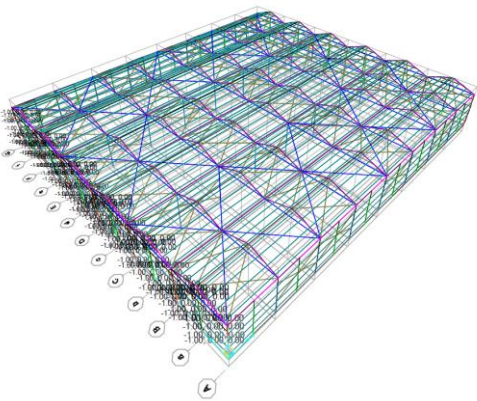
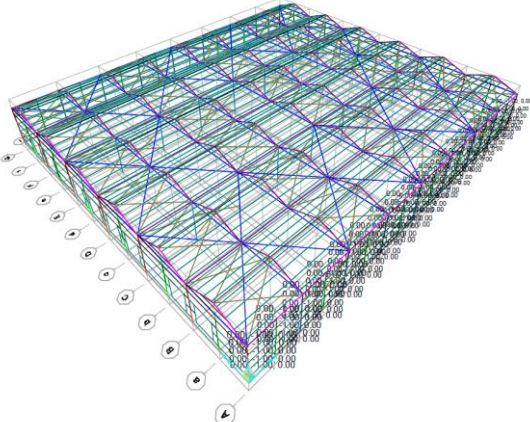


圖 2.2 溫室俯視圖

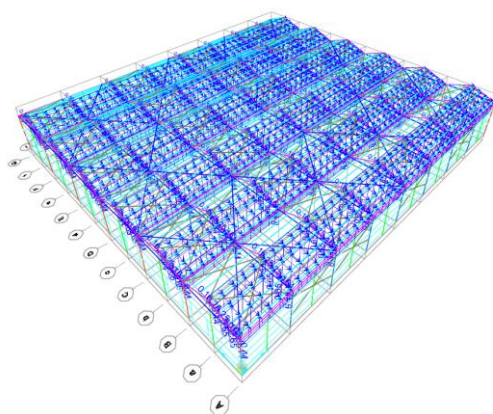
2.2.2. 載重配置

設計載重以面載重的方式加載於面上，其加載方式如表 2.1。

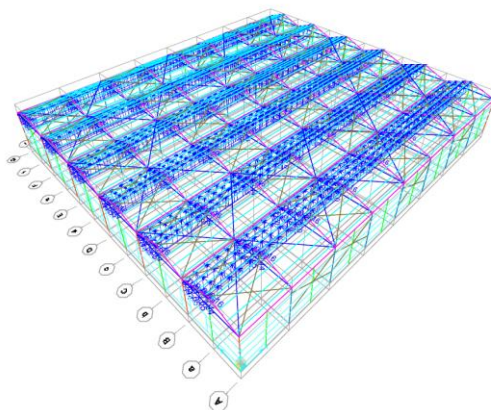
表 2.1 分析模型各加載載重分佈情況

額外靜載重

X 向側向風力

Y 向側風力


屋頂風力



屋頂風力



2.2.3. 結構分析結果

分析結果，主要構件應力比小於 1.0，故可符合安全性需求。

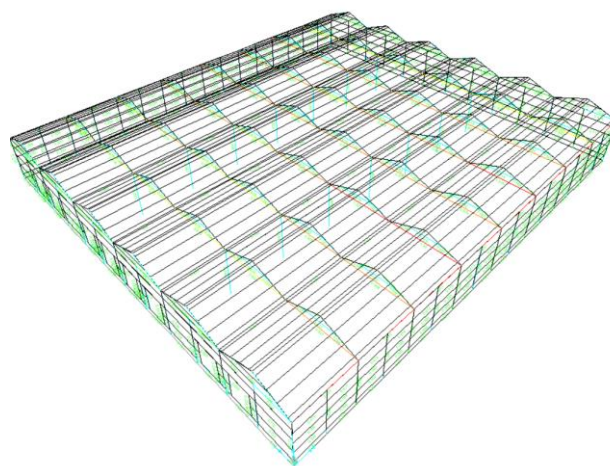


圖 2.2 主構件應力比圖

2.2.4. 基座錨栓及基礎檢核

本菇類栽培場錨栓檢核採用靜載重與活載重及風力作用檢核，基座錨栓之基座板設置於 10cm 地坪下方，降低螺栓及基座板損壞的狀況，當溫室結構經強風、強震後，應檢視基座模栓是否穩固，如有損壞應做適當修復。

菇類栽培場標準圖樣 11368 M 型結構計算

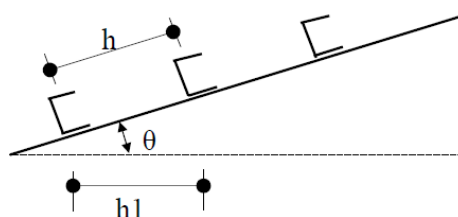
整體基礎則採用 10cm 地坪採用 #3@20 公分配筋，作為結構物之板基礎，當溫室結構經強風、強震後，應檢視基礎是否穩固，如有損壞應做適當修復。主立柱下方亦做獨立基礎，副立柱則以 RC 柱頭往下延伸以錨定基座錨栓。

2.2.5. 桁條檢核

桁 條 設 計

一．基本資料

1. 桁條跨度 $L=$ 400 cm
2. 防垂桿間距 $L'=$ 400 cm
3. 桁條間距 $h=$ 70 cm
4. 屋頂 $\theta=$ 25 度
5. 桁條水平間距 $h_1=$ 63.4 cm



二．載重計算

1. 靜載重 $W_g=$ 5 kg/m²
2. 活載重 $W_l=$ 5 kg/m²
3. 風載重 $W_w = c q =$ -45.5 kg/m² 其中 $c=$ -0.5
 $q=$ 91 kg/m²
4. 設計載重 $W_u = [W_g + W_l, 0.75(W_g + 1.25W_w)]_{MAX} =$ 38.9 kg/m²
 (由 W_w 控制)

三．應力檢核

	1	2	3	4	5	6	7
	C-75*45*15* C-150*65* C-150*65* C-75*45*1 BOX-125*75*3.2						
$S_x=$	9.9	44.3	53.5	33	41.1		
$S_y=$	4.24	12.2	14.5	9.12	31.1		
$I_x=$	37.1	332	401	248	257		
Try C-75*45*15*2.3							
$S_x=$	9.9	cm ³					
$S_y=$	4.24	cm ³					
$I_x=$	37.1	cm ⁴					

1. 強軸載重分量 $W_x = W_u h_1 \cos \theta =$ 22.37 kg/m
2. 弱軸載重分量 $W_y = W_u h_1 \sin \theta =$ 10.43 kg/m
3. 強軸彎矩 $M_x = W_x L^2 / 8 =$ 4.47 t-cm
4. 弱軸彎矩 $M_y = W_y (L')^2 / 8 =$ 2.09 t-cm
5. 容許撓曲應力 $F_{bx} = F_{by} = 0.6 F_y =$ 1.44 t/cm², 其中 $F_y =$ 2.4 t/cm²
6. 兩向彎矩交互作用檢核
 $(M_x / S_x) / F_{bx} + (2M_y / S_y) / F_{by} =$ 1.00 < 1, OK!

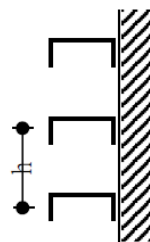
四．撓度檢核

$$\delta = 5W_x L^4 / (384EI_x) = 0.96 \text{ cm} \quad (= L/418 < L/150, \text{ OK!})$$

圍 梁 設 計

一．基本資料

1. 圍梁跨度 $L=$ 400 cm
2. 防垂桿間距 $L'=$ 400 cm
3. 圍梁間距 $h=$ 70 cm



二．載重計算

1. 靜載重 $W_g=$ 5 kg/m²
2. 風載重 $W_w= c q =$ 81.6 kg/m²

其中 $c=$ 0.8
 $q=$ 102 kg/m²

三．應力檢核

Try C-75*45*15*2.3

$S_x=$ 9.9 cm³

$S_y=$ 4.24 cm³

$I_x=$ 37.1 cm⁴

1. 強軸載重分量 $W_x = 0.75 * 1.25 * W_w h =$ 53.6 kg/m
2. 弱軸載重分量 $W_y = 0.75 * W_g h =$ 2.6 kg/m
3. 強軸彎矩 $M_x = W_x L^2 / 8 =$ 10.71 t-cm
4. 弱軸彎矩 $M_y = W_y (L')^2 / 8 =$ 0.53 t-cm
5. 容許撓曲應力 $F_{bx}=F_{by}=0.6F_y$ 1.5 t/cm², 其中 $F_y=$ 2.5 t/cm²
6. 兩向彎矩交互作用檢核
 $(M_x/S_x)/F_{bx} + (2M_y/S_y)/F_{by} =$ 0.89 < 1, OK!

四．撓度檢核

$\delta = 5W_x L^4 / (384EI_x) =$ 2.29 cm (= $L / 175$ < $L/90$, OK!)

附件1 風力計算

一、順風向風力計算

座落於 地況C：平坦開闊之地面，依規範2.2 可知大氣邊界層平均風速剖面指數率公式指數 $\alpha=0.15$ 梯度高度 $Z_g=300$
依規範第2.4條 設計風速 $V_{10}(C)=37.5$ m/sec

$$V_k = 1.666 V_{10}(C) \left(\frac{h}{Z_g} \right)^\alpha = 32.684 \text{ m/sec}$$

建築物高度處設計風速依規範第2.6條解說，知

風速壓依據規範第(2.6)式為 $q(z) = 0.06 K(z) K_{zt} [I \cdot V_{10}(C)]^2$ ，其中 K_{zt} 為地形係數； $I=0.9$ ； $V_{10}(C)=37.5$ m/sec

$$K(z) = 2.774 \left(\frac{z}{Z_g} \right)^{2\alpha} \quad K(z) = 2.774 \left(\frac{5}{Z_g} \right)^{2\alpha}$$

$z \geq 5\text{m}$ ， $z < 5\text{m}$ 。

【各樓層風速表】

樓層	高度 m	$K_{zt}(z)$	$K(z)$	$q(z)$
1 F	3.515	1.000	0.8122	55.51

$$q(h)=55.51 \text{ kgf/m}^2$$

本建築物的 $fn = 5.715$ Hz, $B = 28.80$ m

依據規範第1.3條的定義屬於普通建築物

普通建築物之陣風反應因子依規範第(2.9)式決定，如下式所示：

$$G = 1.927 \left(\frac{(1 + 1.7 g_p I_z Q)}{1 + 1.7 g_v I_z} \right) = 1.791$$

式中 g_Q 和 g_V 均可取3.4

$$\text{紊流強度 } I_z \text{ 依規範第(2.10)式計算： } I_z = c(10/z)^{1/6} = 0.2285$$

$$\text{紊流積分尺度 } L_z = \ell(\bar{z}/10)^{7/6} = 129.6$$

$$Q = \sqrt{\frac{1}{1 + 0.63 \left(\frac{B+h}{L_z} \right)^{0.63}}} = 0.8815$$

背景反應 = 0.8815

普通建築物順風向單面之設計風壓 p ，依規範2.1式計算：

$$p = q G C_p - q_i (G C_{pi})$$

其中由規範表2.4可知， $L/B=1.111$

迎風面 $q=q(z)$ ， $C_p=0.8$ ；

背風面 $q=q(h)$ ， $C_p=-0.4778$ ；

$G C_{pi}$ 取用0.375

$$\text{各高度層順風向迎風面設計風壓計算如 } p_1(z) = q(z) G_f C_p - q(h) (G C_{pi})$$

$$\text{各高度層順風向背風面設計風壓計算如 } p_2(z) = q(h) G_f C_p - q(h) (G C_{pi})$$

$$\text{順風向設計風壓} = \text{迎風面設計風壓} - \text{背風面設計風壓} = p_1(z) - p_2(z)$$

【各樓層順風向風力表】

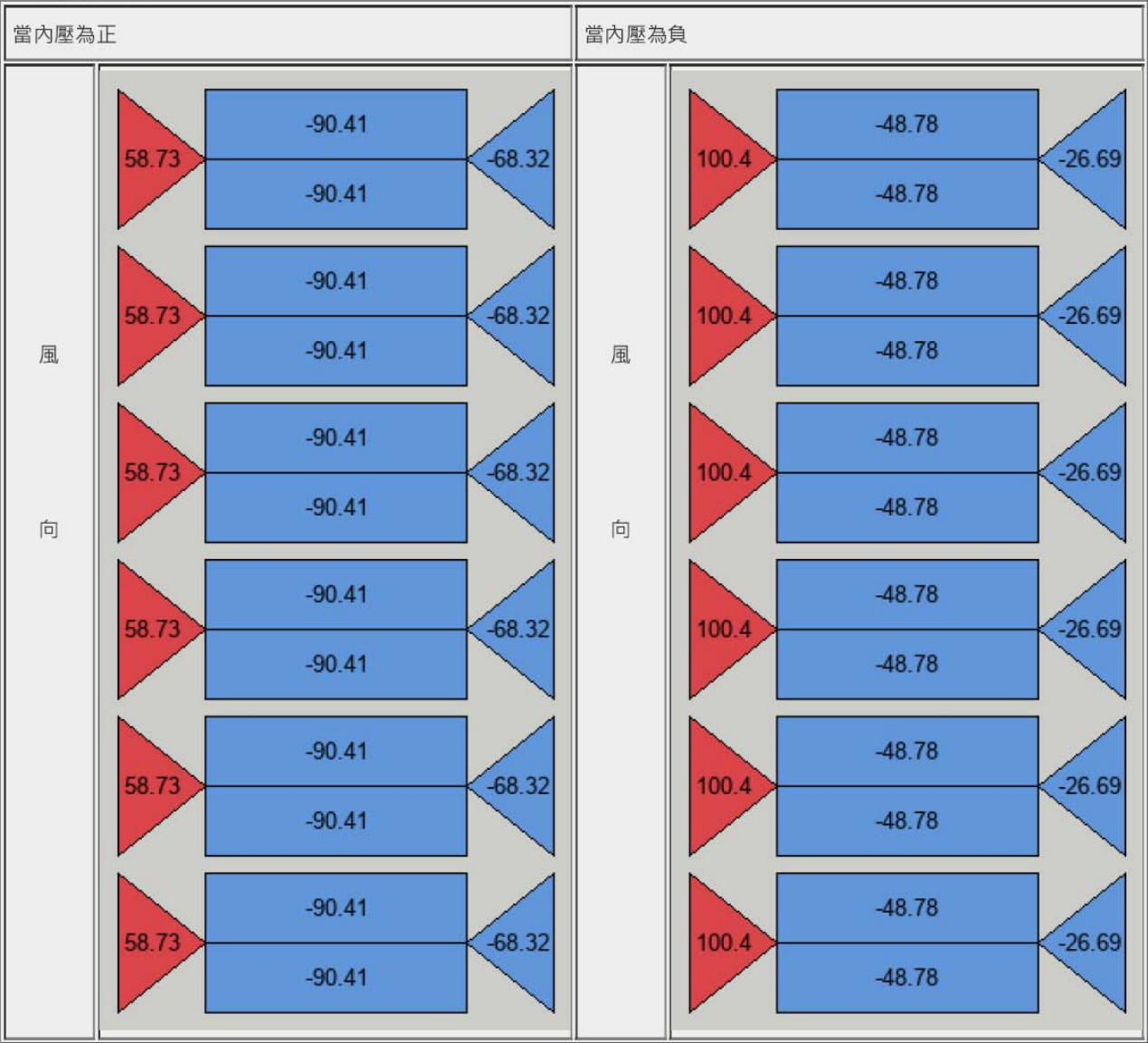
樓層	高度 m	面積 m^2	$p_1(z)$ (kgf/m 2)	$p_2(z)$ (kgf/m 2)	順風向設計風壓 (kgf/m 2)	順風向設計風力 (t)
1 F	3.515	50.62	58.73	-68.32	127.0	6.431
基底剪力：						6.431

【各樓層順風向各牆面設計風壓表】 *上下兩值分別為當內壓為正負兩種狀況

樓層	高度 m	設計風壓 (kgf/m ²)		
		迎風面牆	側牆	背風面牆
1 F	3.515	58.73 100.4		-68.32 -26.69

屋頂面各面風壓值(屋頂上視展開圖pxyx5.1)

[單位為 kgf/m²]



一、順風向風力計算

座落於 地況C：平坦開闊之地面，依規範2.2 可知大氣邊界層平均風速剖面指數率公式指數 $\alpha=0.15$ 梯度高度 $Z_g=300$
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依據規範第1.3條的定義屬於普通建築物

普通建築物之陣風反應因子依規範第(2.9)式決定，如下式所示：

$$G = 1.927 \left(\frac{(1 + 1.7 g_p I_z Q)}{1 + 1.7 g_v I_z} \right) = 1.784$$

式中 g_Q 和 g_V 均可取3.4

$$\text{紊流強度 } I_z \text{ 依規範第(2.10)式計算： } I_z = c(10/z)^{1/6} = 0.2285$$

$$\text{紊流積分尺度 } L_z = \ell(\bar{z}/10)^{7/6} = 129.6$$

$$Q = \sqrt{\frac{1}{1 + 0.63 \left(\frac{B + h}{L_z} \right)^{0.63}}} = 0.8756$$

背景反應 = 0.8756

普通建築物順風向單面之設計風壓 p ，依規範2.1式計算：

$$p = q G C_p - q_i (G C_{pi})$$

其中由規範表2.4可知， $L/B=0.9000$

迎風面 $q=q(z)$ ， $C_p=0.8$ ；

背風面 $q=q(h)$ ， $C_p=-0.5000$ ；

$G C_{pi}$ 取用0.375

$$\text{各高度層順風向迎風面設計風壓計算如 } p_1(z) = q(z) G_f C_p - q(h) (G C_{pi})$$

$$\text{各高度層順風向背風面設計風壓計算如 } p_2(z) = q(h) G_f C_p - q(h) (G C_{pi})$$

$$\text{順風向設計風壓} = \text{迎風面設計風壓} - \text{背風面設計風壓} = p_1(z) - p_2(z)$$

【各樓層順風向風力表】

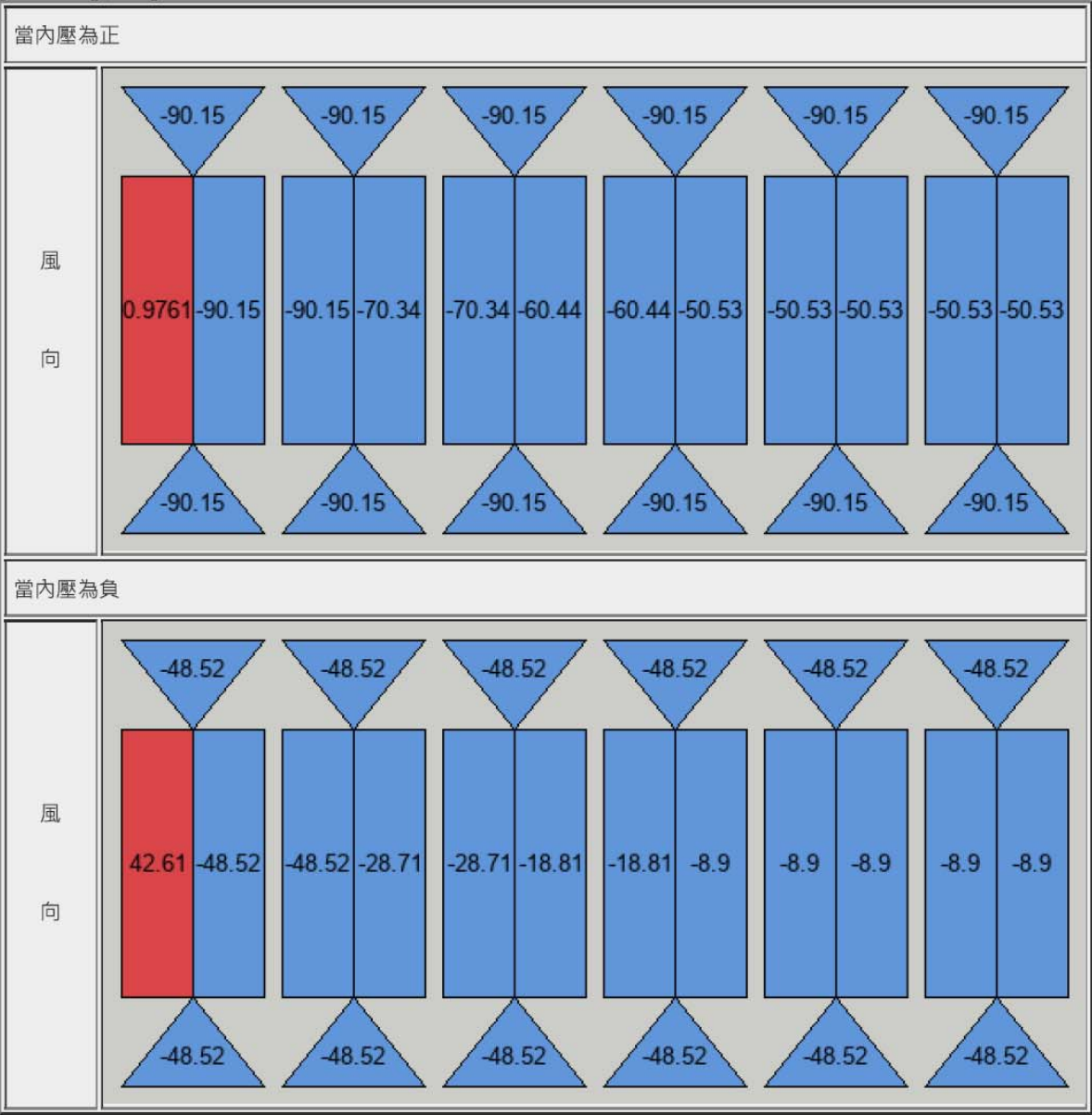
樓層	高度 m	面積 m^2	$p_1(z)$ (kgf/m 2)	$p_2(z)$ (kgf/m 2)	順風向設計風壓 (kgf/m 2)	順風向設計風力 (t)
1 F	3.515	56.24	58.43	-70.34	128.8	7.242
基底剪力：						7.242

【各樓層順風向各牆面設計風壓表】 *上下兩值分別為當內壓為正負兩種狀況

樓層	高度 m	設計風壓 (kgf/m ²)		
		迎風面牆	側牆	背風面牆
1 F	3.515	58.43 100.1		-70.34 -28.71

屋頂面各面風壓值(屋頂上視展開圖pxyy5.1)

[單位為 kgf/m²]



附件2 SAP2000分析資料

TABLE: Steel Design 1 - Summary Data - AISC360-05-IBC2006

Frame	DesignSect	DesignType	Status	Ratio	RatioType	Combo	Location
Text	Text	Text	Text	Unitless	Text	Text	cm
187	BOX-100x50x2	Brace	No Messages	0.295615 PMM		W0.6DB01	128.16
189	BOX-100x50x2	Brace	No Messages	0.309577 PMM		W0.6DB01	93.207
201	BOX-150X75X4(2)	Column	No Messages	0.428648 PMM		WDA02	0
203	BOX-150X75X4(2)	Column	No Messages	0.37117 PMM		WDA02	0
205	BOX-150X75X4(2)	Column	No Messages	0.364469 PMM		WDA02	0
207	BOX-150X75X4(2)	Column	No Messages	0.361819 PMM		WDA02	0
209	BOX-150X75X4(2)	Column	No Messages	0.362467 PMM		WDA02	0
211	BOX-150X75X4(2)	Column	No Messages	0.416417 PMM		WDA02	0
213	BOX-150X75X4(2)	Column	No Messages	0.603044 PMM		WDA04	0
215	BOX-150X75X4(2)	Column	No Messages	0.526372 PMM		WDA04	0
217	BOX-150X75X4(2)	Column	No Messages	0.536001 PMM		WDA04	0
219	BOX-150X75X4(2)	Column	No Messages	0.532051 PMM		WDA04	0
221	BOX-150X75X4(2)	Column	No Messages	0.513956 PMM		WDA04	0
223	BOX-150X75X4(2)	Column	No Messages	0.585064 PMM		WDA04	0
225	BOX-150X75X4(2)	Column	No Messages	0.192013 PMM		WDB01	192
227	BOX-150X75X4(2)	Column	No Messages	0.191488 PMM		WDB01	192
229	BOX-150X75X4(2)	Column	No Messages	0.191136 PMM		WDB01	192
231	BOX-150X75X4(2)	Column	No Messages	0.190449 PMM		WDB01	192
233	BOX-150X75X4(2)	Column	No Messages	0.189781 PMM		WDB01	192
235	BOX-150X75X4(2)	Column	No Messages	0.188983 PMM		WDB01	192
237	BOX-150X75X4(2)	Column	No Messages	0.189886 PMM		WDB01	192
239	BOX-150X75X4(2)	Column	No Messages	0.192811 PMM		WDB04	192
280	BOX-100x50x2	Brace	No Messages	0.242686 PMM		W0.6DA01	23.302
282	BOX-100x50x2	Brace	No Messages	0.169247 PMM		W0.6DA01	233.018
308	BOX-100x50x2	Brace	No Messages	0.15774 PMM		W0.6DA03	128.16
310	BOX-100x50x2	Brace	No Messages	0.178317 PMM		W0.6DA01	23.302
336	BOX-100x50x2	Brace	No Messages	0.178033 PMM		W0.6DA01	23.302
338	BOX-100x50x2	Brace	No Messages	0.158928 PMM		W0.6DA03	23.302
364	BOX-100x50x2	Brace	No Messages	0.170622 PMM		W0.6DB04	233.018
366	BOX-100x50x2	Brace	No Messages	0.242847 PMM		W0.6DA01	23.302
420	BOX-100x50x2	Brace	No Messages	0.596459 PMM		W0.6DB01	128.16
422	BOX-100x50x2	Brace	No Messages	0.592598 PMM		W0.6DB01	93.207
448	BOX-100x50x2	Brace	No Messages	0.314605 PMM		W0.6DB01	93.207
450	BOX-100x50x2	Brace	No Messages	0.363221 PMM		W0.6DA01	128.16
476	BOX-100x50x2	Brace	No Messages	0.354238 PMM		W0.6DA03	128.16
478	BOX-100x50x2	Brace	No Messages	0.268944 PMM		W0.6DA03	233.018
504	BOX-100x50x2	Brace	No Messages	0.270043 PMM		W0.6DA03	233.018
506	BOX-100x50x2	Brace	No Messages	0.354394 PMM		W0.6DA03	128.16
532	BOX-100x50x2	Brace	No Messages	0.363619 PMM		W0.6DA01	128.16
534	BOX-100x50x2	Brace	No Messages	0.308418 PMM		W0.6DA03	233.018
588	BOX-100x50x2	Brace	No Messages	0.605684 PMM		W0.6DB01	128.16
590	BOX-100x50x2	Brace	No Messages	0.598187 PMM		W0.6DB01	93.207
616	BOX-100x50x2	Brace	No Messages	0.35061 PMM		W0.6DB04	93.207
618	BOX-100x50x2	Brace	No Messages	0.351042 PMM		W0.6DB04	128.16
644	BOX-100x50x2	Brace	No Messages	0.352808 PMM		W0.6DB04	128.16
646	BOX-100x50x2	Brace	No Messages	0.34384 PMM		W0.6DB04	128.16
672	BOX-100x50x2	Brace	No Messages	0.346277 PMM		W0.6DB04	128.16
674	BOX-100x50x2	Brace	No Messages	0.358186 PMM		W0.6DA01	128.16
700	BOX-100x50x2	Brace	No Messages	0.359631 PMM		W0.6DB04	128.16

1430	BOX-100x50x2	Brace	No Messages	0.590849 PMM		W0.6DB01	93.207
1456	BOX-100x50x2	Brace	No Messages	0.314222 PMM		W0.6DB01	93.207
1458	BOX-100x50x2	Brace	No Messages	0.317856 PMM		W0.6DB01	128.16
1484	BOX-100x50x2	Brace	No Messages	0.270786 PMM		W0.6DA03	128.16
1486	BOX-100x50x2	Brace	No Messages	0.259795 PMM		W0.6DA03	128.16
1512	BOX-100x50x2	Brace	No Messages	0.259903 PMM		W0.6DA03	128.16
1514	BOX-100x50x2	Brace	No Messages	0.271421 PMM		W0.6DA03	128.16
1540	BOX-100x50x2	Brace	No Messages	0.273183 PMM		W0.6DA03	128.16
1542	BOX-100x50x2	Brace	No Messages	0.274145 PMM		W0.6DB04	23.302
1568	BOX-100x50x2	Brace	No Messages	0.275514 PMM		W0.6DB04	23.302
1570	BOX-100x50x2	Brace	No Messages	0.266688 PMM		W0.6DA03	128.16
1596	BOX-100x50x2	Brace	No Messages	0.29398 PMM		W0.6DB01	128.16
1598	BOX-100x50x2	Brace	No Messages	0.308521 PMM		W0.6DB01	93.207
1624	BOX-100x50x2	Brace	No Messages	0.250357 PMM		W0.6DA03	23.302
1626	BOX-100x50x2	Brace	No Messages	0.174617 PMM		W0.6DB04	233.018
1652	BOX-100x50x2	Brace	No Messages	0.15939 PMM		W0.6DA01	128.16
1654	BOX-100x50x2	Brace	No Messages	0.182824 PMM		W0.6DA03	23.302
1680	BOX-100x50x2	Brace	No Messages	0.182517 PMM		W0.6DA03	23.302
1682	BOX-100x50x2	Brace	No Messages	0.159297 PMM		W0.6DA01	128.16
1708	BOX-100x50x2	Brace	No Messages	0.175805 PMM		W0.6DB04	233.018
1710	BOX-100x50x2	Brace	No Messages	0.250233 PMM		W0.6DA03	23.302
1736	BOX-100x50x2	Brace	No Messages	0.243959 PMM		W0.6DA03	23.302
1738	BOX-100x50x2	Brace	No Messages	0.176069 PMM		W0.6DB04	233.018
1886	BOX-150X75X4(2)	Column	No Messages	0.282282 PMM		WDB02	192
1887	BOX-150X75X4(2)	Column	No Messages	0.28239 PMM		WDB02	192
1888	BOX-150X75X4(2)	Column	No Messages	0.282171 PMM		WDB02	192
1889	BOX-150X75X4(2)	Column	No Messages	0.282644 PMM		WDB02	192
1890	BOX-150X75X4(2)	Column	No Messages	0.283179 PMM		WDB02	192
1891	BOX-150X75X4(2)	Column	No Messages	0.283796 PMM		WDB02	192
1892	BOX-150X75X4(2)	Column	No Messages	0.283857 PMM		WDB02	192
1893	BOX-150X75X4(2)	Column	No Messages	0.282826 PMM		WDB02	192
2142	C-75x45x2.3	Beam	No Messages	0.550517 PMM		WDA04	144
2143	C-75x45x2.3	Beam	No Messages	0.726442 PMM		WDA04	96
2144	C-75x45x2.3	Beam	No Messages	0.711967 PMM		WDA04	144
2145	C-75x45x2.3	Beam	No Messages	0.550504 PMM		WDA04	96
2146	C-75x45x2.3	Beam	No Messages	0.727265 PMM		WDA04	96
2147	C-75x45x2.3	Beam	No Messages	0.717797 PMM		WDA04	144
2148	C-75x45x2.3	Beam	No Messages	0.550505 PMM		WDA04	96
2149	C-75x45x2.3	Beam	No Messages	0.728043 PMM		WDA04	96
2150	C-75x45x2.3	Beam	No Messages	0.722466 PMM		WDA04	96
2151	C-75x45x2.3	Beam	No Messages	0.550516 PMM		WDA04	96
2152	C-75x45x2.3	Beam	No Messages	0.728757 PMM		WDA04	96
2153	C-75x45x2.3	Beam	No Messages	0.725876 PMM		WDA04	96
2154	C-75x45x2.3	Beam	No Messages	0.550513 PMM		WDA04	96
2155	C-75x45x2.3	Beam	No Messages	0.72896 PMM		WDA04	96
2156	C-75x45x2.3	Beam	No Messages	0.728806 PMM		WDA04	96
2157	C-75x45x2.3	Beam	No Messages	0.550516 PMM		WDA04	96
2158	C-75x45x2.3	Beam	No Messages	0.729092 PMM		WDA04	96
2159	C-75x45x2.3	Beam	No Messages	0.730199 PMM		WDA04	96
2160	C-75x45x2.3	Beam	No Messages	0.550516 PMM		WDA04	96
2161	C-75x45x2.3	Beam	No Messages	0.729064 PMM		WDA04	144
2162	C-75x45x2.3	Beam	No Messages	0.73006 PMM		WDA04	144

702	BOX-100x50x2	Brace	No Messages	0.350429 PMM		W0.6DB04	128.16
728	BOX-100x50x2	Brace	No Messages	0.351762 PMM		W0.6DB04	128.16
730	BOX-100x50x2	Brace	No Messages	0.367353 PMM		W0.6DA01	128.16
756	BOX-100x50x2	Brace	No Messages	0.596745 PMM		W0.6DB01	128.16
758	BOX-100x50x2	Brace	No Messages	0.59711 PMM		W0.6DB01	93.207
784	BOX-100x50x2	Brace	No Messages	0.353635 PMM		W0.6DA03	93.207
786	BOX-100x50x2	Brace	No Messages	0.342484 PMM		W0.6DB04	128.16
812	BOX-100x50x2	Brace	No Messages	0.339134 PMM		W0.6DB04	128.16
814	BOX-100x50x2	Brace	No Messages	0.351509 PMM		W0.6DA01	128.16
840	BOX-100x50x2	Brace	No Messages	0.352502 PMM		W0.6DA01	128.16
842	BOX-100x50x2	Brace	No Messages	0.346132 PMM		W0.6DA03	128.16
868	BOX-100x50x2	Brace	No Messages	0.353712 PMM		W0.6DA01	128.16
870	BOX-100x50x2	Brace	No Messages	0.354249 PMM		W0.6DA03	93.207
896	BOX-100x50x2	Brace	No Messages	0.356365 PMM		W0.6DA01	128.16
898	BOX-100x50x2	Brace	No Messages	0.348971 PMM		W0.6DA03	128.16
924	BOX-100x50x2	Brace	No Messages	0.597074 PMM		W0.6DB01	128.16
926	BOX-100x50x2	Brace	No Messages	0.585998 PMM		W0.6DB01	93.207
952	BOX-100x50x2	Brace	No Messages	0.35299 PMM		W0.6DA01	128.16
954	BOX-100x50x2	Brace	No Messages	0.341543 PMM		W0.6DB04	128.16
980	BOX-100x50x2	Brace	No Messages	0.341167 PMM		W0.6DB04	128.16
982	BOX-100x50x2	Brace	No Messages	0.342949 PMM		W0.6DB04	128.16
1008	BOX-100x50x2	Brace	No Messages	0.347375 PMM		W0.6DA03	128.16
1010	BOX-100x50x2	Brace	No Messages	0.348251 PMM		W0.6DA01	128.16
1036	BOX-100x50x2	Brace	No Messages	0.346789 PMM		W0.6DB04	128.16
1038	BOX-100x50x2	Brace	No Messages	0.354143 PMM		W0.6DA01	128.16
1064	BOX-100x50x2	Brace	No Messages	0.35282 PMM		W0.6DA03	128.16
1066	BOX-100x50x2	Brace	No Messages	0.357404 PMM		W0.6DA01	128.16
1092	BOX-100x50x2	Brace	No Messages	0.597818 PMM		W0.6DB01	128.16
1094	BOX-100x50x2	Brace	No Messages	0.595576 PMM		W0.6DB01	93.207
1120	BOX-100x50x2	Brace	No Messages	0.345237 PMM		W0.6DB04	93.207
1122	BOX-100x50x2	Brace	No Messages	0.345427 PMM		W0.6DB04	128.16
1148	BOX-100x50x2	Brace	No Messages	0.346061 PMM		W0.6DB04	128.16
1150	BOX-100x50x2	Brace	No Messages	0.344109 PMM		W0.6DB04	128.16
1176	BOX-100x50x2	Brace	No Messages	0.343861 PMM		W0.6DB04	128.16
1178	BOX-100x50x2	Brace	No Messages	0.353832 PMM		W0.6DA03	128.16
1204	BOX-100x50x2	Brace	No Messages	0.350326 PMM		W0.6DB04	128.16
1206	BOX-100x50x2	Brace	No Messages	0.352546 PMM		W0.6DA03	128.16
1232	BOX-100x50x2	Brace	No Messages	0.353942 PMM		W0.6DA01	93.207
1234	BOX-100x50x2	Brace	No Messages	0.356211 PMM		W0.6DA03	128.16
1260	BOX-100x50x2	Brace	No Messages	0.600657 PMM		W0.6DB01	128.16
1262	BOX-100x50x2	Brace	No Messages	0.59968 PMM		W0.6DB01	93.207
1288	BOX-100x50x2	Brace	No Messages	0.346992 PMM		W0.6DB04	93.207
1290	BOX-100x50x2	Brace	No Messages	0.360672 PMM		W0.6DA03	128.16
1316	BOX-100x50x2	Brace	No Messages	0.341198 PMM		W0.6DB04	128.16
1318	BOX-100x50x2	Brace	No Messages	0.354711 PMM		W0.6DA03	128.16
1344	BOX-100x50x2	Brace	No Messages	0.355455 PMM		W0.6DA03	128.16
1346	BOX-100x50x2	Brace	No Messages	0.344777 PMM		W0.6DB04	128.16
1372	BOX-100x50x2	Brace	No Messages	0.361143 PMM		W0.6DA03	128.16
1374	BOX-100x50x2	Brace	No Messages	0.346754 PMM		W0.6DB04	128.16
1400	BOX-100x50x2	Brace	No Messages	0.353785 PMM		W0.6DA03	128.16
1402	BOX-100x50x2	Brace	No Messages	0.354166 PMM		W0.6DB04	128.16
1428	BOX-100x50x2	Brace	No Messages	0.592747 PMM		W0.6DB01	128.16

2226	C-75x45x2.3	Column	No Messages	0.254936 PMM	WDA02	0
2227	C-75x45x2.3	Column	No Messages	0.254968 PMM	WDA02	87
2228	C-75x45x2.3	Column	No Messages	0.254914 PMM	WDA02	0
2229	C-75x45x2.3	Beam	No Messages	0.003254 Major Shear	W0.6DA02	45
2230	C-75x45x2.3	Beam	No Messages	0.003254 Major Shear	W0.6DA02	45
2231	C-75x45x2.3	Column	No Messages	0.257536 PMM	WDA02	87
2232	C-75x45x2.3	Column	No Messages	0.257482 PMM	WDA02	0
2233	C-75x45x2.3	Column	No Messages	0.257479 PMM	WDA02	87
2234	C-75x45x2.3	Column	No Messages	0.257425 PMM	WDA02	0
2235	C-75x45x2.3	Beam	No Messages	0.003254 Major Shear	W0.6DA02	45
2236	C-75x45x2.3	Beam	No Messages	0.003254 Major Shear	W0.6DA02	45
2237	C-75x45x2.3	Column	No Messages	0.258347 PMM	WDA02	87
2238	C-75x45x2.3	Column	No Messages	0.258293 PMM	WDA02	0
2239	C-75x45x2.3	Column	No Messages	0.258722 PMM	WDA02	87
2240	C-75x45x2.3	Column	No Messages	0.258667 PMM	WDA02	0
2241	C-75x45x2.3	Beam	No Messages	0.003254 Major Shear	W0.6DA02	45
2242	C-75x45x2.3	Beam	No Messages	0.003254 Major Shear	W0.6DA02	0
2243	C-75x45x2.3	Column	No Messages	0.259583 PMM	WDA02	87
2244	C-75x45x2.3	Column	No Messages	0.259528 PMM	WDA02	0
2245	C-75x45x2.3	Column	No Messages	0.260084 PMM	WDA02	87
2246	C-75x45x2.3	Column	No Messages	0.260033 PMM	WDA02	0
2247	C-75x45x2.3	Beam	No Messages	0.003254 Major Shear	W0.6DA02	0
2248	C-75x45x2.3	Beam	No Messages	0.003254 Major Shear	W0.6DA02	45
2249	C-75x45x2.3	Column	No Messages	0.260933 PMM	WDA02	87
2250	C-75x45x2.3	Column	No Messages	0.260878 PMM	WDA02	0
2251	C-75x45x2.3	Column	No Messages	0.261016 PMM	WDA02	87
2252	C-75x45x2.3	Column	No Messages	0.260961 PMM	WDA02	0
2253	C-75x45x2.3	Beam	No Messages	0.003254 Major Shear	W0.6DA02	45
2254	C-75x45x2.3	Beam	No Messages	0.003254 Major Shear	W0.6DA02	0
2255	C-75x45x2.3	Column	No Messages	0.263687 PMM	WDA02	87
2256	C-75x45x2.3	Column	No Messages	0.263633 PMM	WDA02	0
2257	C-75x45x2.3	Column	No Messages	0.263292 PMM	WDA02	87
2258	C-75x45x2.3	Column	No Messages	0.263237 PMM	WDA02	0
2259	C-75x45x2.3	Beam	No Messages	0.003254 Major Shear	W0.6DA02	0
2260	C-75x45x2.3	Beam	No Messages	0.003254 Major Shear	W0.6DA02	45
2261	C-75x45x2.3	Column	No Messages	0.263884 PMM	WDA02	87
2262	C-75x45x2.3	Column	No Messages	0.263829 PMM	WDA02	0
2263	C-75x45x2.3	Column	No Messages	0.263315 PMM	WDA02	87
2264	C-75x45x2.3	Column	No Messages	0.263261 PMM	WDA02	0
2	BOX-100x50x2	Brace	No Messages	0.236587 PMM	W0.6DA01	23.302
19	BOX-100x50x2	Brace	No Messages	0.173365 PMM	W0.6DA01	233.018
30	BOX-100x50x2	Brace	No Messages	0.298562 PMM	W0.6DB04	233.018
41	BOX-100x50x2	Brace	No Messages	0.360743 PMM	W0.6A03	128.16
72	BOX-100x50x2	Beam	No Messages	0.546596 PMM	W0.6DA01	200
75	BOX-100x50x2	Beam	No Messages	0.486471 PMM	W0.6DA01	200
77	BOX-100x50x2	Beam	No Messages	0.436441 PMM	W0.6DA01	200
79	BOX-100x50x2	Beam	No Messages	0.205707 PMM	W0.6DB04	200
82	BOX-100x50x2	Beam	No Messages	0.309428 PMM	W0.6DB04	200
84	BOX-100x50x2	Beam	No Messages	0.43146 PMM	W0.6DA03	200
86	BOX-100x50x2	Beam	No Messages	0.509794 PMM	W0.6DA03	200
89	BOX-100x50x2	Beam	No Messages	0.586554 PMM	W0.6DA03	200
91	BOX-100x50x2	Beam	No Messages	0.26309 PMM	W0.6DA02	200

32	C-75x45x2.3	Beam	No Messages	0.395444 PMM	WDB02	100
33	C-75x45x2.3	Beam	No Messages	0.395215 PMM	WDB02	100
34	C-75x45x2.3	Beam	No Messages	0.415842 PMM	WDB02	100
35	C-75x45x2.3	Beam	No Messages	0.319147 PMM	WDB02	100
36	C-75x45x2.3	Beam	No Messages	0.397432 PMM	WDB02	100
37	C-75x45x2.3	Beam	No Messages	0.395944 PMM	WDB02	100
38	C-75x45x2.3	Beam	No Messages	0.413025 PMM	WDB02	100
39	C-75x45x2.3	Beam	No Messages	0.320968 PMM	WDB02	100
40	C-75x45x2.3	Beam	No Messages	0.39523 PMM	WDB02	100
42	C-75x45x2.3	Beam	No Messages	0.395482 PMM	WDB02	100
43	C-75x45x2.3	Beam	No Messages	0.415872 PMM	WDB02	100
44	C-75x45x2.3	Beam	No Messages	0.319116 PMM	WDB02	100
45	C-75x45x2.3	Beam	No Messages	0.396808 PMM	WDB02	100
46	C-75x45x2.3	Beam	No Messages	0.395752 PMM	WDB02	100
47	C-75x45x2.3	Beam	No Messages	0.414689 PMM	WDB02	100
48	C-75x45x2.3	Beam	No Messages	0.3208 PMM	WDB02	100
49	C-75x45x2.3	Beam	No Messages	0.395084 PMM	WDB02	100
50	C-75x45x2.3	Beam	No Messages	0.395337 PMM	WDB02	100
51	C-75x45x2.3	Beam	No Messages	0.416404 PMM	WDB02	100
58	C-75x45x2.3	Beam	No Messages	0.319085 PMM	WDB02	100
1069	C-75x45x2.3	Beam	No Messages	0.396655 PMM	WDB02	100
1070	C-75x45x2.3	Beam	No Messages	0.395628 PMM	WDB02	100
1071	C-75x45x2.3	Beam	No Messages	0.414139 PMM	WDB02	100
1072	C-75x45x2.3	Beam	No Messages	0.320663 PMM	WDB02	100
1073	C-75x45x2.3	Beam	No Messages	0.395376 PMM	WDB02	100
1074	C-75x45x2.3	Beam	No Messages	0.395333 PMM	WDB02	100
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1093	C-75x45x2.3	Beam	No Messages	0.396004 PMM	WDB02	100
1095	C-75x45x2.3	Beam	No Messages	0.395262 PMM	WDB02	100
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1100	C-75x45x2.3	Beam	No Messages	0.394867 PMM	WDB02	100
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1130	C-75x45x2.3	Beam	No Messages	0.292687 PMM	WDB04	100
1131	C-75x45x2.3	Beam	No Messages	0.304743 PMM	WDB04	100
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1153	C-75x45x2.3	Beam	No Messages	0.304668 PMM	WDB04	100
1154	C-75x45x2.3	Beam	No Messages	0.239009 PMM	WDB04	100

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96	BOX-100x50x2	Beam	No Messages	0.135678 PMM	W0.6DA01	200
98	BOX-100x50x2	Beam	No Messages	0.125416 PMM	W0.6DA03	200
100	BOX-100x50x2	Beam	No Messages	0.12101 PMM	W0.6DA01	200
103	BOX-100x50x2	Beam	No Messages	0.125499 PMM	W0.6DA01	200
105	BOX-100x50x2	Beam	No Messages	0.132612 PMM	W0.6DA01	200
107	BOX-100x50x2	Beam	No Messages	0.279027 PMM	W0.6DA04	200
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124	BOX-100x50x2	Beam	No Messages	0.161957 PMM	W0.6DB04	200
125	BOX-100x50x2	Beam	No Messages	0.152111 PMM	W0.6DB04	200
126	BOX-100x50x2	Beam	No Messages	0.213687 PMM	W0.6DB04	200
127	BOX-100x50x2	Beam	No Messages	0.433706 PMM	W0.6DA03	200
128	BOX-100x50x2	Beam	No Messages	0.25856 PMM	W0.6DA02	200
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3	C-75x45x2.3	Beam	No Messages	0.320007 PMM	WDB02	100
4	C-75x45x2.3	Beam	No Messages	0.394826 PMM	WDB02	100
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13	C-75x45x2.3	Beam	No Messages	0.318973 PMM	WDB02	100
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1179	C-75x45x2.3	Beam	No Messages	0.2405 PMM	WDB04	100
1181	C-75x45x2.3	Beam	No Messages	0.293545 PMM	WDB04	100
1182	C-75x45x2.3	Beam	No Messages	0.292757 PMM	WDB04	100
1183	C-75x45x2.3	Beam	No Messages	0.305401 PMM	WDB04	100
1184	C-75x45x2.3	Beam	No Messages	0.240601 PMM	WDB04	100
1185	C-75x45x2.3	Beam	No Messages	0.293452 PMM	WDB04	100
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1210	C-75x45x2.3	Beam	No Messages	0.23958 PMM	WDB04	100
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1233	C-75x45x2.3	Beam	No Messages	0.305758 PMM	WDB04	100
1235	C-75x45x2.3	Beam	No Messages	0.239866 PMM	WDB04	100
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1238	C-75x45x2.3	Beam	No Messages	0.292623 PMM	WDB04	100
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1263	C-75x45x2.3	Beam	No Messages	0.293257 PMM	WDB04	100
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1266	C-75x45x2.3	Beam	No Messages	0.240231 PMM	WDB04	100
1267	C-75x45x2.3	Beam	No Messages	0.29323 PMM	WDB04	100
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1269	C-75x45x2.3	Beam	No Messages	0.30549 PMM	WDB04	100
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1271	C-75x45x2.3	Beam	No Messages	0.29322 PMM	WDB04	100
1272	C-75x45x2.3	Beam	No Messages	0.292911 PMM	WDB04	100
1289	C-75x45x2.3	Beam	No Messages	0.306156 PMM	WDB04	100
1291	C-75x45x2.3	Beam	No Messages	0.240846 PMM	WDB04	100
1293	C-75x45x2.3	Beam	No Messages	0.293414 PMM	WDB04	100
1294	C-75x45x2.3	Beam	No Messages	0.293404 PMM	WDB04	100
1295	C-75x45x2.3	Beam	No Messages	0.306012 PMM	WDB04	100
1296	C-75x45x2.3	Beam	No Messages	0.239898 PMM	WDB04	100

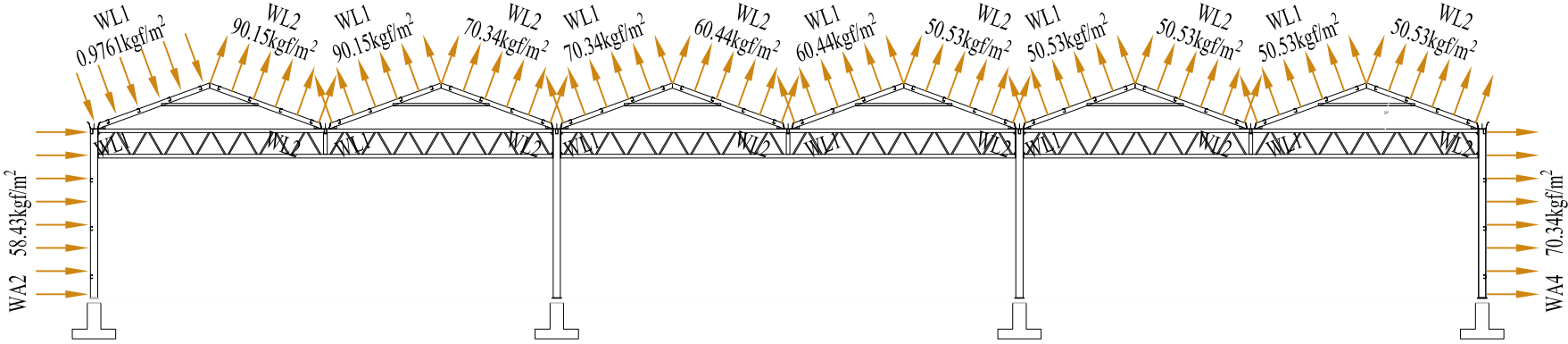
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1298	C-75x45x2.3	Beam	No Messages	0.292567 PMM	WDB04	100
1299	C-75x45x2.3	Beam	No Messages	0.305683 PMM	WDB04	100
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559	BOX-150x75x4	Column	No Messages	0.227367 PMM	W0.6DA02	0
1317	BOX-150x75x4	Column	No Messages	0.238887 PMM	W0.6DA02	0
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1323	BOX-150x75x4	Column	No Messages	0.232355 PMM	W0.6DA02	0
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1327	BOX-150x75x4	Column	No Messages	0.277293 PMM	WDB01	42
1345	BOX-75X150X4	Column	No Messages	0.535669 PMM	W0.6DB04	0
1349	BOX-75X150X4	Column	No Messages	0.293974 PMM	W0.6DB01	0
1351	BOX-75X150X4	Column	No Messages	0.332774 PMM	W0.6DB04	350
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1373	BOX-75X150X4	Column	No Messages	0.29584 PMM	W0.6DB01	0
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1379	BOX-75X150X4	Column	No Messages	0.398548 PMM	W0.6DA01	297
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1401	BOX-75X150X4	Column	No Messages	0.397992 PMM	W0.6DB04	350
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1489	BOX-75X150X4	Column	No Messages	0.35015 PMM	W0.6DB04	350
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1493	BOX-150x75x4	Column	No Messages	0.333658 PMM	WDB03	0
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1517	BOX-150x75x4	Column	No Messages	0.362861 PMM	W0.6DA04	0
1519	BOX-150x75x4	Column	No Messages	0.348855 PMM	W0.6DA04	0
1521	BOX-150x75x4	Column	No Messages	0.345522 PMM	W0.6DA04	0
1523	BOX-150x75x4	Column	No Messages	0.323563 PMM	WDB01	0
1	SBI-COMB BEAM	Beam	No Messages	0.412193 PMM	W0.6DA02	239.999
5	SBI-COMB BEAM	Beam	No Messages	0.551414 PMM	W0.6DA02	240.001
6	SBI-COMB BEAM	Beam	No Messages	0.545248 PMM	W0.6DA02	0
7	SBI-COMB BEAM	Beam	No Messages	0.511653 PMM	W0.6DA02	240.001
8	SBI-COMB BEAM	Beam	No Messages	0.536203 PMM	W0.6DA02	0
9	SBI-COMB BEAM	Beam	No Messages	0.536026 PMM	W0.6DA02	240.001
10	SBI-COMB BEAM	Beam	No Messages	0.537712 PMM	W0.6DA02	0

67	SBI-COMB BEAM	Beam	No Messages	0.538615 PMM	W0.6DA02	240.001
69	SBI-COMB BEAM	Beam	No Messages	0.515776 PMM	W0.6DA02	0
71	SBI-COMB BEAM	Beam	No Messages	0.553346 PMM	W0.6DA02	240.001
73	SBI-COMB BEAM	Beam	No Messages	0.564802 PMM	W0.6DA02	0
74	SBI-COMB BEAM	Beam	No Messages	0.425741 PMM	W0.6DA02	0
97	SBI-COMB BEAM	Beam	No Messages	0.927264 PMM	W0.6DB04	480
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102	SBI-COMB BEAM	Beam	No Messages	0.770359 PMM	W0.6DA03	480
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120	SBI-COMB BEAM	Beam	No Messages	0.856819 PMM	W0.6DA01	480
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122	SBI-COMB BEAM	Beam	No Messages	0.880793 PMM	W0.6DA03	0
755	SBI-COMB BEAM	Beam	No Messages	0.93954 PMM	W0.6DB04	0
783	SBI-COMB BEAM	Beam	No Messages	0.899848 PMM	W0.6DA03	480
1091	SBI-COMB BEAM	Beam	No Messages	0.943862 PMM	W0.6DB04	0
1119	SBI-COMB BEAM	Beam	No Messages	0.903814 PMM	W0.6DA01	480
1147	SBI-COMB BEAM	Beam	No Messages	0.935866 PMM	W0.6DA01	480
1175	SBI-COMB BEAM	Beam	No Messages	0.910476 PMM	W0.6DA03	0
1324	SBI-COMB BEAM	Beam	No Messages	0.924431 PMM	W0.6DB04	0
1326	SBI-COMB BEAM	Beam	No Messages	0.883856 PMM	W0.6DA03	480
1328	SBI-COMB BEAM	Beam	No Messages	0.936821 PMM	W0.6DA03	480
1380	SBI-COMB BEAM	Beam	No Messages	0.933982 PMM	W0.6DB04	0
1382	SBI-COMB BEAM	Beam	No Messages	0.902091 PMM	W0.6DA01	480
1384	SBI-COMB BEAM	Beam	No Messages	0.948969 PMM	W0.6DA01	480
1399	SBI-COMB BEAM	Beam	No Messages	0.920075 PMM	W0.6DA03	0
1431	SBI-COMB BEAM	Beam	No Messages	0.881595 PMM	W0.6DB04	480
1434	SBI-COMB BEAM	Beam	No Messages	0.837706 PMM	W0.6DB04	0
1436	SBI-COMB BEAM	Beam	No Messages	0.791788 PMM	W0.6DB04	0
1438	SBI-COMB BEAM	Beam	No Messages	0.739127 PMM	W0.6DA03	480
1440	SBI-COMB BEAM	Beam	No Messages	0.78292 PMM	W0.6DA03	480
1455	SBI-COMB BEAM	Beam	No Messages	0.810554 PMM	W0.6DA03	0
1487	SBI-COMB BEAM	Beam	No Messages	0.423743 PMM	W0.6DA04	239.999
1490	SBI-COMB BEAM	Beam	No Messages	0.562851 PMM	W0.6DA04	240.001
1492	SBI-COMB BEAM	Beam	No Messages	0.556677 PMM	W0.6DA04	0
1494	SBI-COMB BEAM	Beam	No Messages	0.518191 PMM	W0.6DA04	240.001
1496	SBI-COMB BEAM	Beam	No Messages	0.541134 PMM	W0.6DA04	0
1511	SBI-COMB BEAM	Beam	No Messages	0.539158 PMM	W0.6DA04	240.001
1515	SBI-COMB BEAM	Beam	No Messages	0.540541 PMM	W0.6DA04	0
1518	SBI-COMB BEAM	Beam	No Messages	0.543216 PMM	W0.6DA04	240.001
1520	SBI-COMB BEAM	Beam	No Messages	0.521813 PMM	W0.6DA04	0
1522	SBI-COMB BEAM	Beam	No Messages	0.563802 PMM	W0.6DA04	240.001
1524	SBI-COMB BEAM	Beam	No Messages	0.575429 PMM	W0.6DA04	0
1539	SBI-COMB BEAM	Beam	No Messages	0.436299 PMM	W0.6DA04	0

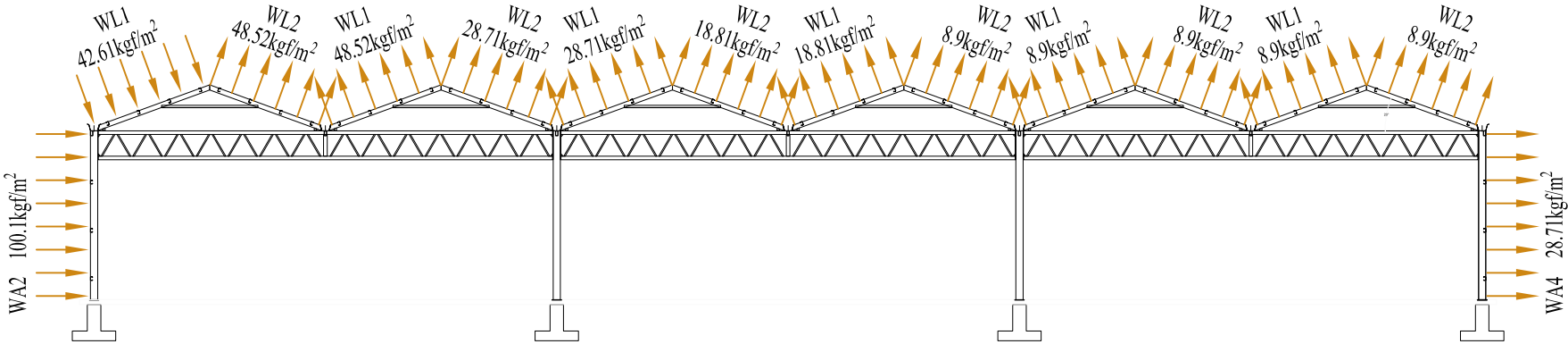
附件3 內力及外力輸出

名稱	方向性	WA1	WA2	WA3	WA4	WL1	WL2	風力組合
WCASEA1	X(內壓為正)	-58.73		68.32		90.41	90.41	WCASEA1=WA1+WA3+WL1+WL2
WCASEA2	X(內壓為負)	-100.4		26.69		48.78	48.78	WCASEA2=WA1+WA3+WL1+WL2
WCASEB1	Y(內壓為正)		-58.43		70.34	依風力計算結果	依風力計算結果	WCASEB1=WA2+WA4+WL1+WL2
WCASEB2	Y(內壓為負)		-100.1		28.71	依風力計算結果	依風力計算結果	WCASEB2=WA2+WA4+WL1+WL2

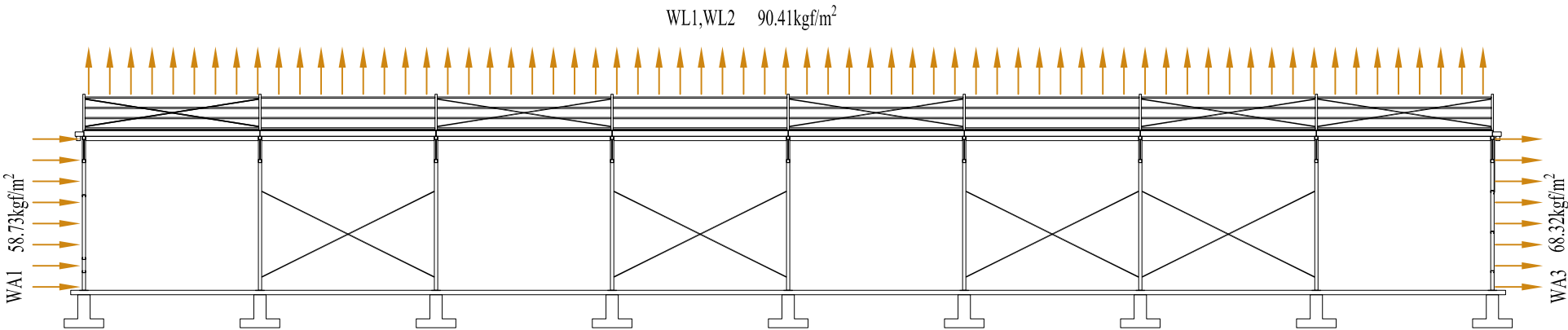
WA1為1-LINE風壓、WA2為A-LINE風壓、WA3為9-LINE風壓、WA4為M-LINE風壓，WL1及WL2則為屋頂風壓



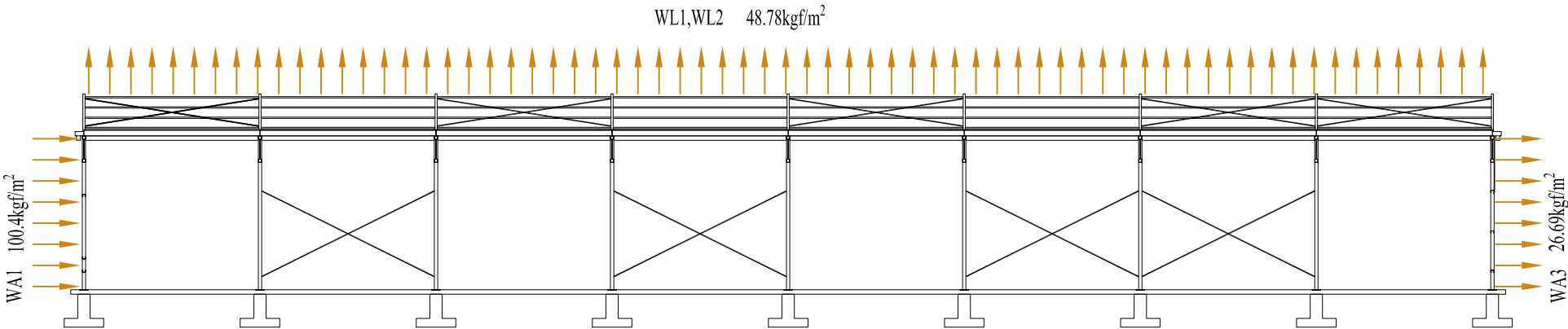
橫向構架風力示意圖一(內壓為正－WACASEB1)



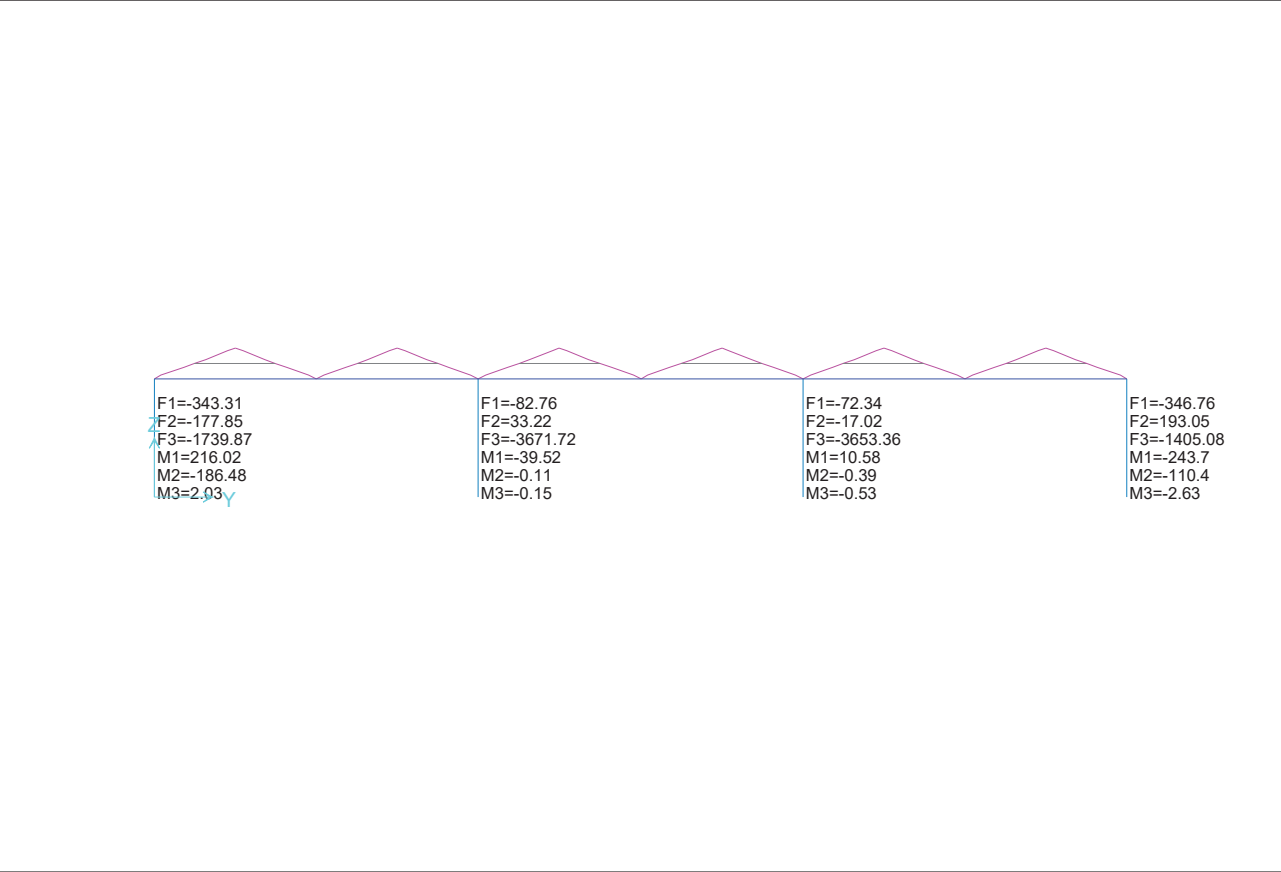
橫向構架風力示意圖二(內壓為負－WACASEB2)



縱向構架風力示意圖一(內壓為正－WACASEA1)

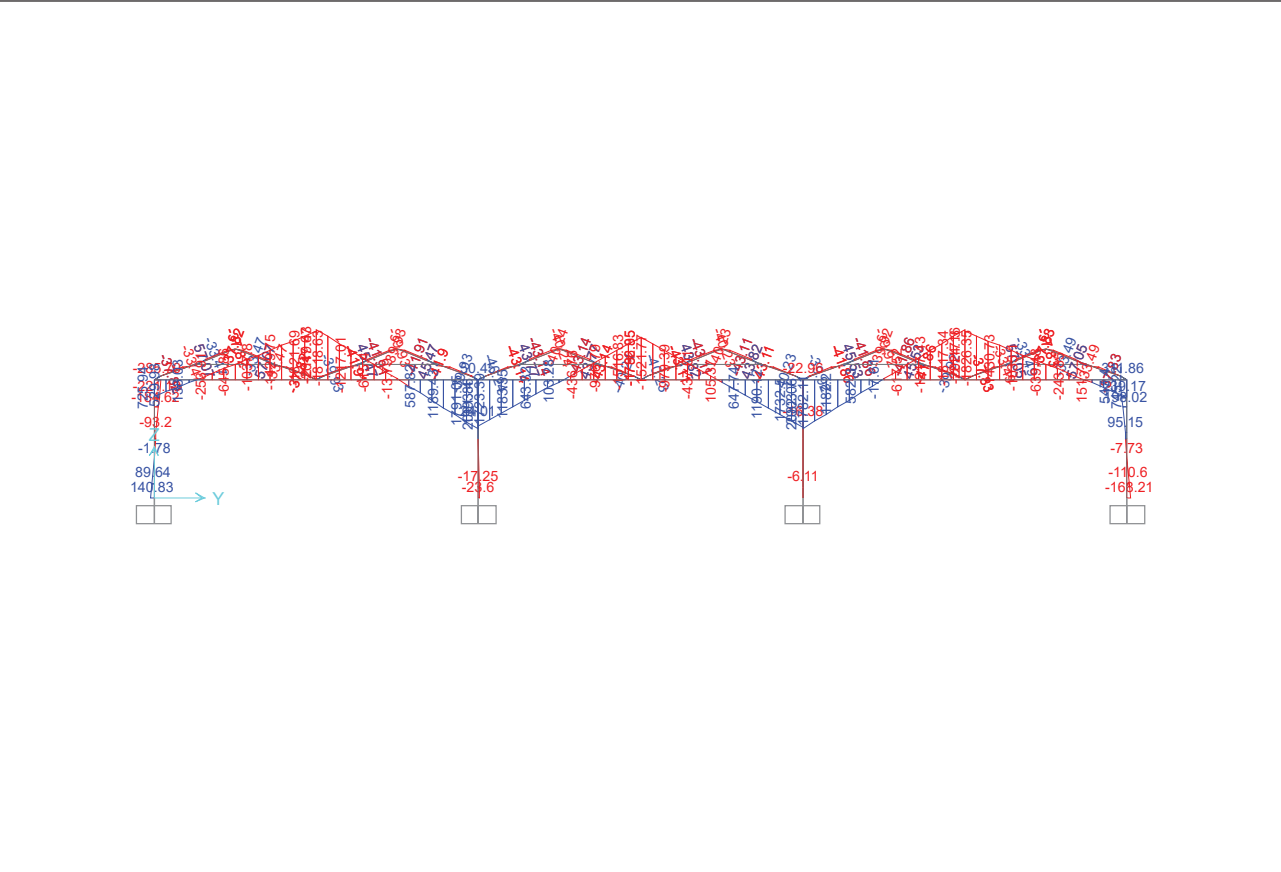


縱向構架風力示意圖一(內壓為負－WACASEA2)



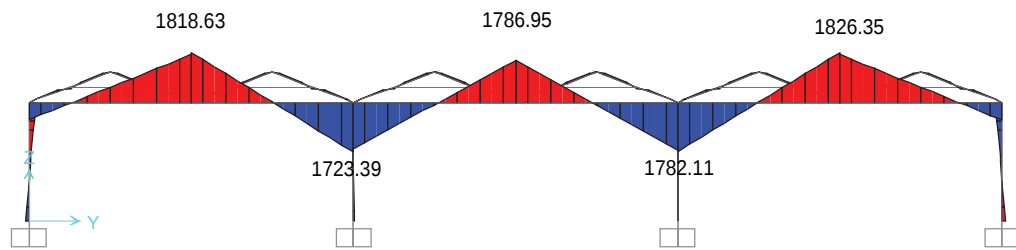
Joint Reactions (WACASEA1)

Kgf, m, C



Moment 3-3 Diagram (WACASEA1)

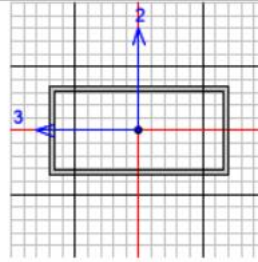
Kgf, m, C



Moment 3-3 Diagram (WACASEA1) Kgf, m, C

File

Units Kgf, cm, C



AISC360-05/IBC2006 STEEL SECTION CHECK (Summary for Combo and Station) Units : Kgf, cm, C

Frame : 503 X Mid: 0. Combo: W0.6DB04 Design Type: Column
Length: 350. Y Mid: 0. Shape: BOX-150x75x4 Frame Type: SMF
Loc : 350. Z Mid: 175. Class: Non-Compact Princpl Rot: 90. degrees

Provision: ASD Analysis: Direct Analysis
D/C Limit=0.95 2nd Order: General 2nd Order Reduction: Tau-b Fixed
AlphaPr/Py=0.018 AlphaPr/Pe=0.002 Tau_b=1. EA factor=0.8 EI factor=0.8

OmegaB=1.67 OmegaC=1.67 OmegaTY=1.67 OmegaTF=2.
OmegaV=1.67 OmegaV-RI=1.5 OmegaVT=1.67

A=17.36 I33=171.441 r33=3.143 S33=45.718 Av3=12.
J=396.144 I22=510.706 r22=5.424 S22=68.094 Av2=6.
Ixy=0. Imax=510.706 rmax=5.424 Smax=68.094
Rot= 90. deg Imin=171.441 rmin=3.143 Smin=45.718
E=2040000. Fy=2520. Ry=1.587 z33=51.578
RLLF=1. Fu=4592. z22=84.128

HSS Welding: ERW Reduce HSS Thickness? No

STRESS CHECK FORCES & MOMENTS (Combo W0.6DB04)

Location	Pr	Mr33	Mr22	Vr2	Vr3	Tr
350.	505.618	49.791	-33594.445	2.832	195.787	-65.763

PMM DEMAND/CAPACITY RATIO (H1.2,H1-1b)

D/C Ratio: 0.275 = 0.01 + 0. + 0.265
= (1/2)(Pr/Pc) + (Mr33/Mc33) + (Mr22/Mc22)

AXIAL FORCE & BIAXIAL MOMENT DESIGN (H1.2,H1-1b)

Factor	L	K1	K2	B1	B2	Cm
Major Bending	0.237	1.	1.	1.	1.	1.
Minor Bending	0.377	1.	1.	1.	1.	1.

	Lltb	Kltb	Cb
LTB	0.377	1.	1.851

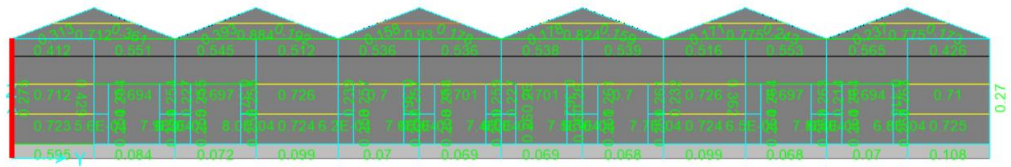
	Pr	Pnc/Omega	Pnt/Omega
	Force	Capacity	Capacity
Axial	505.618	25255.918	26195.928

	Mr	Mn/Omega	Mn/Omega
	Moment	Capacity	No LTB
Major Moment	49.791	73812.56	73812.56
Minor Moment	-33594.445	126947.641	

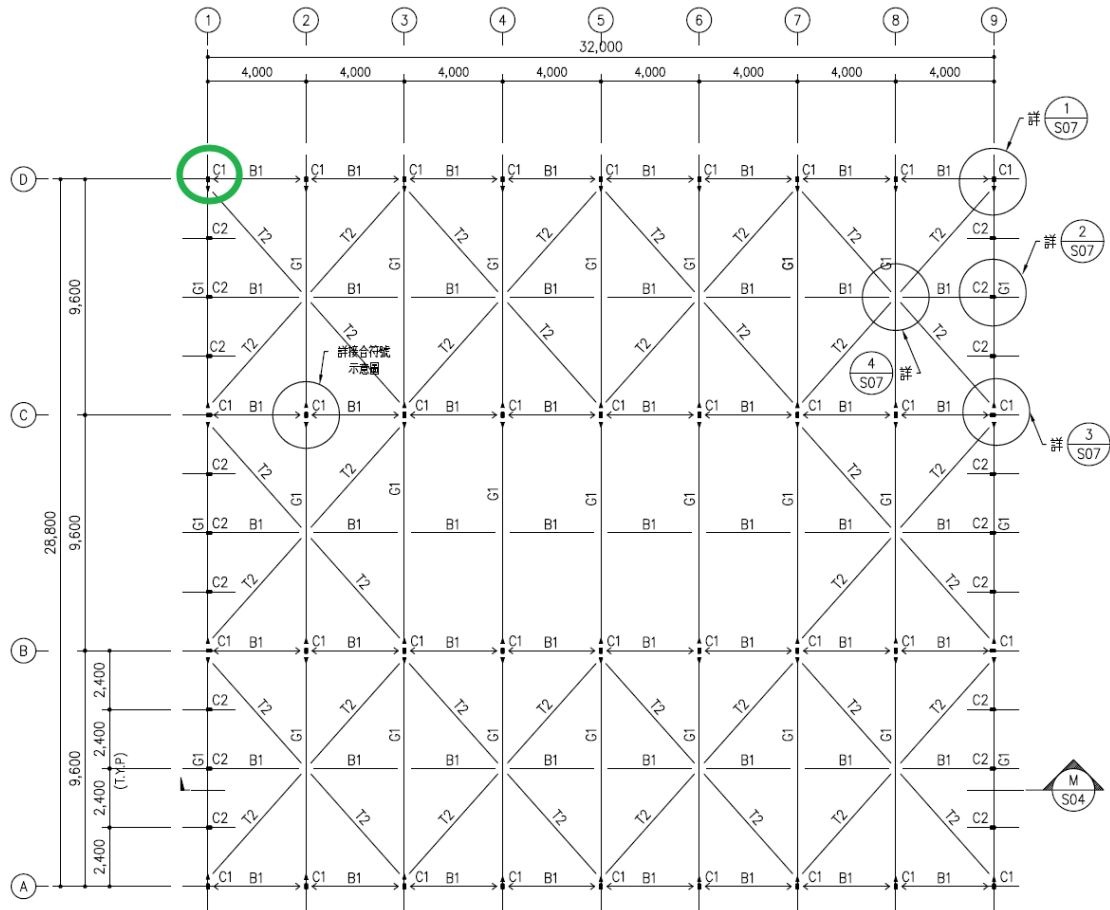
	Tr	Tn	Tn/Omega
	Moment	Capacity	Capacity
Torsion	-65.763	125013.337	74858.286

SHEAR CHECK

	Vr	Vn/Omega	Stress	Status
	Force	Capacity	Ratio	Check
Major Shear	2.832	4563.162	0.001	OK
Minor Shear	195.787	9995.497	0.02	OK



山牆立柱應力比計算(1-LINE)



檢討風力WACASEA1

TABLE: Joint Reactions								
Joint	OutputCase	CaseType	F1	F2	F3	M1	M2	M3
Text	Text	Text	Kgf	Kgf	Kgf	Kgf-m	Kgf-m	Kgf-m
1	WACASEA1	Combinat	-274.5	-15.47	-436.24	-1.02	-158.28	16.38
9	WACASEA1	Combinat	-164.61	-4.37	-924.55	0.52	-235.71	-1.45
11	WACASEA1	Combinat	-178.83	-5.41	-567.77	0.63	-232.64	1.64
13	WACASEA1	Combinat	-164.78	-7.54	-801.61	0.89	-229.93	0.17
15	WACASEA1	Combinat	-179.01	-9.47	-568.41	1.12	-223.55	-1.32
17	WACASEA1	Combinat	-164.66	-10.66	-922.61	1.25	-217.75	1.97
19	WACASEA1	Combinat	-240.32	-50.45	-840.99	-2.65	-87.49	-22.42
133	WACASEA1	Combinat	-331.33	-121.89	-1778.2	140.83	-180.15	1.92
137	WACASEA1	Combinat	-82.67	21.16	-3645.1	-23.6	-0.19	-0.38
141	WACASEA1	Combinat	-72.51	-5.27	-3628	-4.53	-0.45	-0.31
145	WACASEA1	Combinat	-335.38	137.16	-1454.3	-168.21	-107.43	-2.63
147	WACASEA1	Combinat	-360.42	-162.29	-1531.6	189.81	-195.8	1.26
151	WACASEA1	Combinat	-61.81	33.85	-3451.5	-32.7	10.64	-0.15
155	WACASEA1	Combinat	-51.26	-23.79	-3469.6	15.1	10.42	-0.49
159	WACASEA1	Combinat	-242.87	171.53	-1232.6	-206.55	-82.37	-1.8
161	WACASEA1	Combinat	-385.59	-169.89	-1232.2	195.09	-198.27	0.8
165	WACASEA1	Combinat	-82.17	36.5	-3834	-35.08	0.01078	0.03341
169	WACASEA1	Combinat	-71.16	-34.15	-3809.9	31.14	-0.13	-0.7
173	WACASEA1	Combinat	-251.58	172.17	-1892.5	-199.13	-83.69	-1.36
175	WACASEA1	Combinat	-379.96	-173.64	-1911.6	206.63	-196.48	0.42
179	WACASEA1	Combinat	-62.69	32.43	-3514.4	-26.86	10.34	0.16
183	WACASEA1	Combinat	-52.34	-32.14	-3537.1	26.49	9.97	-0.83
187	WACASEA1	Combinat	-237.82	174.47	-1213.8	-207.4	-79.9	-0.98
189	WACASEA1	Combinat	-375.14	-169.77	-1174.9	198.77	-194.28	0.1
193	WACASEA1	Combinat	-59.23	29.73	-3750.5	-24.22	5.22	0.29
197	WACASEA1	Combinat	-55.93	-36.97	-3730.5	37.24	3.25	-0.95
201	WACASEA1	Combinat	-256.19	163.28	-1888.2	-186.74	-84.92	-0.66
203	WACASEA1	Combinat	-360.76	-174.79	-2001	212.05	-190.26	-0.45
207	WACASEA1	Combinat	-190.24	20.6	-3696.9	-10.82	-17.22	0.44
211	WACASEA1	Combinat	-164.54	-30.66	-3701.8	28.8	-14.57	-1.1
215	WACASEA1	Combinat	-247.14	166.05	-1241.9	-195.33	-83.34	-0.13
217	WACASEA1	Combinat	-340.79	-134.36	-1044.5	166.39	-181.63	-1.06
221	WACASEA1	Combinat	19.88	6.71	-3200.5	4.49	31.17	0.55
225	WACASEA1	Combinat	23.4	-25.38	-3213.3	28.66	29.31	-1.21
229	WACASEA1	Combinat	-266.4	116.68	-1798.2	-134.36	-89.61	0.44
231	WACASEA1	Combinat	-330.88	-4.37	-400.03	22.49	-168.19	44.58
233	WACASEA1	Combinat	-386.58	-2.18	-1114.9	7.75	-323.63	-4.85
235	WACASEA1	Combinat	-395.22	-3.22	-692.74	8	-351.18	1.1
237	WACASEA1	Combinat	-391.69	-4.64	-975.94	8.26	-340	-0.27
239	WACASEA1	Combinat	-392.16	-6.09	-691.43	8.52	-340.32	-1.68
241	WACASEA1	Combinat	-380.26	-7.25	-1117.5	8.8	-301.3	4.75
243	WACASEA1	Combinat	-295.43	-23.3	13.34	26.59	-94.67	-48.19
313	WACASEA1	Combinat	-176.39	-3.53	54.94	0.44	-372.72	0.22

側向力檢核				
	高	長	面風壓	側向力
WA1	3.75	28.8	100.4	10843.2
WA2	3.75	28.8	26.69	2882.52
				13725.72

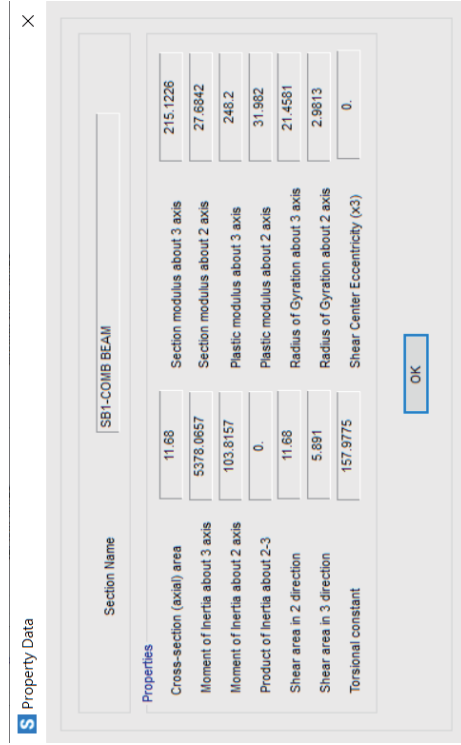
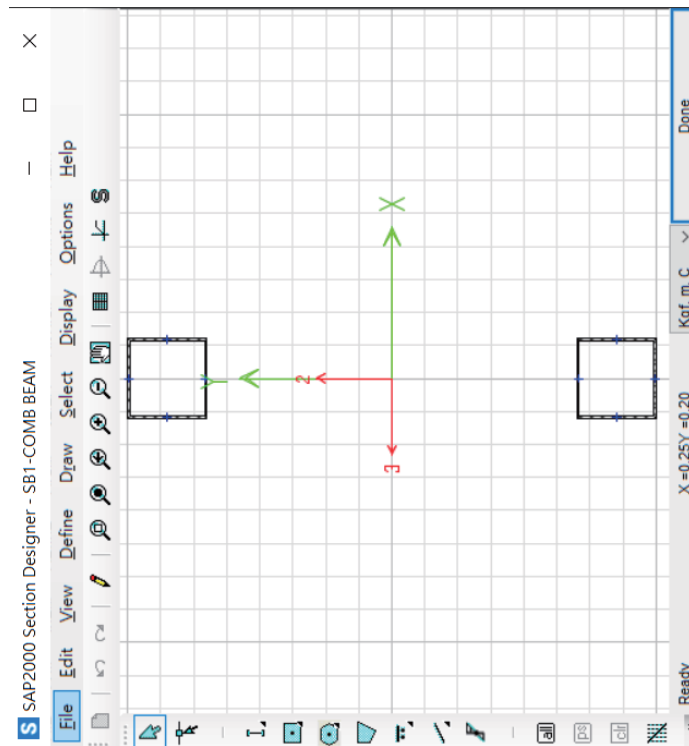
SAP2000分析所得基座側向力為12897.8 kgf。
經計算側向風力為13725.72 kgf。
兩者計算結果數值相當。

315	WACASEA1	Combinat	-173.84	-5.73	-99.5	0.66	-328.32	-1.17
317	WACASEA1	Combinat	-159.73	-6.69	-71.78	0.79	-320.37	1
319	WACASEA1	Combinat	-159.79	-8.41	-71.03	0.98	-316.72	-0.49
321	WACASEA1	Combinat	-173.73	-9.14	-100.67	1.09	-316.89	1.68
323	WACASEA1	Combinat	-174.55	-10.25	71.43	1.24	-353.85	0.28
325	WACASEA1	Combinat	-441.48	-1.76	39.35	7.66	-525.74	-8.71
327	WACASEA1	Combinat	-420.7	-2.62	-117.61	7.87	-464.11	3.57
329	WACASEA1	Combinat	-426.2	-3.91	-118.47	8.13	-480.68	-1.18
331	WACASEA1	Combinat	-424.91	-5.38	-119.13	8.38	-476.25	0.27
333	WACASEA1	Combinat	-416.63	-6.74	-115.79	8.66	-450.28	-4.51
335	WACASEA1	Combinat	-432.87	-7.77	23.8	8.93	-503.13	7.38
337	WACASEA1	Combinat	127.05	-1.41	-25.86	0	0	0
353	WACASEA1	Combinat	-22.86	1.55	-25.85	0	0	0
355	WACASEA1	Combinat	-27.42	2.04	-26.26	0	0	0
357	WACASEA1	Combinat	-19.6	2.2	-26.41	0	0	0
359	WACASEA1	Combinat	-20.07	2.07	-26.41	0	0	0
361	WACASEA1	Combinat	-20.49	2.08	-26.4	0	0	0
363	WACASEA1	Combinat	-20.5	1.97	-26.43	0	0	0
365	WACASEA1	Combinat	-19.6	1.32	-26.38	0	0	0
367	WACASEA1	Combinat	-19.91	-0.64	-25.65	0	0	0
1525	WACASEA1	Combinat	-123.94	-1.95	-26.47	0	0	0
1526	WACASEA1	Combinat	-121.16	-2.15	-26.29	0	0	0
1527	WACASEA1	Combinat	-115.08	-2.04	-26.43	0	0	0
1528	WACASEA1	Combinat	-115.06	-2.1	-26.41	0	0	0
1529	WACASEA1	Combinat	-116.2	-2.01	-26.45	0	0	0
1530	WACASEA1	Combinat	-116.92	-1.41	-26.39	0	0	0
1531	WACASEA1	Combinat	-114.04	0.48	-25.54	0	0	0
			-12897.8					

附件4 力霸型大梁檢討

力霸型大梁桿件模擬方式

力霸型大梁於 SAP2000 中採用 Section Designer 建置。



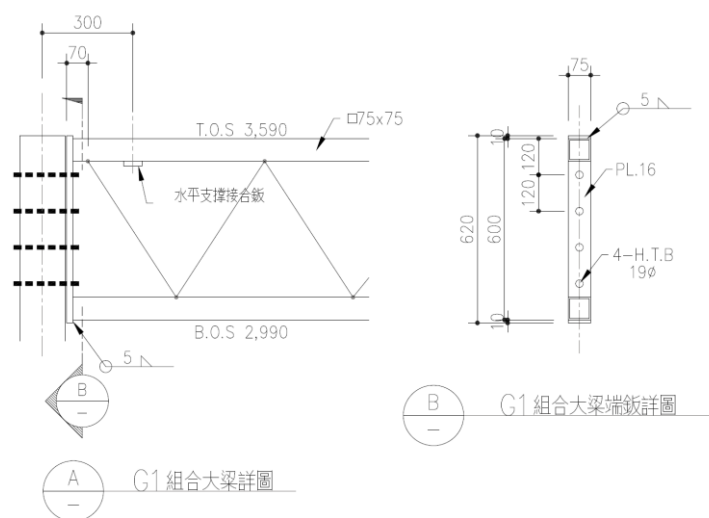
斷面性質圖



力霸型大梁採線元素模擬

大梁接頭螺栓檢核

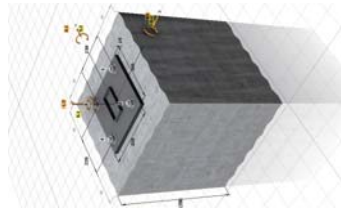
	P	V2	V3	T	M2	M3
	Tonf	Tonf	Tonf	Tonf-cm	Tonf-cm	Tonf-cm
W0.6DB03	3.535	-0.2456	-0.0006849	-0.03	-0.009409	45.184
W0.6DB04	-1.8308	0.5214	0.0006988	-0.033	0.105	60.119
W0.6DB04	-1.1101	1.0707	0.00021	0.012	-0.047	-255.829
W0.6DB03	-1.1101	-1.0707	-0.0002106	-0.016	-0.047	-255.828
WDA02	-0.1627	0.11	0.5658	0.34	53.429	19.781
WDA01	-0.2258	-0.1282	-0.56	-0.402	-51.596	-22.429
W0.6DA01	0.6809	0.3989	-0.3712	11.054	-66.298	13.02
W0.6DA02	0.298	-0.3707	0.3407	-10.958	59.228	-12.121
WDA04	-0.8232	-0.3722	0.5286	-7.726	93.185	-12.01
W0.6DA03	0.8574	0.3713	-0.5211	6.742	-93.159	11.912
W0.6DB04	-1.0133	1.0382	-0.0006403	0.011	-0.145	251.953
W0.6DB04	-1.1101	1.0707	0.00021	0.012	-0.047	-255.829



螺栓	彎矩	256 tf*cm	單顆螺栓拉力為 255.829/30=8.53 tf
採用 19Ø 螺栓			
螺栓面積	3.14159	cm ²	
螺栓剪應力 $f_v =$	0.113605	tf/cm ²	< 容許剪應力 $F_v = 1.48$ tf/cm ² (ok)
螺栓容許拉應力 $F_t =$	3.09	tf/cm ²	
=>	單顆螺栓拉力 8.53 tf	<	容許拉力 $T = 9.71$ tf (ok)

附件5 細部設計資料

5.Geometric Conditions



h_{slab}	1200	mm	h_{min}	464,200	mm
Edge Cx-	∞	mm	c_{min}	18,113	mm
Edge Cx+	∞	mm	c_{ac}	652,463	mm
Edge Cy-	∞	mm	s_{min}	88,900	mm
Edge Cy+	∞	mm			

6.Summary Results

Tension Loading

Design Proof	Demand(kN)	Capacity(kN)	Utilization	Status	Critical
Steel Strength:	18.06	89.34	0.202	OK	
Concrete Breakout Strength:	35.94	361.18	0.099	OK	
Pullout Strength:	18.06	19.22	0.940	OK	Controls

Shear Loading

Design Proof	Demand(kN)	Capacity(kN)	Utilization	Status	Critical
Steel Strength	2.14	46.46	0.046	OK	Controls
Concrete Breakout Strength:	0.00	0.00	0.000	OK	
Pryout Strength	8.11	842.79	0.010	OK	

Input data and results must be checked for agreement with the existing conditions, the standards and guidelines and must be checked for plausibility

7.Warnings and Remarks

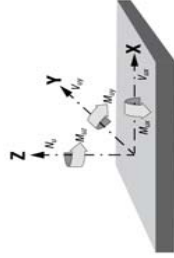
ANCHOR DESIGN CRITERIA IS SATISFIED

- The results of the calculations carried out by means of the DDA Software are based essentially on the data you put in. Therefore, you bear the sole responsibility for the absence of errors, the completeness and the relevance of the data to be put in by you. Moreover, you bear sole responsibility for having the results of the calculation checked and cleared by a design professional/engineer, particularly with regard to compliance with applicable standards, norms and permits, prior to using them for your specific project. The DDA Software serves only as an aid to interpret standards, norms and permits without any guarantee as to the absence of errors, the correctness and the relevance of the results or suitability for a specific application.
- Verification of a sufficiently stiff base plate in respect to base plate deformations is not performed by the DDA Software, this check should be done by a design professional/engineer outside of the DDA Software. The DDA base plate thickness analysis is based on a proof of stresses, the base plate is assumed to not deform under load actions.

8.Load Condition

Design Loads / Actions

Nu	-1.5	kN	Vux	8.1	kN	Vuy	0.1	kN
Muz	0.1	kNm	Mux	-0.1	kNm	Muy	9.2	kNm
Consider Load Reversal			X Direction	0%	Y Direction	0%		



Input data and results must be checked for agreement with the existing conditions, the standards and guidelines and must be checked for plausibility

11. Design Proof Tension Loading

Steel Strength

ACI 318-14 17.4.1

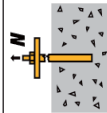
Variables

N_{sa} (kN)	ϕ
119,126	0.75

Results

ϕN_{sa}	=	89.3	kN
N_{ua}	=	18.1	kN
Utilization	=	20.2%	

Table 17.3.1.1



Concrete Breakout Strength

ACI 318-14 17.4.2

Equations

$$N_{cbg} = (A_{Nc} / A_{Nc0}) \cdot \Psi_{ec,N} \cdot \Psi_{ed,N} \cdot \Psi_{cs,N} \cdot \Psi_{cp,N} \cdot N_b$$
$$N_b = 3.9 \cdot \lambda_a \cdot (f'_c)^{0.5} \cdot h_{ef}^{5/3}$$

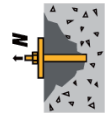
Variables

A_{Nc} (mm ²)	A_{Nc0} (mm ²)	$\Psi_{ec,N}$	$\Psi_{ed,N}$	$\Psi_{cs,N}$	$\Psi_{cp,N}$
1989913.00	1702829.00	0.999	1.000	1.000	1.000
0	0				
c_{ac} (mm)	k_c	λ_a	f'_c (MPa)	h_{ef} (mm)	
652.463	10.000	1.000	20.59	434.98	
N_b (kN)	ϕ				
441.910	0.70				

Results

ϕN_{cbg}	=	361.18	kN
N_{ua}	=	35.9	kN
Utilization	=	9.9%	

Table 17.3.1.1



Eqn. 17.4.2.1b
Eqn. 17.4.2.2b

Input data and results must be checked for agreement with the existing conditions, the standards and guidelines and must be checked for plausibility

Pullout Strength:

ACI 318-14 17.4.3

Equations

$$N_{pn} = \Psi_{cs,P} \cdot N_p$$
$$N_p = 0.9 \cdot f'_c \cdot c_h \cdot d_n$$

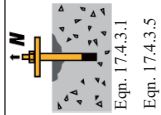
Variables

$\Psi_{cs,P}$	$N_{p,cr}$	c_h	f'_c (MPa)	ϕ
1.000	27,460	66.68	21	0.70

Results

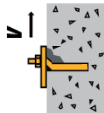
ϕN_{pn}	=	19.22	kN
N_{ua}	=	18.06	kN
Utilization	=	94.0%	

Table 17.3.1.1



Eqn. 17.4.3.1
Eqn. 17.4.3.5

Input data and results must be checked for agreement with the existing conditions, the standards and guidelines and must be checked for plausibility

DEWALT		DEWALT DESIGN ASSIST 1.7.3.0		Page 8
A05		2025/3/7		
12.Design Proof Shear Loading				
Reference				
Steel Strength				
ACI 318-14 17.5.1				
Variables				
V_{sa}		(kN)		
71.48		ϕ		
		0.65		
Results				
ϕV_{sa}		=		46.46 kN
V_{ua}		=		2.14 kN
Utilization		=		4.6%
				Table 17.3.1.1
				
Input data and results must be checked for agreement with the existing conditions, the standards and guidelines and must be checked for plausibility				

DEWALT

DEWALT DESIGN ASSIST 1.7.3.0

Page 9

A05

2025/3/7

Pryout Strength

ACI 318-14 17.5.3

Equations

$V_{cpg} = k_{cp} \cdot N_{cpg}$

Eqn. 17.5.3.1b

$N_{chg} = (A_{Nc} / A_{Nc0}) \cdot \Psi_{ec,N} \cdot \Psi_{ed,N} \cdot \Psi_{c,N} \cdot \Psi_{cp,N} \cdot N_b$

Eqn. 17.4.2.1b

$N_b = k_c \cdot \lambda_a \cdot (f_c')^{0.5} \cdot h_{ef}^{1.5}$

Eqn. 17.4.2.2a

Variables

A_{Nc}	(mm ²)	A_{Nc0}	(mm ²)	$\Psi_{ec,N}$	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$
2340645.50		1702829.25		0.991	1.000	1.000	1.000
6		6					
c_{ac}	(mm)	k_c		λ_a	h_{ef}	(mm)	f_c
652.463		10.000		1.000	434.98		20.590
N_b	(kN)	k_{cp}		N_{cpg}	(kN)	ϕ	
441.909		2.000		601.990		0.70	

Results

ϕV_{cpg}

=

842.79

kN

V_{ua}

=

8.11

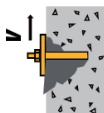
kN

Utilization

=

1.0%

Table 17.3.1.1



Input data and results must be checked for agreement with the existing conditions, the standards and guidelines and must be checked for plausibility

 DEWALT DESIGN ASSIST 1.7.3.0 A05		Page 10
13. Interaction of Tension and Shear Loads ACI 318-14 17.6		2025/3/7
Equations	$(N_{ua} / \phi \cdot N_n)^{5/3} + (V_{ua} / \phi \cdot V_n)^{5/3} \leq 1.0$	Eqn. 17.6.3
Variables	$\frac{N_{ua} / \phi \cdot N_n}{0.940}$ $\frac{V_{ua} / \phi \cdot V_n}{0.046}$	
Results	0.907 ≤ 1.0	
Status	: OK	
ANCHOR DESIGN CRITERIA IS SATISFIED 		
Input data and results must be checked for agreement with the existing conditions, the standards and guidelines and must be checked for plausibility		

基礎檢核

	F1	F2	F3	M1	M2	M3
	Tonf	Tonf	Tonf	Tonf-m	Tonf-m	Tonf-m
LR-0.9D+1.3WA04	0.7674	0.0079	-0.3307	-0.01422	0.66661	0.00067
LR-1.2D+1.0L+1.3WA02	-0.7589	0.0103	-0.0209	-0.01477	-0.63968	0.00492
LR-0.9D+1.3WA03	0.3928	0.2668	-2.1946	-0.32963	0.12467	0.00268
LR-0.9D+1.3WB02	-0.0017	-0.8934	-0.8462	0.93761	-0.0009	0.00005128
LR-1.2D+1.0L+1.3WB01	0.0027	-0.3521	5.1858	0.56721	0.00022	-0.00056
LR-0.9D+1.3WB04	-0.002	-0.3182	-4.431	0.52894	-0.00015	-0.00039
LR-0.9D+1.3WB04	-0.0023	-0.827	-1.7725	0.97868	-0.001	0.00019
LR-0.9D+1.3WA03	0.3768	0.2643	-1.108	-0.3297	0.11979	0.00218
LR-0.9D+1.3WA04	0.765	0.0126	-0.4238	-0.01542	0.66917	0.02357
LR-1.2D+1.0L+1.3WA02	-0.7589	0.0103	-0.0209	-0.01477	-0.6397	0.00492
LR-0.9D+1.3WA04	0.4986	0.0056	-0.8014	-0.03822	0.15249	0.13756
LR-0.9D+1.3WA02	-0.5148	0.0121	-0.7089	-0.04324	-0.15895	-0.1393

基礎設計

一、設計載重(工作載重)

軸壓力(+)	P	1.77 t
彎矩	M	0.98 t-m
假設土壤承載力	Fp 或 Fu	5.00 t/m2
牆底土壤磨擦角	δ	12.50 °

極限用 Fu
1/2-2/3 φ

二、假設基礎基本規格 (無偏心基礎)

寬度	B	1.50 m
長度	L	1.50 m
版厚度	T	0.35 m
基礎深度	H	1.10 m
RC 柱頭寬度	B1	0.35 m
RC 柱頭長度	L1	0.35 m
fc'		210.00 kg/cm2
fy		2800.00 kg/cm2

剪力方向長度

B 方向柱頭寬
L 方向柱頭寬

三、版底應力分析假設

3.3 土壤承載力分析

$\Sigma M=M_d$	0.98 t-m
$e=\Sigma M/Pr$	0.15 m
$x=B/2-e$	0.60 m
B/6	0.25 m
$e < B/6$	OK
$F_{max}=Pr/B/L*(1+6*e/B)$	4.73 t/m2
$F_{min}=Pr/B/L*(1-6*e/B)$	1.24 t/m2
Fp	5.00 t/m2
Fp>Fmax	1.06
	OK
$F_{ave}=(F_{max}+F_{min})/B$	2.32 t/m2

←

四、基礎版厚度檢核

穿孔剪力檢核

d=T-0.09

R=1.7 或 1.0(極限強度取 1.0)

0.26 m
1.00

穿孔剪力 $V_u = R \cdot P$ 1.77 t
剪力周長 $L = 2 \cdot B_1 + 2 \cdot L + 4 \cdot d$ 2.44 m
穿孔剪力強度 $V_d = 1.06 \cdot \sqrt{f_c} \cdot d \cdot L'$ 97.45 t
 $\phi = 0.85$ 或 1.0 (極限強度取 1.0) 1.00
 $V_d > V_u$ 55.06
OK

樑式剪力檢核
取單位寬 $l_m = 100\text{cm}$
 $W_s = P_1/B/L$ 2.20 t/m2
 $B_3 = 0$ 0.00 m
 $B_2 = (B - B_1)/2 - d$ 0.32 m
 $B_{23} = B_2 - B_3 > 0$ 0.32
 $V_c = 0.53 \cdot \sqrt{f_c} \cdot 100 \cdot d \cdot 100/1000$ 19.97 t
 $V = W_s \cdot B_2 - F_{inc} \cdot (B_2 - B_3)/2 - F_{min} \cdot (B_2 - B_3)$ 0.06 t
 $V_u = R \cdot V$ 0.06 t
 $V_c > V_u$ 307.85
OK

五、基礎版配筋分析

下層筋
取單位寬 $l_m = 100\text{cm}$ 0.58 m
 $B_4 = (B - B_1)/2$ 3.39 t/m2
 $F_{moment} = F_{max} - F_{inc} \cdot B_4$ 0.56 t-m
 $M_1 = 1/2 \cdot F_{moment} \cdot B_4^2$ 0.15 t-m
 $M_2 = 1/3 \cdot (F_{max} - F_{moment}) \cdot B_4^2$ 0.36 t-m
 $M_3 = 1/2 \cdot W_s \cdot B_4^2$ 1.00
 $R = 1.7$ 或 1.0 (極限強度取 1.0) 0.34 t-m
 $M_u = R \cdot (M_1 + M_2 - M_3)$

彎矩配筋
 d 26.00 cm
 $\phi = 0.9$ 或 1.0 (極限強度取 1.0) 1.00
 $R_n = M_u \cdot 100000 / (\phi \cdot 100 \cdot x_d^2)$ 0.51
 $f_y =$ 2800.00 kg/cm2
 $f_c =$ 210.00 kg/cm2
 $m = f_y / (0.85 \cdot f_c)$ 15.69
鋼筋比 $= (1 - \text{SQRT}(1 - 2 \cdot m \cdot R_n / f_y)) / m$ 0.00018
 $As_need\ l =$ 0.47 cm2

最小鋼筋比 $= 0.002 \cdot 0.0018$ 0.00200
 $As_need\ 2 =$ 3.50 cm2
需要鋼筋量 $As_need =$ 3.50 cm2
採用 #4@15
#4 $As =$ 1.27 cm2
 $ds =$ 15.00 cm
 As 單位寬 100cm 8.47 cm2
 $As > As_need$ 2.42
OK

上層筋
取單位寬 $l_m = 100\text{cm}$ 0.58 m
 $B_4 = (B - B_1)/2$ 0.36 t-m
 $M_1 = 1/2 \cdot W_s \cdot B_4^2$ 0.28 t-m
 $M_2 = 1/2 \cdot F_{min} \cdot B_4^2 + 1/6 \cdot F_{inc} \cdot B_4^2 > 0$ 0.08 t-m
 $M_u = R \cdot (M_1 - M_2)$
彎矩配筋
 d 26.00 cm
 $R_n = M_u \cdot 100000 / (\phi \cdot 100 \cdot x_d^2)$ 0.12
 $f_y =$ 2800.00 kg/cm2
 $f_c =$ 210.00 kg/cm2
 $m = f_y / (0.85 \cdot f_c)$ 15.69
鋼筋比 $= (1 - \text{SQRT}(1 - 2 \cdot m \cdot R_n / f_y)) / m$ 0.00004
 $As_need\ l =$ 0.12 cm2
最小鋼筋比 $= 0.002 \cdot 0.0018$ 0.00200
 $As_need\ 2 =$ 3.50

需要鋼筋量 $As_need =$ 3.50 cm2
採用 #4@15
#4 $As =$ 1.27 cm2
 $ds =$ 15.00 cm
 As 單位寬 100cm 8.47 cm2
 $As > As_need$ 2.42
OK

基礎拉拔檢核

	F1	F2	F3	M1	M2	M3
LR-1.2D+1.0L+1.3WB01	0.0027	-0.3521	5.1858	0.56721	0.00022	-0.00056

經分析，最大拉力為 5.186tf

混凝土基腳尺寸為 150cm x 150cm x 35cm，上方覆土 75cm 並有 10cm RC 板

經核算基礎抵抗重量為 6.108 tf > 5.186 tf (ok)

編號	單位:tf-m			
1	一層板厚度	板面積 (2*2)	板單位重	板重
	0.1	4	2.4	0.96
2	土深度	土面積	土單位重	土重
	0.75	2.25	1.8	3.0375
3	基礎厚度	基礎面積 (BxD=1.5*1.5)	基礎單位重	基礎重
	0.35	2.25	2.4	1.89
4	柱深	柱面積	柱單位重	RC 柱重
	0.75	0.1225	2.4	0.2205
合計總重				6.108

基礎與覆土重量足夠，不會有上浮情況發生。