

# 營建業之CAD與二次e化

以開發RC結構鋼筋施工圖程式為例



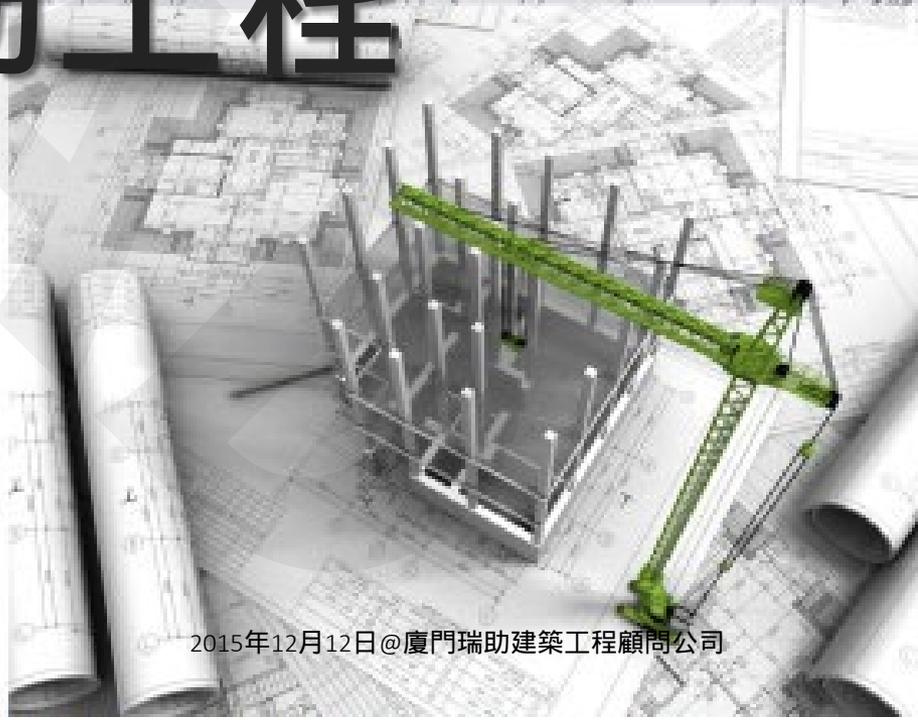
# BIM

## 趨勢已成，無可避免





# 鋼筋工程



# 鋼筋工程的特性

- 材料價昂
- 資料量大
- 計算繁瑣
- 結構安全



● **誰**最在意鋼筋量?



A 3D illustration featuring a yellow humanoid figure with a blue head, standing on a white path of arrows that leads towards the right. Above the figure is a large, blue, 3D question mark. The background is white with a faint, large, light gray watermark of a question mark. The text '更好的方法' is positioned to the right of the question mark.

# 更好的方法

# 精準 成本控制



# 一致性



# 可施工性

A 3D puzzle with one blue piece highlighted. The puzzle pieces are arranged in a grid, with the blue piece standing out prominently. The background is white with faint, light gray puzzle pieces scattered around.

數據正確，才能**管理**

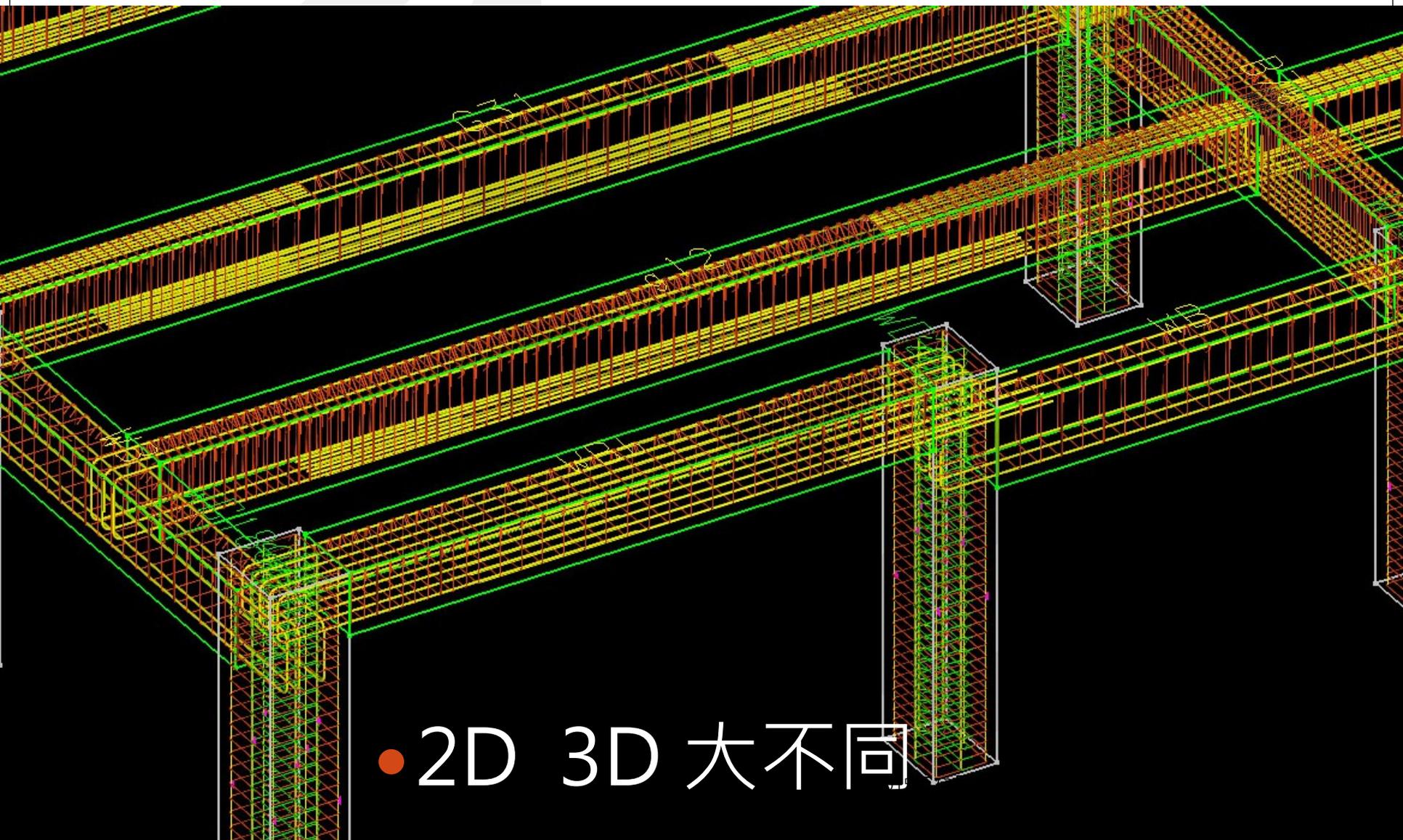
2015年12月12日@廈門瑞助建築工程顧問公司

# RCAD\_鋼筋模型系統

用**新**的技術  
處理鋼筋

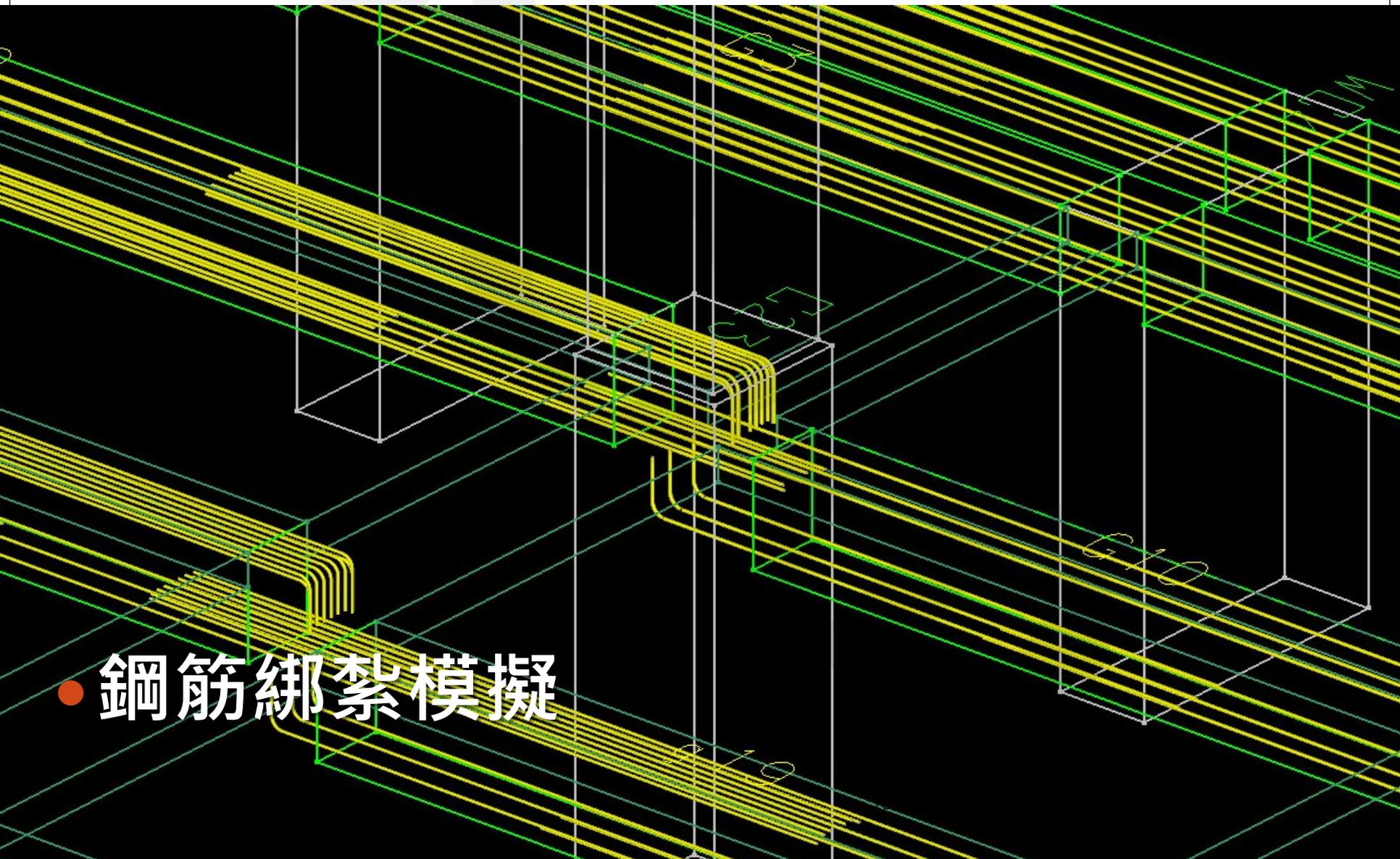


# 鋼筋行為的複雜性



- 2D 3D 大不同

# 品質 = 安全



● 鋼筋綁紮模擬

The image displays a 3D wireframe model of a building's structural reinforcement. The model consists of a grid of vertical and horizontal lines, with yellow and green lines representing the rebar layout. The rebar is shown in a complex, multi-level arrangement, with some sections curving and connecting to form a dense network. The background is black, making the white and colored lines stand out. The overall appearance is that of a technical drawing or a digital simulation used in construction planning.

# 整合的元素

結構模型

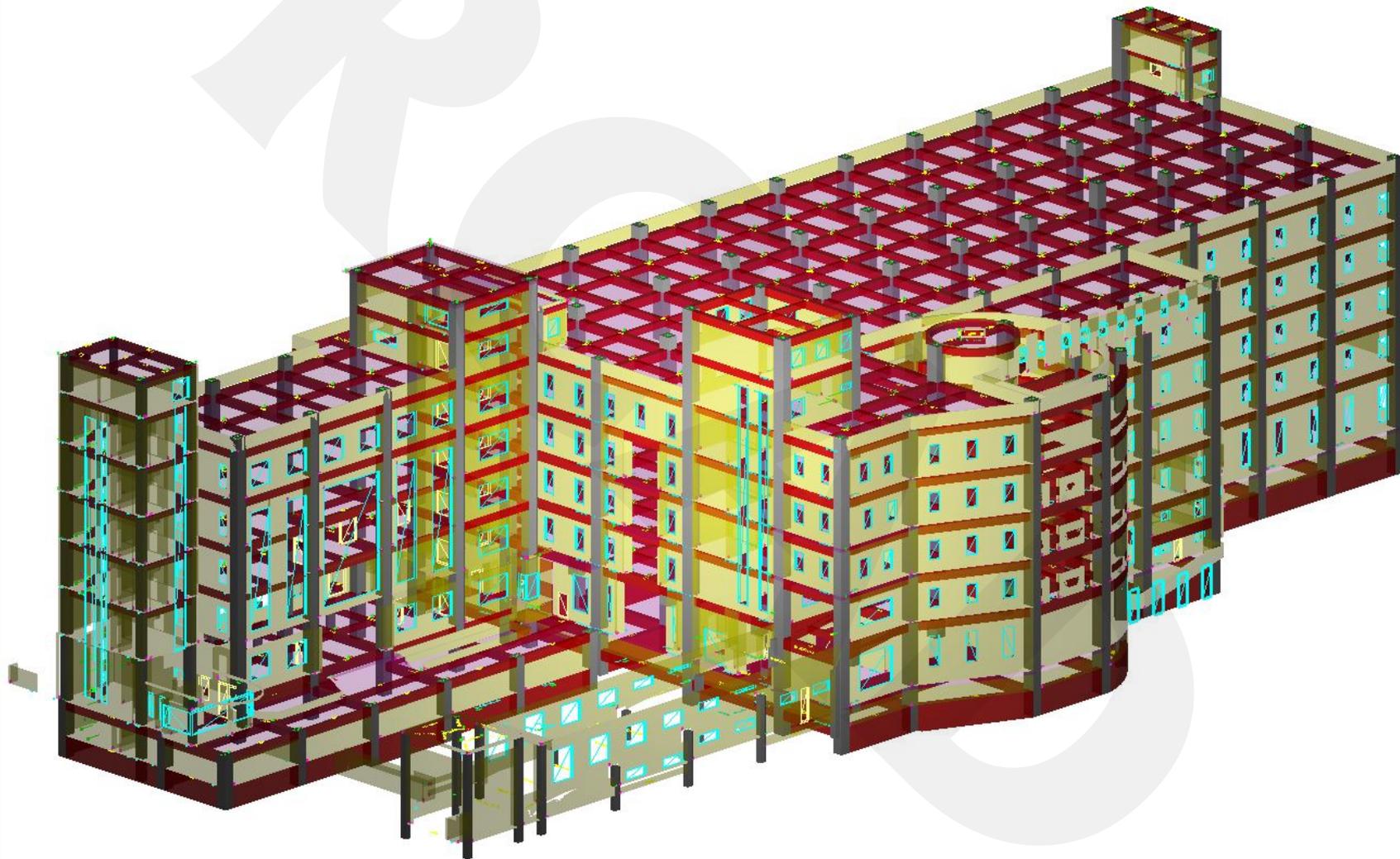
鋼筋模型

DWG IO

各種參數

料單·施工圖

# 系統現況



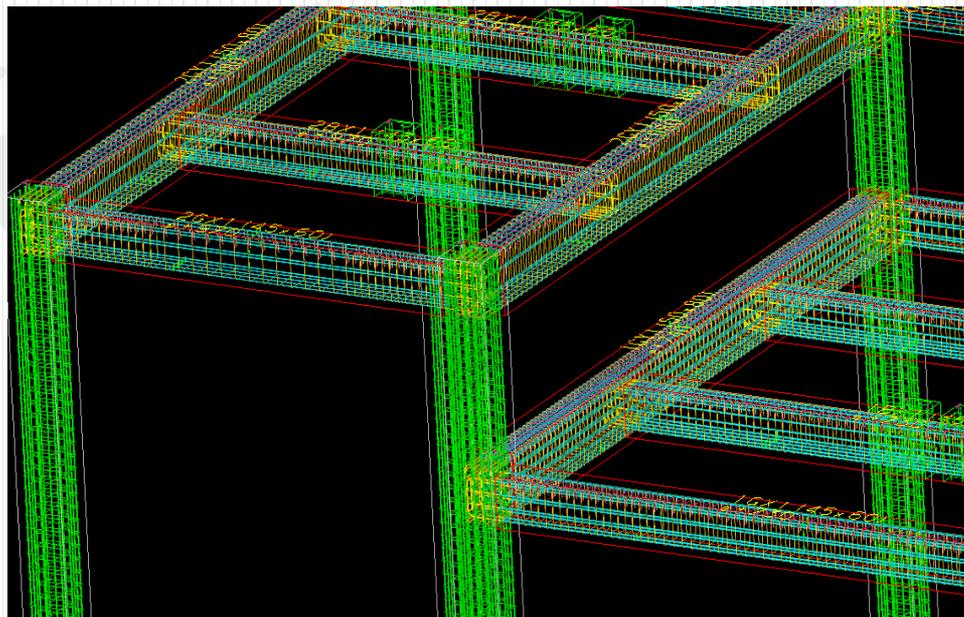
# 1. 讀入梁柱資訊

讀入 柱配筋

讀入 梁配筋

讀入 柱位

讀入 梁位



# RCAD 的資料讀入方式

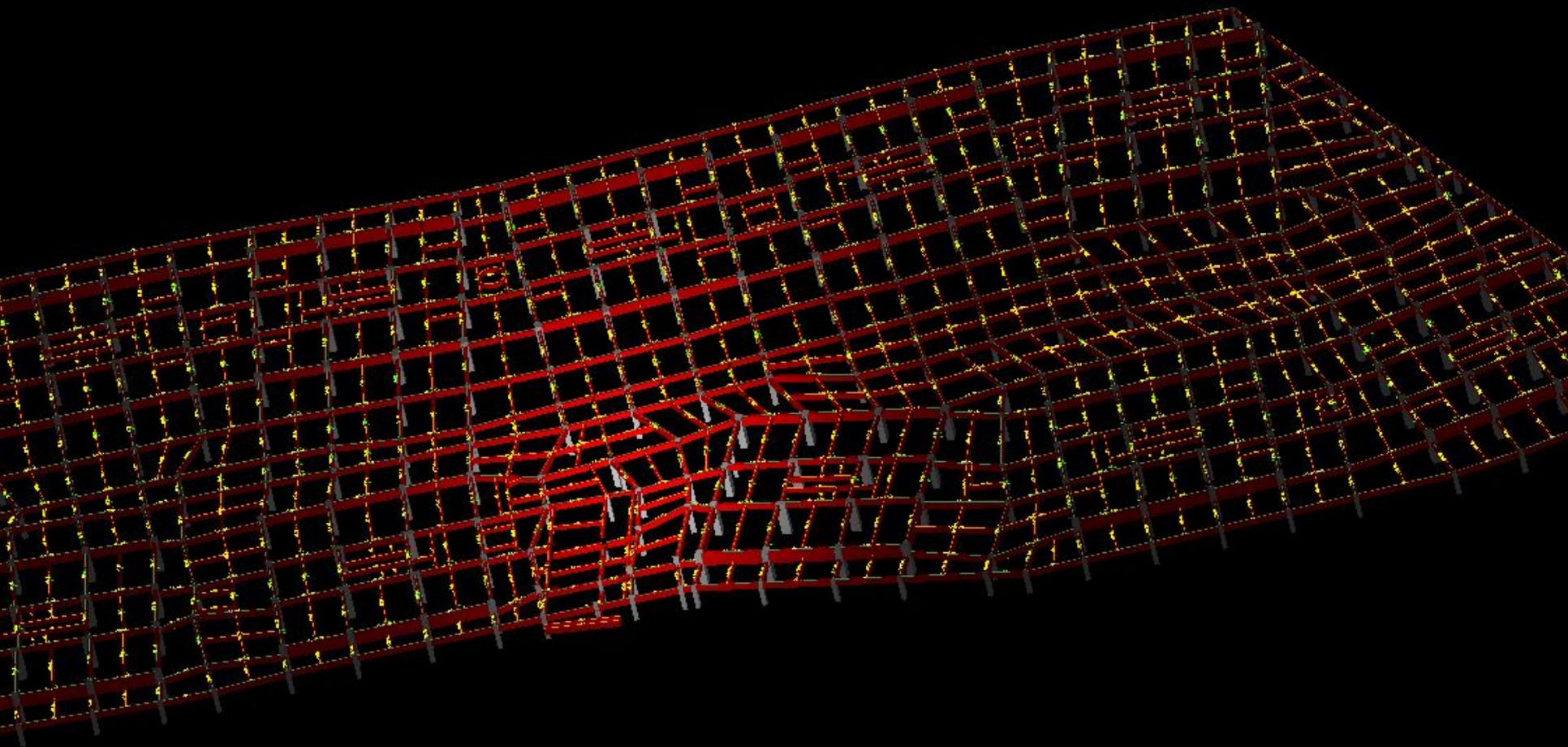
## 直接框選

1. 速度
2. 避免錯誤

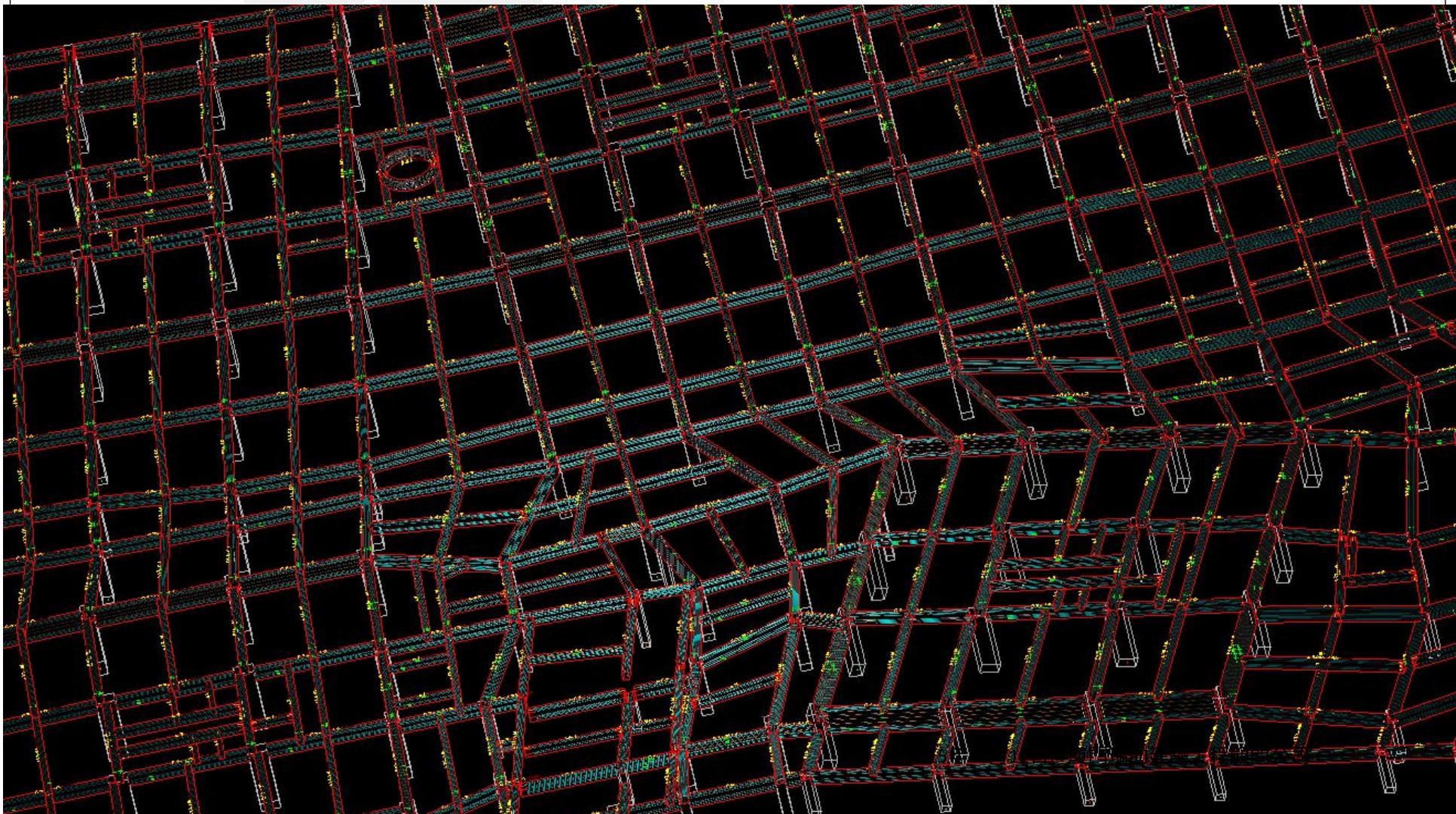


mistake

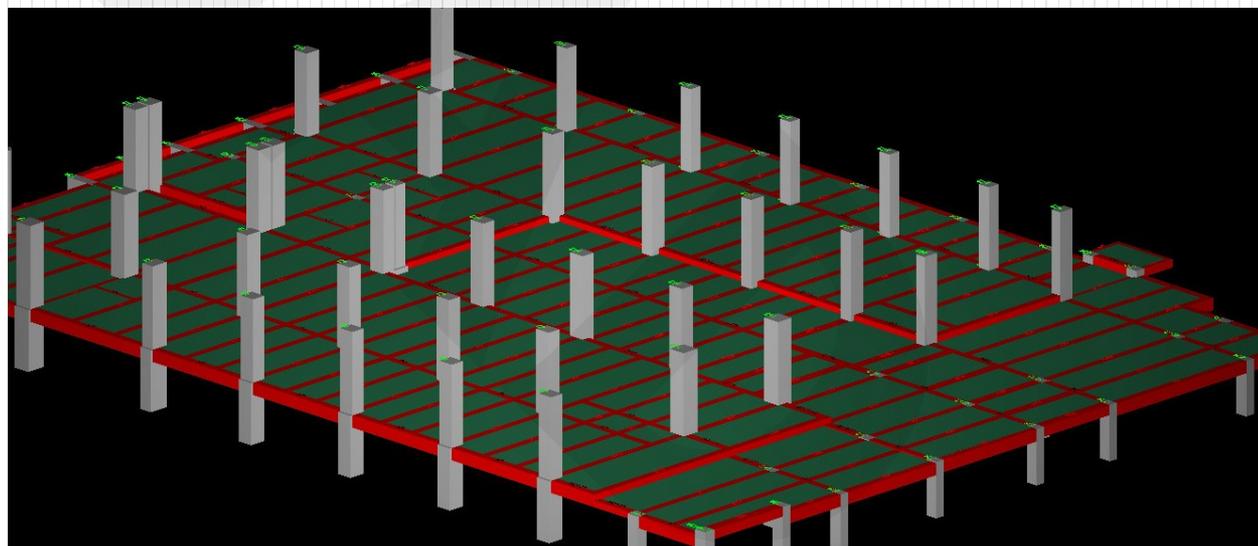
# 梁柱就位

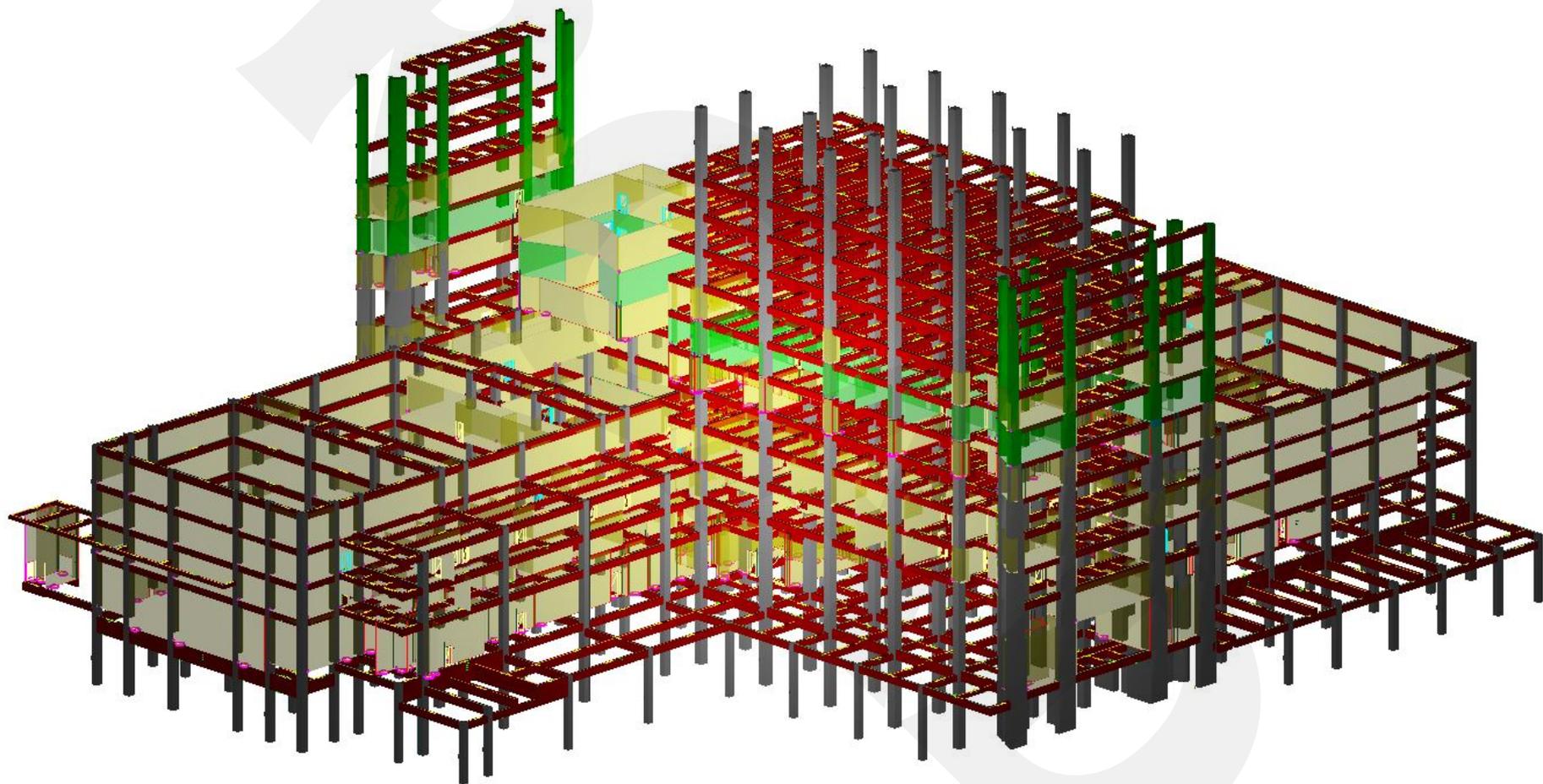


# 鋼筋就位

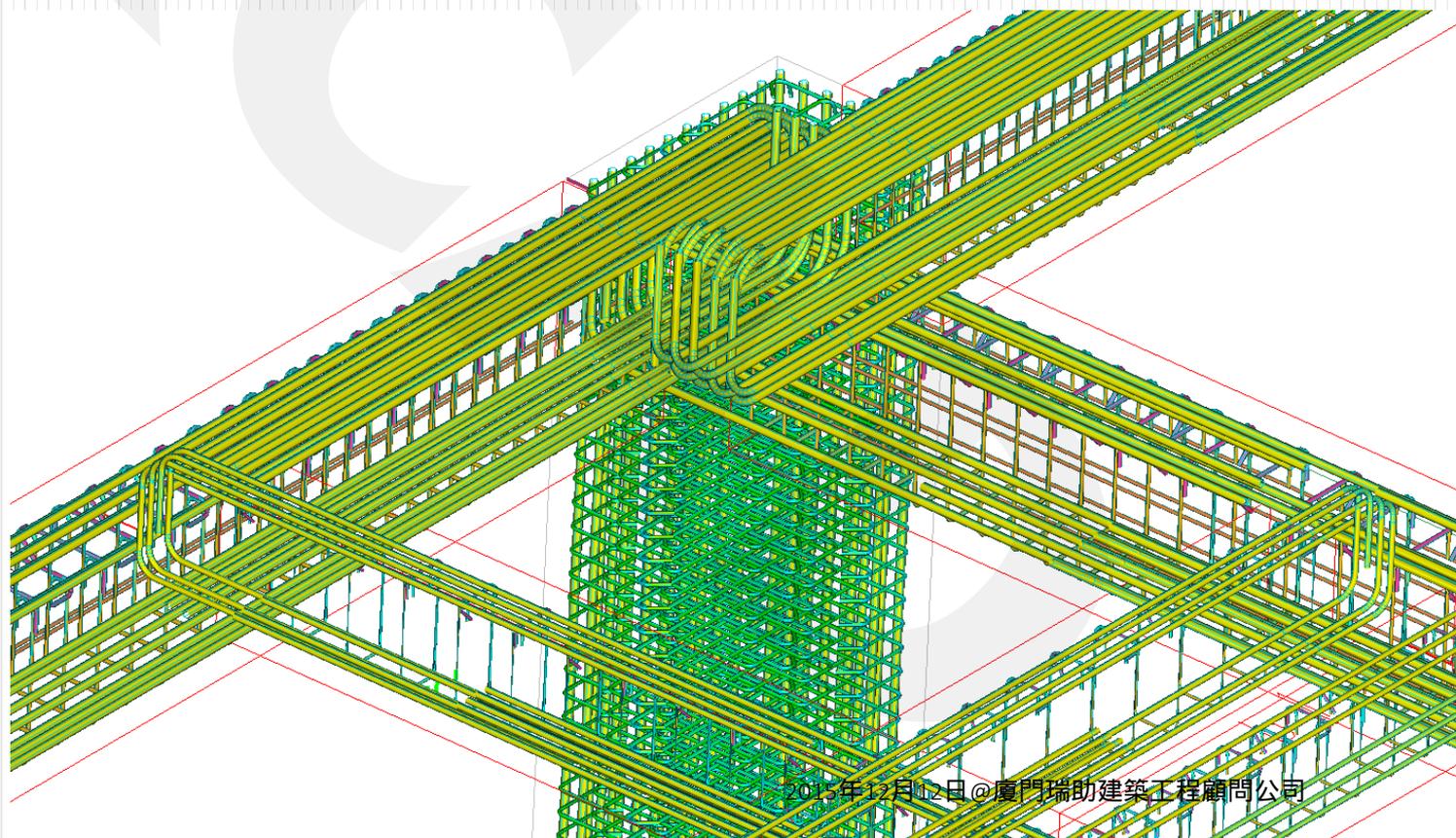


## 2. 完成結構模型

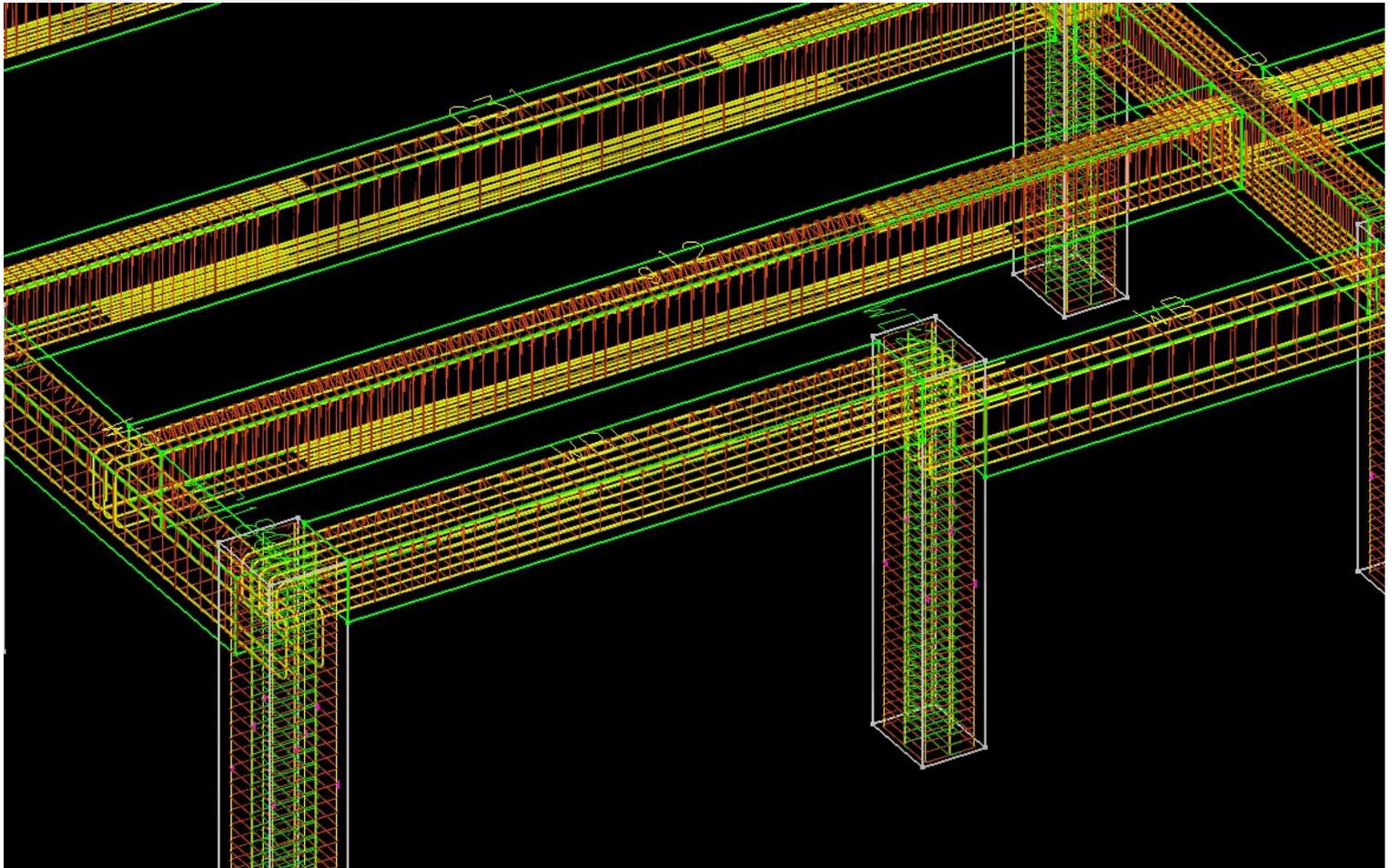




### 3. 配置鋼筋模型



# 配設鋼筋



# 程式特色：2D 3D 施工圖 同步

RCAD\_Building

檔案(F) 設定(S) 梁(B) 柱(C) 版(W) 牆(W) 轉面(W) 工具(K) 說明

BOM窗狀態欄

顯示選項

- Apply
- OK
- Cancel

2.梁

3.柱

4.斜撐

5.版

6.梯

7.牆

8.門

9.窗

10.柱配筋圖

11.料單分區

12.水平支撐

13.地面

14.Isolator

16F

15F

14F

13F

12F

11F

10F

9F

8F

7F

6F

5F

4F

Column 16

Beam 54

Slab 0

Stair 0

Wall 96

Door.W 49

Brace 0

梁台 0

版台 0

牆台 0

3F

Column 16

Beam 59

Slab 0

Stair 0

Wall 110

Door.W 83

Brace 0

梁台 36

版台 0

牆台 0

2F

GA3-12(50x80)

GA3-23(50x80)

GA3-34(50x80)

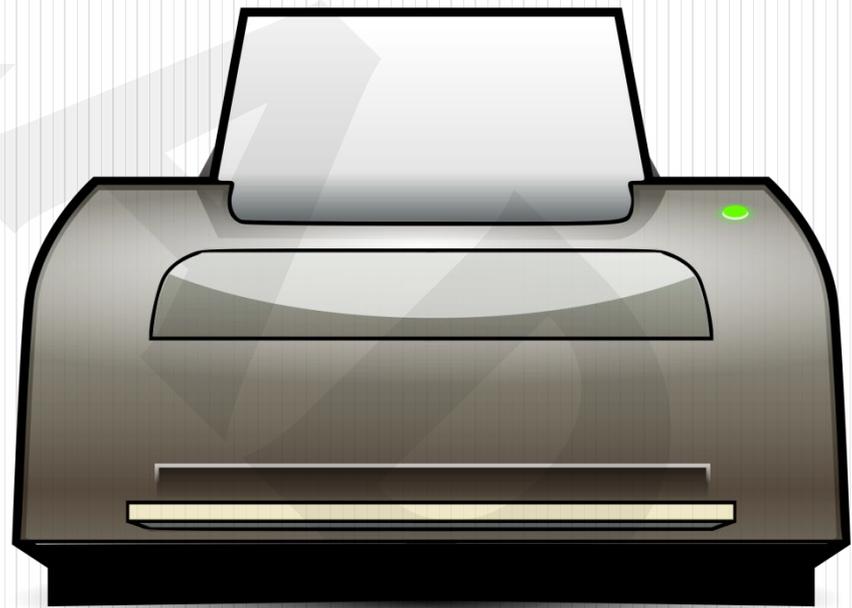
GA3-

765 120 705 120 750 80 612 81 750 0

80	765	120	705	120	750	80	612	81	750	0
CA6	CA7	CA7	CA7	CA7	CA7	CA7	CA7	CA7	CA7	CA7
80 55 680 x2	110 55 388 x1	110 100 x9	110 328 x5	110 258 x17	80 550 x17					
80 55 680 x1	110 55 388 x4	110 100 x9	110 328 x5	110 258 x17	80 550 x17					
80 55 750 x6	110 55 388 x4	110 100 x9	110 328 x5	110 258 x17	80 550 x17					
80 55 750 x2	110 55 388 x4	110 100 x9	110 328 x5	110 258 x17	80 550 x17					
80 55 450 x2	110 55 388 x4	110 100 x9	110 328 x5	110 258 x17	80 550 x17					
80 55 428 x4	110 55 388 x4	110 100 x9	110 328 x5	110 258 x17	80 550 x17					

## 4. 匯出施工圖、料單

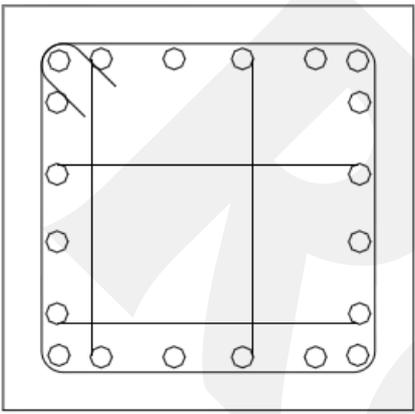
---



1

共合

LEVEL 4+740



C2-60X60

1GY2,80 1GX2,60 1GX1,60

LEVEL 3

梁柱接頭箍筋 #4@15  
 柱圓束區箍筋 #4@15  
 柱中央區箍筋 #4@15

55 840 #10 895 x20

#4@15x57

50 50 #4 x 57支 @15

12 51 12 #4 x228支 @15 梁柱接頭繫筋

855

#10 840x20

BASE LEVEL -115

TB1,50

工程名稱 aaa

柱 BASE LEVEL~LEVEL 4 C2

## 鋼筋檢料總表

工程名稱：中鼎測試

結構位置：**ALL柱**

鋼筋號數	總重量(Kg)	轉換歐規(T)
#3 (T10)	58	69
#4(T12)	2,273	2,031
#5(T16)	172	174
#8(T25)	2,855	2,765
#10(T32)	4,575	4,522
合計總重	9,933	9,562

第 1 頁

2

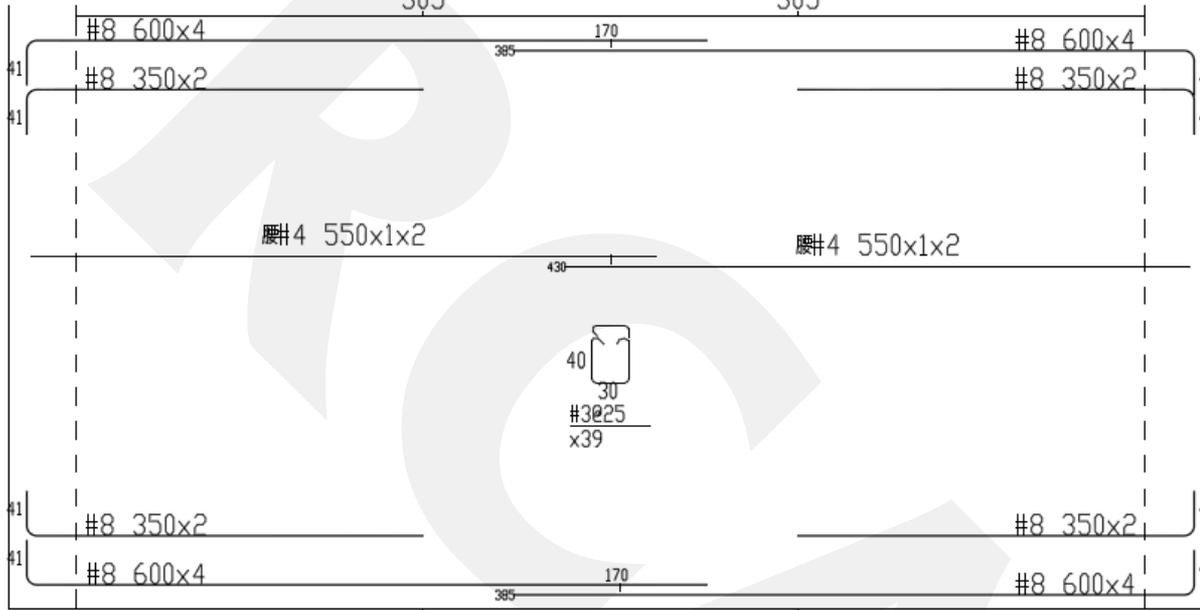
柱台

TB1(40x50)

305

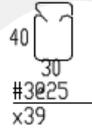
305

上層搭接長  
#8:138



腰筋搭接長  
#4腰筋67

#8:138  
下層搭接長



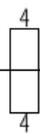
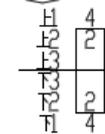
305

940

305

60  
C1

60  
C1



#8 41 600 x16	#4 550 x4	#3 40 30 x39
#8 41 350 x8		#3 11 30 x39

總重=595 KG

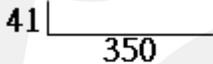
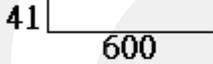
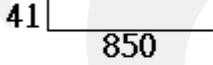
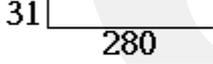
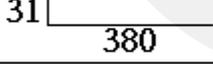
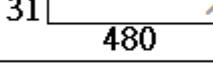
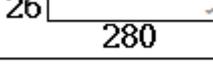
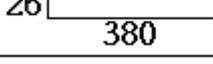
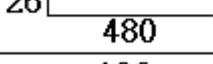
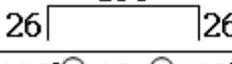
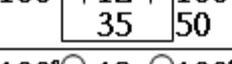
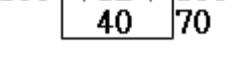
工程名稱 aaa

梁台 BASE LEVEL,2

2015年12月12日@廈門瑞助建築工程顧問公司

梁跨總長=1060

# 鋼筋料單

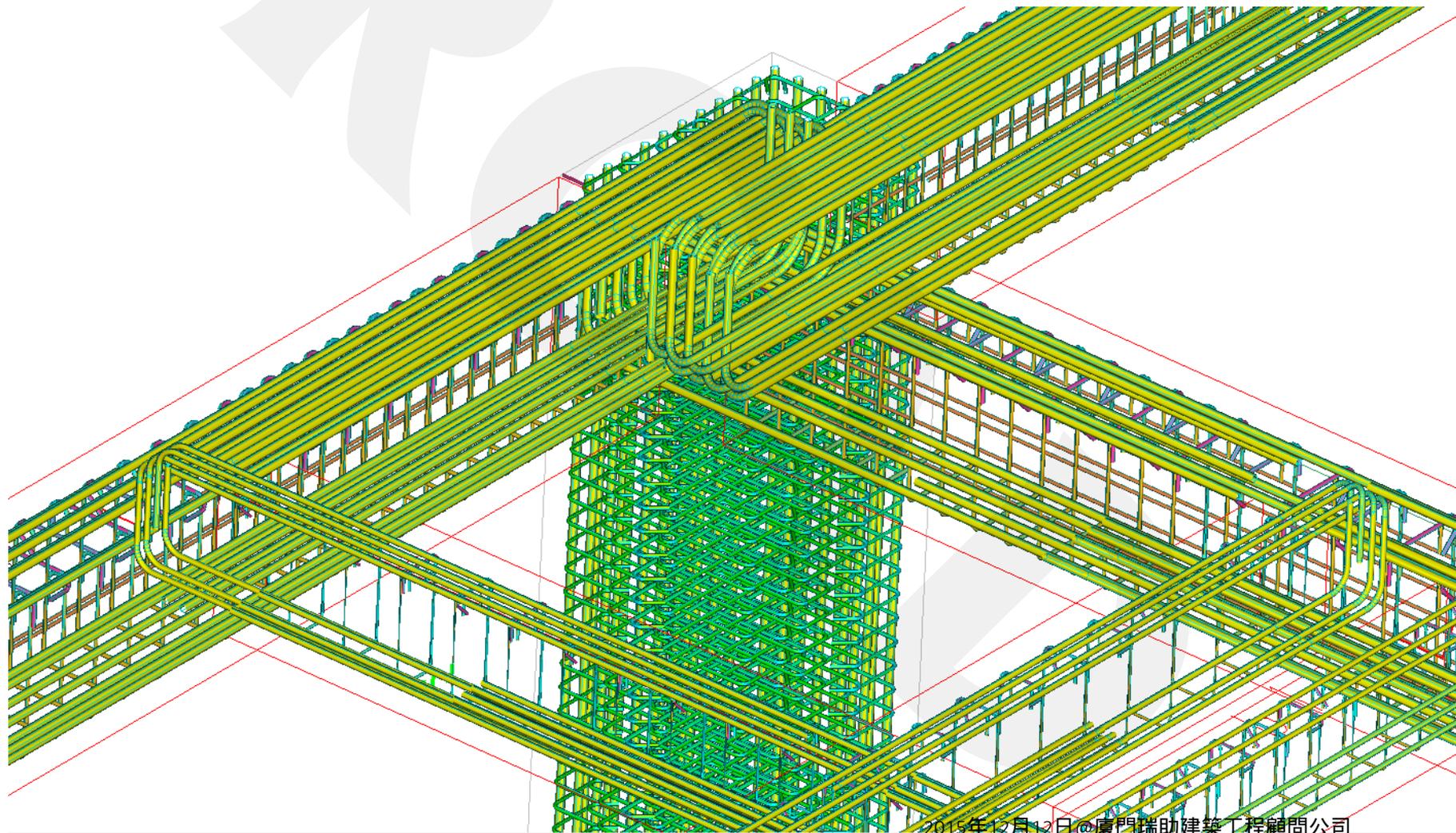
工程名稱：		中鼎測試		結構位置：		LEVEL 8 梁
編號	號數	圖示	長度(cm)	數量	重量(kg)	備註
1	#8		580	16	369	
2	#6		380	32	274	
3	#8		391	10	156	
4	#8		641	20	510	
5	#8		891	10	355	
6	#6		311	12	84	
7	#6		411	12	111	
8	#6		511	12	138	
9	#5		306	8	38	
10	#5		406	16	101	
11	#5		506	8	63	
12	#5		248	7	27	
13	#4		159	182	288	
14	#4		204	152	308	

第 1 頁

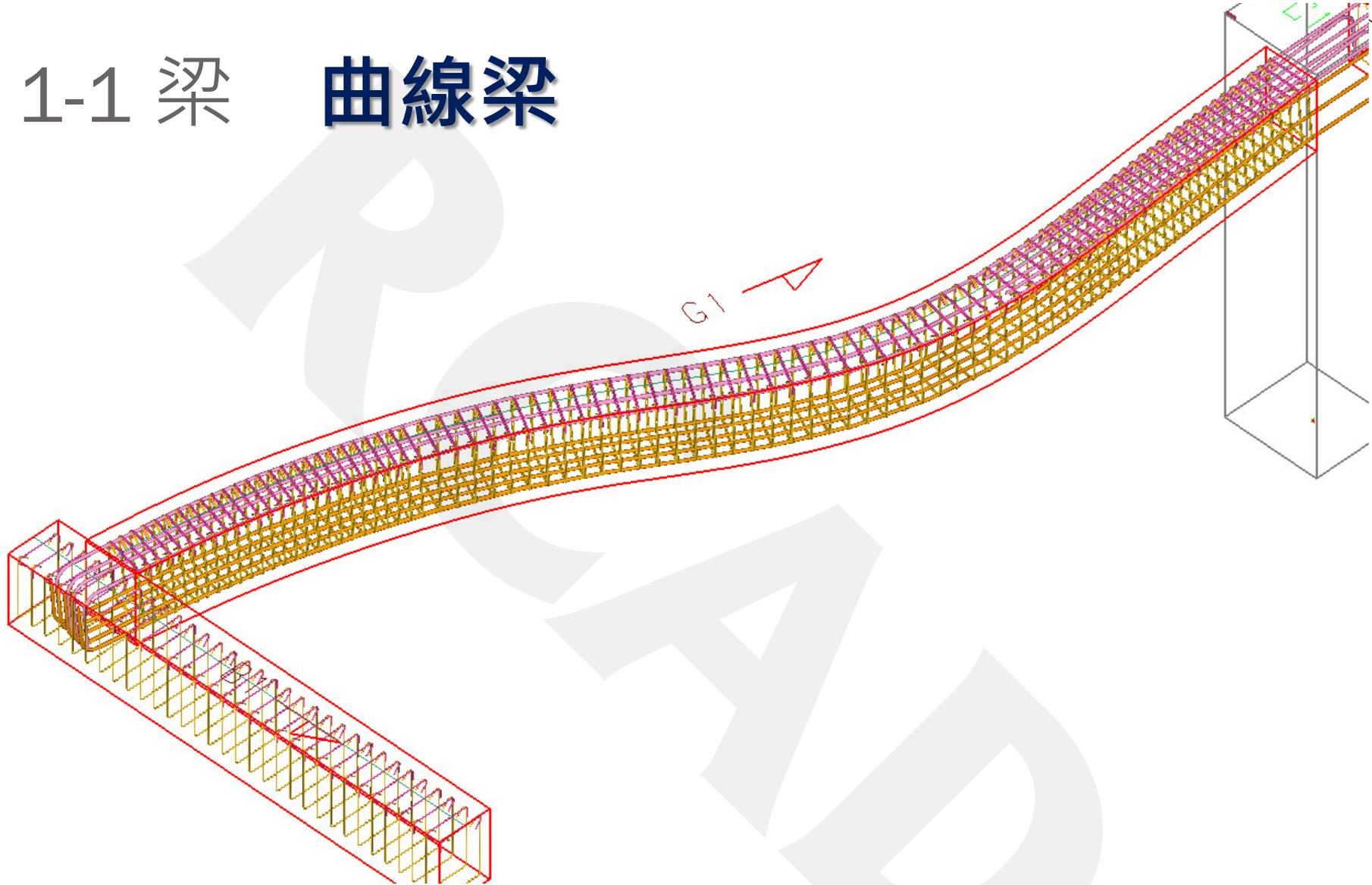
# PART 2

# 編輯鋼筋

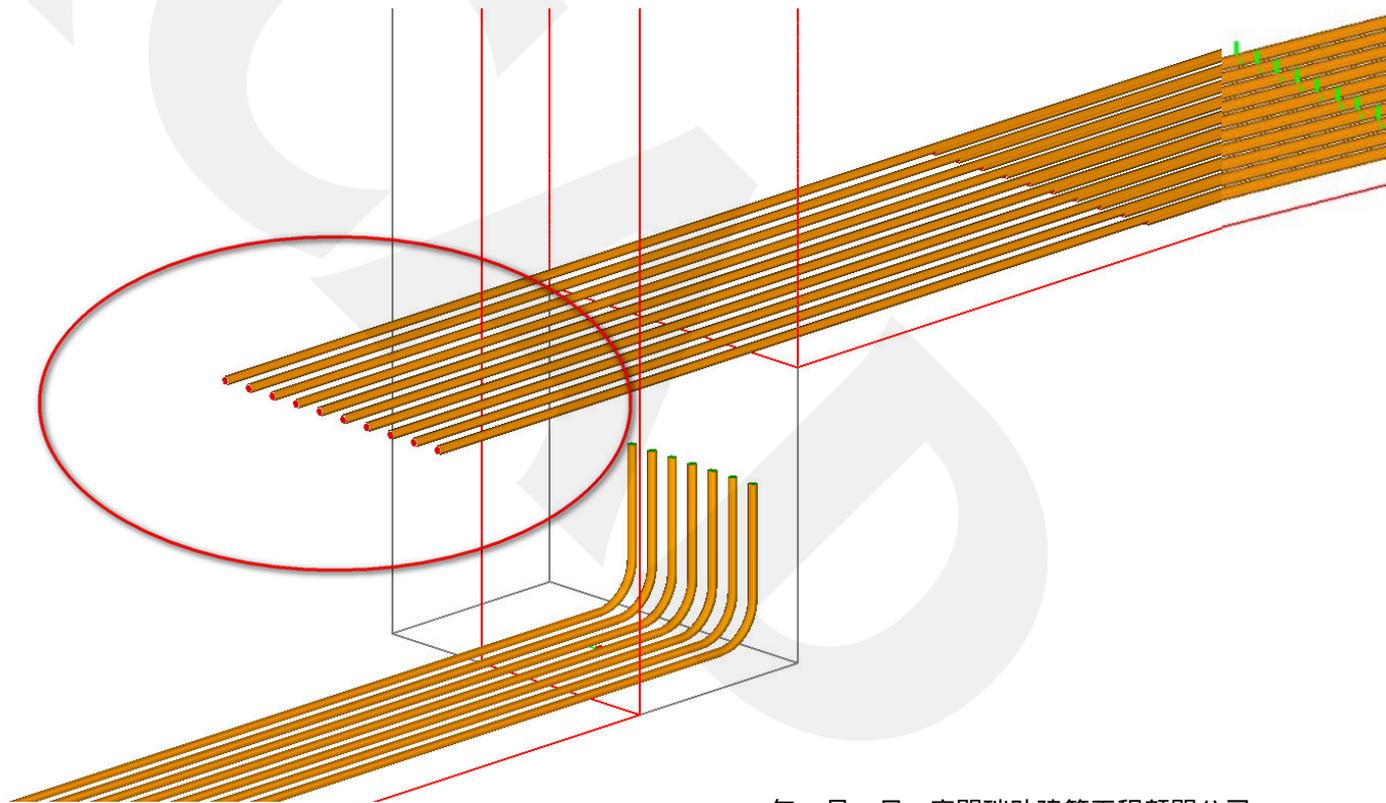
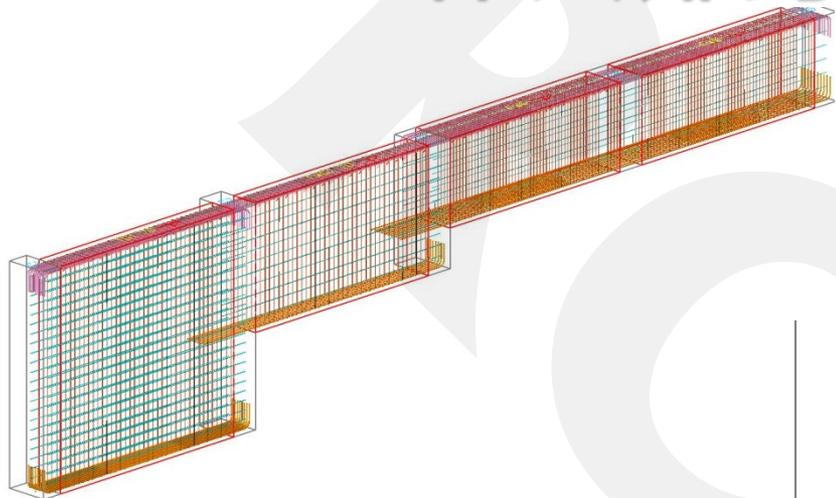
# 1. 梁 面面觀



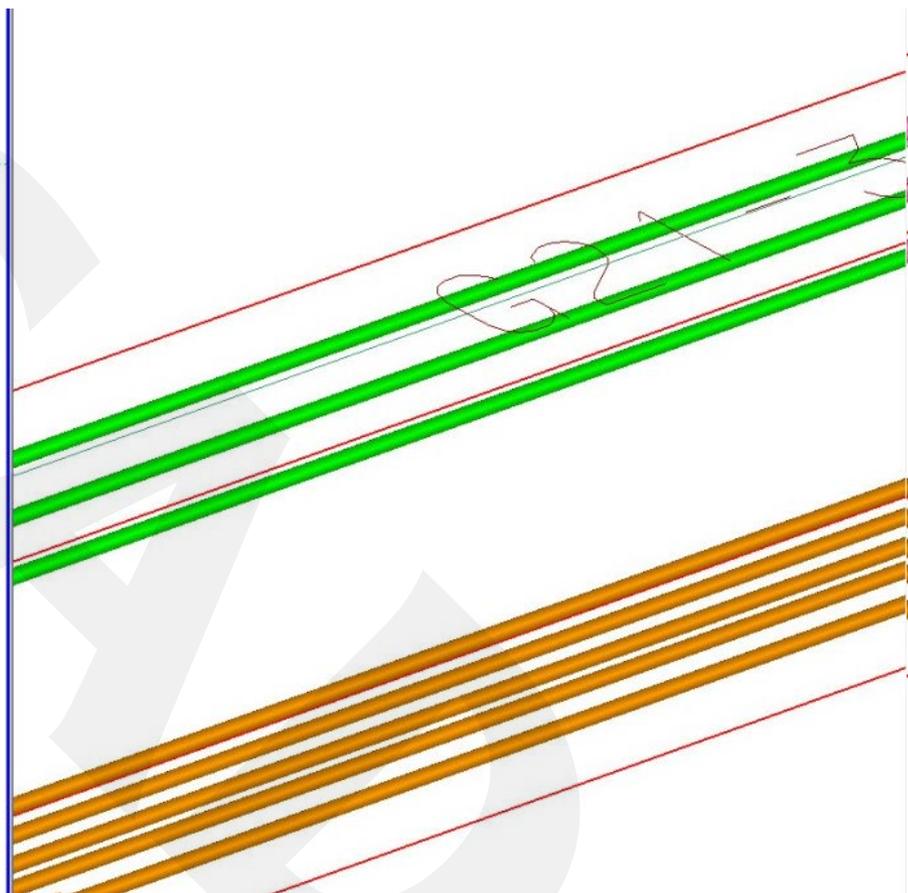
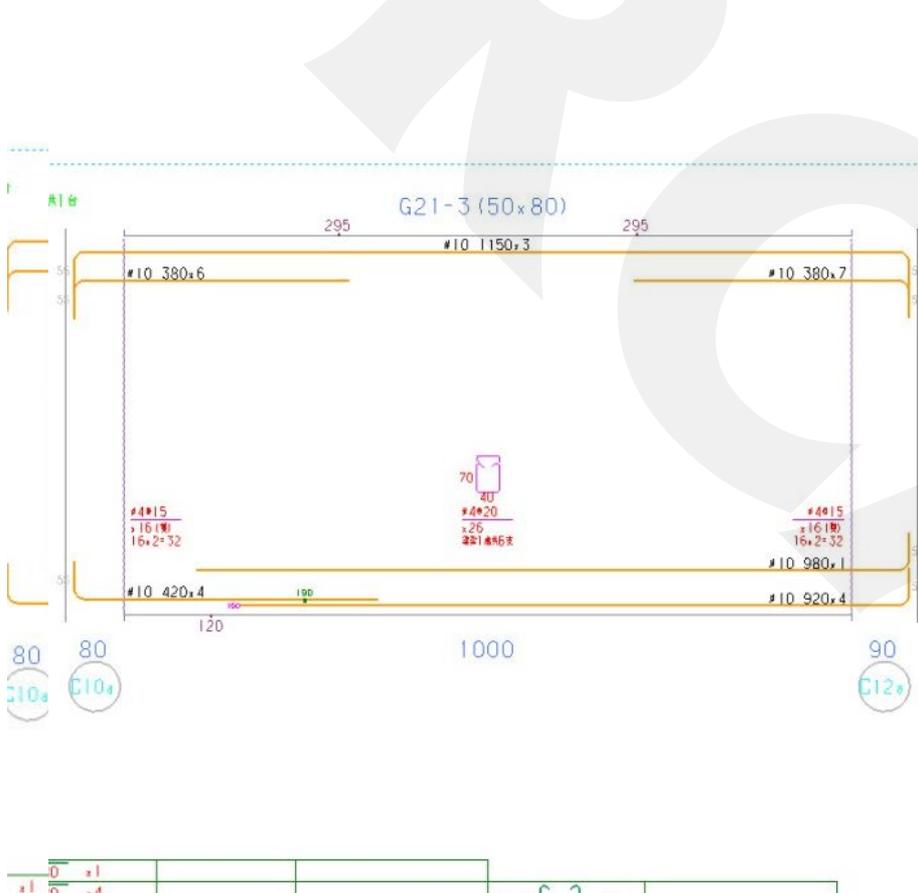
# 1-1 梁 曲線梁



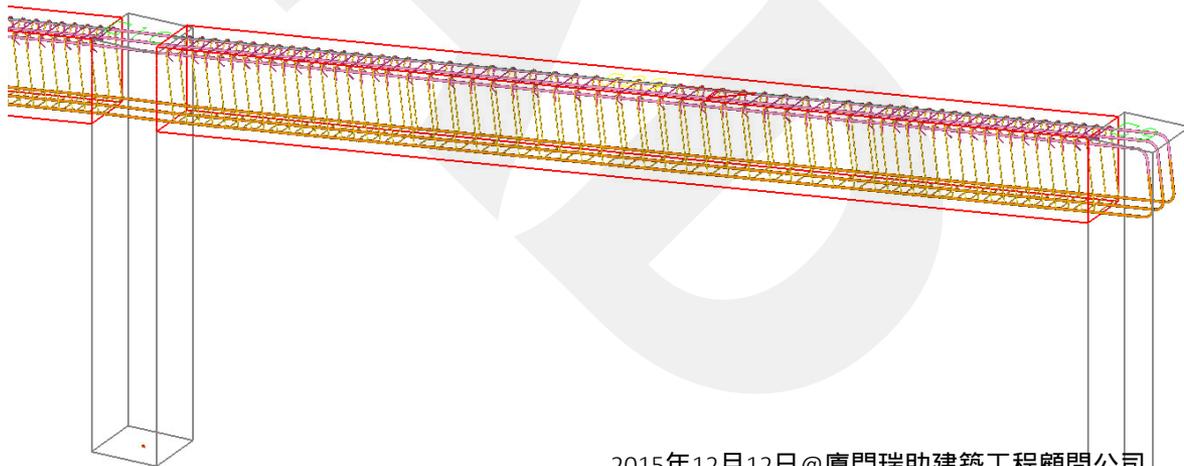
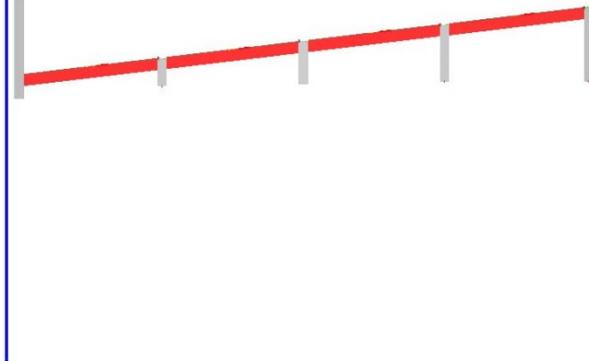
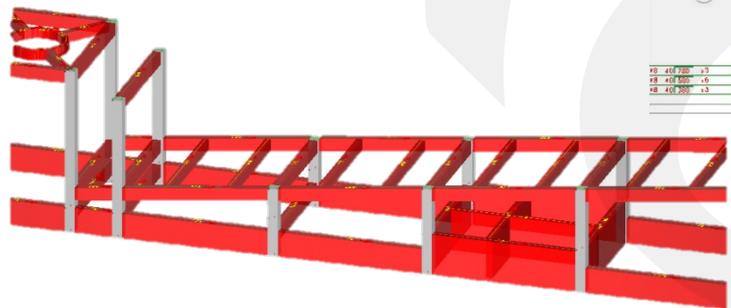
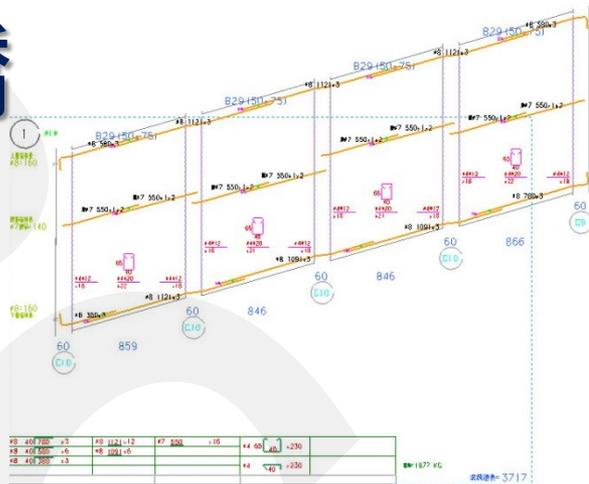
# 1-2 梁 伸入鄰跨



# 1-3 梁 刪除搭接點

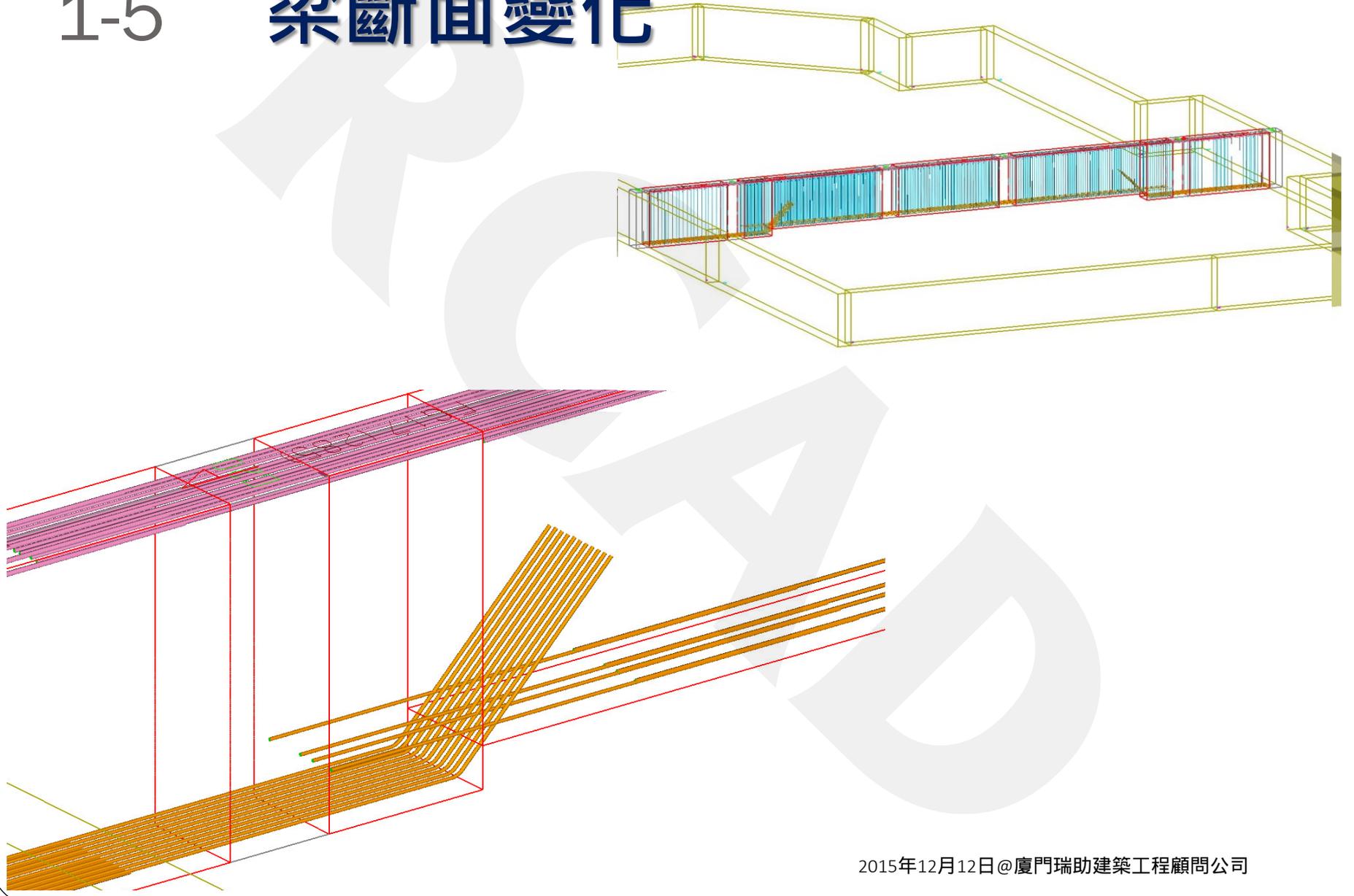


# 1-4 梁 車橋

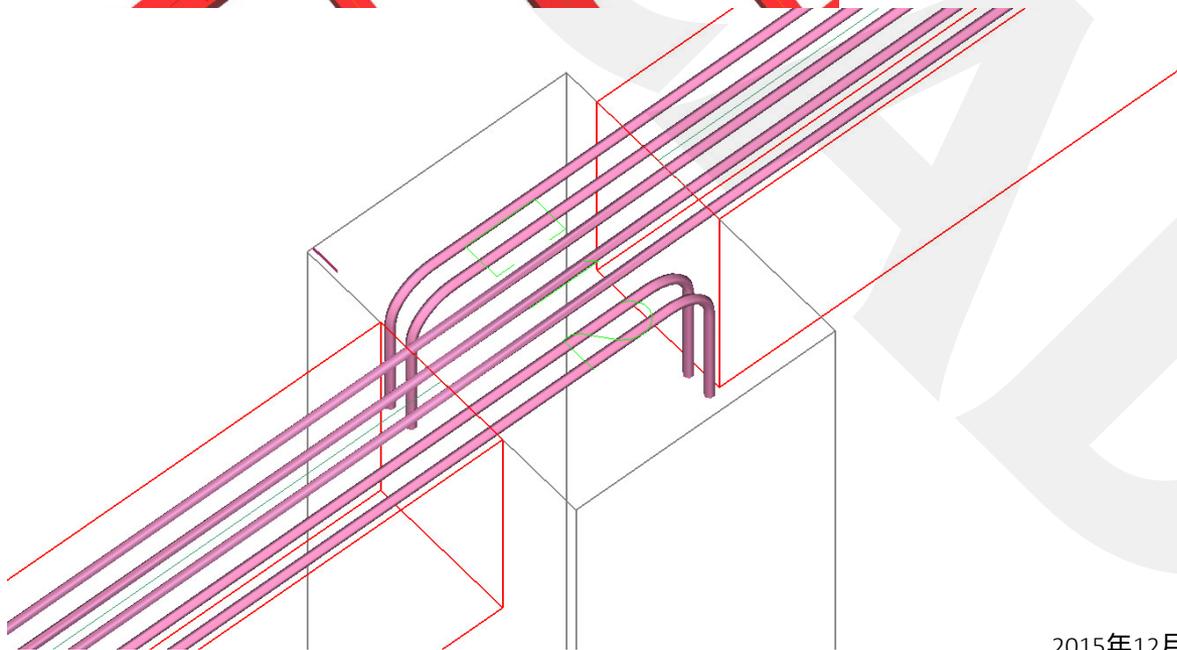
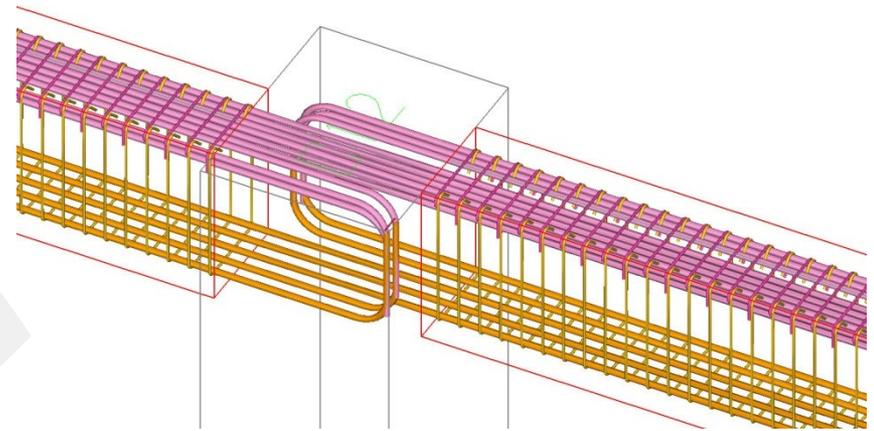


1-5

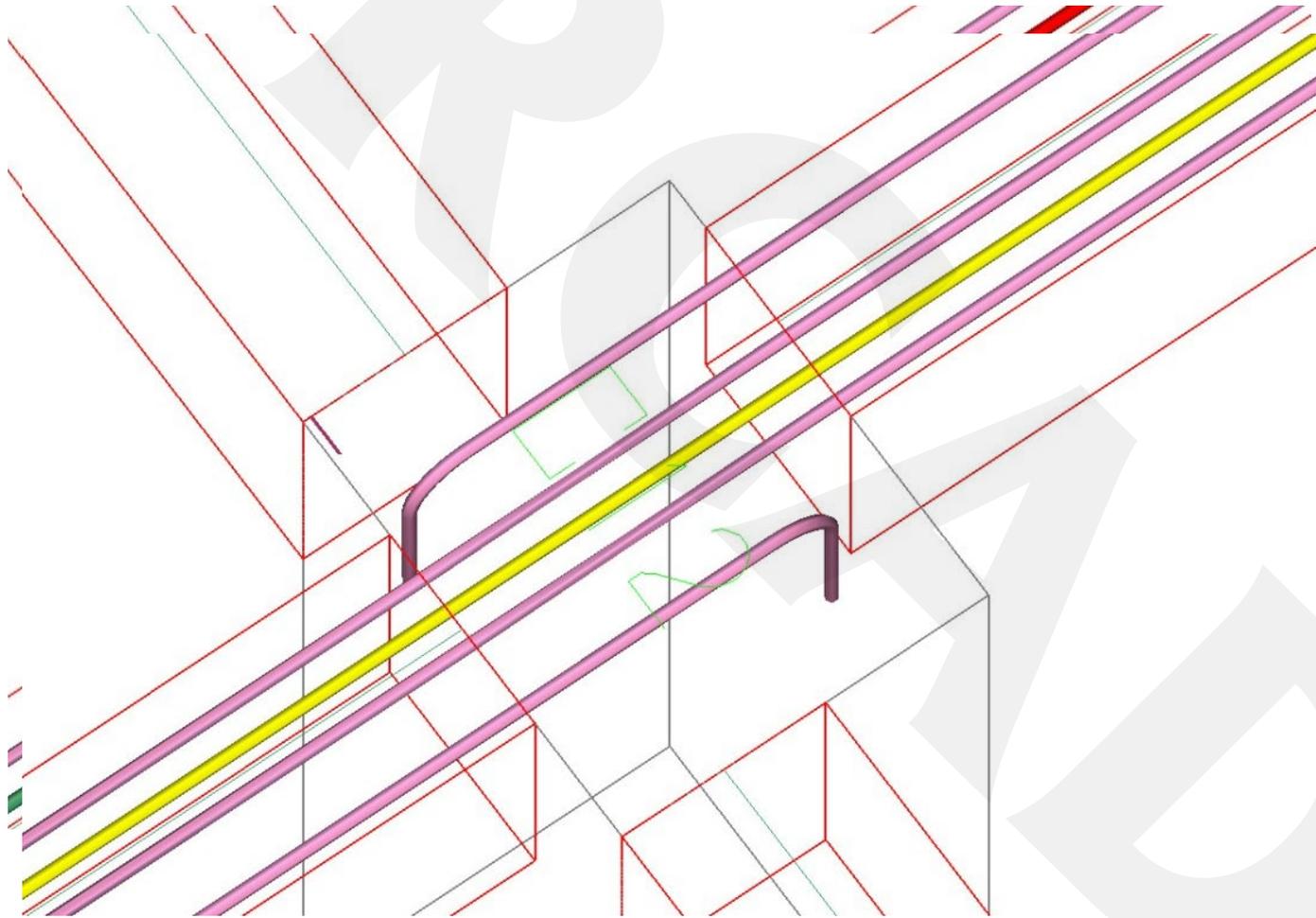
# 梁斷面變化



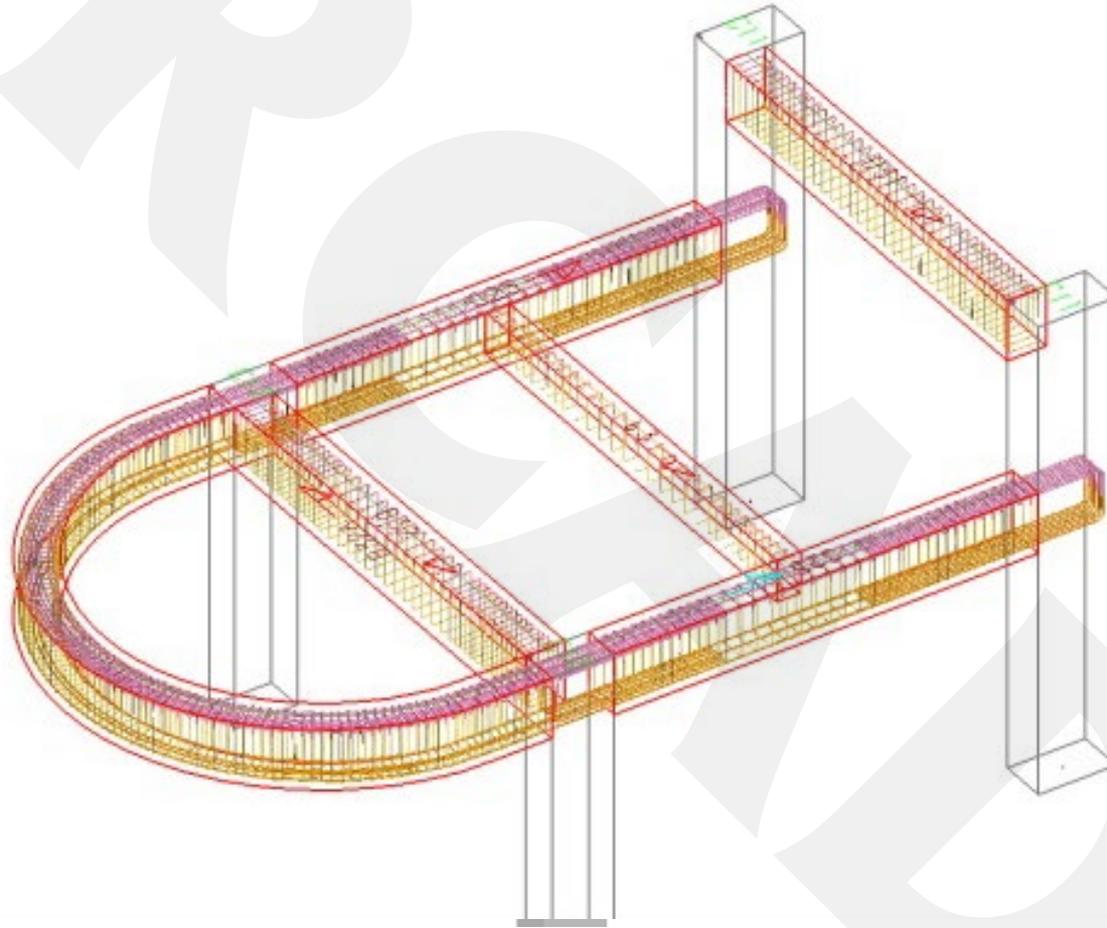
# 1-6 梁 梁錯位



# 1-7 梁 合併筋串

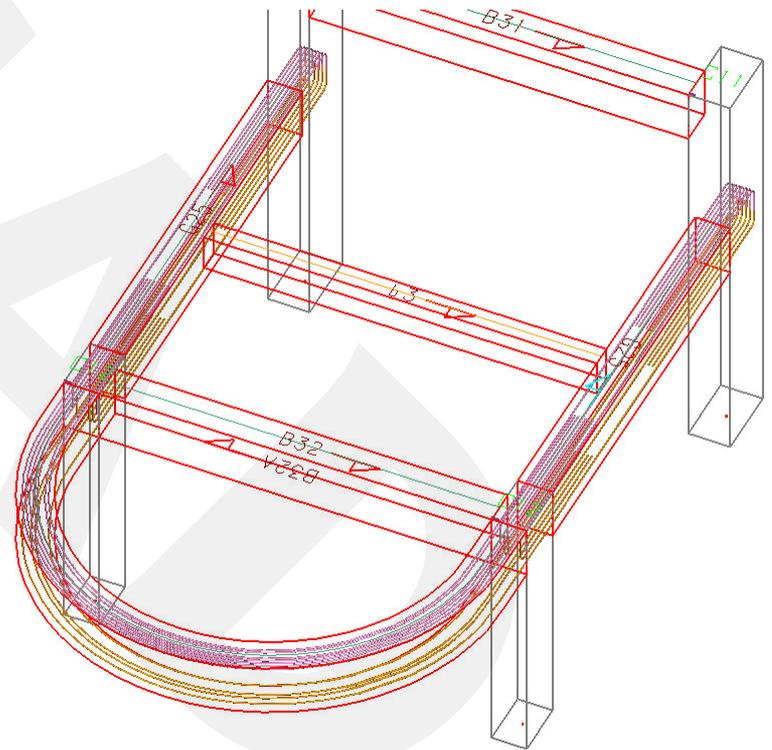
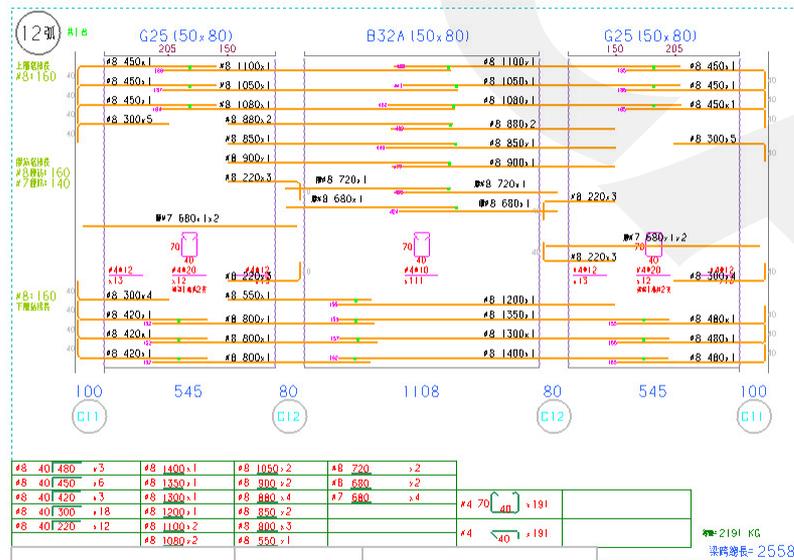


# 1-8 梁 圓弧梁

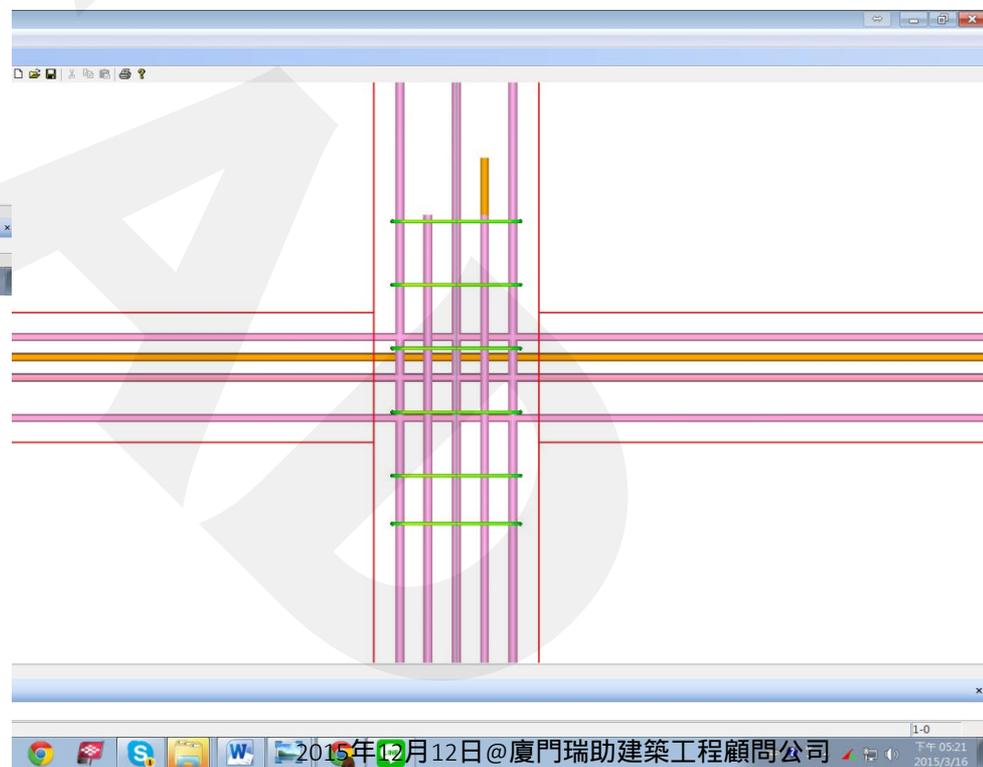
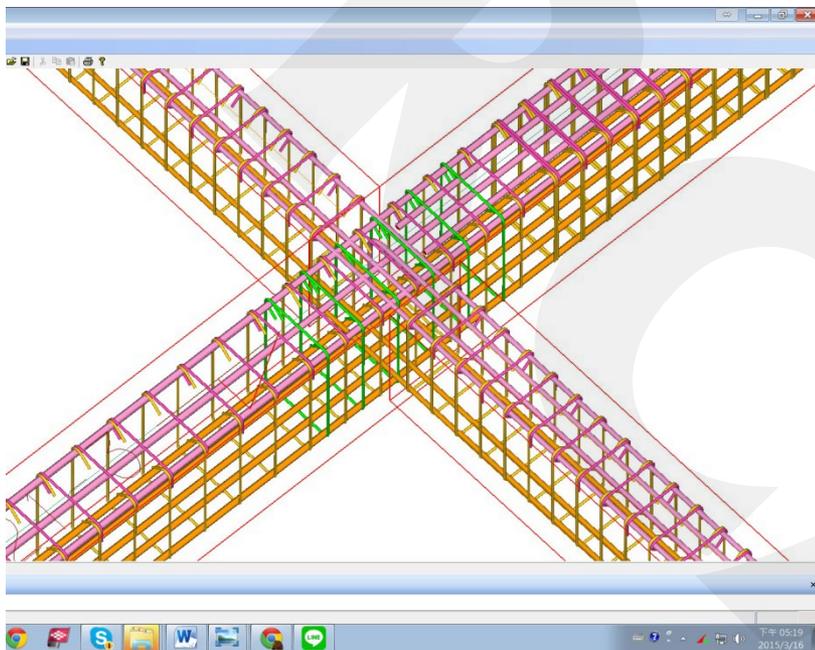


# 1-8 梁 圓弧梁

## ● 2D 3D 施工圖同步

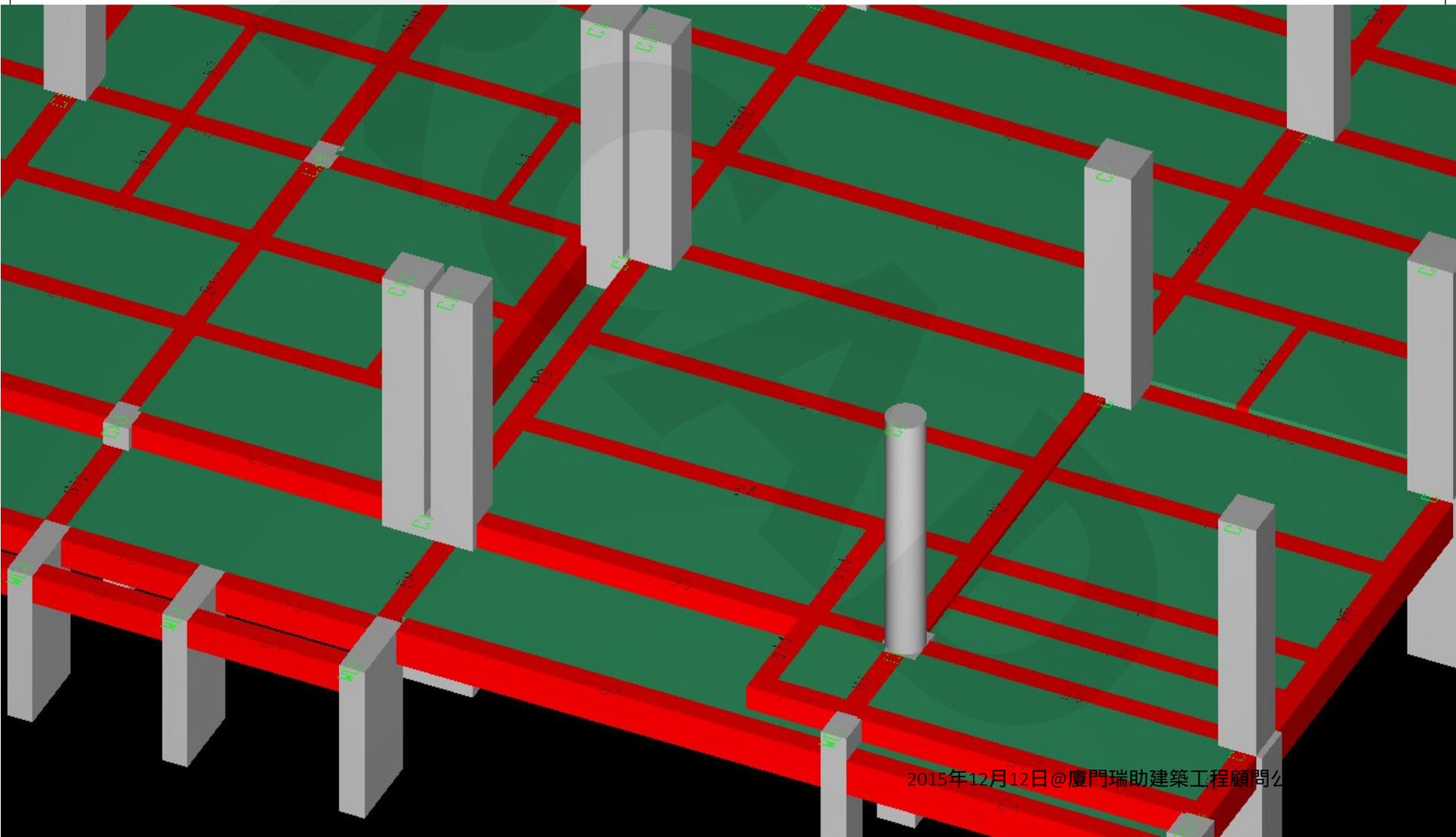


# 1-9 梁 補強箍筋



- 先自動計算
- 可手動修改

# 2. 柱 的疑難雜症



# 2-1 2D3D同步移動續接器

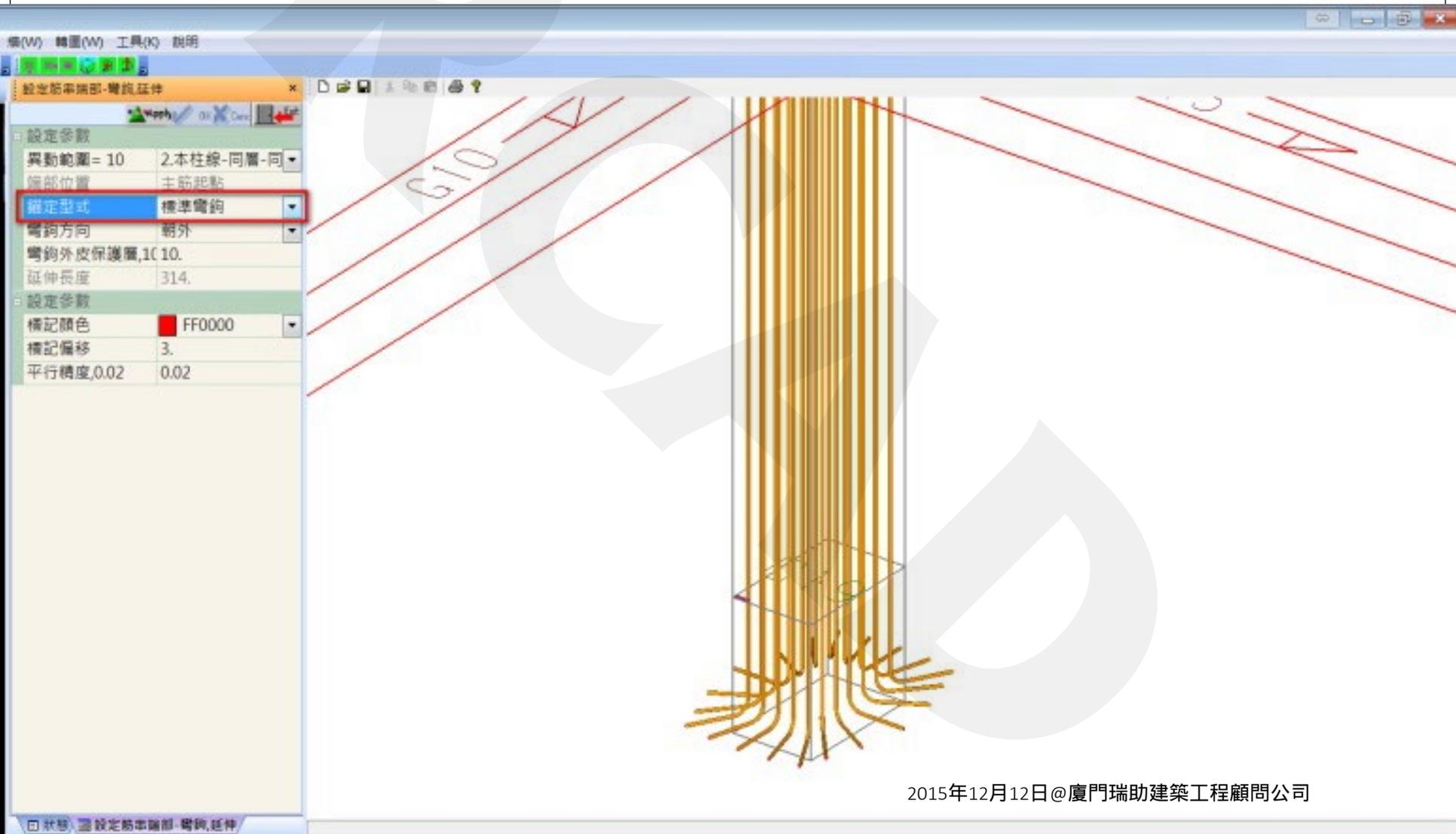
The screenshot displays the RCAD software interface for editing a column stack. The left sidebar shows the BOM tree with 'CRCAD\_BuildingsCtl' expanded to '柱線 1' and '31 C19 B1F~RF 6' selected. The middle panel shows the '移動 2F:C19' properties, with the '搭接位置' (lap position) set to 200. The right panel shows a 2D technical drawing of a column section with reinforcement bars (#4, #7) and dimensions (200, 270, 350, 400, 410, 60, 120). The 3D model on the far right shows the column with reinforcement bars highlighted in orange. Red arrows and circles indicate the synchronization of the 200mm lap position parameter across the 2D drawing and 3D model.

設定參數	值
搭接位置	200
搭接位置-現值	200.
異動範圍	2.本柱線-同層-同
物件總數	10
Highlight	
柱主筋	FFFF00
分段點-顏色	FF0000
分段點-線寬	3

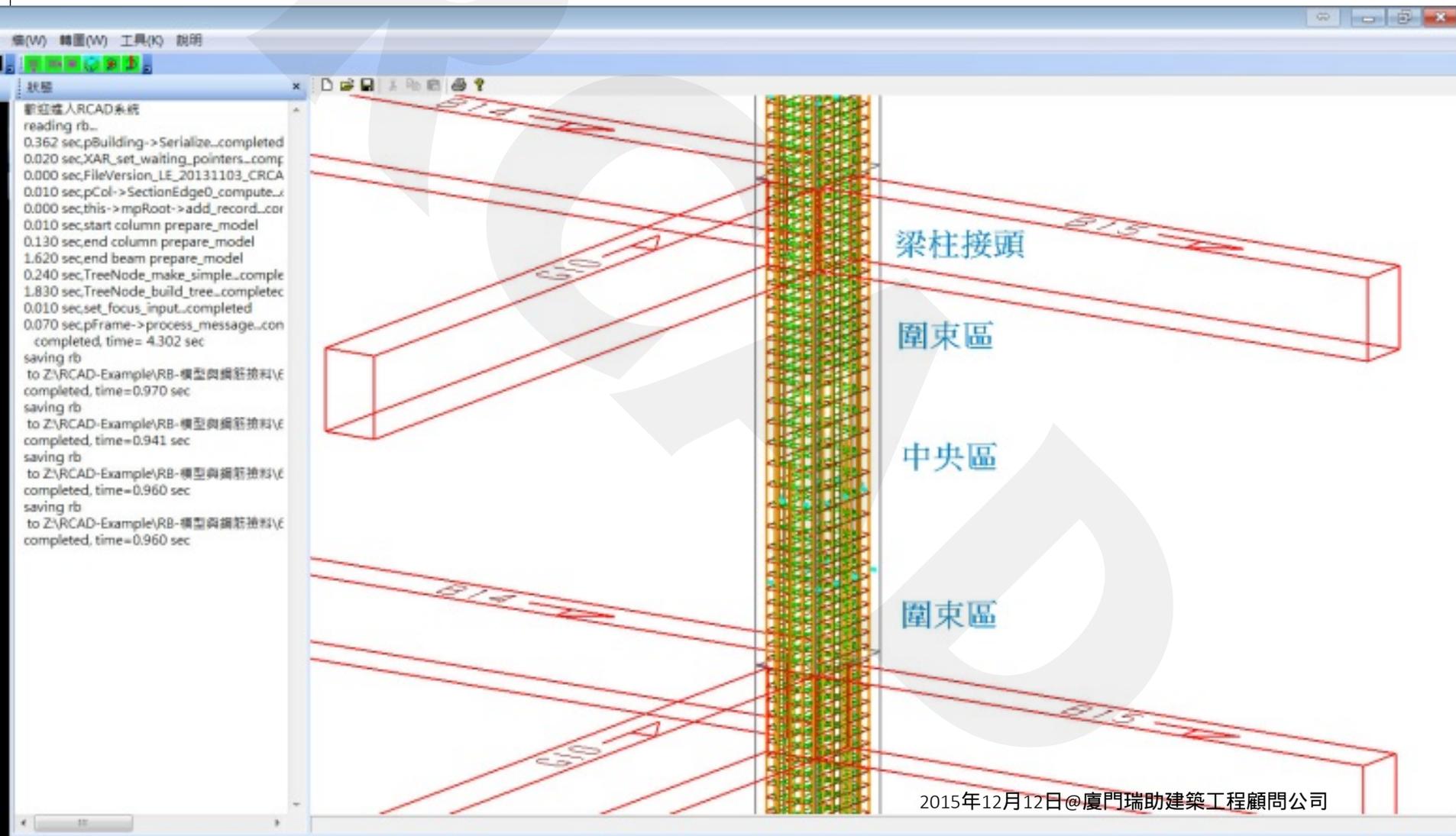
重算高度

命令: bgoo

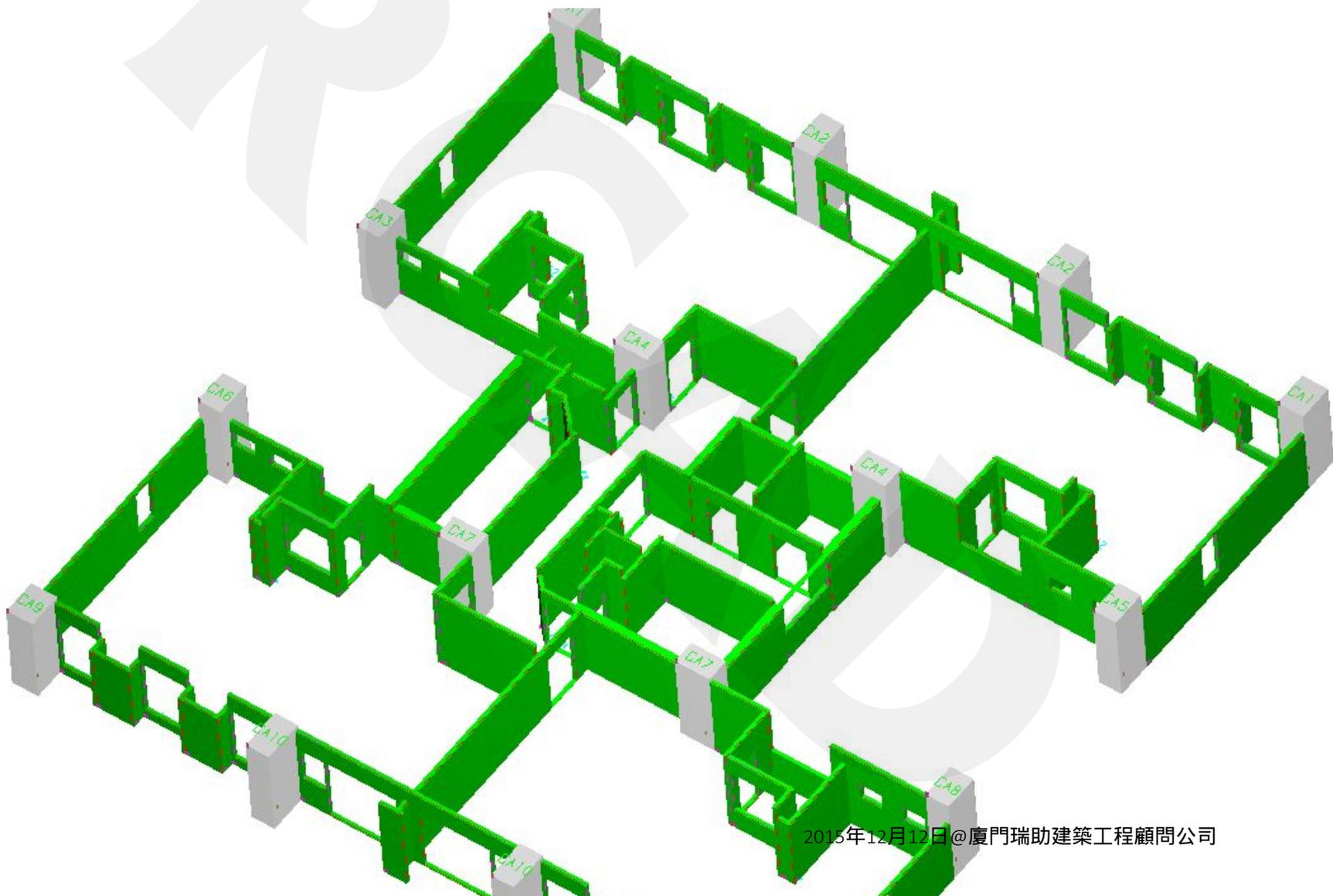
## 2-2 柱錨定



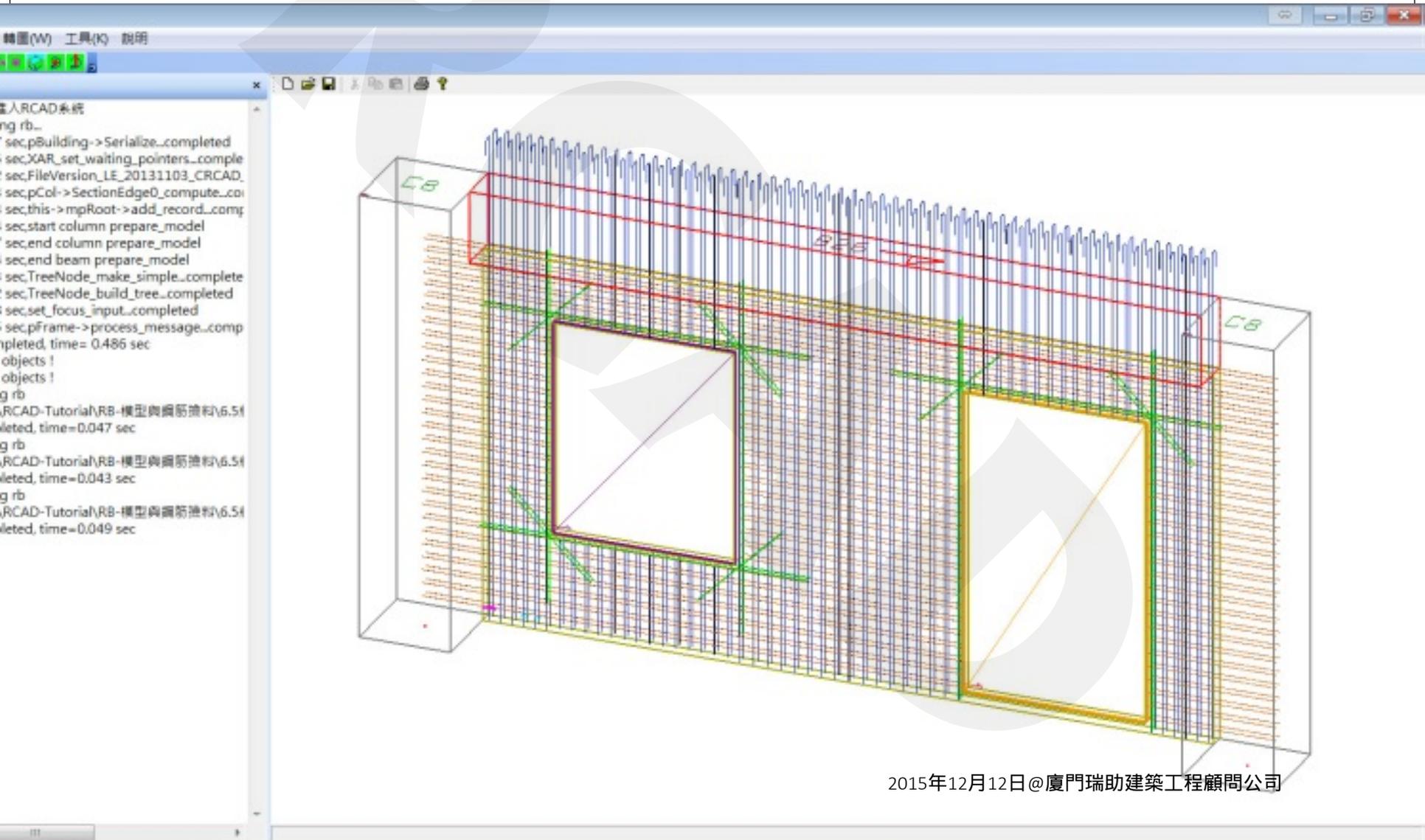
## 2-3 箍筋自動配設



# 3. 牆的細節



# 3-1 牆開口補強 / 預留筋安全彎勾



# BIM流程: IFC In

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傳統流程

清圖

讀2D建築平立剖

建3D建築模型

讀2D結構配筋

佈3D鋼筋模型

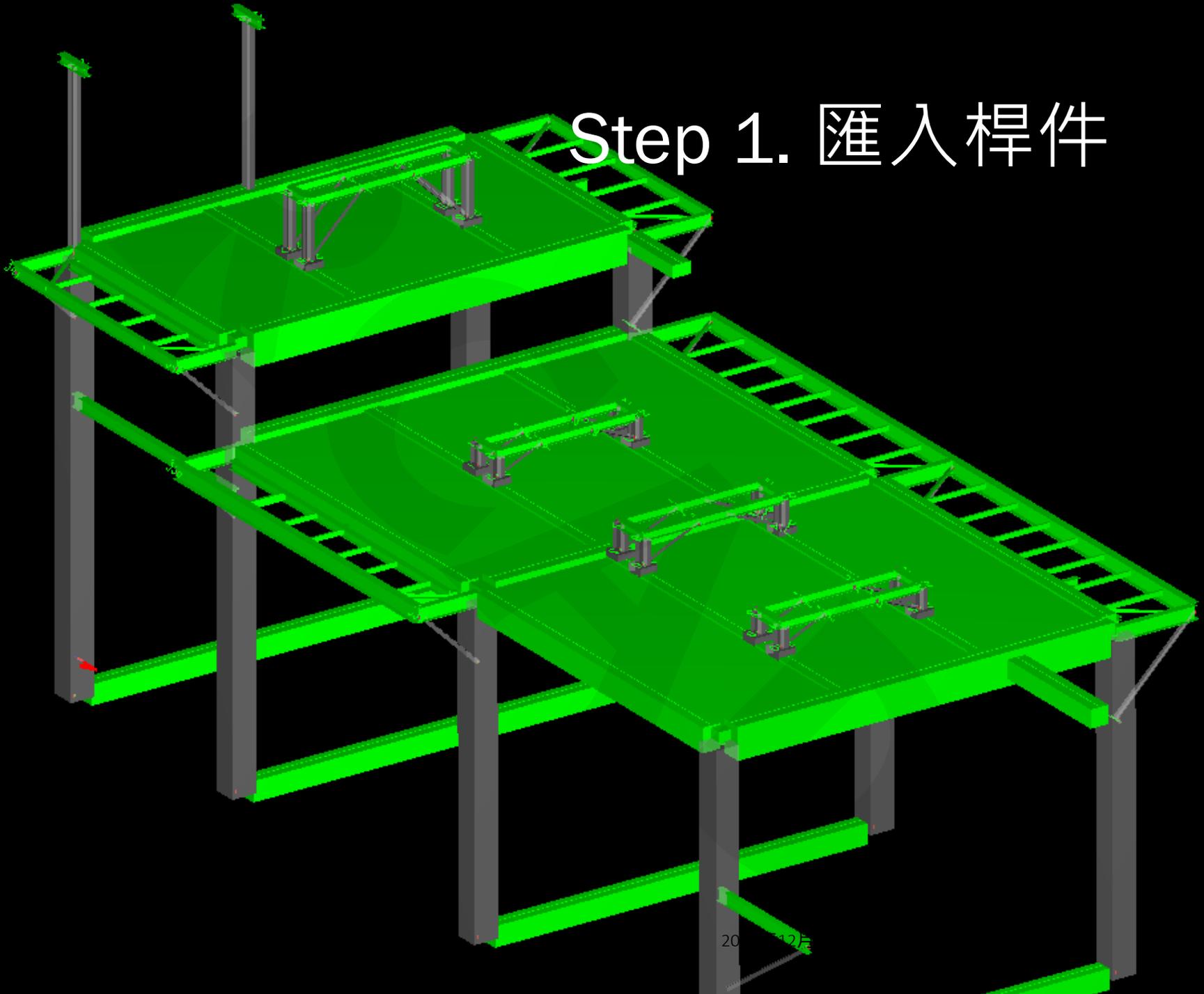
調整鋼筋細節

產生鋼筋施工圖

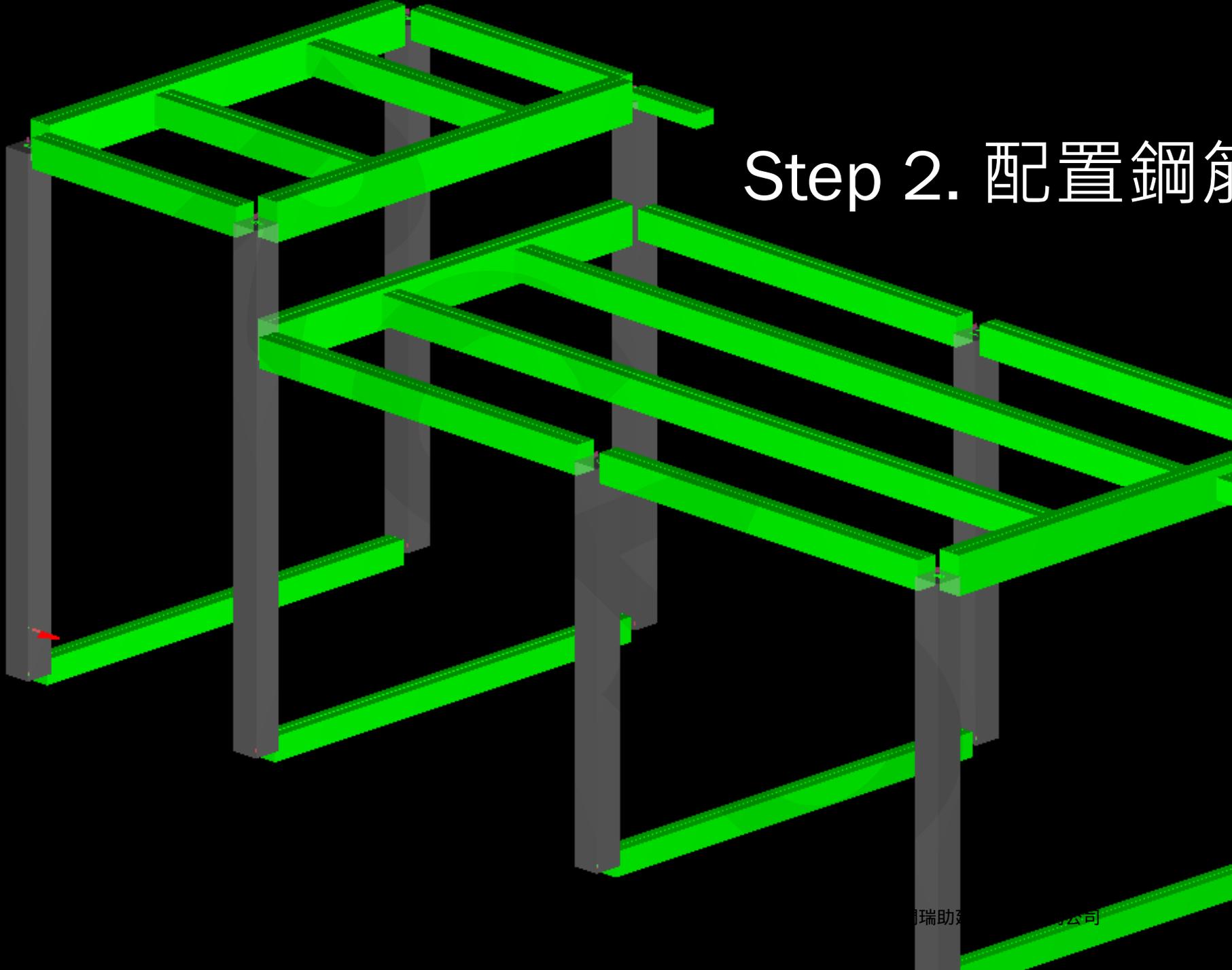
輸出料單

BIM流程

# Step 1. 匯入桿件

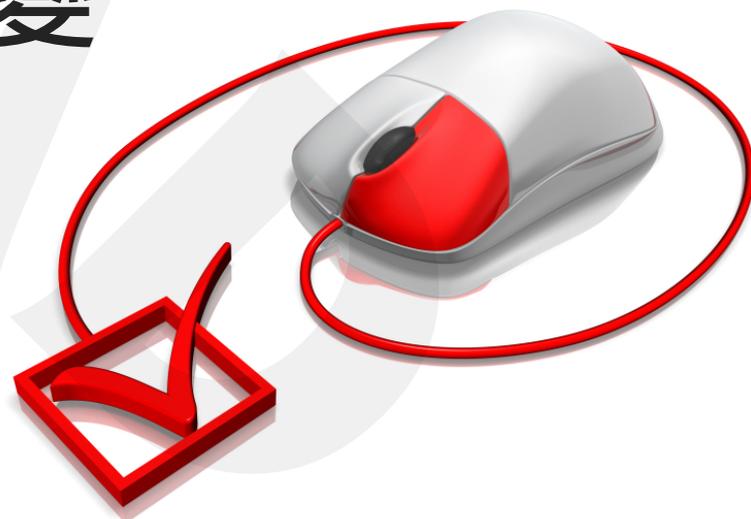


## Step 2. 配置鋼筋



# 值得想一想

有**想法** 才會**改變**



# 結論



2D 3D **BIM**

**更好的明天**



**環佳富**科技  
吳杰彥  
吳舒涵