

# 始終來自於需求的BIM應用

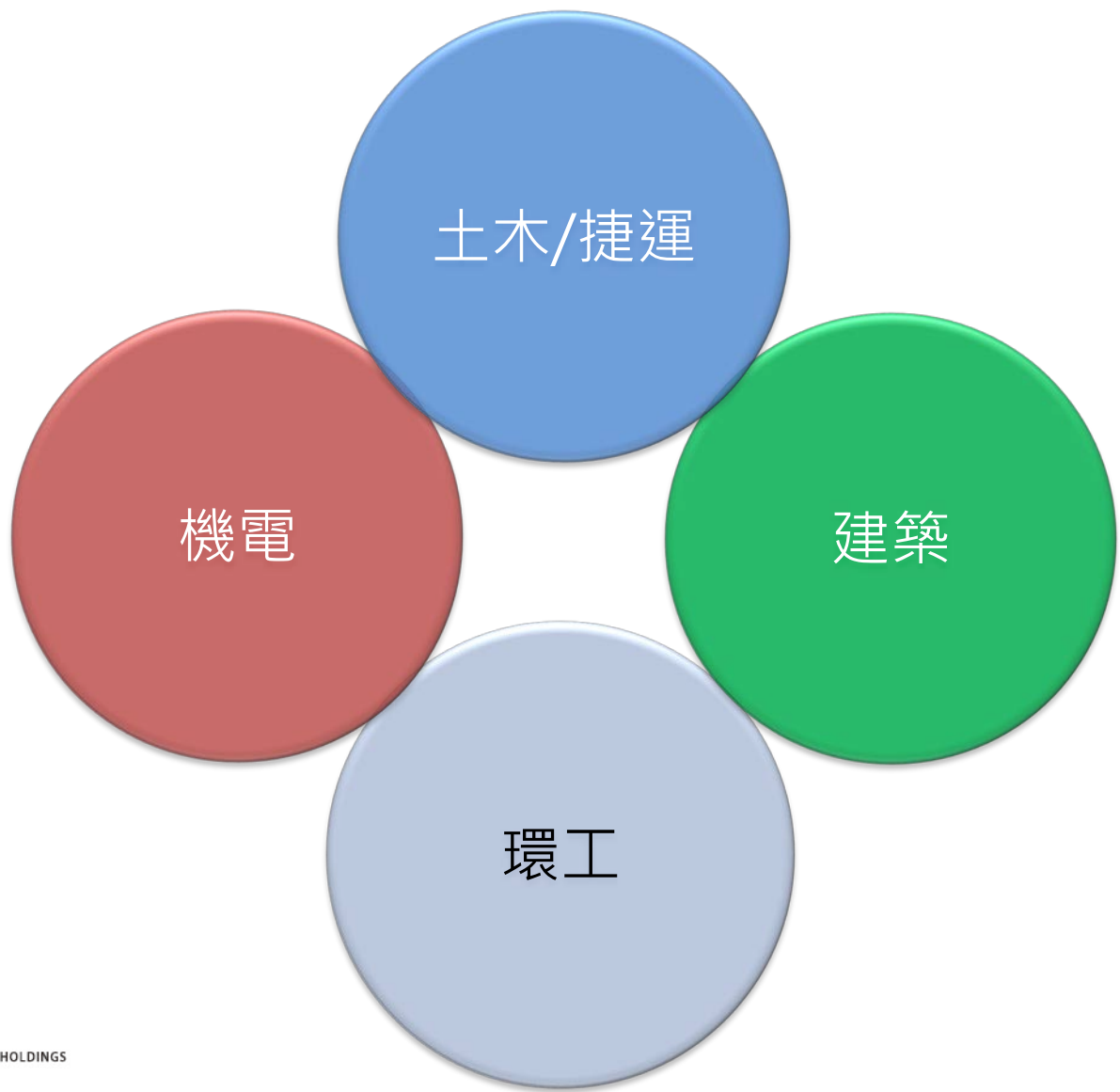
## -以營造廠為例



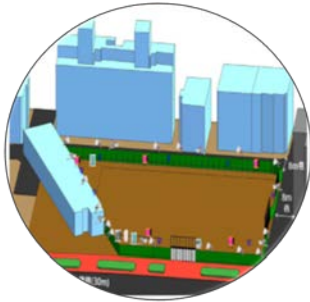
BIM

大陸工程股份有限公司  
建築專案部 / 江志雲 經理  
2018/12

# BIM技術與工程領域的串連



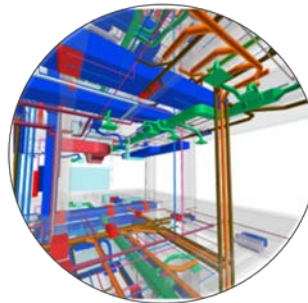
# Our BIM Uses Now



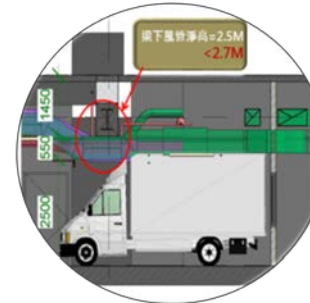
Site Planning



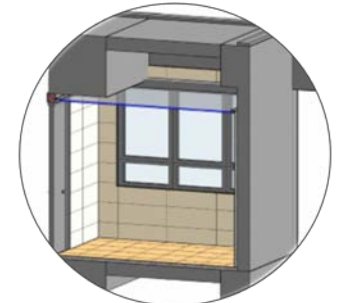
Traffic planning



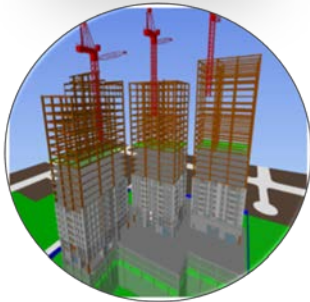
Clash detection &  
RFI documents



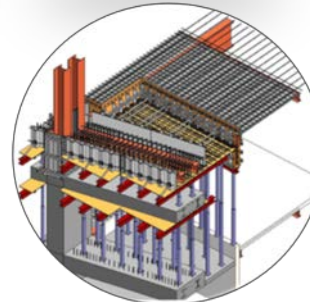
headroom checking



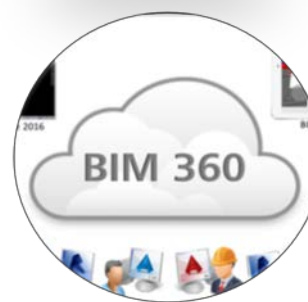
Ceramic tile layout



4D Simulation



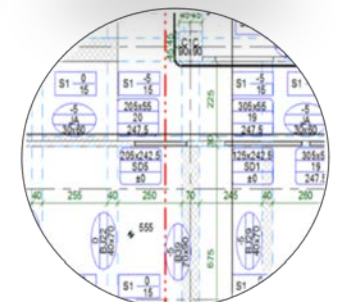
Construction Method  
Simulation



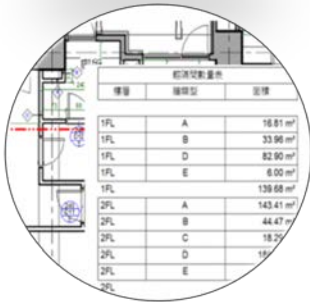
Collaboration in  
Cloud



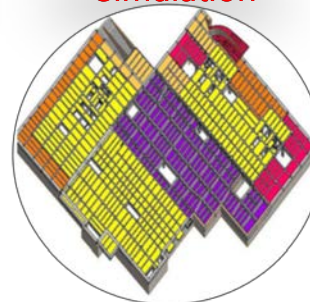
Rendering simulation



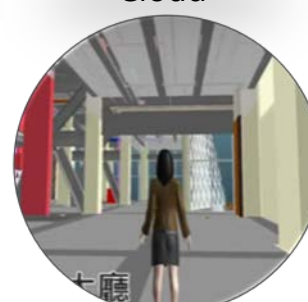
Structural working  
drawing



Quantity checking



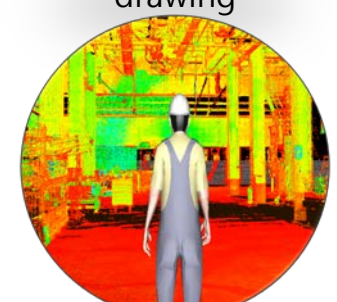
Other drawings and  
information needed



3D Visual  
Communications



Site inspection



Laser Scan

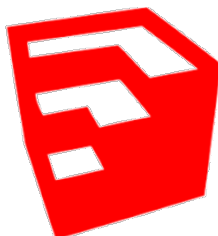
# 多樣的BIM軟體工具



B2M



Pano2VR 5



SketchUp



Autodesk Revit



Navisworks



ENSCAPE™



MS Project



AUTODESK®  
BIM 360™



Google Earth



AutoCAD



Ecotect



Revit API



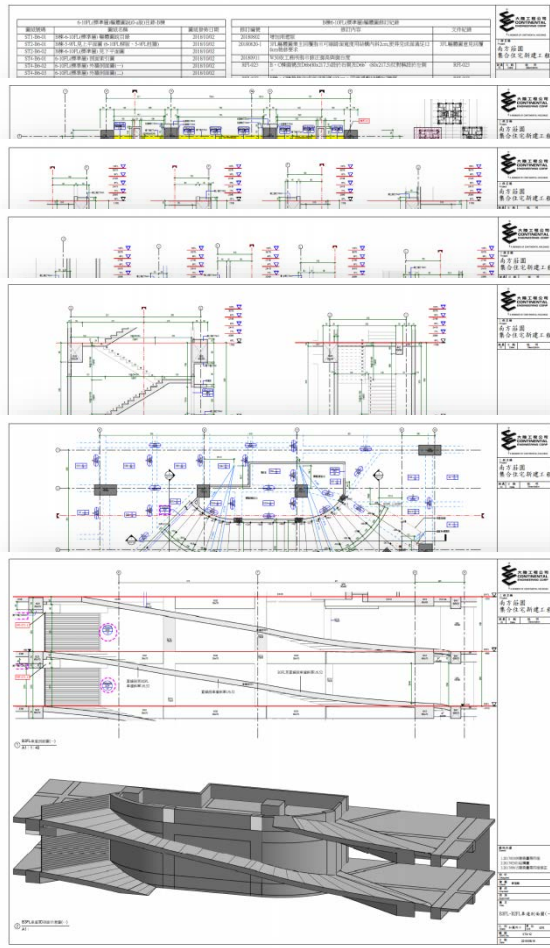
Dynamo



# BIM在建築工程的應用

# BIM產出圖說

## 軀體圖



## 內裝圖



## 外裝圖



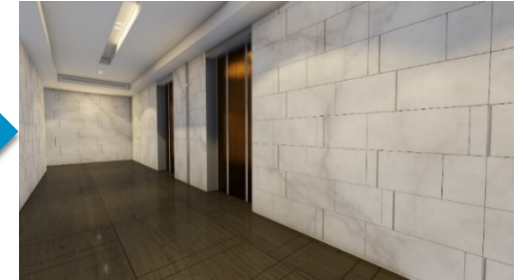
# 室內裝修彩現檢討過程



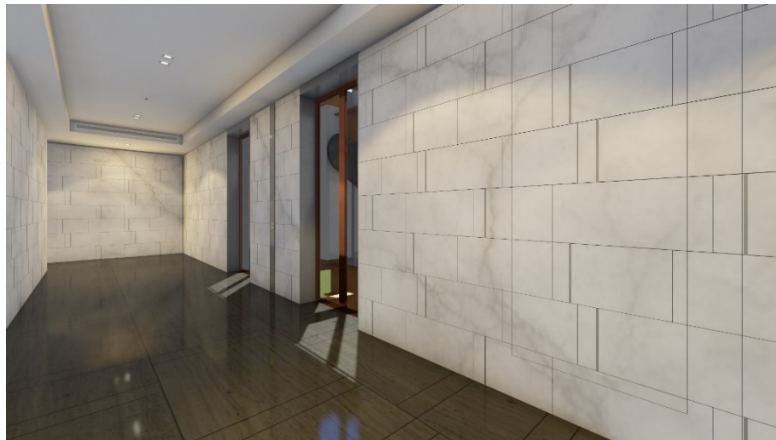
原設計草圖



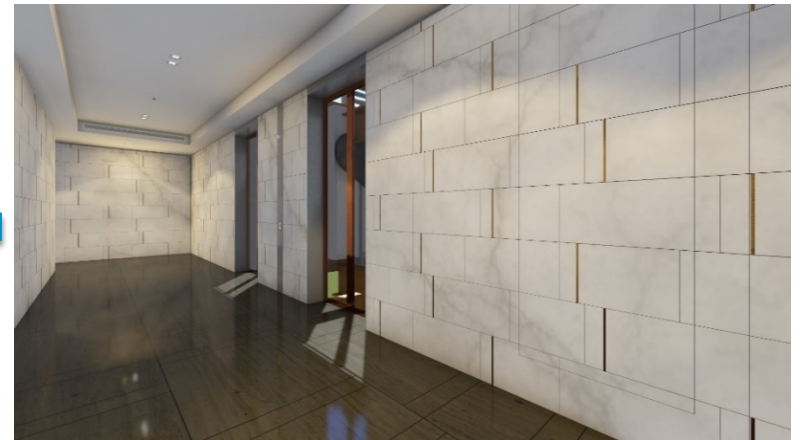
依據草圖建模



依據討論第一次修正



VE方案



依據討論第二次修正

# 穿樑開孔介面整合(SEM)-(API程式開發)

## 提供資訊給Stakeholder的需求

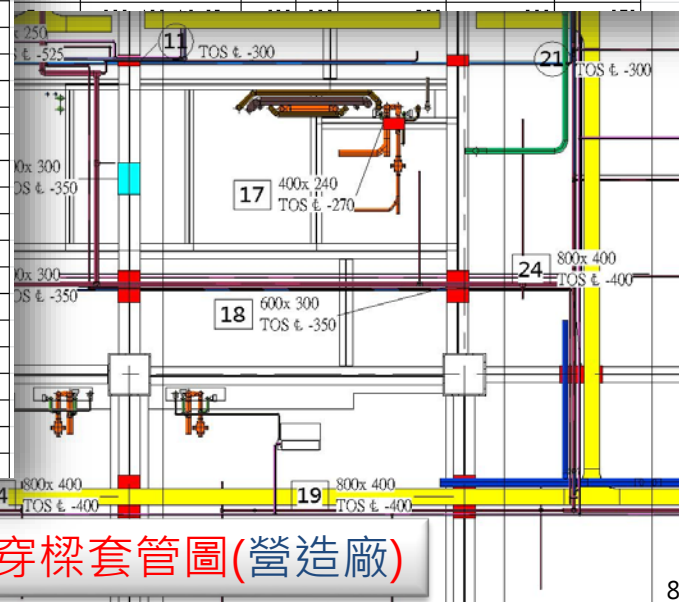


	A	B	C	D	E	F	G	H	I	J	K
1	開孔編號	開孔形狀	樓層	樑編號	樑尺寸	W(D)	H	開口上邊距	開口下邊距	TOS/TOC	
2	1	矩形孔	16FL	G2	H-800x450x16x32	800	400	200	200	-400	
3	1	矩形孔	17FL	G2	H-800x450x16x32	800	300	200	300	-350	
4	1	矩形孔	18FL	G2	H-800x450x16x32	800	300	220	280	-370	
5	2	矩形孔	16FL	B6	H-800x300x14x25	800	400	200	200	-400	
6	2	矩形孔	17FL	G2	H-800x450x16x32	800	300	200	300	-350	
7	2	矩形孔	18FL	G1	H-800x450x16x32	300	200	200	400	-300	
8	3	矩形孔	17FL	B6	H-800x300x14x25	700	400	200	200	-400	
9	3	矩形孔	18FL	B1	H-800x300x14x28	300	200	200	400	-300	
10	3	矩形孔	16FL	g1	H-500x200x10x16	800	240	150	110	-270	
11	4	矩形孔	16FL	B3	H-800x300x14x25	800	400	200	200	-400	
12	4	矩形孔	17FL	B3	H-800x300x14x25	400	300	200	300	-350	
13	4	矩形孔	18FL	B6	H-800x300x14x25	300	200	250	350	-350	
14	5	矩形孔	17FL	G5	H-800x400x16x32	200	200	200	400	-300	
15	5	矩形孔	18FL	B3	H-800x300x14x25	800	400	200	200	-400	
16	5	矩形孔	16FL	g6	H-500x200x10x16	800	240	150	120	-260	
17	6	矩形孔	16FL	G5	H-800x400x16x32	200	200	200	400	-300	
18	6	矩形孔	17FL	G5	H-800x400x16x32	200	200	200	400	-300	
19	6	矩形孔	18FL	B3	H-800x300x14x25	800	400	200	200	-400	
20	6	矩形孔	16FL	g6	H-500x200x10x16	800	240	150	100	-175	
21	6	矩形孔	17FL	G5	H-800x400x16x32	200	200	200	300	-350	
22	6	矩形孔	18FL	B1	H-800x300x14x28	300	200	200	400	-300	
23	6	矩形孔	16FL	g6	H-500x200x10x16	800	240	150	130	-270	

套管開口與鋼樑位置  
Check(結構)

	B	C	D	E	F	G
1	樓層	套管編號	形狀	W(D)	H	說明
2	16FL	1	矩形孔	800	400	REP32 mm x1, EA100ø x1, SA150ø x1, CW20 mm x1, HW25 mm x1, HWR15 mm x1, FS50 mm x1, 電信Tray x1
3	16FL	2	矩形孔	800	400	EA100ø x1, EA150ø x1, OA150ø x1
4	16FL	3	矩形孔	800	240	REP32 mm x1, SA150ø x1, FS25 mm x1
5	16FL	4	矩形孔	800	400	SA150ø x1, CW20 mm x1, 電信Tray x1, REP32 mm x1, FS65 mm x1
6	16FL	5	矩形孔	800	220	SA150ø x1, 電信Tray x1, REP32 mm x1, FS40 mm x1
7	16FL	6	矩形孔	200	200	
8	16FL	7	矩形孔	700	150	EA150ø x1, EA100ø x1, OA150ø x1
9	16FL	8	矩形孔	600	300	FS80 mm x1, HWR15 mm x1, CW20 mm x1, HW25 mm x1
10	16FL	10	矩形孔	600	250	FS100 mm x1, FS25 mm x1, 電信Tray x1
11	16FL	11	矩形孔	200	200	CW40 mm x1, FS32 mm x1, FA40 mm x1, FH65 mm x1
12	16FL	12	矩形孔	600	300	
13	16FL	13	矩形孔	600	300	FS25 mm x1, FS80 mm x1, HWR15 mm x1, CW20 mm x1, HW25 mm x1
14	16FL	14	矩形孔	800	220	SA150ø x1, FS40 mm x1, 電信Tray x1, REP32 mm x1
15	16FL	15	矩形孔	800	220	FS40 mm x1, 電信Tray x1, REP32 mm x1
16	16FL	16	矩形孔	200	200	
17	16FL	17	矩形孔	200	200	CW40 mm x1
18	16FL	18	矩形孔	400	240	VP50 mm x5, SP100 mm x1, SP80 mm x1, WP40 mm x2
19	16FL	19	矩形孔	600	300	FS25 mm x1, FS80 mm x1, HWR15 mm x1, CW20 mm x1, HW25 mm x1
20	16FL	20	矩形孔	800		
21	16FL	22	矩形孔	300		
22	16FL	23	矩形孔	800		

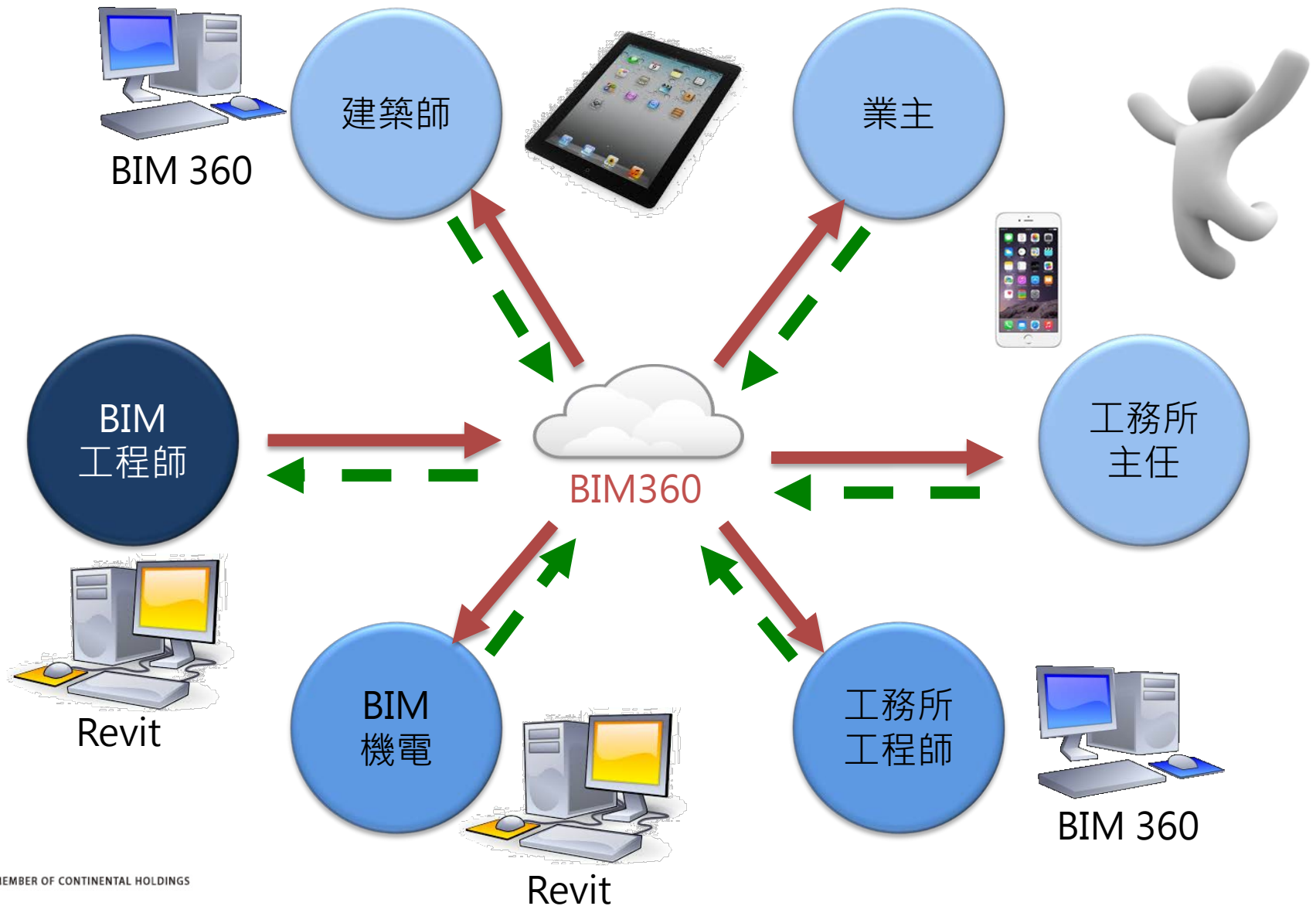
套管與管線彙整明細表(業主)



穿樑套管圖(營造廠)



# 雲端平台BIM360



# VR體驗 安全衛生講座

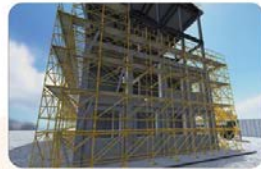
ZERO INCIDENT



## 2018年安全衛生促進活動

### VR巡迴體驗開跑了

- 活動目的：透過本活動將身歷其境體驗各種作業環境危害與辨識，開發更有效的訓練方式讓員工務實以手到、眼到、口到、心到模擬應用提示工地同仁危害辨識與風險管控能力。
- 參加資格：現職於 CEC 工程單位之所有同仁。
- 報名方式：各工程單位欲參加體驗之同仁，請向工地安衛管理人員報名登記，職安室將協調排定日期至工務所巡迴體驗虛擬實境。



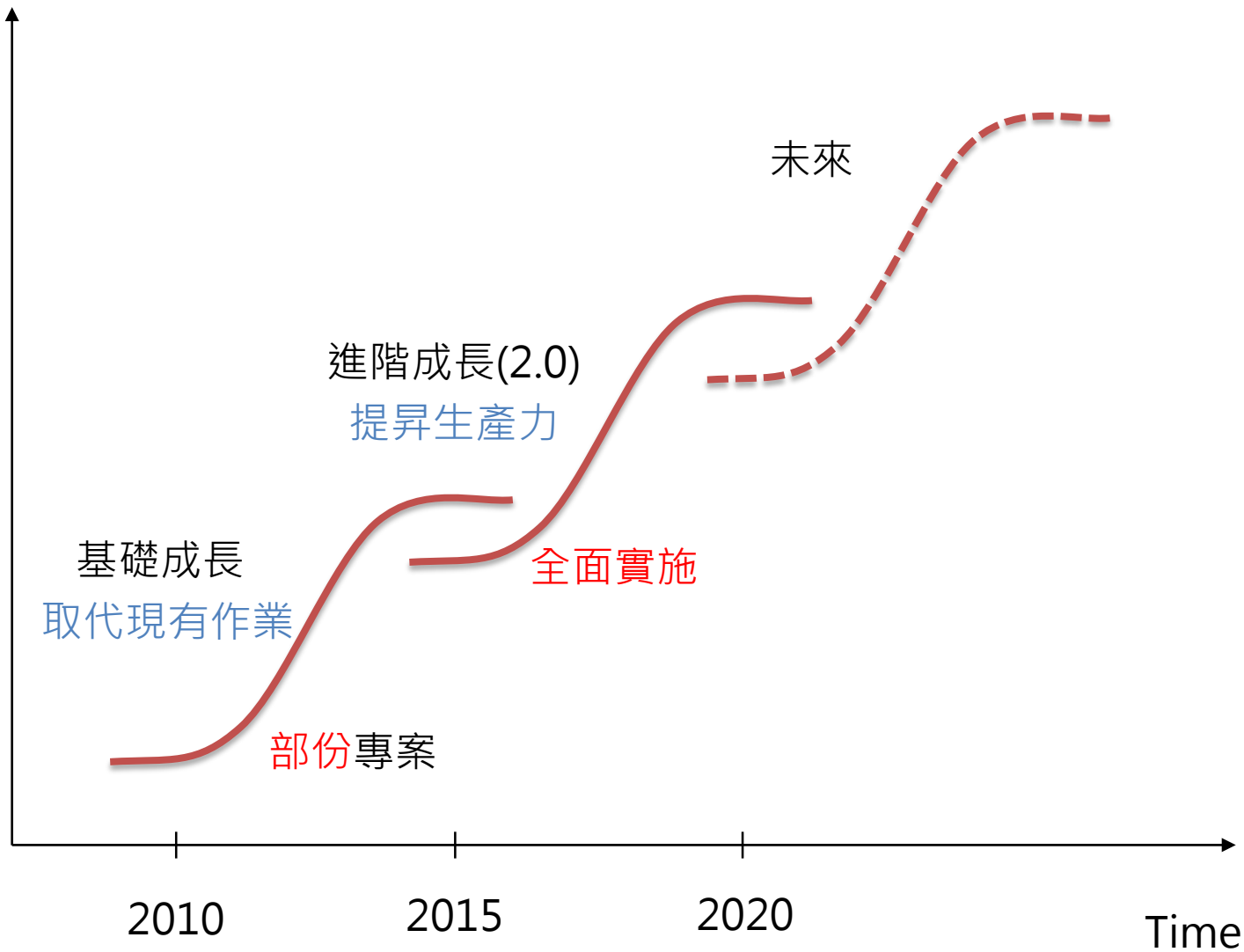
# VR技術在安衛作業的勤前模擬



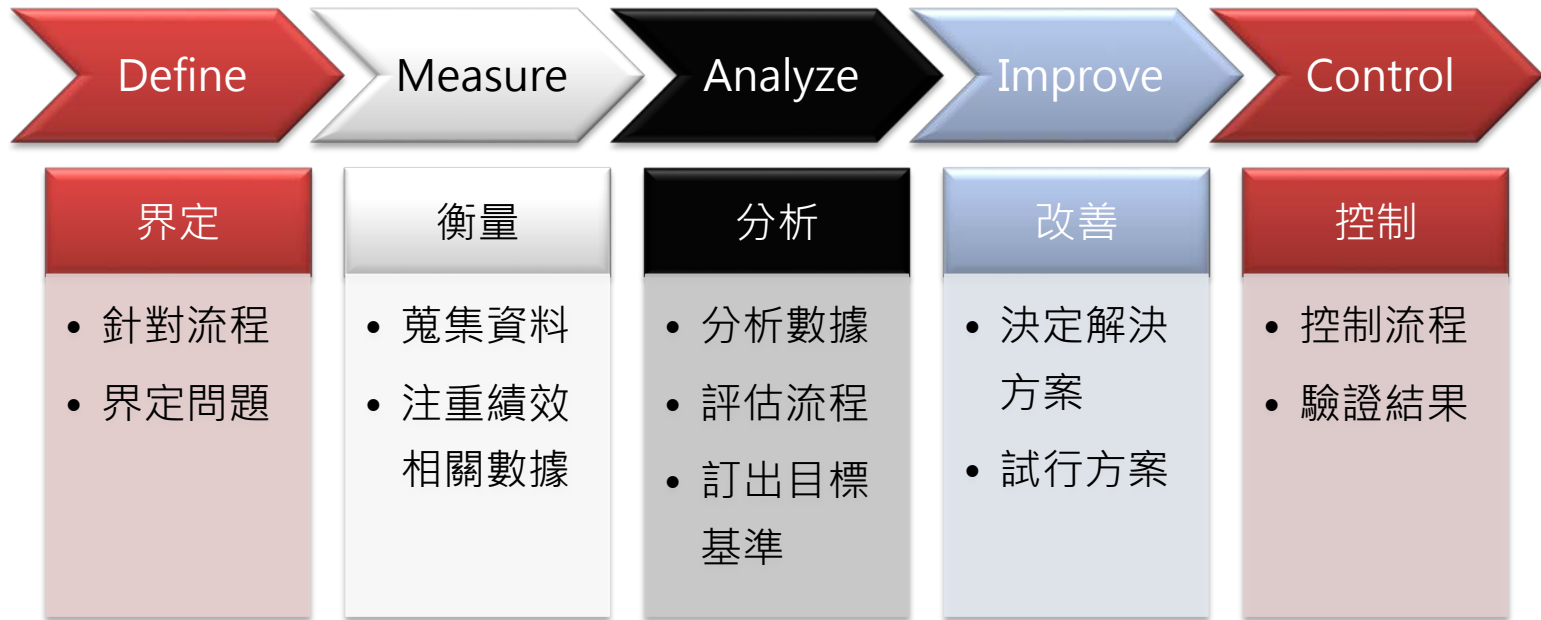


你做的BIM對嗎？

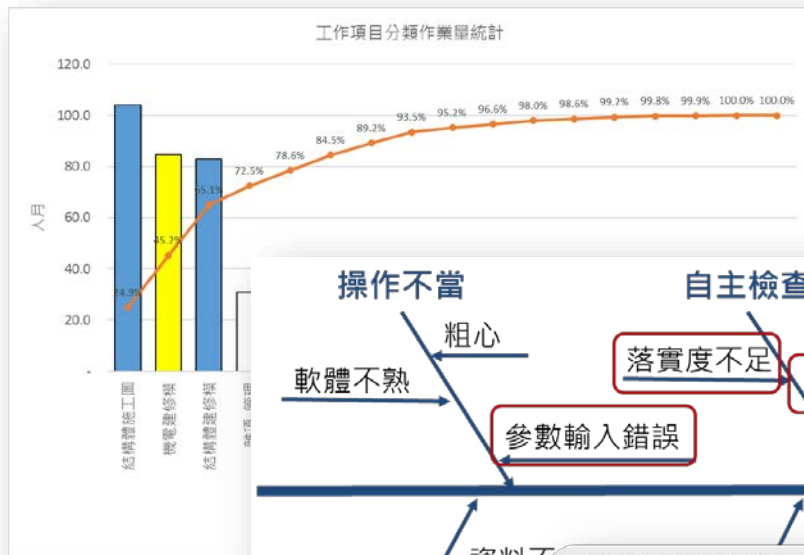
# 生產力再提昇



# 品質改善手法 – 6標準差 DMAIC



# BIM建模效率改善探討



Measure



Analyze



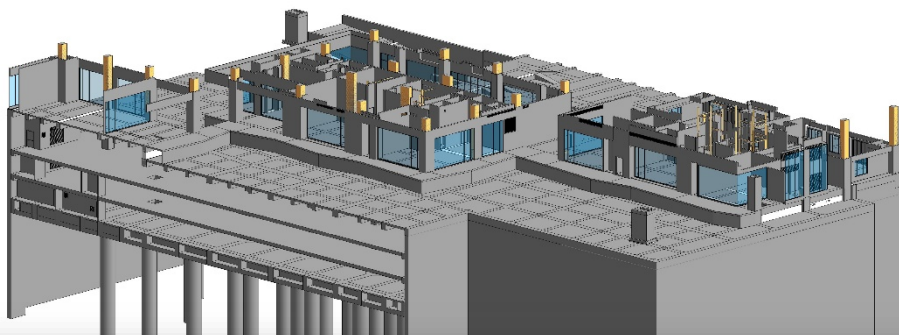
Improve

Control

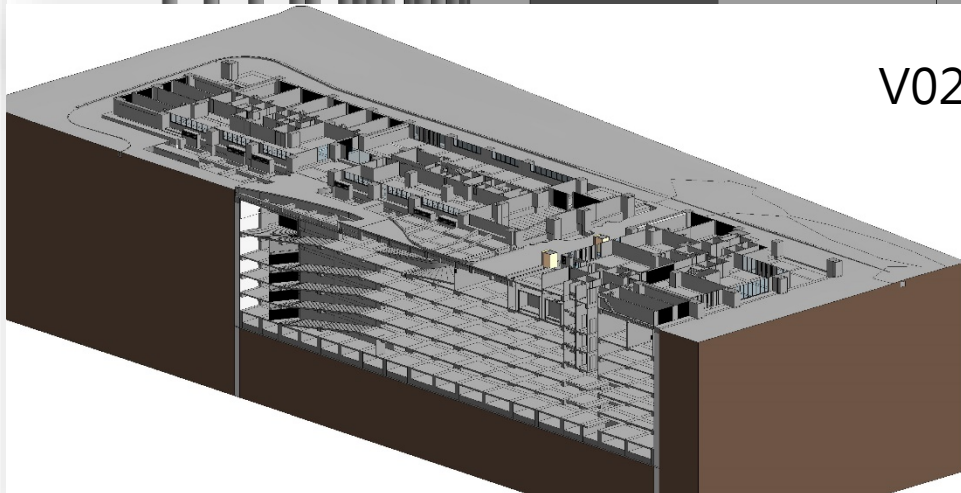
- 訓練 (Training)
- 工時紀錄 (Time Record)
- 驗證效率 (Verification Efficiency)

# Control - 建模流程改善驗證-專案案例

V01



V02



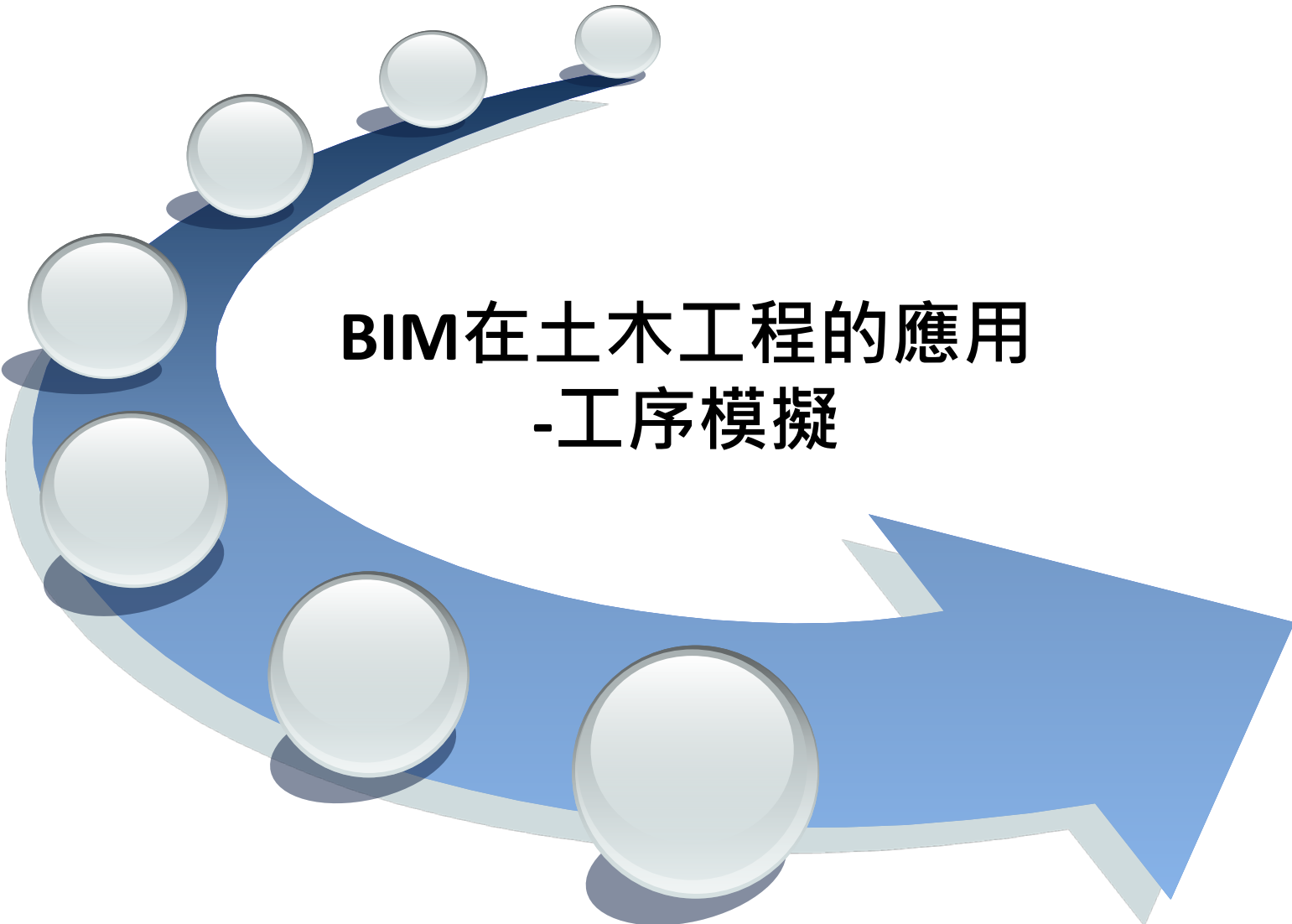
專案	地下層 面積(萬m <sup>2</sup> ) Area	生產力 提昇
V01	2.918	118%
V02	3.806	156%





# 2013、2017 BIM技術獲得優勝獎



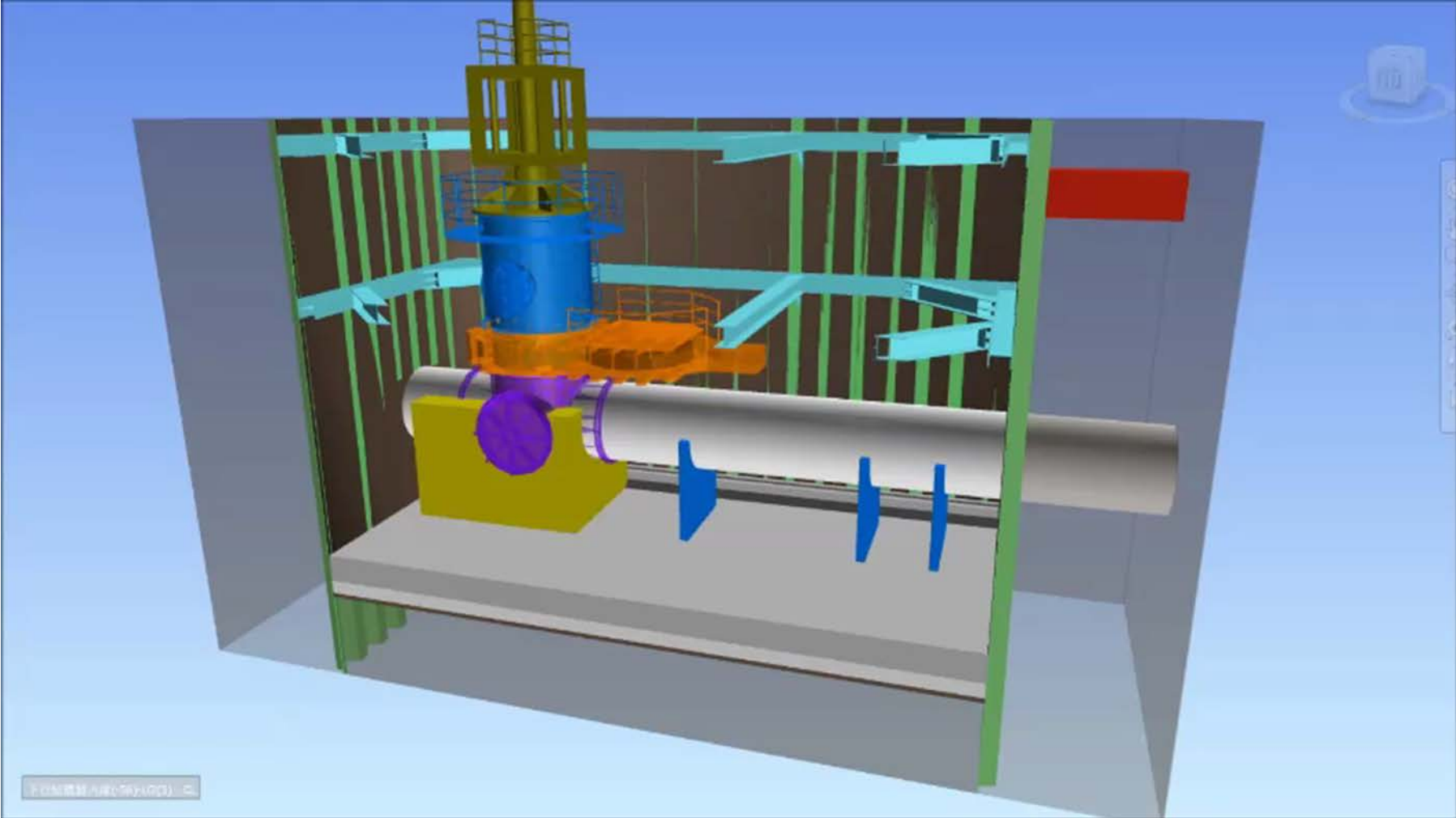


# BIM在土木工程的應用 -工序模擬

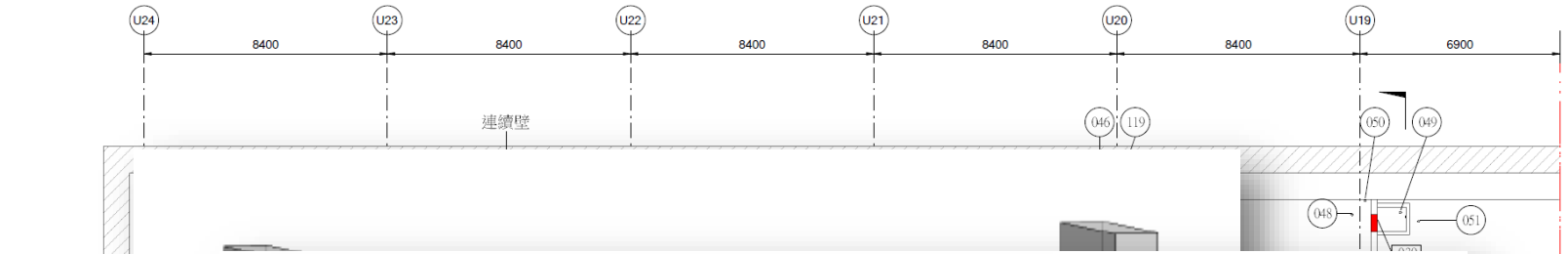
# 配合危評檢討系統牆模與重型支撐架工序



# 不斷水系統工序模擬

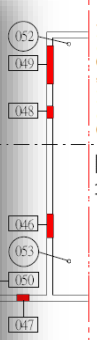
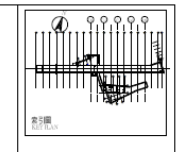


# 穿牆、版套管檢討



SEM-穿牆套管				
型式	尺寸	套管編號	管底高程FFL+	系統別
穿牆套管	直徑=80mm	023	3000	(814A-ECS)
穿牆套管	直徑=80mm	024	3000	(814A-ECS)
穿牆套管	直徑=50mm	025	3200	(系統標-AFC)
穿牆套管	直徑=50mm	026	3200	(系統標-AFC)
穿牆套管	直徑=125mm	027	3000	(814A-ECS)
穿牆套管	直徑=125mm	028	3000	(814A-ECS)
穿牆套管	直徑=100mm	029	3000	(814A-ECS)
穿牆套管	直徑=100mm	030	3000	(814A-ECS)
穿牆套管	直徑=100mm	031	3200	(系統標-SN)
穿牆套管	直徑=100mm	032	3200	(系統標-SN)
穿牆套管	直徑=125mm	033	3000	(814A-ECS)
穿牆套管	直徑=125mm	034	3000	(814A-ECS)
穿牆套管	直徑=125mm	040	3000	(814A-ECS)
穿牆套管	直徑=125mm	041	3000	(814A-ECS)
穿牆套管	直徑=125mm	042	3000	(814A-ECS)
穿牆套管	直徑=125mm	043	3000	(814A-ECS)
穿牆套管	直徑=100mm	054	3100	(814A-ECS)
穿牆套管	直徑=100mm	055	3100	(814A-ECS)
穿牆套管	直徑=150mm	061	3100	(814A-ECS)

管號	尺寸	管底	管頂	管底	管頂
023	80 X 300	880	1200	880	1200
024	80 X 300	880	1200	880	1200
025	50 X 300	880	1200	880	1200
026	50 X 300	880	1200	880	1200
027	125 X 300	880	1200	880	1200
028	125 X 300	880	1200	880	1200
029	100 X 300	880	1200	880	1200
030	100 X 300	880	1200	880	1200
031	100 X 300	880	1200	880	1200
032	100 X 300	880	1200	880	1200
033	125 X 300	880	1200	880	1200
034	125 X 300	880	1200	880	1200
040	125 X 300	880	1200	880	1200
041	125 X 300	880	1200	880	1200
042	125 X 300	880	1200	880	1200
043	125 X 300	880	1200	880	1200
054	100 X 300	880	1200	880	1200
055	100 X 300	880	1200	880	1200
061	150 X 300	880	1200	880	1200



接圖 : Q841/LG01 / Q841/LG01 / MATCH LINE DRG

TAIPEI METROPOLITAN AREA RAPID TRANSIT SYSTEM  
 台北都會區捷運系統  
 TAIPEI METROPOLITAN AREA RAPID TRANSIT SYSTEM  
 台北都會區捷運系統  
 系統標-AFC  
 系統標-SN  
 系統標-ECS  
 系統標-SEM

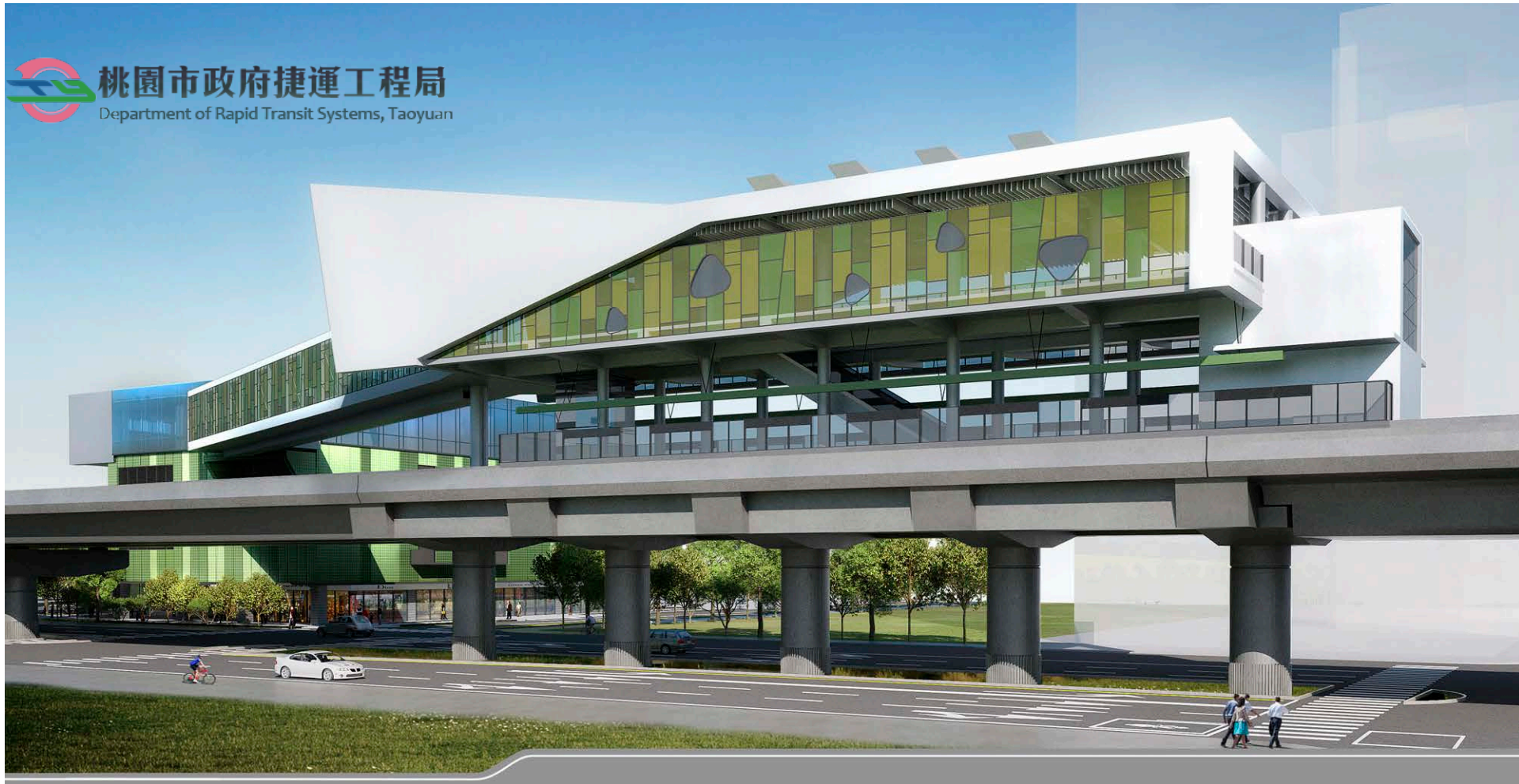
CEC1 台灣建築工程顧問股份有限公司  
 CEC1 Engineering Consultants, Inc., Taiwan

CONTRINENTAL  
 大陸工程公司  
 Continental Engineering

台北都會區捷運系統  
 TAIPEI METROPOLITAN AREA RAPID TRANSIT SYSTEM  
 系統標-AFC  
 系統標-SN  
 系統標-ECS  
 系統標-SEM

圖名: C0841H/SEM002  
 圖次: A

# 桃園捷運綠線GC01標高架段土建統包工程



 桃園市政府捷運工程局  
Department of Rapid Transit Systems, Taoyuan

統包



顧問公司

TYLIN INTERNATIONAL TAIWAN BRANCH  
美商同樅國際工程顧問股份有限公司台灣分公司

張樞建築師事務所  
Shu Chang & associates, architects

# 計畫範圍

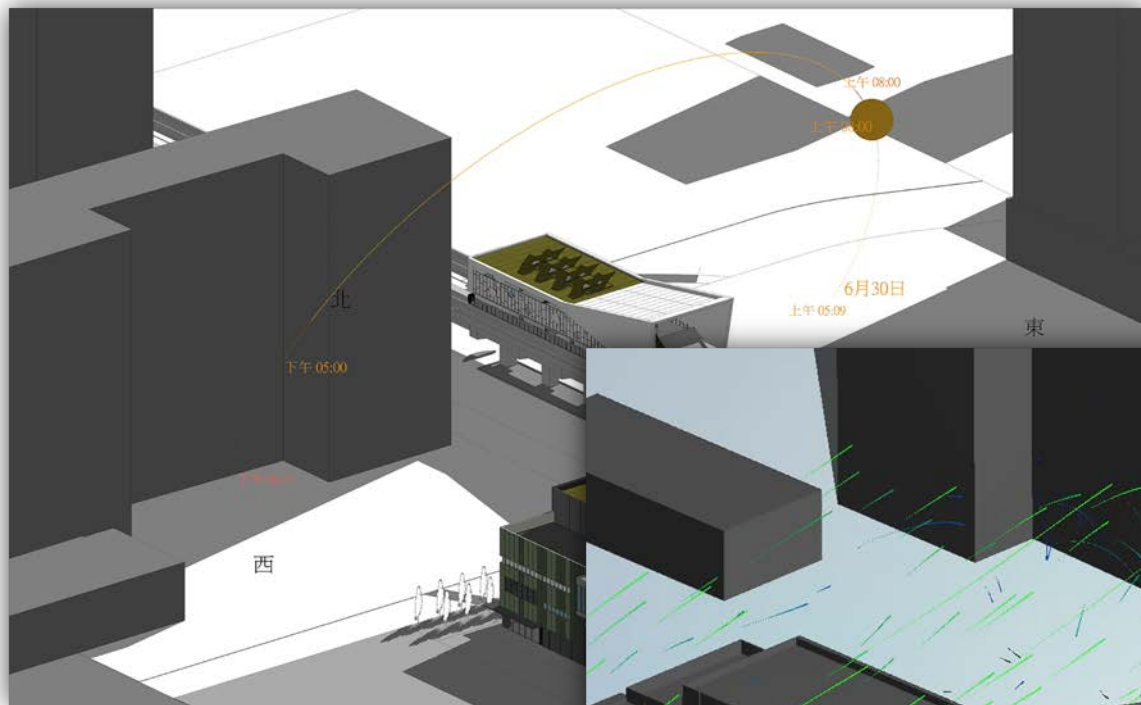


# 本案BIM應用的技術



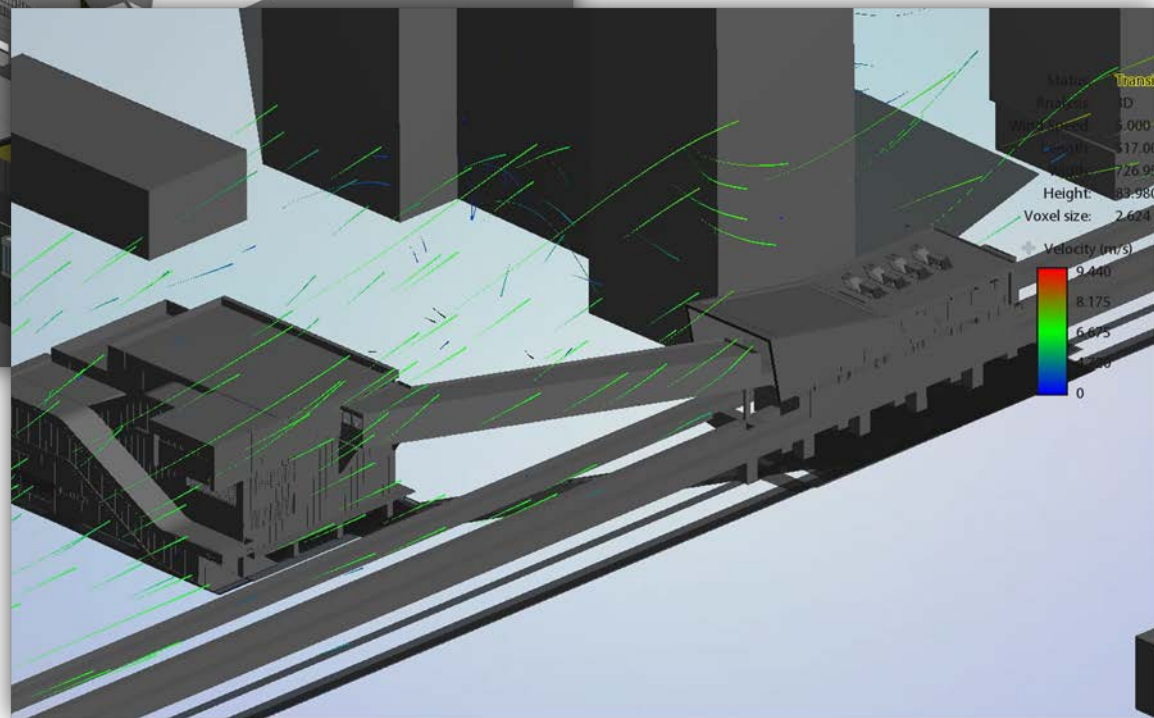


# 綠能分析



日照幅射模擬

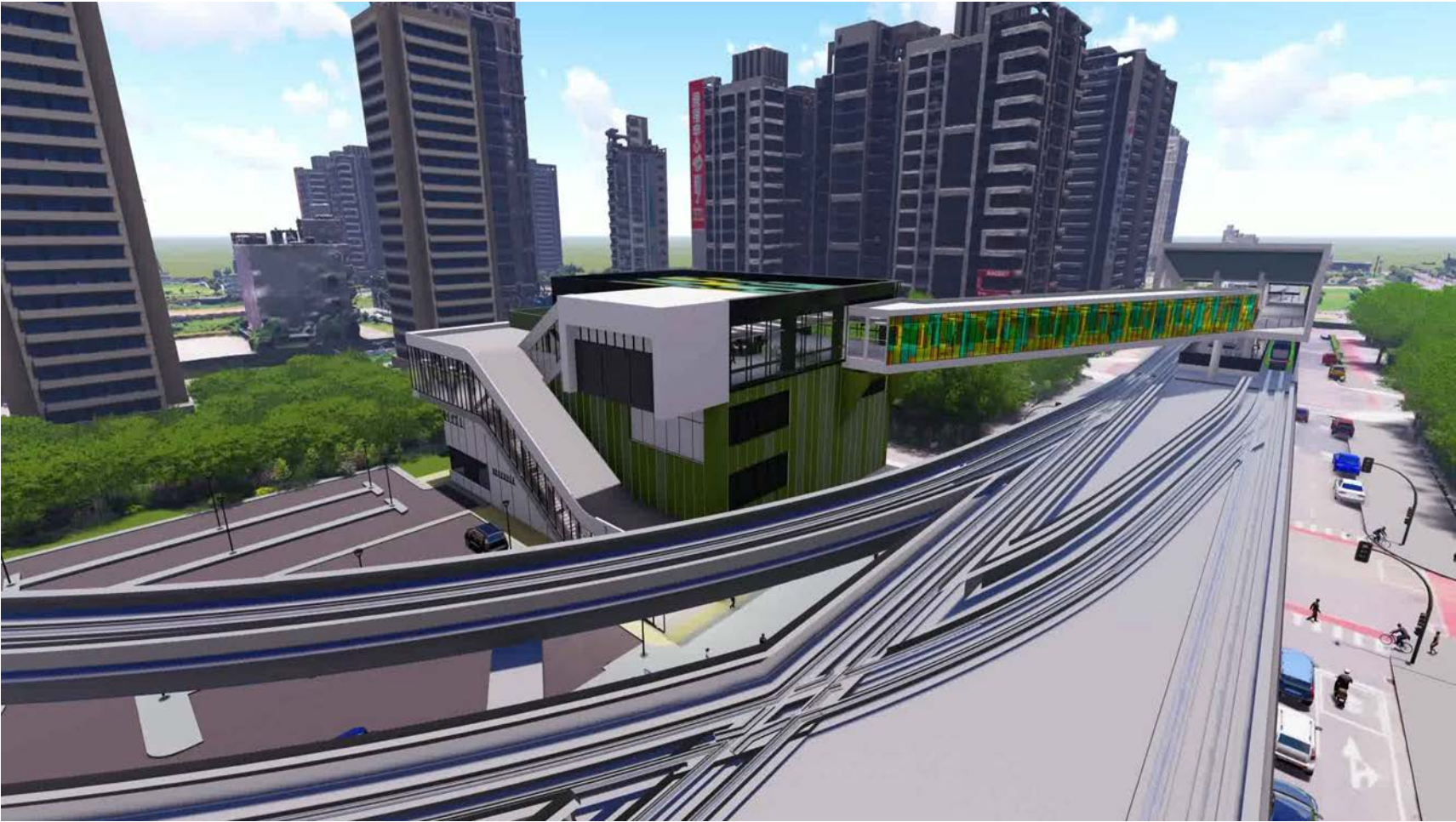
風場氣流模擬



# 人流尖峰情境分析



# 空拍三維景觀模型套疊



# 跨高鐵路橋施工工序模擬(CMS)




# 南崁溪景觀橋



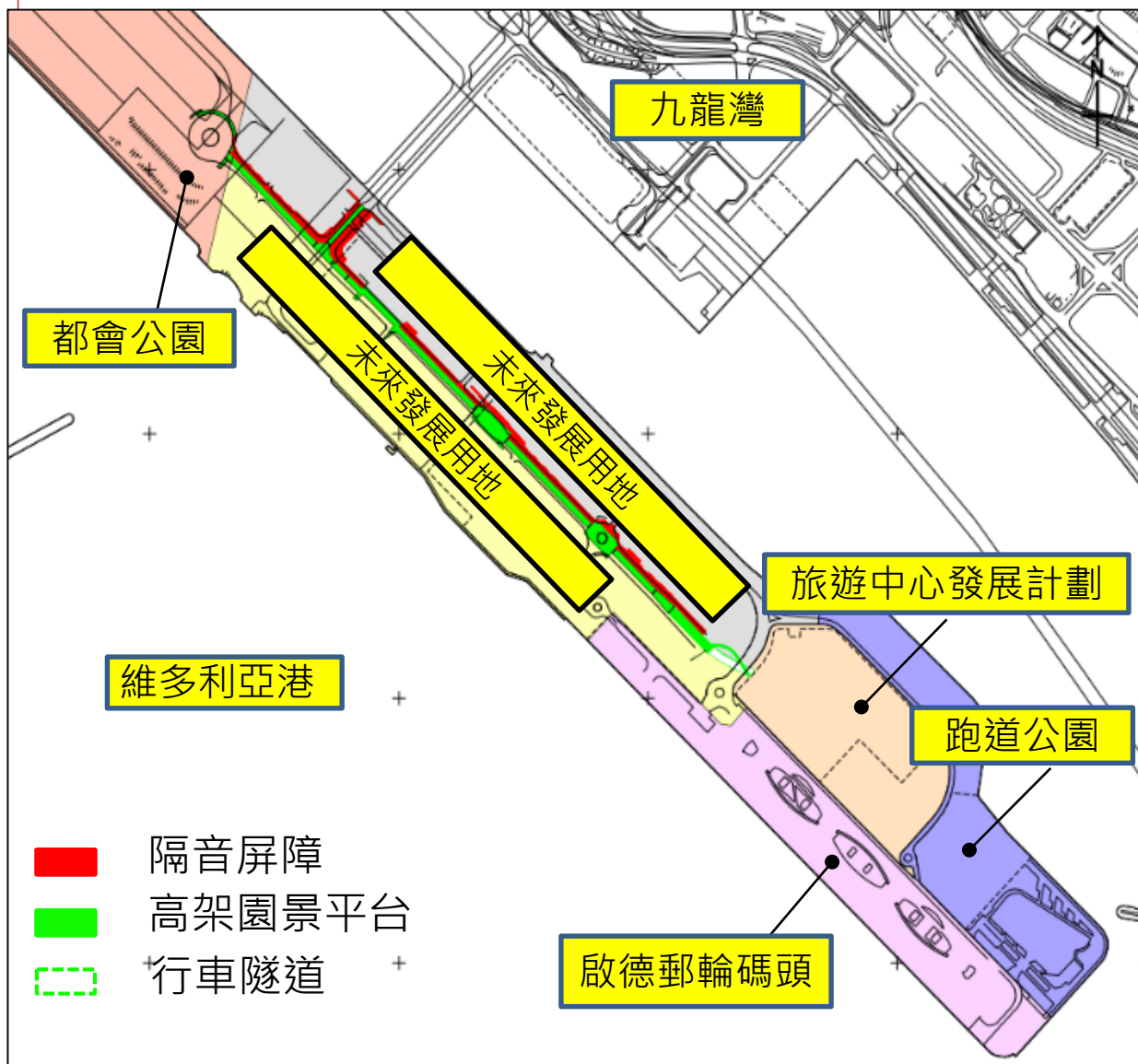
# 南崁溪橋施工工序模擬(CMS)





**香港啟德發展計劃  
基礎設施工程第二期  
統包工程**

# 工程位置圖



位置圖

業主:



項目顧問:



統包JV:



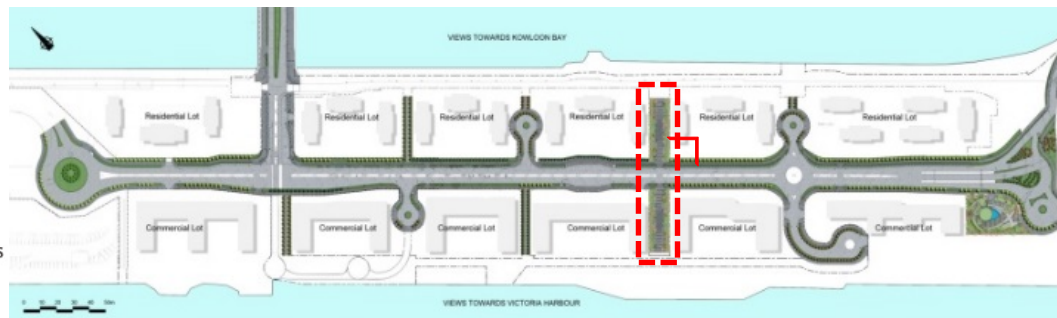
大陸工程·捷卓建築聯營  
CEC · CCC JOINT VENTURE

設計師:





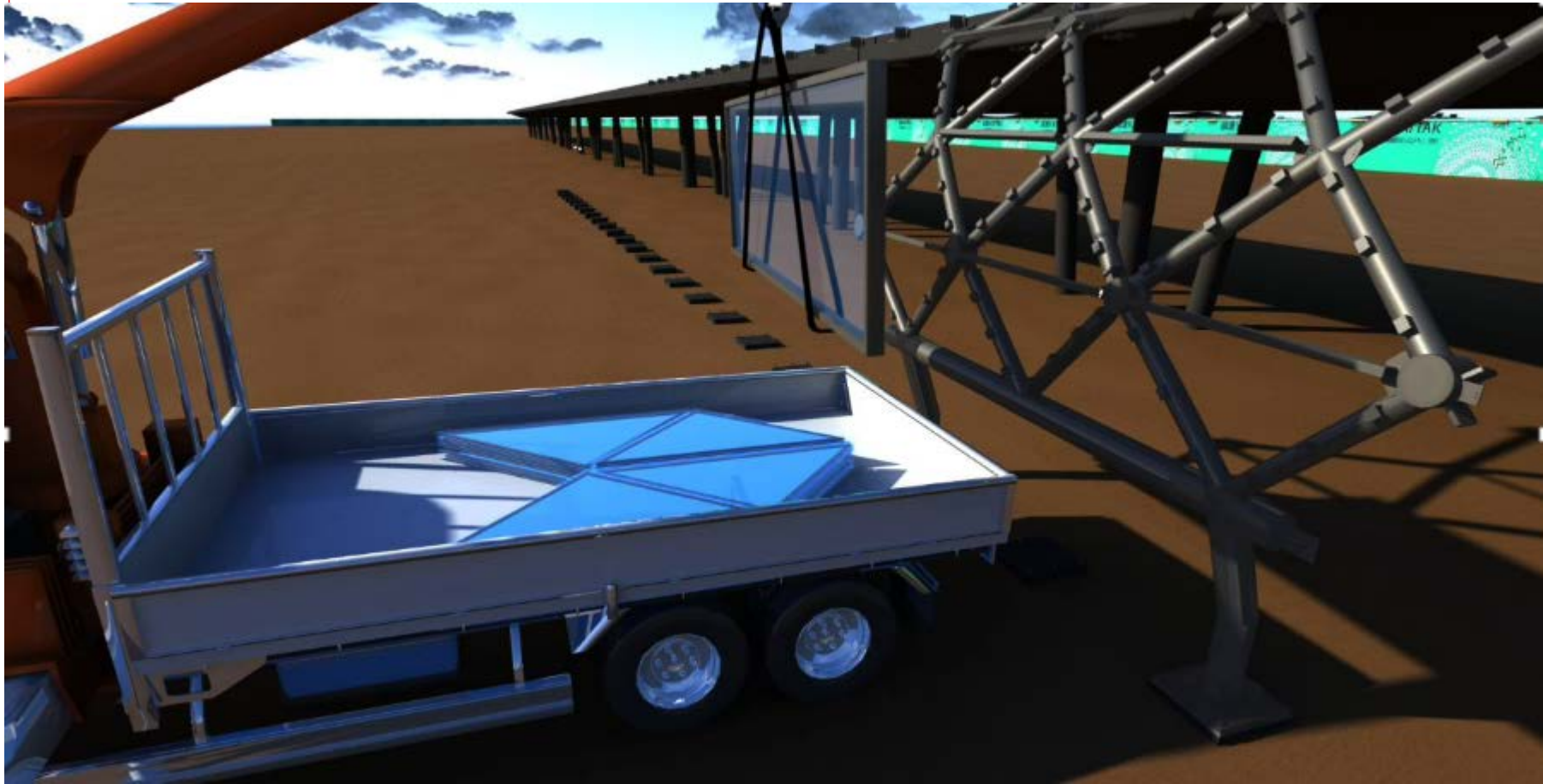
# 空中園景廊 (鳥瞰構想圖)



# D3A街道 - 隔音屏障內的景觀 (構想圖)



# 工序模擬(CMS)



簡報完畢  
敬請指教

