

# ConstructionIT@Taiwan

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**Research Center for Building & Infrastructure  
Information Modeling and Management**

**Department of Civil Engineering**

**National Taiwan University, Taipei, Taiwan**

The rising star:

**BIM**

# Overview

- Increasing number of public and private construction projects that demand use of BIM
- Increasing number of AEC companies that have adopted or are adopting BIM
- Taiwan BIM Awards 2011
- Several BIM Centers have been established
- More BIM education/training activities
- More BIM Practices

# Taiwan BIM Award 2011

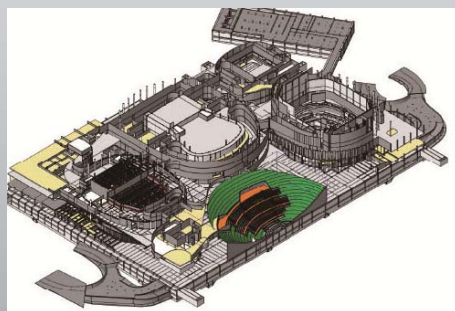
(2011. 7. 15) Submission: 12

(2011. 8. 03) Nomination: 7

(2011. 9. 01) Awarded: 5



# Wei Wu Ying Center for Arts



Chien Kuo Construction Co.

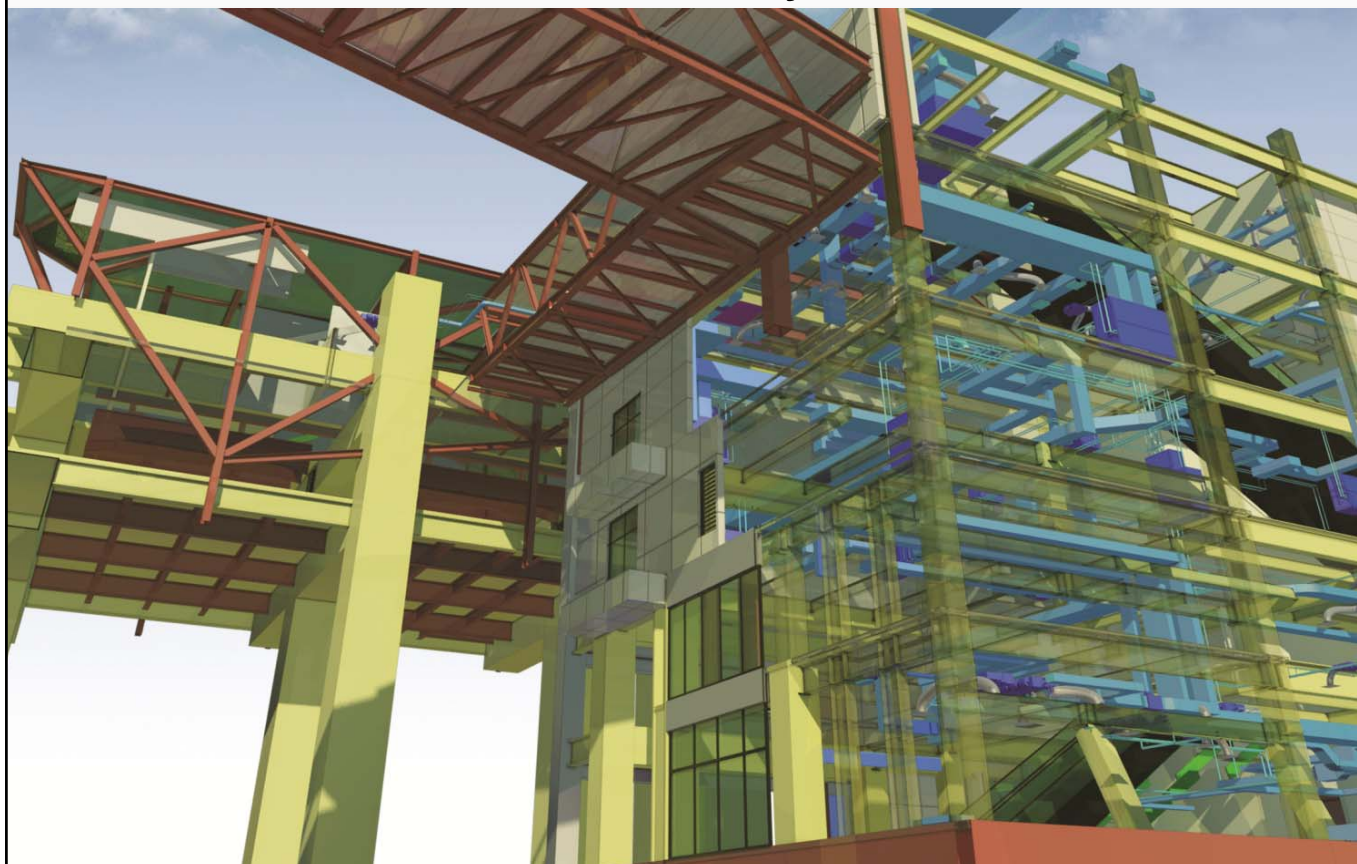
# Arts Museum Station in Kaohsiung by CECI



# Congregate housing project by CECI



## Y19 Taipei MRT Station by Moh & Associates





# Sinotech Engineering R&D Building

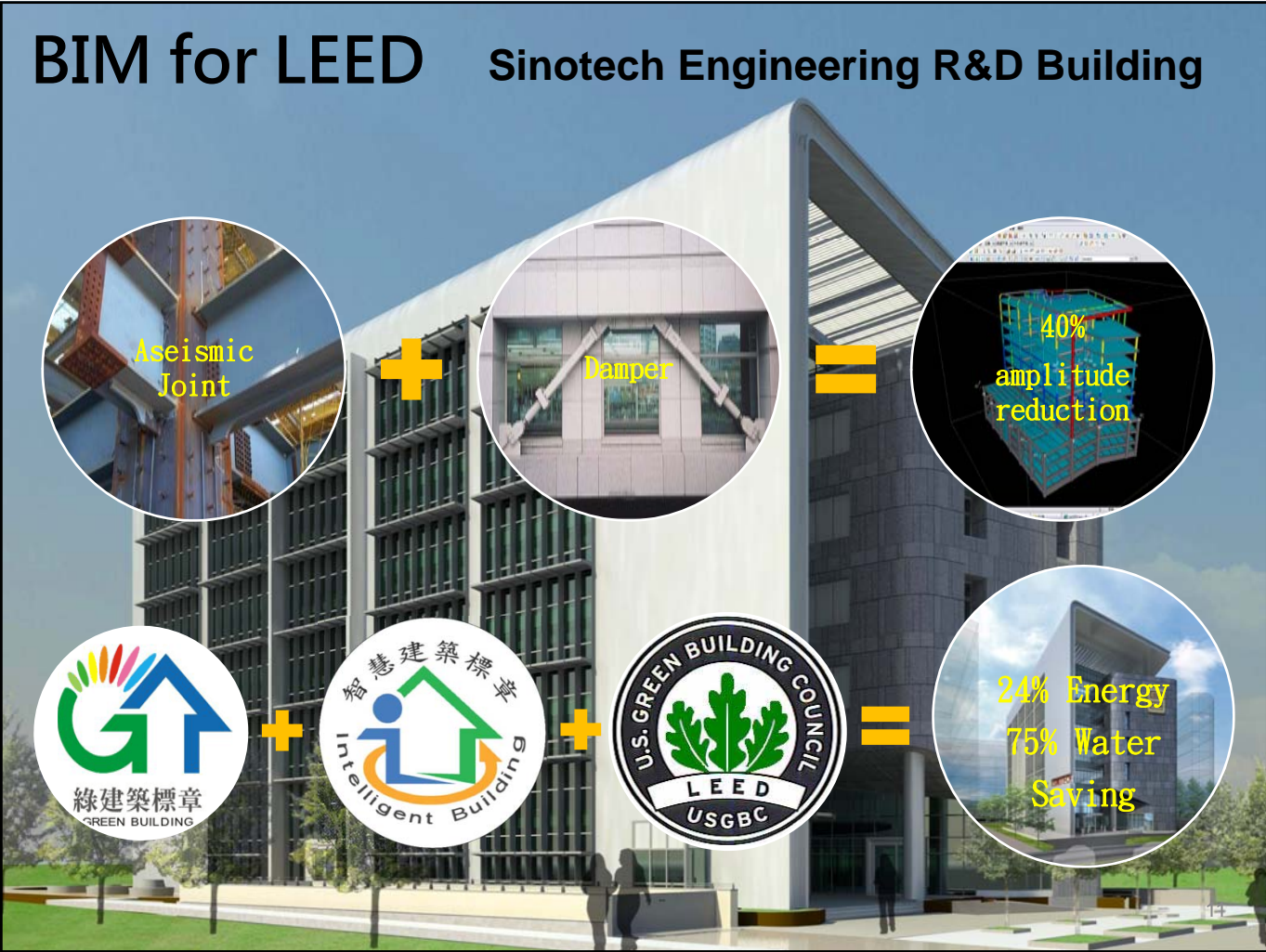


# Sinotech Engineering R&D Building



- Tendered with BIM models (1<sup>st</sup> in Taiwan)

# BIM for LEED Sinotech Engineering R&D Building



# BIM Centers @ Taiwan

- NTU BIM Center (2009)
- CECI BIM Center (2010)
- MAA BIM Center (2011)
- SinoTech BIM Center (2011)
- KUAS BIM Center (2011)
- ...

## Research Center for Building & Infrastructure Information Modeling and Management

Established in late 2009 to

address the Industry's needs in adopting BIM technologies

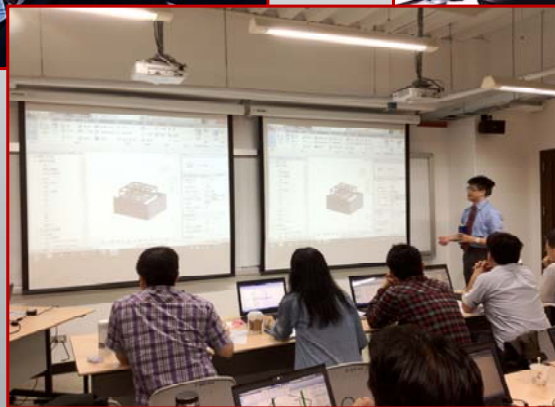
provide a service platform for development, implementation, training, and application of BIM-related technology

facilitate collaboration among industry, academia, and government.

## Activities @ NTU BIM Center

- Conference/symposium/seminar/forum
- Hands-on training workshop/Short courses
- Consulting services
- Research projects
- Publications
- Development of teaching/training materials

# Hands-on Training Workshops



# Short courses on specific topics





# BIM Quarterly Review Forum



# BIM Breakfast Brief (Monthly)



# Publications



## 3D/BIM Education at NTUCE

- Engineering Graphics (2 credits, 3 hours per week)
- 2D CAD (AutoCAD) + 3D CAD (Sketchup) + Rendering/Animation (Blender) + image, photo & video editing
- Engineering Information Management (3 credits)
- BIM Technology and Application (3 credits)



# Government Actions

## Government Actions

- No action on strategic BIM plans and national BIM standards yet.
- Some research projects funded.
- Taipei City MRT projects
- New Taipei City sports centers
- ...

# BIM Practices

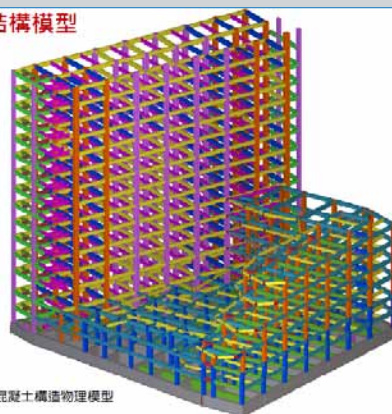
量體模擬



整體BIM建築模型

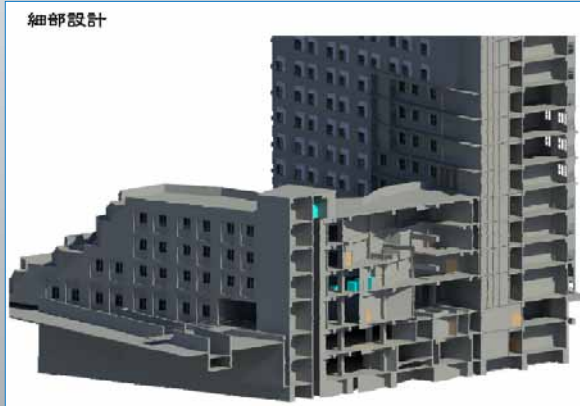


整體BIM結構模型



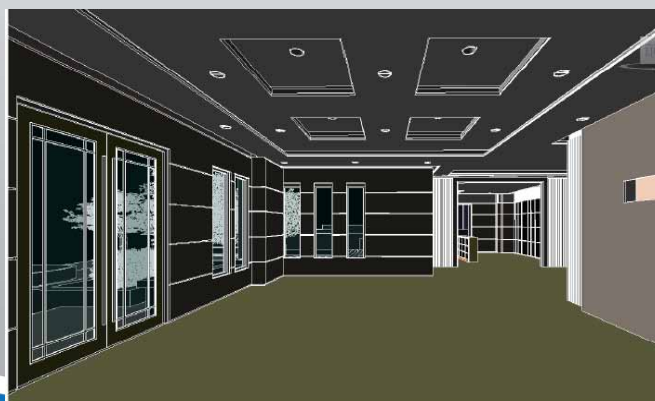
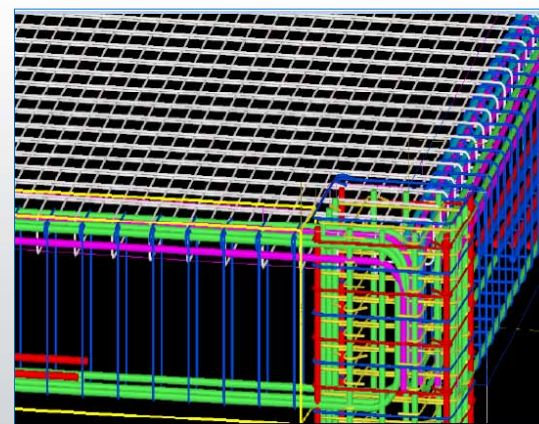
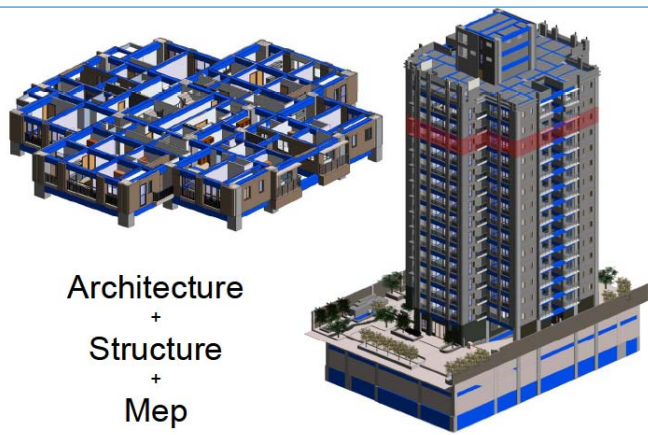
鋼筋混凝土構造物理模型

細部設計



Courtesy of MAA

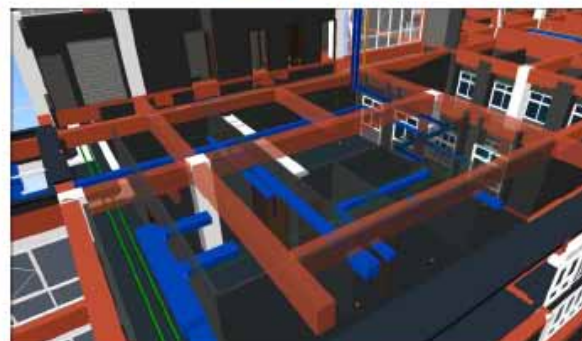
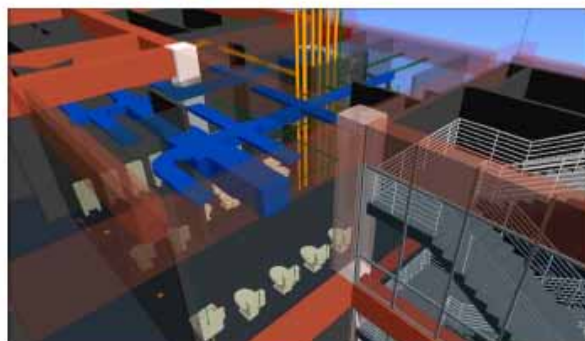
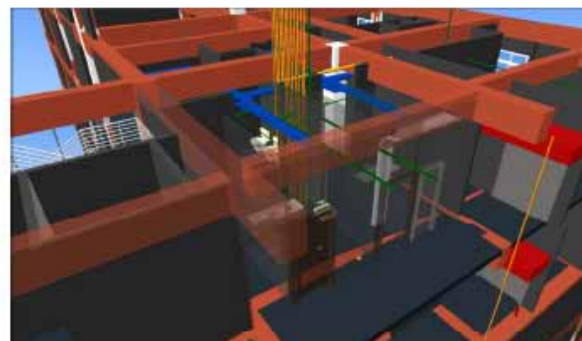




Courtesy of MAA

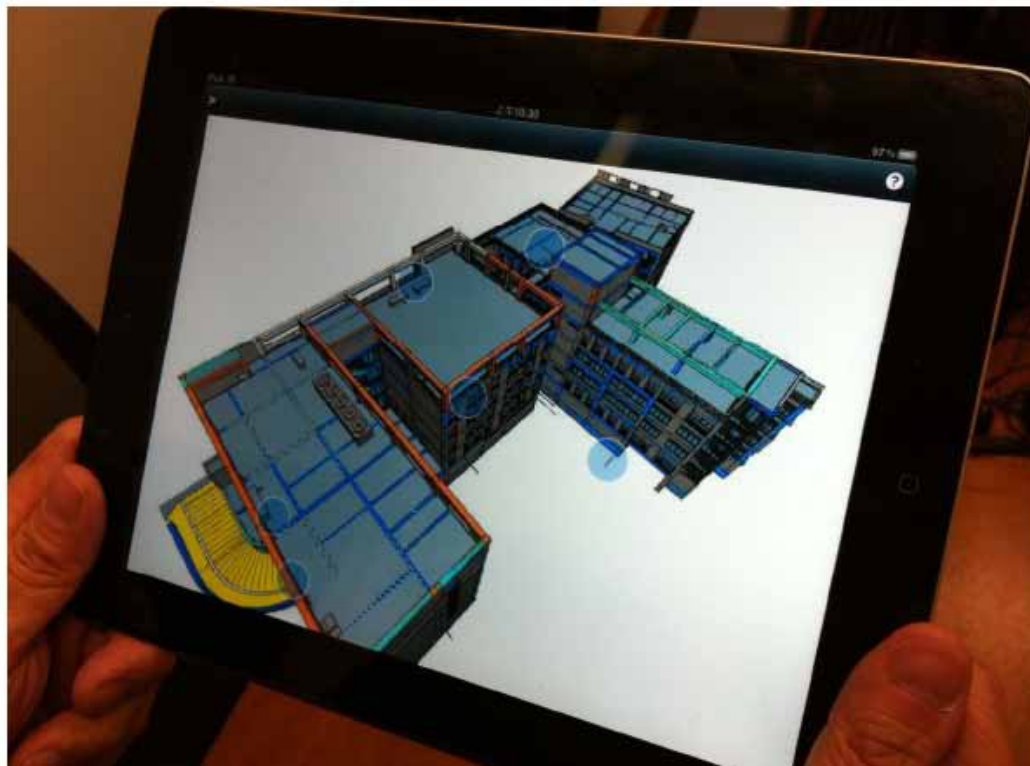
建模及資料協同整合

結構 + 建築 + 機電 模型套疊整合



Courtesy of MAA

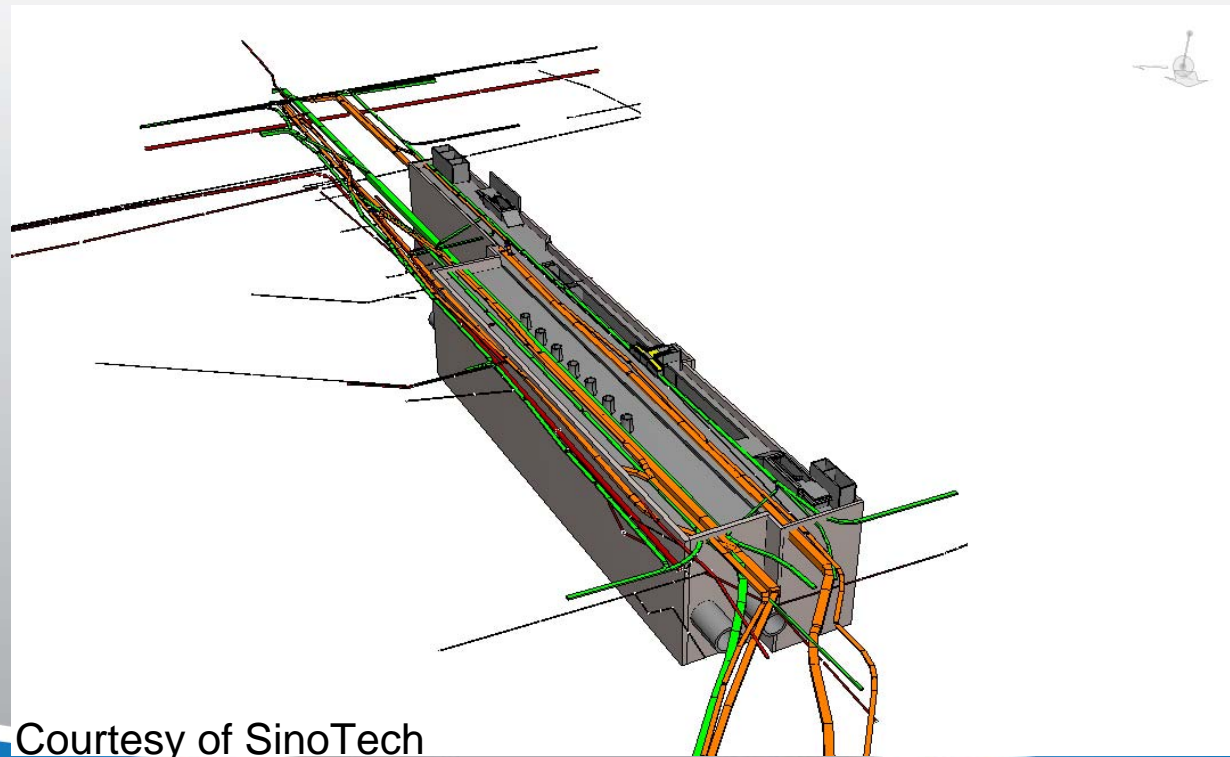
### Navigator for iPad2



Courtesy of MAA

# Taipei MRT System

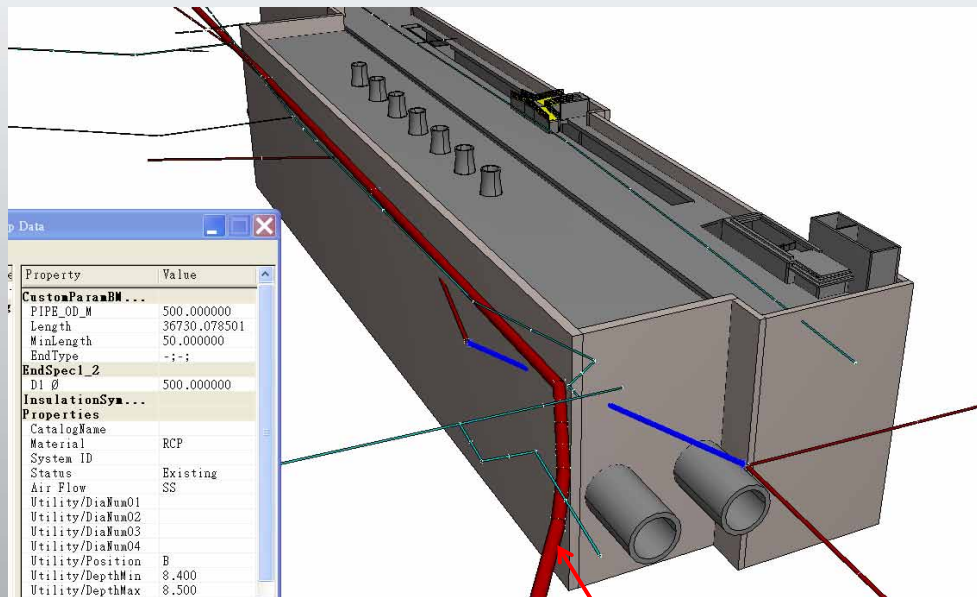
## LG05 Station with Underground Pipes



Courtesy of SinoTech

# Taipei MRT System

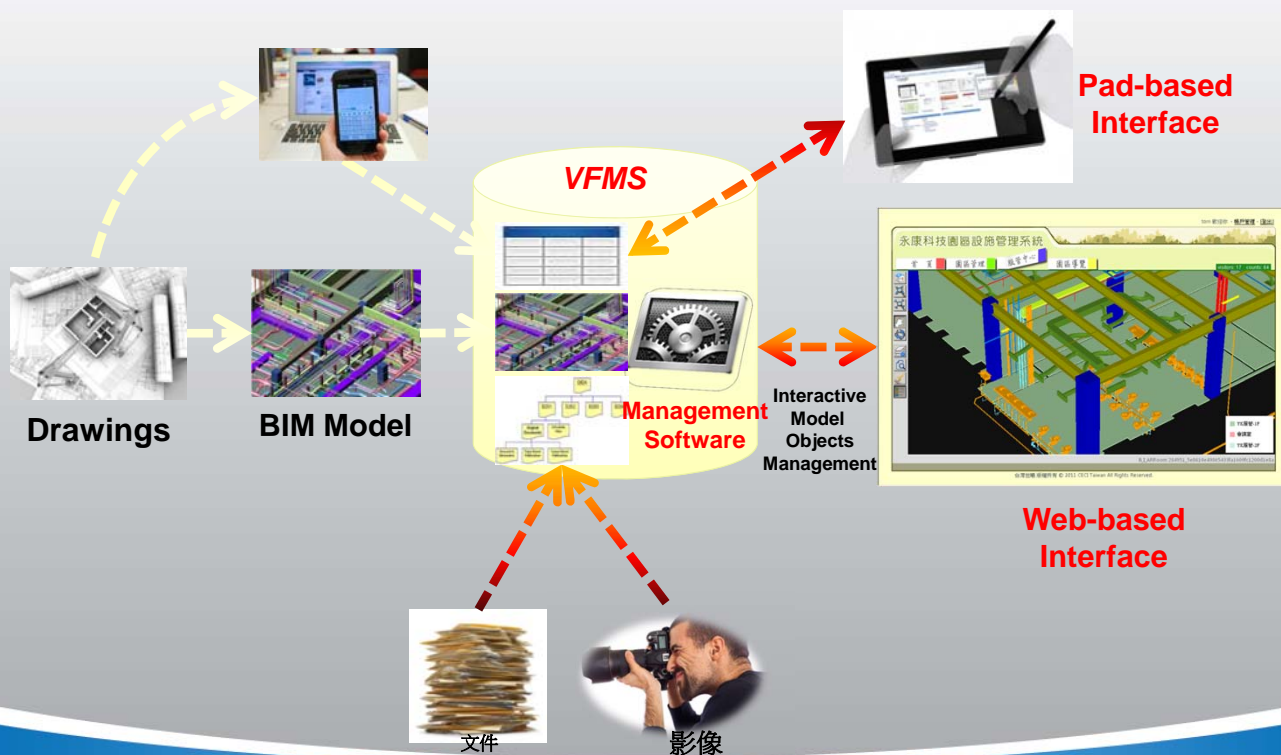
## Conflict Resolution between Structure and Sewage Pipes in LG 05 Station using BIM




Sewage Pipes

Courtesy of SinoTech

# VFMS – Visual Facility Management System



Courtesy of CECI



臺大土木工程資訊模擬與管理研究中心

## VFMS – Space Management

永康科技園區設施管理系統

首頁 園區管理 服管中心 園區導覽

空間資訊 維修紀錄

**空間資訊**

空間名稱: 便利商店  
 空間編號: 1F-5  
 保管人: 王曉明  
 連絡電話: 06-123456  
 面積: 1,825.07 m<sup>2</sup> (552.08坪)  
 空間類型: 店鋪  
 所在樓層: 1FL  
 備註:

可出租  
 出租情形: 已出租  
 租金: 100,000  
 租期: 05/01/2012 ~ 05/31/2012  
 租借單位: 全家

編輯空間資訊


圖例

- 機房、管道間
- 樓、電梯間
- 儲藏室
- 郵局、銀行
- 店鋪
- 公共空間
- 廁所
- 辦公空間
- 中庭

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Courtesy of CECI



臺大土木工程資訊模擬與管理研究中心

## VFMS – Space Management

### 永康科技園區設施管理系統

首頁
園區管理
服管中心
園區導覽

visitors: 121 counts: 400

租用

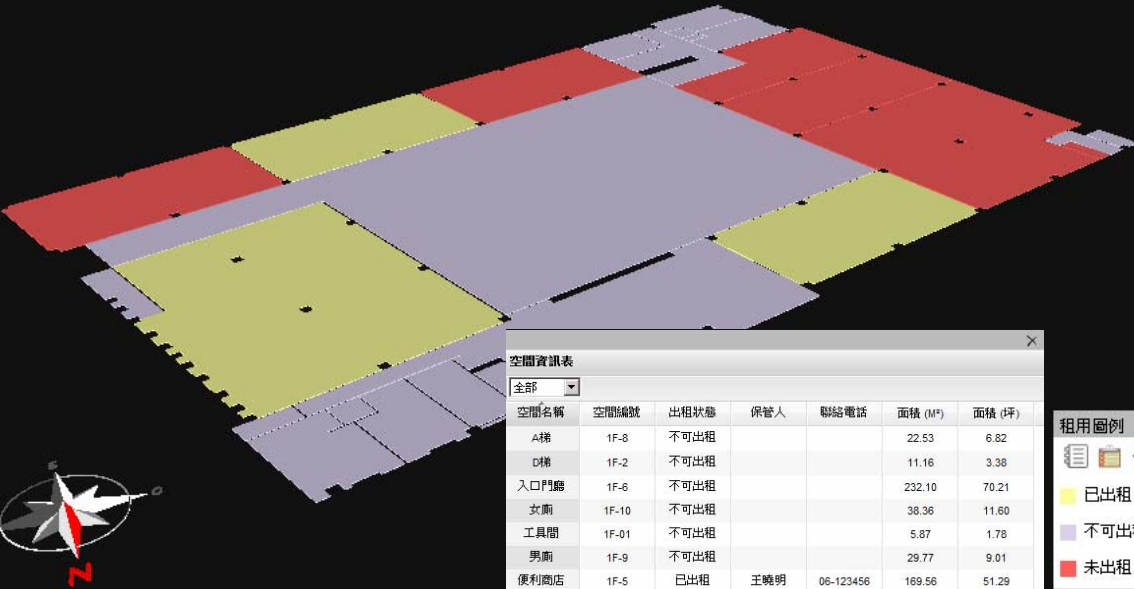
RF

3F

2F

1F

B1



租用圖例

- 已出租
- 不可出租
- 未出租

空間資訊表						
空間名稱	空間編號	出租狀態	保管人	聯絡電話	面積 (M <sup>2</sup> )	面積 (坪)
A梯	1F-8	不可出租			22.53	6.82
D梯	1F-2	不可出租			11.16	3.38
入口門廳	1F-6	不可出租			232.10	70.21
女廁	1F-10	不可出租			38.36	11.60
工具間	1F-01	不可出租			5.87	1.78
男廁	1F-9	不可出租			29.77	9.01
便利商店	1F-5	已出租	王曉明	06-123456	169.56	51.29
預留昇降梯	1F-7	不可出租			10.13	3.06
銀行	1F-4	未出租			326.74	98.84
儲藏室	1F-3	未出租			4.59	1.39

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Page 1 of 3

Courtesy of CECI



**BiIM** 臺大土木工程資訊模擬與管理研究中心 **VFMS - MEP Facility Management**

永康科技園區設施管理系統

首頁 園區管理 服管中心 園區導覽

visitors: 137 counts: 455

空間及設施圖層控制器

- 建築
- 電力系統
- 空調系統
- 消防散水
- 給排水系統

RF  
3F  
2F  
1F  
B1

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附件管理 - Windows Internet Explorer

設備資訊 維修紀錄 附件

名稱: 1200x350 空調百葉

附件


- 主言: 施工大樓  
說明: 百葉窗施工大樓圖
- 主言: 操作手冊  
說明:
- 主言: 廠商報價單  
說明: 百葉窗三家報價單

處理人員/處理

已完成

狀況發生時間	狀況
2012/05/01	
2012/04/02	
2012/04/01	

Courtesy of CECI


臺大土木工程資訊模擬與管理研究中心

## VFMS – Drawings Management

永康科技園區設施管理系統

首頁
園區管理
服管中心
園區導覽

visitors: 137 counts: 455

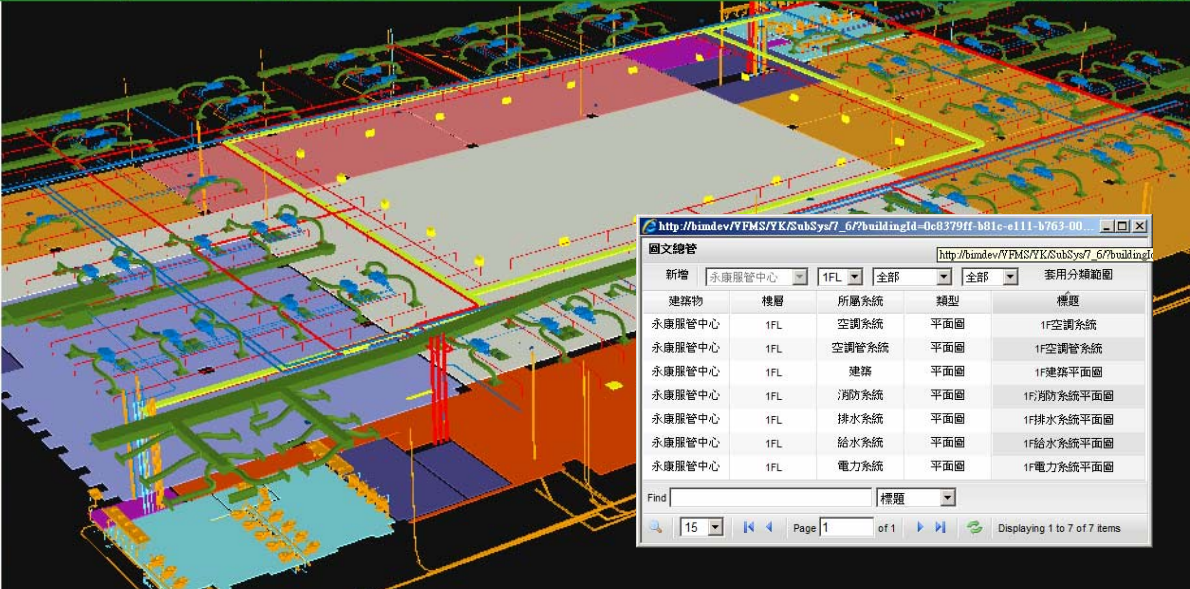
RF

3F

2F

1F

B1



新增	永康服管中心	1FL	全部	全部	套用分類範圍
建築物	樓層	所屬系統	類型	標題	
永康服管中心	1FL	空調系統	平面圖	1F空調系統	
永康服管中心	1FL	空調管系統	平面圖	1F空調管系統	
永康服管中心	1FL	建築	平面圖	1F建築平面圖	
永康服管中心	1FL	消防系統	平面圖	1F消防系統平面圖	
永康服管中心	1FL	排水系統	平面圖	1F排水系統平面圖	
永康服管中心	1FL	給水系統	平面圖	1F給水系統平面圖	
永康服管中心	1FL	電力系統	平面圖	1F電力系統平面圖	

Find  標題

15 Page 1 of 1 Displaying 1 to 7 of 7 items

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Courtesy of CECI

34

## BIM Application @ Ruentex



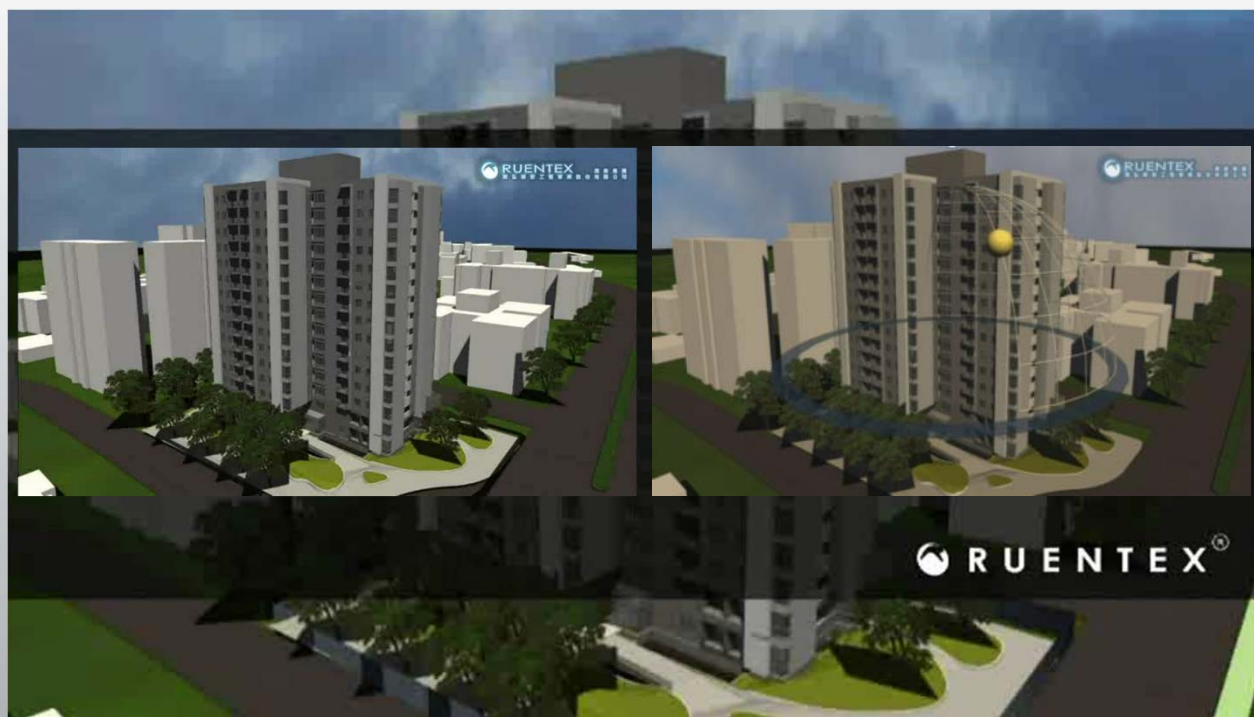
## Building Environment Analysis



# Construction Sequence Simulation



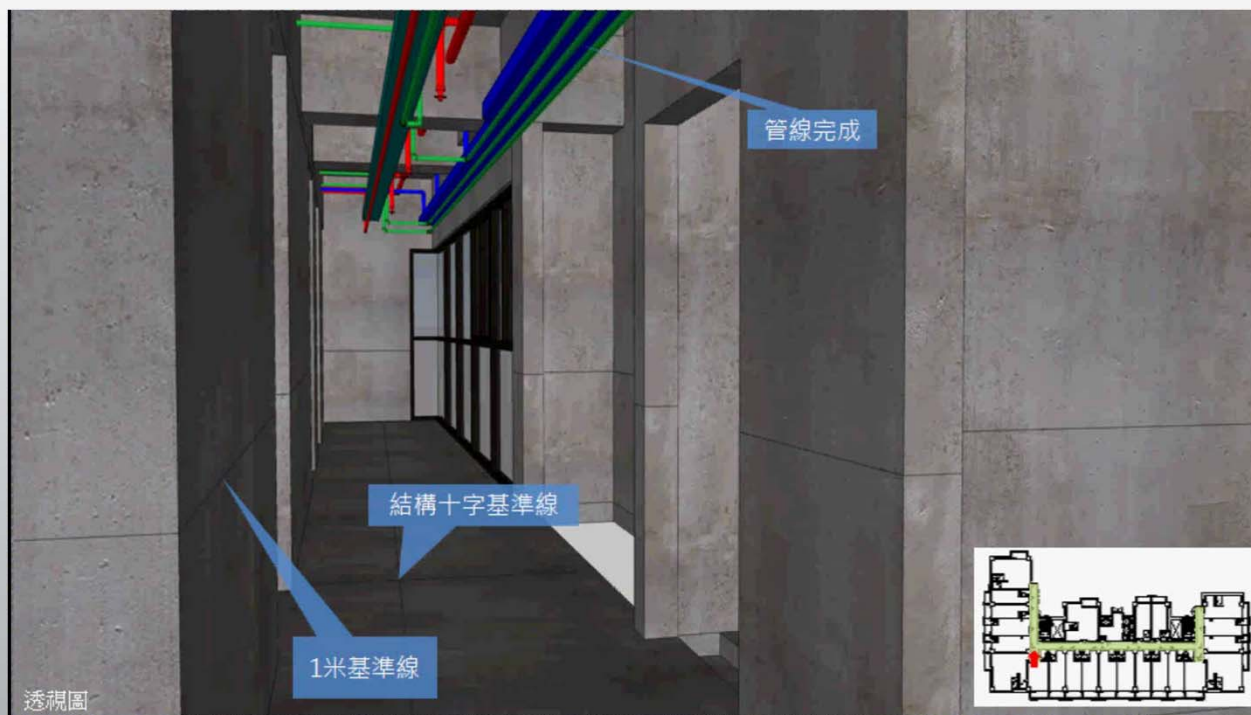
## Sunlight Analysis Application



## Space Planning Application



## System Integration Application





# Facility Management Application

The screenshot displays a web-based Facility Management Application interface. The top section features a navigation menu with options like '行事曆', '設備總覽', '排程設定', '排程查詢', '2D竣工圖', '3D導覽', '網頁維護平台', and '離開系統'. The main content area is divided into two parts: a calendar and a 3D model.

**Calendar Section (2012年5月):**

星期日	星期一	星期二	星期三	星期四	星期五	星期六
	1	2	3 待保養: 10 已保養: 1 維修: 0	4 待保養: 0 已保養: 1 維修: 0	5	
6	7 待保養: 0 已保養: 1 維修: 0	8	9	10	11	12
13	14	15 待保養: 34 已保養: 0 維修: 0	16	17	18	19
20	21	22 待保養: 43 已保養: 1 維修: 0	23 待保養: 1 已保養: 0 維修: 0	24	25 待保養: 1 已保養: 0 維修: 0	26
27	28	29	30	31 待保養: 11 已保養: 0 維修: 0		

**3D Model Section:**

The 3D model shows a detailed architectural rendering of a building complex. The interface includes a toolbar with icons for '旋轉', '平移', '縮放', '飛行', '清除', '選擇', and '動態'. A list of components is visible on the left side of the 3D view, including '排程設定', '排程查詢', '2D竣工圖', '3D導覽', '網頁維護平台', and '離開系統'. The application title '萬壽' is prominently displayed at the top right of the interface.

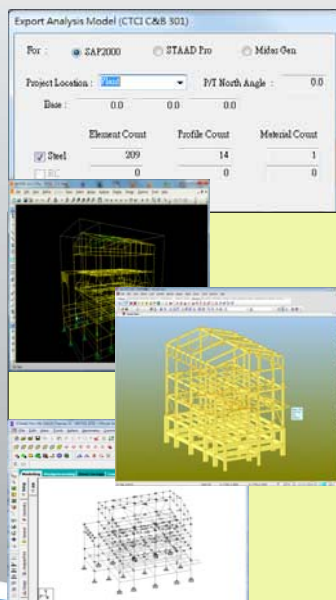


## CTCI 4D Application Outline

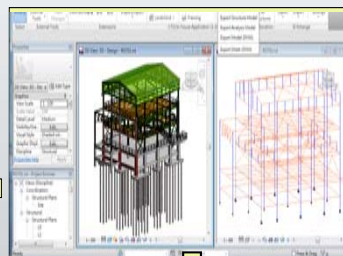
CTCI has the experience of 3D model application in engineering design about 30 years.

### 3D Modeling for Structure Work

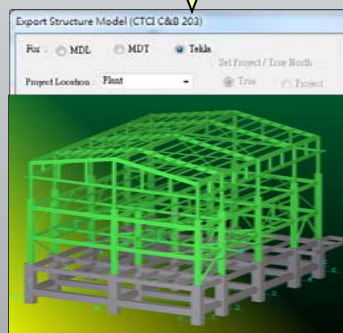
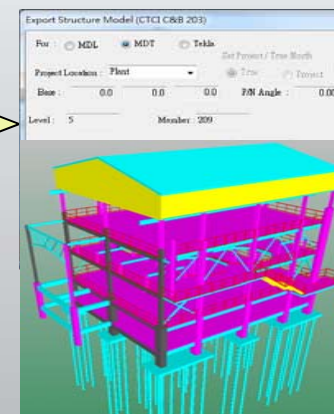
**Structural Analysis & Design**  
SAP2000 / STAAD Pro / Midas Gen



**Autodesk REVIT Structure**

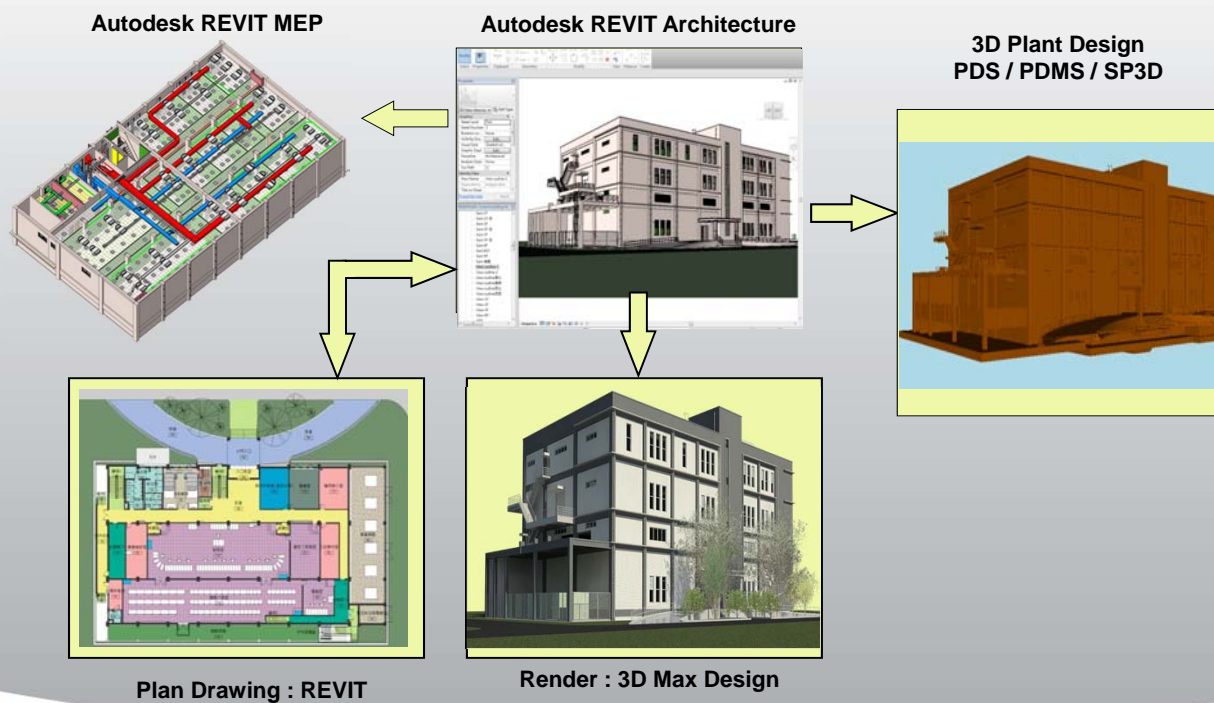


**3D Plant Design**  
PDS / PDMS / SP3D



**TEKLA Structure**

## 3D Modeling for Building Work



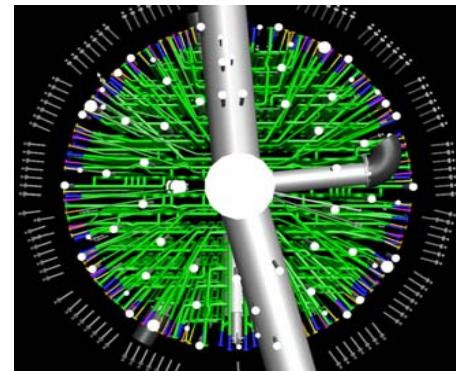
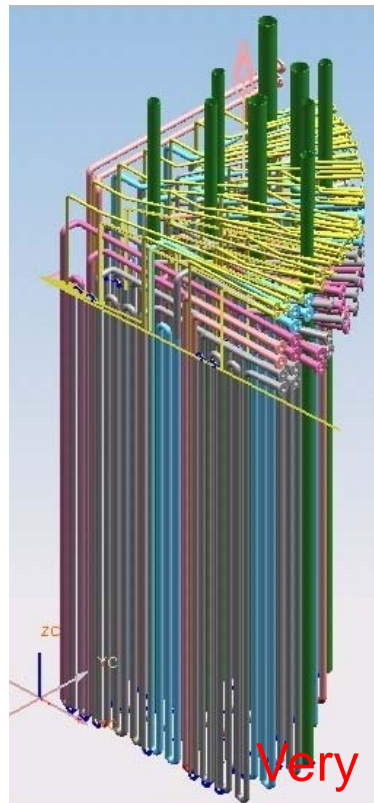
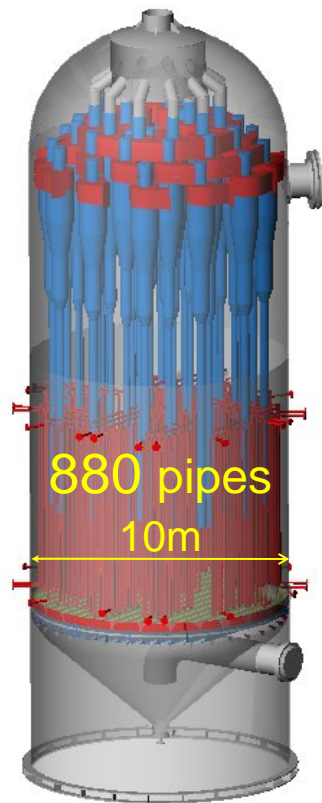
## CTCI 4D Program Introduction

CTCI is a EPC company, so we extend the 3D application to 4D application in construction management.

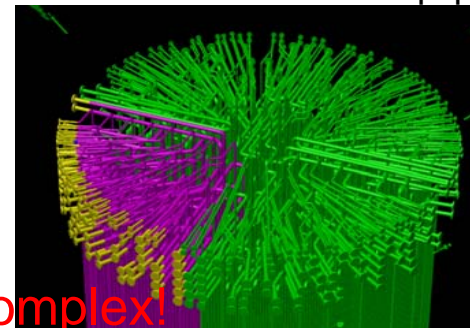


## Construction Simulator Application

AN/MMA reactor piping fabrication sequence simulation



880 pipes are fabricated in a 10-meter-diameter equip.

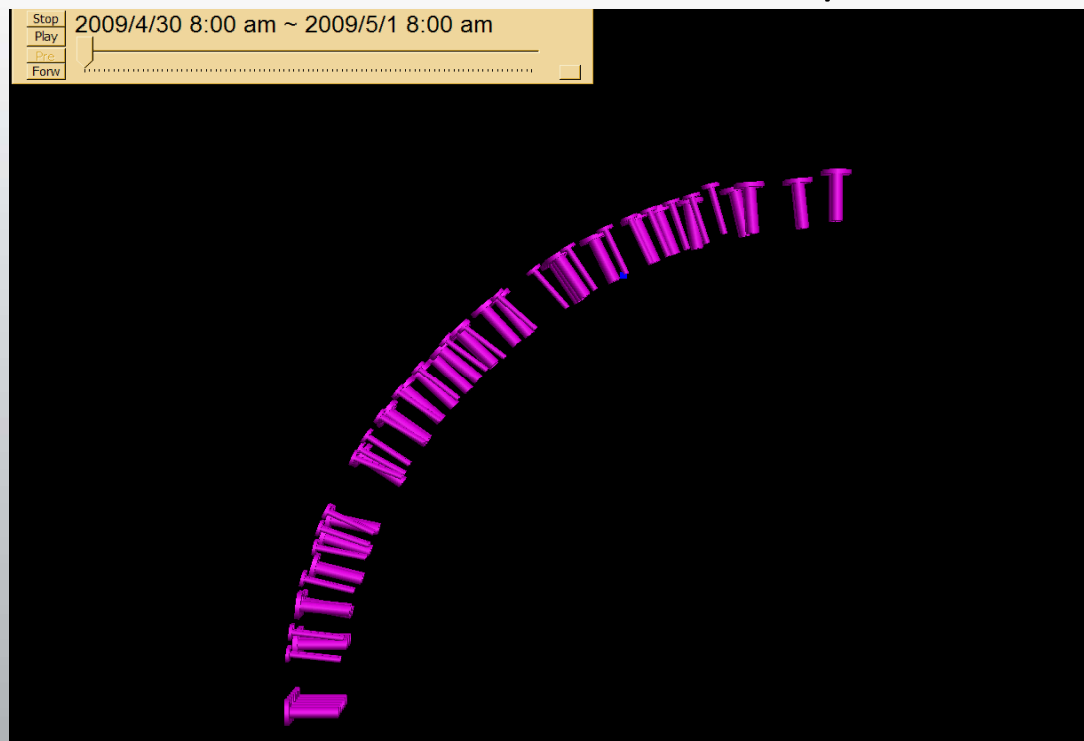


Very complex!

Fabricated sequences are very import.

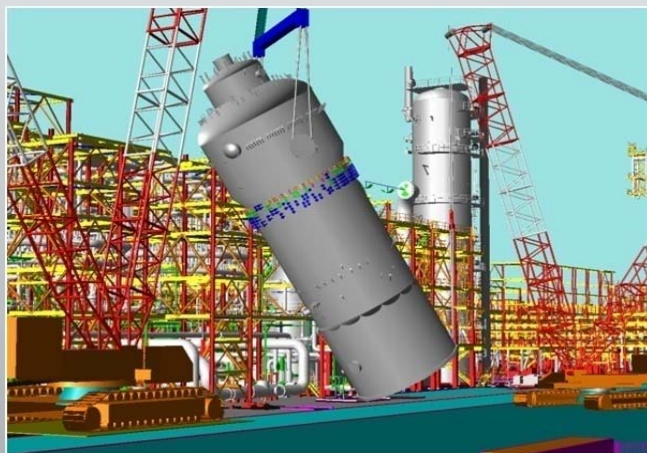
## Eq. fabricated sequence simulation

## AN/MMA Reactor



### Rigging Simulator

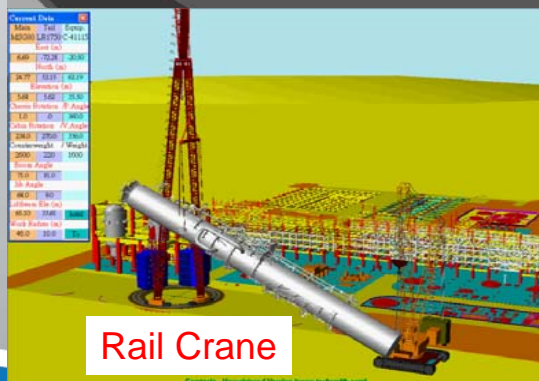
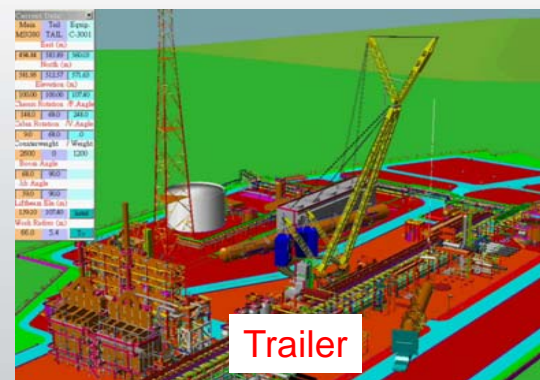
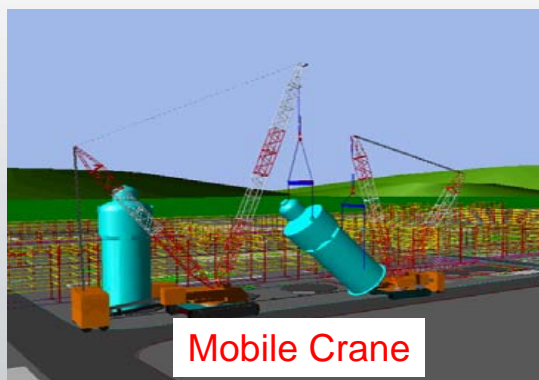
Rigging Plan Simulation



Actual Rigging Work



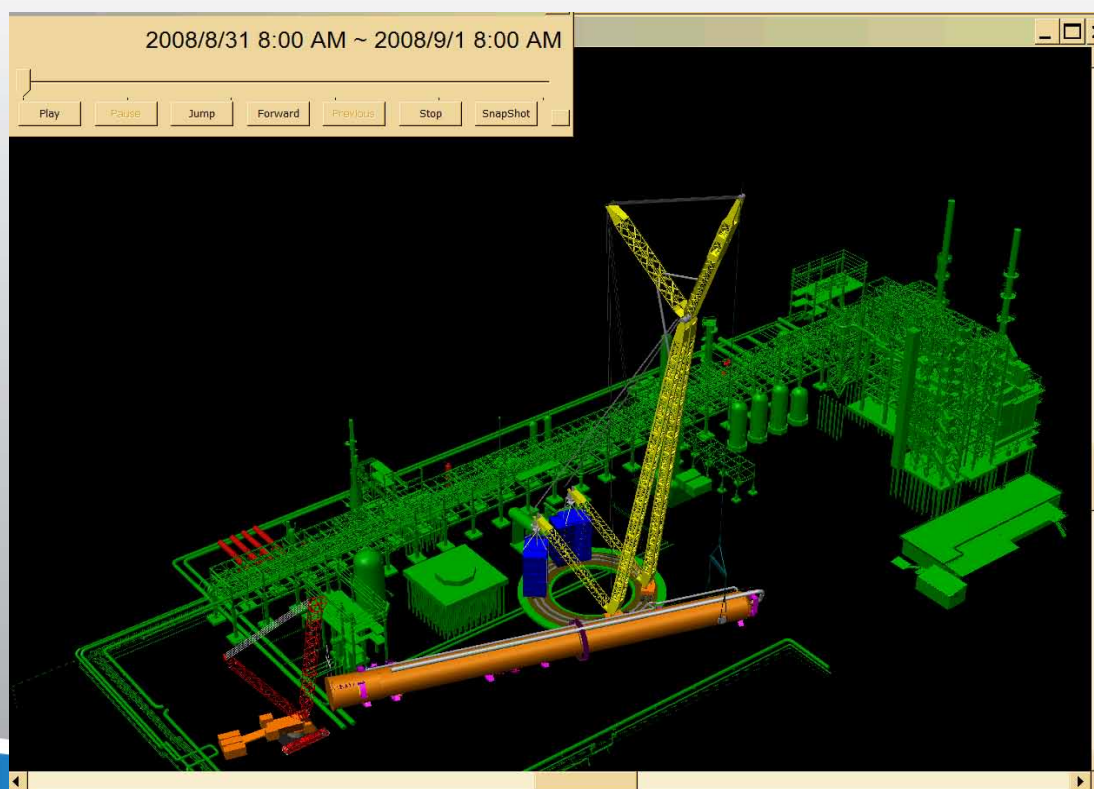
## Rigging Simulator Application





## Construction Plan vs. Rigging plan

PDH in Thailand



**Thanks for your attention!**