



BIM 為建築行業帶來的衝擊

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www.aedas.com



Information 建築資訊

Graphical 圖型性資訊

Plan 平面圖

Section 剖面圖

Elevation 立面圖

Area Diagrams 面積圖

Schematic Designs 方案圖

Building Plan 審批圖

Structural Plans 結構圖

E/M Drawings 機電圖

Schematics 機電示意圖

Details 大樣圖

Other Diagrams... 其他圖

Non-Graphical 非圖型性資訊

Area Schedule 面積表

Finishing Schedules 裝潢表

Door/Window/Louvre 門窗表

Beam/Column Schedule 樑柱

Equipment Schedule... 機器

Program 進度

Cost Estimate 造價表

Quantity Take Off 材料表

Bills of Materials 物料清單

Variation Assessments 變更



Information 建築資訊

Graphical

圖型性資訊

CAD 系統

e.g. AutoCAD,
Microstation

• Plan
• Section
• Elevation
• Area Diagrams
• Schematic Designs
• General Building Plan
• Structural Plans
• E/M Drawings
• Schematics
• Other Diagrams

Non-Graphical

非圖型性資訊

• Area Schedule
• Working Schedules
• Door/Window/Louvre Sch
• Beam/Column Schedule
• Access (Data Base)
• MS Project
• BQ Softwares
• Quantity Take Off
• Bills of Quantities
• Variations



Information

Graphical

- Plan
- Section
- Elevation
- Area Diagrams
- Schematic Designs
- General Building Plan
- Structural Plans
- E/M Drawings
- Schematics
- Other Diagrams

BIM

Non-Graphical

- Area Schedule
- Fitting Schedules
- Door/Window/Louvre Sch
- Beam/Column Schedule
- Equipment Schedule
- Program
- Cost Estimate
- Quantity Take Off
- Bills of Quantities
- Variations

Building Information Modeling

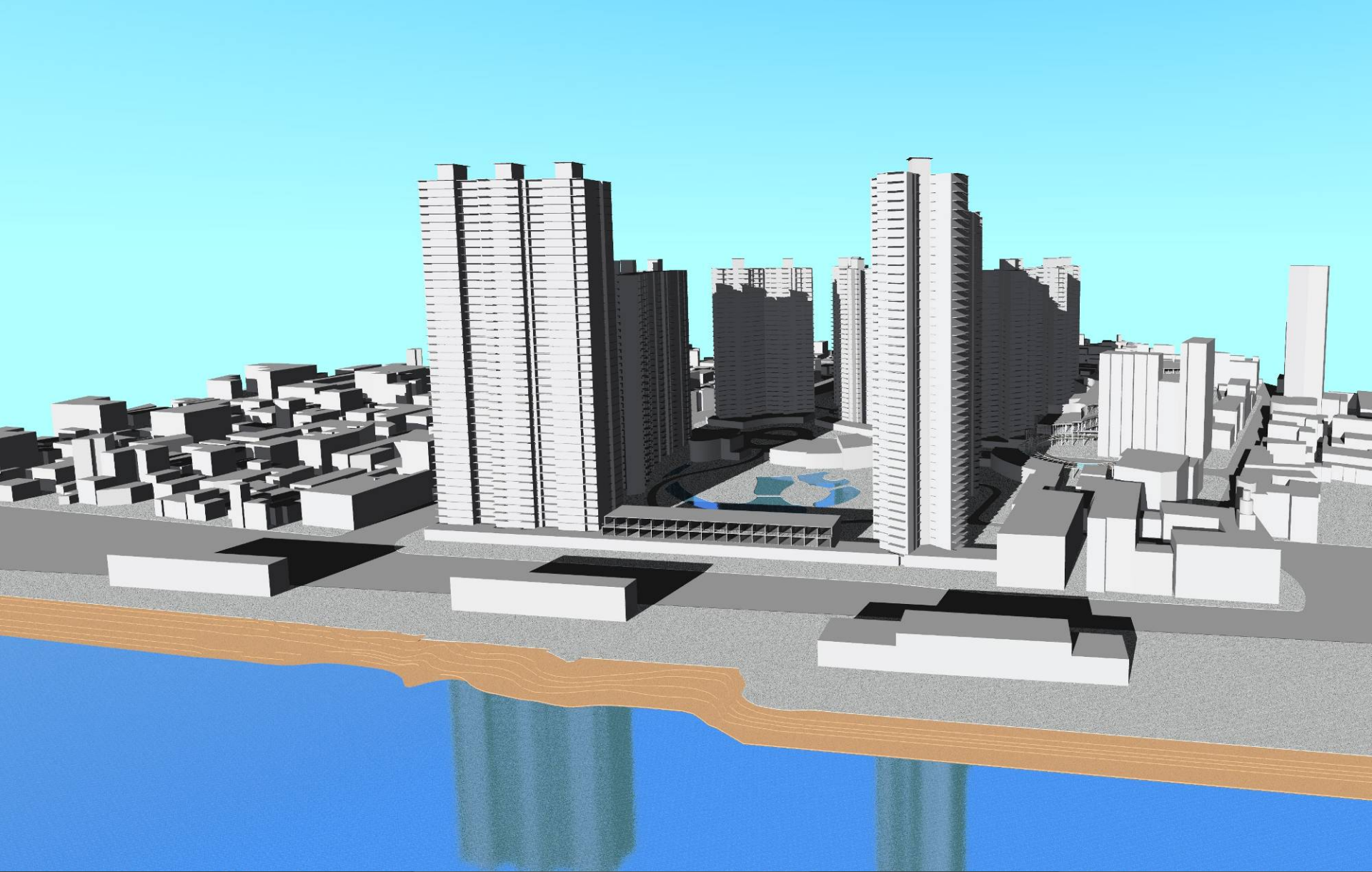
信息化建筑模型



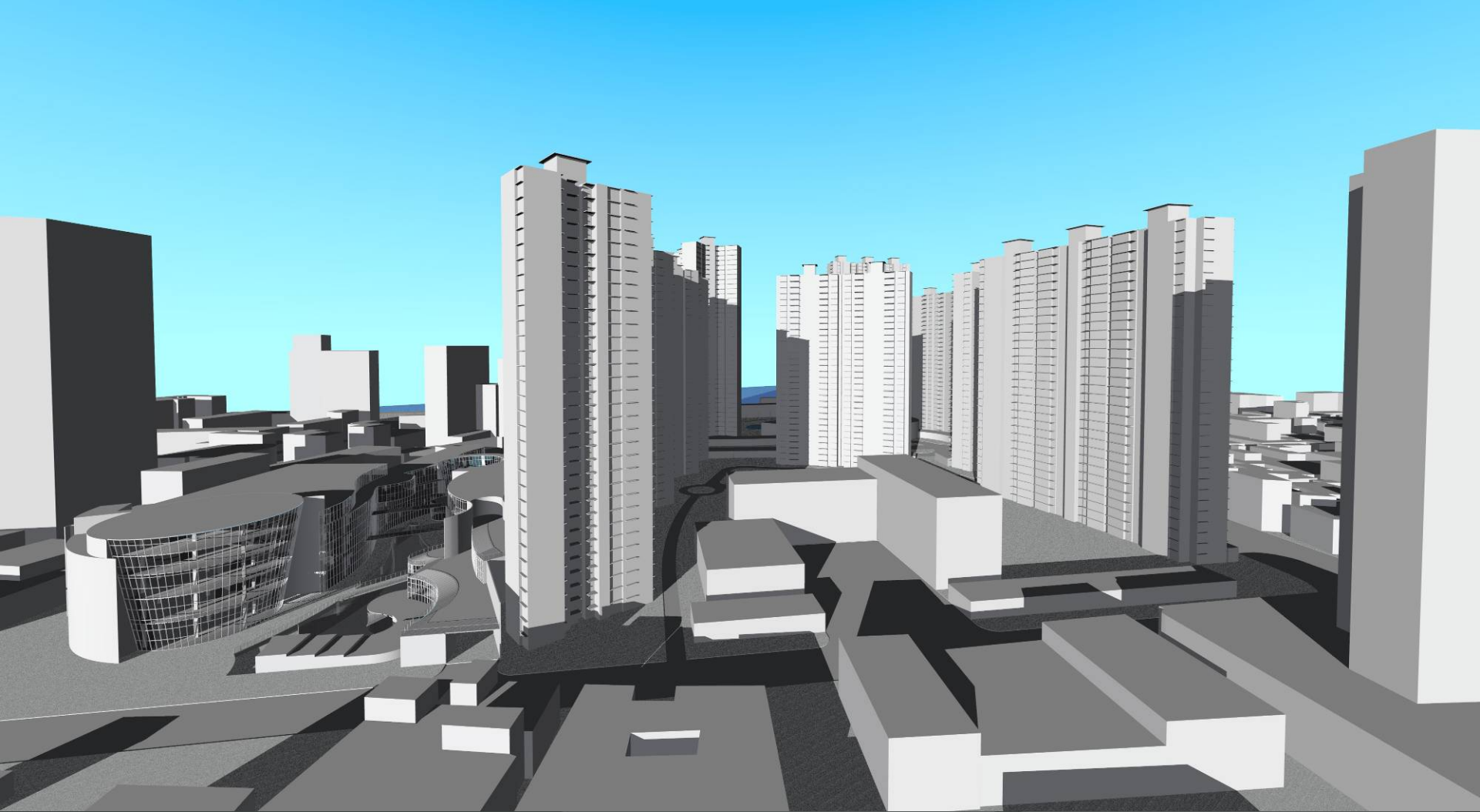
1. **Design visualization** 型像化設計
2. **Drawing Productions** 製作圖件
3. **Services Co-ordination and Clash detection with other disciplines** 各專業協調
4. **Quantity taking and preparation of Tender Document** 投標文件
5. **Automated Statutory Submission** 自動化審批
6. **Scientific analysis of different environmental aspects** 科學性分析
7. **Supply Chain Integration with the manufacturing and production** 生產制造
8. **Complex Geometry** 複雜幾何形狀



- 1. Design visualization** 型像化設計
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BUILDING IN CONTEXT



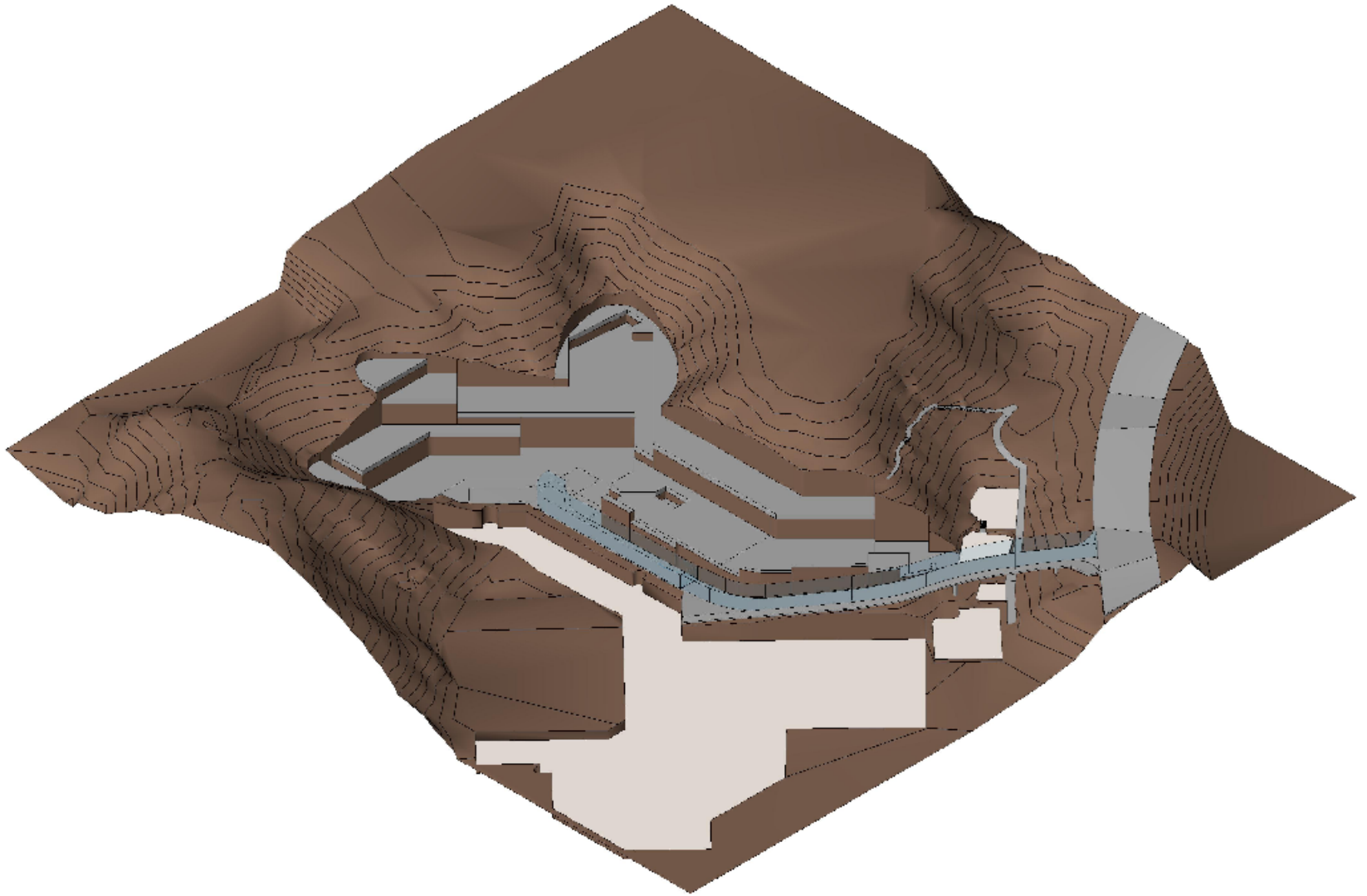
BUILDING IN CONTEXT



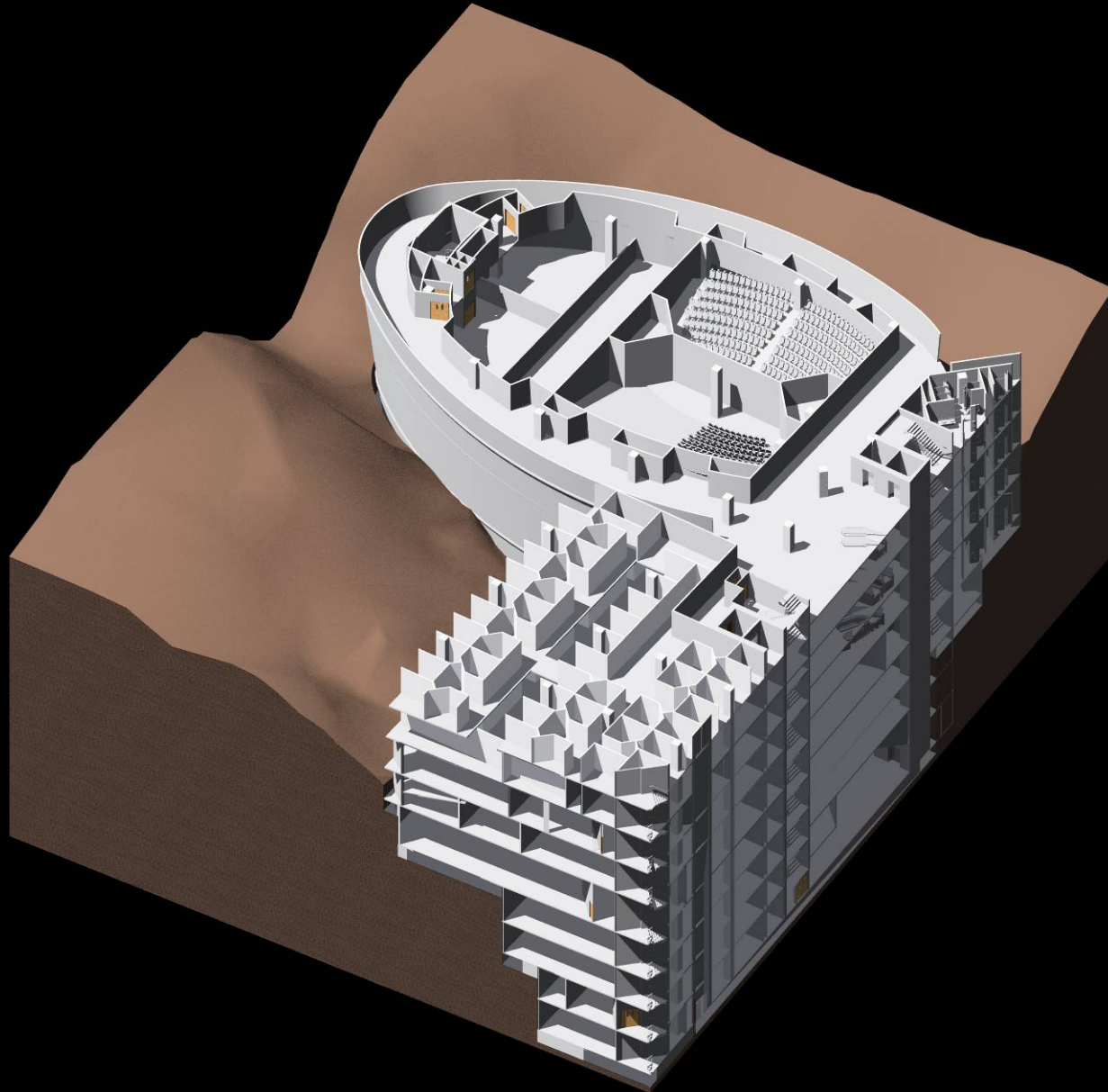
BUILDING IN GOOGLE EARTH

Aedas





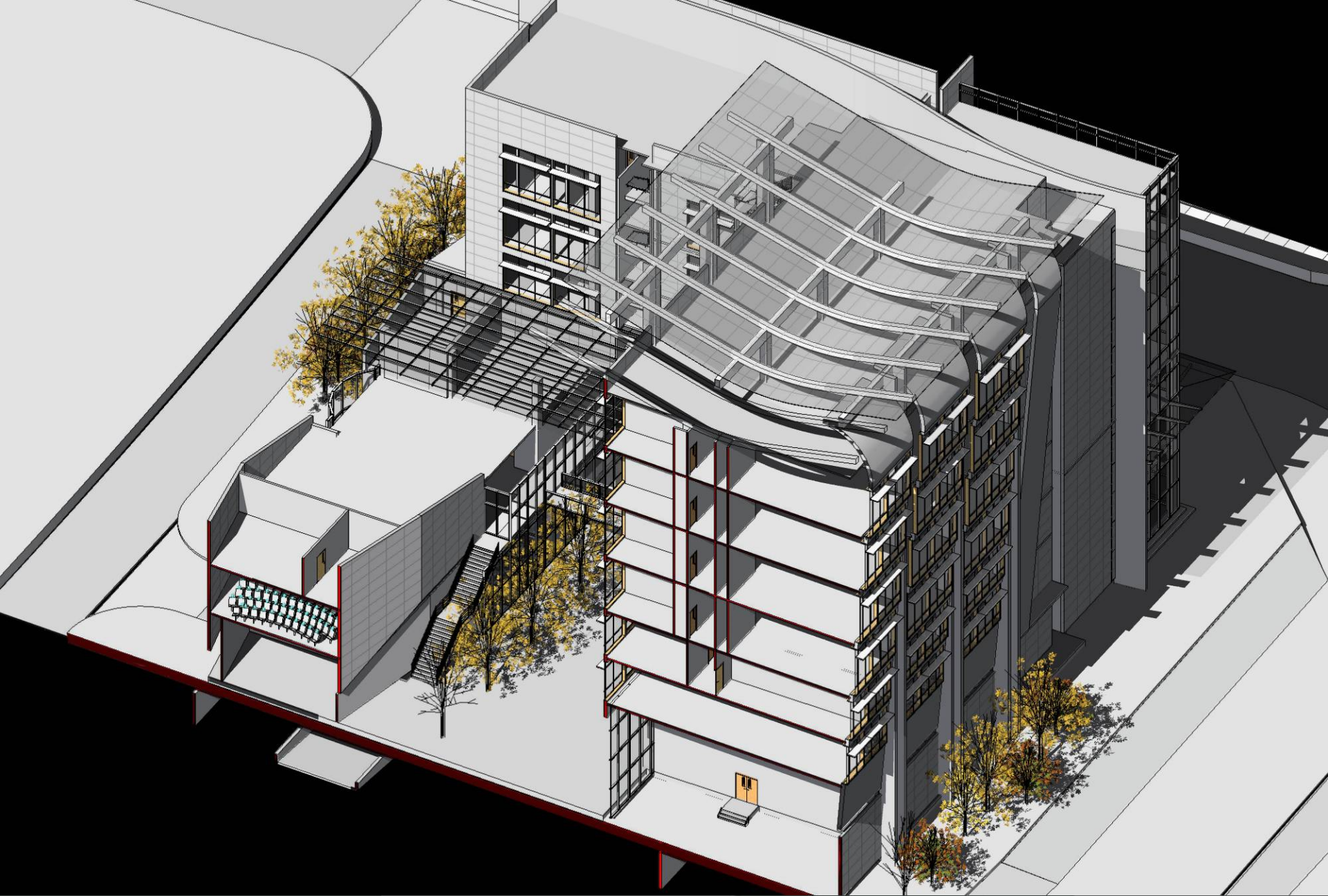
TOPOGRAPHY HANDLING



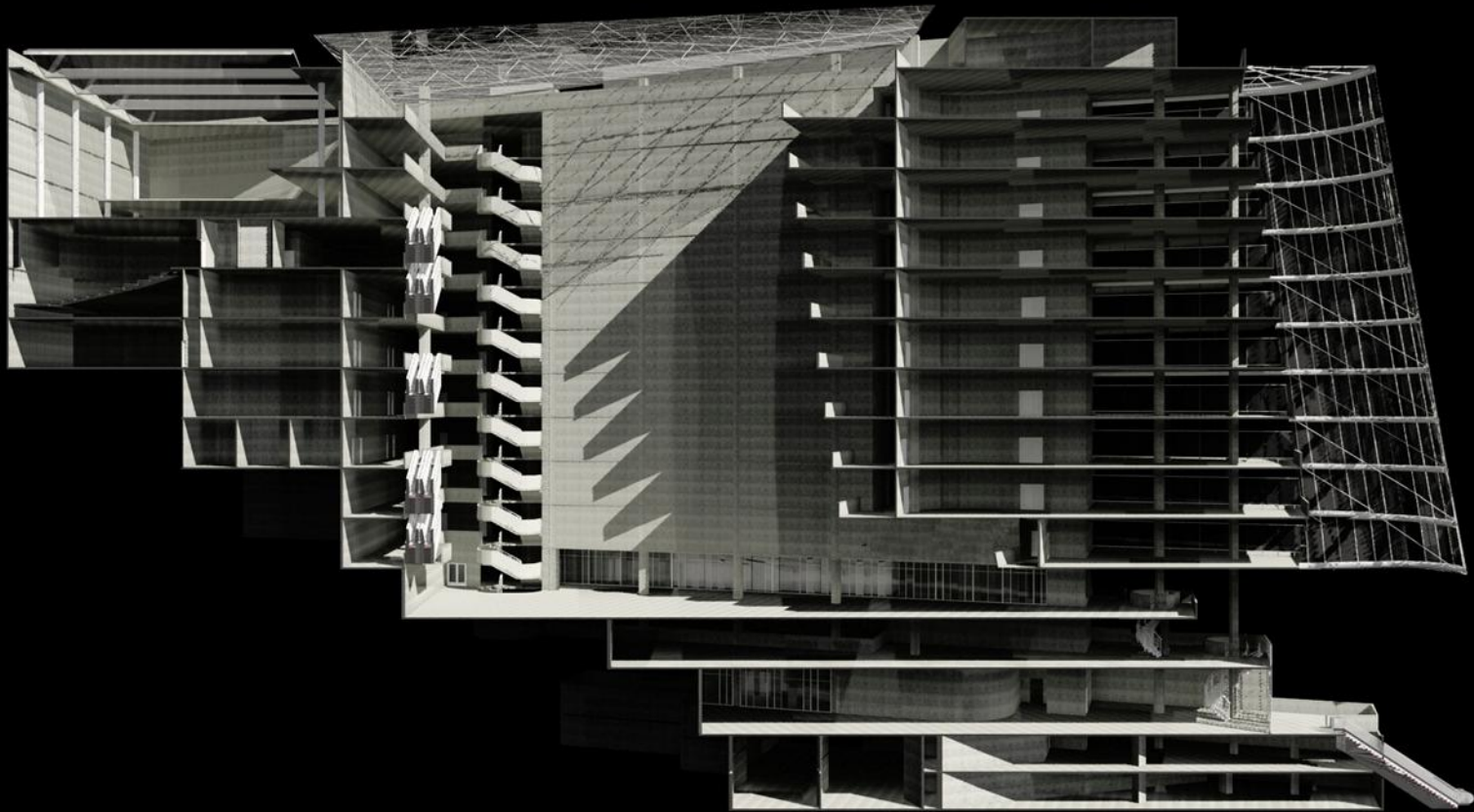
BUILDING IN SITE CONTEXT







PERSPECTIVE



CUT AWAY PERSPECTIVE



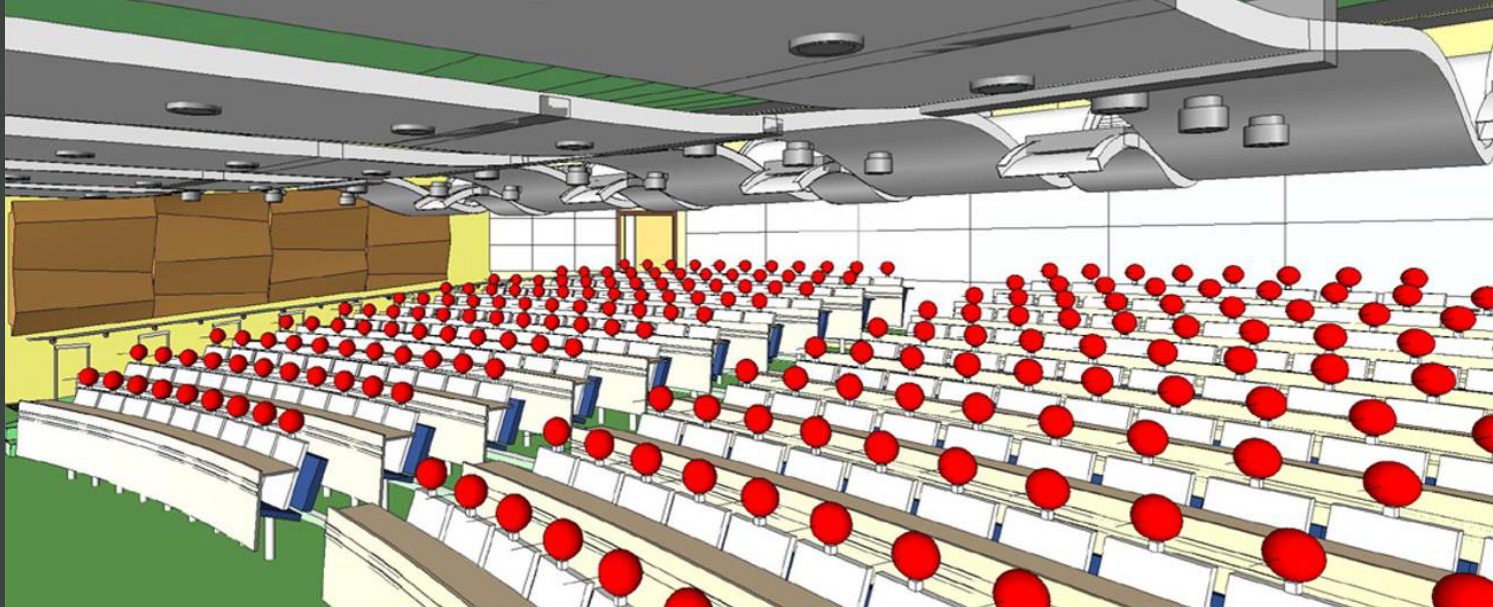




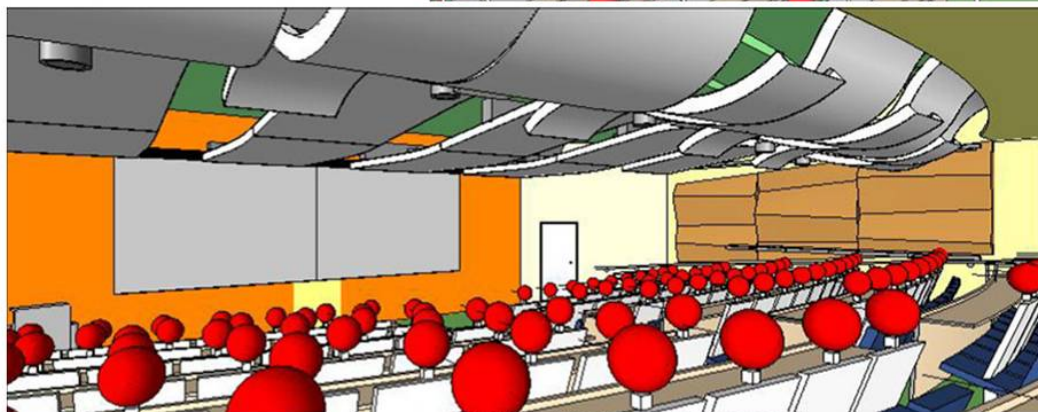


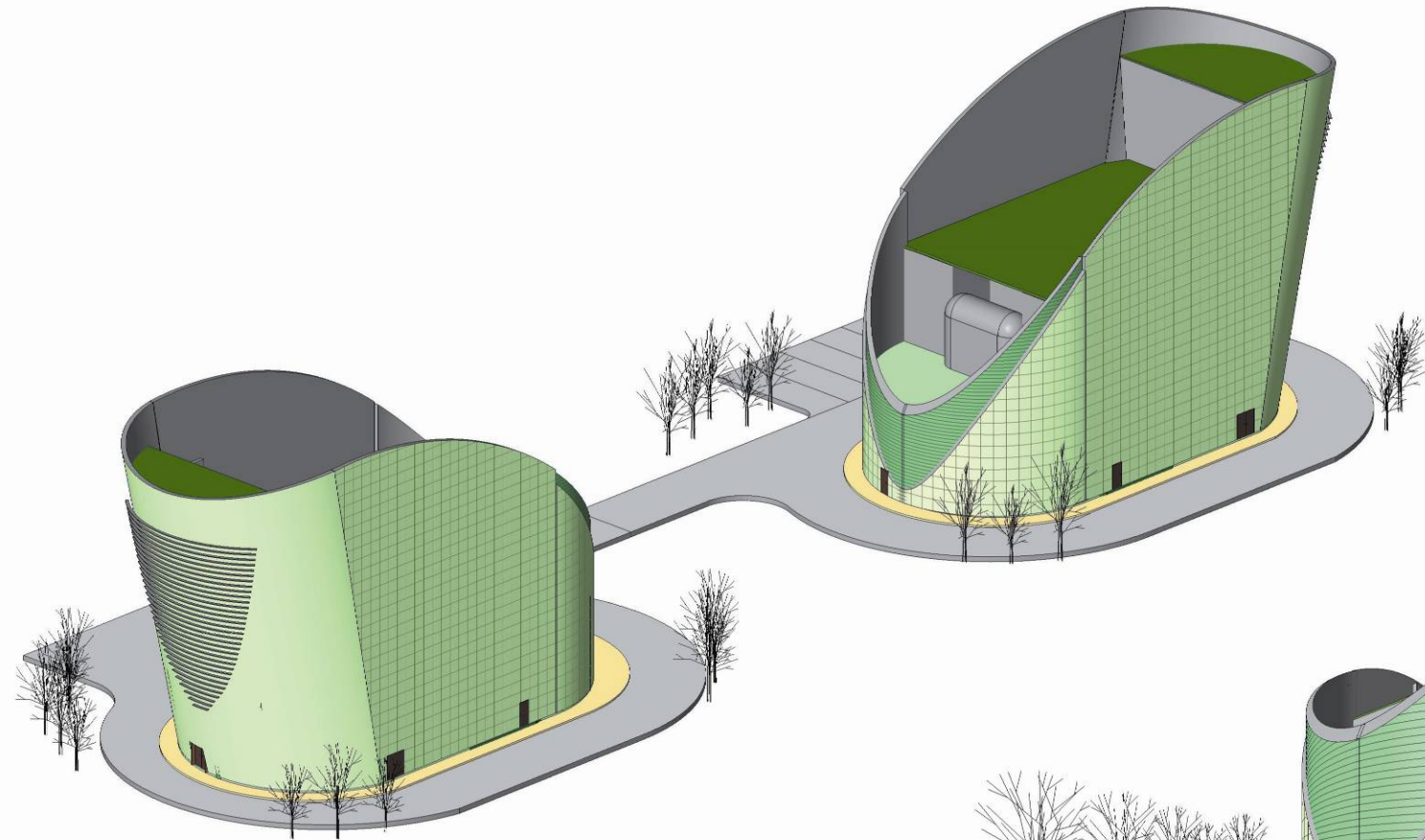


VISUALIZATION



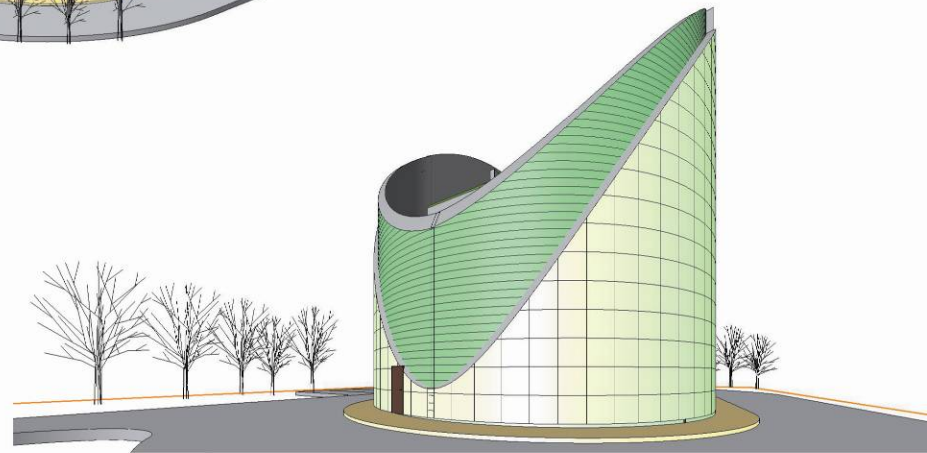
Acoustical curved metal ceiling



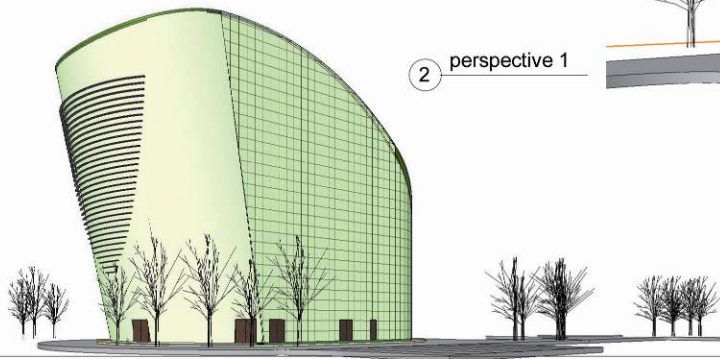


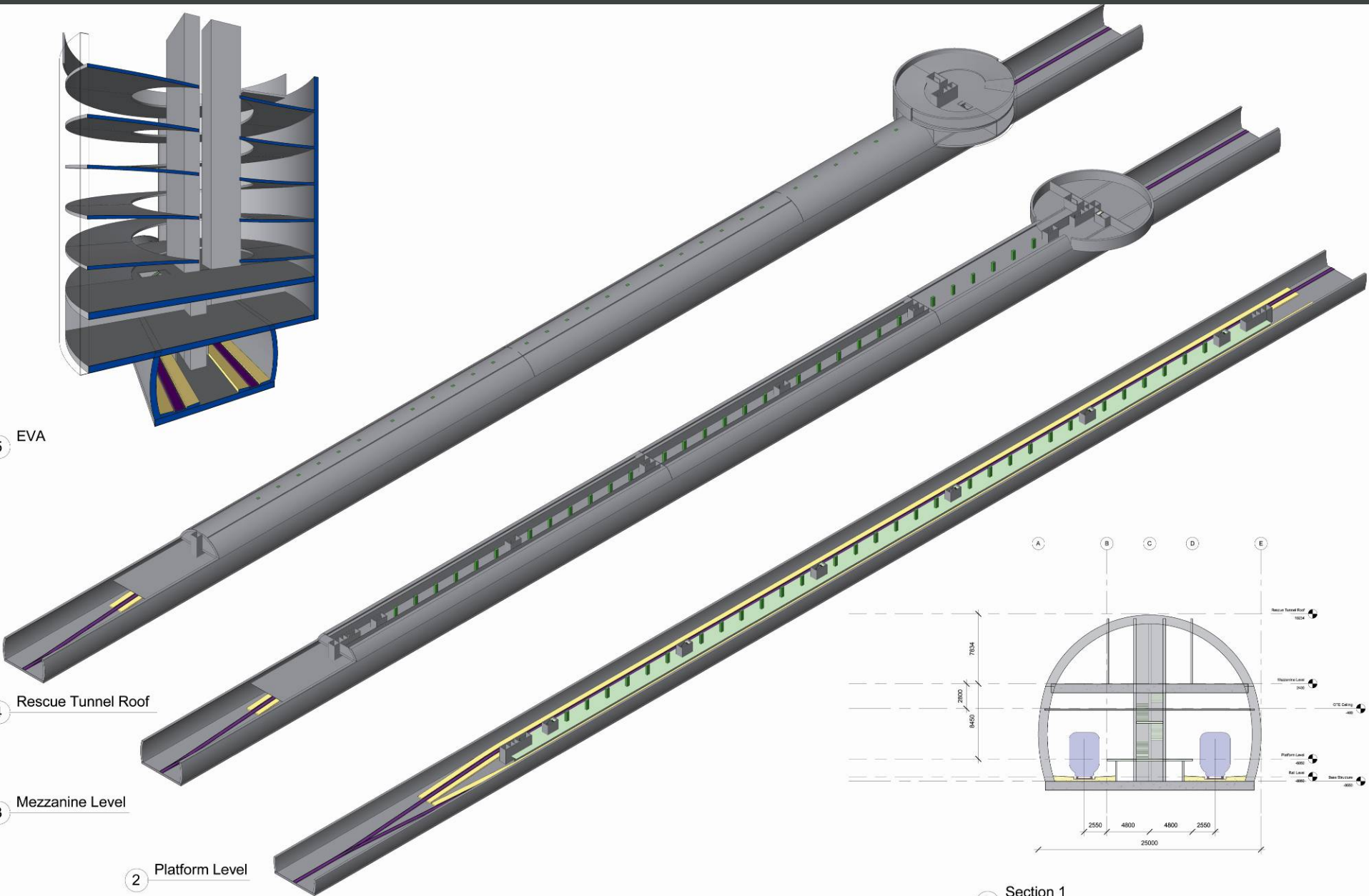
① 3D perspective

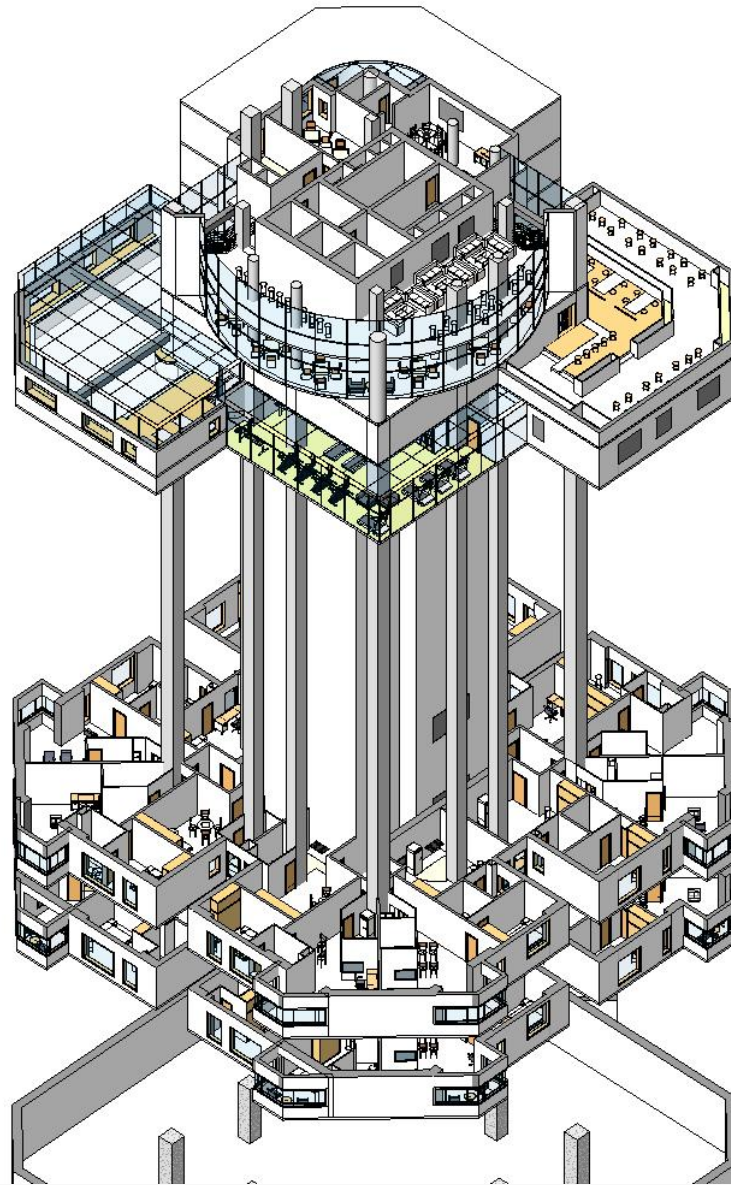
② perspective 1



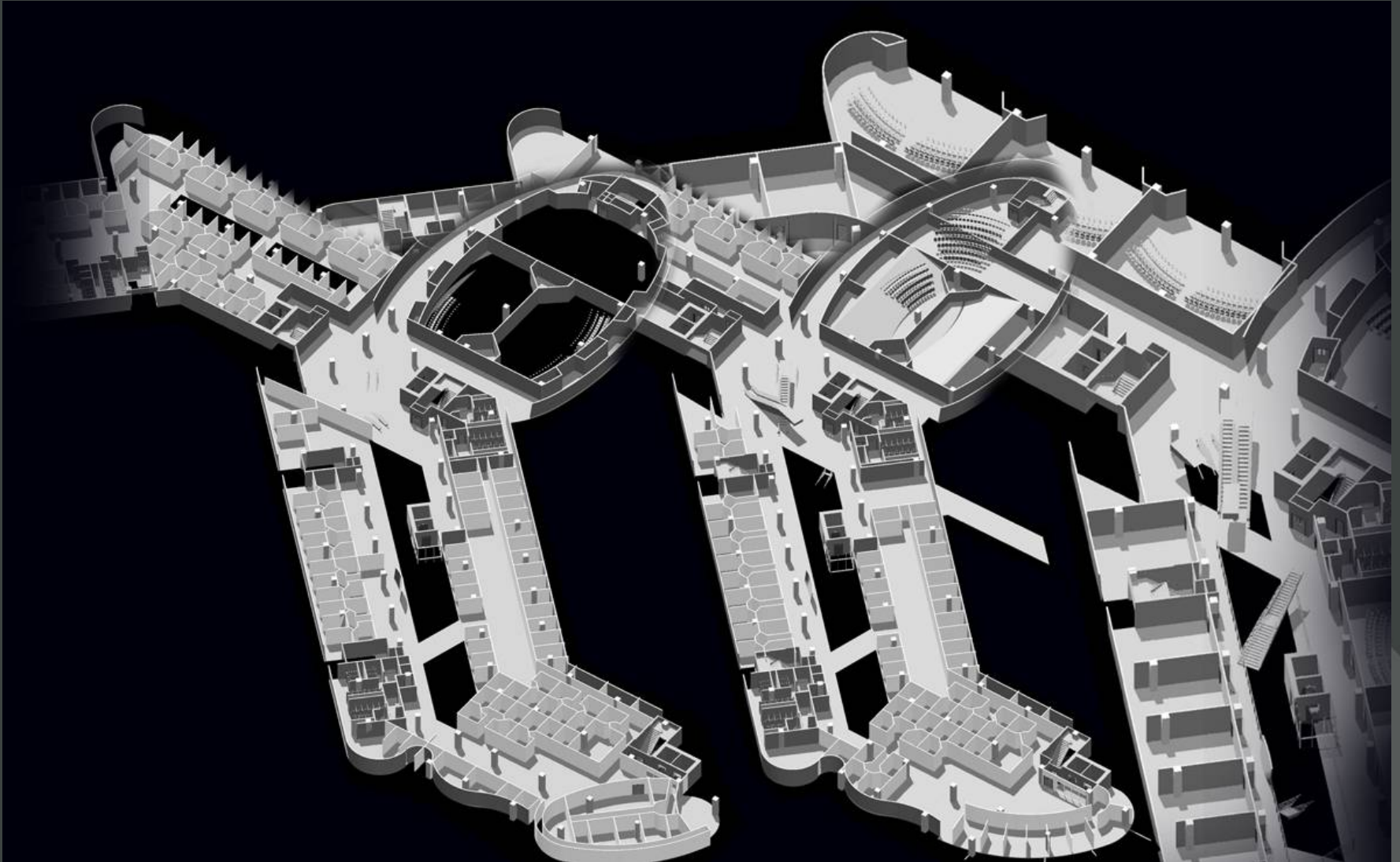
③ perspective 2







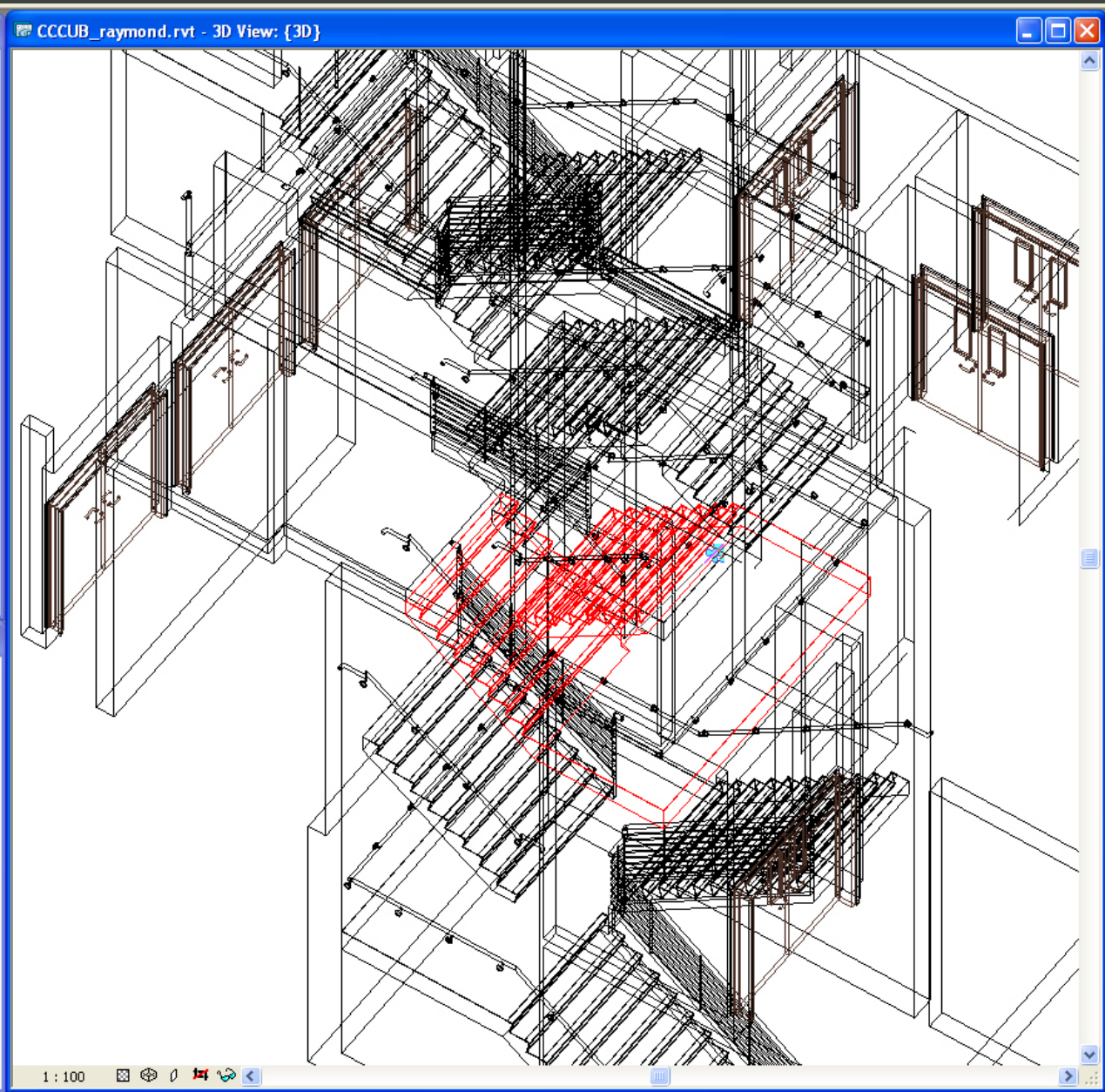
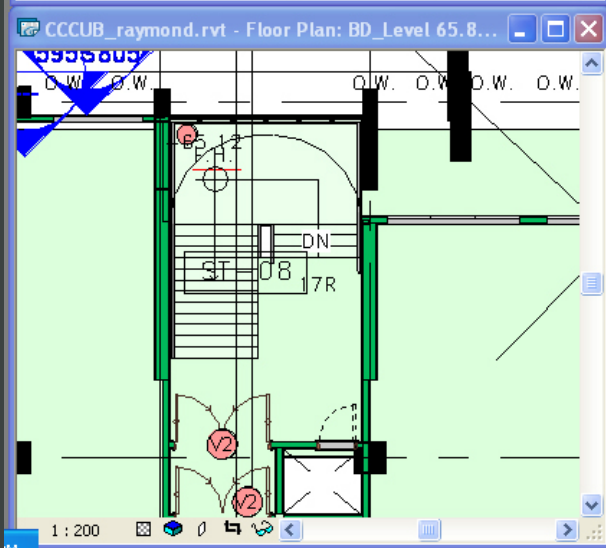
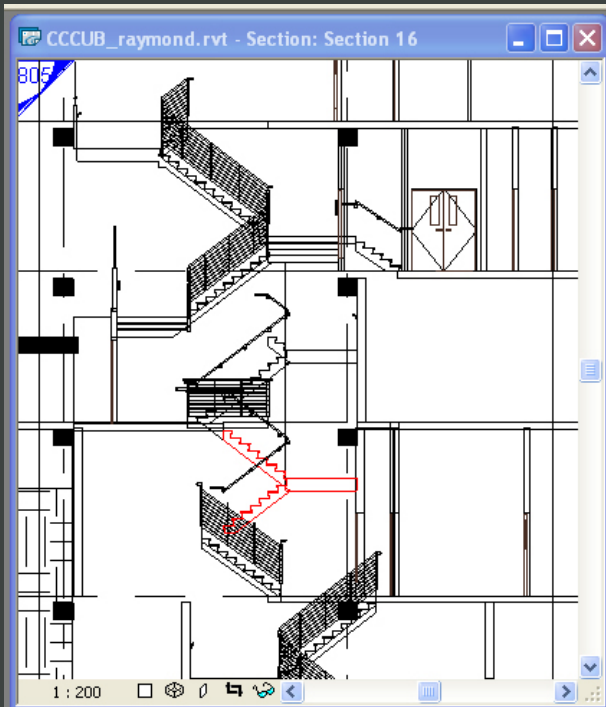
VERTICAL CO-ORDINATION



VERTICAL CO-ORDINATION



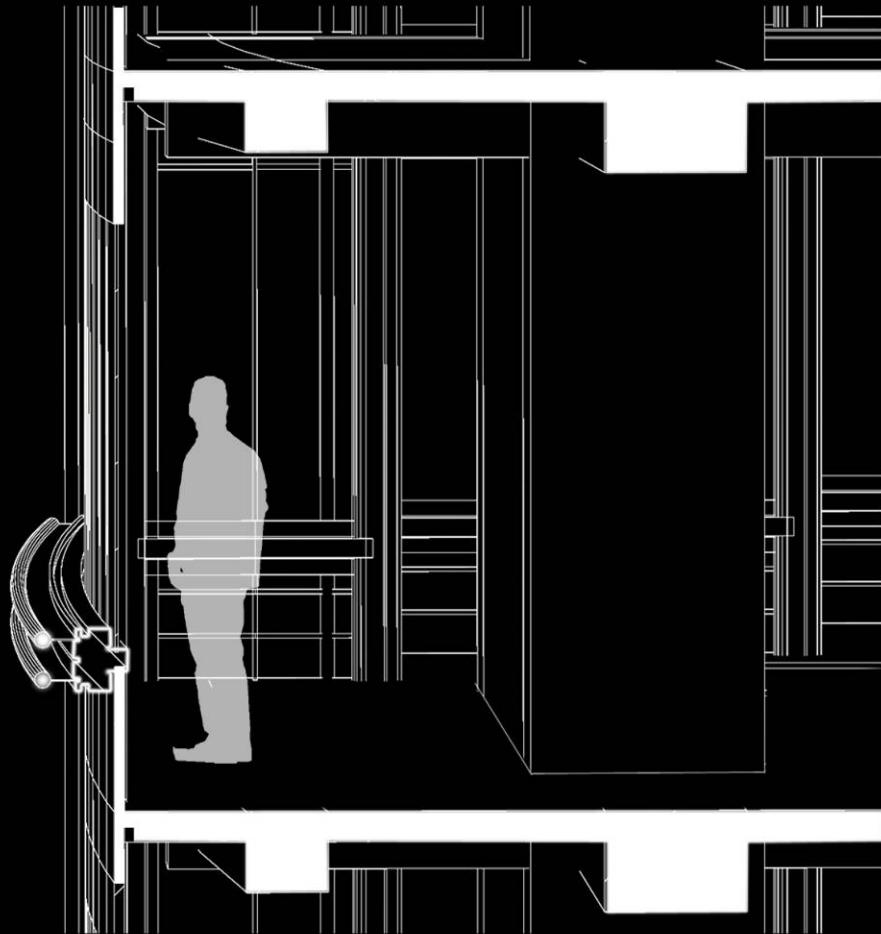
FAÇADE PANEL DESIGN



VERTICAL CO-ORDINATION



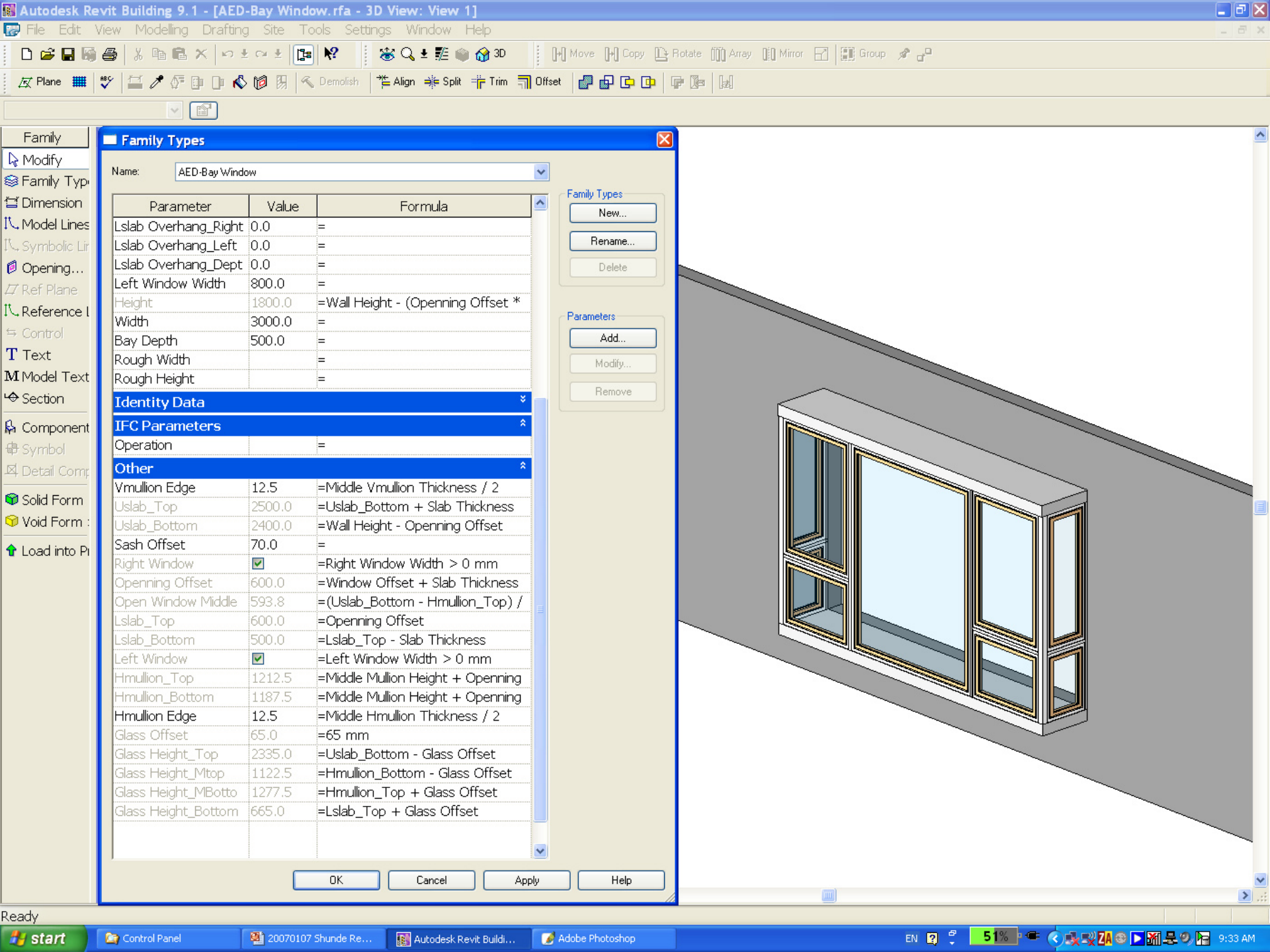
FAÇADE DESIGN and CO-ORDINATION



FAÇADE DESIGN and CO-ORDINATION



REPETITIONS vs VARIATIONS



Family Types

Name: AED-Bay Window

Parameter	Value	Formula
Lslab Overhang_Right	0.0	=
Lslab Overhang_Left	0.0	=
Lslab Overhang_Dept	0.0	=
Left Window Width	800.0	=
Height	1800.0	=Wall Height - (Opening Offset *
Width	4500.0	=
Bay Depth	500.0	=
Rough Width		=
Rough Height		=
Identity Data		
IFC Parameters		
Operation		=
Other		
Vmullion Edge	12.5	=Middle Vmullion Thickness / 2
Uslab_Top	2500.0	=Uslab_Bottom + Slab Thickness
Uslab_Bottom	2400.0	=Wall Height - Opening Offset
Sash Offset	70.0	=
Right Window	☒	=Right Window Width > 0 mm
Opening Offset	600.0	=Window Offset + Slab Thickness
Open Window Middle	593.8	=(Uslab_Bottom - Hmullion_Top) /
Lslab_Top	600.0	=Opening Offset
Lslab_Bottom	500.0	=Lslab_Top - Slab Thickness
Left Window	☒	=Left Window Width > 0 mm
Hmullion_Top	1212.5	=Middle Mullion Height + Opening
Hmullion_Bottom	1187.5	=Middle Mullion Height + Opening
Hmullion Edge	12.5	=Middle Hmullion Thickness / 2
Glass Offset	65.0	=65 mm
Glass Height_Top	2335.0	=Uslab_Bottom - Glass Offset
Glass Height_Mtop	1122.5	=Hmullion_Bottom - Glass Offset
Glass Height_MBotto	1277.5	=Hmullion_Top + Glass Offset
Glass Height_Bottom	665.0	=Lslab_Top + Glass Offset

Family Types

New...

Rename...

Delete

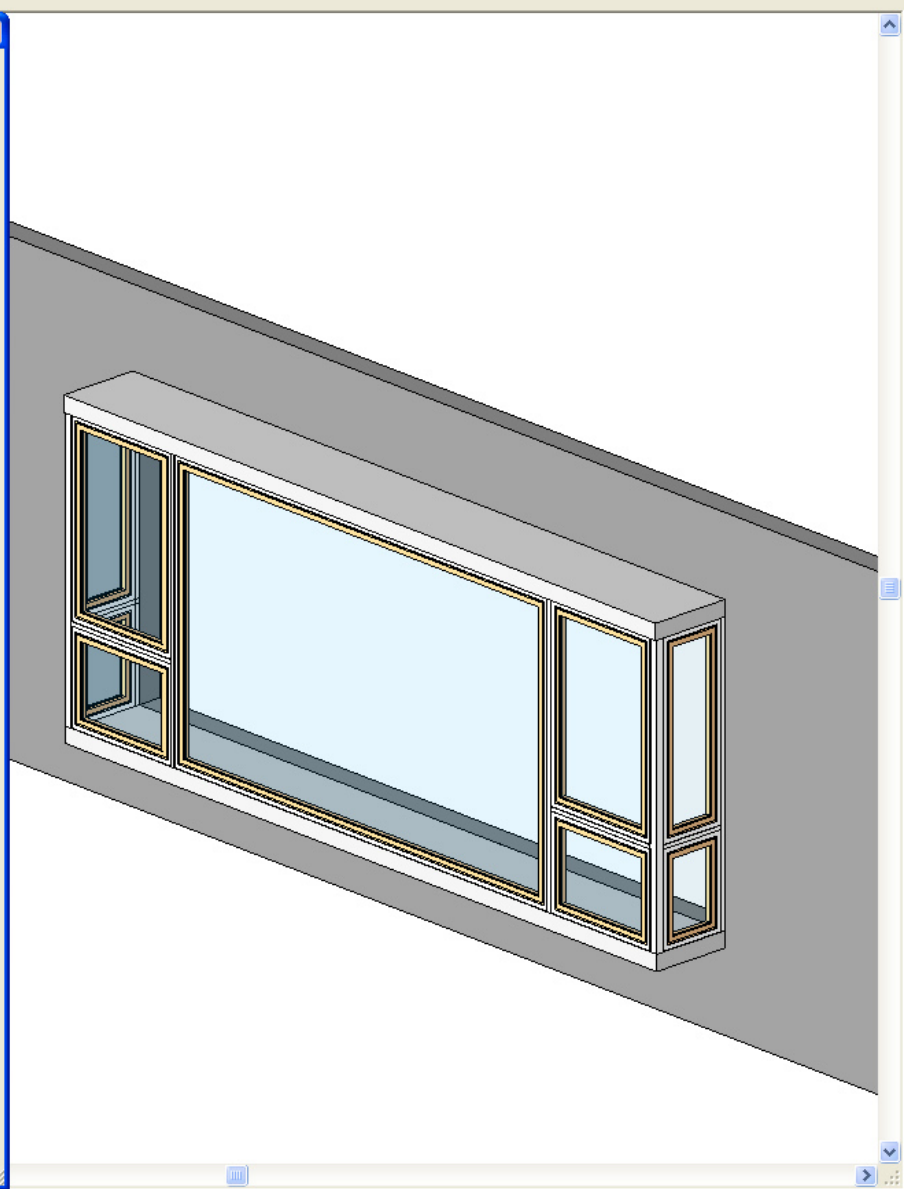
Parameters

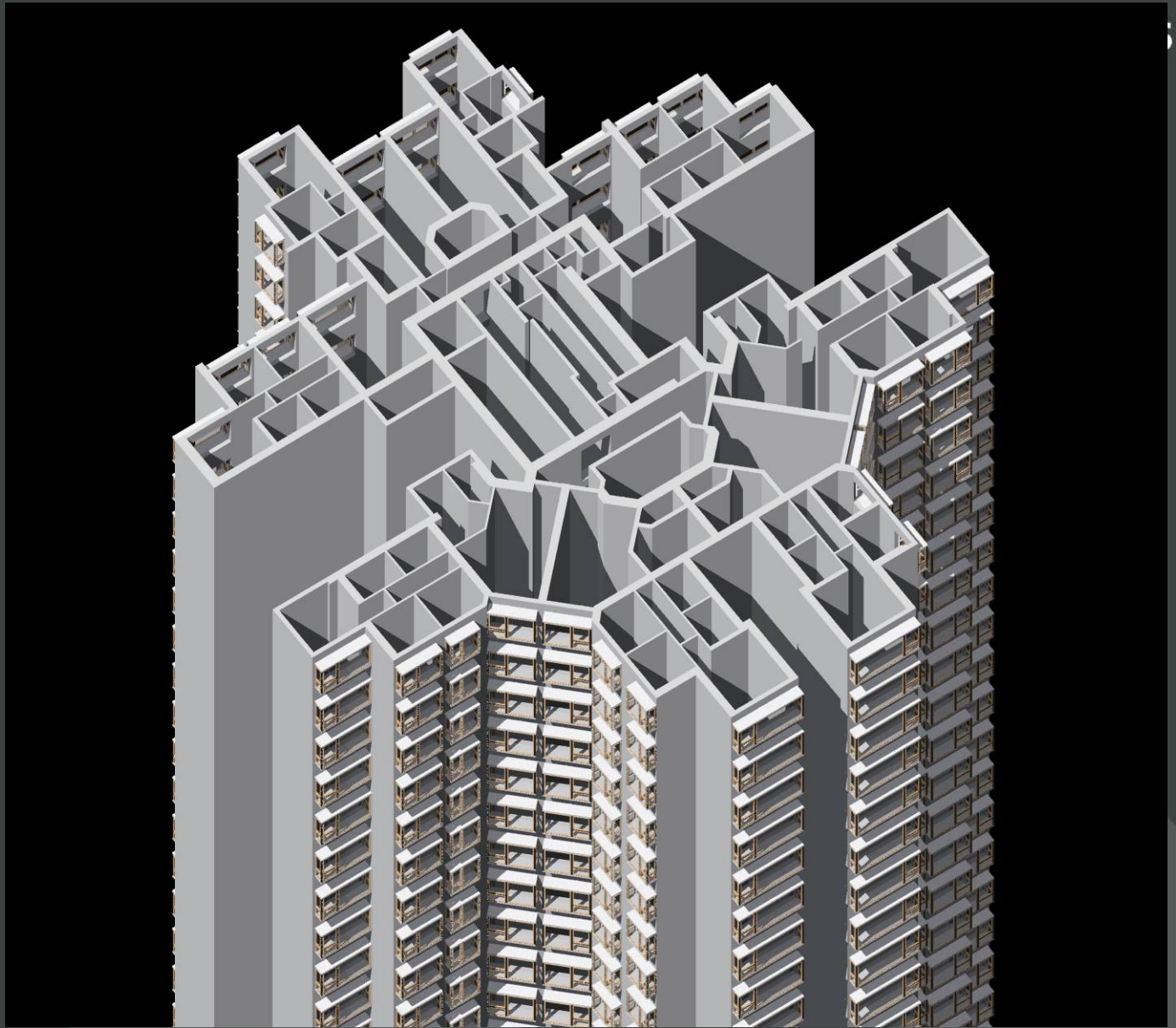
Add...

Modify...

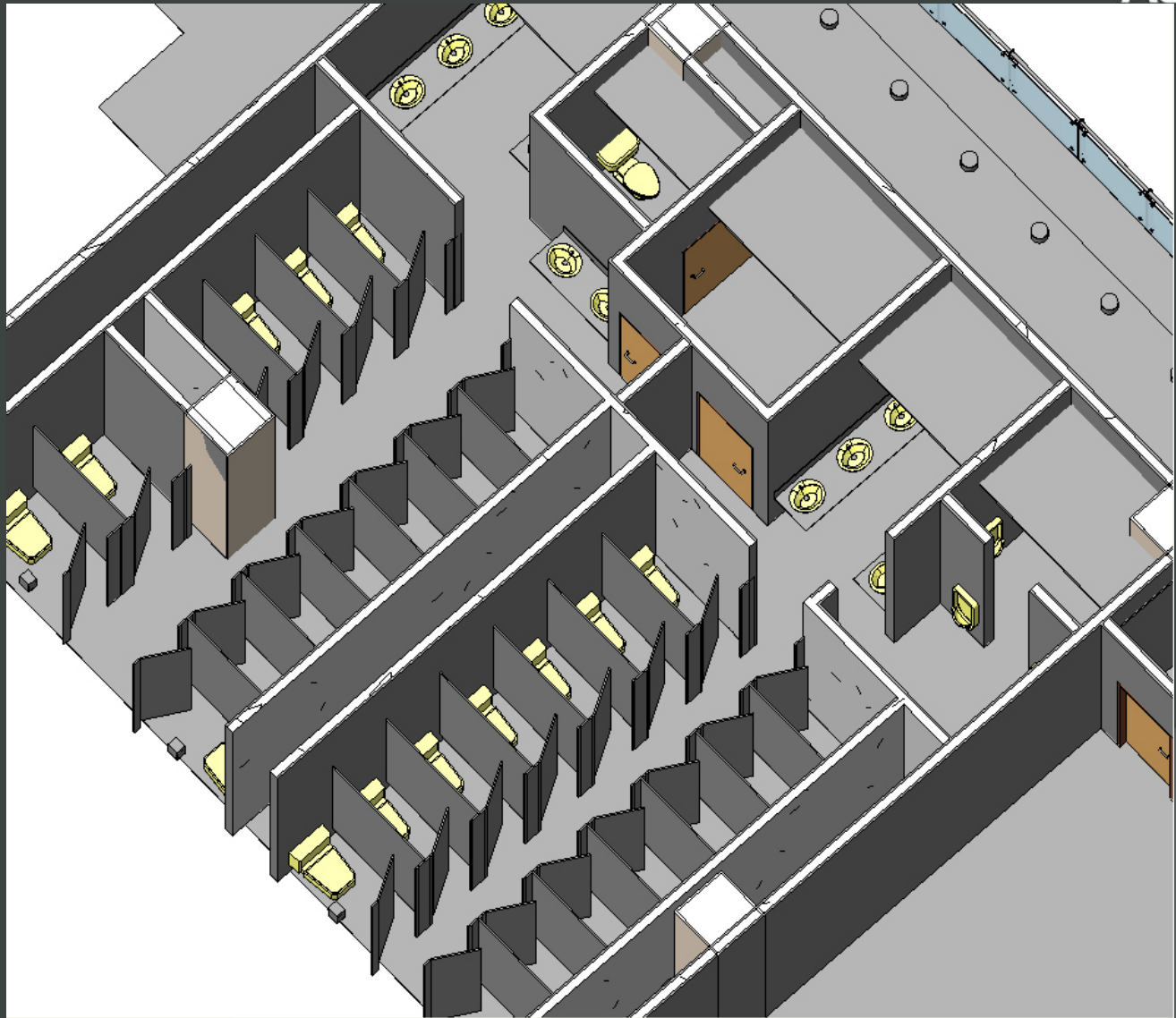
Remove

OK Cancel Apply Help

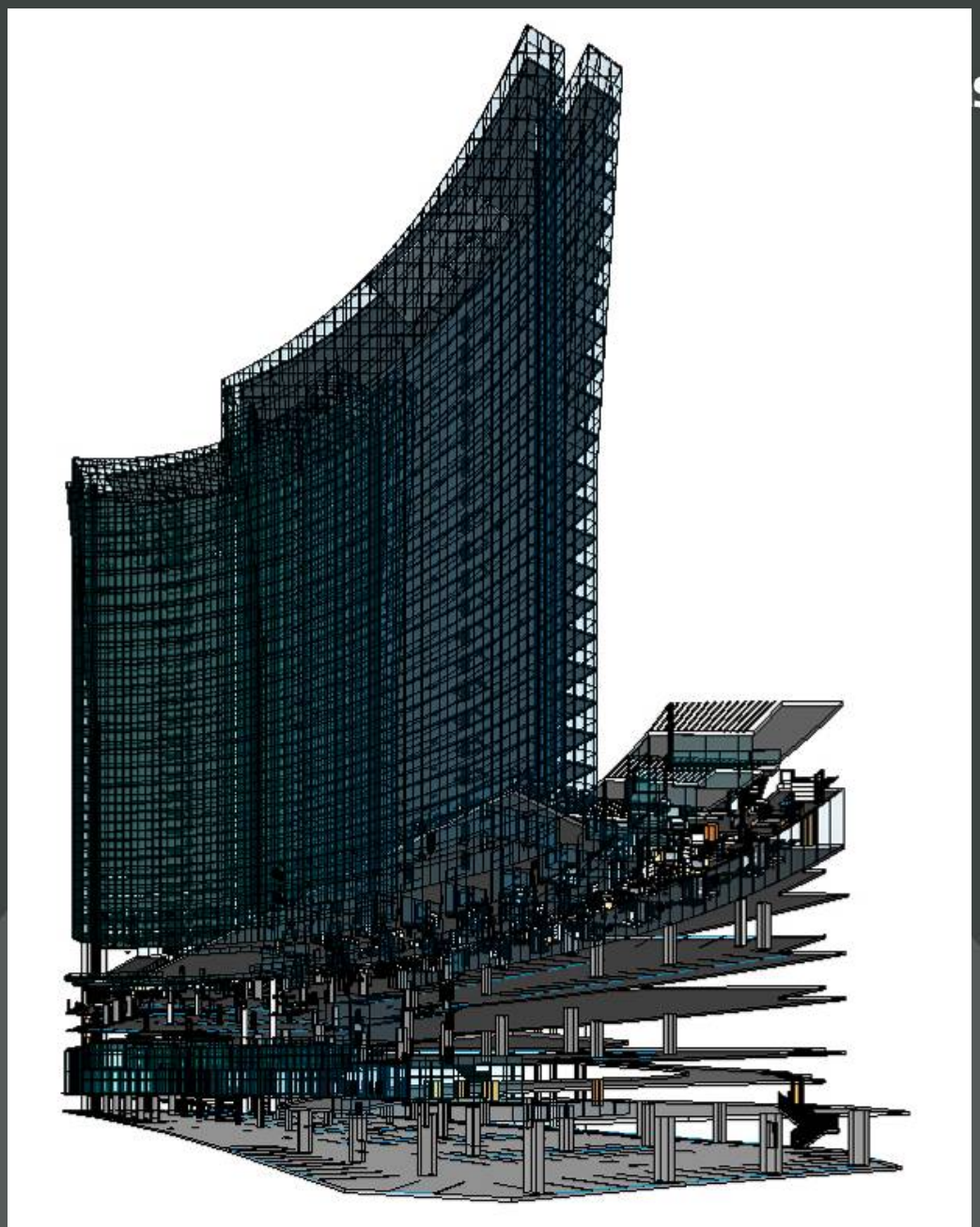




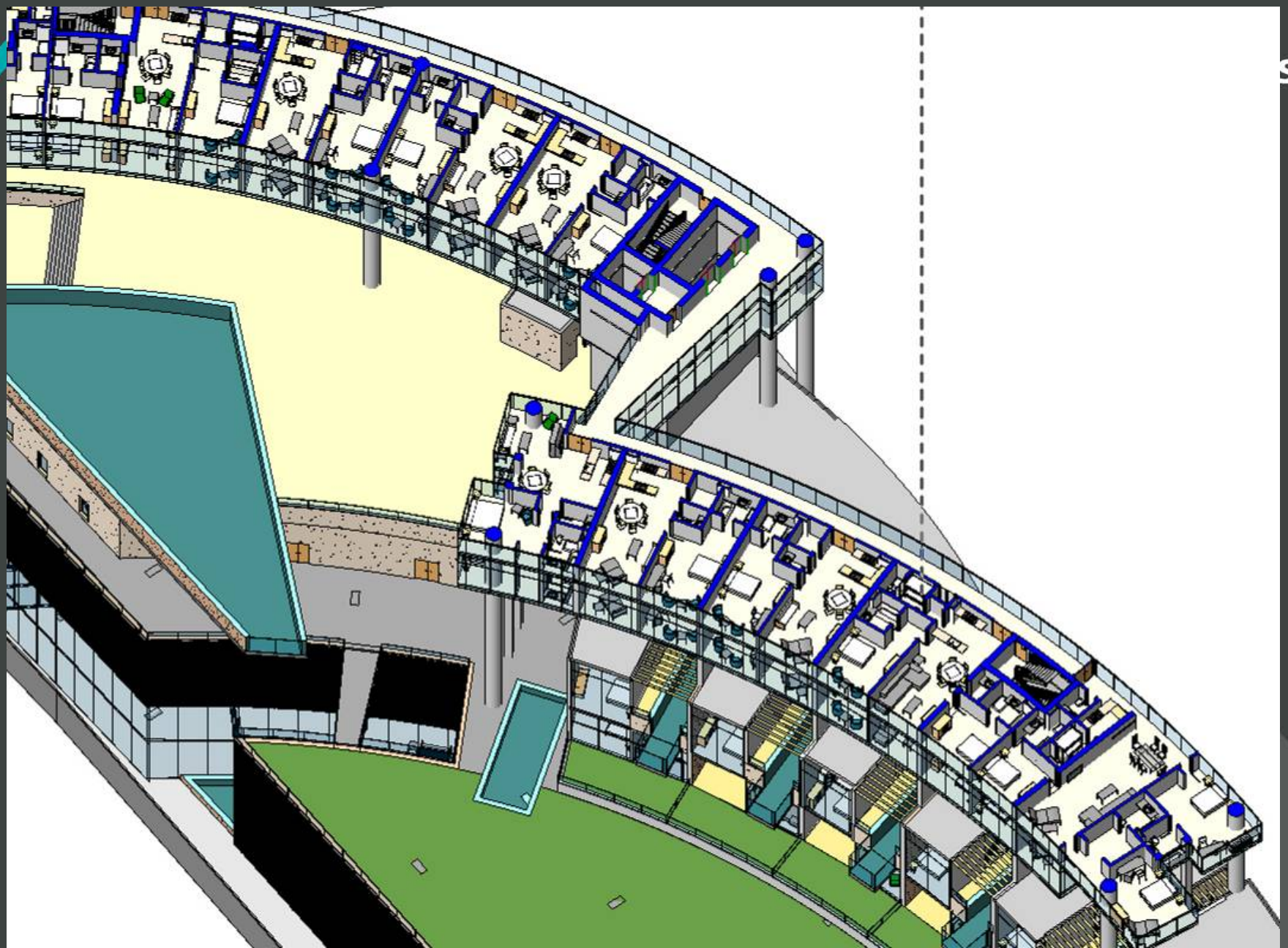
REPETITIONS vs VARIATIONS



CREATIVE TOOLS



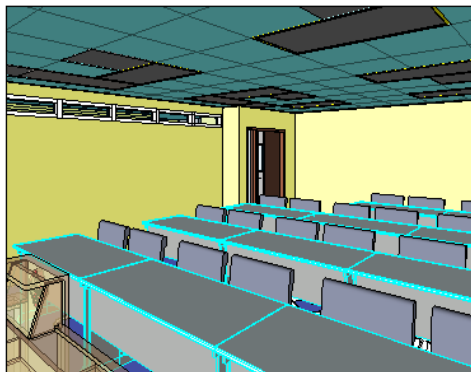
HORIZONTAL REPETITION / MODULARIZATION



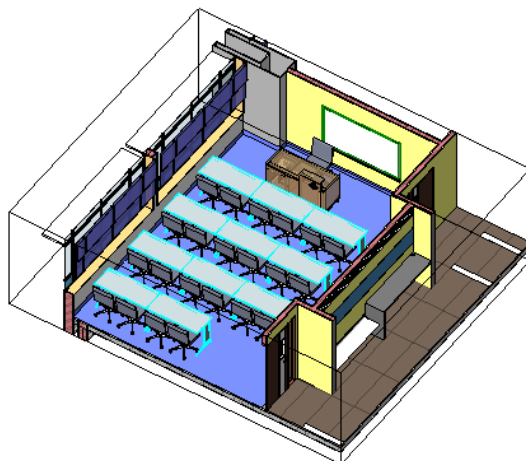
MODULAR DESIGN



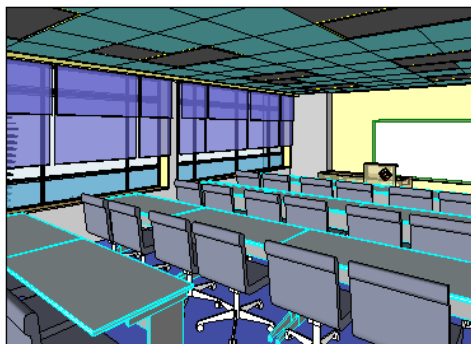
1. Design visualization 型像化設計
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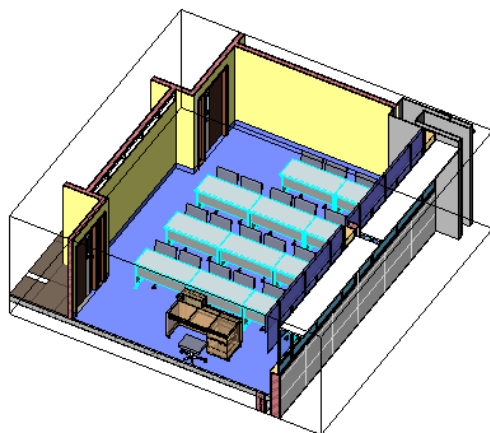
6 行政人员培训室立体示意图2



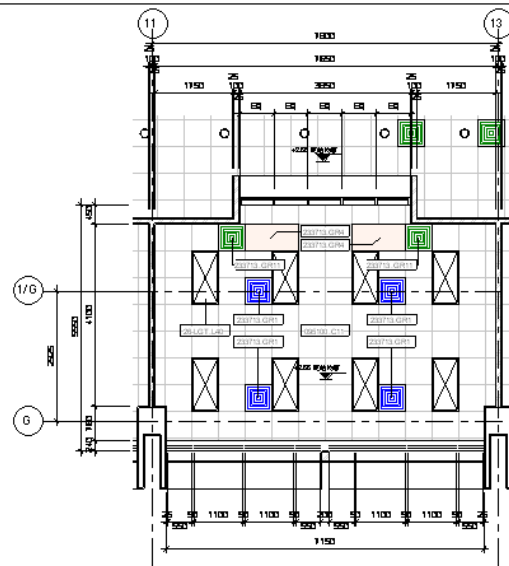
4 行政人员培训室立体剖面示意图2



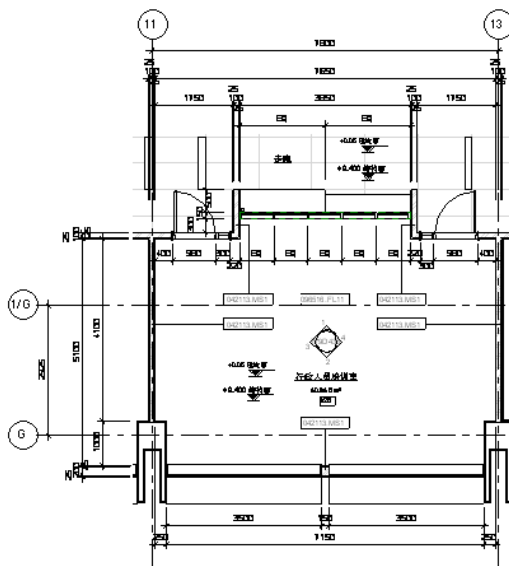
5 行政人员培训室立体示意图1



3 行政人员培训室立体剖面示意图1

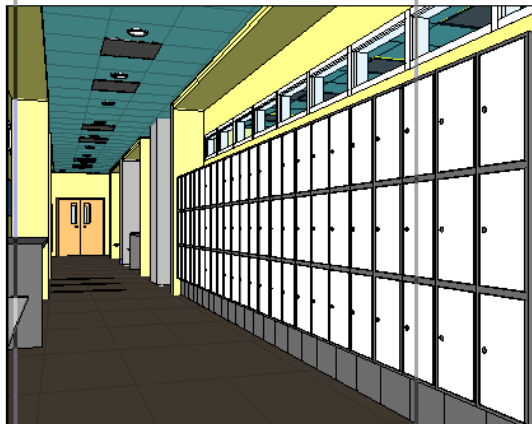


2 行政人员培训室天花平面图(高楼三层)1
1 : 50

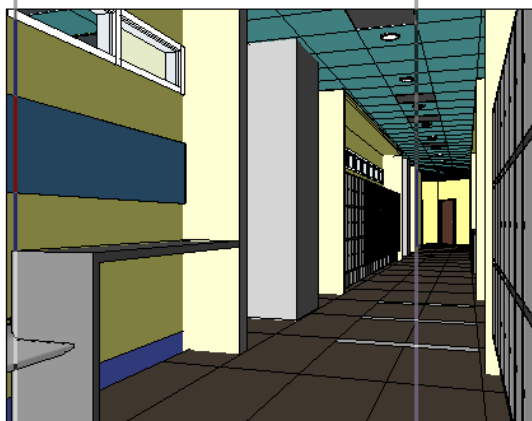


1 行政人员培训室平面图(高楼三层)1
1 : 50

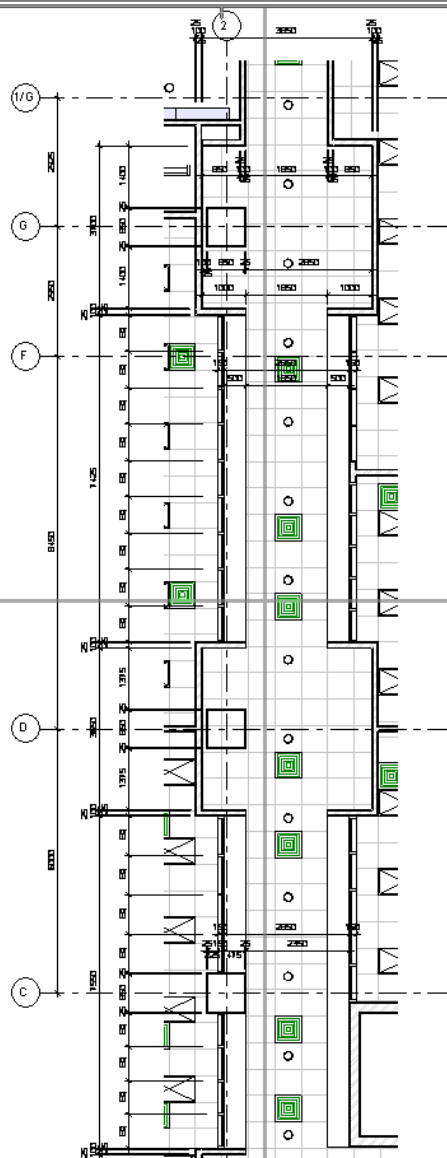
Drawing Type		S.D. SUBMISSION	
S.D. Submission No.		GOVERNMENT REFERENCE NO.	
1-2-2 Submission No.		GOVERNMENT REFERENCE NO.	
Author's Name		AUTHORIZE PERSON OR SUBMIT AREA	
Notes			



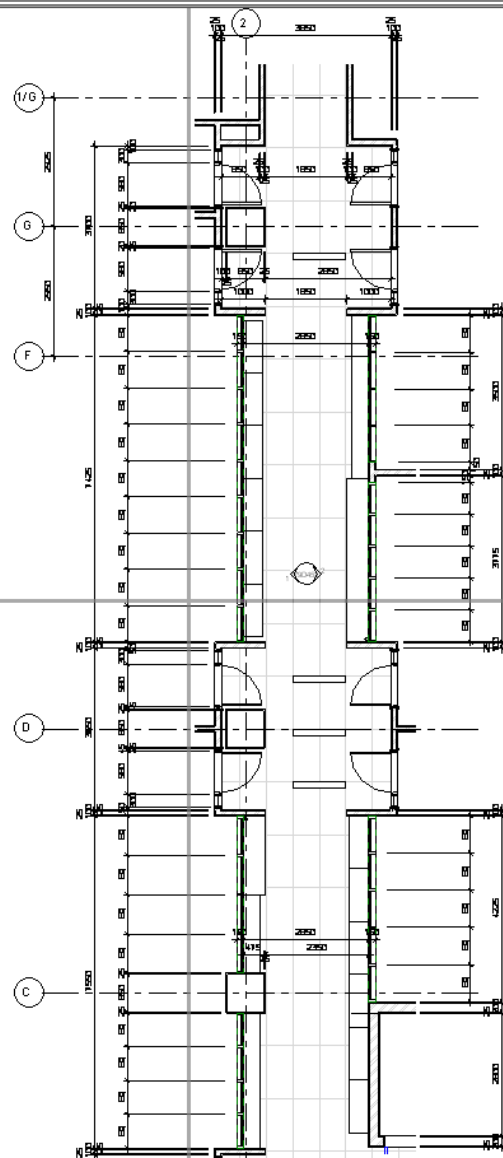
4 走廊立体示意图(低楼三至四层)



3 走廊立体示意图(低楼三至四层)



2 走廊天花平面图(低楼三至四层)
1:50



1 走廊平面图(低楼三至四层)
1:50

Project Information:

- Client: THE HONG KONG POLYTECHNIC UNIVERSITY
- Project Name: POLYTECHNIC UNIVERSITY
- Location: Kowloon, Hong Kong
- Architect: Aedas
- Interior Design: Aedas
- Construction Management: Aedas

Project Team:

- Project Manager: Aedas
- Design Manager: Aedas
- Architect: Aedas
- Interior Design: Aedas
- Construction Management: Aedas

Project Status:

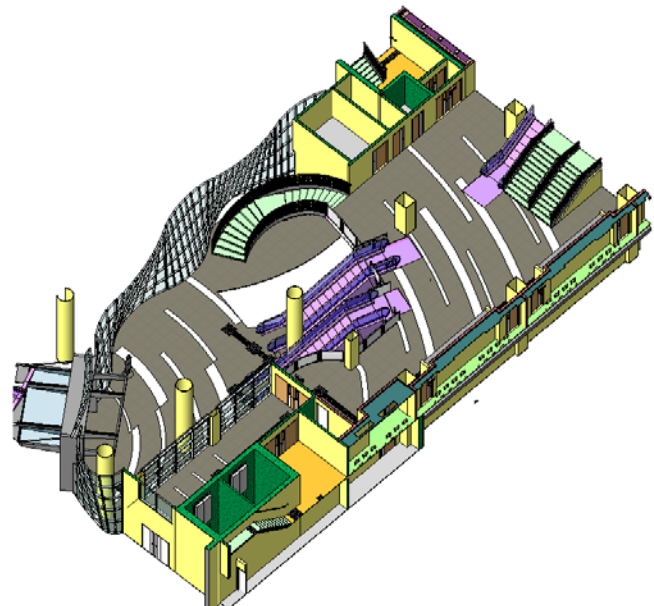
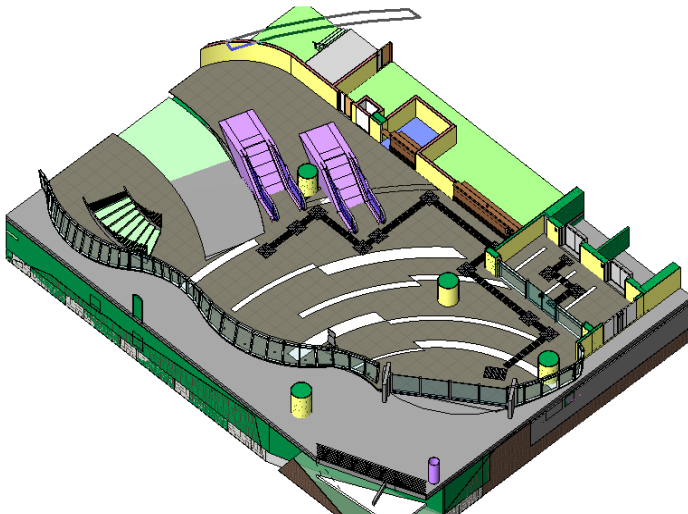
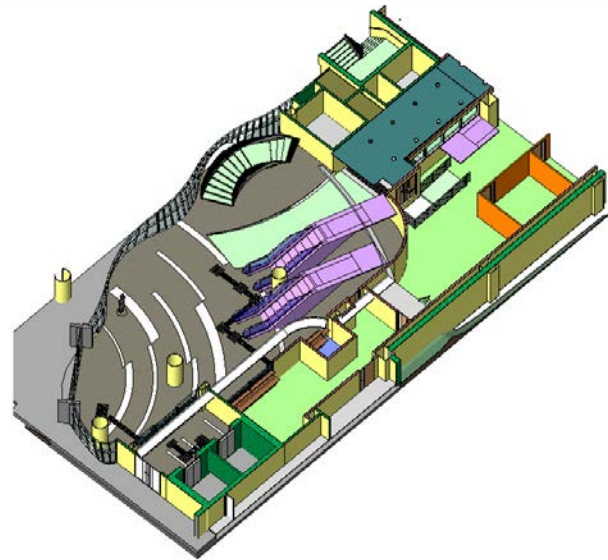
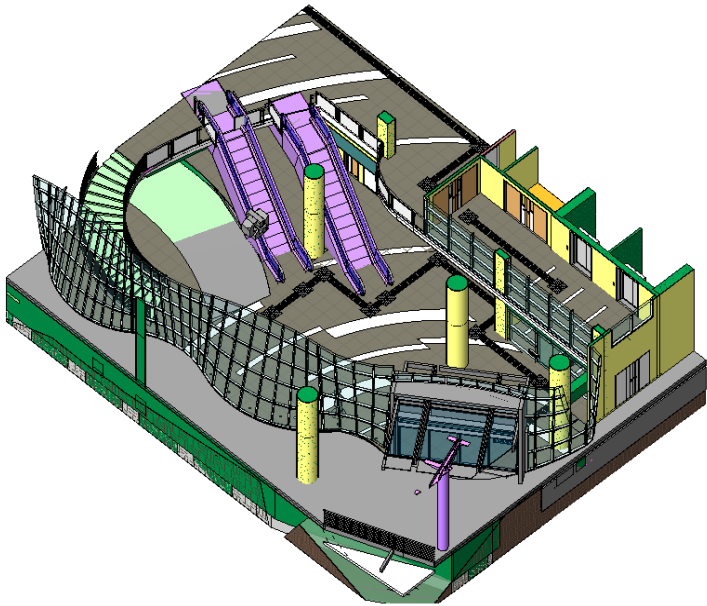
- Design: 100%
- Construction: 100%
- Handover: 100%

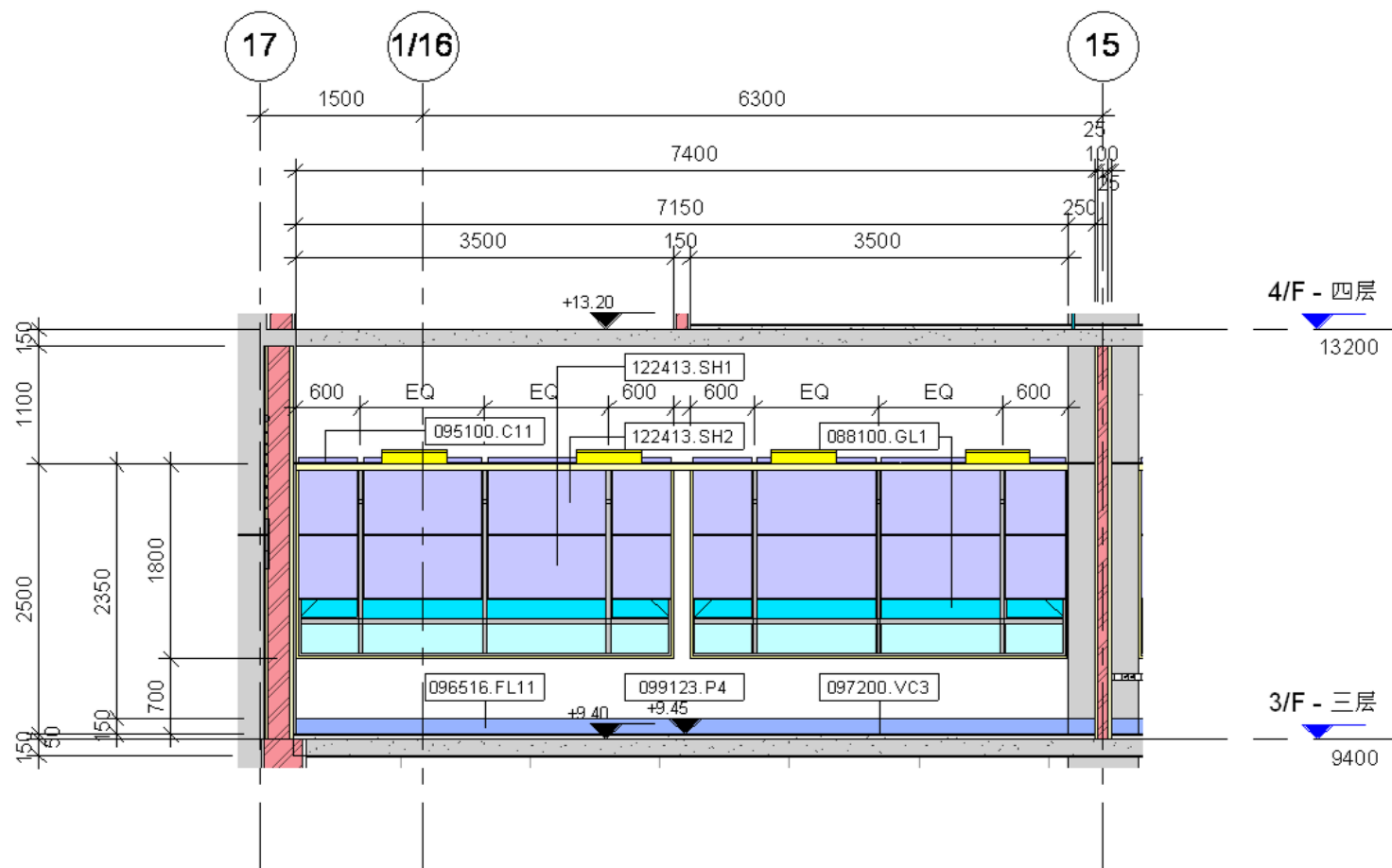
Project Address:

THE HONG KONG POLYTECHNIC UNIVERSITY
Kowloon, Hong Kong

Project Contact:

Aedas
11/F, Aedas
Wing Lok Building
Queen's Road
Hong Kong
T: +852 2801 1728
F: +852 2801 1729
E: hongkong@aedas.com
aedas.com

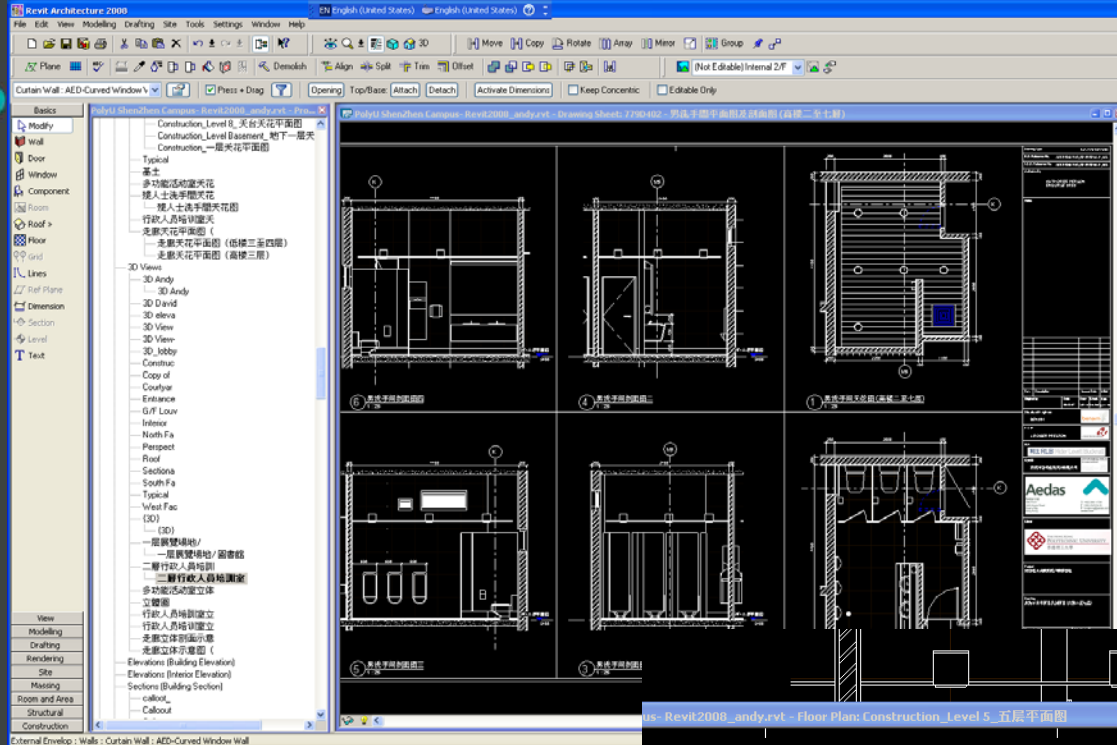




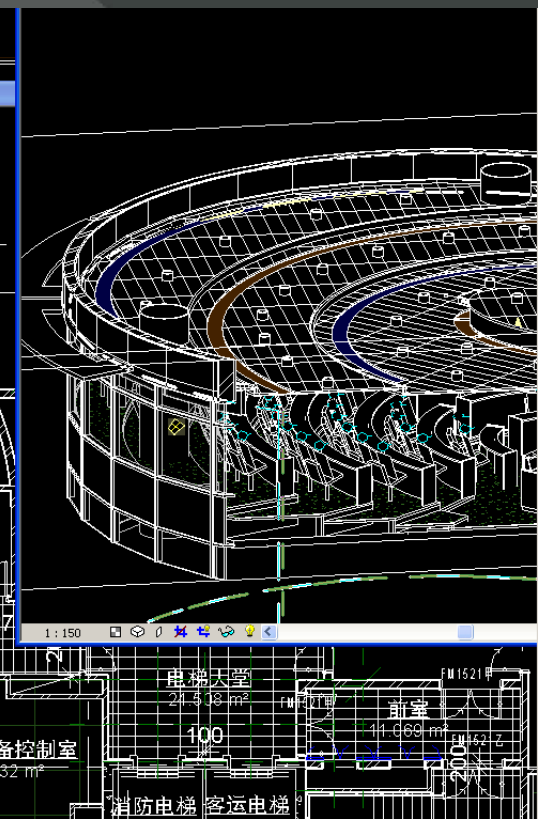
2

行政人员培训室立面图(高楼三层)6

1:50

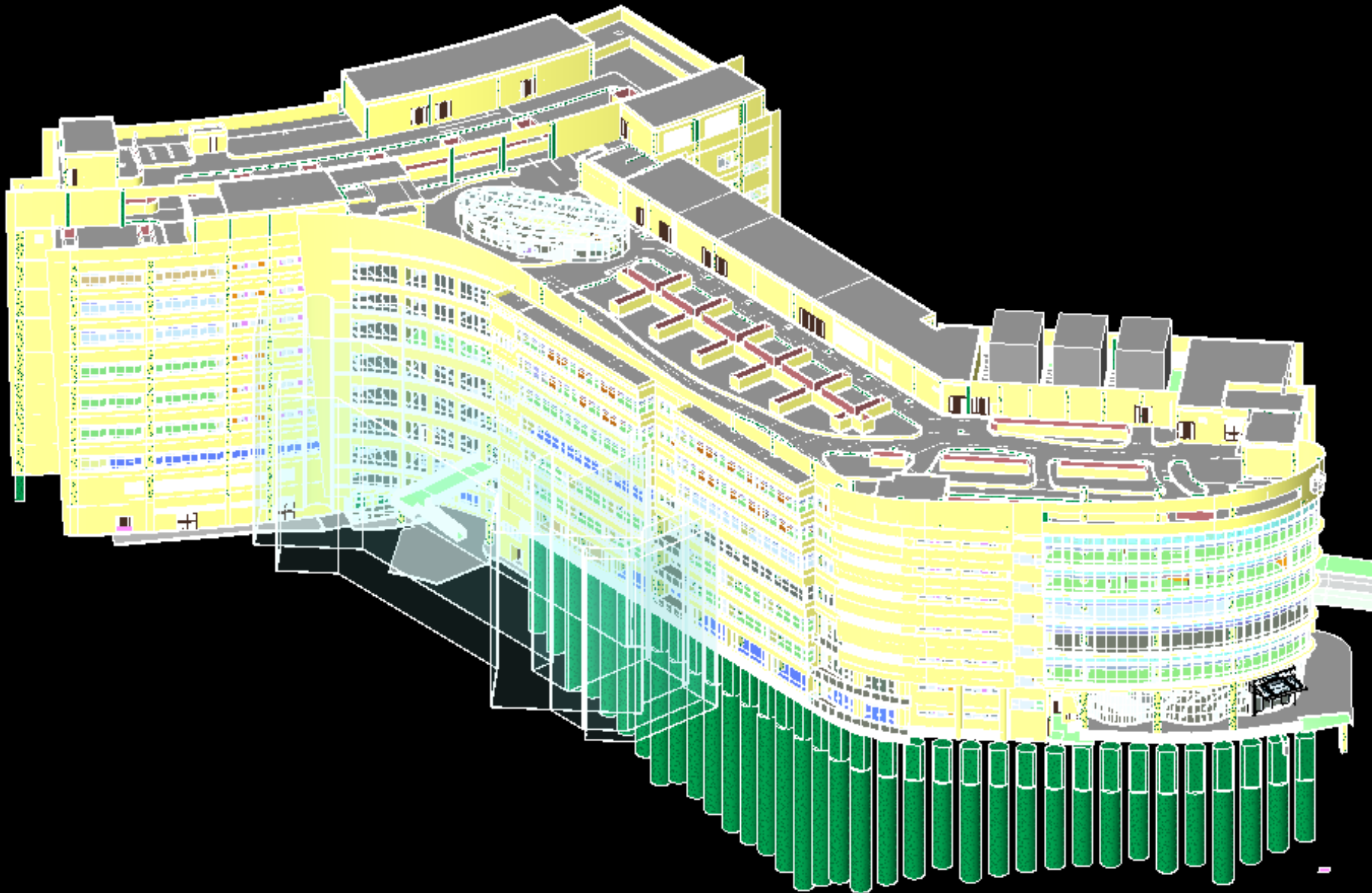


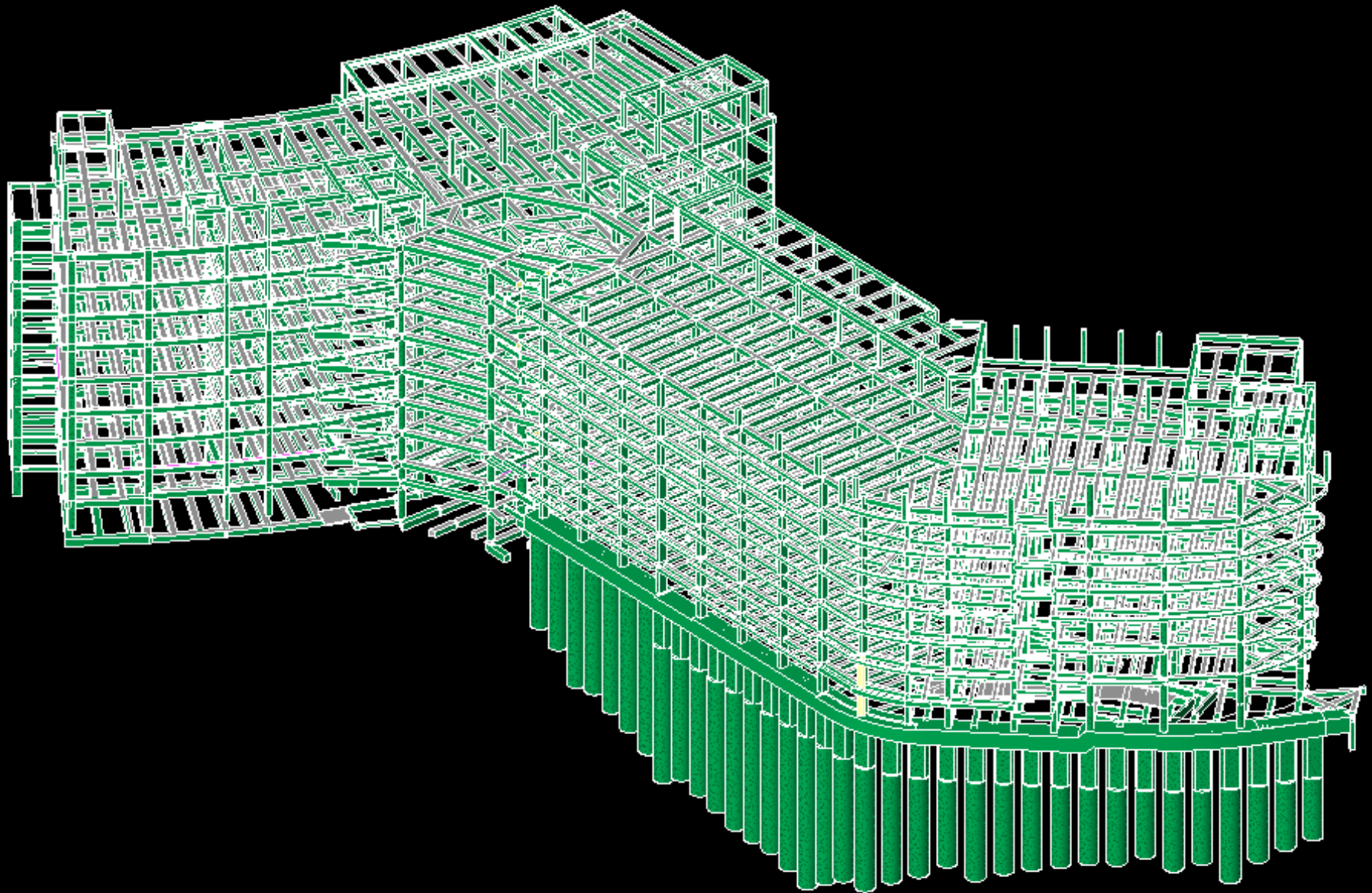
us- Revit2008 andy.rvt - Floor Plan: Construction Level 5 五层平面图

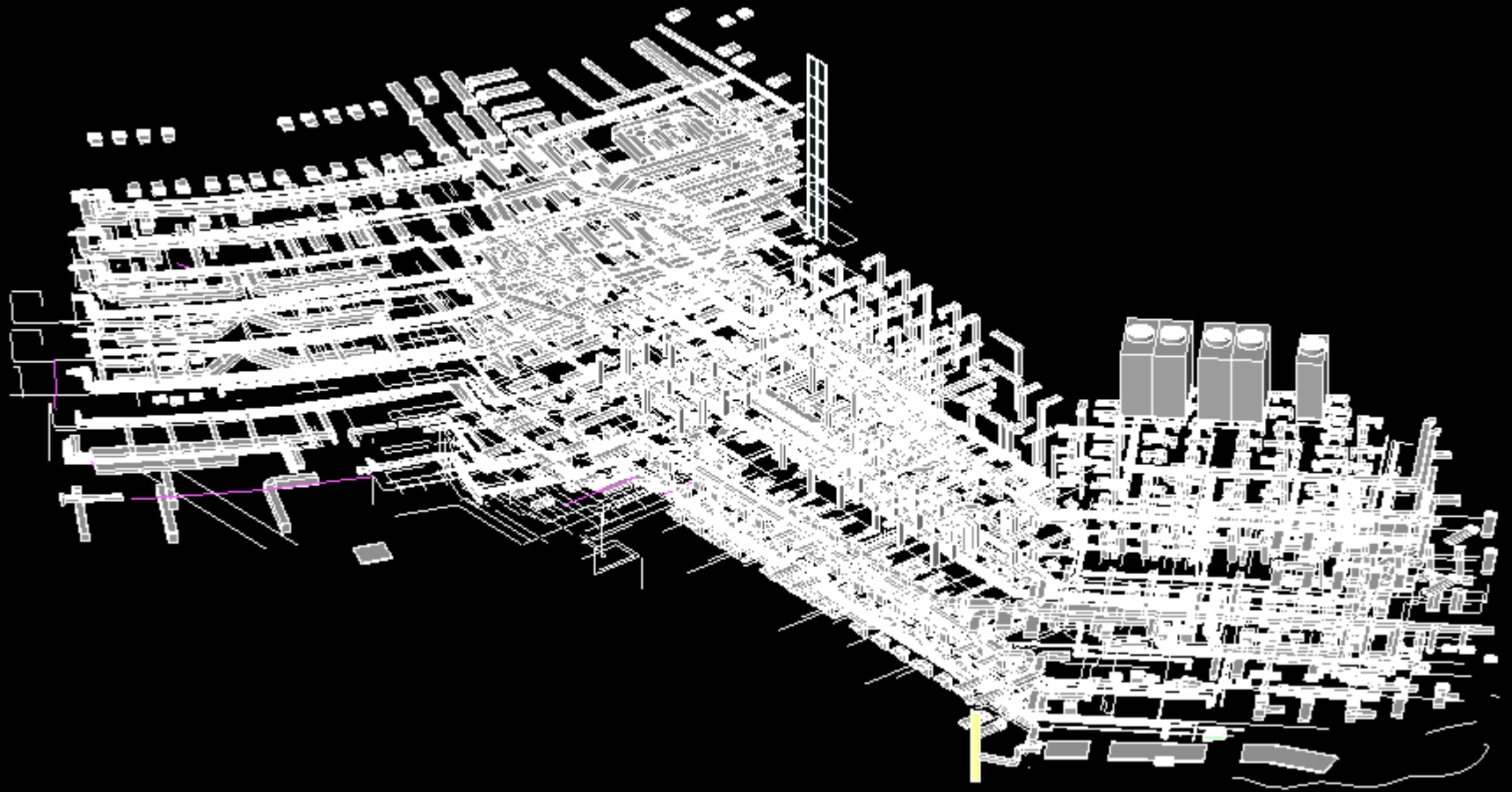


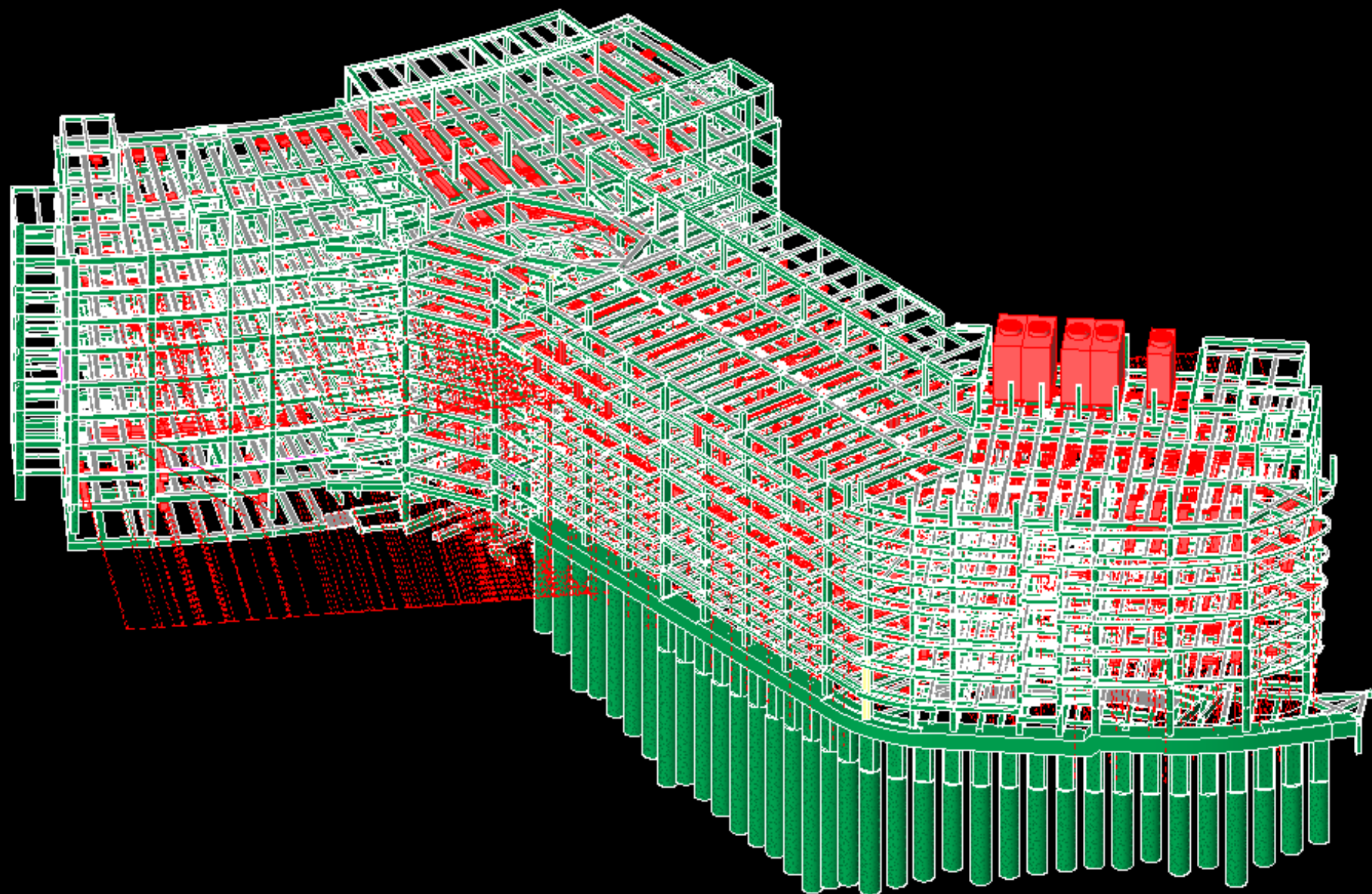


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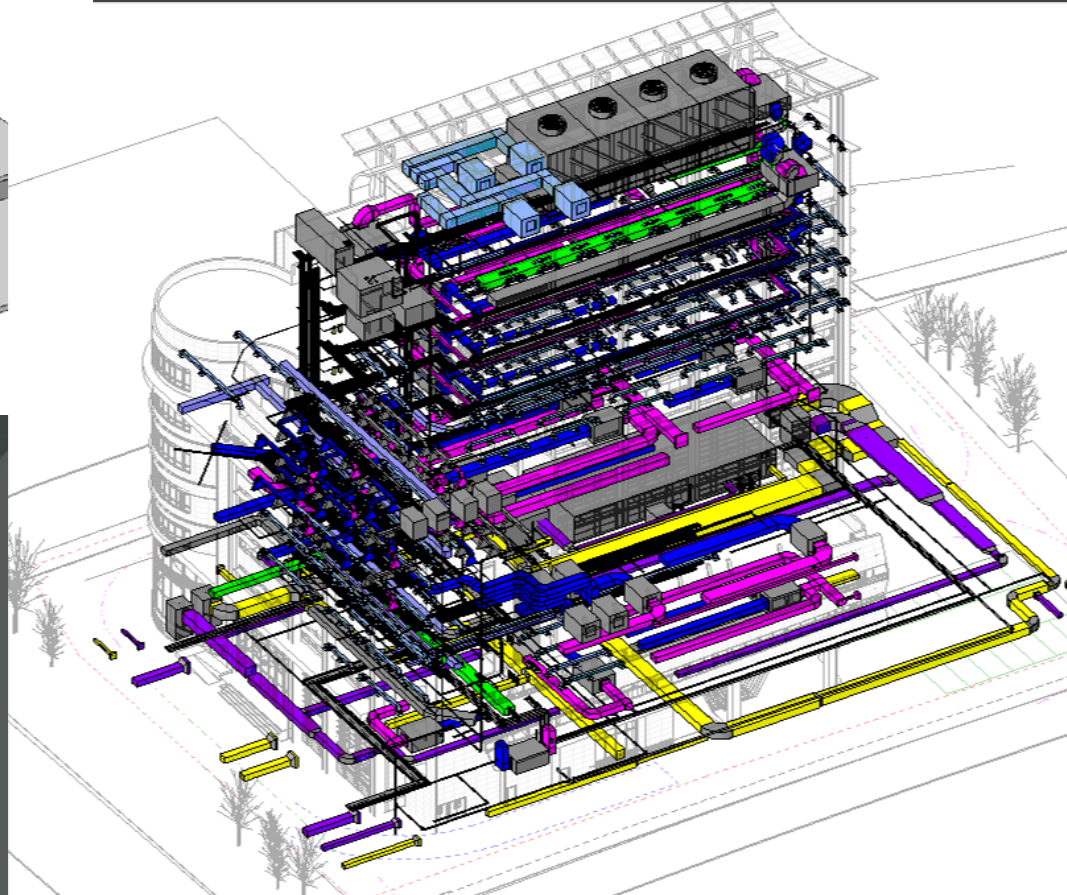
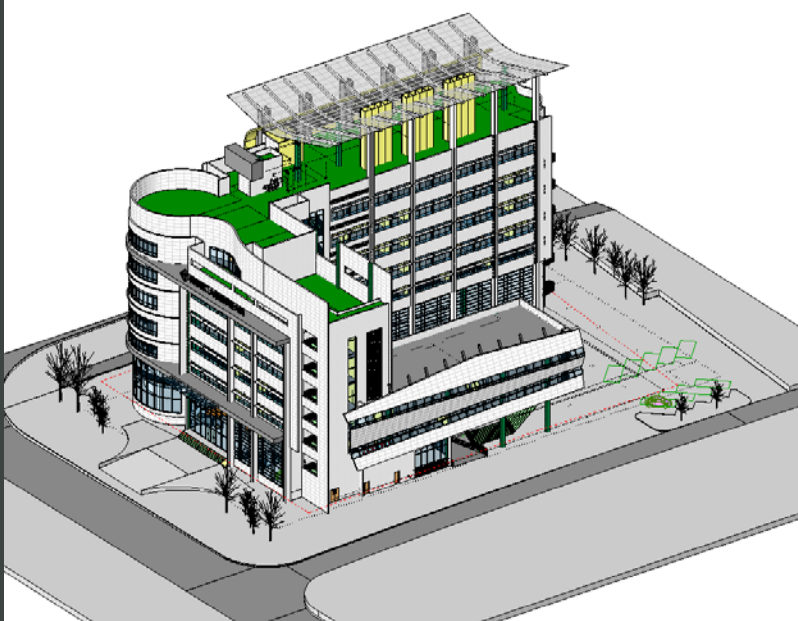




CO-ORDINATION / COLLABORATION

Work Flow – Establish BIM Models

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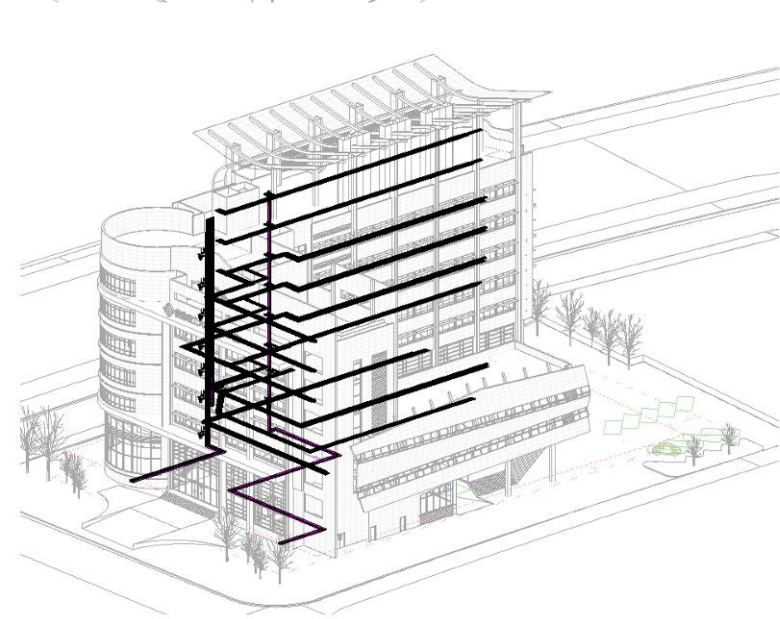
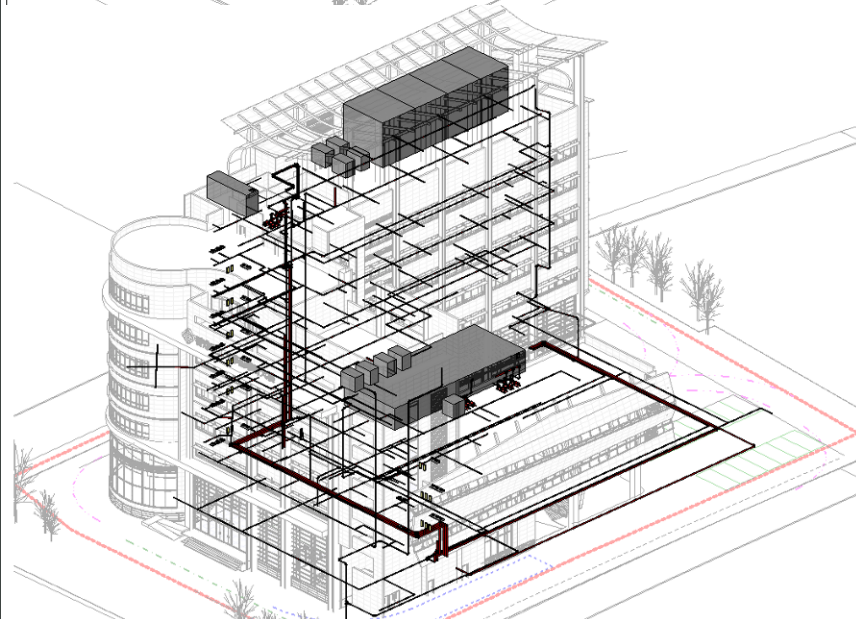
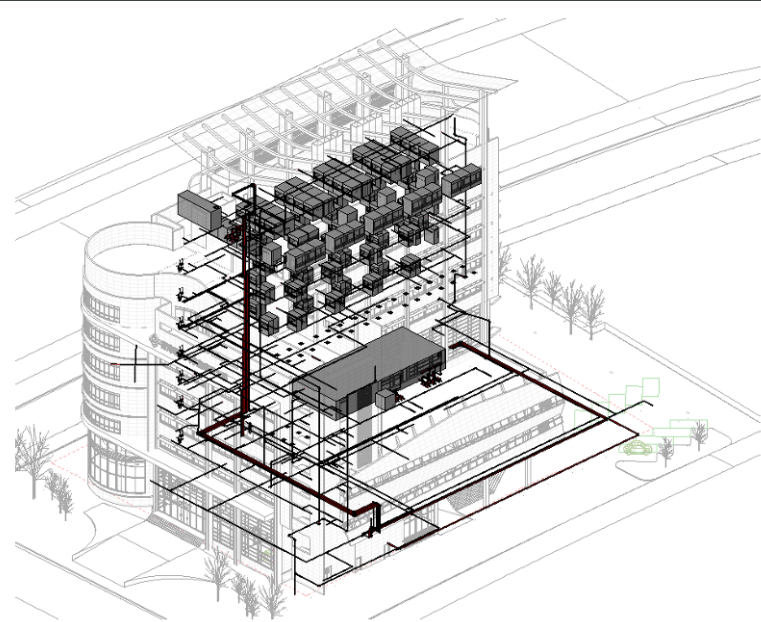
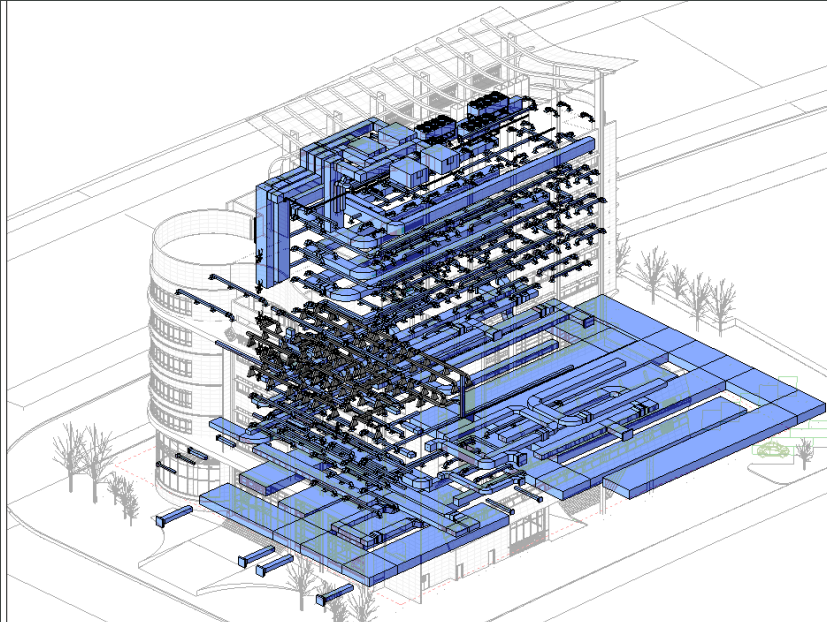




HVAC Installation

Fire Services Installation

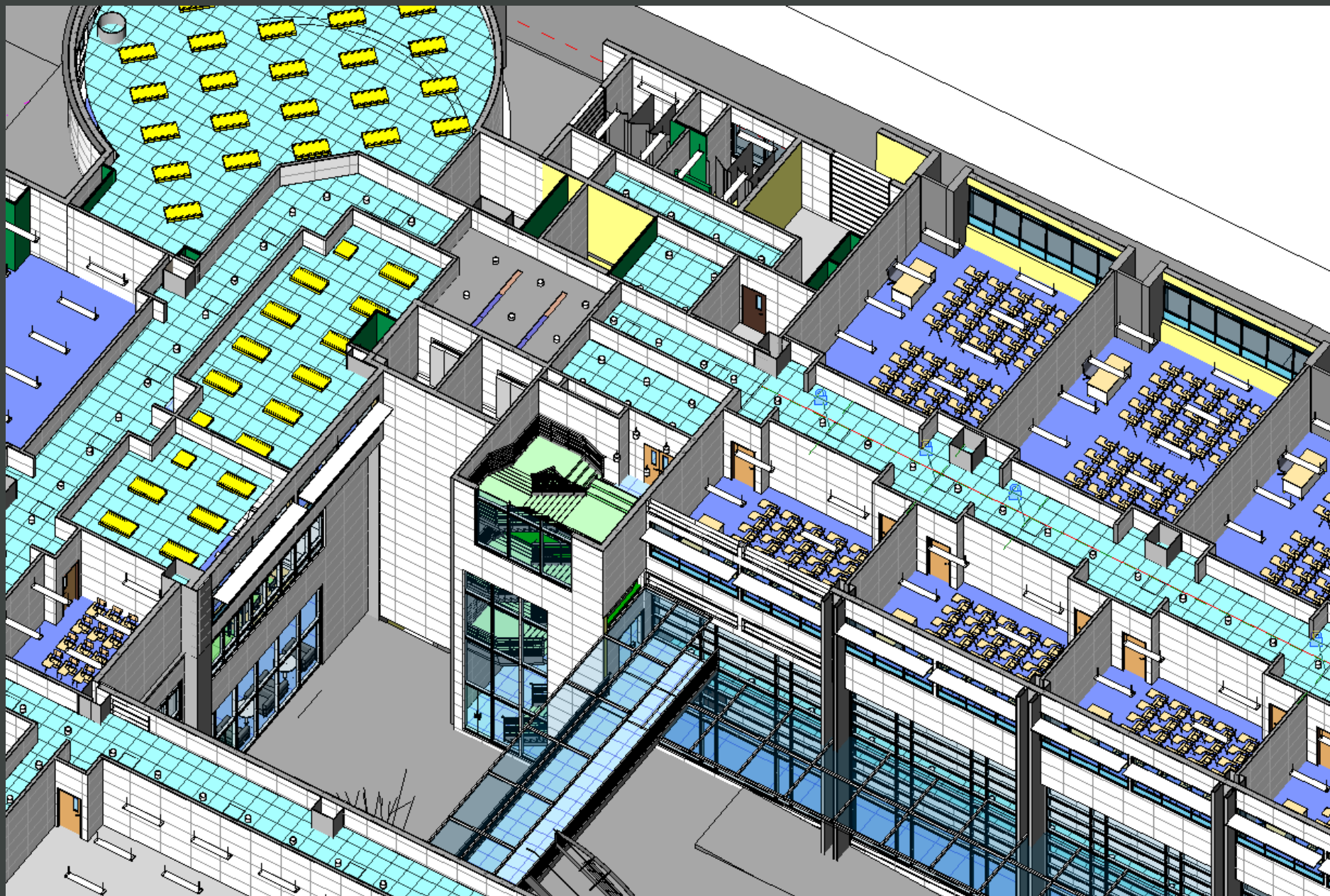
Aedas

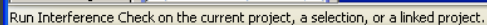


P/D Installation

Electricity Installation







Work Flow – Clashes Report

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The screenshot displays the Autodesk Revit Systems 2 software interface. The main window shows a 3D model of a building's mechanical system, specifically a fan coil unit (M_Fan Coil Unit) with a horizontal basic concealed plenum (M_02). The model is rendered in blue and white, showing various pipes, ducts, and structural elements. A red line highlights a specific pipe in the model.

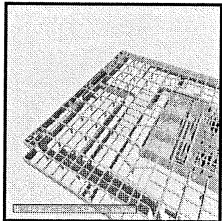
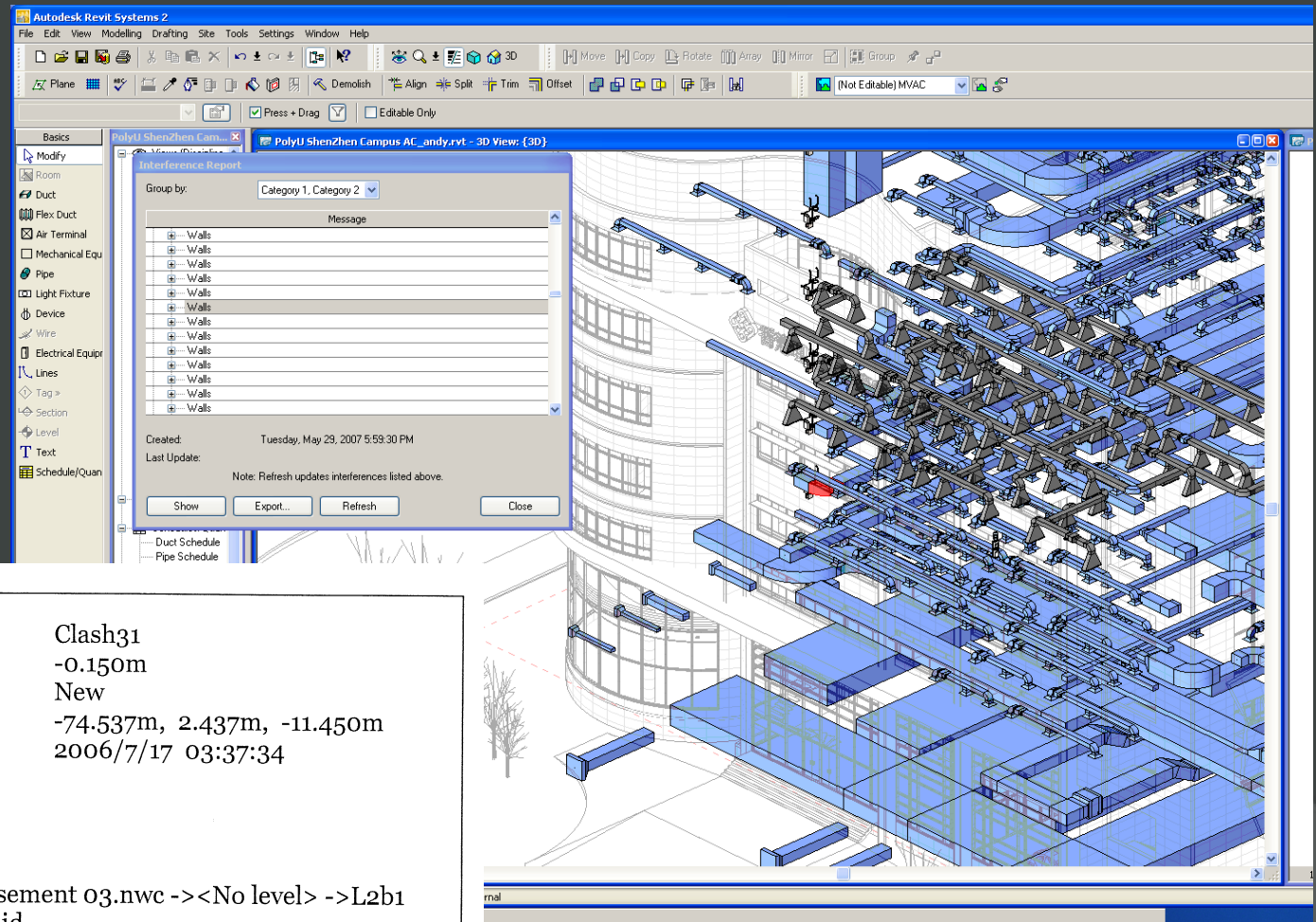
An "Interference Report" dialog box is open in the foreground. It has a "Group by:" dropdown set to "Category 1, Category 2". The "Message" list contains 12 entries, all labeled "Pipes". The "Created:" field shows "Tuesday, May 29, 2007 6:13:54 PM". The "Last Update:" field is empty. A note below the fields states: "Note: Refresh updates interferences listed above." The dialog box has four buttons: "Show", "Export...", "Refresh", and "Close".

The left sidebar shows the "Basics" tab selected, with a list of categories including Room, Duct, Flex Duct, Air Terminal, Mechanical Equ, Pipe, Light Fixture, Device, Wire, Electrical Equip, Lines, Tag, Section, Level, Text, and Schedule/Quan. The "View" tab is also visible, showing a list of views including Architectural, Drafting, Mechanical, Piping, and Plumbing.

The bottom status bar indicates the current view is "1:150" and the model is "M_Fan Coil Unit - Horizontal Basic Concealed with Plenum : M_02". The page number is "Page 4", and the section is "Sec 1". The scale is "4/4". The current location is "At 3.1cm Ln 2 Col 2". The status bar also shows "REC TRK EXT OVR" and "English (U.S)".

Work Flow – Clashes Report

Aedas



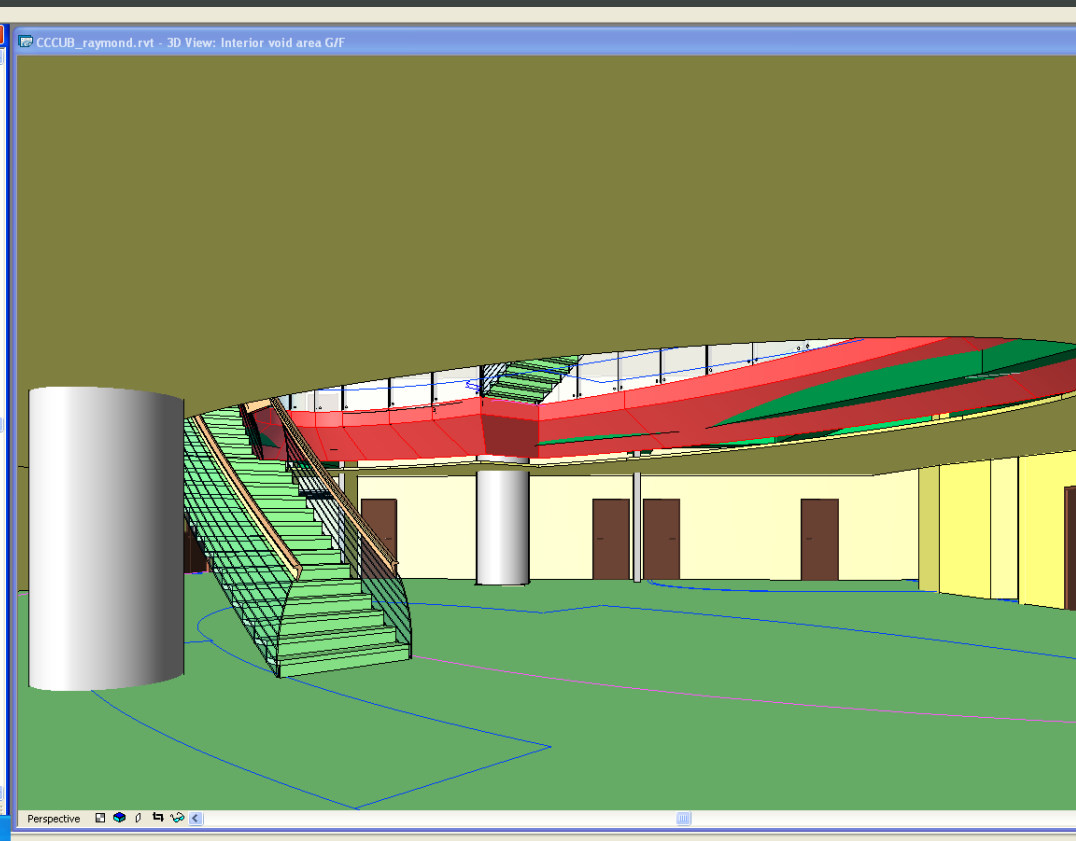
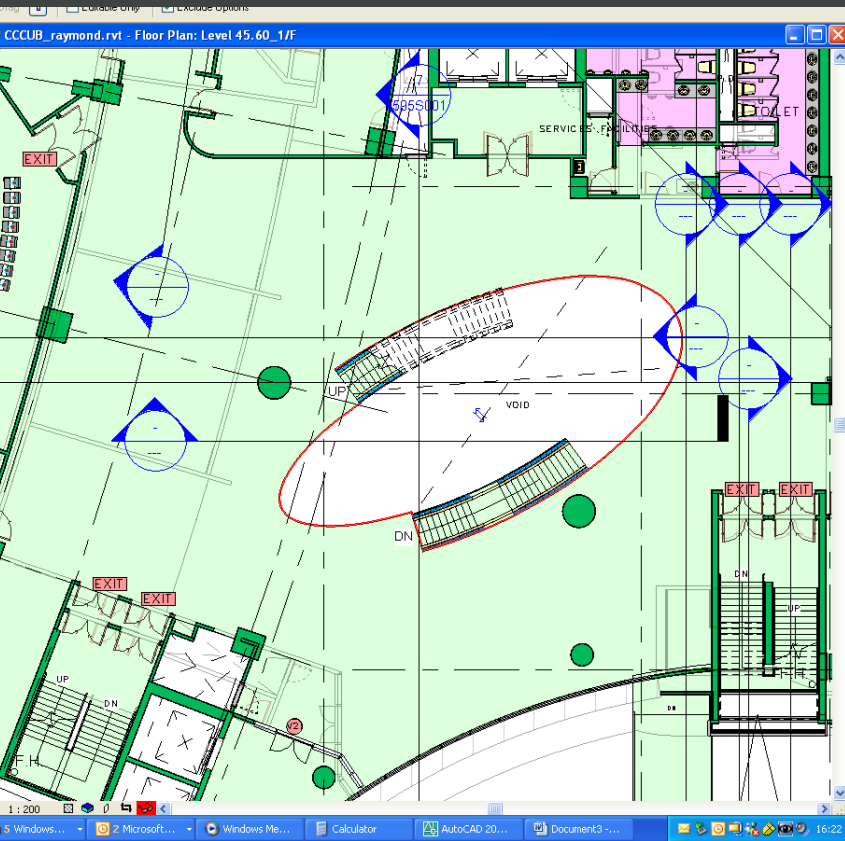
Name Clash31
Distance -0.150m
Status New
Clash Point -74.537m, 2.437m, -11.450m
Date Created 2006/7/17 03:37:34
Approved By

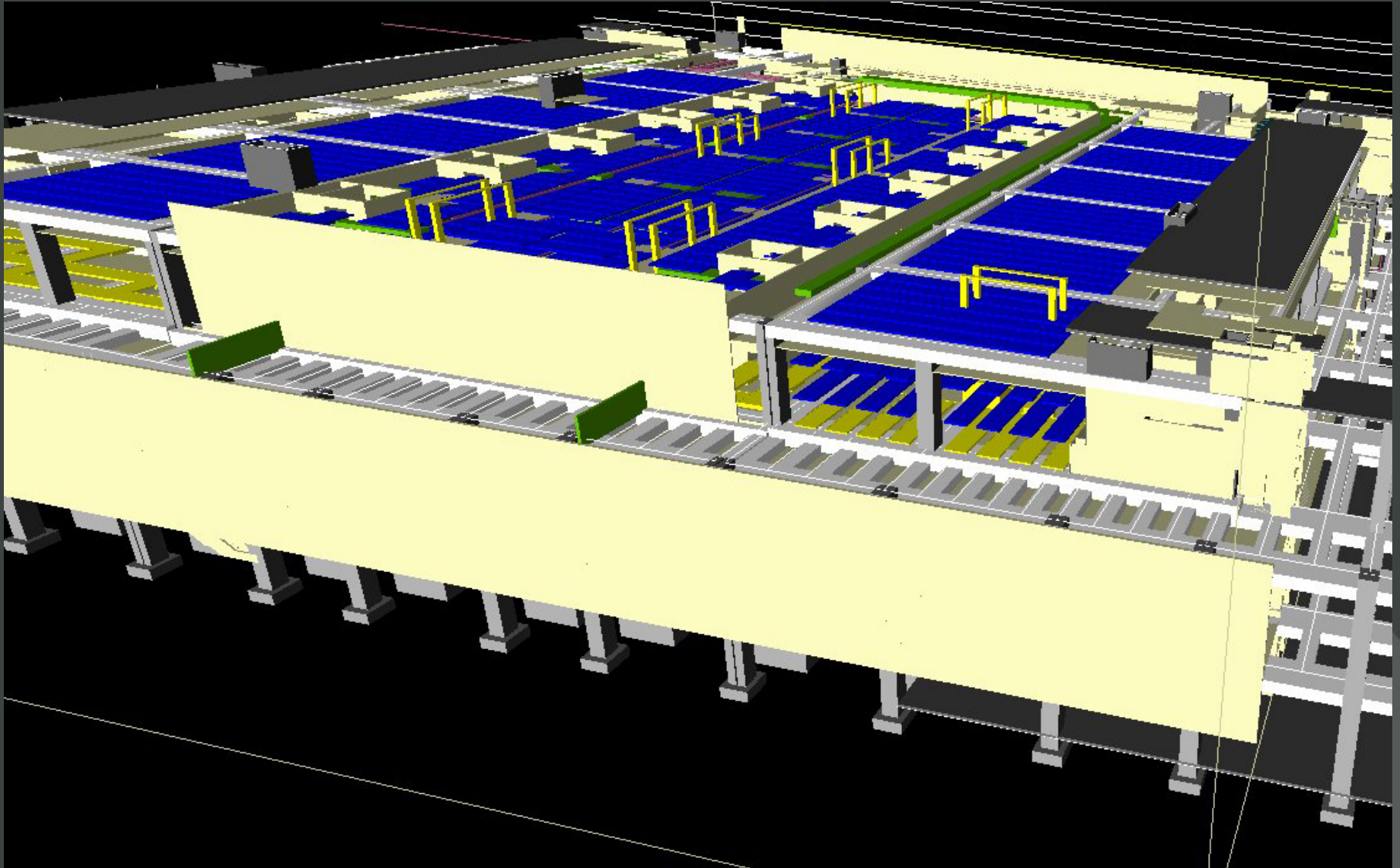
Item 1

Path File ->File ->Basement 03.nwc -><No level> ->L2b1
500 x 700 ->L2b1 500 x 700 ->Solid

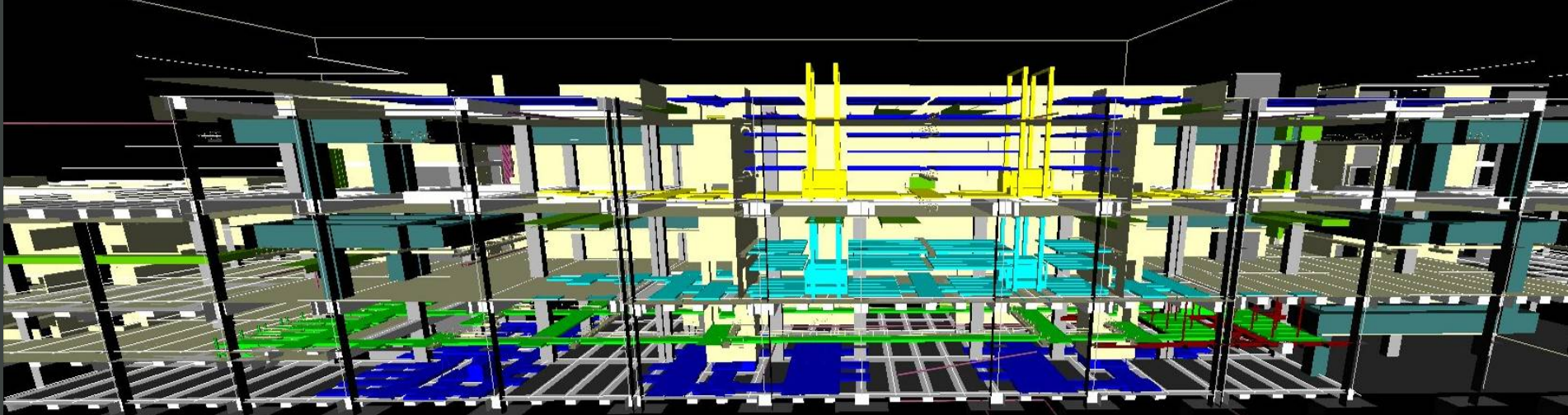
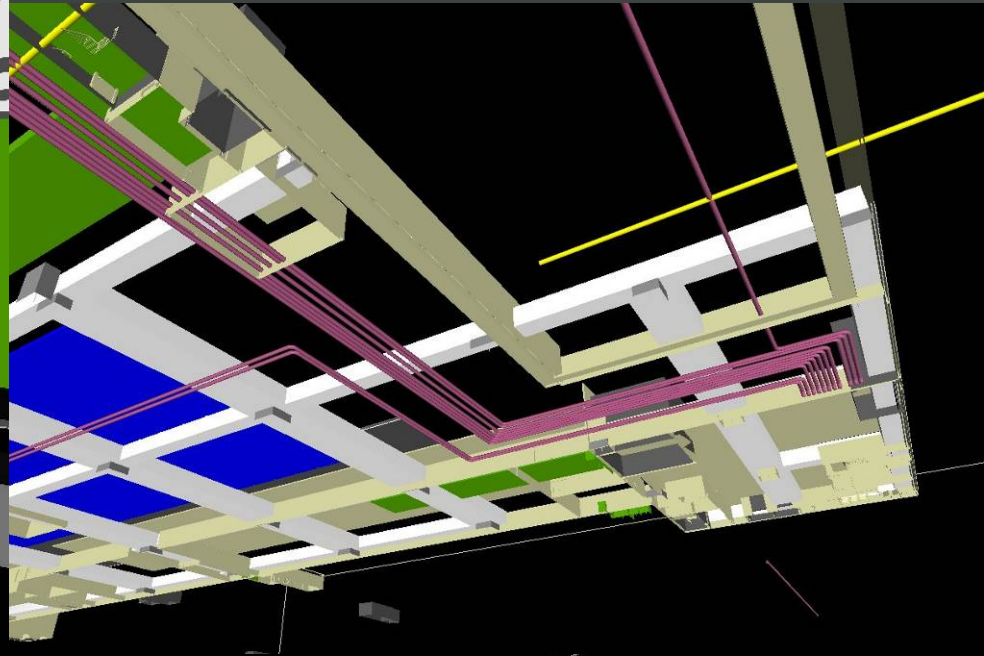
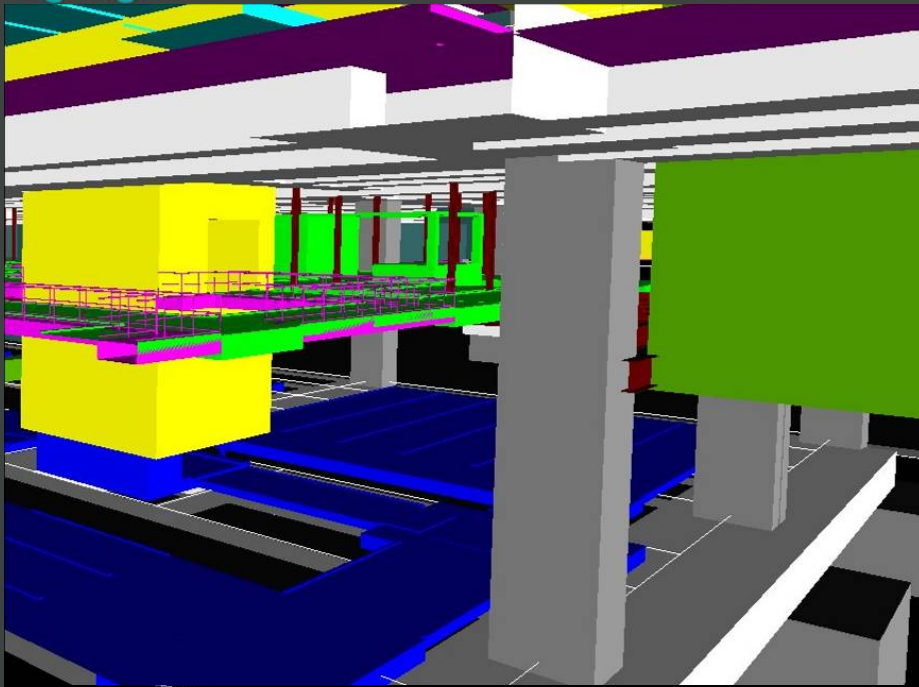
Item 2

Entity Handle 2AD6
Path File ->File ->B3HVAC_Duct.nwd ->H-Ductwork-G -
>Duct

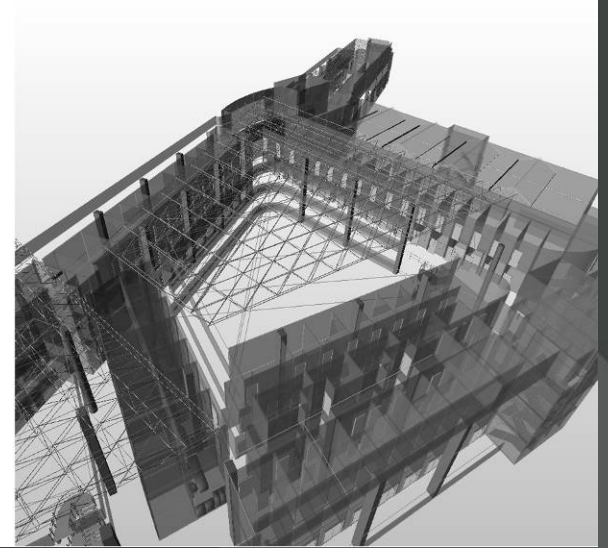
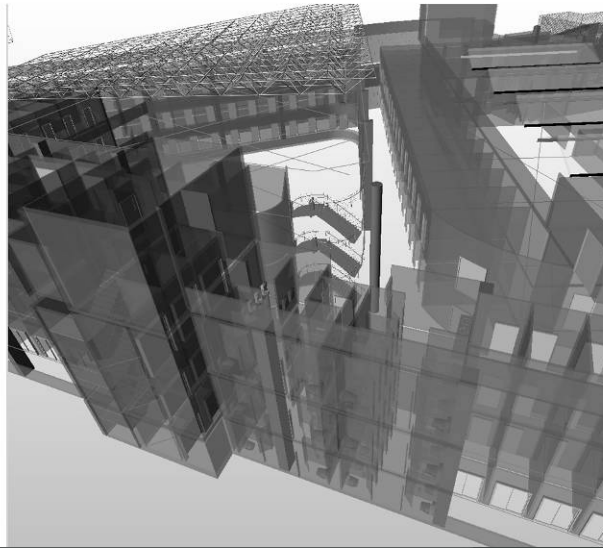
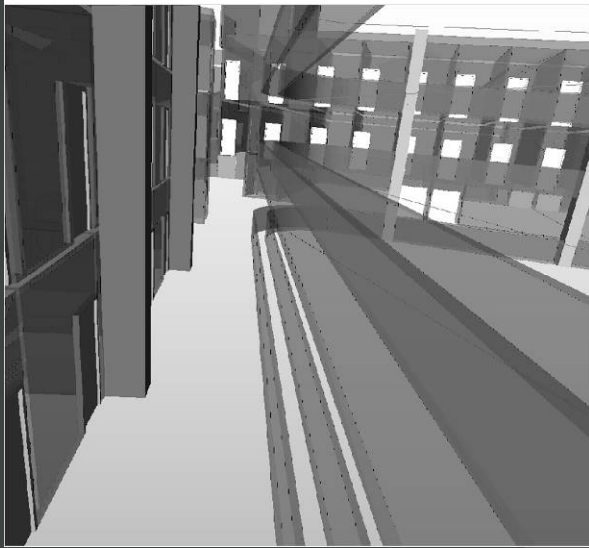
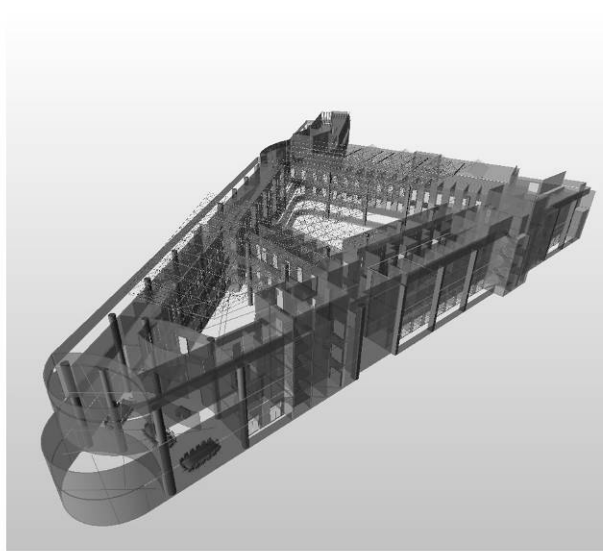
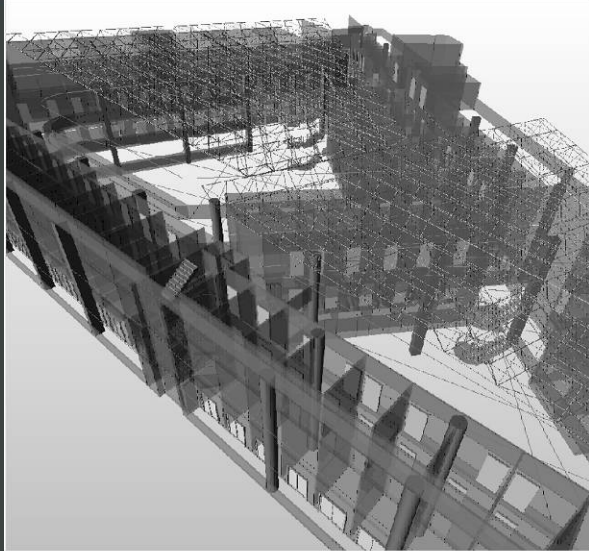




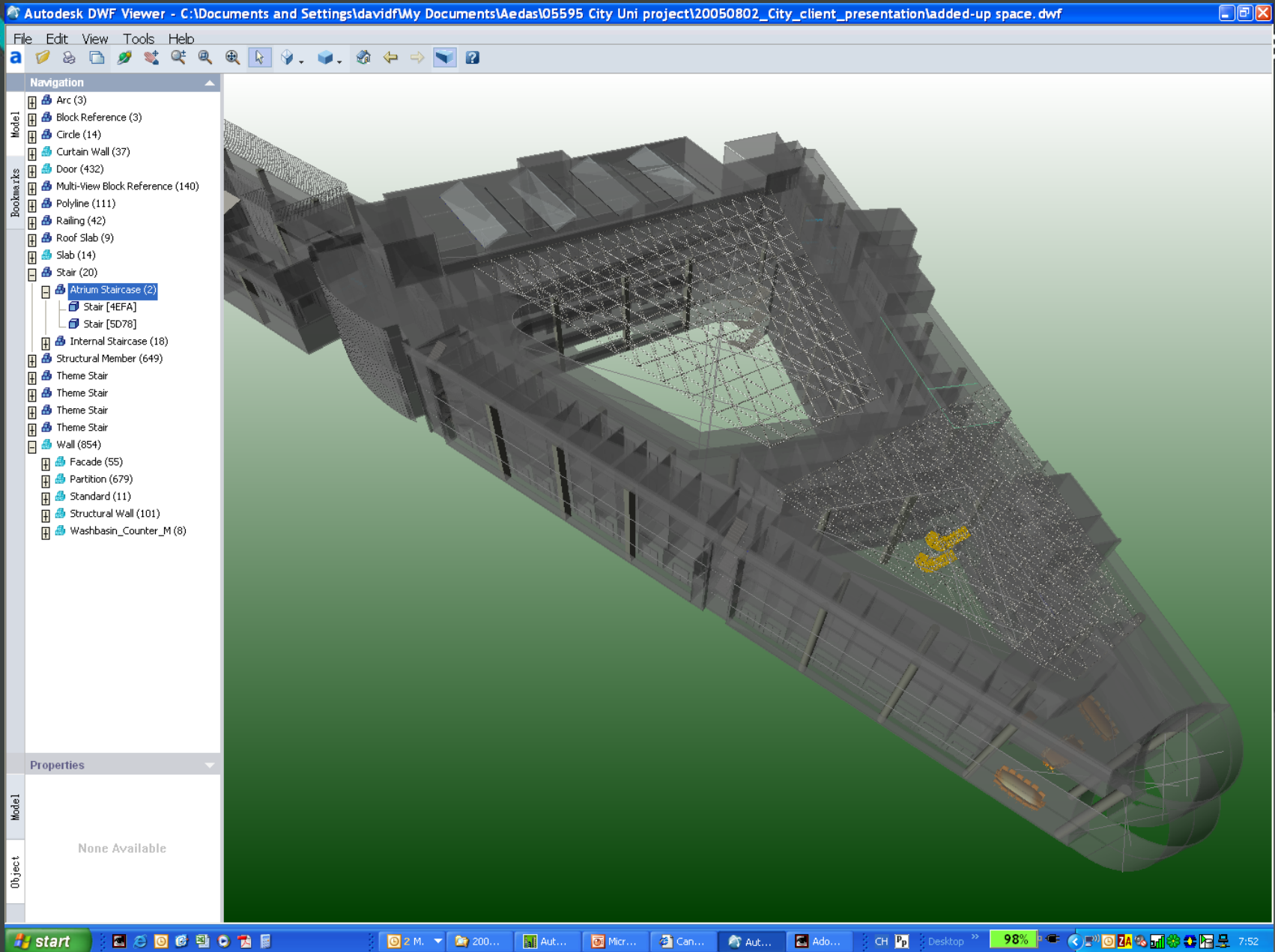
DISCIPLINES COLLABORATION



DISCIPLINES COLLABORATION



INTERACTIVE COMMUNICATION – DWF



INTERACTIVE COMMUNICATION – DWF



1. Design visualization 型像化設計
2. Drawing Productions 製作圖件
3. Services Co-ordination and Clash detection with other disciplines 各專業協調
- 4. Quantity taking and preparation of Tender Document 投標文件**
5. Automated Statutory Submission 自動化審批
6. Scientific analysis of different environmental aspects 科學性分析
7. Supply Chain Integration with the manufacturing and production 生產制造
8. Complex Geometry 複雜幾何形狀



Wall Schedule							Aedas
Family	Family and Type	Length	Width	Count	Area	Volume	
Basic Wall: AED-Concrete - 50mm + Render One sides							
Basic Wall	Basic Wall: AED-Concrete - 50mm + Render One sides	200	50	1	0.548 m2	0.027 m3	
Basic Wall	Basic Wall: AED-Concrete - 50mm + Render One sides	200	50	1	0.548 m2	0.027 m3	
Basic Wall	Basic Wall: AED-Concrete - 50mm + Render One sides	200	50	1	0.548 m2	0.027 m3	
Basic Wall	Basic Wall: AED-Concrete - 50mm + Render One sides	200	50	1	0.548 m2	0.027 m3	
Basic Wall	Basic Wall: AED-Concrete - 50mm + Render One sides	200	50	1	0.548 m2	0.027 m3	
0.548 m2: 5		1000		5	2.738 m2	0.137 m3	
Basic Wall	Basic Wall: AED-Concrete - 50mm + Render One sides	200	50	1	0.578 m2	0.029 m3	
Basic Wall	Basic Wall: AED-Concrete - 50mm + Render One sides	200	50	1	0.578 m2	0.029 m3	
Basic Wall	Basic Wall: AED-Concrete - 50mm + Render One sides	200	50	1	0.578 m2	0.029 m3	
Basic Wall	Basic Wall: AED-Concrete - 50mm + Render One sides	200	50	1	0.578 m2	0.029 m3	
Basic Wall	Basic Wall: AED-Concrete - 50mm + Render One sides	200	50	1	0.578 m2	0.029 m3	
Basic Wall	Basic Wall: AED-Concrete - 50mm + Render One sides	200	50	1	0.578 m2	0.029 m3	
0.578 m2: 6		1200		6	3.465 m2	0.173 m3	
Basic Wall	Basic Wall: AED-Concrete - 50mm + Render One sides	200	50	1	0.608 m2	0.030 m3	
Basic Wall	Basic Wall: AED-Concrete - 50mm + Render One sides	200	50	1	0.608 m2	0.030 m3	
Basic Wall	Basic Wall: AED-Concrete - 50mm + Render One sides	200	50	1	0.608 m2	0.030 m3	
Basic Wall	Basic Wall: AED-Concrete - 50mm + Render One sides	200	50	1	0.608 m2	0.030 m3	
0.608 m2: 4		800		4	2.430 m2	0.122 m3	
Basic Wall	Basic Wall: AED-Concrete - 50mm + Render One sides	200	50	1	0.638 m2	0.032 m3	
Basic Wall	Basic Wall: AED-Concrete - 50mm + Render One sides	200	50	1	0.638 m2	0.032 m3	
Basic Wall	Basic Wall: AED-Concrete - 50mm + Render One sides	200	50	1	0.638 m2	0.032 m3	
0.638 m2: 3		600		3	1.913 m2	0.096 m3	
Basic Wall	Basic Wall: AED-Concrete - 50mm + Render One sides	250	50	1	0.730 m2	0.037 m3	
Basic Wall	Basic Wall: AED-Concrete - 50mm + Render One sides	250	50	1	0.730 m2	0.037 m3	
0.730 m2: 2		500		2	1.460 m2	0.073 m3	

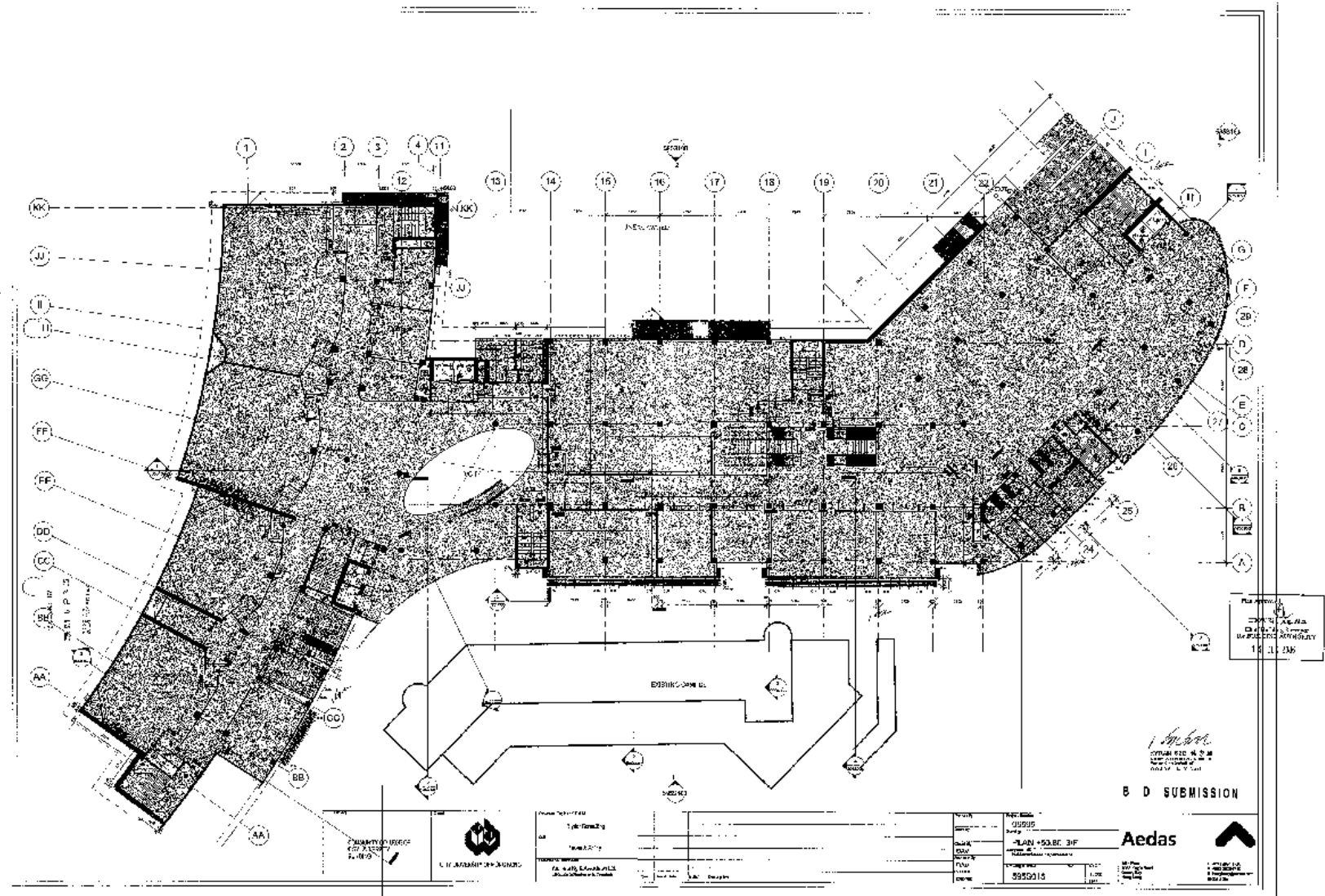
DISCIPLINES COLLABORATION



1. Design visualization 型像化設計
2. Drawing Productions 製作圖件
3. Services Co-ordination and Clash detection with other disciplines 各專業協調
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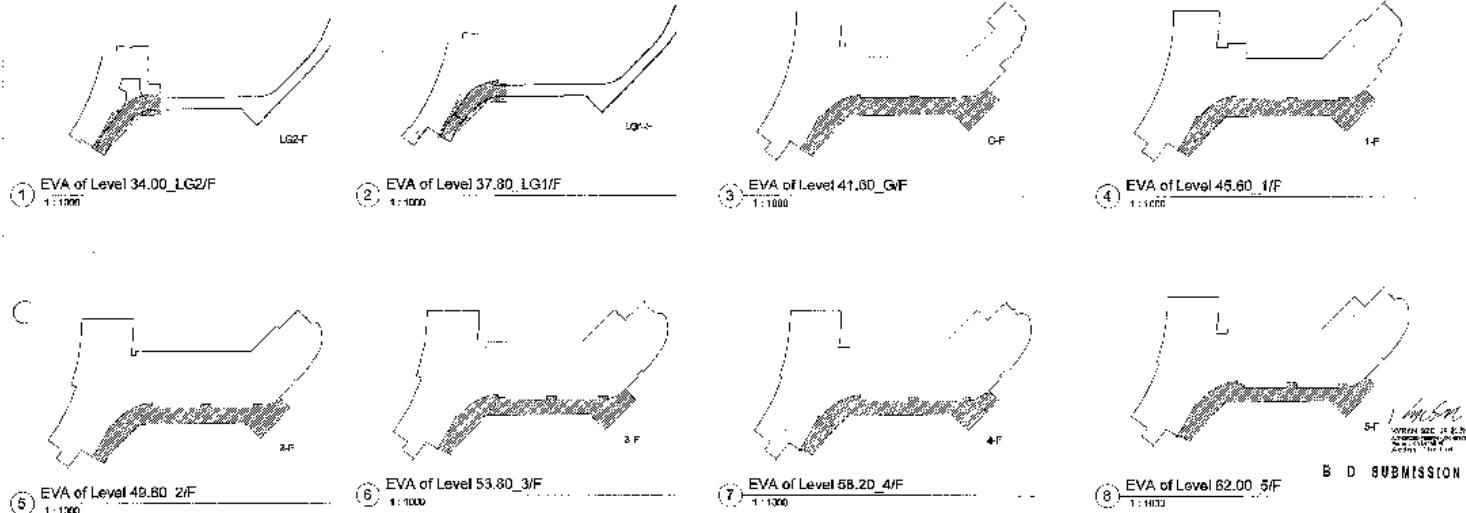
Aedas



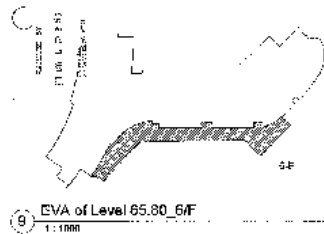


STATUTORY SUBMISSION

Aedas



B D SUBMISSION



*Hatch area represents the total length of the building facade served by the EVA

CALCULATION ON TOTAL LENGTH OF BUILDING FACADE TO BE SERVED BY EVA AND PERCENTAGE OF SUCH LENGTH OVER THE TOTAL LENGTH OF ALL THE PERIMETER WALLS OF THE BUILDING

CALCULATION ON TOTAL LENGTH OF BUILDING FACADE TO BE SERVED BY EVA AND PERCENTAGE OF SUCH LENGTH OVER THE TOTAL LENGTH OF ALL THE PERIMETER WALLS OF THE BUILDING									
FLOOR	LEVEL	AREA (sqm)	PERIMETER (m)	EVA (sqm)	PERCENTAGE (%)	FLOOR	LEVEL	AREA (sqm)	PERIMETER (m)
LG2/F	34.00	100.00	100.00	100.00	100.00	2/F	49.60	100.00	100.00
LG1/F	37.80	100.00	100.00	100.00	100.00	3/F	53.80	100.00	100.00
G/F	41.60	100.00	100.00	100.00	100.00	4/F	58.20	100.00	100.00
1/F	45.60	100.00	100.00	100.00	100.00	5/F	62.00	100.00	100.00
2/F	49.60	100.00	100.00	100.00	100.00	6/F	65.80	100.00	100.00
3/F	53.80	100.00	100.00	100.00	100.00				
4/F	58.20	100.00	100.00	100.00	100.00				
5/F	62.00	100.00	100.00	100.00	100.00				
6/F	65.80	100.00	100.00	100.00	100.00				

CALCULATION ON TOTAL LENGTH OF BUILDING FACADE TO BE SERVED BY EVA AND PERCENTAGE OF SUCH LENGTH OVER THE TOTAL LENGTH OF ALL THE PERIMETER WALLS OF THE BUILDING									
FLOOR	LEVEL	AREA (sqm)	PERIMETER (m)	EVA (sqm)	PERCENTAGE (%)	FLOOR	LEVEL	AREA (sqm)	PERIMETER (m)
LG2/F	34.00	100.00	100.00	100.00	100.00	2/F	49.60	100.00	100.00
LG1/F	37.80	100.00	100.00	100.00	100.00	3/F	53.80	100.00	100.00
G/F	41.60	100.00	100.00	100.00	100.00	4/F	58.20	100.00	100.00
1/F	45.60	100.00	100.00	100.00	100.00	5/F	62.00	100.00	100.00
2/F	49.60	100.00	100.00	100.00	100.00	6/F	65.80	100.00	100.00
3/F	53.80	100.00	100.00	100.00	100.00				
4/F	58.20	100.00	100.00	100.00	100.00				
5/F	62.00	100.00	100.00	100.00	100.00				
6/F	65.80	100.00	100.00	100.00	100.00				

The Applicant
CITYVIEW DEVELOPMENT
CHARTERED SURVEYOR
1/F, 10/F, 20/F

DESIGNED BY CITYVIEW DEVELOPMENT CHARTERED SURVEYOR	APPROVED BY CITYVIEW DEVELOPMENT CHARTERED SURVEYOR	DATE 10/10/2020	SCALE 1:1000	PROJECT CITYVIEW DEVELOPMENT CHARTERED SURVEYOR	DATE 10/10/2020	SCALE 1:1000	PROJECT CITYVIEW DEVELOPMENT CHARTERED SURVEYOR
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Aedas
1/F, 10/F, 20/F



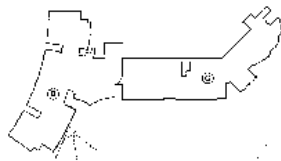
STATUTORY SUBMISSION

Aedas

LG/5/F (+37.82) COMPARTMENT CALCULATION



G/F (+41.80) COMPARTMENT CALCULATION



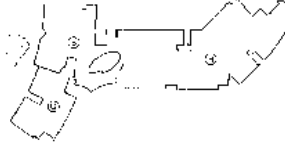
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2/F (+49.80) COMPARTMENT CALCULATION



3/F (+53.80) COMPARTMENT CALCULATION



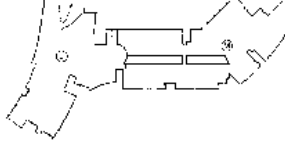
4/F (+58.20) COMPARTMENT CALCULATION



5/F (+62.00) COMPARTMENT CALCULATION



6/F (+65.80) COMPARTMENT CALCULATION



COMPARTMENT OF FLOOR				
LOC.	NO.	TYPE	AREA (sq.m.)	VOLUME (cu.m.)
LG/5/F	1	Office	275.442	9.31
G/F	1	Shop	54.208	3.19
G/F	2	Office	412.213	9.41
3/F	1	Restaurant	178.557	1.77
3/F	2	Kitchen	166.561	4.54
5/F	1	Office	2031.235	9.226
5/F	2	Restaurant	178.557	1.77
5/F	3	Kitchen	166.561	4.54
5/F	4	Exhibition hall	704.211	2.353
Total number of students				6000
Total				8.58

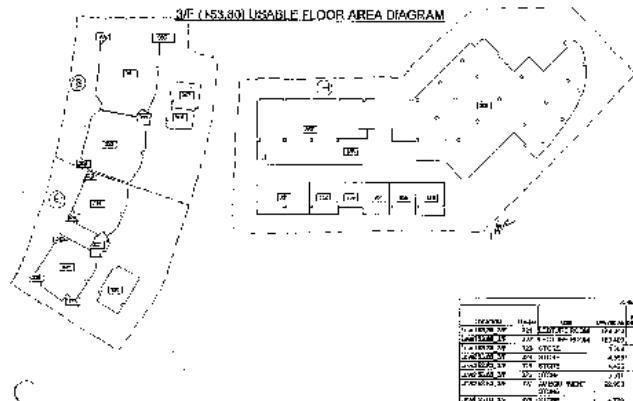
Total Capacity of COCUB				
Location	Use	Area	Factor	Total Capacity
LG/5/F	Office	275.442	9	31
G/F	Shop	54.208	3	19
G/F	Office	412.213	9	41
3/F	Restaurant	178.557	1	177
3/F	Kitchen	166.561	4.5	107
5/F	Office	2031.235	9	294
5/F	Restaurant	178.557	1	177
5/F	Kitchen	166.561	4.5	42
5/F	Exhibition hall	704.211	2	353
Total number of students				6000
Total				8.58

SCHEDULE 1: MINIMUM NUMBER & WIDTH OF EXIT ROUTES FROM EACH FLOOR

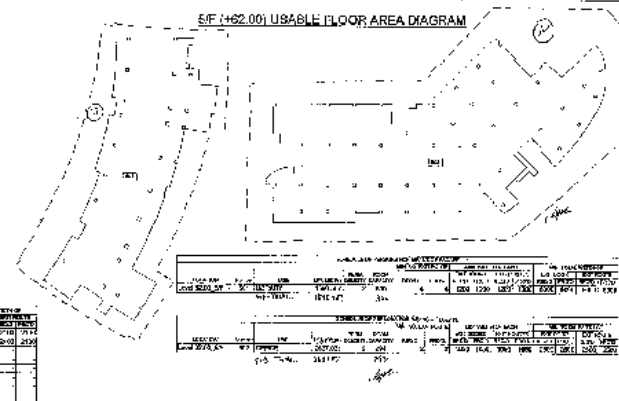
LOCATION	FLOOR	SUBJECT	MIN. NO. OF EXIT ROUTES		MIN. WIDTH OF EACH EXIT ROUTE		MIN. TOTAL WIDTH OF EXIT ROUTES	
			REQD.	PROV.	REQD.	PROV.	REQD.	PROV.
LG/5/F	1	Office	1	1	1.0m	1.0m	1.0m	1.0m
G/F	1	Shop	1	1	1.0m	1.0m	1.0m	1.0m
G/F	2	Office	1	1	1.0m	1.0m	1.0m	1.0m
3/F	1	Restaurant	1	1	1.0m	1.0m	1.0m	1.0m
3/F	2	Kitchen	1	1	1.0m	1.0m	1.0m	1.0m
5/F	1	Office	1	1	1.0m	1.0m	1.0m	1.0m
5/F	2	Restaurant	1	1	1.0m	1.0m	1.0m	1.0m
5/F	3	Kitchen	1	1	1.0m	1.0m	1.0m	1.0m
5/F	4	Exhibition hall	1	1	1.0m	1.0m	1.0m	1.0m

THE RESISTANCE REQUIREMENTS FOR SUB-ELEMENTS OF CONSTRUCTION											
COMPONENT	CLASS	TOTAL VOLUME (REQD.)	THK.	R.C. WALLS (REQD.)	THK.	R.C. BEAMS (REQD.)	THK.	R.C. SLABS (REQD.)	THK.	R.C. STAIRS (REQD.)	THK.
1. CONCRETE	1	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
2. FLOOR OF ASSEMBLY	2	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
3. WALL OF ASSEMBLY	3	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
4. FLOOR OF ASSEMBLY	4	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
5. WALL OF ASSEMBLY	5	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
6. FLOOR OF ASSEMBLY	6	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
7. WALL OF ASSEMBLY	7	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
8. FLOOR OF ASSEMBLY	8	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
9. WALL OF ASSEMBLY	9	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
10. FLOOR OF ASSEMBLY	10	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
11. WALL OF ASSEMBLY	11	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
12. FLOOR OF ASSEMBLY	12	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
13. WALL OF ASSEMBLY	13	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
14. FLOOR OF ASSEMBLY	14	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
15. WALL OF ASSEMBLY	15	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
16. FLOOR OF ASSEMBLY	16	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
17. WALL OF ASSEMBLY	17	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
18. FLOOR OF ASSEMBLY	18	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
19. WALL OF ASSEMBLY	19	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
20. FLOOR OF ASSEMBLY	20	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
21. WALL OF ASSEMBLY	21	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
22. FLOOR OF ASSEMBLY	22	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
23. WALL OF ASSEMBLY	23	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
24. FLOOR OF ASSEMBLY	24	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
25. WALL OF ASSEMBLY	25	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
26. FLOOR OF ASSEMBLY	26	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
27. WALL OF ASSEMBLY	27	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
28. FLOOR OF ASSEMBLY	28	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
29. WALL OF ASSEMBLY	29	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
30. FLOOR OF ASSEMBLY	30	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
31. WALL OF ASSEMBLY	31	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
32. FLOOR OF ASSEMBLY	32	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
33. WALL OF ASSEMBLY	33	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
34. FLOOR OF ASSEMBLY	34	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
35. WALL OF ASSEMBLY	35	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
36. FLOOR OF ASSEMBLY	36	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
37. WALL OF ASSEMBLY	37	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
38. FLOOR OF ASSEMBLY	38	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
39. WALL OF ASSEMBLY	39	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
40. FLOOR OF ASSEMBLY	40	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
41. WALL OF ASSEMBLY	41	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
42. FLOOR OF ASSEMBLY	42	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
43. WALL OF ASSEMBLY	43	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
44. FLOOR OF ASSEMBLY	44	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
45. WALL OF ASSEMBLY	45	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
46. FLOOR OF ASSEMBLY	46	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
47. WALL OF ASSEMBLY	47	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
48. FLOOR OF ASSEMBLY	48	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
49. WALL OF ASSEMBLY	49	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
50. FLOOR OF ASSEMBLY	50	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
51. WALL OF ASSEMBLY	51	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
52. FLOOR OF ASSEMBLY	52	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
53. WALL OF ASSEMBLY	53	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
54. FLOOR OF ASSEMBLY	54	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
55. WALL OF ASSEMBLY	55	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
56. FLOOR OF ASSEMBLY	56	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
57. WALL OF ASSEMBLY	57	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
58. FLOOR OF ASSEMBLY	58	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
59. WALL OF ASSEMBLY	59	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
60. FLOOR OF ASSEMBLY	60	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
61. WALL OF ASSEMBLY	61	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
62. FLOOR OF ASSEMBLY	62	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
63. WALL OF ASSEMBLY	63	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
64. FLOOR OF ASSEMBLY	64	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
65. WALL OF ASSEMBLY	65	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
66. FLOOR OF ASSEMBLY	66	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
67. WALL OF ASSEMBLY	67	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	150
68. FLOOR OF ASSEMBLY	68	1000.000	150	1000.000	150	1000.000	150	1000.000	150	1000.000	1

.. 3/F (153.80) USABLE FLOOR AREA DIAGRAM

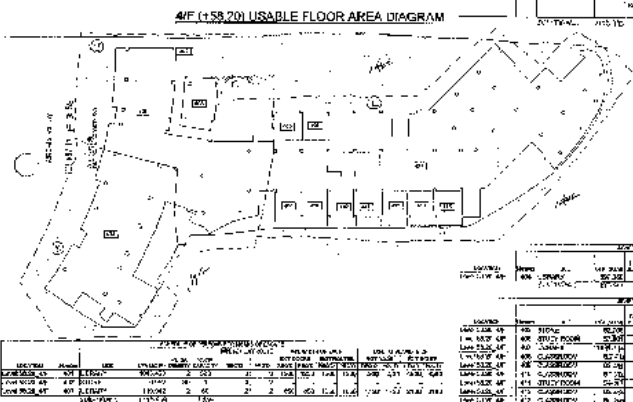
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5/F (+62.00) USABLE FLOOR AREA DIAGRAM

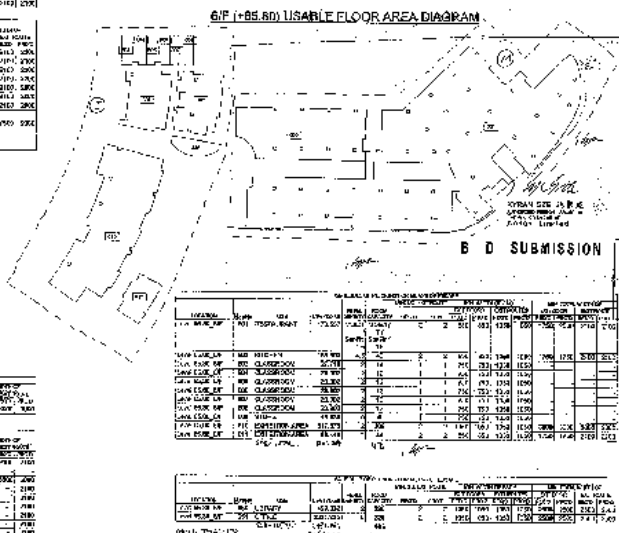


NAME		DATE	TIME	LOCATION	STATUS	REMARKS
JOHN DOE	10/10/1980	10:00	10:00	10:00	10:00	10:00
JANE SMITH	10/10/1980	10:00	10:00	10:00	10:00	10:00
JOHN DOE	10/10/1980	10:00	10:00	10:00	10:00	10:00
JANE SMITH	10/10/1980	10:00	10:00	10:00	10:00	10:00

4/F (+58.20) USABLE FLOOR AREA DIAGRAM

[illegible]

6/F (+85.80) USABLE FLOOR AREA DIAGRAM

[illegible]

B D SUBMISSION

J. M. Applegate
 CHIEF OF ALB.
 Lake & King Survey
 See BULLETIN 20, 1902

DOI: 10.1002/for



SEMPER PARATUS EST

[illegible]

NAME	DECKS
ADDRESS	CAL L
CITY	NEW YORK
STATE	NEW YORK
ZIP	10008

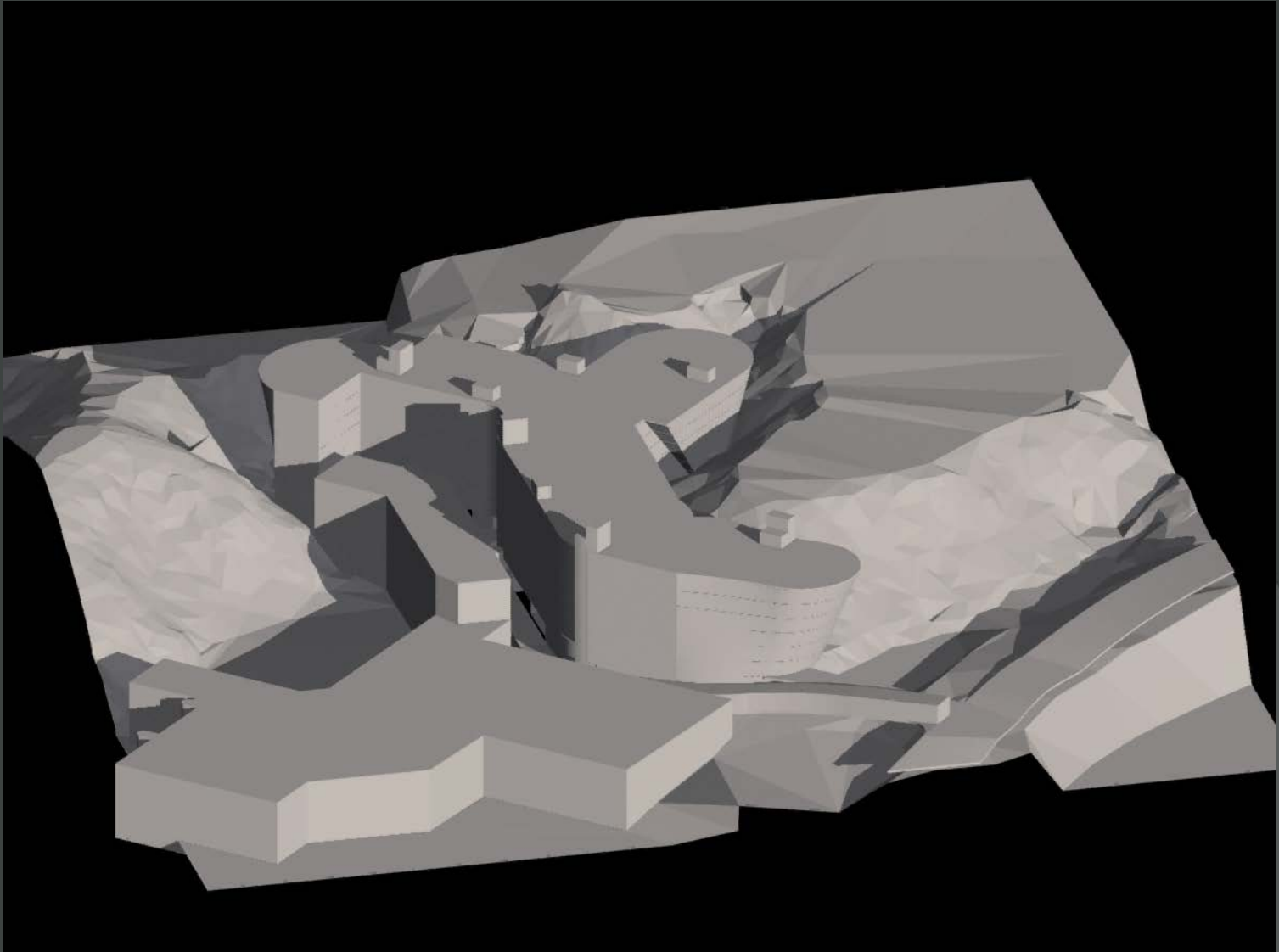
Aedas



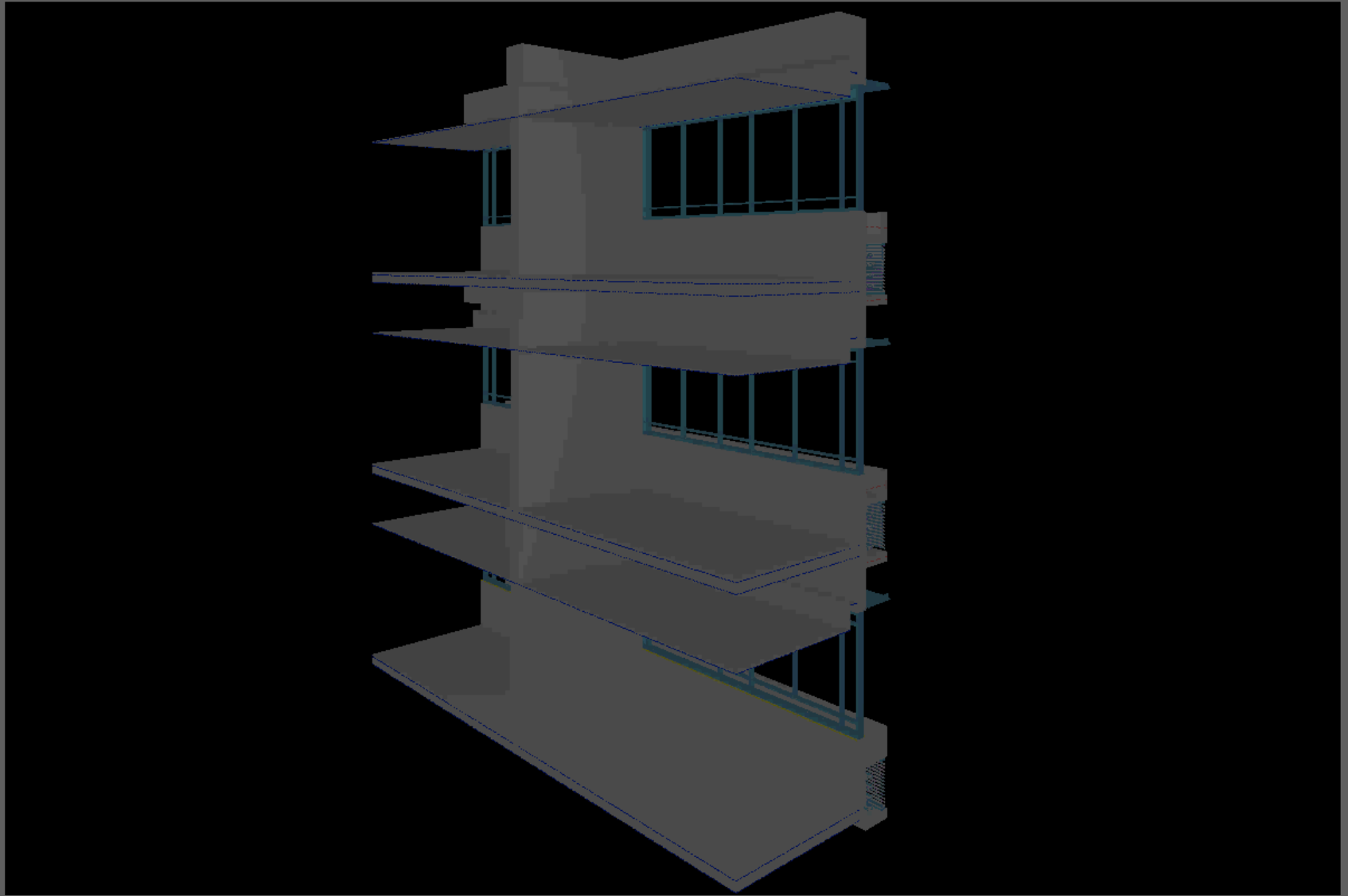
1 4006 1.08 1783
P 441 1.50 1442
C 1405 1.20 1442



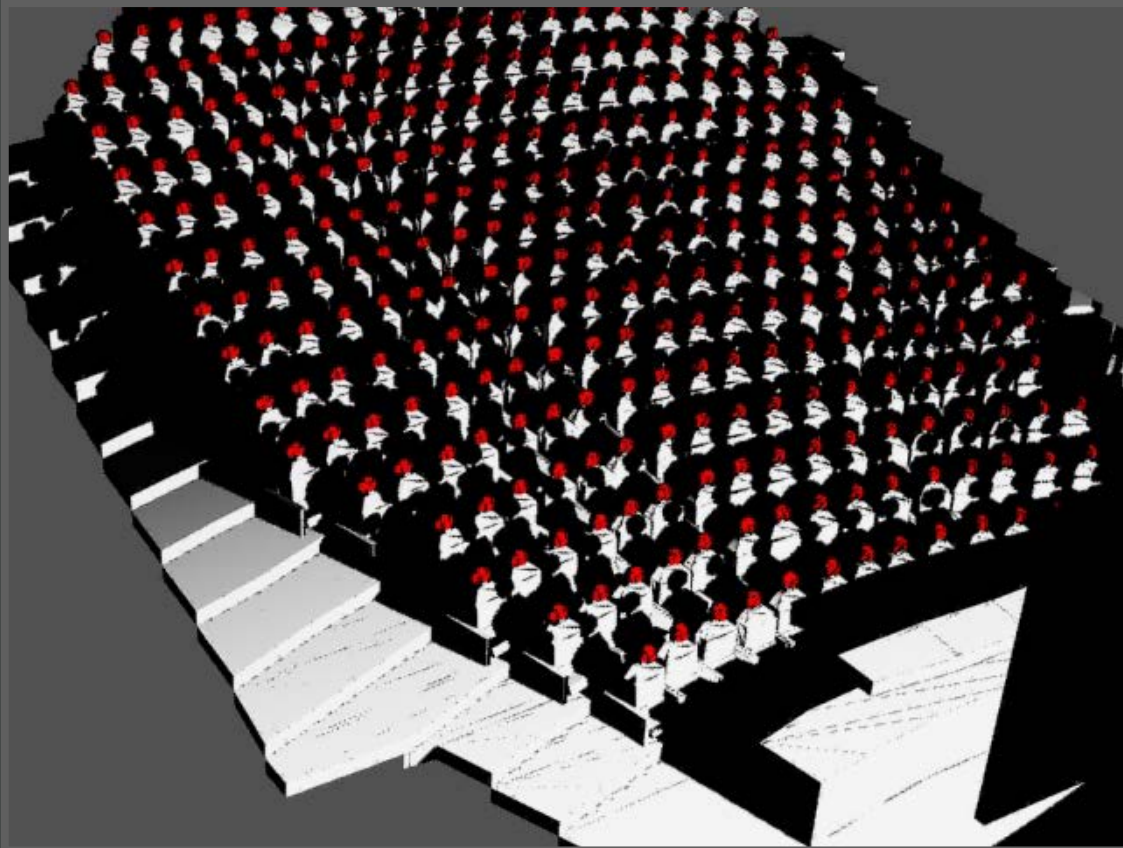
1. Design visualization 型像化設計
2. Drawing Productions 製作圖件
3. Services Co-ordination and Clash detection with other disciplines 各專業協調
4. Quantity taking and preparation of Tender Document 投標文件
5. Automated Statutory Submission 自動化審批
- 6. Scientific analysis of different environmental aspects 科學性分析**
7. Supply Chain Integration with the manufacturing and production 生產制造
8. Complex Geometry 複雜幾何形狀



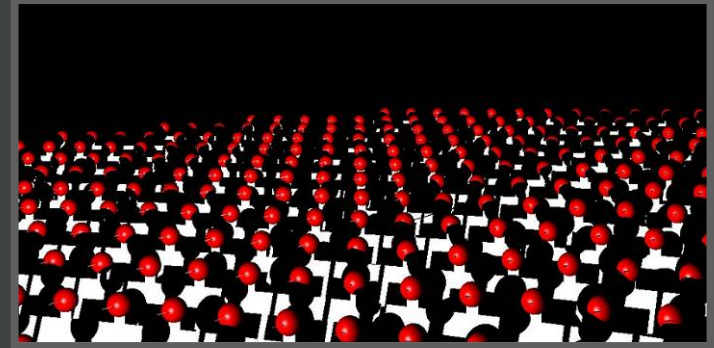
SUN STUDY



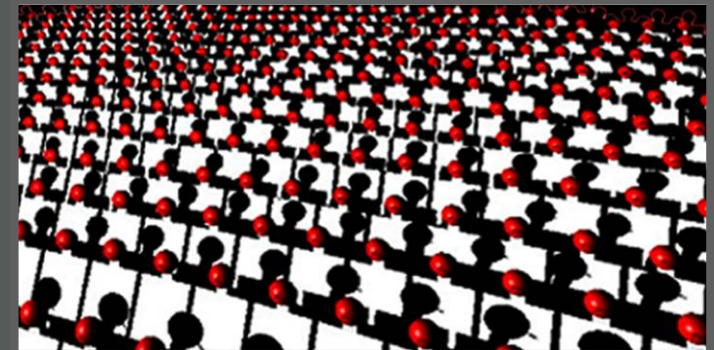
FAÇADE SOLAR STUDY
21/12/2007 7:00am – 6:00pm



Radiating Light Method

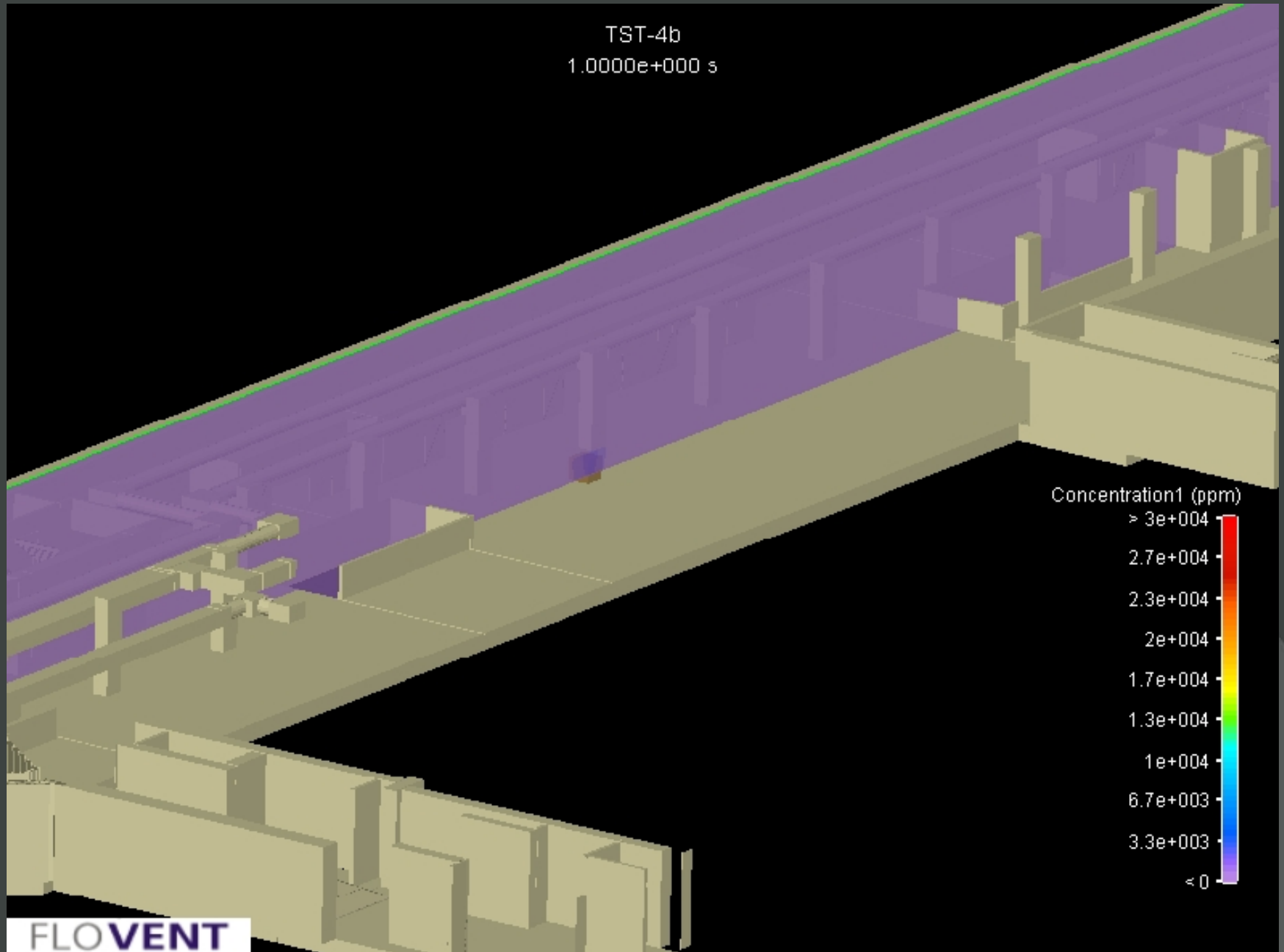


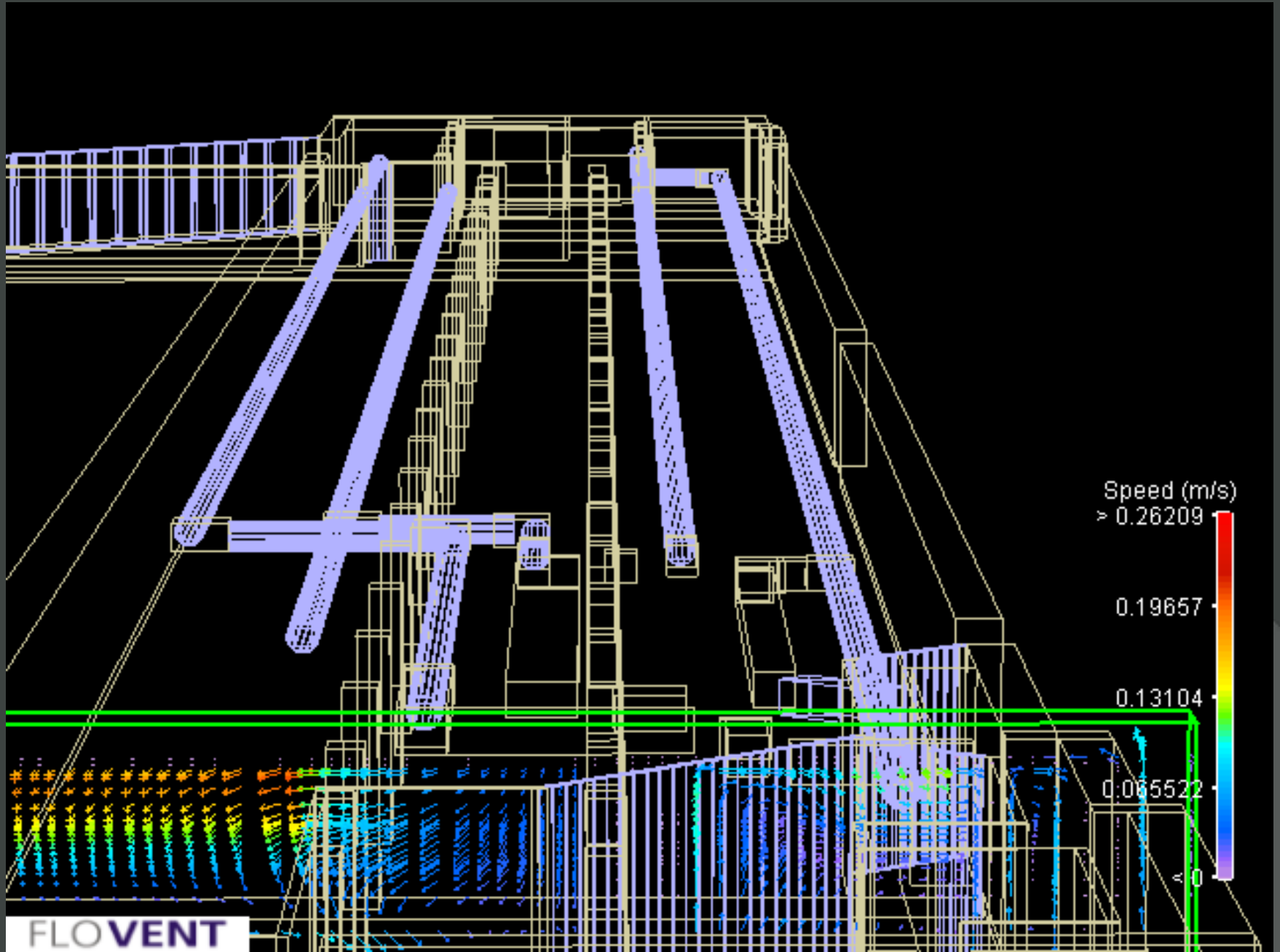
Unsatisfactory sightlines



Satisfactory sightlines

TST-4b
1.0000e+000 s



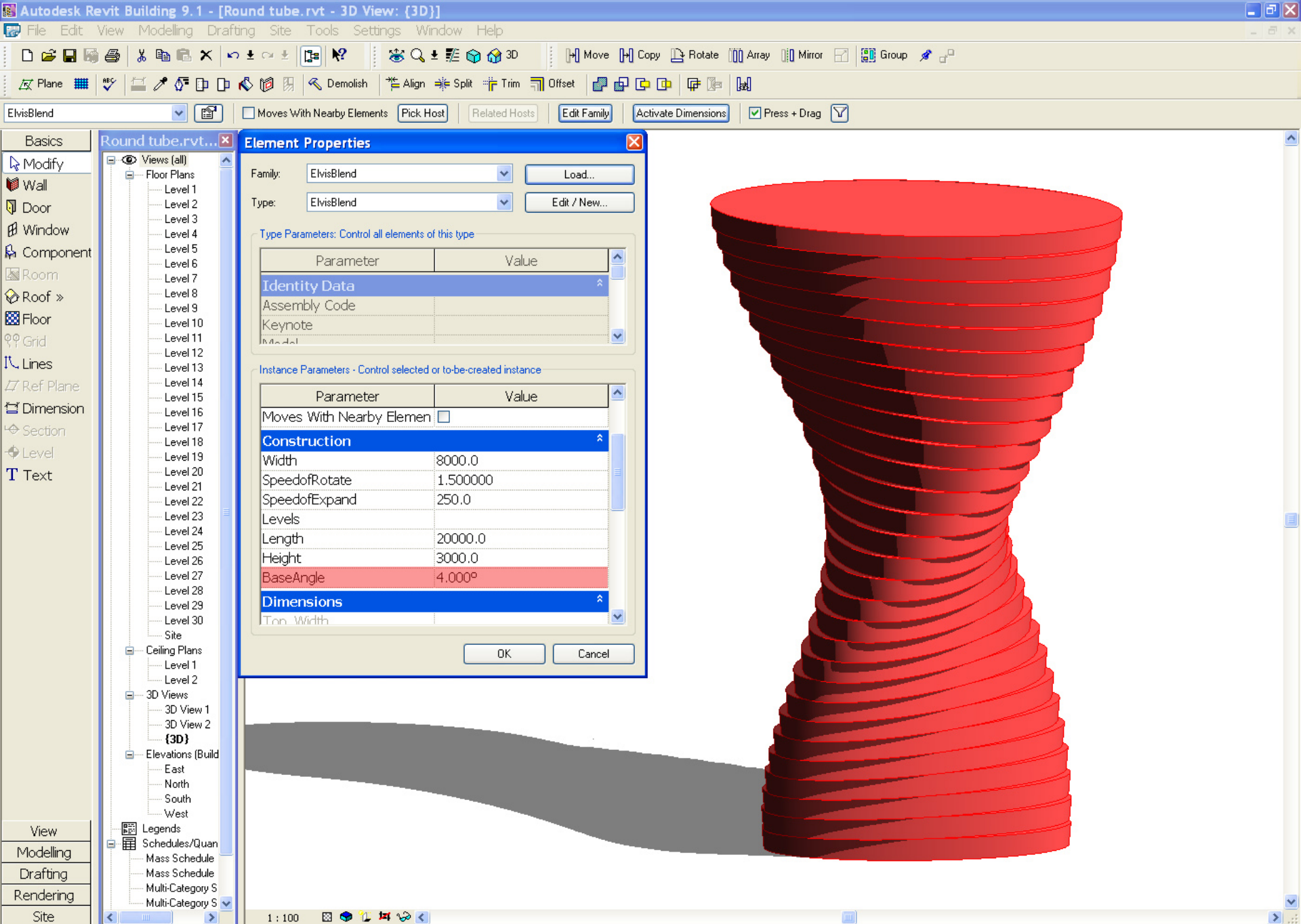




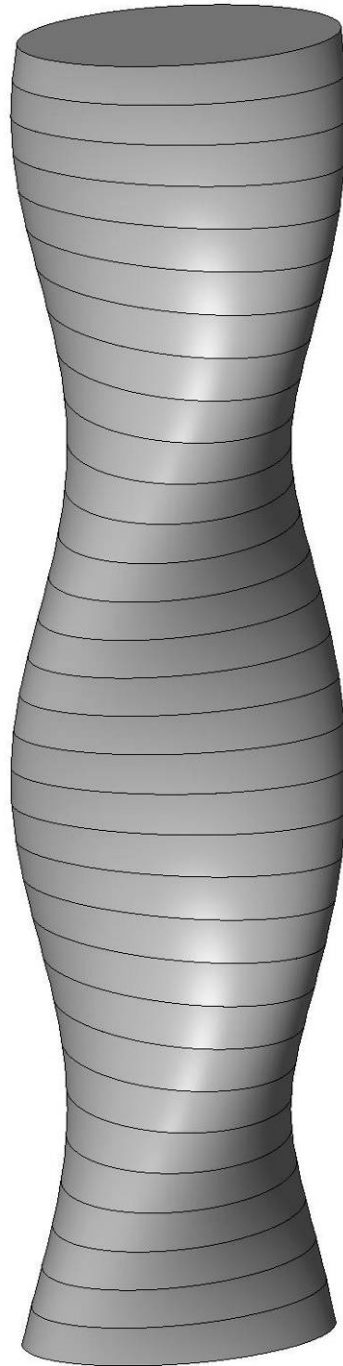
1. Design visualization 型像化設計
2. Drawing Productions 製作圖件
3. Services Co-ordination and Clash detection with other disciplines 各專業協調
4. Quantity taking and preparation of Tender Document 投標文件
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1. Design visualization 型像化設計
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7. Supply Chain Integration with the manufacturing and production 生產制造
- 8. Complex Geometry 複雜幾何形狀**



Click to select, TAB for alternates, CTRL adds, SHIFT unselects.





absolute world BUILDING 2

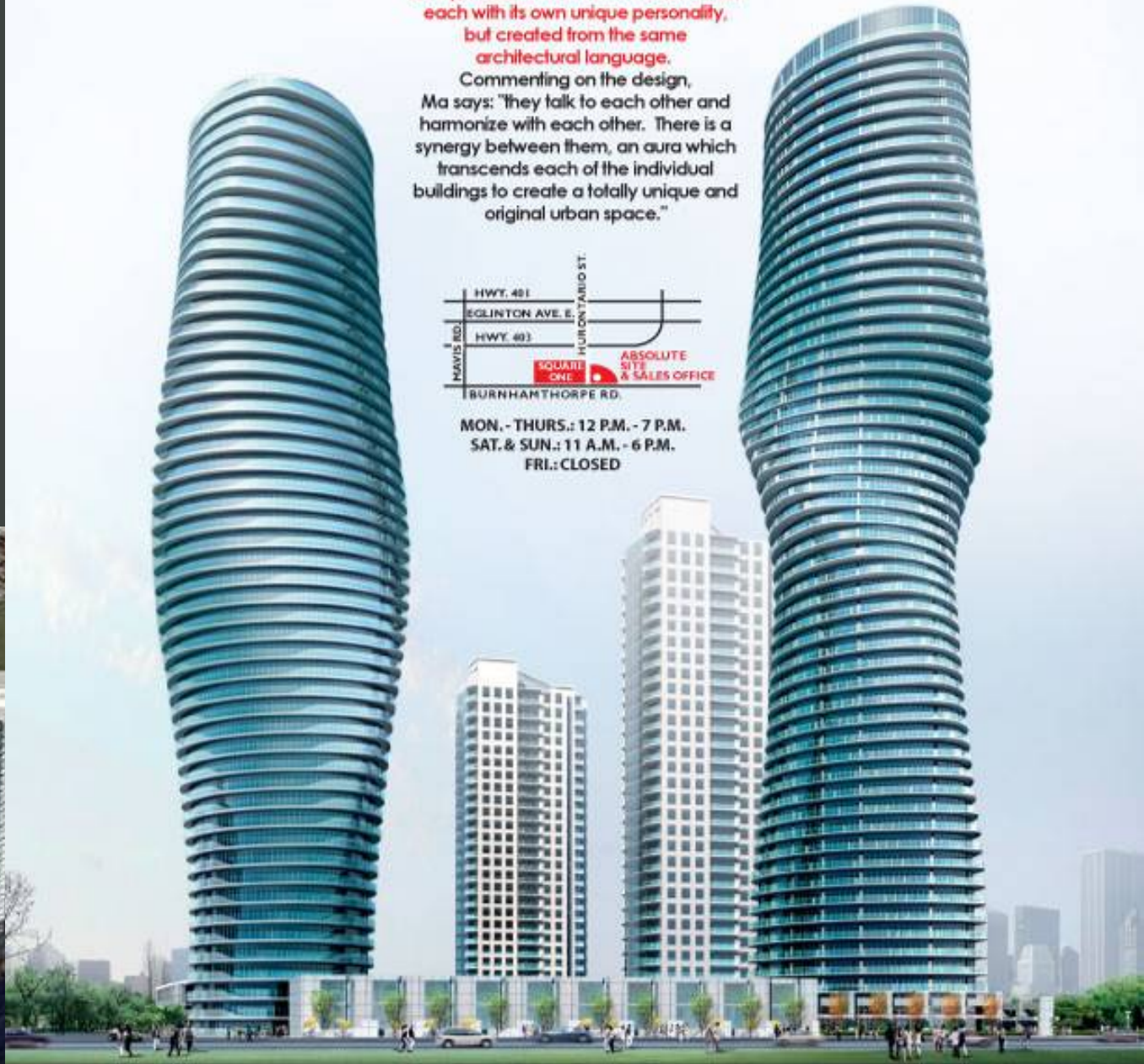
AbsoluteWorld's two buildings, as envisioned by their creator, Yansong Ma. The buildings were designed to complement and enhance each other, each with its own unique personality, but created from the same architectural language.

Commenting on the design, Ma says: "They talk to each other and harmonize with each other. There is a synergy between them, an aura which transcends each of the individual buildings to create a totally unique and original urban space."



MON. - THURS.: 12 P.M. - 7 P.M.
SAT. & SUN.: 11 A.M. - 6 P.M.
FRI.: CLOSED

absolute world BUILDING 1

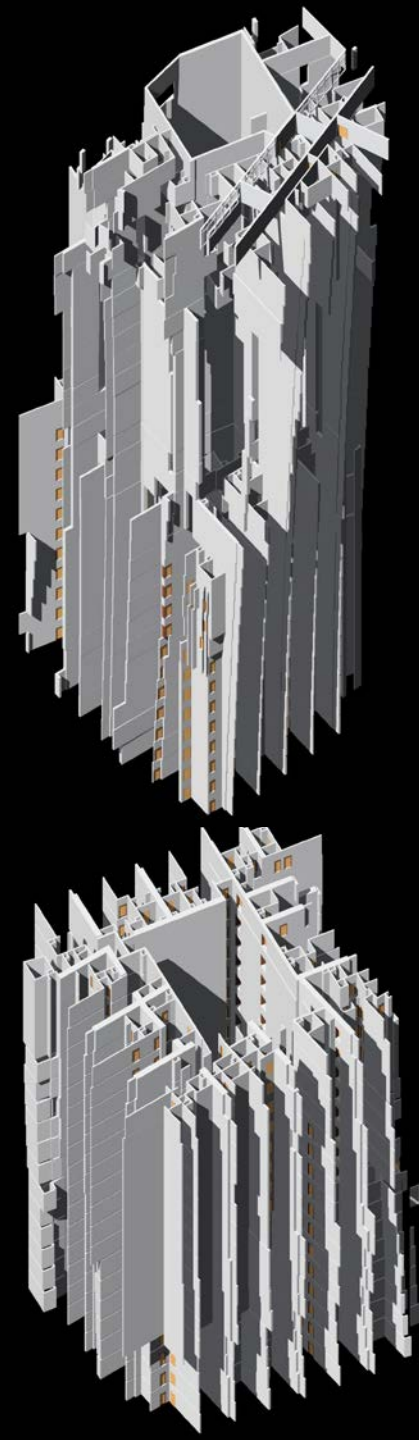




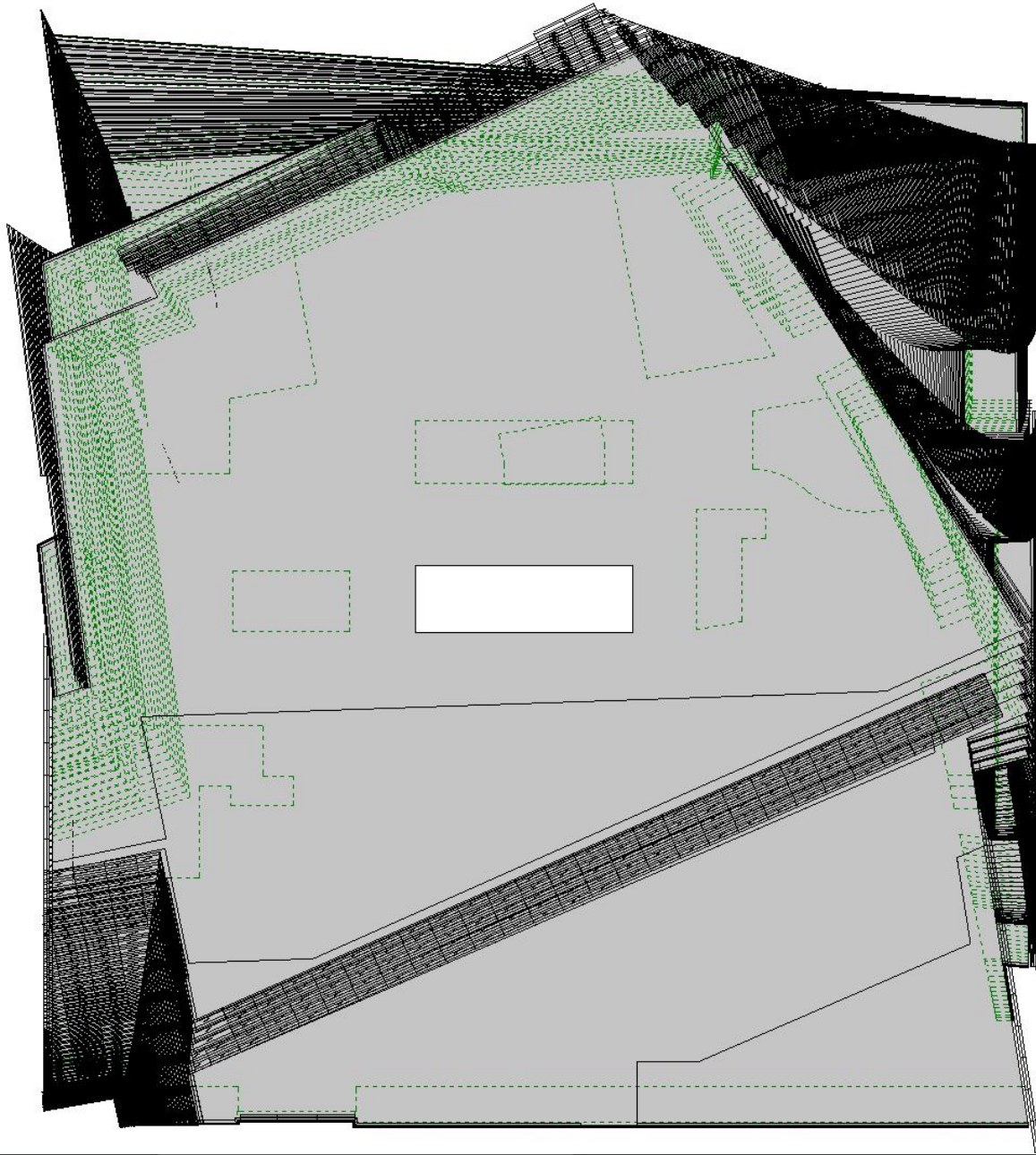
Program: Residential, Site Area: 3,746 sqm
Floor Area: 659,659 sqm | Building Height: 345 m

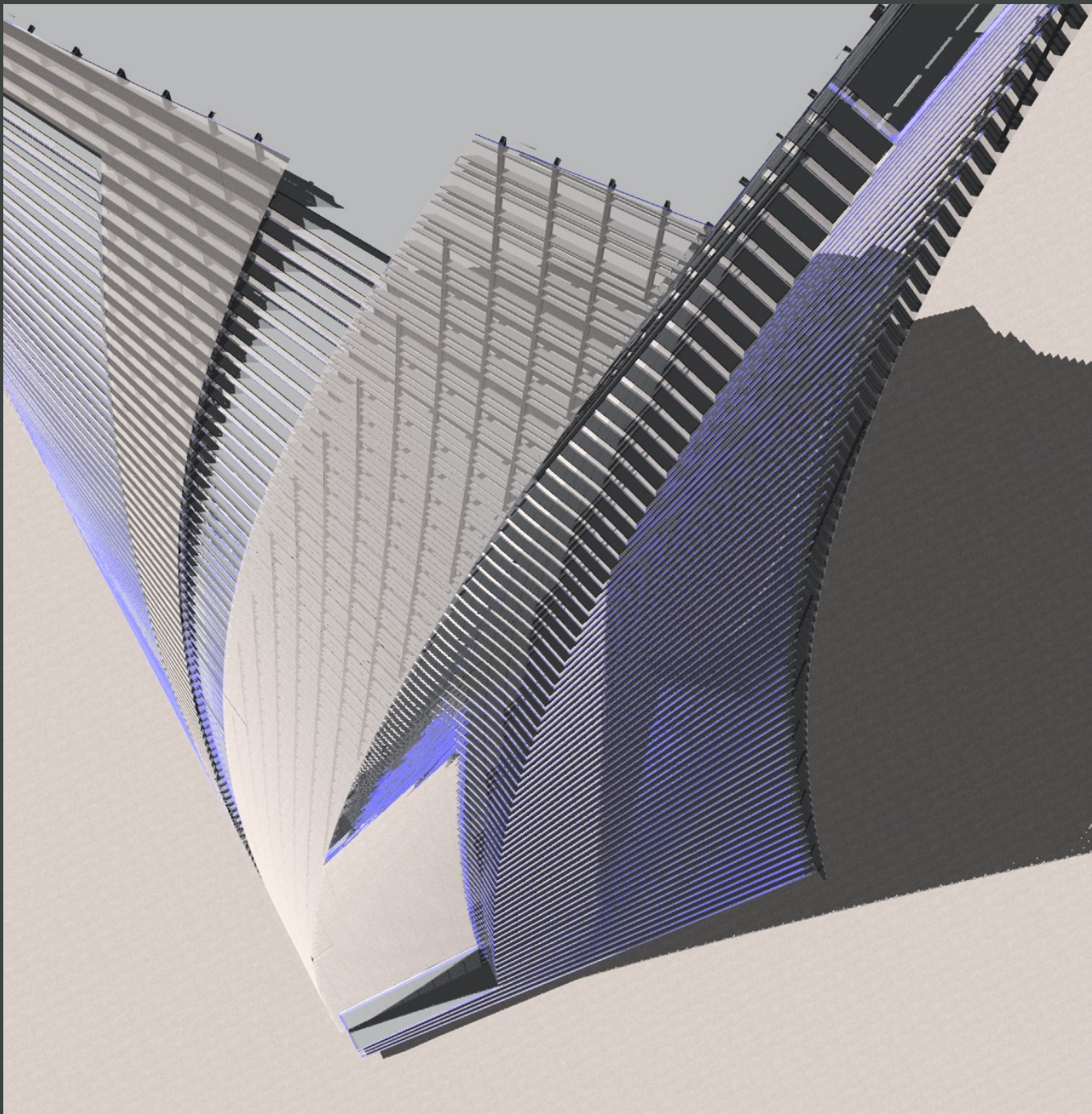


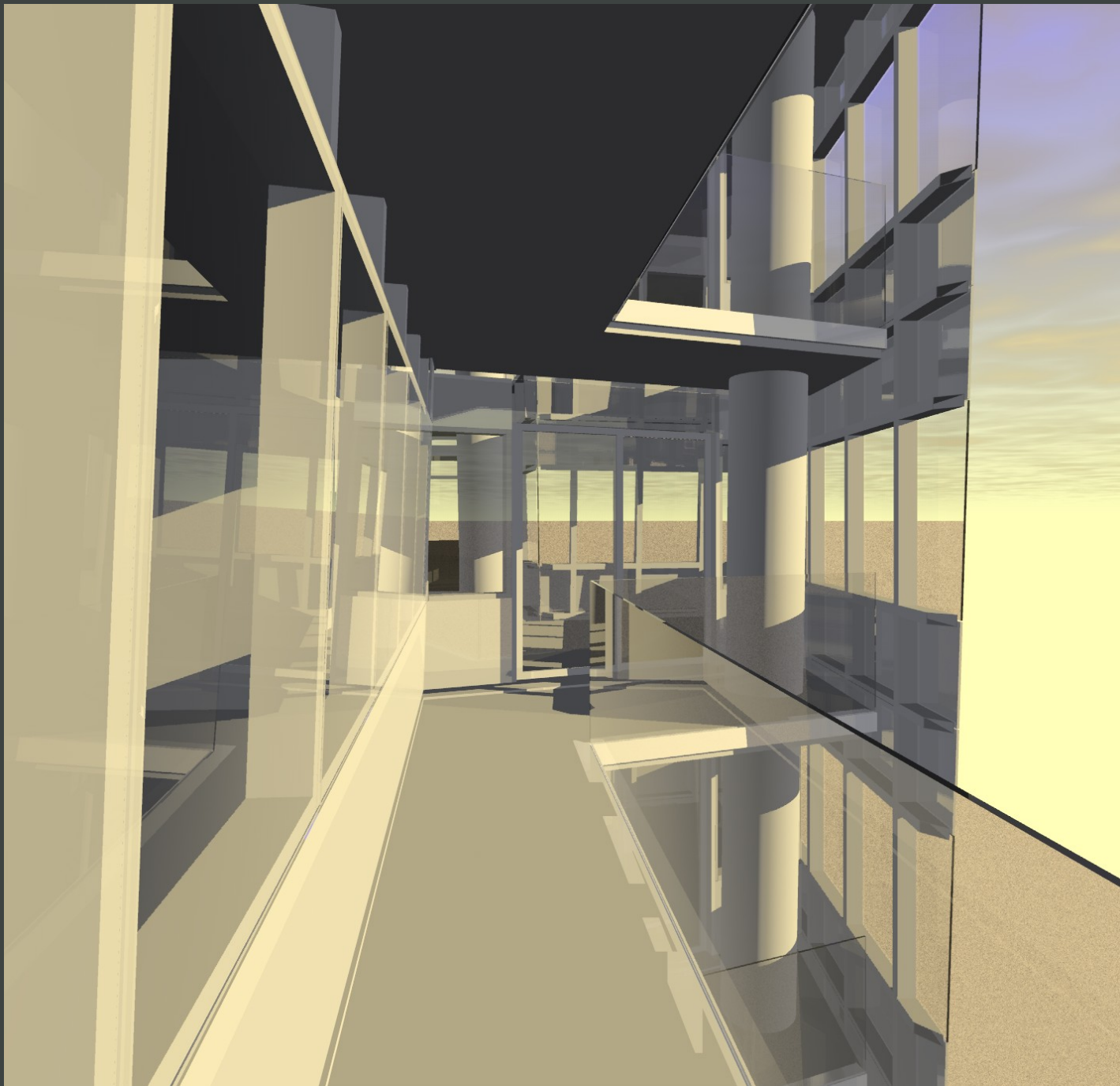
Dubai **Ocean Heights One**

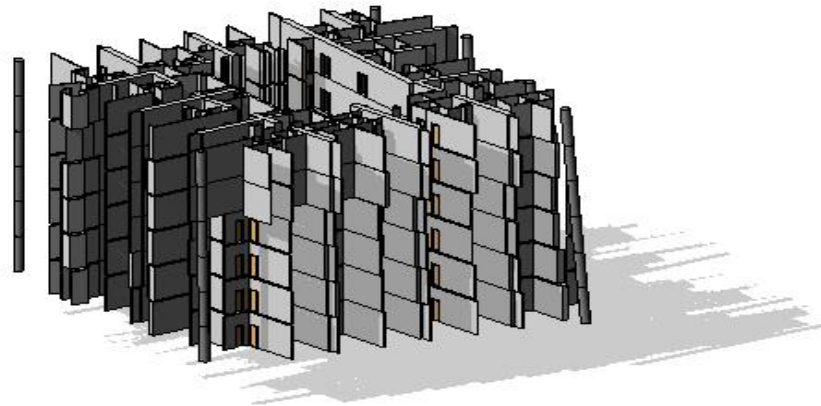


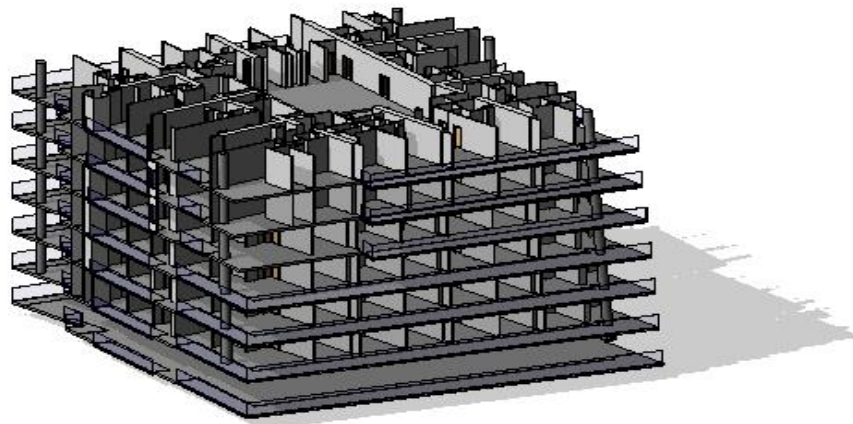
COMPLEX GEOMETRY









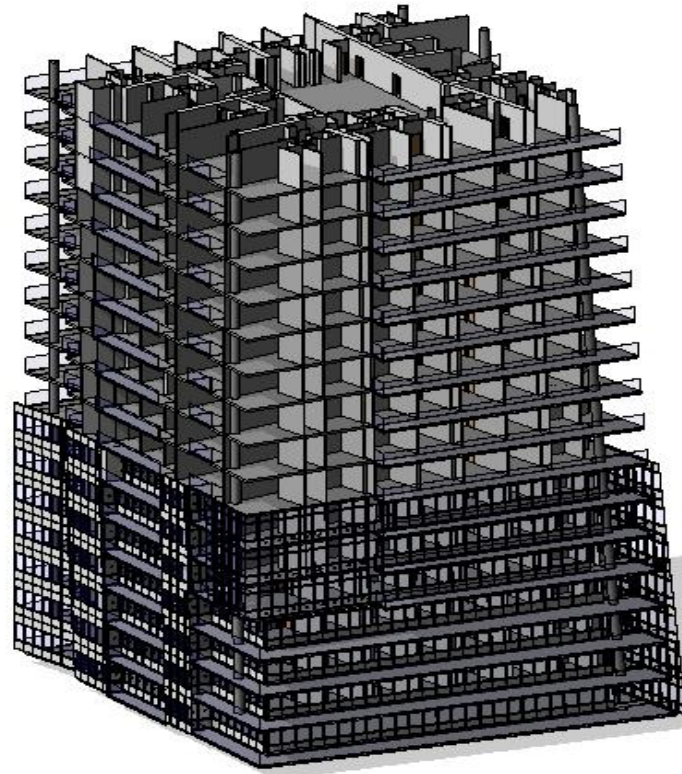


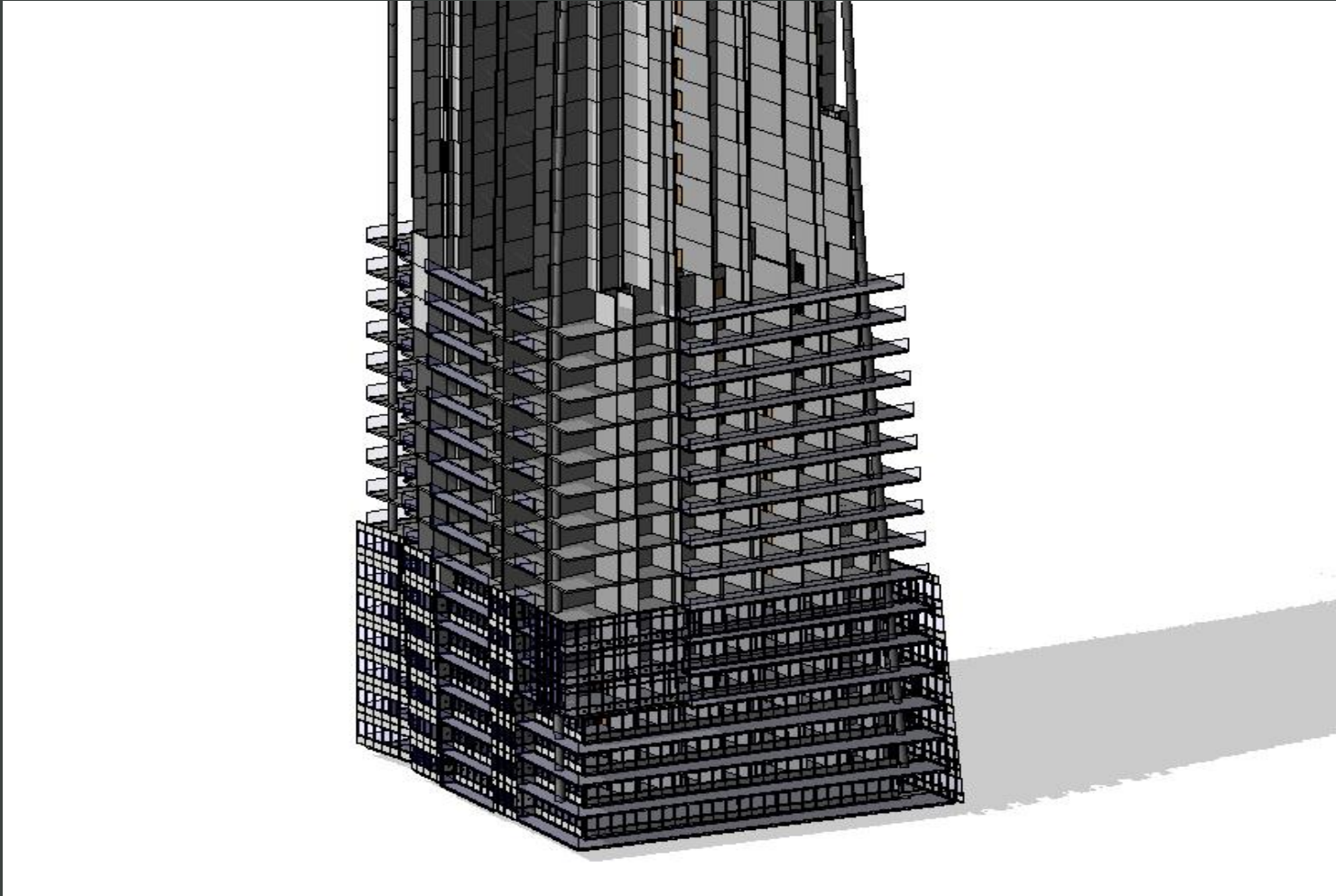








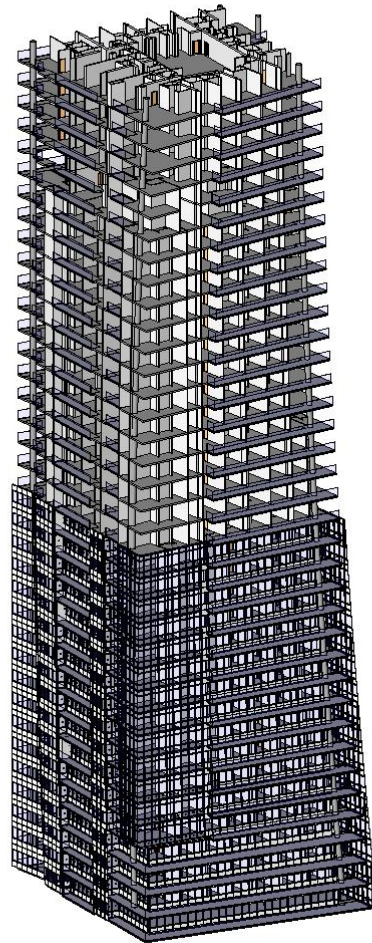


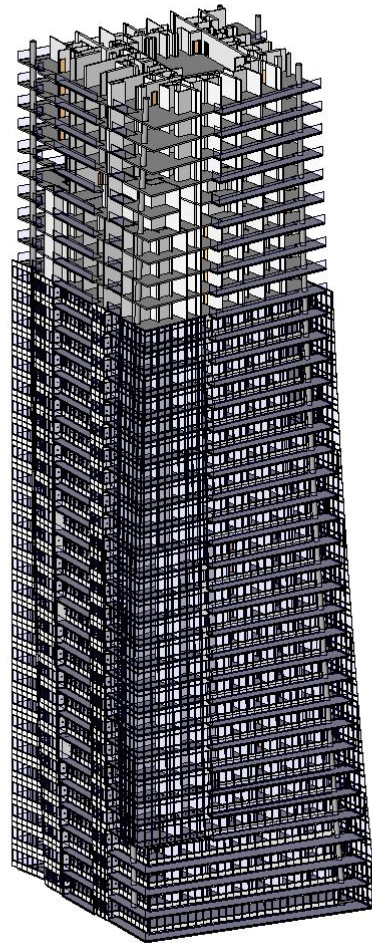


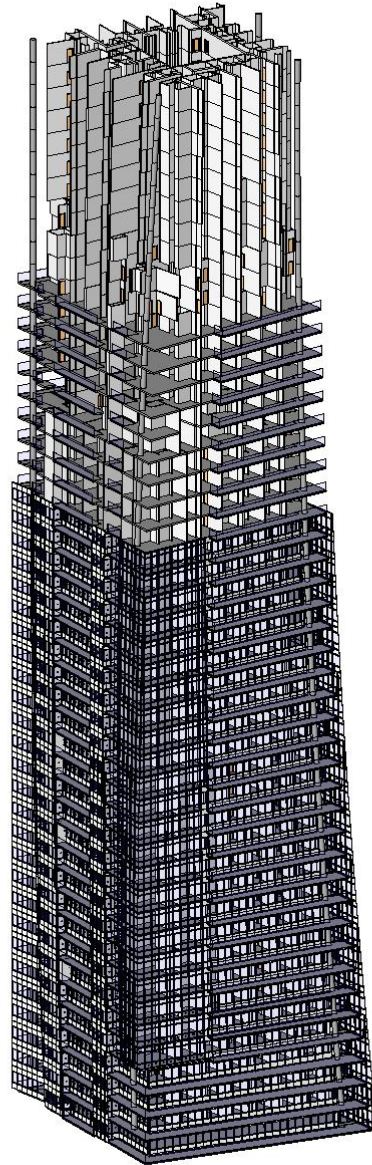


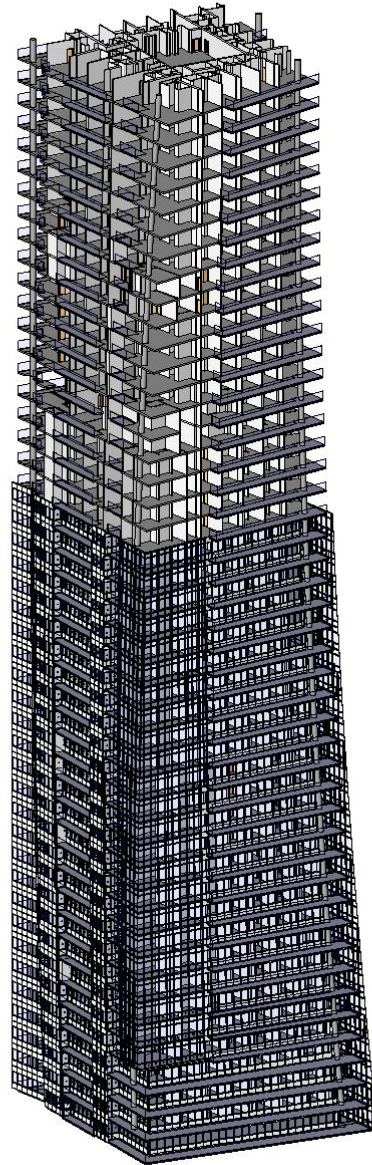


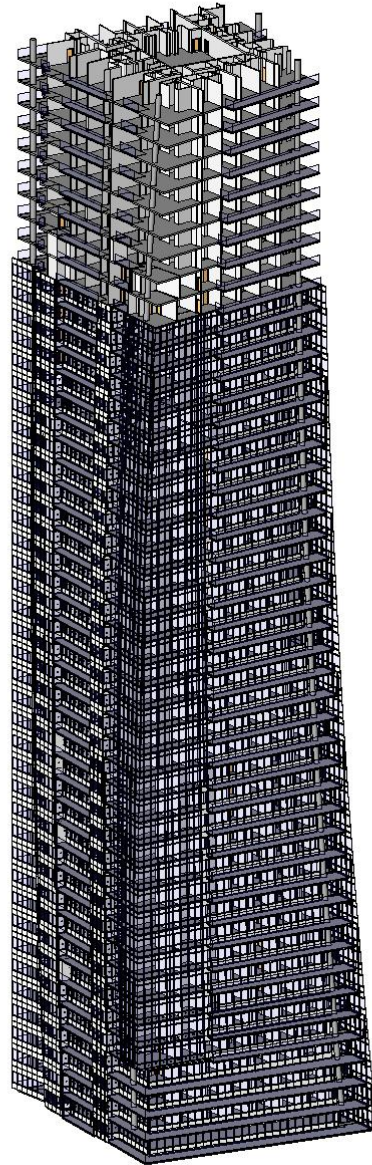


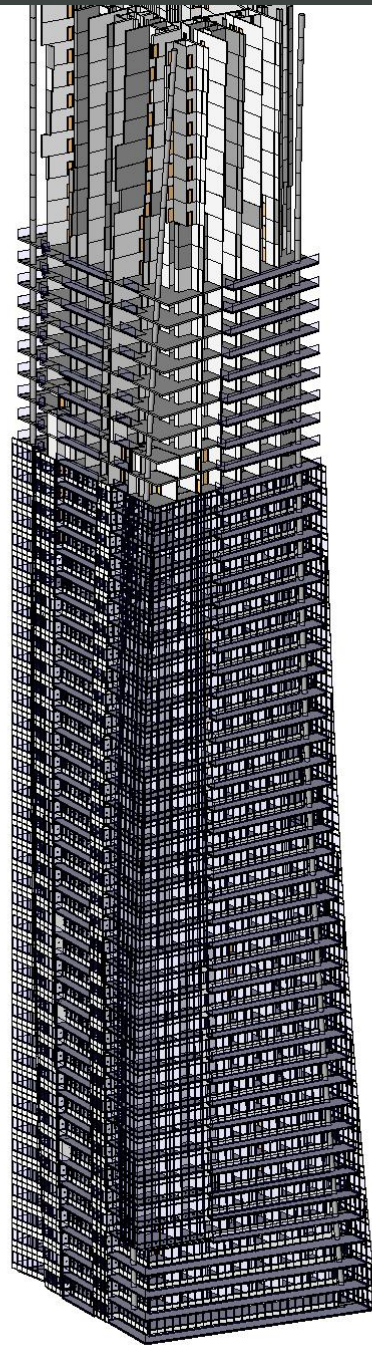


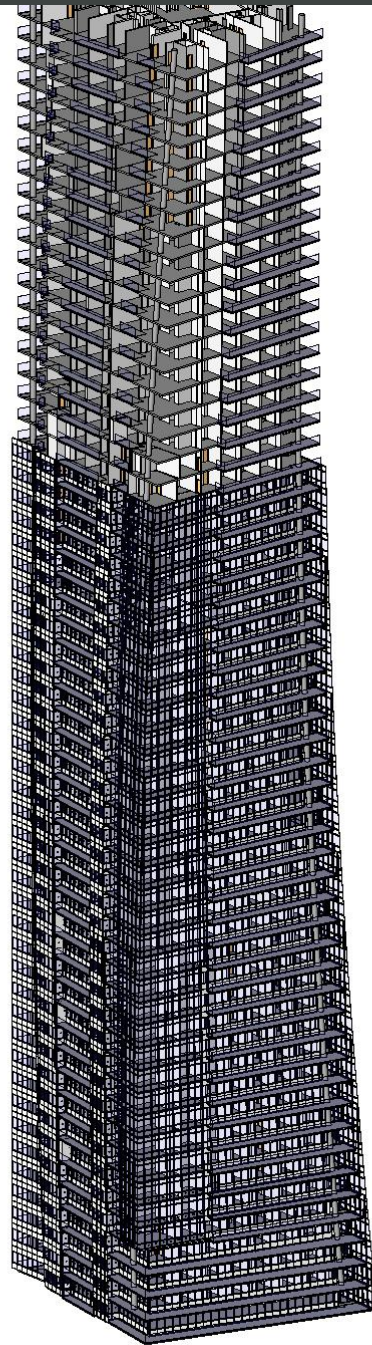


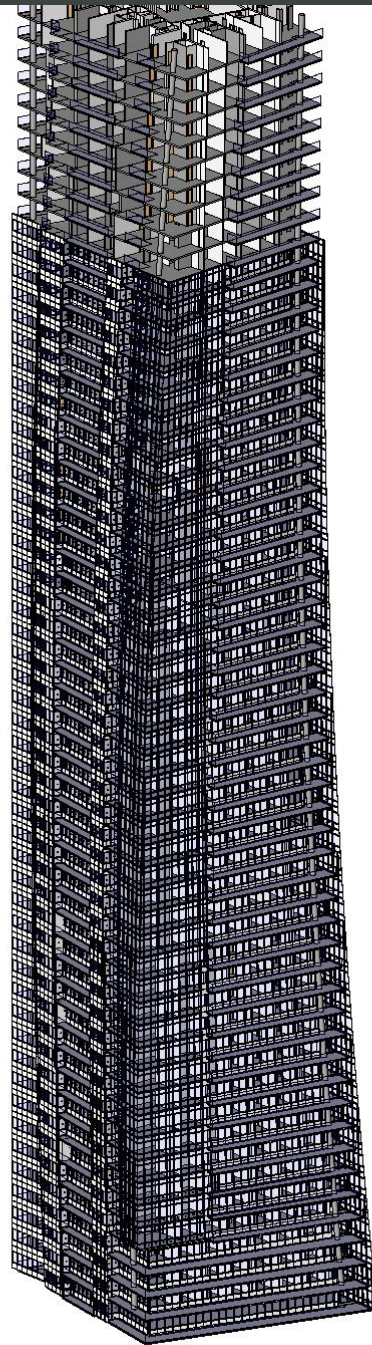
















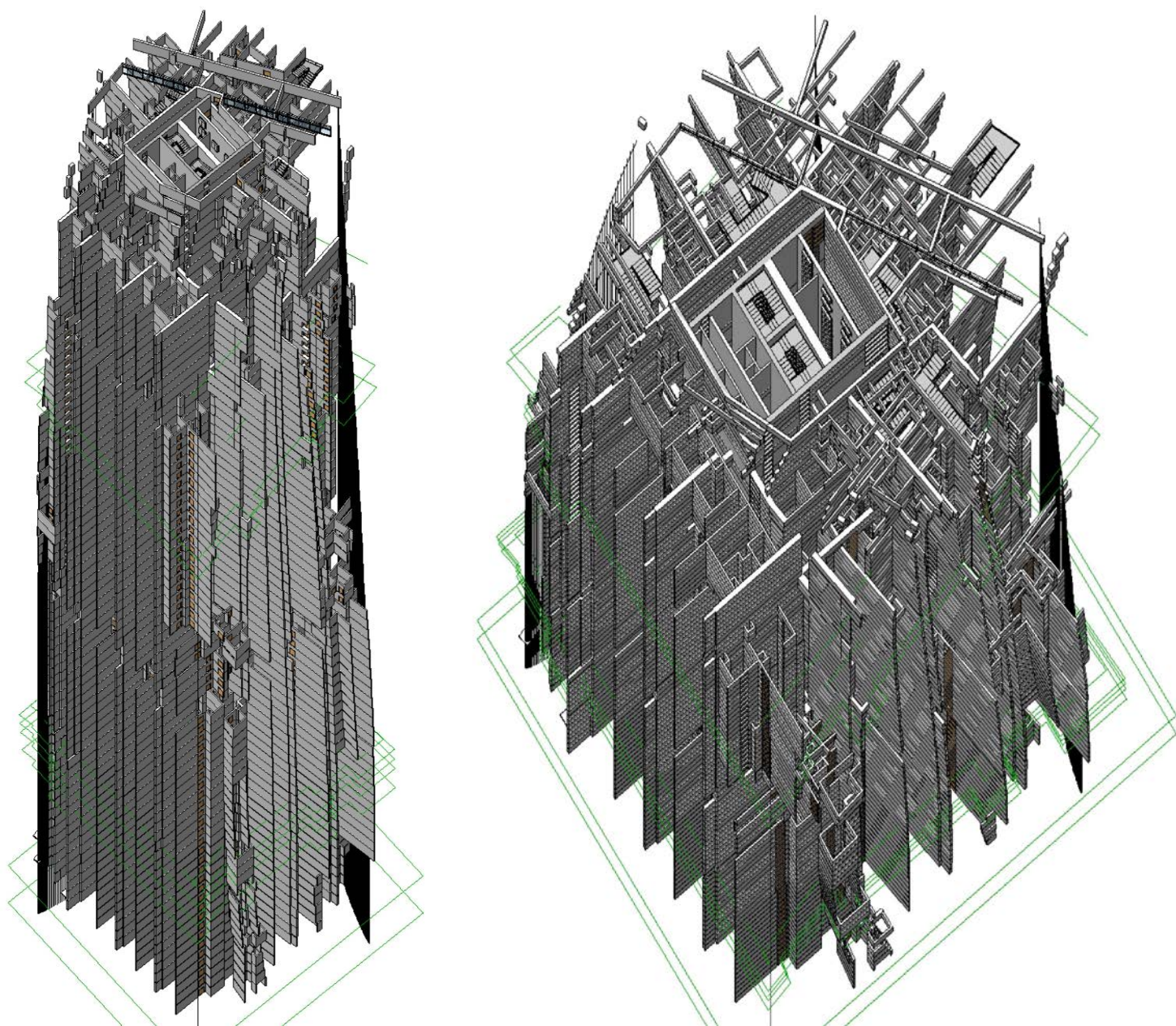




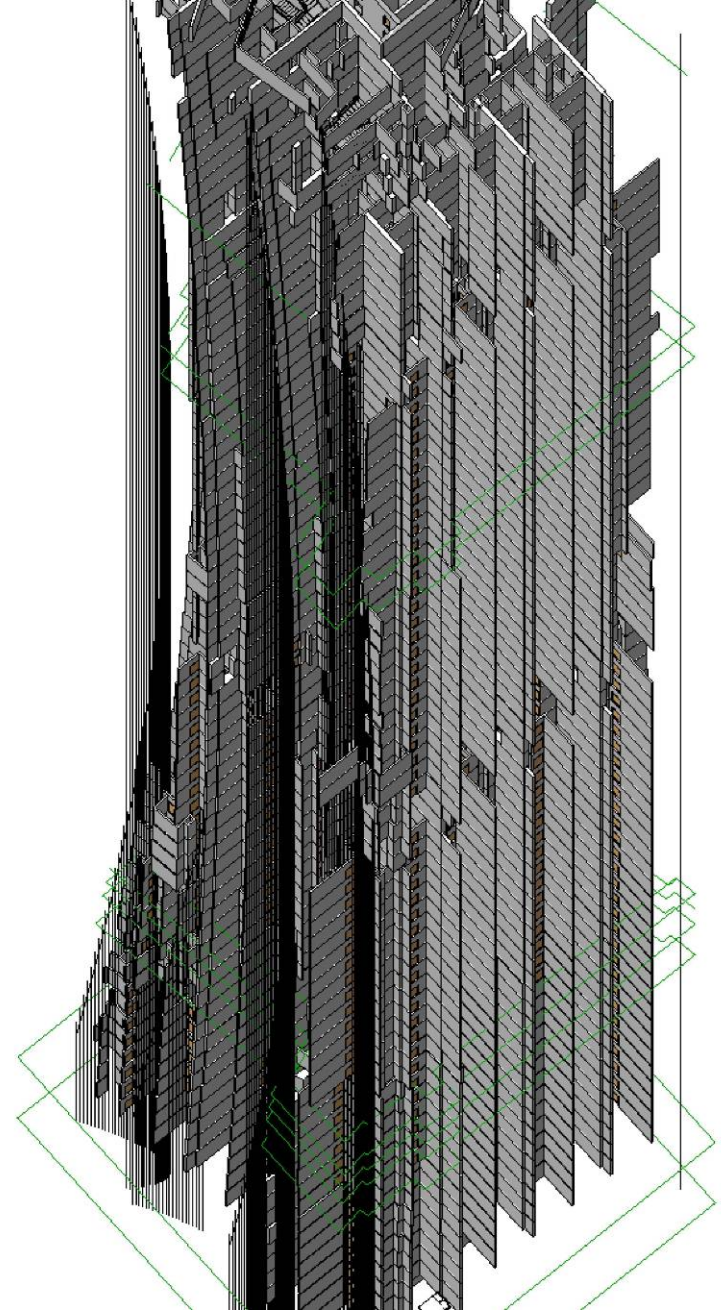
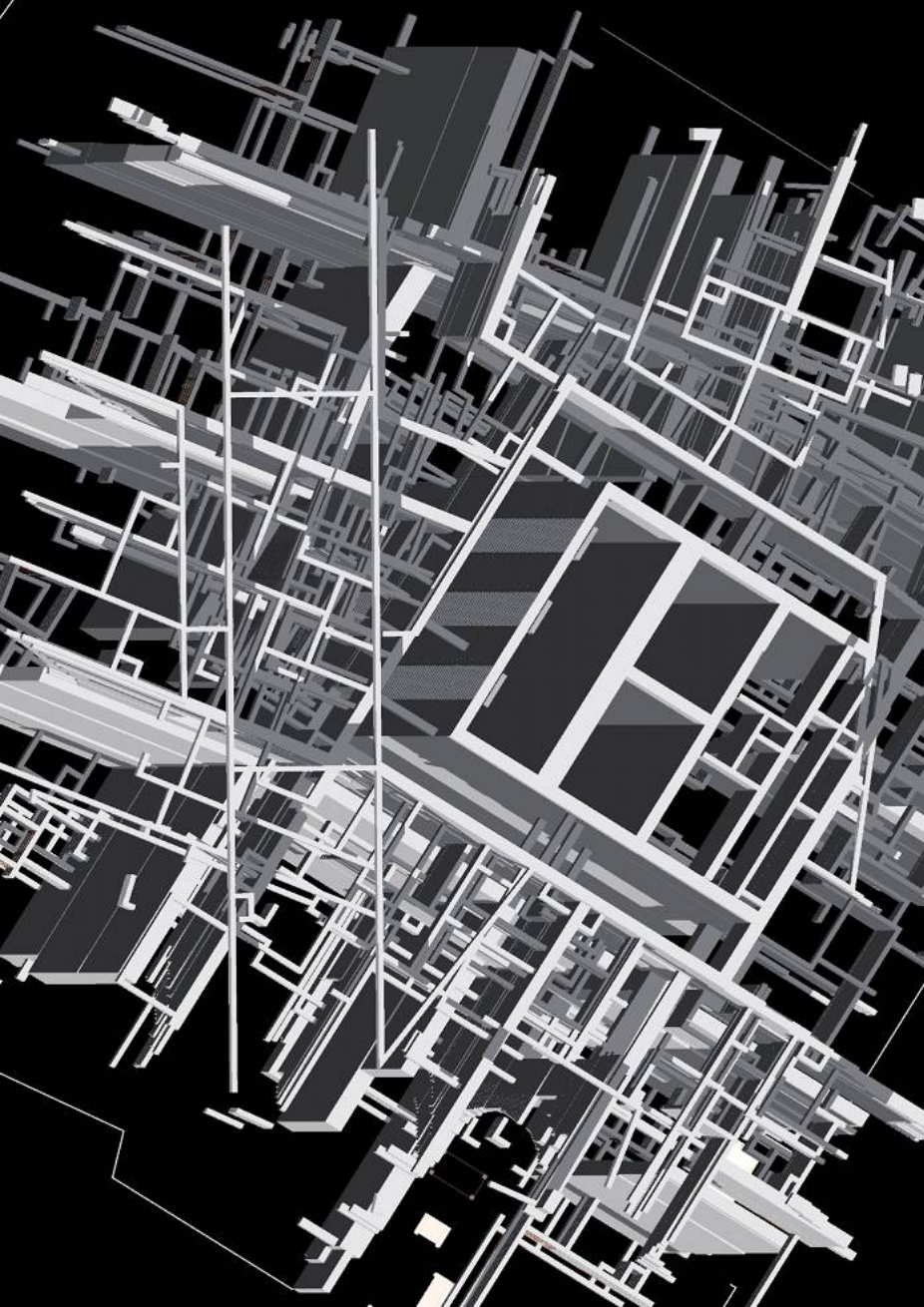




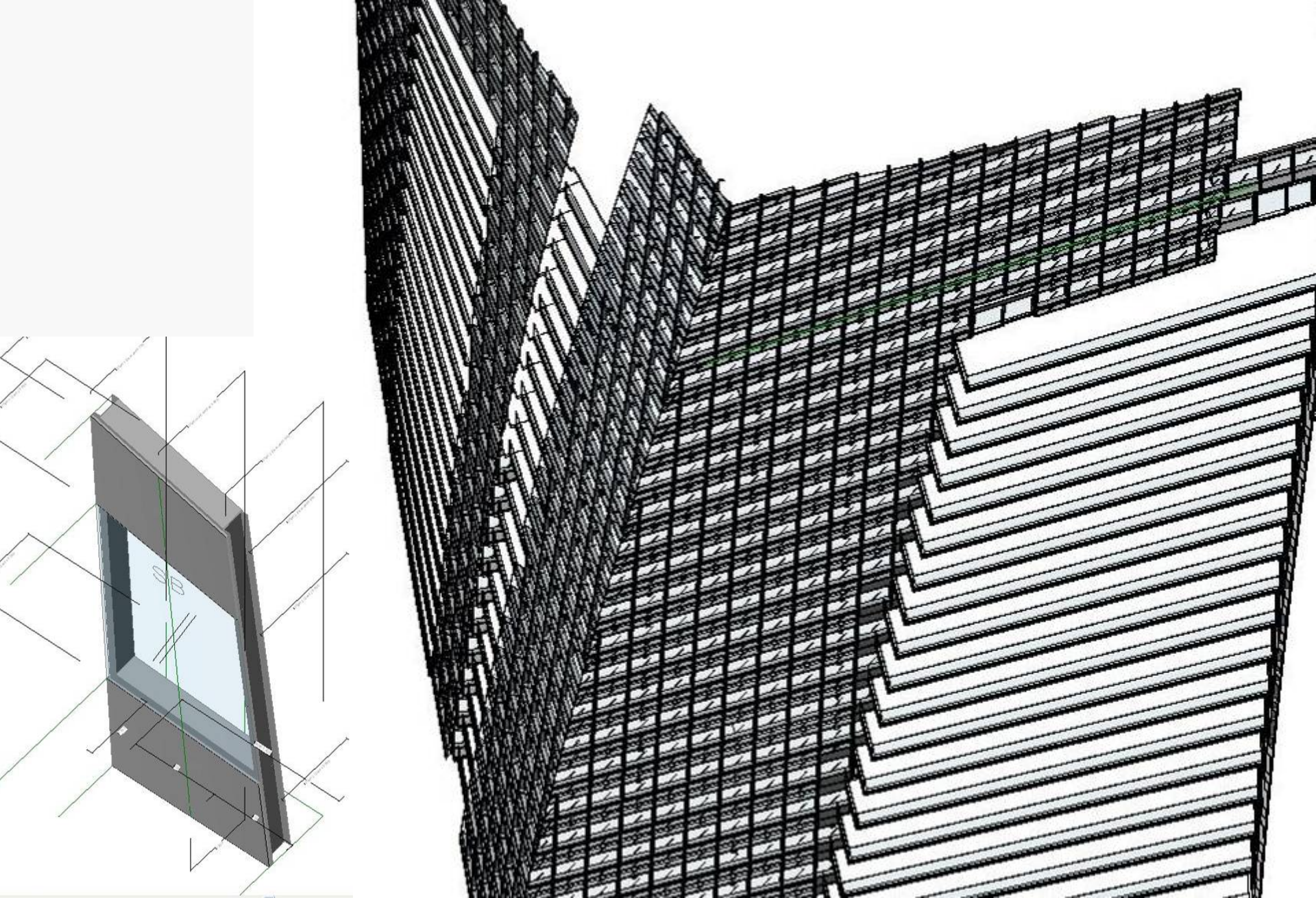




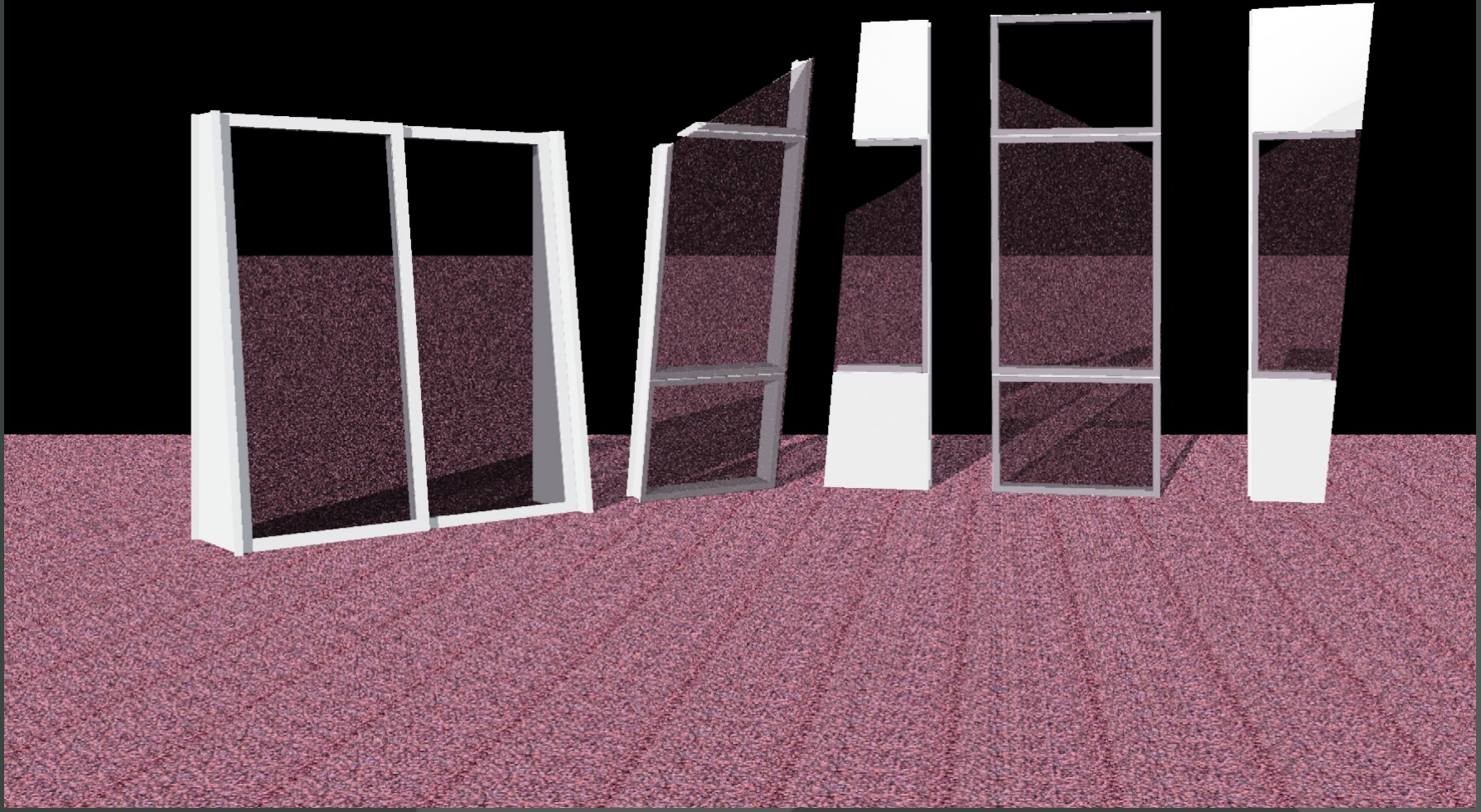
VERTICAL CO-ORDINATION



INTERNAL vs EXTERNAL



COMPLICATED CURTAIN WALL



Autodesk Revit Structure 4 - [Ocean Heights 1 R4 Local 2.rvt - Schedule: Multi-Category Schedule]

File Edit View Modelling Drafting Site Tools Settings Window Help

Clipboard

Copy Paste

Undo Redo

Navigation

3D

Move

Copy

Rotate

Array

Mirror

Group

Plane

ABC

Align

Split

Trim

Offset

Not Editable

Level 31 to

Headers: Group Ungroup

Rows: New Delete Show

Basics

Modify

Structural Color

Structural Wall

Beam

Component

Slab

Grid

Ref Plane

Dimension

Section

Level

Framing Elevati

Text

Ocean Heights 1 R4 L...

Views (all)

Structural Plans

CAD REFERENCE

Level 1

Level 1 - An

Level 2

Level 2 - An

Level 4

Level 10

Level 20

Level 30

Level 40

Level 50

Level 60

Level 65

Level 70

Level 75

3D Views

3D View 1

3D View 2

3D View 3

3D View 4

3D View 5

3D View 6

Copy of 3D V

View 1 - And

(3D)

Elevations (Build

East

North

South

West

Sections (Buildin

Section 1

Section 2

Section 3

Legends

Schedules/Quan

Multi-Category S

Multi-Category S

Sheets (all)

Families

Annotation Synt

Ceilings

Curtain Panels

Curtain Systems

Curtain Wall Mul

Detail Items

Doors

Floors

Furniture

View

Architectural

Drafting

Rendering

Site

Massing

Modelling

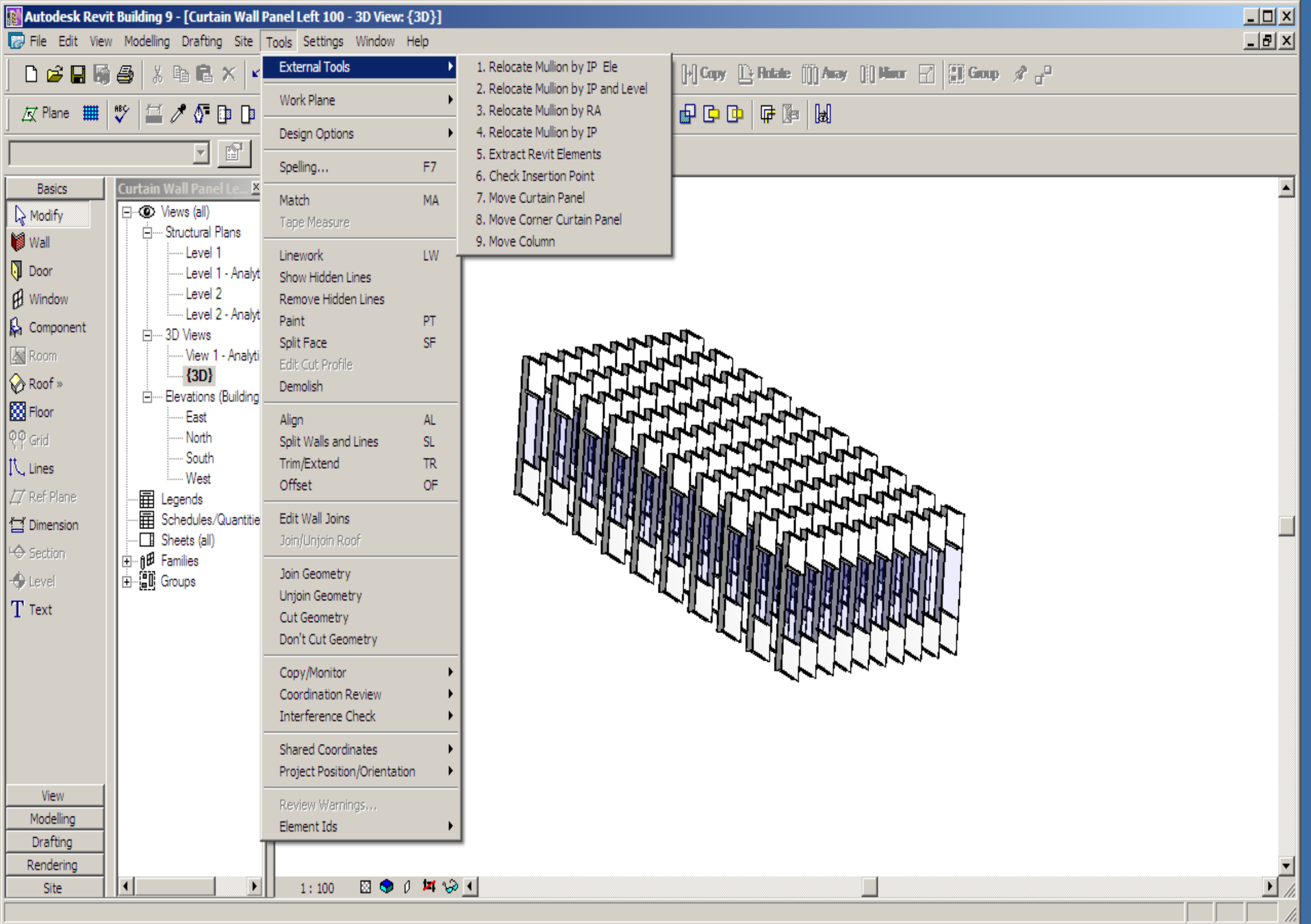
Construction

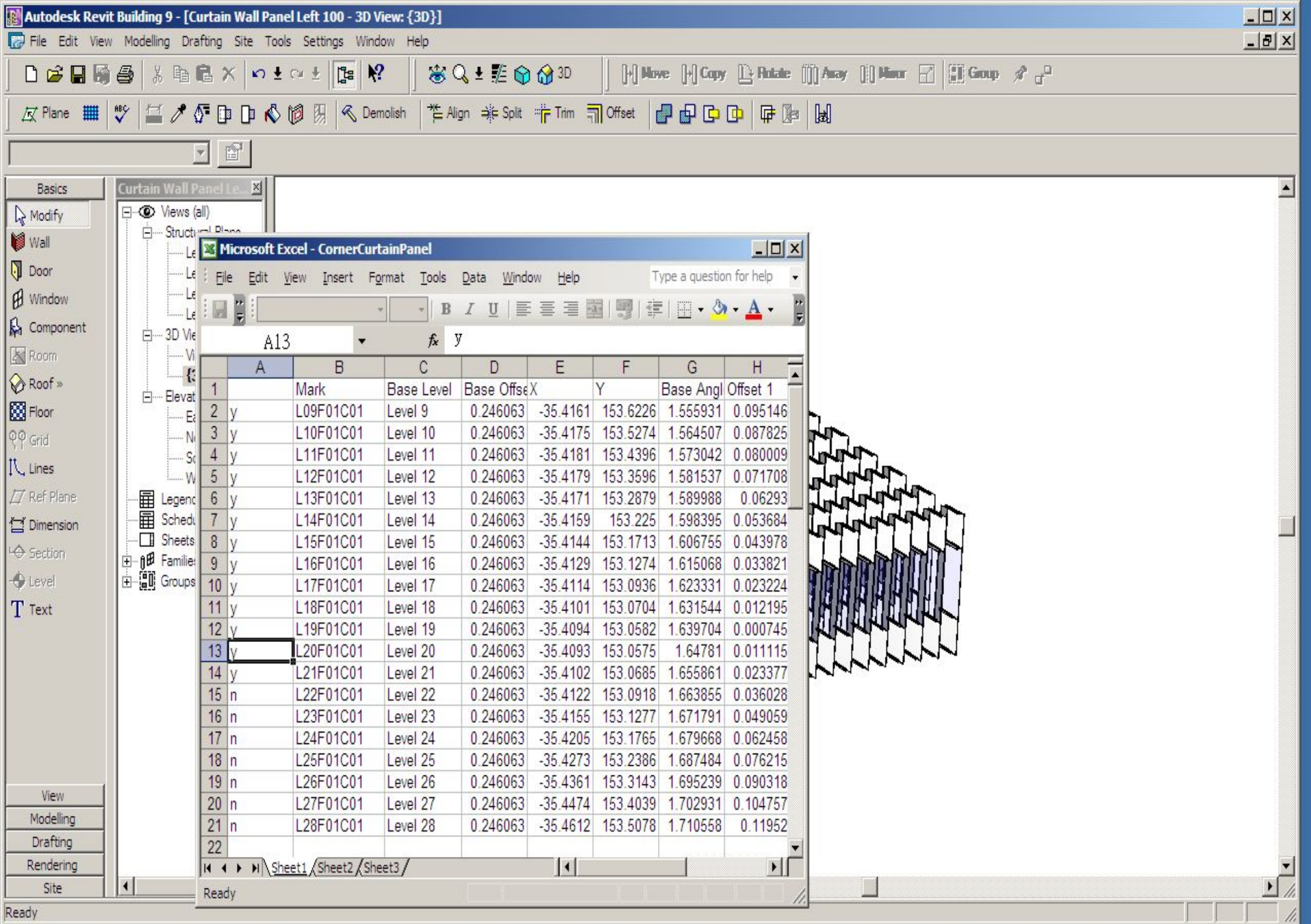
Multi-Category Schedule

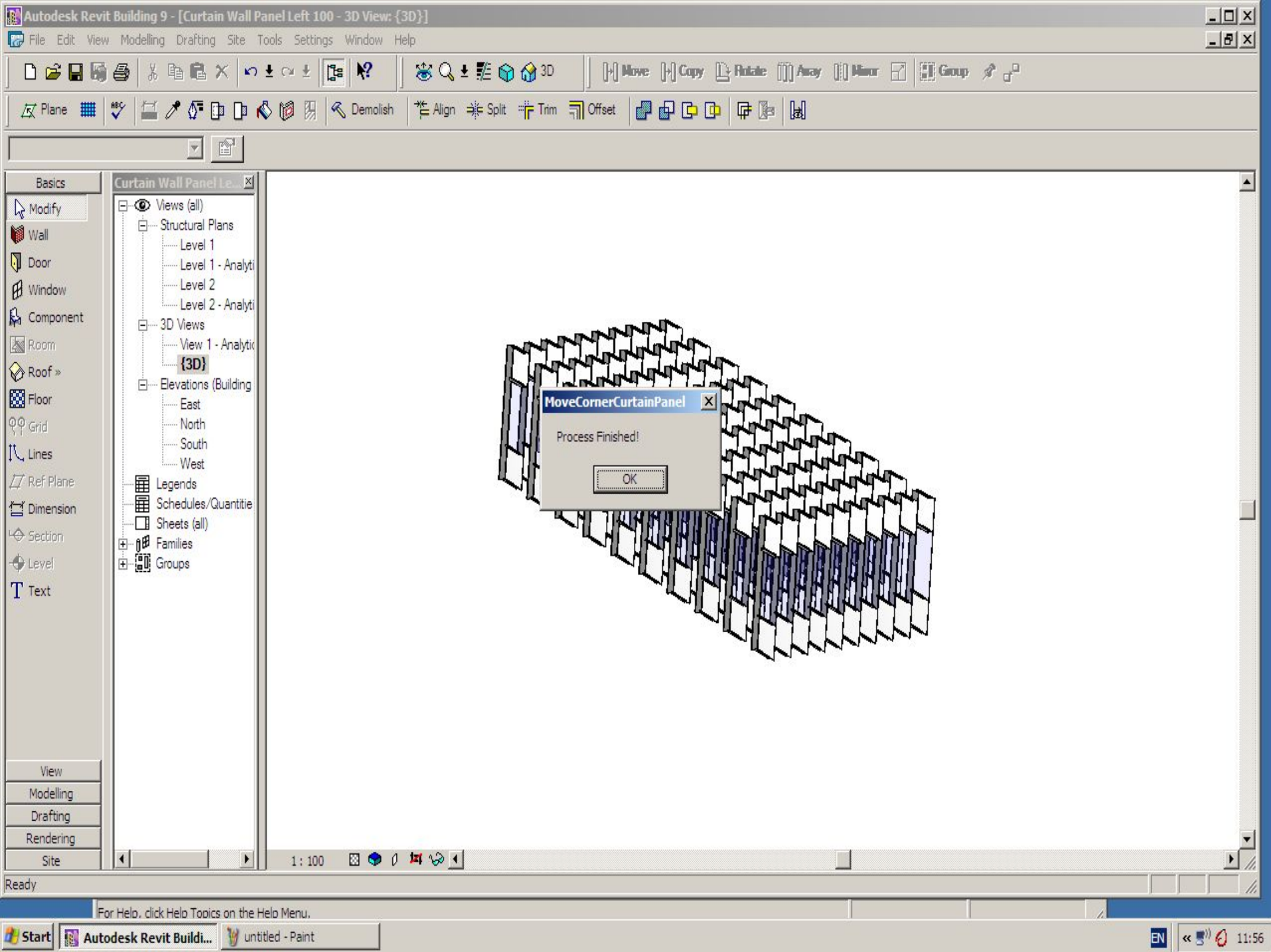
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Curtain Wall Panel 2	L08F01N05	Level 8	1255.67			-74.34	-85.16
Curtain Wall Panel 2	L08F01N06	Level 8	1255.67			-85.16	-95.97
Curtain Wall Panel 2	L08F01N07	Level 8	1255.67			-95.97	-106.79
Curtain Wall Panel 2	L08F01N08	Level 8	1255.67			-106.79	-117.60
Curtain Wall Panel 2	L08F01N09	Level 8	1255.67			-117.60	-117.60
Curtain Wall Panel 2	L08F03N09	Level 8	1224.13			5.31	5.66
Curtain Wall Panel 2	L08F03N10	Level 8	1224.13			5.66	6.01
Curtain Wall Panel 2	L08F03N11	Level 8	1224.13			6.01	6.36
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Curtain Wall Panel 2	L09F01N03	Level 9	1255.72			-50.54	-61.31
Curtain Wall Panel 2	L09F01N04	Level 9	1255.72			-61.31	-72.07
Curtain Wall Panel 2	L09F01N05	Level 9	1255.72			-72.07	-82.84
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Curtain Wall Panel 2	L09F03N10	Level 9	1224.13			0.74	0.84
Curtain Wall Panel 2	L09F03N11	Level 9	1224.13			0.84	0.94
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Curtain Wall Panel 2	L84B1RN01	Level 84	1224.10			0.00	0.00
Curtain Wall Panel 2: 38							
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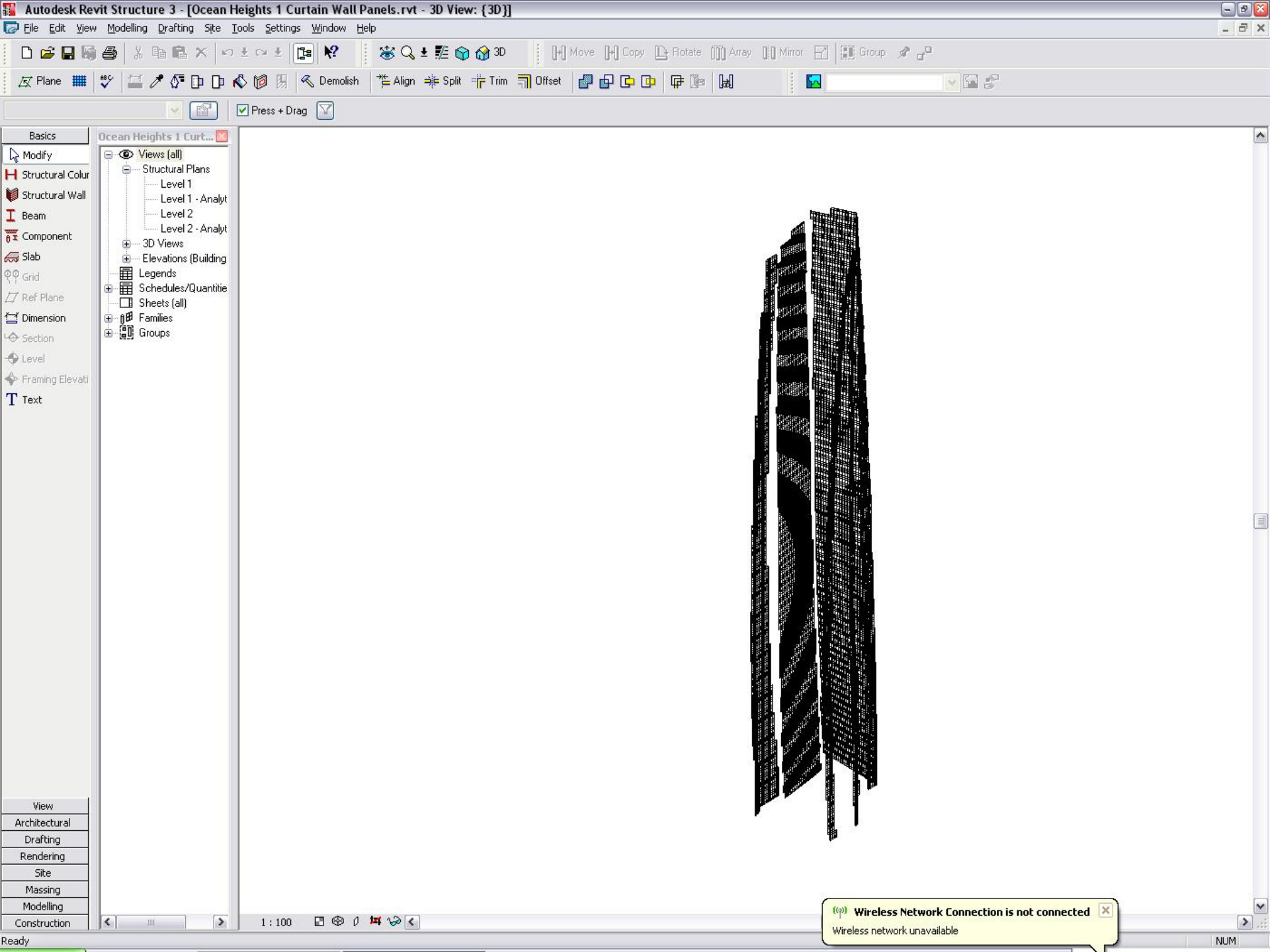
Ready

Ref Plane Dimension Section Level Framing Elevati Text 3D Views 3D View 1 3D View 2 3D View 3 3D View 4 3D View 5 3D View 6 Copy of 3D V View 1 - Ana (3D) Elevations (Build East North South West Sections (Building Section 1 Section 2 Section 3 Legends Schedules/Quan Multi-Category S Multi-Category S Sheets (all) Families Annotation Synt Ceilings Curtain Panels Curtain Systems Curtain Wall Mul Detail Items Doors Floors Furniture View Architectural Drafting Rendering Site Massing Modelling Construction	Level 20	Sliding Door	L71B05D12	Level 71	2550.00		0.00
	Level 30	Sliding Door	L71B05D15	Level 71	2550.00		0.00
	Level 40	Sliding Door	L72B01D02	Level 72	2400.00		0.00
	Level 50	Sliding Door	L72B02D02	Level 72	2500.00		0.00
	Level 60	Sliding Door	L72B04D01	Level 72	1800.00		0.00
	Level 65	Sliding Door	L72B05D03	Level 72	2550.00		0.00
	Level 70	Sliding Door	L72B05D05	Level 72	2550.00		0.00
	Level 75	Sliding Door	L72B05D08	Level 72	2550.00		0.00
		Sliding Door	L72B05D10	Level 72	2550.00		0.00
		Sliding Door	L72B05D12	Level 72	2550.00		0.00
		Sliding Door	L72B05D15	Level 72	2550.00		0.00
		Sliding Door	L73B01D02	Level 73	2400.00		0.00
		Sliding Door	L73B02D02	Level 73	2500.00		0.00
		Sliding Door	L73B04D01	Level 73	1700.00		0.00
		Sliding Door	L73B05D03	Level 73	2550.00		0.00
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		Sliding Door	L73B05D08	Level 73	2550.00		0.00
		Sliding Door	L73B05D10	Level 73	2550.00		0.00
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		Sliding Door	L74B05D15	Level 74	2550.00		0.00
		Sliding Door	L75B01D02	Level 75	2400.00		0.00
		Sliding Door	L75B02D02	Level 75	2500.00		0.00
		Sliding Door	L76B01D02	Level 76	2400.00		0.00
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		Sliding Door	L77B01D02	Level 77	2400.00		0.00
		Sliding Door	L77B02D01	Level 77	2426.17		0.00
		Sliding Door	L78B01D02	Level 78	2400.00		0.00
		Sliding Door	L78B02D01	Level 78	2203.01		0.00
		Sliding Door	L79B01D02	Level 79	2400.00		0.00
		Sliding Door	L79B02D01	Level 79	1974.15		0.00
Sliding Door: 649							
Sliding Door to Replace CW Pan			L10F01N10	Level 10	1255.77		-123.24
Sliding Door to Replace CW Panel: 1							
Grand total: 9740							











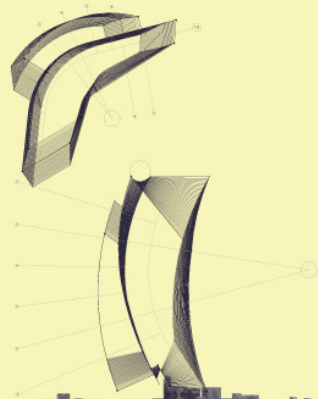
Abu Dhabi Dancing Towers

Located in the heart of Abu Dhabi, Dancing Towers was designed to appropriately fit its surrounding neighbors in scale.

The challenge was how to achieve this when the project was only 70,000 square meters and adjacent properties were relatively small, averaging 900 square-meter floor plates. Two slender towers as opposed to one singular tower was the first step, but the site itself was constrained, forcing a close proximity between the two buildings.

This site constraint is intensified in achieving a viable connective retail podium between the commercial and residential towers, drop-offs to the lobbies and access to supporting functions. The buildings were placed deliberately to maximize the uses down below.

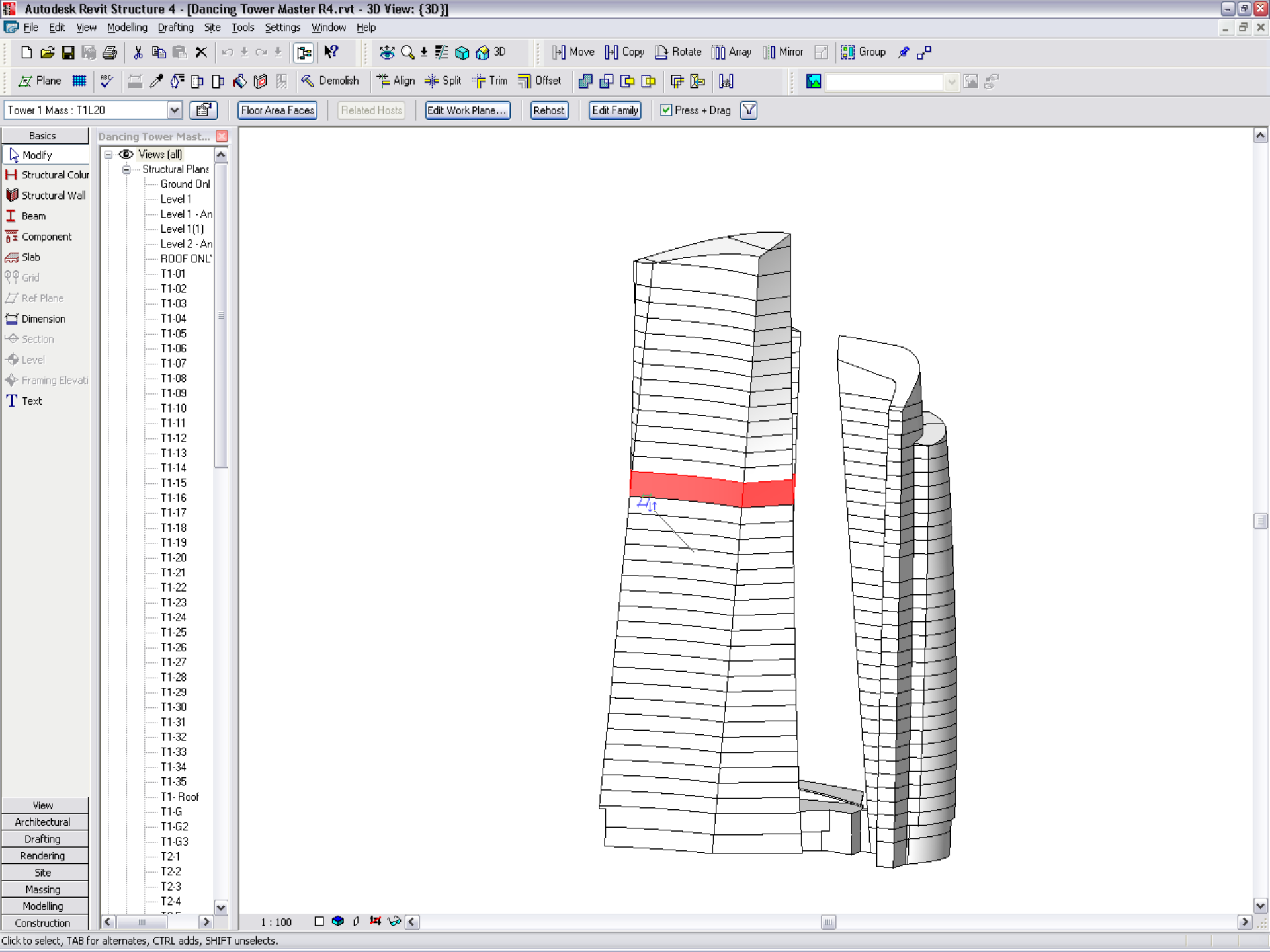
However, the two towers quickly lean, rotate, bend and warp to respond to each other, the adjacent sites and ultimately the view to the ocean at their horizon. These two figures fluidly respond to each other, dynamically engaged and flowing – and ultimately tied together in a passionate dance •

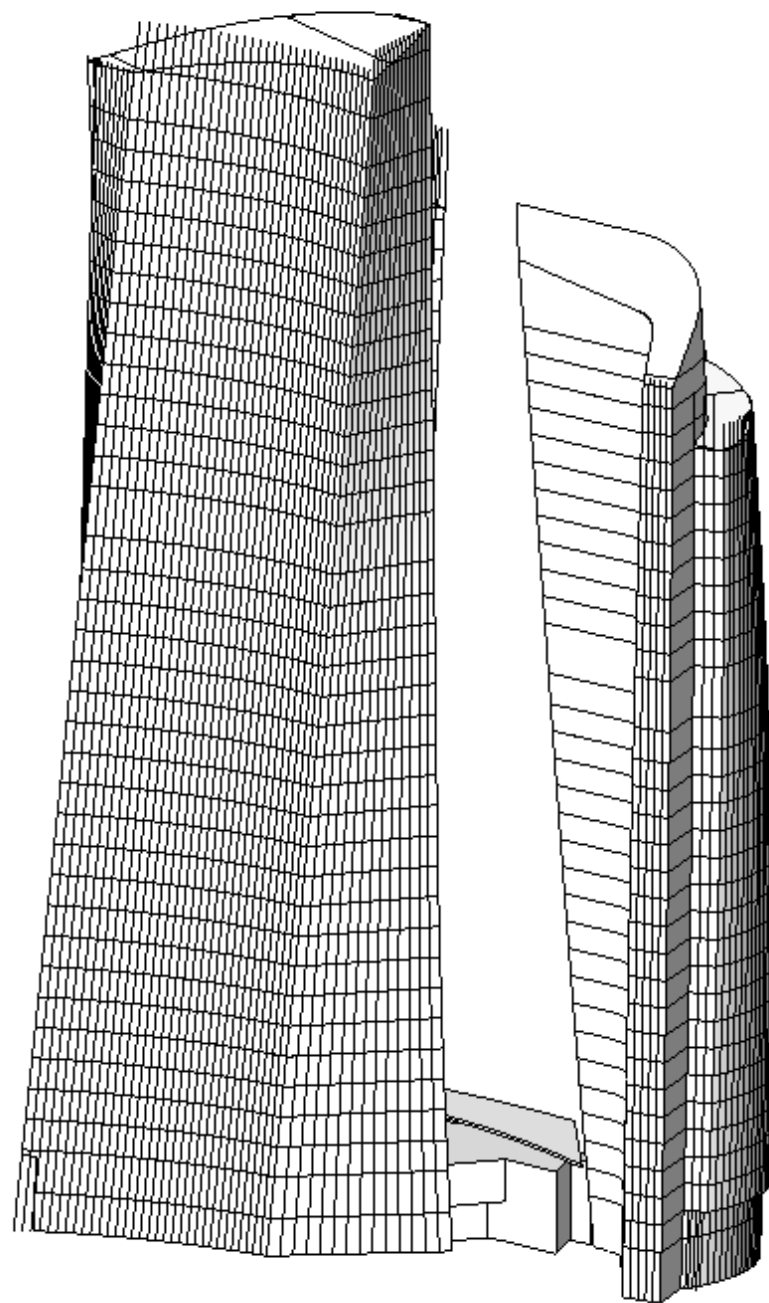


Program Mixed Use Site Area 4,160 sqm
Floor Area 44,235 sqm Building Height 160 m

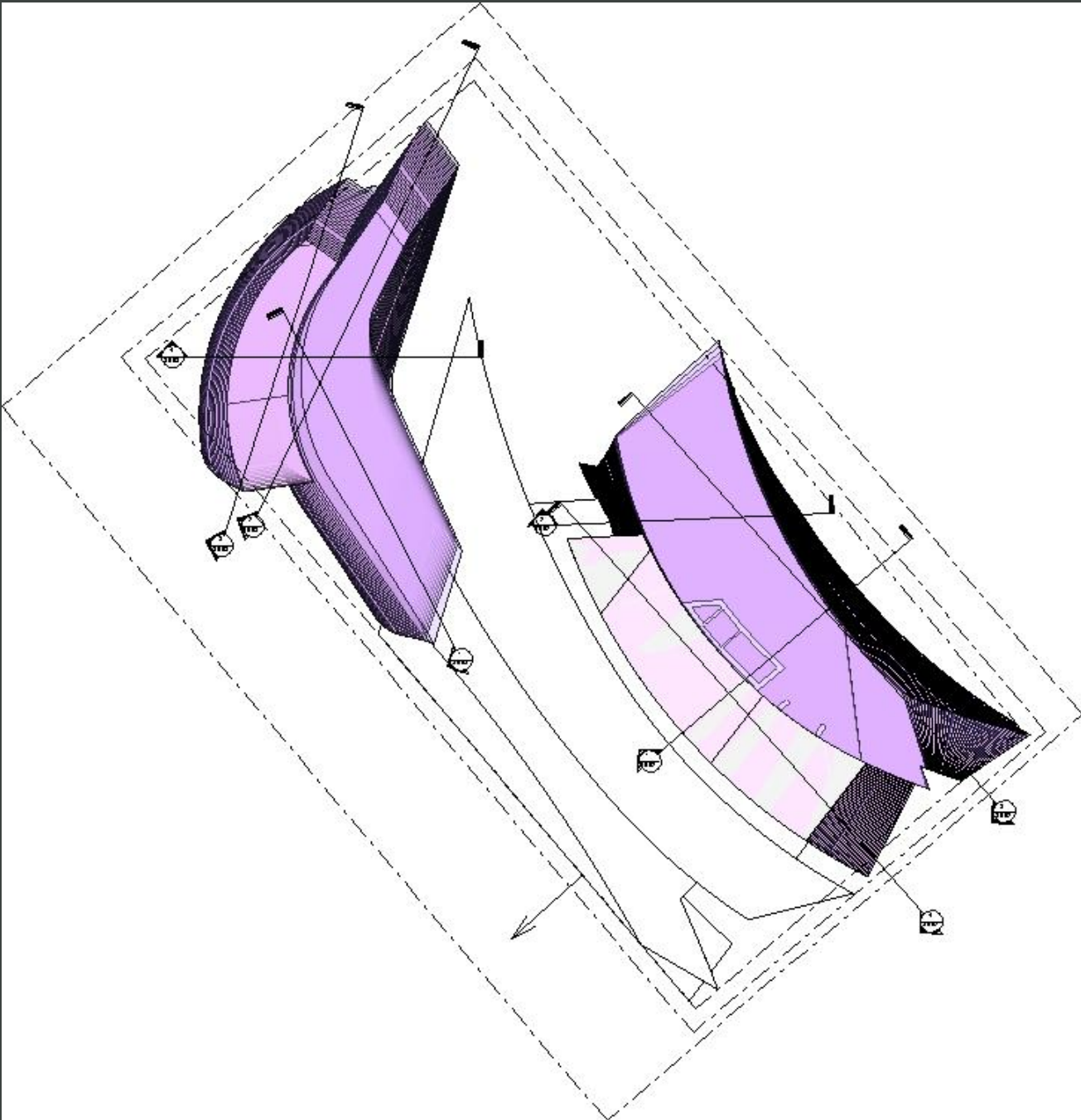


Abu Dhabi Dancing Towers









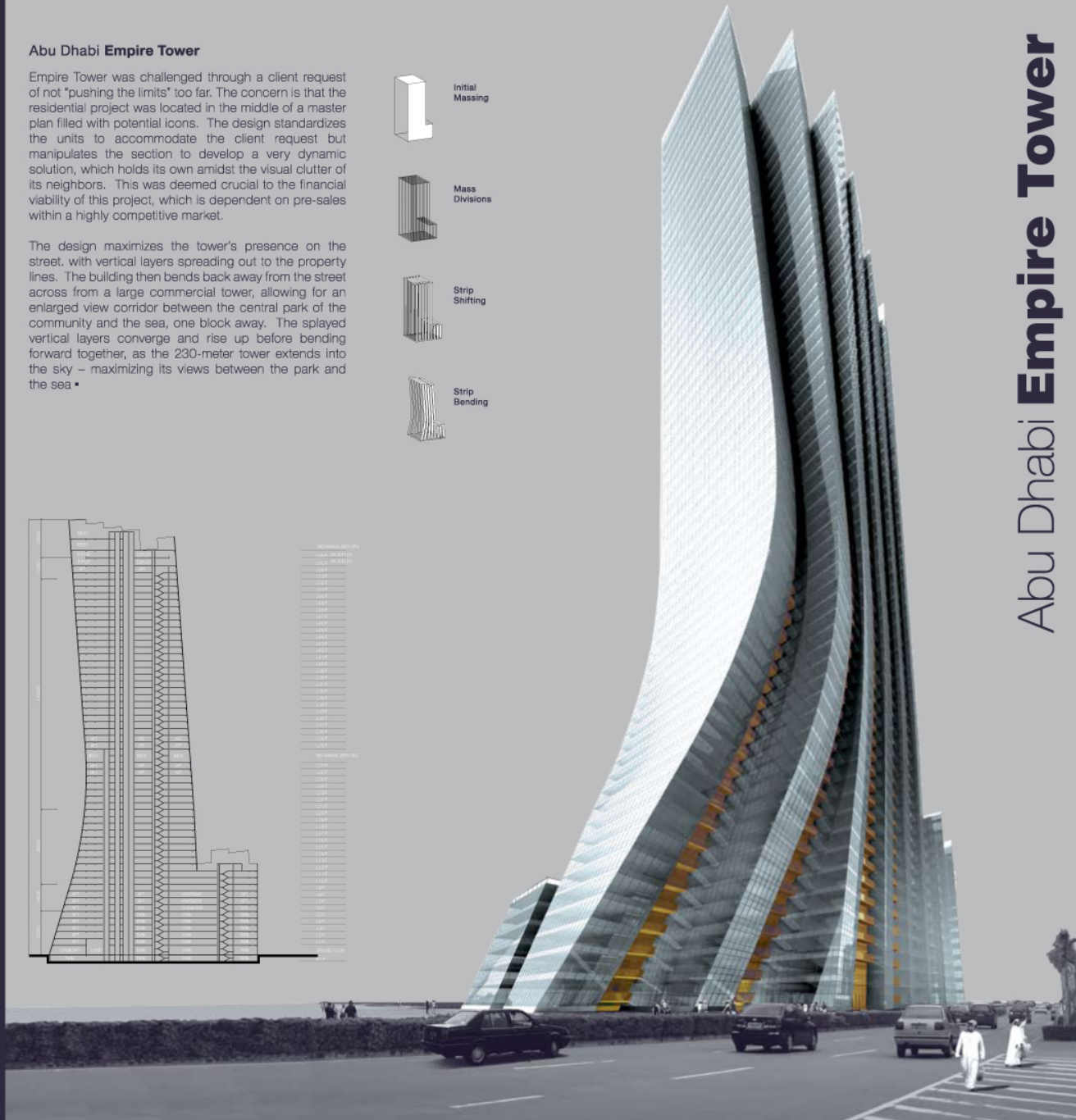
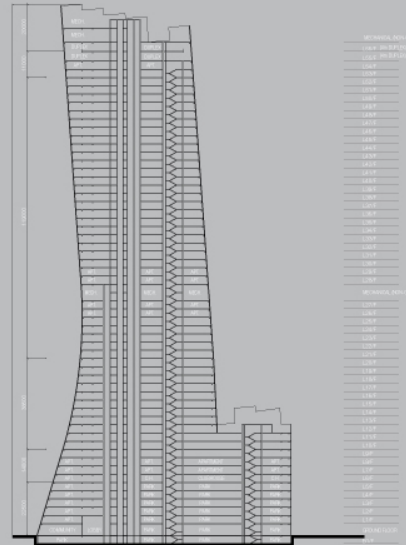


Program: Residential, Site Area 7,007 sqm
Floor Area 90,206 sqm, Building Height 225 m

Abu Dhabi Empire Tower

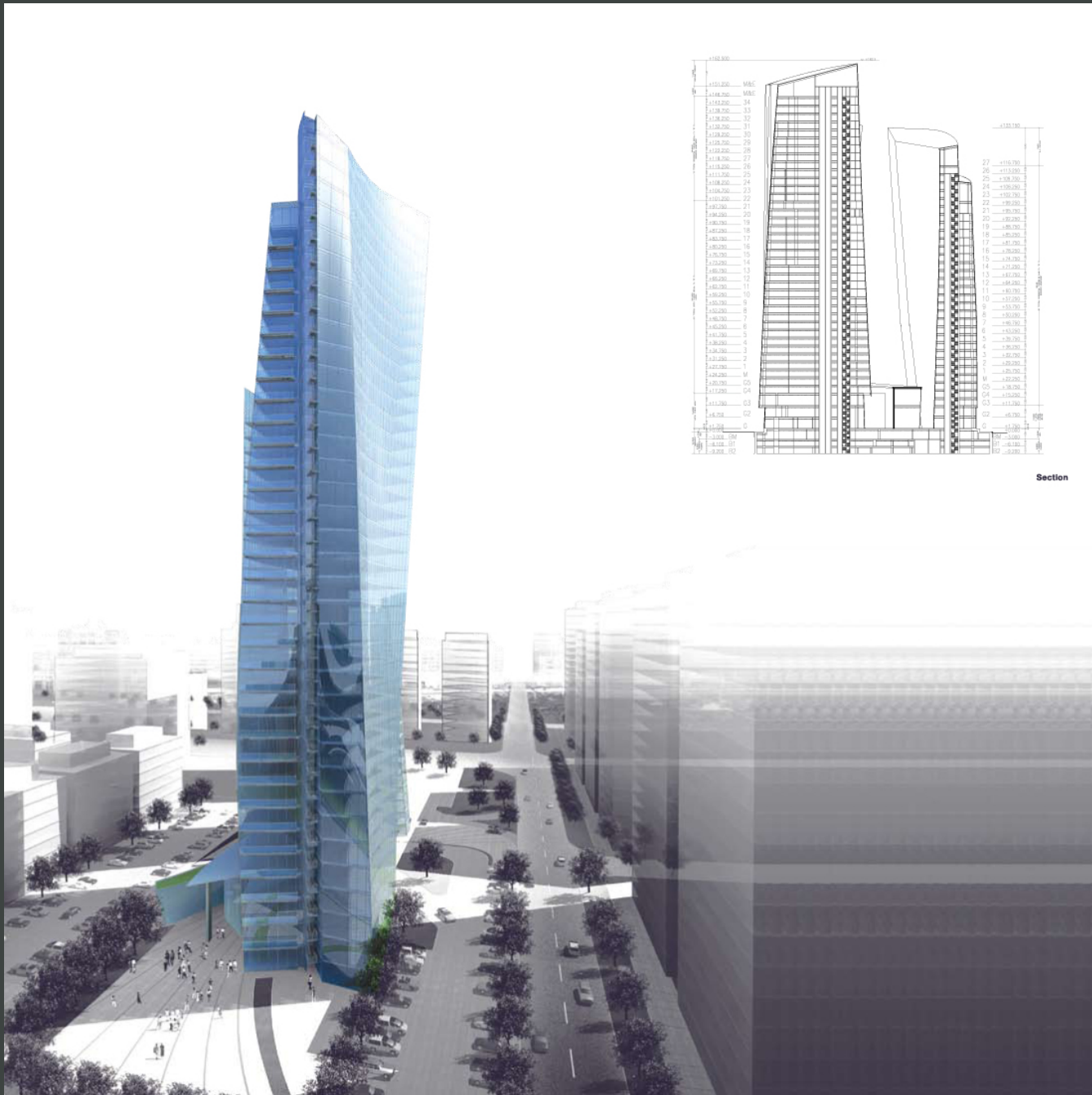
Empire Tower was challenged through a client request of not "pushing the limits" too far. The concern is that the residential project was located in the middle of a master plan filled with potential icons. The design standardizes the units to accommodate the client request but manipulates the section to develop a very dynamic solution, which holds its own amidst the visual clutter of its neighbors. This was deemed crucial to the financial viability of this project, which is dependent on pre-sales within a highly competitive market.

The design maximizes the tower's presence on the street, with vertical layers spreading out to the property lines. The building then bends back away from the street across from a large commercial tower, allowing for an enlarged view corridor between the central park of the community and the sea, one block away. The splayed vertical layers converge and rise up before bending forward together, as the 230-meter tower extends into the sky – maximizing its views between the park and the sea •



Abu Dhabi Empire Tower

Aedas

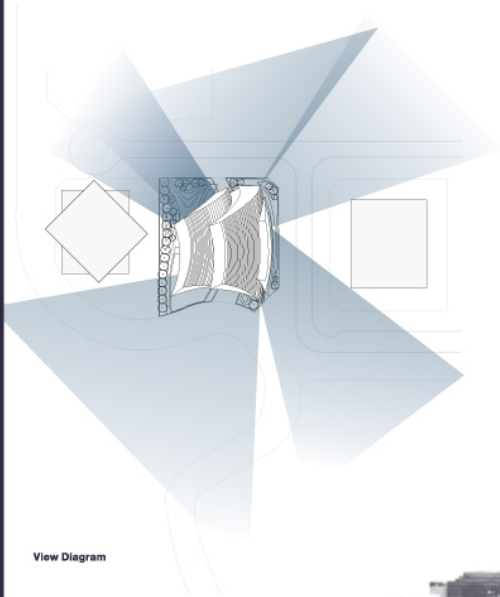




Dubai Ocean Heights Two

Ocean Heights Two is also located in Dubai Marina, UAE, along with its sister project, Ocean Heights One. At 460 meters in height and 105 floors, it will be the tallest tower in its vicinity. However, unlike its predecessor, the requirements for more modulated units up to the 60th floor, forced a different approach while intending to maintain the spirit of its sister.

The first 60th floors of the tower are intended to be service apartments, which in order to be marketable, needed to have the majority of units standardized. The curved shape of the tower improves views past its densely located neighbors. The playfulness of this tower was concentrated into the two most visible faces, allowing units to bend up the tower in two blades. These blades were still modulated up to the 60th floor before the tight restrictions of unit area fluctuations become more relaxed. At this point, the modules drop off and the blades continue, tapering and bending into the sky ■

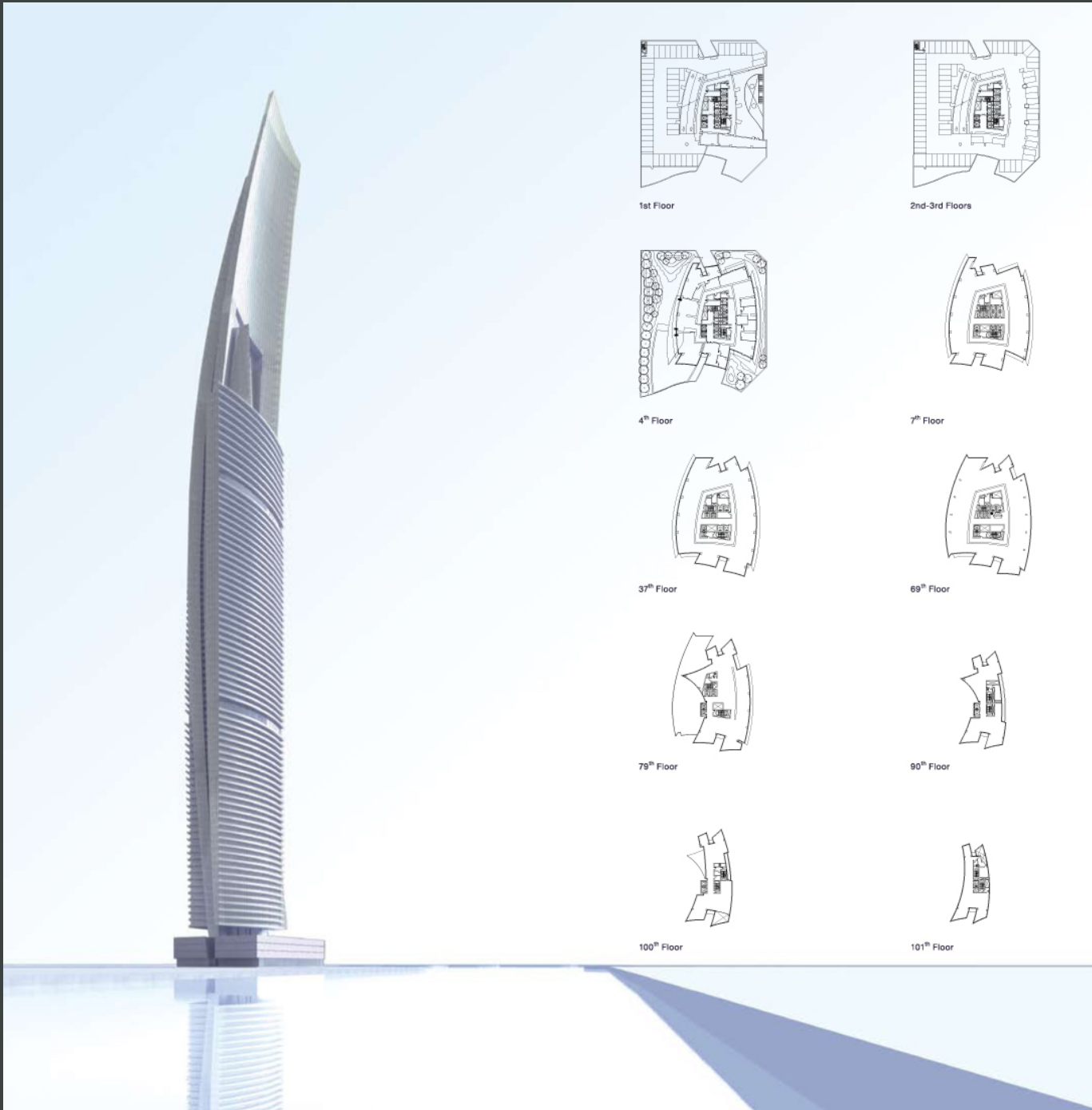


View Diagram

Program Residential Site Area 3,463sqm
Floor Area 197,979 sqm Building Height 460 m

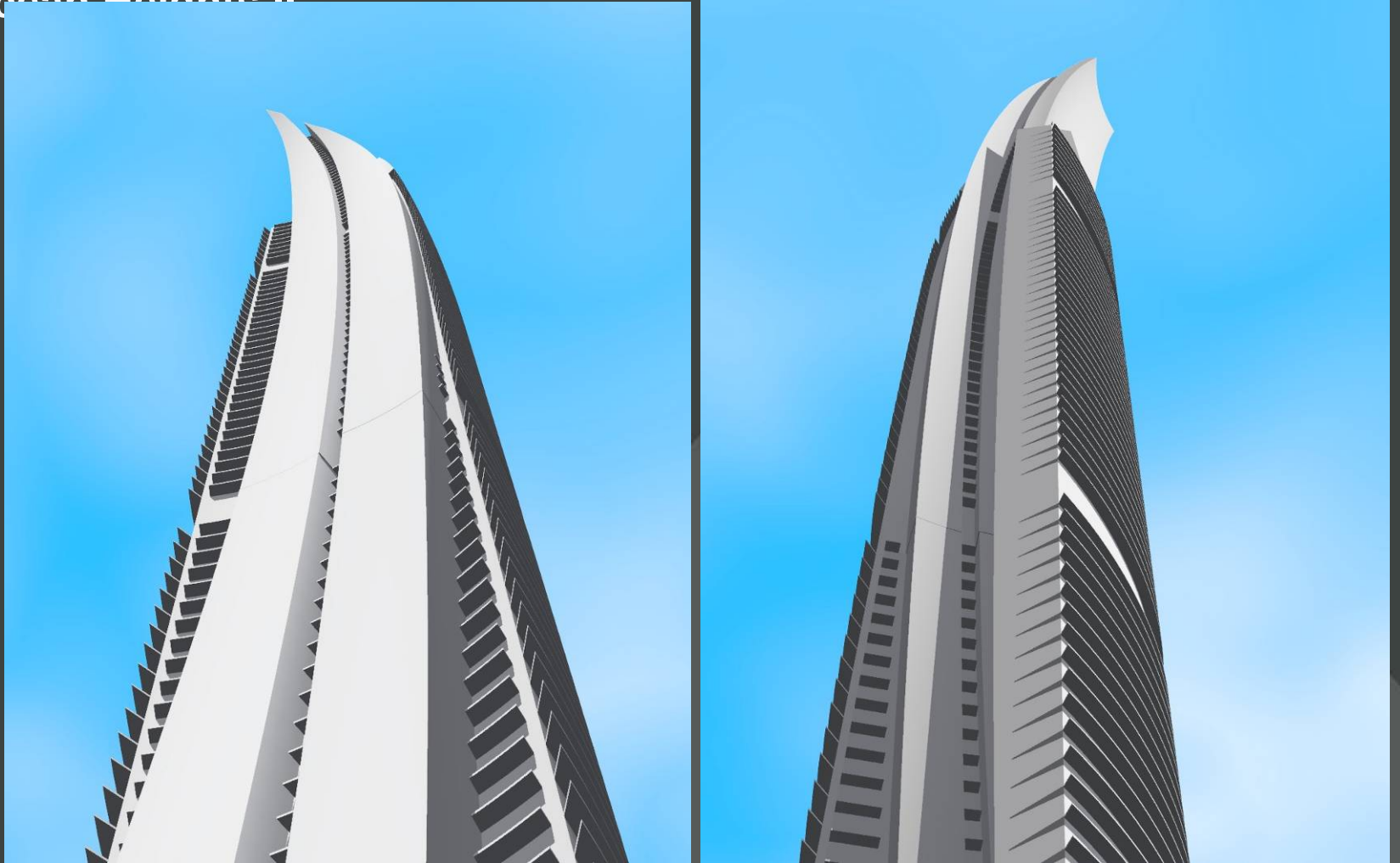
Dubai Ocean Heights Two





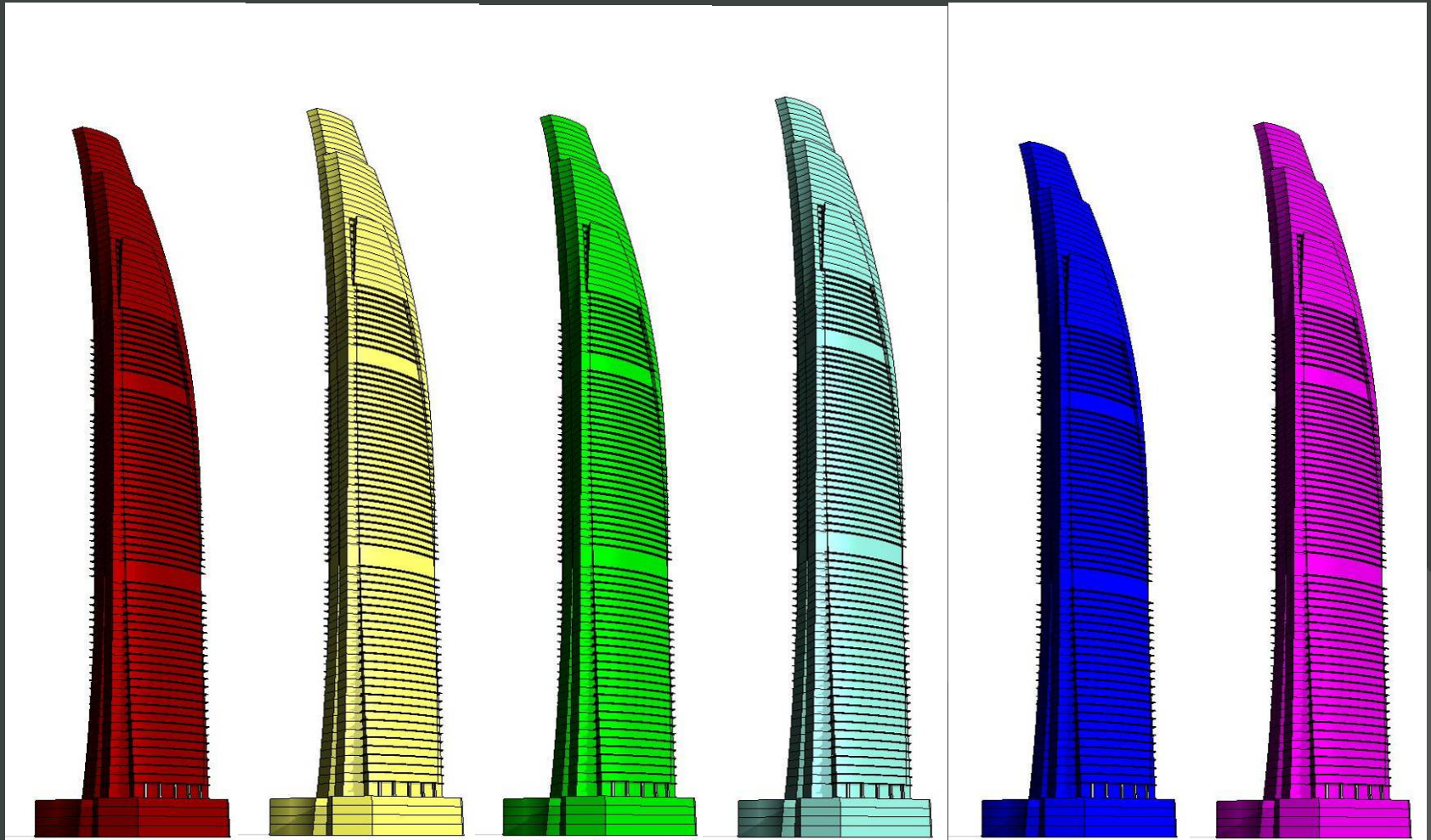


Ocean Heights II



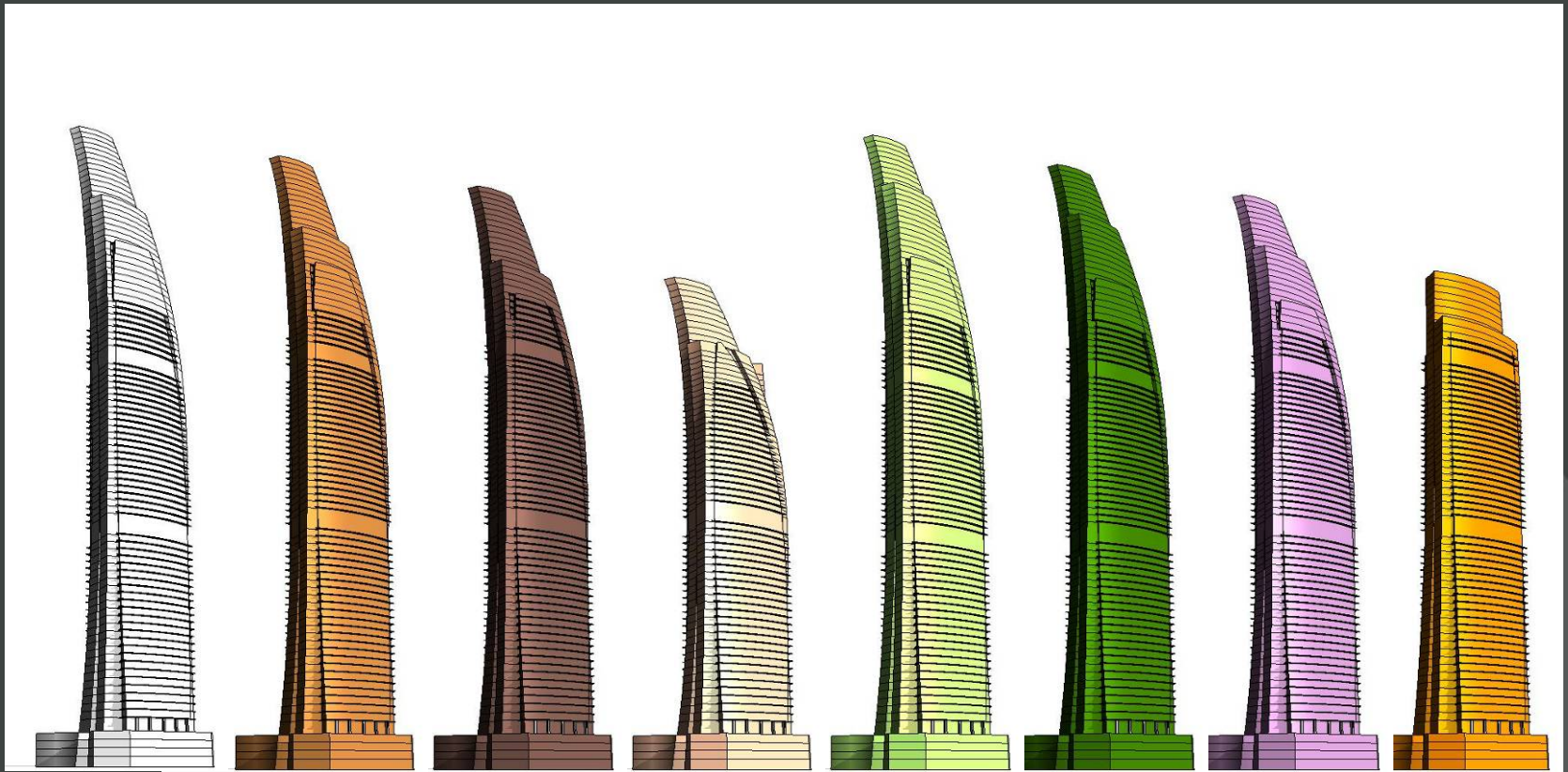


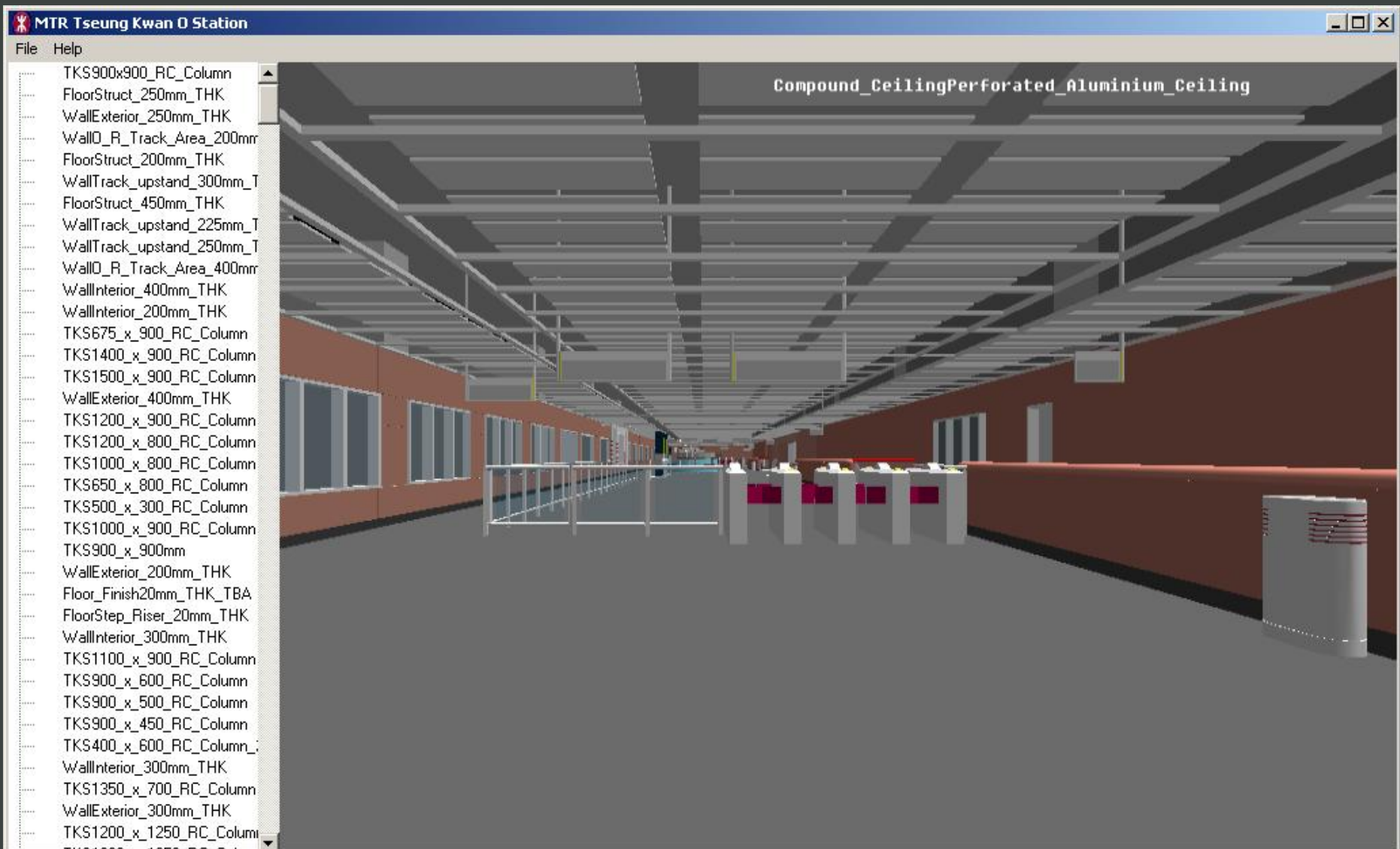
Ocean Heights II – Options

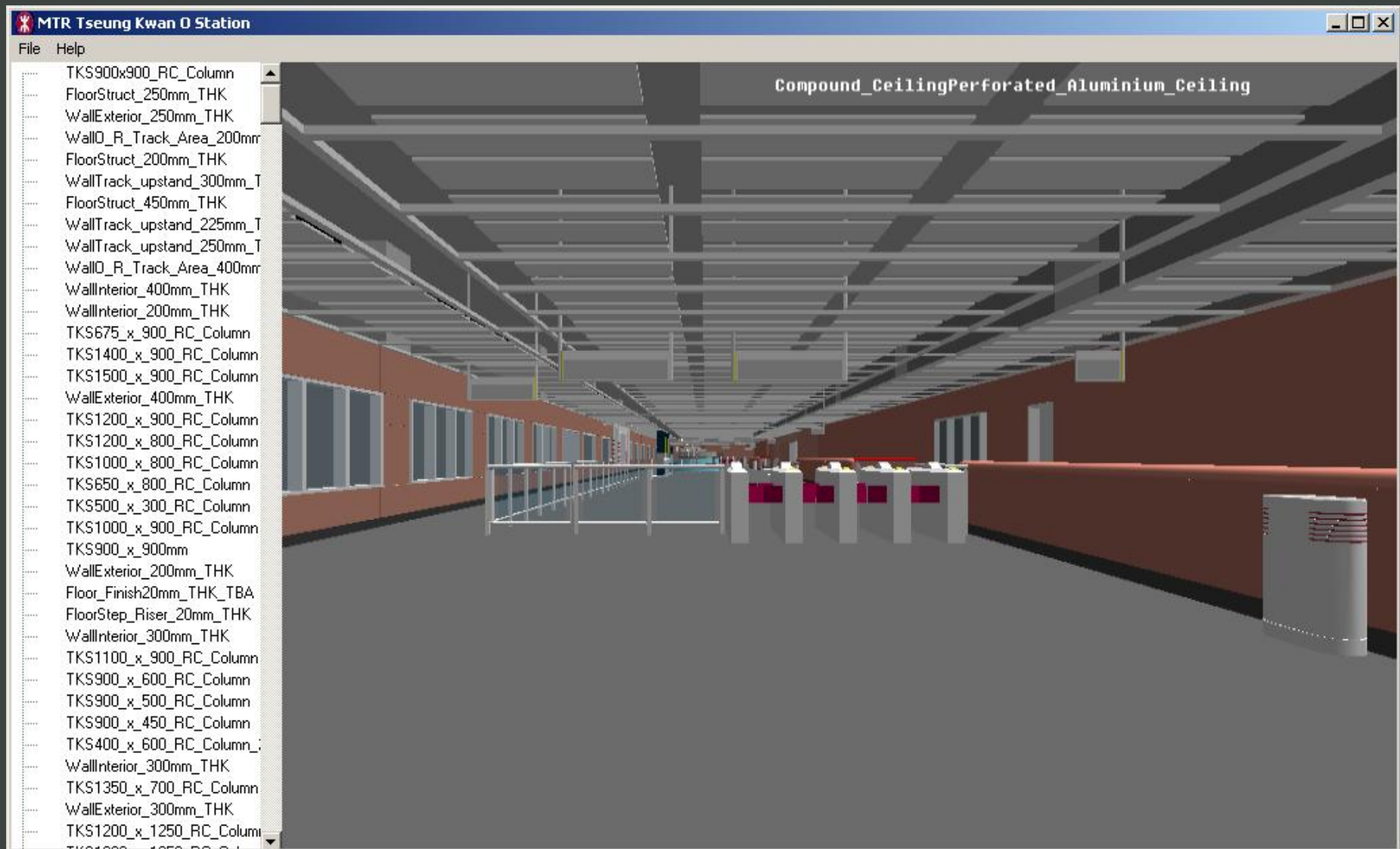




Ocean Heights II – Options









MTR Tseung Kwan O Station

File Help

- TKS900x900_RC_Column
- FloorStruct_250mm_THK
- WallExterior_250mm_THK
- WallO_R_Track_Area_200mm
- FloorStruct_200mm_THK
- WallTrack_upstand_300mm_T
- FloorStruct_450mm_THK
- WallTrack_upstand_225mm_T
- WallTrack_upstand_250mm_T
- WallO_R_Track_Area_400mm
- WallInterior_400mm_THK
- WallInterior_200mm_THK
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- TKS1400_x_900_RC_Column
- TKS1500_x_900_RC_Column
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- TKS500_x_300_RC_Column
- TKS1000_x_900_RC_Column
- TKS900_x_900mm
- WallExterior_200mm_THK
- Floor_Finish20mm_THK_TBA
- FloorStep_Riser_20mm_THK
- WallInterior_300mm_THK
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- TKS900_x_600_RC_Column
- TKS900_x_500_RC_Column
- TKS900_x_450_RC_Column
- TKS400_x_600_RC_Column
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- TKS1200_x_1250_RC_Column

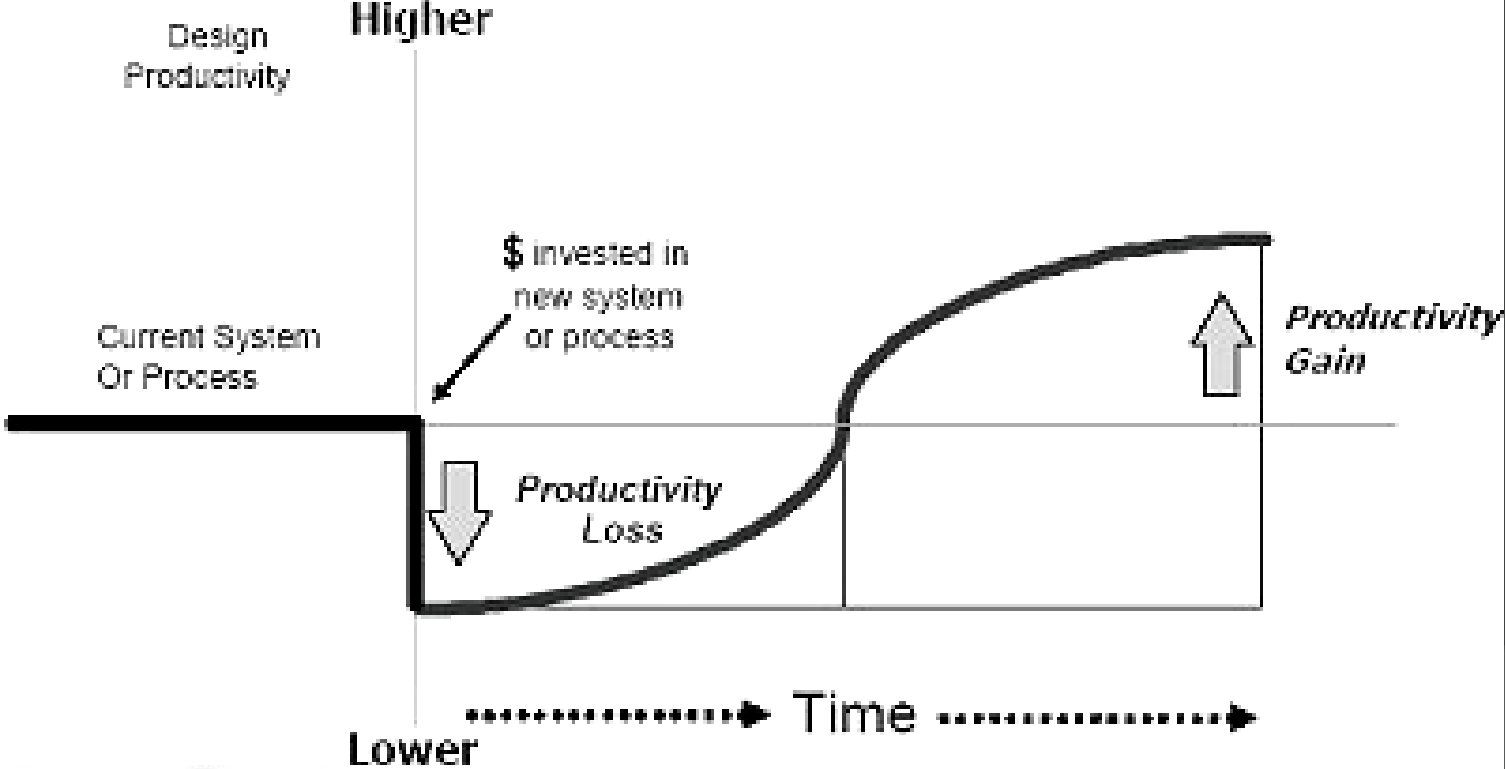
Station Property Detail

Item :	Floor_Mount_Information_SignINF_1
Type :	Perforated Aluminium Ceiling
Station :	Tseung Kwan O South Station
Location :	Platform South Entrance
Installed Date :	15 January, 2003
Installed By :	ABC Engineering Company
Manufacturer :	Aluminium Ceiling Factory
Item WebLink :	http://ACF.com
History :	3 years 11 months
Department :	Operation and Facility Control
Description :	Item is under normal situation



建築行業在改變嗎？





$$\frac{(B - (\frac{B}{1+E})) \times (12 - C)}{A + (B \times C \times D)} = \text{First Year ROI}$$

A = cost of hardware and software (dollars)	
B = monthly labor cost (dollars)	
C = training time (months)	
D = productivity lost during training (percentage)	
E = productivity gain after training (percentage)	

A = cost of hardware and software	\$6,000
B = monthly labor cost	\$4,200
C = training time	3 months
D = productivity loss during training	50%
E = productivity gain after training	25%

Source 26/1/07:
<http://aec.cadalyst.com/aec/article/articleDetail.jsp?id=12422>

生產效率 > 60%



Design and Construction

• Overview

• Architecture & Engineering

• CAD Standards

▶ 3D-4D Building Information Modeling

3D-4D-BIM Overview

Spatial Program Validation

4D Phasing

3D Laser Scanning

Energy and Sustainability

BIM Library

• Commissioning

• Construction Excellence

• Design Excellence and the Arts

• Facility Access for the Disabled

• Sustainable Design

• Urban Development

• Design and Construction Delivery Process

[Home](#) > [Buildings](#) > [Public Buildings](#) > [Design and Construction](#) > 3D-4D Building Information Modeling

3D-4D Building Information Modeling

Since 2003, the General Services Administration (GSA) through its Public Buildings Service (PBS) Office of Chief Architect (OCA) has established the National 3D-4D-BIM Program. OCA has completed 10 pilot projects. It has 11 pilot projects underway in its current capital program, while assessing and supporting 3D, 4D, Building Information Modeling (BIM) applications in over 25 ongoing projects across the nation. The power of visualization, coordination, simulation, and optimization from three-dimensional (3D), four-dimensional (4D), and BIM computer technologies allow GSA to more effectively meet customer, design, construction, and program requirements. GSA is committed to a strategic and incremental adoption of 3D, 4D, BIM technologies.

There is a progression from 2D to 3D, 4D and BIM. While 3D models make valuable contributions to communications, not all 3D models qualify as BIM models since a 3D geometric representation is only part of the BIM concept.

Critical to successful integration of computer models into project coordination, simulation, and optimization is the inclusion of information—the "I" in BIM—to generate feedback. As a shared knowledge resource, BIM can serve as a reliable basis for decision making and reduce the need for re-gathering or re-formatting information. GSA is currently exploring the use of BIM technology throughout a project's lifecycle in the following areas: spatial program validation, 4D phasing, laser scanning, energy and sustainability, and courts design validation.

For all major projects (prospectus-level) receiving design funding in Fiscal Year 2007 and beyond, GSA will require spatial program BIMs be the minimum requirements for submission to OCA for Final Concept approvals by the PBS Commissioner and the Chief Architect. At the same time, all GSA projects are encouraged to deploy mature 3D, 4D, and BIM technologies—spatial program validation and beyond—at strategic project phases in support of specific project challenges.

[BIM Program Flyer](#)

The following are highlights of the GSA National 3D-4D-BIM Program:

- Established policy to phase in 3D, 4D, and BIM adoption for all major projects
- Leading 3D-4D-BIM pilot application on current capital projects
- Providing expert support and assessment for ongoing capital projects to incorporate 3D, 4D, and BIM technologies
- Assessing industry readiness and technology maturity
- Developed GSA-specific incentives for 3D-4D-BIM
- Developed solicitation and contractual language for 3D-4D-BIM services
- Partnered with BIM vendors, professional associations, open standard organizations, and academic/research institutions

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