

BIM 為建築行業帶來的衝擊

馮樹堅 註冊建築師

Senior Associate, BIM Division Head; Registered Architect, HKIA, AIAB

Aedas Ltd 凱達

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 Quantities 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

Word
g Schedules

Door/Window/Louvre Sch

Excel (spreadsheet)

Beam/Column Schedule

Access (Data Base)

MS Project

BQ Softwares

Quantity Take Off

Bills of Quantities

Variations

Information

Graphical

Non-Graphical

BIM

Building Information Modeling

信息化建筑模型

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

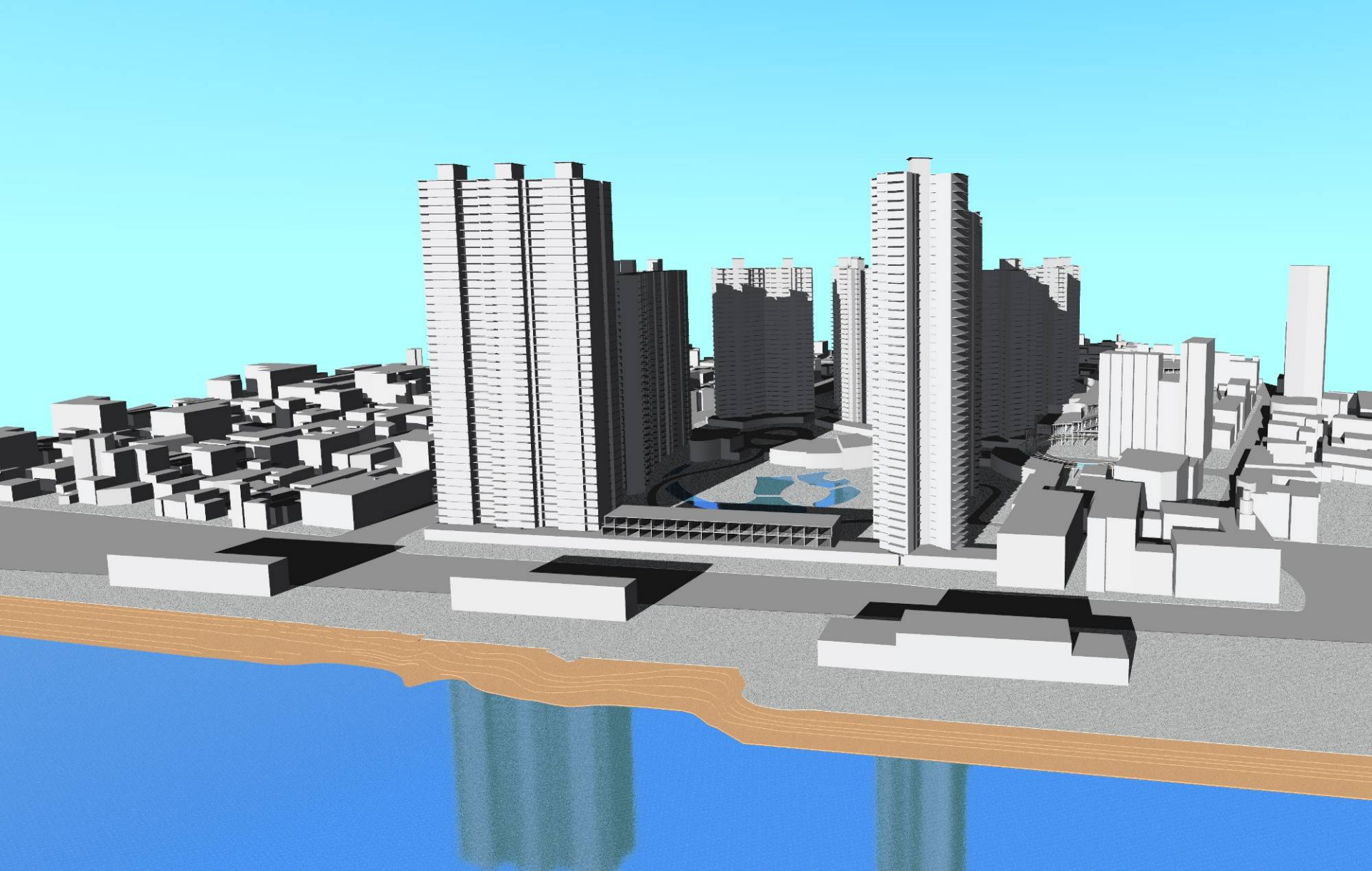
- Area Schedule
- Finishing Schedules
- Door/Window/Louvre Sch
- Beam/Column Schedule
- Equipment Schedule
- Cost Estimate
- Quantity Take Off
- Bills of Quantities
- Variations

BIM 的運用範圍

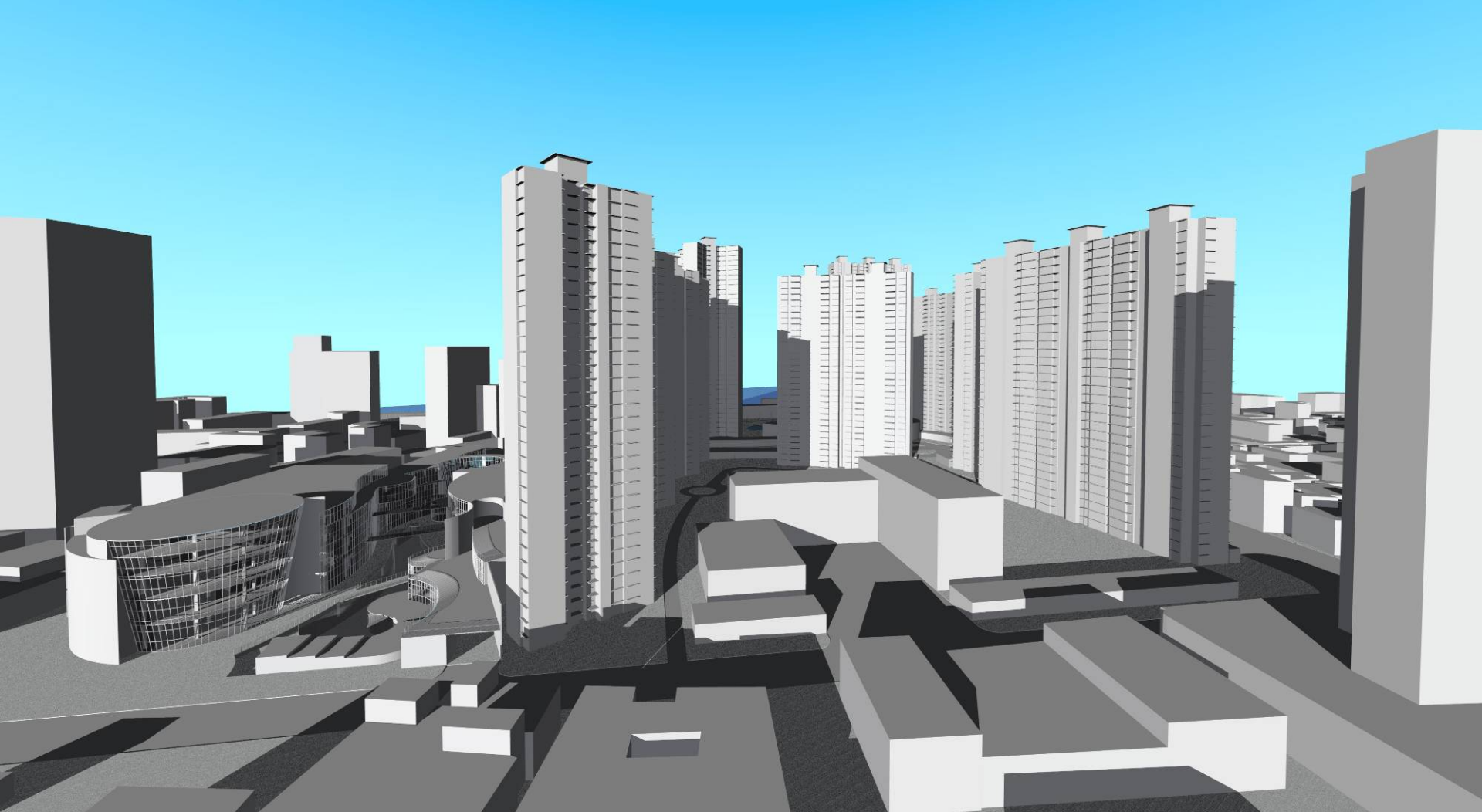
1. **Design visualization** 型像化設計
2. **Drawing Productions** 製作圖件
3. **Services Co-ordination and Clash detection with other disciplines** 各專業協調
4. **Quantity taking and preparation of Tender Document** 投標文件
5. **Automated Statutory Submission** 自動化審批
6. **Scientific analysis of different environmental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

BIM 的運用範圍

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** 生產製造
8. **Complex Geometry** 複雜幾何形狀



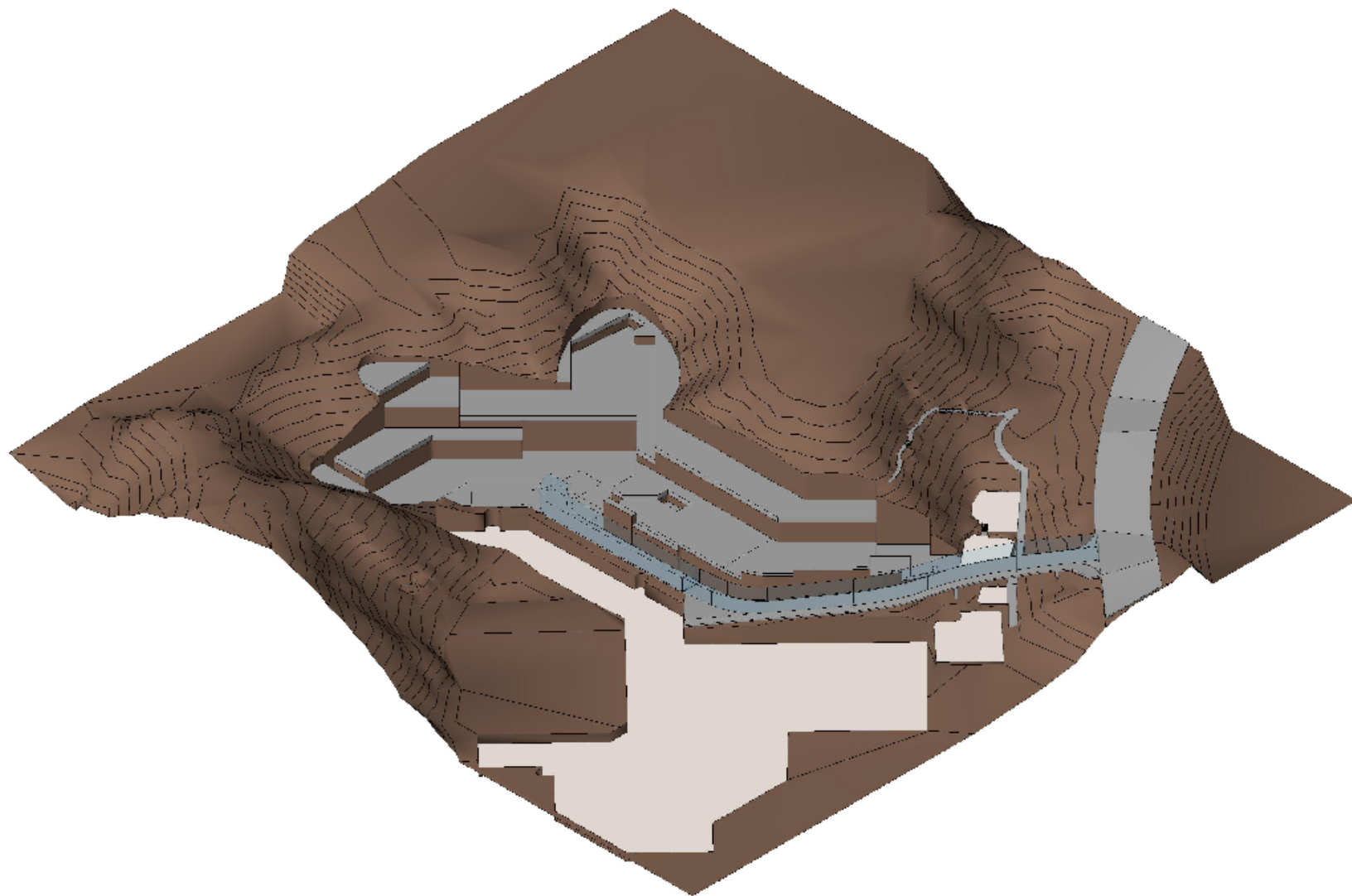
BUILDING IN CONTEXT



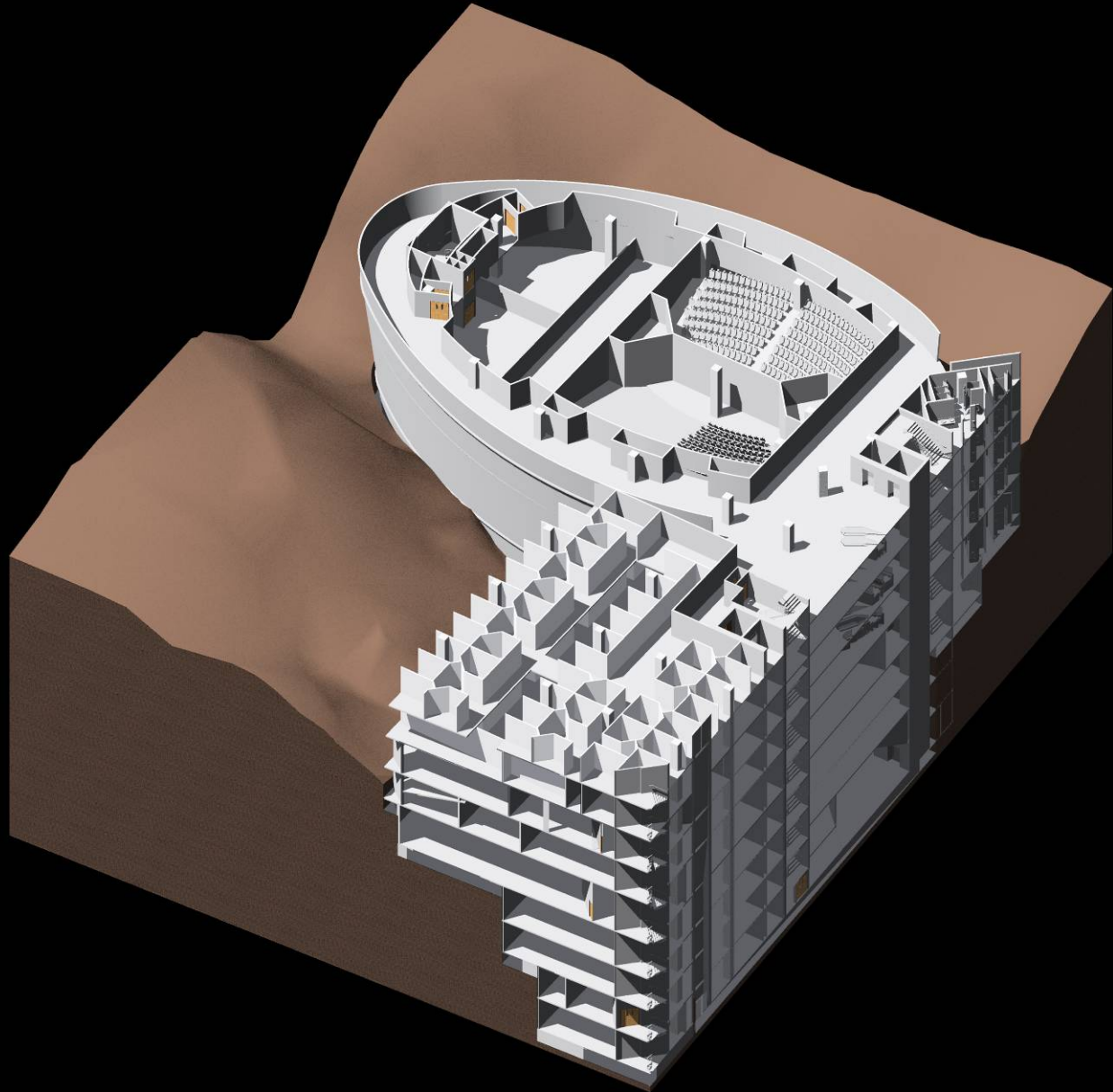
BUILDING IN CONTEXT

BUILDING IN GOOGLE EARTH





TOPOGRAPHY HANDLING



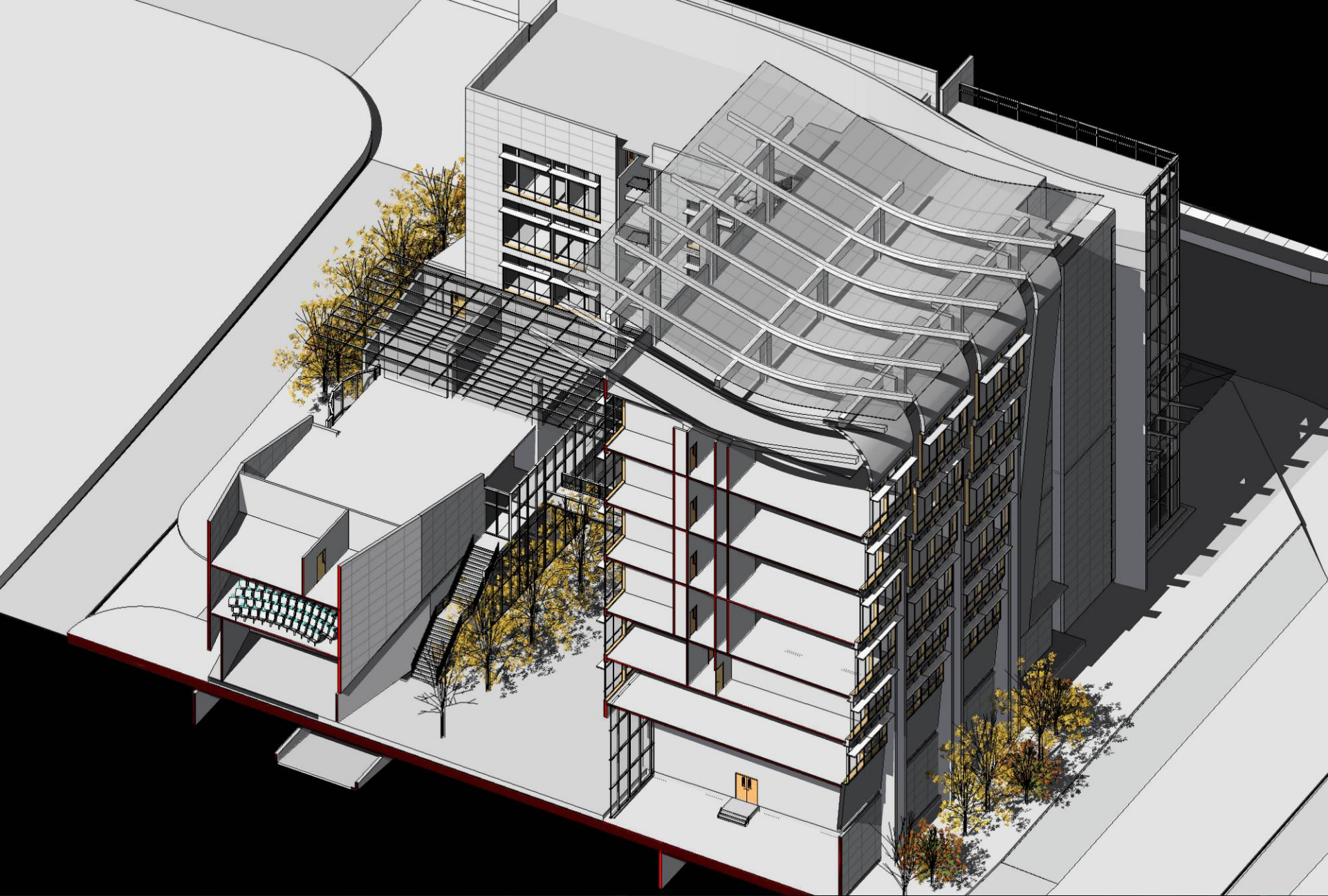
BUILDING IN SITE CONTEXT

VISUALIZATION & DRAWING PRODUCTION

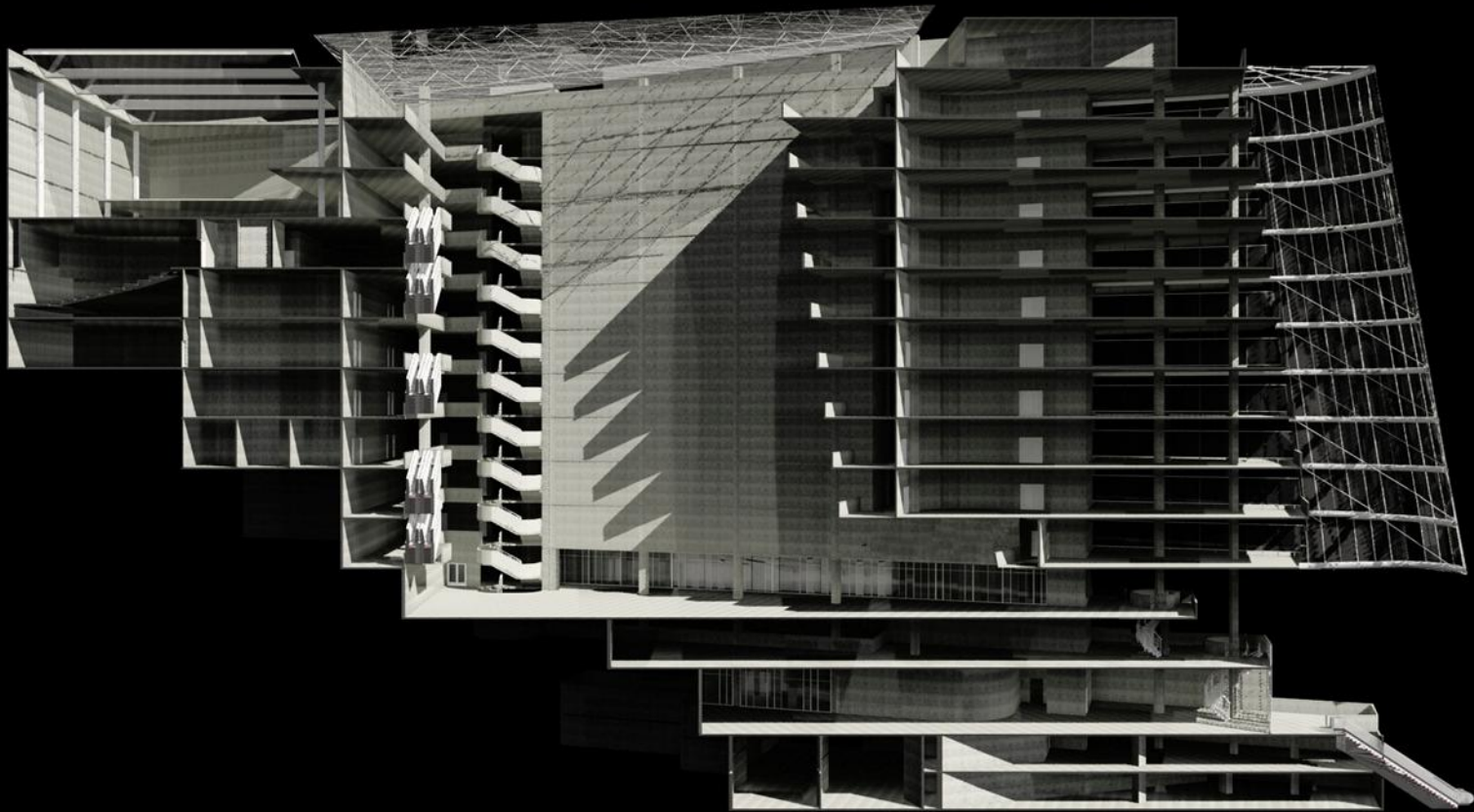


VISUALIZATION & DRAWING PRODUCTION





PERSPECTIVE



CUT AWAY PERSPECTIVE

VISUALIZATION & PRODUCTION



VISUALIZATION & PRODUCTION



VISUALIZATION & PRODUCTION

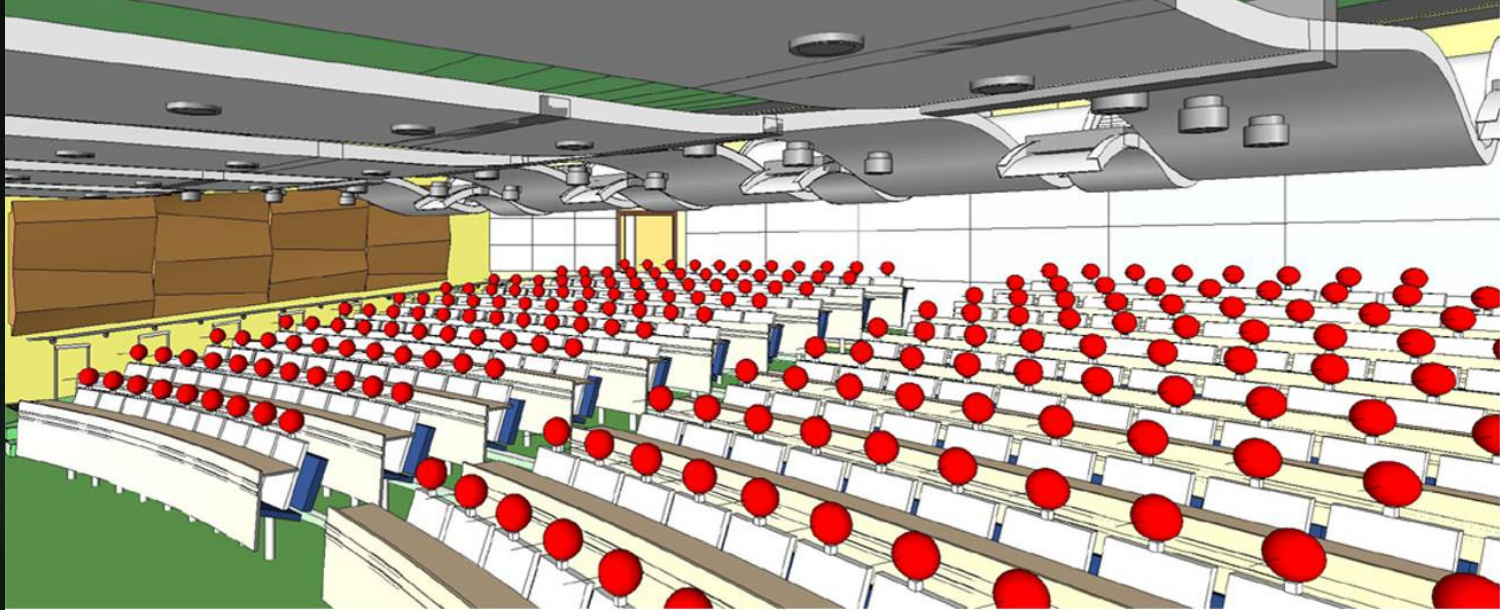


VISUALIZATION & PRODUCTION

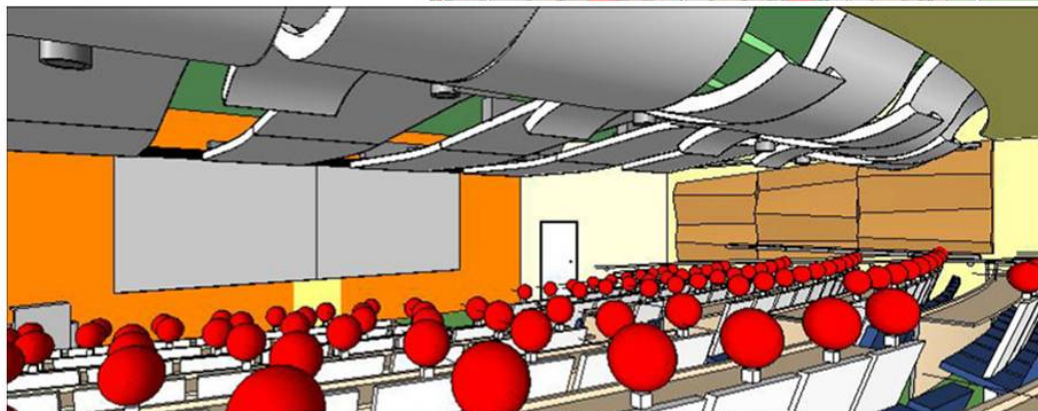


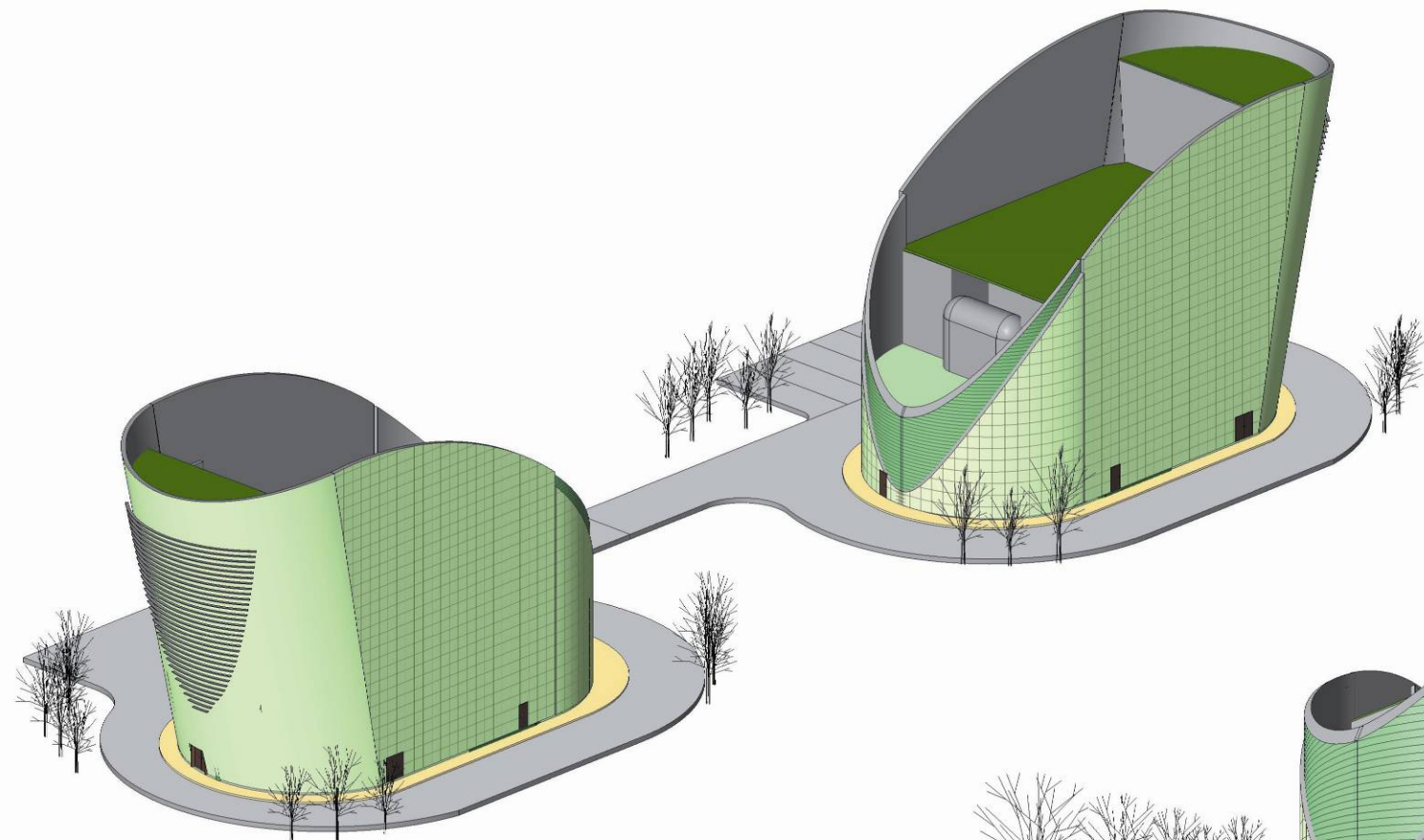


VISUALIZATION



Acoustical curved metal ceiling

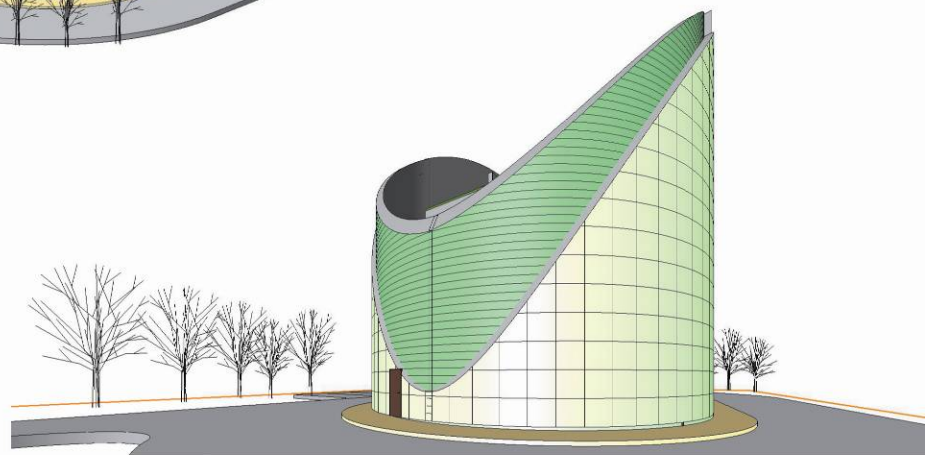




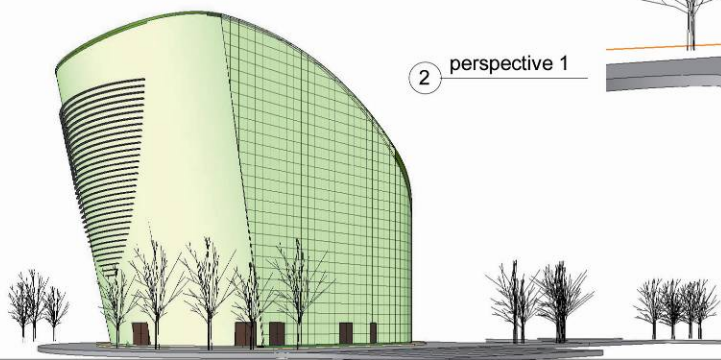
1 3D perspective

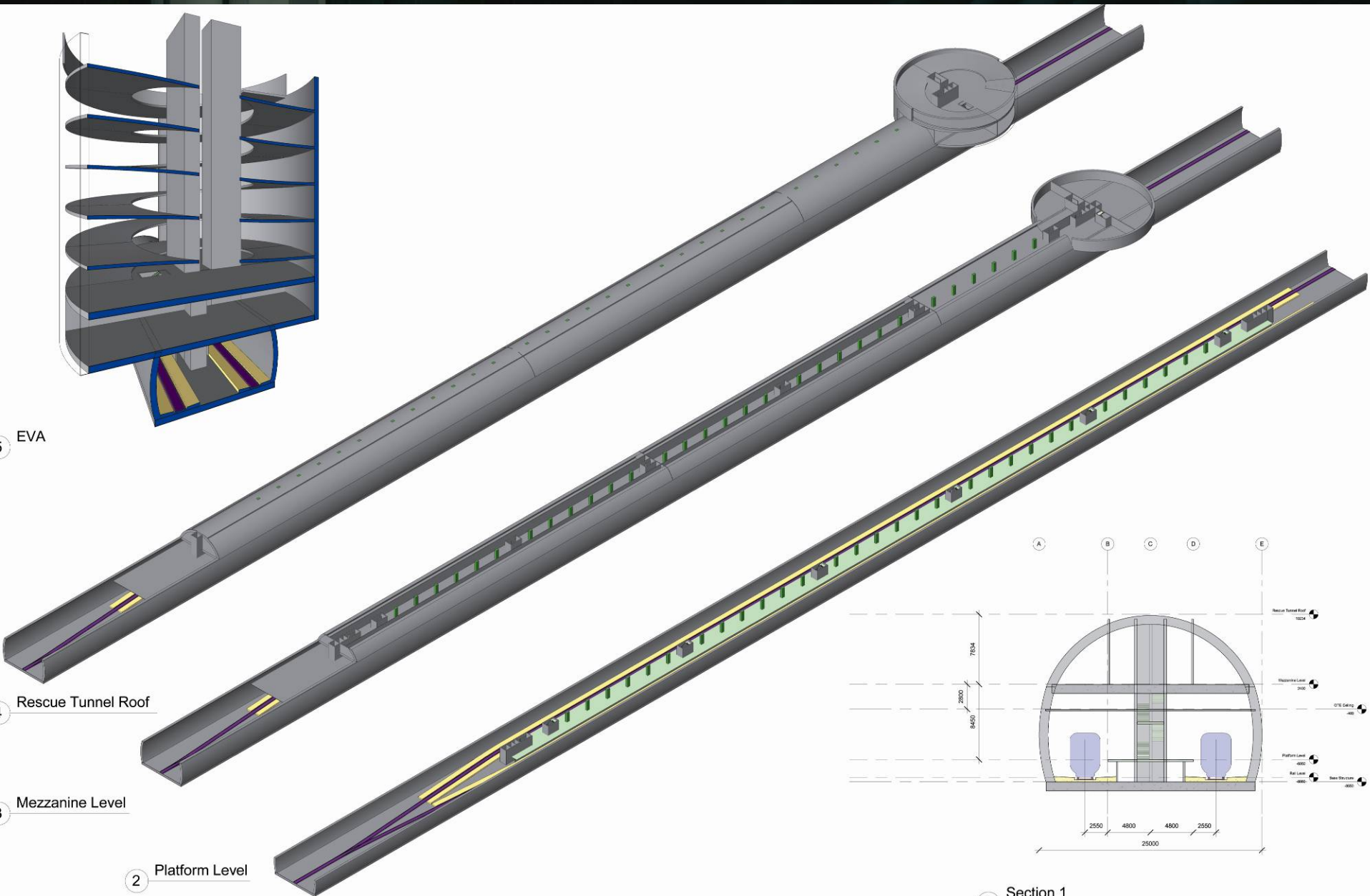


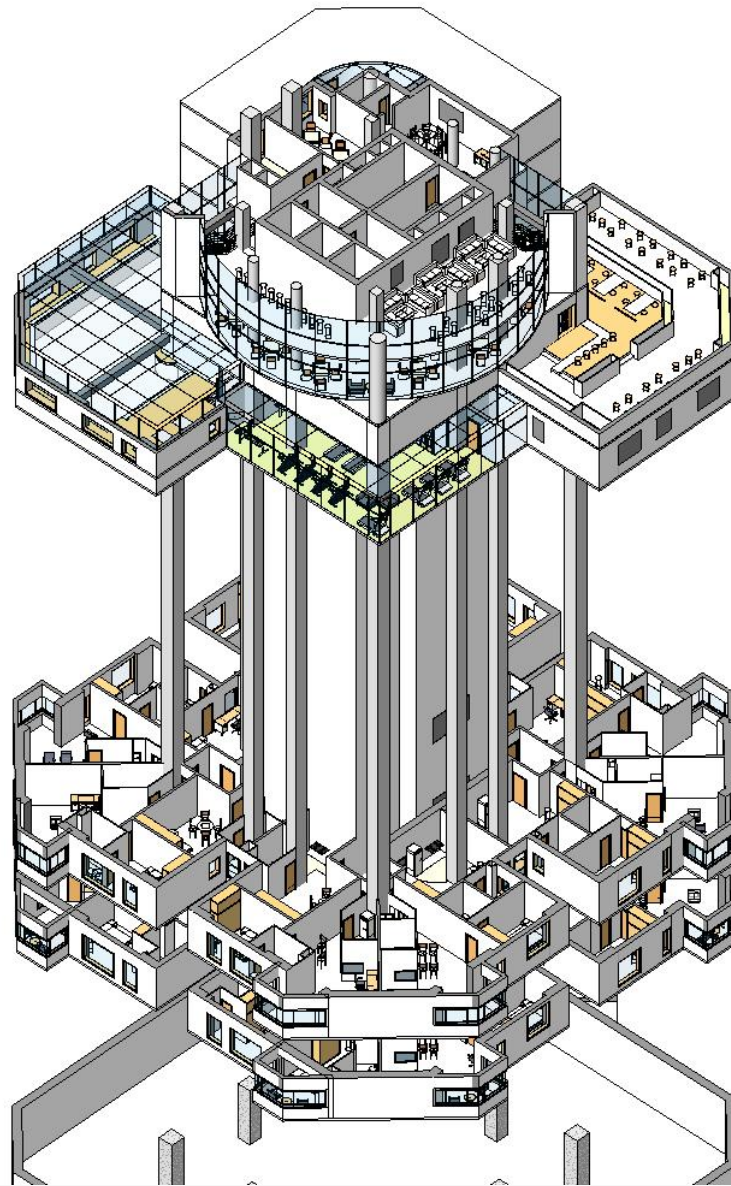
2 perspective 1



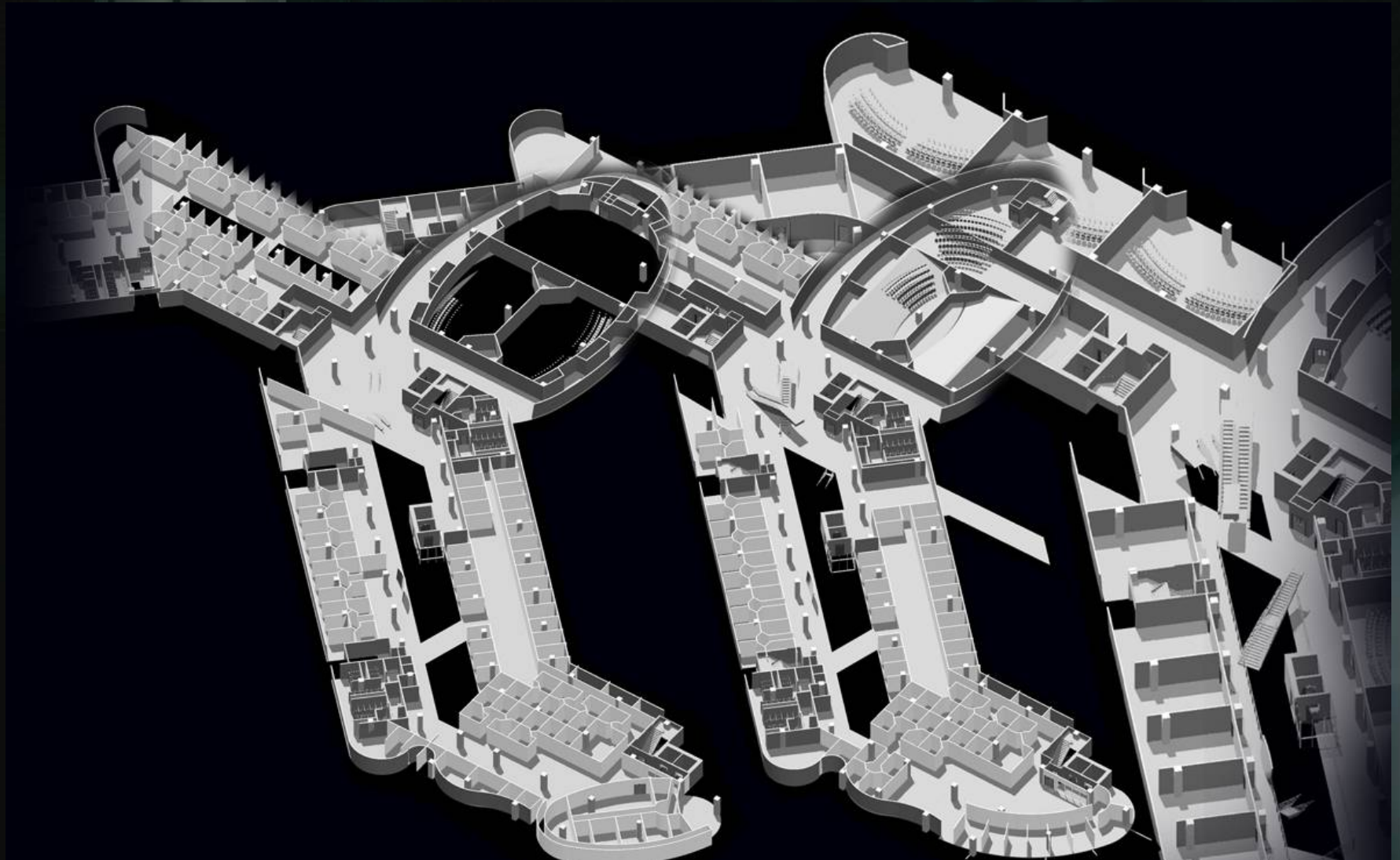
3 perspective 2







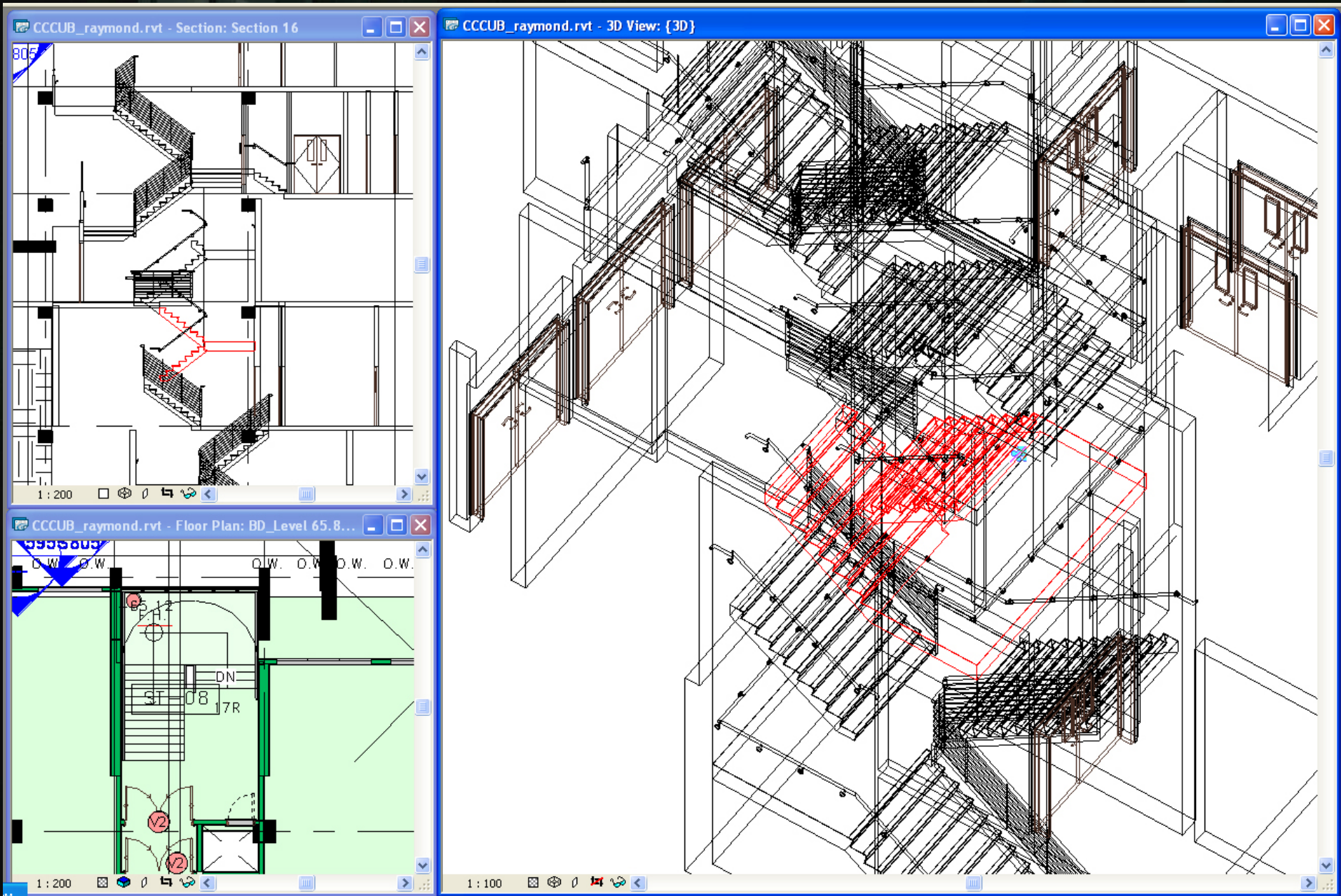
VERTICAL CO-ORDINATION



VERTICAL CO-ORDINATION



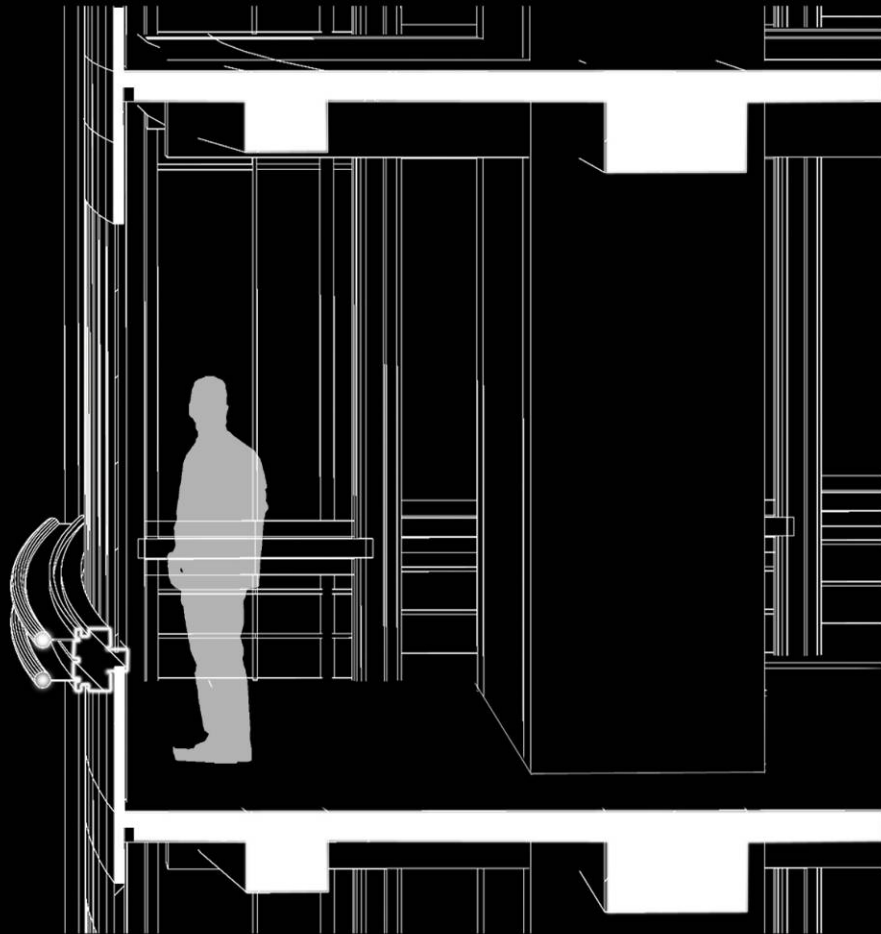
FAÇADE PANEL DESIGN



VERTICAL CO-ORDINATION



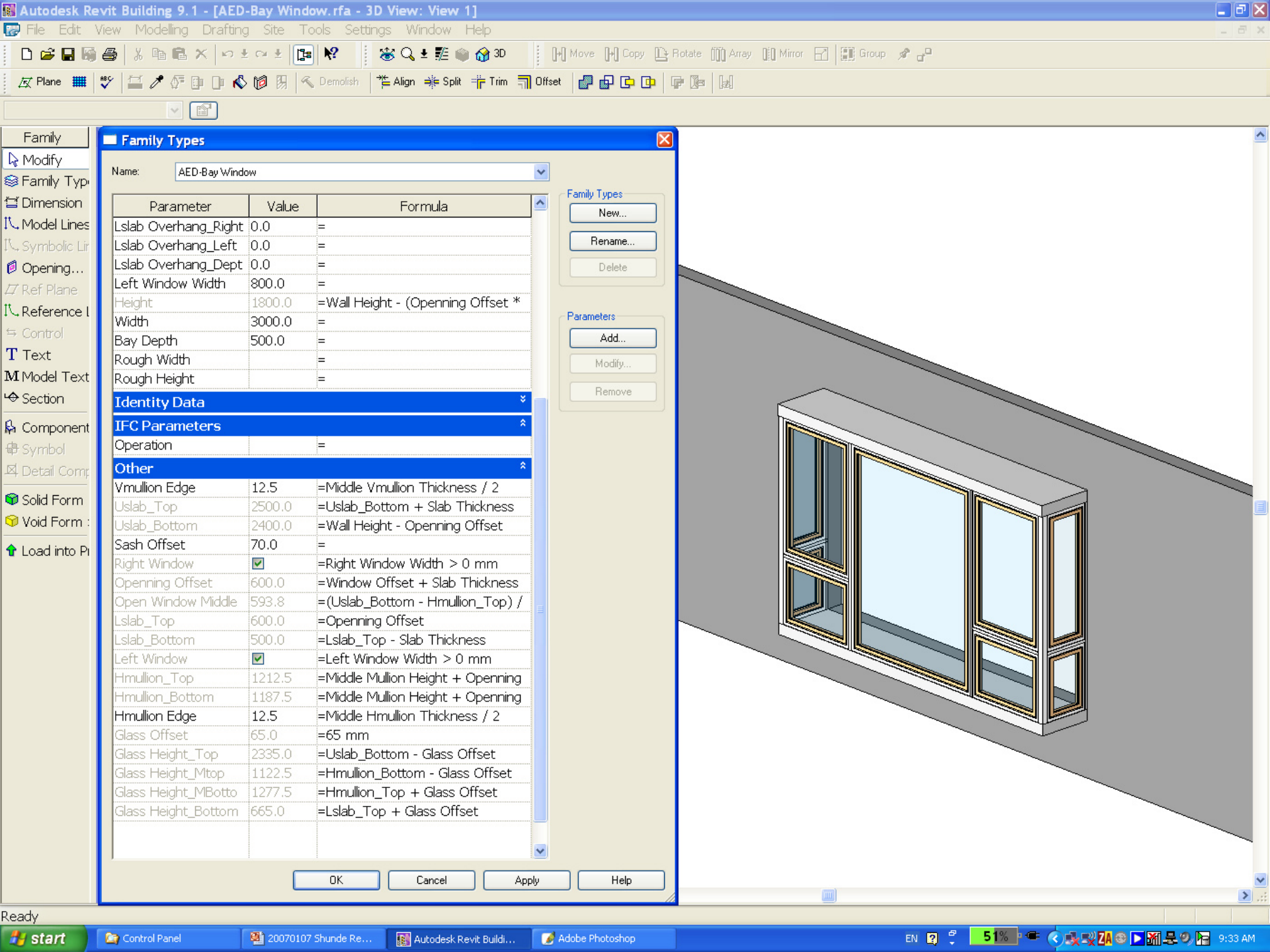
FAÇADE DESIGN and CO-ORDINATION



FAÇADE DESIGN and CO-ORDINATION



REPETITIONS vs VARIATIONS

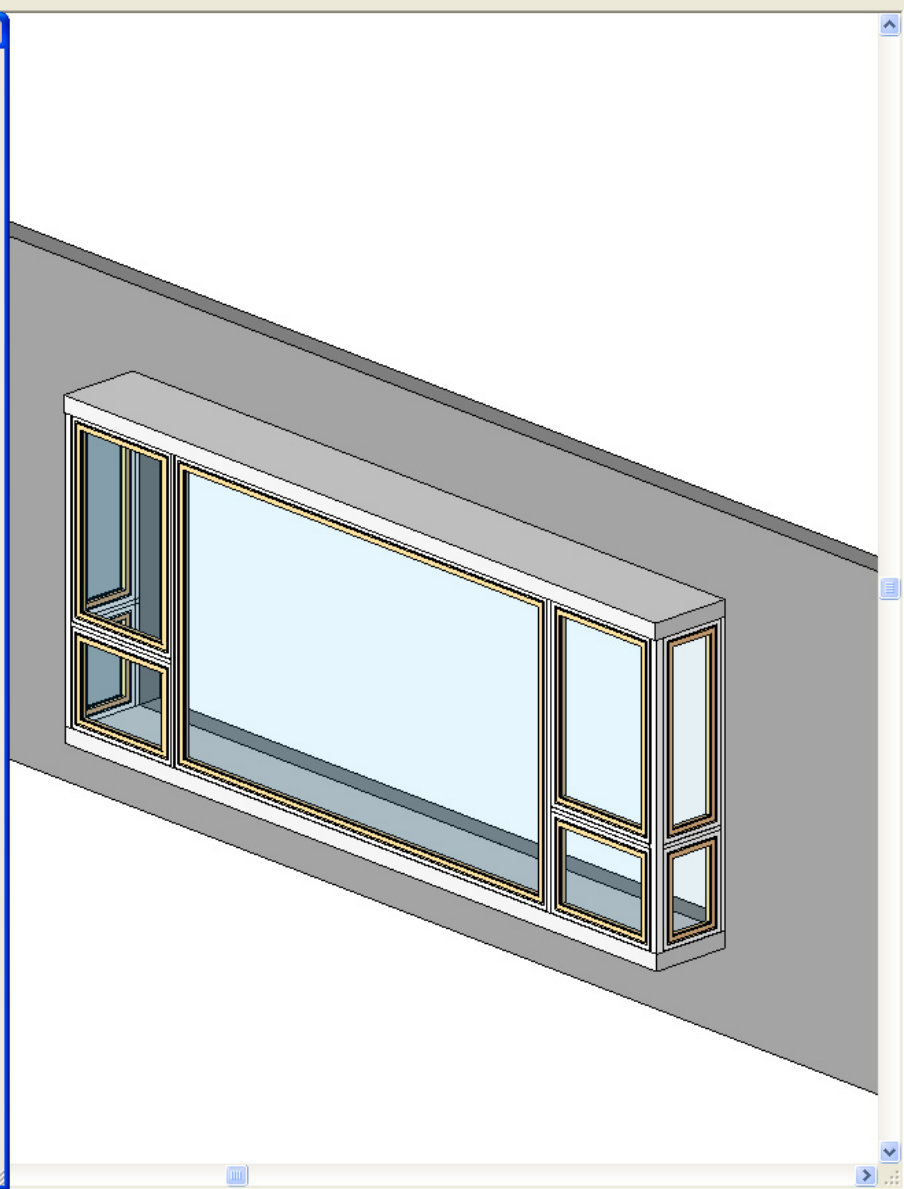


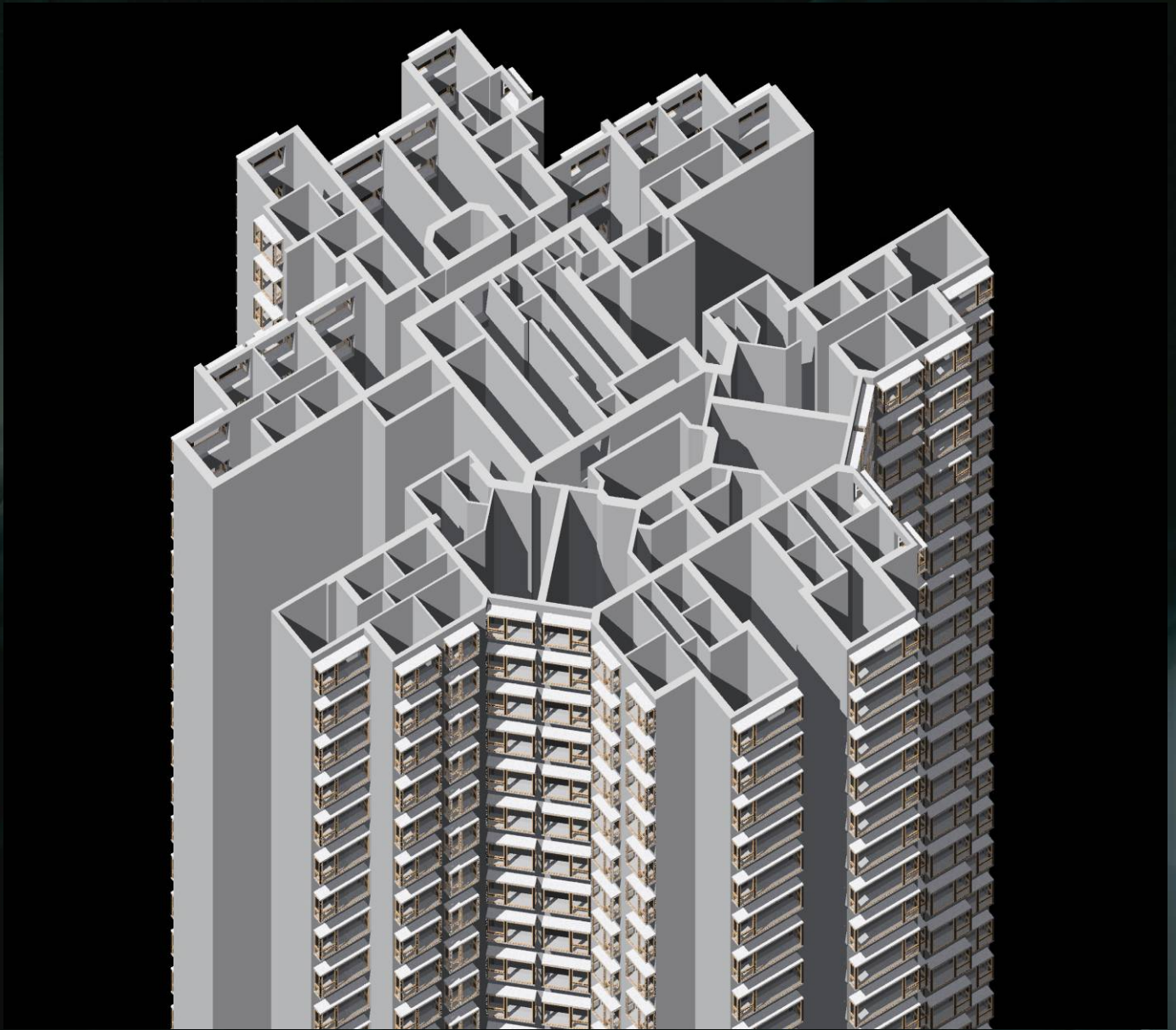
Family Types

Name: AED-Bay Window

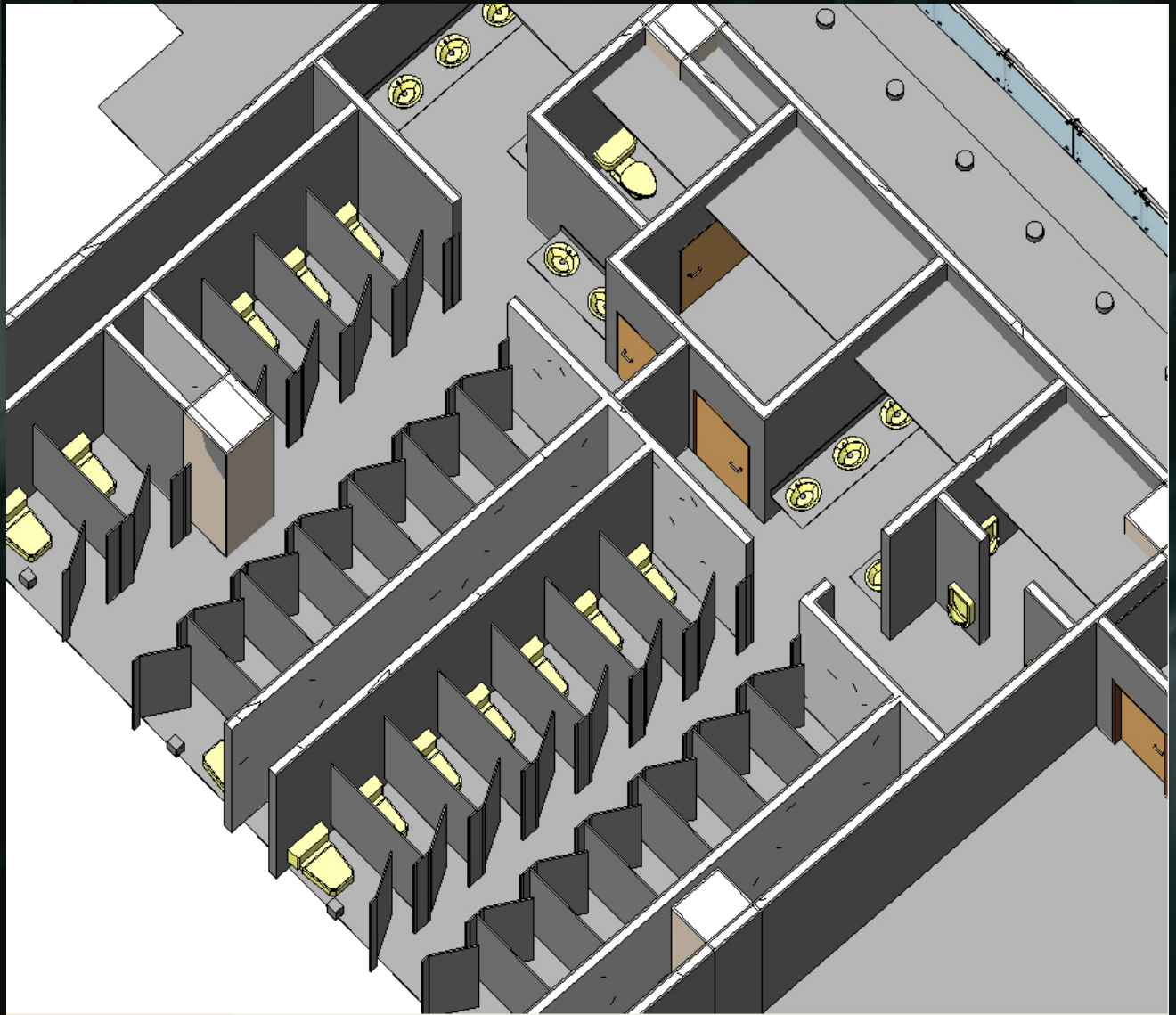
Parameter	Value	Formula
Lslab Overhang_Right	0.0	=
Lslab Overhang_Left	0.0	=
Lslab Overhang_Dept	0.0	=
Left Window Width	800.0	=
Height	1800.0	=Wall Height - (Opening Offset *
Width	4500.0	=
Bay Depth	500.0	=
Rough Width		=
Rough Height		=
Identity Data		
IFC Parameters		
Operation		=
Other		
Vmullion 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

OK Cancel Apply Help

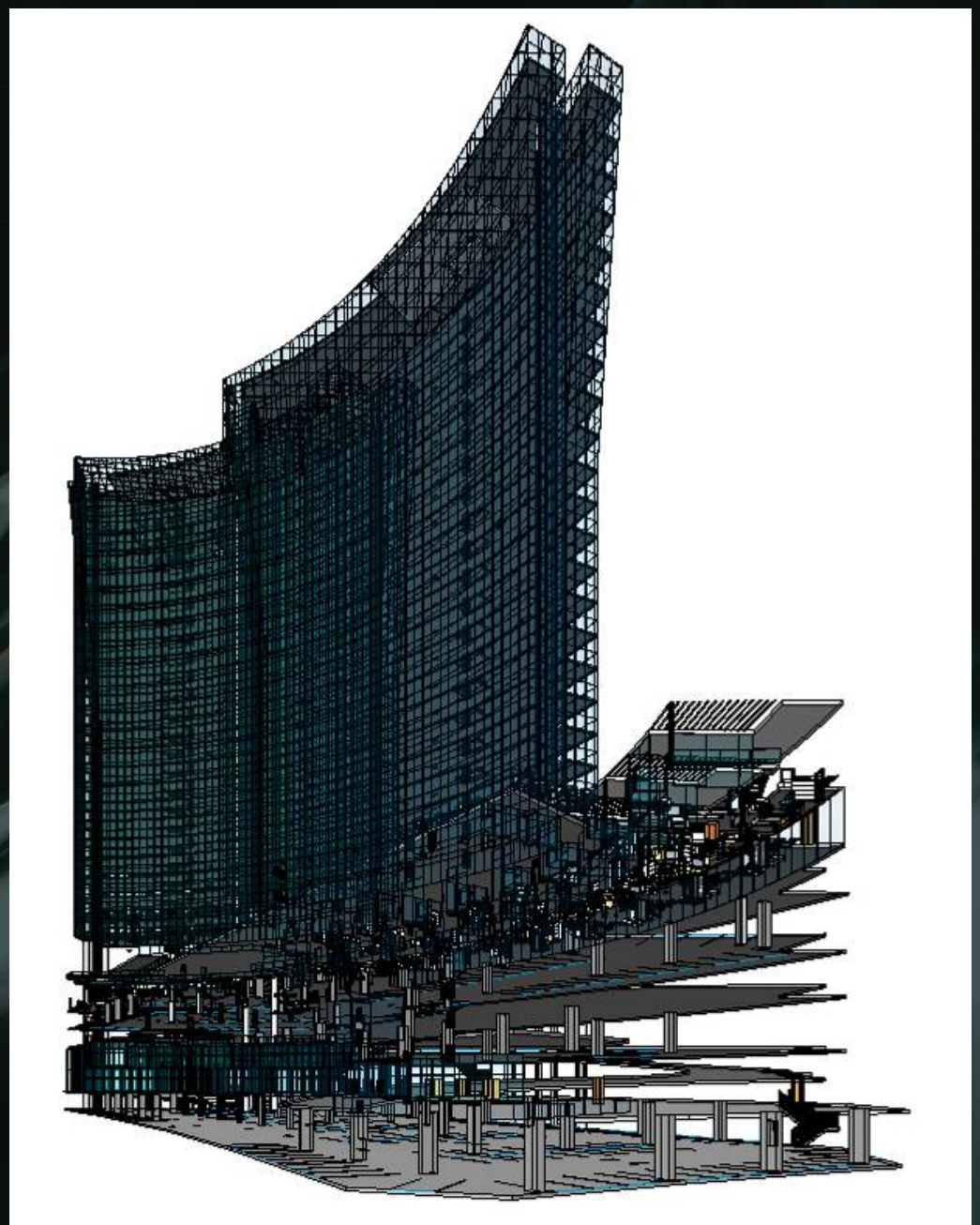




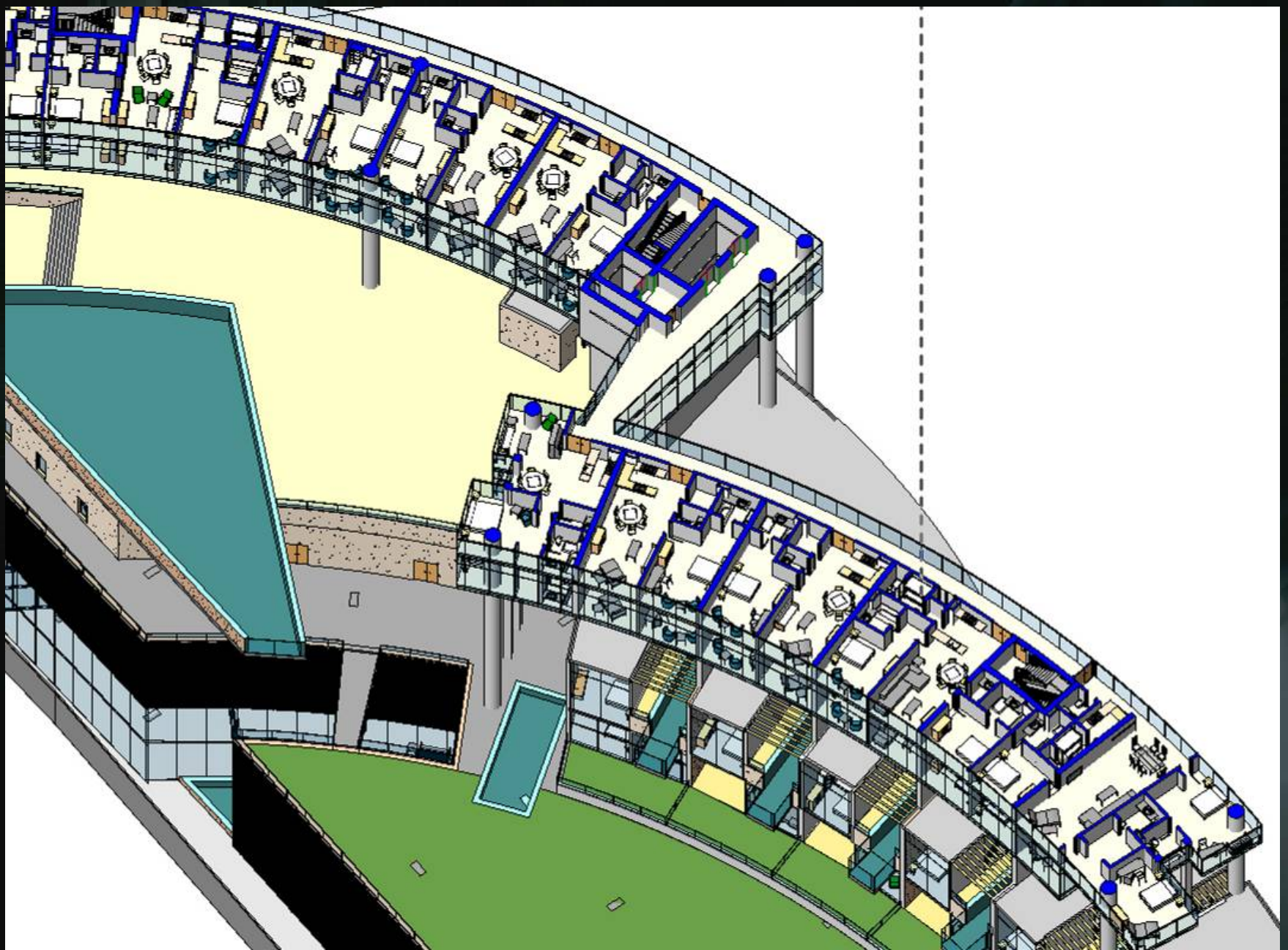
REPETITIONS vs VARIATIONS



CREATIVE TOOLS



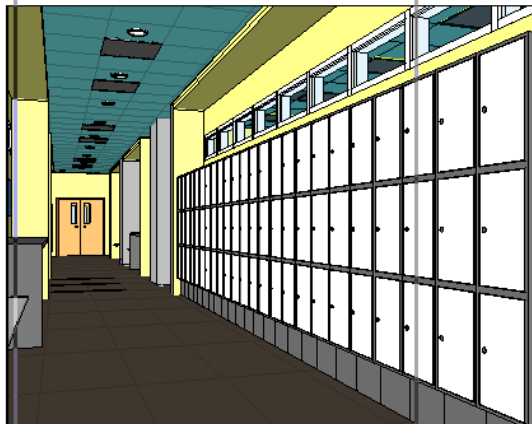
HORIZONTAL REPETITION / MODULARIZATION



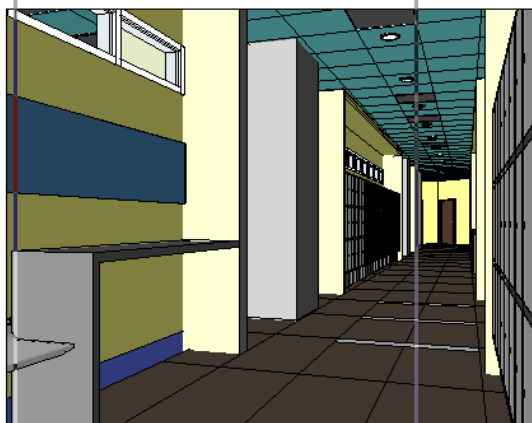
MODULAR DESIGN

BIM 的運用範圍

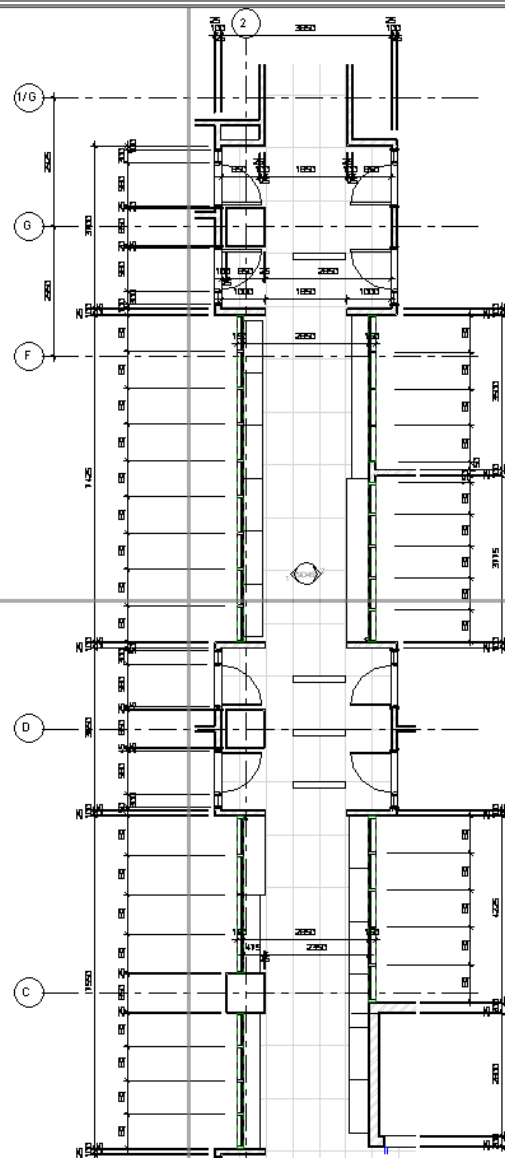
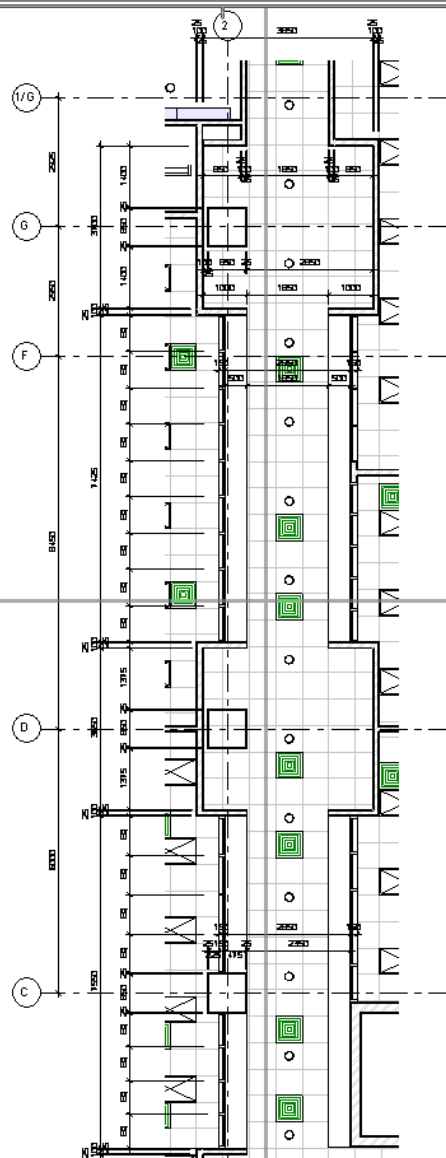
1. Design visualization 型像化設計
2. Drawing Productions 製作圖件
3. Services Co-ordination and Clash detection with other disciplines 各專業協調
4. Quantity taking and preparation of Tender Document 投標文件
5. Automated Statutory Submission 自動化審批
6. Scientific analysis of different environmental aspects 科學性分析
7. Supply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

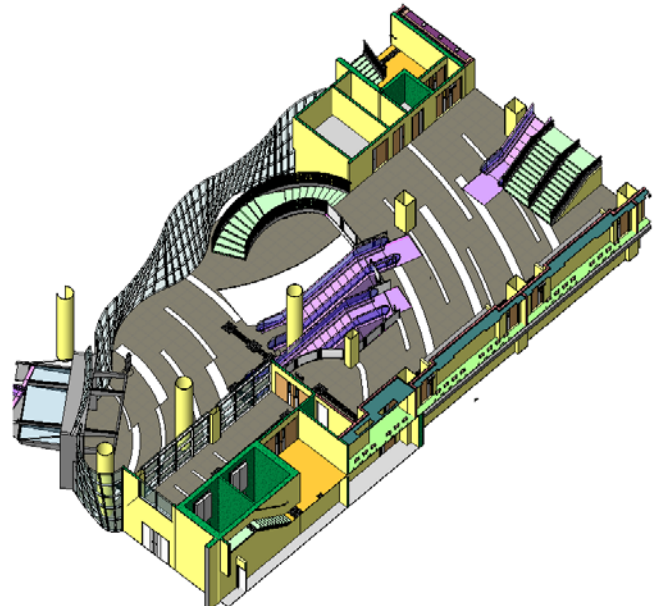
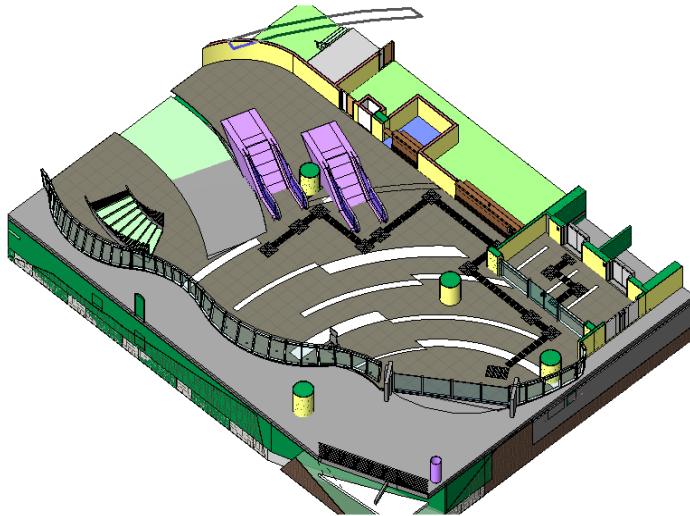
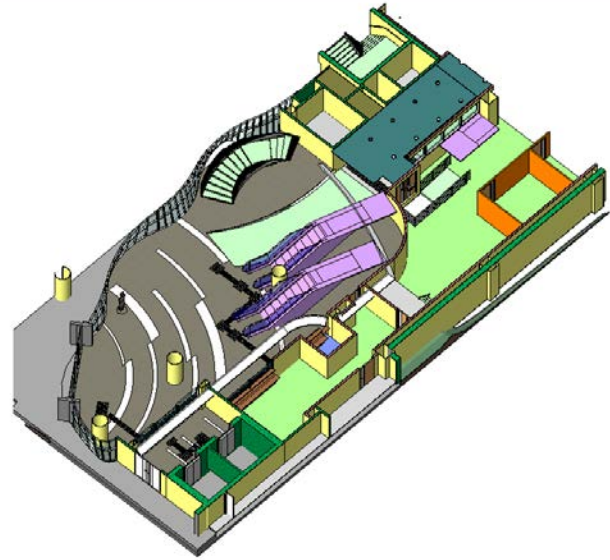
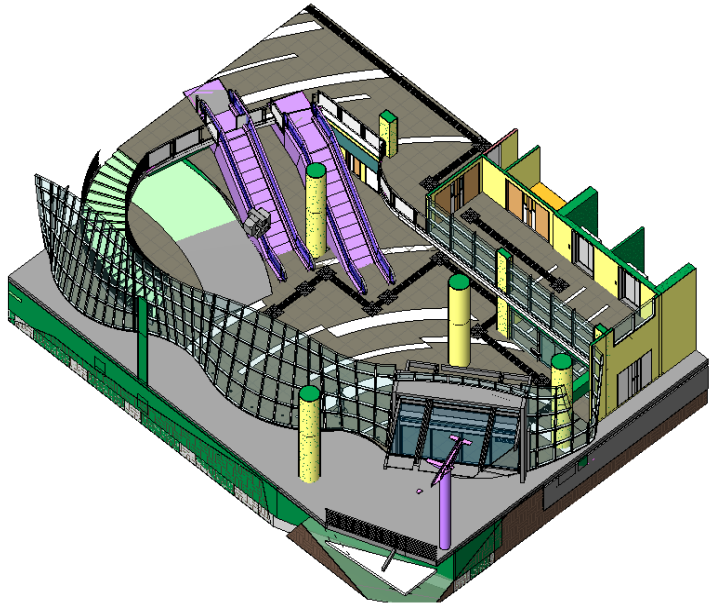


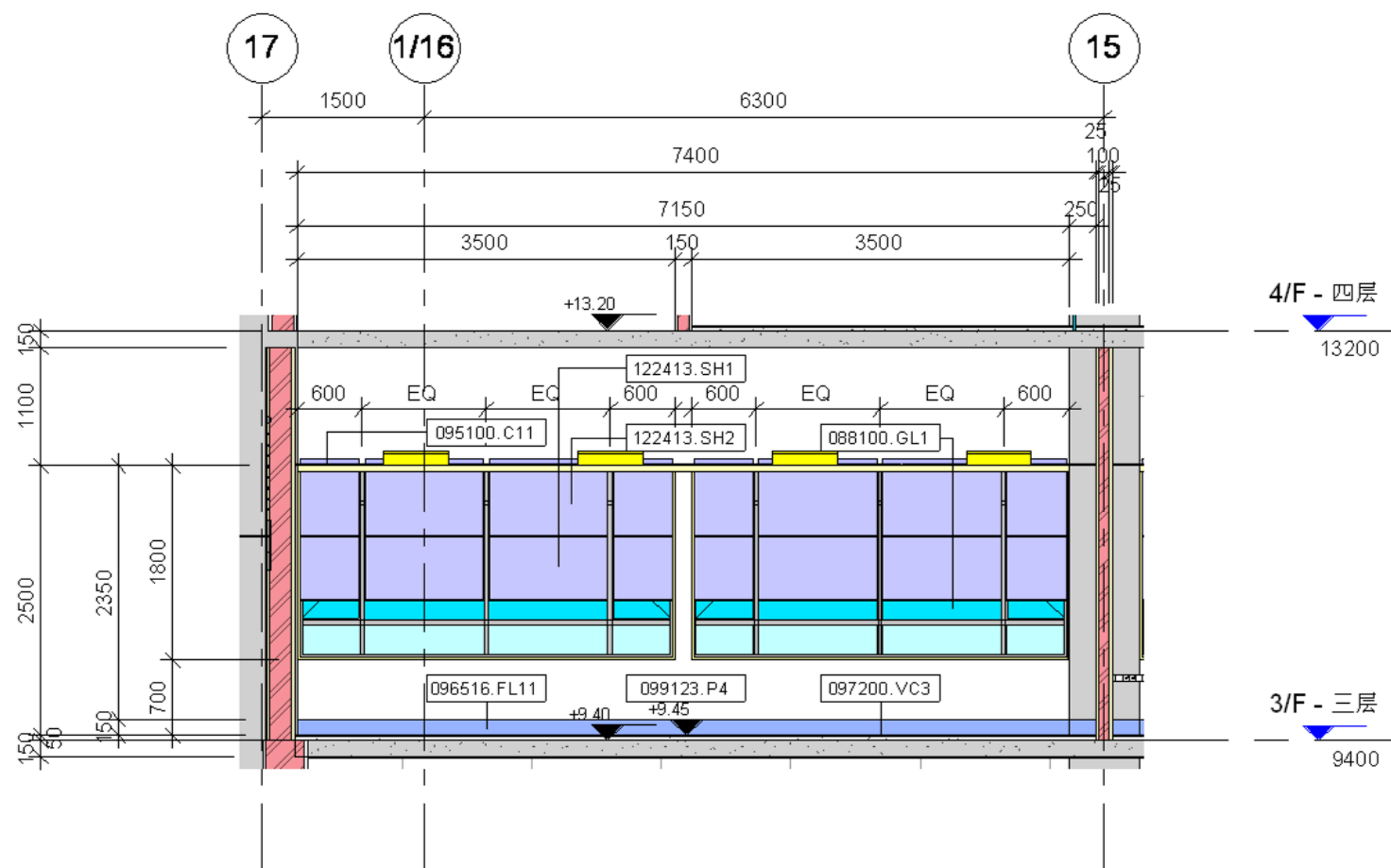
4 走廊立体示意图(低楼三至四层)2



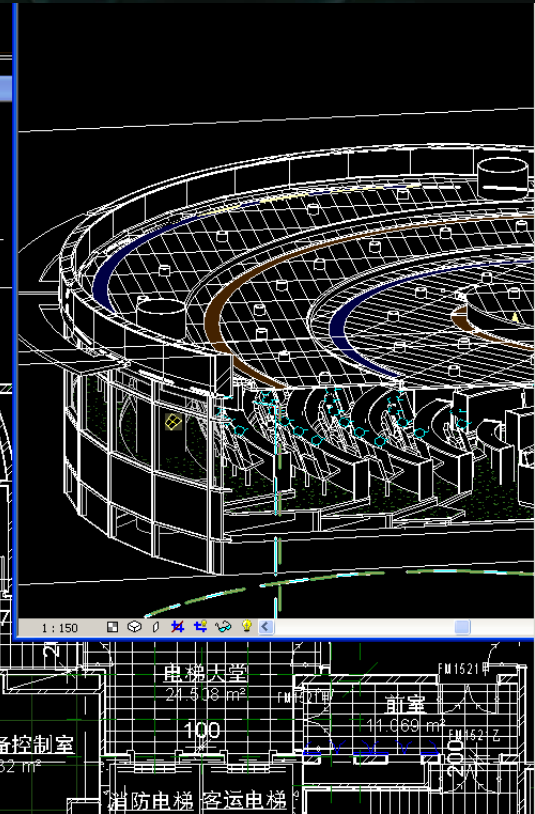
3 走廊立体示意图(低楼三至四层)1

[illegible]



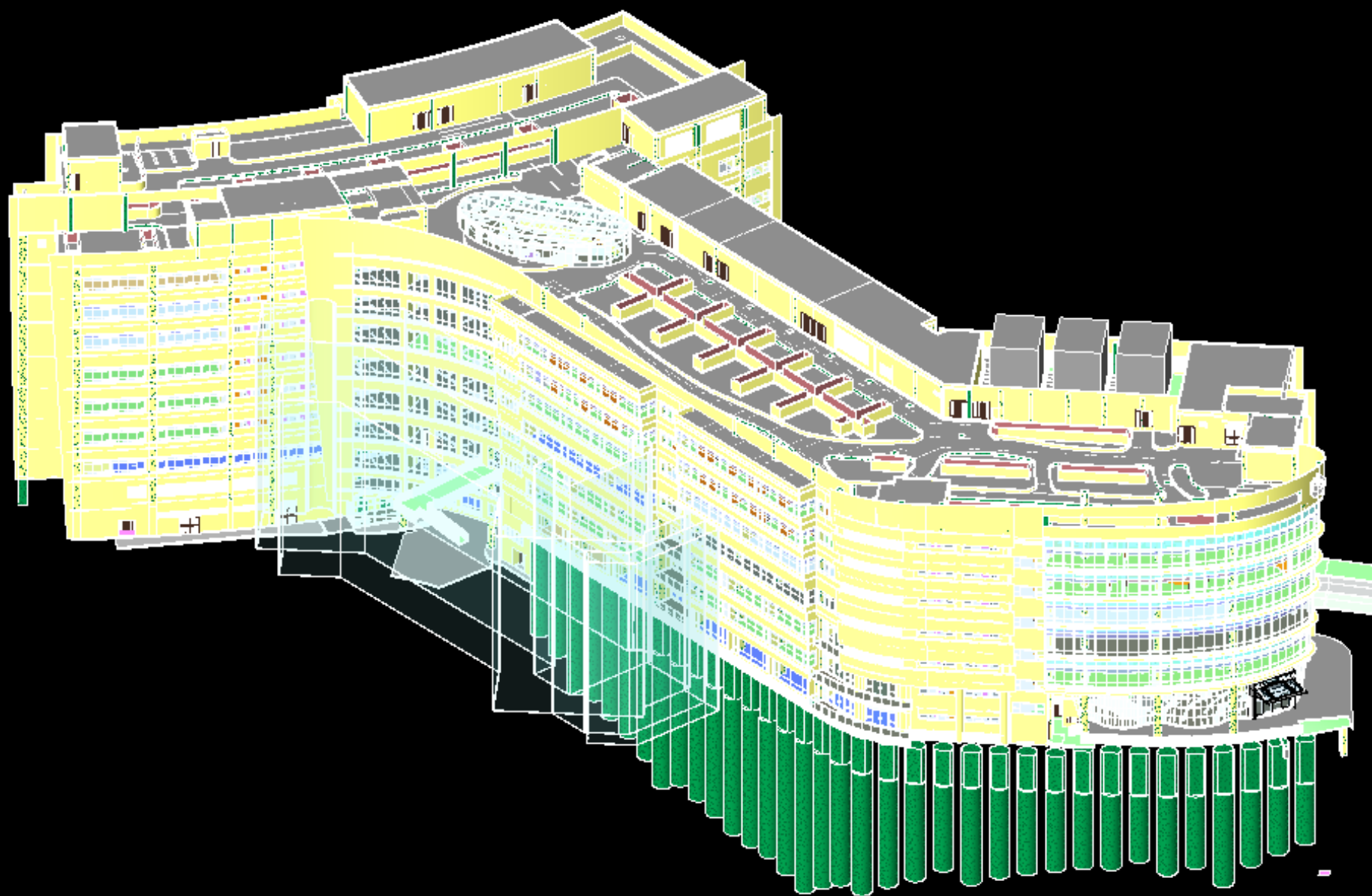


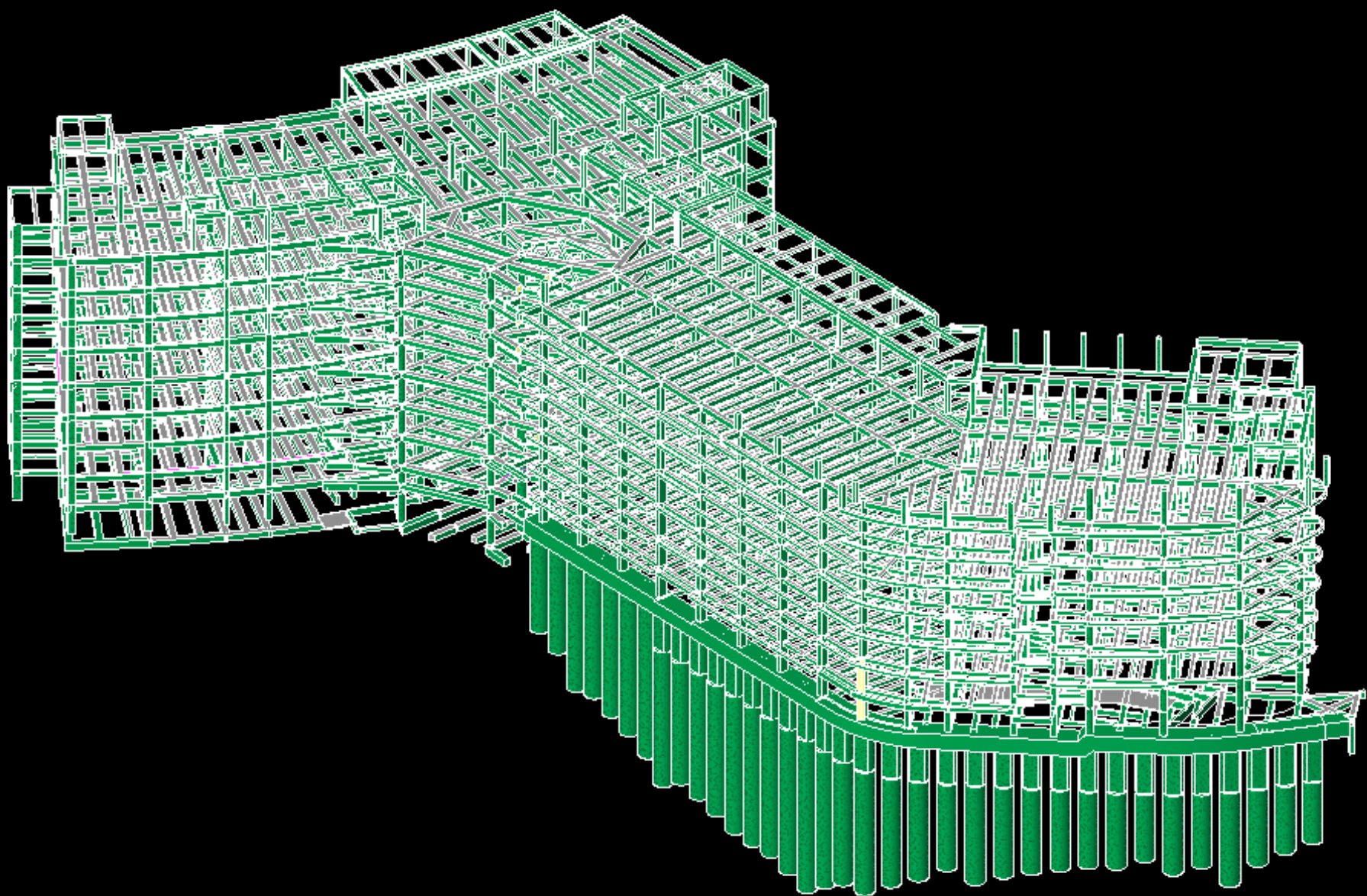
2 行政人员培训室立面图(高楼三层)6
1:50

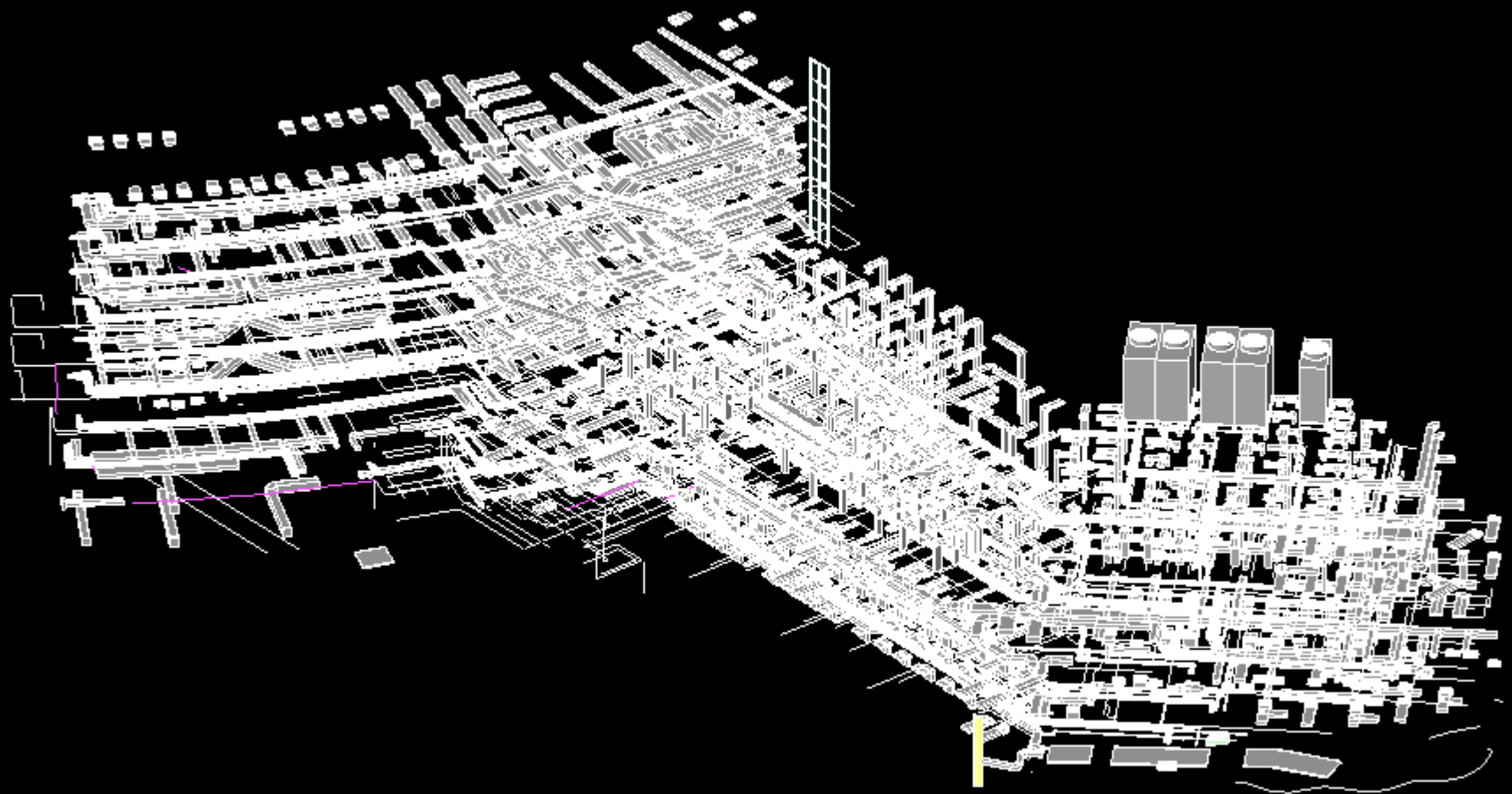


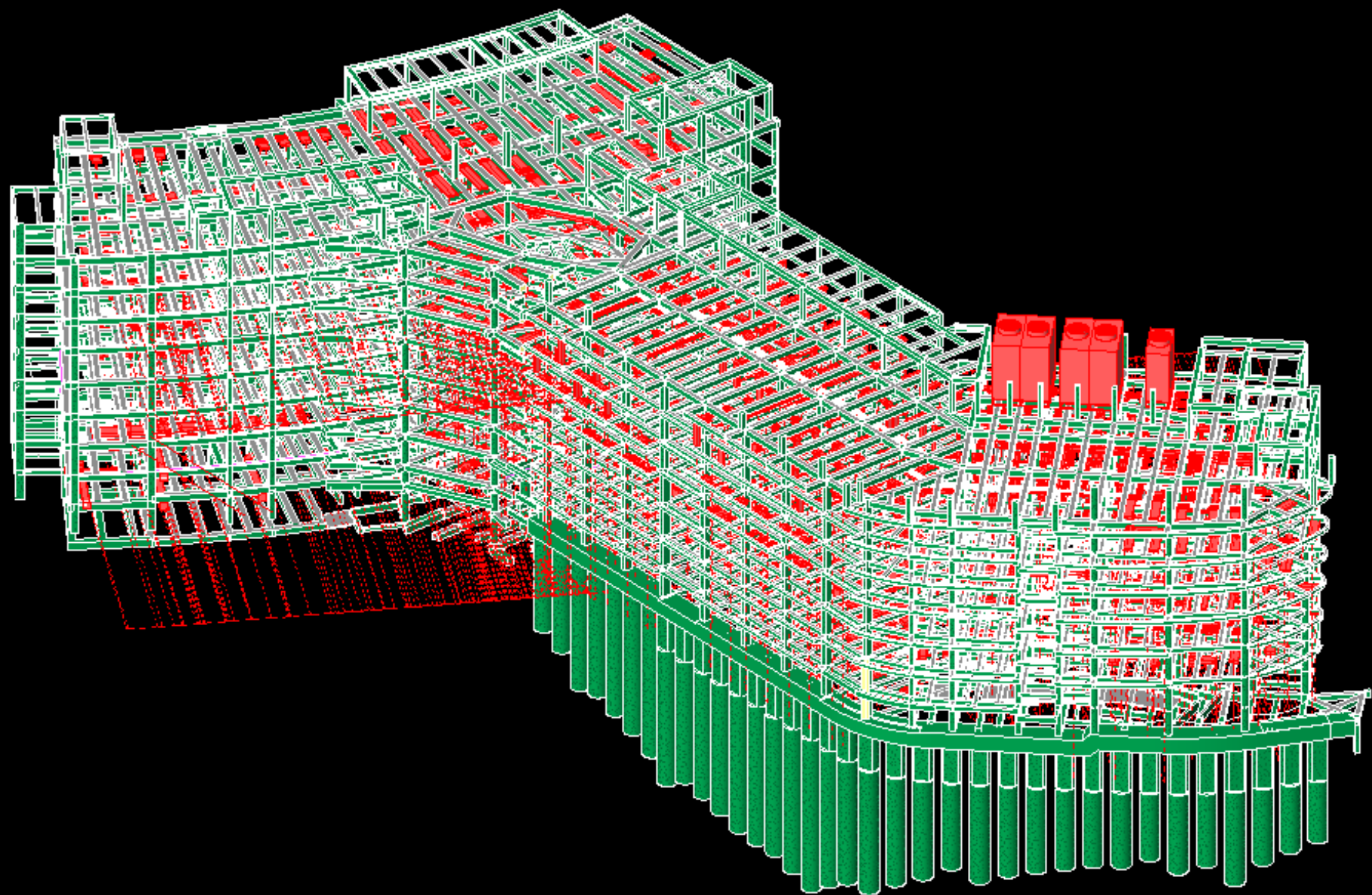
BIM 的運用範圍

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 生產製造
8. Complex Geometry 複雜幾何形狀



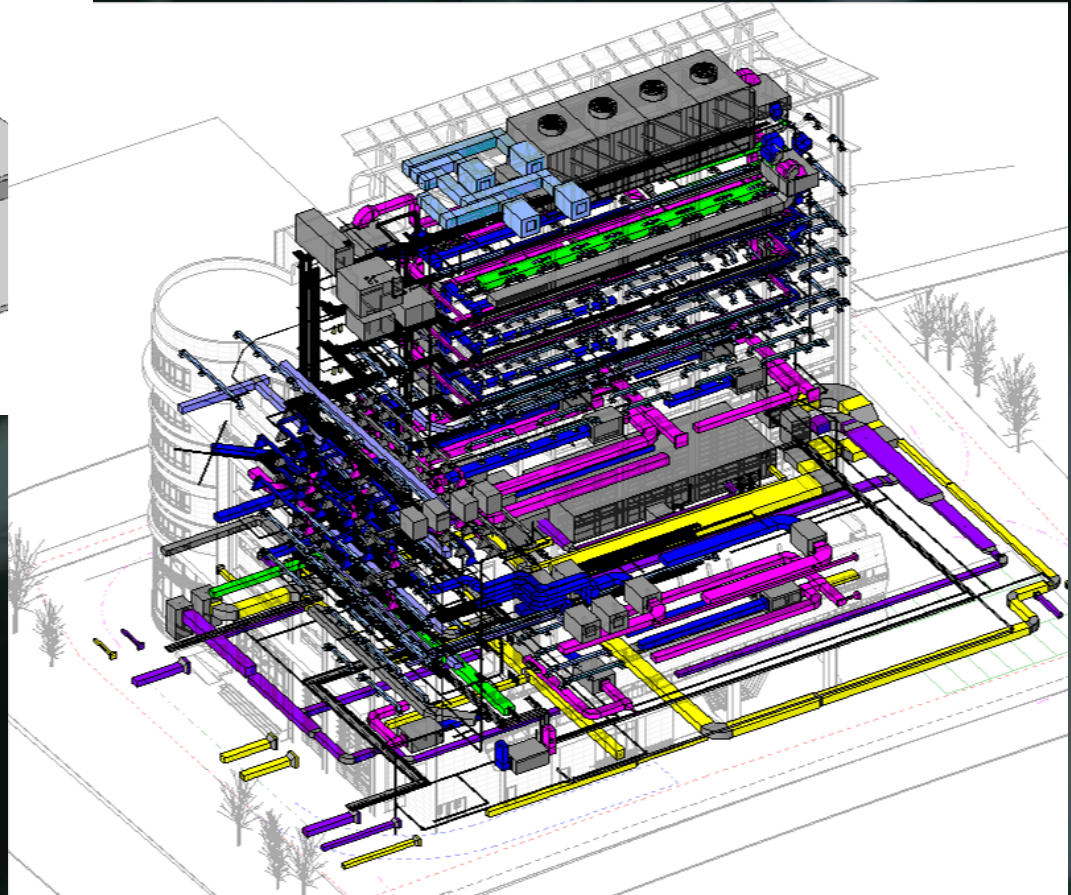
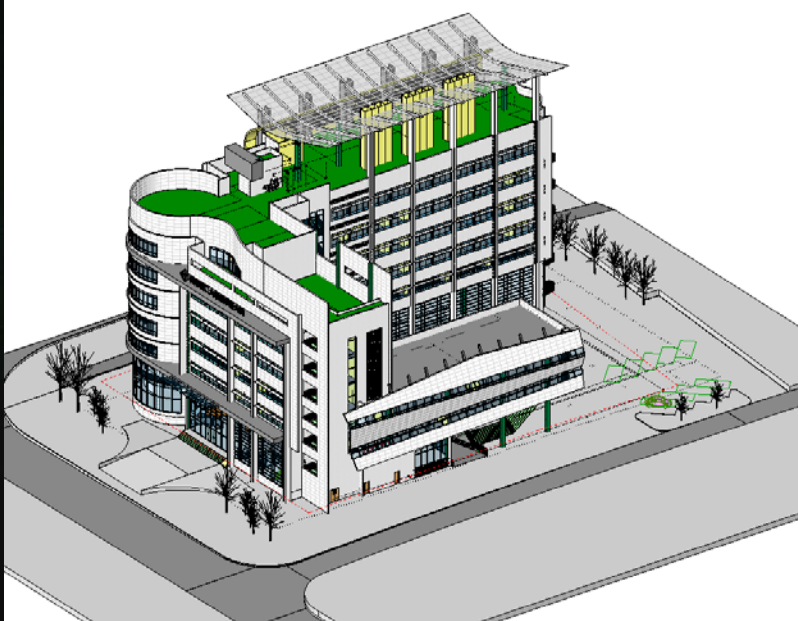




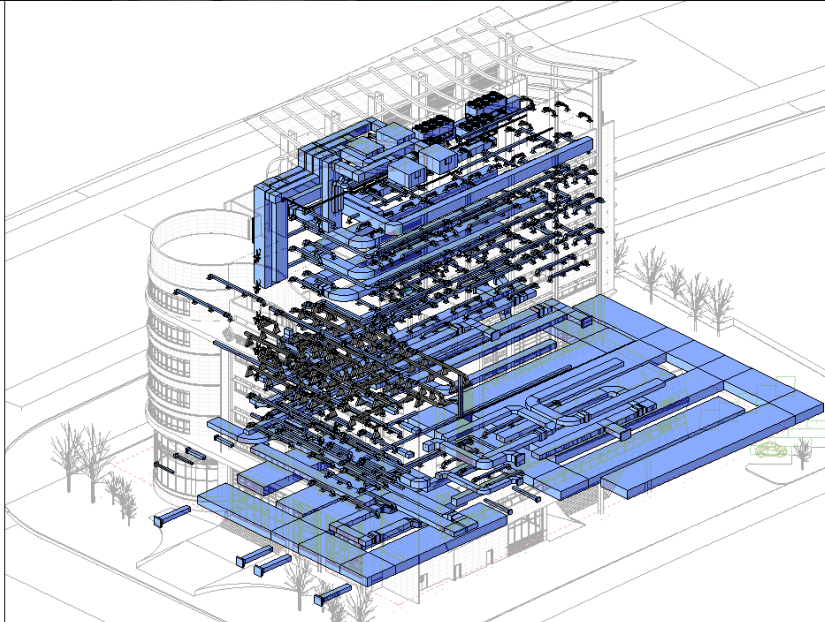


CO-ORDINATION / COLLABORATION

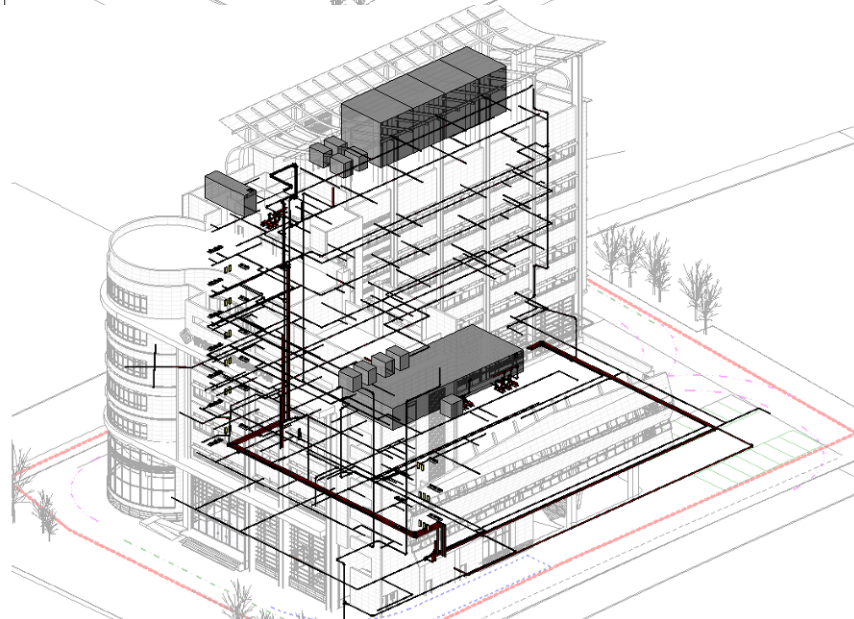
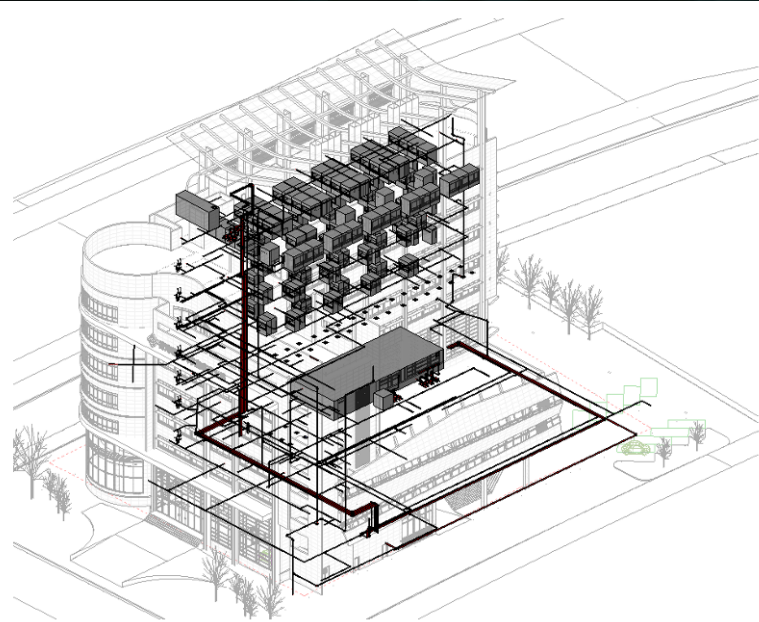
Work Flow – Establish BIM Models



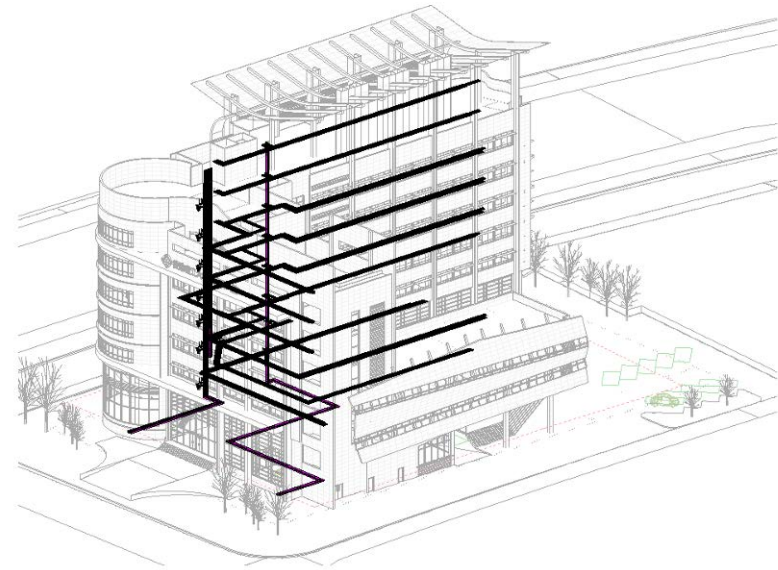
HVAC Installation



Fire Services Installation

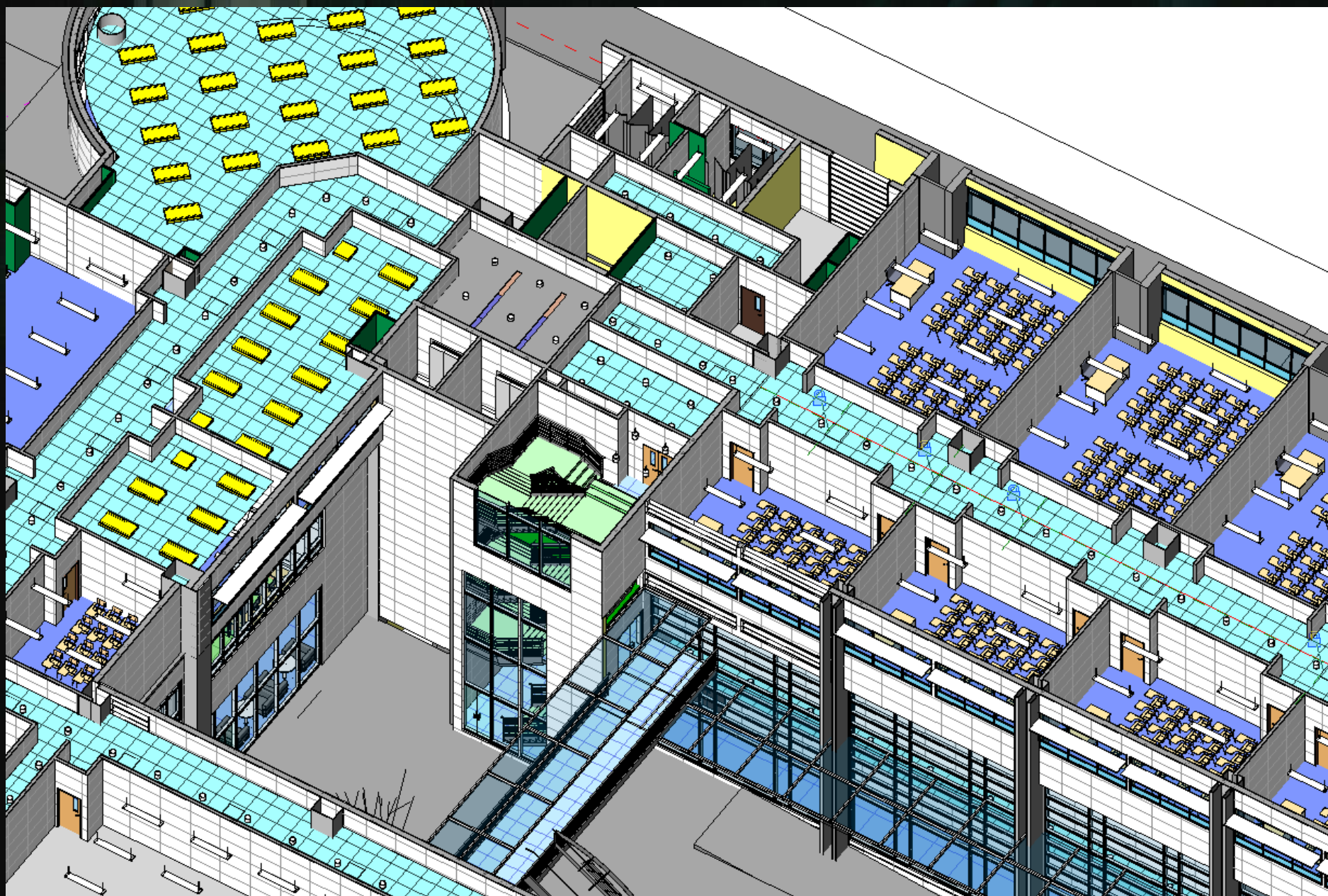


P/D Installation

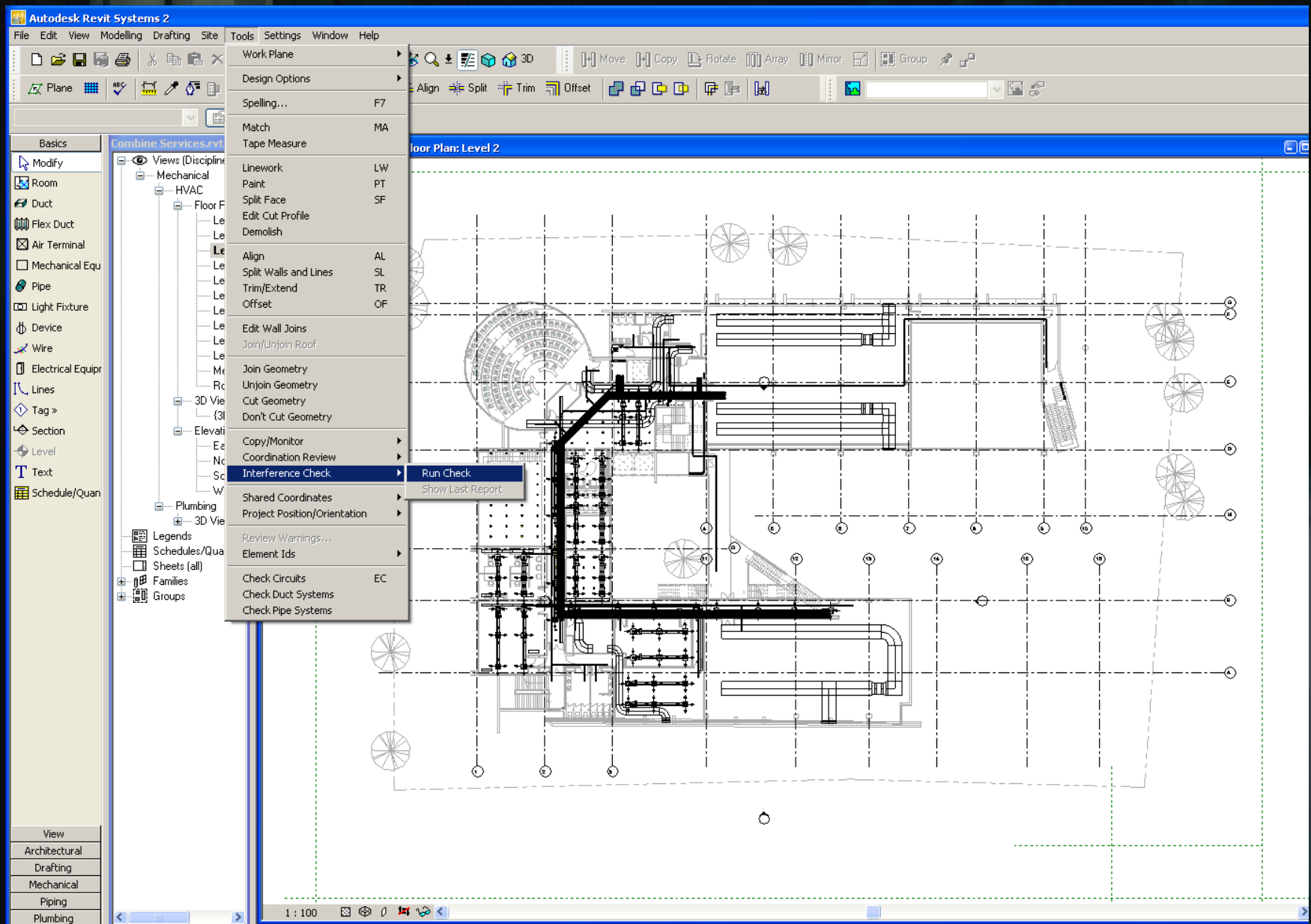


Electricity Installation



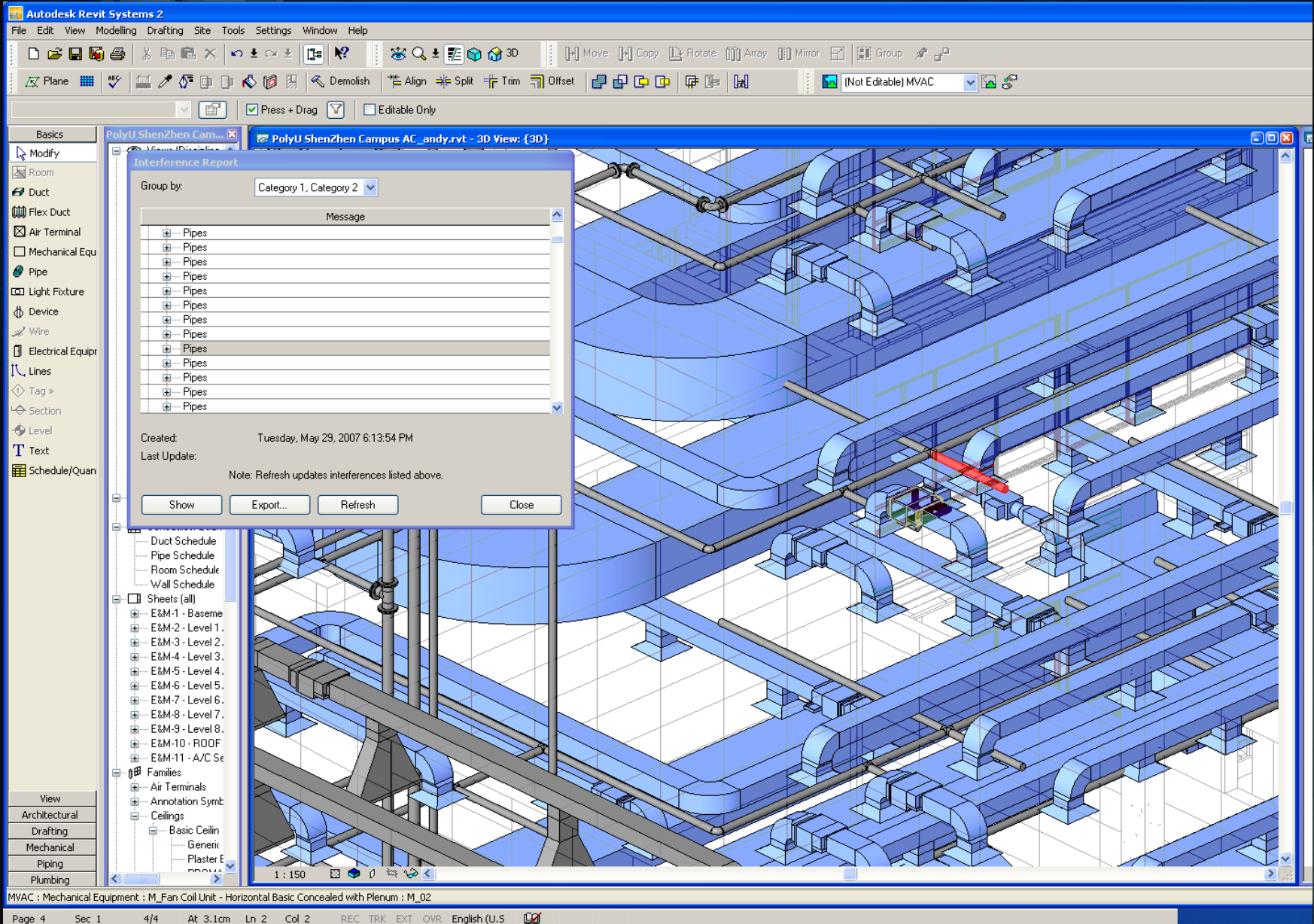


Work Flow – Clashes Report

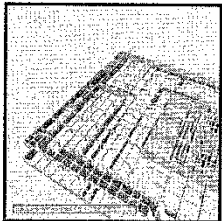
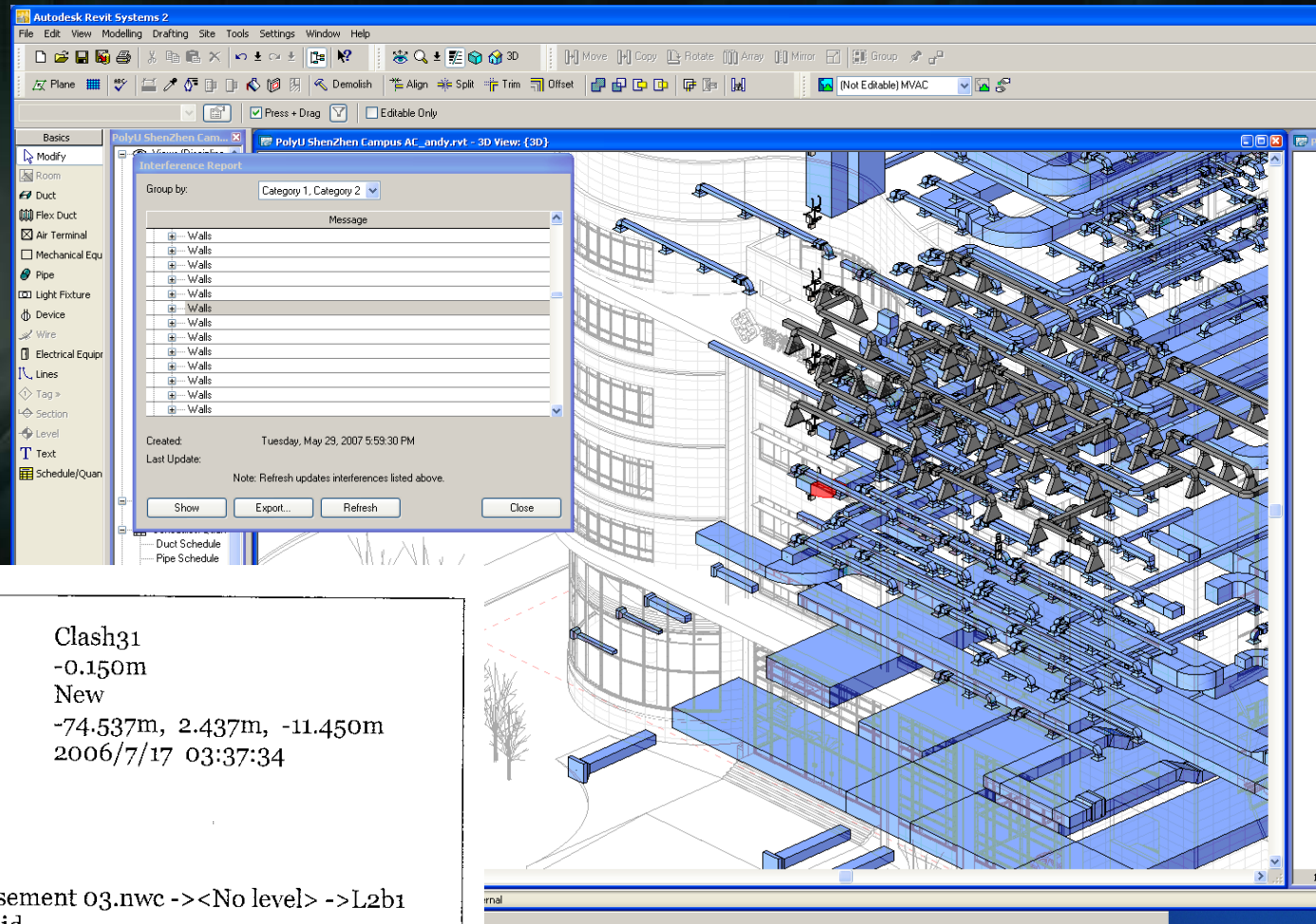


Run Interference Check on the current project, a selection, or a linked project.

Work Flow – Clashes Report



Work Flow – Clashes Report



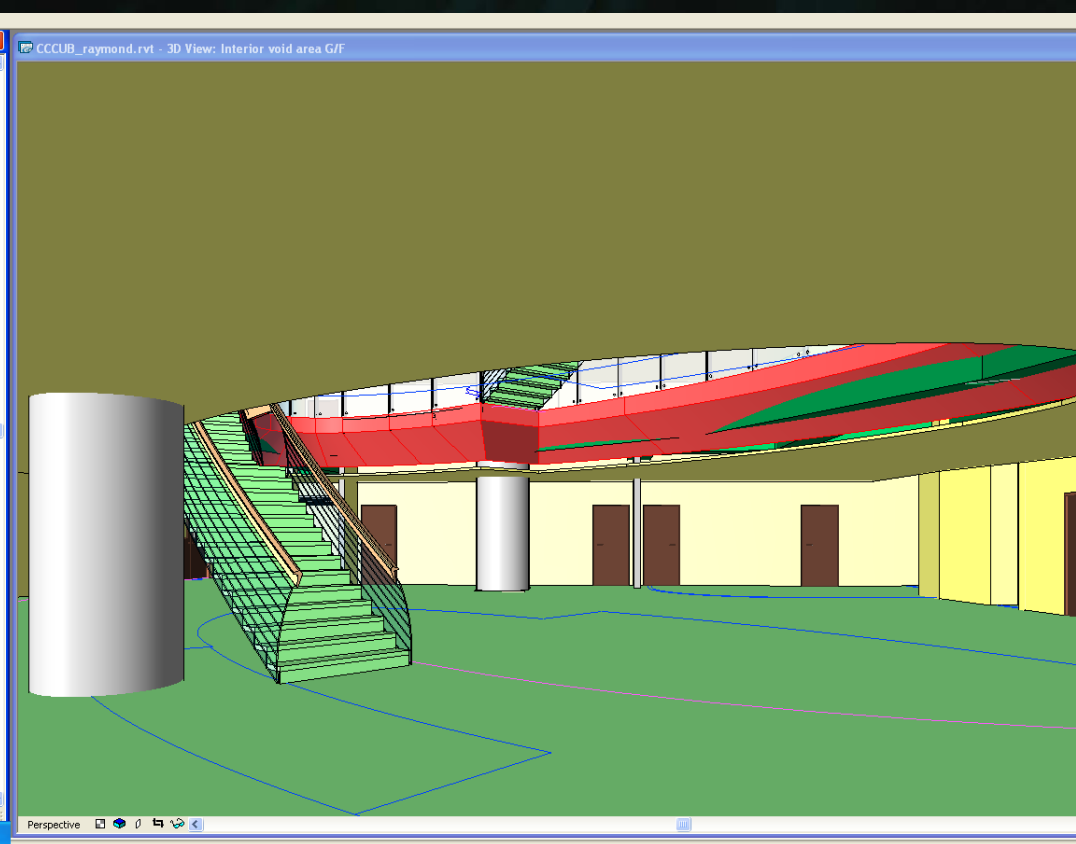
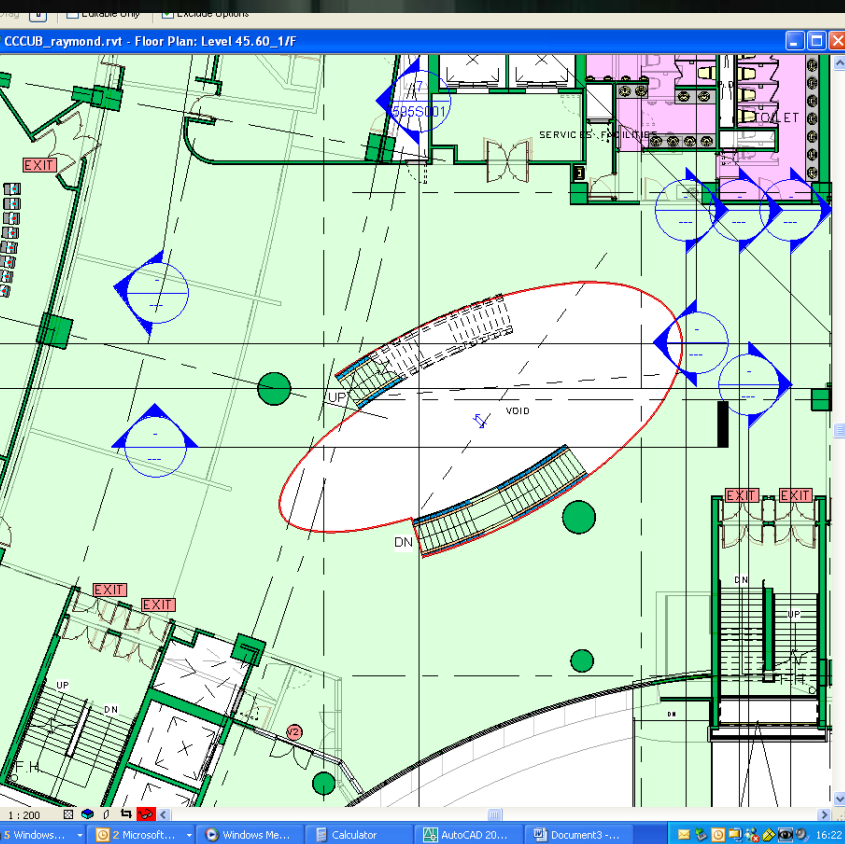
Name Clash31
Distance -0.150m
Status New
Clash Point -74.537m, 2.437m, -11.450m
Date Created 2006/7/17 03:37:34
Approved By

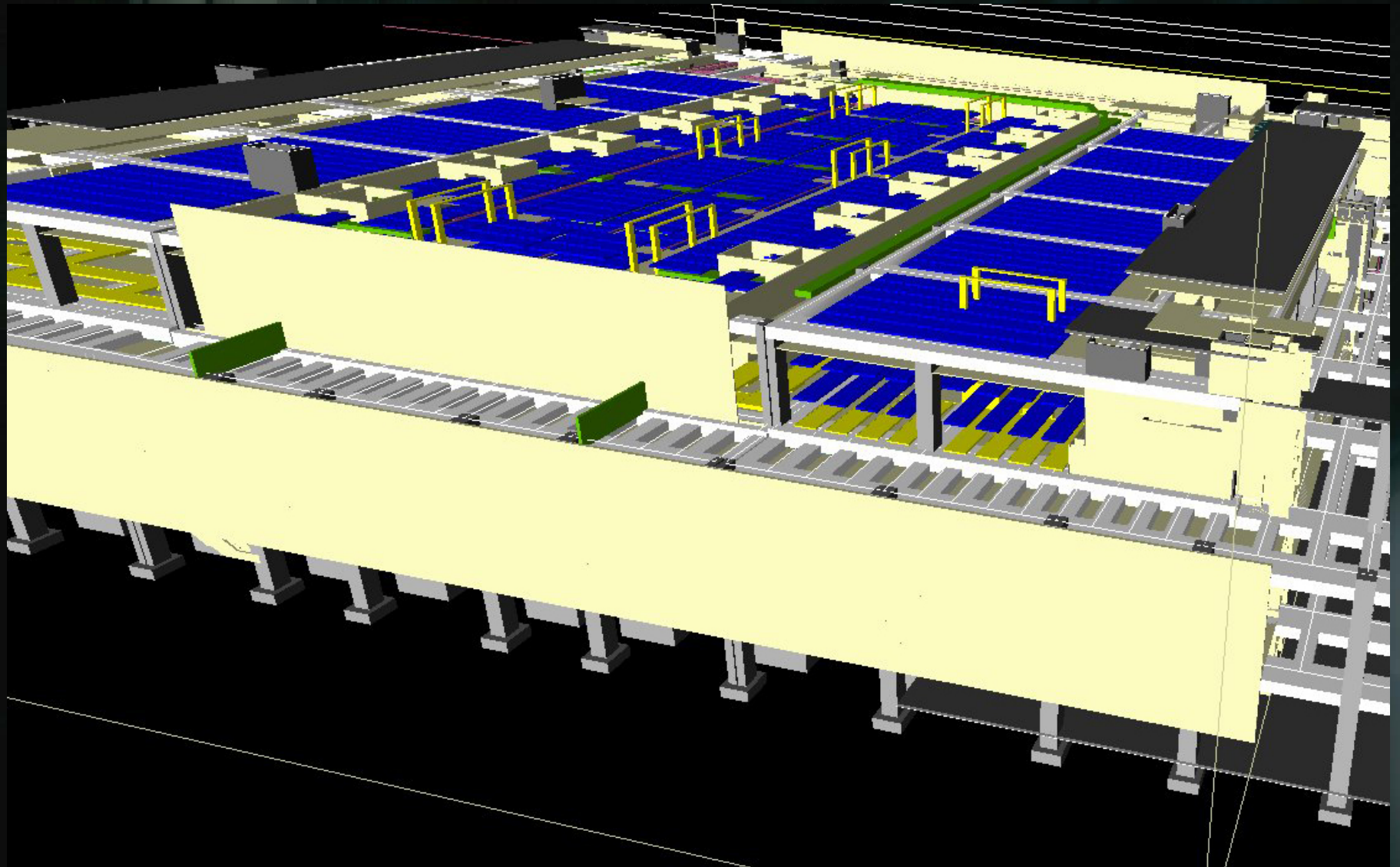
Item 1

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

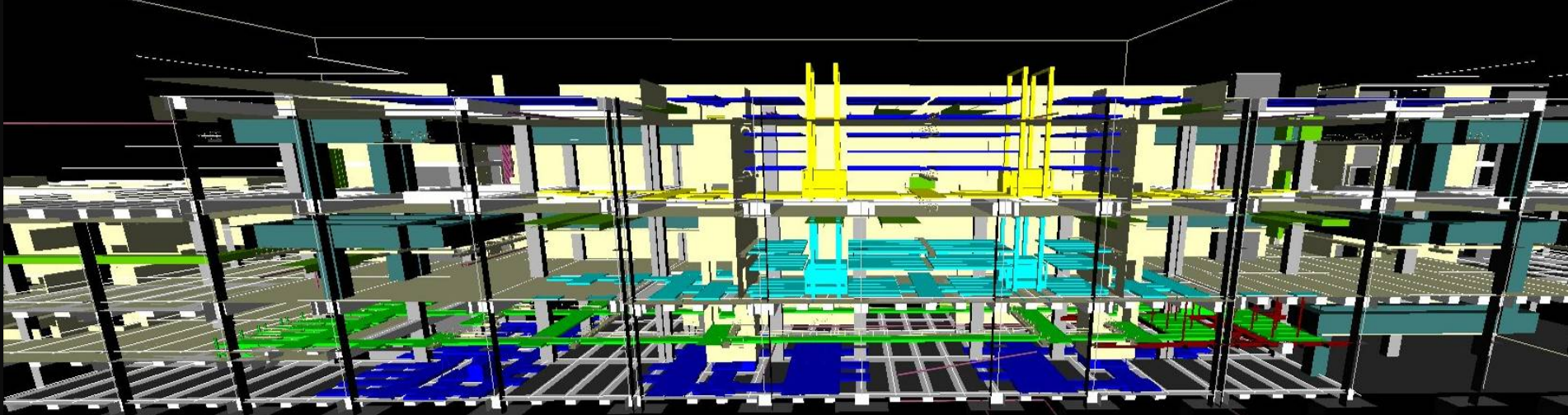
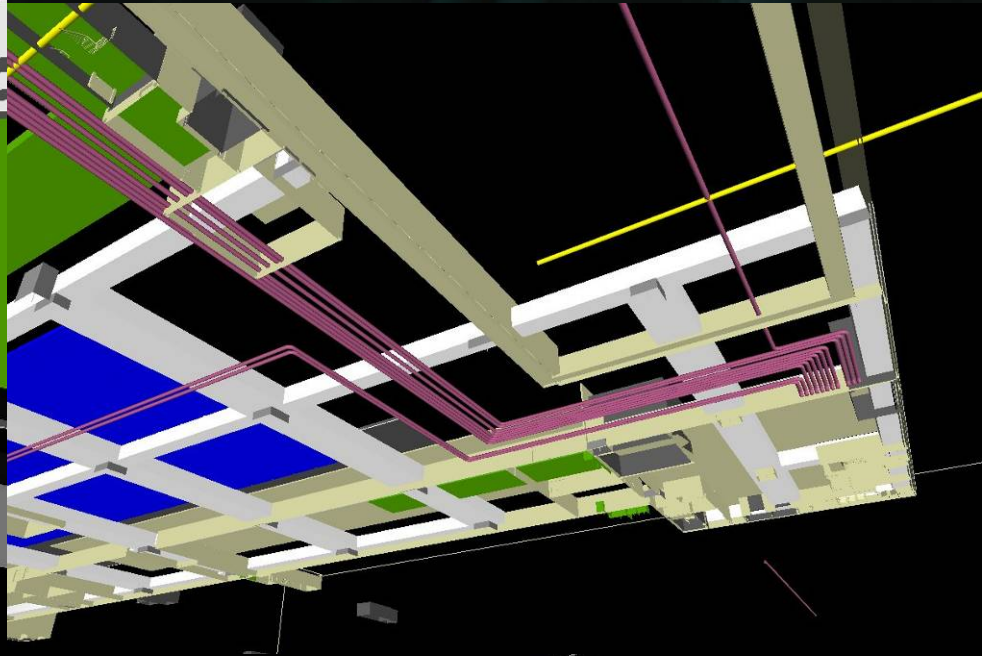
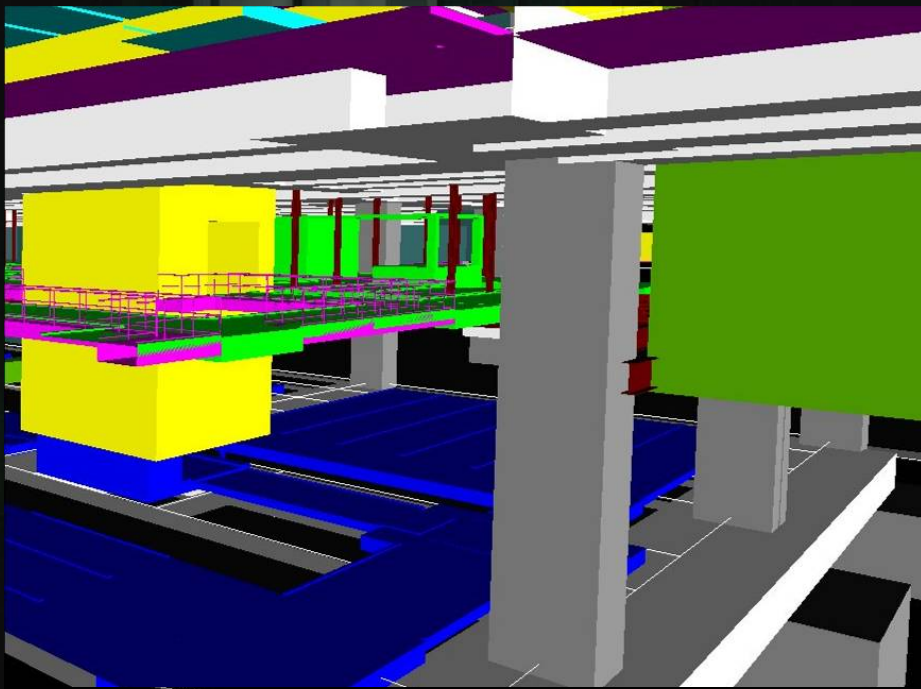
Item 2

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

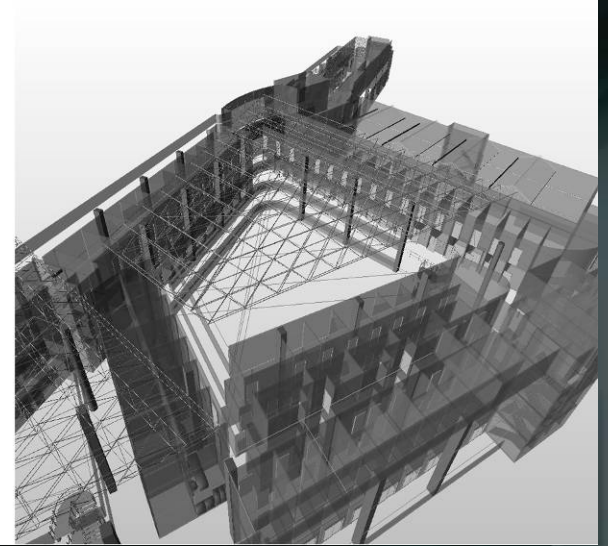
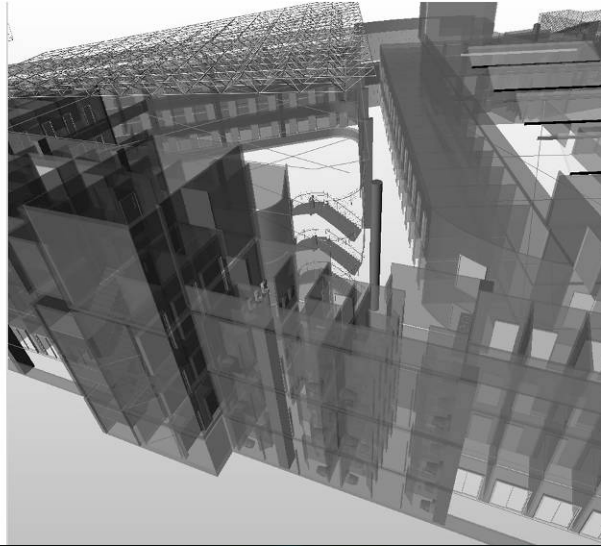
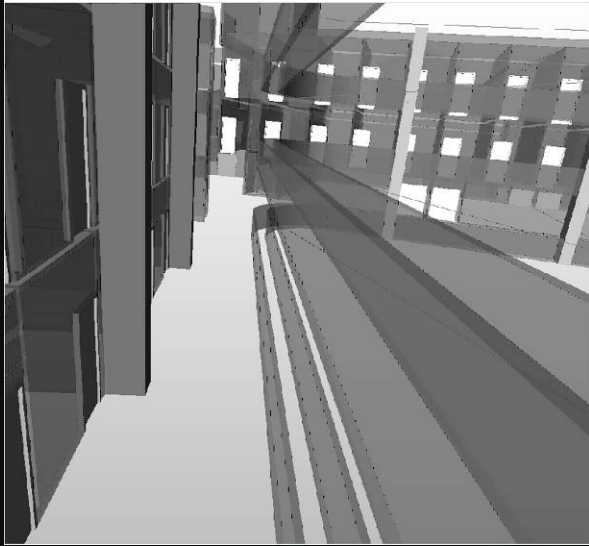
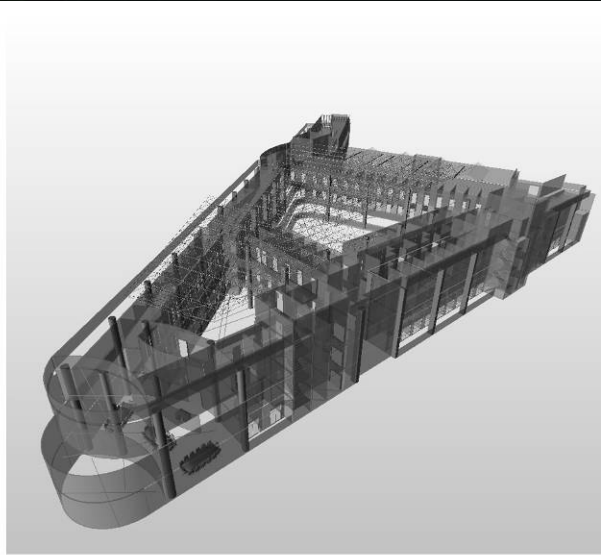
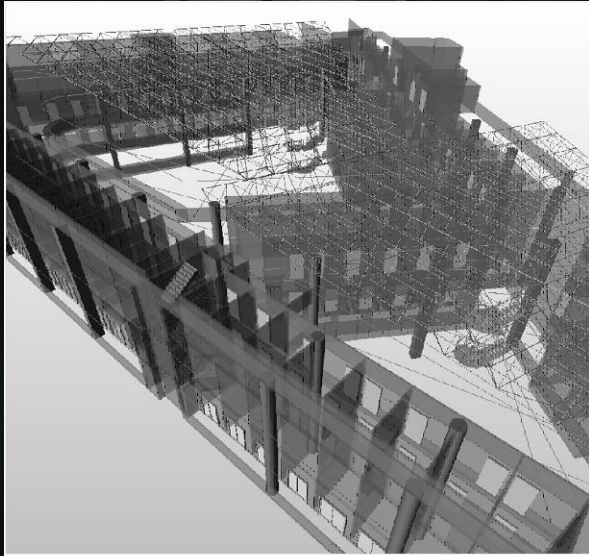




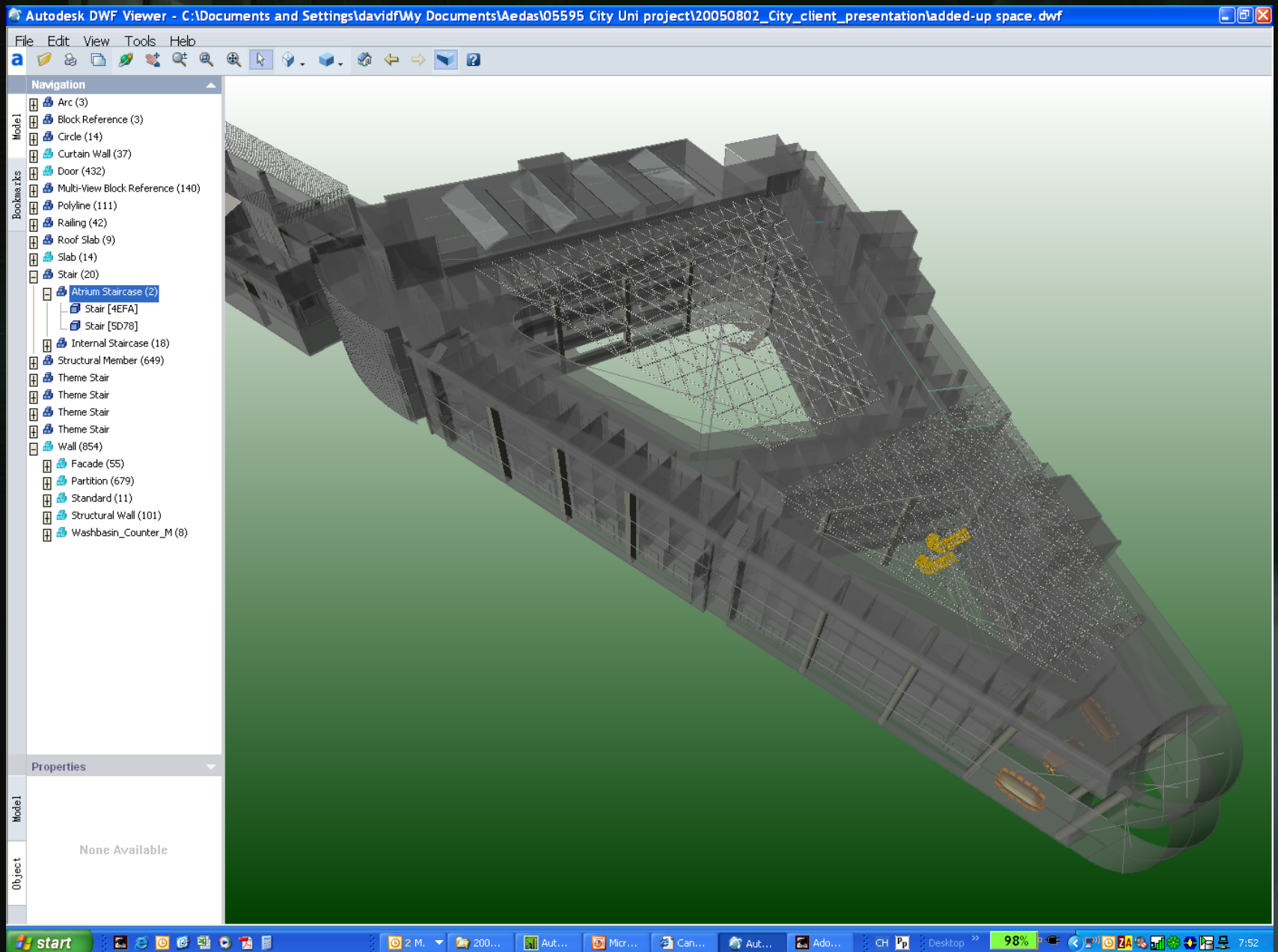
DISCIPLINES COLLABORATION



DISCIPLINES COLLABORATION



INTERACTIVE COMMUNICATION – DWF



INTERACTIVE COMMUNICATION – DWF

BIM 的運用範圍

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							
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	

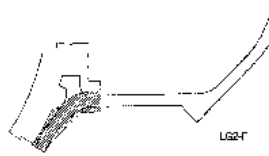
DISCIPLINES COLLABORATION

BIM 的運用範圍

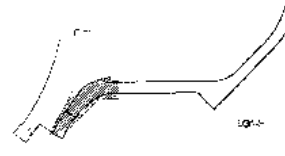
1. Design visualization 型像化設計
2. Drawing Productions 製作圖件
3. Services Co-ordination and Clash detection with other disciplines 各專業協調
4. Quantity taking and preparation of Tender Document 投標文件
5. **Automated Statutory Submission** 自動化審批
6. Scientific analysis of different environmental aspects 科學性分析
7.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

Architectural floor plan of the 3rd floor of the Aedas building. The plan shows a large, irregularly shaped building with a central courtyard area. The plan is overlaid with a grid system with letters A through R and numbers 1 through 24. Various rooms and areas are labeled, including 'RECEPTION', 'LOBBY', 'CORRIDOR', 'STAIRS', and 'ELEVATOR'. A north arrow is located in the bottom right corner. The plan is signed 'Aedas' and 'B D SUBMISSION'.

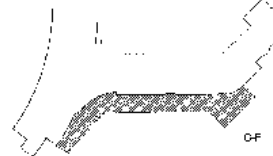
STATUTORY SUBMISSION



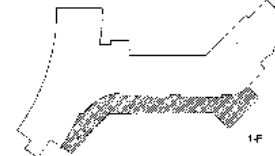
① EVA of Level 34.00_LG2/F
1:1000



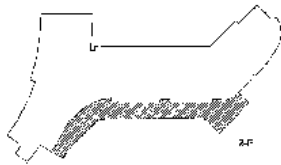
② EVA of Level 37.80_LG1/F
1:1000



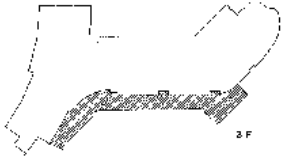
③ EVA of Level 41.60_GF
1:1000



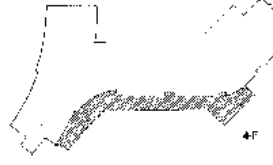
④ EVA of Level 45.80_1/F
1:1000



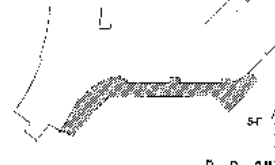
⑤ EVA of Level 49.80_2/F
1:1000



⑥ EVA of Level 53.80_3/F
1:1000

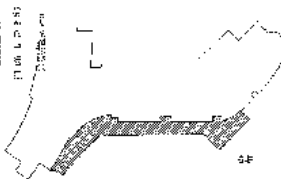


⑦ EVA of Level 58.20_4/F
1:1000



⑧ EVA of Level 62.00_5/F
1:1000

B D SUBMISSION



⑨ EVA of Level 65.80_6/F
1:1000

*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

LEVEL	LEVEL NO.	LEVEL DESCRIPTION	LEVEL AREA (SQ. M)	LEVEL PERIMETER (M)	LEVEL VOLUME (CU. M)	LEVEL FLOOR AREA (SQ. M)	LEVEL FLOOR PERIMETER (M)	LEVEL FLOOR VOLUME (CU. M)	LEVEL FLOOR AREA (SQ. M)	LEVEL FLOOR PERIMETER (M)	LEVEL FLOOR VOLUME (CU. M)
LG2/F	34.00	Level 34.00	1000.00	100.00	1000.00	1000.00	100.00	1000.00	1000.00	100.00	1000.00
LG1/F	37.80	Level 37.80	1000.00	100.00	1000.00	1000.00	100.00	1000.00	1000.00	100.00	1000.00
GF	41.60	Level 41.60	1000.00	100.00	1000.00	1000.00	100.00	1000.00	1000.00	100.00	1000.00
1/F	45.80	Level 45.80	1000.00	100.00	1000.00	1000.00	100.00	1000.00	1000.00	100.00	1000.00
2/F	49.80	Level 49.80	1000.00	100.00	1000.00	1000.00	100.00	1000.00	1000.00	100.00	1000.00
3/F	53.80	Level 53.80	1000.00	100.00	1000.00	1000.00	100.00	1000.00	1000.00	100.00	1000.00
4/F	58.20	Level 58.20	1000.00	100.00	1000.00	1000.00	100.00	1000.00	1000.00	100.00	1000.00
5/F	62.00	Level 62.00	1000.00	100.00	1000.00	1000.00	100.00	1000.00	1000.00	100.00	1000.00
6/F	65.80	Level 65.80	1000.00	100.00	1000.00	1000.00	100.00	1000.00	1000.00	100.00	1000.00

LEVEL	LEVEL NO.	LEVEL DESCRIPTION	LEVEL AREA (SQ. M)	LEVEL PERIMETER (M)	LEVEL VOLUME (CU. M)	LEVEL FLOOR AREA (SQ. M)	LEVEL FLOOR PERIMETER (M)	LEVEL FLOOR VOLUME (CU. M)	LEVEL FLOOR AREA (SQ. M)	LEVEL FLOOR PERIMETER (M)	LEVEL FLOOR VOLUME (CU. M)
LG2/F	34.00	Level 34.00	1000.00	100.00	1000.00	1000.00	100.00	1000.00	1000.00	100.00	1000.00
LG1/F	37.80	Level 37.80	1000.00	100.00	1000.00	1000.00	100.00	1000.00	1000.00	100.00	1000.00
GF	41.60	Level 41.60	1000.00	100.00	1000.00	1000.00	100.00	1000.00	1000.00	100.00	1000.00
1/F	45.80	Level 45.80	1000.00	100.00	1000.00	1000.00	100.00	1000.00	1000.00	100.00	1000.00
2/F	49.80	Level 49.80	1000.00	100.00	1000.00	1000.00	100.00	1000.00	1000.00	100.00	1000.00
3/F	53.80	Level 53.80	1000.00	100.00	1000.00	1000.00	100.00	1000.00	1000.00	100.00	1000.00
4/F	58.20	Level 58.20	1000.00	100.00	1000.00	1000.00	100.00	1000.00	1000.00	100.00	1000.00
5/F	62.00	Level 62.00	1000.00	100.00	1000.00	1000.00	100.00	1000.00	1000.00	100.00	1000.00
6/F	65.80	Level 65.80	1000.00	100.00	1000.00	1000.00	100.00	1000.00	1000.00	100.00	1000.00

The Applicant
CITY OF HONG KONG
PLANNING DEPARTMENT
1/F, 10/F, 20/F

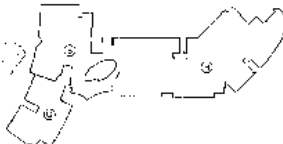
DESIGNER ARCHITECT ENGINEER STRUCTURAL ENGINEER MECHANICAL ENGINEER ELECTRICAL ENGINEER PLUMBING ENGINEER PAINTING ENGINEER LANDSCAPE ARCHITECT INTERIOR DESIGNER ENVIRONMENTAL ENGINEER ACoustics ENGINEER Lighting ENGINEER Fire ENGINEER Transportation ENGINEER Urban Planning ENGINEER Public Works ENGINEER Water Resources ENGINEER Soil Conservation ENGINEER Marine ENGINEER Aviation ENGINEER Space ENGINEER Other ENGINEER	DESIGNER ARCHITECT ENGINEER STRUCTURAL ENGINEER MECHANICAL ENGINEER ELECTRICAL ENGINEER PLUMBING ENGINEER PAINTING ENGINEER LANDSCAPE ARCHITECT INTERIOR DESIGNER ENVIRONMENTAL ENGINEER ACoustics ENGINEER Lighting ENGINEER Fire ENGINEER Transportation ENGINEER Urban Planning ENGINEER Public Works ENGINEER Water Resources ENGINEER Soil Conservation ENGINEER Marine ENGINEER Aviation ENGINEER Space ENGINEER Other ENGINEER	DESIGNER ARCHITECT ENGINEER STRUCTURAL ENGINEER MECHANICAL ENGINEER ELECTRICAL ENGINEER PLUMBING ENGINEER PAINTING ENGINEER LANDSCAPE ARCHITECT INTERIOR DESIGNER ENVIRONMENTAL ENGINEER ACoustics ENGINEER Lighting ENGINEER Fire ENGINEER Transportation ENGINEER Urban Planning ENGINEER Public Works ENGINEER Water Resources ENGINEER Soil Conservation ENGINEER Marine ENGINEER Aviation ENGINEER Space ENGINEER Other ENGINEER	DESIGNER ARCHITECT ENGINEER STRUCTURAL ENGINEER MECHANICAL ENGINEER ELECTRICAL ENGINEER PLUMBING ENGINEER PAINTING ENGINEER LANDSCAPE ARCHITECT INTERIOR DESIGNER ENVIRONMENTAL ENGINEER ACoustics ENGINEER Lighting ENGINEER Fire ENGINEER Transportation ENGINEER Urban Planning ENGINEER Public Works ENGINEER Water Resources ENGINEER Soil Conservation ENGINEER Marine ENGINEER Aviation ENGINEER Space ENGINEER Other ENGINEER
--	--	--	--

STATUTORY SUBMISSION

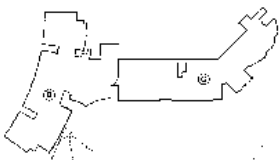
LG/5/F (+37.82) COMPARTMENT CALCULATION



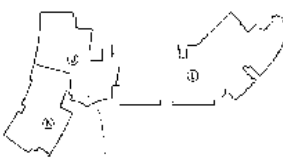
3/F (+53.80) COMPARTMENT CALCULATION



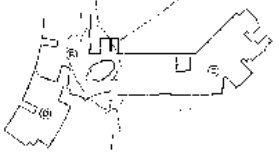
G/F (+41.80) COMPARTMENT CALCULATION



4/F (+53.20) COMPARTMENT CALCULATION



1/F (+45.80) COMPARTMENT CALCULATION



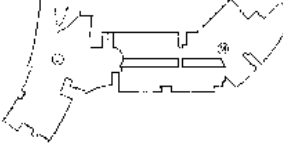
5/F (+52.00) COMPARTMENT CALCULATION



2/F (+49.80) COMPARTMENT CALCULATION



6/F (+55.80) COMPARTMENT CALCULATION



COMPARTMENT OF FLOOR				
FLOOR	AREA	PERIMETER	PERIMETER	PERIMETER
FLOOR	AREA	PERIMETER	PERIMETER	PERIMETER
LG/5/F	100.00	100.00	100.00	100.00
3/F	100.00	100.00	100.00	100.00
G/F	100.00	100.00	100.00	100.00
4/F	100.00	100.00	100.00	100.00
1/F	100.00	100.00	100.00	100.00
5/F	100.00	100.00	100.00	100.00
2/F	100.00	100.00	100.00	100.00
6/F	100.00	100.00	100.00	100.00

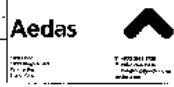
Total Capacity of COQUE				
Location	Use	Area	Factor	Total Capacity
LG/5/F	Office	275.442	9	31
G/F	Shop	54.208	3	19
G/F	Office	412.243	9	41
3/F	Restaurant	178.557	1	177
3/F	Kitchen	481.136	4.5	107
5/F	Office	212.144	9	294
6/F	Office	2031.235	9	226
6/F	Restaurant	178.557	1	177
6/F	Kitchen	166.561	4.5	42
6/F	Exhibition hall	704.244	2	353
Total number of students				6000
Total				874

SCHEDULE 1: MINIMUM NUMBER & WIDTH OF EXIT ROUTES FOR EACH FLOOR									
LOCATION	FLOOR	AREA	PERIMETER	PERIMETER	PERIMETER	PERIMETER	PERIMETER	PERIMETER	PERIMETER
LG/5/F	1	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
3/F	1	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
G/F	1	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
4/F	1	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1/F	1	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
5/F	1	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
2/F	1	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
6/F	1	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

THE RESISTANCE REQUIREMENTS FOR SUBSTRUCTURE OF CONSTRUCTION									
COMPONENT	THICKNESS	PERIMETER	PERIMETER	PERIMETER	PERIMETER	PERIMETER	PERIMETER	PERIMETER	PERIMETER
1. FLOOR	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
2. FLOOR	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
3. FLOOR	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
4. FLOOR	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
5. FLOOR	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
6. FLOOR	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
7. FLOOR	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
8. FLOOR	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
9. FLOOR	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
10. FLOOR	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

1. Approved
2. Approved
3. Approved
4. Approved
5. Approved
6. Approved
7. Approved
8. Approved
9. Approved
10. Approved

B D SUBMISSION



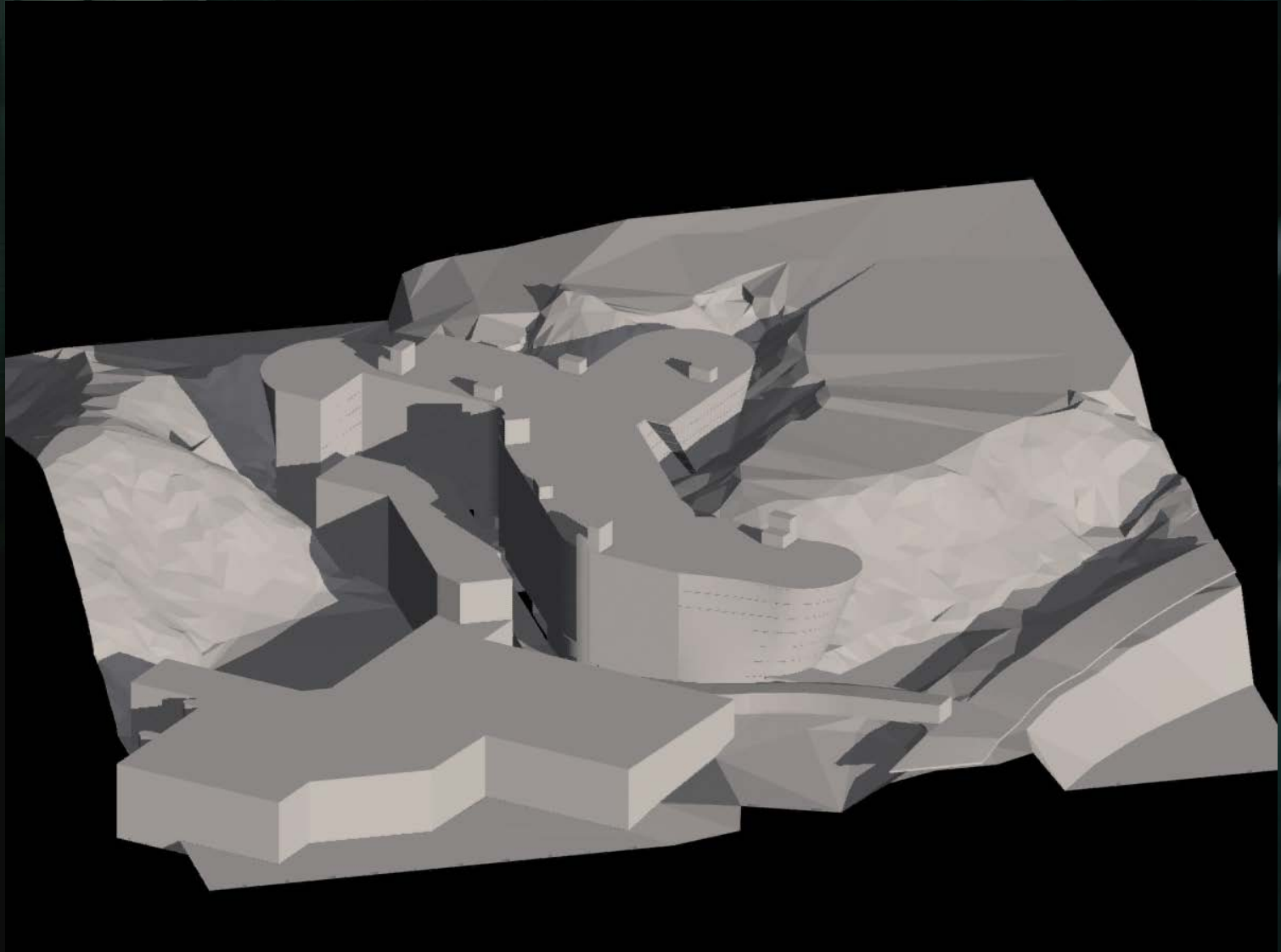
Aedas

TEL: +852 2607 9111
FAX: +852 2607 9112
E-MAIL: info@aedas.com.hk
www.aedas.com.hk

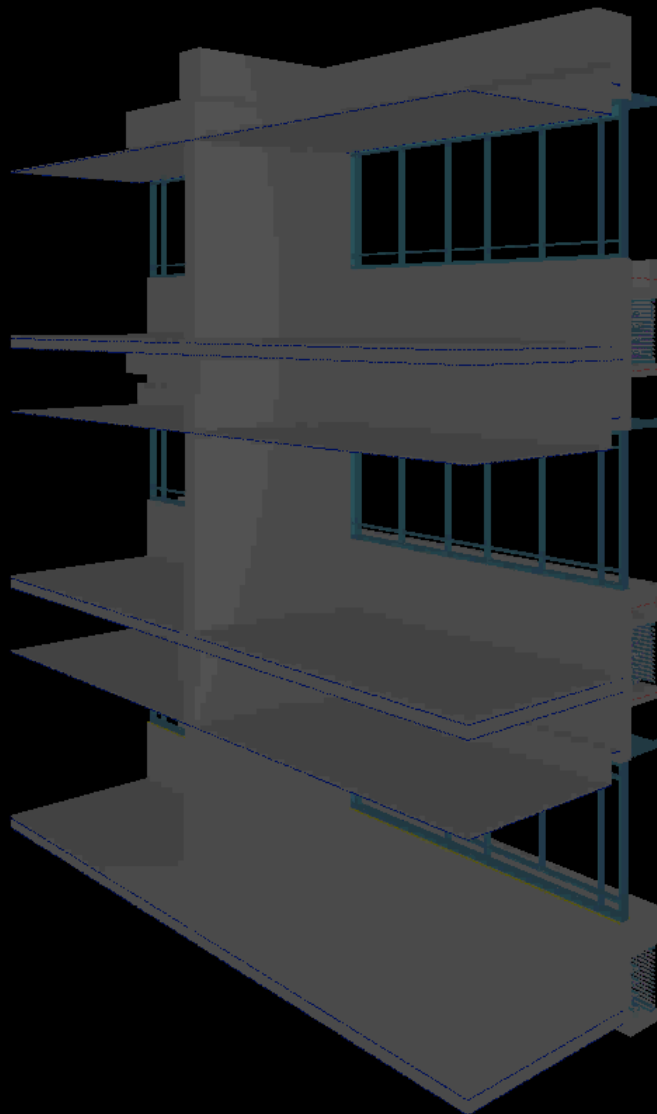
BIM 的運用範圍

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 生產製造
8. Complex Geometry 複雜幾何形狀

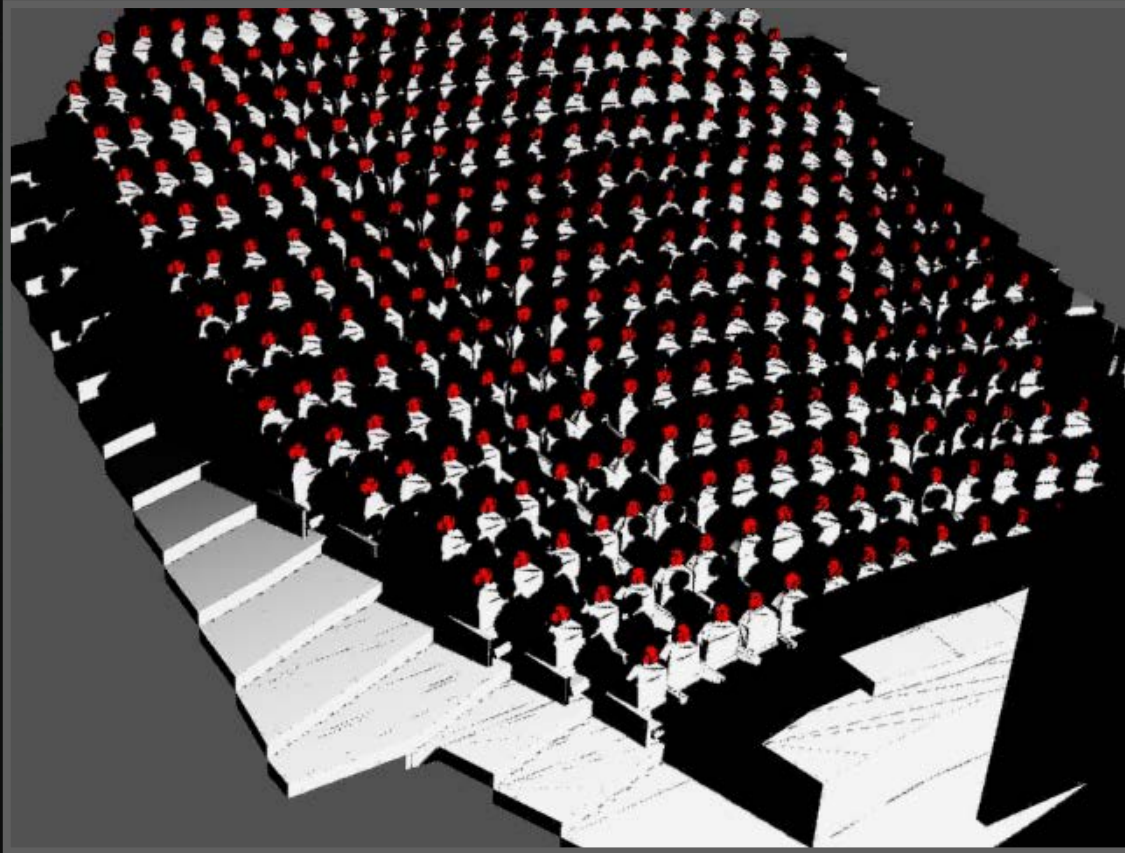
ANALYSIS



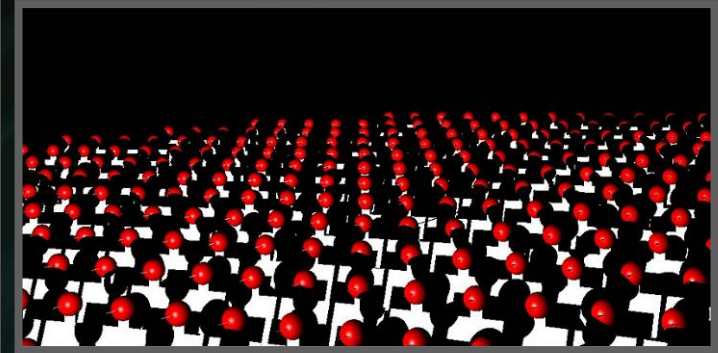
SUN STUDY



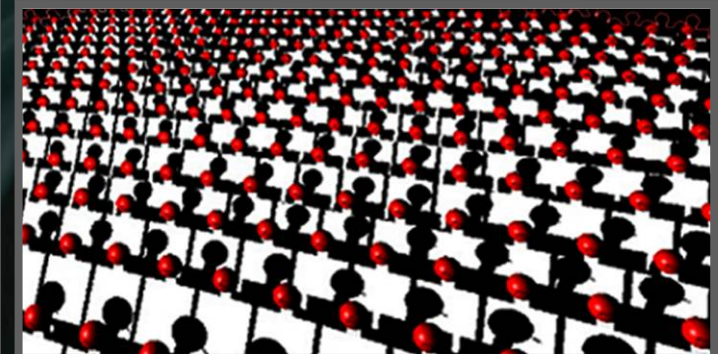
FAÇADE SOLAR STUDY
21/12/2007 7:00am – 6:00pm



Radiating Light Method



Unsatisfactory sightlines

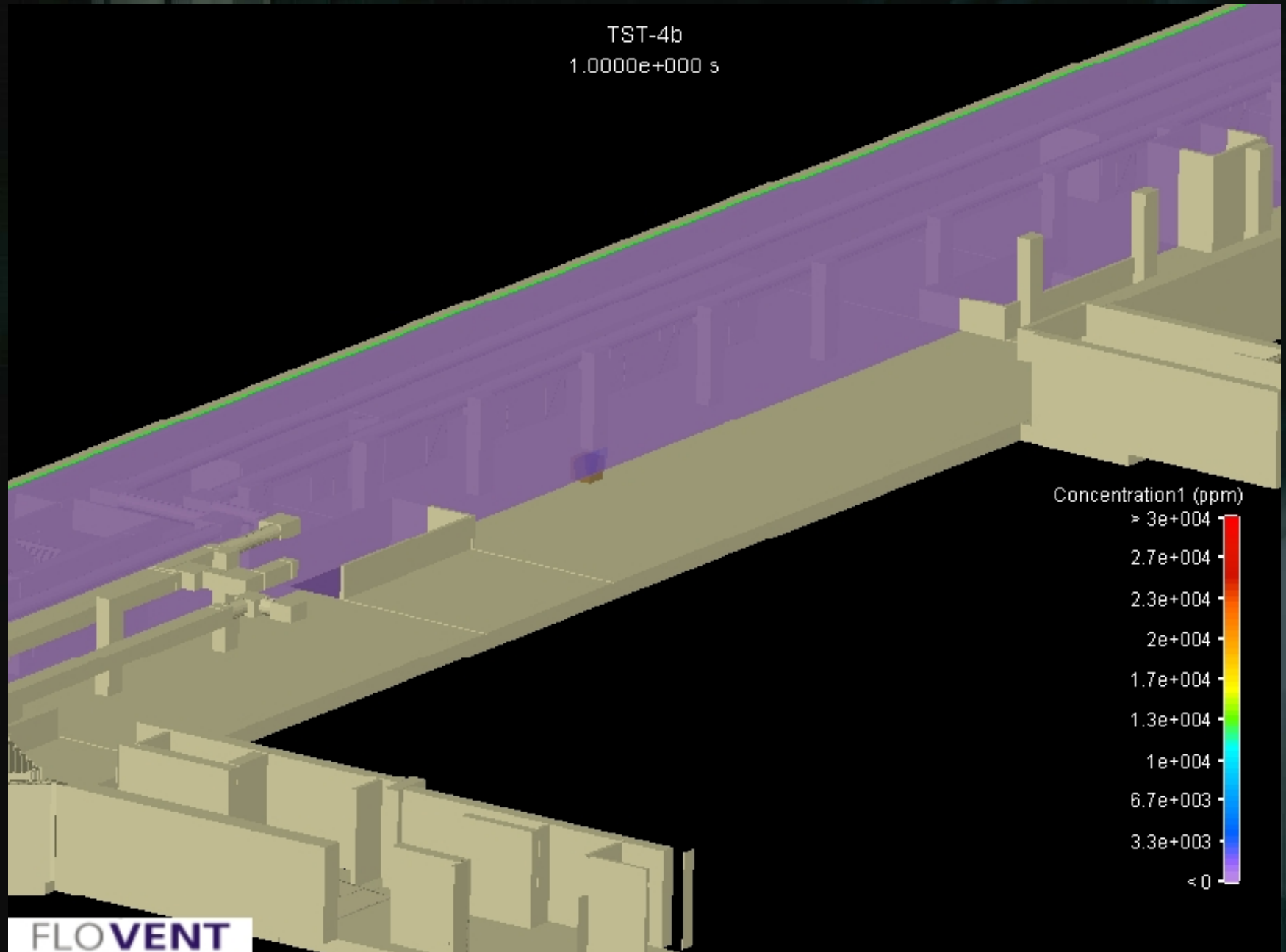


Satisfactory sightlines

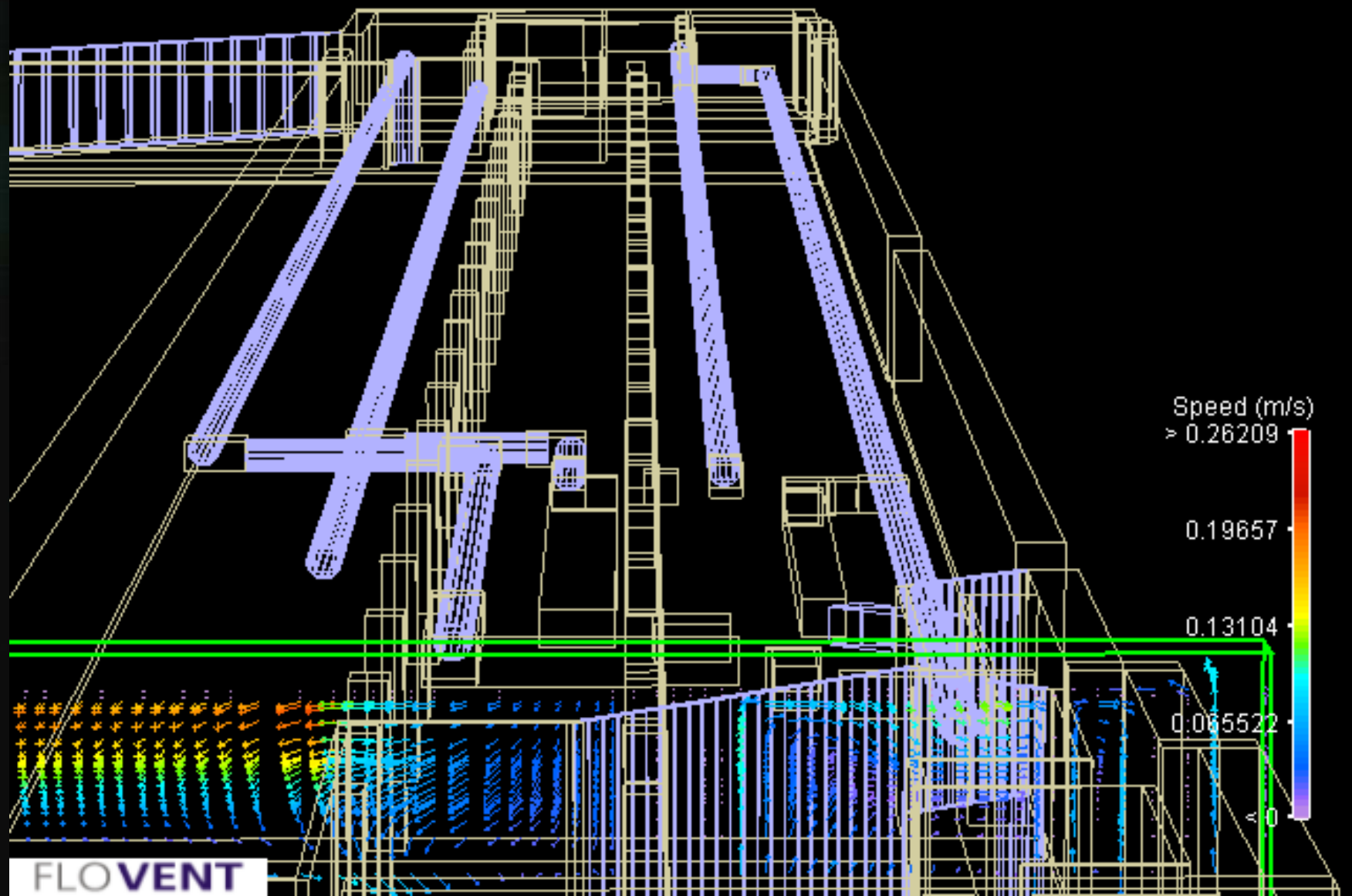
SIGHTLINE STUDIES

ANALYSIS

TST-4b
1.0000e+000 s



ANALYSIS

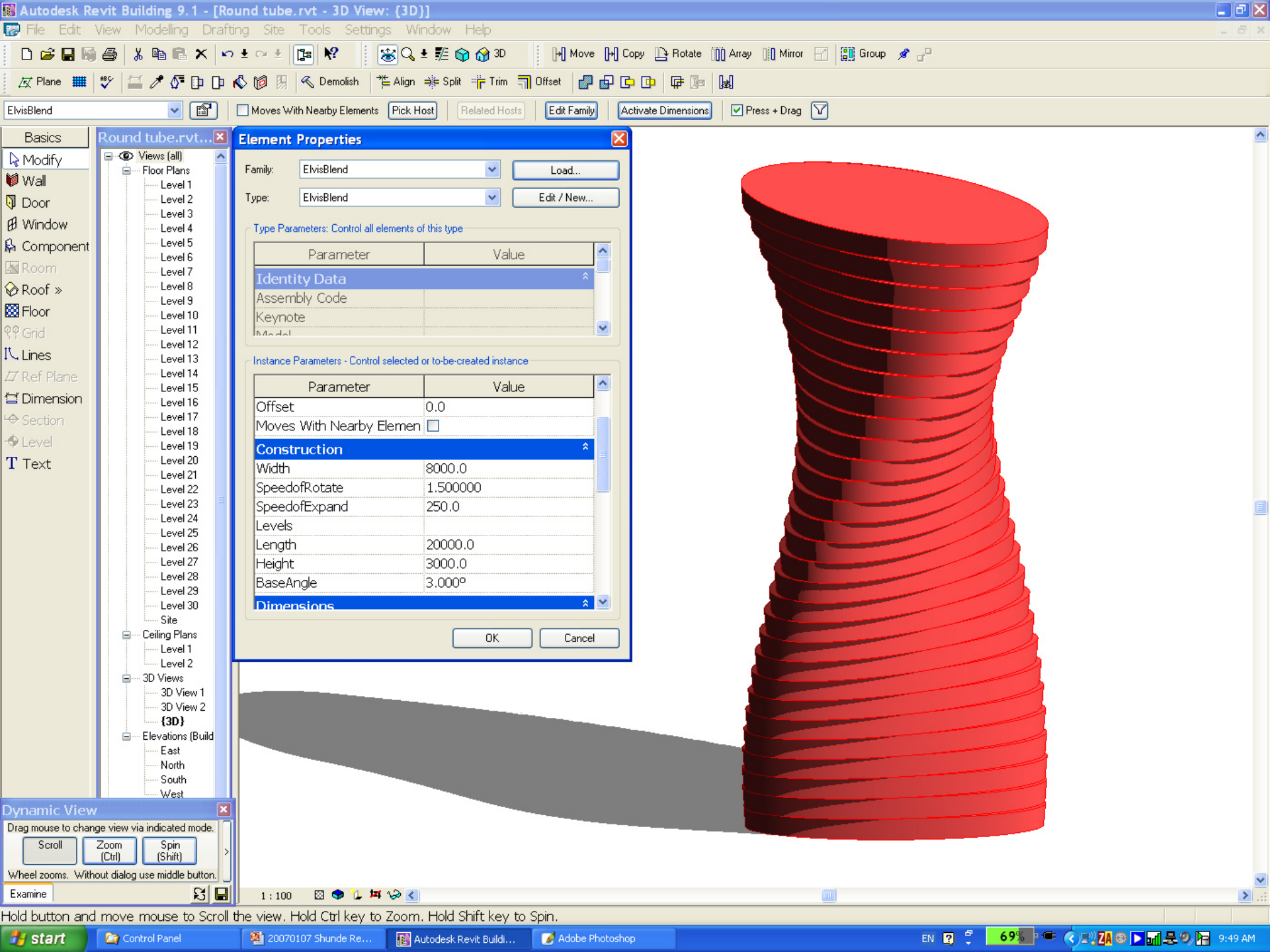


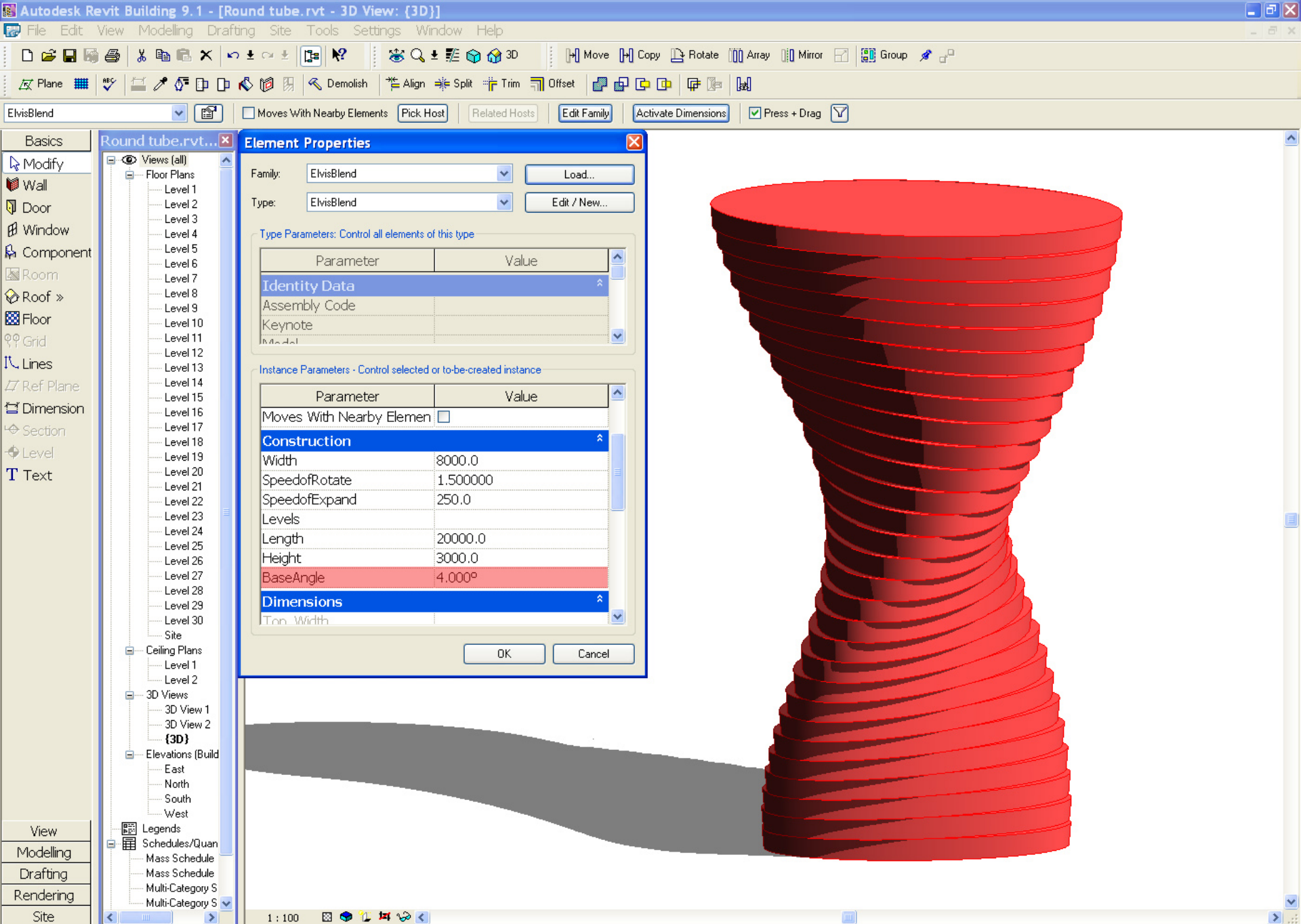
BIM 的運用範圍

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 生產製造
8. Complex Geometry 複雜幾何形狀

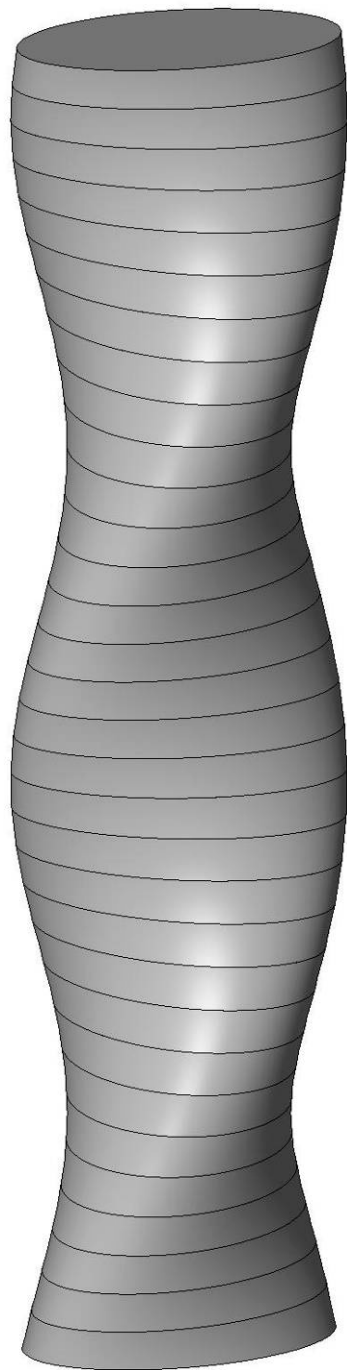
BIM 的運用範圍

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





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.

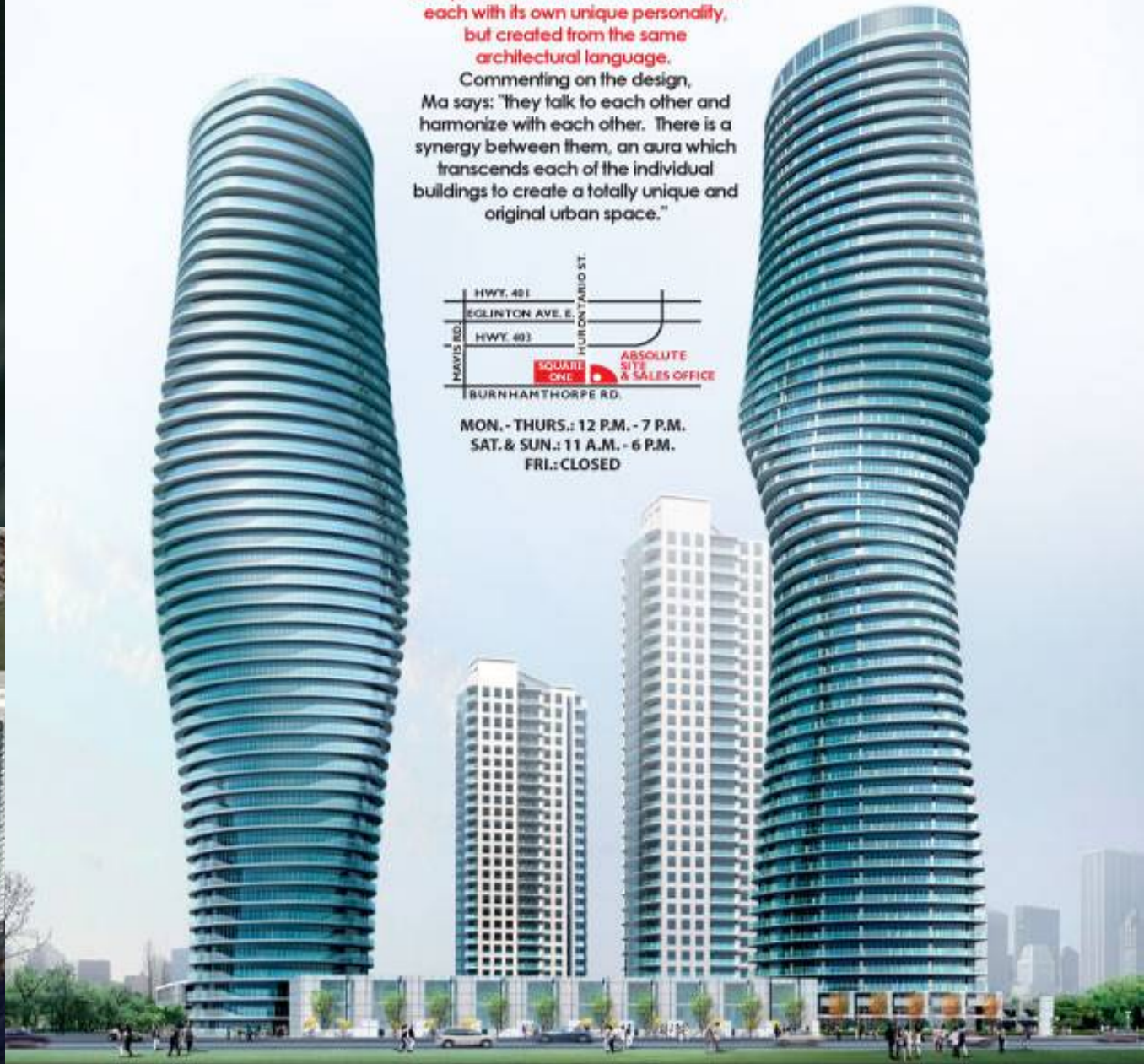
Commenting on the design, Ma says: "They talk to each other and harmonize with each other. There is a synergy between them, an aura which transcends each of the individual buildings to create a totally unique and original urban space."



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

absolute world

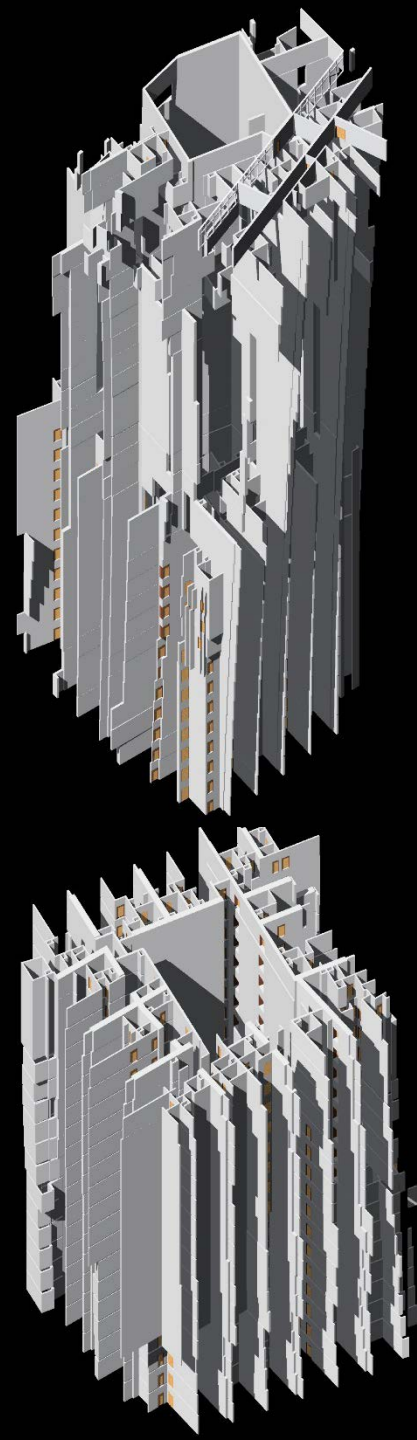
BUILDING 1



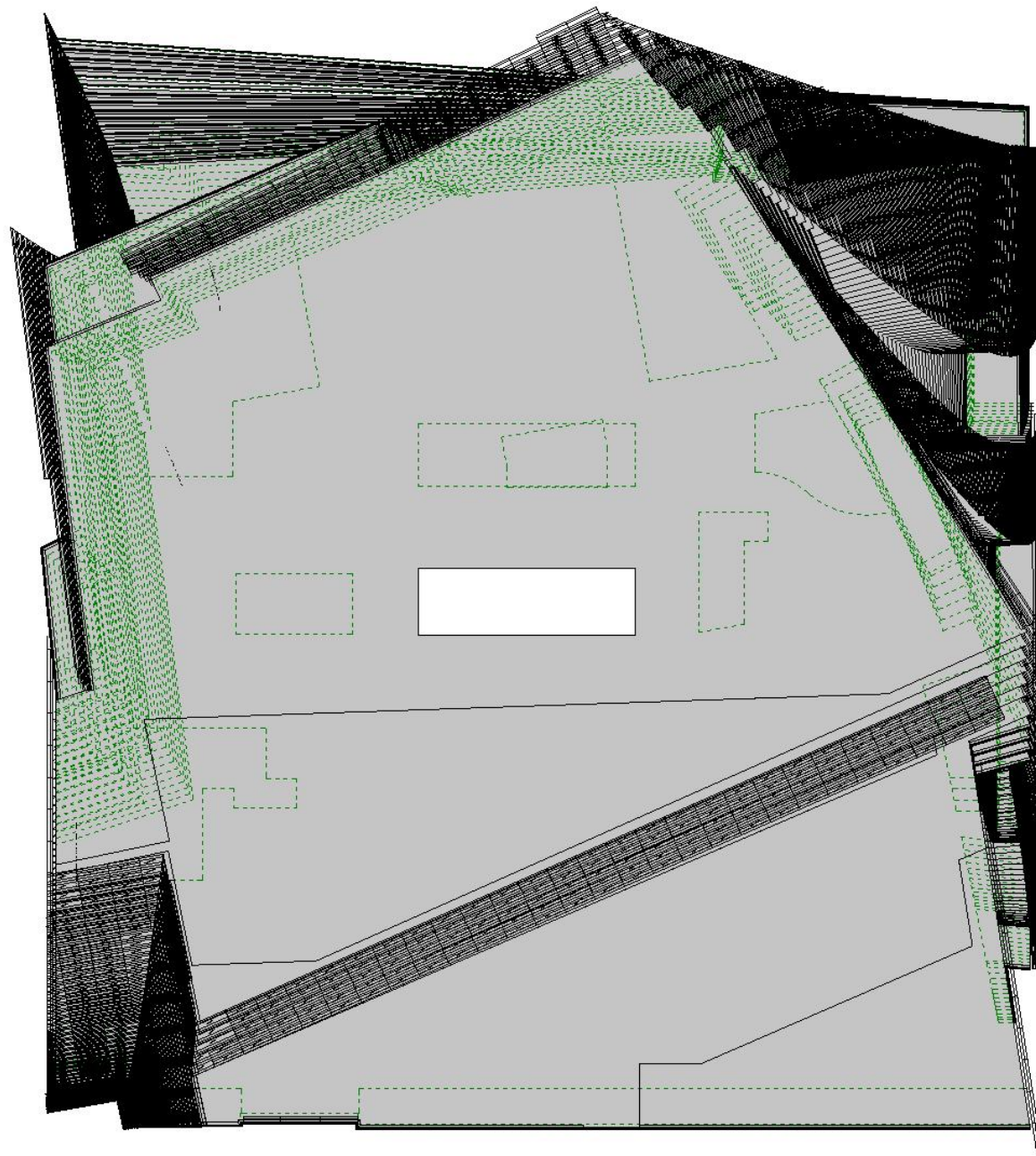
Program: Residential Site Area: 3,746 sqm
Floor Area: 659,659 sqm Building Height: 345 m

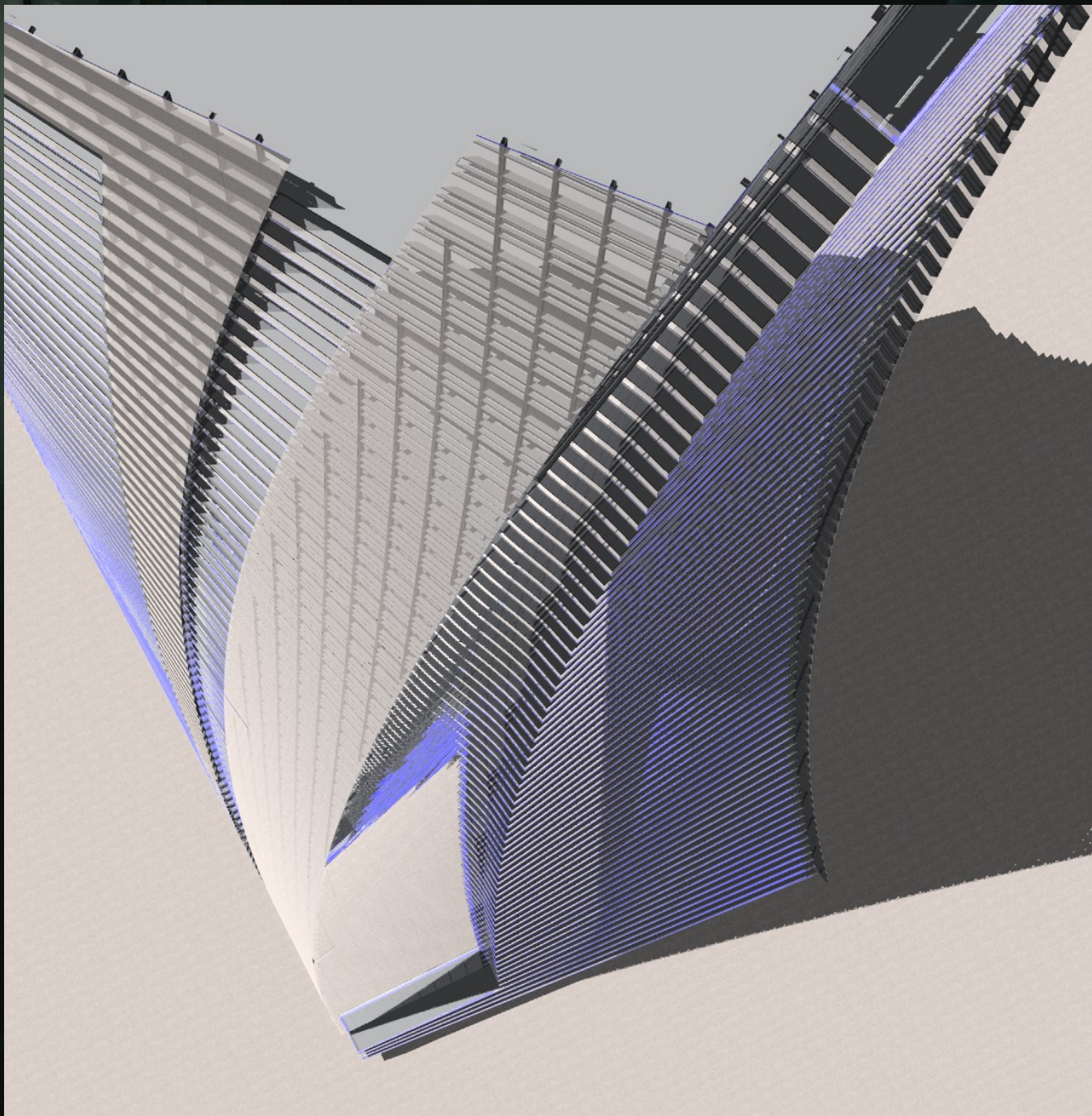


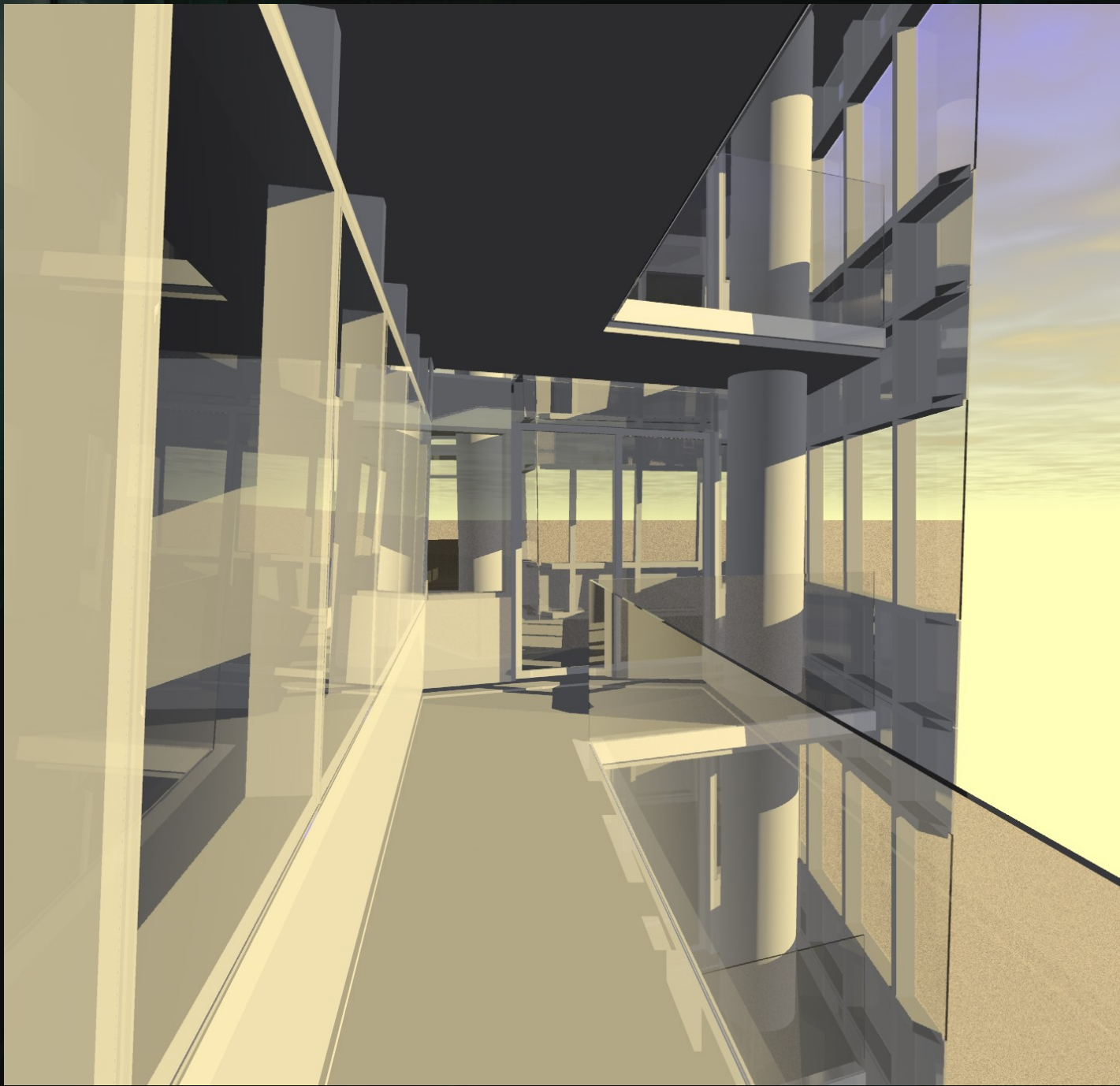
Dubai **Ocean Heights One**

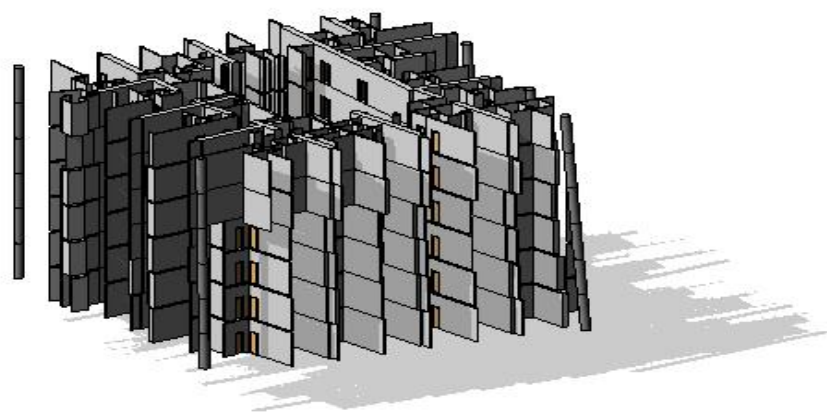


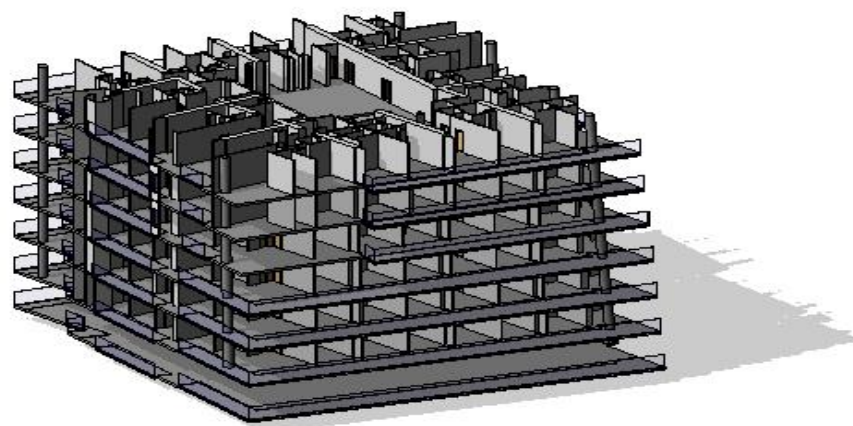
COMPLEX GEOMETRY









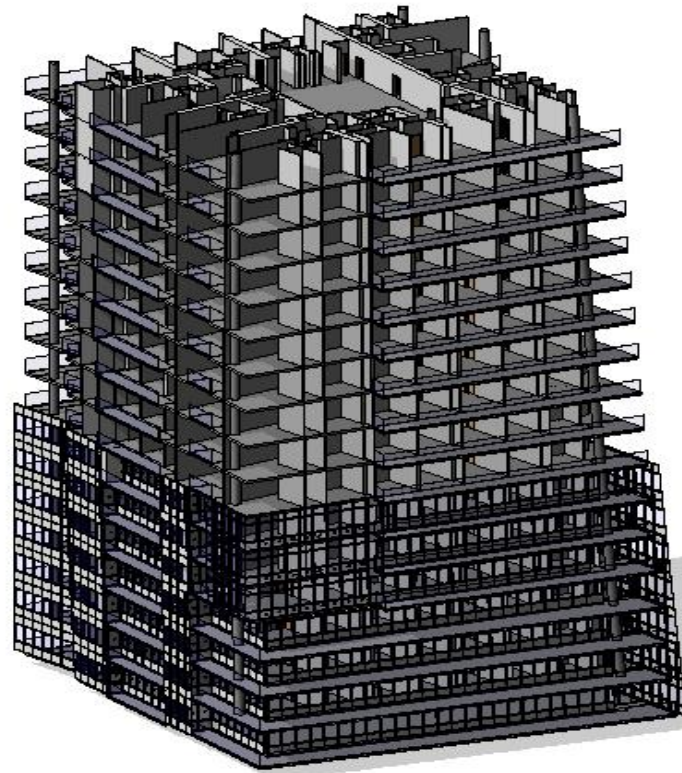










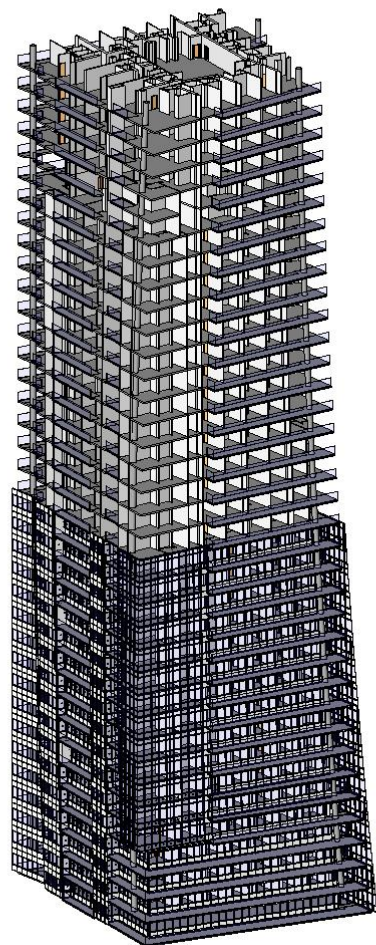


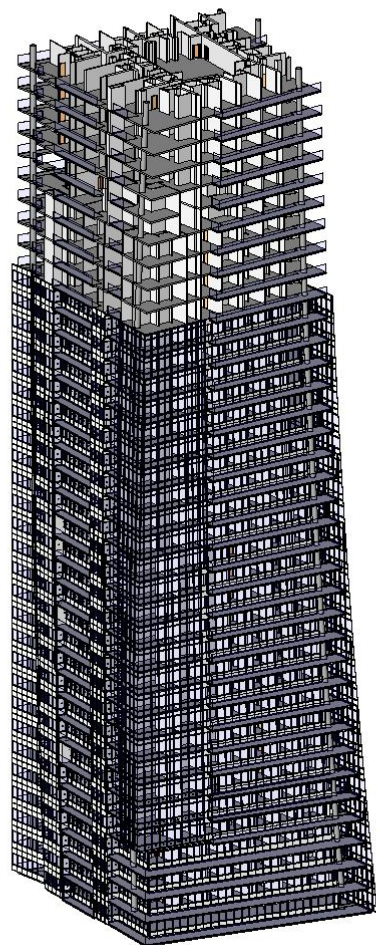


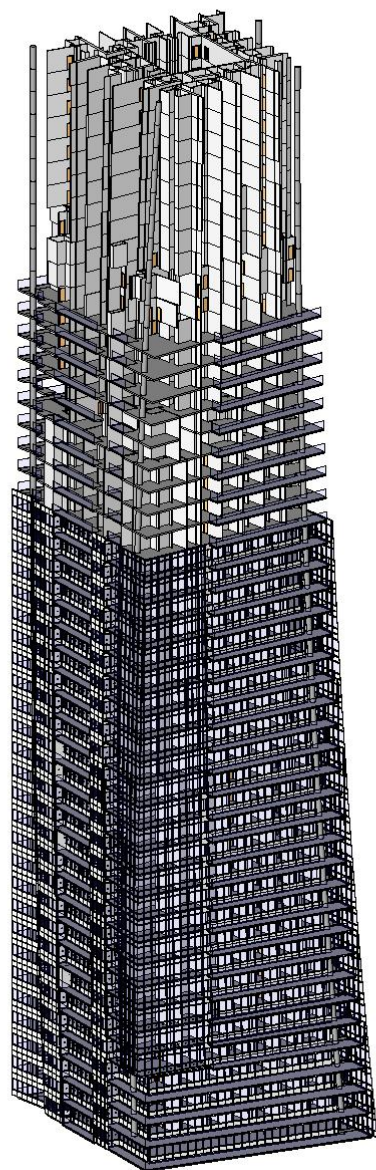


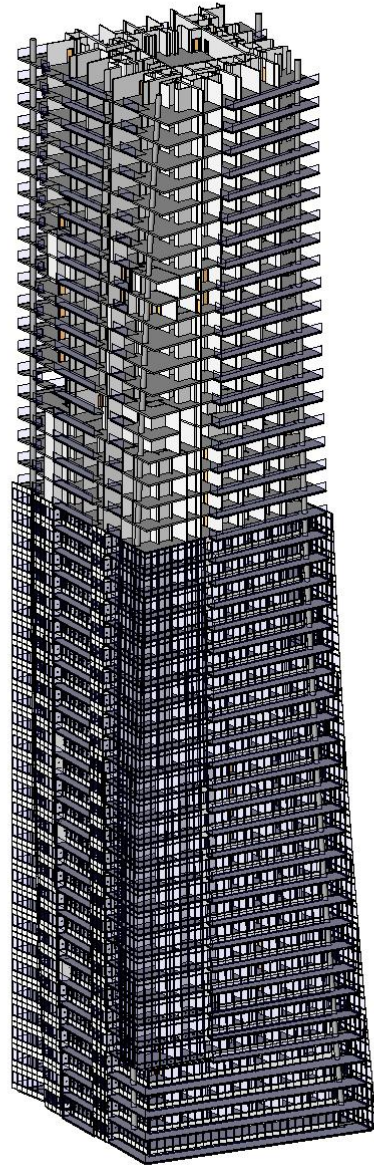


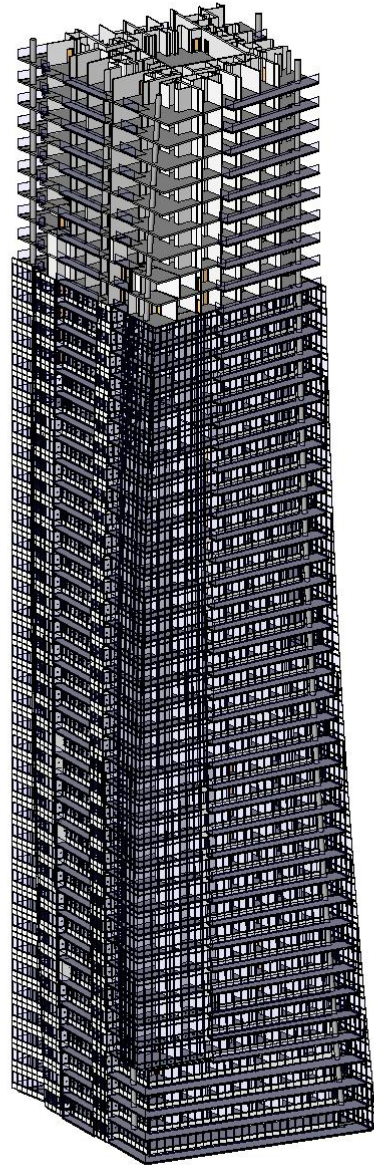


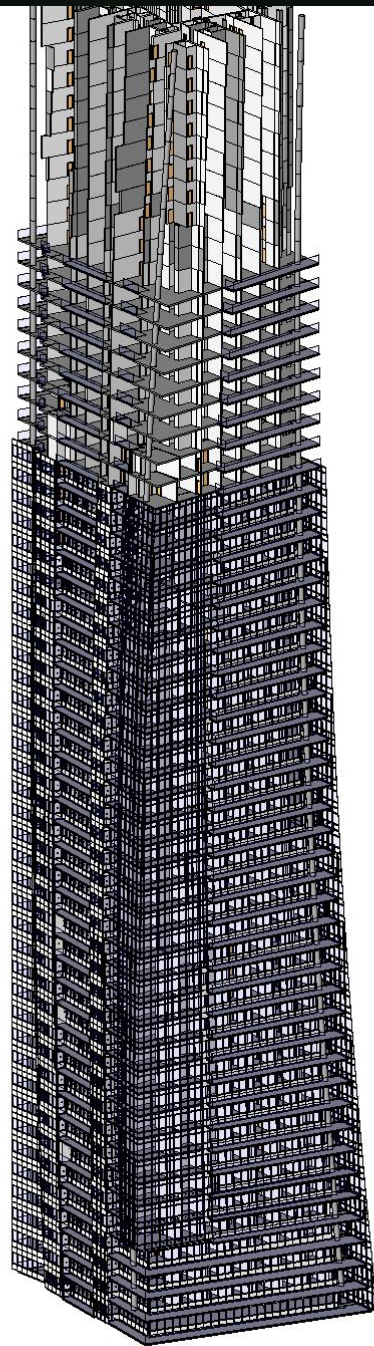


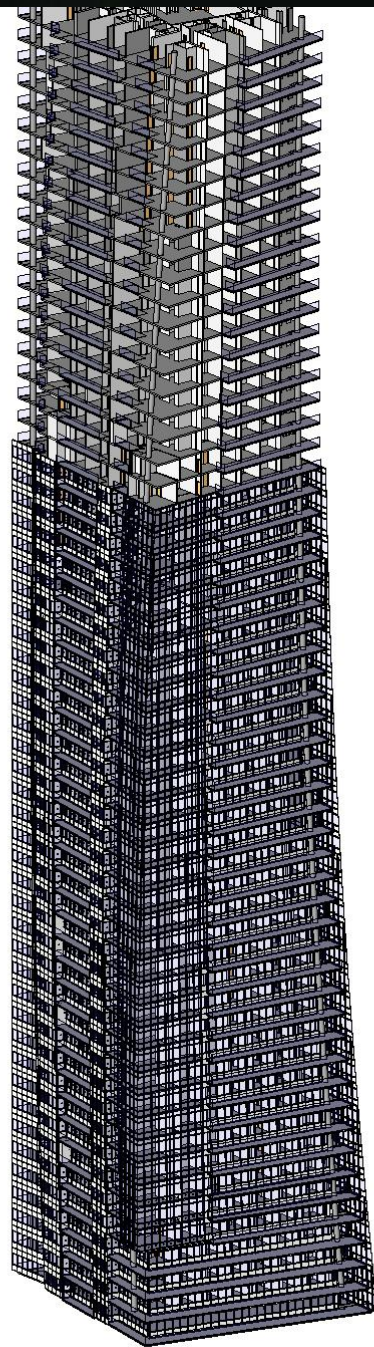


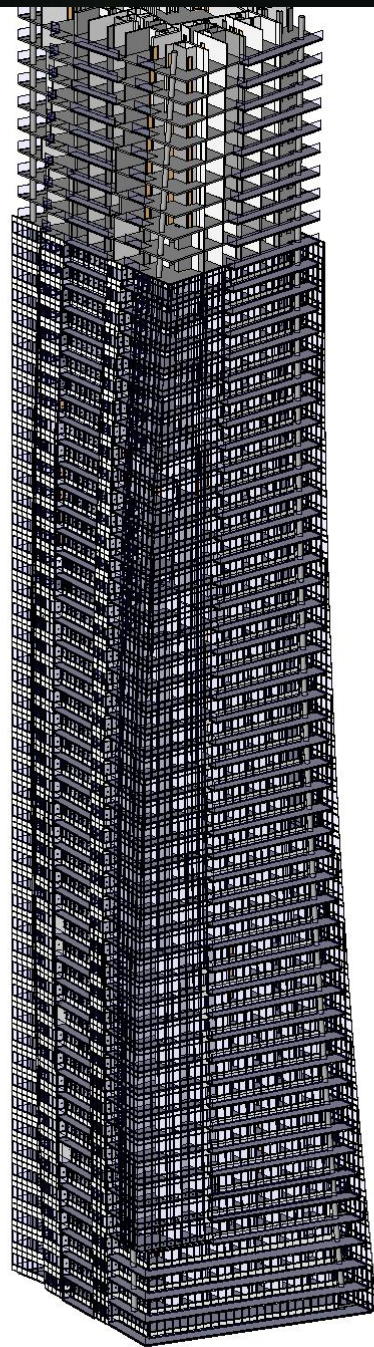
















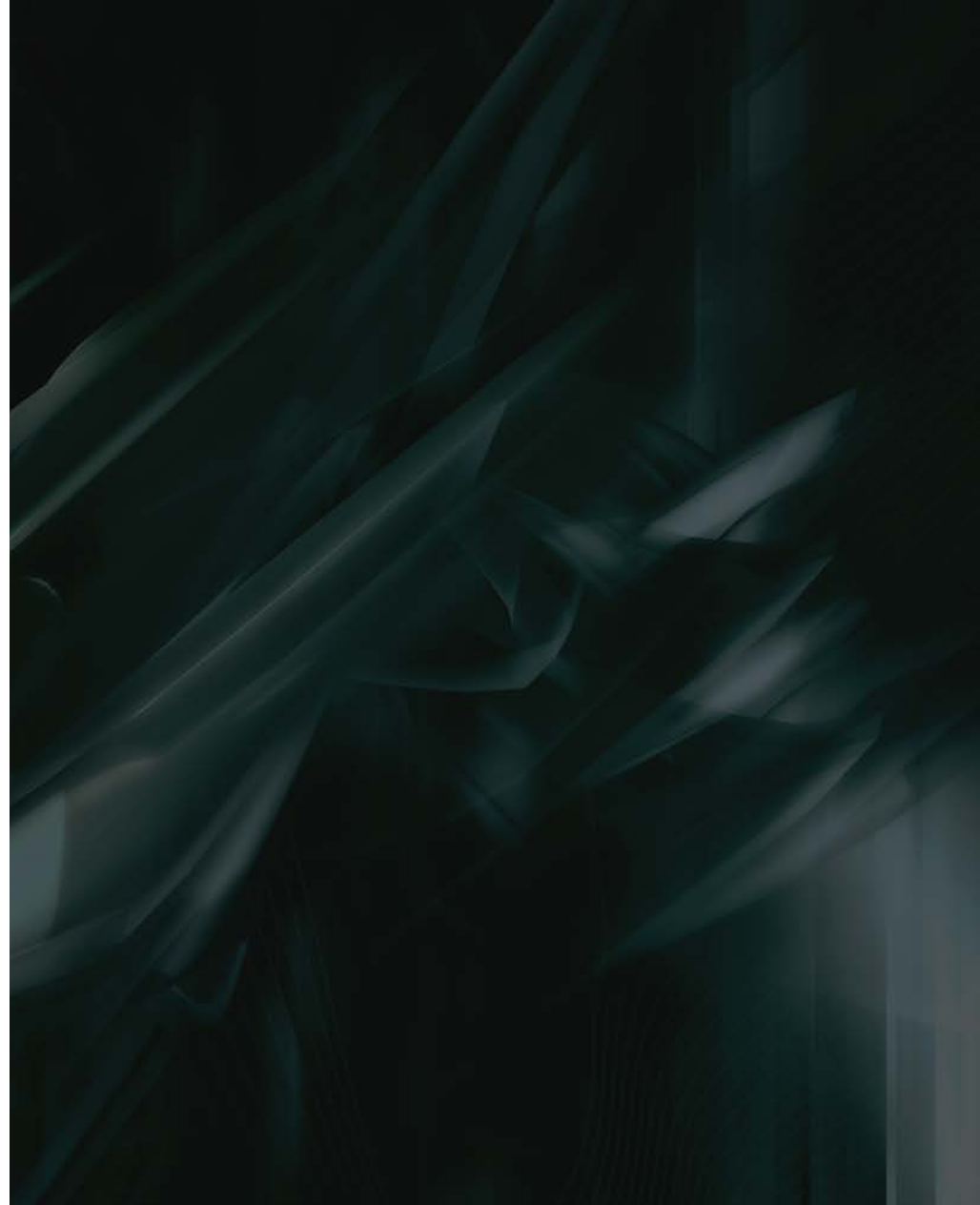
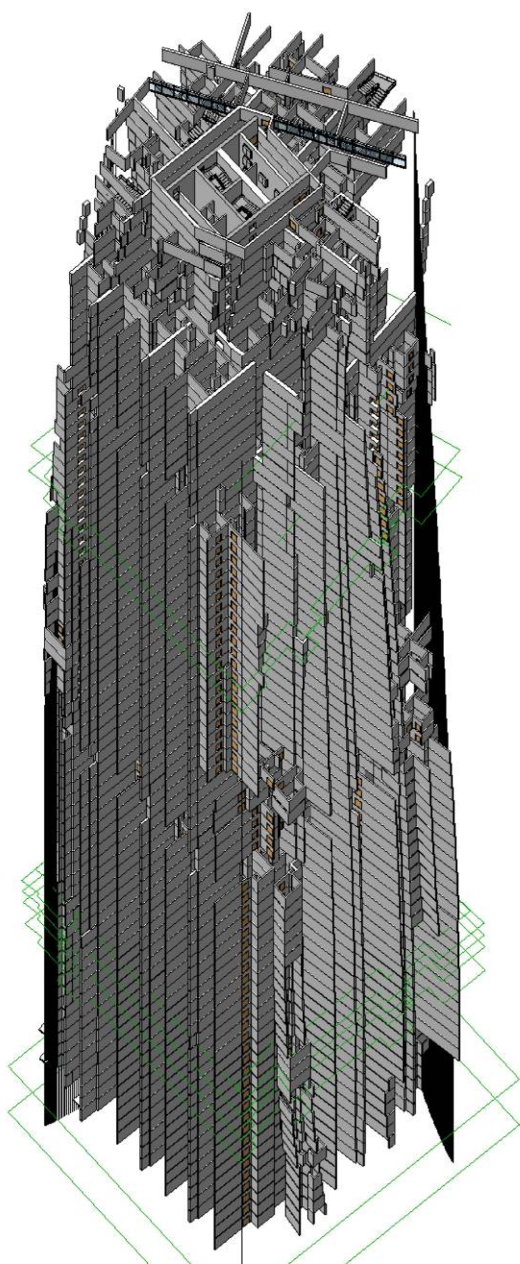




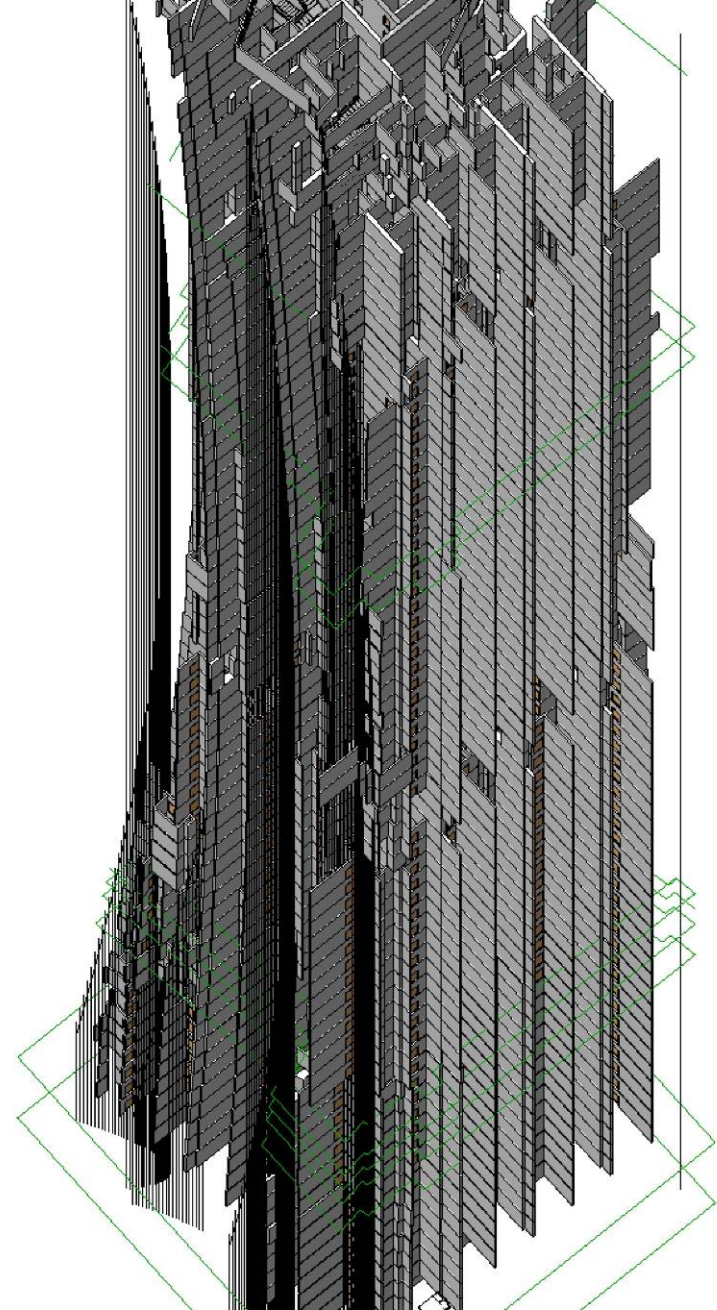
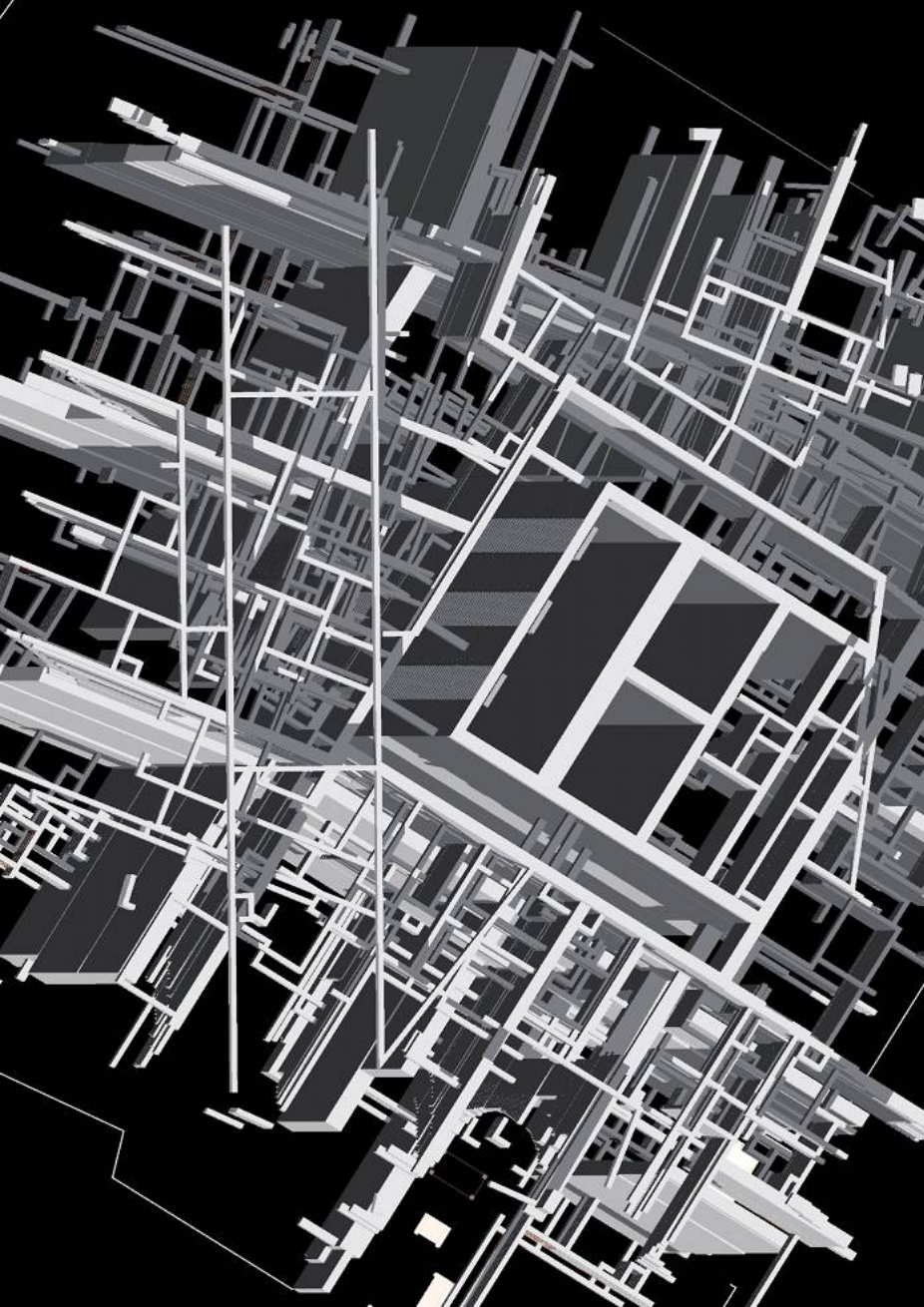




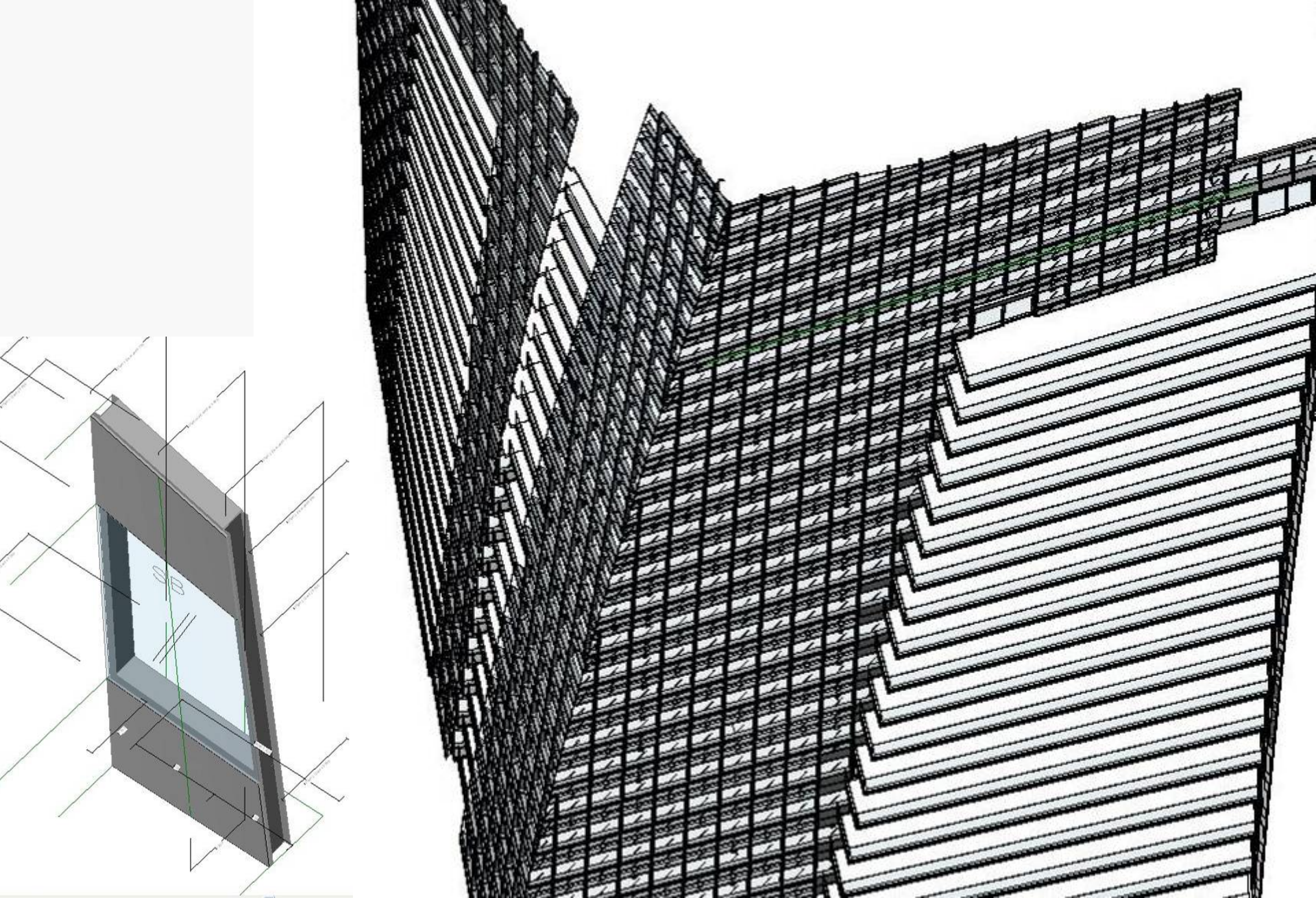




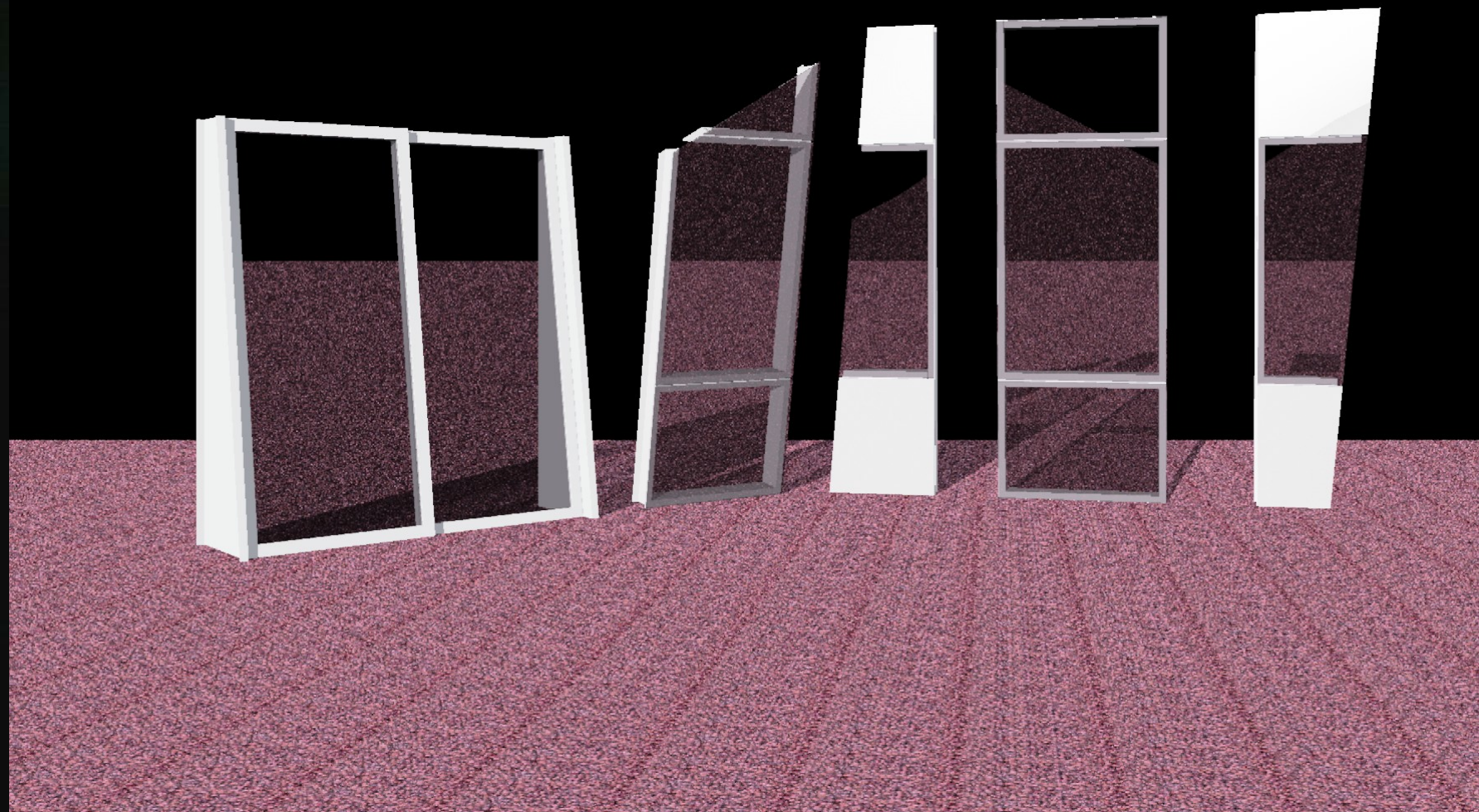
VERTICAL CO-ORDINATION

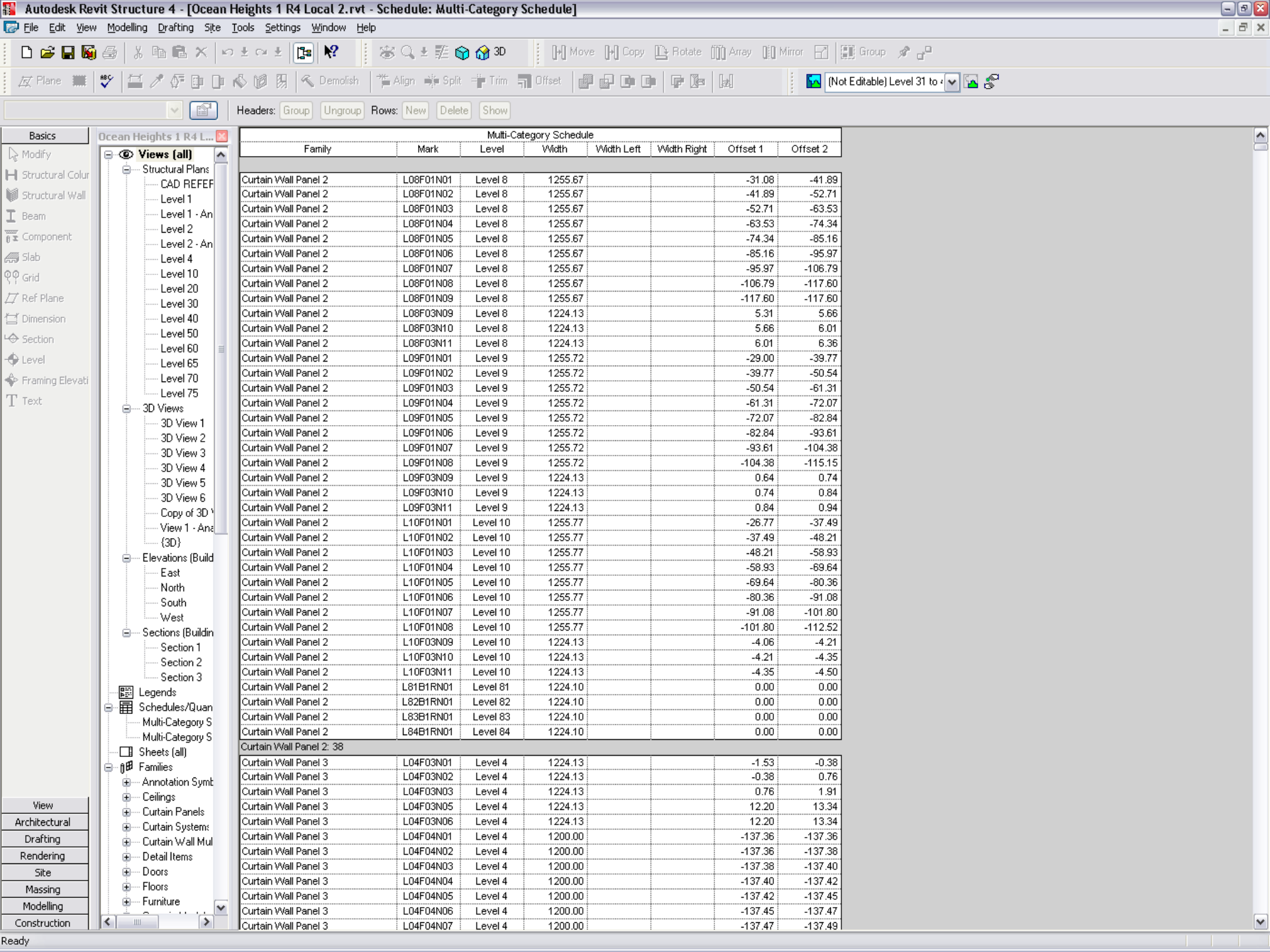


INTERNAL vs EXTERNAL



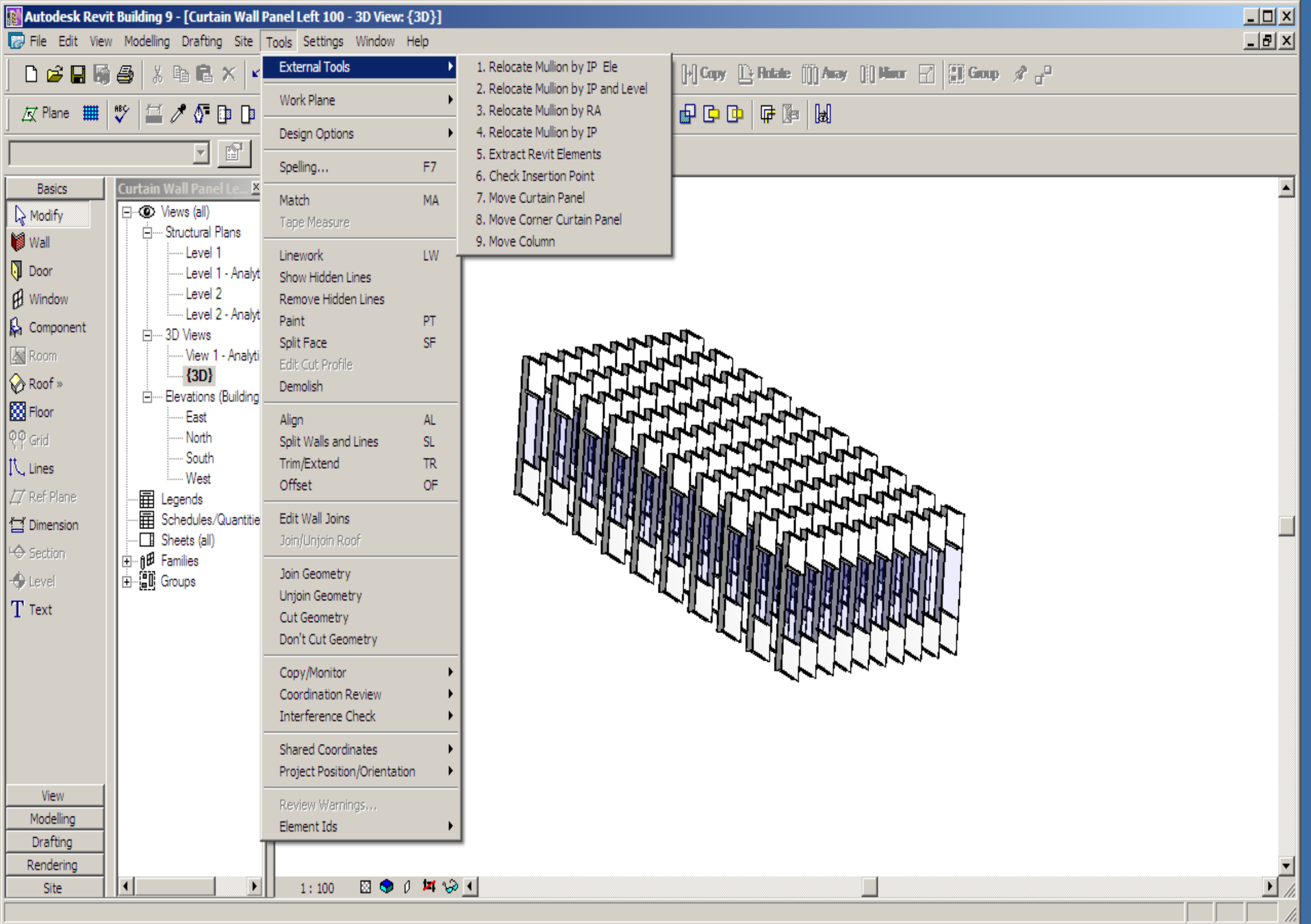
COMPLICATED CURTAIN WALL

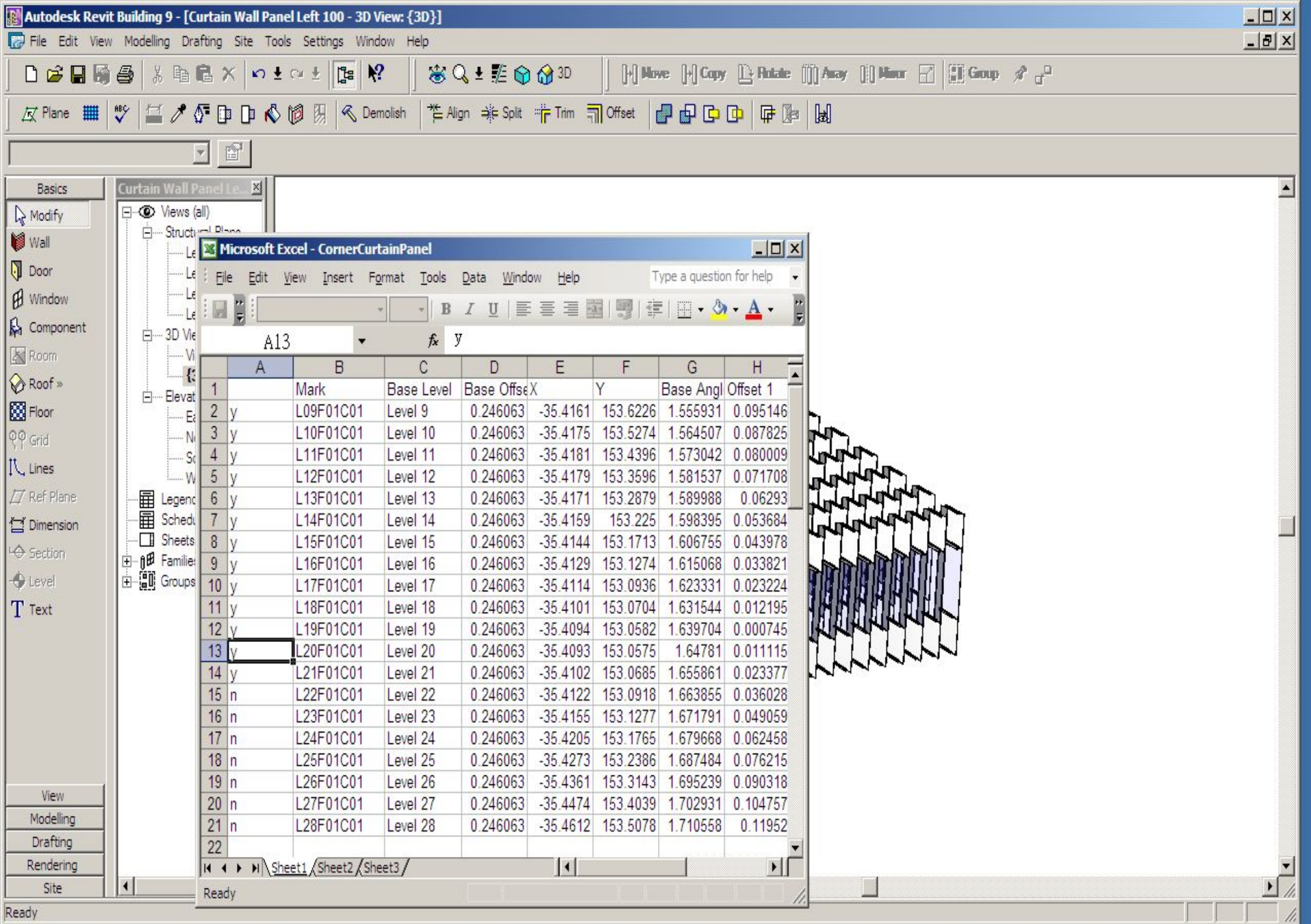


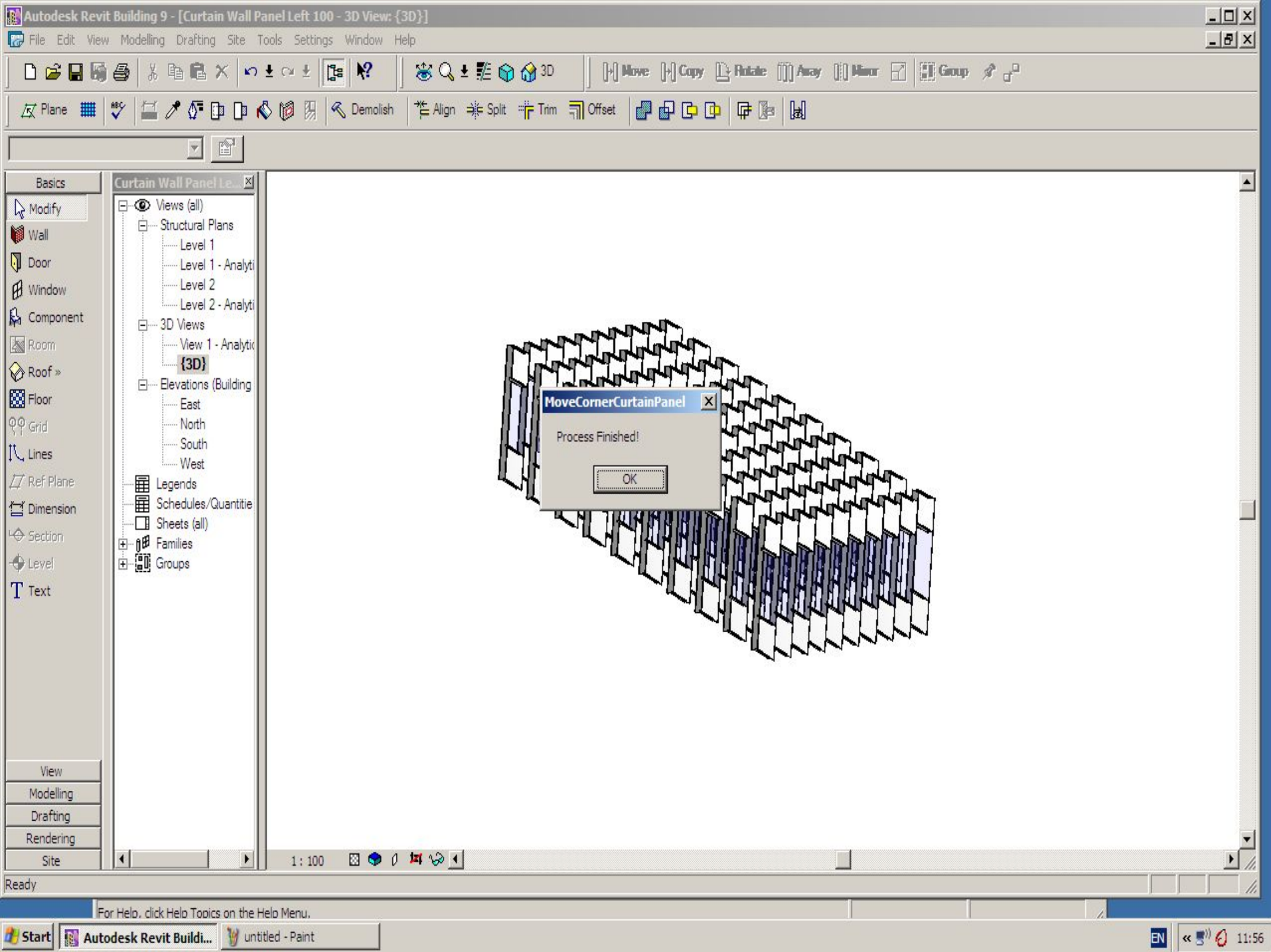


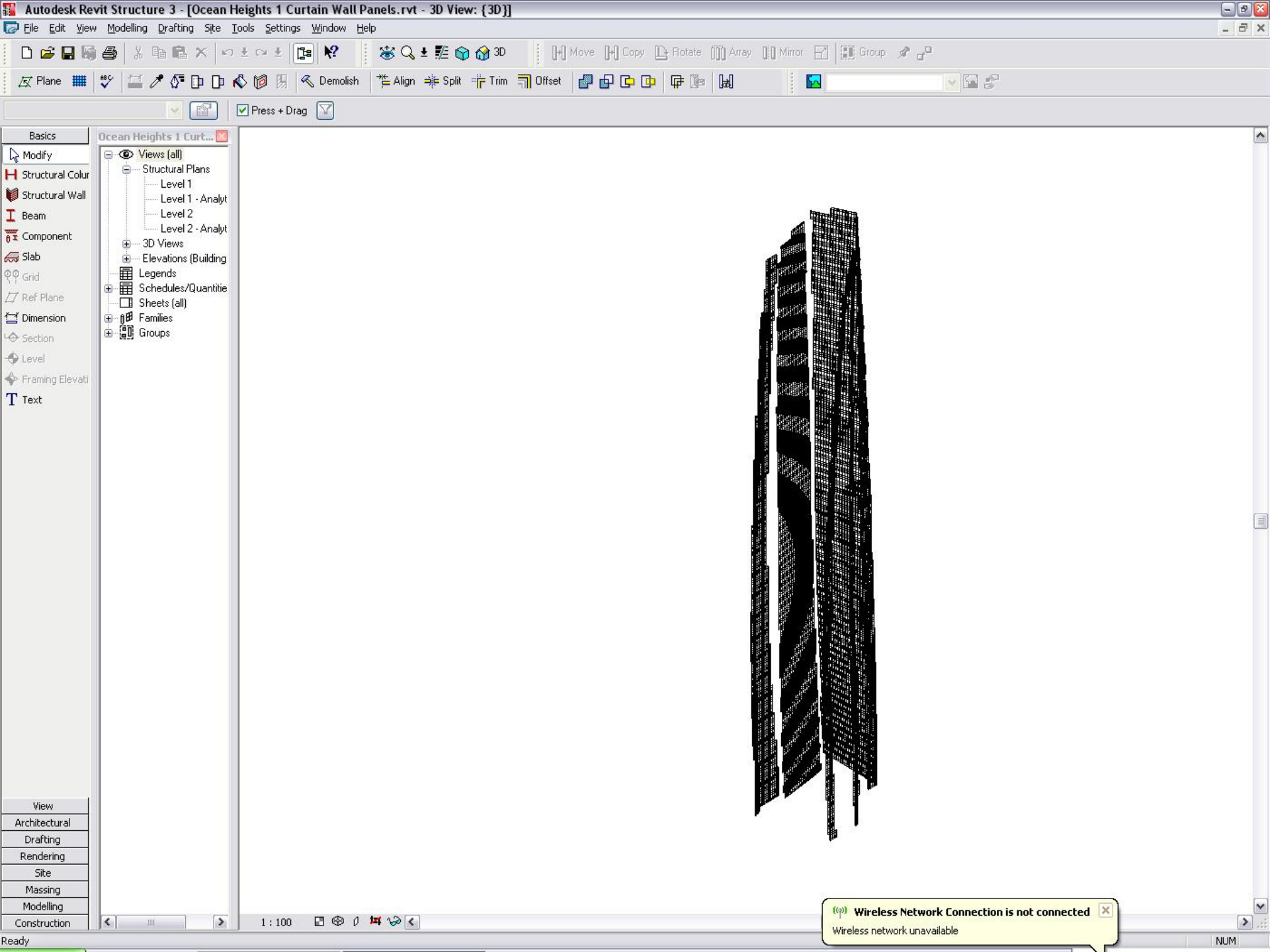
Multi-Category Schedule							
Family	Mark	Level	Width	Width Left	Width Right	Offset 1	Offset 2
Curtain Wall Panel 2	L08F01N01	Level 8	1255.67			-31.08	-41.89
Curtain Wall Panel 2	L08F01N02	Level 8	1255.67			-41.89	-52.71
Curtain Wall Panel 2	L08F01N03	Level 8	1255.67			-52.71	-63.53
Curtain Wall Panel 2	L08F01N04	Level 8	1255.67			-63.53	-74.34
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
Curtain Wall Panel 2	L09F01N01	Level 9	1255.72			-29.00	-39.77
Curtain Wall Panel 2	L09F01N02	Level 9	1255.72			-39.77	-50.54
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
Curtain Wall Panel 2	L09F01N06	Level 9	1255.72			-82.84	-93.61
Curtain Wall Panel 2	L09F01N07	Level 9	1255.72			-93.61	-104.38
Curtain Wall Panel 2	L09F01N08	Level 9	1255.72			-104.38	-115.15
Curtain Wall Panel 2	L09F03N09	Level 9	1224.13			0.64	0.74
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
Curtain Wall Panel 2	L10F01N01	Level 10	1255.77			-26.77	-37.49
Curtain Wall Panel 2	L10F01N02	Level 10	1255.77			-37.49	-48.21
Curtain Wall Panel 2	L10F01N03	Level 10	1255.77			-48.21	-58.93
Curtain Wall Panel 2	L10F01N04	Level 10	1255.77			-58.93	-69.64
Curtain Wall Panel 2	L10F01N05	Level 10	1255.77			-69.64	-80.36
Curtain Wall Panel 2	L10F01N06	Level 10	1255.77			-80.36	-91.08
Curtain Wall Panel 2	L10F01N07	Level 10	1255.77			-91.08	-101.80
Curtain Wall Panel 2	L10F01N08	Level 10	1255.77			-101.80	-112.52
Curtain Wall Panel 2	L10F03N09	Level 10	1224.13			-4.06	-4.21
Curtain Wall Panel 2	L10F03N10	Level 10	1224.13			-4.21	-4.35
Curtain Wall Panel 2	L10F03N11	Level 10	1224.13			-4.35	-4.50
Curtain Wall Panel 2	L81B1RN01	Level 81	1224.10			0.00	0.00
Curtain Wall Panel 2	L82B1RN01	Level 82	1224.10			0.00	0.00
Curtain Wall Panel 2	L83B1RN01	Level 83	1224.10			0.00	0.00
Curtain Wall Panel 2	L84B1RN01	Level 84	1224.10			0.00	0.00
Curtain Wall Panel 2: 38							
Curtain Wall Panel 3	L04F03N01	Level 4	1224.13			-1.53	-0.38
Curtain Wall Panel 3	L04F03N02	Level 4	1224.13			-0.38	0.76
Curtain Wall Panel 3	L04F03N03	Level 4	1224.13			0.76	1.91
Curtain Wall Panel 3	L04F03N05	Level 4	1224.13			12.20	13.34
Curtain Wall Panel 3	L04F03N06	Level 4	1224.13			12.20	13.34
Curtain Wall Panel 3	L04F04N01	Level 4	1200.00			-137.36	-137.36
Curtain Wall Panel 3	L04F04N02	Level 4	1200.00			-137.36	-137.38
Curtain Wall Panel 3	L04F04N03	Level 4	1200.00			-137.38	-137.40
Curtain Wall Panel 3	L04F04N04	Level 4	1200.00			-137.40	-137.42
Curtain Wall Panel 3	L04F04N05	Level 4	1200.00			-137.42	-137.45
Curtain Wall Panel 3	L04F04N06	Level 4	1200.00			-137.45	-137.47
Curtain Wall Panel 3	L04F04N07	Level 4	1200.00			-137.47	-137.49

	Ref Plane		Level 20	Sliding Door	L71B05D12	Level 71	2550.00		0.00
	Dimension		Level 30	Sliding Door	L71B05D15	Level 71	2550.00		0.00
	Section		Level 40	Sliding Door	L72B01D02	Level 72	2400.00		0.00
	Level		Level 50	Sliding Door	L72B02D02	Level 72	2500.00		0.00
	Framing Elevati		Level 60	Sliding Door	L72B04D01	Level 72	1800.00		0.00
	Text		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
			3D Views	Sliding Door	L72B05D10	Level 72	2550.00		0.00
			3D View 1	Sliding Door	L72B05D12	Level 72	2550.00		0.00
			3D View 2	Sliding Door	L72B05D15	Level 72	2550.00		0.00
			3D View 3	Sliding Door	L73B01D02	Level 73	2400.00		0.00
			3D View 4	Sliding Door	L73B02D02	Level 73	2500.00		0.00
			3D View 5	Sliding Door	L73B04D01	Level 73	1700.00		0.00
			3D View 6	Sliding Door	L73B05D03	Level 73	2550.00		0.00
			Copy of 3D V	Sliding Door	L73B05D05	Level 73	2550.00		0.00
			View 1 - Ana	Sliding Door	L73B05D08	Level 73	2550.00		0.00
			(3D)	Sliding Door	L73B05D10	Level 73	2550.00		0.00
			Elevations (Build	Sliding Door	L73B05D12	Level 73	2550.00		0.00
			East	Sliding Door	L73B05D15	Level 73	2550.00		0.00
			North	Sliding Door	L74B01D02	Level 74	2400.00		0.00
			South	Sliding Door	L74B02D02	Level 74	2500.00		0.00
			West	Sliding Door	L74B04D01	Level 74	1600.00		0.00
			Sections (Building	Sliding Door	L74B05D03	Level 74	2550.00		0.00
			Section 1	Sliding Door	L74B05D05	Level 74	2550.00		0.00
			Section 2	Sliding Door	L74B05D08	Level 74	2550.00		0.00
			Section 3	Sliding Door	L74B05D10	Level 74	2550.00		0.00
			Legends	Sliding Door	L74B05D12	Level 74	2550.00		0.00
			Schedules/Quan	Sliding Door	L74B05D15	Level 74	2550.00		0.00
			Multi-Category S	Sliding Door	L75B01D02	Level 75	2400.00		0.00
			Multi-Category S	Sliding Door	L75B02D02	Level 75	2500.00		0.00
			Sheets (all)	Sliding Door	L76B01D02	Level 76	2400.00		0.00
			Families	Sliding Door	L76B02D02	Level 76	2500.00		0.00
			Annotation Synt	Sliding Door	L77B01D02	Level 77	2400.00		0.00
			Ceilings	Sliding Door	L77B02D01	Level 77	2426.17		0.00
			Curtain Panels	Sliding Door	L78B01D02	Level 78	2400.00		0.00
			Curtain Systems	Sliding Door	L78B02D01	Level 78	2203.01		0.00
			Curtain Wall Mul	Sliding Door	L79B01D02	Level 79	2400.00		0.00
			Detail Items	Sliding Door	L79B02D01	Level 79	1974.15		0.00
			Doors	Sliding Door: 649					
			Floors	Sliding Door to Replace CW Pan	L10F01N10	Level 10	1255.77		-123.24
			Furniture	Sliding Door to Replace CW Panel: 1					
				Grand total: 9740					









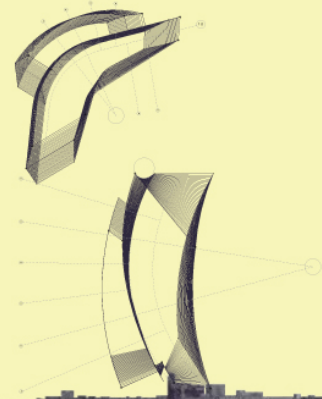
Abu Dhabi Dancing Towers

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.

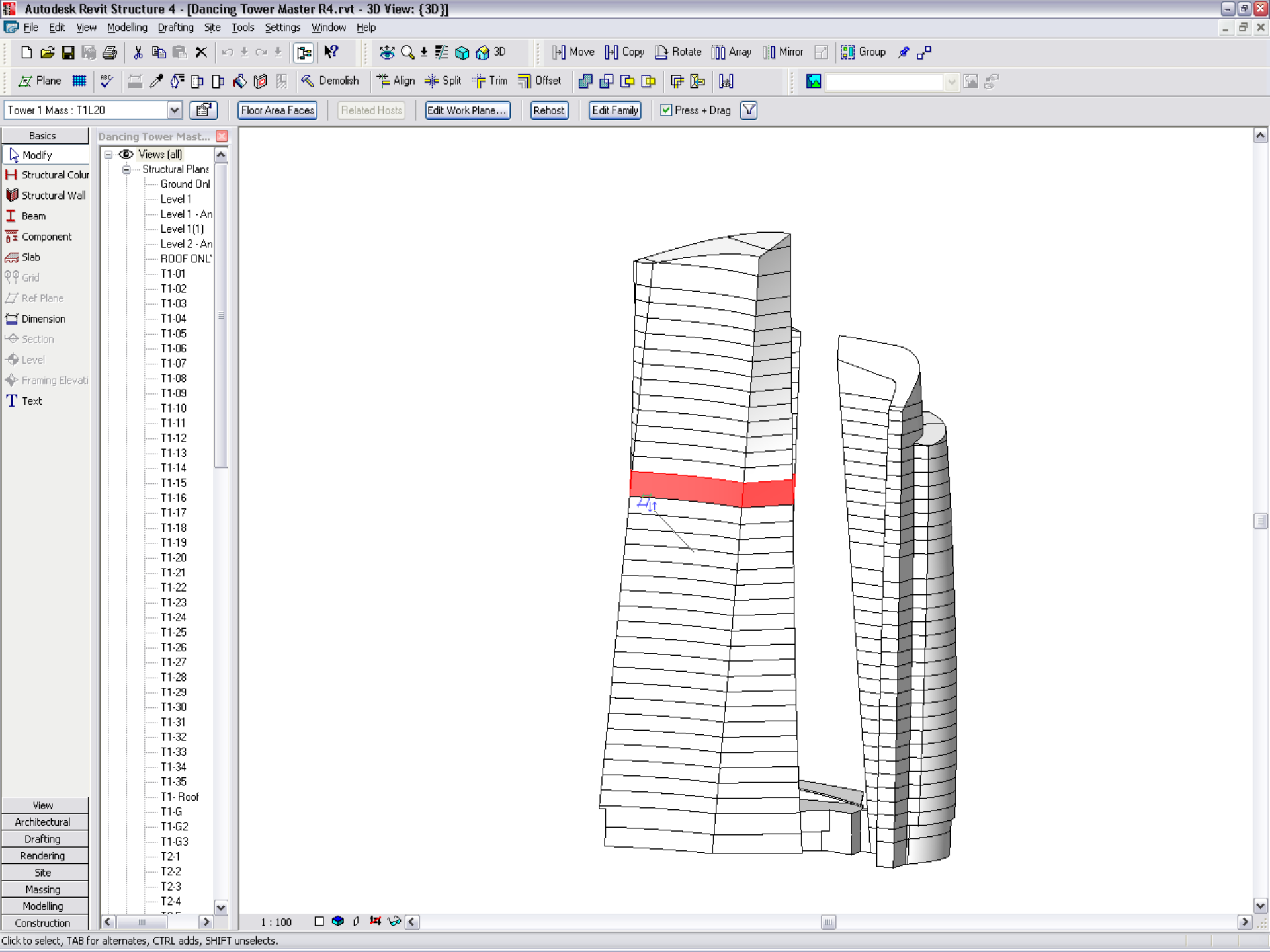
However, the two towers quickly lean, rotate, bend and warp to respond to each other, the adjacent sites and ultimately the view to the ocean at their horizon. These two figures fluidly respond to each other, dynamically engaged and flowing – and ultimately tied together in a passionate dance •

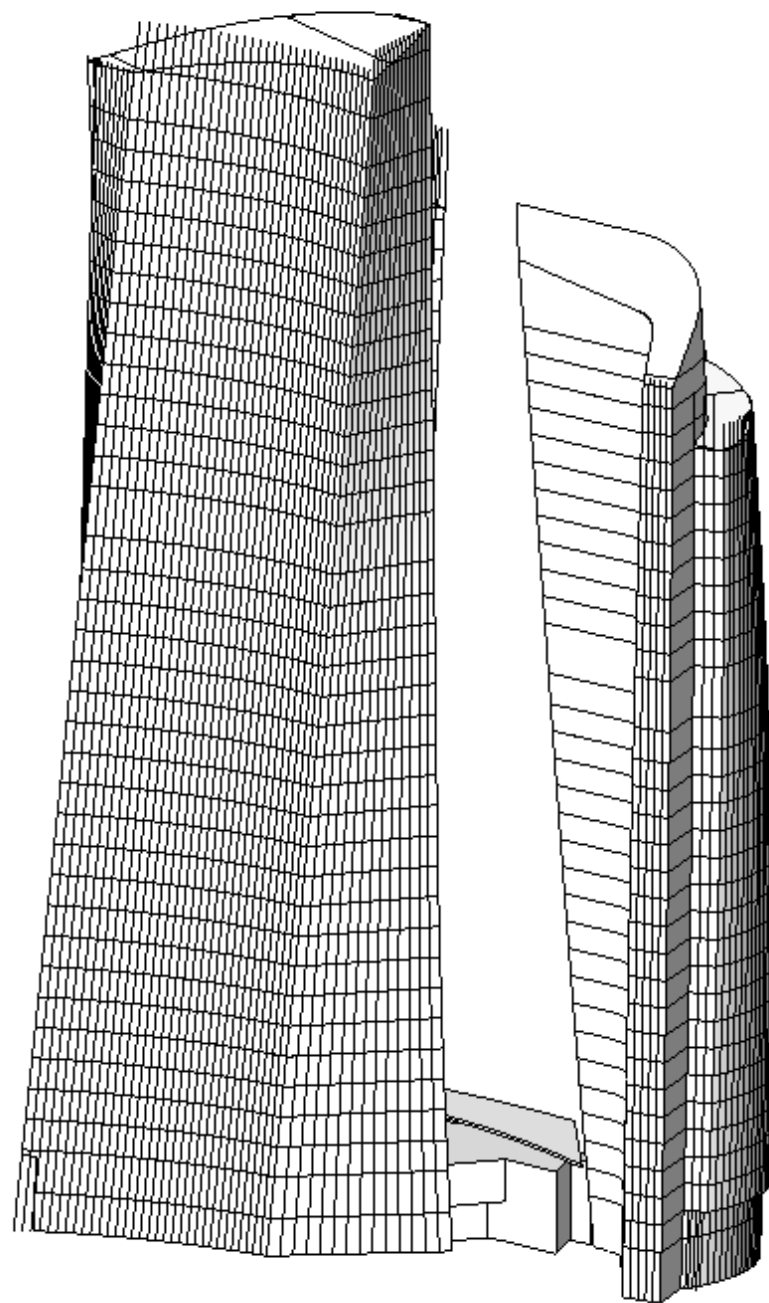


Program Mixed Use Site Area 4,160 sqm
Floor Area 44,235 sqm Building Height 160 m



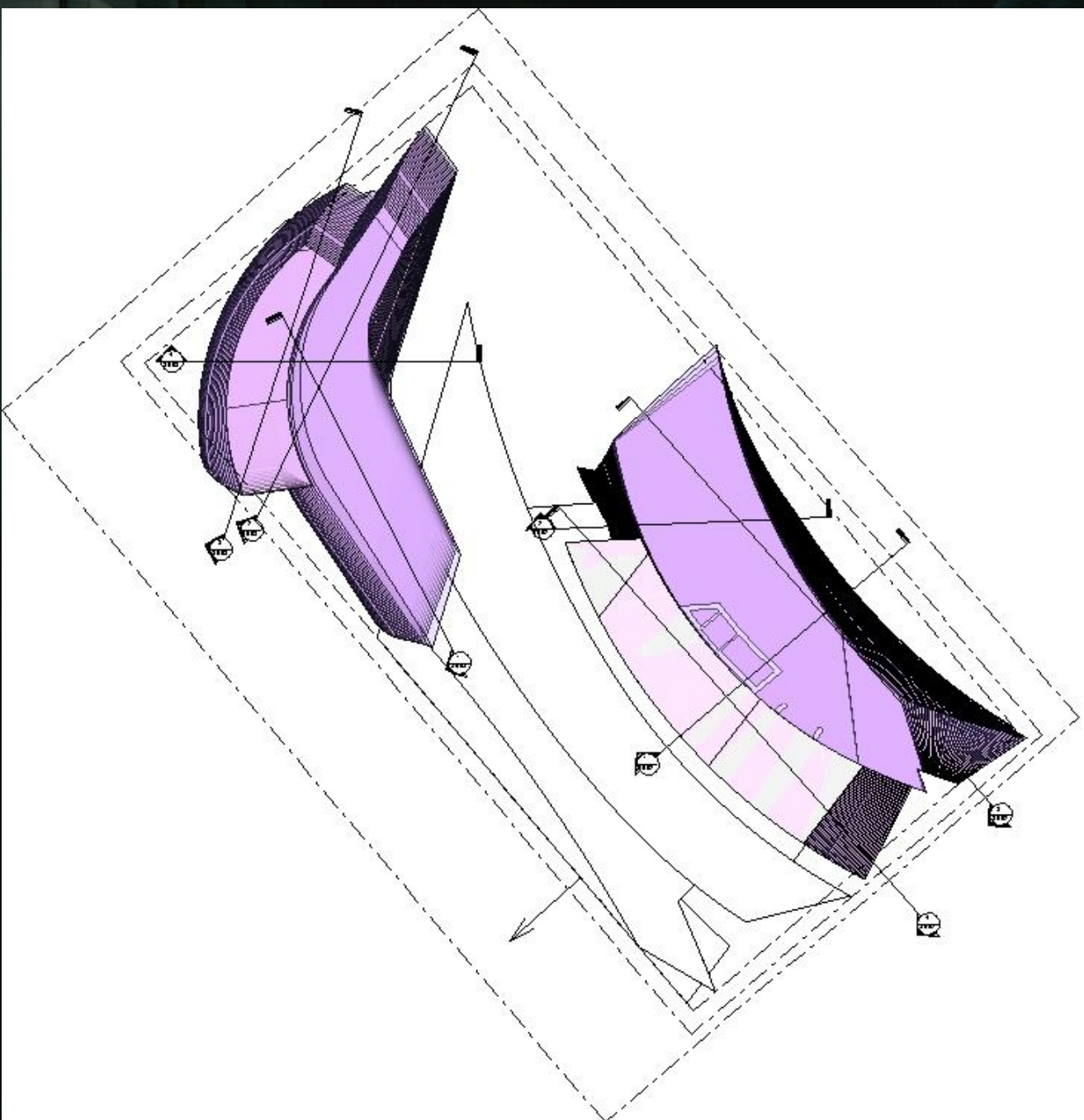
Abu Dhabi **Dancing Towers**







2006/08/25 18:19



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.



Initial Massing



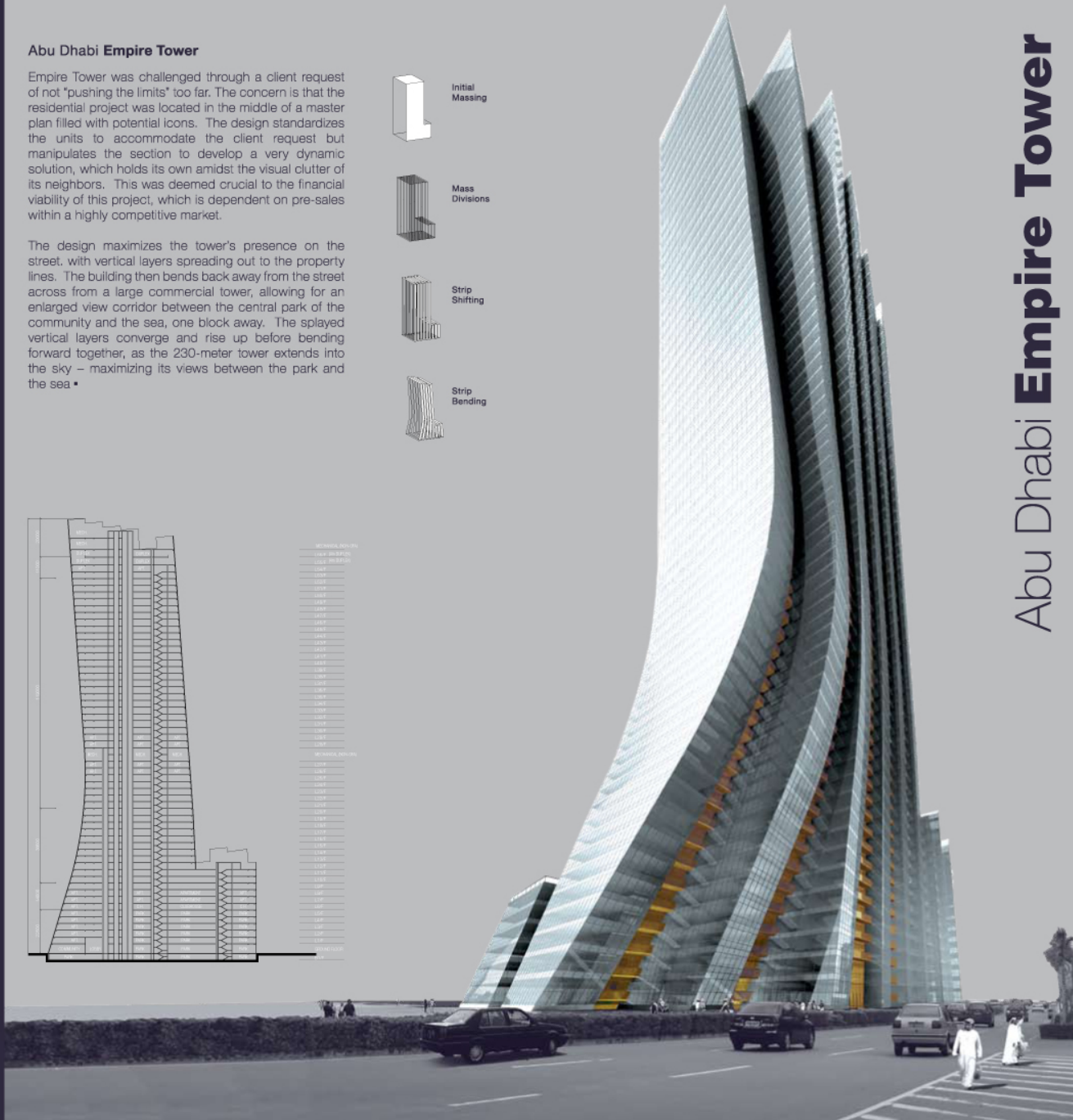
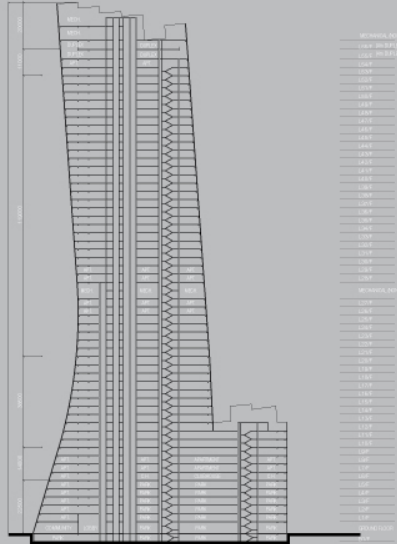
Mass Divisions



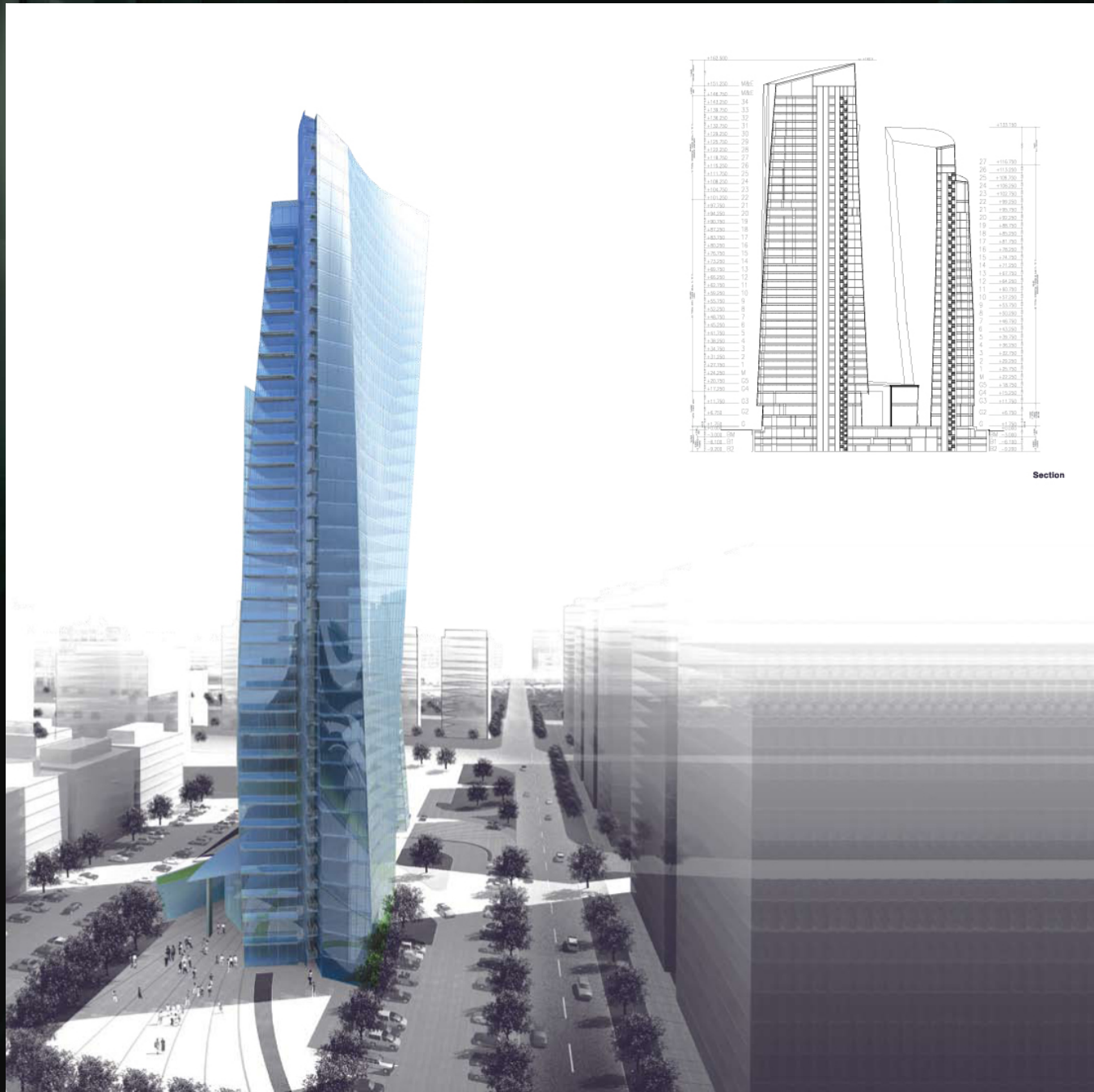
Strip Shifting



Strip Bending



Abu Dhabi Empire Tower

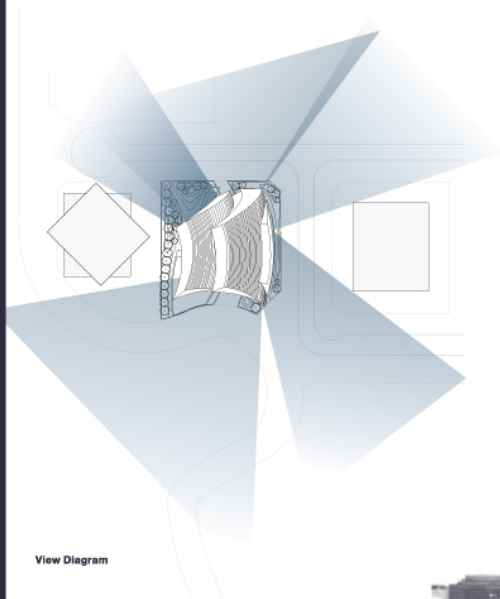


Section

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.

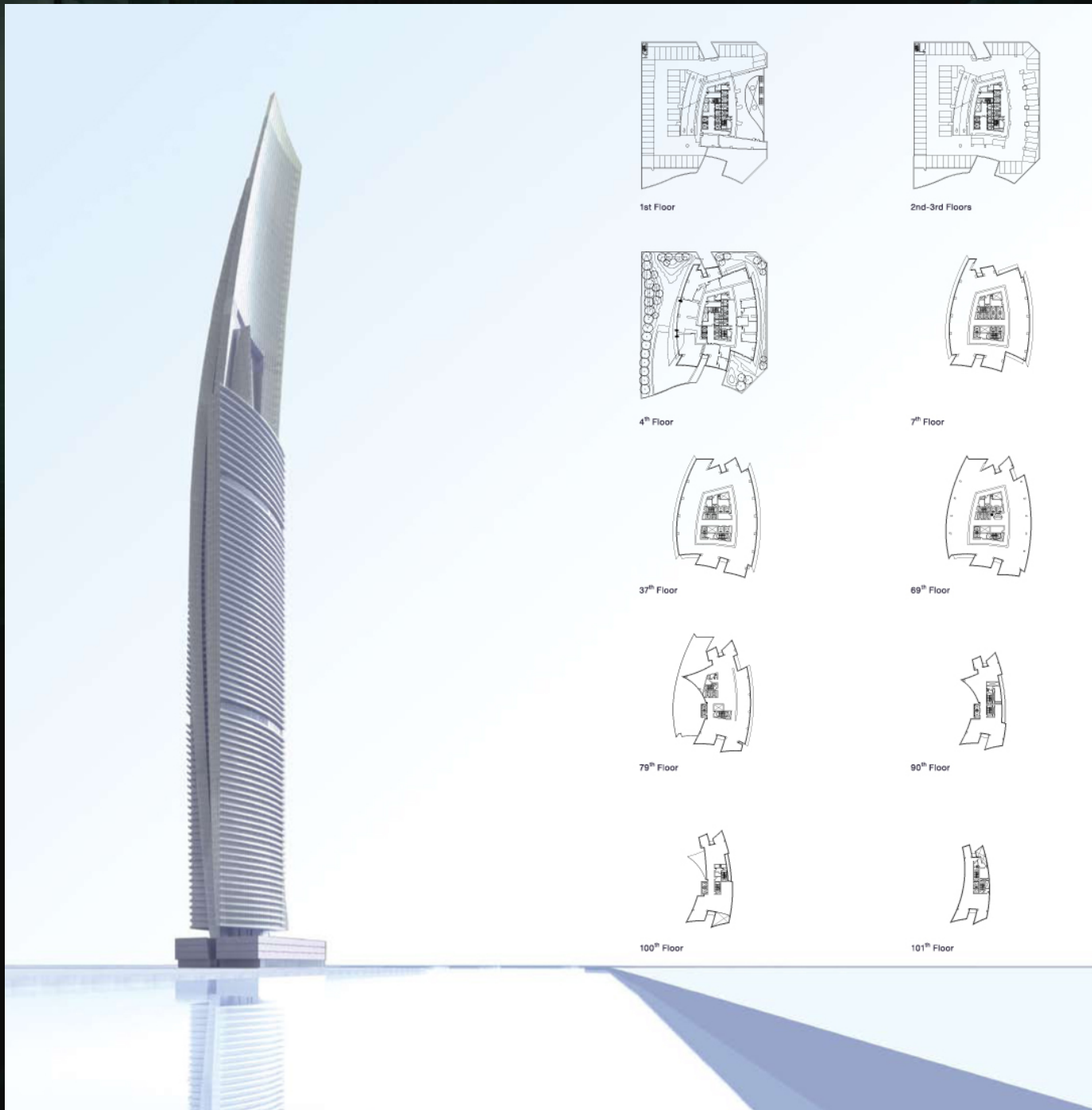
The first 60th floors of the tower are intended to be service apartments, which in order to be marketable, needed to have the majority of units standardized. The curved shape of the tower improves views past its densely located neighbors. The playfulness of this tower was concentrated into the two most 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



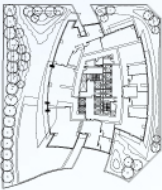
Dubai Ocean Heights Two



1st Floor



2nd-3rd Floors



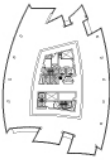
4th Floor



7th Floor



37th Floor



69th Floor



79th Floor



90th Floor



100th Floor

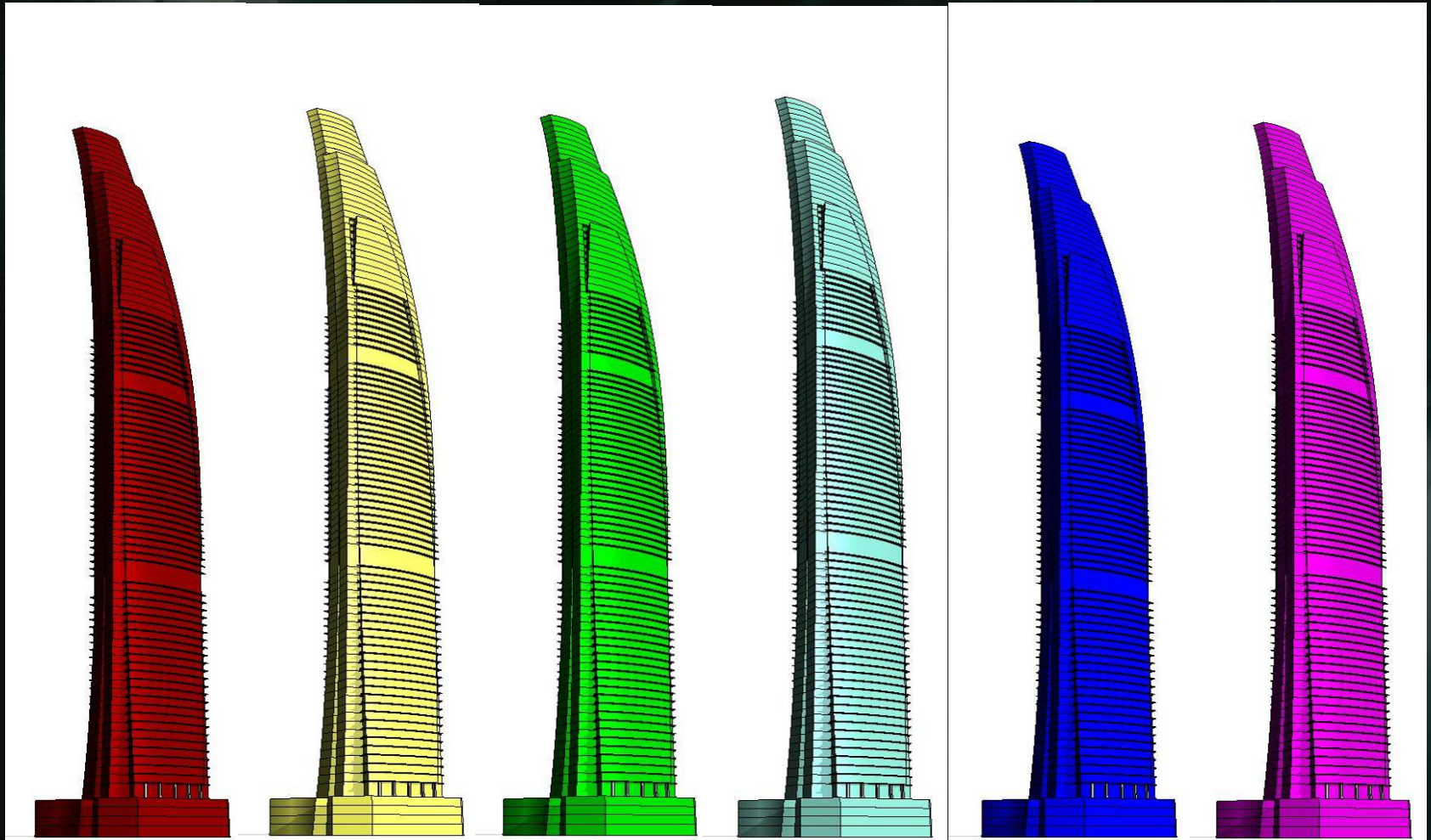


101th Floor

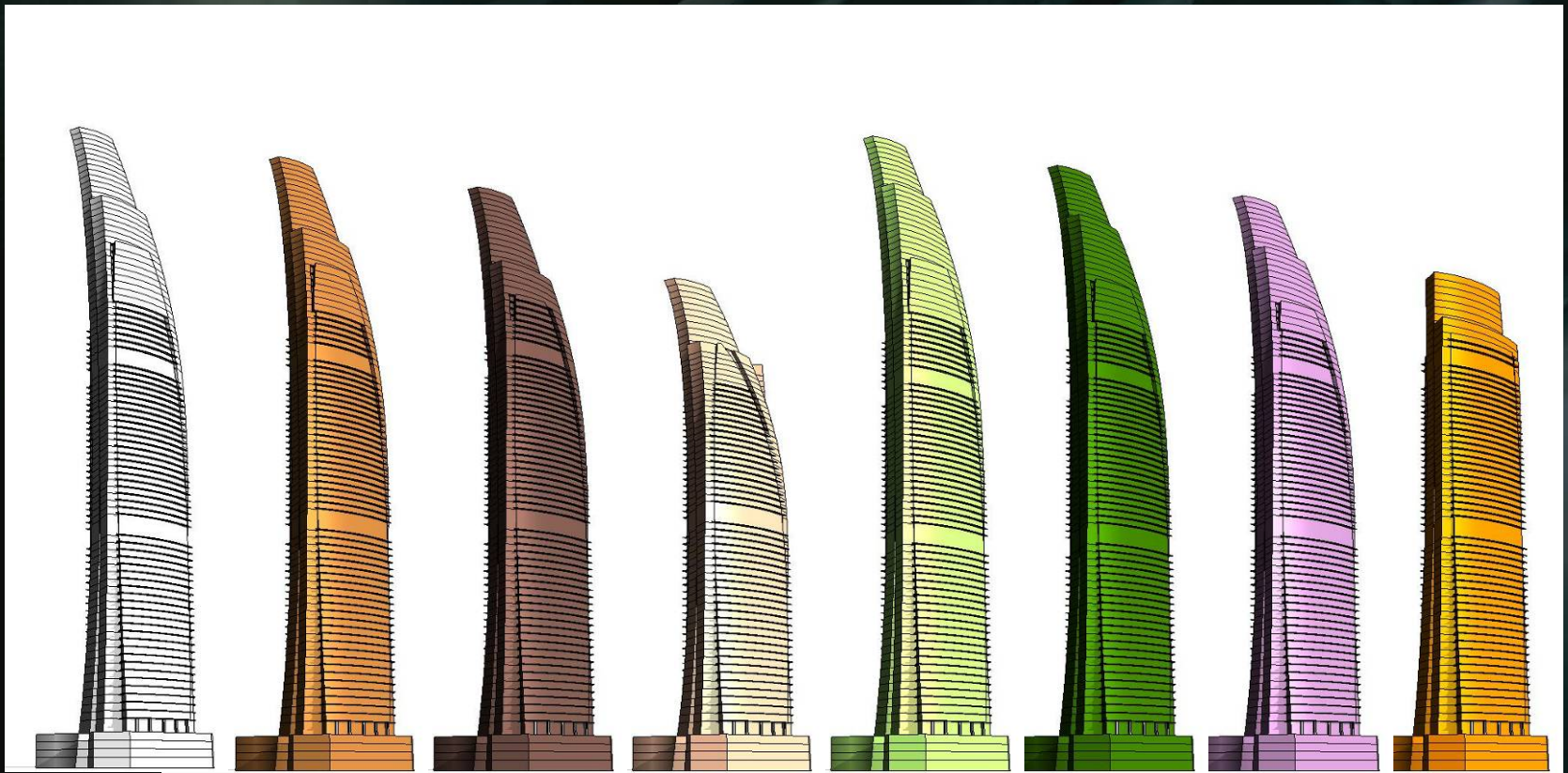
Ocean Heights II

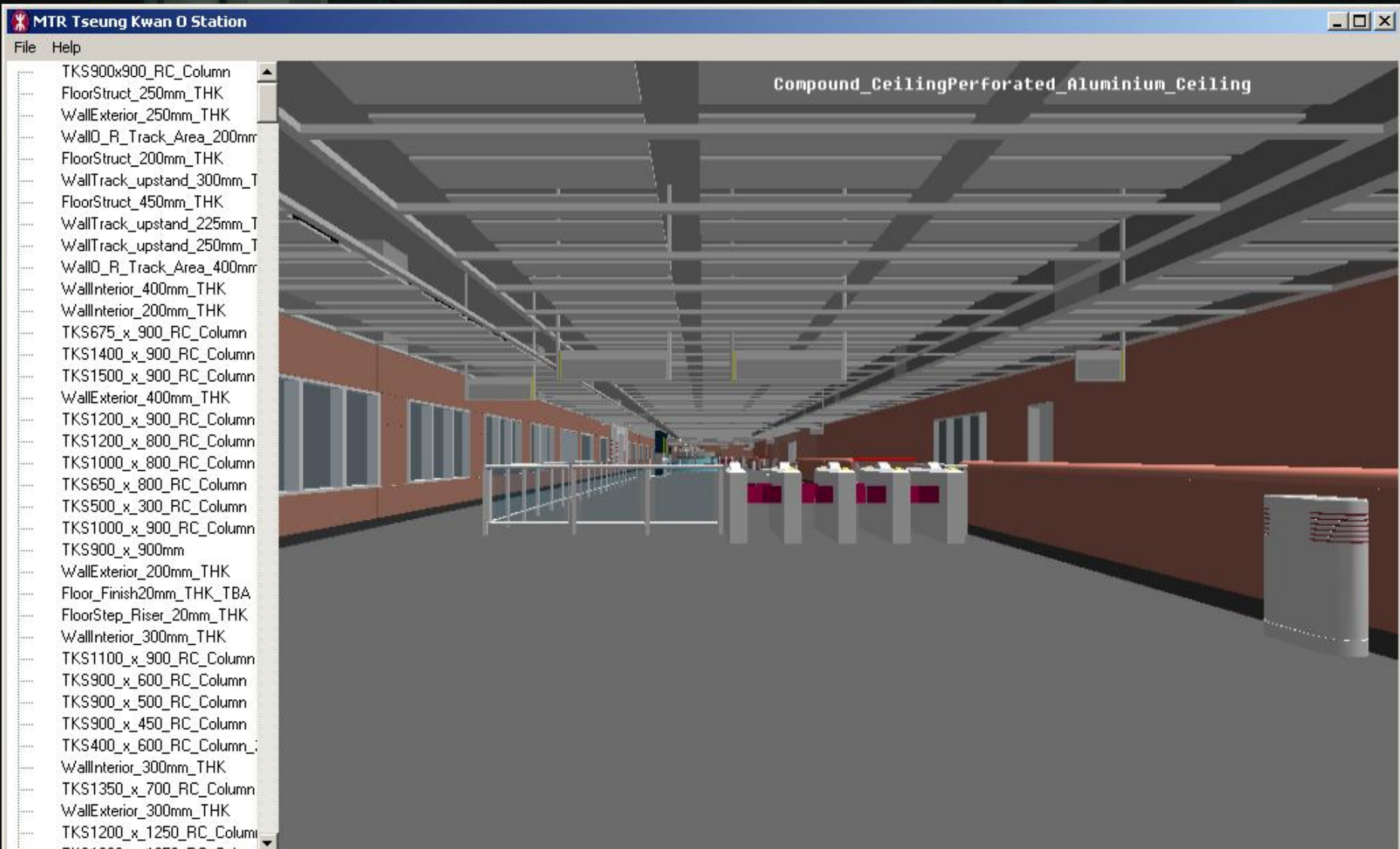


Ocean Heights II – Options



Ocean Heights II – Options





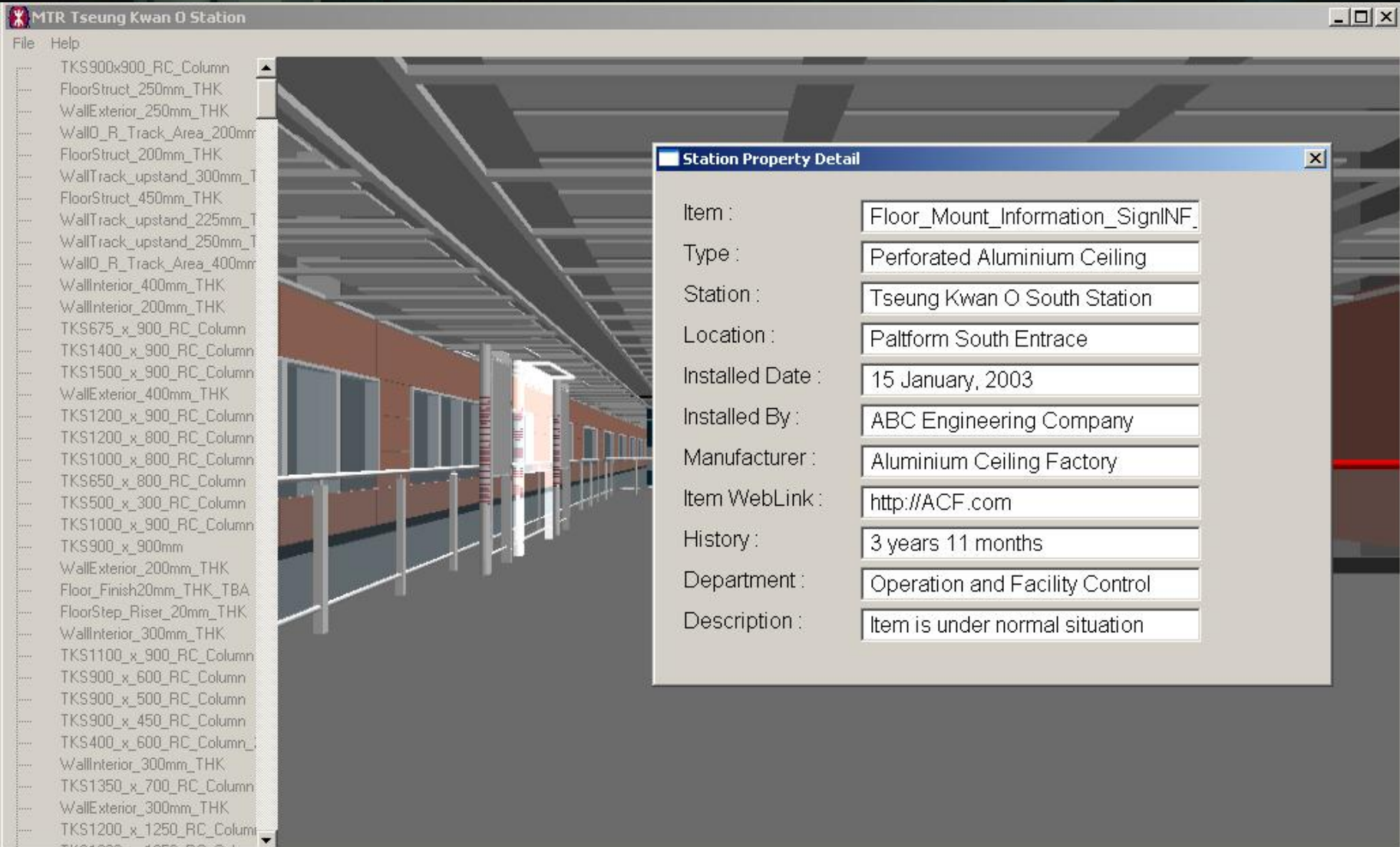
MTR Tseung Kwan O Station

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
 TKS675_x_900_RC_Column
 TKS1400_x_900_RC_Column
 TKS1500_x_900_RC_Column
 WallExterior_400mm_THK
 TKS1200_x_900_RC_Column
 TKS1200_x_800_RC_Column
 TKS1000_x_800_RC_Column
 TKS650_x_800_RC_Column
 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
 TKS1100_x_900_RC_Column
 TKS900_x_600_RC_Column
 TKS900_x_500_RC_Column
 TKS900_x_450_RC_Column
 TKS400_x_600_RC_Column
 WallInterior_300mm_THK
 TKS1350_x_700_RC_Column
 WallExterior_300mm_THK
 TKS1200_x_1250_RC_Column
 TKS1200_x_1250_RC_Column

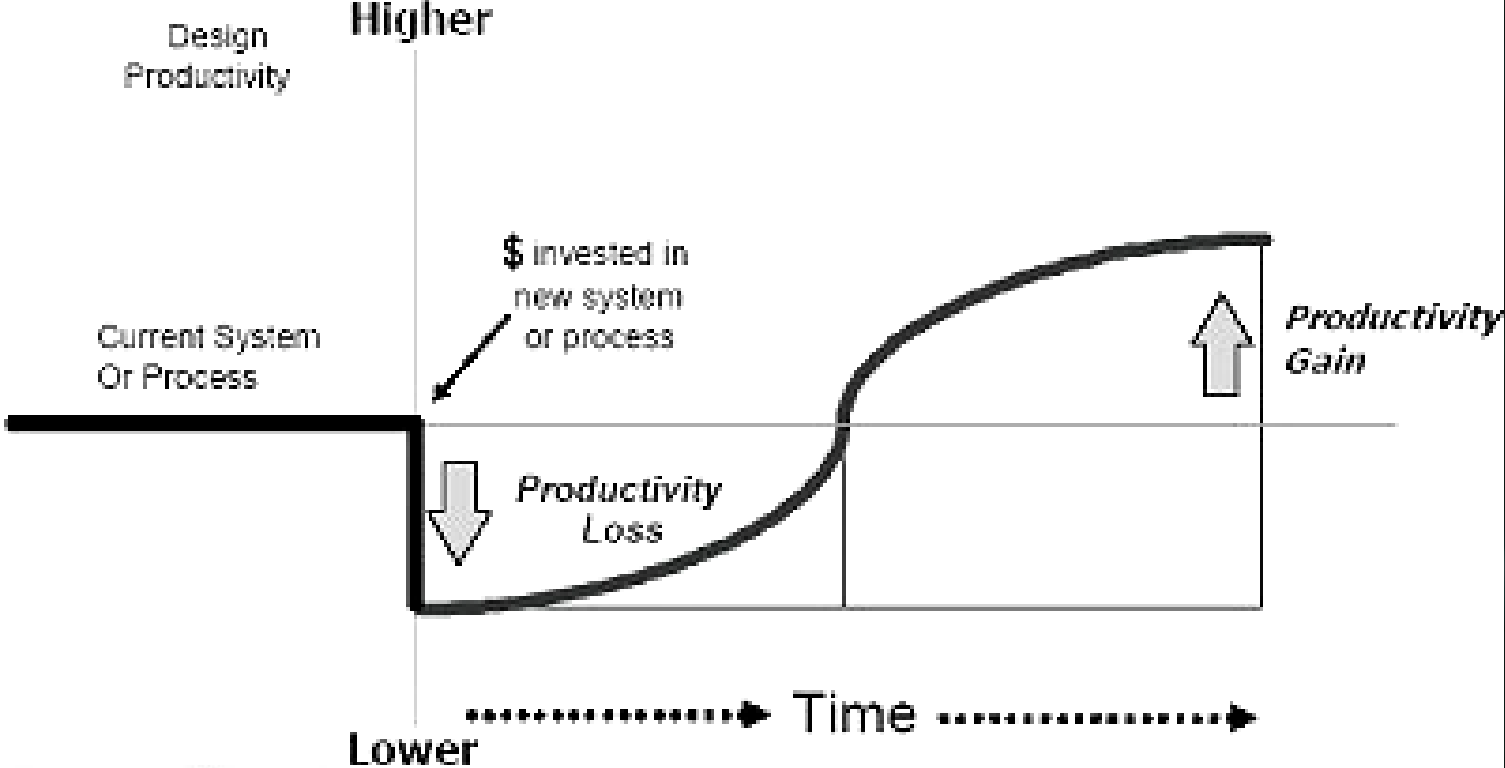
Compound_CeilingPerforated_Aluminium_Ceiling





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

CONTACTS

Charles Matta
(202) 219-2355
charles.matta@gsa.gov
• [View Contact Details](#)

Calvin Kam
(202) 208-0447
calvin.kam@gsa.gov
• [View Contact Details](#)

Contact Us

[GSA Staff Directory](#)

GSA Organizations

Choose...
[Abbreviation Look-up](#)

GSA Regions by State

Choose State:

QuickLinks

[A-Z Links to GSA Topics](#)

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.

謝謝...