



BIM Applications in Practice

David Fung



Information 情報

Graphical

図面上

Plan

Section

Elevation

Area Diagrams

Schematic Designs

General Building Plan

Structural Plans

E/M Drawings

Schematics

Details

Other Diagrams...

Non-Graphical

非図面上

Area Schedule

Finishing Schedules

Door/Window/Louvre

Schedules

Beam/ Column Schedule

Equipment Schedule...

Program

Cost Estimate

Quantity Take Off

Bills of Quantities

Variation Assessments

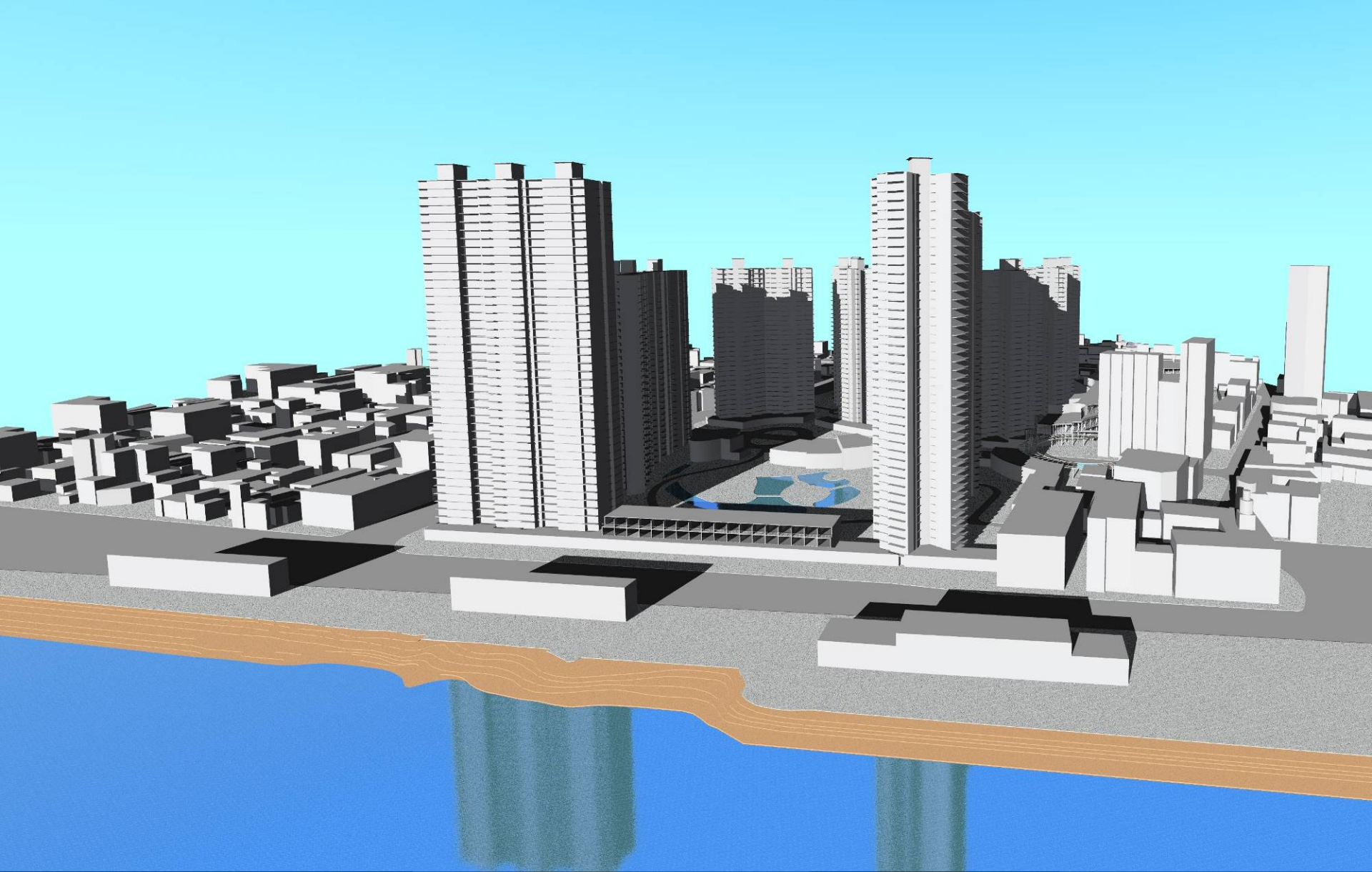
Use of Building Information Modeling (BIM)

BIMの活用

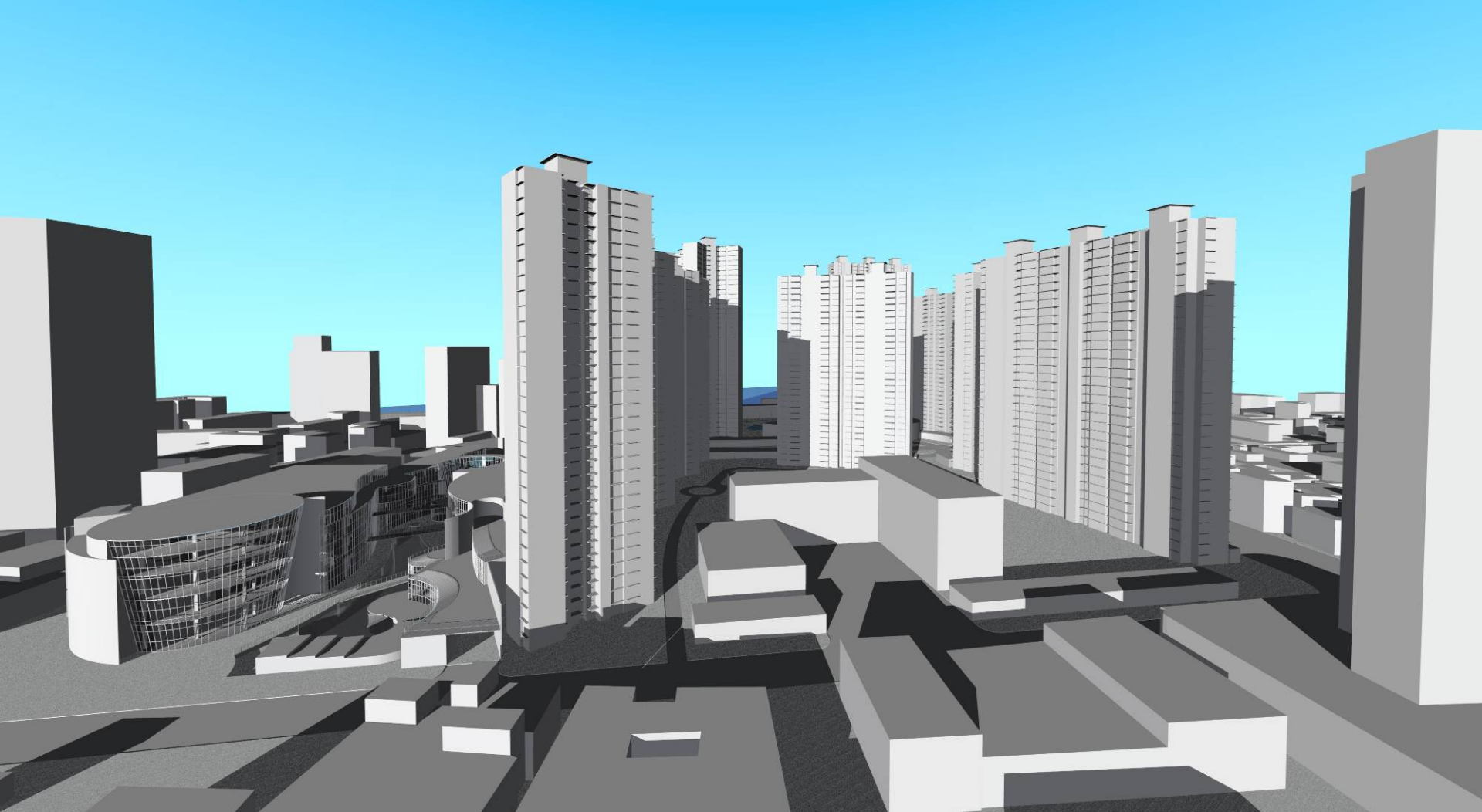
Aedas

1. **Design visualization** 設計の可視化
2. **Drawing Productions** 図面製作
3. **Services Co-ordination and Clash detection with other disciplines** 多部門との連携と干渉チェック
4. **Quantity taking and preparation of Tender Document** 数量拾い及び入札書類の作成
5. **Automated Statutory Submission** 確認申請図書作成の自動化
6. **Scientific analysis of different environmental aspects** 様々な環境解析
7. **Supply Chain Integration with the manufacturing and production** サプライヤとの連携
8. **Complex Geometry** 複雑な形状を実現可能

- 1. Design visualization** 設計の可視化
2. Drawing Productions
3. Services Co-ordination and Clash detection with other disciplines
4. Quantity taking and preparation of Tender Document
5. Automated Statutory Submission
6. Scientific analysis of different environmental aspects
7. Supply Chain Integration with the manufacturing and production
8. Complex Geometry



BUILDING IN CONTEXT



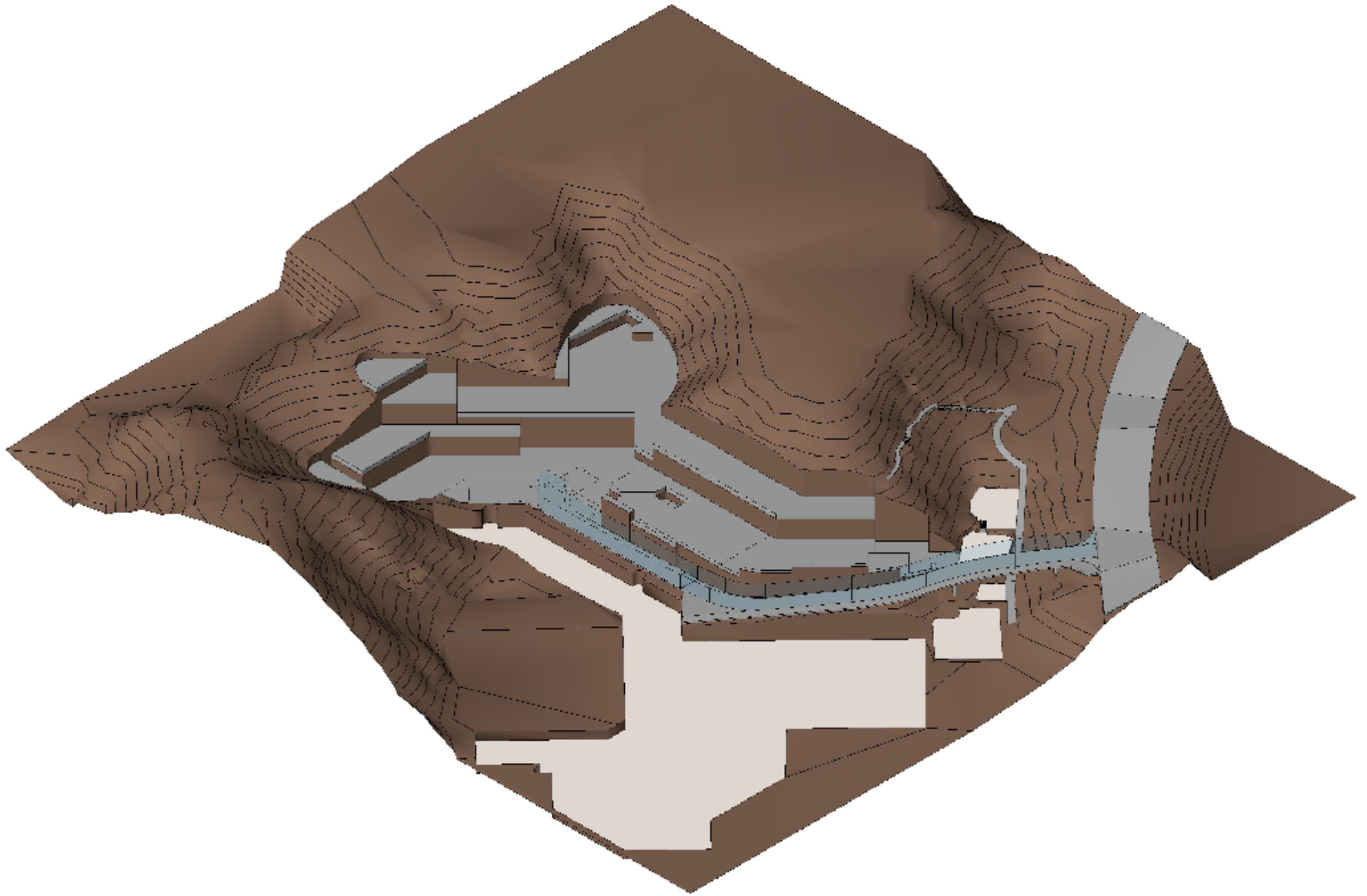
BUILDING IN CONTEXT



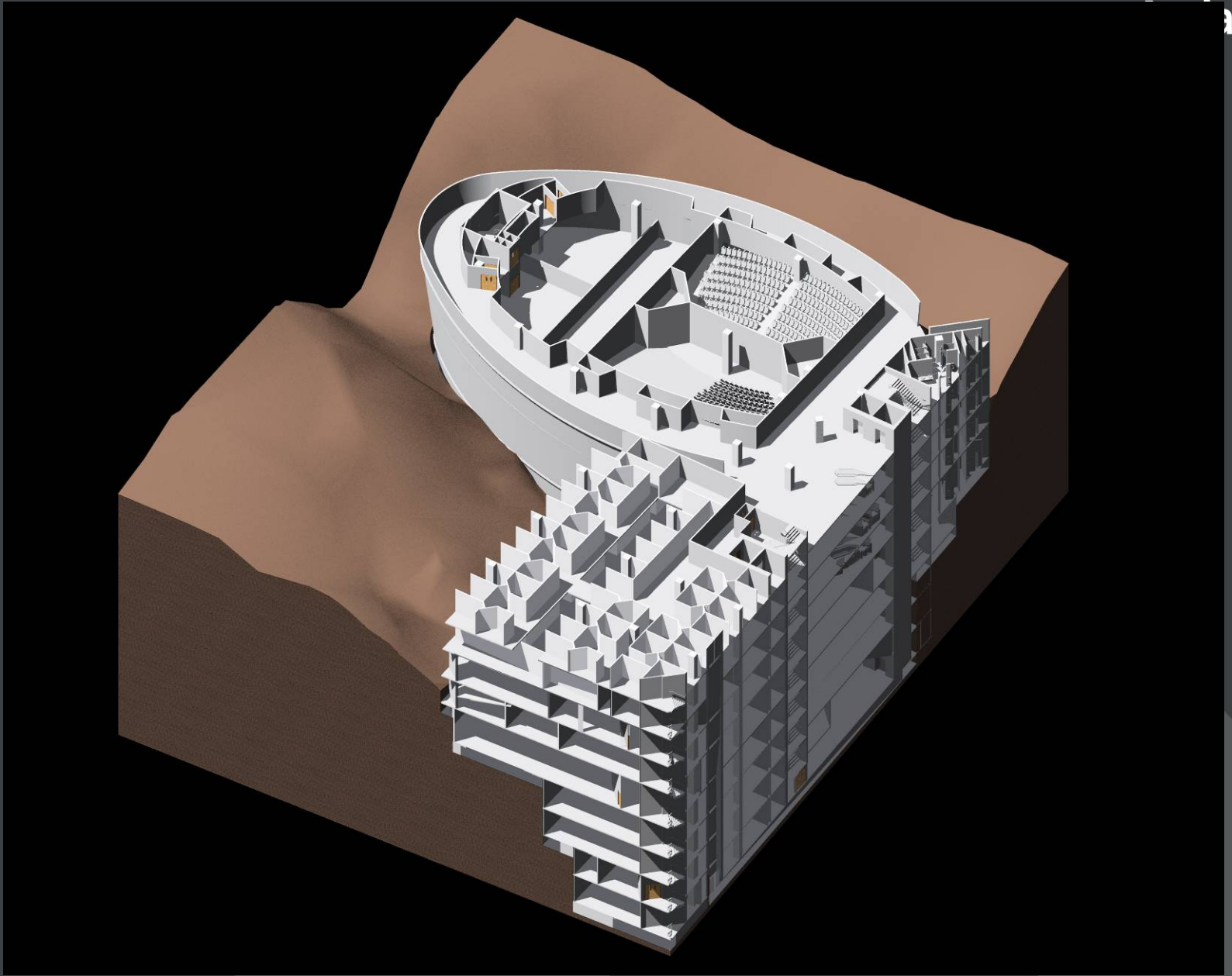
BUILDING IN GOOGLE EARTH

Aedas





TOPOGRAPHY HANDLING



BUILDING IN SITE CONTEXT





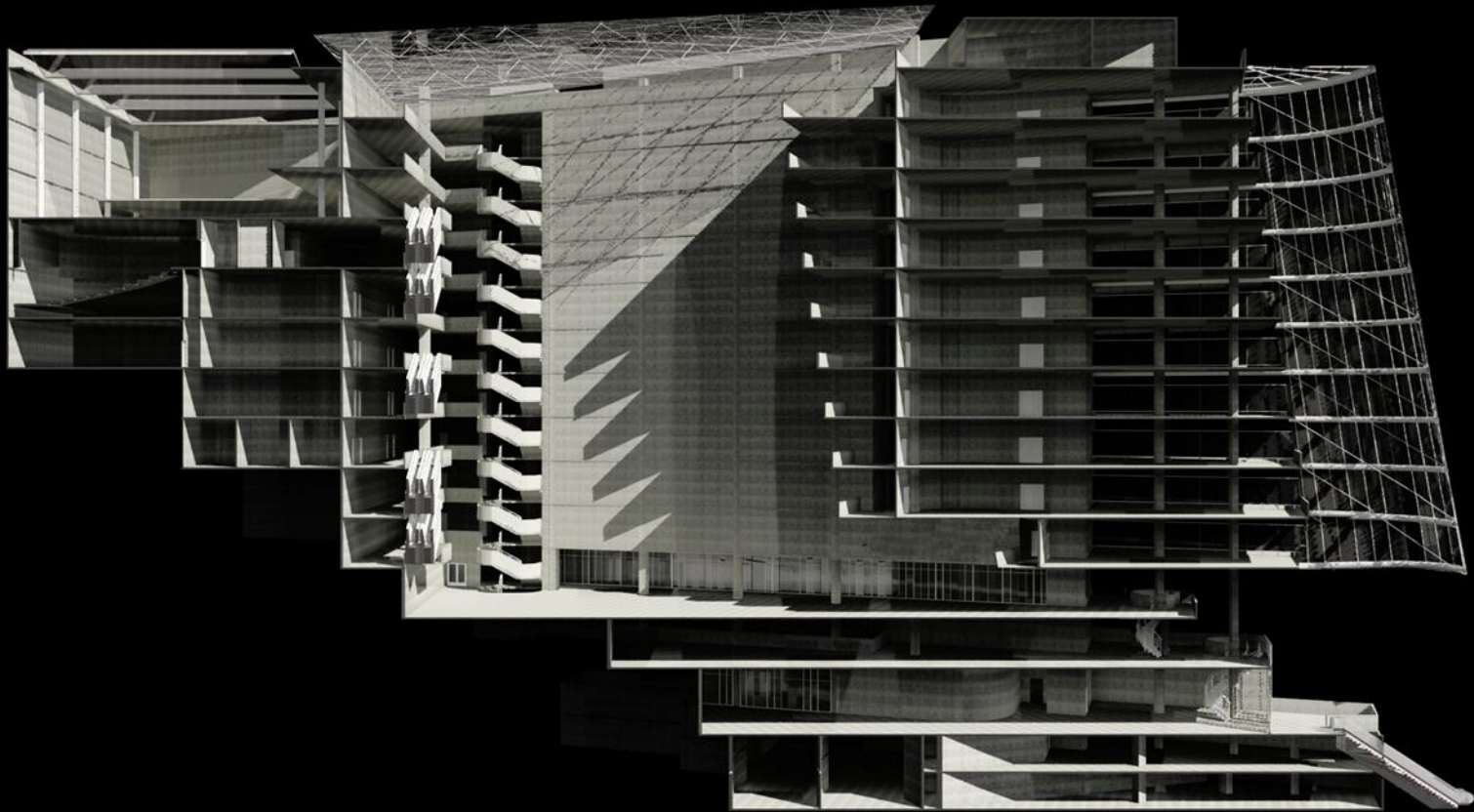




PERSPECTIVE



PERSPECTIVE



CUT AWAY PERSPECTIVE







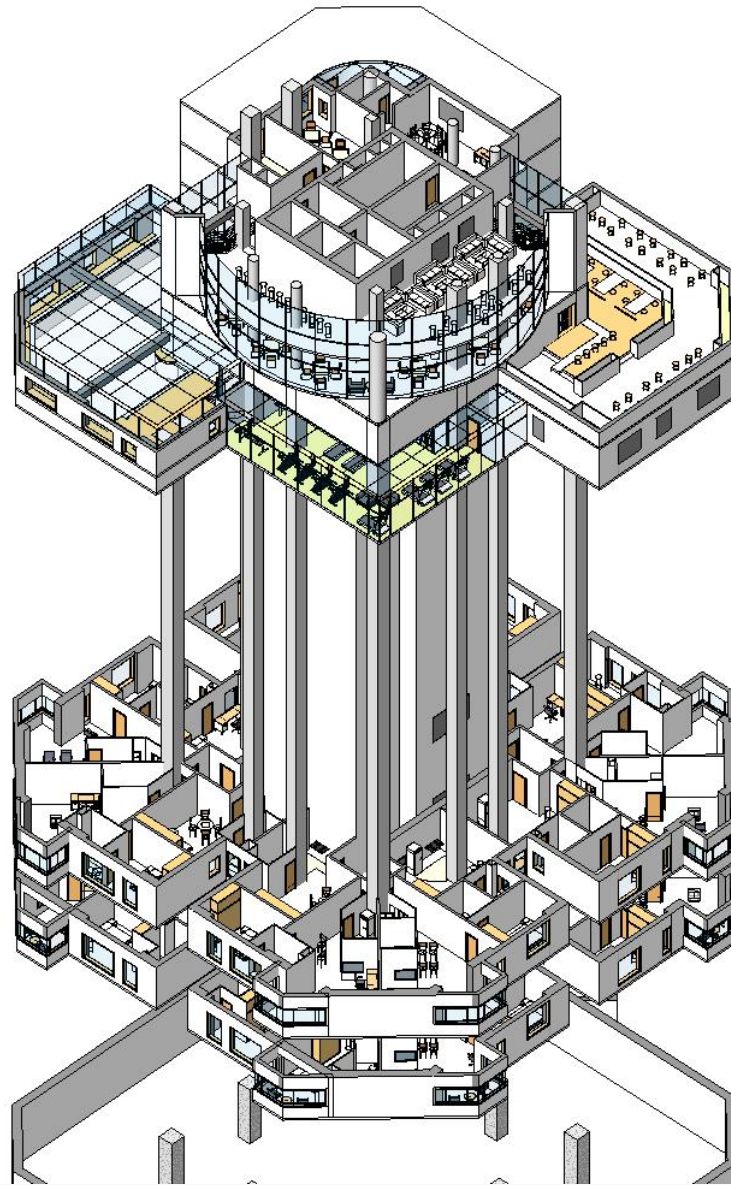




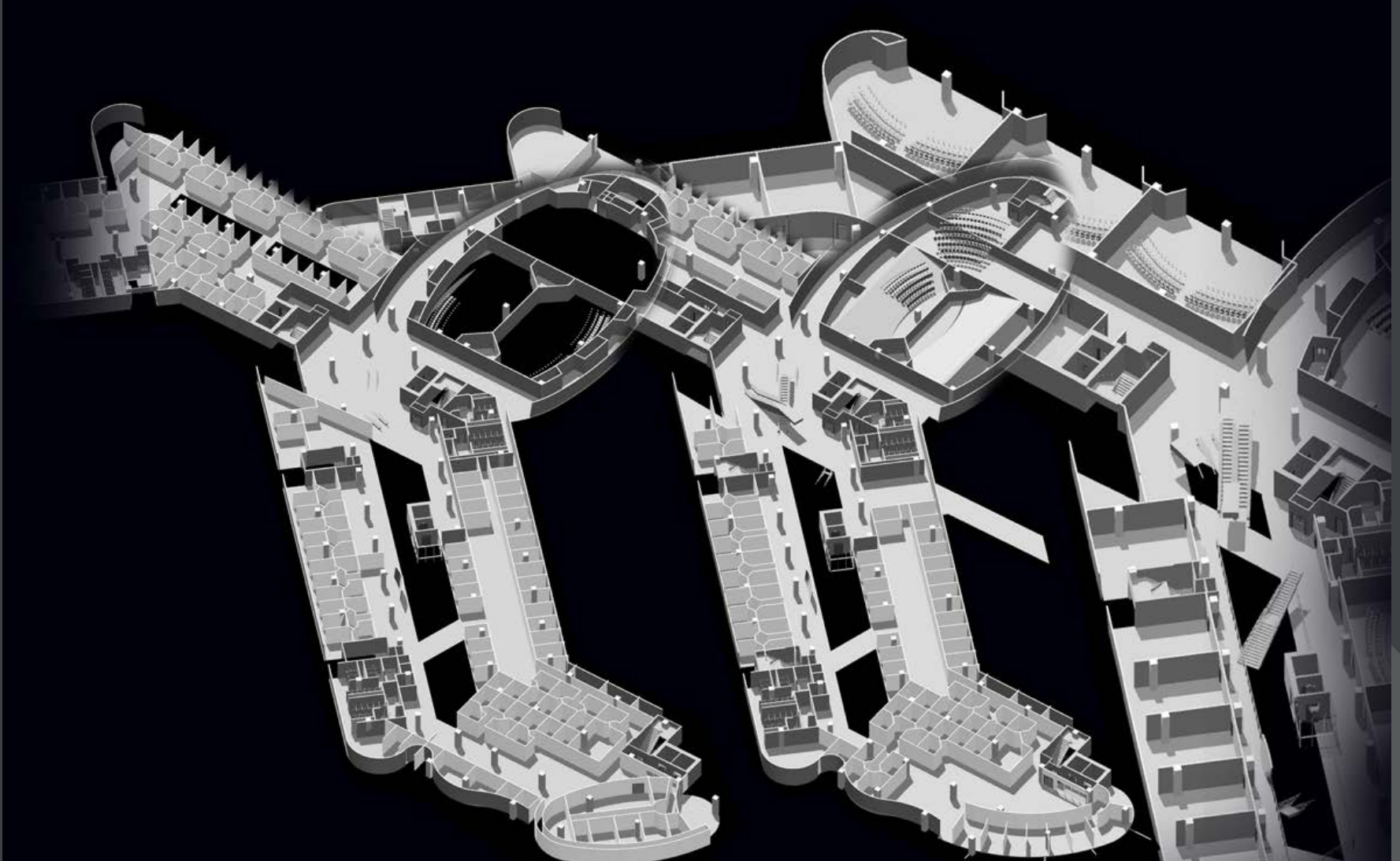
VISUALIZATION



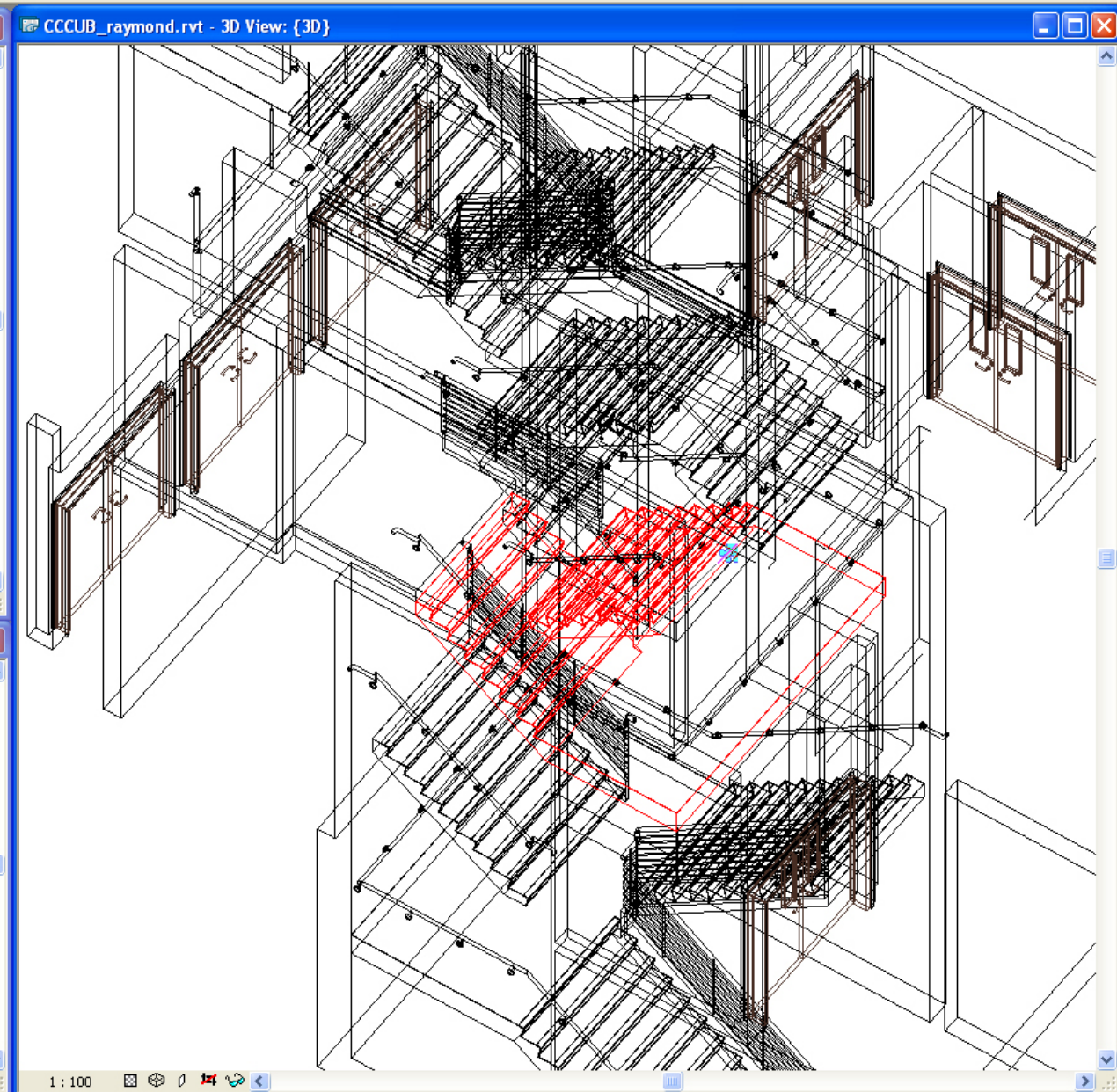
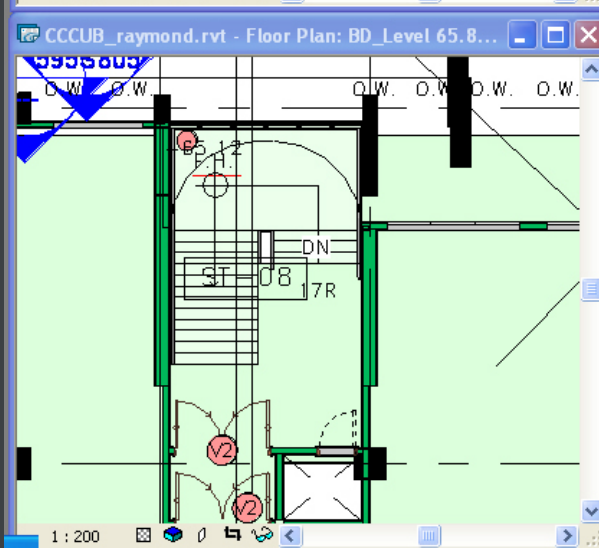
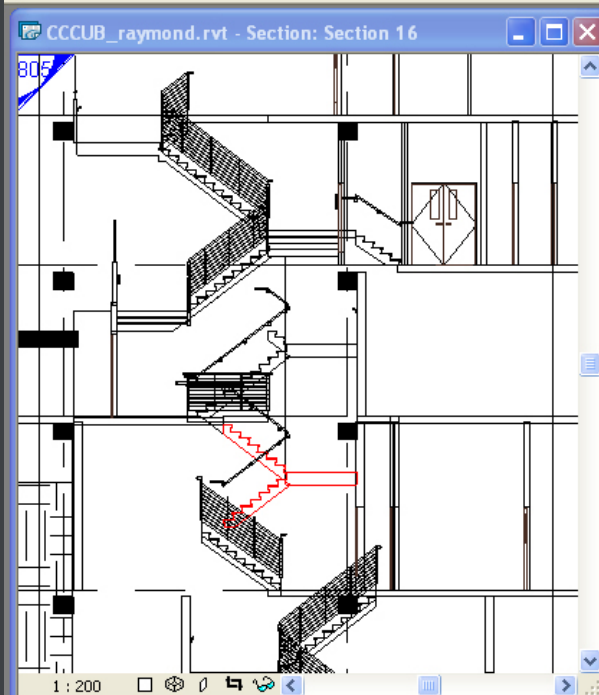
FAÇADE PANEL DESIGN



VERTICAL CO-ORDINATION



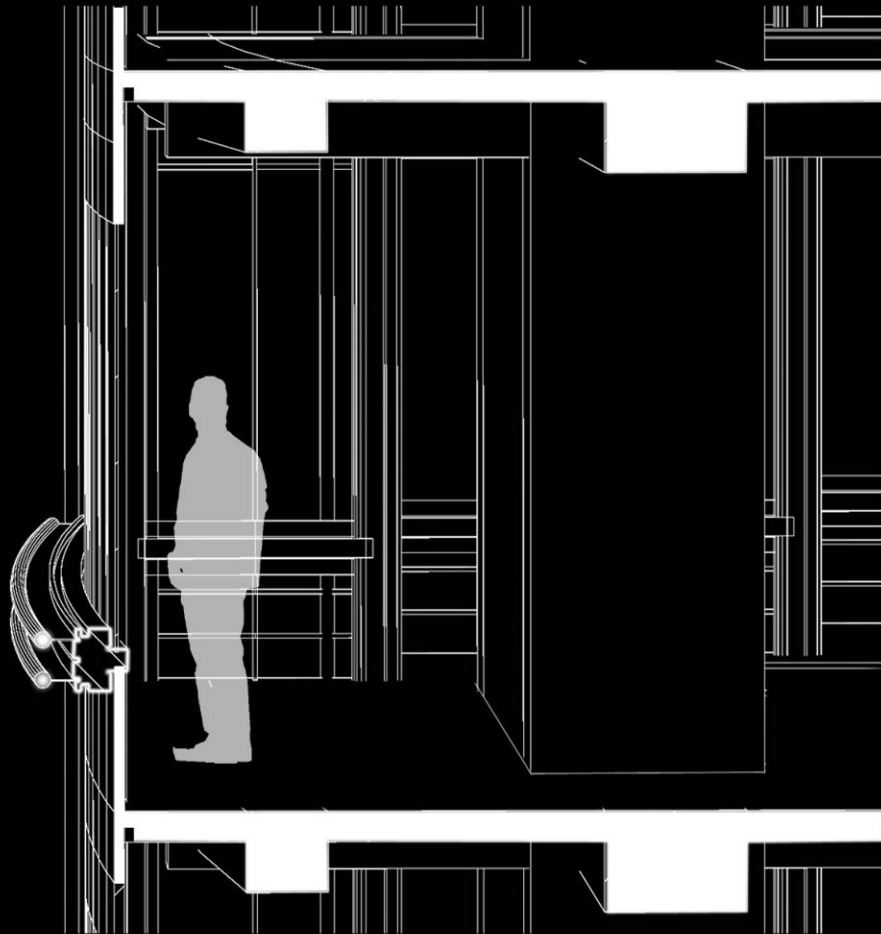
DIFFERENT DESIGN APPROACH



VERTICAL CO-ORDINATION



FAÇADE DESIGN and CO-ORDINATION



FAÇADE DESIGN and CO-ORDINATION



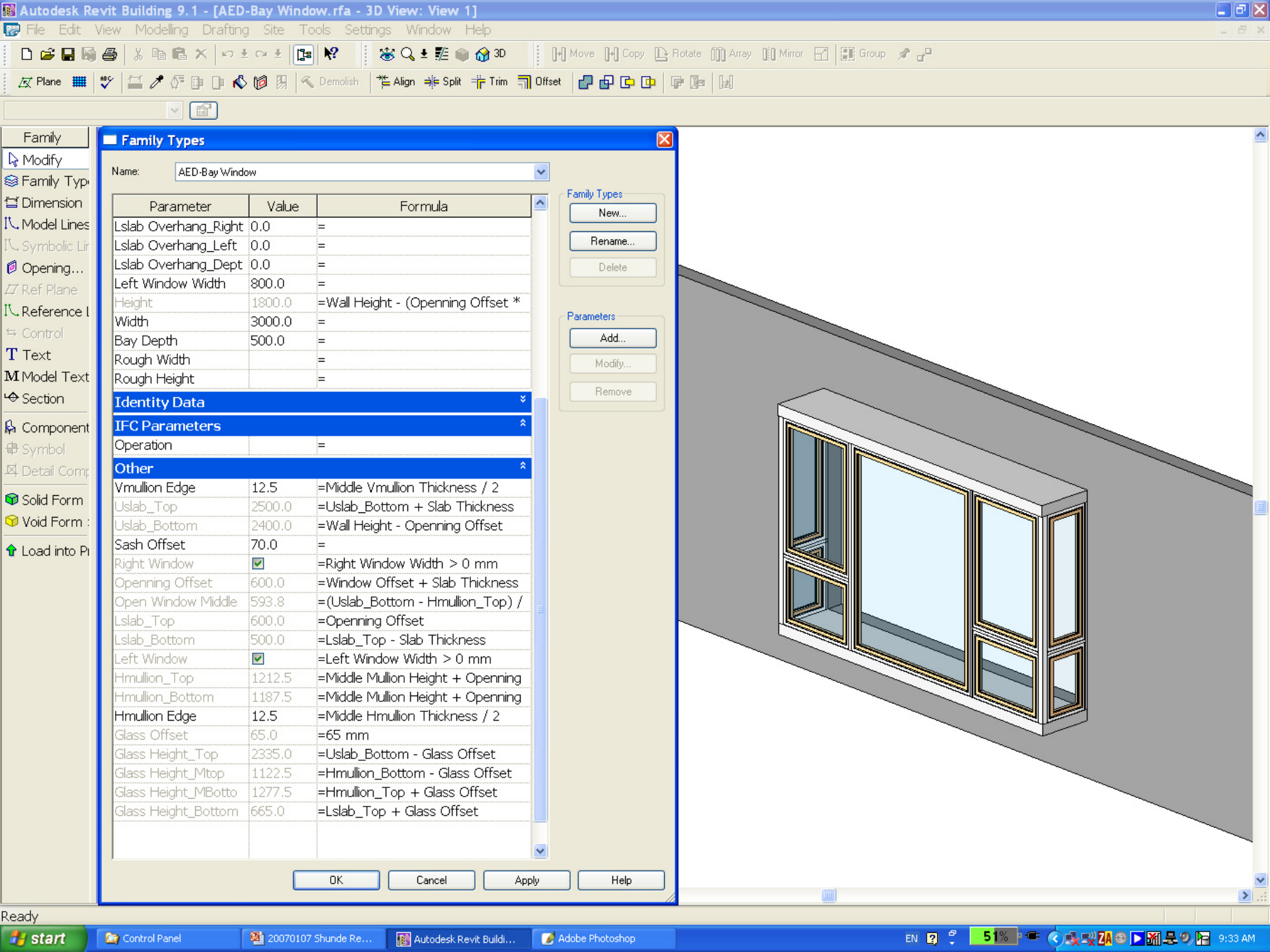
REPETITIONS vs VARIATIONS



PARAMETRIC MODELLING

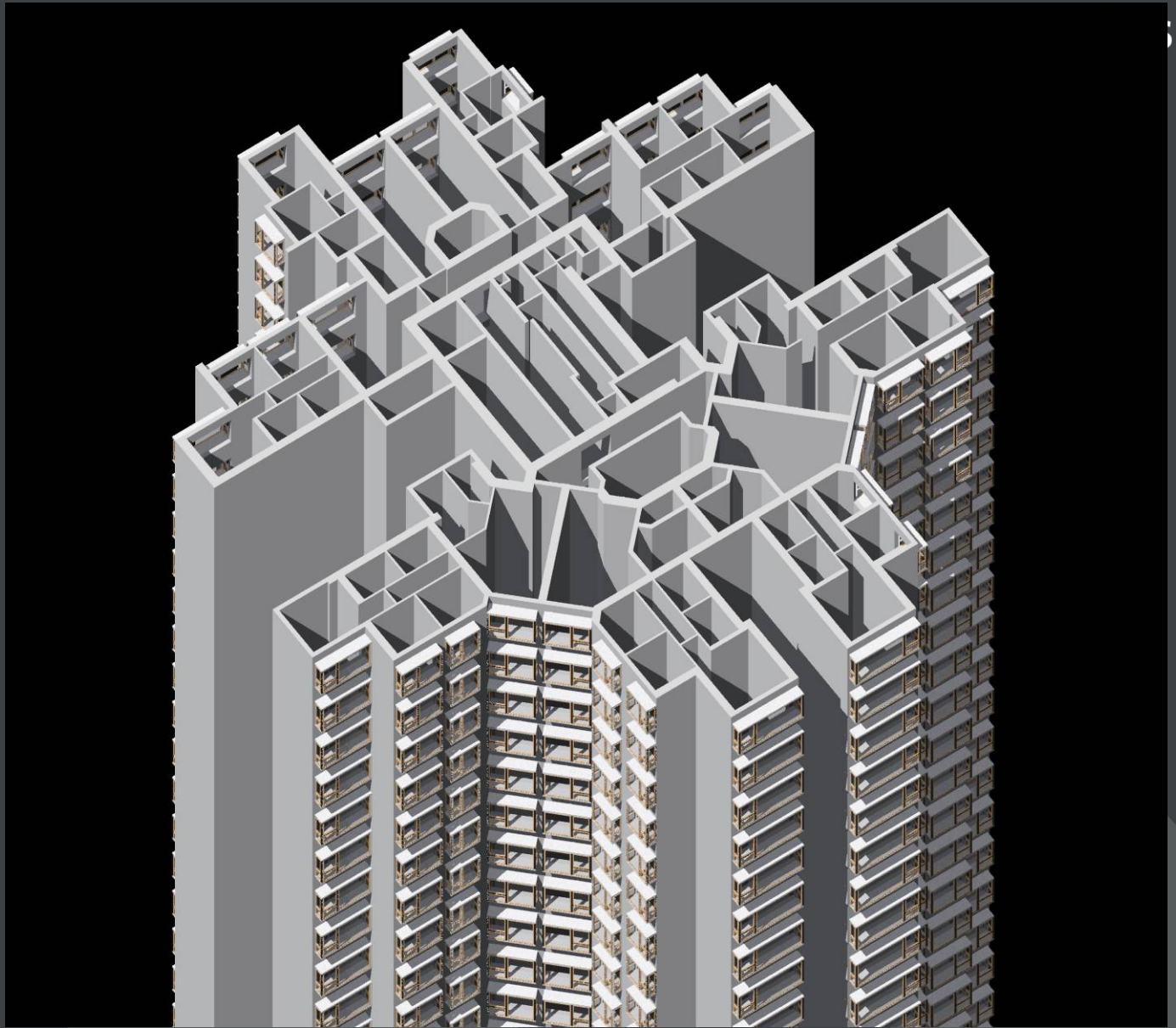
Aedas





Remove





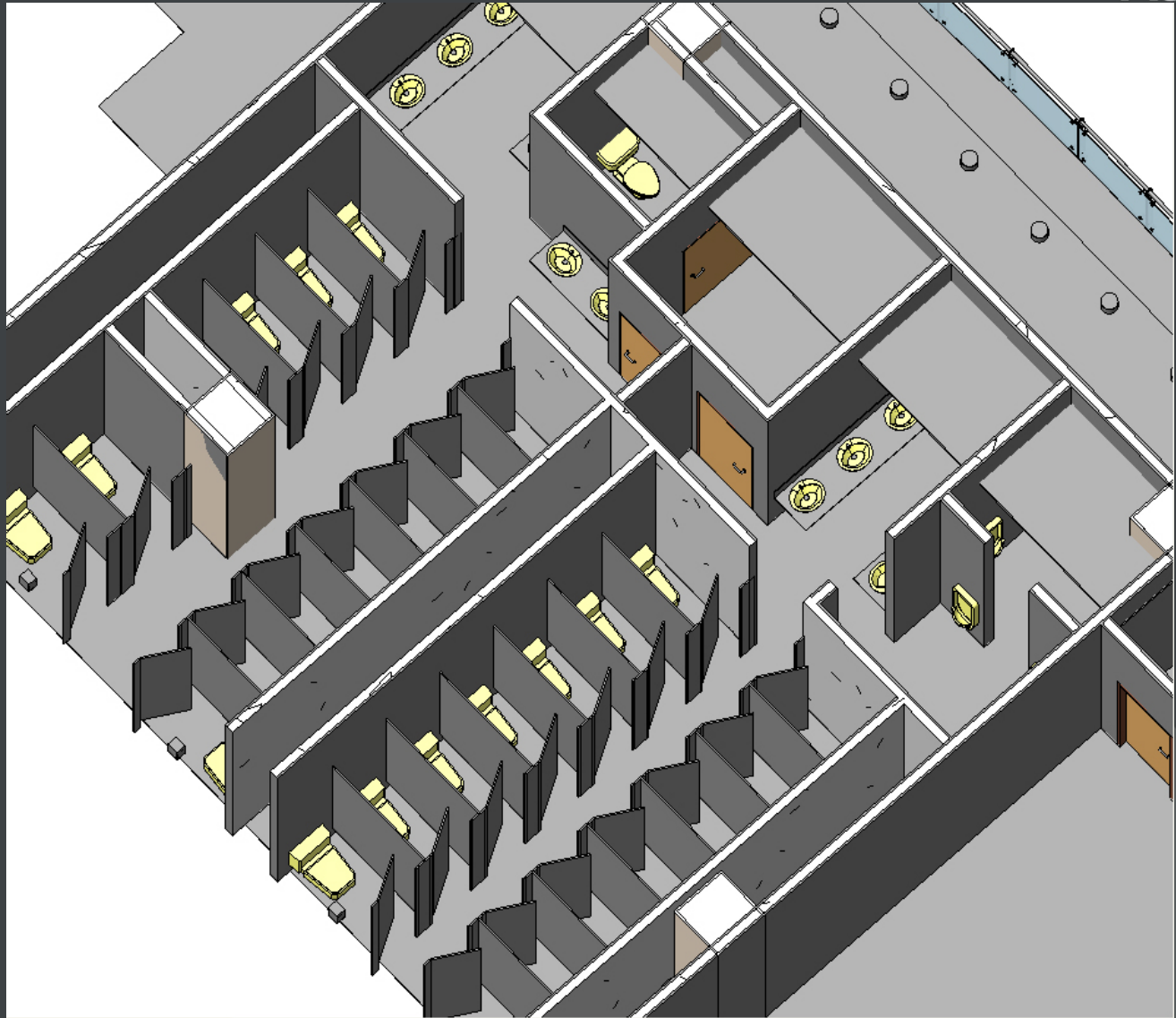
REPETITIONS vs VARIATIONS

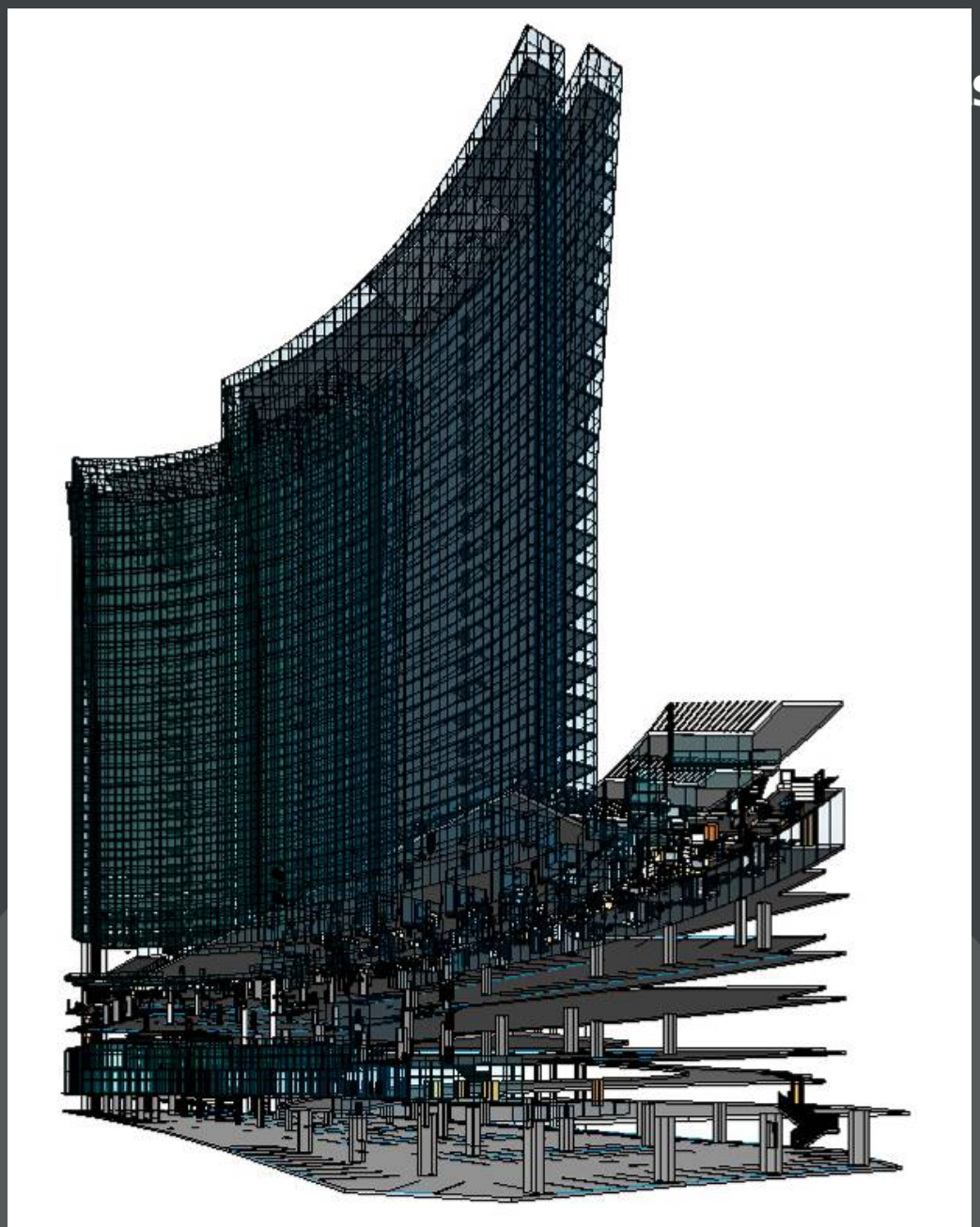


PARAMETRIC MODELLING

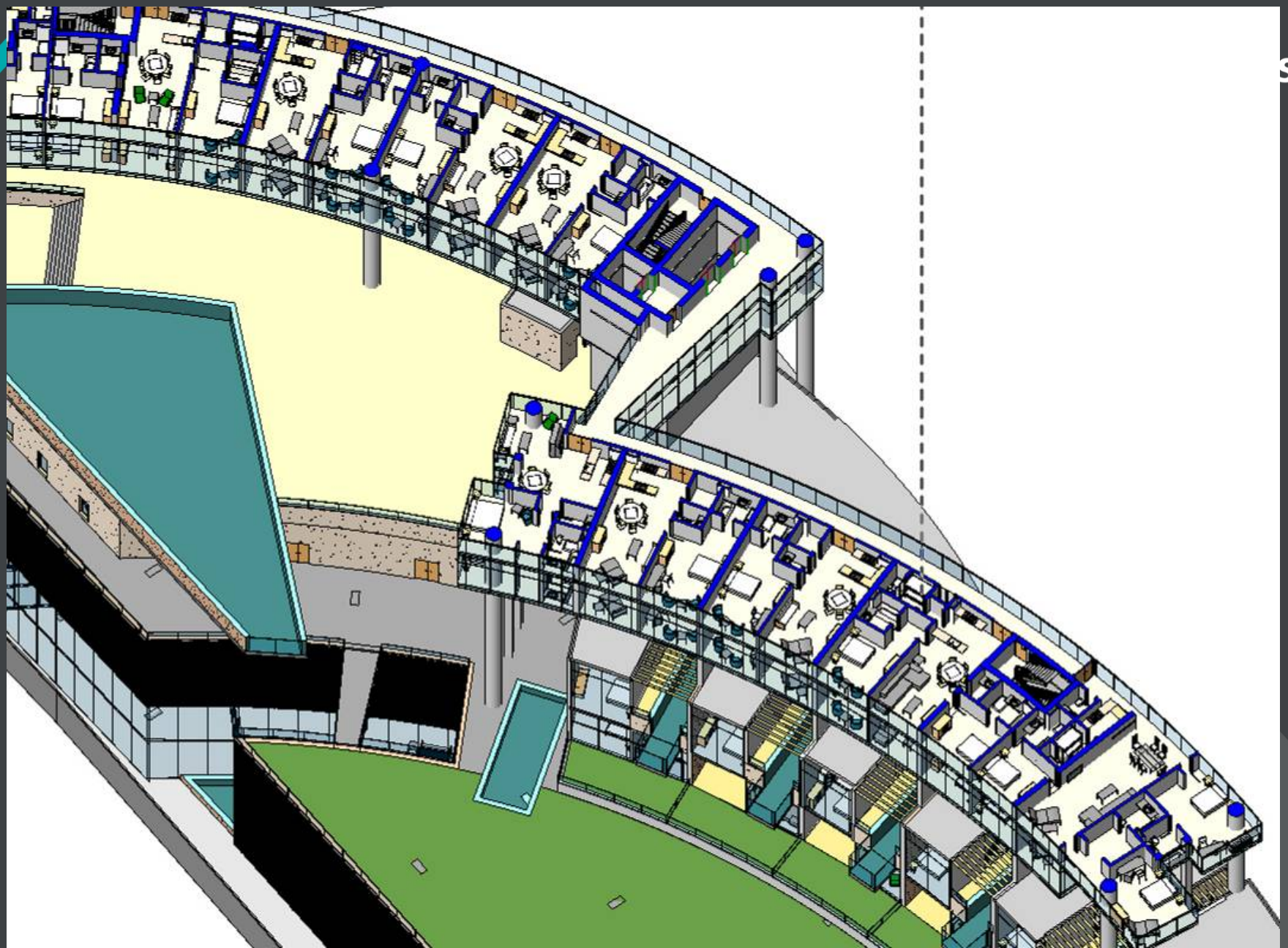
Aedas







HORIZONTAL REPETITION / MODULARIZATION



MODULAR DESIGN

1. Design visualization

2. Drawing Productions 図面製作

3. Services Co-ordination and Clash detection with other disciplines

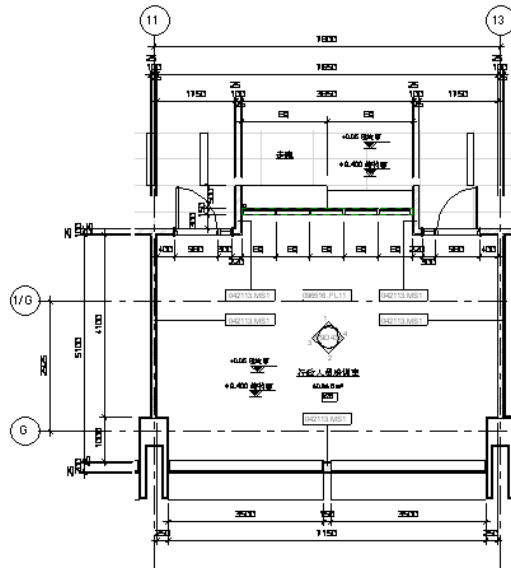
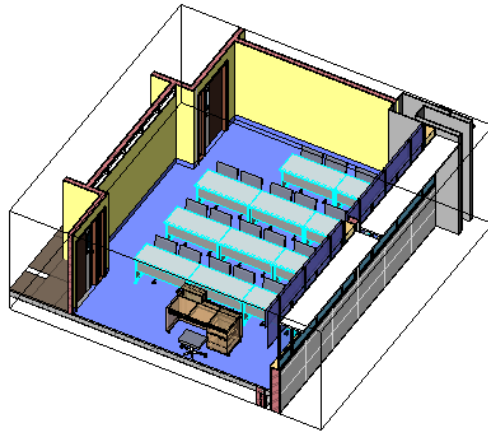
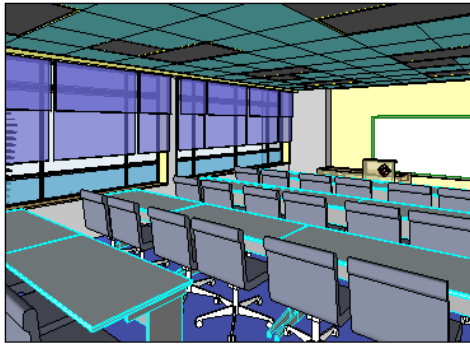
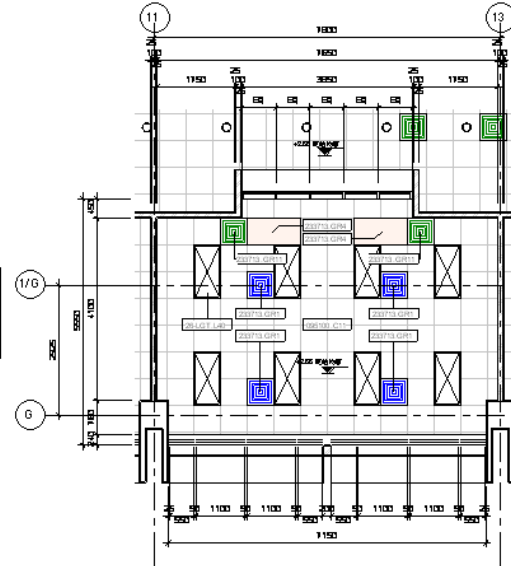
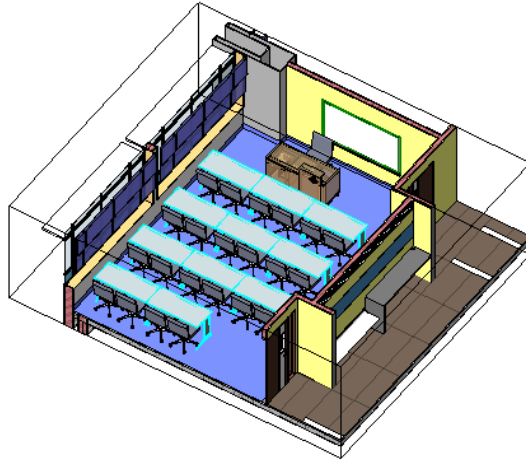
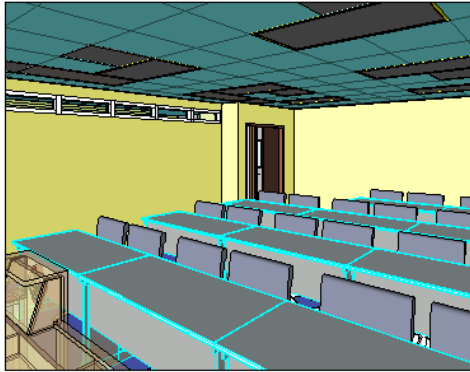
4. Quantity taking and preparation of Tender Document

5. Automated Statutory Submission

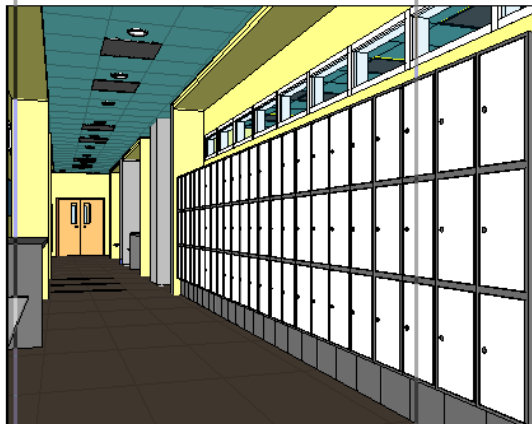
6. Scientific analysis of different environmental aspects

7. Supply Chain Integration with the manufacturing and production

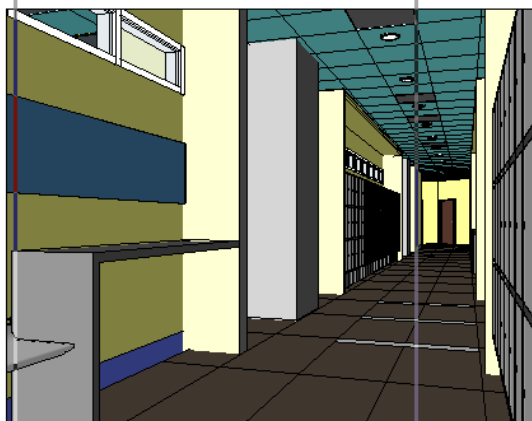
8. Complex Geometry



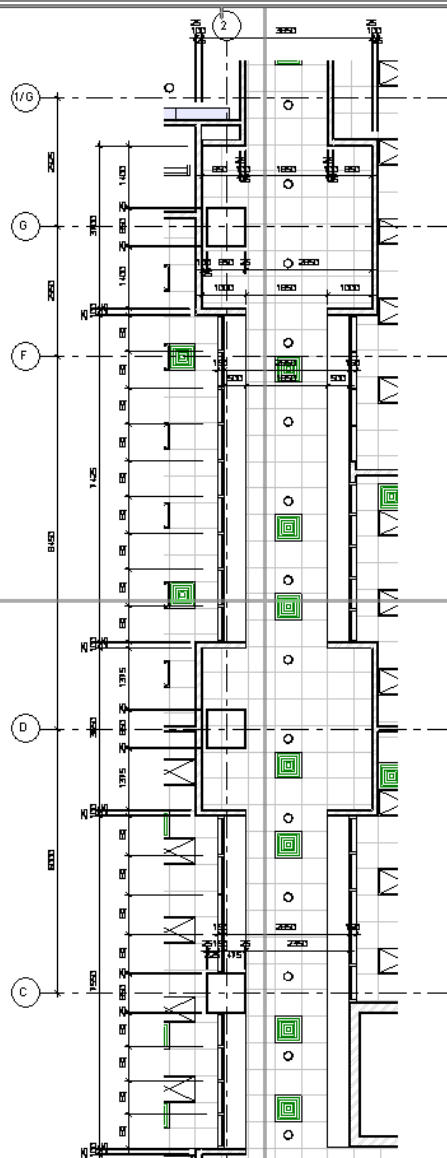
Drawing Type		B.D. SUBMISSION	
B.D. Submission No.		GOVERNMENT REFERENCE NO.	
F.B.D. Submission No.		GOVERNMENT REFERENCE NO.	
Authority AUTHORITY PERIOD EBB RBC AREA			
Notes			
Rev.		Description	
Originality		Drawn	Checked
		DATE	DATE
Structural Engineer		benam	
E & M			
J. R. RIDER, PARENTO II			
G.S.			
利比 RLB Rider Levett Bucknall			
香港中環皇后大道中 香港中環皇后大道中		香港中環皇后大道中 香港中環皇后大道中	
Aedas			
Aedas Ltd. 1101-1102 1101-1102 Queen's Road Hong Kong		T +852 2861 1728 F +852 2520 8816 E aedas@aedas.com.hk aedas.com.hk	
Client			
THE HONG KONG POLYTECHNIC UNIVERSITY 香港理工大學			
Project			
香港理工大學 中環站地 香港理工大學 中環站地			
Drawing			
行政人員申請字樣圖 (高樓三層) 1			
Drawing No. 0877 778 0430		Sheet Count 087707 1 : 52 Rev. 1 087707	
Drawing/Revisions 087707 087707		Rev. 1 087707	
This drawing and its content constitute all of the drawings. This work has been prepared for the use of the client and is not to be used for any other purpose without the written consent of the client. The client is responsible for the accuracy of the information provided and for the accuracy of the drawings. The client is responsible for the accuracy of the information provided and for the accuracy of the drawings.			



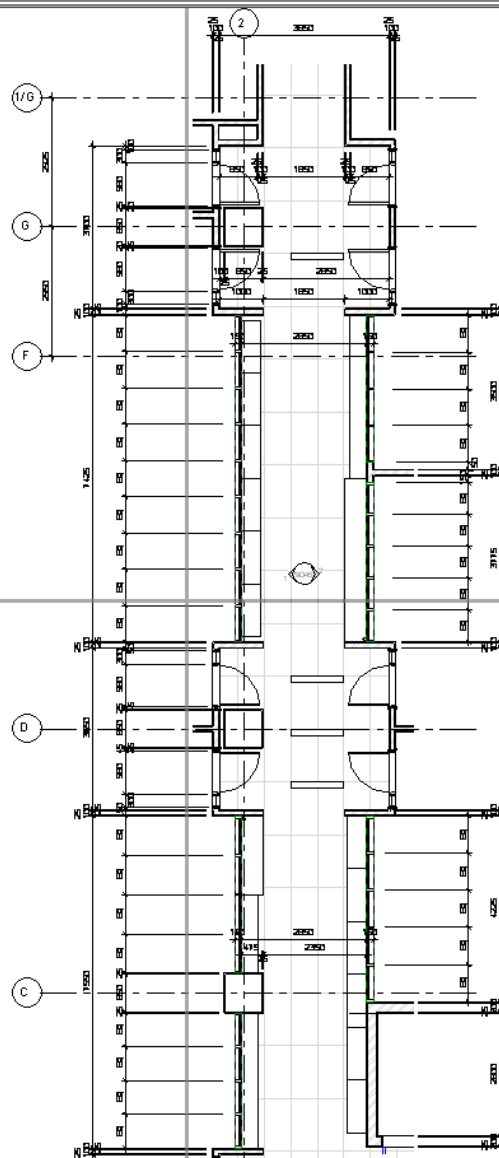
4 走廊立体示意图(低楼三至四层)



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:

- Project Name: POLYTECHNIC UNIVERSITY
- Client: THE HONG KONG POLYTECHNIC UNIVERSITY
- Location: Kowloon, Hong Kong
- Architect: AEDAS LTD.
- Engineer: RLB Rider Levett Bucknall

Project Team:

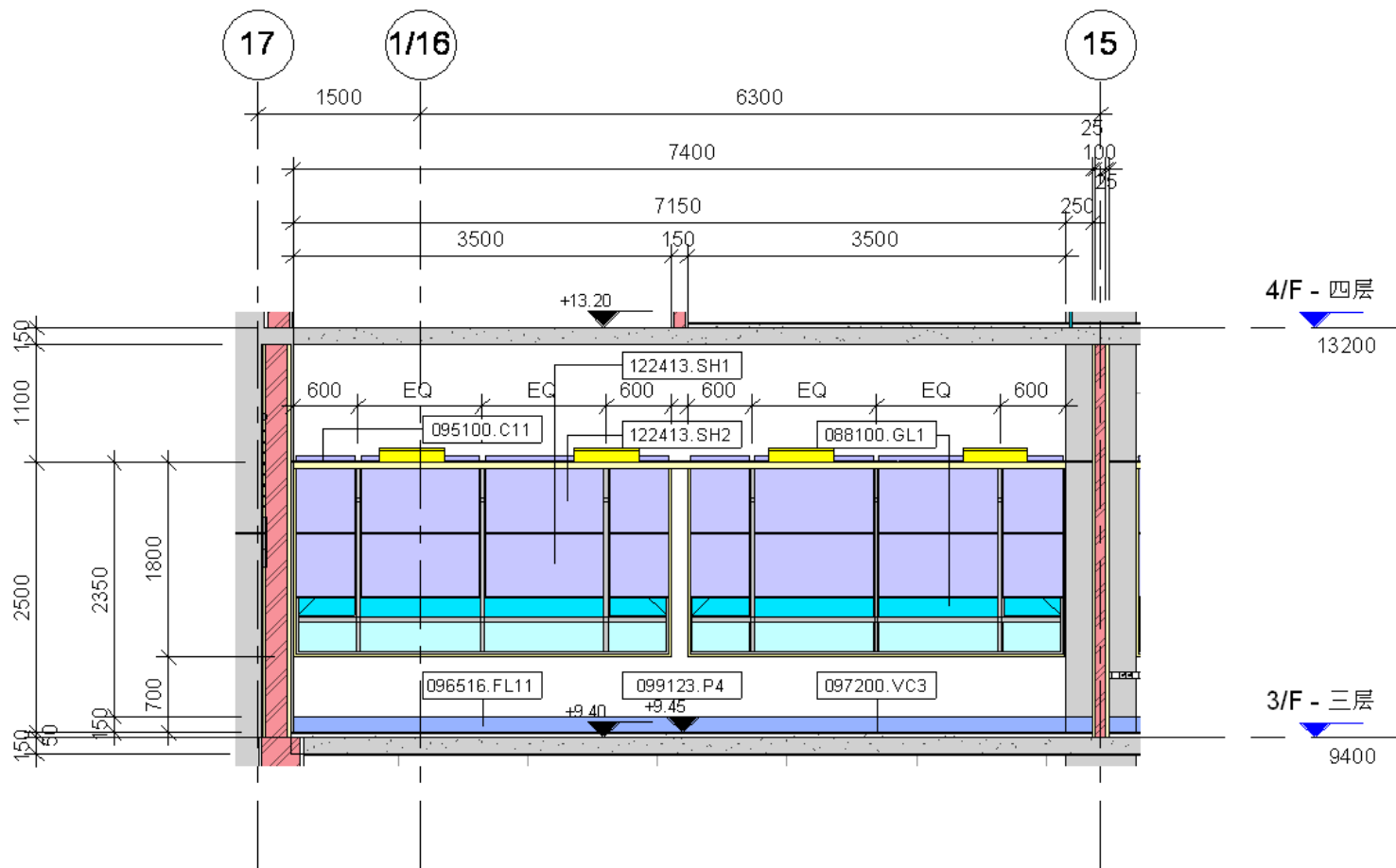
- Project Manager: Mr. [Name]
- Project Engineer: Mr. [Name]
- Project Assistant: Ms. [Name]

Project Status:

- Design Stage: [Status]
- Construction Stage: [Status]

Project Address:

THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大学



2

行政人员培训室立面图(高楼三层)6

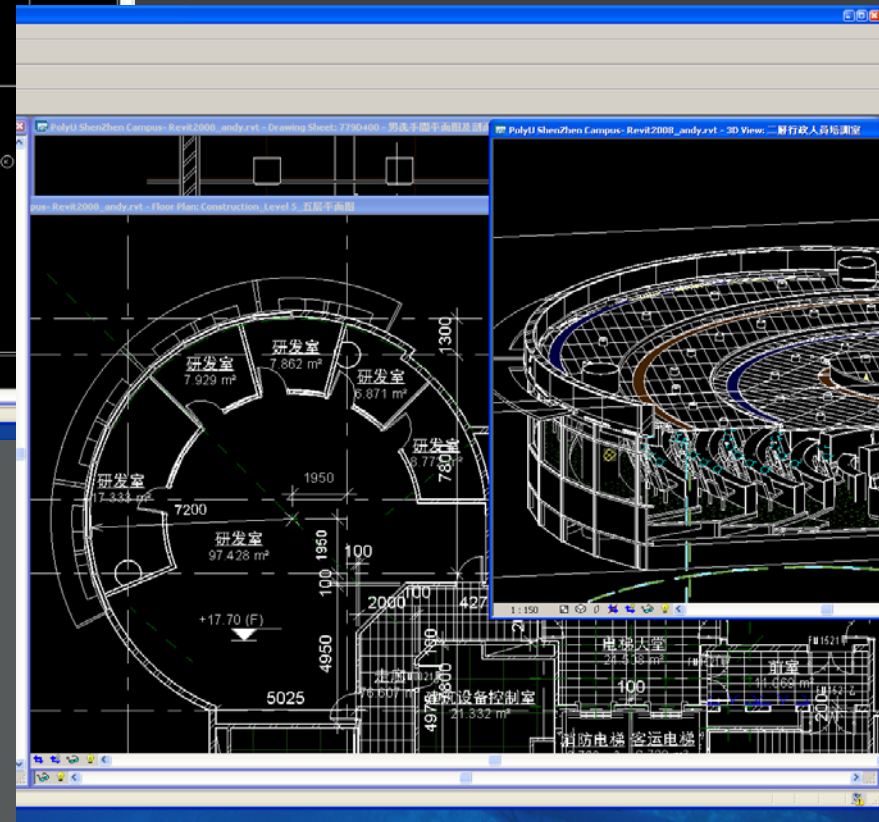
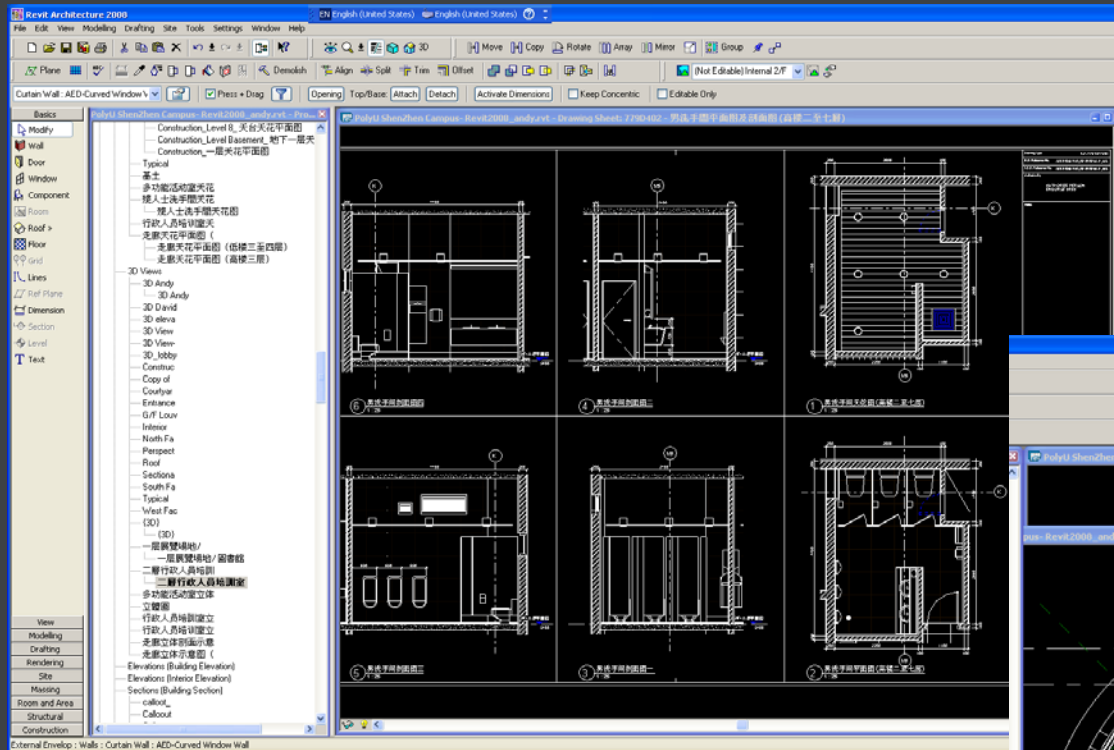
1:50

1. Design visualization
2. Drawing Productions
- 3. Services Co-ordination and Clash detection with other disciplines**
多部門との連携と干渉チェック
4. Quantity taking and preparation of Tender Document
5. Automated Statutory Submission
6. Scientific analysis of different environmental aspects
7. Supply Chain Integration with the manufacturing and production
8. Complex Geometry



Production

Aedas

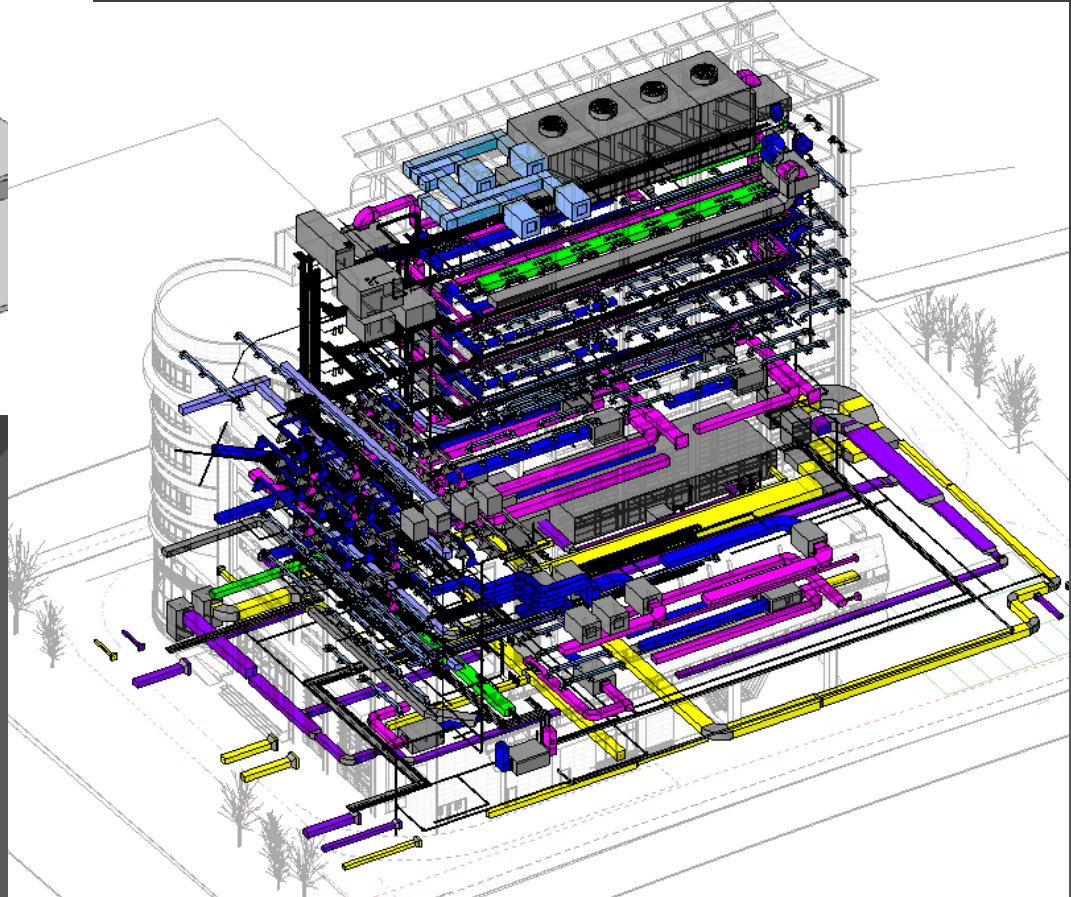
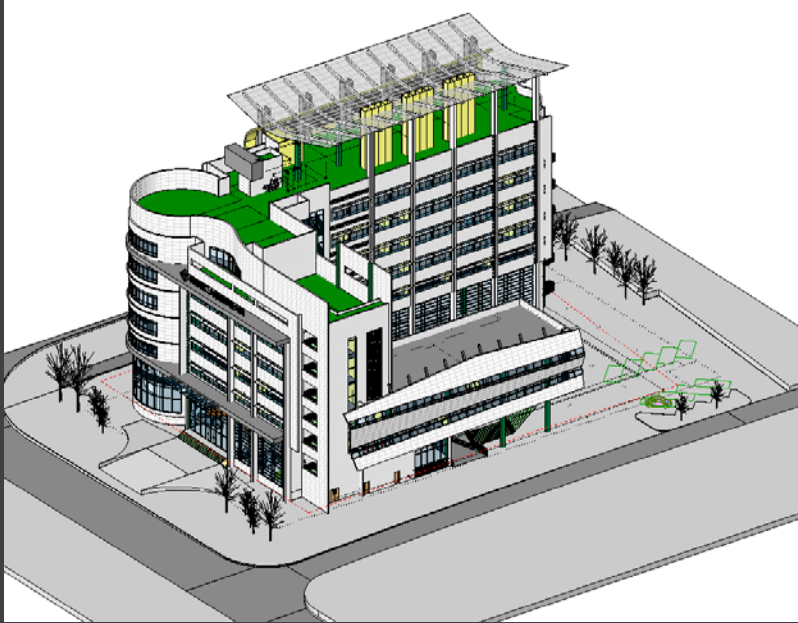




CO-ORDINATION / COLLABORATION

Work Flow – Establish BIM Models

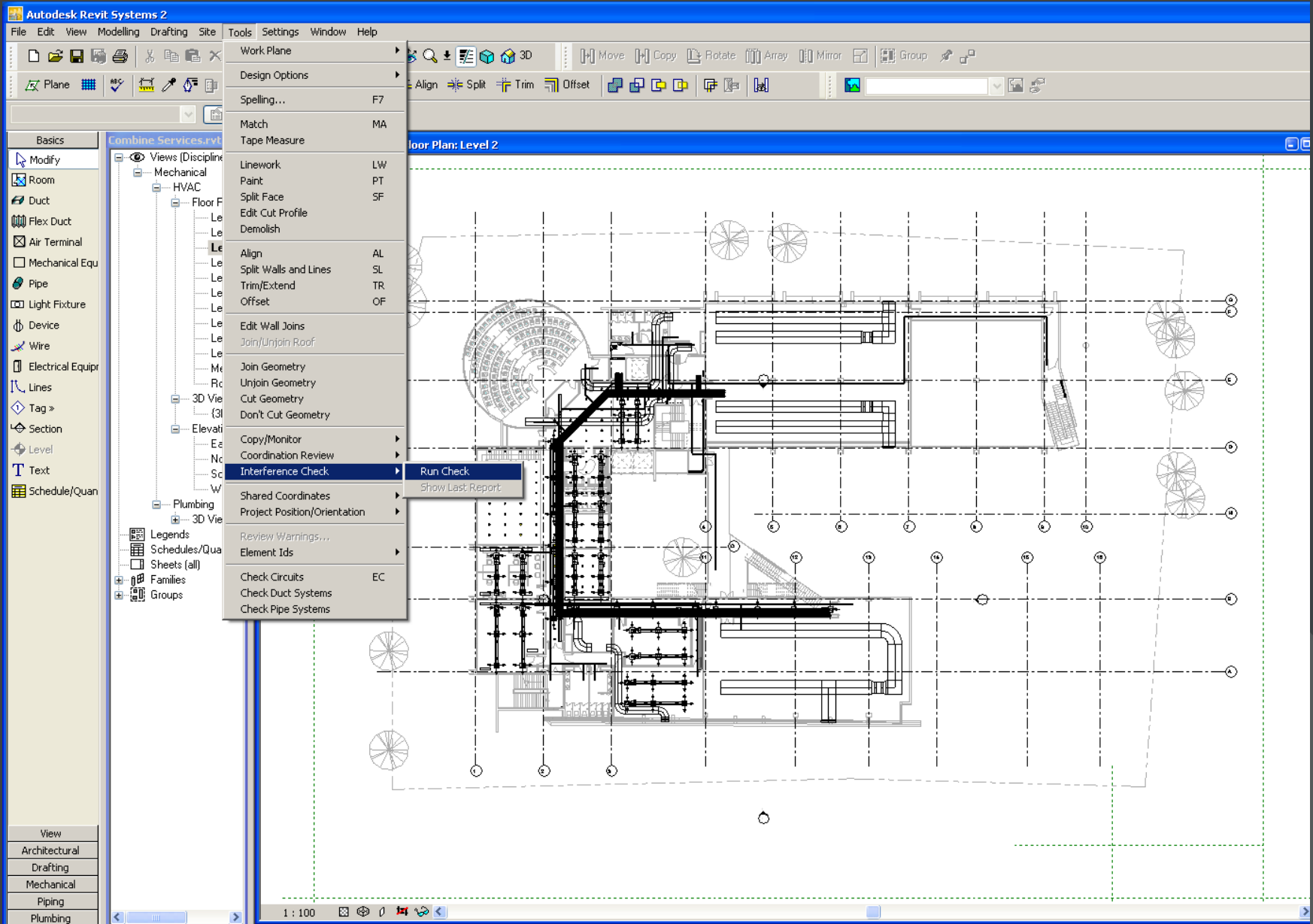
Aedas





Work Flow – Clashes Report

Aedas



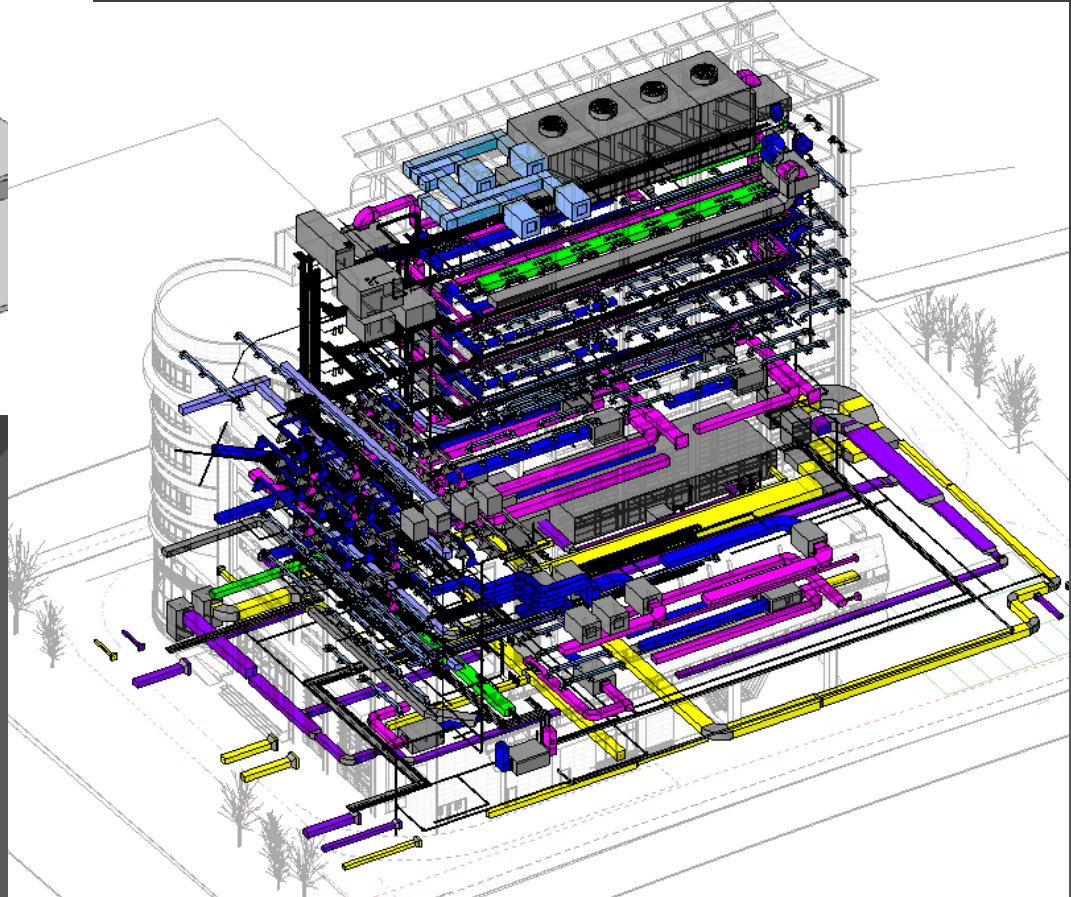
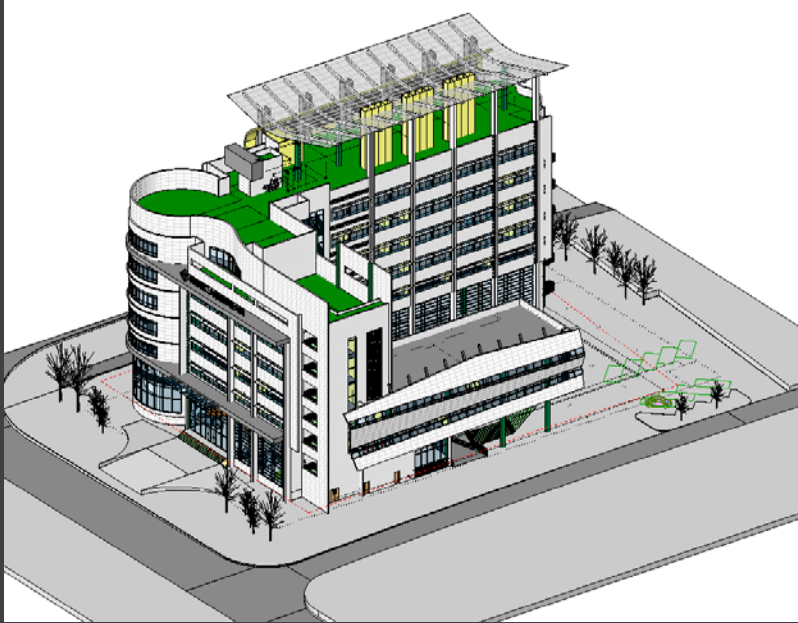
Run Interference Check on the current project, a selection, or a linked project.

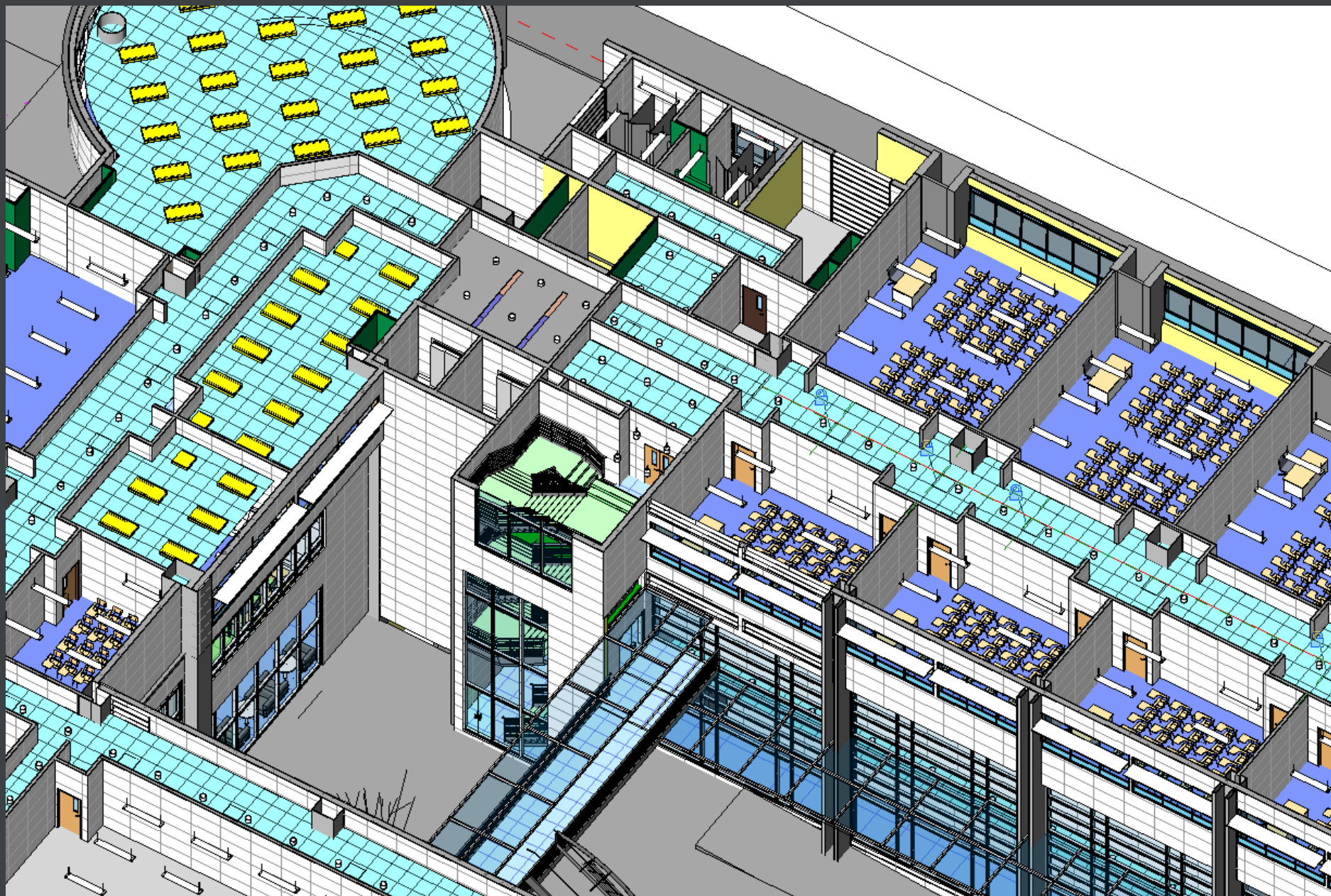


CO-ORDINATION / COLLABORATION

Work Flow – Establish BIM Models

Aedas



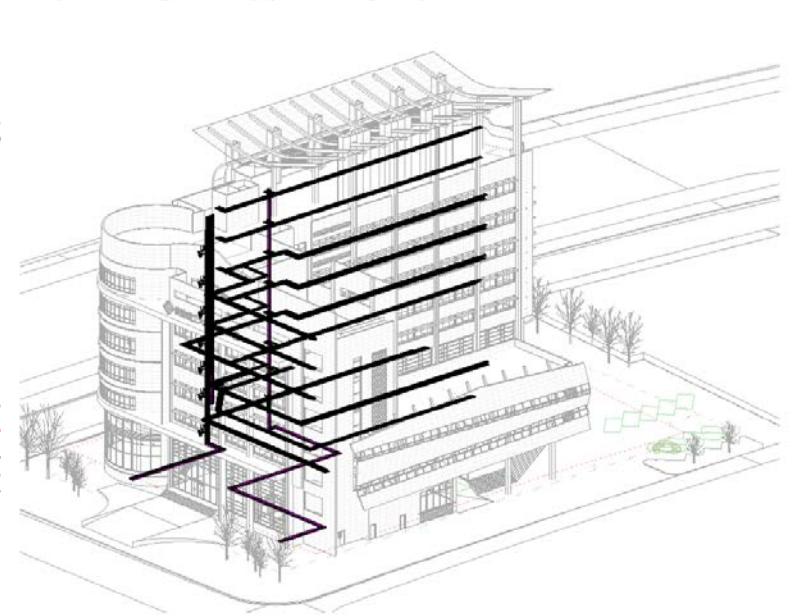
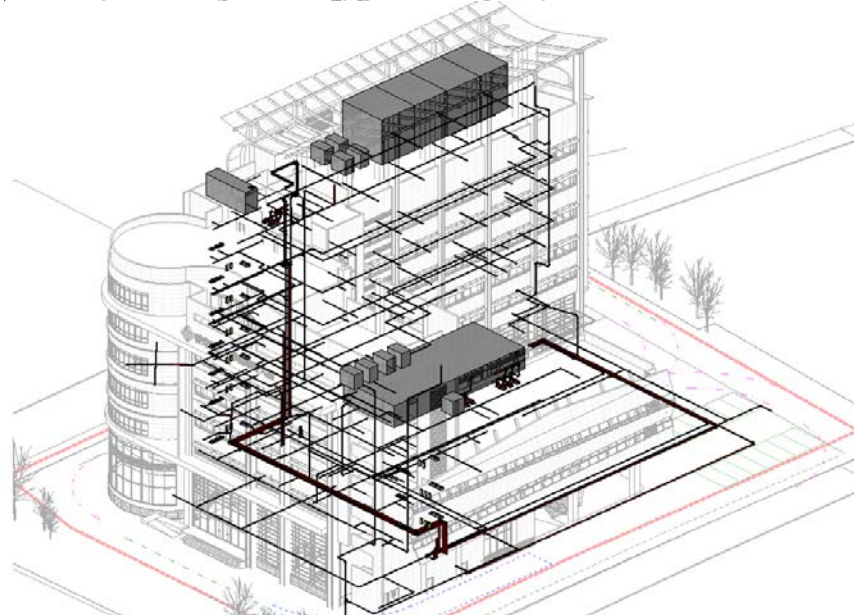
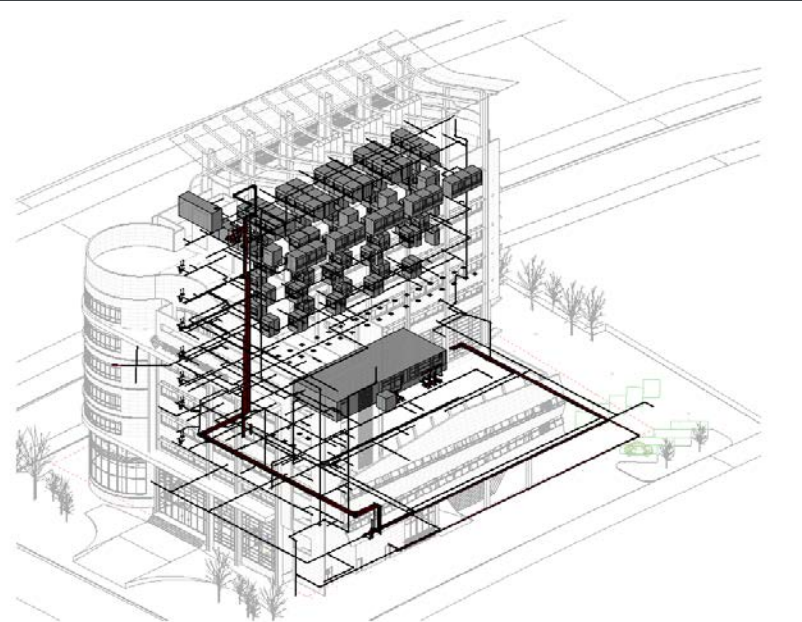
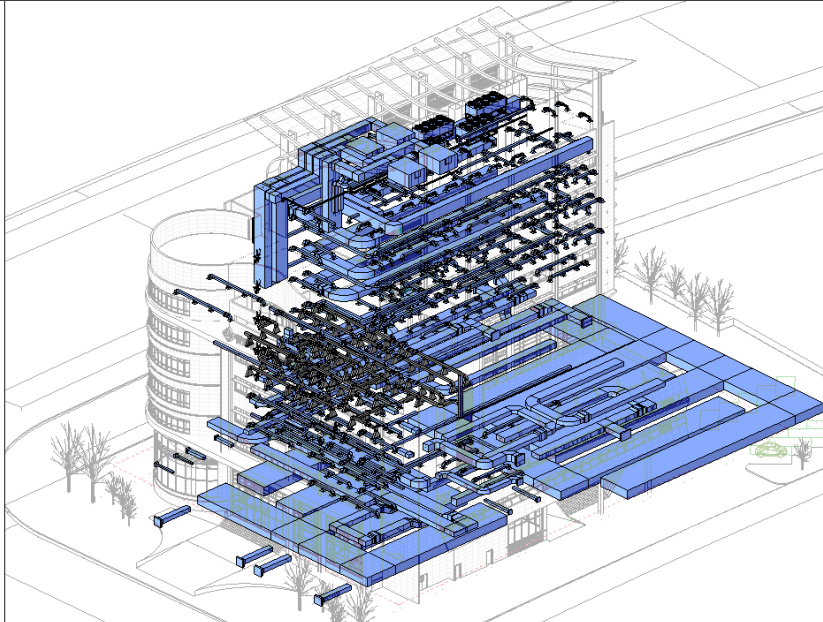




HVAC Installation

Fire Services Installation

Aedas



P/D Installation

Electricity Installation

Work Flow – Clashes Report

Aedas

The screenshot displays the Autodesk Revit Systems 2 interface. The main window shows a 3D view of a building's mechanical system, including ducts, pipes, and equipment. A dialog box titled "Interference Report" is open, showing a list of categories and a message. The dialog box includes a "Group by:" dropdown set to "Category 1, Category 2". The "Message" column lists various categories, including Pipes, Duct, and Mechanical Equ. The "Created:" field shows "Tuesday, May 29, 2007 6:13:54 PM". The "Last Update:" field is empty. A note at the bottom of the dialog box states: "Note: Refresh updates interferences listed above." The dialog box has buttons for "Show", "Export...", "Refresh", and "Close".

Autodesk Revit Systems 2

File Edit View Modeling Drafting Site Tools Settings Window Help

Plane Grid Section Line

Move Copy Rotate Array Mirror Group

(Not Editable) MVAC

Press + Drag Editable Only

PolyU Shenzhen Campus AC_andy.rvt - 3D View: {3D}

Interference Report

Group by: Category 1, Category 2

Message

- Pipes
- Pipes
- Pipes
- Pipes
- Pipes
- Pipes
- Pipes
- Pipes
- Pipes
- Pipes
- Pipes
- Pipes
- Pipes
- Pipes

Created: Tuesday, May 29, 2007 6:13:54 PM

Last Update:

Note: Refresh updates interferences listed above.

Show Export... Refresh Close

Duct Schedule
Pipe Schedule
Room Schedule
Wall Schedule

Sheets (all)

- E&M-1 - Baseme
- E&M-2 - Level 1.
- E&M-3 - Level 2.
- E&M-4 - Level 3.
- E&M-5 - Level 4.
- E&M-6 - Level 5.
- E&M-7 - Level 6.
- E&M-8 - Level 7.
- E&M-9 - Level 8.
- E&M-10 - ROOF
- E&M-11 - A/C Se

Families

- Air Terminals
- Annotation Symb
- Ceilings
- Basic Ceilin
- Generic
- Plaster E

View

Architectural

Drafting

Mechanical

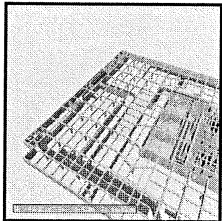
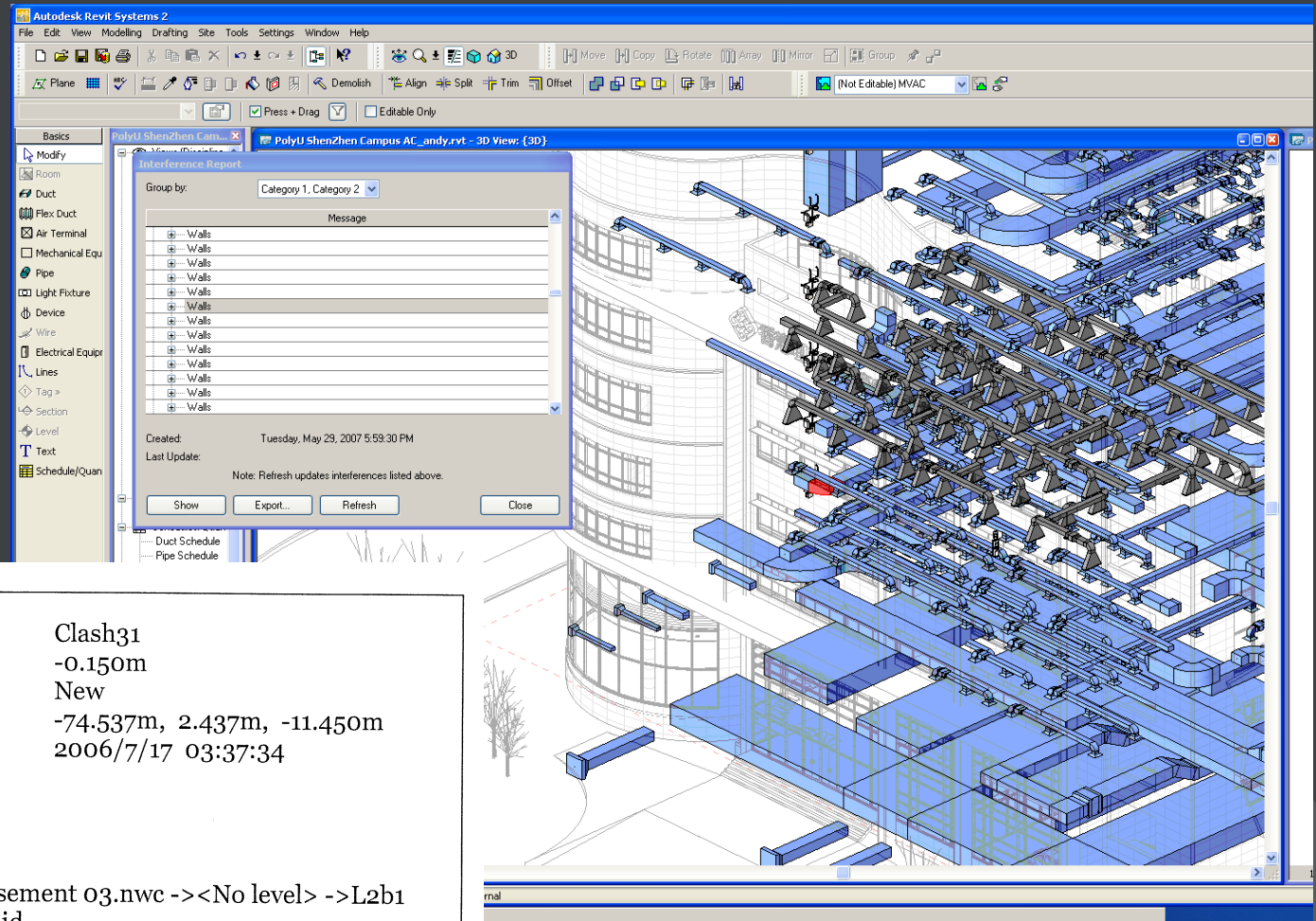
Piping

Plumbing

1 : 150

MVAC : Mechanical Equipment : M_Fan Coil Unit - Horizontal Basic Concealed with Plenum : M_02

Page 4 Sec 1 4/4 At 3.1cm Ln 2 Col 2 REC TRK EXT OVR English (U.S)



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

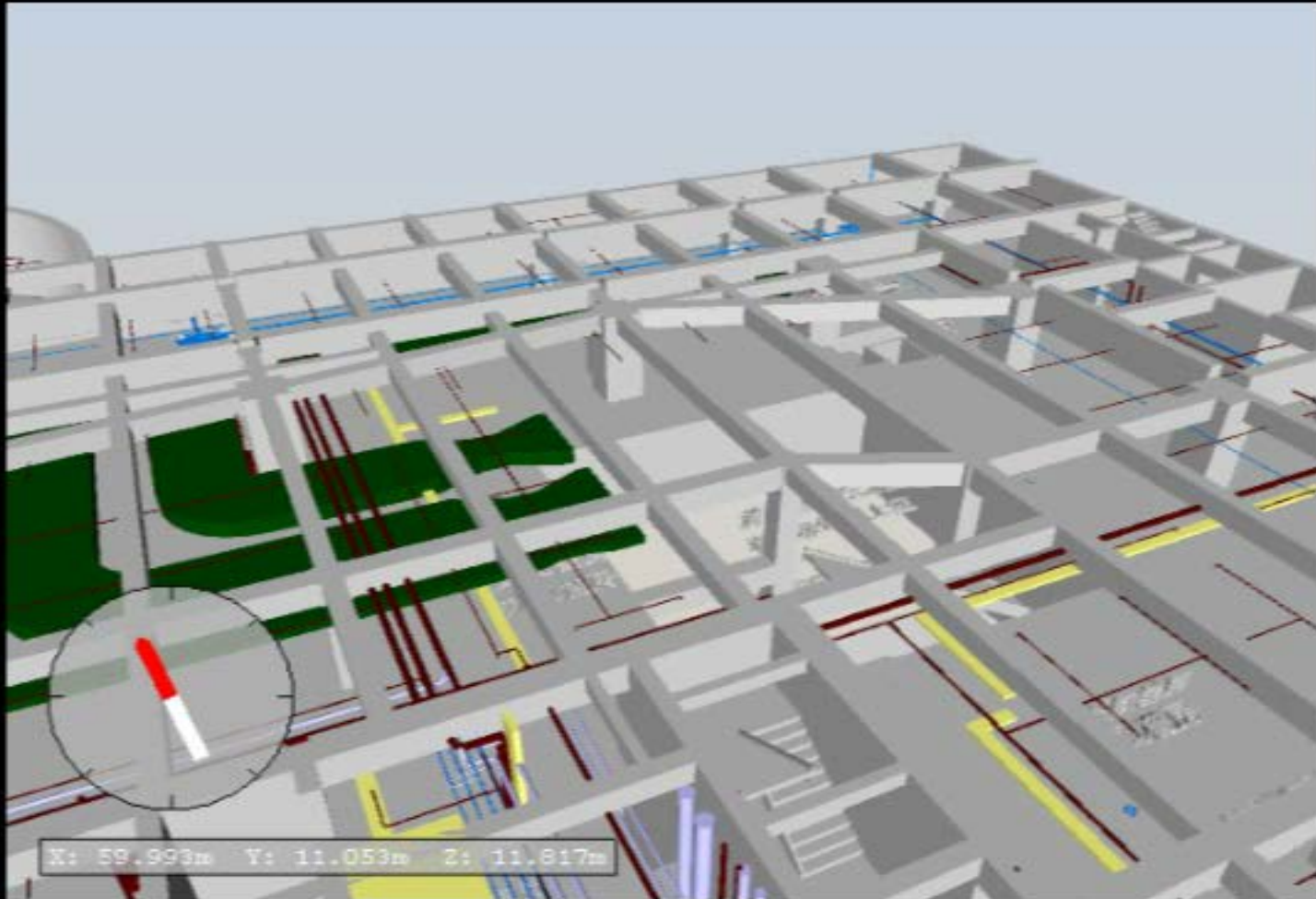
Path File ->File ->Basement 03.nwc -><No level> ->L2b1
 500 x 700 ->L2b1 500 x 700 ->Solid

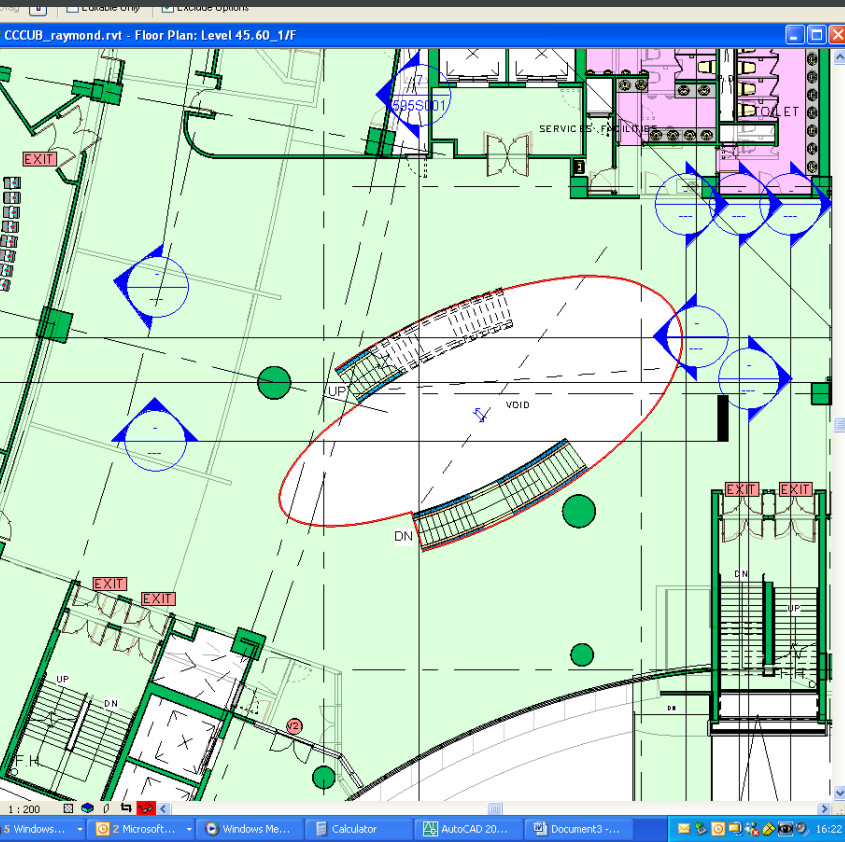
Item 2

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



Work Flow - Clashes Identification Processes



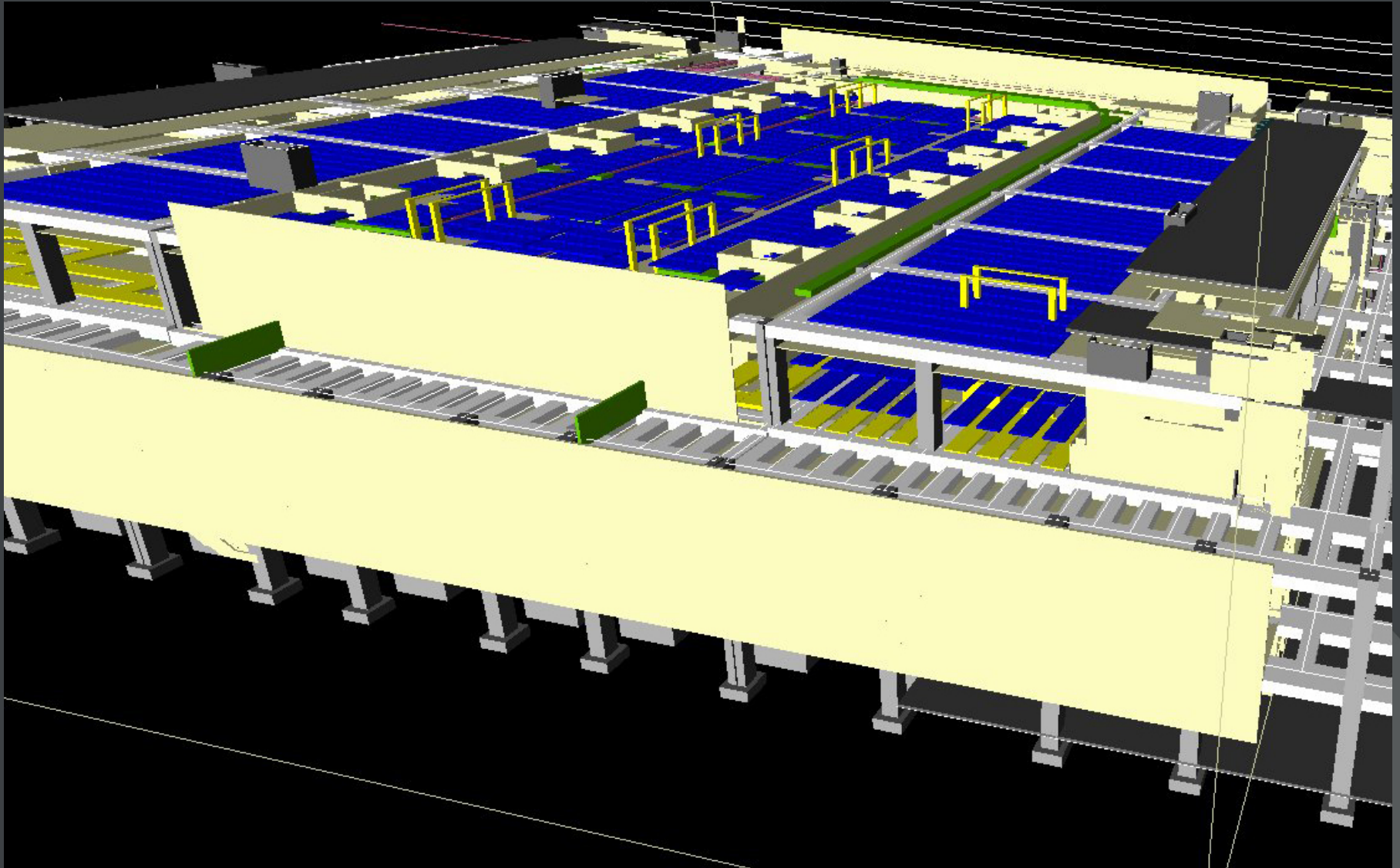




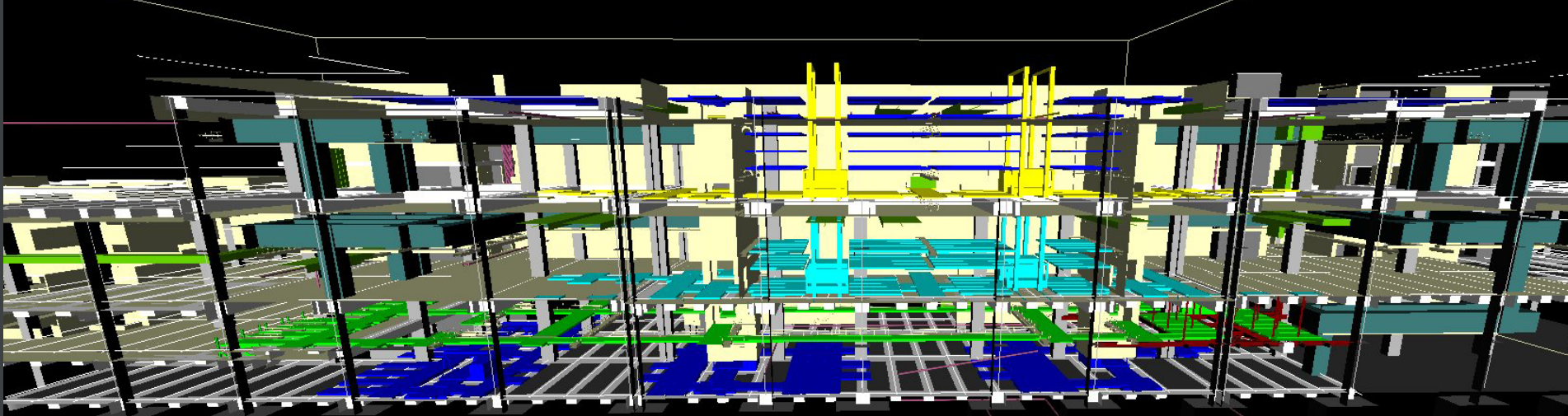
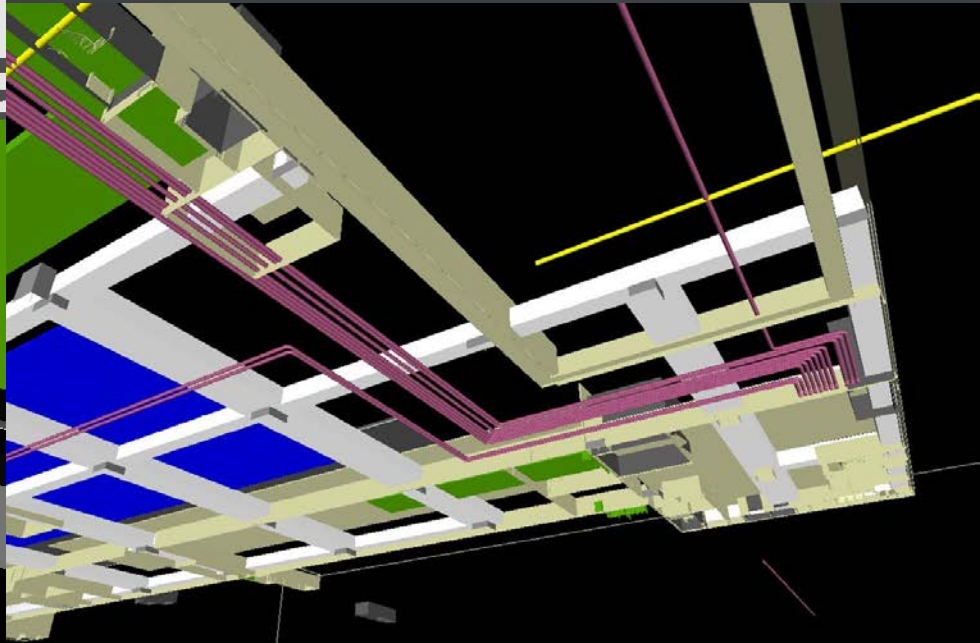
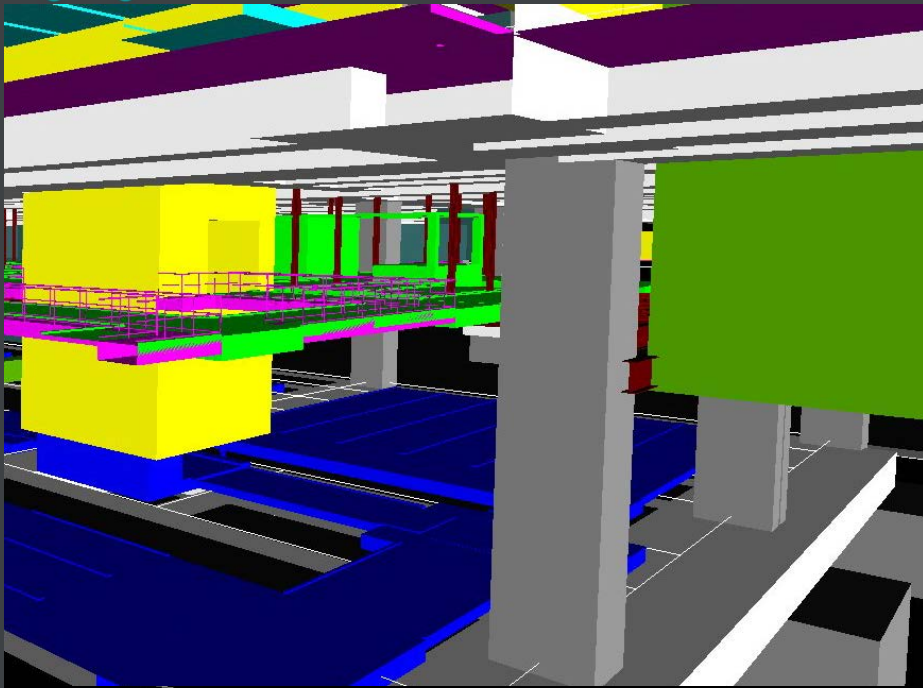
Results – No of Clashes

結果 – 碰撞數目

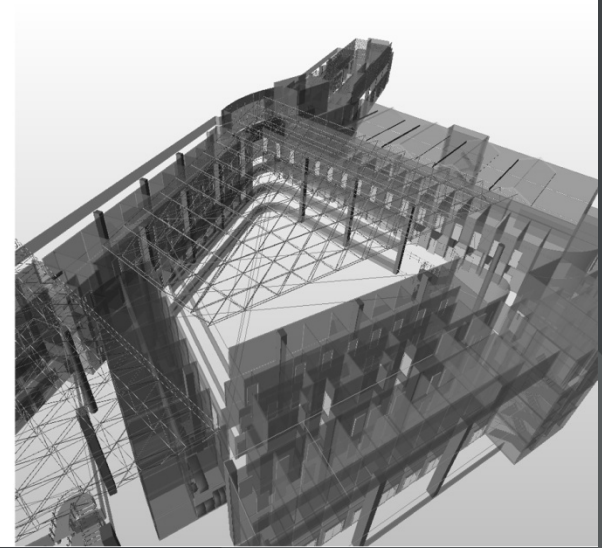
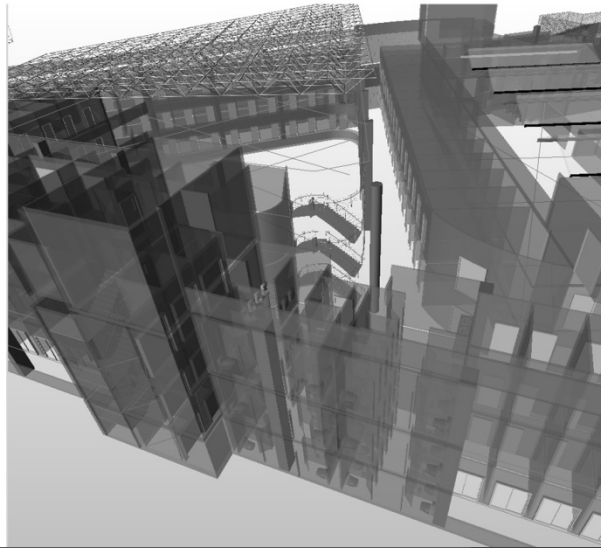
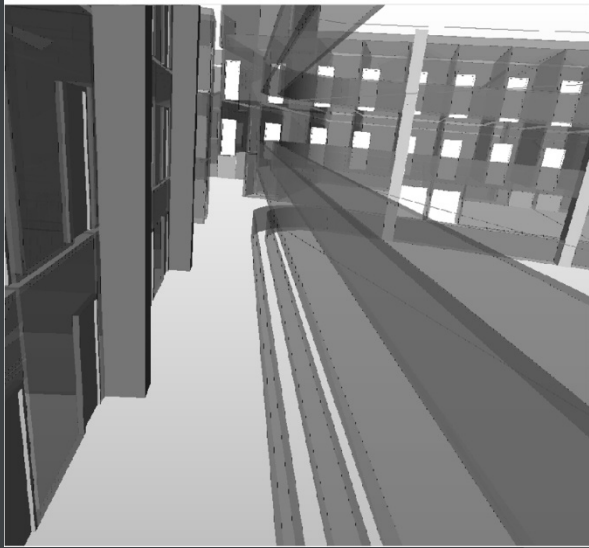
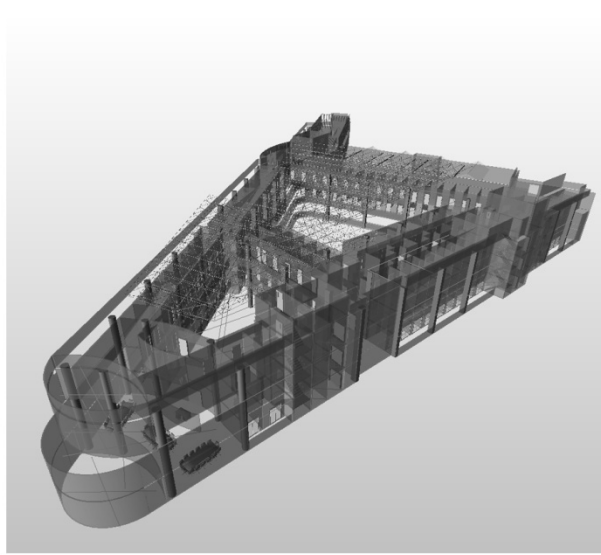
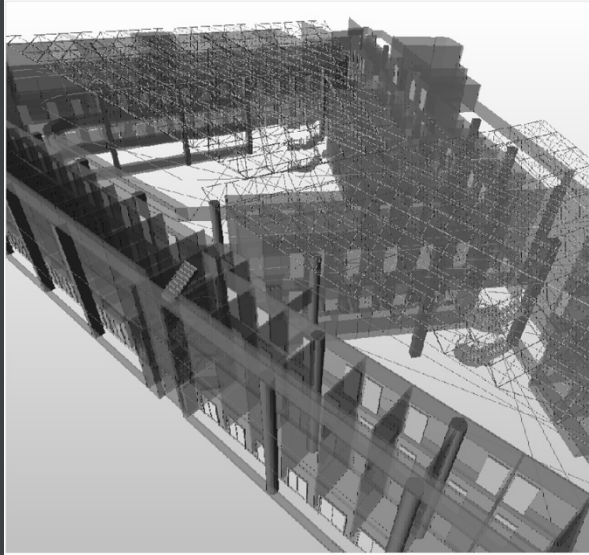
	HVAC Ductwork	Chiller Water Pipe	Fire Services	P&D	Electrical	Total
B1	0	0	0	0	0	0
B1M	0	0	0	0	0	0
B2	0	0	0	0	0	0
B3	0	0	0	0	0	0
Total	0	0	0	0	0	0



DISCIPLINES COLLABORATION



DISCIPLINES COLLABORATION



INTERACTIVE COMMUNICATION – DWF

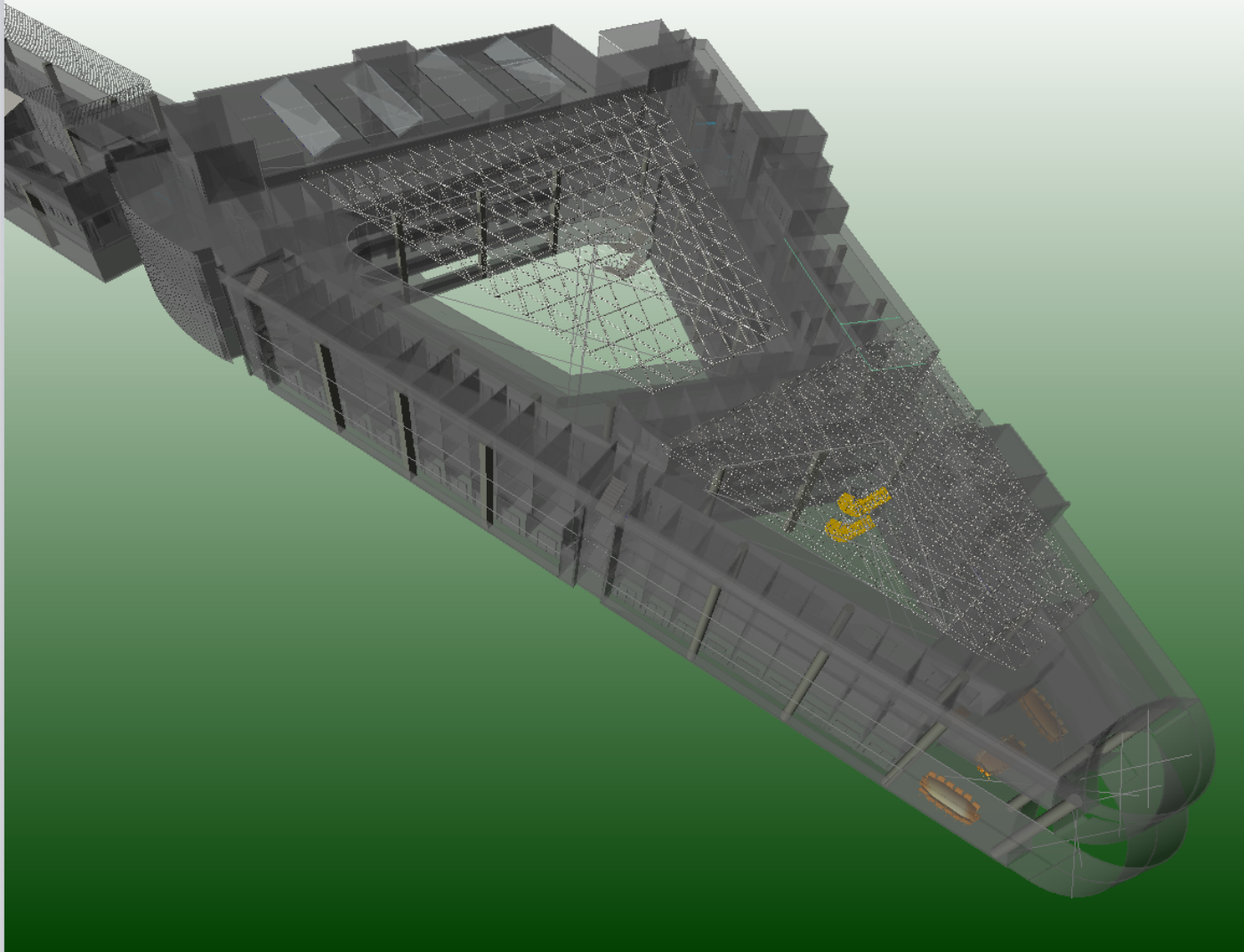


Navigation

- Model
 - Arc (3)
 - Block Reference (3)
 - Circle (14)
 - Curtain Wall (37)
 - Door (432)
 - Multi-View Block Reference (140)
 - Polyline (111)
 - Railing (42)
 - Roof Slab (9)
 - Slab (14)
 - Stair (20)
 - Atrium Staircase (2)
 - Stair [4EFA]
 - Stair [SD78]
 - Internal Staircase (18)
 - Structural Member (649)
 - Theme Stair
 - Theme Stair
 - Theme Stair
 - Theme Stair
 - Wall (854)
 - Facade (55)
 - Partition (679)
 - Standard (11)
 - Structural Wall (101)
 - Washbasin_Counter_M (8)

Properties

- Model
 - Object
- None Available



1. Design visualization
2. Drawing Productions
3. Services Co-ordination and Clash detection with other disciplines
- 4. Quantity taking and preparation of Tender Document** 数量拾い及び入札書類の作成
5. Automated Statutory Submission
6. Scientific analysis of different environmental aspects
7. Supply Chain Integration with the manufacturing and production
8. Complex Geometry



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	

Use of Building Information Modeling (BIM)

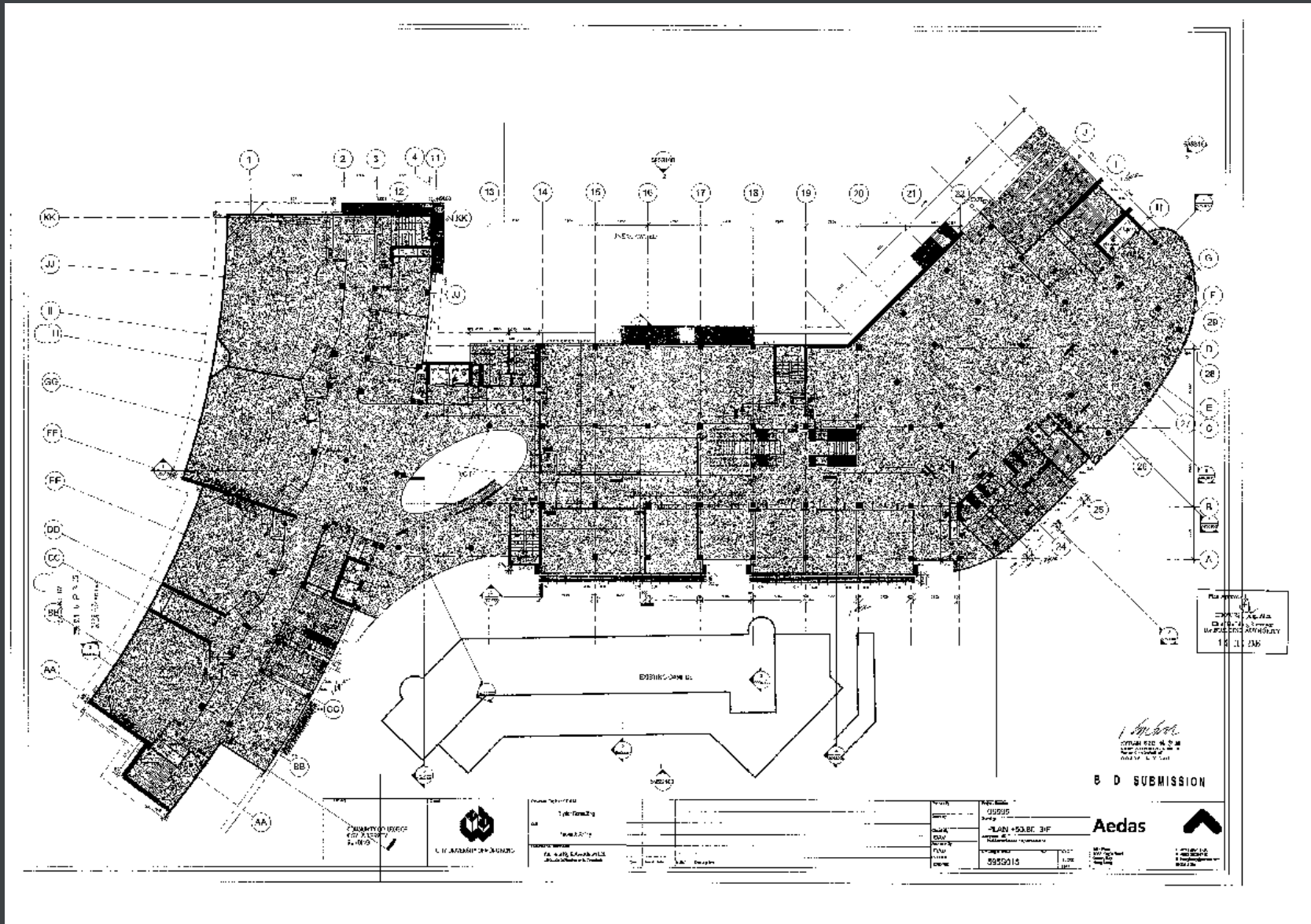
Aedas

1. Design visualization
2. Drawing Productions
3. Services Co-ordination and Clash detection with other disciplines
4. Quantity taking and preparation of Tender Document
- 5. Automated Statutory Submission** 確認申請図書作成の自動化
6. Scientific analysis of different environmental aspects
7. Supply Chain Integration with the manufacturing and production
8. Complex Geometry



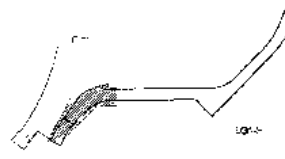
STATUTORY SUBMISSION

Aedas

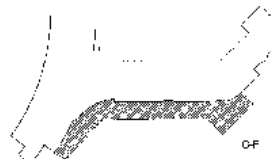




① EVA of Level 34.00_LG2/F
1:1000



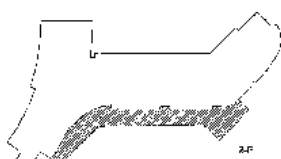
② EVA of Level 37.80, LG1/F
1:1000



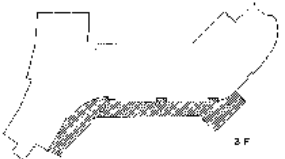
③ $\frac{\text{EVA of Level 41.60_GF}}{1:1000}$



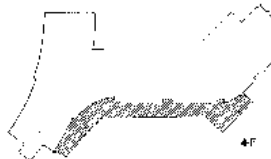
④ EVA of Level 45.60 $\frac{1}{1.1555}$



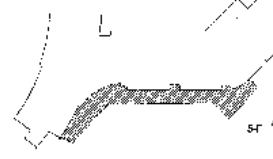
⑤ EVA of Level 49.80 2rF
1:1300



⑥ EVA of Level 53.80_3/F
1:1000

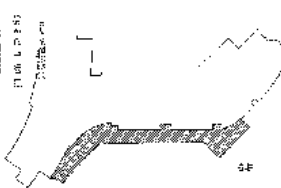


7 EVA of Level 5B.2D_4/F
1:1000



⑧ EVA of Level 62.00 5/F

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 OF TOTAL LENGTH OF BUILDING FACADE TO BE SERVED BY EVA AND HENGCHEN FIRE OF SUCH LENGTH OVER THE TOTAL LENGTH OF ALL THE PERIMETER WALLS OF THE BUILDING

1. www.marine-weather.com																																	
Date		Time		Lat		Long		Alt		Speed		Heading		Temp		Pressure		Humidity		Wind		Wave		Sea		Sky		Cloud		Visibility		Remarks	
Day	Month	Year	Hour	Min	Sec	N	E	S	W	Feet	Knots	Deg	Deg	Deg	Deg	Deg	Deg	Deg	Deg	Deg	Deg	Deg	Deg	Deg	Deg	Deg	Deg	Deg	Deg	Deg	Deg	Deg	
1	1	1970	12	00	00	10	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
2	1	1970	12	01	00	10	01	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
3	1	1970	12	02	00	10	02	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
4	1	1970	12	03	00	10	03	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
5	1	1970	12	04	00	10	04	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
6	1	1970	12	05	00	10	05	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
7	1	1970	12	06	00	10	06	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
8	1	1970	12	07	00	10	07	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
9	1	1970	12	08	00	10	08	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
10	1	1970	12	09	00	10	09	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
11	1	1970	12	10	00	10	10	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
12	1	1970	12	11	00	10	11	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
13	1	1970	12	12	00	10	12	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
14	1	1970	12	13	00	10	13	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
15	1	1970	12	14	00	10	14	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
16	1	1970	12	15	00	10	15	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
17	1	1970	12	16	00	10	16	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
18	1	1970	12	17	00	10	17	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
19	1	1970	12	18	00	10	18	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20	1	1970	12	19	00	10	19	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
21	1	1970	12	20	00	10	20	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
22	1	1970	12	21	00	10	21	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
23	1	1970	12	22	00	10	22	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
24	1	1970	12	23	00	10	23	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
25	1	1970	12	24	00	10	24	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
26	1	1970	12	25	00	10	25	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
27	1	1970	12	26	00	10	26	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
28	1	1970	12	27	00	10	27	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
29	1	1970	12	28	00	10	28	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
30	1	1970	12	29	00	10	29	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
31	1	1970	12	30	00	10	30	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
32	1	1970	12	31	00	10	31	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
33	1	1970	12	32	00	10	32	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
34	1	1970	12	33	00	10	33	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
35	1	1970	12	34	00	10	34	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
36	1	1970	12	35	00	10	35	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
37	1	1970	12	36	00	10	36	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
38	1	1970	12	37	00	10	37	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
39	1	1970	12	38	00	10	38	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
40	1	1970	12	39	00	10	39	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
41	1	1970	12	40	00	10	40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
42	1	1970	12	41	00	10	41	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
43	1	1970	12	42	00	10	42	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
44	1	1970	12	43	00	10	43	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
45	1	1970	12	44	00	10	44	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
46	1	1970	12	45	00	10	45	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
47	1	1970	12	46	00	10	46	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
48	1	1970	12	47	00	10	47	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
49	1	1970	12	48	00	10	48	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
50	1	1970	12	49	00	10	49	00	00	00	00	00	00	00	0																		

姓名	性别	出生年月	民族	籍贯	学历	学位	职称	工作单位	研究方向
王德胜	男	1965.03	汉族	山东烟台	硕士		副教授	烟台大学	应用数学
李小明	男	1972.08	汉族	河南郑州	本科		讲师	河南大学	计算机科学
张小红	女	1978.12	汉族	湖北武汉	硕士		讲师	武汉大学	物理学
赵国强	男	1985.05	汉族	四川成都	本科		助教	四川大学	化学工程
陈丽娟	女	1988.09	汉族	广东广州	本科		助教	中山大学	生物科学
周志远	男	1990.01	汉族	浙江杭州	本科		助教	浙江大学	机械工程
吴昊	男	1992.06	汉族	江苏南京	本科		助教	南京大学	环境工程
孙悦	女	1995.11	汉族	北京海淀	本科		助教	清华大学	材料科学
郑宇	男	1998.03	汉族	湖南长沙	本科		助教	湖南大学	能源工程
王芳	女	2000.07	汉族	安徽合肥	本科		助教	安徽大学	地质工程
李强	男	2002.12	汉族	福建厦门	本科		助教	厦门大学	海洋工程

[illegible]

Van Aggen
 Chief Building Surveyor
 for the City of Seattle
 1/1/2011

[illegible]



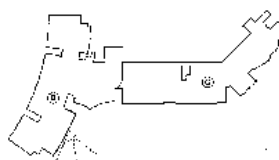
STATUTORY SUBMISSION

Aedas

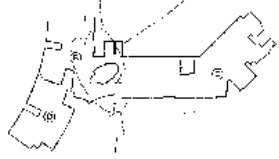
LG/5/F (+37.82) COMPARTMENT CALCULATION



G/F (+41.80) COMPARTMENT CALCULATION



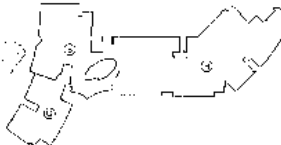
1/F (+45.80) COMPARTMENT CALCULATION



2/F (+49.80) COMPARTMENT CALCULATION



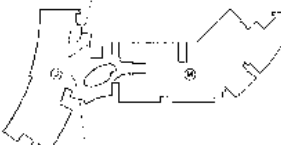
3/F (+53.80) COMPARTMENT CALCULATION



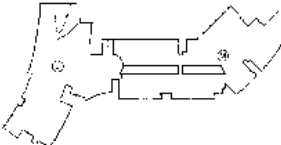
4/F (+58.20) COMPARTMENT CALCULATION



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	10.175
G/F	1	Shop	54.208	2.052
G/F	2	Office	412.213	15.654
3/F	1	Restaurant	178.557	6.704
3/F	2	Kitchen	481.136	18.124
5/F	1	Office	2031.235	77.184
6/F	1	Restaurant	178.557	6.704
6/F	2	Kitchen	166.561	6.218
6/F	3	Exhibition hall	704.211	26.558
Total number of students				6000

Total Capacity of COQUE			
Location	Use	Area	Total Capacity
LG/5/F	Office	275.442	9
G/F	Shop	54.208	3
G/F	Office	412.213	9
3/F	Restaurant	178.557	1
3/F	Kitchen	481.136	4.5
5/F	Office	2031.235	9
6/F	Restaurant	178.557	1
6/F	Kitchen	166.561	4.5
6/F	Exhibition hall	704.211	2
Total number of students			6000
Total			54

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

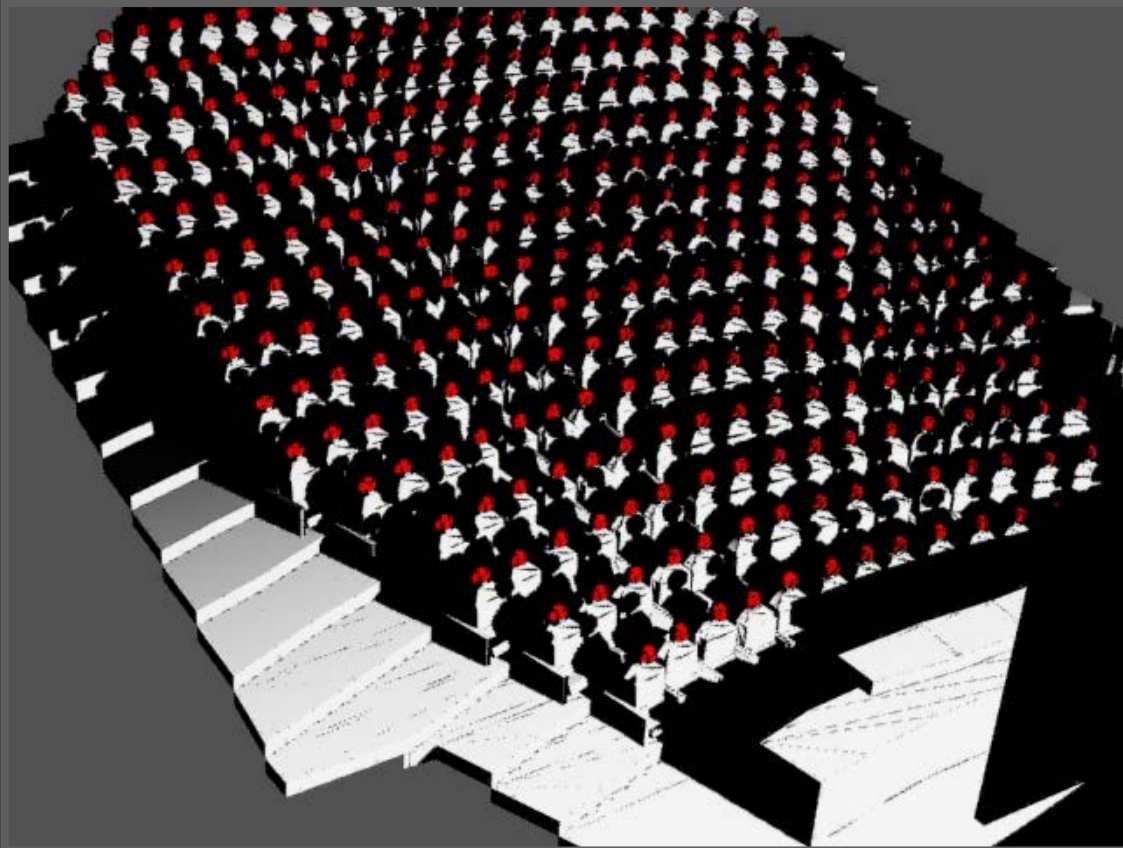
LOCATION	FLOOR	SUBJECT	MIN. NO. OF EXIT ROUTES		MIN. WIDTH OF EACH EXIT ROUTE		MIN. TOTAL WIDTH OF EXIT ROUTES	
			REQD.	PROV.	REQD.	PROV.	REQD.	PROV.
LG/5/F	1	Office	1	1	1.00	1.00	1.00	1.00
G/F	1	Shop	1	1	1.00	1.00	1.00	1.00
G/F	2	Office	1	1	1.00	1.00	1.00	1.00
3/F	1	Restaurant	1	1	1.00	1.00	1.00	1.00
3/F	2	Kitchen	1	1	1.00	1.00	1.00	1.00
5/F	1	Office	1	1	1.00	1.00	1.00	1.00
6/F	1	Restaurant	1	1	1.00	1.00	1.00	1.00
6/F	2	Kitchen	1	1	1.00	1.00	1.00	1.00
6/F	3	Exhibition hall	1	1	1.00	1.00	1.00	1.00

THE RESISTANCE REQUIREMENTS FOR SUBSTRUCTURE OF CONSTRUCTION												
COMPONENT NO.	SECTION	TOTAL VOLUME	RESISTANCE	R.C. WALL & COLUMN		CONCRETE		R.C. BEAM		R.C. STAIR		
				THK.	CONCRETE STEE.	THK.	% STEEL	THK.	% STEEL	THK.	% STEEL	
A	1. FLOOR	1592.52	2	75	15	100	20	40	30	25	95	100
B	2. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
C	3. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
D	4. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
E	5. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
F	6. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
G	7. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
H	8. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
I	9. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
J	10. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
K	11. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
L	12. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
M	13. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
N	14. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
O	15. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
P	16. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
Q	17. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
R	18. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
S	19. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
T	20. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
U	21. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
V	22. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
W	23. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
X	24. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
Y	25. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
Z	26. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
AA	27. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
AB	28. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
AC	29. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
AD	30. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
AE	31. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
AF	32. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
AG	33. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
AH	34. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
AI	35. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
AJ	36. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
AK	37. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
AL	38. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
AM	39. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
AN	40. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
AO	41. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
AP	42. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
AQ	43. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
AR	44. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
AS	45. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
AT	46. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
AU	47. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
AV	48. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
AW	49. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
AX	50. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
AY	51. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
AZ	52. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
BA	53. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
BB	54. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
BC	55. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
BD	56. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
BE	57. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
BF	58. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
BG	59. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
BH	60. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
BI	61. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
BJ	62. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
BK	63. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
BL	64. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
BM	65. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
BN	66. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
BO	67. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
BP	68. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
BQ	69. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
BR	70. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
BS	71. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
BT	72. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
BU	73. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
BV	74. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
BW	75. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
BX	76. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
BY	77. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
BZ	78. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
CA	79. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
CB	80. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
CC	81. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
CD	82. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
CE	83. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
CF	84. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
CG	85. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
CH	86. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
CI	87. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
CJ	88. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
CK	89. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
CL	90. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
CM	91. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
CN	92. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
CO	93. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
CP	94. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
CQ	95. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
CR	96. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
CS	97. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
CT	98. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
CU	99. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
CV	100. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
CW	101. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
CX	102. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
CY	103. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
CZ	104. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
DA	105. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
DB	106. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
DC	107. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
DD	108. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
DE	109. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
DF	110. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
DG	111. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100
DH	112. FLOOR OF ASSEMBLY	1841.02	2	100	25	100	40	30	25	25	100	100

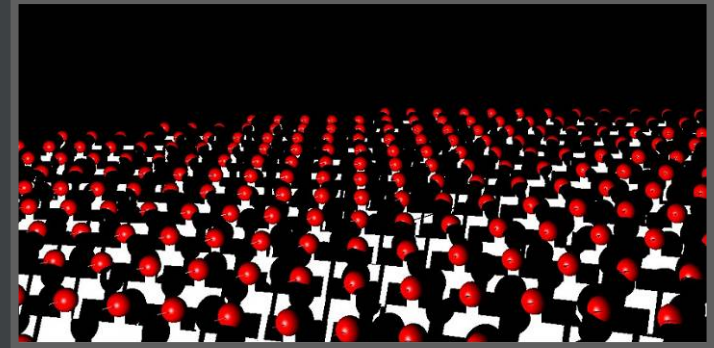
Use of Building Information Modeling (BIM)

Aedas

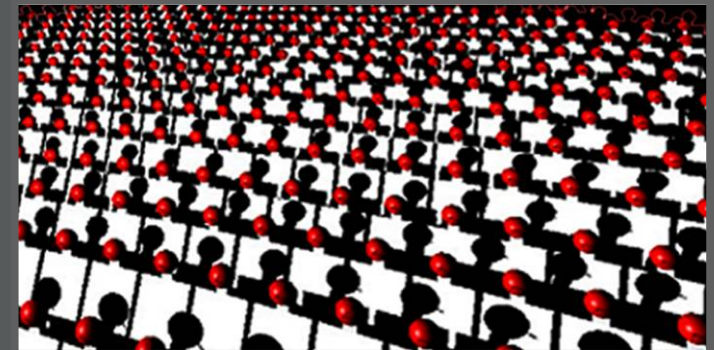
1. Design visualization
2. Drawing Productions
3. Services Co-ordination and Clash detection with other disciplines
4. Quantity taking and preparation of Tender Document
5. Automated Statutory Submission
- 6. Scientific analysis of different environmental aspects** 様々な環境
解析
7. Supply Chain Integration with the manufacturing and production
8. Complex Geometry



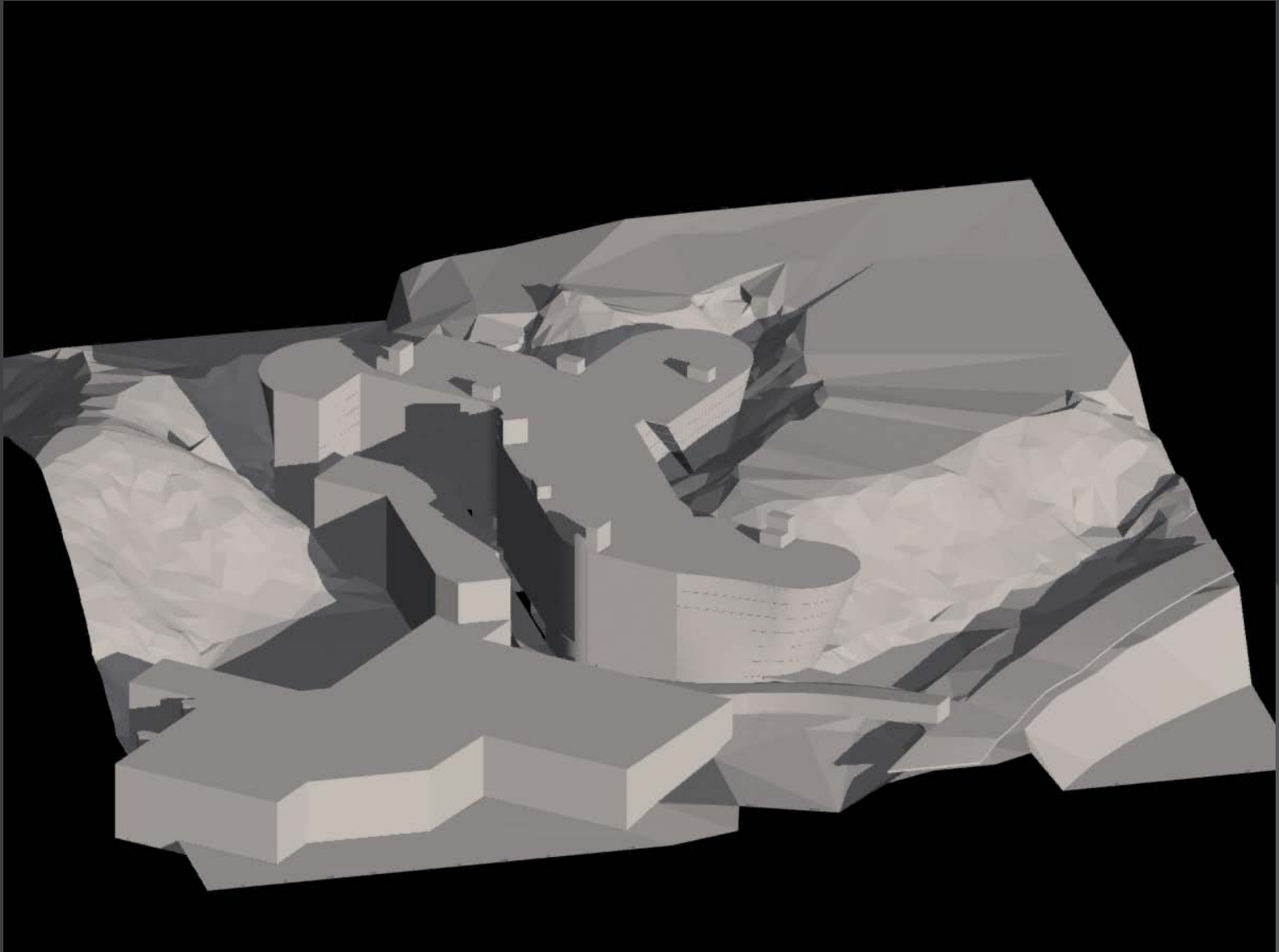
Radiating Light Method

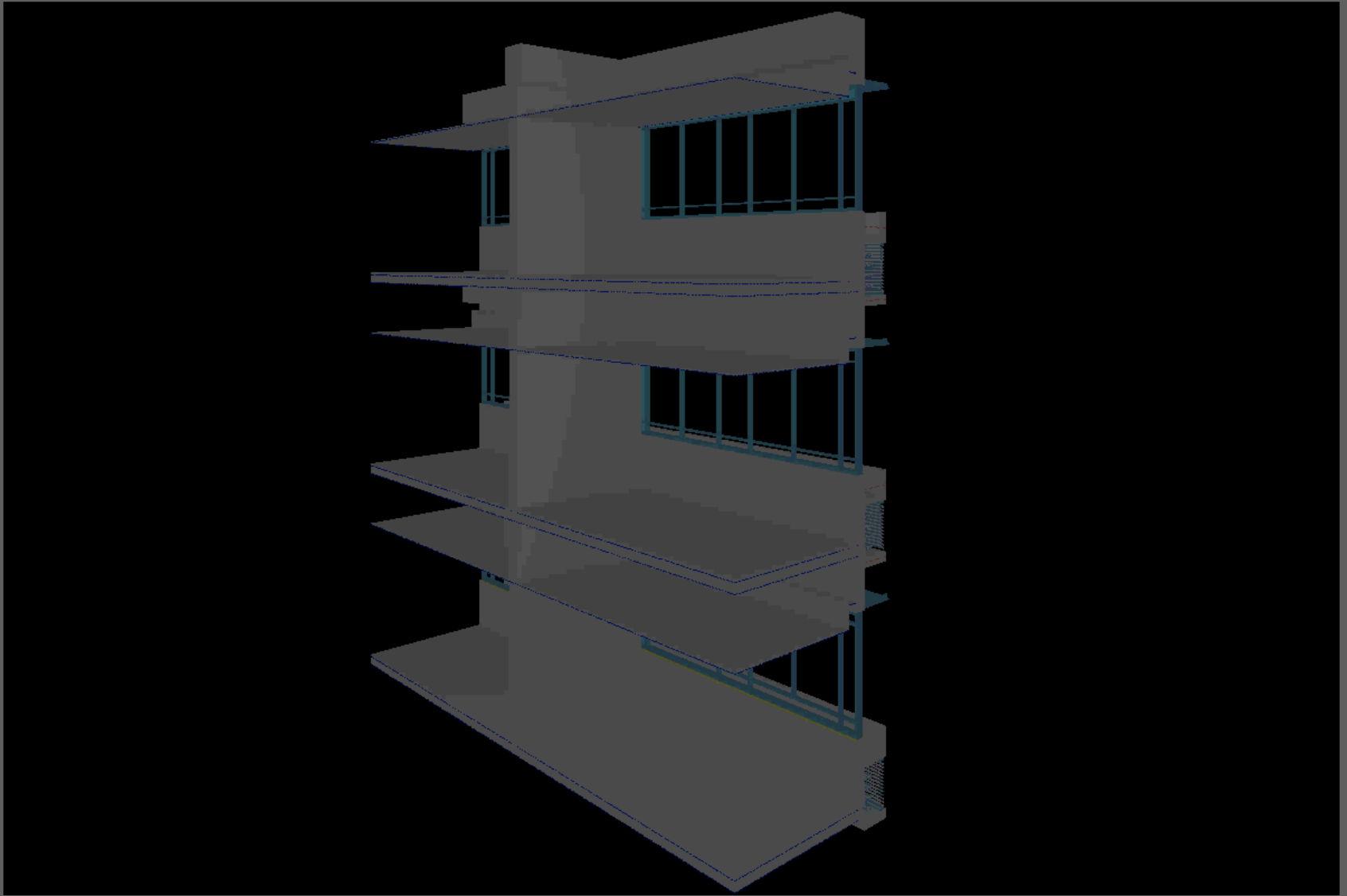


Unsatisfactory sightlines



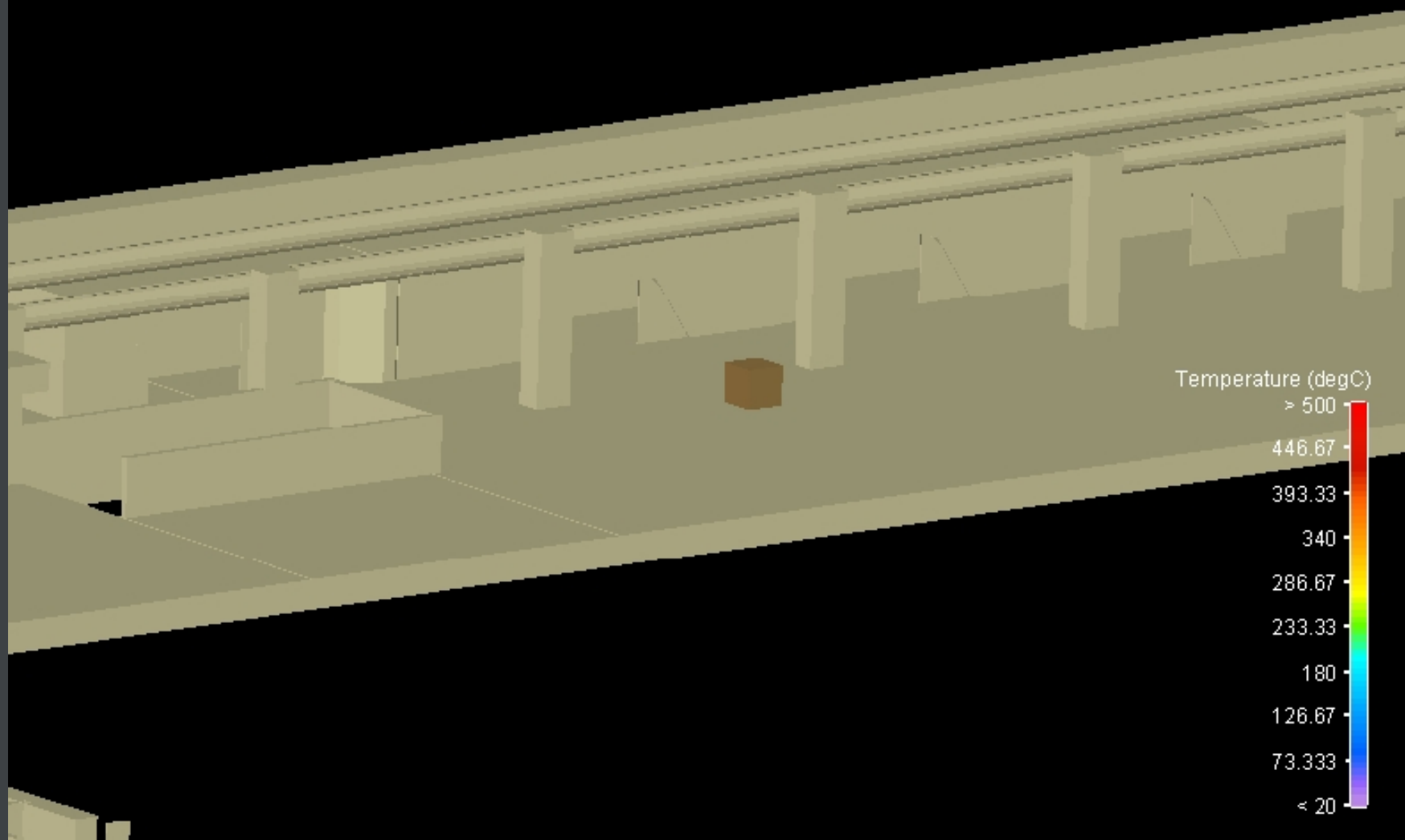
Satisfactory sightlines



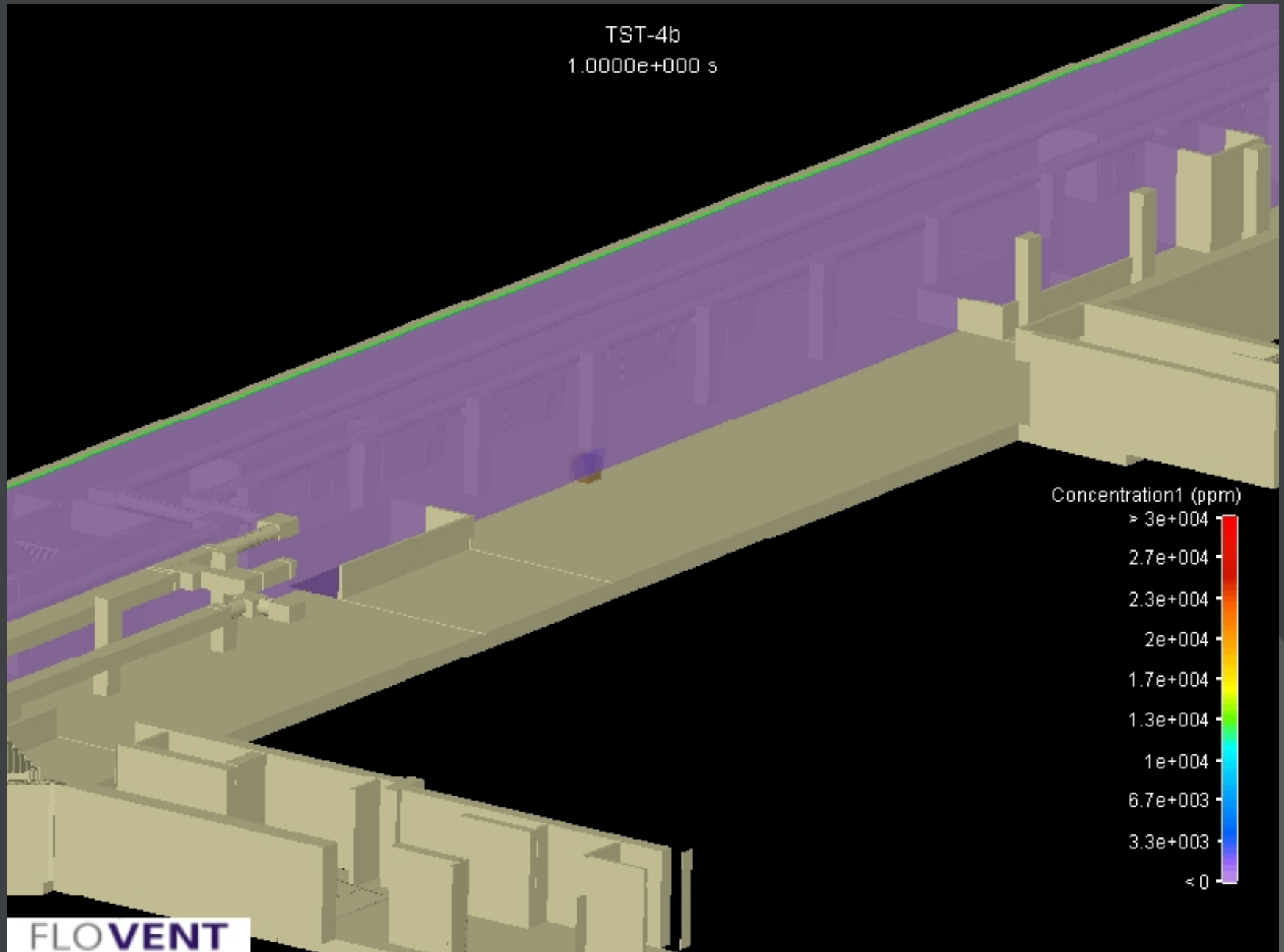


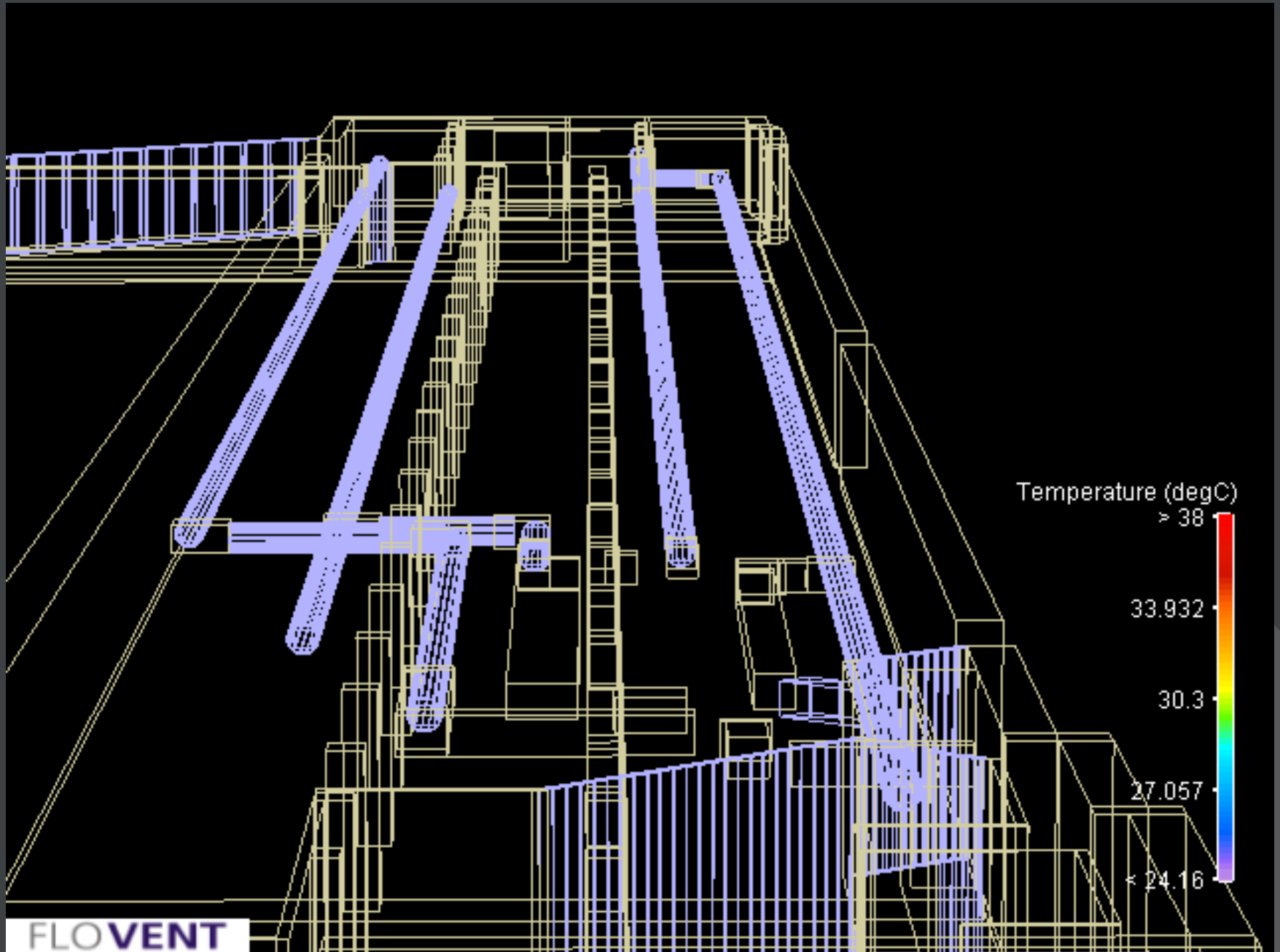
FAÇADE SOLAR STUDY
21/12/2006 7:00am – 6:00pm

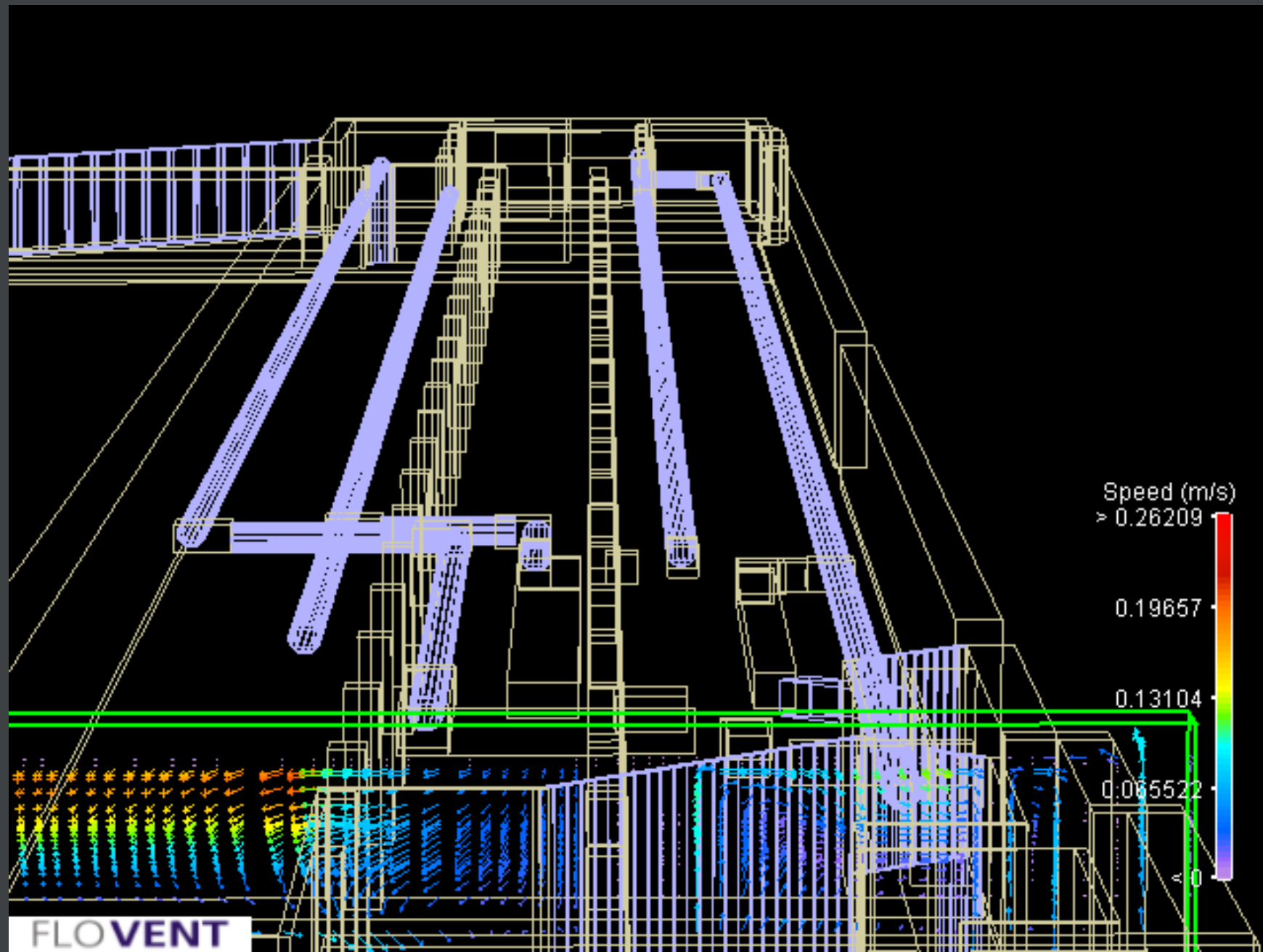
TST-4c
1.0000e+000 s



TST-4b
1.0000e+000 s





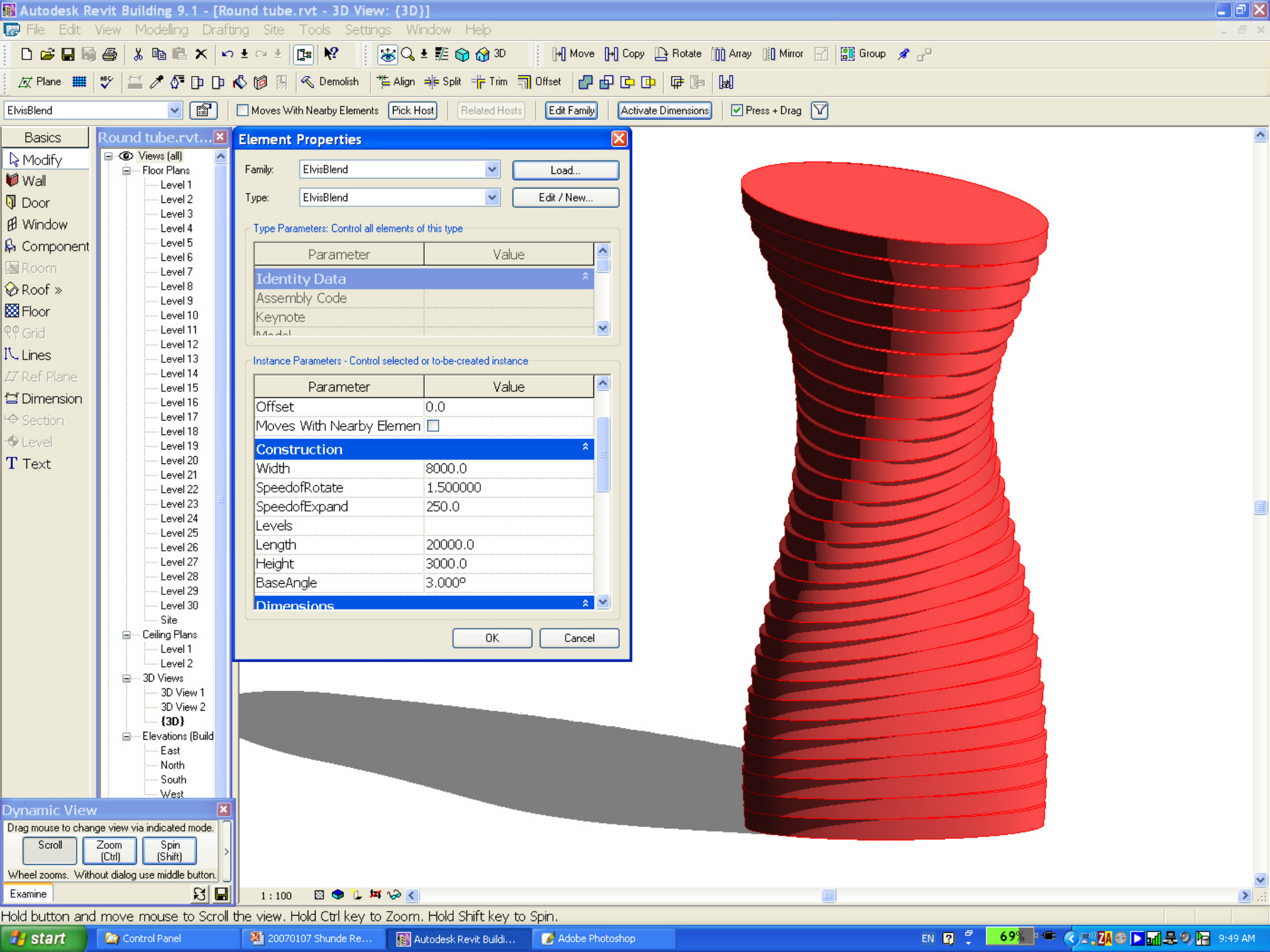


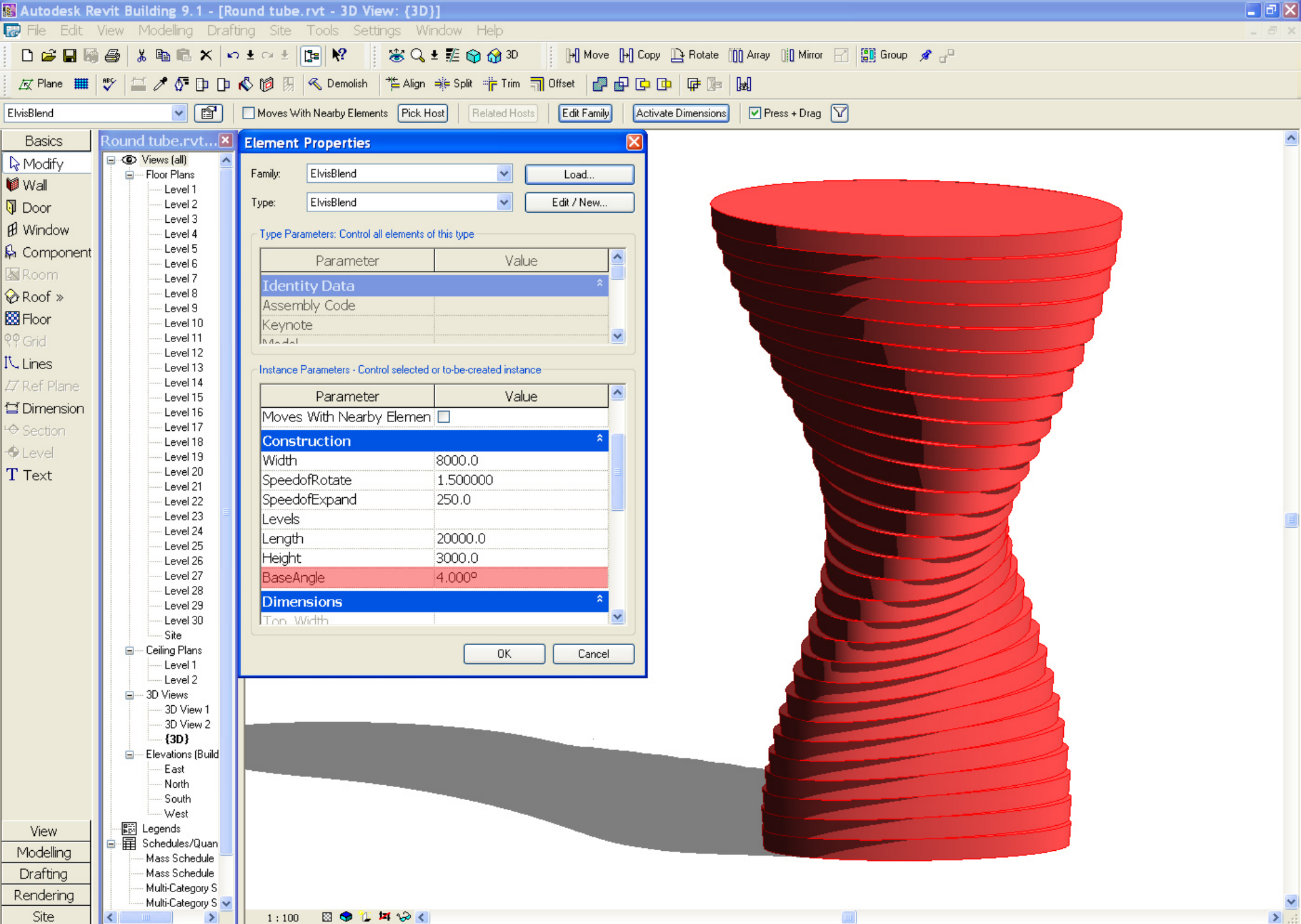
1. Design visualization
2. Drawing Productions
3. Services Co-ordination and Clash detection with other disciplines
4. Quantity taking and preparation of Tender Document
5. Automated Statutory Submission
6. Scientific analysis of different environmental aspects
- 7. Supply Chain Integration with the manufacturing and production**
サプライヤとの連携
8. Complex Geometry

Use of Building Information Modeling (BIM)

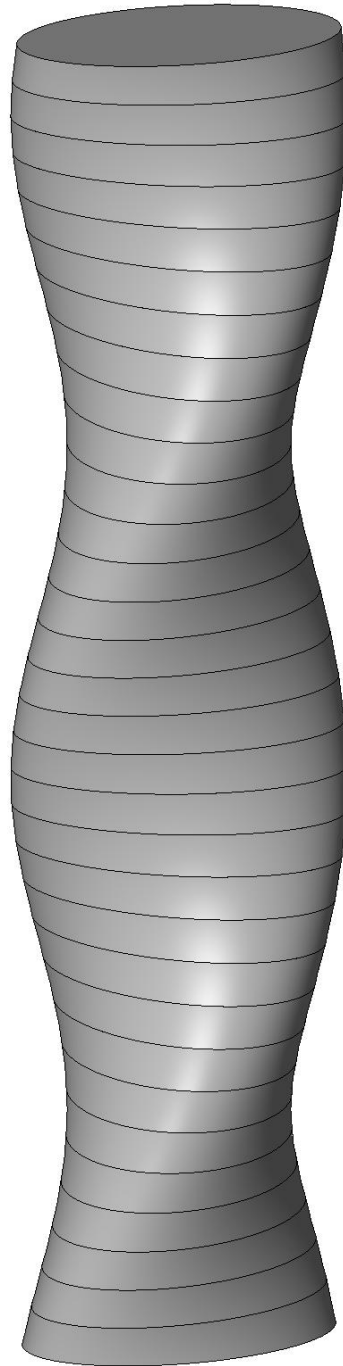
Aedas

1. Design visualization
2. Drawing Productions
3. Services Co-ordination and Clash detection with other disciplines
4. Quantity taking and preparation of Tender Document
5. Automated Statutory Submission
6. Scientific analysis of different environmental aspects
7. Supply Chain Integration with the manufacturing and production
8. **Complex Geometry** 複雑な形状を実現可能





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





absolute world BUILDING 2

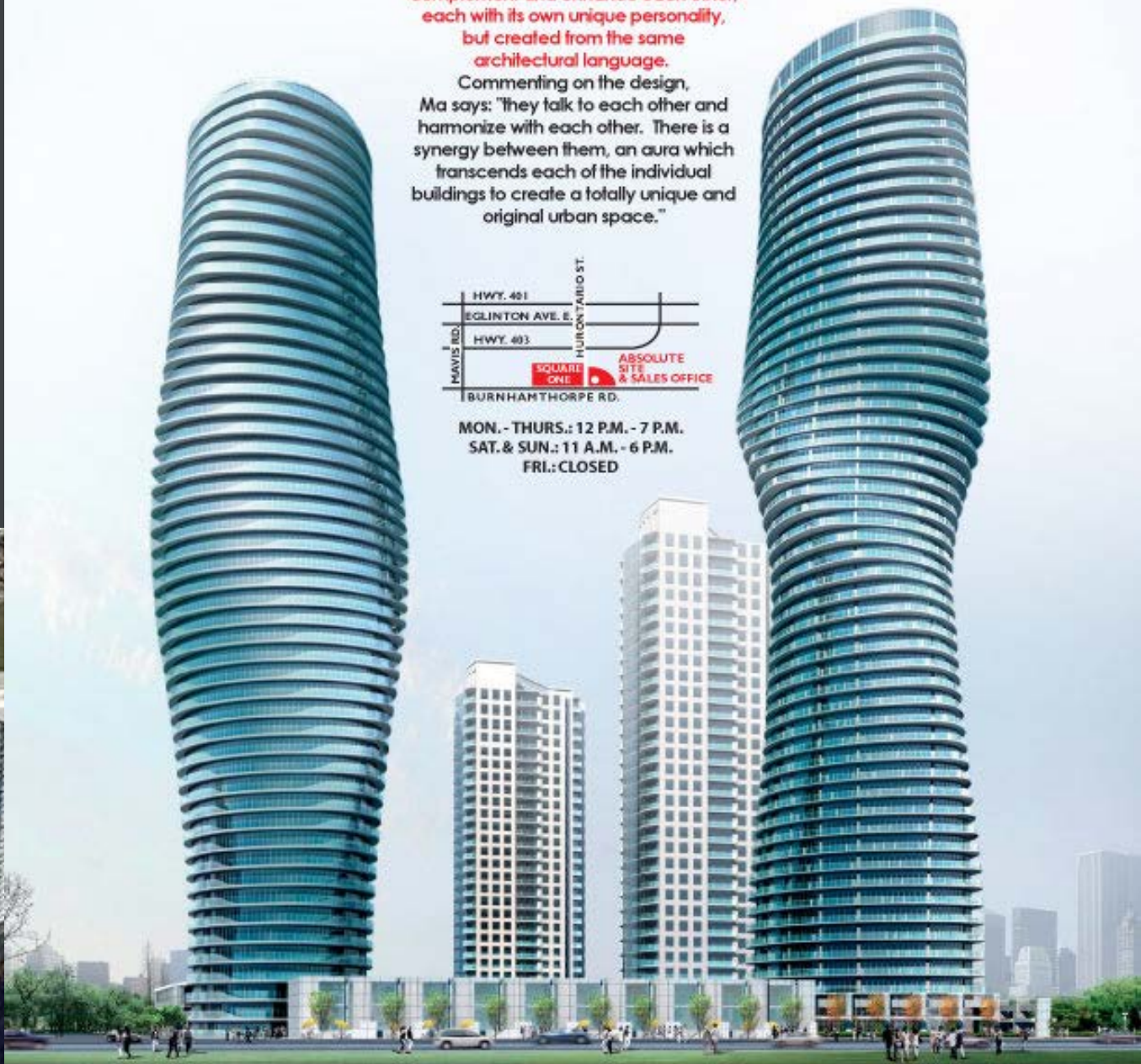
AbsoluteWorld's two buildings, as envisioned by their creator, Yansong Ma. The buildings were designed to complement and enhance each other, each with its own unique personality, but created from the same architectural language.

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."

absolute world BUILDING 1



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

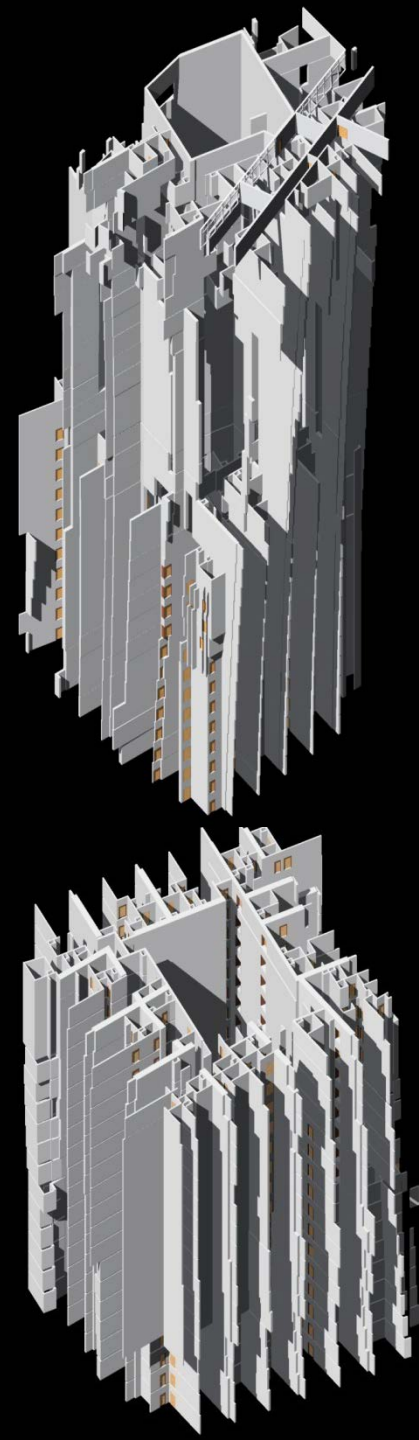




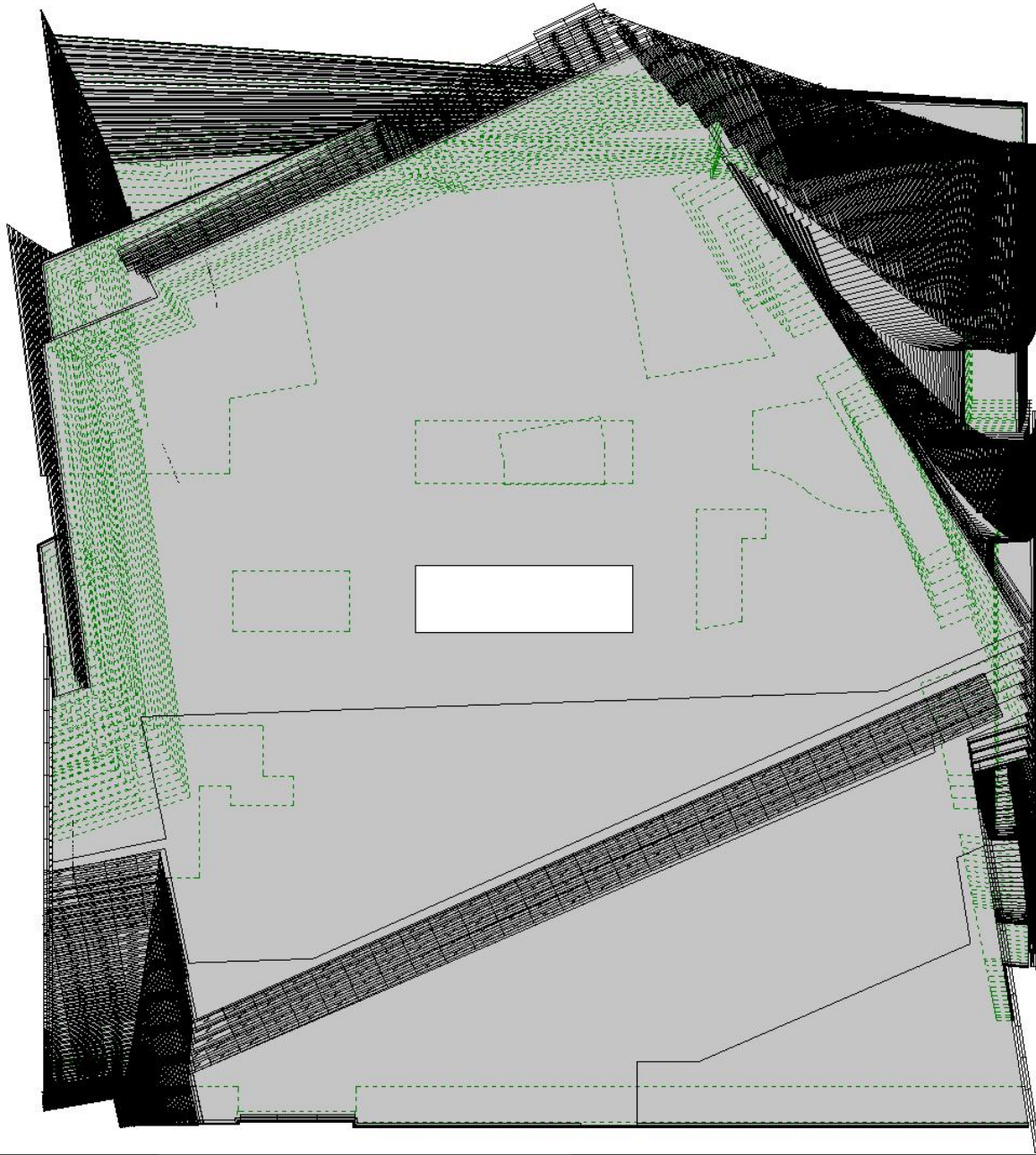
Program: Residential, Site Area: 3,746 sqm
Floor Area: 659,659 sqm | Building Height: 345 m

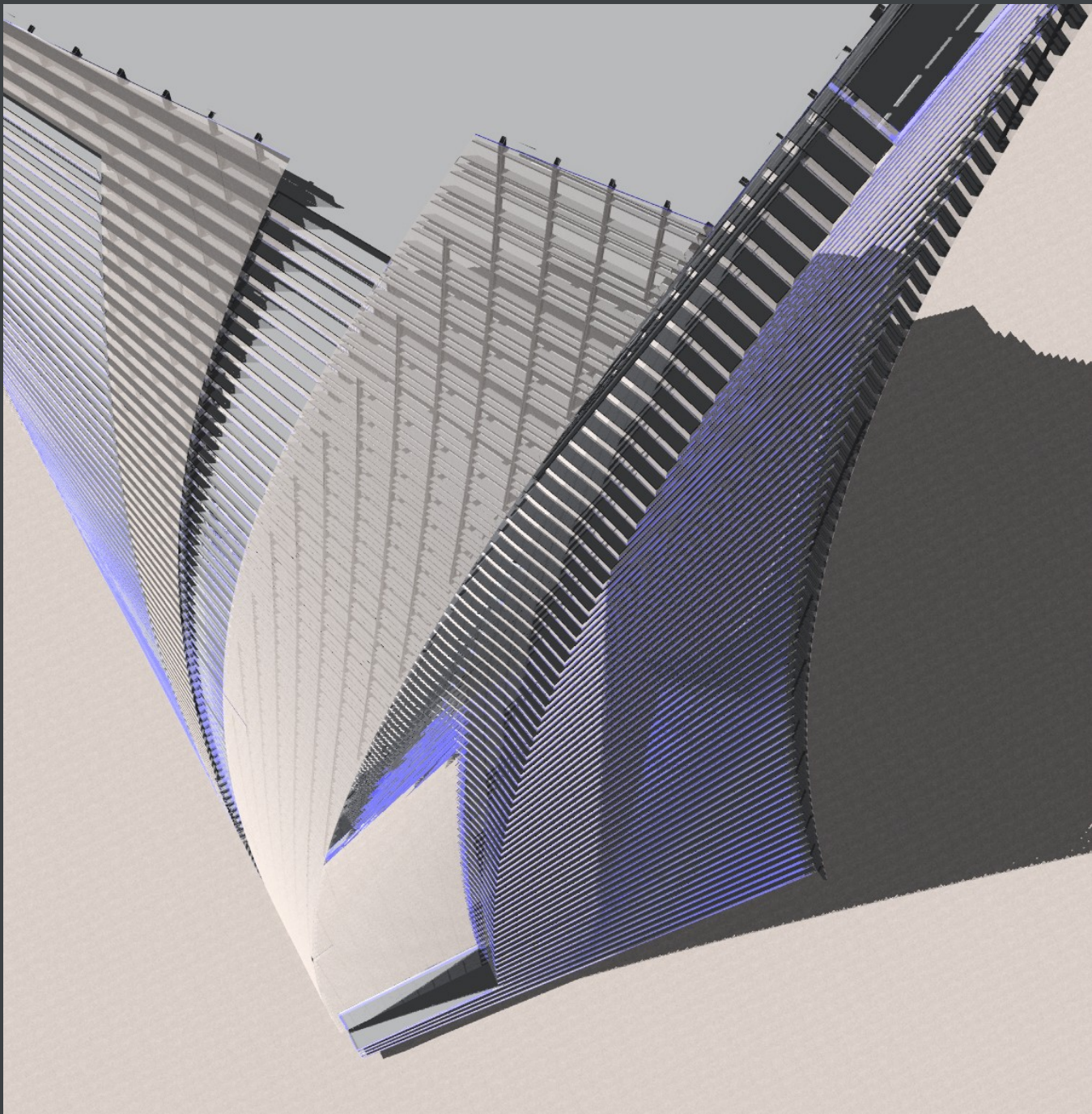


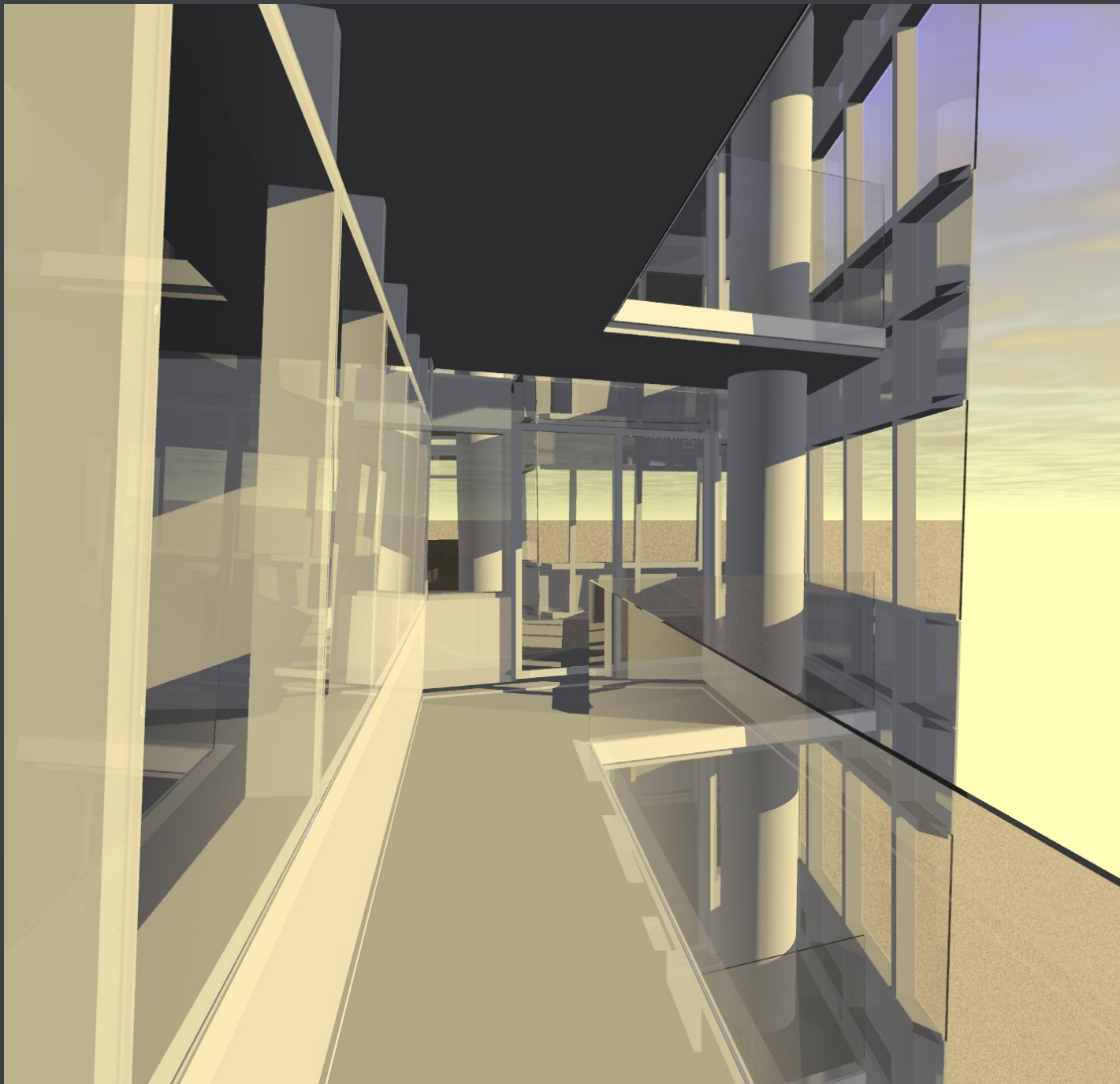
Dubai **Ocean Heights One**

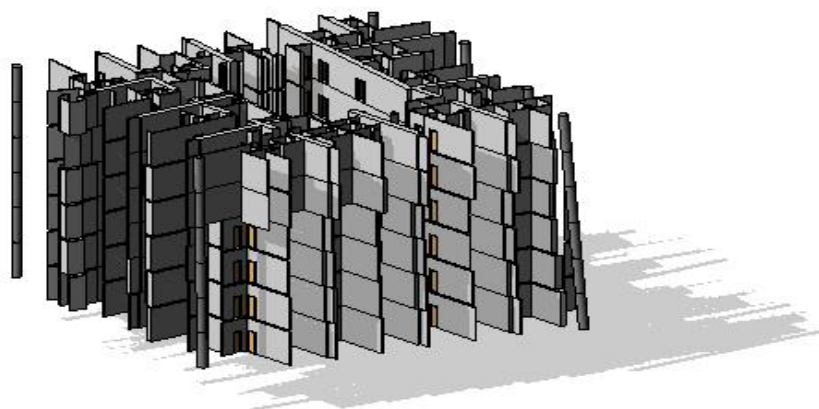


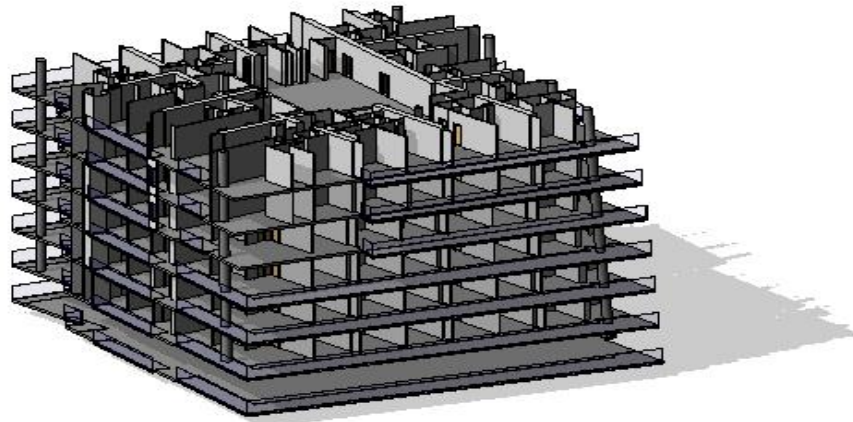
COMPLEX GEOMETRY









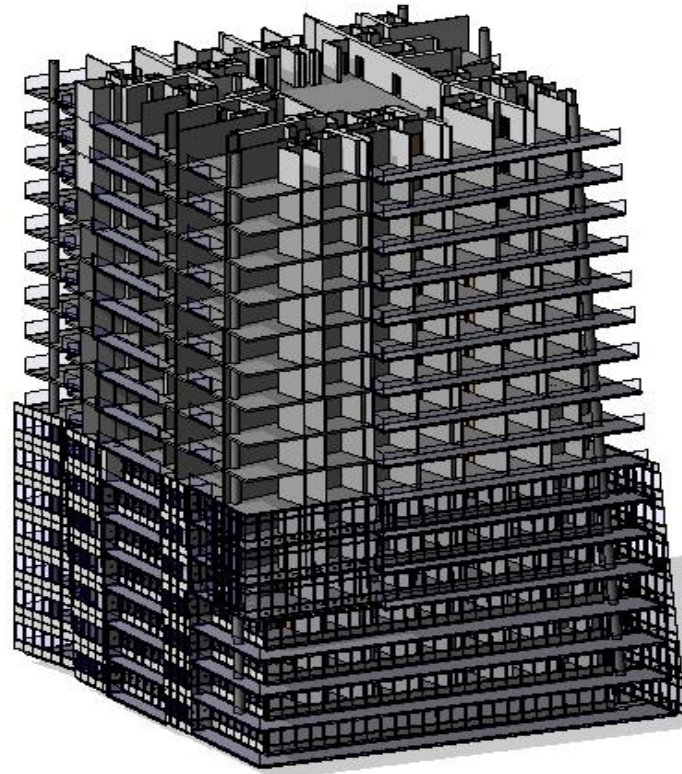


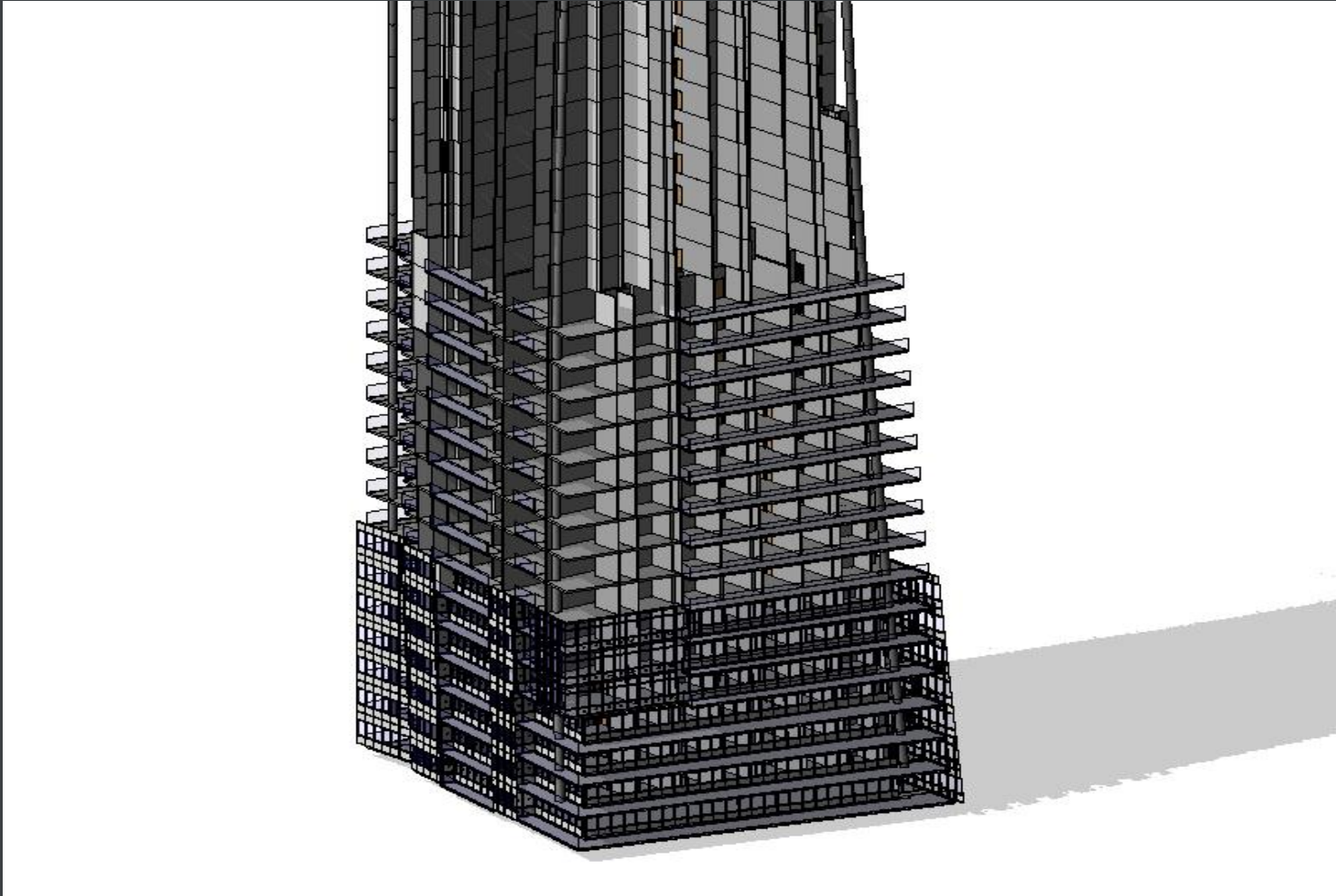








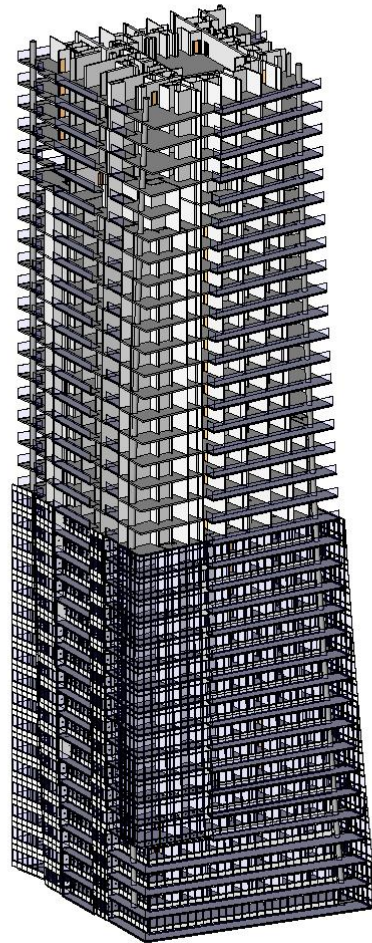


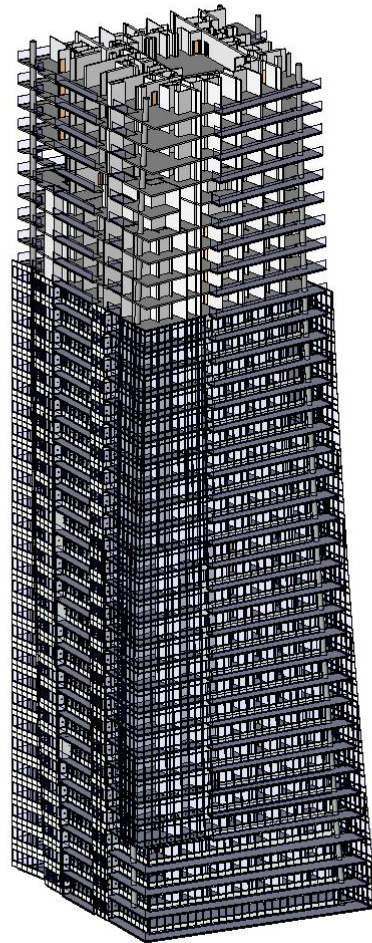


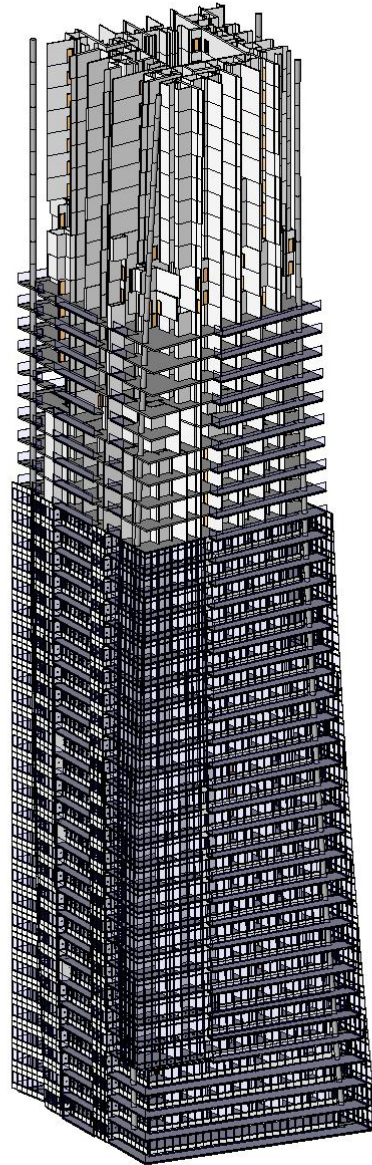


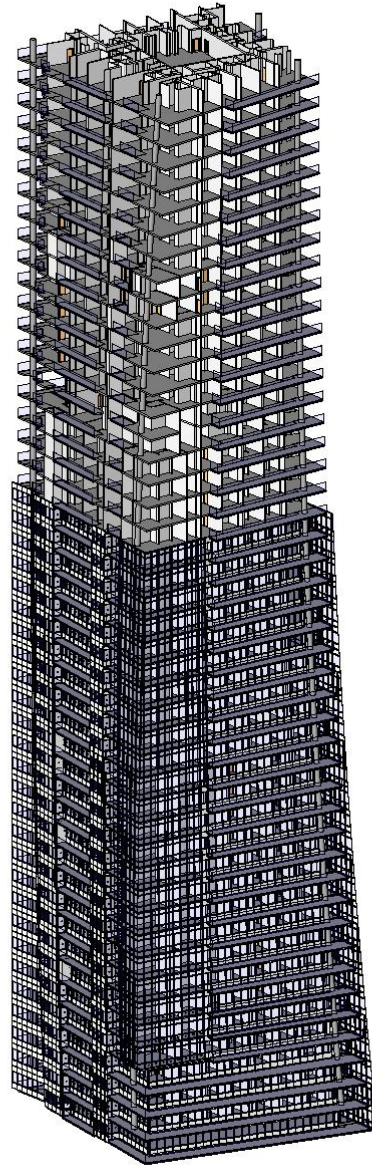


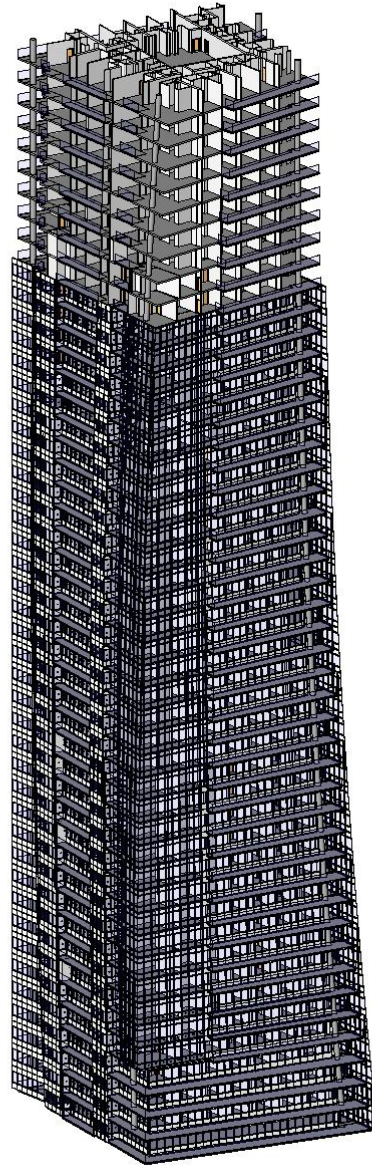


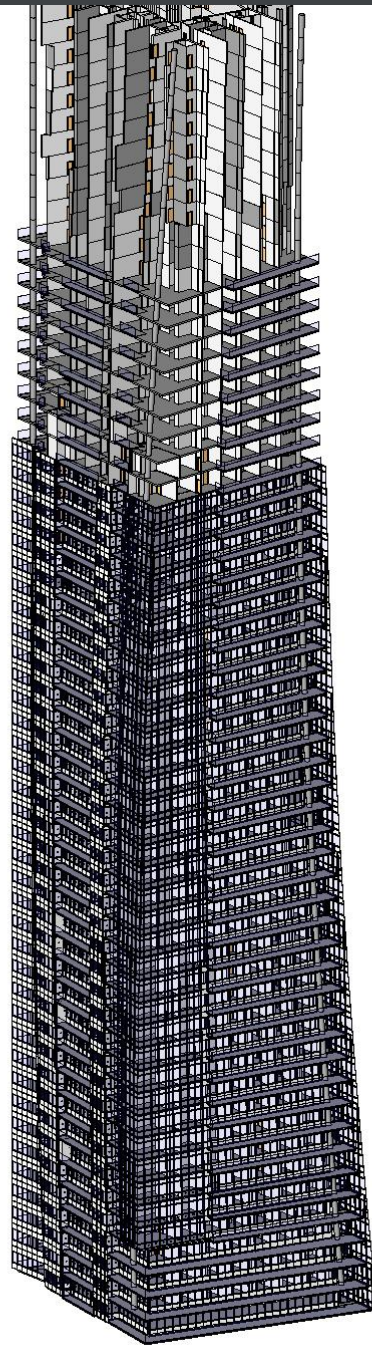


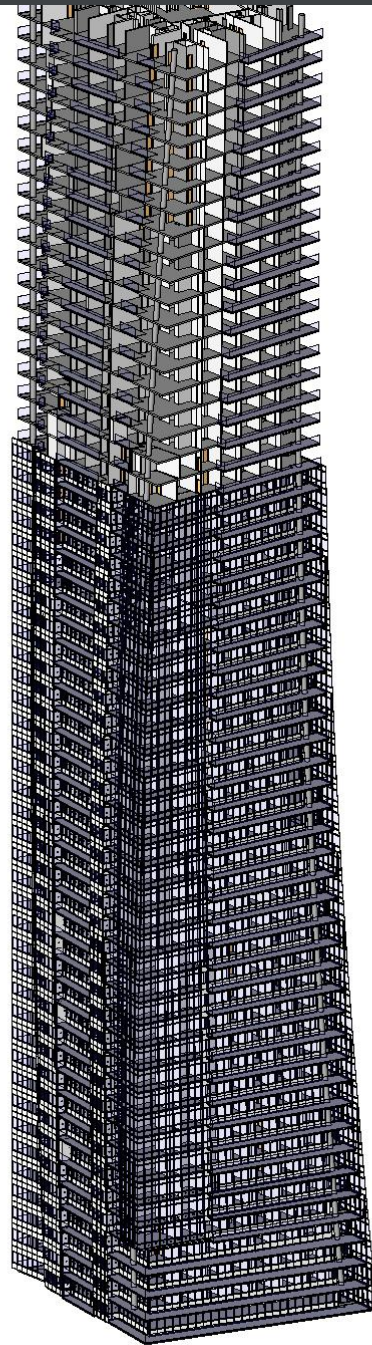


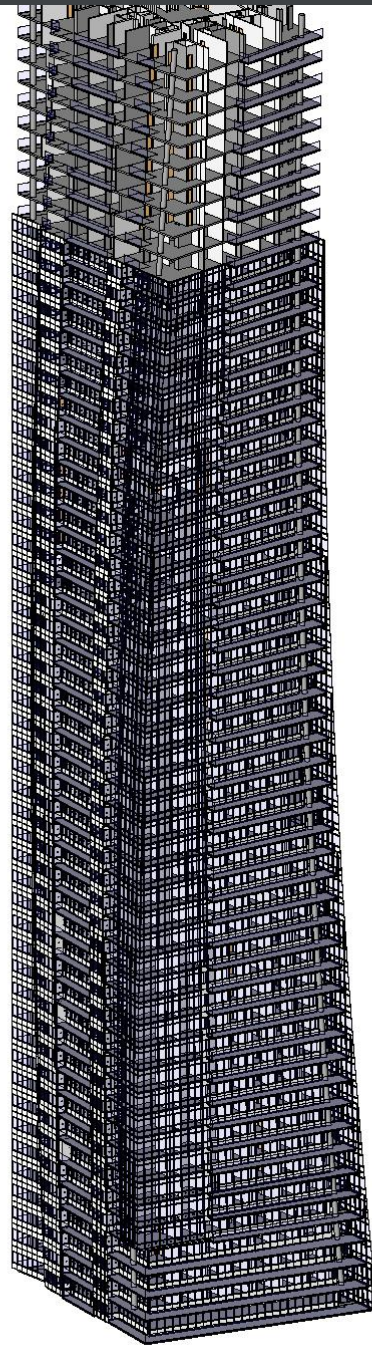










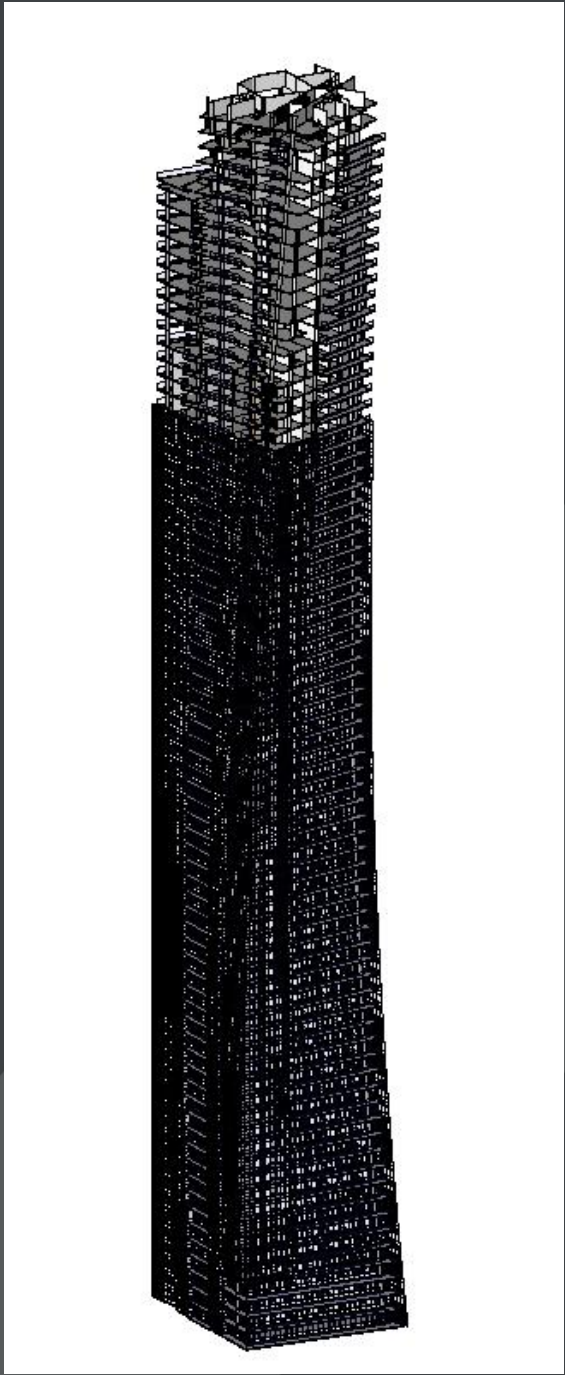






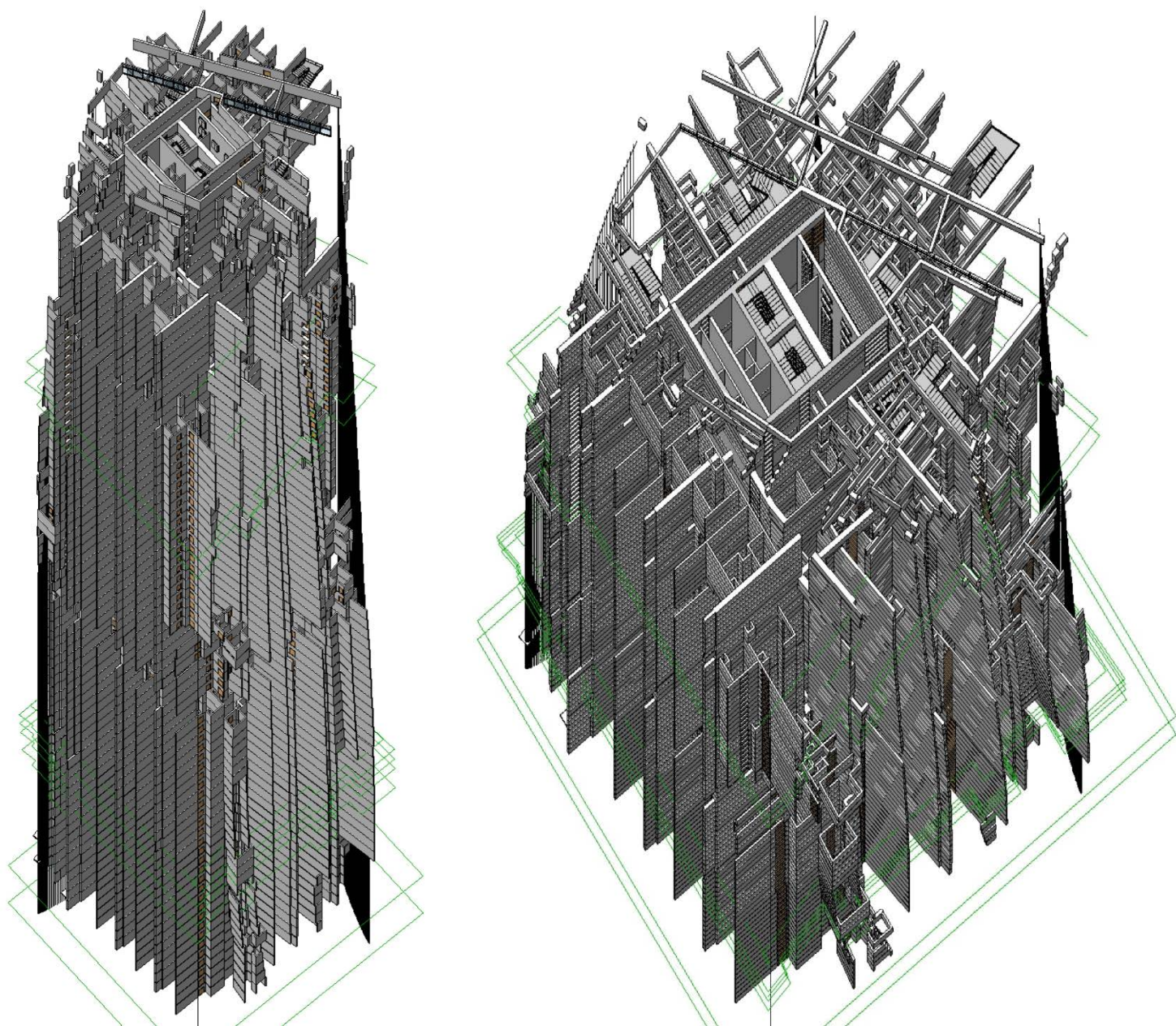




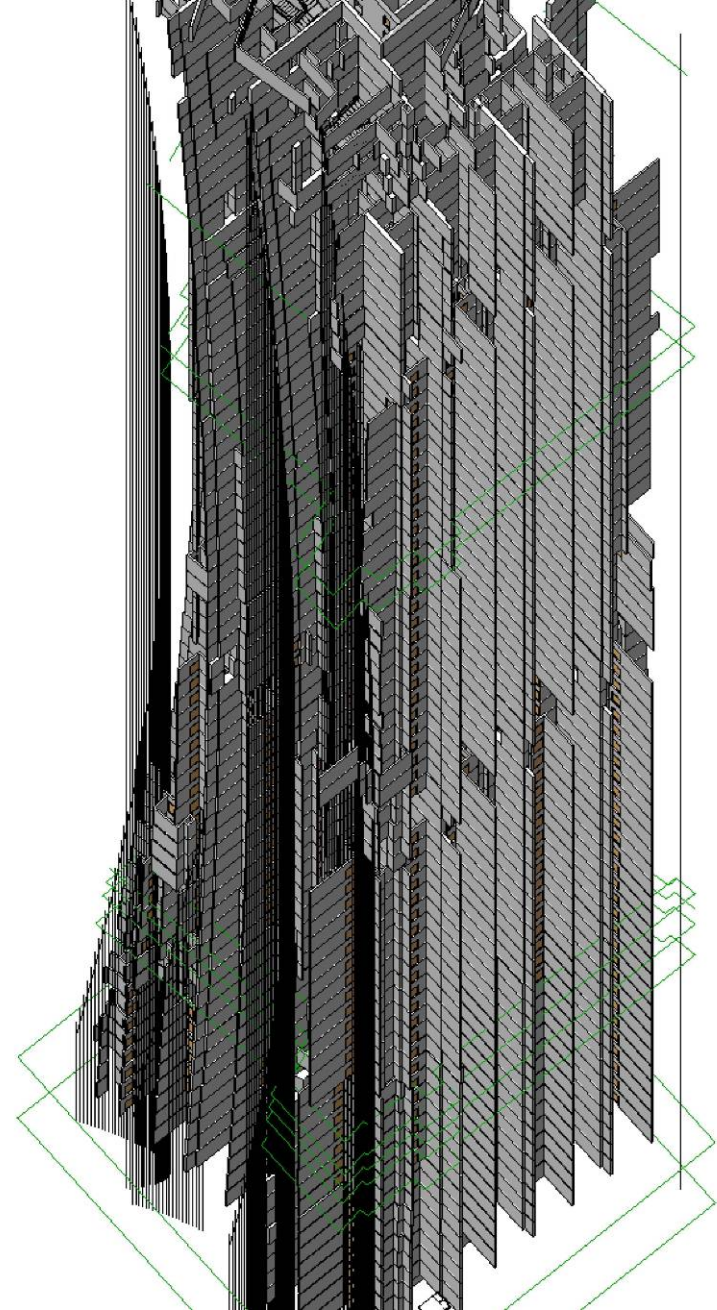
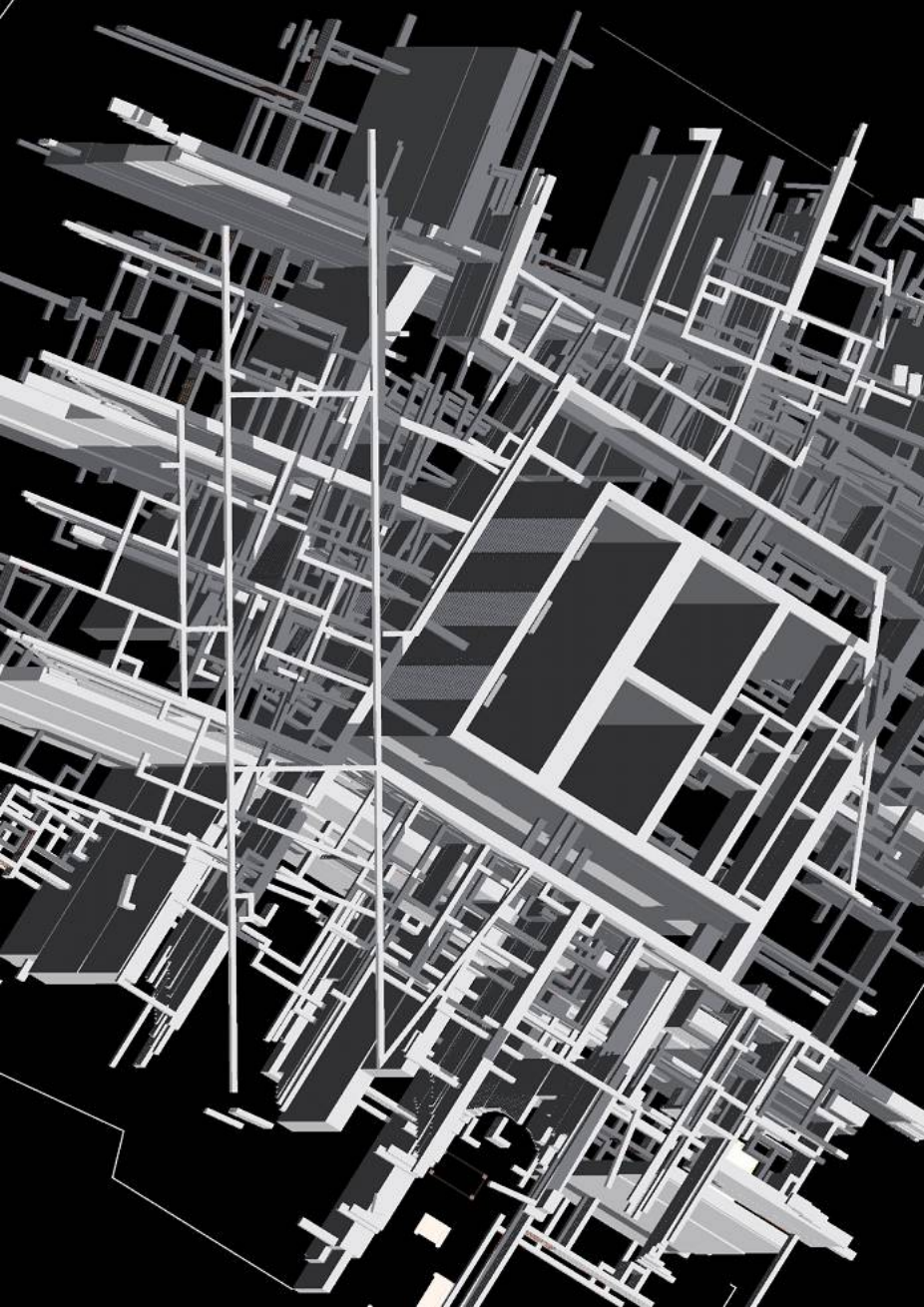




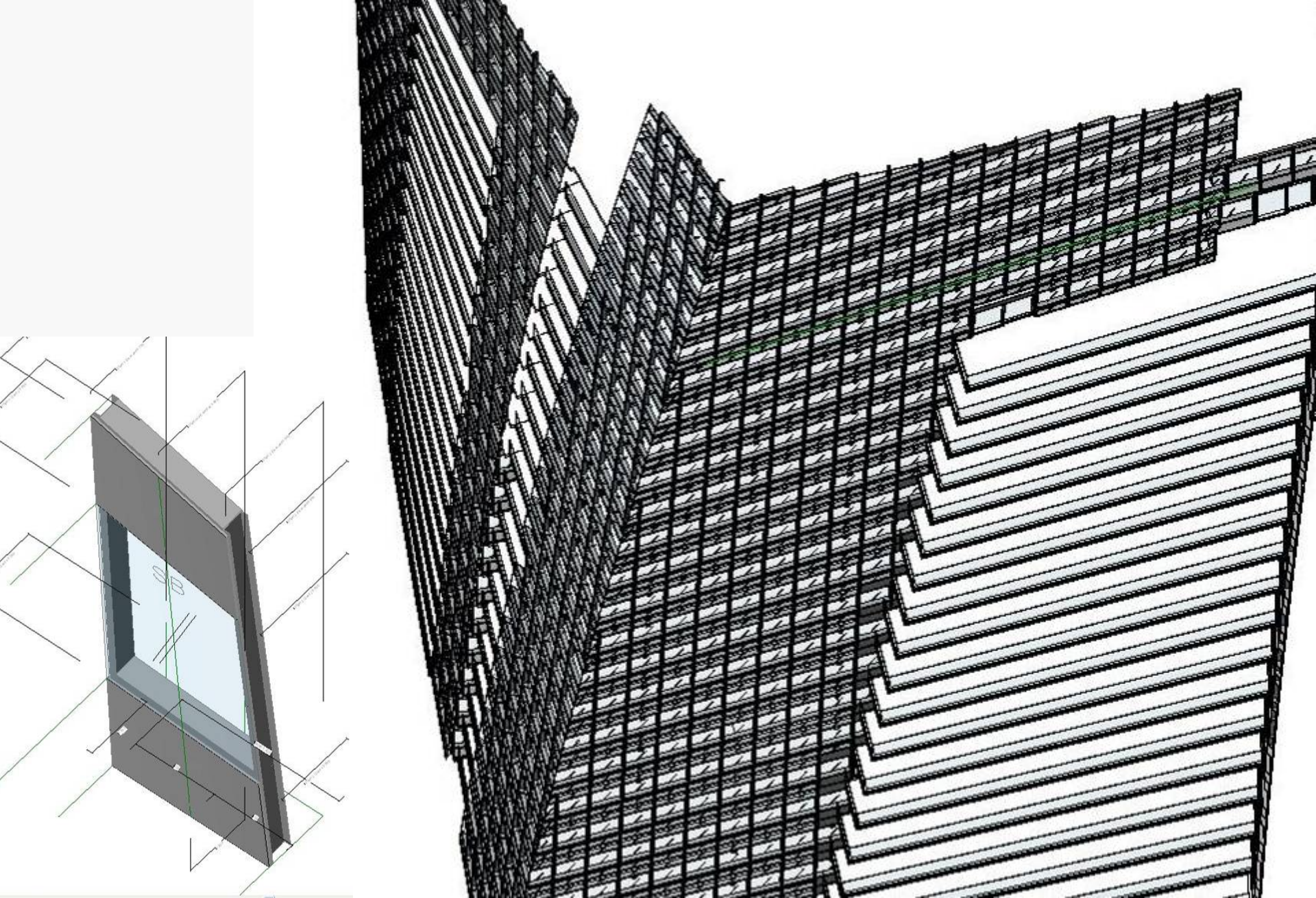




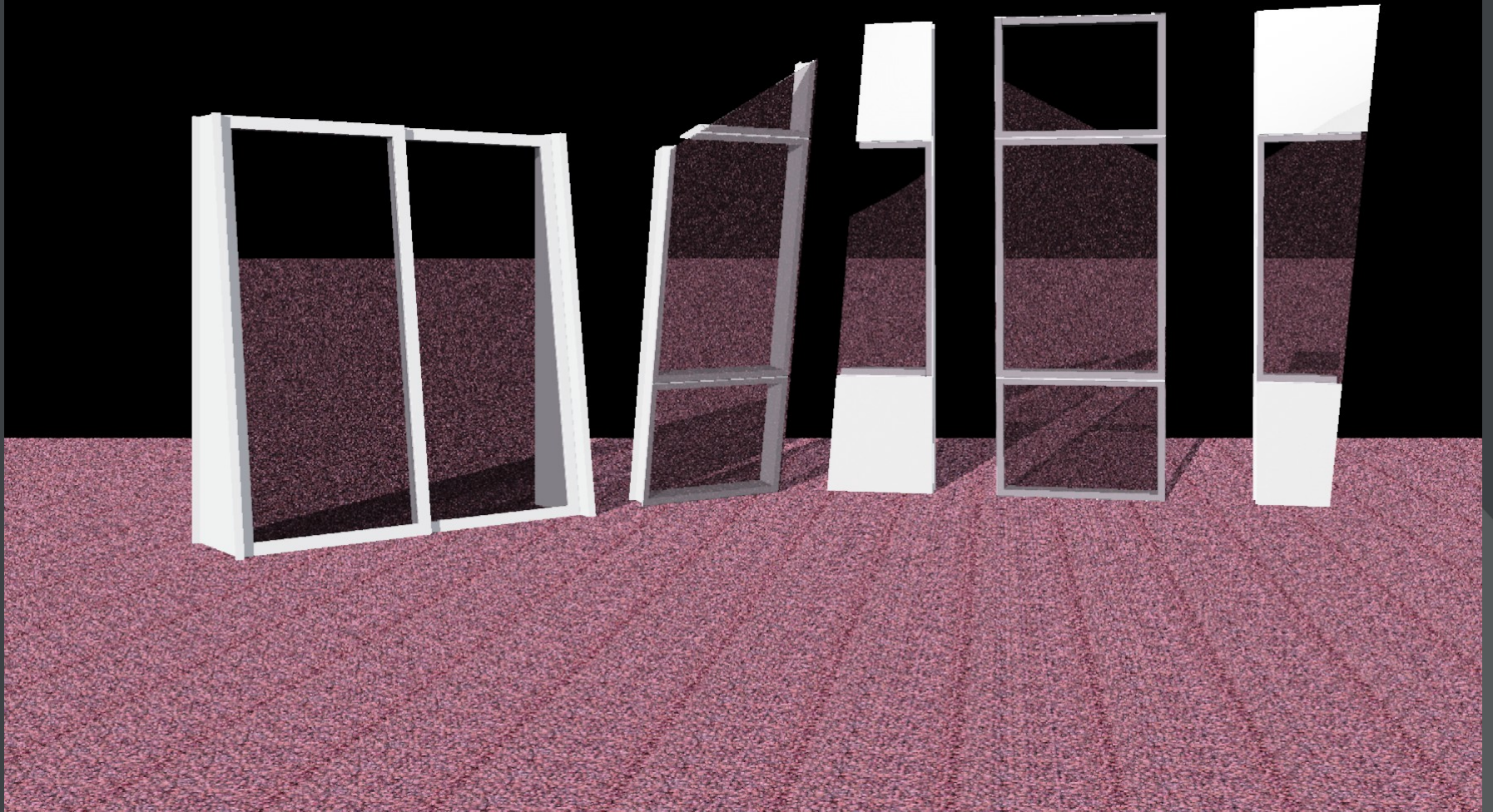
VERTICAL CO-ORDINATION



INTERNAL vs EXTERNAL



COMPLICATED CURTAIN WALL



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

FileEditViewModellingDraftingSiteToolsSettingsWindowHelp

PlaneABC

Demolish

AlignSplitTrimOffset

MoveCopyRotateArrayMirrorGroup

Not Editable Level 31 to

Headers: GroupUngroupRows: NewDeleteShow

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

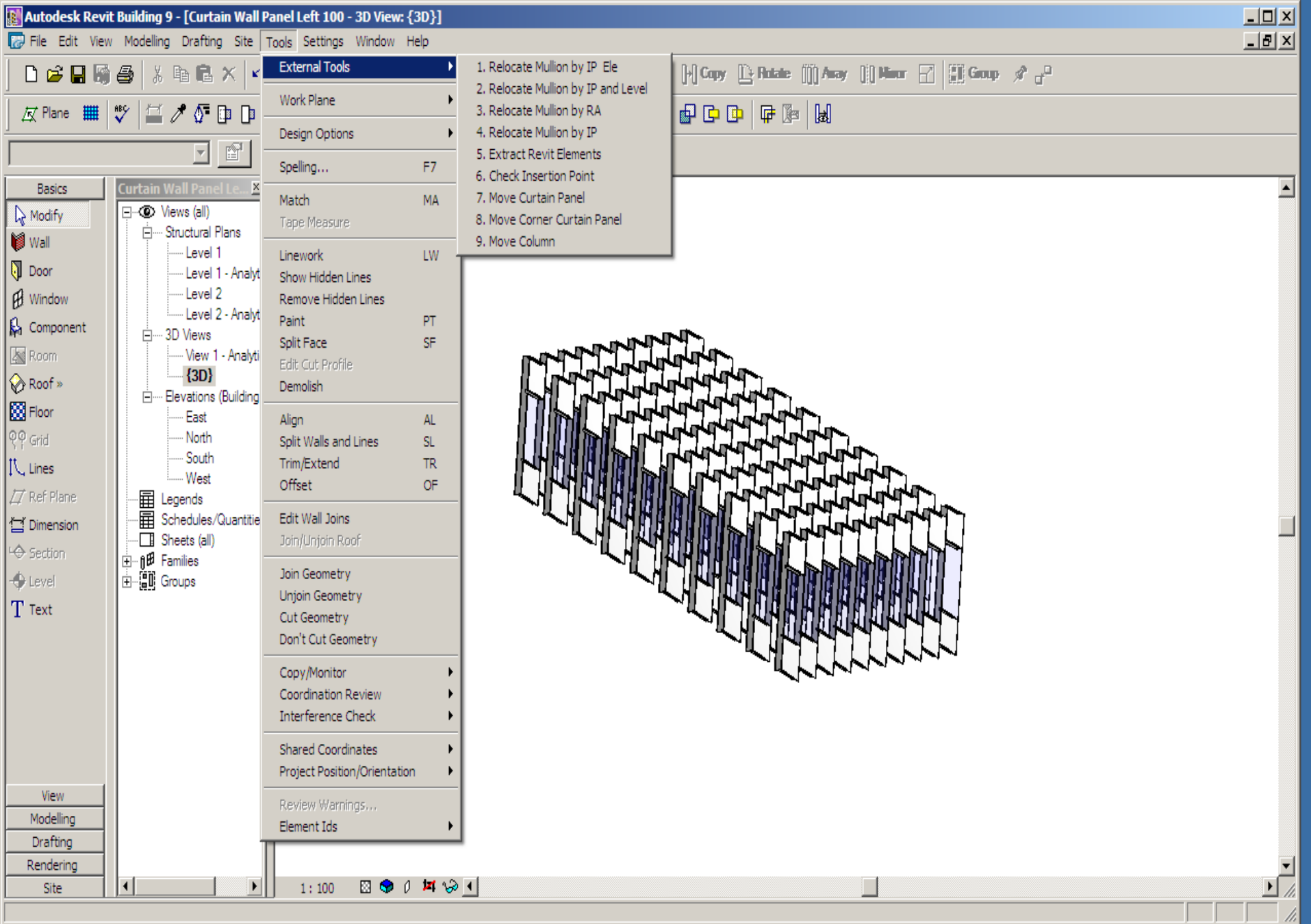
Construction

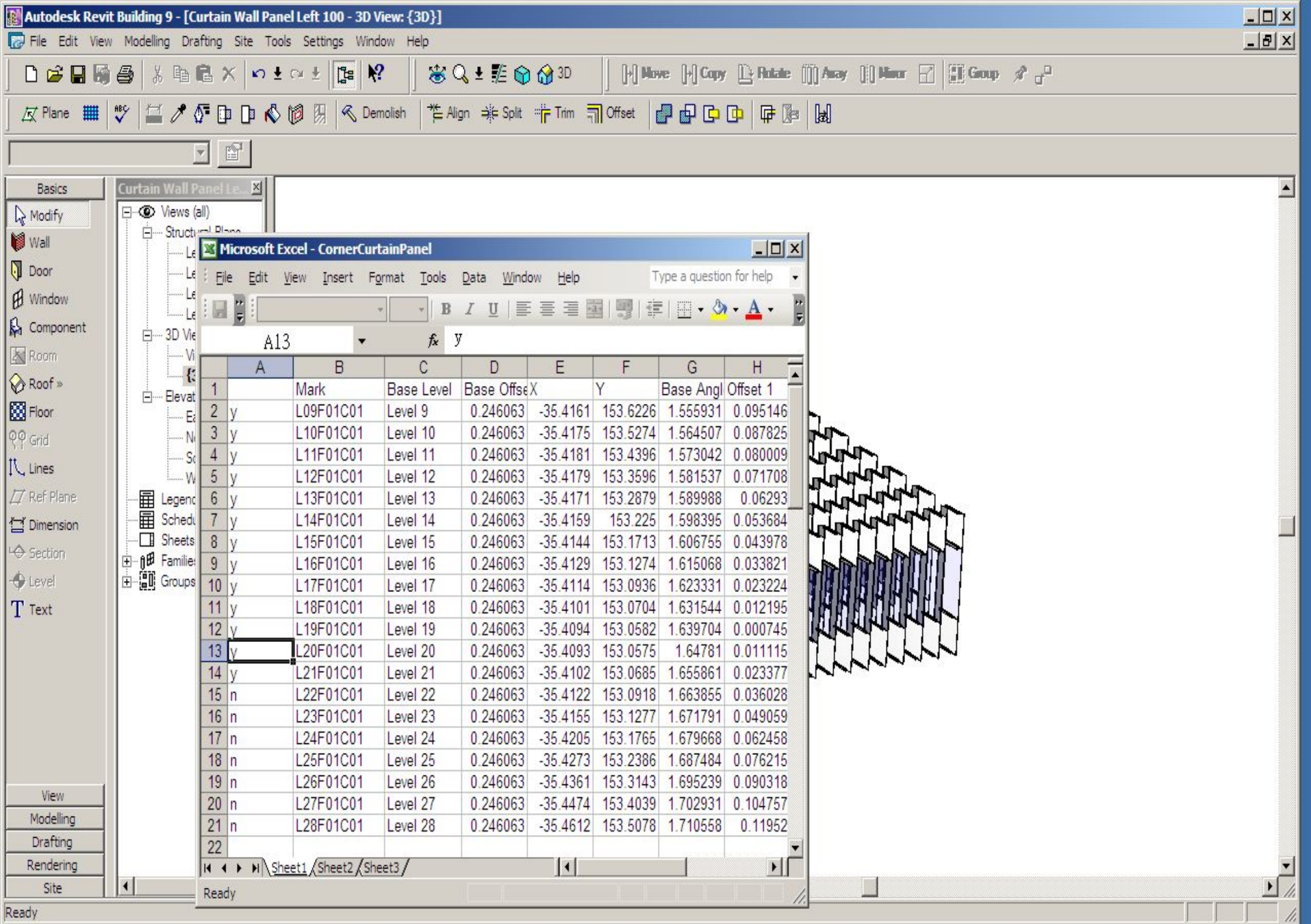
Multi-Category Schedule

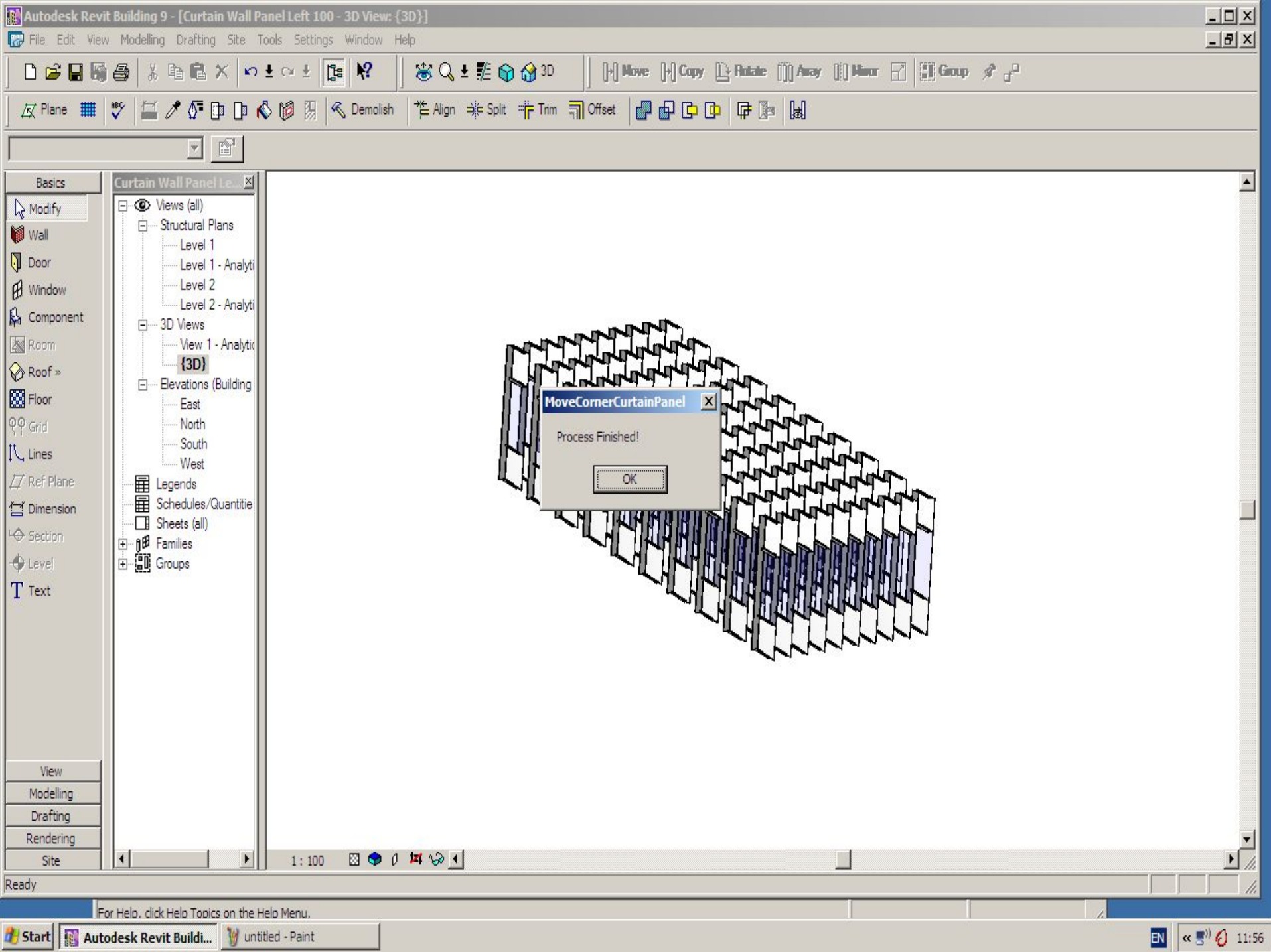
Family	Mark	Level	Width	Width Left	Width Right	Offset 1	Offset 2
Curtain Wall Panel 2	L08F01N01	Level 8	1255.67			-31.08	-41.89
Curtain Wall Panel 2	L08F01N02	Level 8	1255.67			-41.89	-52.71
Curtain Wall Panel 2	L08F01N03	Level 8	1255.67			-52.71	-63.53
Curtain Wall Panel 2	L08F01N04	Level 8	1255.67			-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

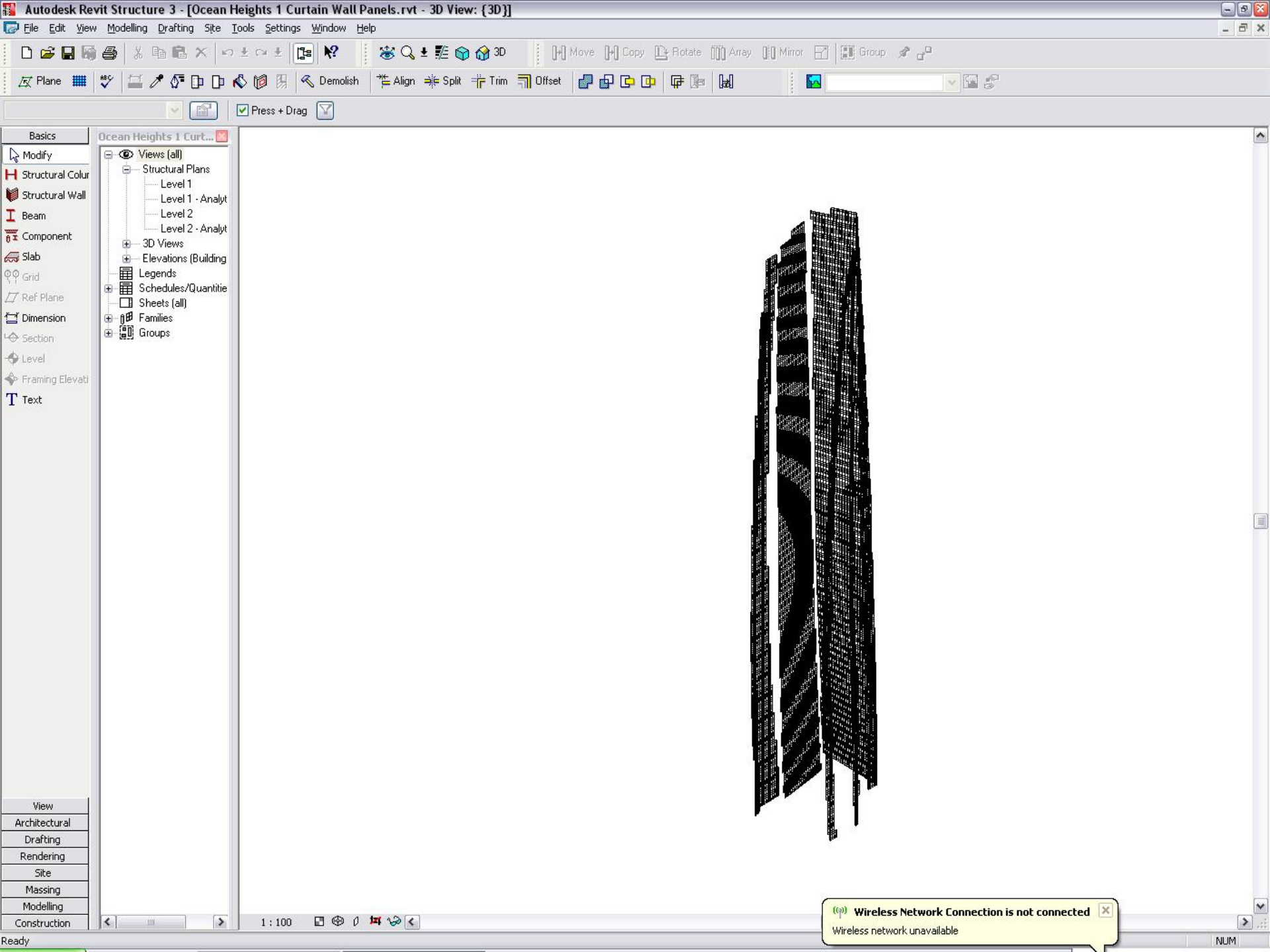
Ready

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 Symb	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					











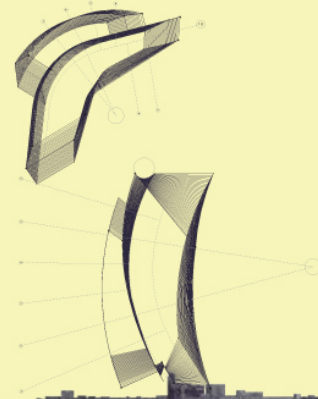
Abu Dhabi Dancing Towers

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.

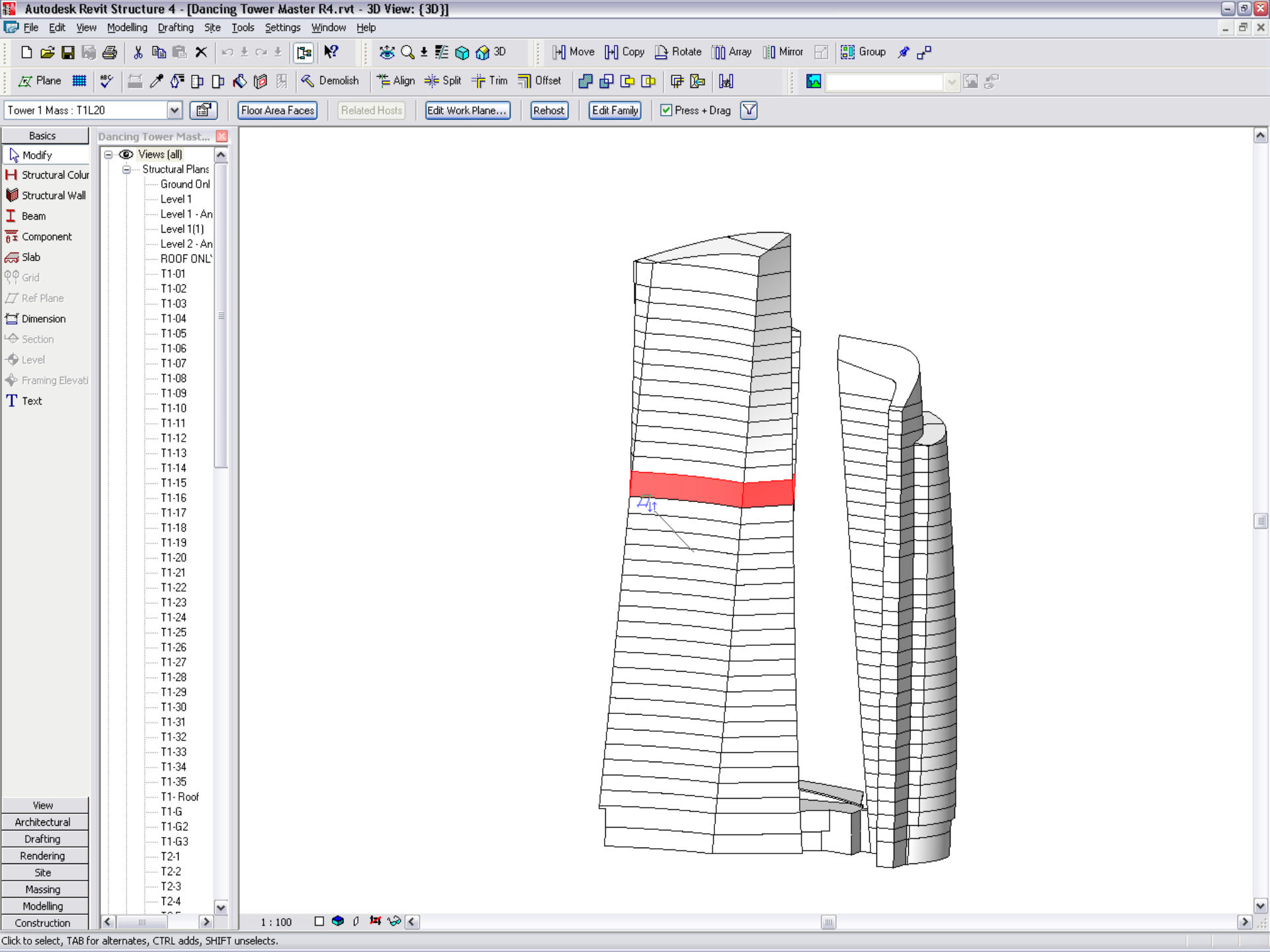
However, the two towers quickly lean, rotate, bend and warp to respond to each other, the adjacent sites and ultimately the view to the ocean at their horizon. These two figures fluidly respond to each other, dynamically engaged and flowing – and ultimately tied together in a passionate dance •

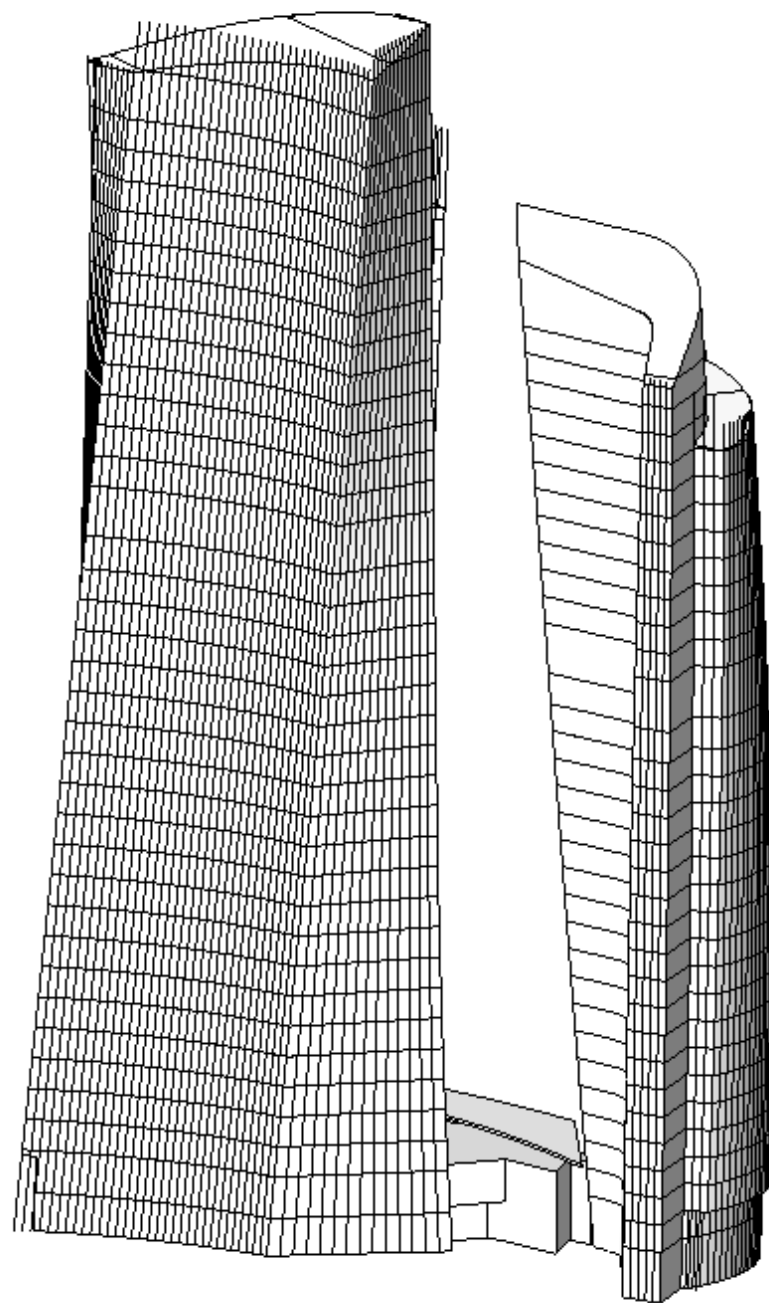


Program Mixed Use Site Area 4,160 sqm
Floor Area 44,235 sqm Building Height 160 m

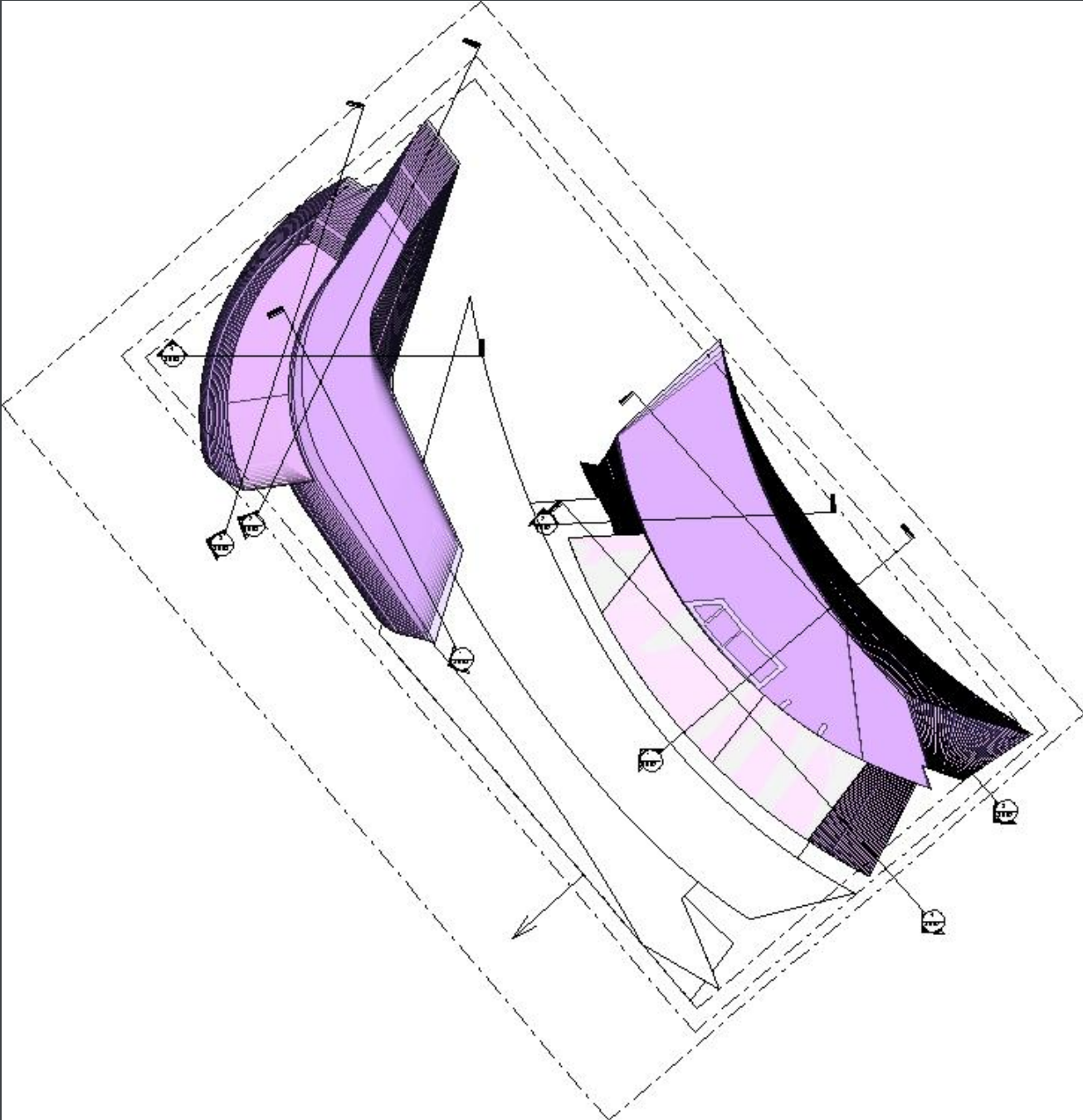


Abu Dhabi **Dancing Towers**



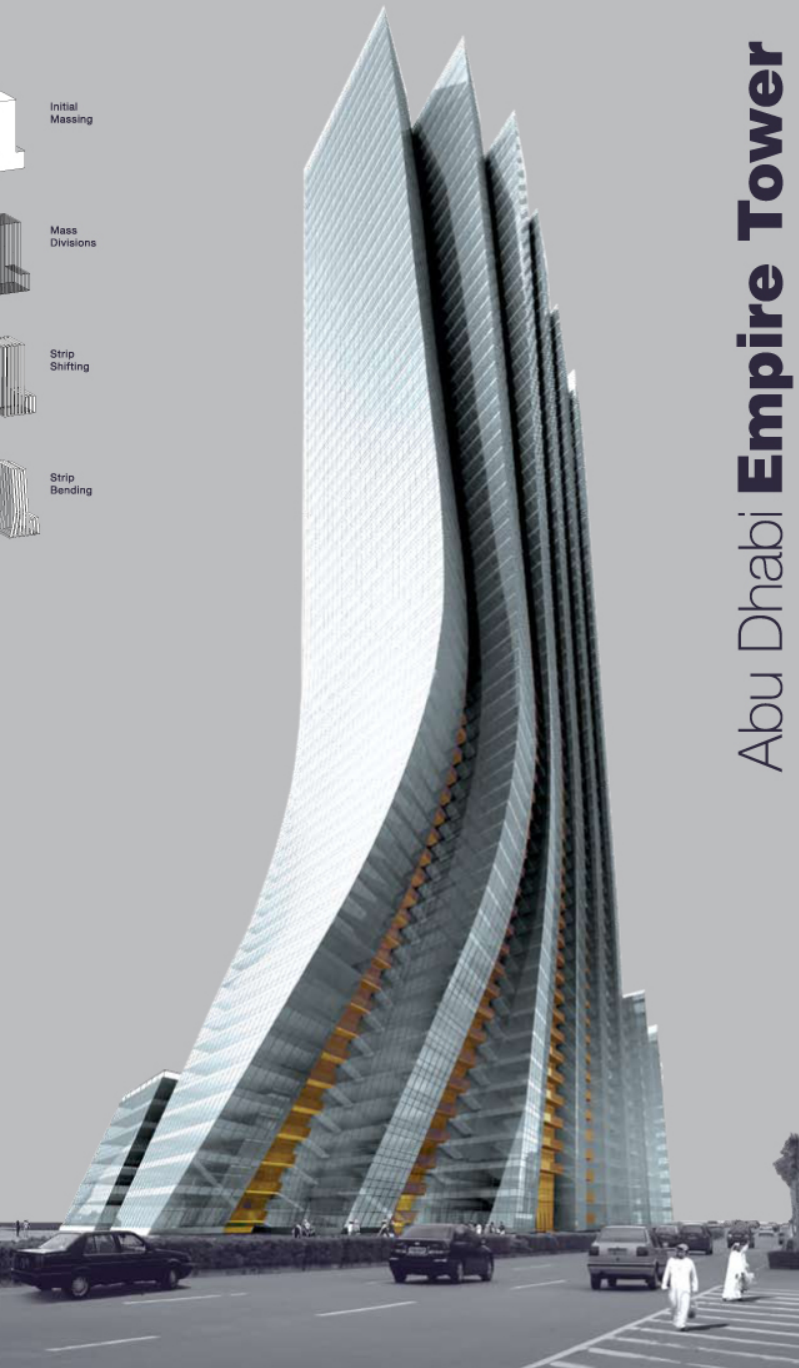
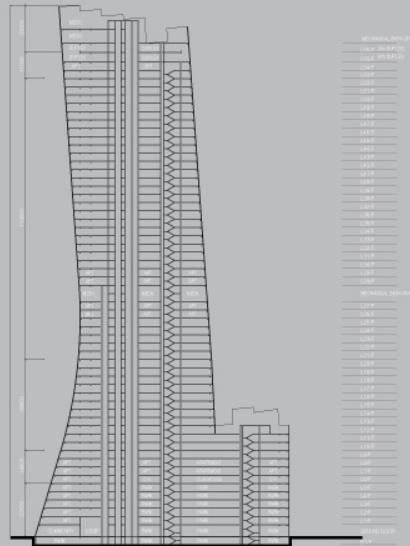






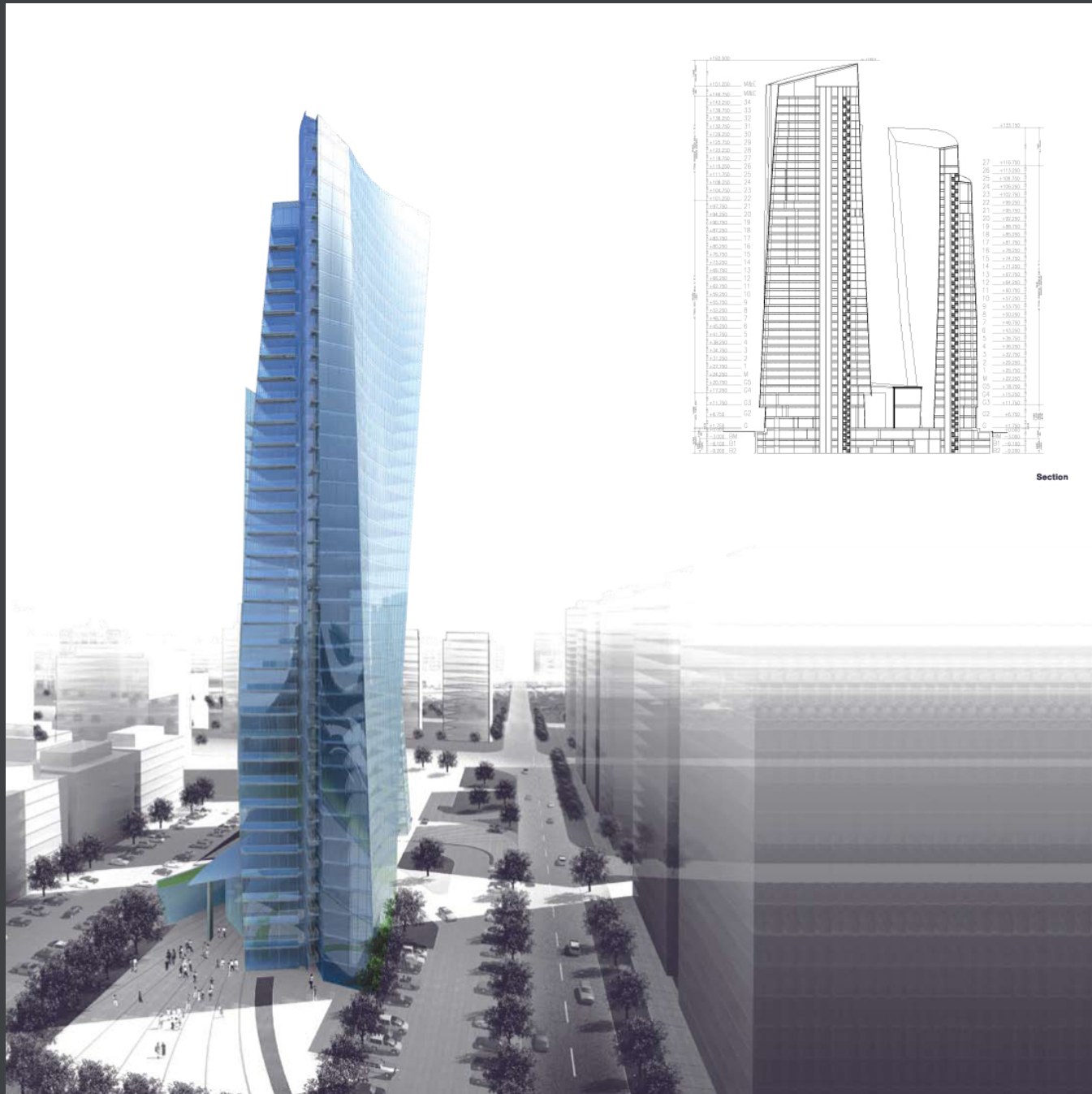


The design maximizes the tower's presence on the street, with vertical layers spreading out to the property lines. The building then bends back away from the street across from a large commercial tower, allowing for an enlarged view corridor between the central park of the community and the sea, one 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

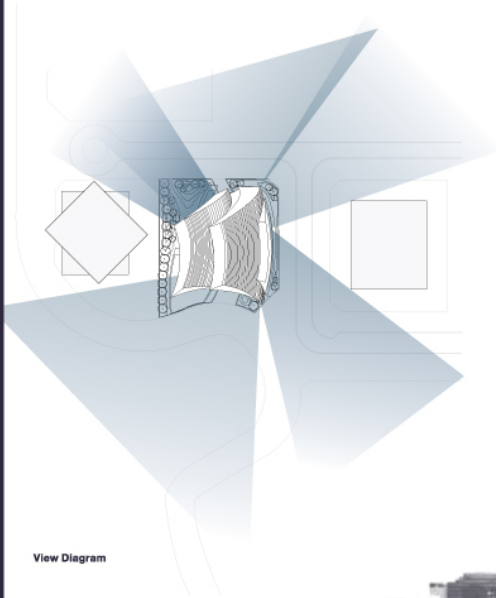




Dubai Ocean Heights Two

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 ■

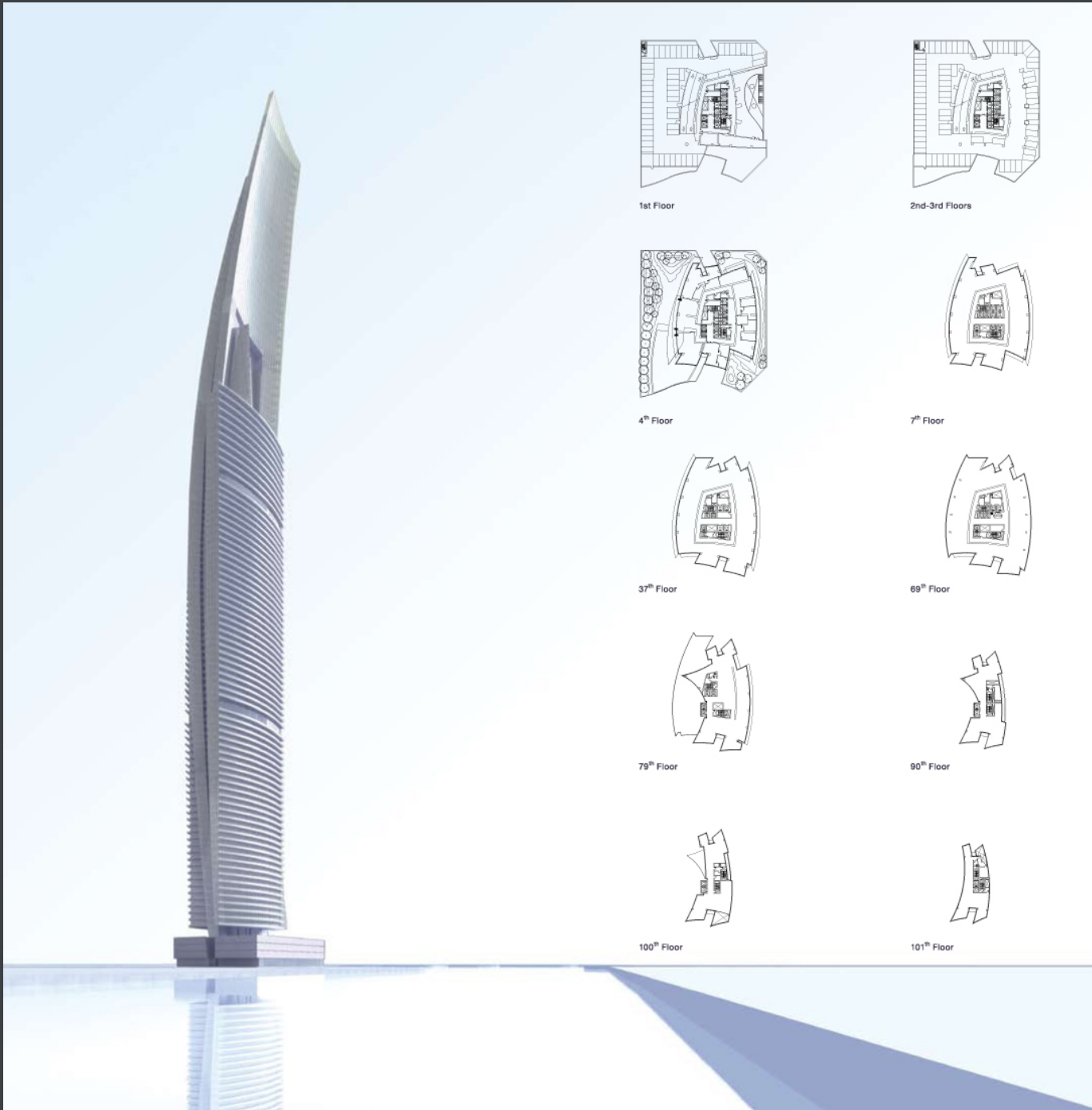


View Diagram

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

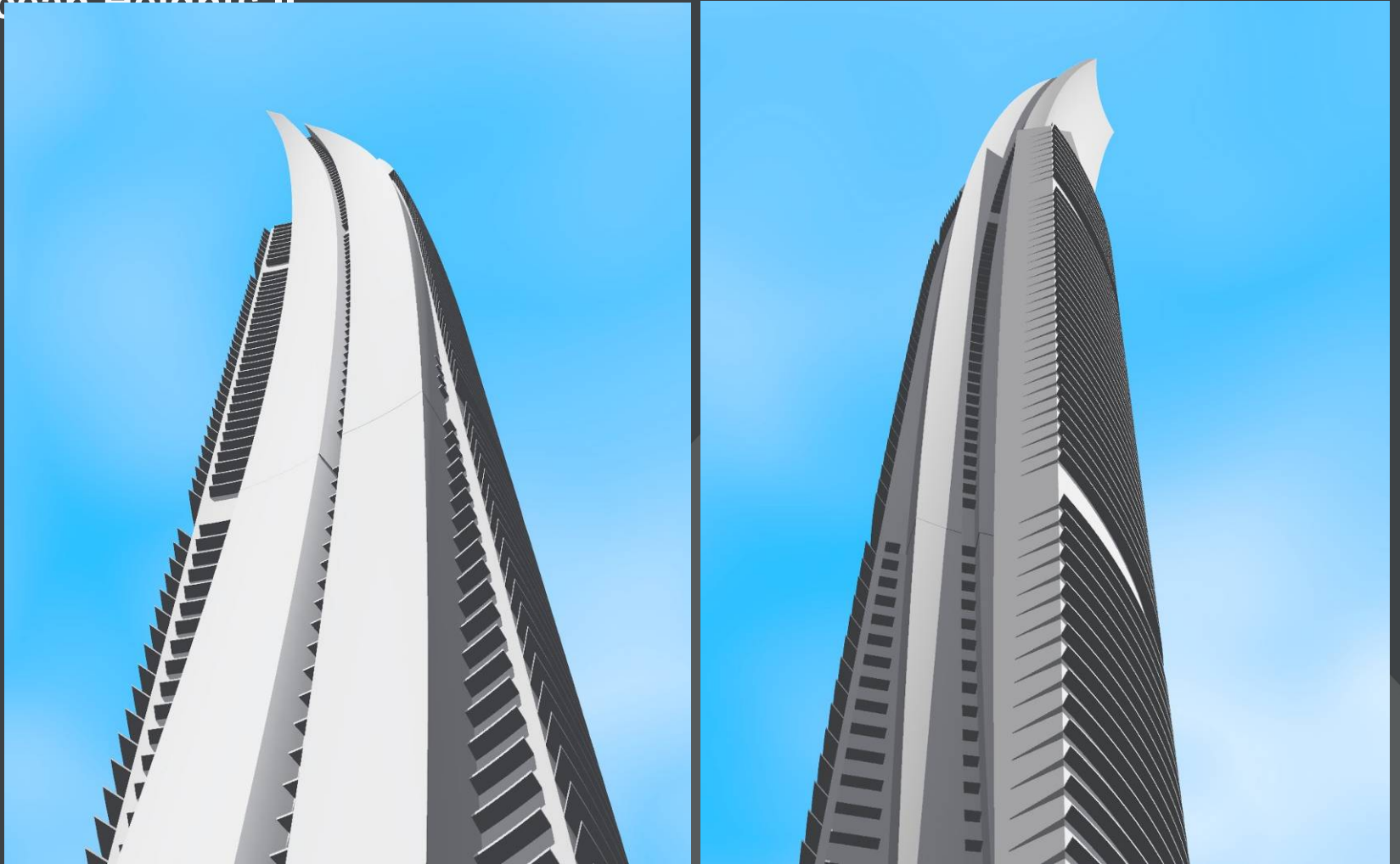
Dubai Ocean Heights Two





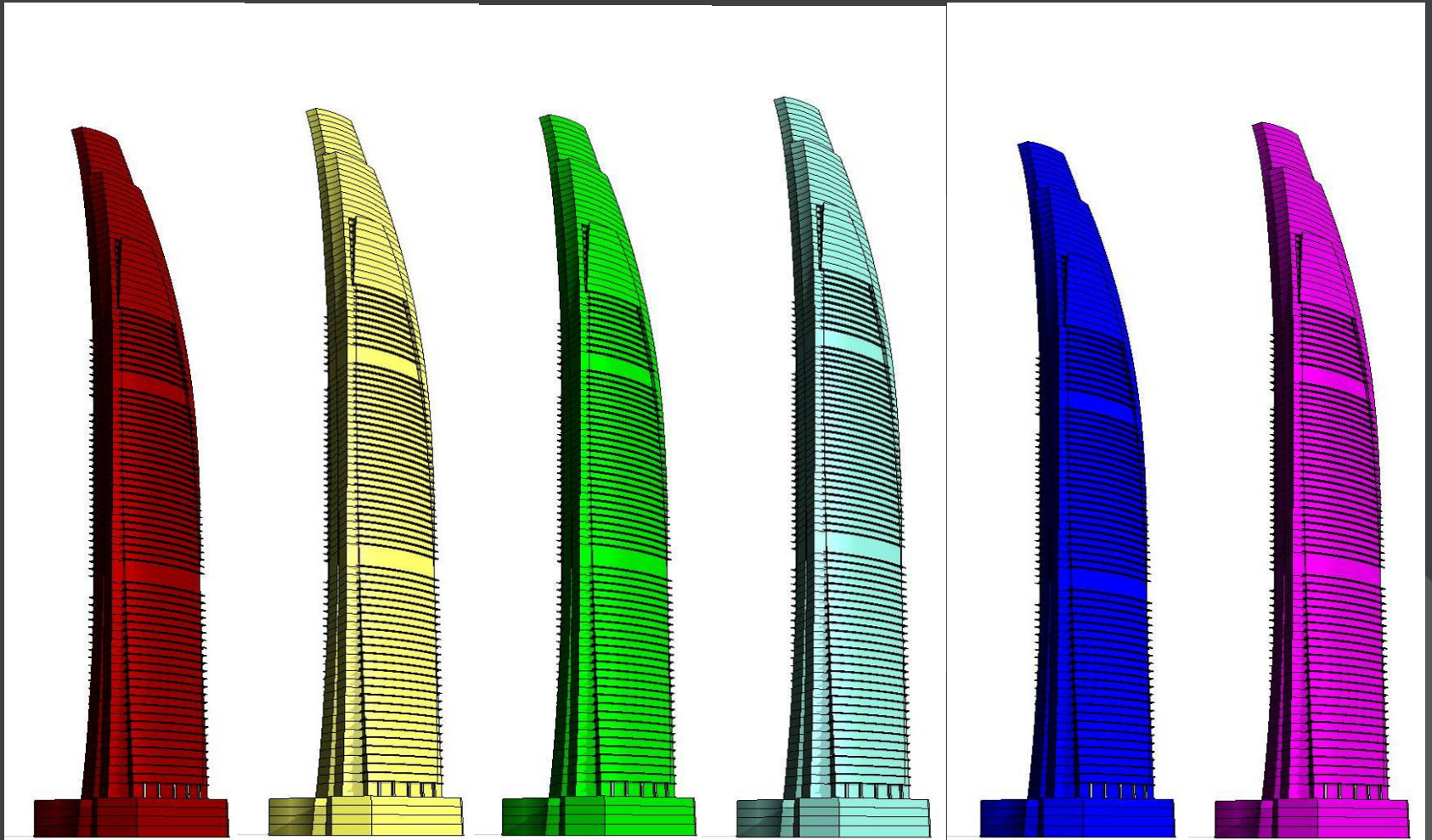


Ocean Heights II



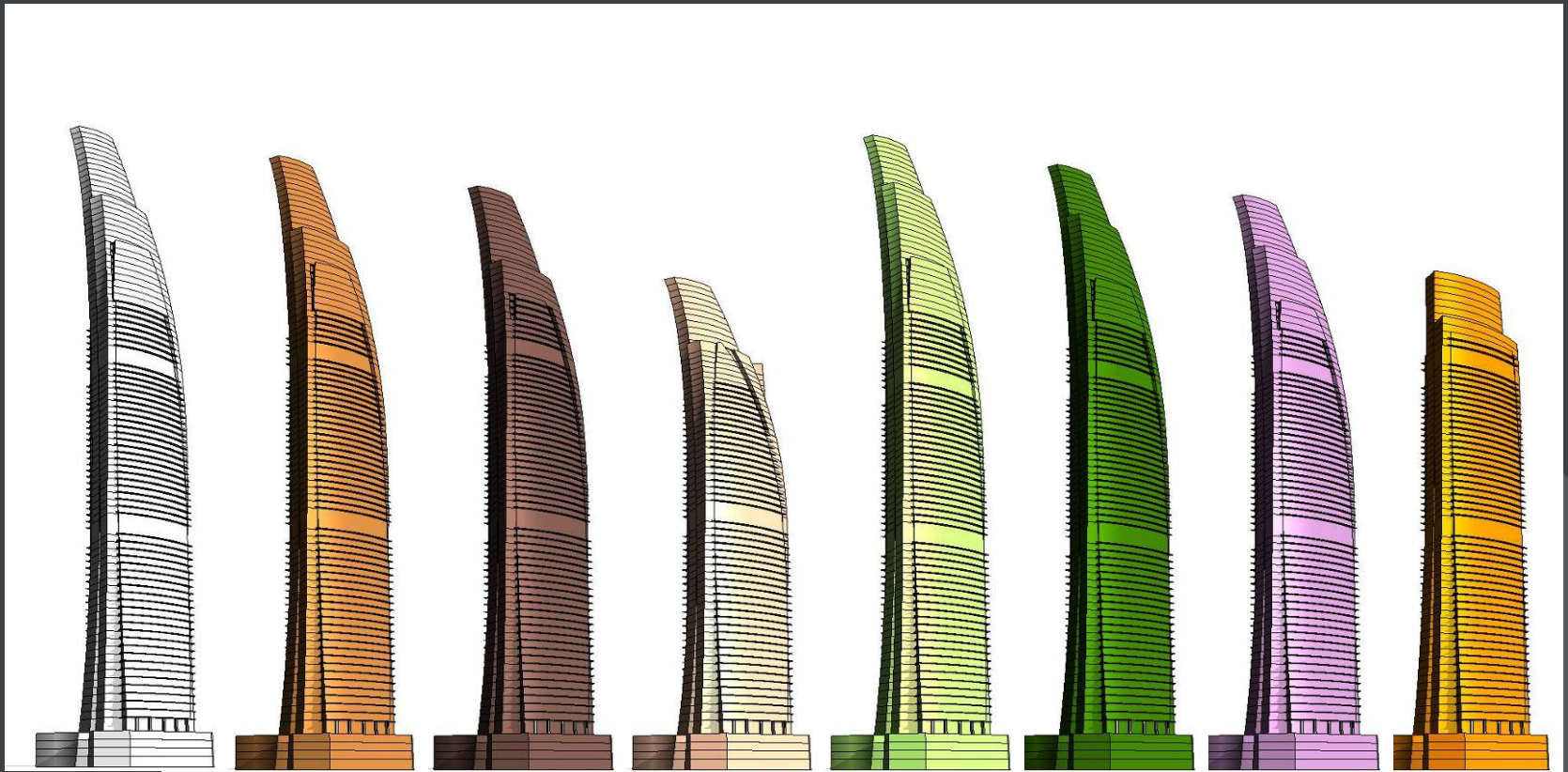


Ocean Heights II – Options

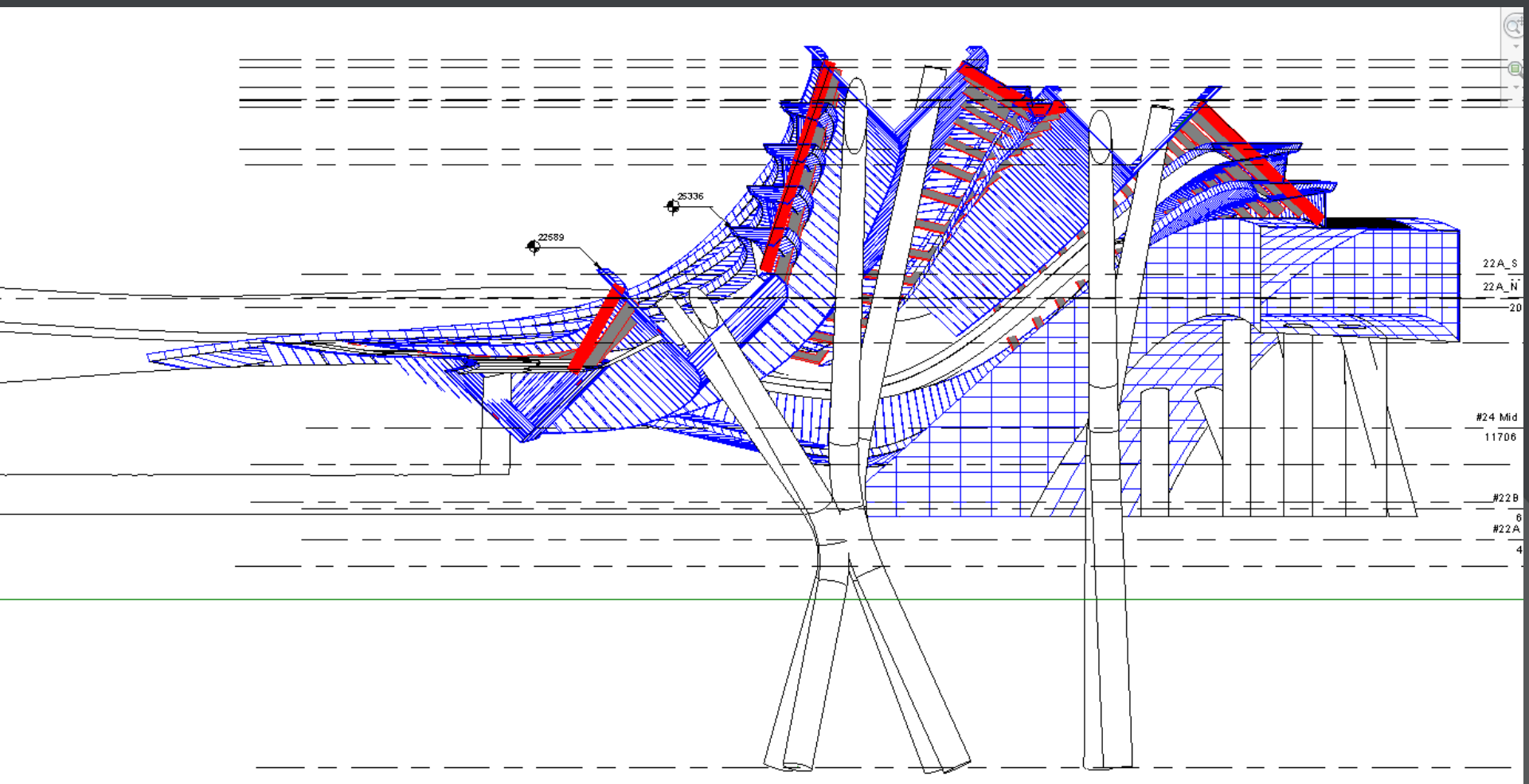


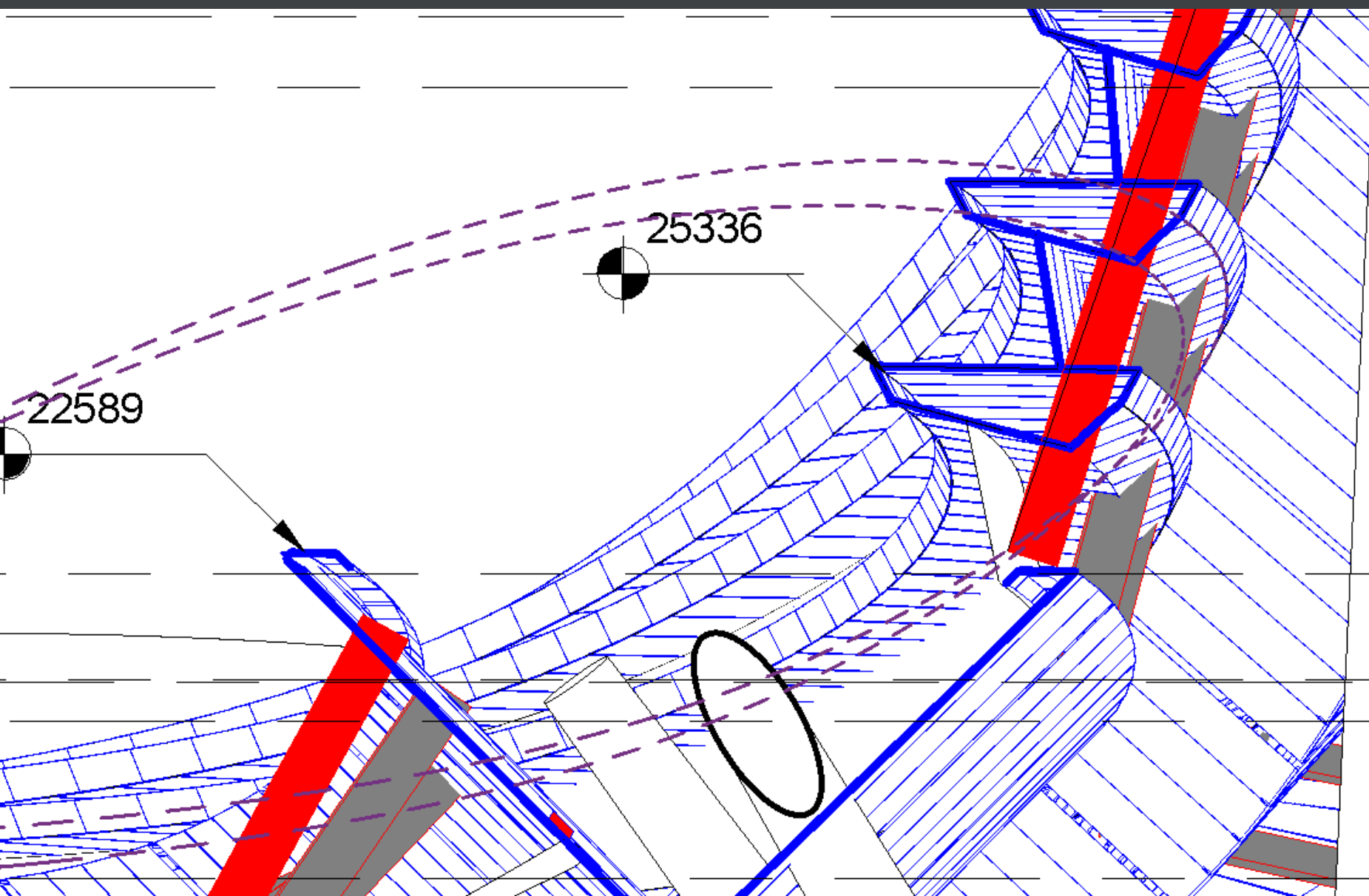


Ocean Heights II – Options









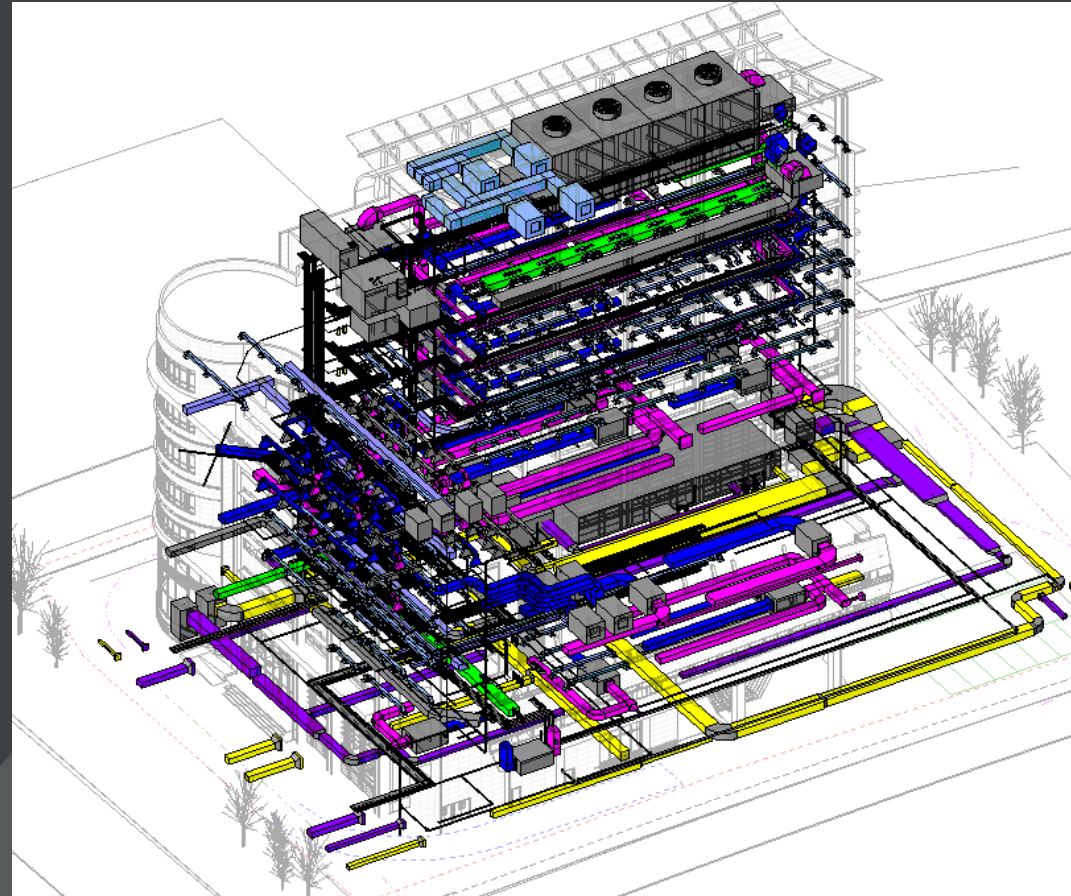




CONSTRUCTION

Aedas







CONSTRUCTION

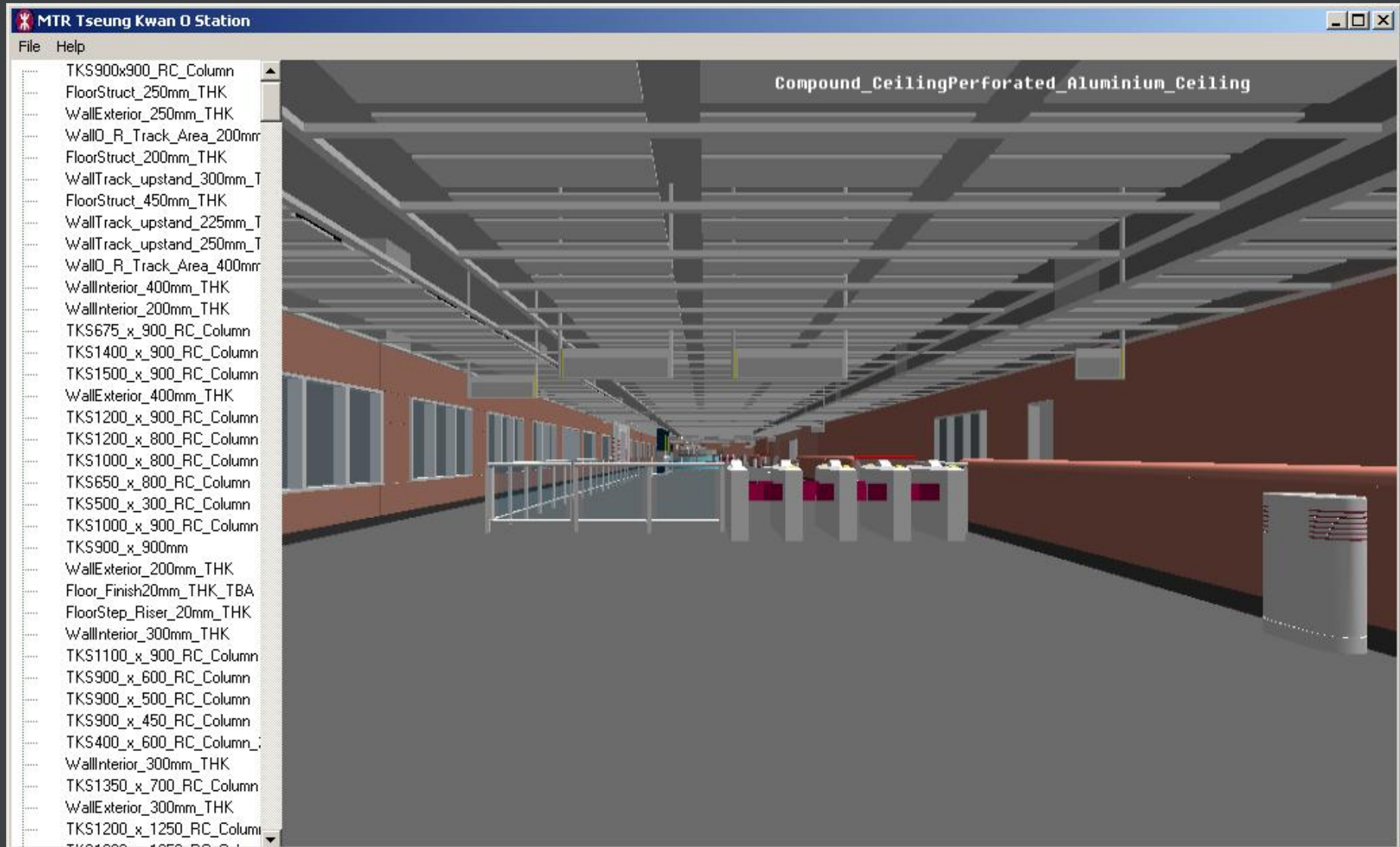
Aedas

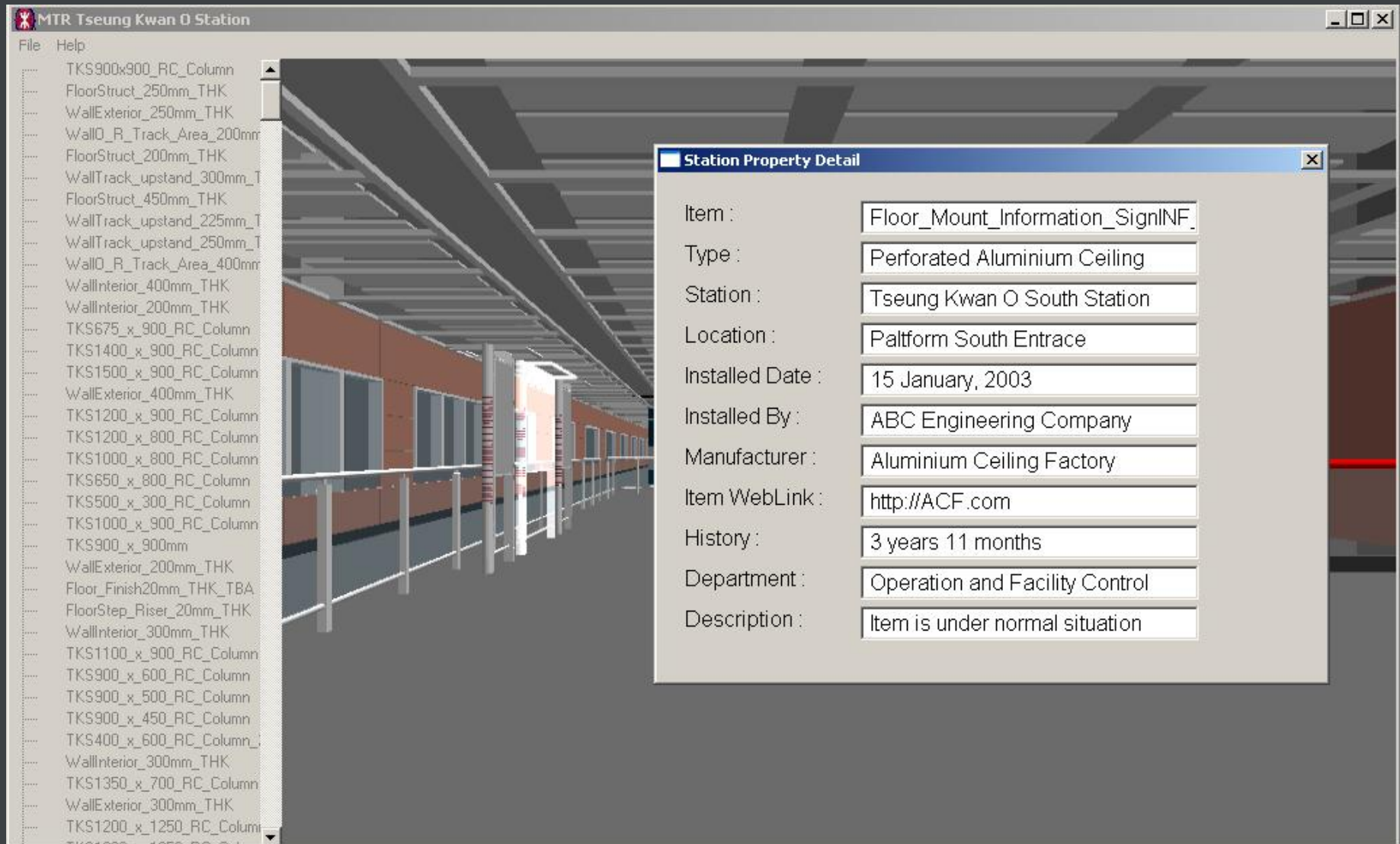












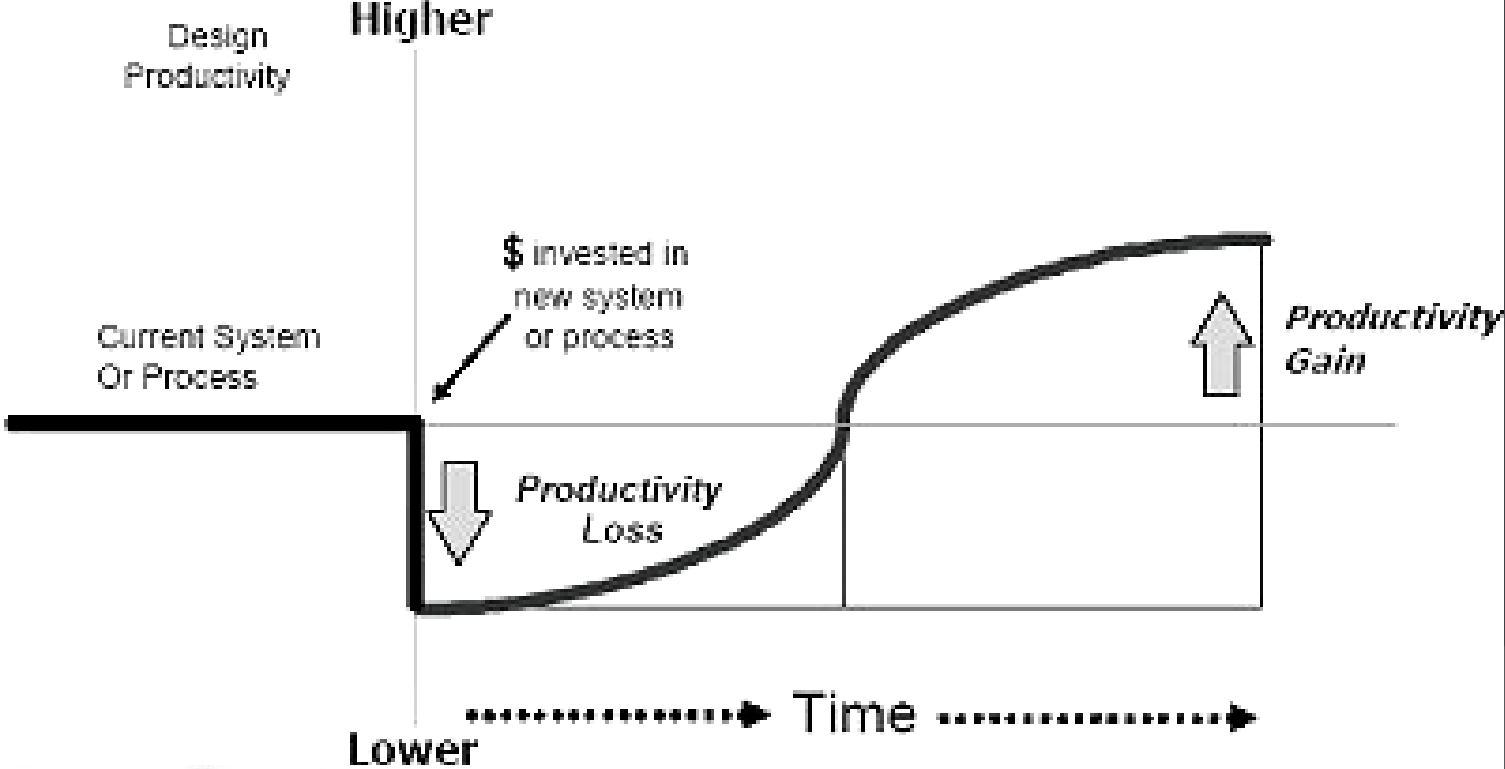
1. Design visualization
2. Drawing Productions
3. Services Co-ordination and Clash detection with other disciplines
4. Quantity taking and preparation of Tender Document
5. Automated Statutory Submission
6. Scientific analysis of different environmental aspects
7. Supply Chain Integration with the manufacturing and production
8. Complex Geometry 複雑な形状を実現可能

Sustainable Design



Is the AEC Industry Changing?





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

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)	

Source 26/1/07:
<http://aec.cadalyst.com/aec/article/articleDetail.jsp?id=124222>

**PRODUCTIVITY
 >60%**

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



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:

AK



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.



Q & A



Thank You...