

Building Information Modelling workflow – Design, Collaboration, Realization, Operation and beyond

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HKIBIM Board Member*

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AIAB immediate past Chairman*

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

Building Projects

Modelling

Information

BIM

- 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
- Program
- Cost Estimate
- Quantity Take Off
- Bills of Quantities
- Variations

Building Information Modeling

信息化建築模型

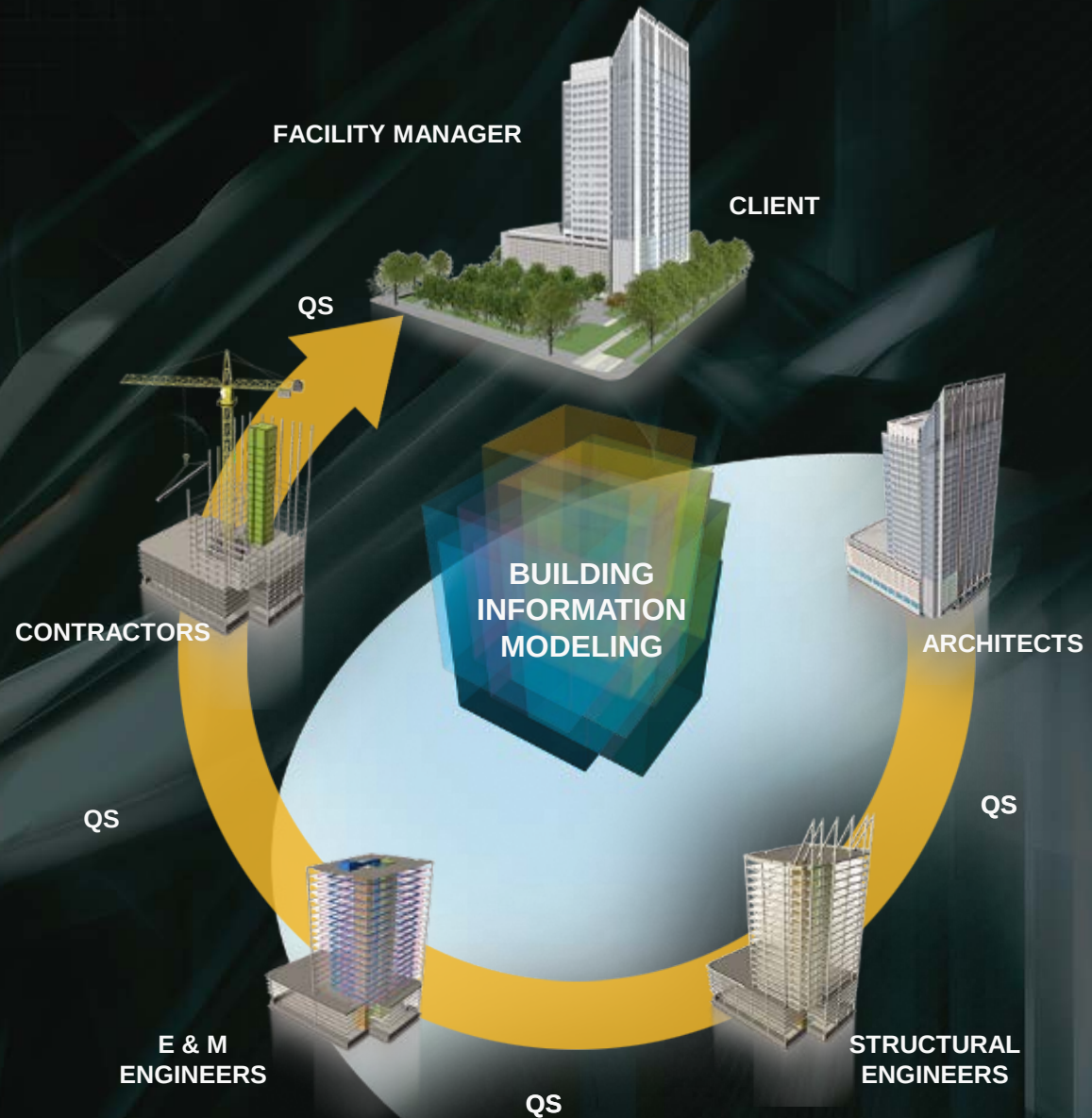
Graphical Data
(model)

+

Non-Graphical
Data
(Information)

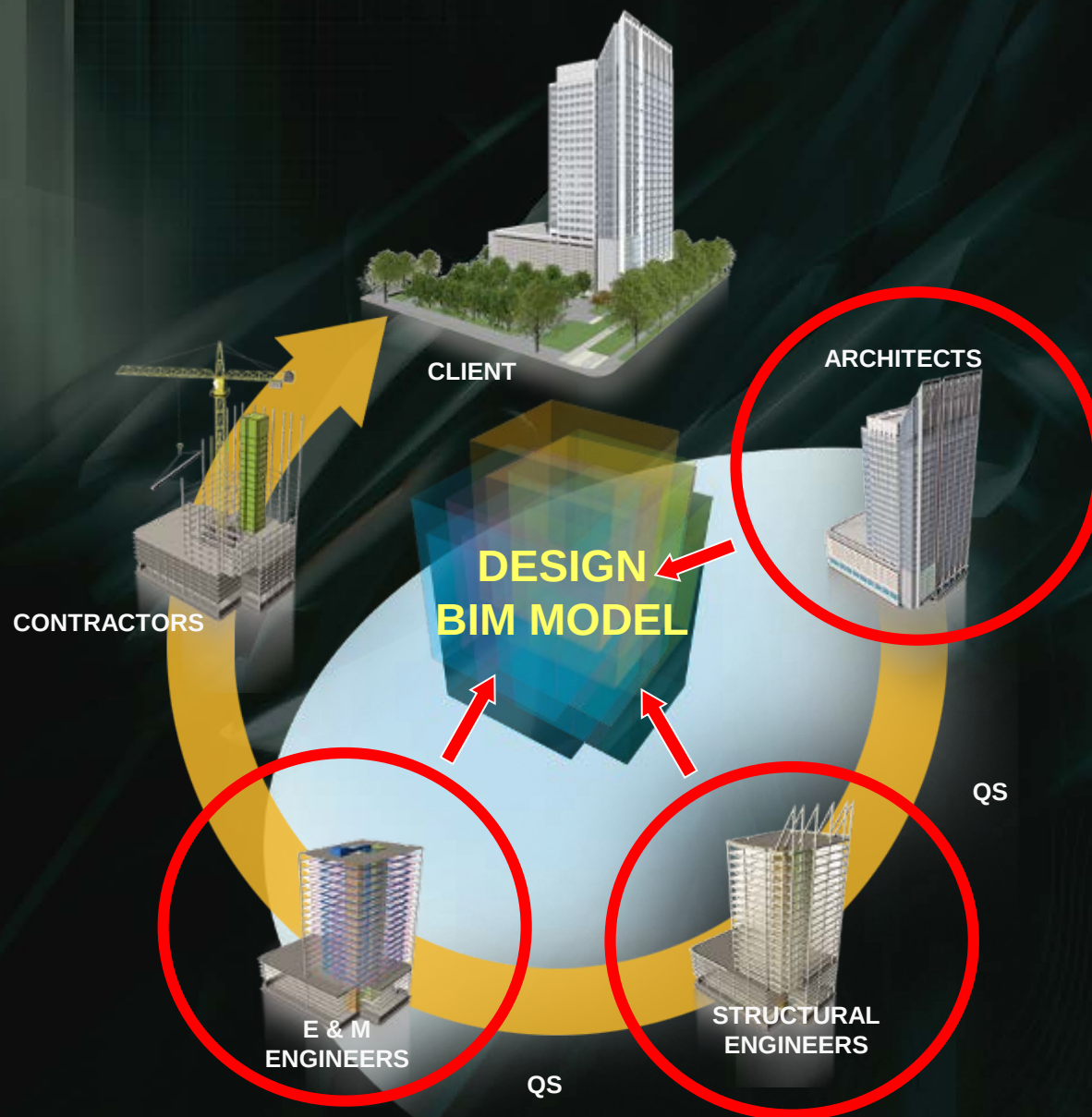
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New workflow

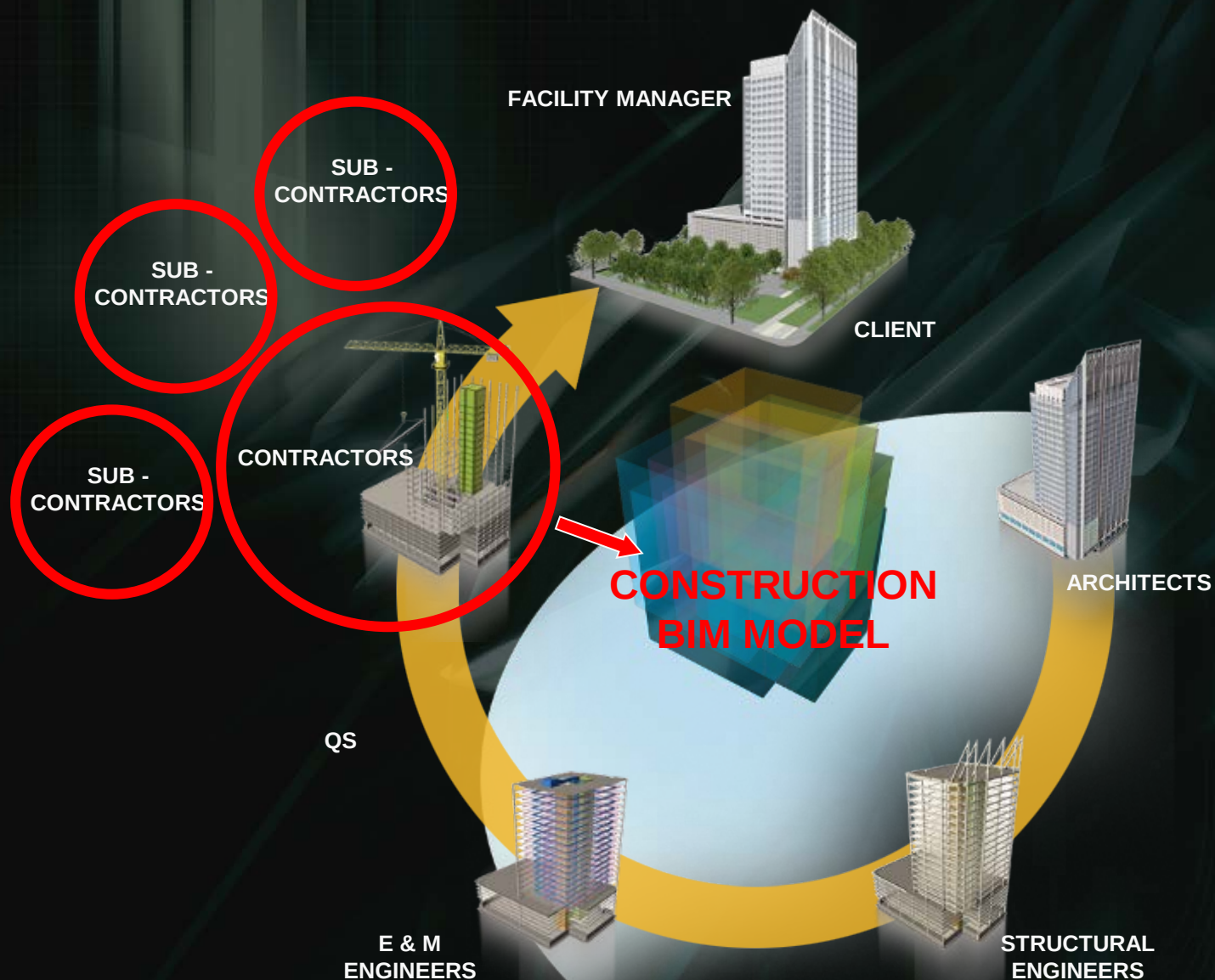




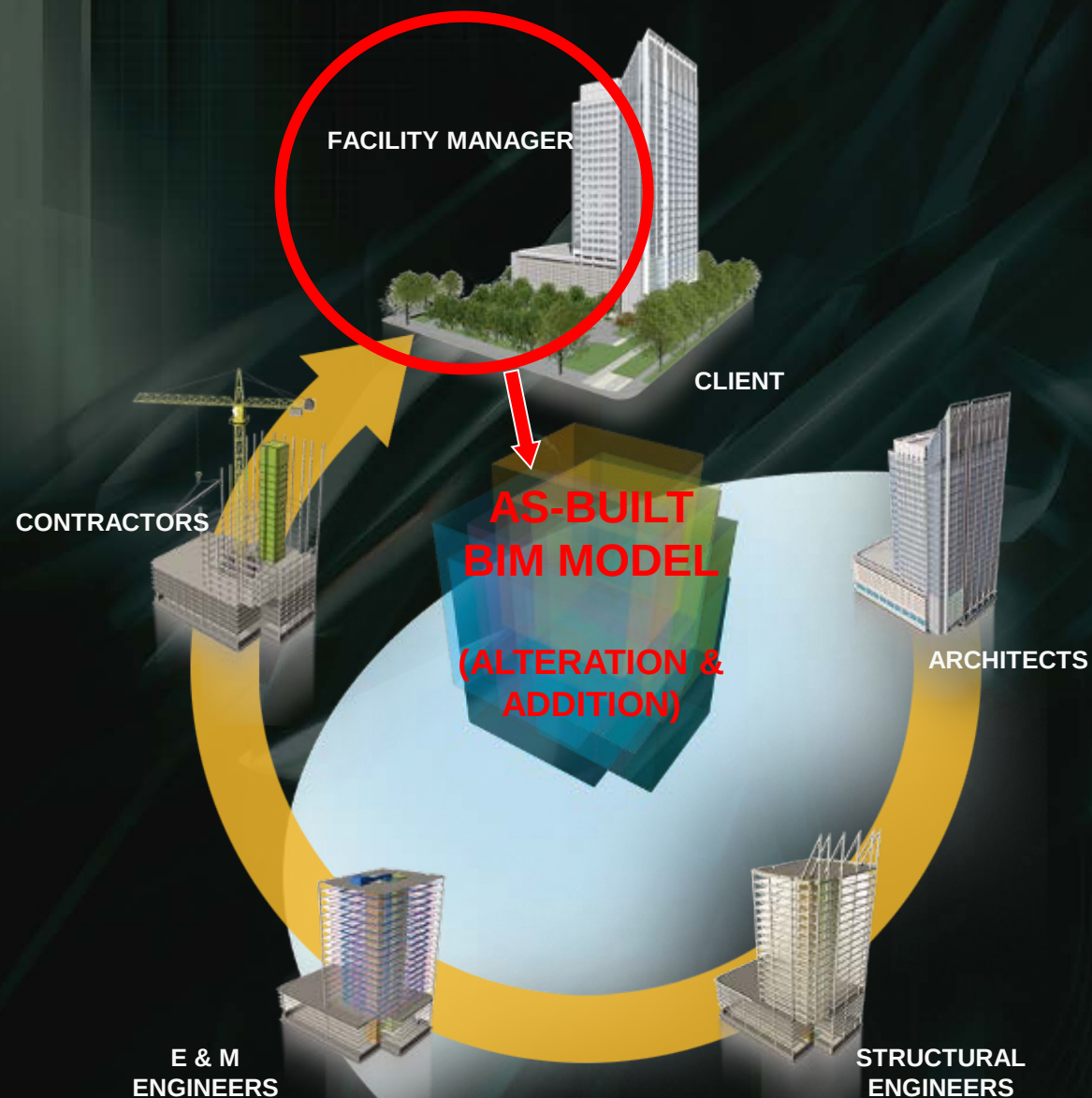
HOW BIM WORKS?



CONSTRUCTION BIM MODEL



AS BUILT BIM MODEL



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

Parametric Modelling

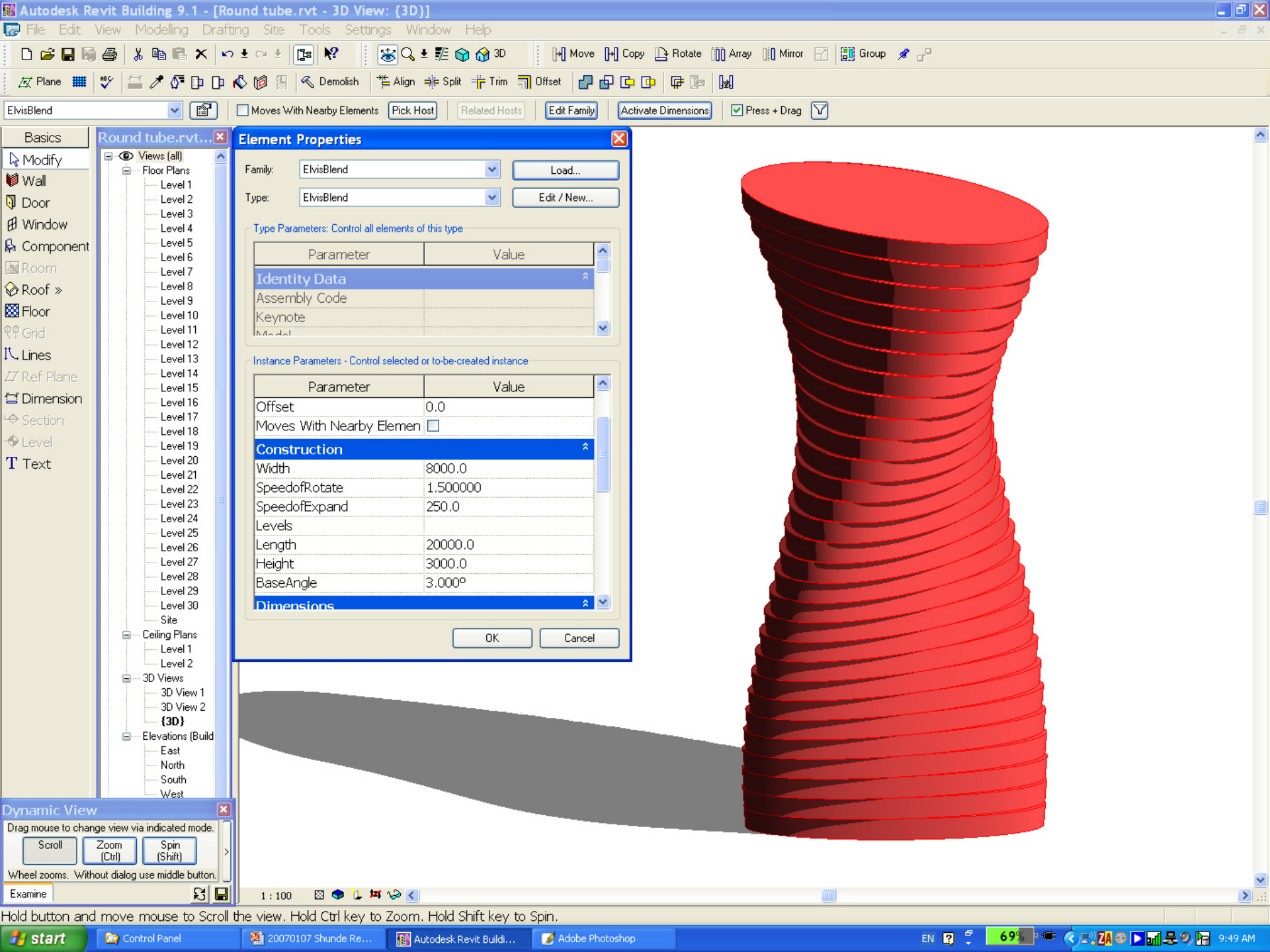
- Use parameters to drive the model
- Relates related to the approach taken in the **design process** than the software tools an architect uses.
- Creating and modifying these relationships is an important part of the design process. A parametric model is often defined by rules and constraints. Changing a rule or constraint, or modifying a part of the model itself, often has implications in the entire model.
- Why Changes? - **Responses** to environmental conditions such as sun and shadows, zoning criteria, views, and size (floor areas and program verification, façade surface areas, volume), aesthetics; or other requirements.

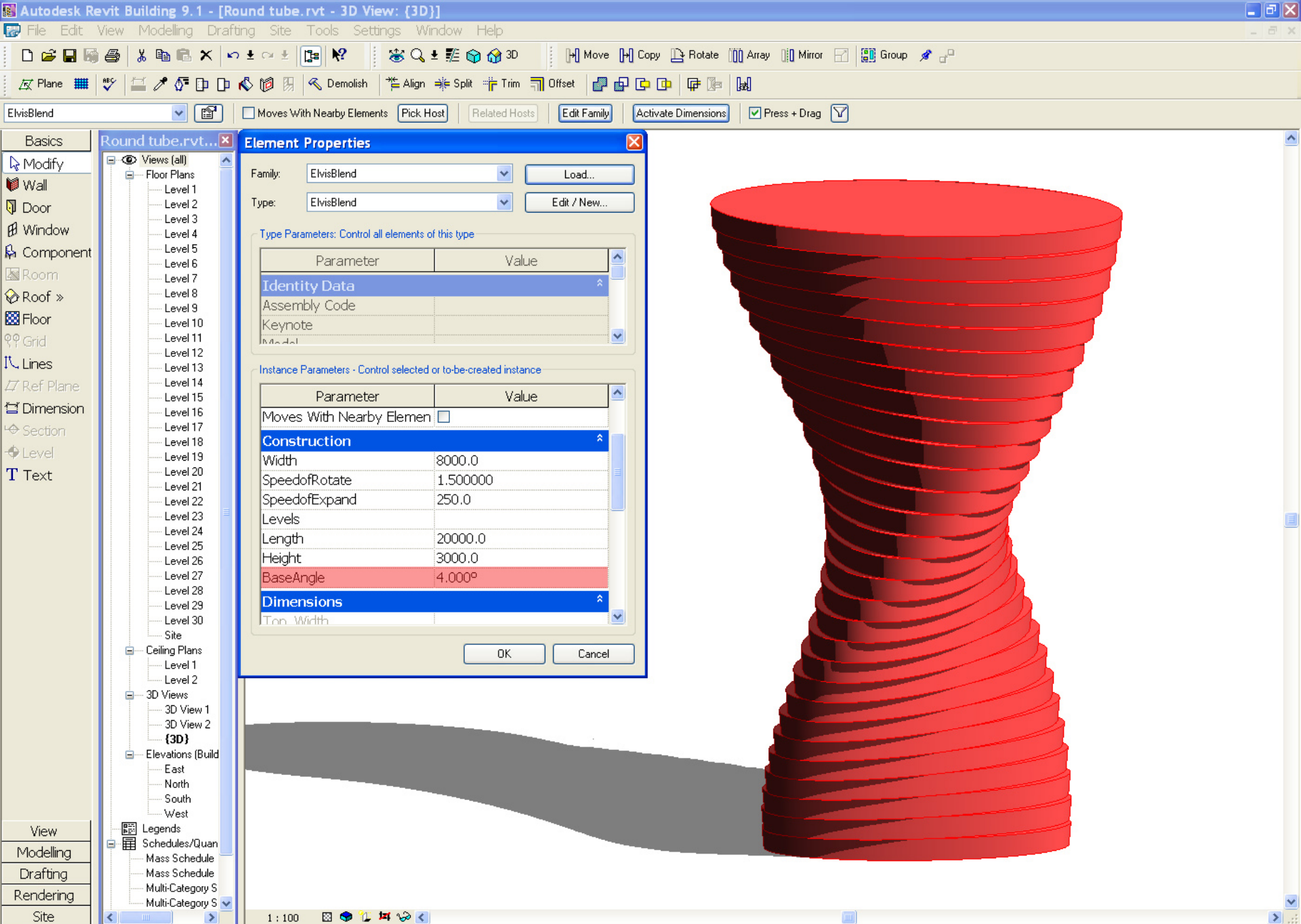
Parametric Modelling



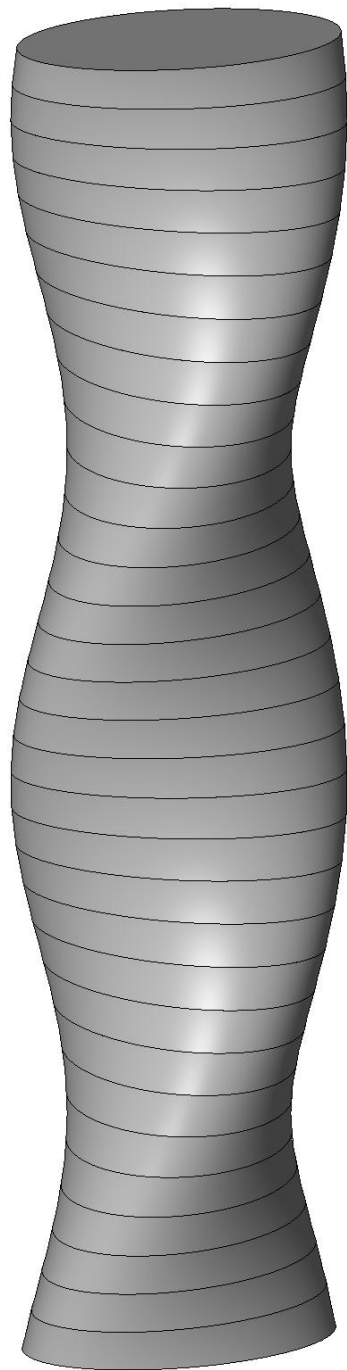
“Design a Design Tool” - Thinking creatively and not being constrained by one’s own thinking or by a limiting set of tools is the key to innovative designs and design processes.







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





absoluteworld BUILDING 2

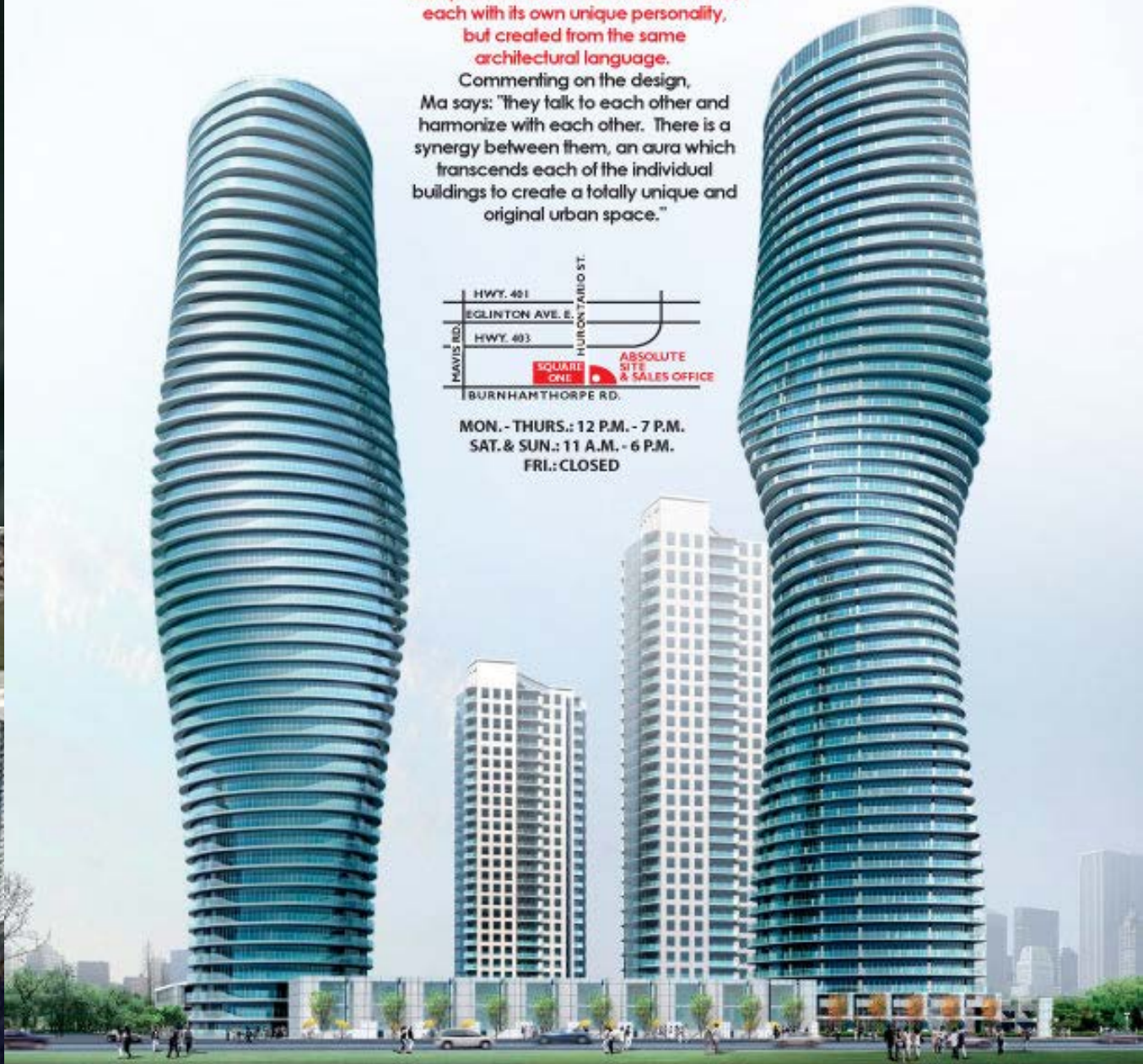
AbsoluteWorld's two buildings, as envisioned by their creator, Yansong Ma. The buildings were designed to complement and enhance each other, each with its own unique personality, but created from the same architectural language.

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."

absoluteworld BUILDING 1



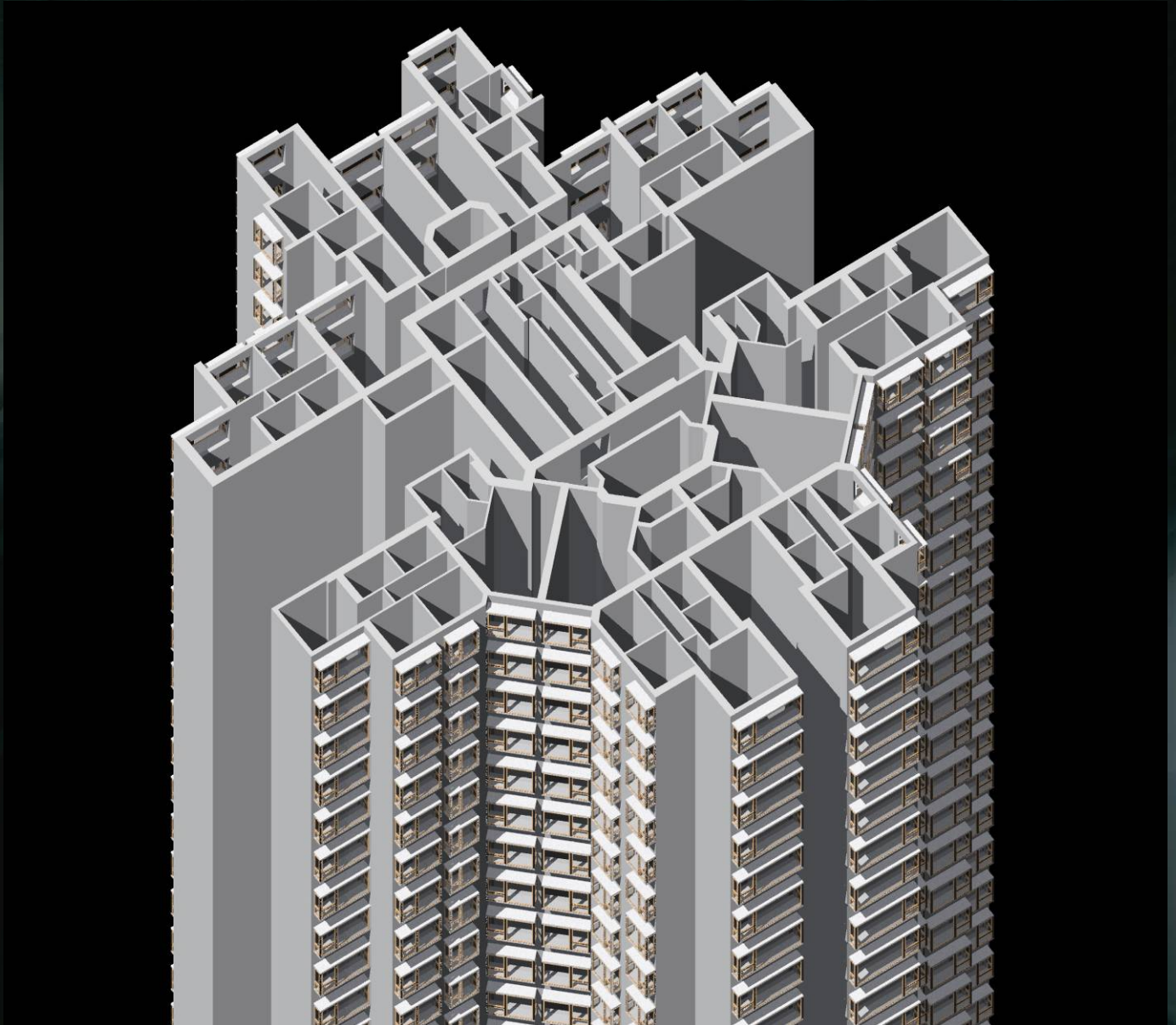
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SAT. & SUN.: 11 A.M. - 6 P.M.
FRI.: CLOSED

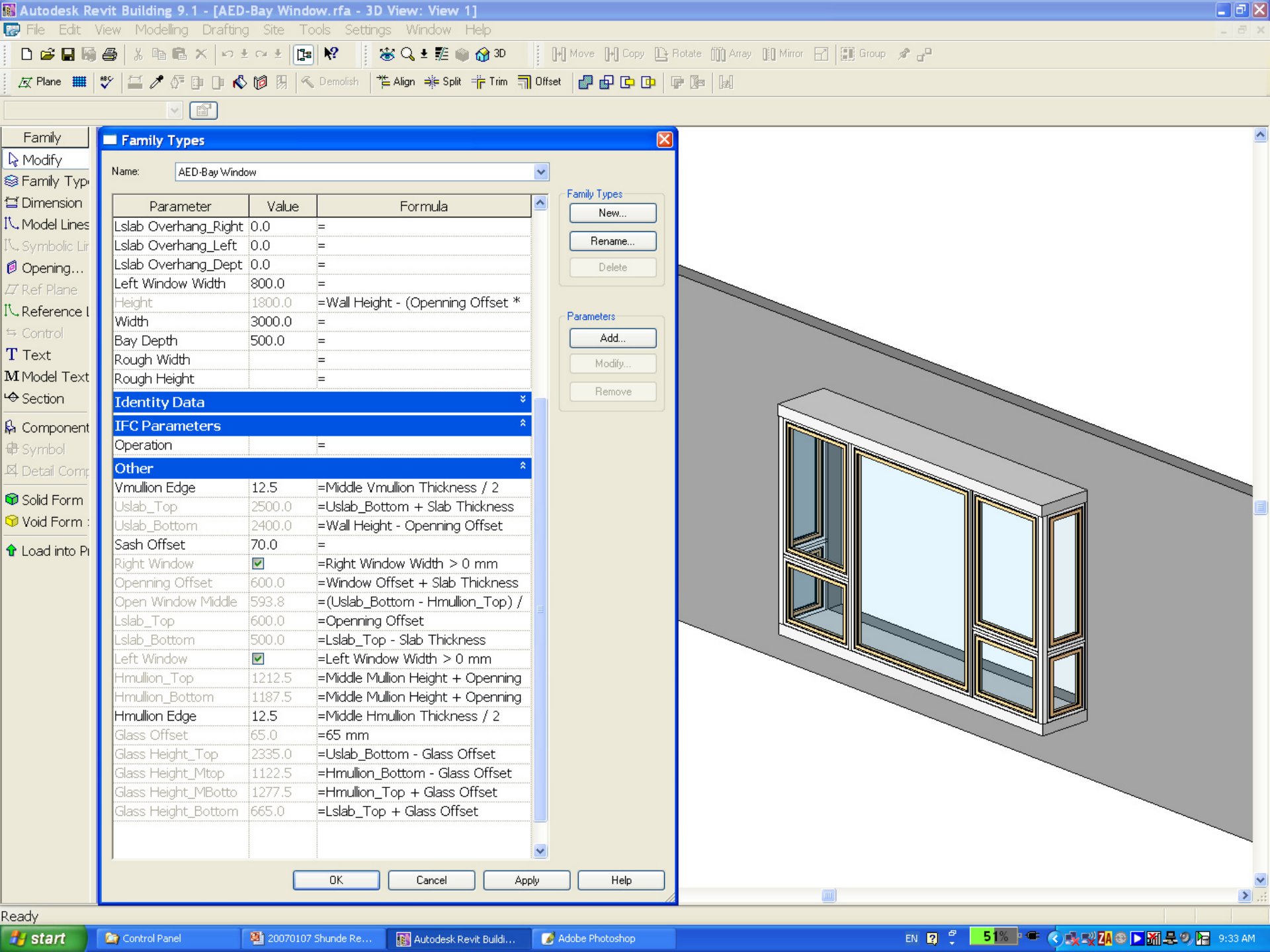


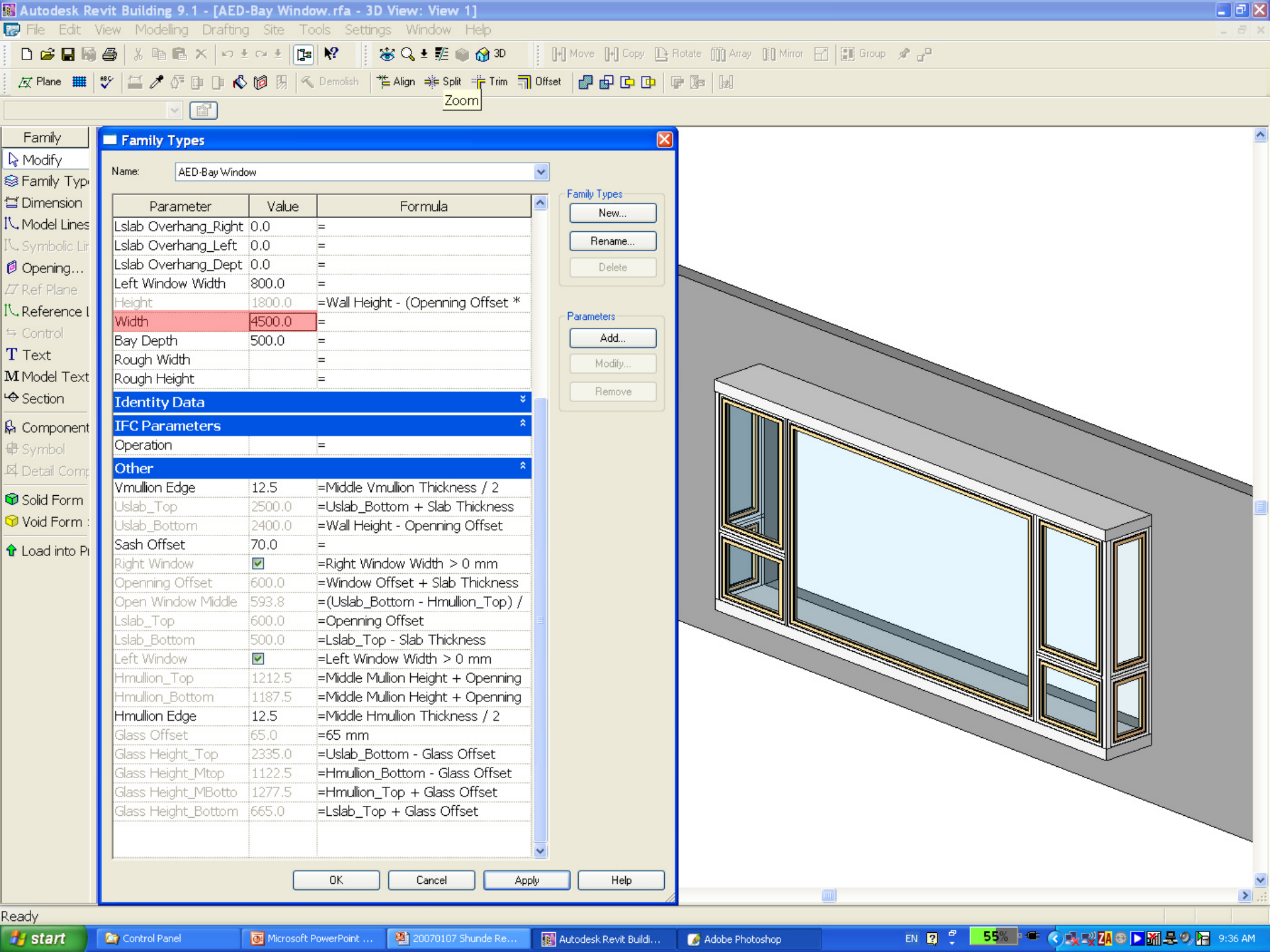


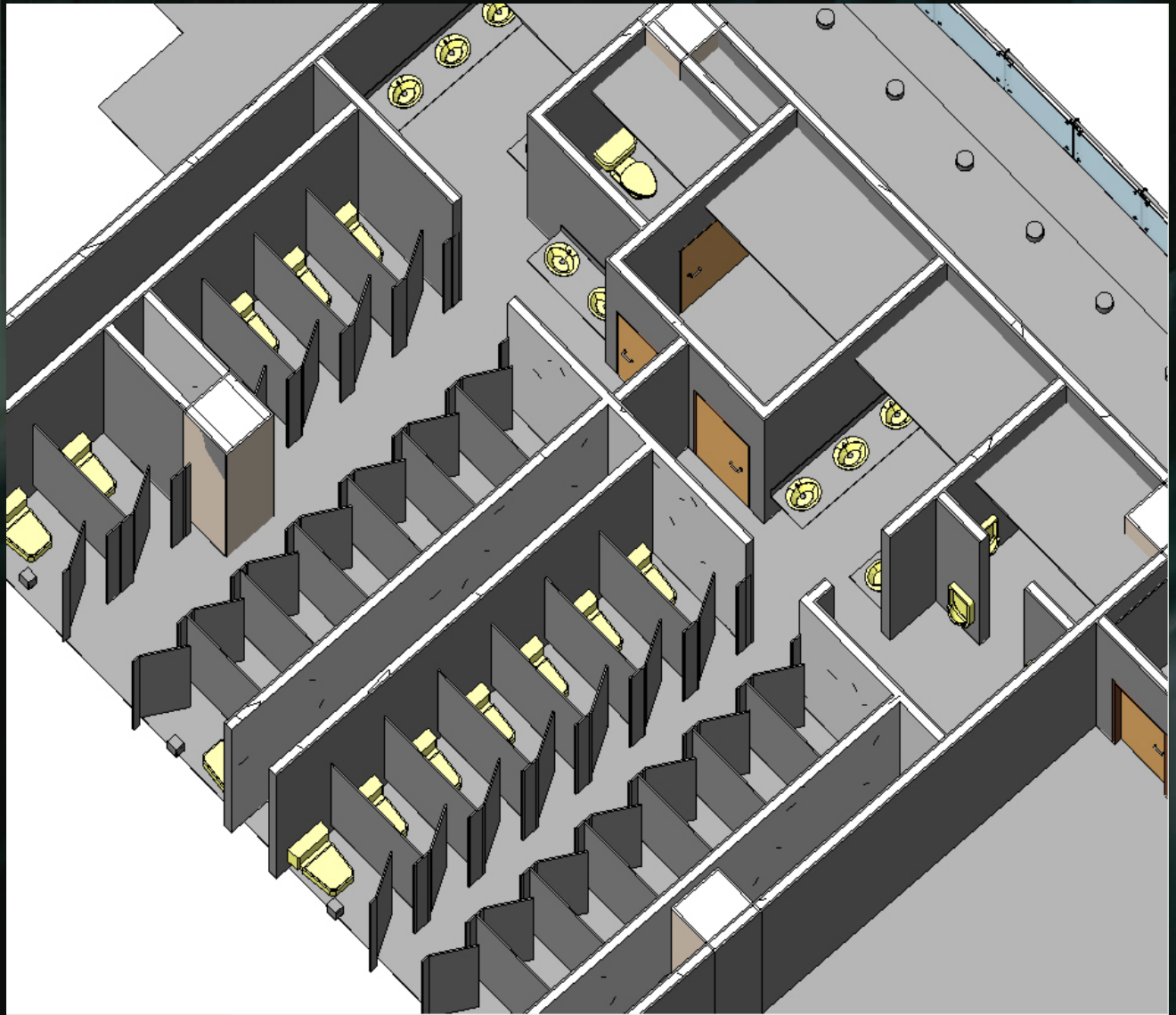
REPETITIONS vs VARIATIONS

PARAMETRIC MODELLING

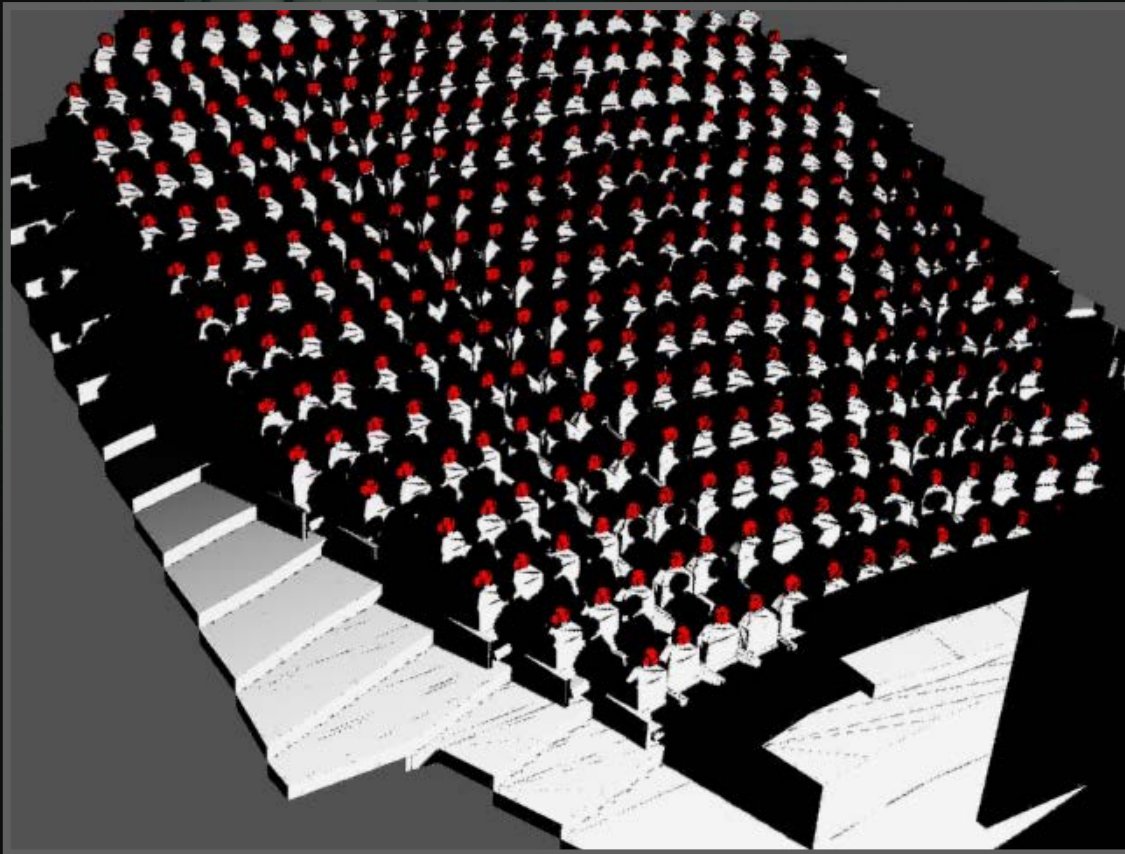




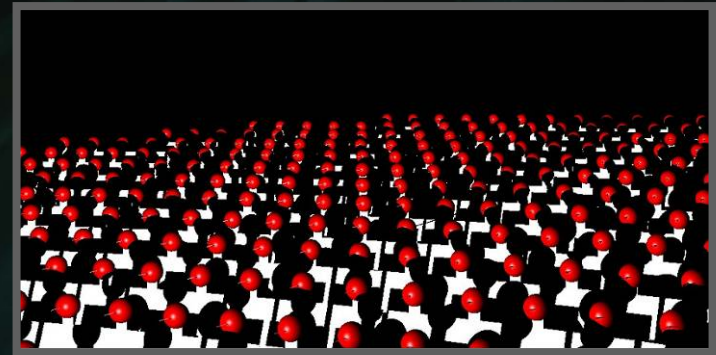




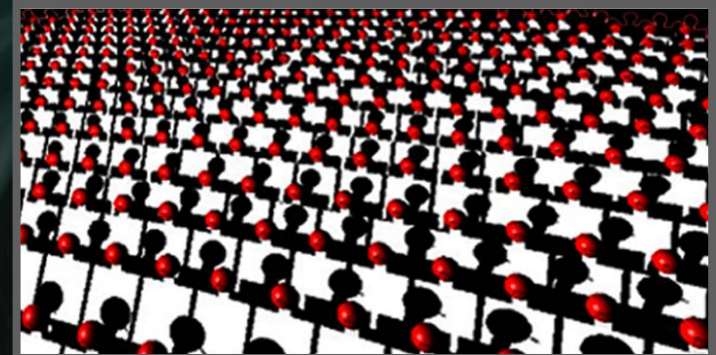
CREATIVE TOOLS



Radiating Light Method



Unsatisfactory sightlines



Satisfactory sightlines

SIGHTLINE STUDIES



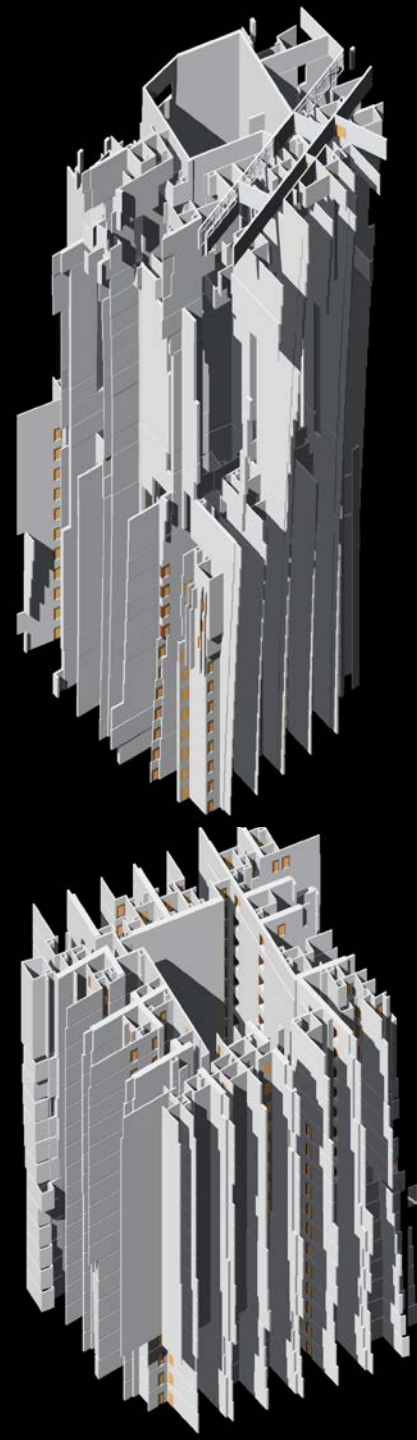


FAÇADE PANEL DESIGN

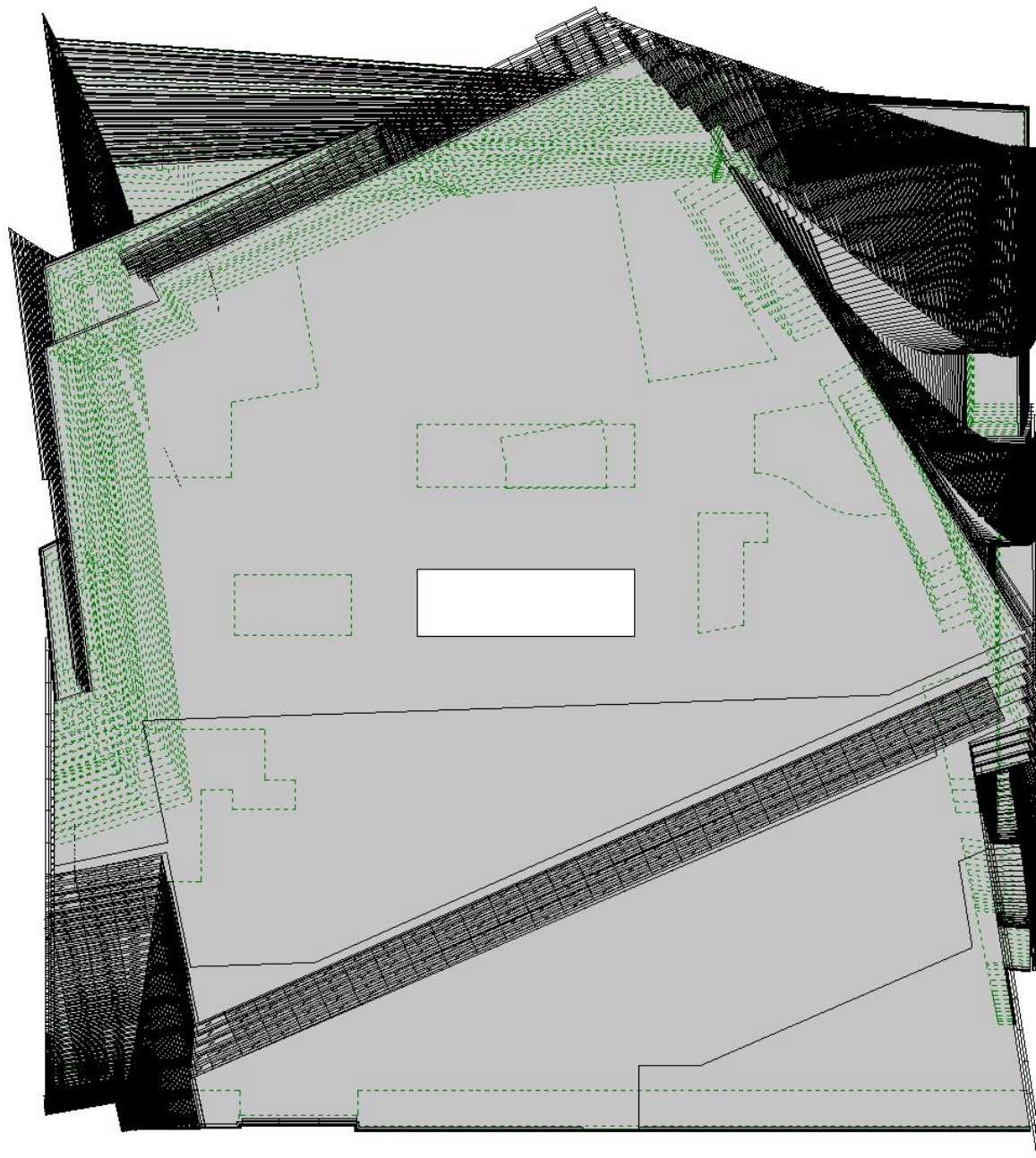
Program: Residential Site Area: 3,746 sqm
Floor Area: 659,659 sqm Building Height: 345 m

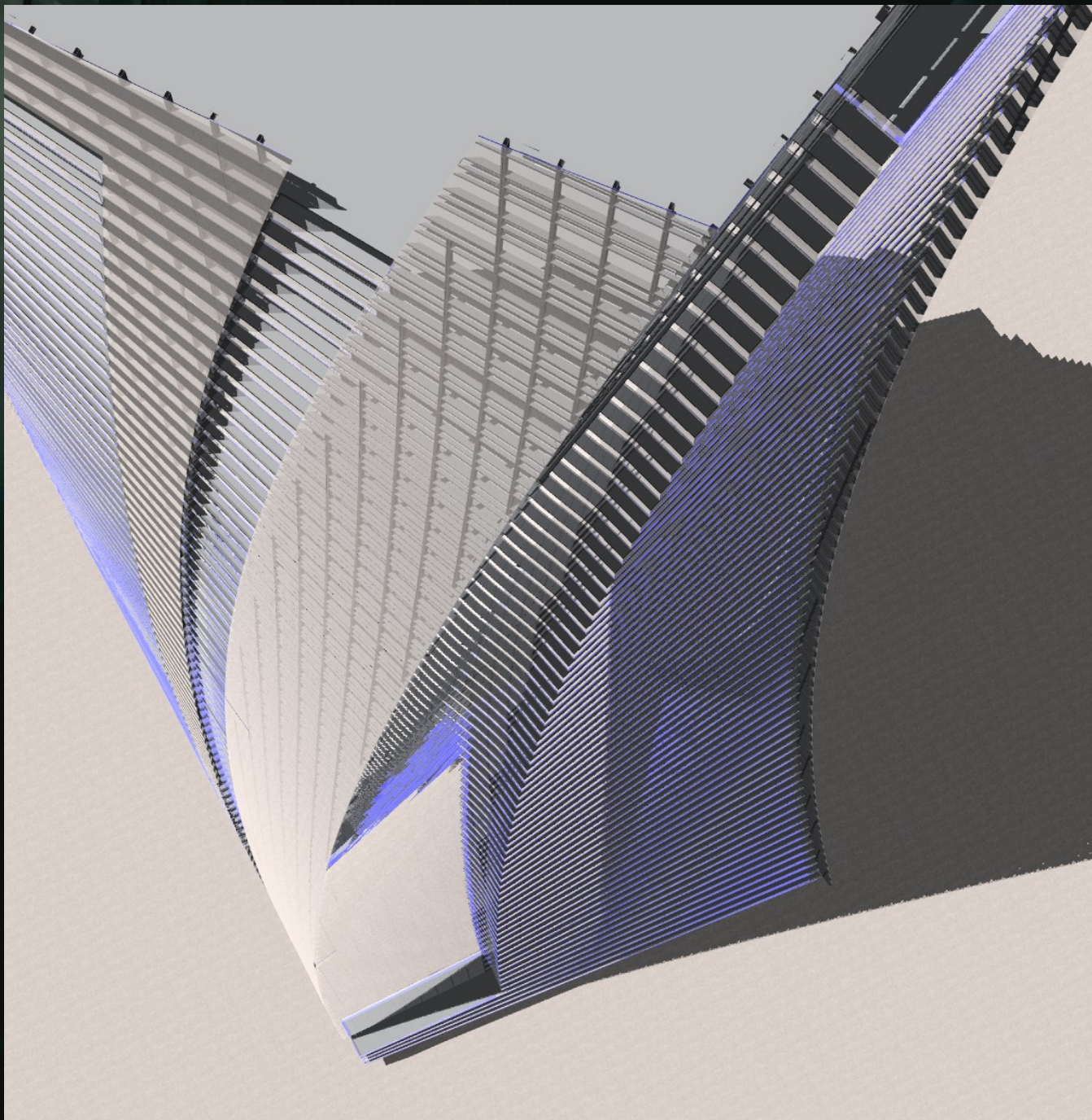


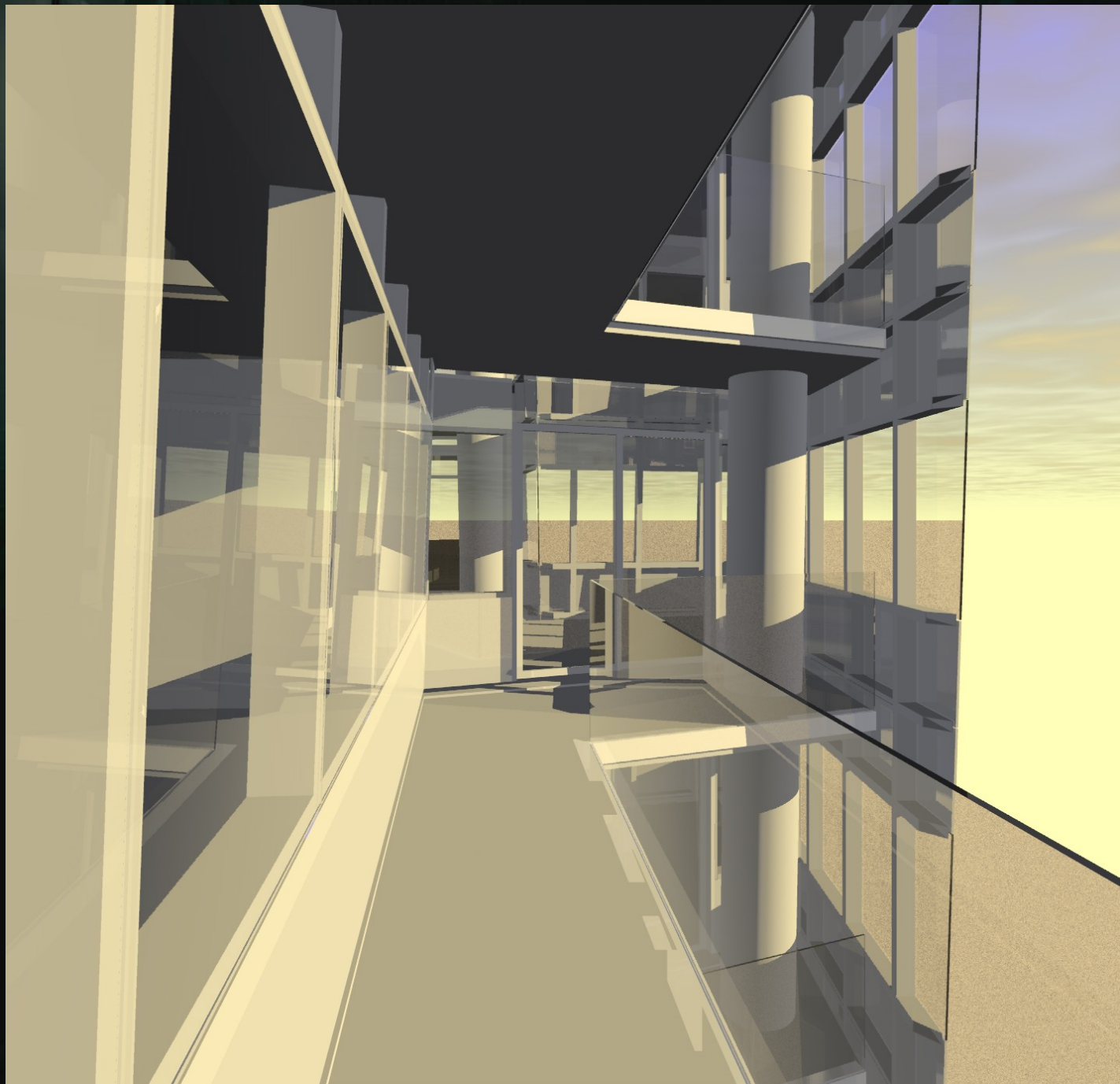
Dubai **Ocean Heights One**

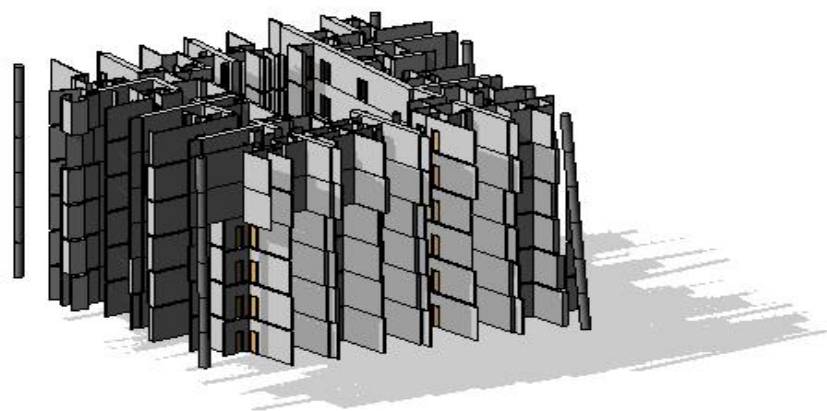


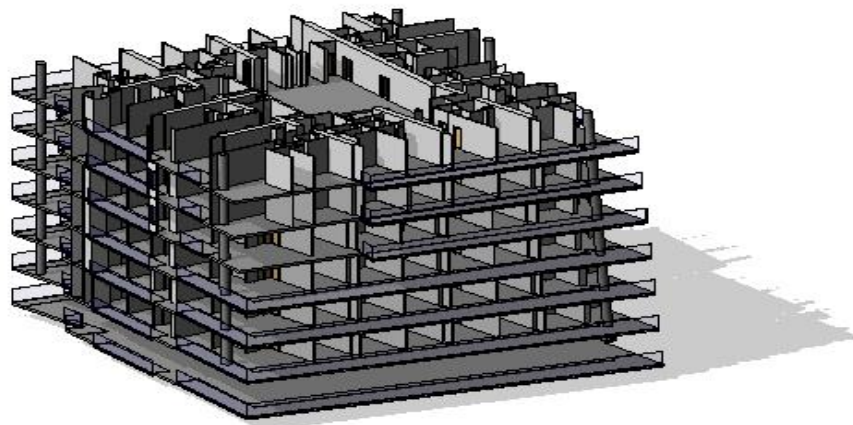
COMPLEX GEOMETRY









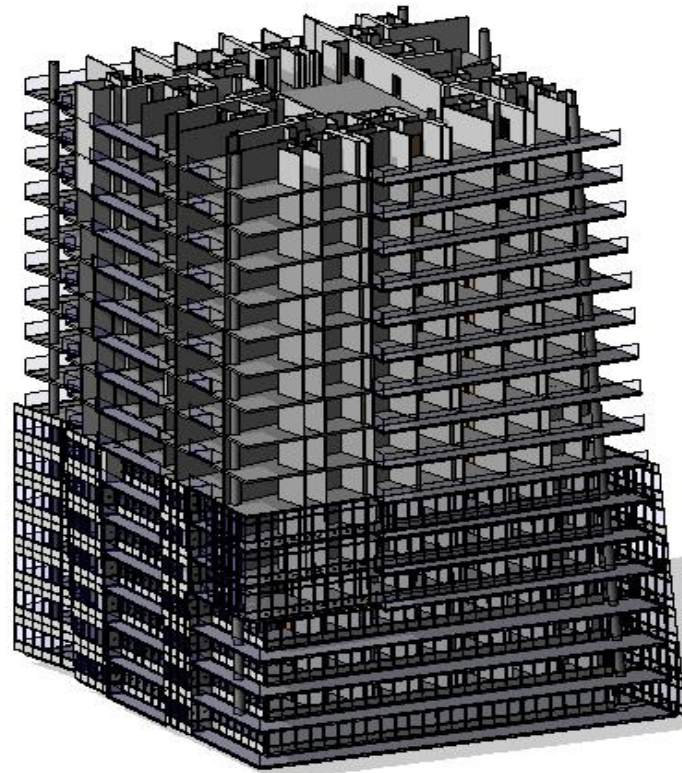










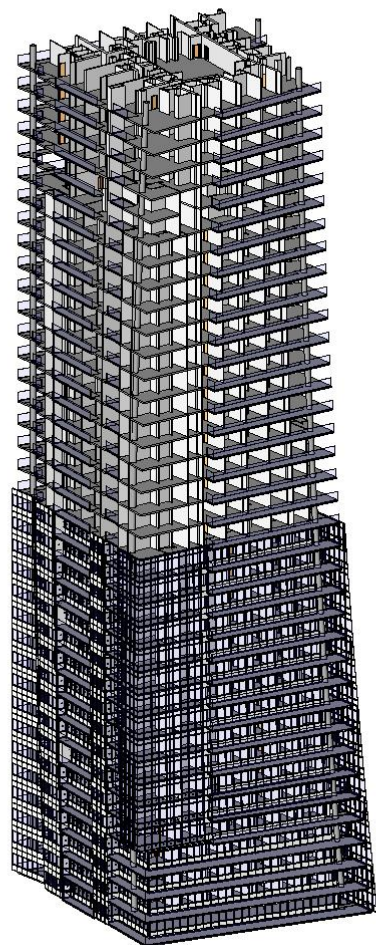


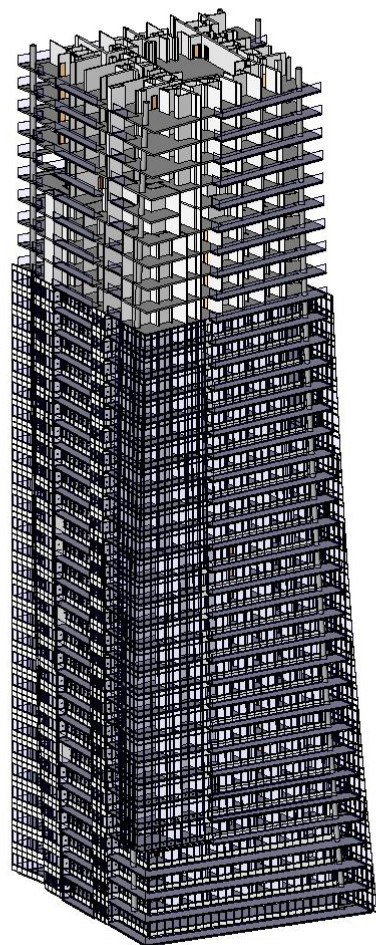


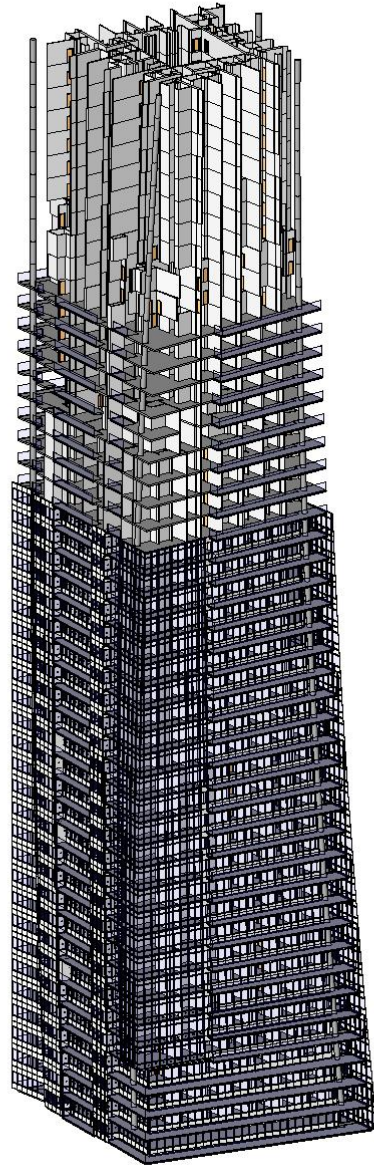


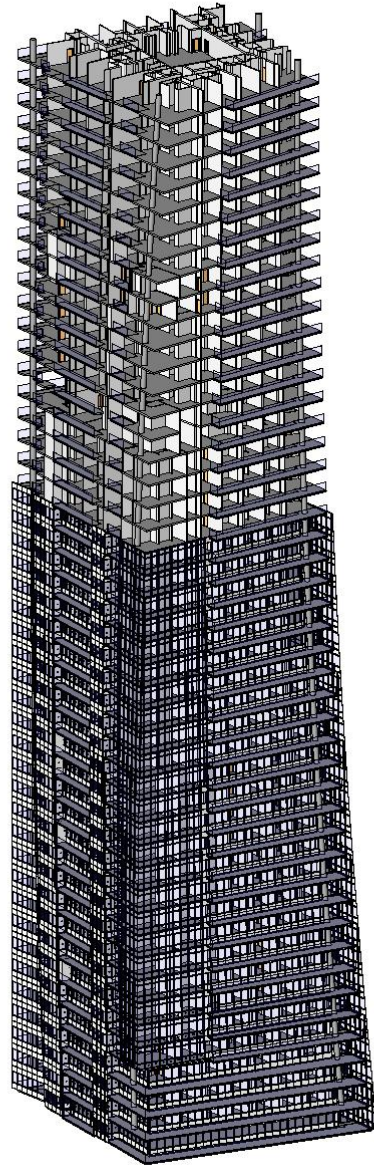


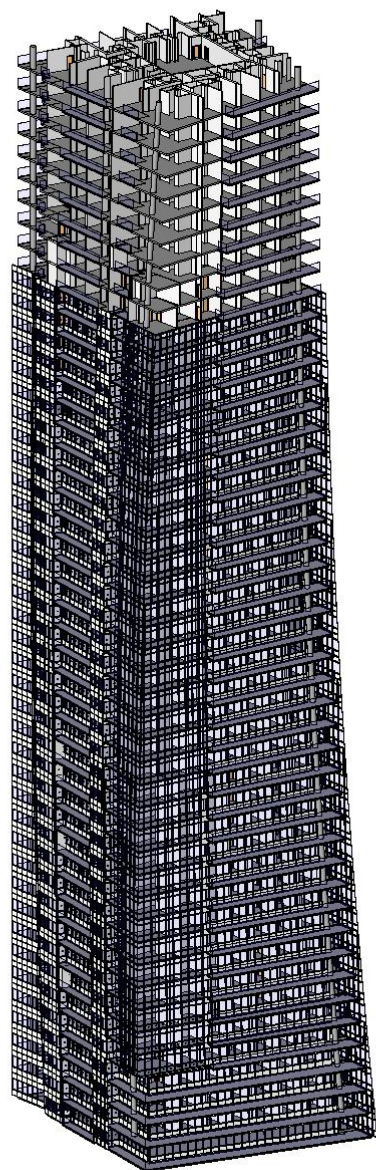


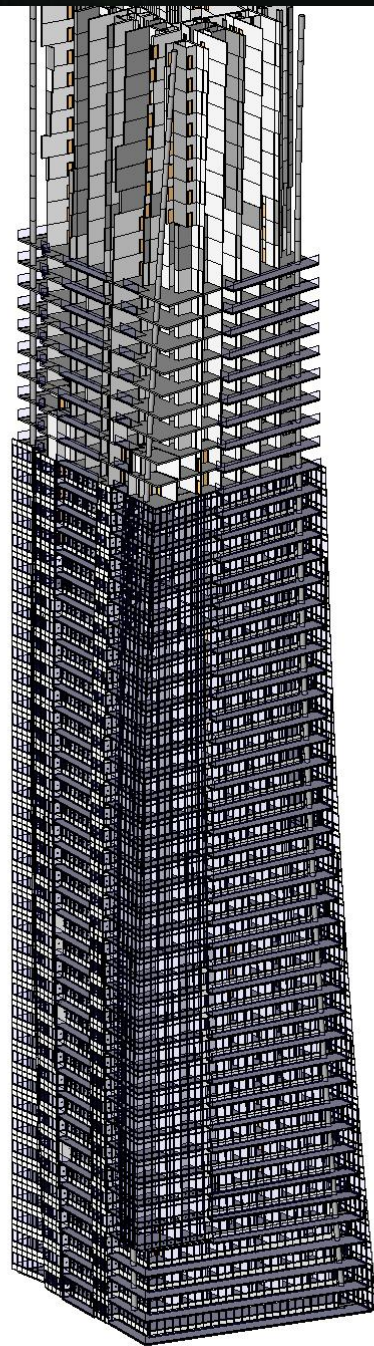


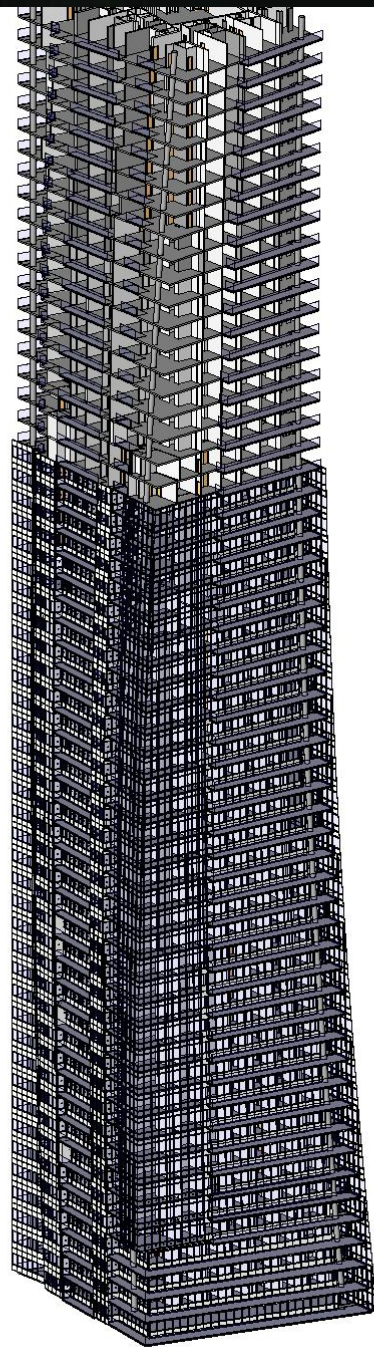


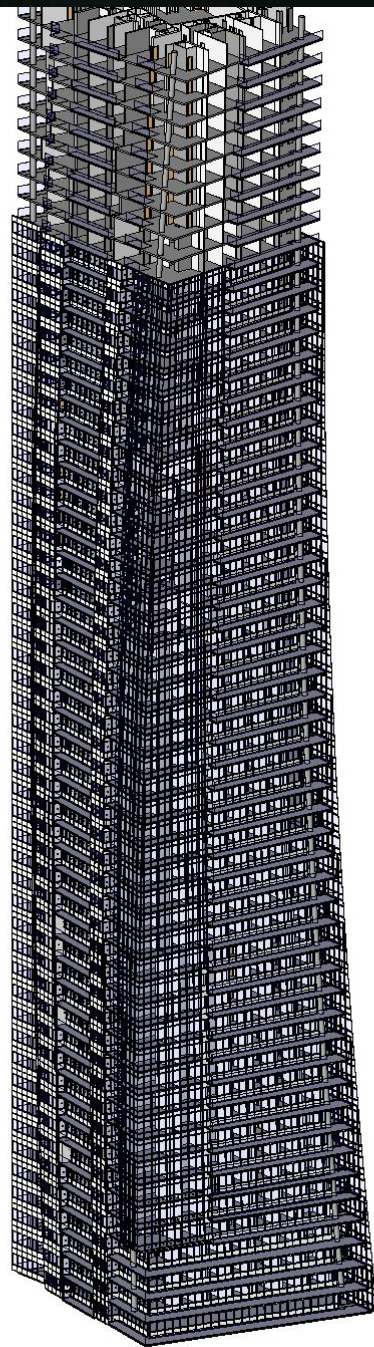
















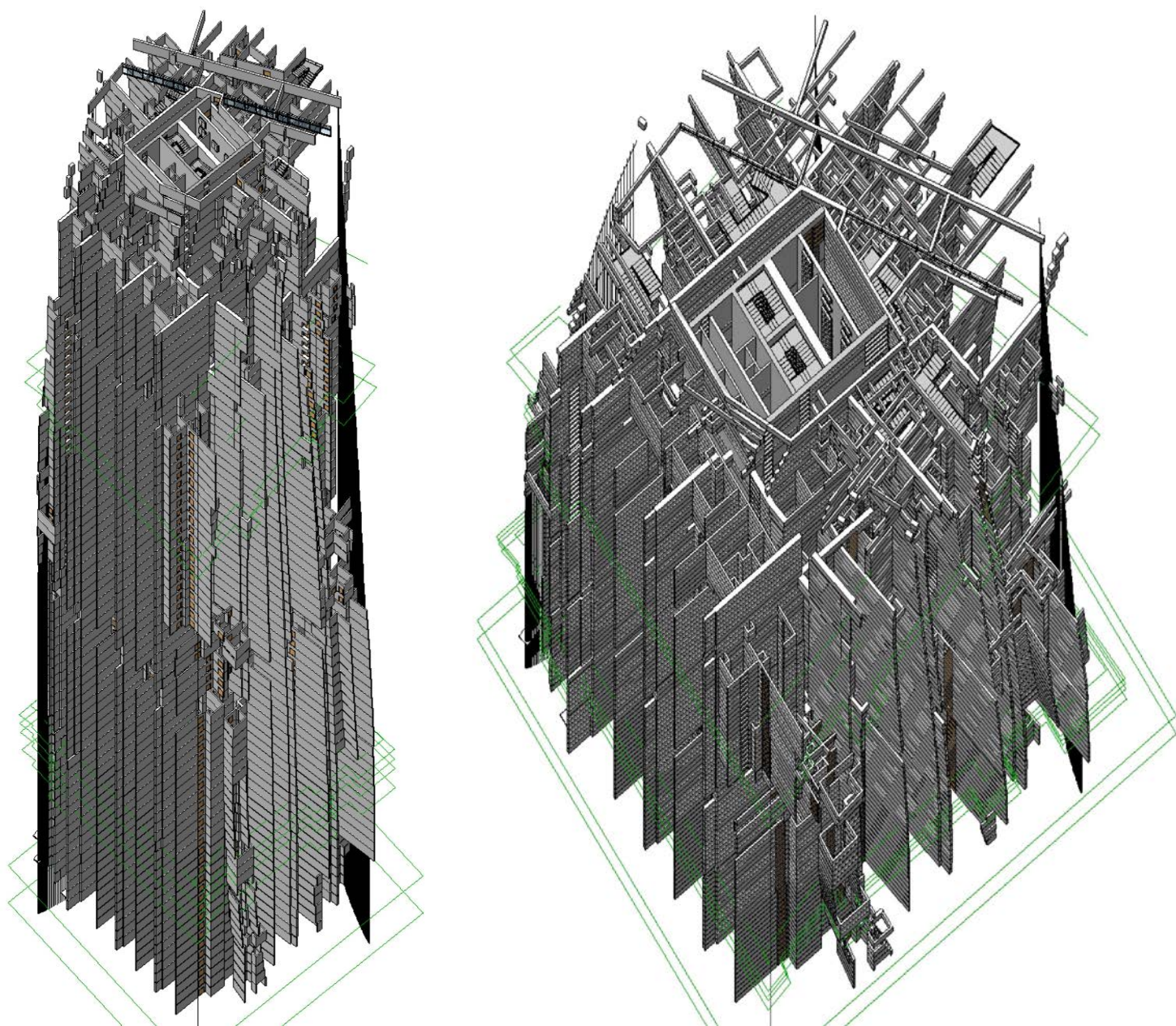




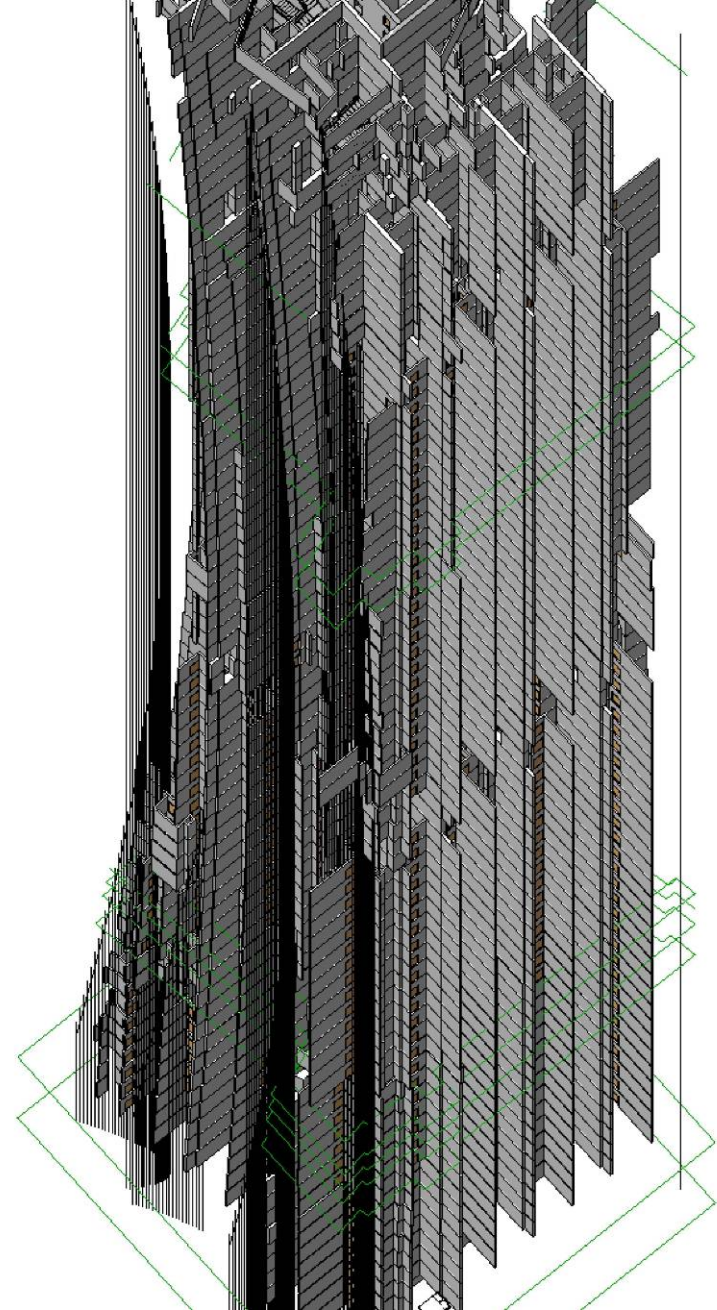
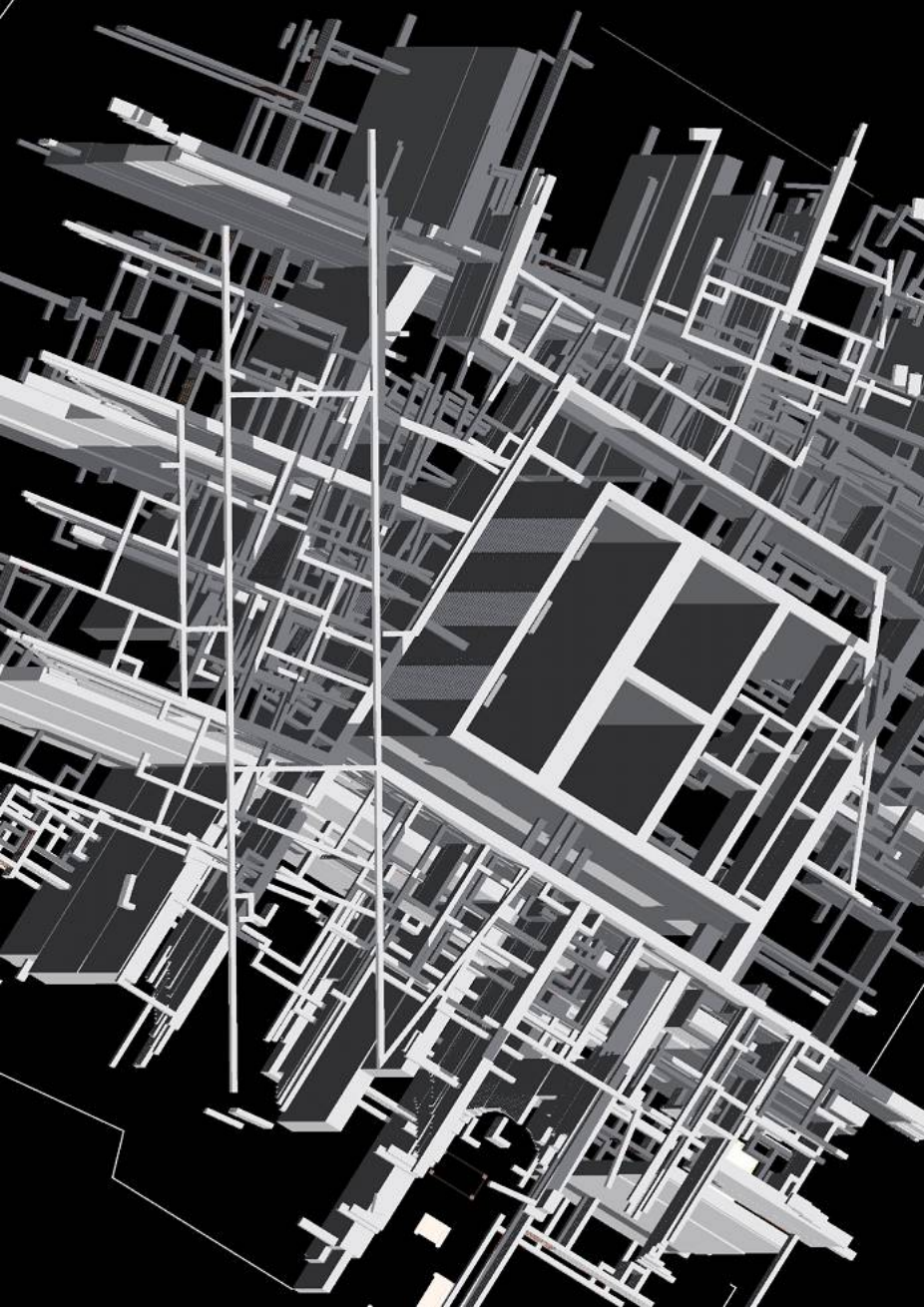




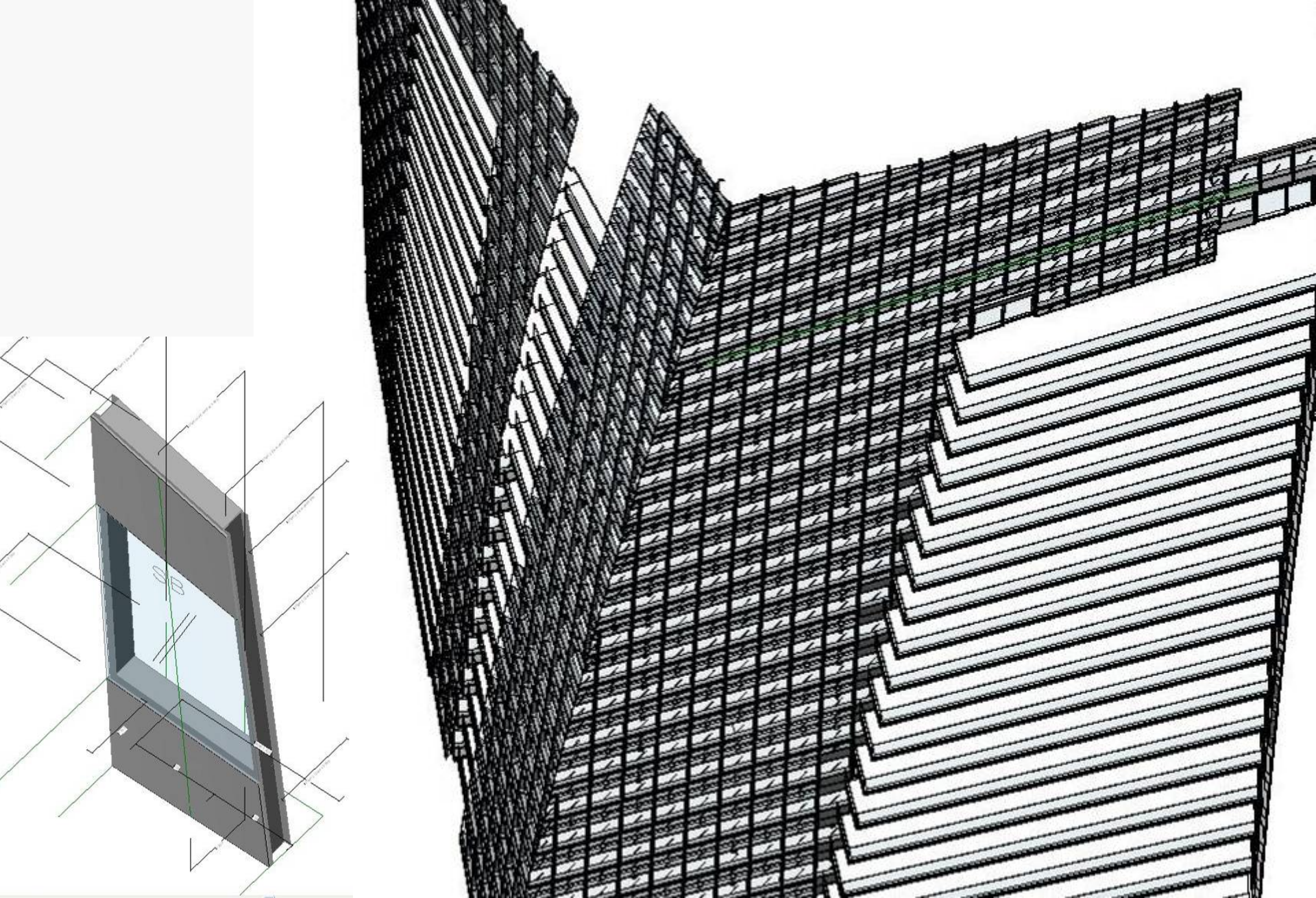




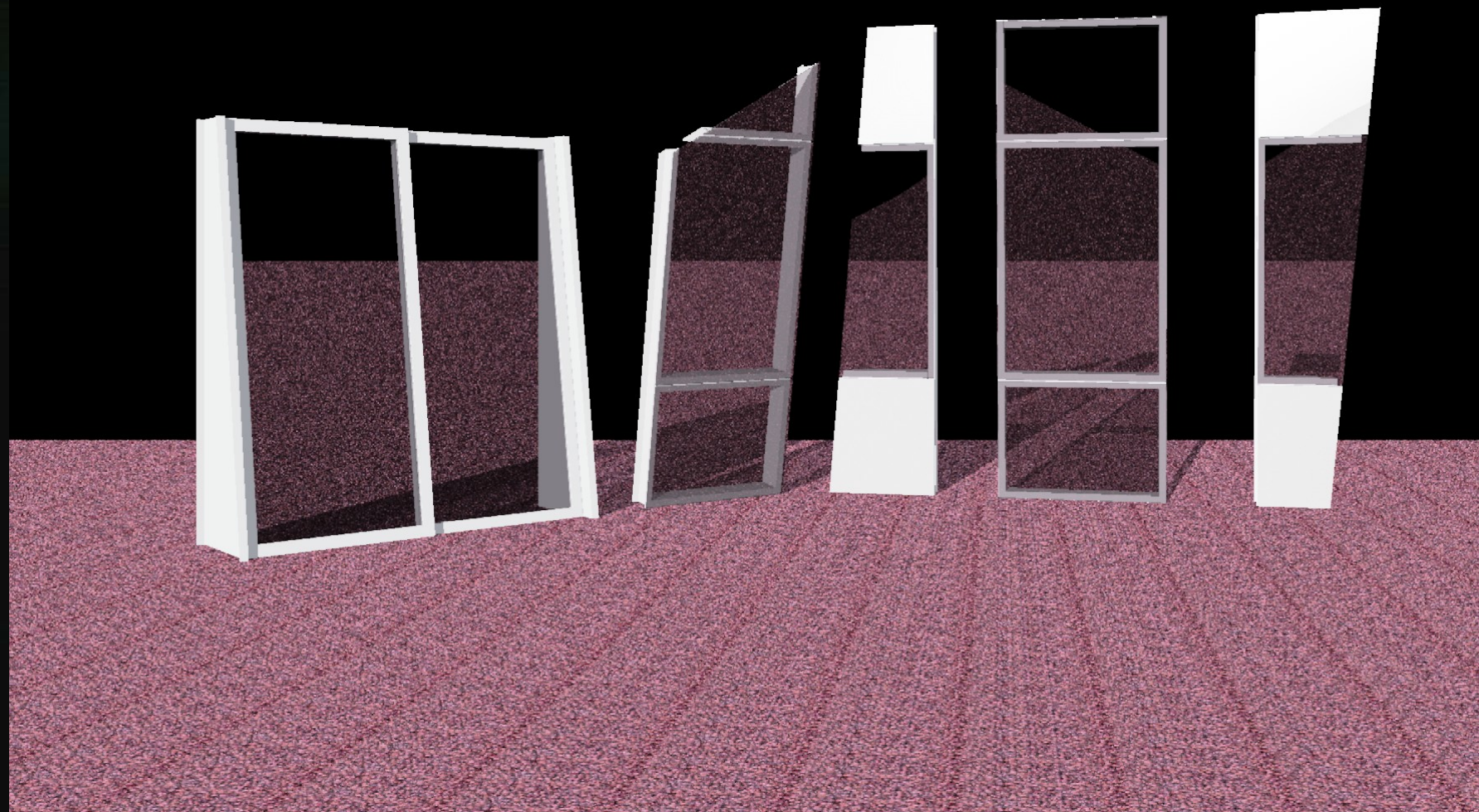
VERTICAL CO-ORDINATION



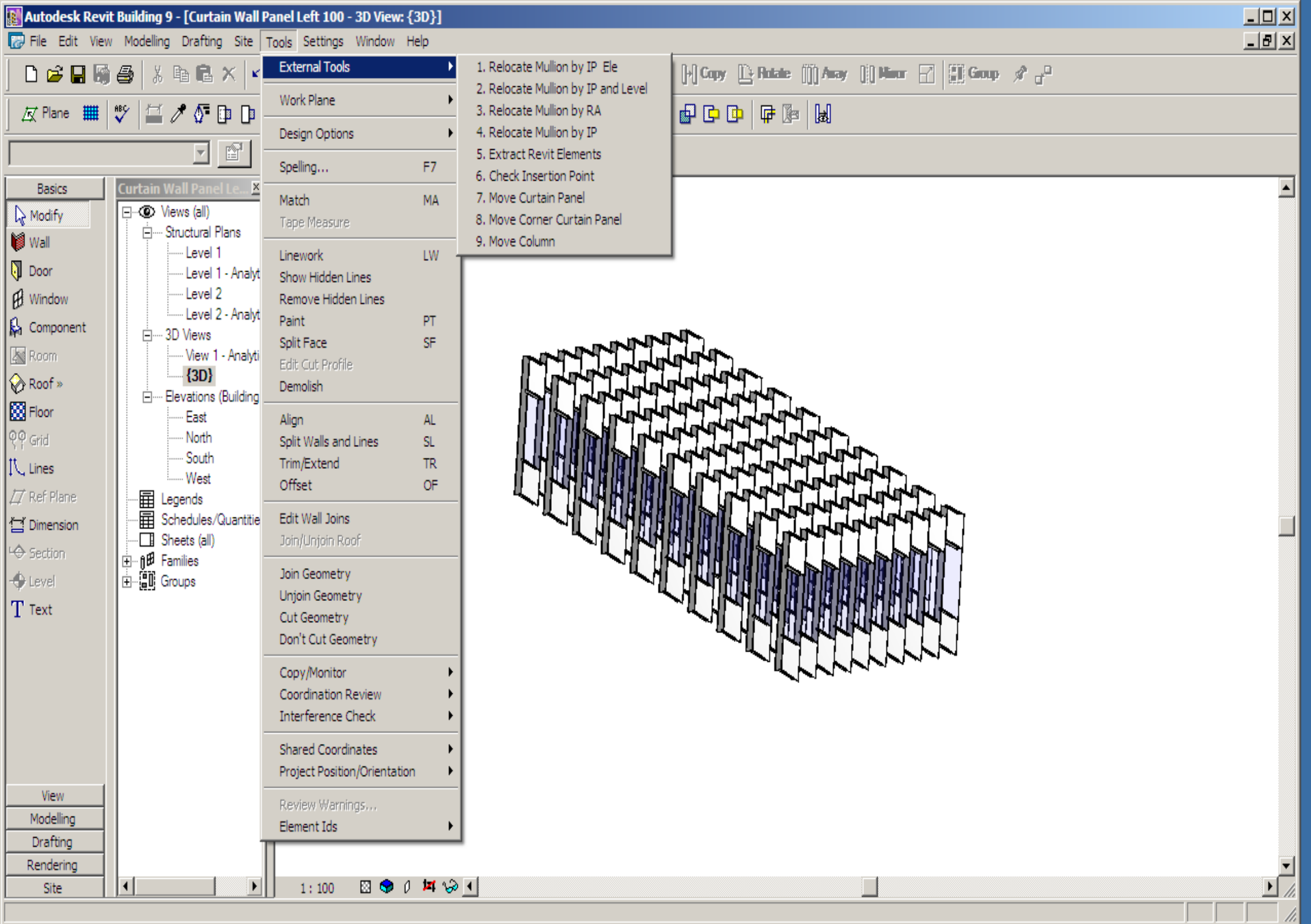
INTERNAL vs EXTERNAL

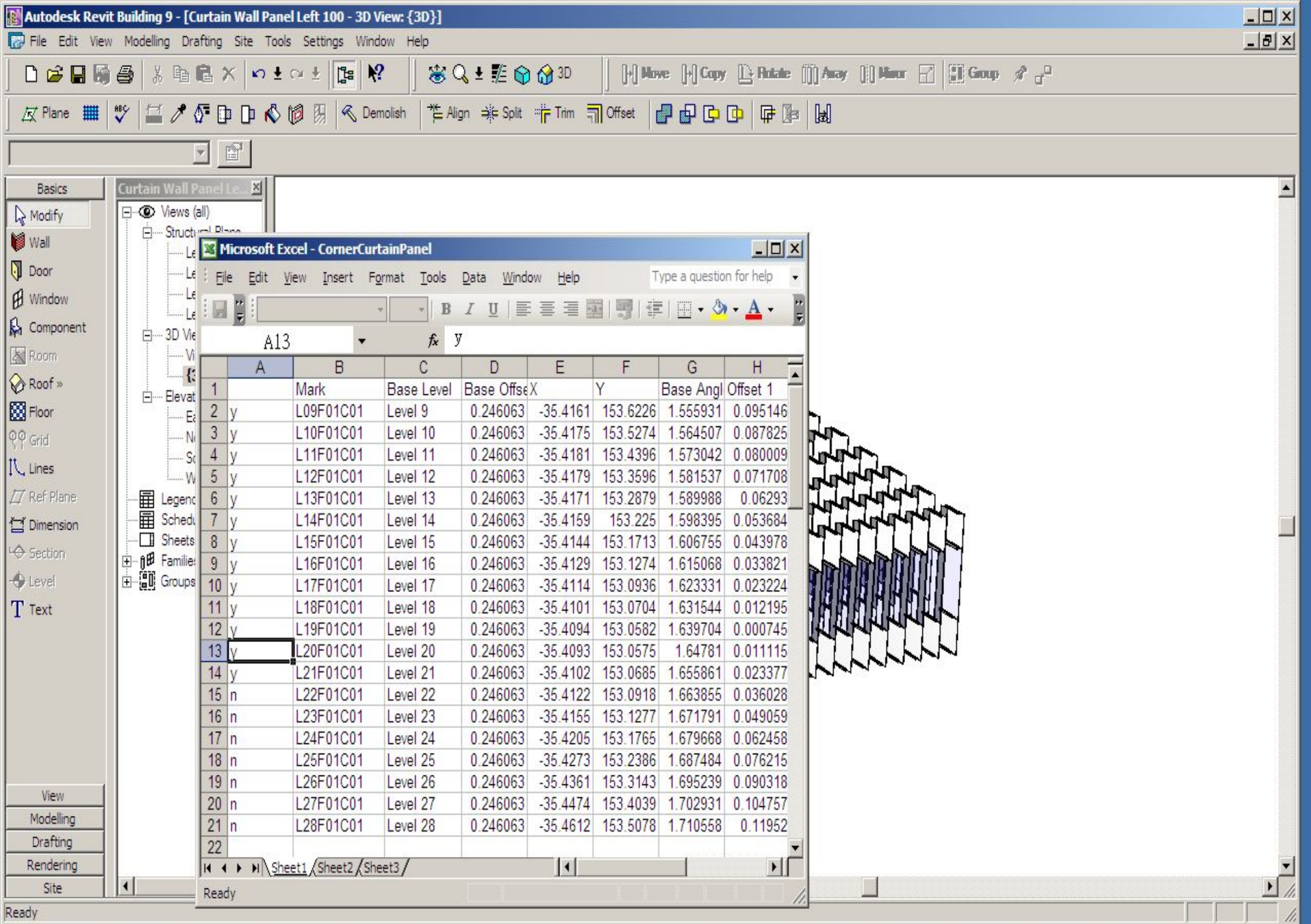


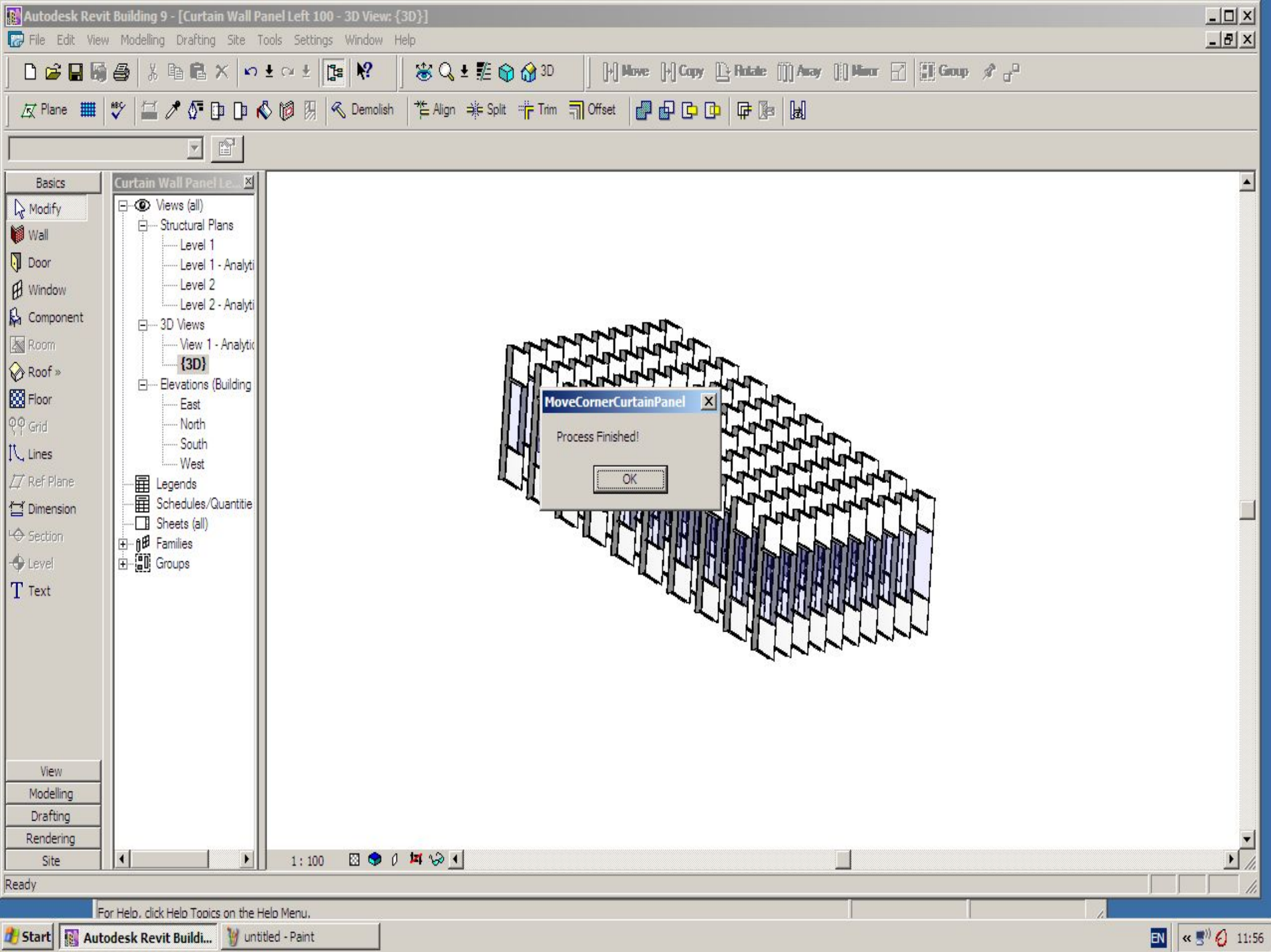
COMPLICATED CURTAIN WALL

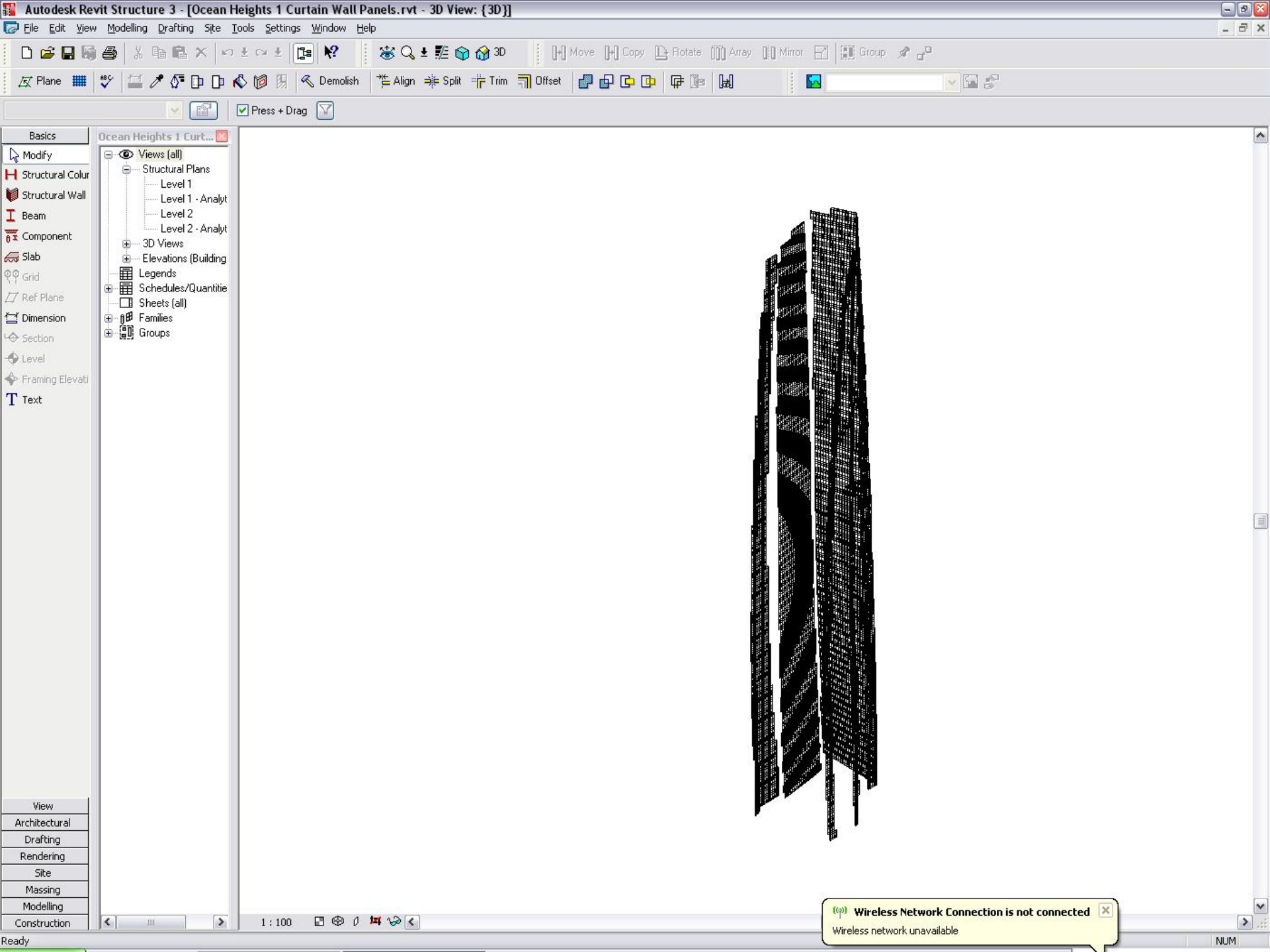


Ref Plane	Level 20	Sliding Door	L71B05D12	Level 71	2550.00		0.00
Dimension	Level 30	Sliding Door	L71B05D15	Level 71	2550.00		0.00
Section	Level 40	Sliding Door	L72B01D02	Level 72	2400.00		0.00
Level	Level 50	Sliding Door	L72B02D02	Level 72	2500.00		0.00
Framing Elevati	Level 60	Sliding Door	L72B04D01	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					











Dubai Construction Update
ImreSolt.com - 2010 ©



Organic Architecture — 流線型建築

現代建築大師

Frank O. Gehry



Frank O. Gehry



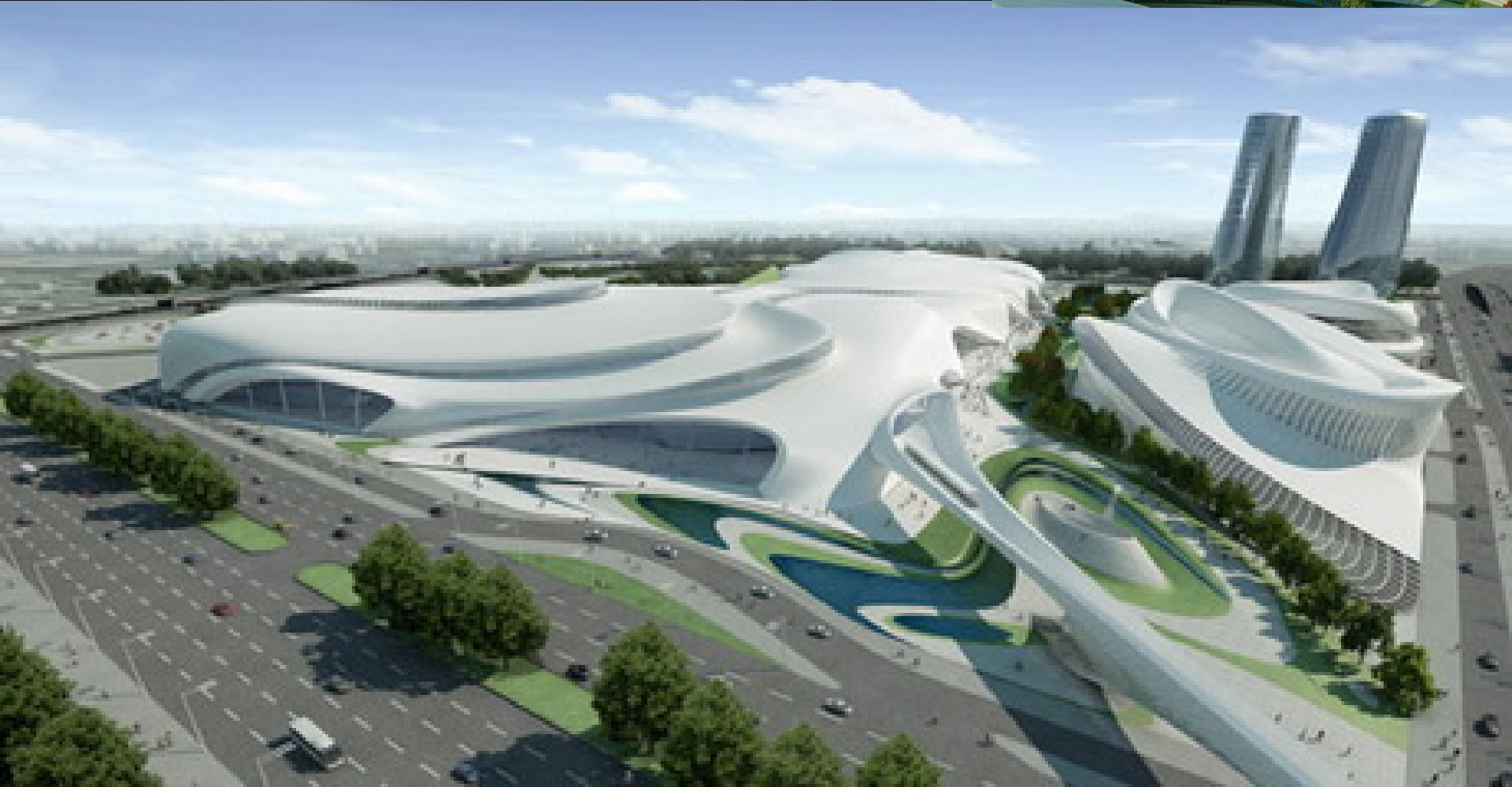
Frank O. Gehry



Santiago Calatrava



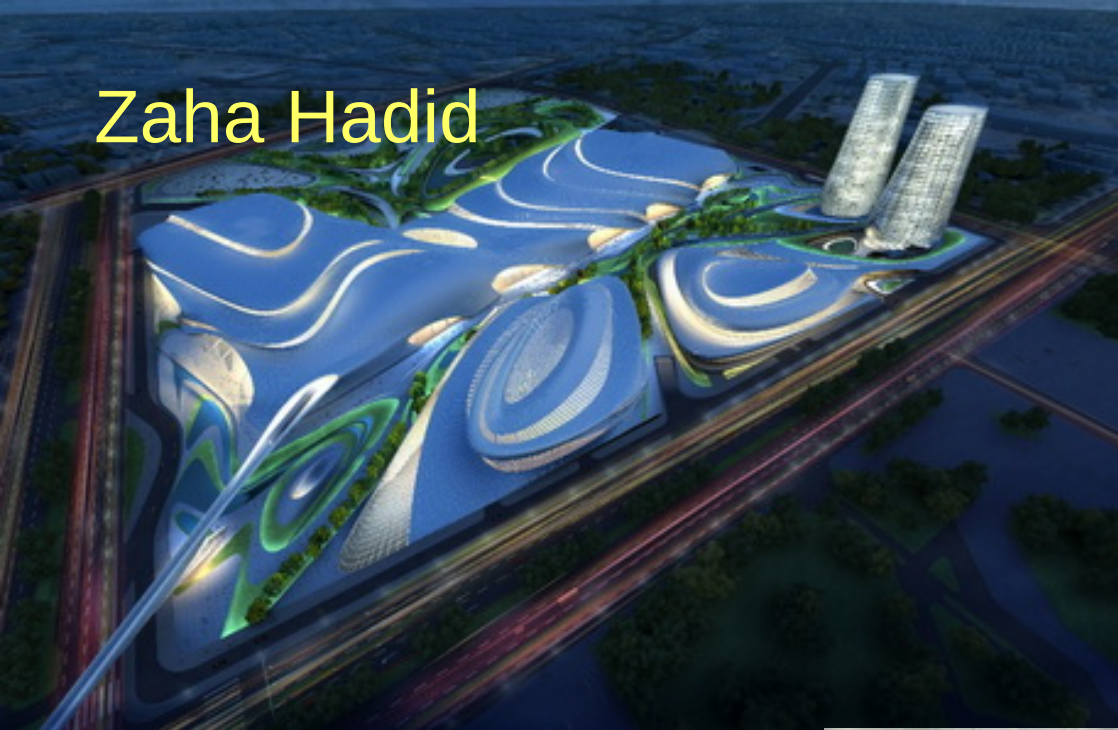
Zaha Hadid



Zaha Hadid



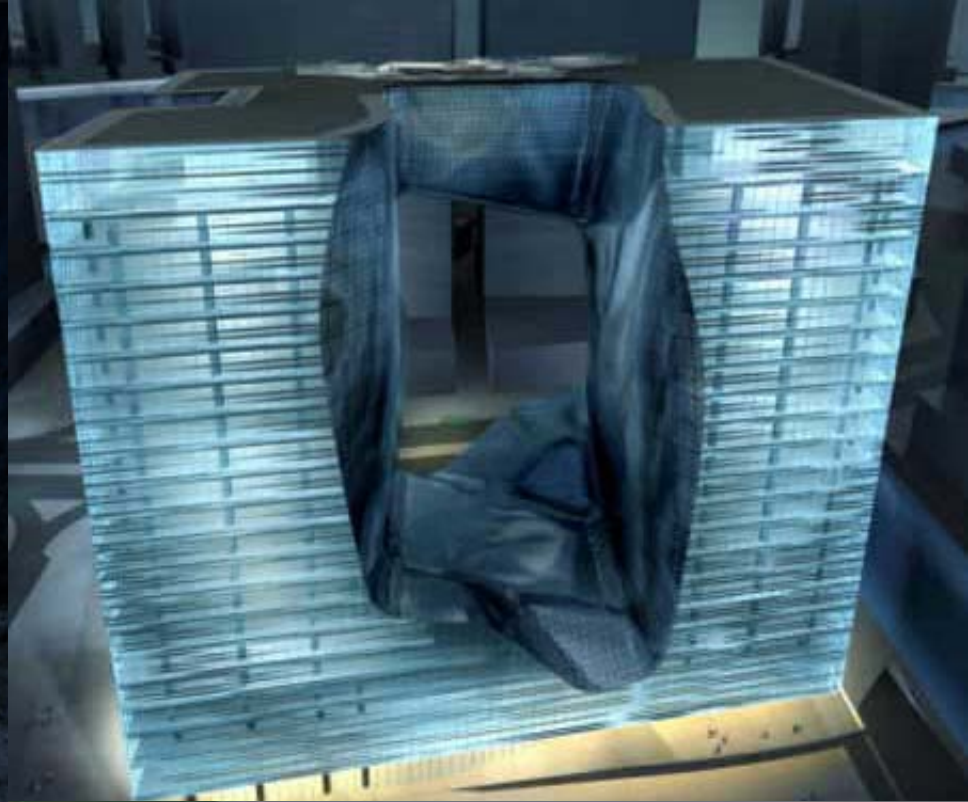
Zaha Hadid



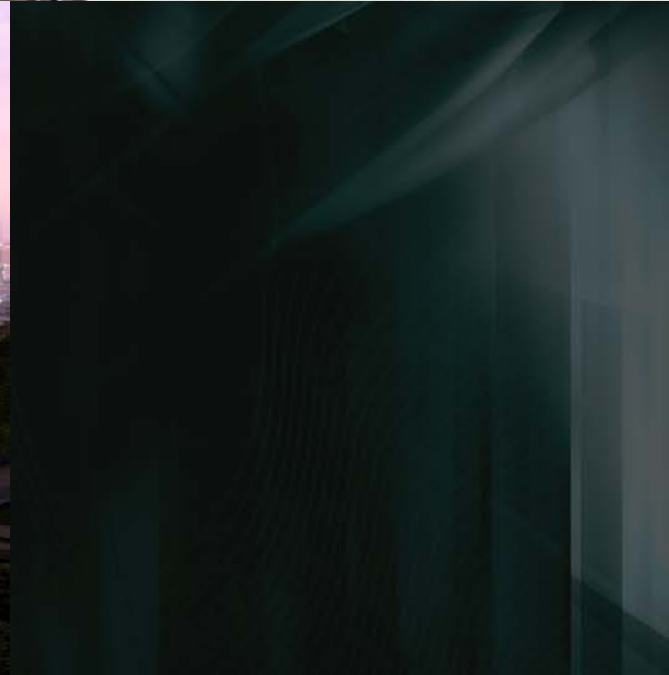
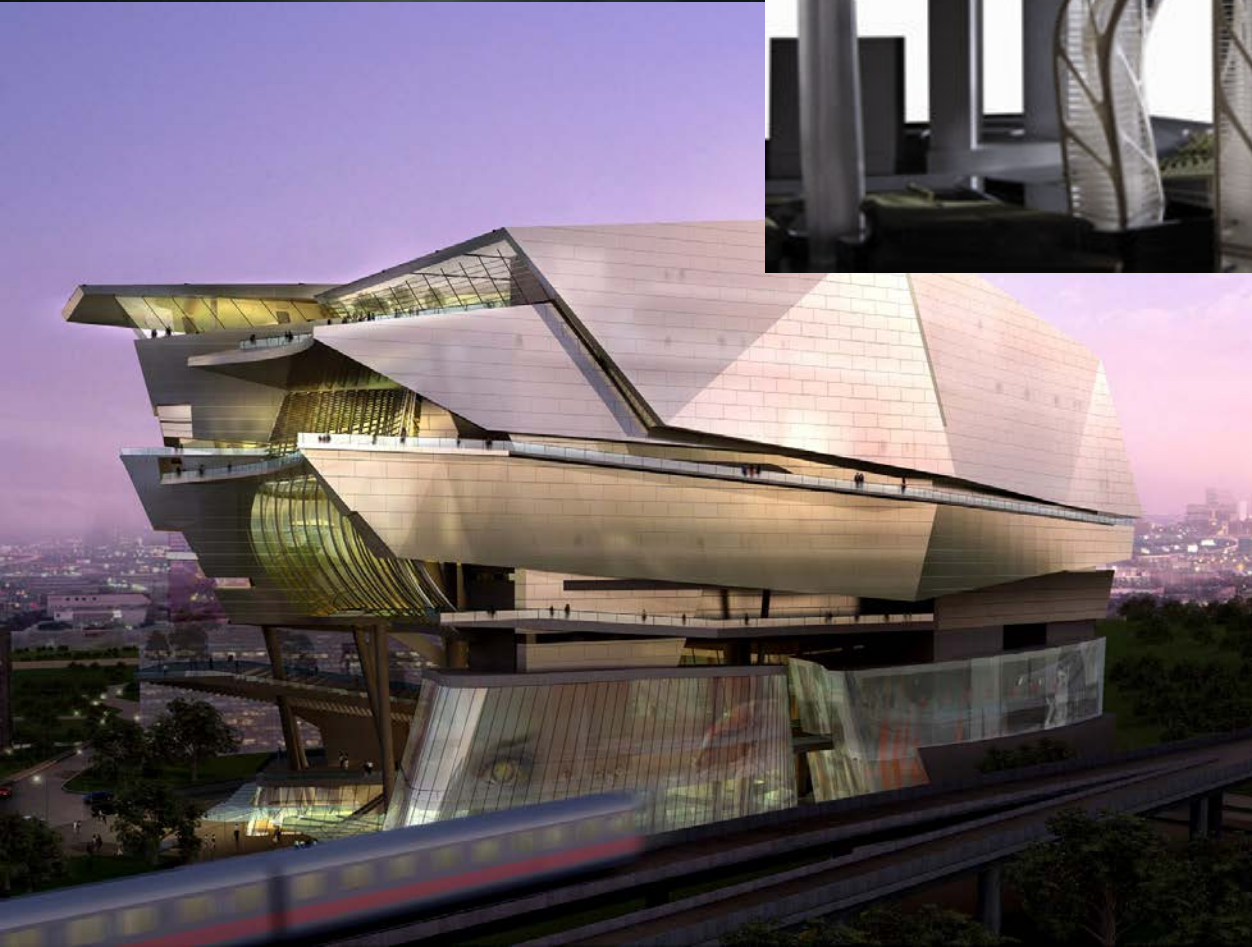
Zaha Hadid



Zaha Hadid



Aedas



Aedas

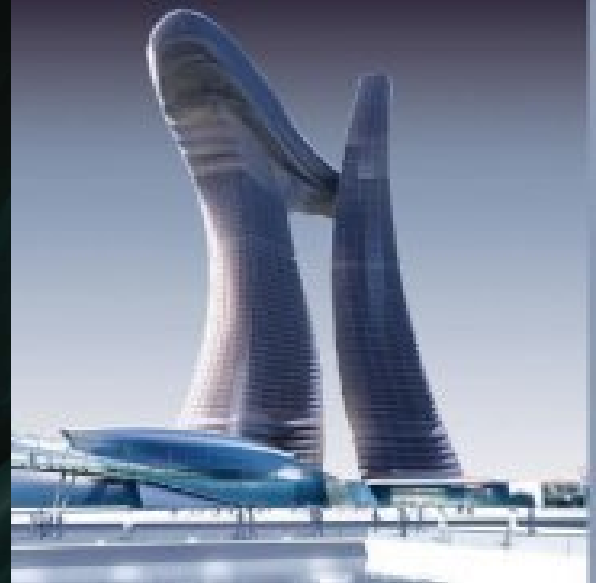
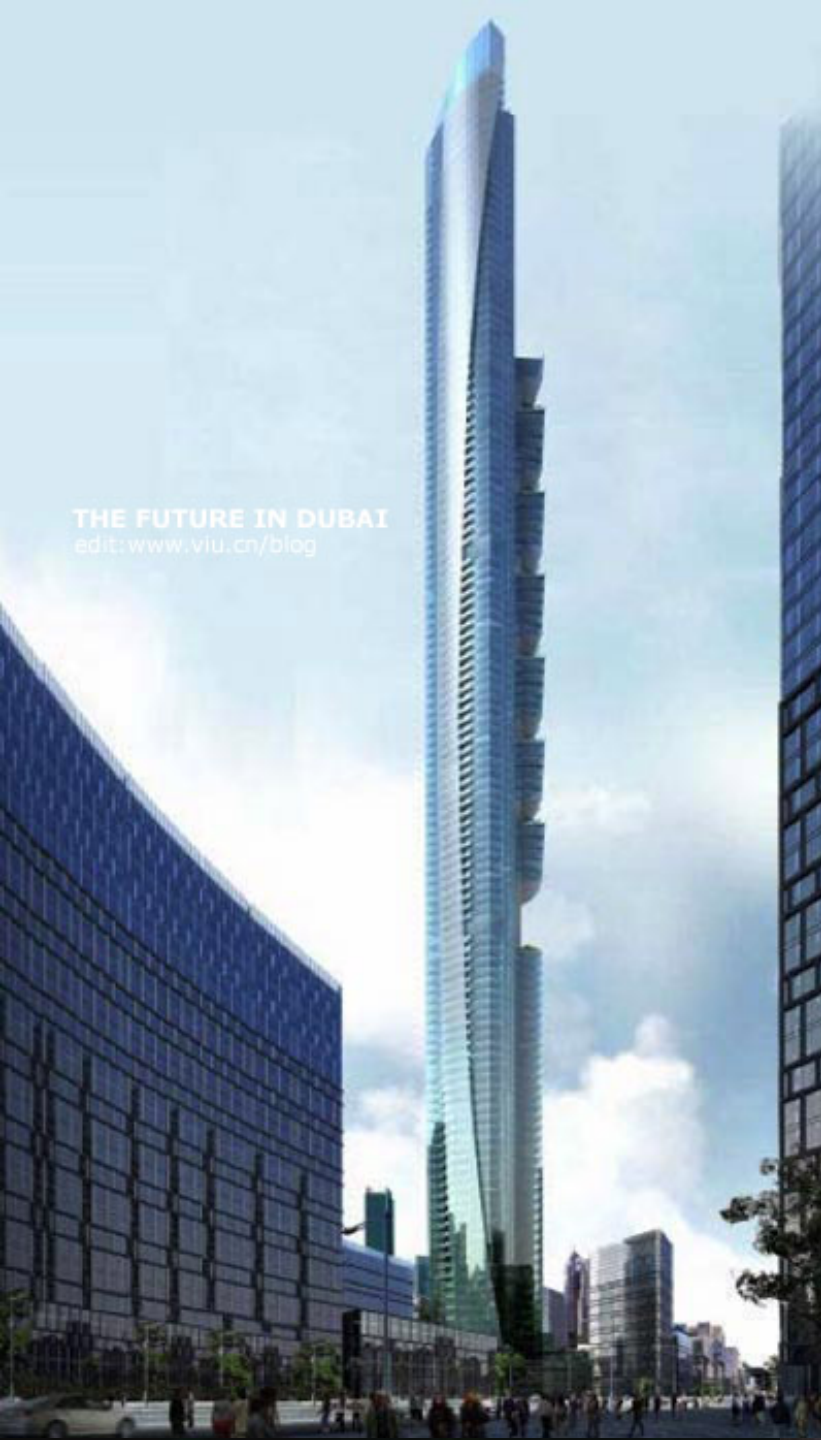


Aedas



Aedas

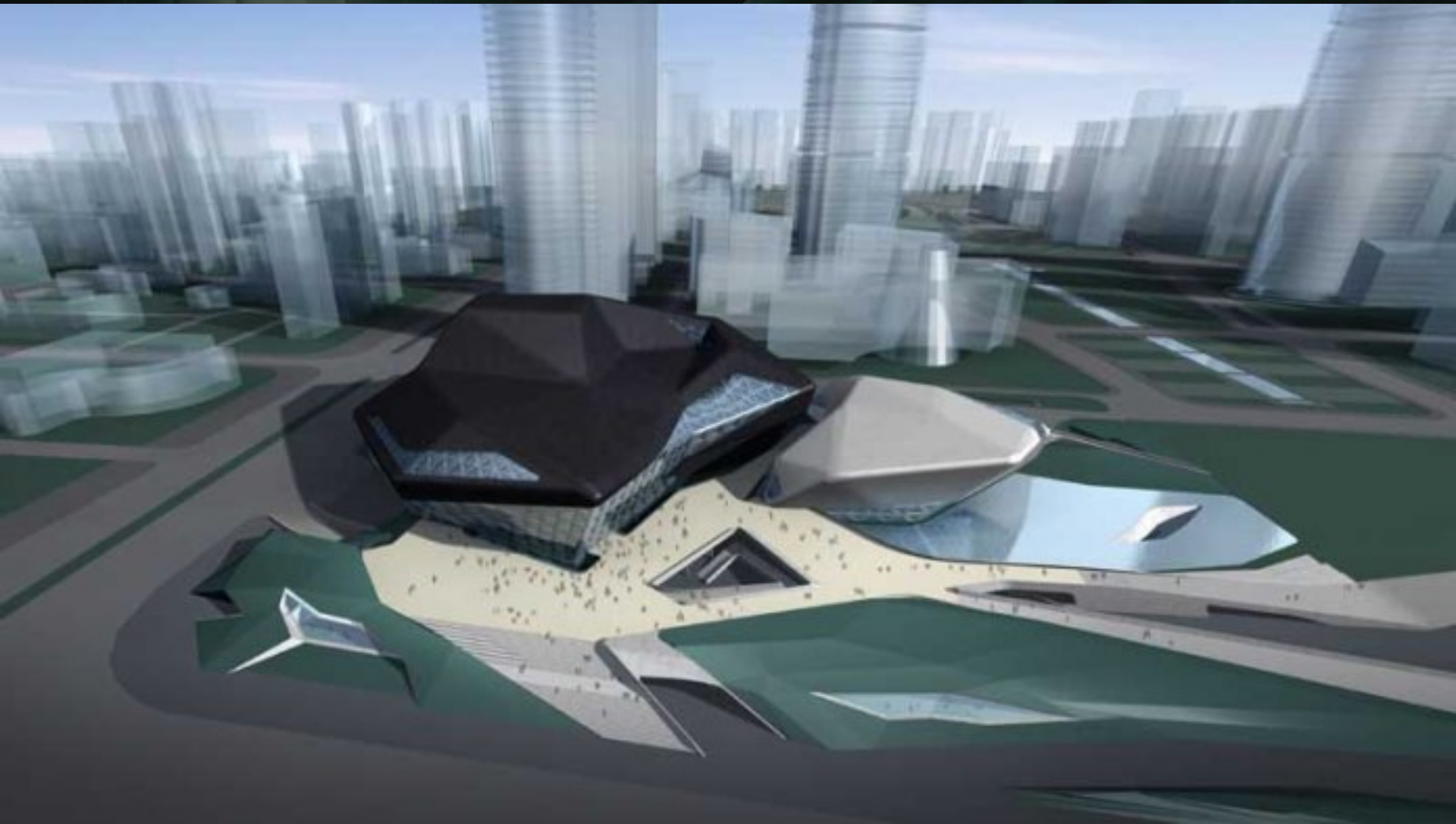
THE FUTURE IN DUBAI
edit: www.viu.cn/blog



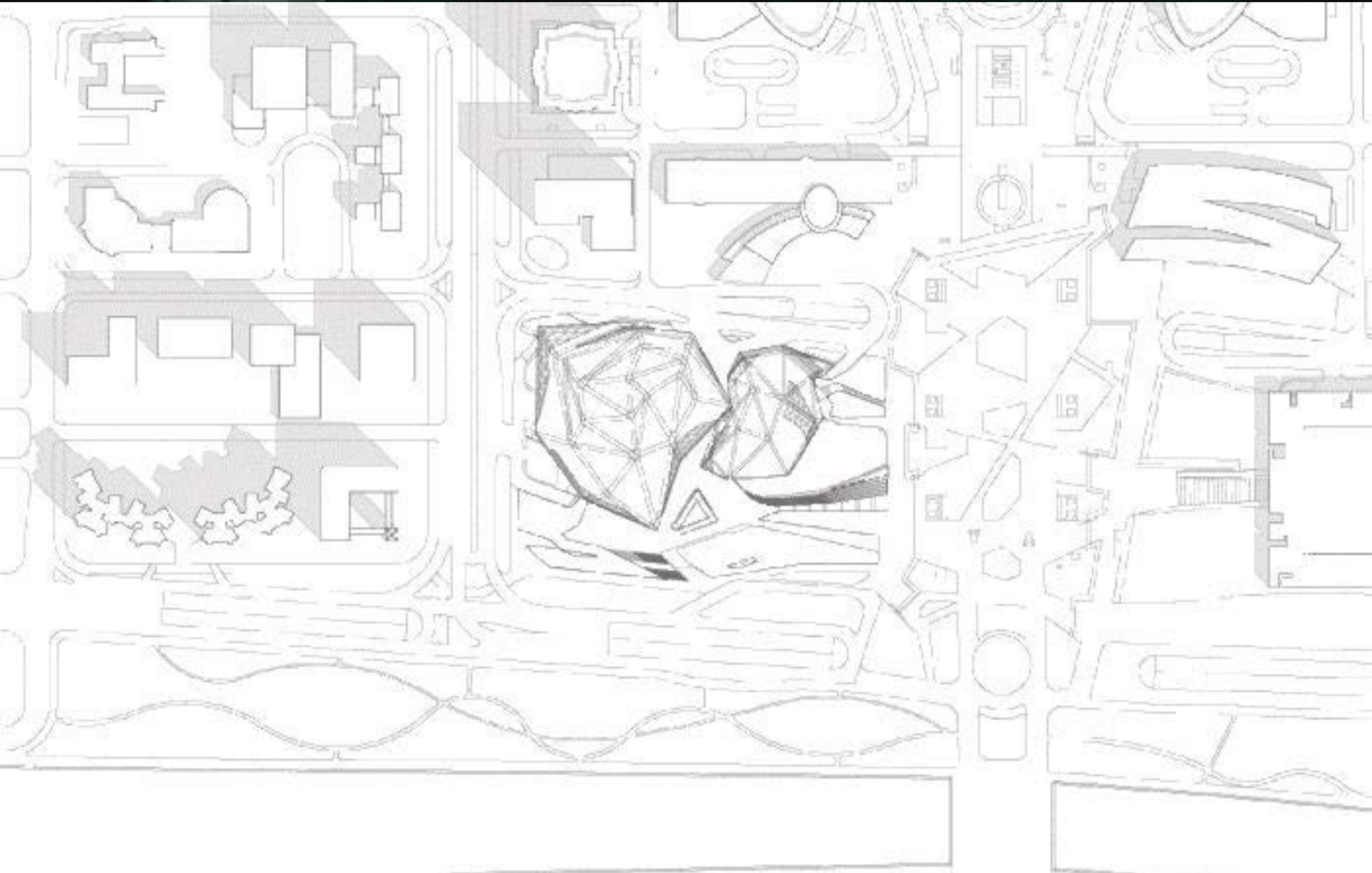
Zaha Hadid Guangzhou Opera House



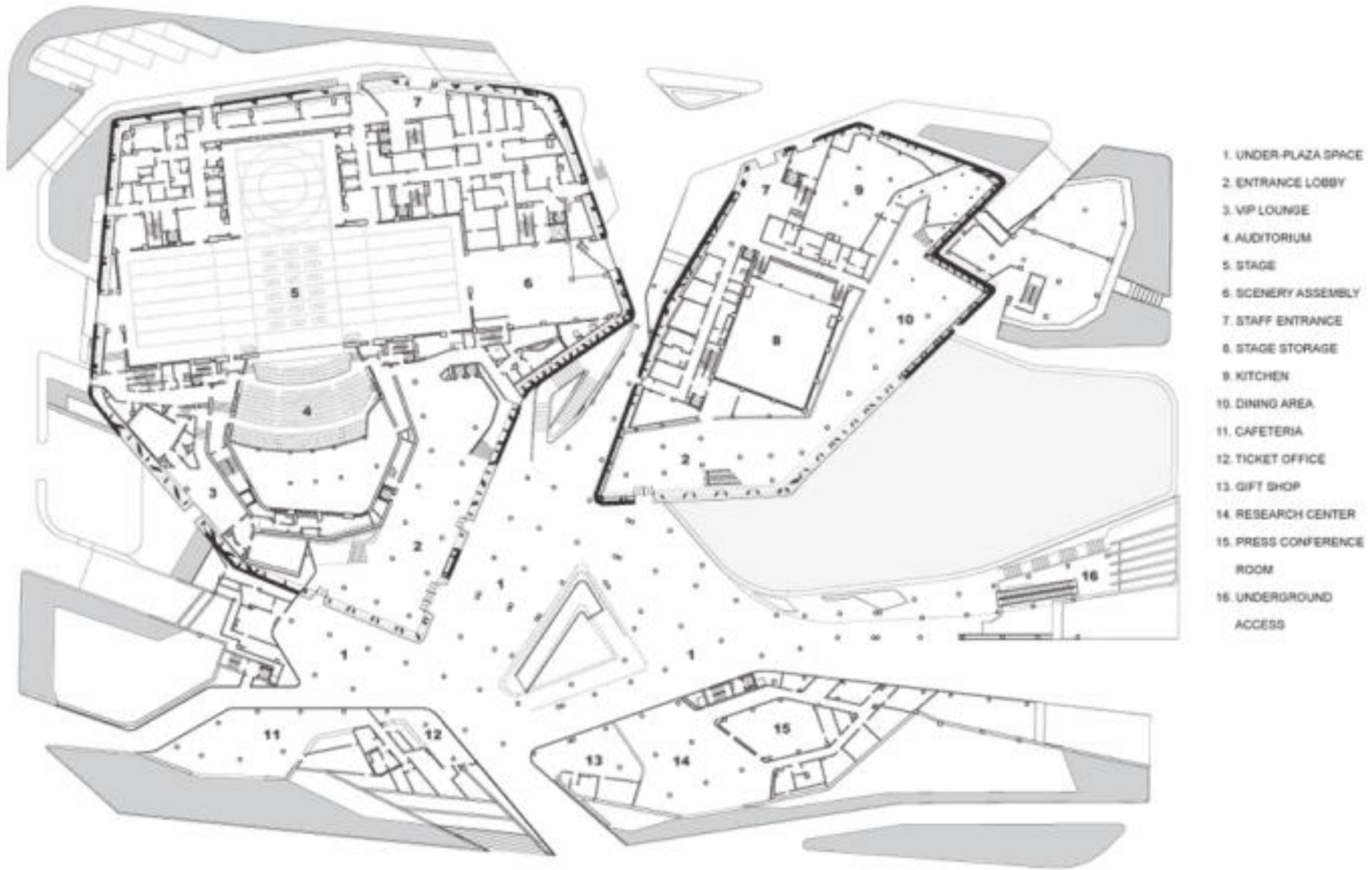
Zaha Hadid Guangzhou Opera House



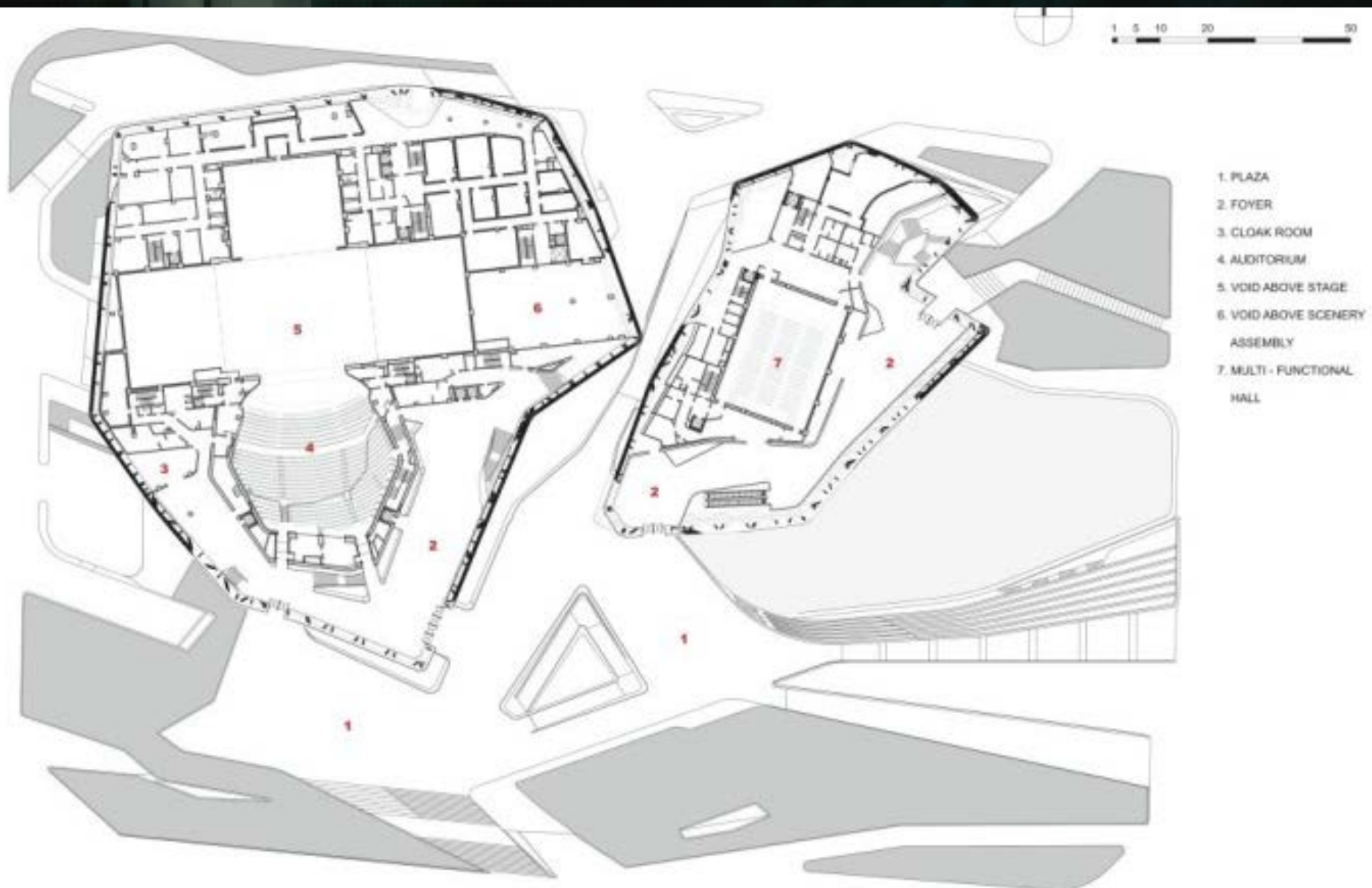
Zaha Hadid Guangzhou Opera House



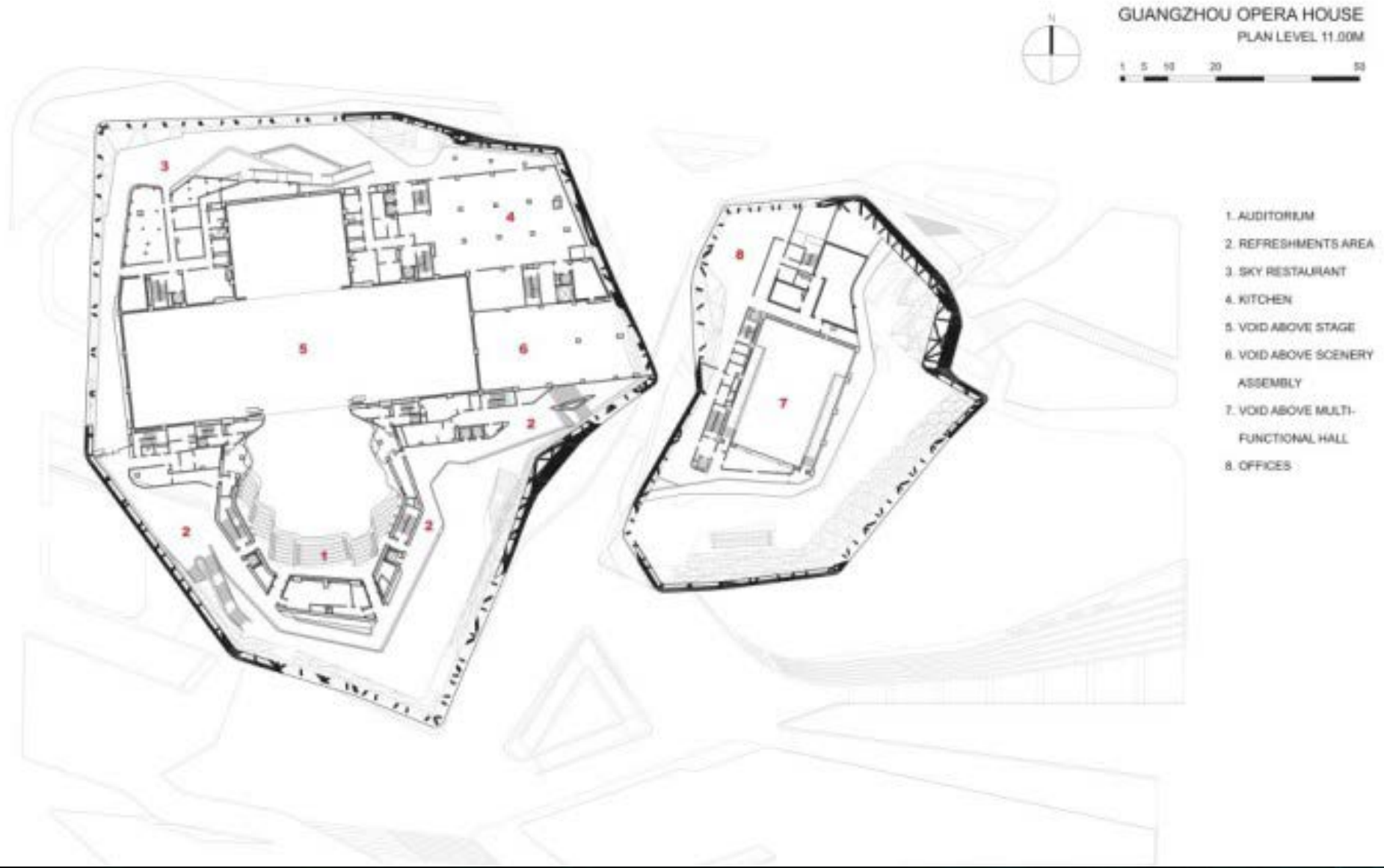
Zaha Hadid Guangzhou Opera House



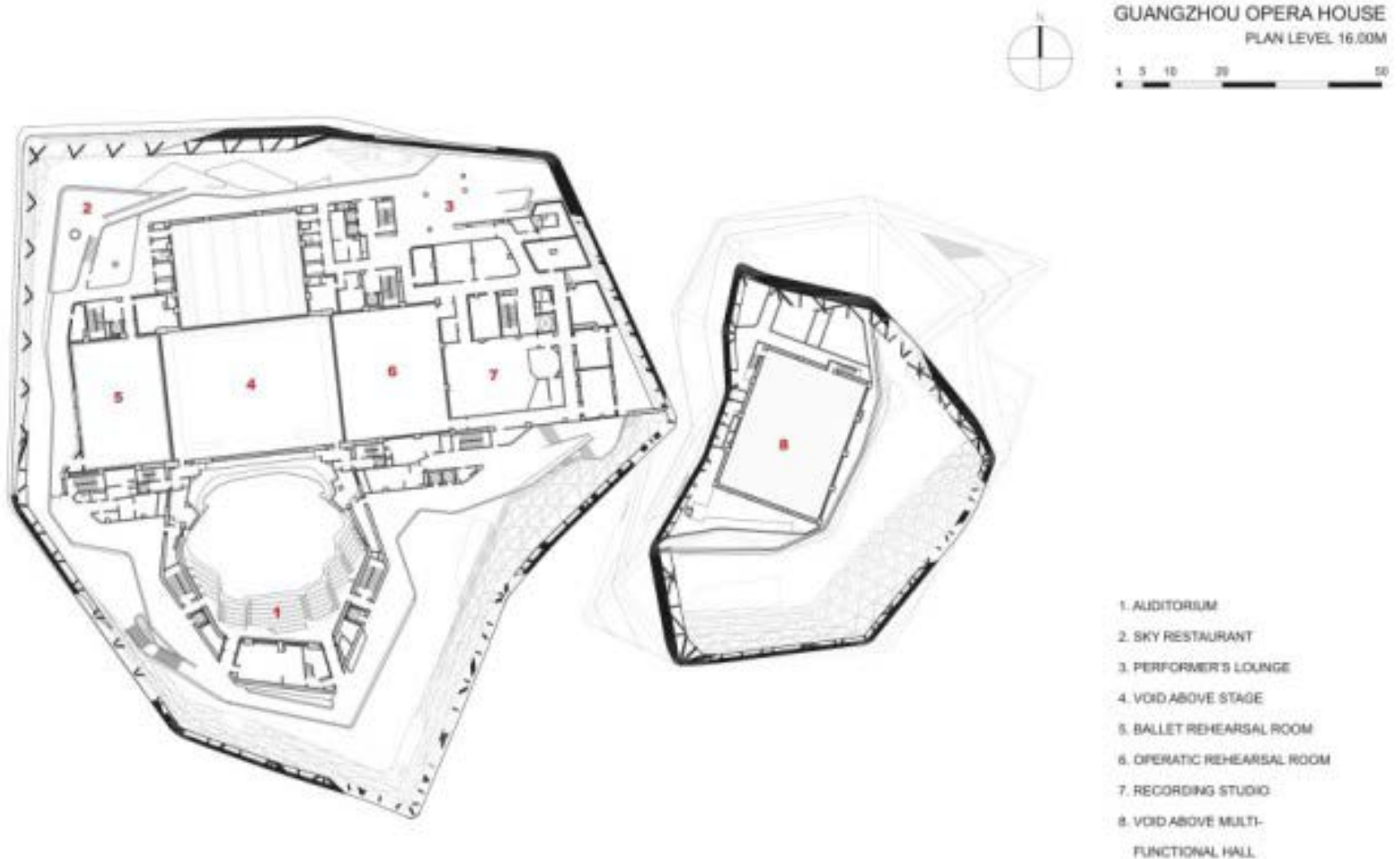
Zaha Hadid Guangzhou Opera House



Zaha Hadid Guangzhou Opera House



Zaha Hadid Guangzhou Opera House

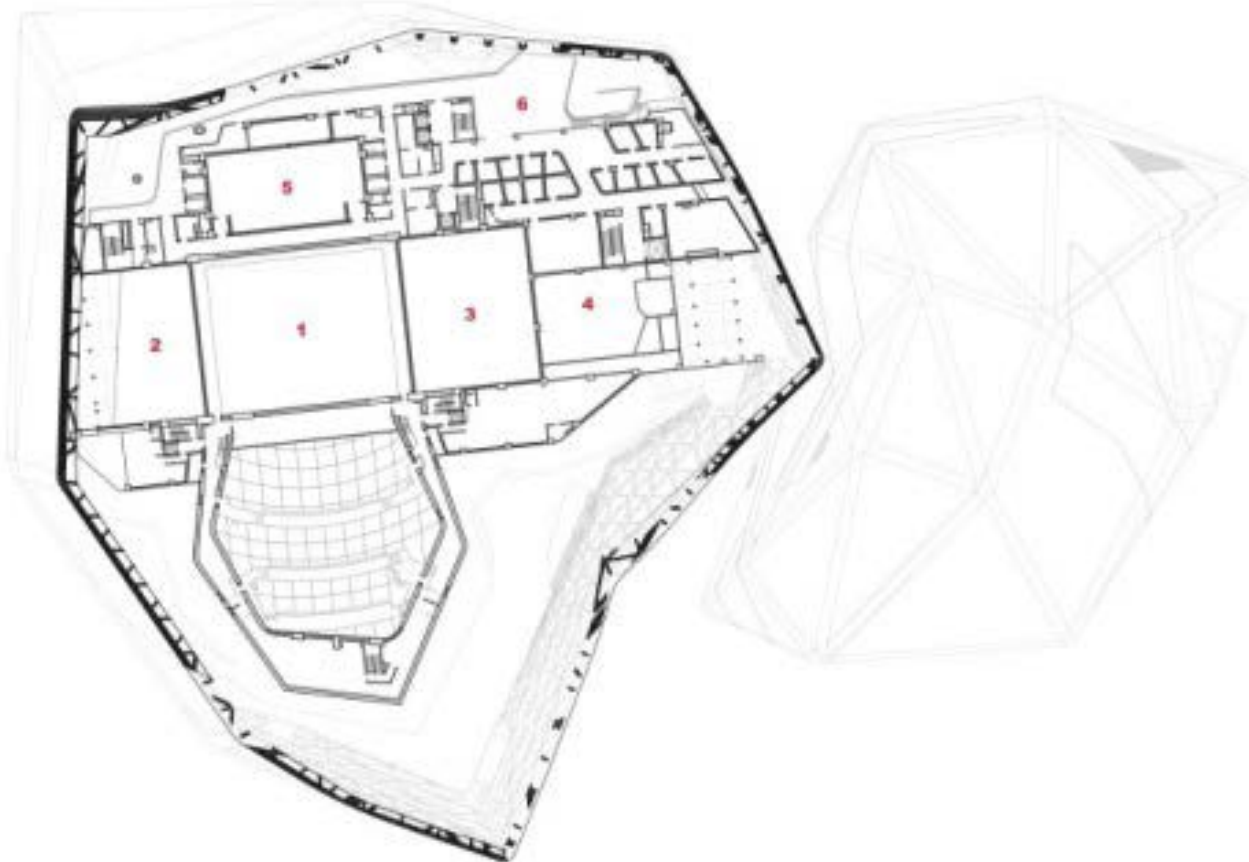


Zaha Hadid Guangzhou Opera House



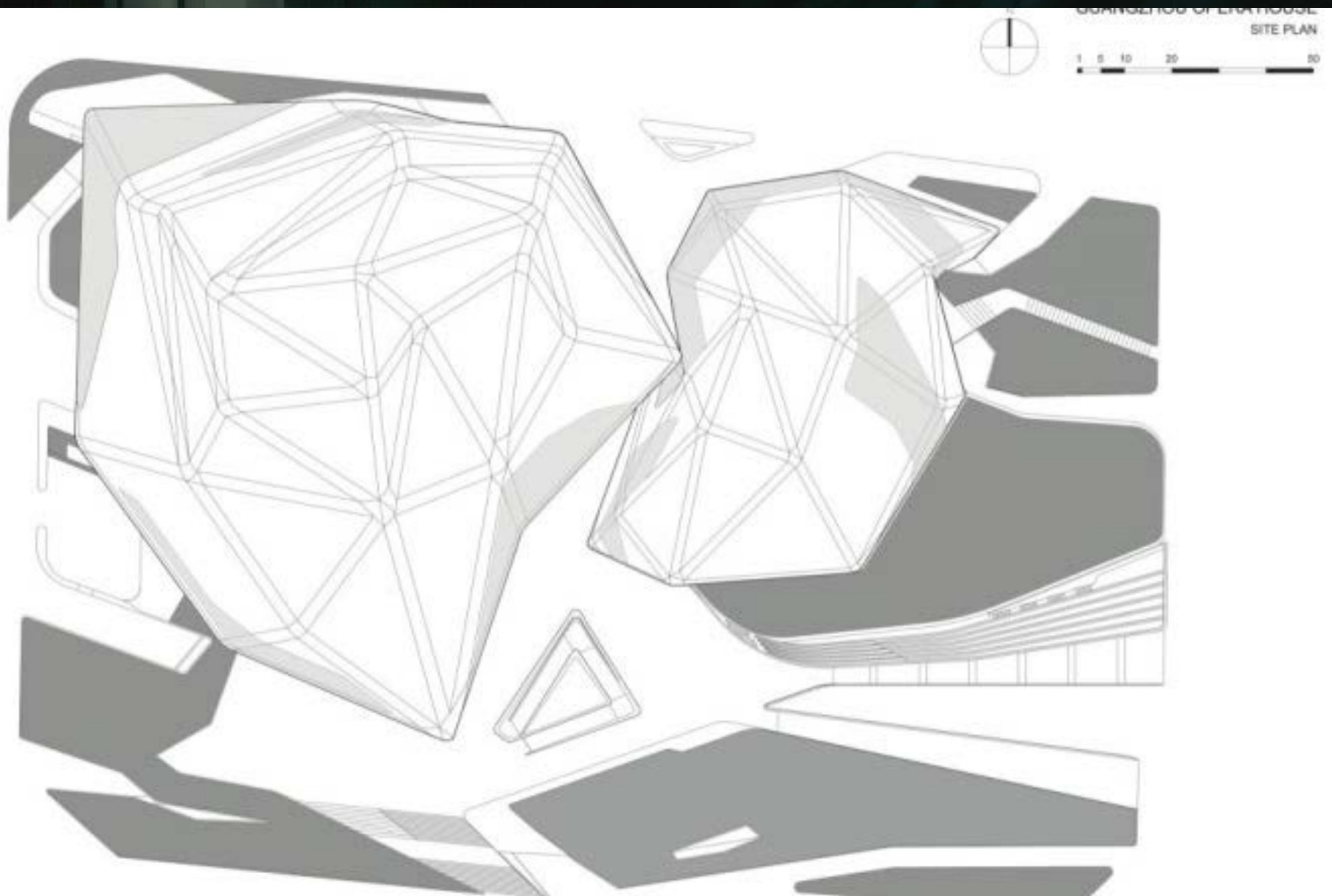
GUANGZHOU OPERA HOUSE
PLAN LEVEL 20.50M

1 5 10 20 50

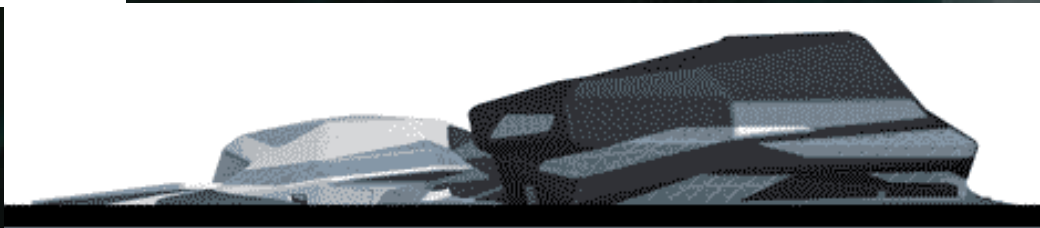
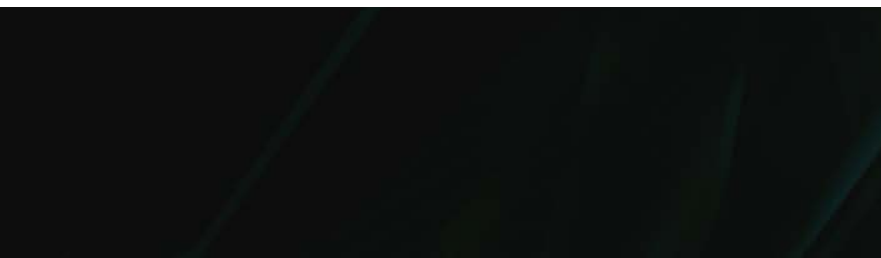
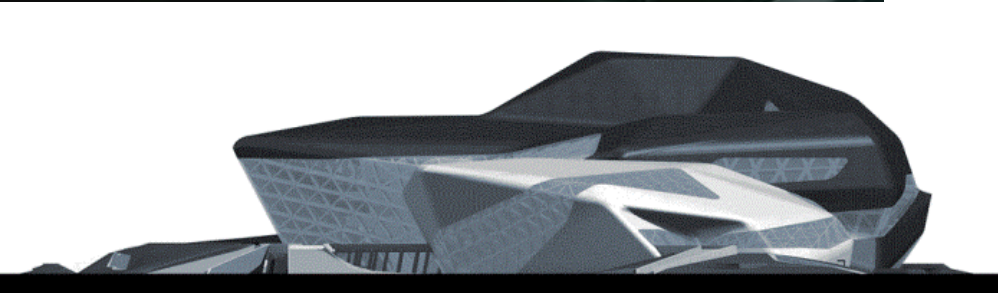
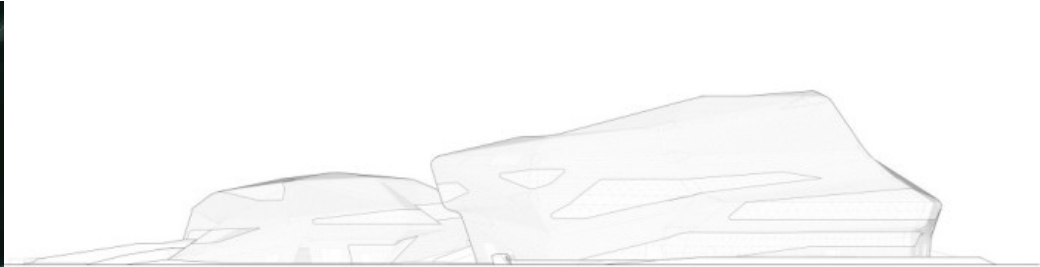
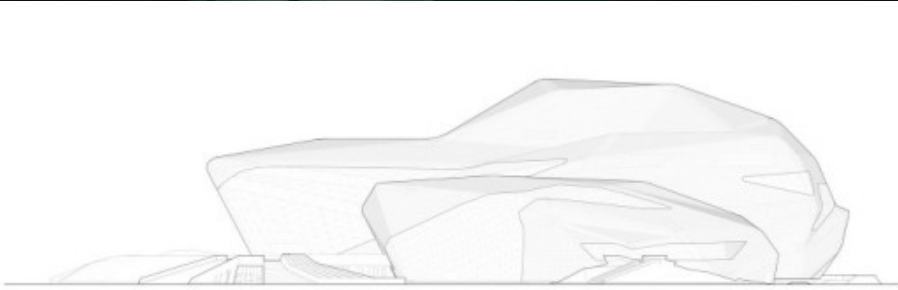


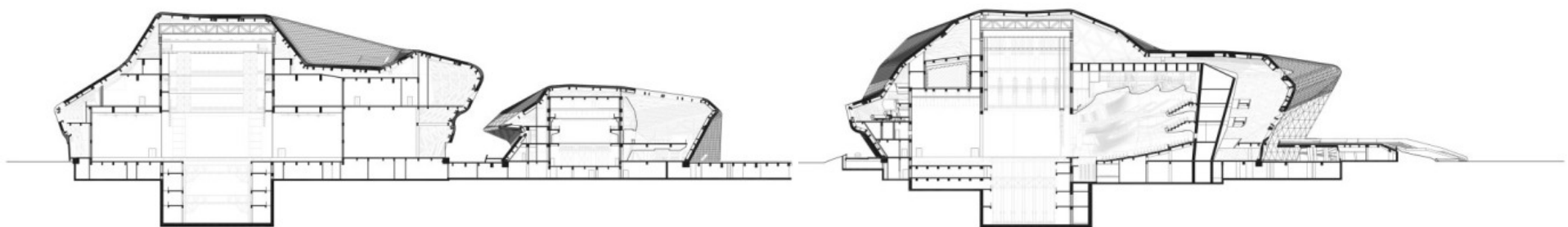
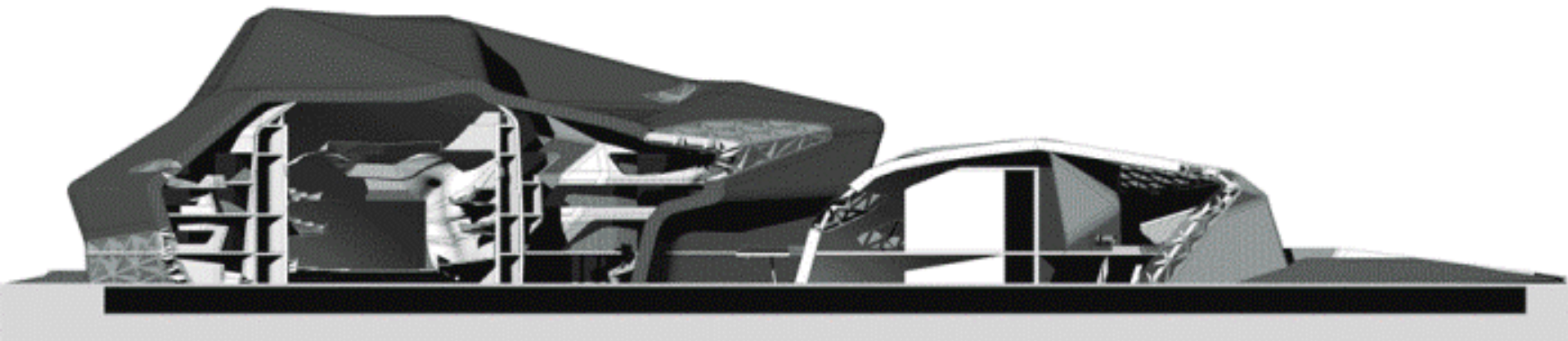
- 1. VOID ABOVE STAGE
- 2. VOID ABOVE BALLET REHEARSAL
- 3. VOID ABOVE OPERATIC REHEARSAL
- 4. VOID ABOVE RECORDING STUDIO
- 5. ORCHESTRA REHEARSAL ROOM
- 6. PERFORMERS' LOUNGE

Zaha Hadid Guangzhou Opera House

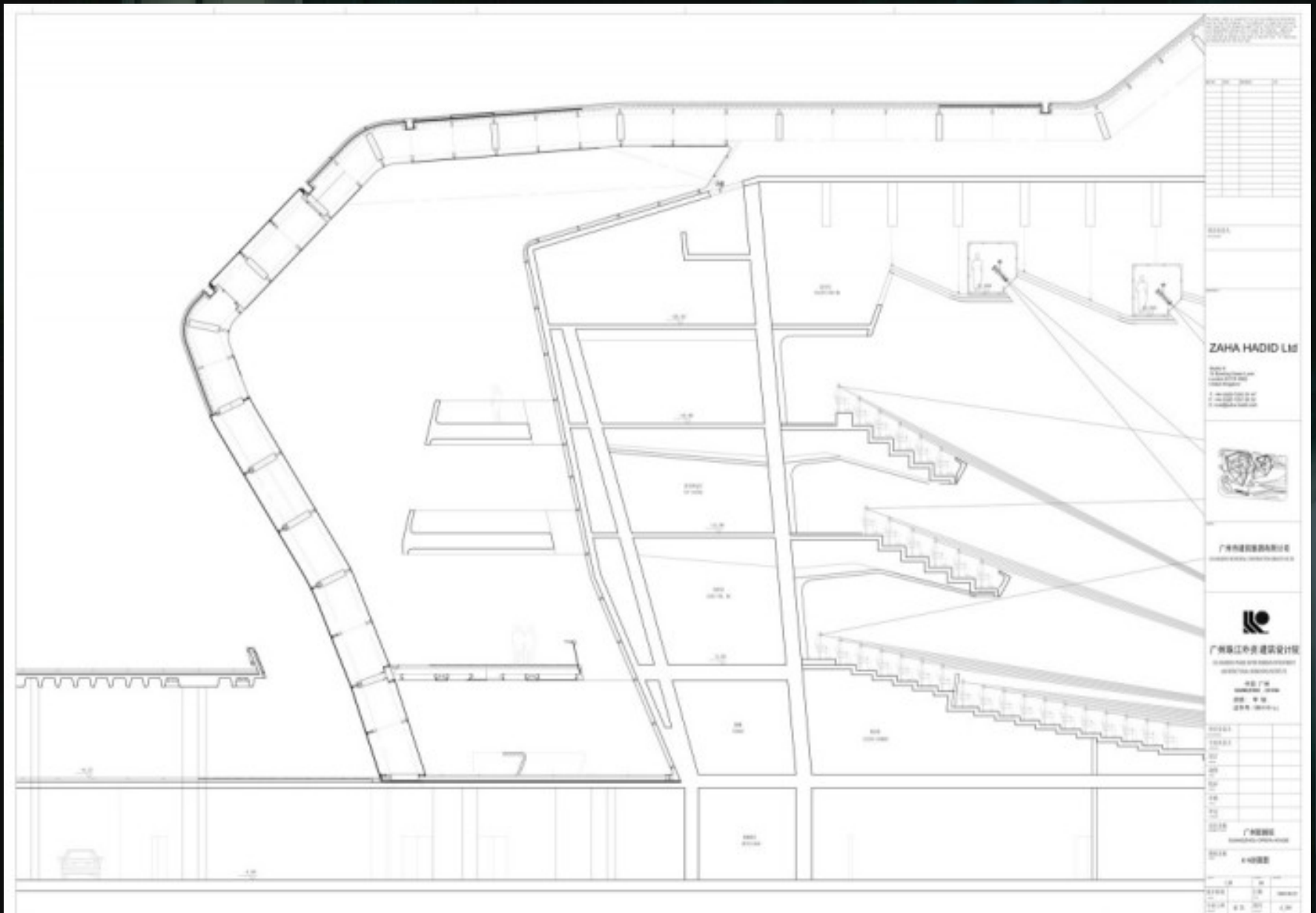


Zaha Hadid Guangzhou Opera House





Zaha Hadid Guangzhou Opera House



Zaha Hadid Guangzhou Opera House



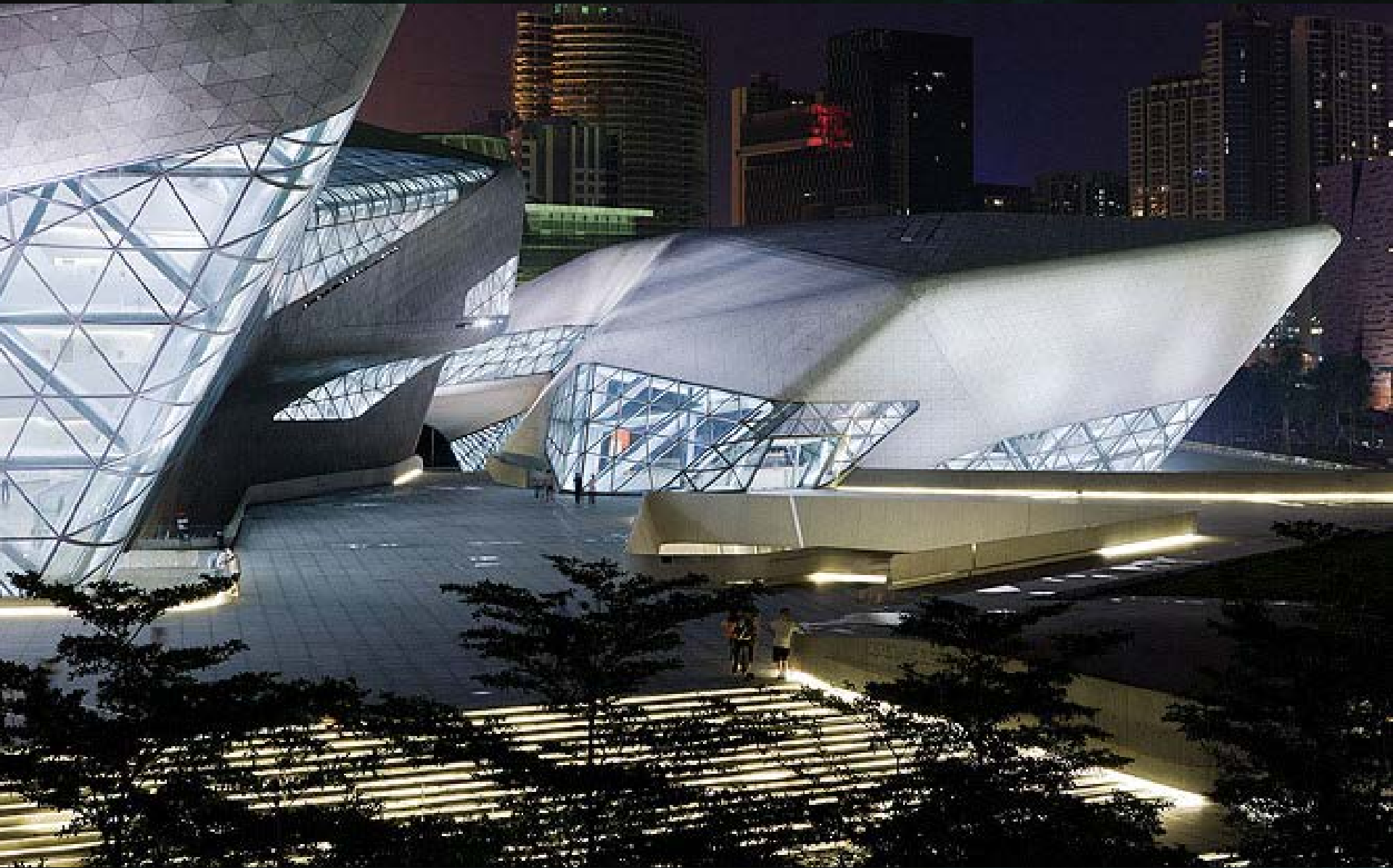
Zaha Hadid Guangzhou Opera House



Zaha Hadid Guangzhou Opera House



Zaha Hadid Guangzhou Opera House

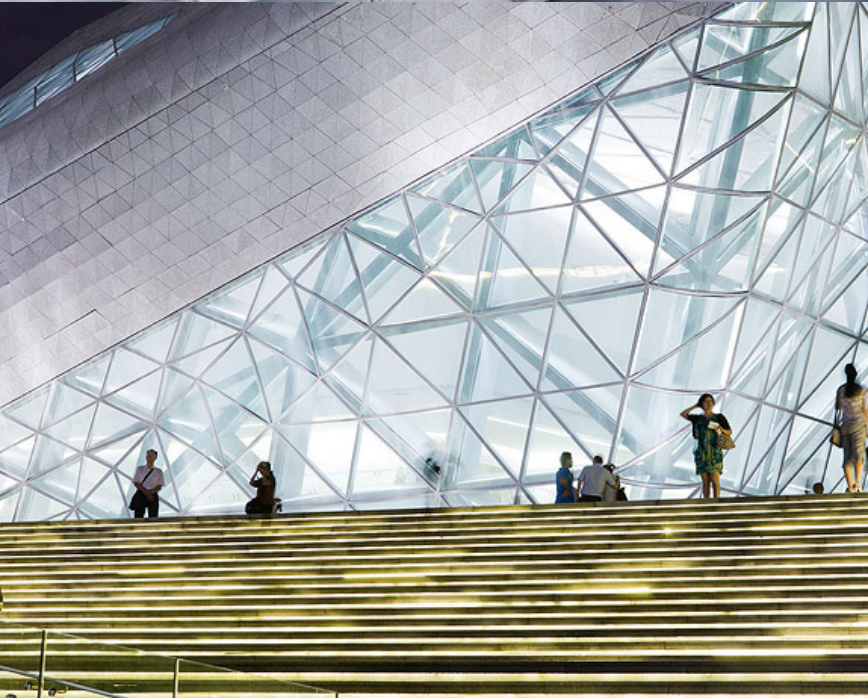


Zaha Hadid Guangzhou Opera House

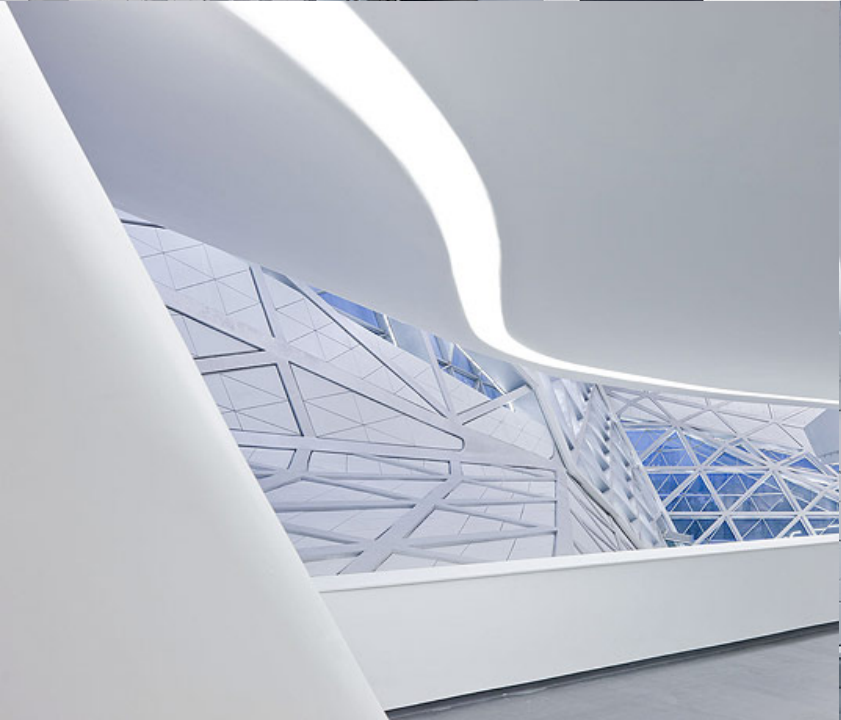


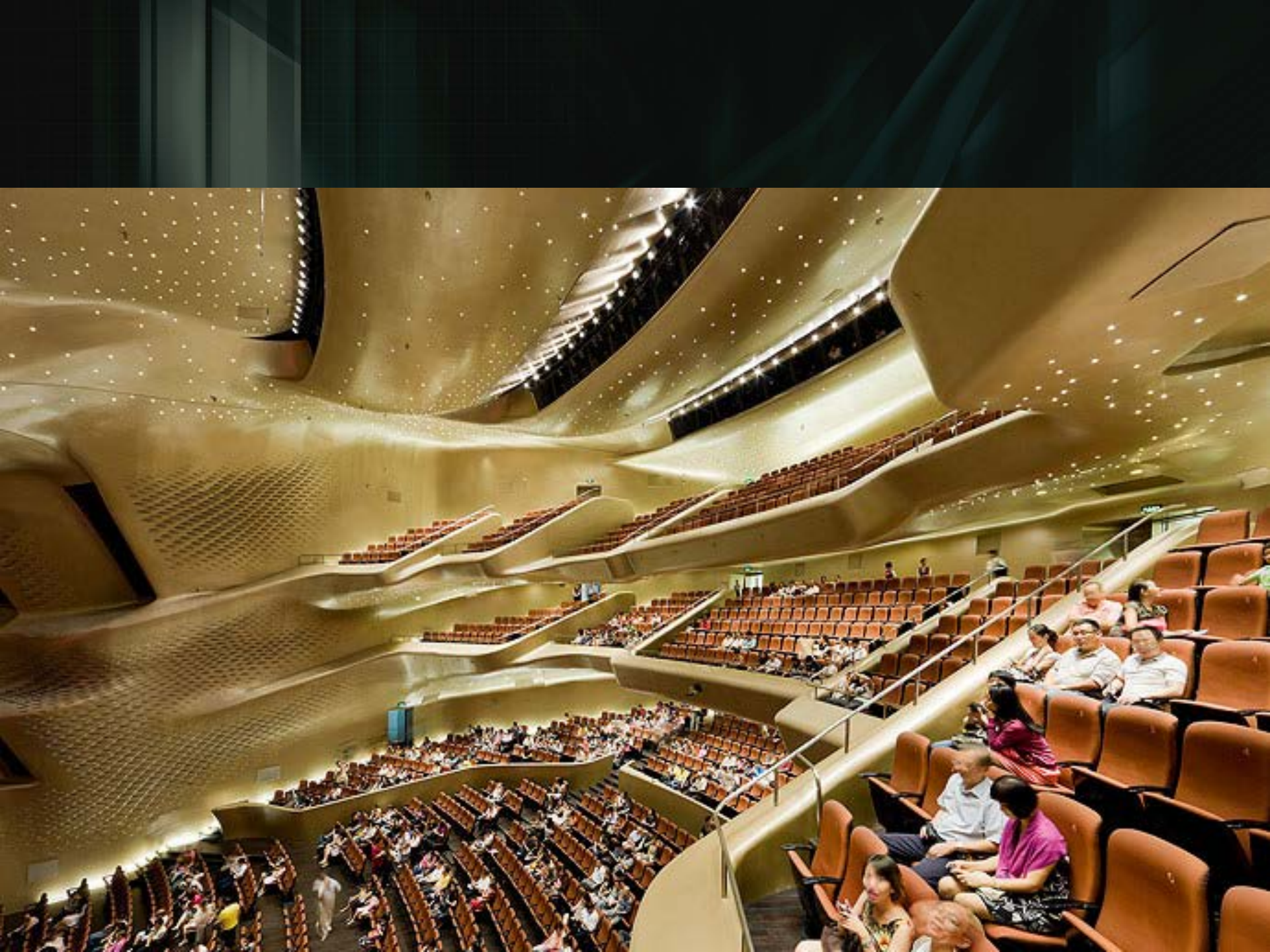
Zaha Hadid Guangzhou Opera House















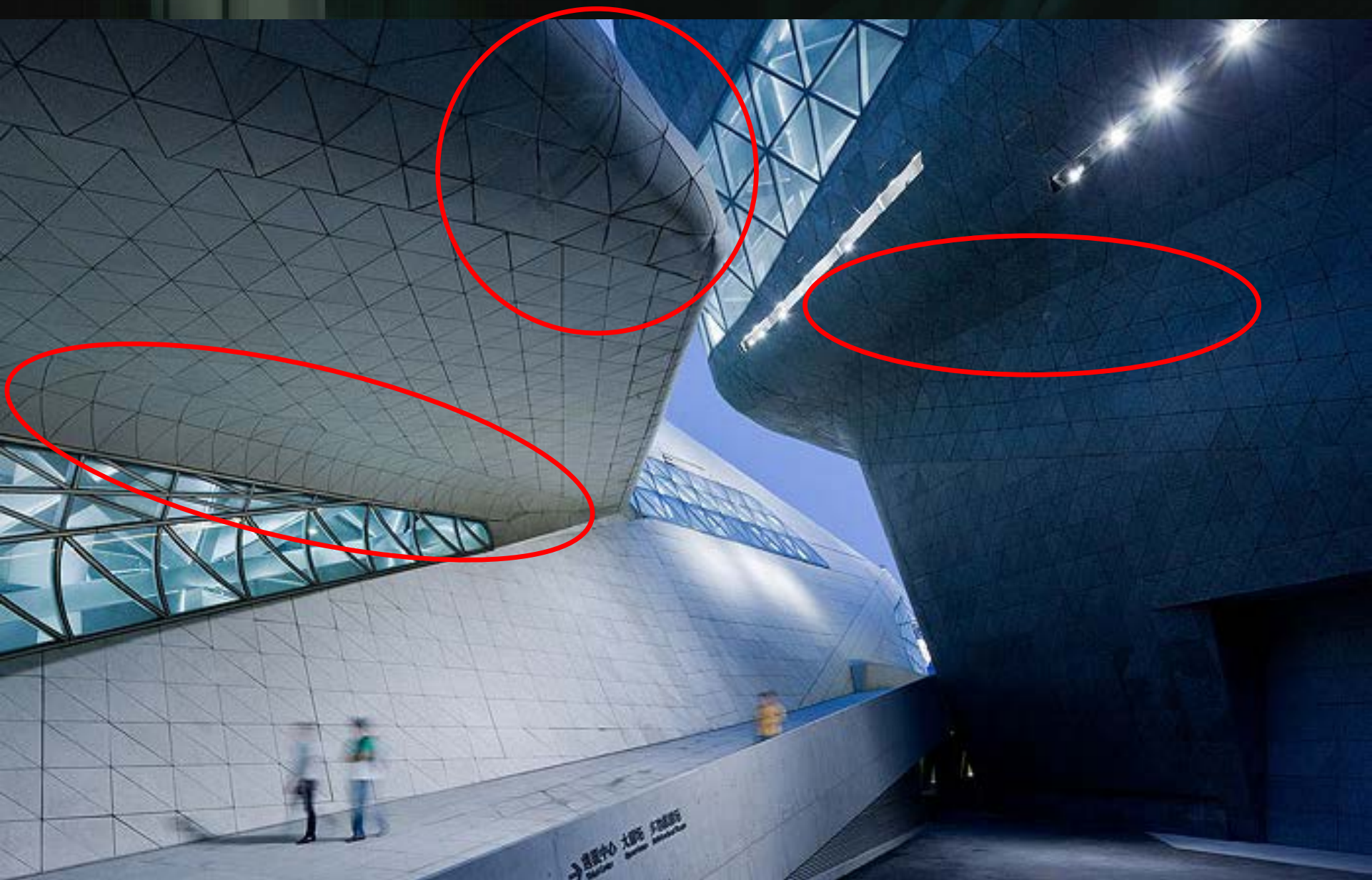


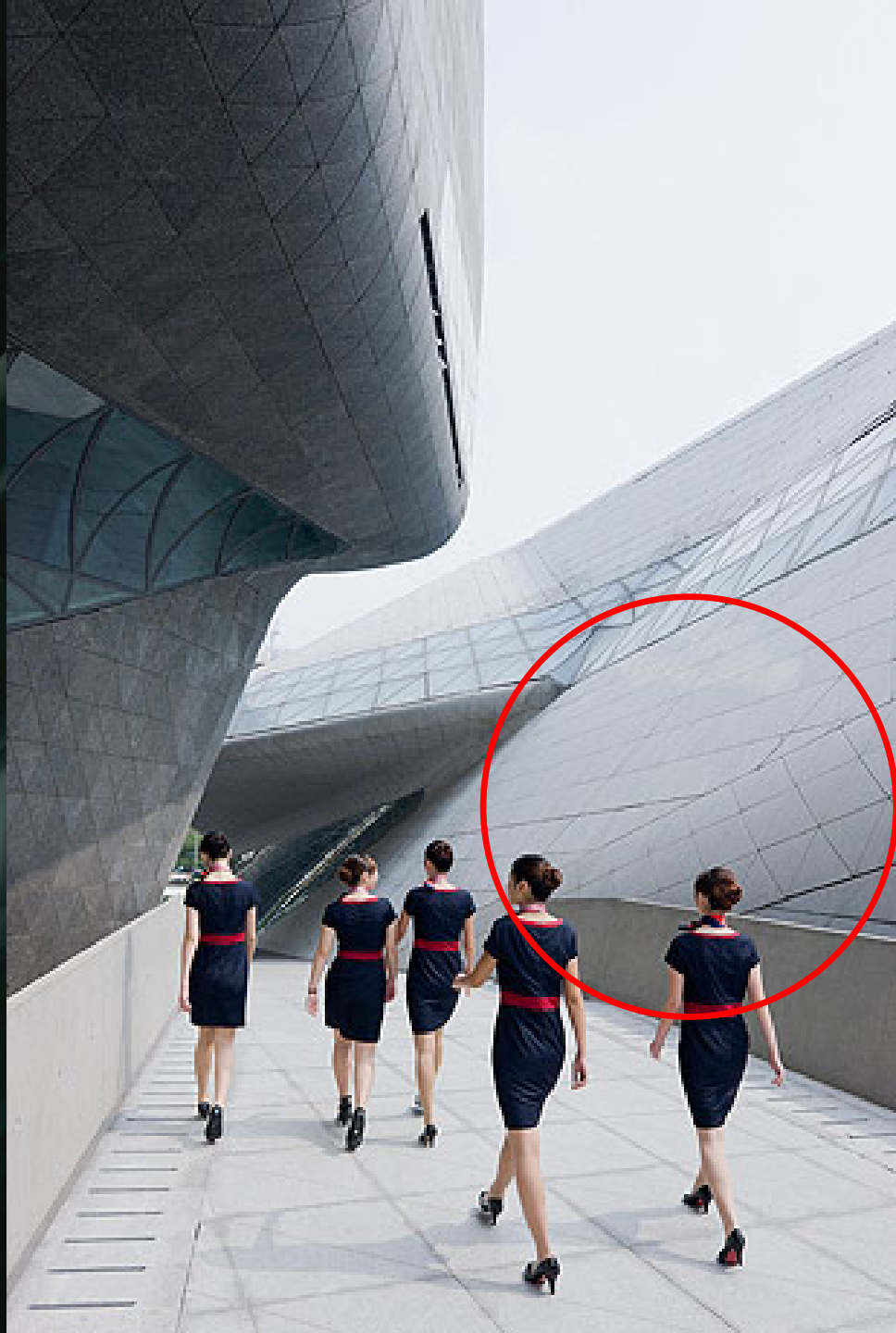


Excited? But wait.....



Zaha Hadid Guangzhou Opera House

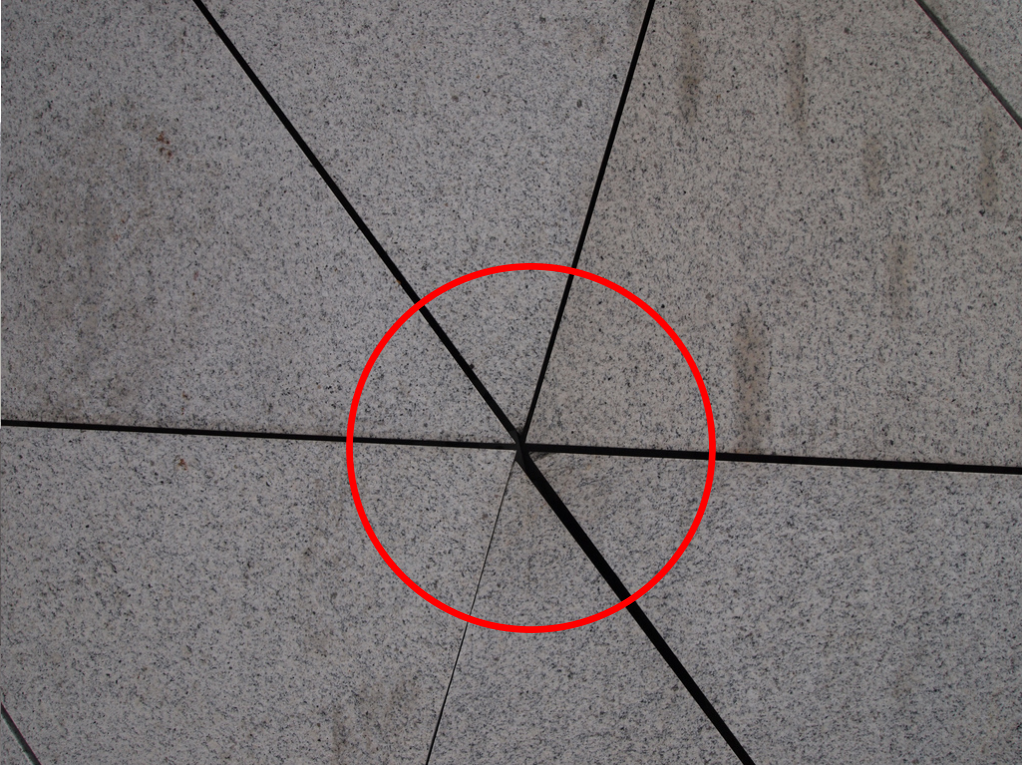
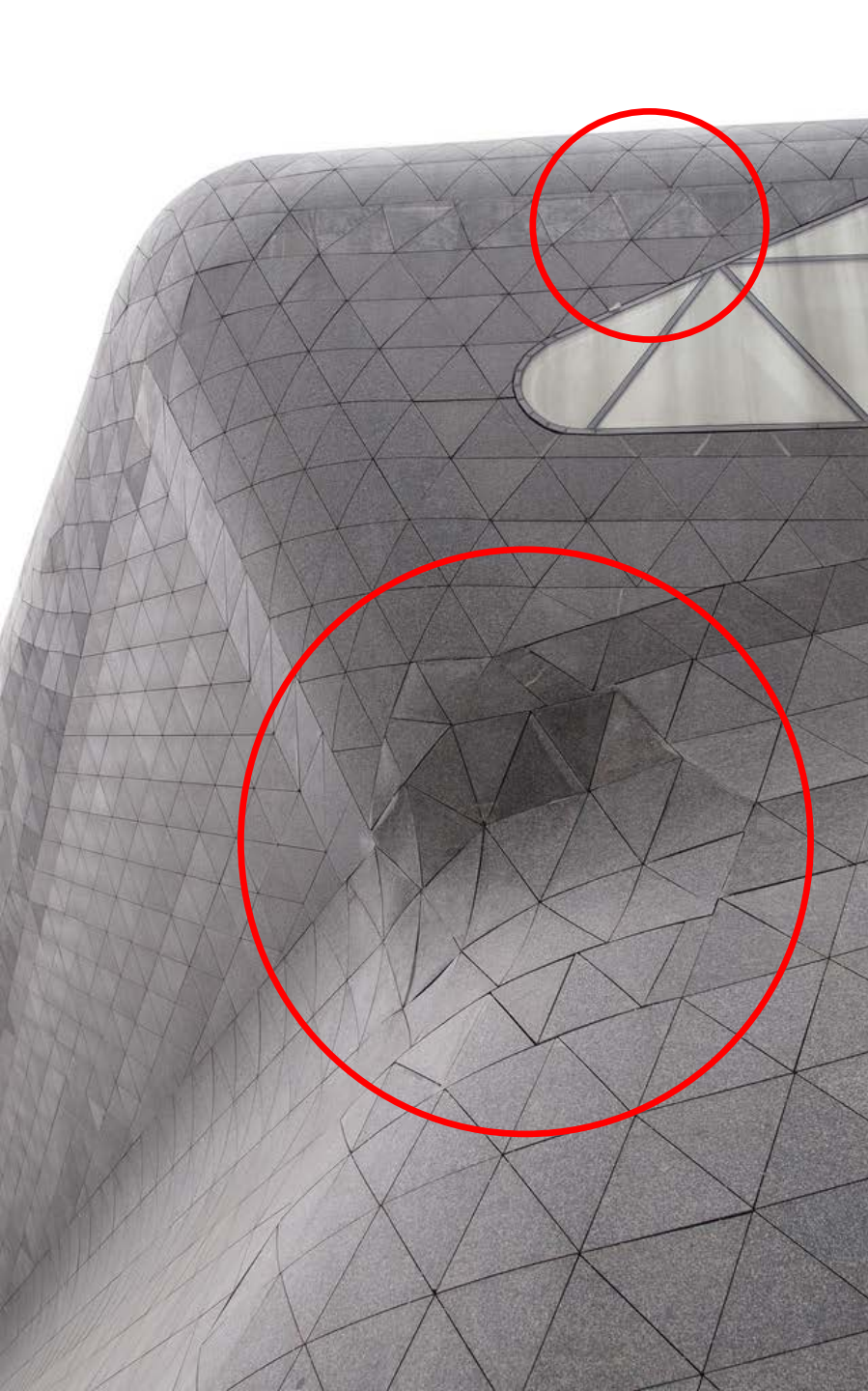


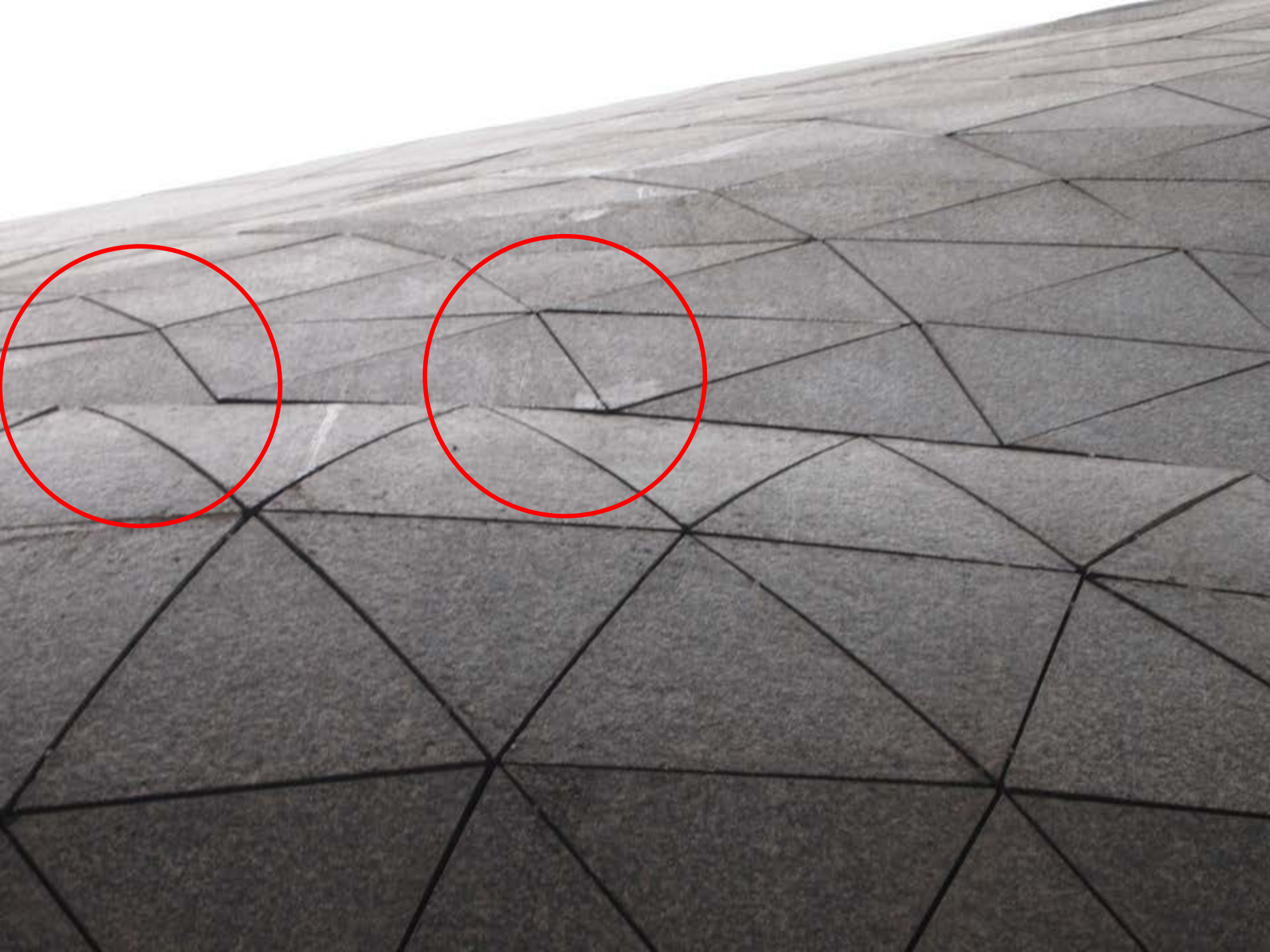












SCULPTURE

vs

ARCHITECTURE



Purely decorative, NO accommodation

Built by Sculptor (Designer)

Materials freedom of choice - malleable

Direct production

Changes as one thinks fit

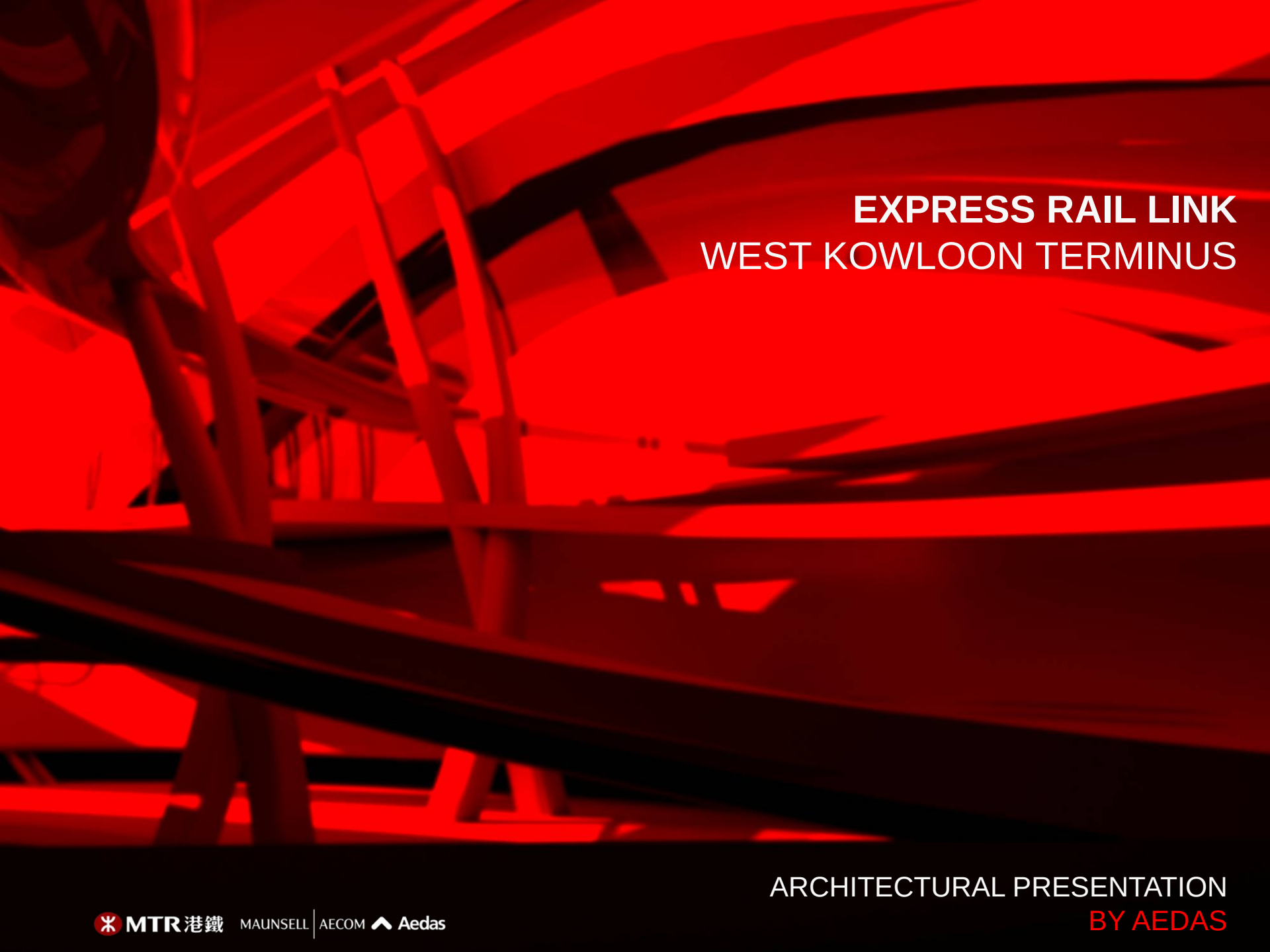
Accommodations - area, uses, clear height, travel distance constraints

Built by Workers (Not Designer)

Large size, material built up by sticks, sheets

Drawings – form of communications

Record of Changes => \$ and Time



EXPRESS RAIL LINK WEST KOWLOON TERMINUS

ARCHITECTURAL PRESENTATION
BY AEDAS

TERMINUS STATION



CONTEXT



FROM / TO
GUANGZHOU

SITE

WEST KOWLOON

TSIM SHA TSUI

VICTORIA
HARBOUR

HONG KONG
ISLAND SKYLINE



CONTEXT



TERMINUS STATION



CONVERGING FORCES

RAIL TO CHINA

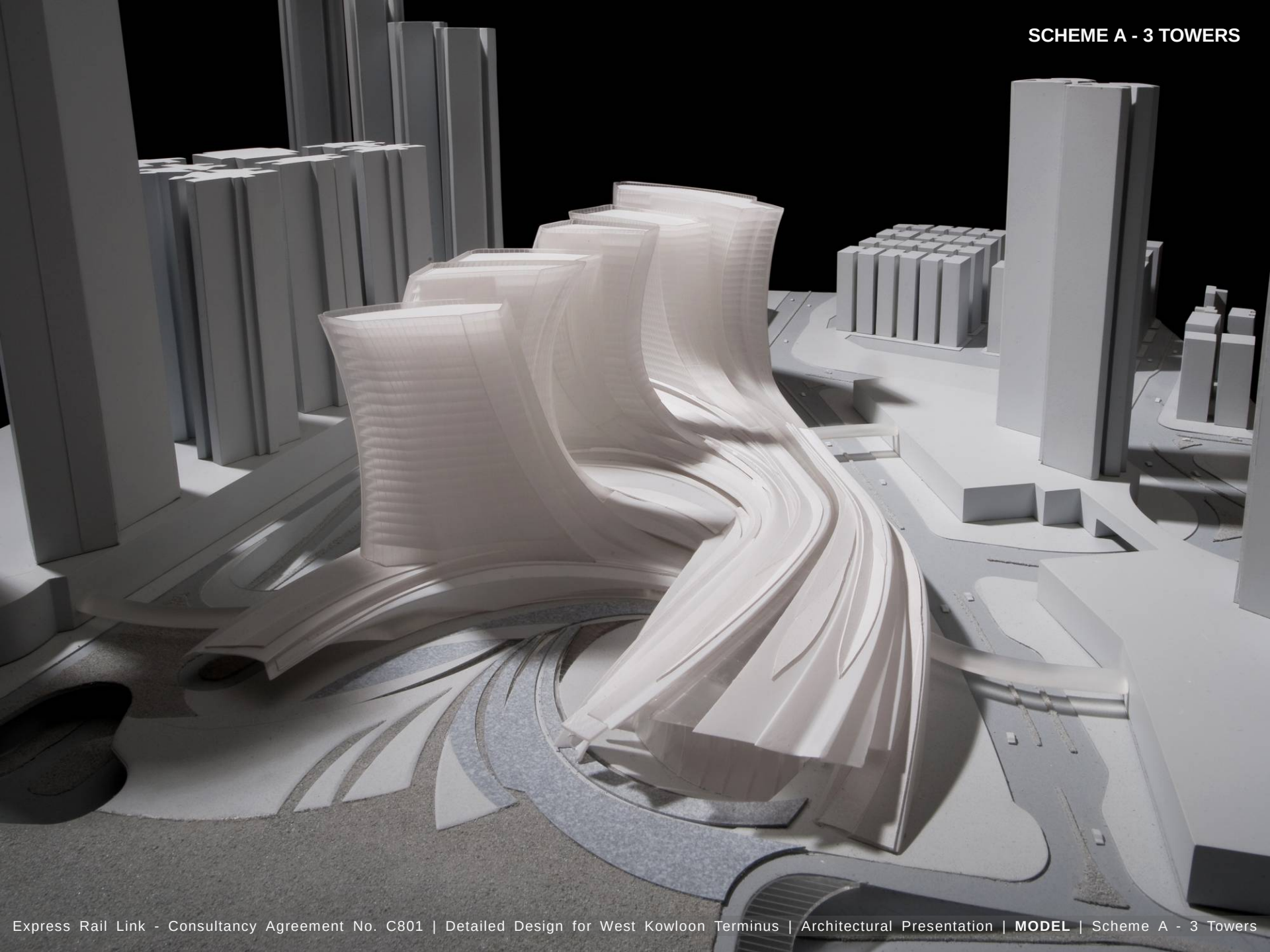
SCHEME A - 3 TOWERS

WIND

VEHICULAR
CIRCULATION

PEDESTRIAN
CONNECTIONS

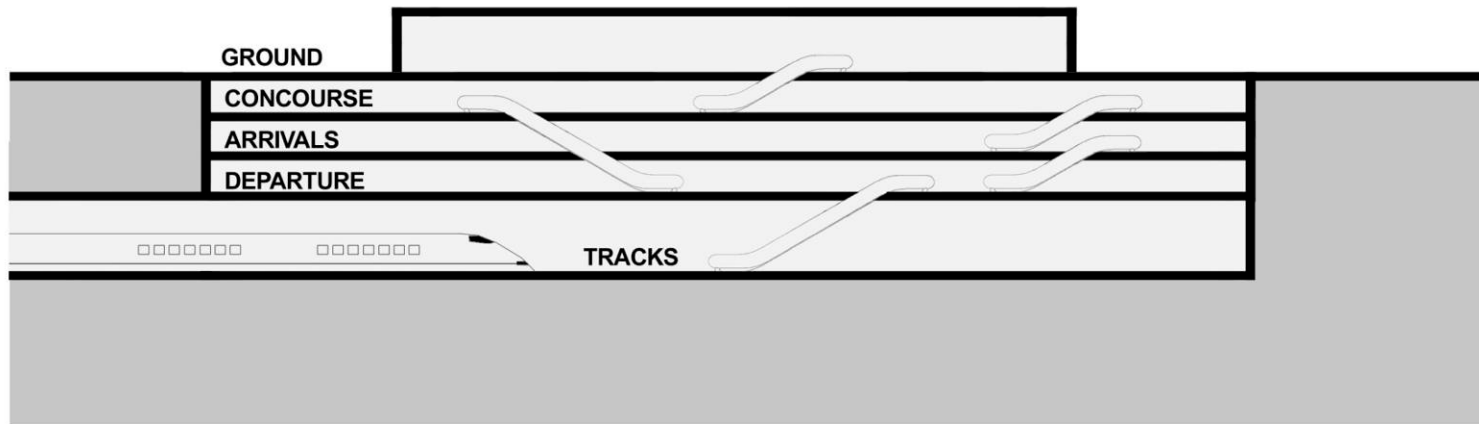
PEDESTRIAN
CONNECTION
TO WKCD



HOLISTIC

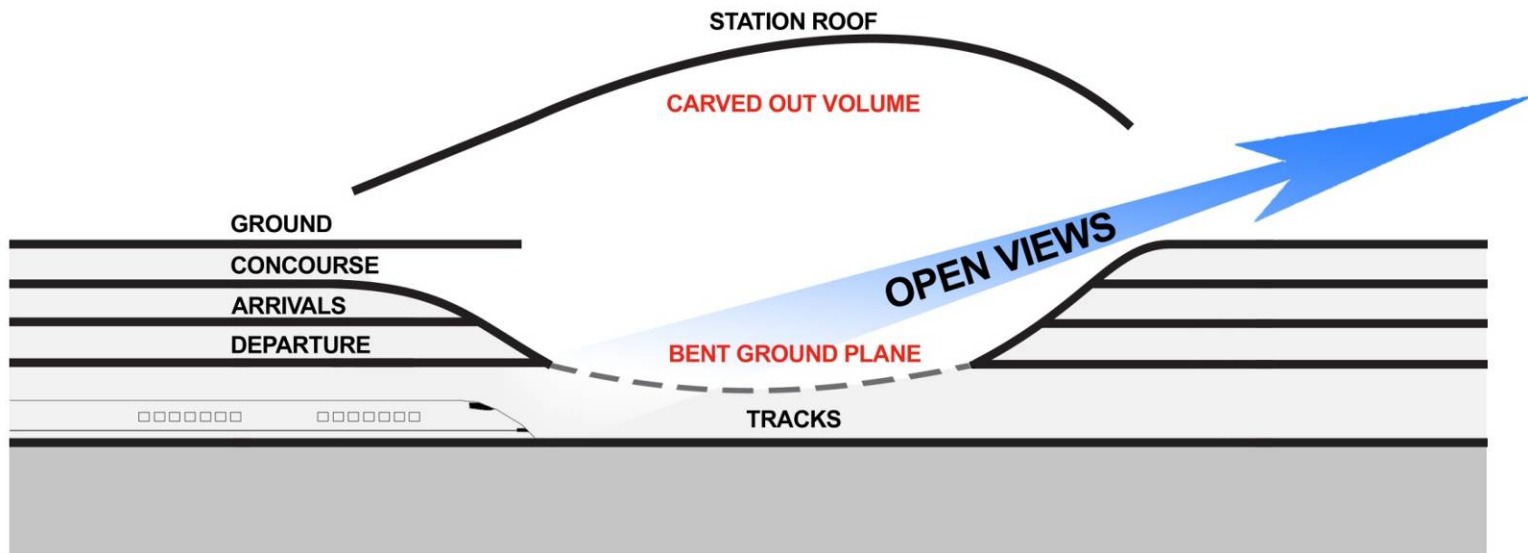


SCHEME A



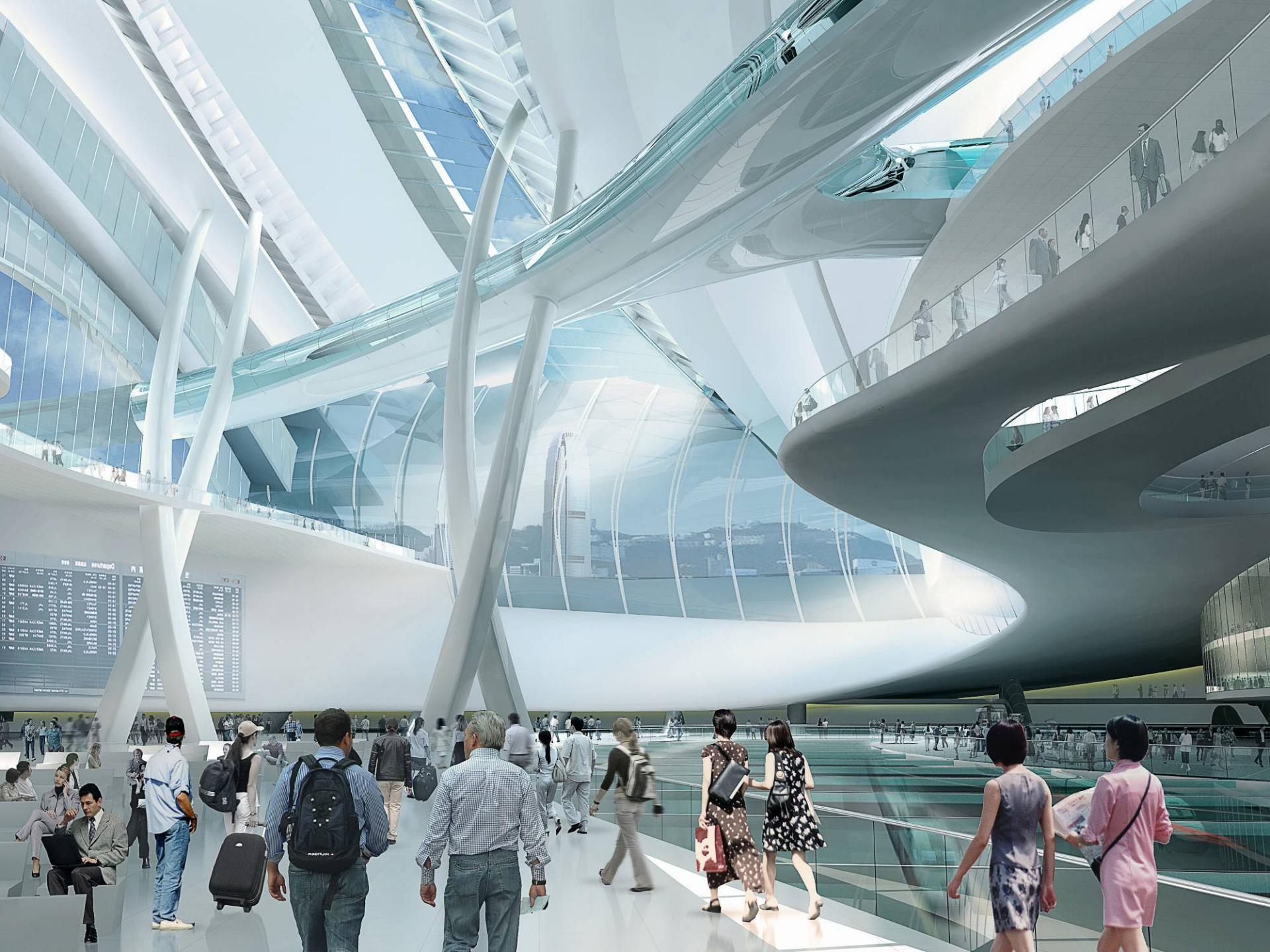
TRADITIONAL UNDERGROUND STATION

Perceptually No Awareness of Surrounding Environment



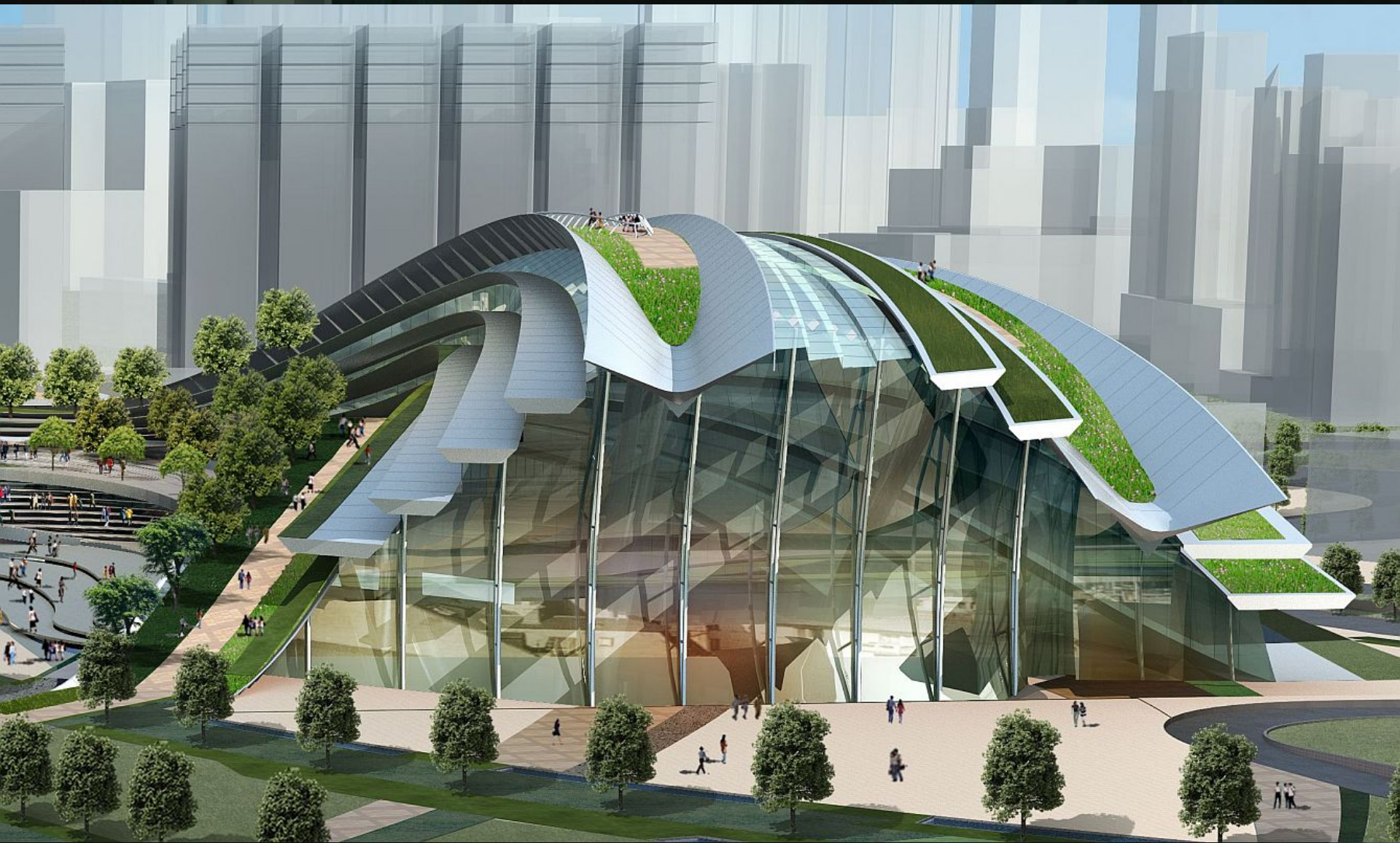
PROPOSED UNDERGROUND STATION

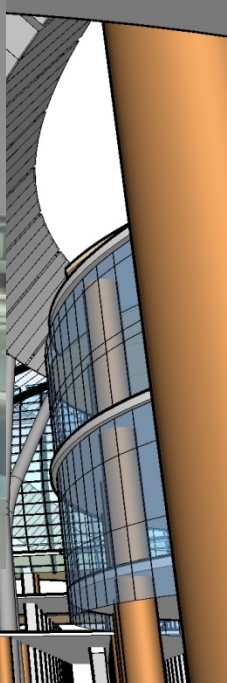
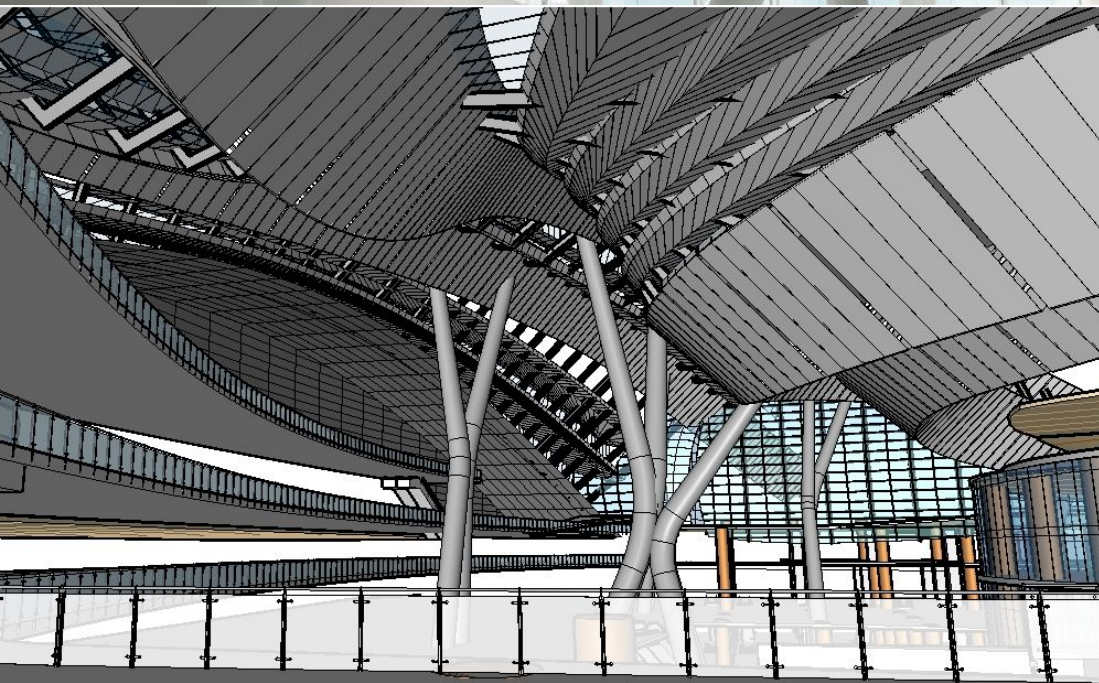
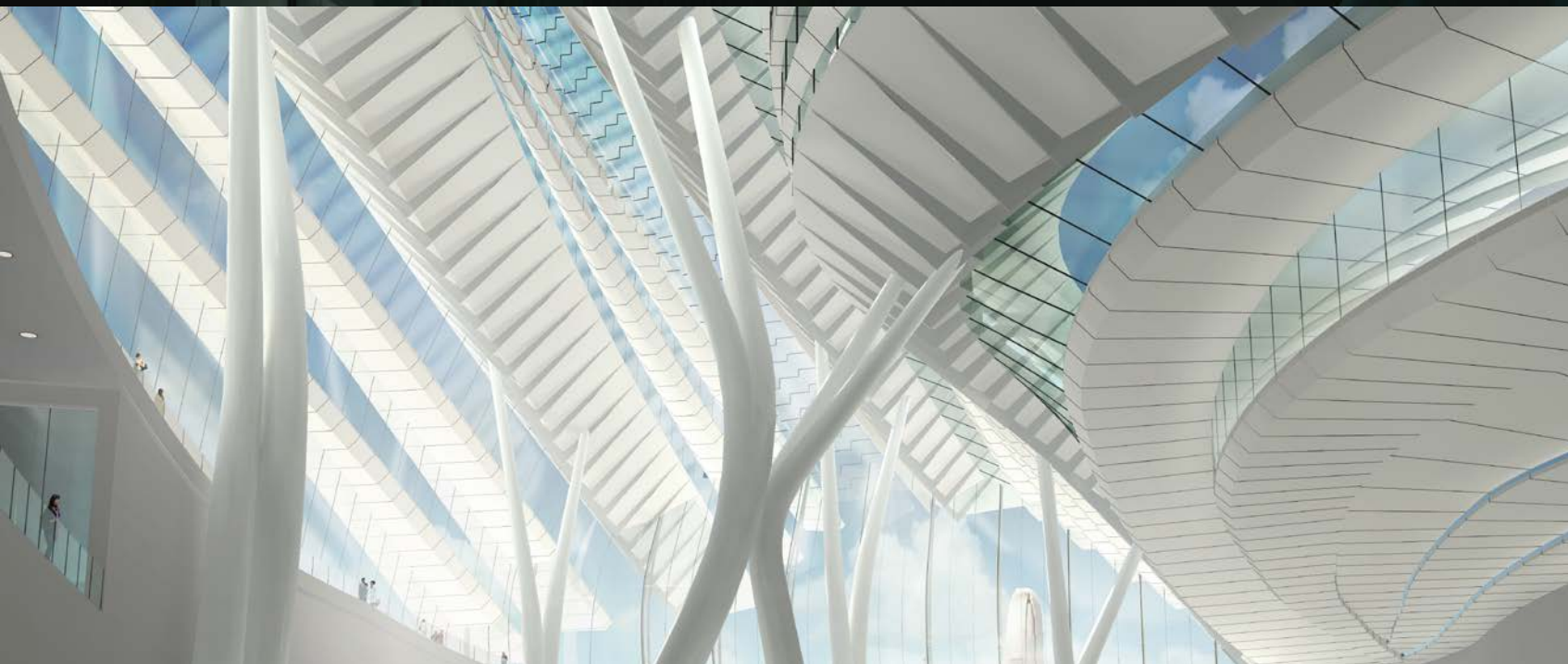
Awareness of Surrounding Environment













DESIGN

RHINO



PANELIZATION

GRASSHOPPER



EXPORT

DATABASE

REVIT API



IMPORT

RATIONALIZATION

REVIT API



BIM RECREATION

REVIT



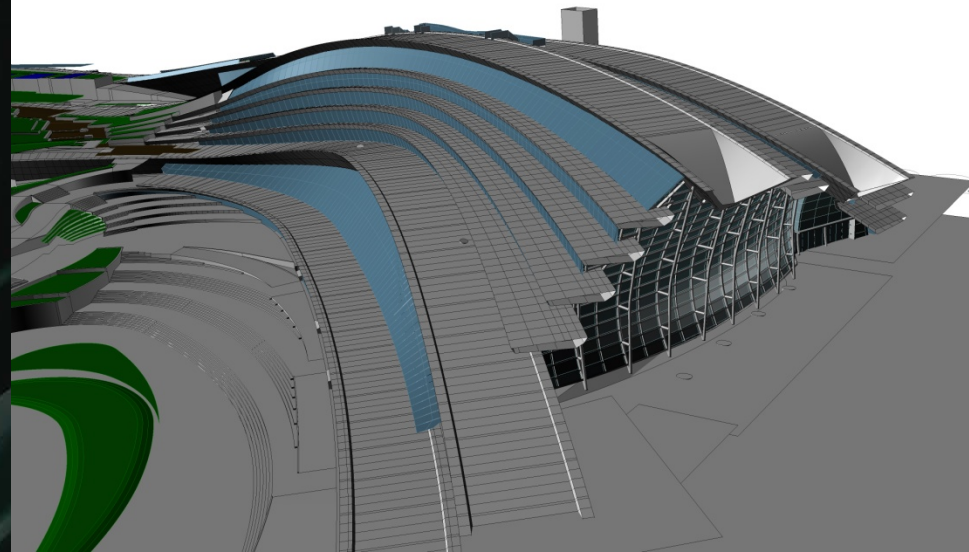
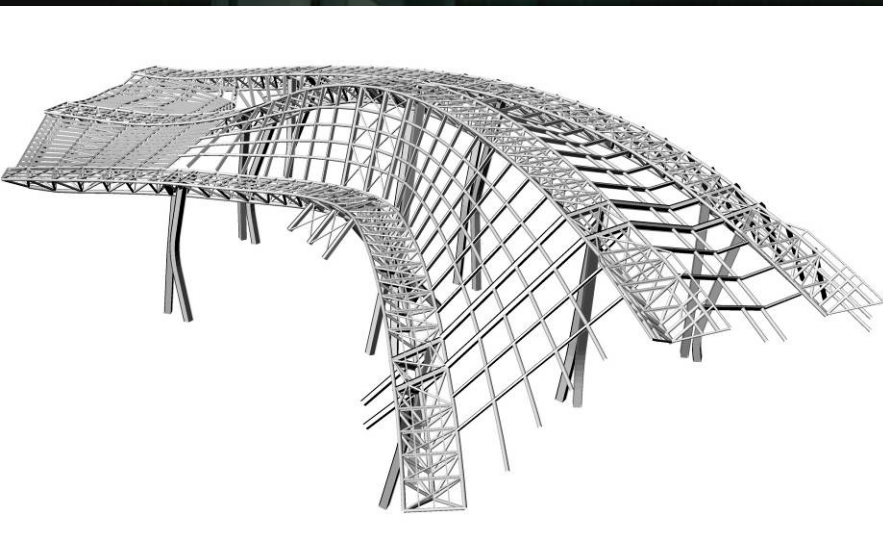
DOCUMENTATION

REVIT



TENDER

MANUF/CONSTRUCTION

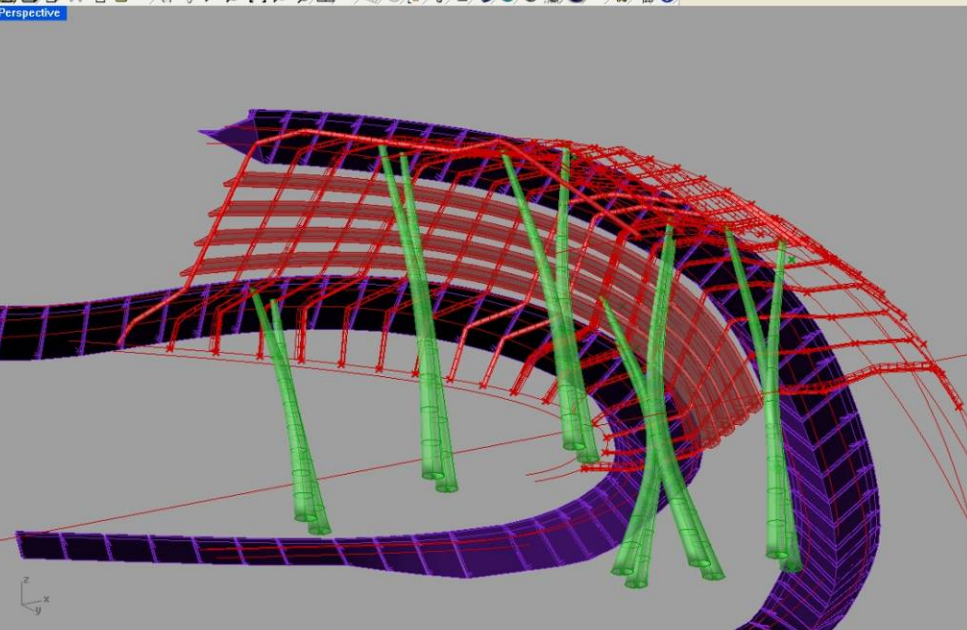


COLUMN HEAD STUDY - Rhinoceros [Commercial] - [Perspective]

File View Curve Surface Solid Mesh Dimension Transform Tools Analyze Render Help
 Hide
 Invert
 Instances, 111 hatches, 452 points, 1924 curves, 117 polysurfaces, 126 surfaces, 36 text added to selection.
 Hide



Perspective



☒ Near ☒ Point ☒ Mid ☐ Cen ☐ Int ☐ Perp ☐ Tan ☐ Quad ☐ Knot ☐ Project ☐ STrack ☐ Disable

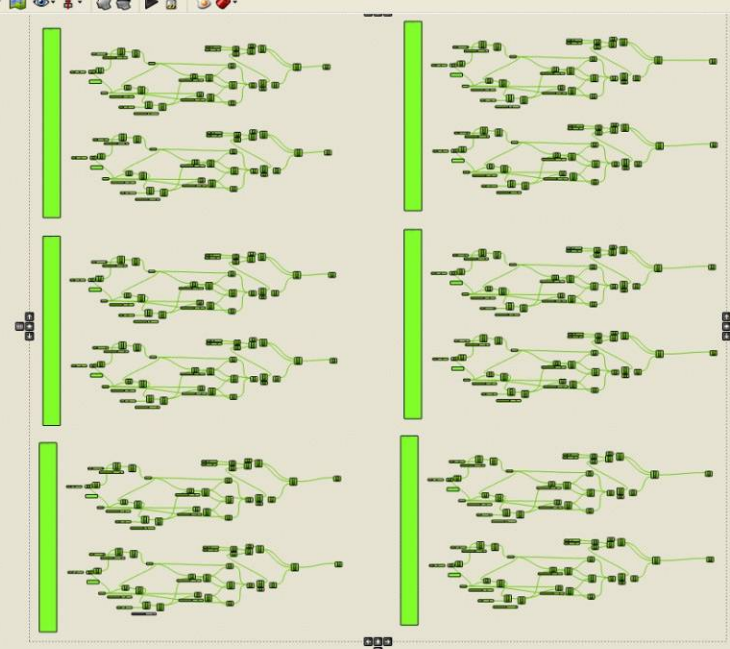
356.991 y 191.236 z 0.000 0.000 Layer 12 Snap Ortho Planar Osnap Record History

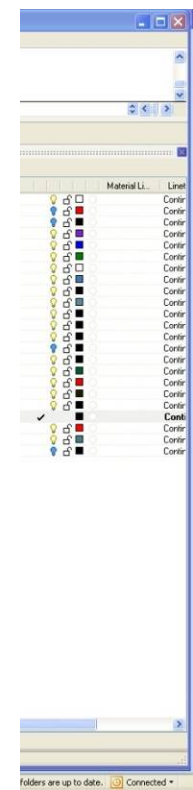
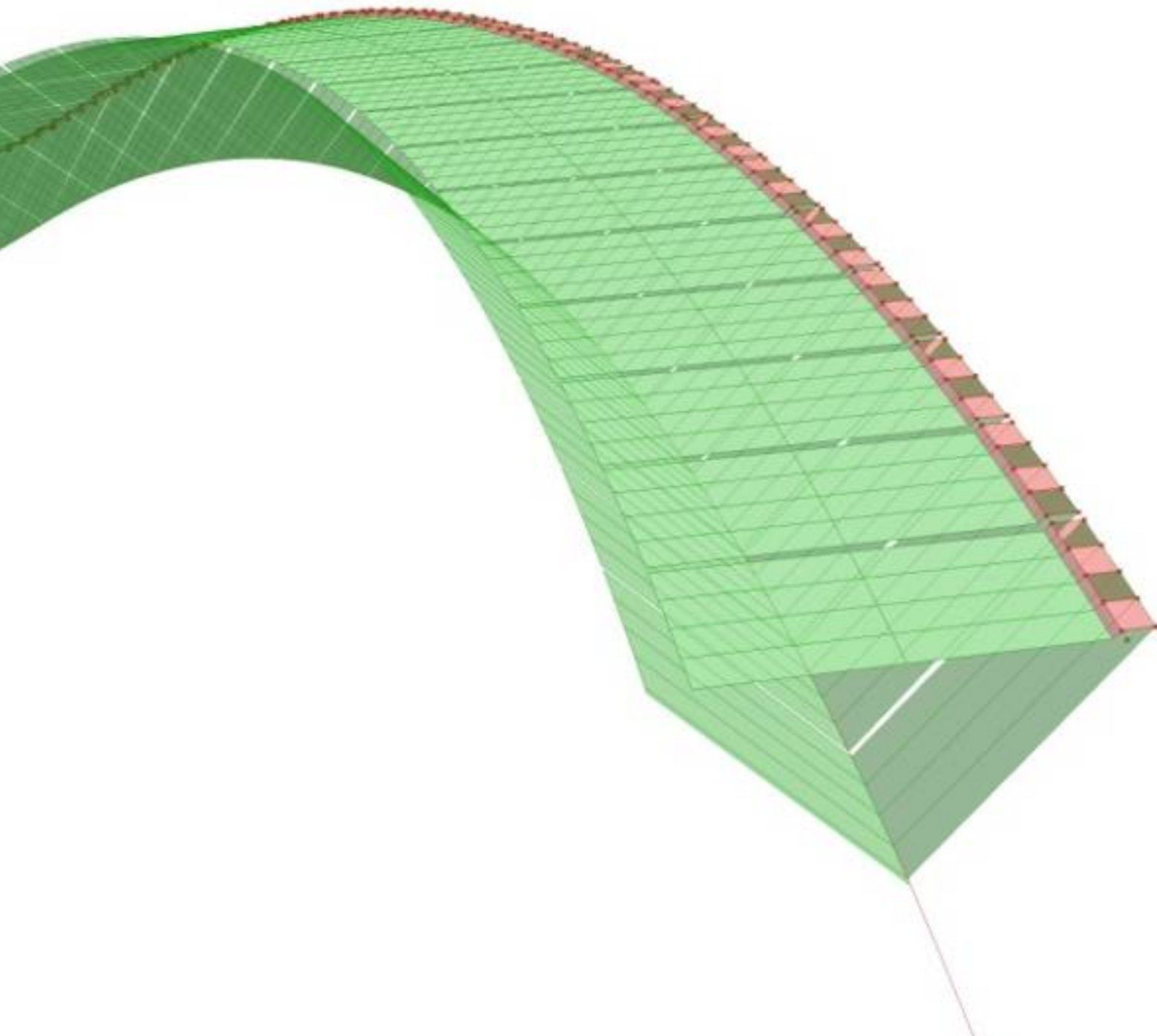
Grasshopper - column head with secondary structure until eastern arch

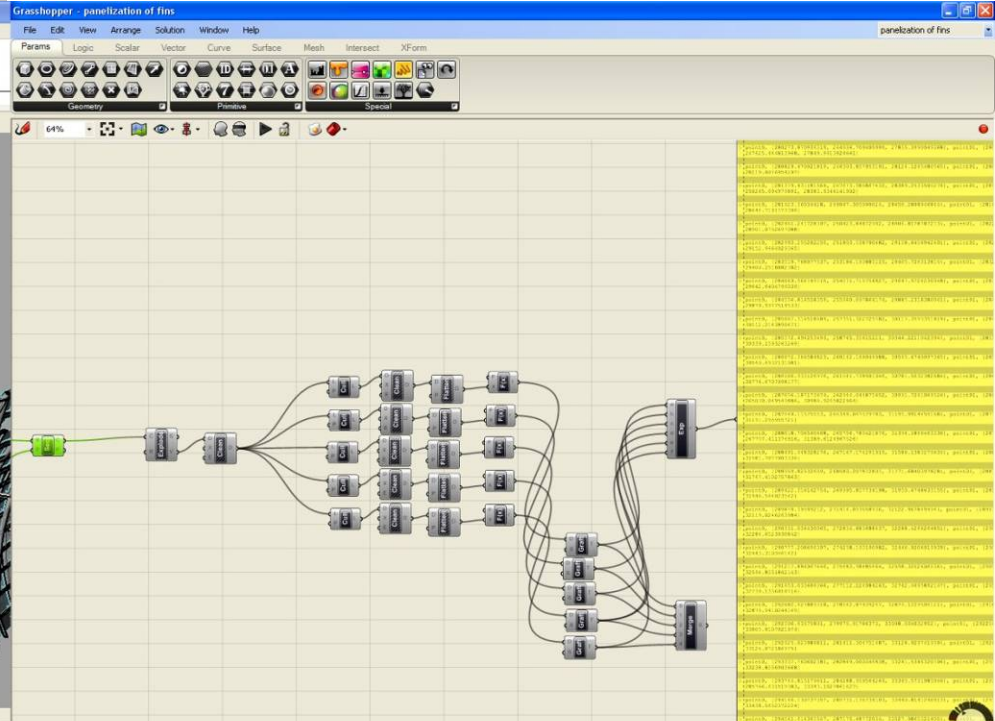
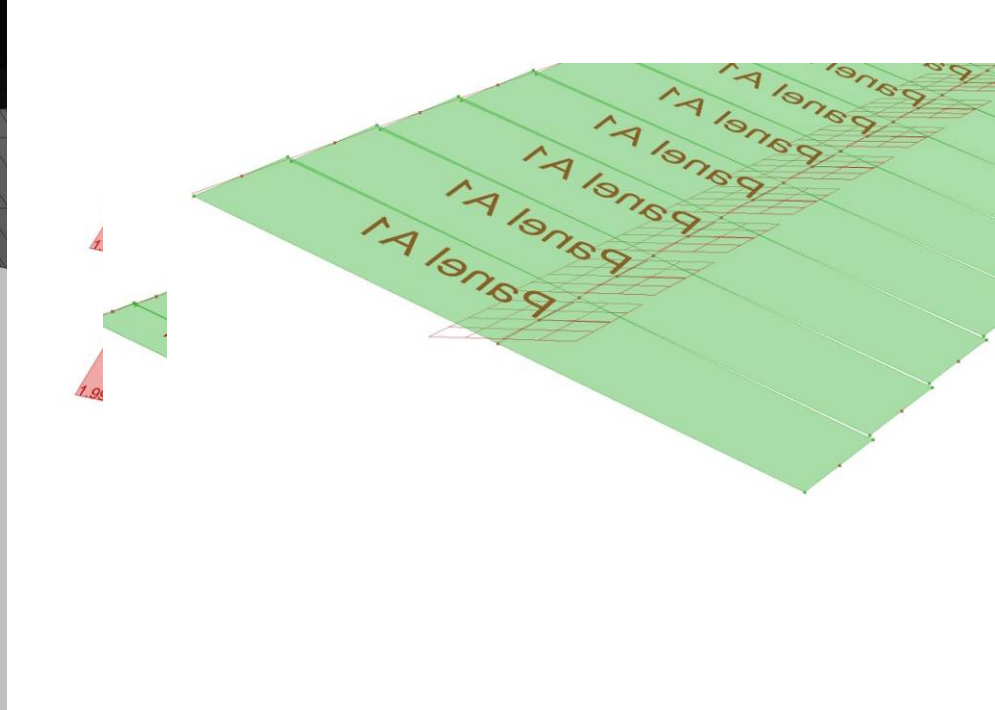
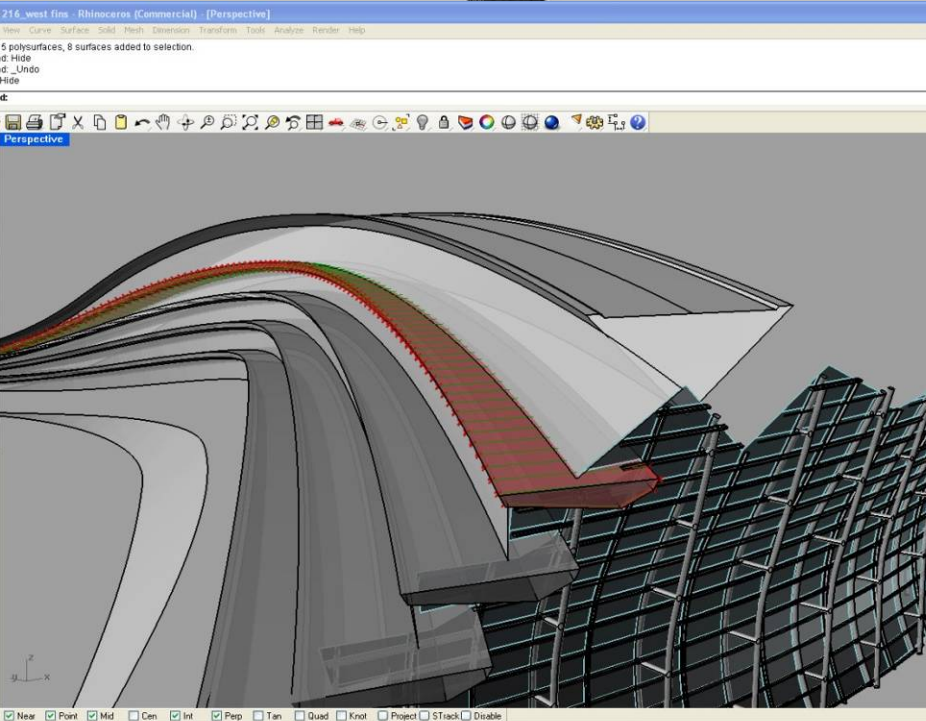
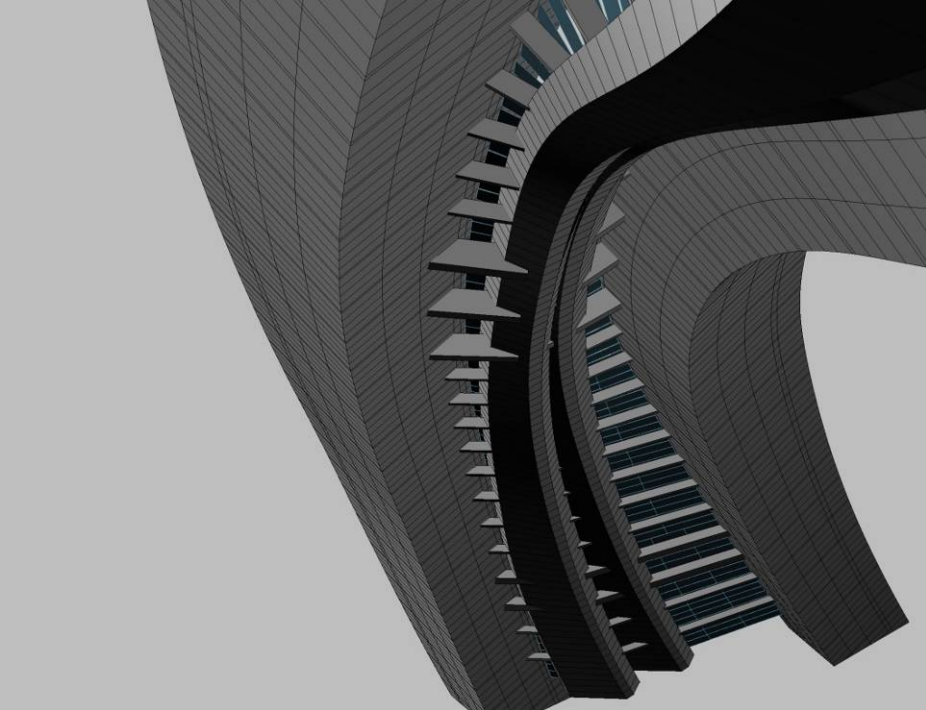
File Edit View Arrange Solution Window Help

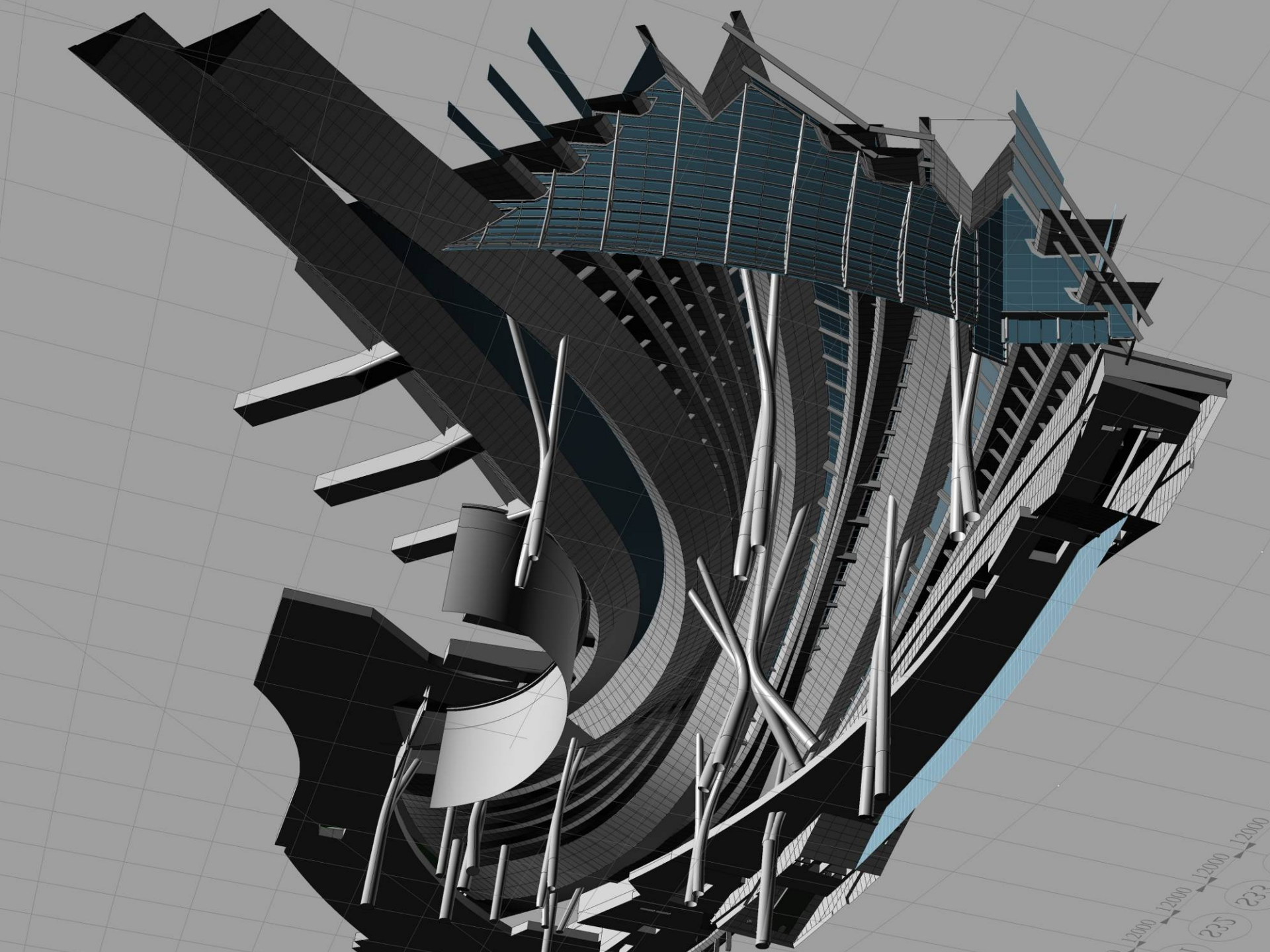


13%











DESIGN

RHINO



PANELIZATION

GRASSHOPPER



EXPORT

DATABASE

REVIT API



IMPORT

RATIONALIZATION

REVIT API



BIM RECREATION

REVIT



DOCUMENTATION

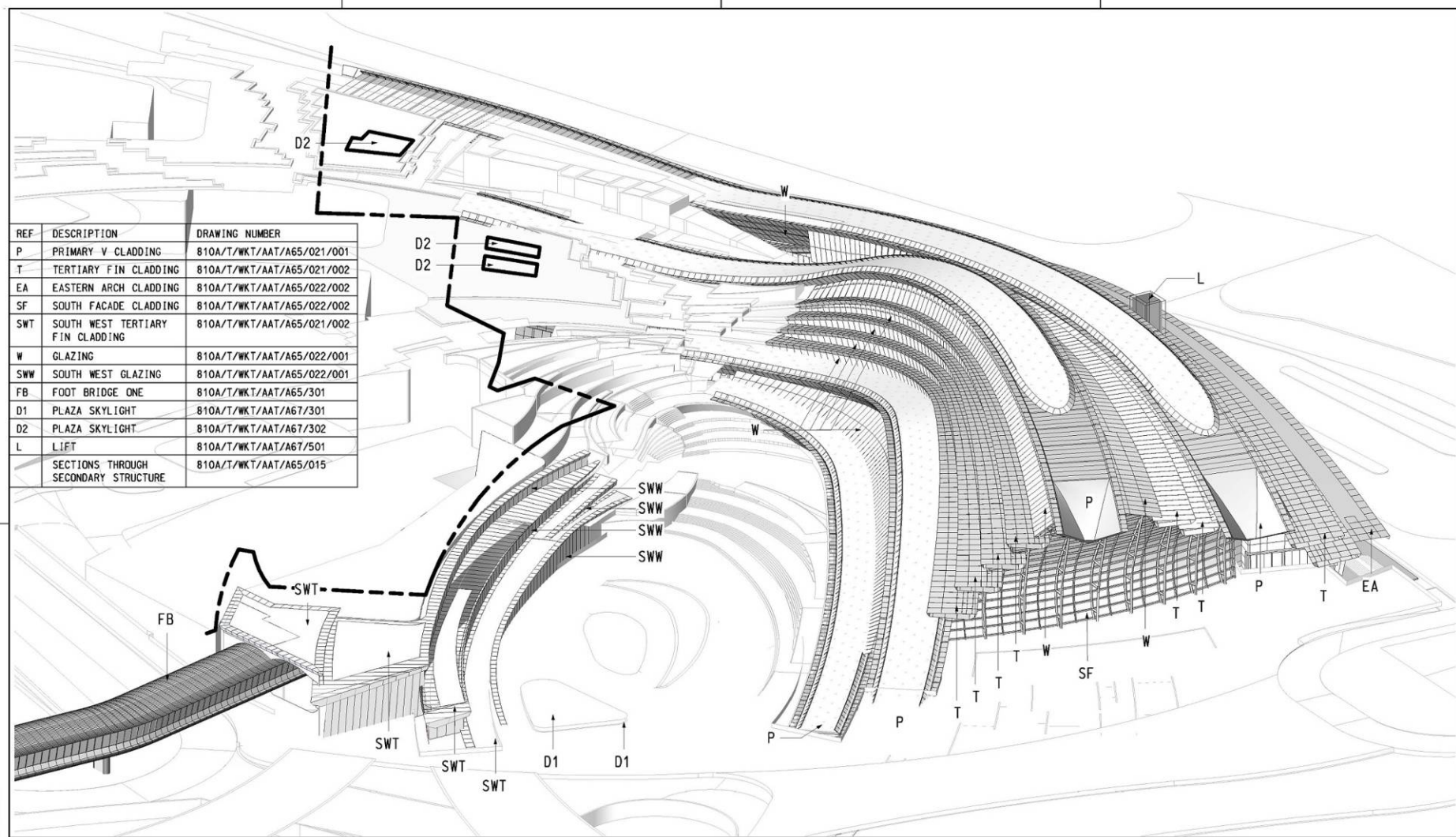
REVIT



TENDER

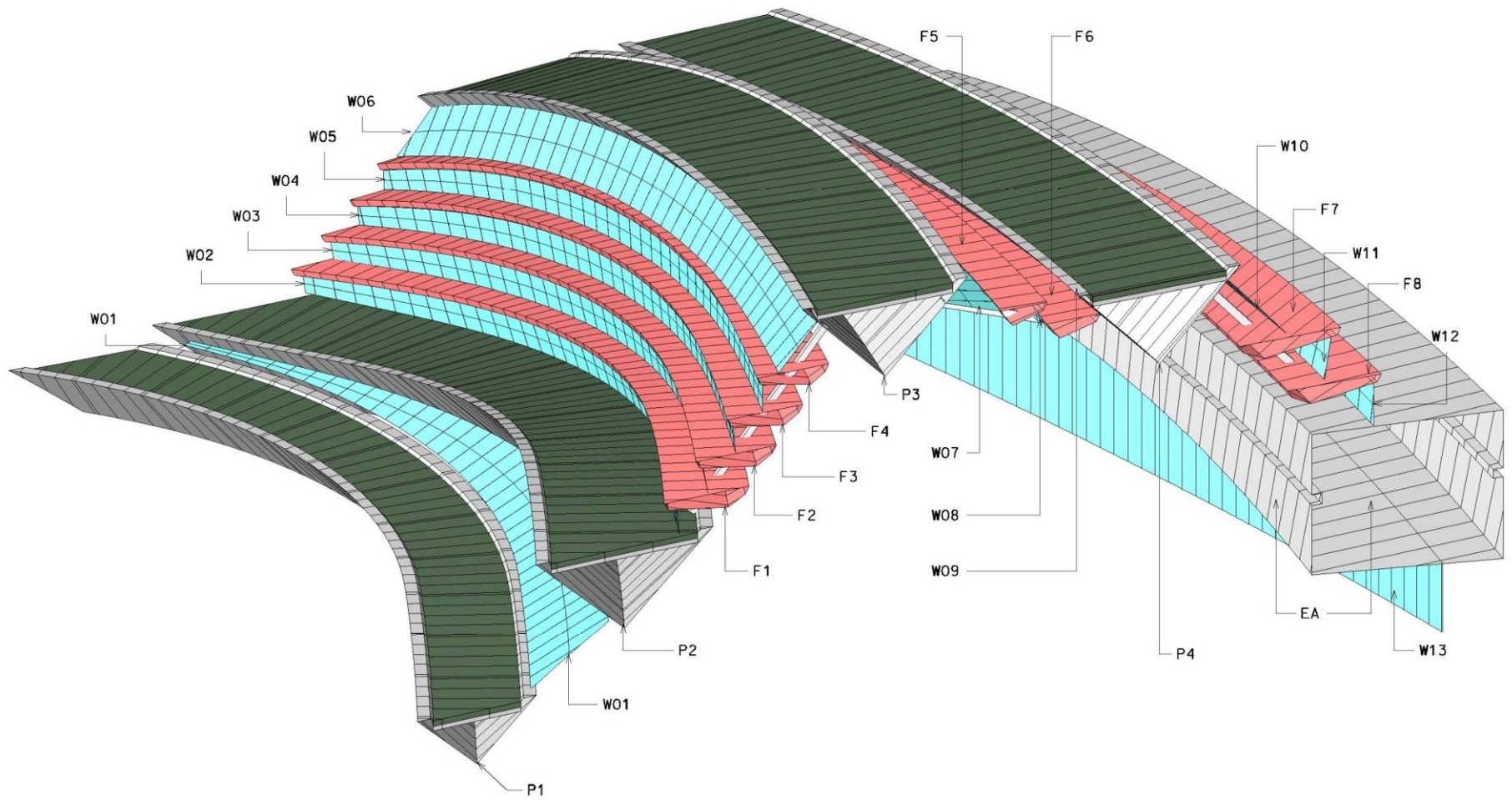
MANUF/CONSTRUCTION

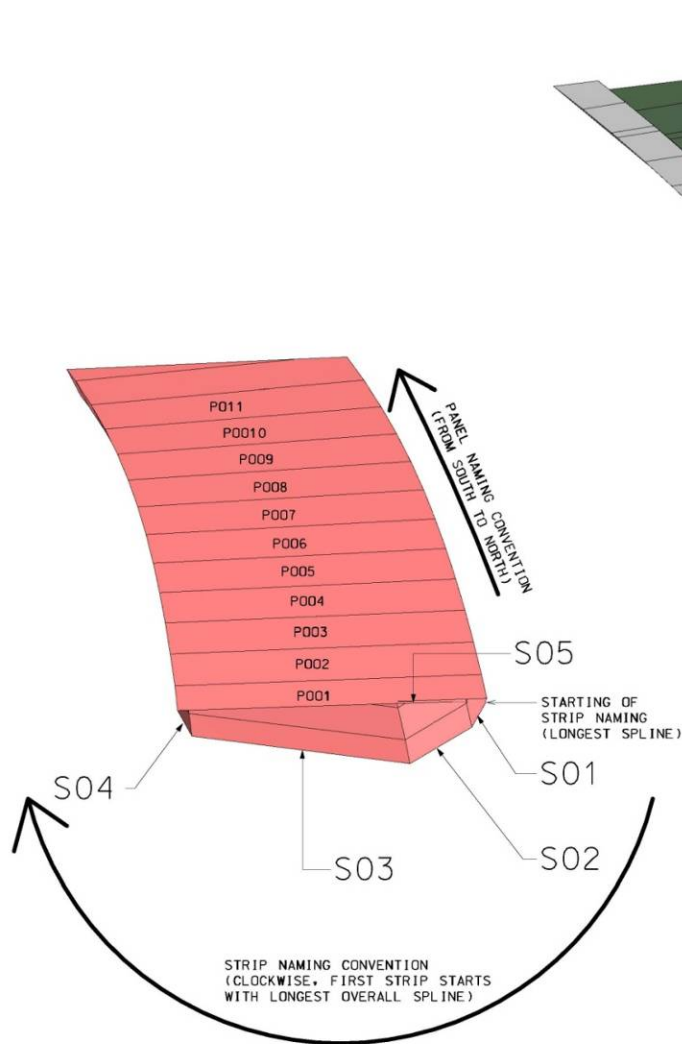
06/22/2010 14:47:03 PM
PROJECT: 810A/T/WKT/AAT/A65/011
DRAWING: 810A/T/WKT/AAT/A65/011



REF	DESCRIPTION	DRAWING NUMBER
P	PRIMARY V CLADDING	810A/T/WKT/AAT/A65/021/001
T	TERTIARY FIN CLADDING	810A/T/WKT/AAT/A65/021/002
EA	EASTERN ARCH CLADDING	810A/T/WKT/AAT/A65/022/002
SF	SOUTH FACADE CLADDING	810A/T/WKT/AAT/A65/022/002
SWT	SOUTH WEST TERTIARY FIN CLADDING	810A/T/WKT/AAT/A65/021/002
W	GLAZING	810A/T/WKT/AAT/A65/022/001
SWW	SOUTH WEST GLAZING	810A/T/WKT/AAT/A65/022/001
FB	FOOT BRIDGE ONE	810A/T/WKT/AAT/A65/301
D1	PLAZA SKYLIGHT	810A/T/WKT/AAT/A67/301
D2	PLAZA SKYLIGHT	810A/T/WKT/AAT/A67/302
L	LIFT	810A/T/WKT/AAT/A67/501
	SECTIONS THROUGH SECONDARY STRUCTURE	810A/T/WKT/AAT/A65/015

01 3D SOUTH

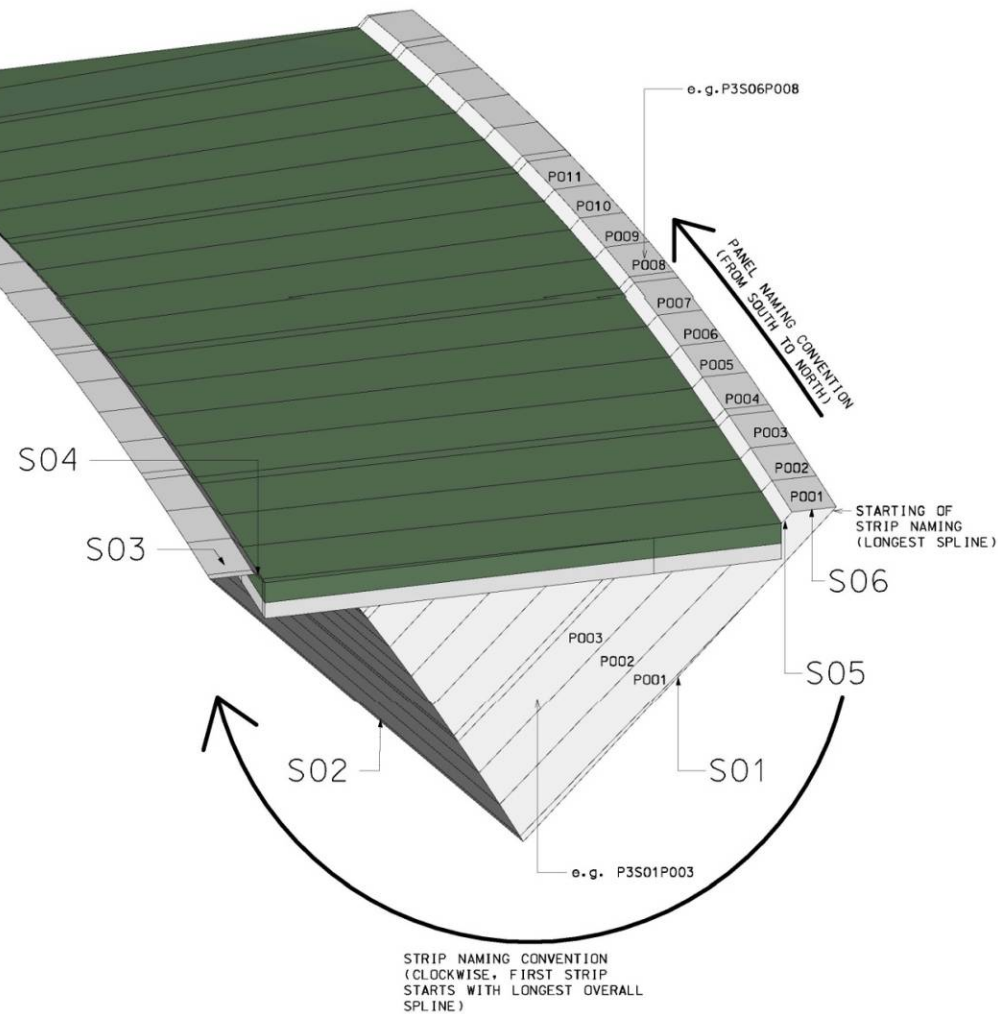




Nomenclature - Fin Cladding

② e.g. F1

NAMING CONVENTION:
ELEMENT / STRIP(S) / PANEL(P)
E.G. F1 / SXX / PXXX
F1S03P078

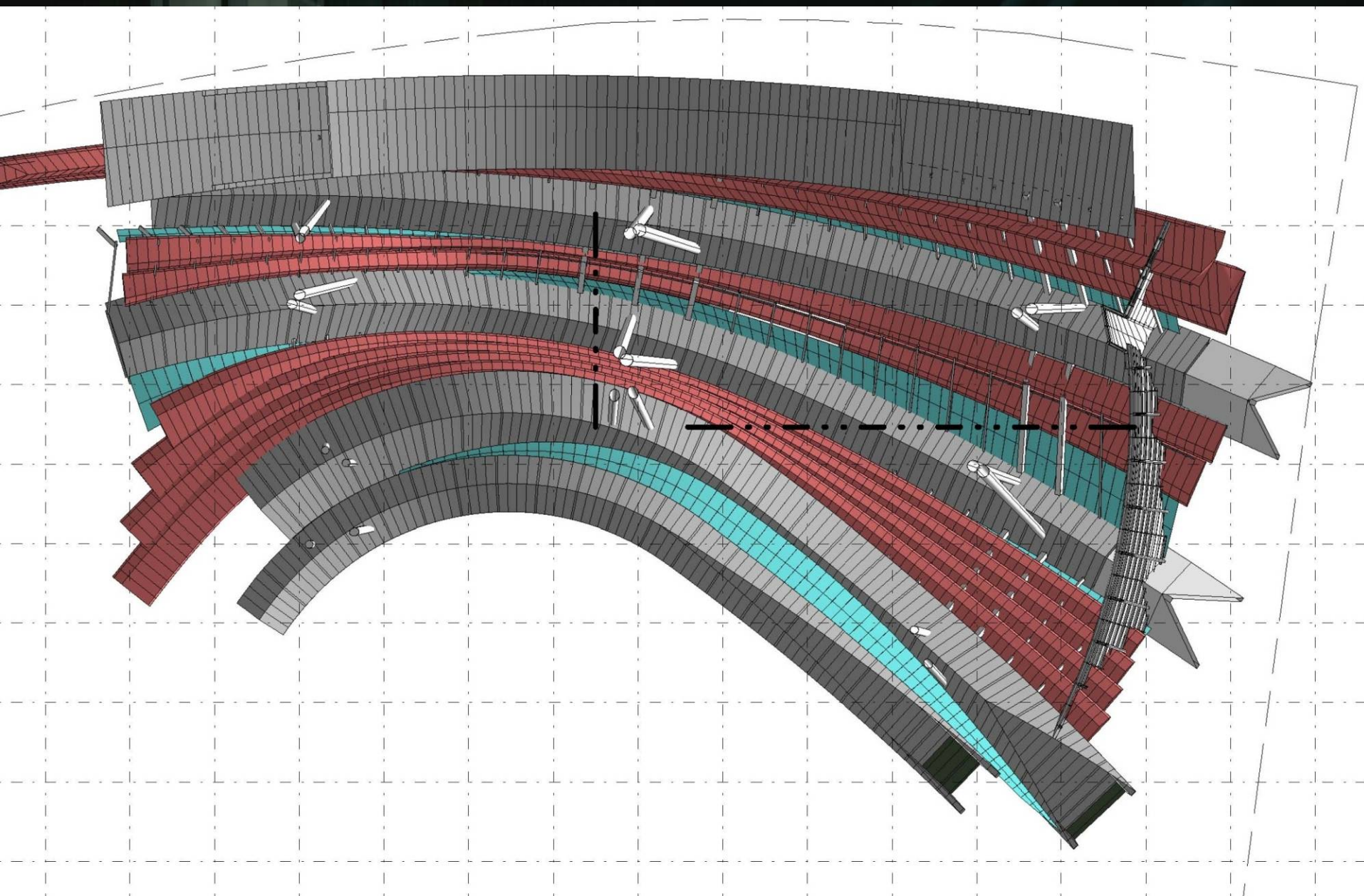


Nomenclature - V Cladding

① e.g. P3

NAMING CONVENTION:
ELEMENT / STRIP(S) / PANEL(P)
E.G. P3 / SXX / PXXX
P3S17P123





1		P01x###	lengt	P01y###	lengt	P01z###	lengt	P02x###	lengt	P02y###	lengt	P02z###	lengt	P03x###	lengt	P03y###	lengt	P03z###	lengt	P04x###	lengt	P04y###	lengt	P04z###	lengt	Panel Type	##not
2	P3S06P001	149572.632		43124.1138		30997.4089		150034.096		44497.0923		31201.1007		151479.165		44220.6936		29756.4955		151017.994		42846.0425		29553.4116		P3S06P001	
3	P3S06P002	150034.096		44497.0923		31201.1007		150490.205		45872.5015		31400.2904		151935		45597.7674		29955.086		151479.165		44220.6936		29756.4955		P3S06P002	
4	P3S06P003	150490.205		45872.5015		31400.2904		150940.93		47250.3052		31594.9821		152385.473		46977.2334		30149.1841		151935		45597.7674		29955.086		P3S06P003	
5	P3S06P004	150940.93		47250.3052		31594.9821		151386.267		48630.4698		31785.1616		152830.57		48359.0618		30338.7828		152385.473		46977.2334		30149.1841		P3S06P004	
6	P3S06P005	151386.267		48630.4698		31785.1616		151474.689		48906.7825		31822.6539		152918.944		48635.7079		30376.1616		152830.57		48359.0618		30338.7828		P3S06P005	
7	P3S06P006	151474.689		48906.7825		31822.6539		151913.575		50289.7323		32007.3872		153357.585		50020.3276		30560.3477		152918.944		48635.7079		30376.1616		P3S06P006	
8	P3S06P007	151913.575		50289.7323		32007.3872		152347.08		51674.9657		32187.576		153790.836		51407.2369		30740.0246		153357.585		50020.3276		30560.3477		P3S06P007	
9	P3S06P008	152347.08		51674.9657		32187.576		152775.147		53062.4739		32363.2813		154218.667		52796.4316		30915.2314		153790.836		51407.2369		30740.0246		P3S06P008	
10	P3S06P009	152775.147		53062.4739		32363.2813		153197.744		54452.3272		32534.6167		154641.09		54188.0429		31086.0665		154218.667		52796.4316		30915.2314		P3S06P009	
11	P3S06P010	153197.744		54452.3272		32534.6167		153281.603		54730.5766		32568.3694		154724.924		54466.654		31119.7184		154641.09		54188.0429		31086.0665		P3S06P010	
12	P3S06P011	153281.603		54730.5766		32568.3694		153697.624		56123.188		32734.5715		155140.841		55861.1282		31285.4274		154724.924		54466.654		31119.7184		P3S06P011	
13	P3S06P012	153697.624		56123.188		32734.5715		154108.128		57517.7498		32896.4211		155551.199		57257.4509		31446.8027		155140.841		55861.1282		31285.4274		P3S06P012	
14	P3S06P013	154108.128		57517.7498		32896.4211		154513.02		58914.0007		33053.6684		155955.863		58655.1793		31603.5689		155551.199		57257.4509		31446.8027		P3S06P013	
15	P3S06P014	154513.02		58914.0007		33053.6684		154912.275		60311.9726		33206.0604		156354.833		60054.3601		31755.4605		155955.863		58655.1793		31603.5689		P3S06P014	
16	P3S06P015	154912.275		60311.9726		33206.0604		154991.455		60591.8003		33235.9403		156433.956		60334.4167		31785.2395		156354.833		60054.3601		31755.4605		P3S06P015	
17	P3S06P016	154991.455		60591.8003		33235.9403		155384.039		61992.164		33382.3144		156826.258		61735.9125		31931.1206		156433.956		60334.4167		31785.2395		P3S06P016	
18	P3S06P017	155384.039		61992.164		33382.3144		155771.104		63394.5402		33523.6095		157213.036		63139.4019		32071.9532		156826.258		61735.9125		31931.1206		P3S06P017	
19	P3S06P018	155771.104		63394.5402		33523.6095		156152.641		64799.0536		33659.8994		157594.329		64545.1147		32207.8035		157213.036		63139.4019		32071.9532		P3S06P018	
20	P3S06P019	156152.641		64799.0536		33659.8994		156528.665		66205.8406		33791.3989		157970.193		65953.318		32338.8909		157594.329		64545.1147		32207.8035		P3S06P019	
21	P3S06P020	156528.665		66205.8406		33791.3989		156603.207		66487.4657		33817.1437		158044.711		66235.2527		32364.5566		157970.193		65953.318		32338.8909		P3S06P020	
22	P3S06P021	156603.207		66487.4657		33817.1437		156972.591		67896.8372		33943.1573		158414.002		67646.2548		32490.1972		158044.711		66235.2527		32364.5566		P3S06P021	
23	P3S06P022	156972.591		67896.8372		33943.1573		157336.329		69307.9002		34064.607		158777.619		69058.83		32611.2857		158414.002		67646.2548		32490.1972		P3S06P022	
24	P3S06P023	157336.329		69307.9002		34064.607		157694.338		70720.5482		34181.3772		159135.5		70472.822		32727.6793		158777.619		69058.83		32611.2857		P3S06P023	
25	P3S06P024	157694.338		70720.5482		34181.3772		158046.558		72134.4265		34293.1711		159487.514		71887.6646		32839.0806		159135.5		70472.822		32727.6793		P3S06P024	
26	P3S06P025	158046.558		72134.4265		34293.1711		158116.297		72417.2914		34314.8748		159557.191		72170.6364		32860.703		159487.514		71887.6646		32839.0806		P3S06P025	
27	P3S06P026	158116.297		72417.2914		34314.8748		158461.474		73832.0687		34419.7934		159901.955		73585.5129		32965.2043		159557.191		72170.6364		32860.703		P3S06P026	
28	P3S06P027	158461.474		73832.0687		34419.7934		158800.798		75247.6674		34518.1928		160240.723		75000.5299		33063.172		159901.955		73585.5129		32965.2043		P3S06P027	
29	P3S06P028	158800.798		75247.6674		34518.1928		159134.34		76664.522		34609.6099		160573.676		76416.4942		33154.1589		160240.723		75000.5299		33063.172		P3S06P028	
30	P3S06P029	159134.34		76664.522		34609.6099		159462.105		78082.6818		34693.7628		160900.837		77833.534		33237.8995		160573.676		76416.4942		33154.1589		P3S06P029	
31	P3S06P030	159462.105		78082.6818		34693.7628		159526.964		78366.4655		34709.6976		160965.574		78117.0662		33253.7554		160900.837		77833.534		33237.8995		P3S06P030	
32	P3S06P031	159526.964		78366.4655		34709.6976		159847.917		79786.6698		34784.8936		161285.941		79536.0393		33328.5833		160965.574		78117.0662		33253.7554		P3S06P031	
33	P3S06P032	159847.917		79786.6698		34784.8936		160163.369		81209.1412		34852.7734		161600.864		80957.3769		33396.1369		161285.941		79536.0393		33328.5833		P3S06P032	
34	P3S06P033	160163.369		81209.1412		34852.7734		160473.329		82633.6703		34913.5237		161910.348		82380.8678		33456.5958		161600.864		80957.3769		33396.1369		P3S06P033	
35	P3S06P034	160473.329		82633.6703		34913.5237		160777.356		84058.5399		34967.1102		162213.944		83804.7494		33509.9212		161910.348		82380.8678		33456.5958		P3S06P034	
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37	P3S06P036	160837.419		84343.4967		34976.9482		161133.92		85768.179		35021.638		162570.037		85513.2534		33564.1916		162273.925		84089.5132		33519.7114		P3S06P036	
38	P3S06P037	161133.92		85768.179		35021.638		161424.472		87194.961		35058.7408		162860.157		86938.7178		33601.1181		162570.037		85513.2534		33564.1916		P3S06P037	
39	P3S06P038	161424.472		87194.961		35058.7408		161710.115		88626.5835		35088.1259		163145.242		88368.1089		33630.3397		162860.157		86938.7178		33601.1181		P3S06P038	
40	P3S06P039	161710.115		88626.5835		35088.1259		161991.372		90062.1491		35109.5513		163425.853		89800.6144		33651.6209		163145.242		88368.1089		33630.3397		P3S06P039	
41	P3S06P040	161991.372		90062.1491		35109.5513		162046.965		90348.8387		35112.8371		163481.328		90086.742		33654.8892		163425.853		89800.6144		33651.6209		P3S06P040	
42	P3S06P041	162046.965		90348.8387		35112.8371		162320.456		91777.2531		35124.1735		163754.377		91513.2313		33666.1912		163481.328		90086.742		33654.8892		P3S06P041	
43	P3S06P042	162320.456		91777.2531		35124.1735		162582.475		93187.6147		35126.9896		164016.659		92925.0915		33668.9867		163754.377		91513.2313		33666.1912		P3S06P042	

```

    {
        case 'x':
            p[index].x = System.Convert.ToDouble(para.AsValueString());
            break;
        case 'y':
            p[index].y = System.Convert.ToDouble(para.AsValueString());
            break;
        case 'z':
            p[index].z = System.Convert.ToDouble(para.AsValueString());
            break;
        default:
            MessageBox.Show("Wrong format of parameter name");
            break;
    }
}

}

CladdingPanel c1 = new CladdingPanel(p, PanelCounter); // new panel created from list of points.
double Area_m2 = c1.PanelArea / 1000000; // division by 1000000 to get area in m2 from mm2

//current family type parameter is updated with value of Area_m2 ;
document.BeginTransaction();
if( symbol.ParametersMap["Area"].Set(Area_m2) == false )
{
    MessageBox.Show("Wrong parameter type");
}
document.EndTransaction();

ArrayOfPanels.Add(c1); // new panel inserted into the array of panels

output += c1.UniqueNumber + " " + Area_m2 + " " + c1.T_edge[0] + " " + c1.T_edge[1] + " " + c1.T_edge[2] + " " + c1.T_edge[3]

// creating panel objects in space
document.BeginTransaction();
FamilyInstance instance = document.Create.NewFamilyInstance(location, symbol, StructuralType.NonStructural);
document.EndTransaction();
}

//MessageBox.Show(output);

```



```

public bool CompareEdgesWith(EdgeGroup otherPanel, double tolerance)
{
    if
    (
        Math.Abs(nextPanel.G_edge[0] - G_edge[0]) <= tolerance
        &&
        Math.Abs(nextPanel.G_edge[1] - G_edge[1]) <= tolerance
        &&
        Math.Abs(nextPanel.G_edge[2] - G_edge[2]) <= tolerance
        &&
        Math.Abs(nextPanel.G_edge[3] - G_edge[3]) <= tolerance
        &&
        Math.Abs(nextPanel.G_diagonal_1 - G_diagonal_1) <= tolerance * Math.Sqrt(2)
    )
    { return true; }
    else
    { return false; }

}

}

#endregion

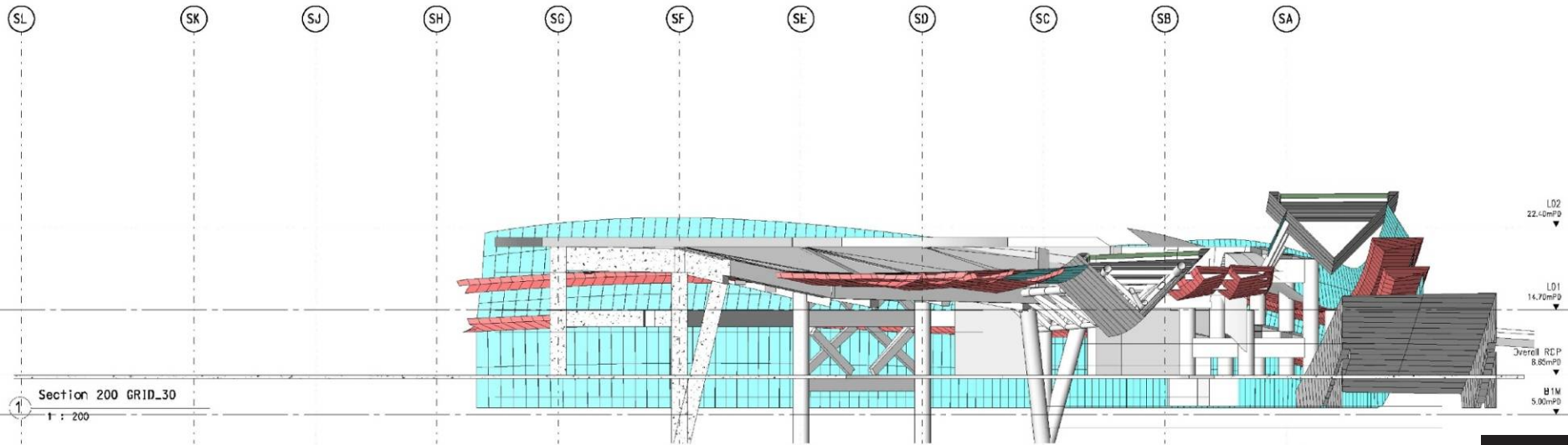
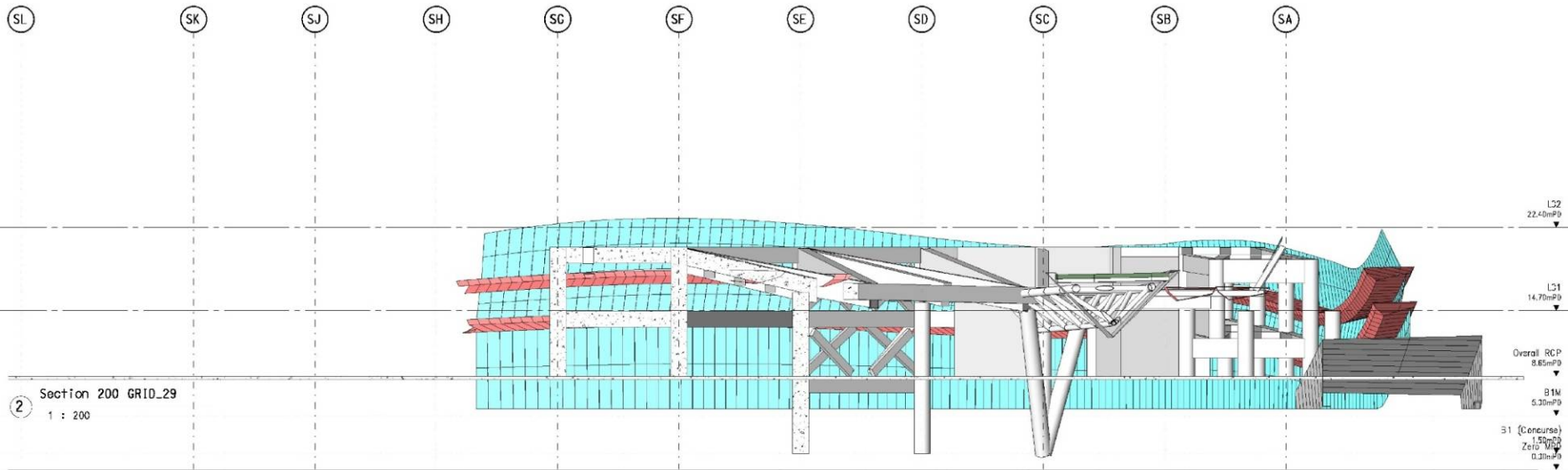
public class Group
{
    public int GroupNumber;
    public double[] Edge; //array of lengths of groups's edges.
    public double Diagonal; //length of group's diagonal.
    public double Area; //area of a grouped panel;
}

double toFeet(double value) //conversion of linear sizes for family instances
{
    return value * FACTOR_MMtoFT;
}

double toSqFeet(double value) //conversion of areal sizes for family instances
{

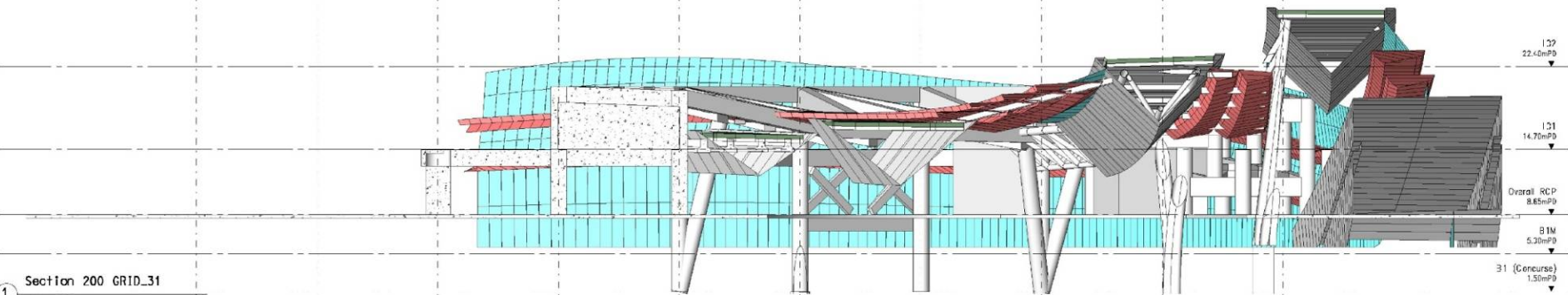
```

CONTEXT

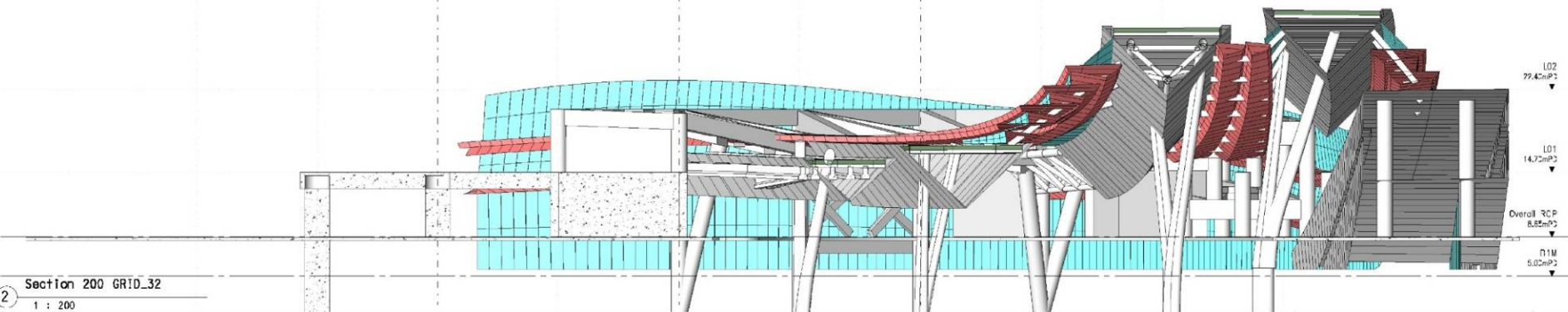


TERMINUS STATION

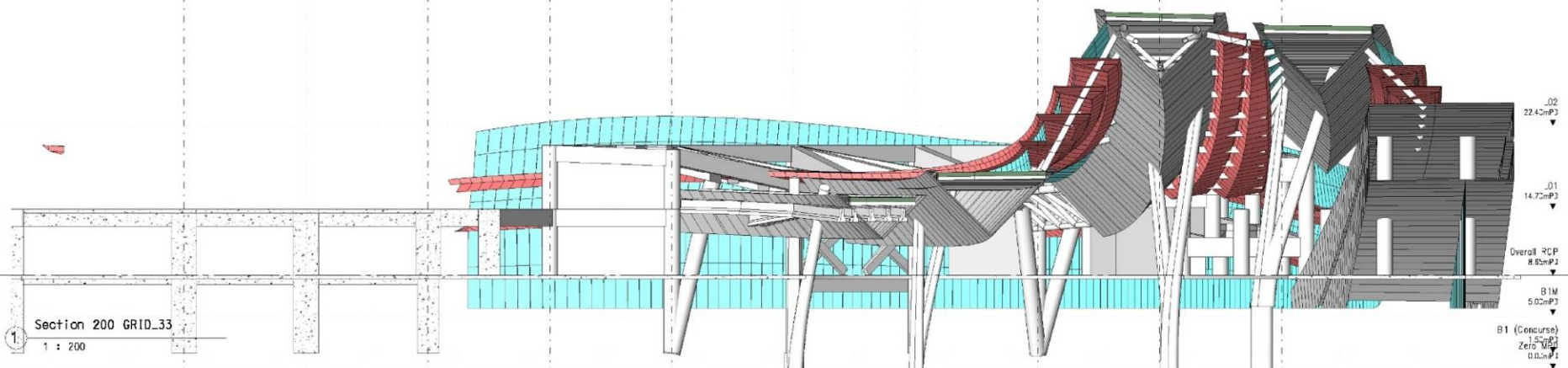
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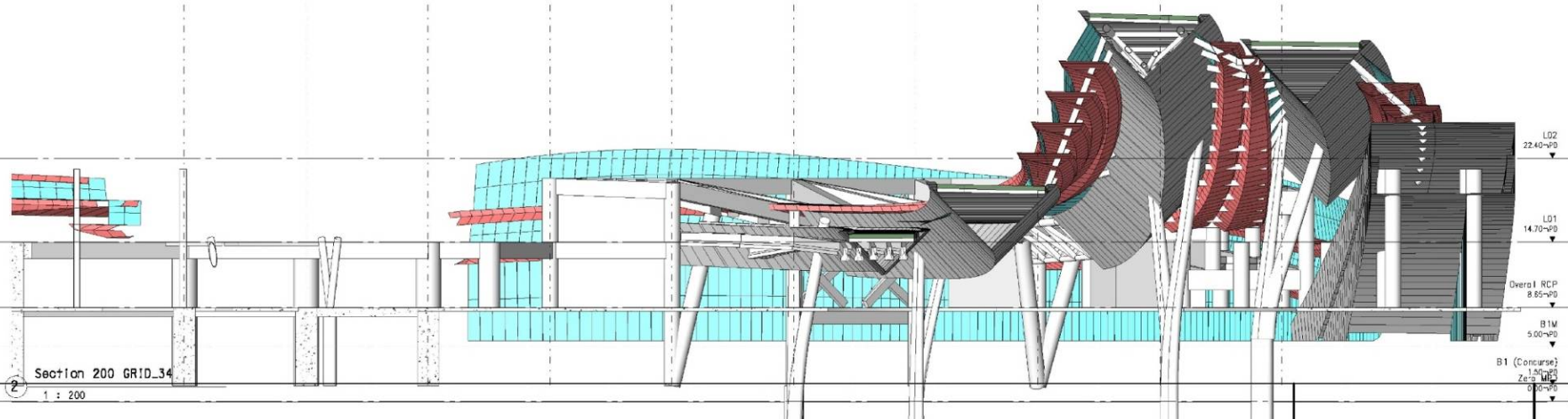
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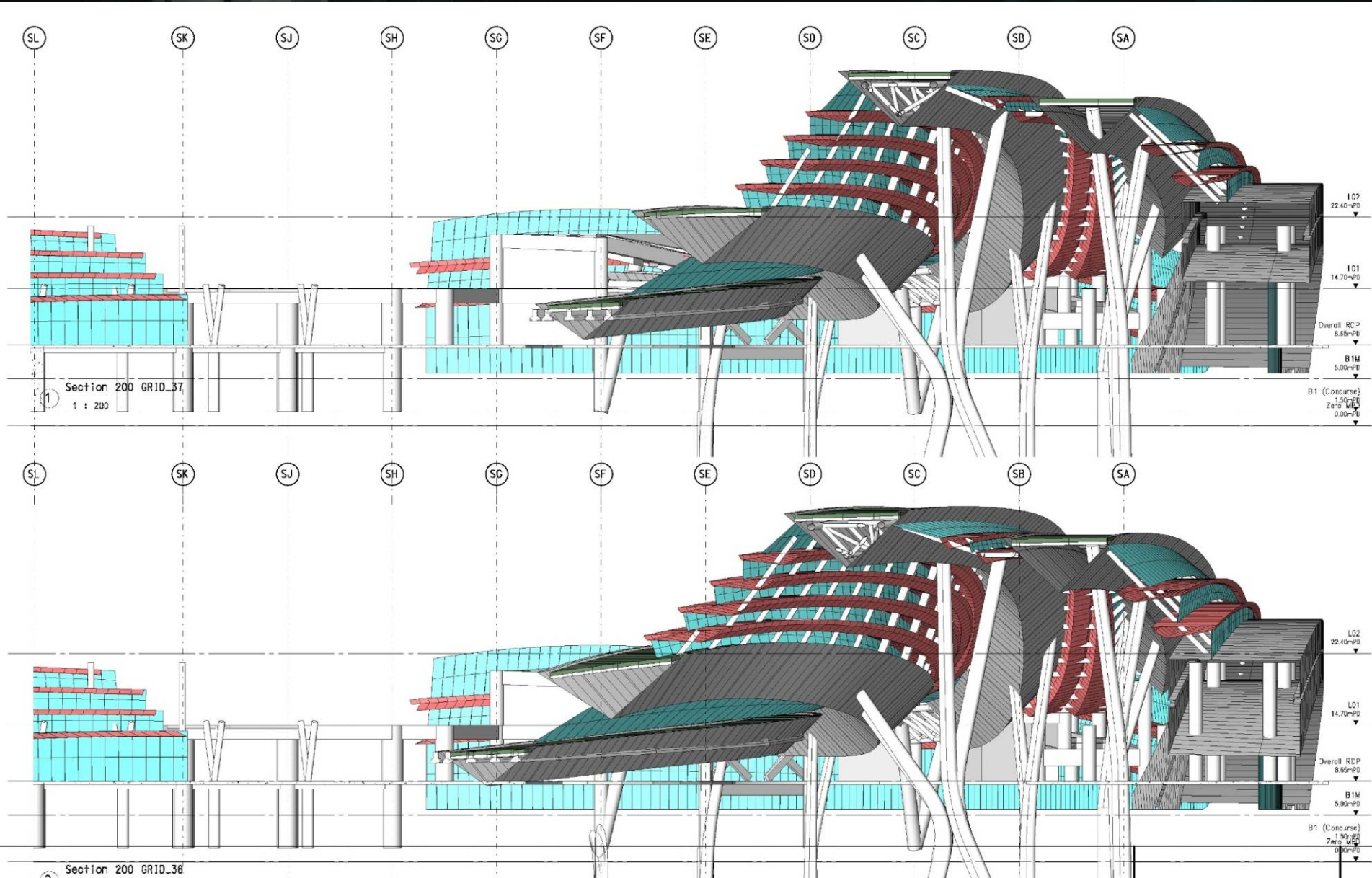


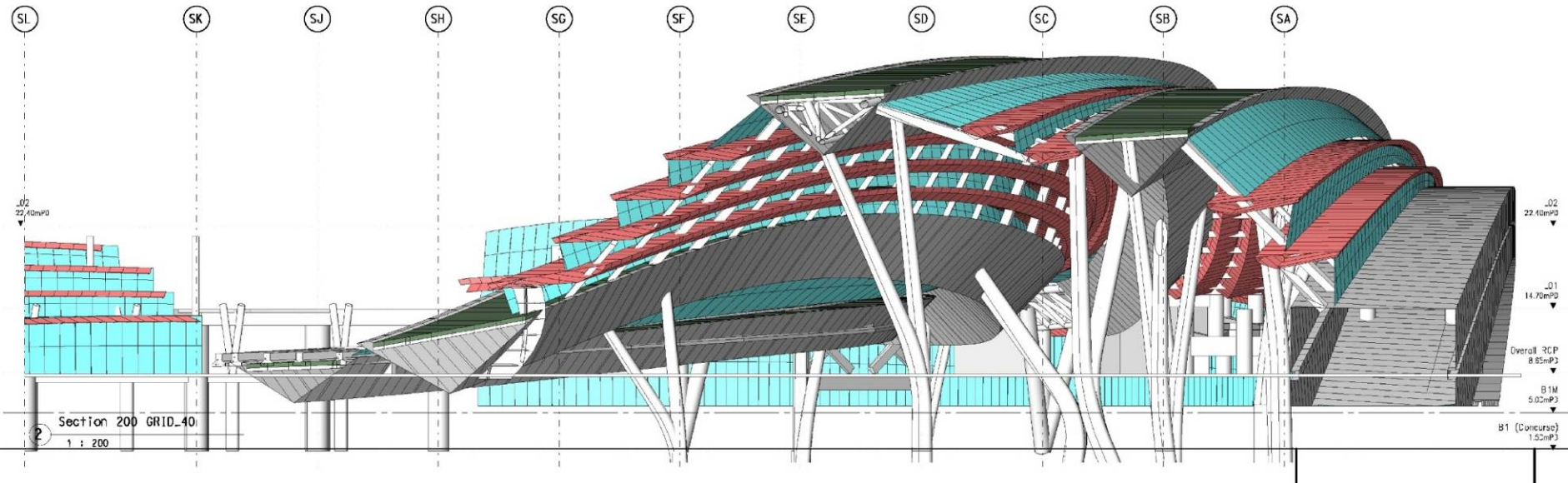
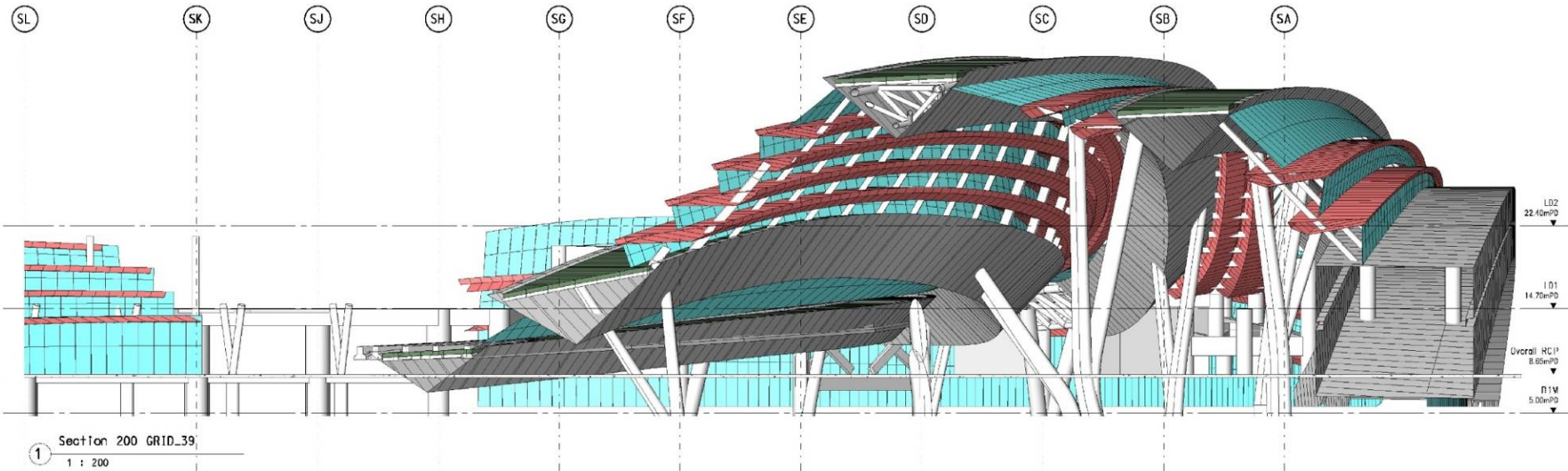
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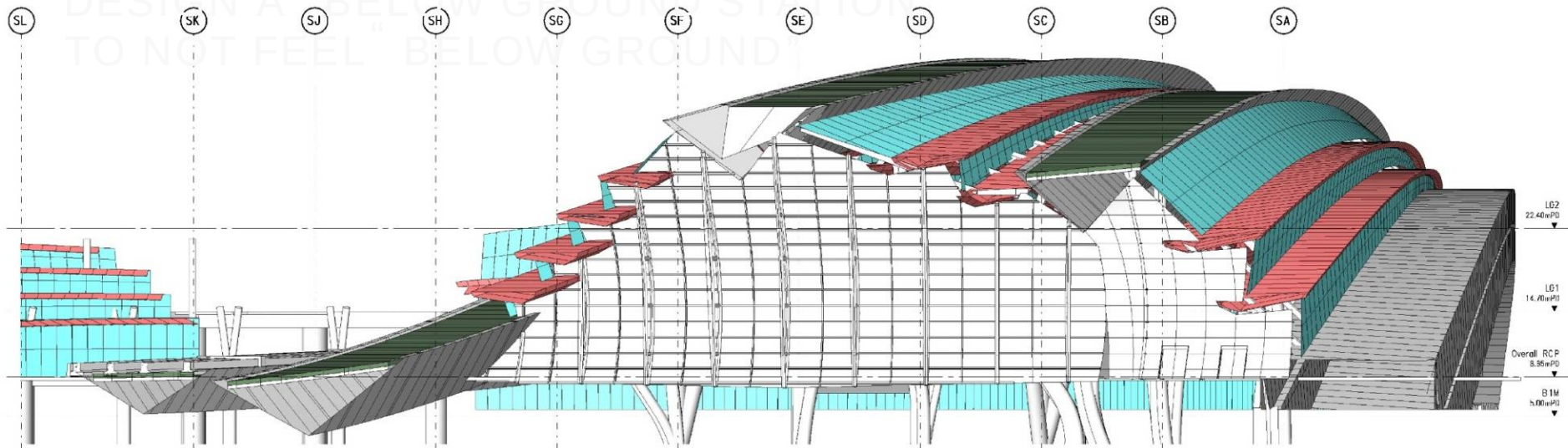
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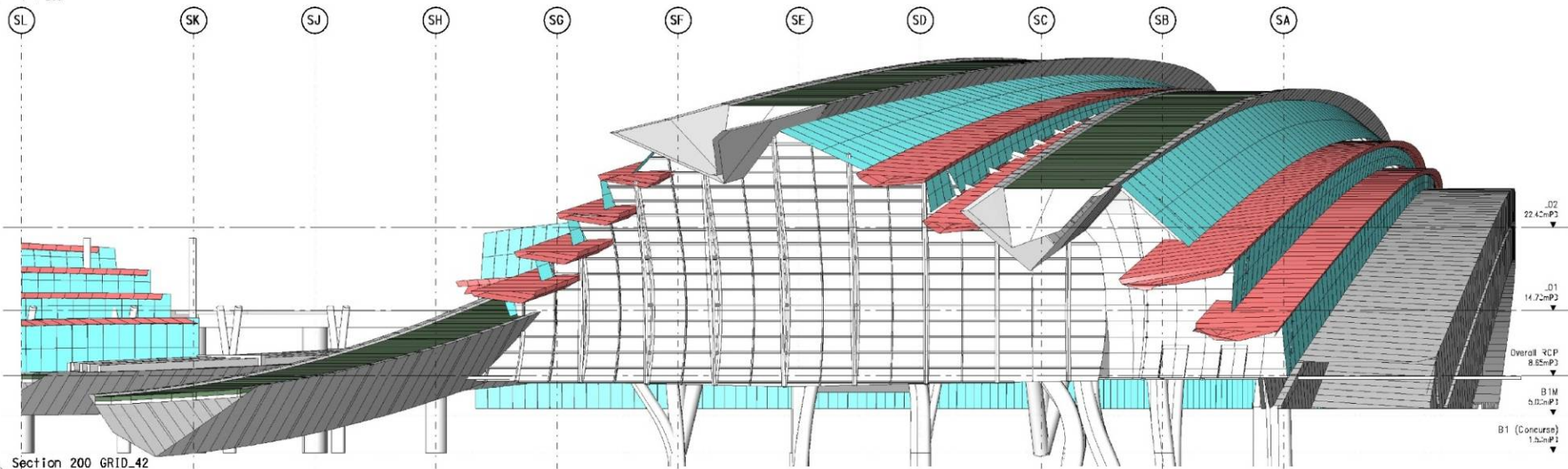


DESIGN A "BELOW GROUND STATION" TO NOT FEEL "BELOW GROUND"



Section 200 GRID.41

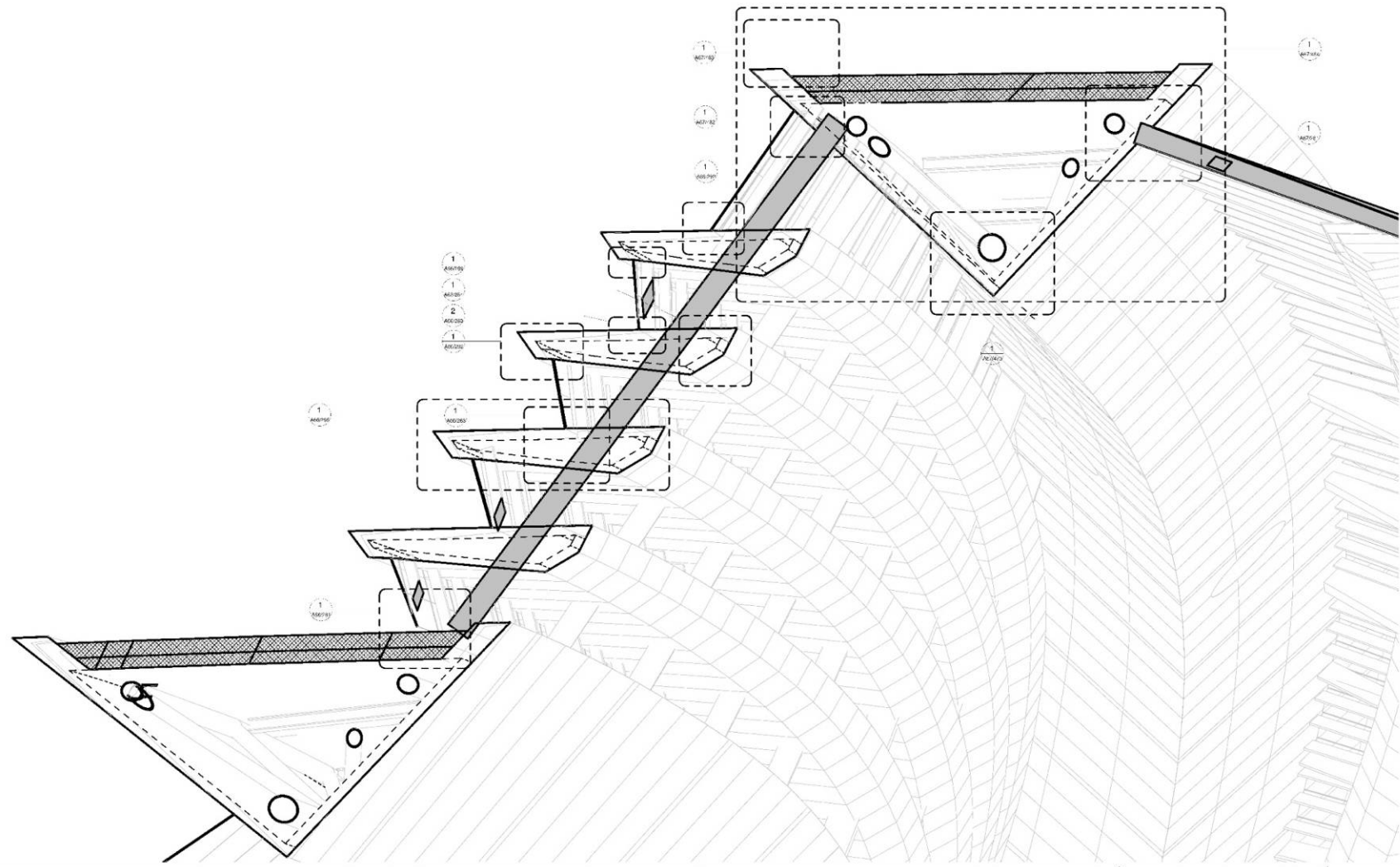
1 : 200



Section 200 GRID.42

1 : 200

Project: Kowloon Terminus
Date: 03/03/2010 12:21:08 PM
Drawing: 810A/T/WKT/AAT/A12/A67/421



REVISION				APPROVAL				DATE				DESCRIPTION			
REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED	REV

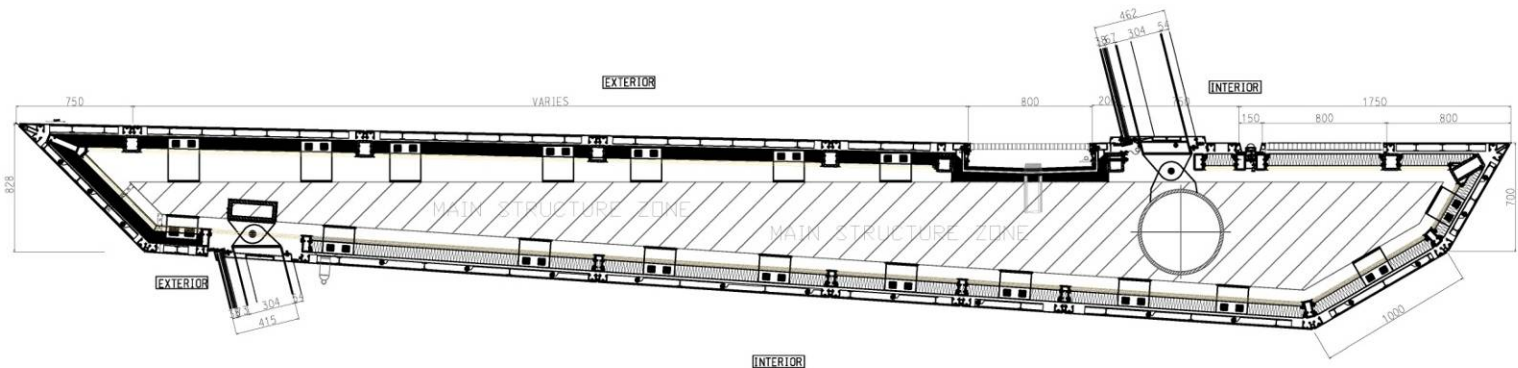
DRAWN			
DESIGNED			
CHECKED	F. MCNEIL		
APPROVED	K. CHONG		
DATE	2010/03/03		
NOT TO SCALE: THIS DRAWING IS FOR INFORMATION ONLY. IT IS NOT TO BE USED FOR CONSTRUCTION. THE DESIGNER IS NOT RESPONSIBLE FOR ANY ERRORS OR OMISSIONS. THE USER OF THIS DRAWING IS ADVISED THAT THE DESIGNER IS NOT RESPONSIBLE FOR ANY ERRORS OR OMISSIONS.			

MTR		EXPRESS RAIL LINK	
ORIGINATOR		MAUNSELL AECOM Aedas	
CHECKED		MAUNSELL AECOM Aedas	

TITLE		CONTRACT 810A	
		WKT - ABWF WORKS	
		Entrance Building, Wall Type G, V Beam P3 Typical Section	

SCALE	As Indicated	DRAWING NO.	810A/T/WKT/AAT/A12/A67/421	REV	
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24.



01 CLERESTORY

ADVANCE CHECK PRINT

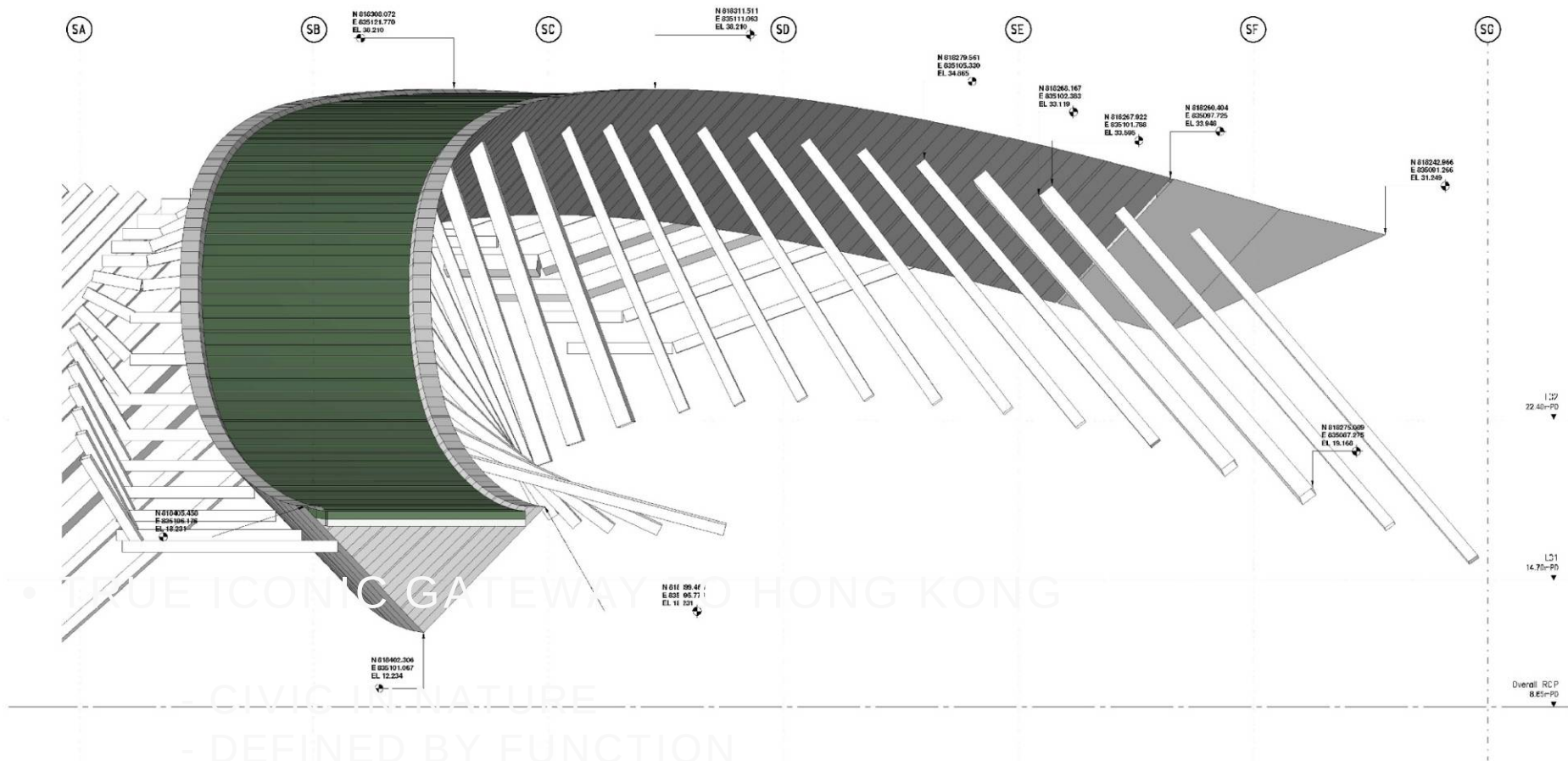
DRAWN
 DESIGNED
 CHECKED
 APPROVED
 DATE

ORIGINATOR
 MAUNSELL
 AEDAS
 MEINHARDT
 MVA
 BURO
 HAPPOLD
 EDWARDS
 MOTT

EXPRESS RAIL LINK
 MAUNSELL | AECOM | Aedas
 MAUNSELL • AEDAS • MEINHARDT • MVA • BURO HAPPOLD • EDWARDS • MOTT
 CAD REF.

TITLE
 CONTRA
 WKT -
 ENTRANCE BL
 WALL TYPE 1
 SCALE
 1:15 @ A1

- LANDSCAPE GRASS
- LANDSCAPE GRAVEL
- SKYLIGHT
- WATER FEATURE
- METAL CLADDING
- COMMERCIAL OFFICE

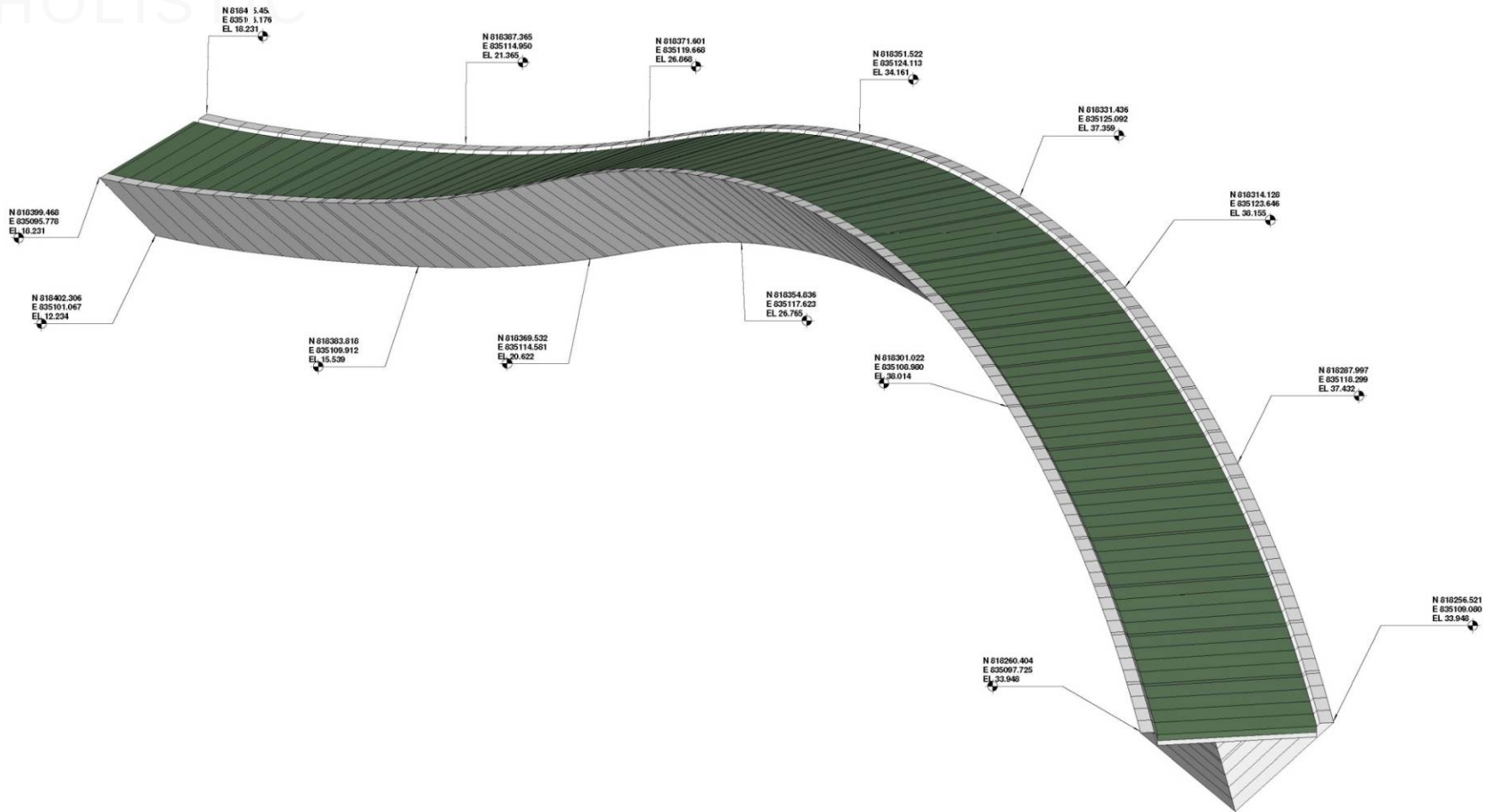


Component Elevation P3 North

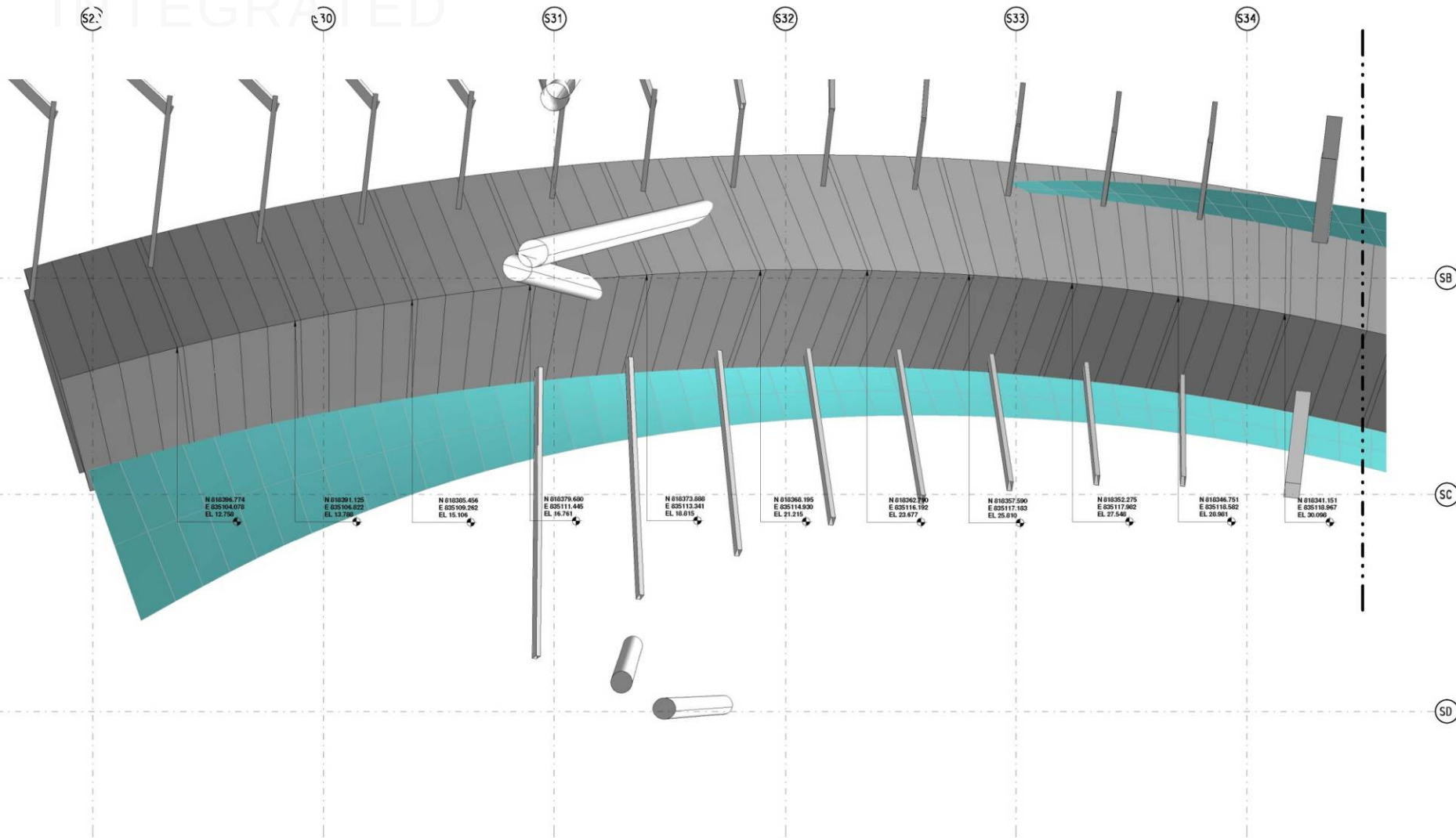
1 : 100

- EXCEEDING EXPECTATIONS

HOLISTIC



INTEGRATED



LEFT_Component RCP P3

1 : 100

ARRIVING or DEPARTING...

Panel P3S03P082

Group AL 36
Edge 1 1391 mm
Edge 2 839 mm
Edge 3 1398 mm
Edge 4 839 mm
Diagonal 1628 mm
Area 1.197 m²

Panel P3S03P081

Group AL 33
Edge 1 1358 mm
Edge 2 839 mm
Edge 3 1366 mm
Edge 4 839 mm
Diagonal 1600 mm
Area 1.169 m²

Panel P3S03P080

Group AL 34
Edge 1 267 mm
Edge 2 824 mm
Edge 3 269 mm
Edge 4 824 mm
Diagonal 867 mm
Area 0.234 m²

Panel P3S03P079

Group AL 33
Edge 1 1358 mm
Edge 2 839 mm
Edge 3 1366 mm
Edge 4 839 mm
Diagonal 1600 mm
Area 1.169 m²

Panel P3S03P078

Group AL 33
Edge 1 1358 mm
Edge 2 839 mm
Edge 3 1366 mm
Edge 4 839 mm
Diagonal 1600 mm
Area 1.169 m²

Panel P3S03P077

Group AL 33
Edge 1 1358 mm
Edge 2 839 mm
Edge 3 1366 mm
Edge 4 839 mm
Diagonal 1600 mm
Area 1.169 m²

Panel P3S04P082

Group AL 43
Edge 1 1378 mm
Edge 2 276 mm
Edge 3 1378 mm
Edge 4 276 mm
Diagonal 1405 mm
Area 0.400 m²

Panel P3S04P081

Group AL 40
Edge 1 1347 mm
Edge 2 276 mm
Edge 3 1354 mm
Edge 4 276 mm
Diagonal 1379 mm
Area 0.392 m²

Panel P3S04P080

Group AL 41
Edge 1 265 mm
Edge 2 271 mm
Edge 3 266 mm
Edge 4 271 mm
Diagonal 381 mm
Area 0.078 m²

Panel P3S04P079

Group AL 40
Edge 1 1347 mm
Edge 2 276 mm
Edge 3 1354 mm
Edge 4 276 mm
Diagonal 1379 mm
Area 0.392 m²

Panel P3S04P078

Group AL 40
Edge 1 1347 mm
Edge 2 276 mm
Edge 3 1354 mm
Edge 4 276 mm
Diagonal 1379 mm
Area 0.392 m²

Panel P3S04P077

Group AL 40
Edge 1 1347 mm
Edge 2 276 mm
Edge 3 1354 mm
Edge 4 276 mm
Diagonal 1379 mm
Area 0.392 m²

Panel P3S02P082

Group AL 30
Edge 1 1412 mm
Edge 2 8443 mm
Edge 3 1400 mm
Edge 4 8443 mm
Diagonal 8559 mm
Area 11.992 m²

Panel P3S02P081

Group AL 29
Edge 1 1400 mm
Edge 2 8443 mm
Edge 3 1367 mm
Edge 4 8443 mm
Diagonal 8551 mm
Area 11.801 m²

Panel P3S02P080

Group AL 23
Edge 1 272 mm
Edge 2 8298 mm
Edge 3 272 mm
Edge 4 8298 mm
Diagonal 8296 mm
Area 2.361 m²

Panel P3S02P079

Group AL 29
Edge 1 1400 mm
Edge 2 8443 mm
Edge 3 1367 mm
Edge 4 8443 mm
Diagonal 8551 mm
Area 11.801 m²

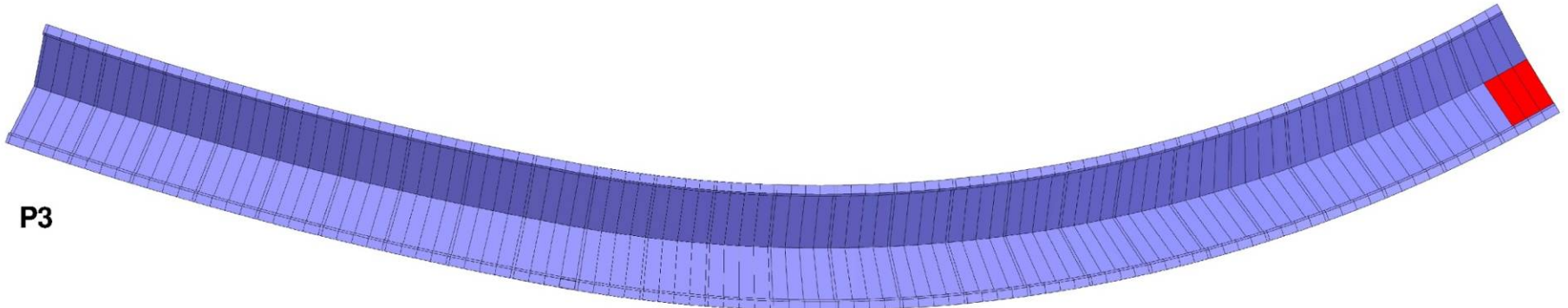
Panel P3S02P078

Group AL 29
Edge 1 1400 mm
Edge 2 8443 mm
Edge 3 1367 mm
Edge 4 8443 mm
Diagonal 8551 mm
Area 11.801 m²

Panel P3S02P077

Group AL 29
Edge 1 1400 mm
Edge 2 8443 mm
Edge 3 1367 mm
Edge 4 8443 mm
Diagonal 8551 mm
Area 11.801 m²

P3



Schedule of panels																						
Panel	Point 1				Point 2				Point 3				Point 4				Center of weight				Edges	Area
	P01 x	P01 y	P01 z		P02 x	P02 y	P02 z		P03 x	P03 y	P03 z		P04 x	P04 y	P04 z		C x	C y	C z	Edge 1	Edge 2	Edge 3
P3S01P001	835106129	818405551	18298	835101017	818402394	12231	835106871	818404239	18290	835101802	818401012	12299	835103955	818403297	15262	1493	8448	1583	8448	8585	13.111 m²	AL 1
P3S01P002	835106871	818404239	18290	835101802	818401012	12299	835107598	818402931	18391	835102588	818399625	12410	835104710	818401952	15347	1493	8448	1583	8448	8585	13.111 m²	AL 1
P3S01P003	835107598	818402931	18391	835102588	818399625	12410	835108310	818401617	18528	835103312	818398241	12560	835105447	818400604	15472	1493	8448	1583	8448	8585	13.111 m²	AL 1
AL 1.3																						35.335 m²
P3S01P004	835108310	818401617	18528	835103312	818398241	12560	835109007	818400300	18696	835104033	818396862	12745	835106166	818399255	15633	1493	8448	1559	8448	8583	13.010 m²	AL 2
AL 2.1																						13.010 m²
P3S01P005	835109007	818400300	18696	835104033	818396862	12745	835109144	818400036	18736	835104175	818396588	12786	835106560	818398446	15741	294	8313	305	8313	8318	2.594 m²	AL 3
P3S01P010	835111765	818394722	19674	835106783	818391211	13770	835111890	818394544	19728	835109506	818390943	13826	835109338	818392833	16760	294	8313	305	8313	8318	2.594 m²	AL 3
P3S01P015	835114256	818398075	20934	835109228	818385543	15084	835114368	818388805	21001	835109337	818395271	15154	835111797	818387174	18043	294	8313	305	8313	8318	2.594 m²	AL 3
P3S01P020	835116476	818383392	22499	835111414	818379769	16734	835116575	818383121	22582	835111511	818379492	16822	835113994	818381444	19659	294	8313	305	8313	8318	2.594 m²	AL 3
P3S01P025	835118417	818377721	24432	835113315	818373975	16781	835118503	818377451	24534	835113398	818373701	16888	835115906	818375712	21659	294	8313	305	8313	8318	2.594 m²	AL 3
P3S01P030	835120084	818372092	26716	835114909	818368280	21178	835120157	818371825	26832	835114977	818368015	21297	835117532	818370053	24068	294	8313	305	8313	8318	2.594 m²	AL 3
AL 3.6																						15.564 m²
P3S01P036	835109144	818400036	18736	835104175	818396588	12786	835109622	818398714	18942	835104883	818395227	13005	835107001	818397641	16867	1493	8448	1534	8448	8581	12.901 m²	AL 4
P3S01P018	835115454	818386100	21710	835110405	818382531	15899	835115973	818384746	22094	835110918	818381150	16305	835113167	818383632	19002	1493	8448	1534	8448	8581	12.901 m²	AL 4
P3S01P019	835115973	818384746	22094	835110918	818381150	16305	835116476	818383392	22499	835114144	818379769	16734	835113993	818386264	19408	1493	8448	1534	8448	8581	12.901 m²	AL 4
P3S01P021	835116575	818383121	22582	835111511	818379492	16822	835117059	818381769	23013	835111987	818378111	17278	835114283	818380623	19924	1493	8448	1534	8448	8581	12.901 m²	AL 4
P3S01P022	835117059	818381769	23013	835111987	818378111	17278	835117528	818380417	23465	835112447	818376730	17757	835114755	818379257	20378	1493	8448	1534	8448	8581	12.901 m²	AL 4
P3S01P023	835117528	818380417	23465	835112447	818376730	17757	835117980	818379088	23938	835112890	818375351	18258	835115211	818377891	20855	1493	8448	1534	8448	8581	12.901 m²	AL 4
P3S01P024	835117980	818379088	23938	835112890	818375351	18258	835118417	818377721	24432	835113315	818373975	16781	835115550	818376629	21353	1493	8448	1534	8448	8581	12.901 m²	AL 4
P3S01P026	835118503	818373975	16781	835113398	818373701	16888	835118921	818376718	25052	835113802	818372392	19436	835116156	818374988	21978	1493	8448	1534	8448	8581	12.901 m²	AL 4
AL 4.8																						103.208 m²
P3S01P007	835109822	818398714	18942	835104883	818395227	13005	835110485	818397388	19170	835105522	818393885	13245	835107673	818396303	16000	1493	8445	1507	8445	8578	12.786 m²	AL 5
P3S01P008	835110485	818397388	19170	835105522	818393885	13245	835111332	818396057	19414	835109161	818392551	13500	835106325	818394070	16332	1493	8445	1507	8445	8578	12.786 m²	AL 5
P3S01P009	835111332	818396057	19414	835109161	818392551	13500	835111765	818394722	19674	835106783	818391211	13770	835109960	818393635	16590	1493	8445	1507	8445	8578	12.786 m²	AL 5
P3S01P011	835111890	818394544	19728	835109506	818385093	13826	835112504	818393115	20006	835107510	818386599	14116	835108702	818382028	16919	1493	8445	1507	8445	8578	12.786 m²	AL 5
P3S01P012	835112504	818393115	20006	835107510	818386599	14116	835113103	818391771	20300	835108097	818388252	14422	835110304	818390654	17211	1493	8445	1507	8445	8578	12.786 m²	AL 5
P3S01P013	835113103	818391771	20300	835108097	818388252	14422	835113688	818390425	20609	835108670	818386600	14745	835110890	818389357	17519	1493	8445	1507	8445	8578	12.786 m²	AL 5
P3S01P014	835113688	818390425	20609	835108670	818386600	14745	835114256	818389075	20934	835109228	818385543	15084	835111450	818387968	17943	1493	8445	1507	8445	8578	12.786 m²	AL 5
P3S01P016	835114368	818388805	21001	835109337	818385271	15154	835114919	818387453	21346	835109678	818383806	15516	835112126	818386359	18254	1493	8445	1507	8445	8578	12.786 m²	AL 5
P3S01P017	835114919	818387453	21346	835109678	818383806	15516	835115454	818386100	21710	835110405	818382531	15899	835112654	818384998	18918	1493	8445	1507	8445	8578	12.786 m²	AL 5
P3S01P027	835118921	818376718	25052	835113802	818372392	19436	835119324	818373428	26145	835114189	818370671	20002	835116559	818373544	22520	1493	8445	1507	8445	8578	12.786 m²	AL 5
P3S01P028	835119324	818373428	26145	835114189	818370671	20002	835119711	818373428	26145	835114589	818368618	20585	835116948	818372196	23081	1493	8445	1507	8445	8578	12.786 m²	AL 5
P3S01P029	835119711	818373428	26145	835114589	818368618	20585	835120084	818372092	26716	835114909	818368280	21178	835117316	818370855	23656	1493	8445	1507	8445	8578	12.786 m²	AL 5
AL 5.12																						153.439 m²
P3S01P031	835120157	818371825	26832	835114977	818368015	21297	835120513	818370490	27416	835115304	818366697	21896	835117738	818369257	24360	1493	8445	1477	8445	8574	12.661 m²	AL 6
AL 6.1																						12.661 m²

Panel P3S02P002

Group AL 14
Edge 1 1583 mm
Edge 2 8445 mm
Edge 3 1367 mm
Edge 4 8445 mm
Diagonal 8568 mm
Area 12.573 m²

N 818401012
E 835101802
EL 12299

N 818404239
E 835106871
EL 18290

Panel P3S01P002
Group AL 1
Edge 1 1493 mm
Edge 2 8446 mm
Edge 3 1583 mm
Edge 4 8446 mm
Diagonal 8585 mm
Area 13.111 m²

Panel P3S01P009

Group AL 5
Edge 1 1493 mm
Edge 2 8445 mm
Edge 3 1507 mm
Edge 4 8445 mm
Diagonal 8578 mm
Area 12.786 m²

Remark: An above table is a portion extracted for presentation purpose from the full schedule of panels included in the BIM model.

P3

N 818398670
E 835109844
EL 18950

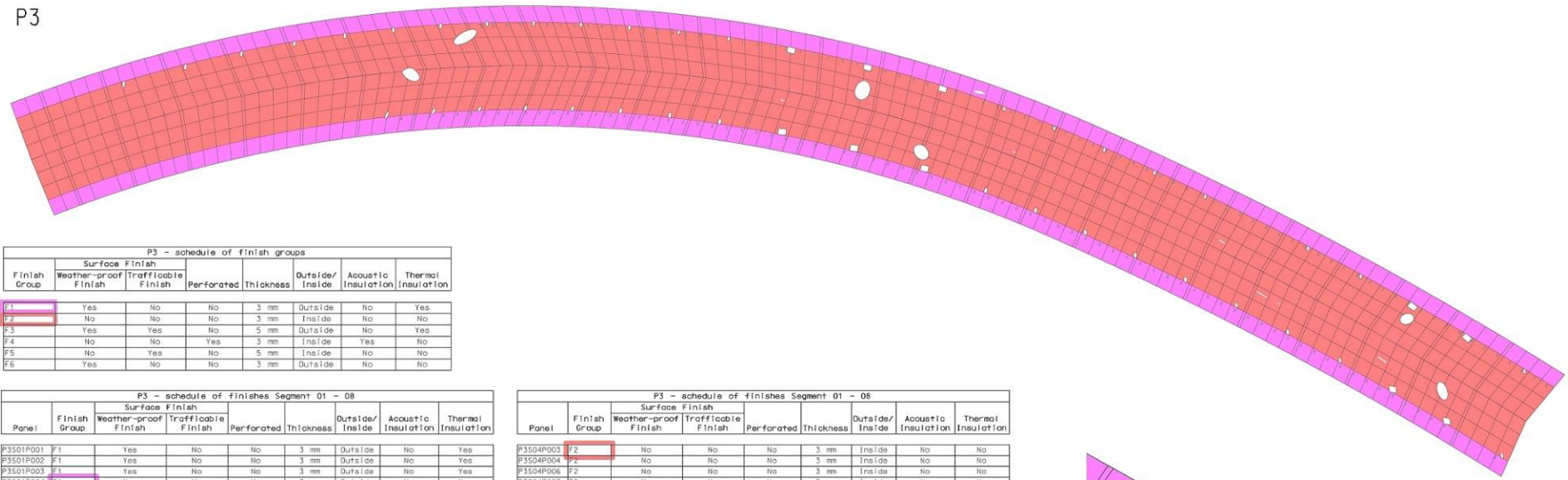
N 818405541
E 835106129
EL 18228

N 818402394
E 835101017
EL 12231

N 818398353
E 835096414
EL 18290

Schedule of panel groups								
Group Name	Number of panels	Edge 1	Edge 2	Edge 3	Edge 4	Diagonal	Panel area	Group Area
AL 1	3	1493	8446	1593	8446	8595	13.111 m ²	39.333 m ²
AL 2	1	1493	8446	1599	8446	8583	13.010 m ²	13.010 m ²
AL 3	6	284	8313	305	8313	8318	2.594 m ²	15.564 m ²
AL 4	9	1493	8448	1534	8446	8581	12.901 m ²	103.208 m ²
AL 5	12	1493	8445	1507	8445	8578	12.786 m ²	153.433 m ²
AL 6	1	1493	8445	1477	8445	8574	12.661 m ²	12.661 m ²
AL 7	32	1493	8444	1452	8444	8572	12.554 m ²	401.734 m ²
AL 8	5	1493	8444	1424	8444	8569	12.436 m ²	62.180 m ²
AL 9	13	1493	8444	1398	8444	8567	12.325 m ²	160.227 m ²
AL 10	13	284	8303	272	8302	8307	2.453 m ²	80.933 m ²
AL 11	25	1493	8443	1399	8443	8564	12.199 m ²	304.979 m ²
AL 12	3	1493	8443	1354	8443	8562	12.139 m ²	60.676 m ²
AL 13	3	1493	8443	1338	8443	8560	12.069 m ²	36.208 m ²
AL 14	3	1583	8445	1367	8445	8568	12.673 m ²	37.718 m ²
AL 15	1	1559	8445	1368	8445	8560	12.479 m ²	12.479 m ²
AL 16	6	1533	8445	1389	8445	8556	12.372 m ²	98.979 m ²
AL 17	3	1513	8445	1374	8445	8547	12.311 m ²	36.932 m ²
AL 18	1	1497	8446	1385	8445	8536	12.290 m ²	12.290 m ²
AL 19	1	1477	8445	1387	8445	8534	12.209 m ²	12.209 m ²
AL 20	1	1452	8445	1387	8445	8531	12.102 m ²	12.102 m ²
AL 21	1	1424	8445	1387	8445	8529	11.984 m ²	11.984 m ²
AL 22	1	1388	8444	1386	8444	8527	11.871 m ²	11.871 m ²
AL 23	11	272	8298	272	8298	8296	2.361 m ²	25.974 m ²
AL 24	6	1569	8444	1385	8444	8524	11.742 m ²	70.452 m ²
AL 25	7	1254	8444	1384	8444	8524	11.674 m ²	81.716 m ²
AL 26	3	1338	8443	1381	8443	8524	11.595 m ²	34.788 m ²
AL 27	6	1362	8442	1389	8442	8539	11.648 m ²	93.185 m ²
AL 28	3	1380	8442	1367	8442	8543	11.714 m ²	35.143 m ²
AL 29	10	1400	8443	1367	8443	8551	11.801 m ²	118.005 m ²
AL 30	1	1412	8443	1400	8443	8559	11.992 m ²	11.992 m ²
AL 31	10	1427	8444	1431	8444	8564	12.187 m ²	121.867 m ²
AL 32	24	1440	8444	1453	8444	8568	12.334 m ²	296.014 m ²
AL 33	62	1358	839	1366	839	1607	1.169 m ²	66.791 m ²
AL 34	16	267	824	269	824	867	0.294 m ²	3.748 m ²
AL 35	13	1372	839	1379	839	1611	1.181 m ²	15.348 m ²
AL 36	1	1391	839	1398	839	1628	1.197 m ²	1.197 m ²
AL 37	31	1422	839	1426	839	1653	1.222 m ²	37.880 m ²
AL 38	3	1444	839	1447	839	1671	1.240 m ²	3.720 m ²
AL 39	34	284	825	285	825	873	0.248 m ²	8.448 m ²
AL 40	54	1347	276	1354	276	1379	0.392 m ²	21.163 m ²
AL 41	24	265	271	266	271	361	0.078 m ²	1.883 m ²
AL 42	11	1361	276	1366	276	1396	0.396 m ²	4.353 m ²
AL 43	1	1378	276	1378	276	1405	0.400 m ²	0.400 m ²
AL 44	32	1406	276	1408	276	1432	0.408 m ²	13.052 m ²
AL 45	2	1426	276	1425	276	1452	0.414 m ²	0.827 m ²
AL 46	26	261	271	261	271	390	0.083 m ²	2.154 m ²
AL 47	100	1456	276	1453	276	1481	0.422 m ²	42.209 m ²
AL 48	100	1474	839	1483	839	1700	1.269 m ²	126.892 m ²
Grand total:	750							2923.908 m ²

P3

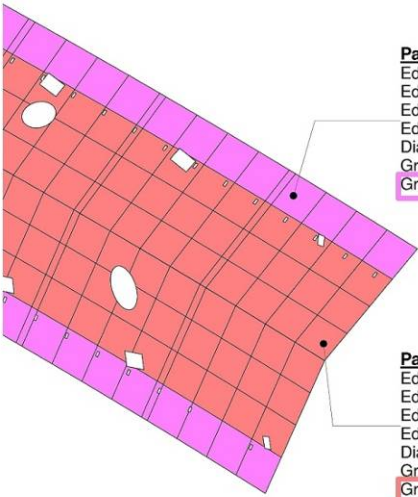


P3 - schedule of finish groups							
Finish Group	Surface Finish		Perforated	Thickness	Outside/ Inside	Acoustic Insulation	Thermal Insulation
	Weather-proof Finish	Trafficable Finish					
F1	Yes	No	No	3 mm	Outside	No	Yes
F2	No	No	No	3 mm	Inside	No	No
F3	Yes	Yes	No	5 mm	Outside	No	Yes
F4	No	No	Yes	3 mm	Inside	Yes	No
F5	No	Yes	No	5 mm	Inside	No	No
F6	Yes	No	No	3 mm	Outside	No	No

P3 - schedule of finishes Segment 01 - 08								
Panel	Finish Group	Surface Finish		Perforated	Thickness	Outside/ Inside	Acoustic Insulation	Thermal Insulation
		Weather-proof Finish	Trafficable Finish					
P3501P001	F1	Yes	No	No	3 mm	Outside	No	Yes
P3501P002	F1	Yes	No	No	3 mm	Outside	No	Yes
P3501P003	F1	Yes	No	No	3 mm	Outside	No	Yes
P3501P004	F1	Yes	No	No	3 mm	Outside	No	Yes
P3501P005	F1	Yes	No	No	3 mm	Outside	No	Yes
P3501P006	F1	Yes	No	No	3 mm	Outside	No	Yes
P3501P007	F1	Yes	No	No	3 mm	Outside	No	Yes
P3501P008	F1	Yes	No	No	3 mm	Outside	No	Yes
P3501P009	F1	Yes	No	No	3 mm	Outside	No	Yes
P3508P001	F1	Yes	No	No	3 mm	Outside	No	Yes
P3508P002	F1	Yes	No	No	3 mm	Outside	No	Yes
P3508P003	F1	Yes	No	No	3 mm	Outside	No	Yes
P3508P004	F1	Yes	No	No	3 mm	Outside	No	Yes
P3508P005	F1	Yes	No	No	3 mm	Outside	No	Yes
P3508P006	F1	Yes	No	No	3 mm	Outside	No	Yes
P3508P007	F1	Yes	No	No	3 mm	Outside	No	Yes
P3508P008	F1	Yes	No	No	3 mm	Outside	No	Yes
F 1: 17								
P3502P001	F2	No	No	No	3 mm	Inside	No	No
P3502P002	F2	No	No	No	3 mm	Inside	No	No
P3502P003	F2	No	No	No	3 mm	Inside	No	No
P3502P004	F2	No	No	No	3 mm	Inside	No	No
P3502P005	F2	No	No	No	3 mm	Inside	No	No
P3502P006	F2	No	No	No	3 mm	Inside	No	No
P3502P007	F2	No	No	No	3 mm	Inside	No	No
P3502P008	F2	No	No	No	3 mm	Inside	No	No
P3502P009	F2	No	No	No	3 mm	Inside	No	No
P3503P001	F2	No	No	No	3 mm	Inside	No	No
P3503P002	F2	No	No	No	3 mm	Inside	No	No
P3503P003	F2	No	No	No	3 mm	Inside	No	No
P3503P004	F2	No	No	No	3 mm	Inside	No	No
P3503P005	F2	No	No	No	3 mm	Inside	No	No
P3503P006	F2	No	No	No	3 mm	Inside	No	No
P3503P007	F2	No	No	No	3 mm	Inside	No	No
P3503P008	F2	No	No	No	3 mm	Inside	No	No
P3503P009	F2	No	No	No	3 mm	Inside	No	No
P3504P001	F2	No	No	No	3 mm	Inside	No	No
P3504P002	F2	No	No	No	3 mm	Inside	No	No

P3 - schedule of finishes Segment 01 - 08								
Panel	Finish Group	Surface Finish		Perforated	Thickness	Outside/ Inside	Acoustic Insulation	Thermal Insulation
		Weather-proof Finish	Trafficable Finish					
P3504P003	F2	No	No	No	3 mm	Inside	No	No
P3504P004	F2	No	No	No	3 mm	Inside	No	No
P3504P006	F2	No	No	No	3 mm	Inside	No	No
P3504P007	F2	No	No	No	3 mm	Inside	No	No
P3504P008	F2	No	No	No	3 mm	Inside	No	No
P3504P009	F2	No	No	No	3 mm	Inside	No	No
F 2: 25								
P3505P005	F2	No	No	No	3 mm	Inside	No	No
P3504P005	F2	No	No	No	3 mm	Inside	No	No
P3505P001	F2	No	No	No	3 mm	Inside	No	No
P3505P002	F2	No	No	No	3 mm	Inside	No	No
P3505P003	F2	No	No	No	3 mm	Inside	No	No
P3505P004	F2	No	No	No	3 mm	Inside	No	No
P3505P005	F2	No	No	No	3 mm	Inside	No	No
P3505P006	F2	No	No	No	3 mm	Inside	No	No
P3505P007	F2	No	No	No	3 mm	Inside	No	No
P3505P008	F2	No	No	No	3 mm	Inside	No	No
P3505P009	F2	No	No	No	3 mm	Inside	No	No
P3506P001	F2	No	No	No	3 mm	Inside	No	No
P3506P002	F2	No	No	No	3 mm	Inside	No	No
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P3506P008	F2	No	No	No	3 mm	Inside	No	No
P3506P009	F2	No	No	No	3 mm	Inside	No	No
P3507P001	F2	No	No	No	3 mm	Inside	No	No
P3507P002	F2	No	No	No	3 mm	Inside	No	No
P3507P003	F2	No	No	No	3 mm	Inside	No	No
P3507P004	F2	No	No	No	3 mm	Inside	No	No
P3507P005	F2	No	No	No	3 mm	Inside	No	No
P3507P006	F2	No	No	No	3 mm	Inside	No	No
P3507P007	F2	No	No	No	3 mm	Inside	No	No
P3507P008	F2	No	No	No	3 mm	Inside	No	No
P3507P009	F2	No	No	No	3 mm	Inside	No	No
F 6: 29								

Remark: An above is a portion extracted for presentation purpose the full schedule of panels included in the BIM model.

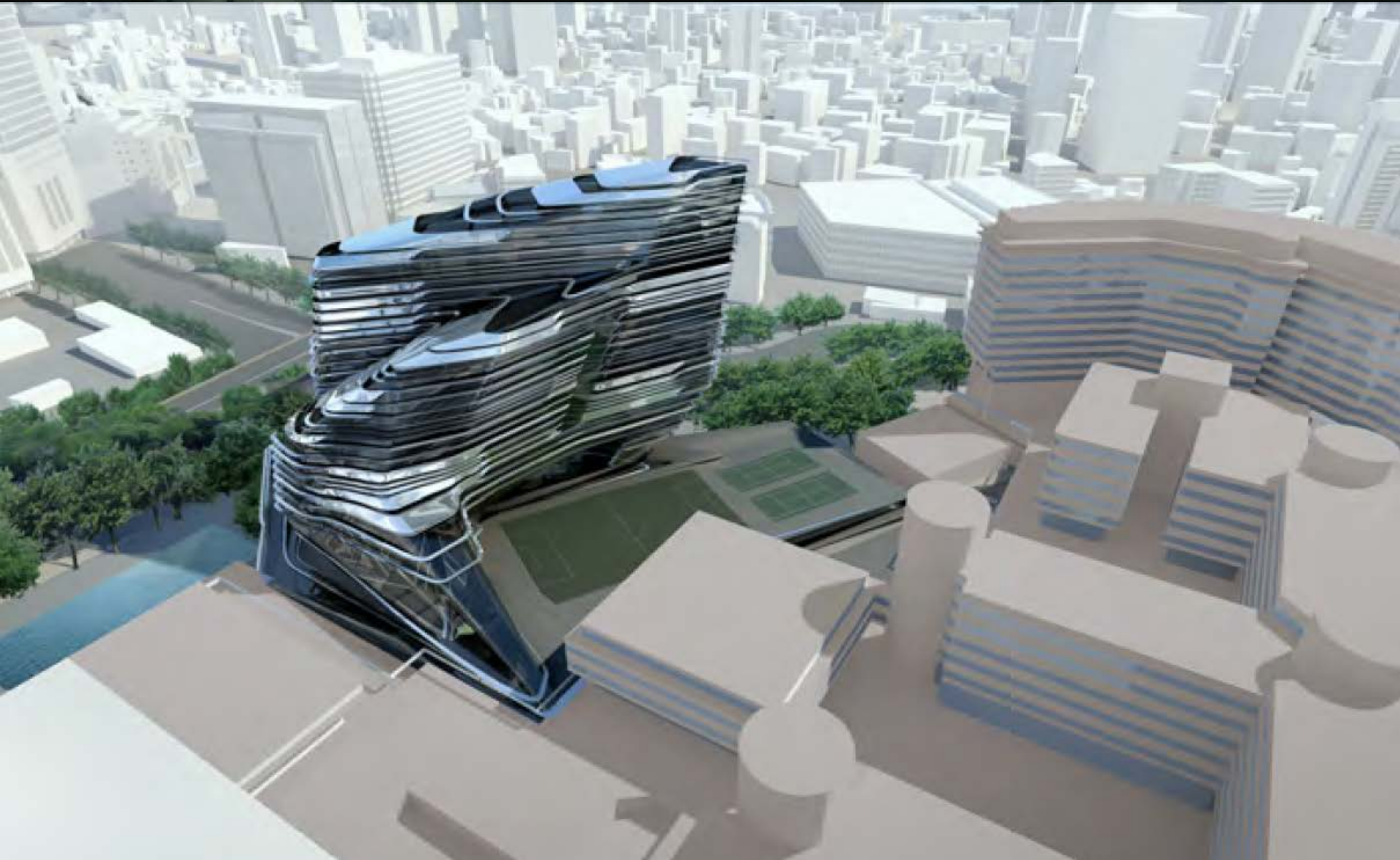


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Edge 2 2279 mm
Edge 3 1476 mm
Edge 4 2279 mm
Diagonal 2720 mm
Group(Size) A 1
Group(Finish)... F 1

Panel P3S04P001
Edge 1 1460 mm
Edge 2 2042 mm
Edge 3 1445 mm
Edge 4 2042 mm
Diagonal 2508 mm
Group(Size) A 13
Group(Finish)... F 2



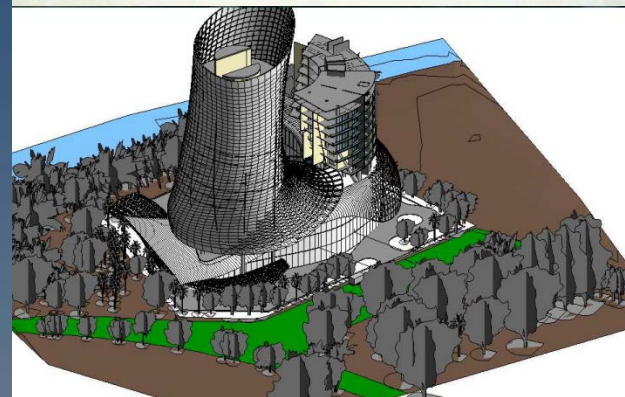
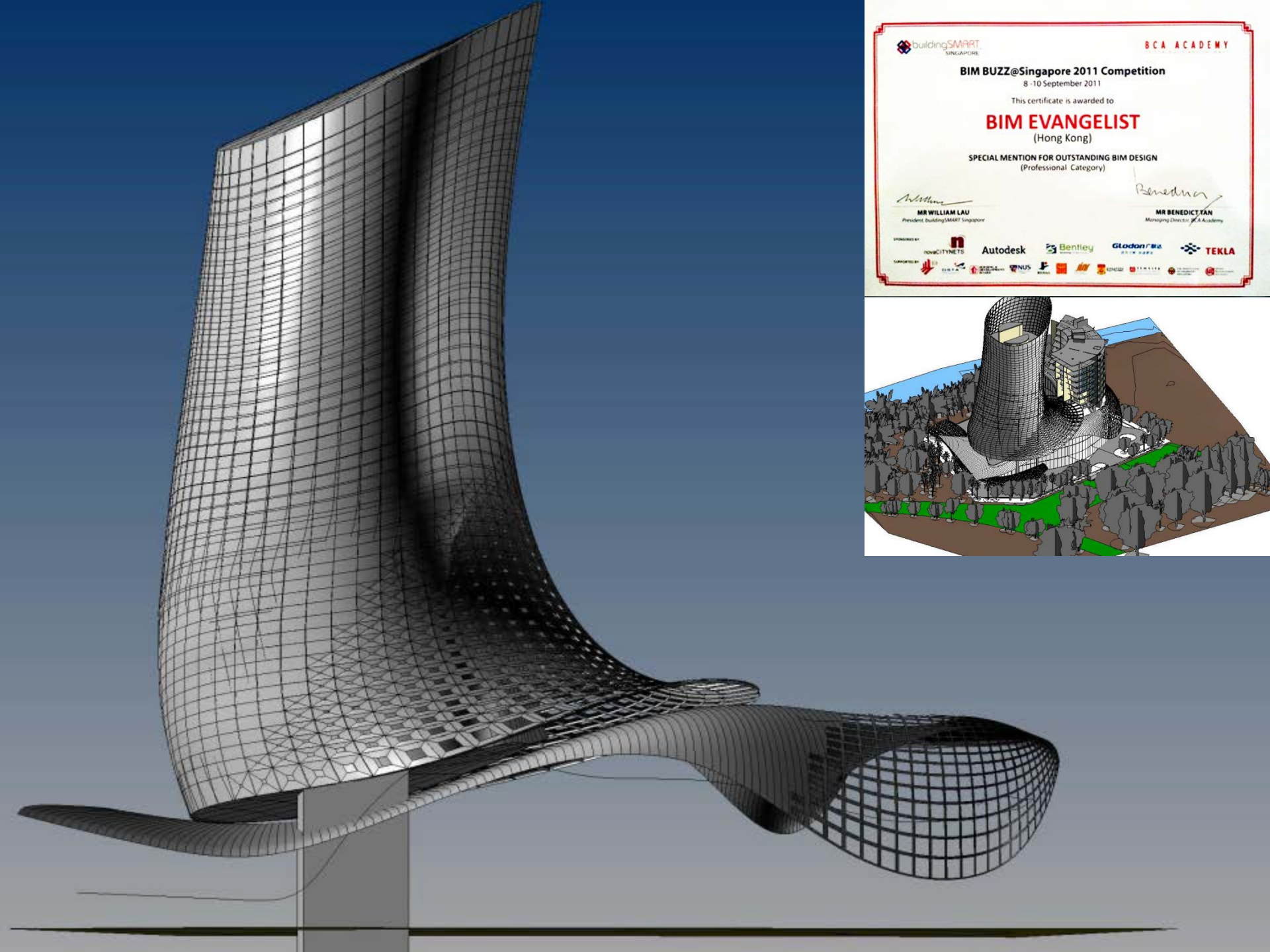
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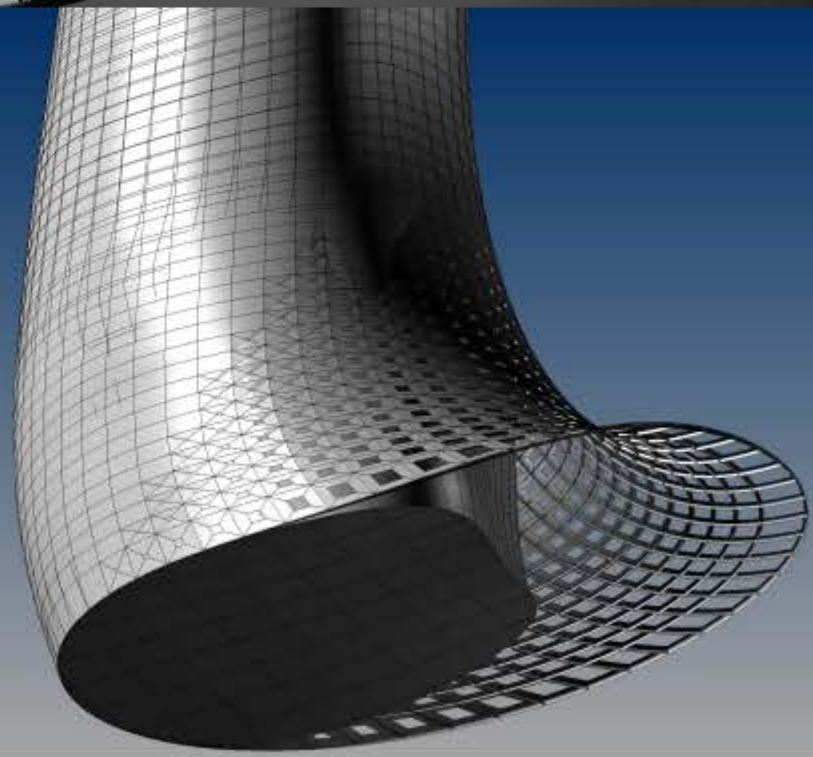
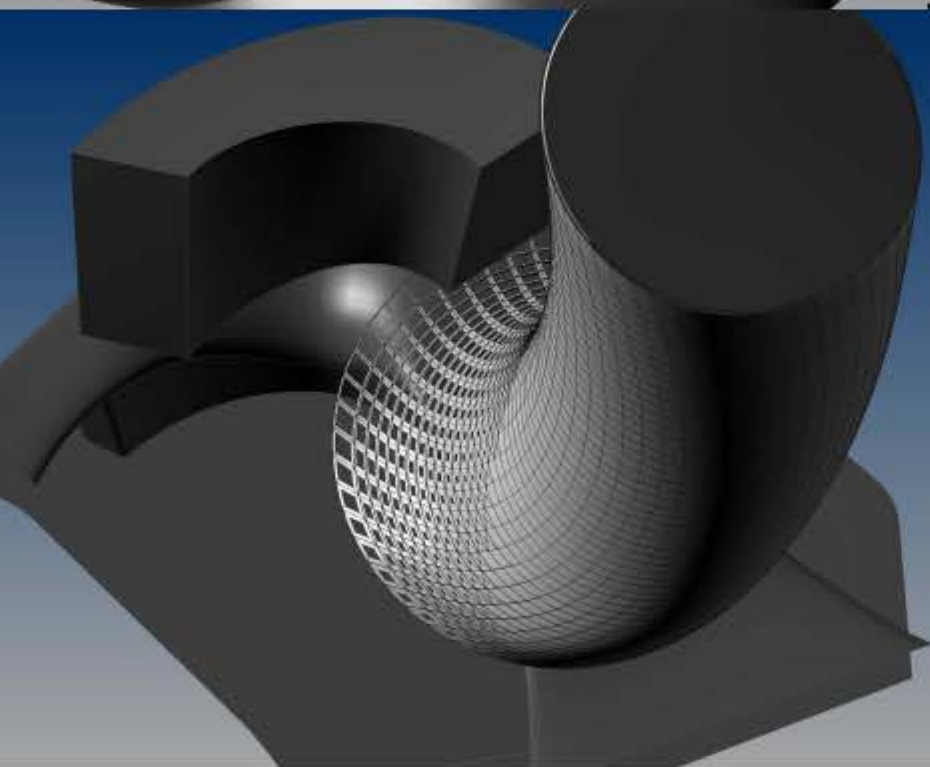
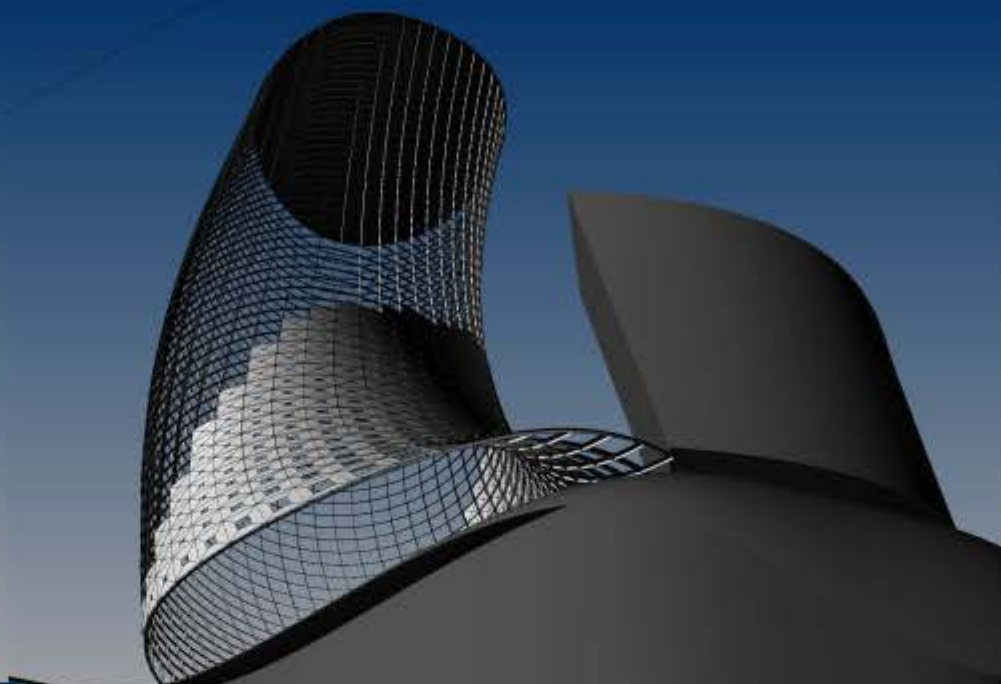
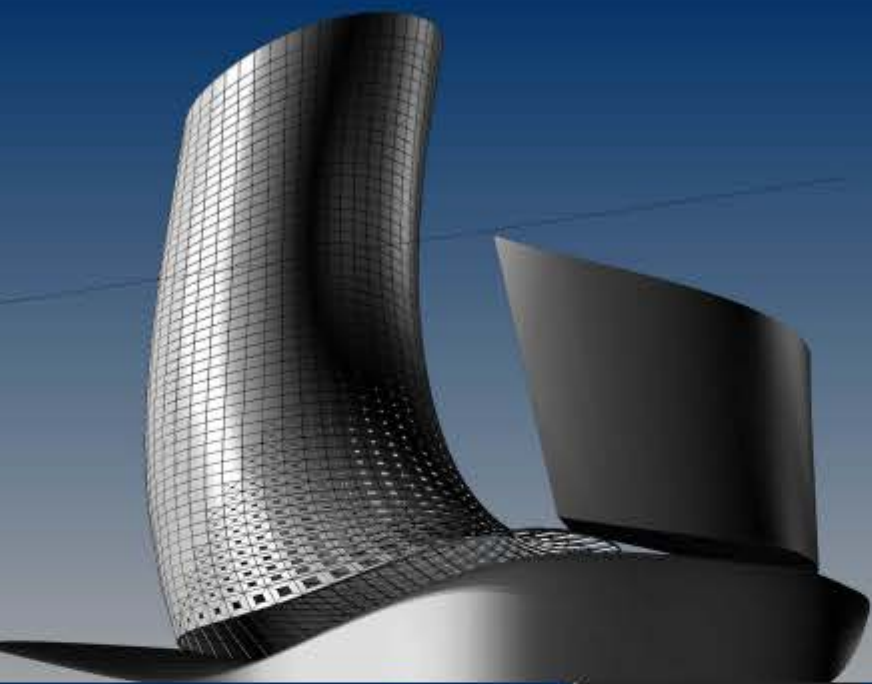


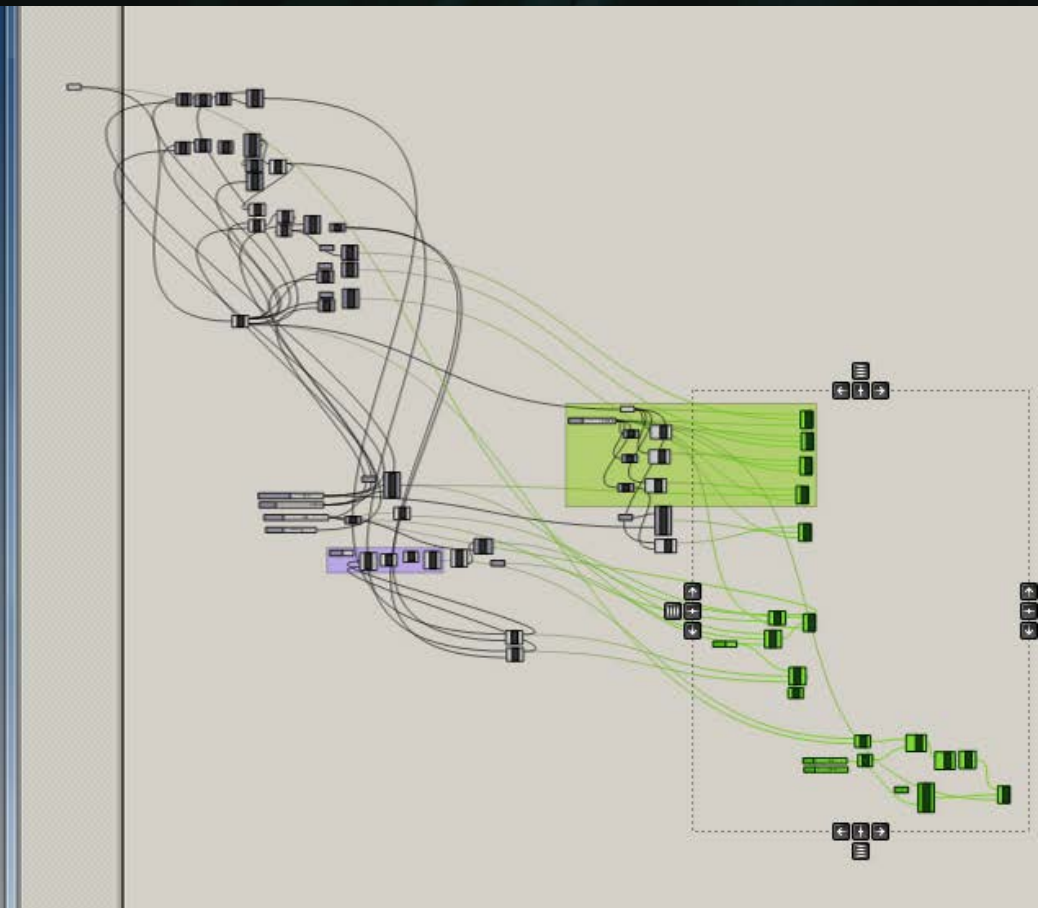
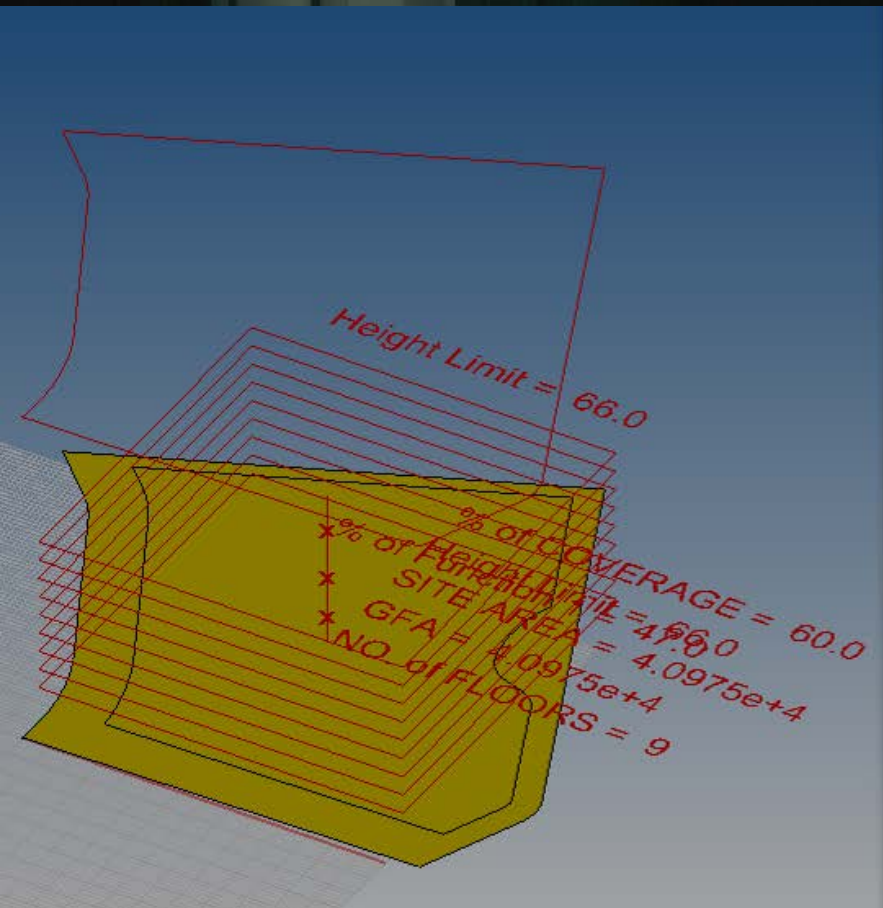
HONG KONG POLYTECHNIC UNIVERSITY

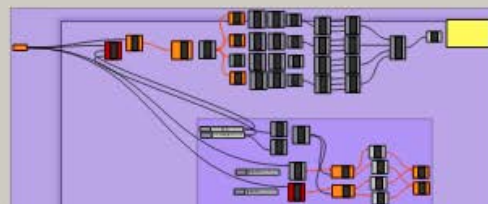
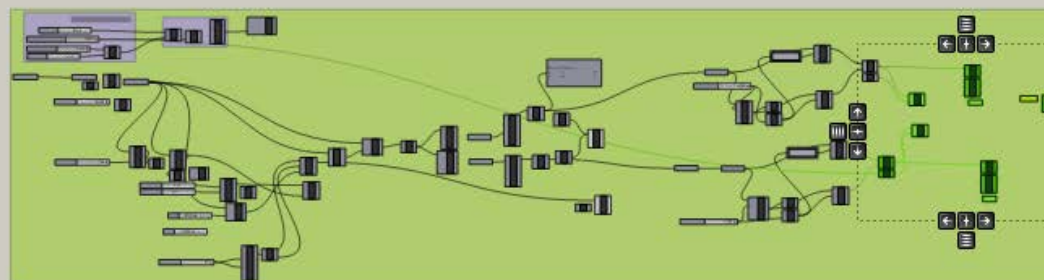
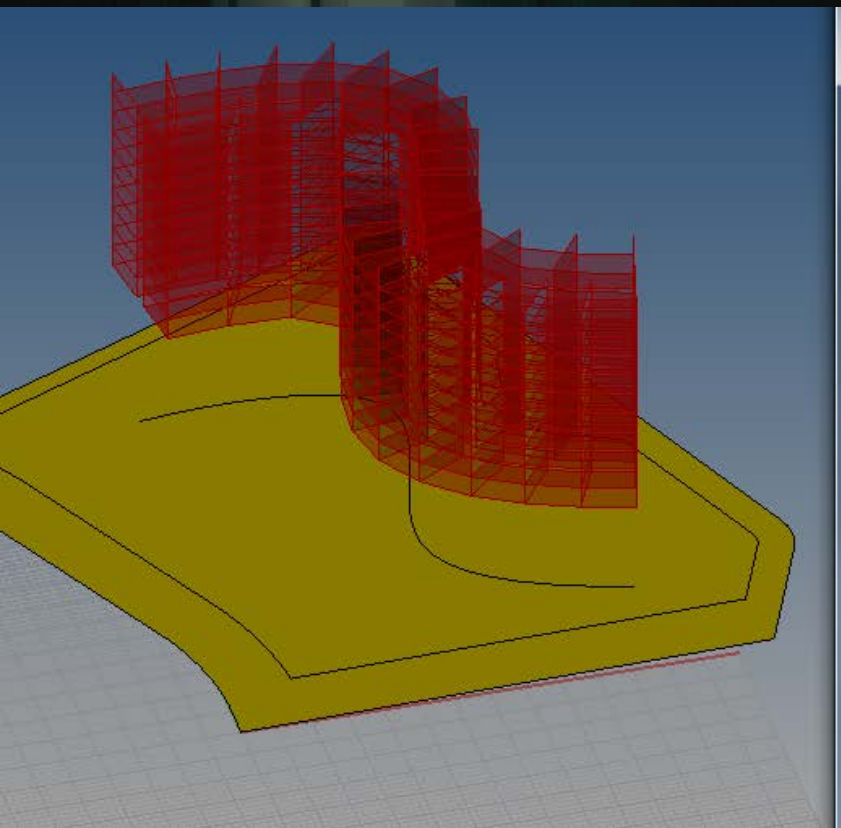


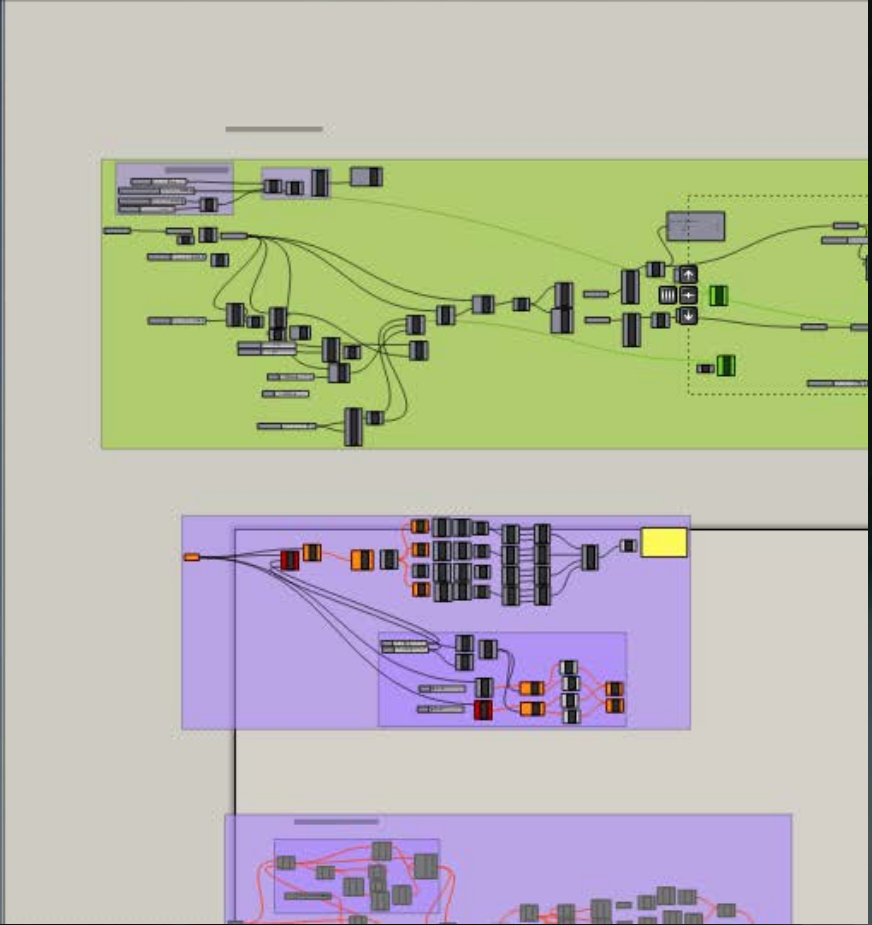
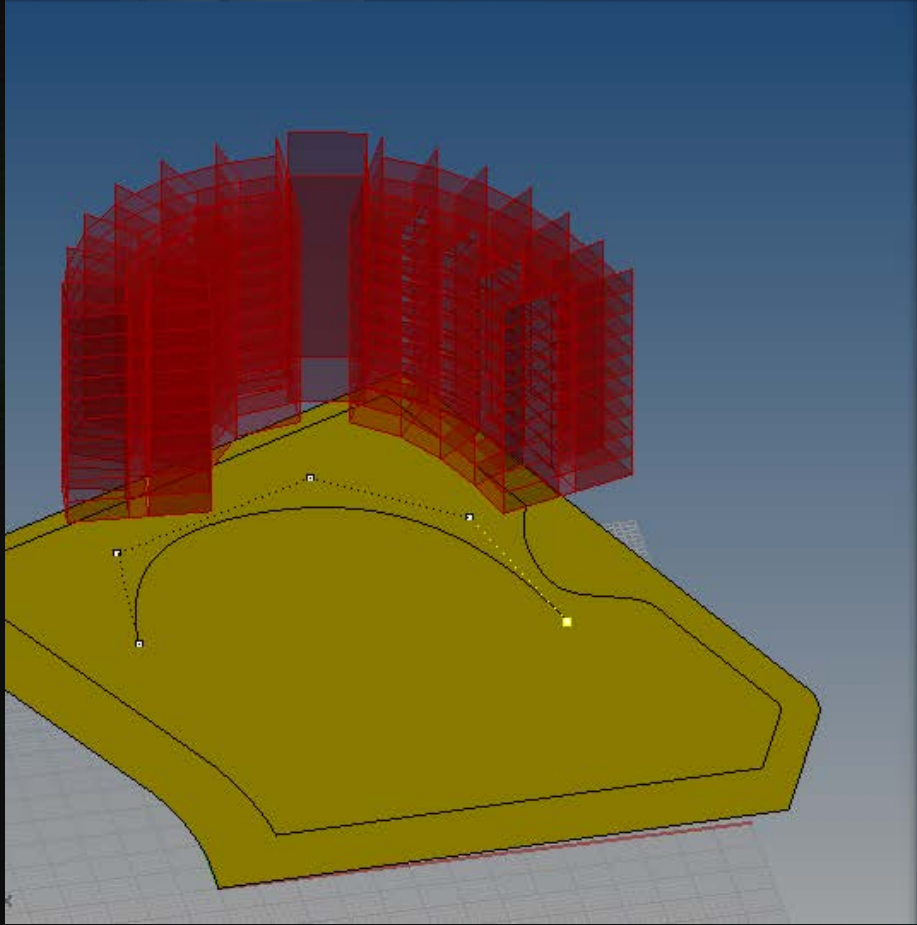
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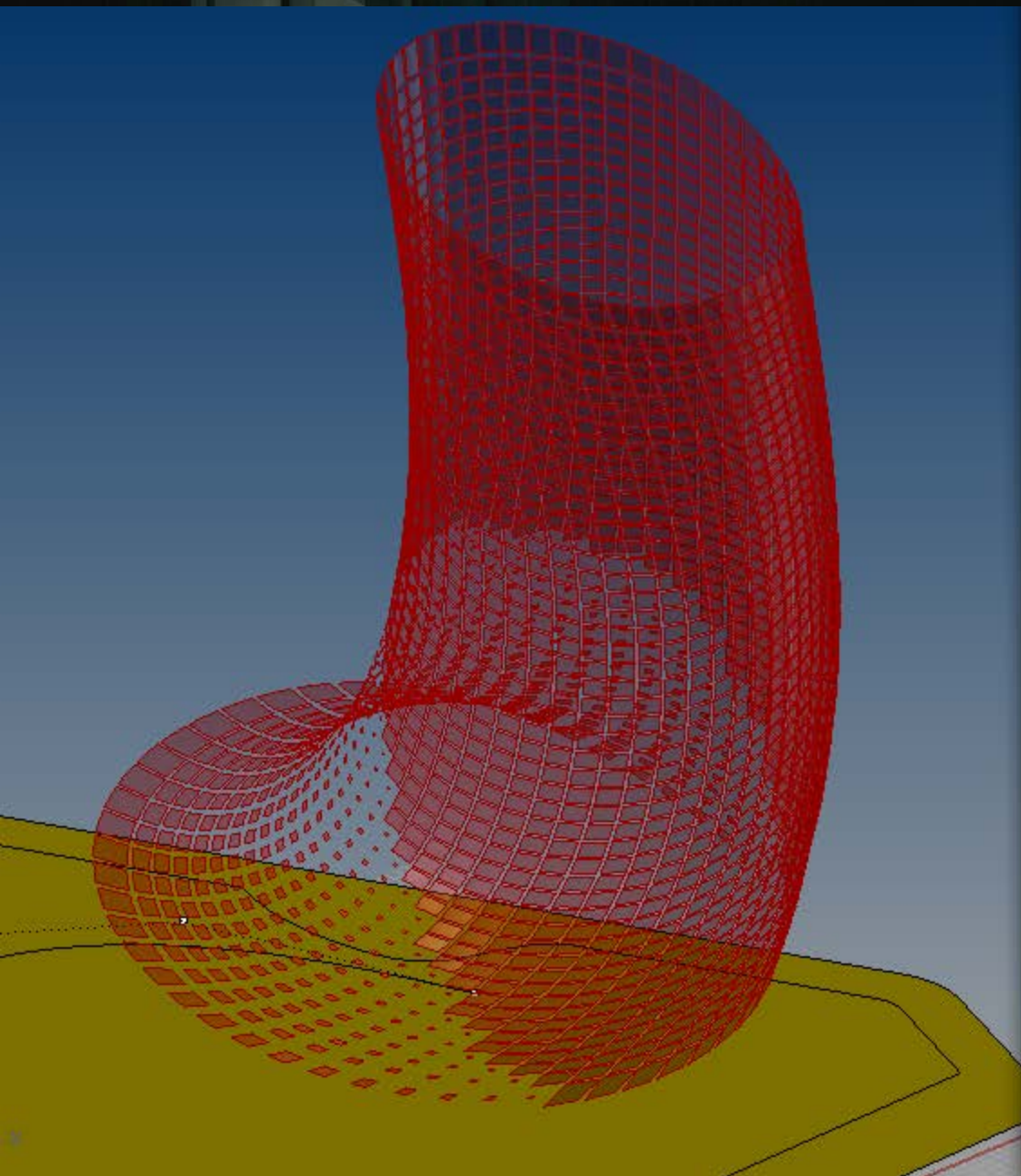












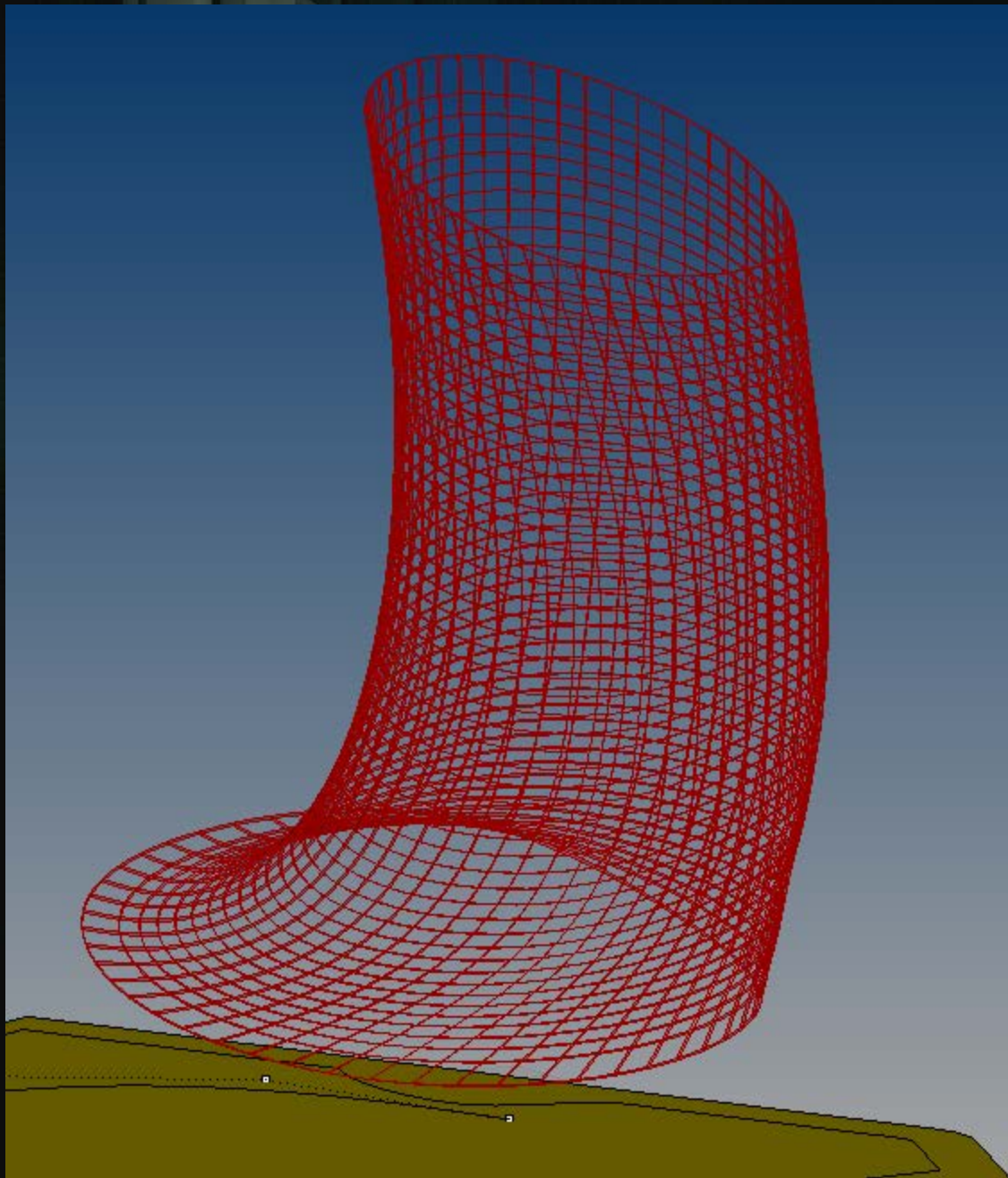
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Params Math Sets Vector Curve Surface Mesh

Geometry Primitive

21%

Solution completed in ~24.9 seconds (140 seconds ago)



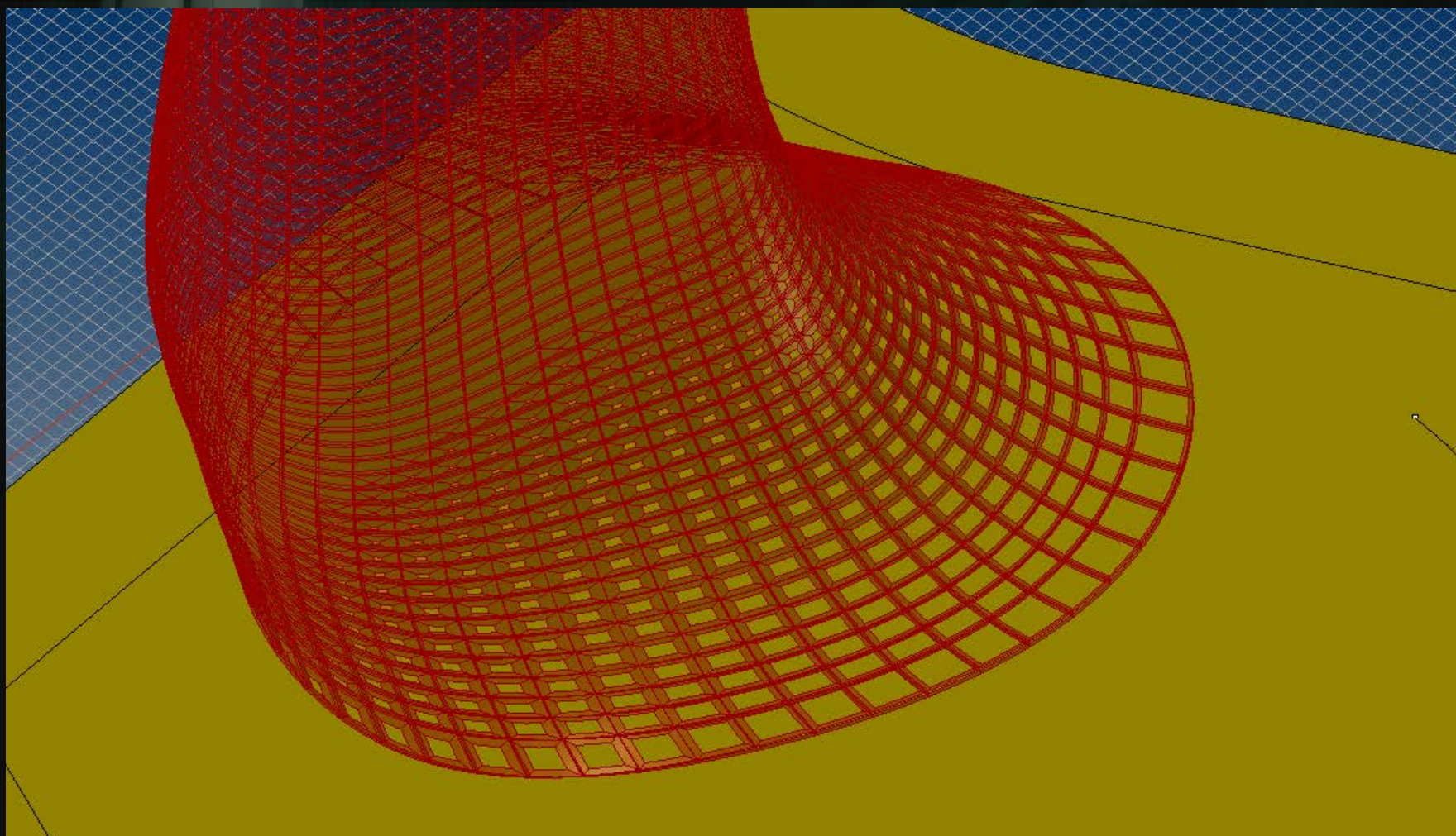
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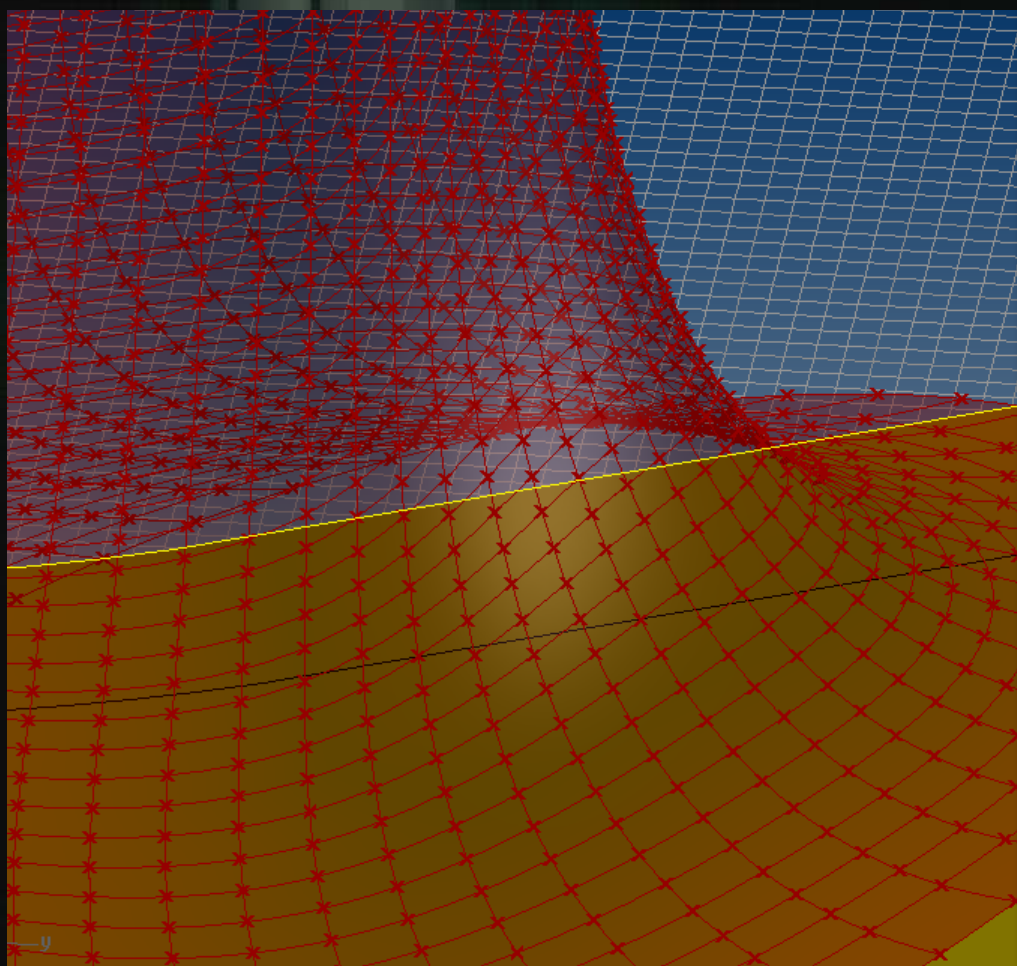
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Geometry Primitive

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Params Math Sets Vector Curve Surface Mesh Intersect Transform

Geometry Primitive Special

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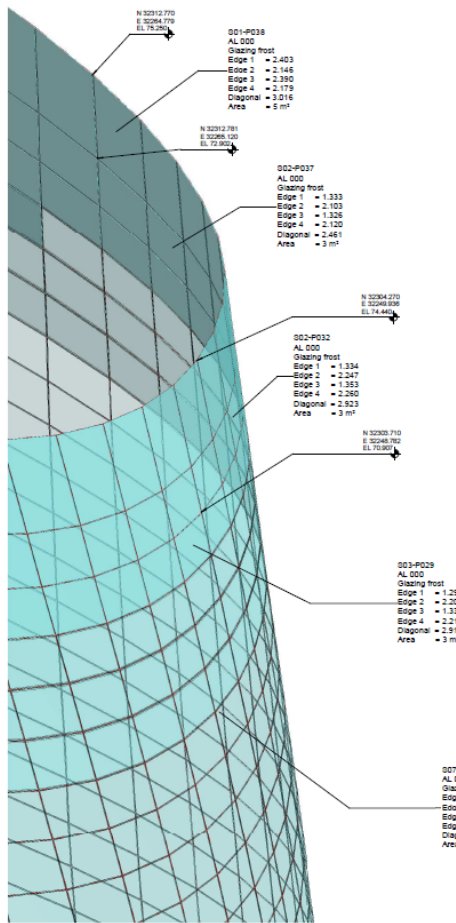
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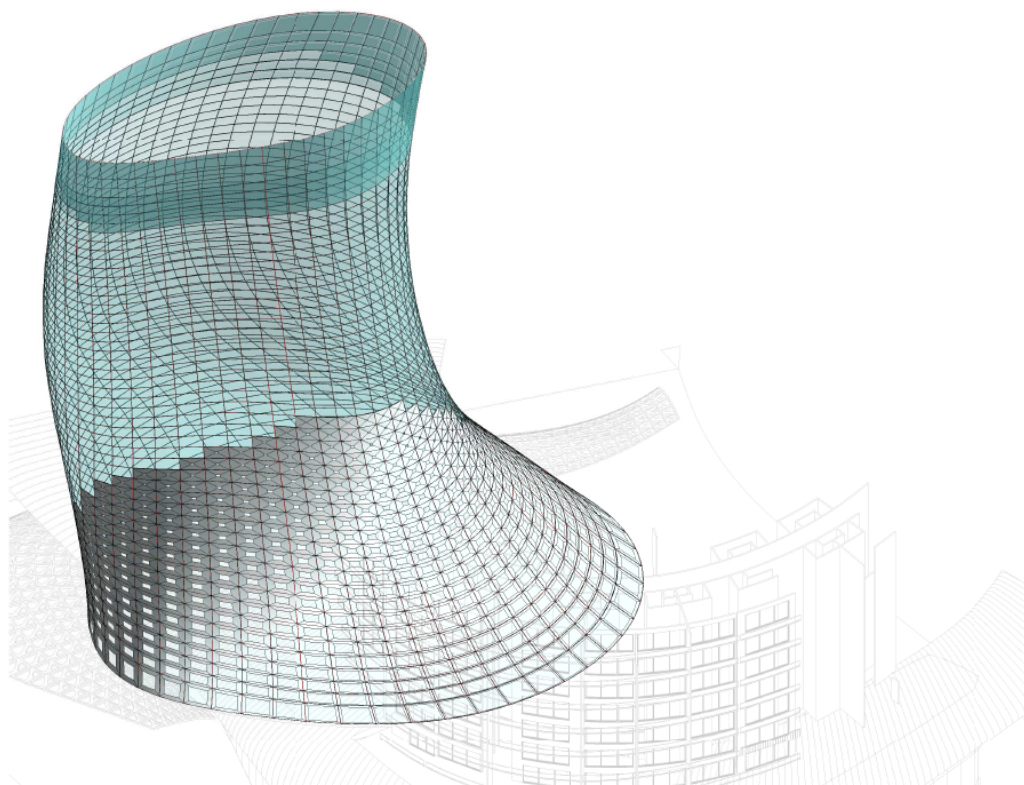
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1 TAG & ANNOTATION

BIM EVANGELIST

		Panelisation Schedule (Partial)																				
Panel Type	Material	P01x	P01y	P01z	P02x	P02y	P02z	P03x	P03y	P03z	P04x	P04y	P04z	Edge 1	Edge 2	Edge 3	Edge 4	Diagonal	Area			
D04-P024	Glazing b	41.228	19.153	71.590	41.563	18.877	70.124	43.351	17.800	69.607	42.999	18.053	71.034	1.491	2.190	1.929	2.157	2.204	2.787 m²			
D04-P025	Glazing b	42.999	18.053	71.034	43.351	17.800	69.607	42.970	16.975	69.189	44.908	17.201	70.575	1.451	2.131	1.491	2.140	3.119	2.759 m²			
D04-P026	Glazing b	44.908	17.201	70.575	43.351	16.975	69.189	44.975	15.800	68.200	45.908	16.320	71.500	1.451	2.131	1.491	2.140	3.119	2.759 m²			
D04-P027	Glazing b	45.908	16.320	70.222	47.293	16.420	68.877	49.394	16.126	66.558	48.032	16.297	69.963	1.365	2.133	1.408	2.145	2.962	2.736 m²			
D04-P028	Glazing b	47.293	16.297	69.963	49.394	16.126	66.558	48.032	15.148	66.069	48.512	15.194	68.213	1.365	2.133	1.408	2.145	2.962	2.736 m²			
D04-P029	Glazing b	48.512	15.194	68.213	49.394	16.069	66.558	48.512	15.148	66.069	48.512	15.194	68.213	1.365	2.133	1.408	2.145	2.962	2.736 m²			
D04-P030	Glazing b	49.394	16.069	66.558	48.512	15.148	66.069	48.512	15.194	68.213	49.394	16.069	66.558	1.365	2.133	1.408	2.145	2.962	2.736 m²			
D04-P031	Glazing b	50.588	16.347	69.652	50.330	16.231	68.616	51.917	15.967	68.559	50.681	16.541	69.654	1.254	2.216	1.296	2.227	2.871	2.708 m²			
D04-P032	Glazing b	51.917	15.967	68.559	50.330	16.231	68.616	50.367	15.809	67.765	51.793	16.495	69.229	1.231	2.231	1.254	2.240	2.858	2.679 m²			
D04-P033	Glazing b	53.768	17.163	69.385	53.901	16.590	67.266	53.901	16.590	66.212	54.953	18.703	69.385	1.207	2.208	1.214	2.216	2.754	2.607 m²			
D04-P034	Glazing b	54.953	18.703	69.385	54.239	16.666	68.212	54.159	16.680	68.205	55.206	18.706	69.382	1.207	2.171	1.207	2.179	2.688	2.576 m²			
D04-P035	Glazing b	56.688	19.706	69.382	54.159	16.680	68.212	56.626	16.620	66.923	56.267	19.655	69.450	1.210	2.127	1.207	2.137	2.596	2.551 m²			
D04-P036	Glazing b	58.688	20.885	69.450	56.626	16.620	66.923	58.627	16.492	66.238	58.211	20.750	69.544	1.210	2.089	1.210	2.101	2.493	2.526 m²			
D04-P037	Glazing b	60.280	22.248	69.615	58.627	16.492	66.238	60.219	16.421	65.908	60.219	22.248	69.615	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P038	Glazing b	62.033	23.903	69.905	60.219	16.421	65.908	62.000	16.500	65.128	61.928	23.904	69.905	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P039	Glazing b	63.924	25.556	70.344	62.033	16.500	65.128	63.924	16.500	65.128	63.924	25.556	70.344	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P040	Glazing b	65.924	27.424	70.861	63.924	16.500	65.128	65.924	16.500	65.128	65.924	27.424	70.861	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P041	Glazing b	67.968	29.577	71.546	65.924	16.500	65.128	67.968	16.500	65.128	67.968	29.577	71.546	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P042	Glazing b	69.968	31.977	72.424	67.968	16.500	65.128	69.968	16.500	65.128	69.968	31.977	72.424	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P043	Glazing b	71.968	34.661	73.461	69.968	16.500	65.128	71.968	16.500	65.128	71.968	34.661	73.461	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P044	Glazing b	73.968	37.661	74.661	71.968	16.500	65.128	73.968	16.500	65.128	73.968	37.661	74.661	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P045	Glazing b	75.968	40.961	75.961	73.968	16.500	65.128	75.968	16.500	65.128	75.968	40.961	75.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P046	Glazing b	77.968	44.461	77.961	75.968	16.500	65.128	77.968	16.500	65.128	77.968	44.461	77.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P047	Glazing b	79.968	48.061	79.961	77.968	16.500	65.128	79.968	16.500	65.128	79.968	48.061	79.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P048	Glazing b	81.968	51.761	81.961	79.968	16.500	65.128	81.968	16.500	65.128	81.968	51.761	81.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P049	Glazing b	83.968	55.561	83.961	81.968	16.500	65.128	83.968	16.500	65.128	83.968	55.561	83.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P050	Glazing b	85.968	59.461	85.961	83.968	16.500	65.128	85.968	16.500	65.128	85.968	59.461	85.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P051	Glazing b	87.968	63.461	87.961	85.968	16.500	65.128	87.968	16.500	65.128	87.968	63.461	87.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P052	Glazing b	89.968	67.561	89.961	87.968	16.500	65.128	89.968	16.500	65.128	89.968	67.561	89.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P053	Glazing b	91.968	71.761	91.961	89.968	16.500	65.128	91.968	16.500	65.128	91.968	71.761	91.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P054	Glazing b	93.968	76.061	93.961	91.968	16.500	65.128	93.968	16.500	65.128	93.968	76.061	93.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P055	Glazing b	95.968	80.461	95.961	93.968	16.500	65.128	95.968	16.500	65.128	95.968	80.461	95.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P056	Glazing b	97.968	84.961	97.961	95.968	16.500	65.128	97.968	16.500	65.128	97.968	84.961	97.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P057	Glazing b	99.968	89.561	99.961	97.968	16.500	65.128	99.968	16.500	65.128	99.968	89.561	99.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P058	Glazing b	101.968	94.261	101.961	99.968	16.500	65.128	101.968	16.500	65.128	101.968	94.261	101.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P059	Glazing b	103.968	99.061	103.961	101.968	16.500	65.128	103.968	16.500	65.128	103.968	99.061	103.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P060	Glazing b	105.968	103.961	105.961	103.968	16.500	65.128	105.968	16.500	65.128	105.968	103.961	105.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P061	Glazing b	107.968	108.961	107.961	105.968	16.500	65.128	107.968	16.500	65.128	107.968	108.961	107.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P062	Glazing b	109.968	114.061	109.961	107.968	16.500	65.128	109.968	16.500	65.128	109.968	114.061	109.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P063	Glazing b	111.968	119.261	111.961	109.968	16.500	65.128	111.968	16.500	65.128	111.968	119.261	111.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P064	Glazing b	113.968	124.561	113.961	111.968	16.500	65.128	113.968	16.500	65.128	113.968	124.561	113.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P065	Glazing b	115.968	129.961	115.961	113.968	16.500	65.128	115.968	16.500	65.128	115.968	129.961	115.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P066	Glazing b	117.968	135.461	117.961	115.968	16.500	65.128	117.968	16.500	65.128	117.968	135.461	117.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P067	Glazing b	119.968	141.061	119.961	117.968	16.500	65.128	119.968	16.500	65.128	119.968	141.061	119.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P068	Glazing b	121.968	146.761	121.961	119.968	16.500	65.128	121.968	16.500	65.128	121.968	146.761	121.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P069	Glazing b	123.968	152.561	123.961	121.968	16.500	65.128	123.968	16.500	65.128	123.968	152.561	123.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P070	Glazing b	125.968	158.461	125.961	123.968	16.500	65.128	125.968	16.500	65.128	125.968	158.461	125.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P071	Glazing b	127.968	164.461	127.961	125.968	16.500	65.128	127.968	16.500	65.128	127.968	164.461	127.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P072	Glazing b	129.968	170.561	129.961	127.968	16.500	65.128	129.968	16.500	65.128	129.968	170.561	129.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P073	Glazing b	131.968	176.761	131.961	129.968	16.500	65.128	131.968	16.500	65.128	131.968	176.761	131.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P074	Glazing b	133.968	183.061	133.961	131.968	16.500	65.128	133.968	16.500	65.128	133.968	183.061	133.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P075	Glazing b	135.968	189.561	135.961	133.968	16.500	65.128	135.968	16.500	65.128	135.968	189.561	135.961	1.223	2.075	1.223	2.103	2.433	2.539 m²			
D04-P076	Glazing b	137.968	196.061	137.961	135.968	16.500	65.128	137.968	16.500	65.128	137.968	196.061	137.961	1.223	2.075	1.223	2.103	2.433</				



① TOWER FACADE

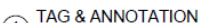
BIM EVANGELIST



PROJECT NAME **KALLANG RIVERSIDE
HOTEL DEVELOPMENT**

DRAWING TITLE **TOWER ON
PANELISATION**

FILE Project Name		SCALE @ A1	
DRAWN Author	CHECK Checker	DATE 10_SEPT.2011	REVISION
DRAWING NO. BIM_A101			



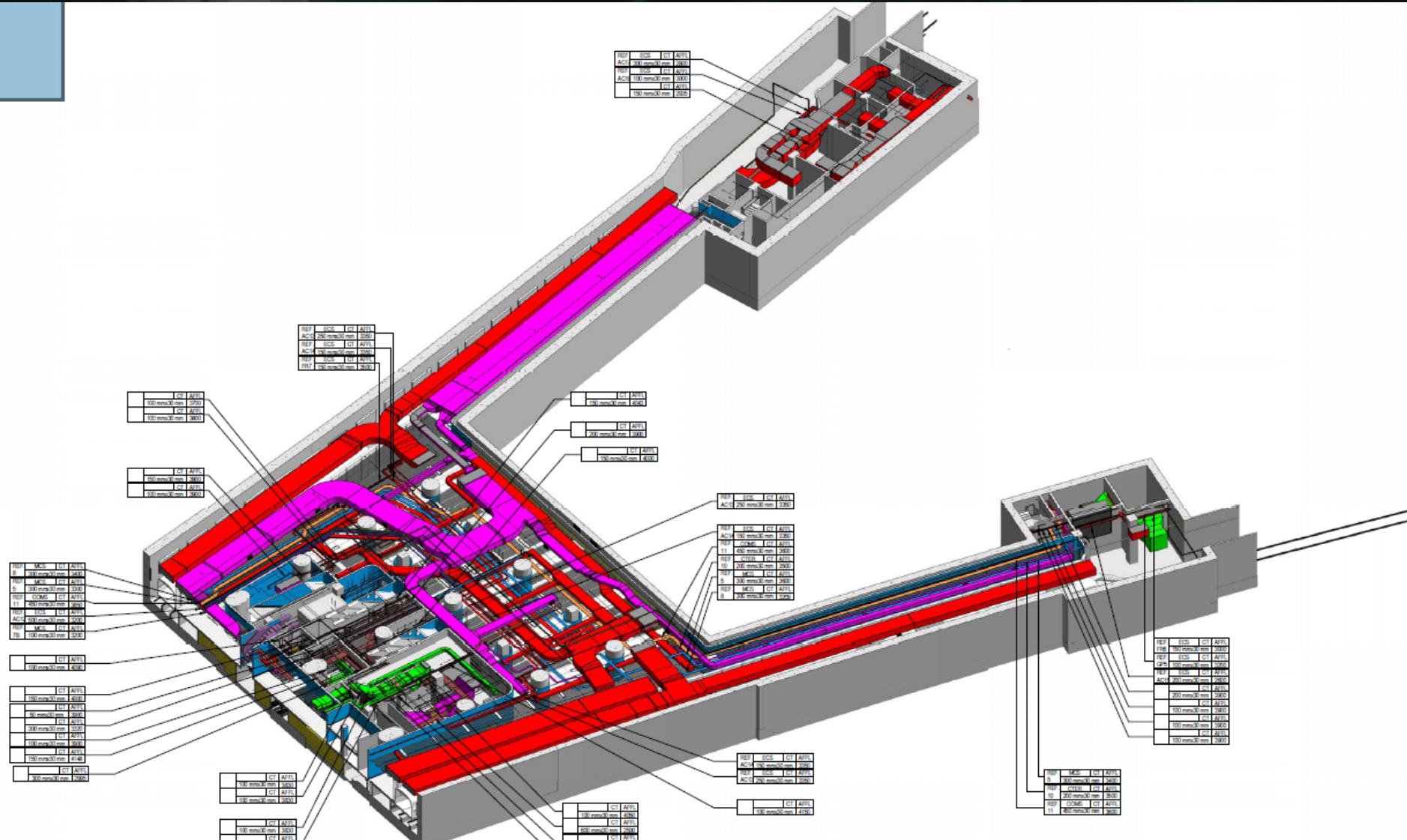
DRAWING TITLE

FILE Project Name		SCALE @ A1	
DRAWN Author	CHECK Checker	DATE 10. SEPT. 2011	
DRAWING NO.		REVISION	

BIM A102

Glazing frost: 55	169.317 m³
Grand total: 75	223.087 m³

CO-ORDINATION

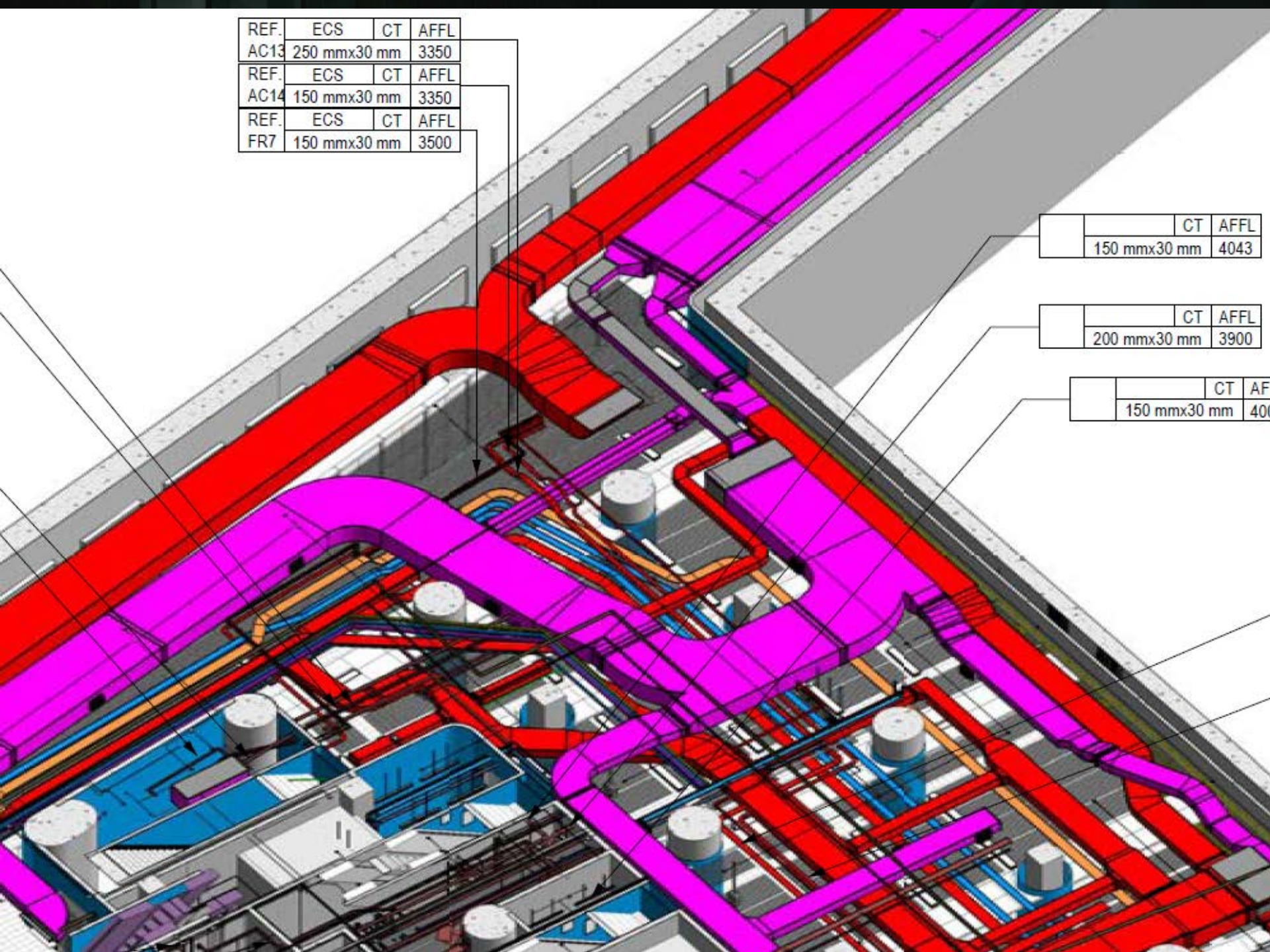


REF.	ECS	CT	AFFL
AC13	250 mmx30 mm	3350	
REF.	ECS	CT	AFFL
AC14	150 mmx30 mm	3350	
REF.	ECS	CT	AFFL
FR7	150 mmx30 mm	3500	

		CT	AFFL
	150 mmx30 mm	4043	

		CT	AFFL
	200 mmx30 mm	3900	

		CT	AF
	150 mmx30 mm	40	



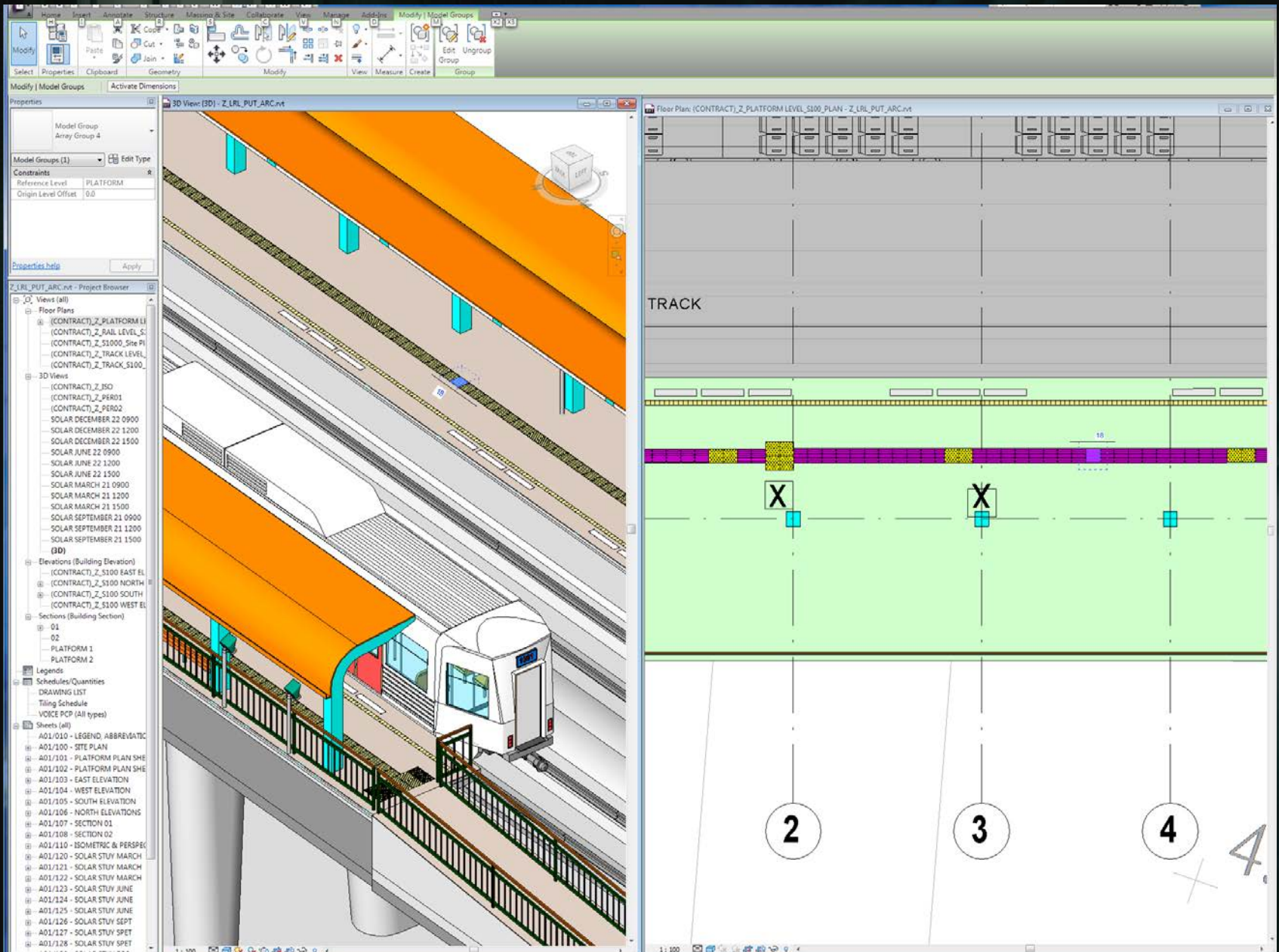
FACILITY MANAGEMENT

ROOM DATA SHEET

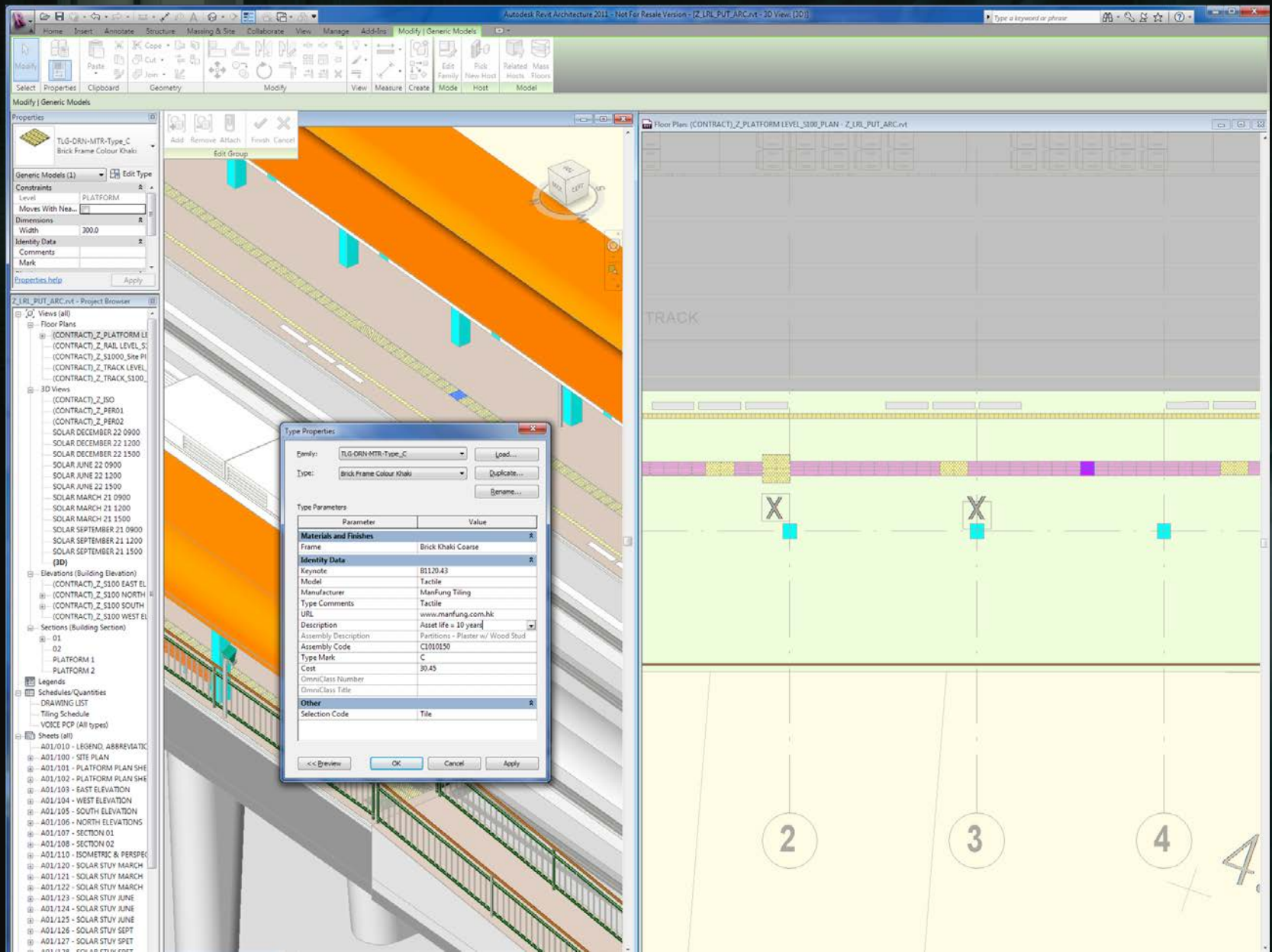
Room No. 3.3 - Cleaners' Room									
Function	A room for storage of small volume of cleansing materials, tools and short stay of cleaners								
Size	15 - 20 m ²								
Occupants	3-5 persons								
Location	Non-public area								
Fire Rating	# In accordance with Fire Safety Standard for KTL/TWL/ISL Stations - S/ARC/PD/005								
Security Level	Low								
Finish	Floor		Skirting		Wall		Ceiling		
	Vitrified ceramic tiles, 150x150x8, on c/s screed - "Pilkington Dorset, colour Dark Grey" or equal approved; on liquid-applied waterproof membrane - "Lacticrete 9235 with fabric reinforcement" or equal approved		Coved ceramic tiles, 150x150x8, on c/s backing - "Pilkington Dorset, colour Dark Grey" or equal approved; on liquid-applied waterproof membrane - "Lacticrete 9235 with fabric reinforcement" or equal approved		Glazed ceramic tiles, 150x150x6.5, on c/s backing - "Pilkington Architectural Colours, colour Vellum White" or equal approved; Durable paint on c/s render above 2100 high - "Alphadecor, colour 9010 White" or equal approved		Durable paint on fairface concrete - "Alphadecor, colour 9010 White" or equal approved		
Door Set	Size	Fire Rating	Acting	Frame	Inside Finish	Outside Finish	Air Resistance	Others	
	900 x 2100 mm	# (see above)	Swing In 90°	Painted/ S/S *	Painted/ S/S *	Painted/ S/S *	N/A	Durable kickplate to u/s of push plate	
Ironing/ery	Lock Set	Security Level	Access Card		Remote Control	Inside Handle	Outside Handle	Accessories	
	Night Latch	Low	No	No	No	Lever handle on back plate	Pull handle on back plate	Door closer, door stop	
Signage	Door Plate (supply by Ops)								
Environment	Temperature	Ventilation	Humidity		Acoustic		Thermal		
	24 °C A/C	N/A	50% ± 10%		NC 50		---		
Lighting	Normal Illuminance	Emergency Illuminance	Type		Diffusers		Source		
	300 Lux	10 Lux	Fluorescent, surface mounted		---		Direct		
Fire	Detection		Suppression		Extinguisher		Smoke Extraction		
	Smoke Detectors		N/A		Relocate existing		---		
Plumbing & Drainage	Water Supply				Drainage				
	Yes				Yes + Floor drain				
E & M, C & C	Equipment		Socket Type		Socket No. / Location		Communications		
	PABX (no outside call feature)		RJ11 provided by in-house C&C		1 / At 1440mm AFFL		Telephone wire to MTRC distribution box		
	General		Twin 13A		2 / Skirting level		---		
Fixtures & Furniture	Slop sink connect to foul drainage, storage cabinets, lockers, vacuum cleaner, table and chair.								
Others	---								

* Dependent on location - stainless steel door to be used when facing public areas.
- painted doors to be used when facing BofH areas.

AS BUILT BIM MODEL DEMONSTRATION



AS BUILT BIM MODEL



AS BUILT BIM MODEL

Select Build Model Circulation Opening Datum Room & Area Work Plane

Properties

Sheet: LEGEND, ABBREVI... Edit Type

Graphics

Visibility/Graphi... Edit...

Scale

Text

C&R No.

Figure No. Prefix Z/LRI/PUT/M...

Sheet Name 2nd...

Identity Data

Properties help Apply

Z_LRI_PUT_ARC.rvt - Project Browser

- Views (all)
 - Floor Plans
 - (CONTRACT)_Z_PLATFORM LE
 - (CONTRACT)_Z_RAIL LEVEL_S
 - (CONTRACT)_Z_S1000_Site Pl
 - (CONTRACT)_Z_TRACK LEVEL
 - (CONTRACT)_Z_TRACK_S100...
 - 3D Views
 - (CONTRACT)_Z_ISO
 - (CONTRACT)_Z_PER01
 - (CONTRACT)_Z_PER02
 - SOLAR DECEMBER 22 0900
 - SOLAR DECEMBER 22 1200
 - SOLAR DECEMBER 22 1500
 - SOLAR JUNE 22 0900
 - SOLAR JUNE 22 1200
 - SOLAR JUNE 22 1500
 - SOLAR MARCH 21 0900
 - SOLAR MARCH 21 1200
 - SOLAR MARCH 21 1500
 - SOLAR SEPTEMBER 21 0900
 - SOLAR SEPTEMBER 21 1200
 - SOLAR SEPTEMBER 21 1500
 - (3D)
 - Elevations (Building Elevation)
 - (CONTRACT)_Z_S100 EAST EL
 - (CONTRACT)_Z_S100 NORTH
 - (CONTRACT)_Z_S100 SOUTH
 - (CONTRACT)_Z_S100 WEST EL
 - Sections (Building Section)
 - 01
 - 02
 - PLATFORM 1
 - PLATFORM 2
 - Legends
 - Schedules/Quantities
 - DRAWING LIST
 - Tiling Schedule
 - VOICE PCP (All types)
 - Sheets (all)
 - A01/010 - LEGEND, ABBREVIAT
 - A01/100 - SITE PLAN
 - A01/101 - PLATFORM PLAN SHE

DRAWING LIST

DRAWING	DRAWING TITLE	REVISION	SHEET IS SHE DATE
A01/010	LEGEND, ABBREVIATION, DRAWING LIST		07/23/10
A01/100	SITE PLAN		07/22/10
A01/101	PLATFORM PLAN SHEET 1 OF 2		07/22/10
A01/102	PLATFORM PLAN SHEET 2 OF 2		07/20/10
A01/103	EAST ELEVATION		08/25/10
A01/104	WEST ELEVATION		07/22/10
A01/105	SOUTH ELEVATION		07/23/10
A01/106	NORTH ELEVATIONS		07/23/10
A01/107	SECTION 01		07/23/10
A01/108	SECTION 02		07/20/10
A01/110	ISOMETRIC & PERSPECTIVES		07/23/10
A01/120	SOLAR STUDY MARCH		07/23/10
A01/121	SOLAR STUDY MARCH		07/23/10
A01/122	SOLAR STUDY MARCH		08/26/10
A01/123	SOLAR STUDY JUNE		08/26/10
A01/124	SOLAR STUDY JUNE		08/26/10
A01/125	SOLAR STUDY JUNE		08/26/10
A01/126	SOLAR STUDY SEPT		08/26/10
A01/127	SOLAR STUDY SEPT		08/26/10
A01/128	SOLAR STUDY SEPT		08/26/10
A01/129	SOLAR STUDY DEC		08/26/10
A01/130	SOLAR STUDY DEC		08/26/10
A01/131	SOLAR STUDY DEC		08/26/10
A01/132	SECTIONS		10/20/10

Tiling Schedule

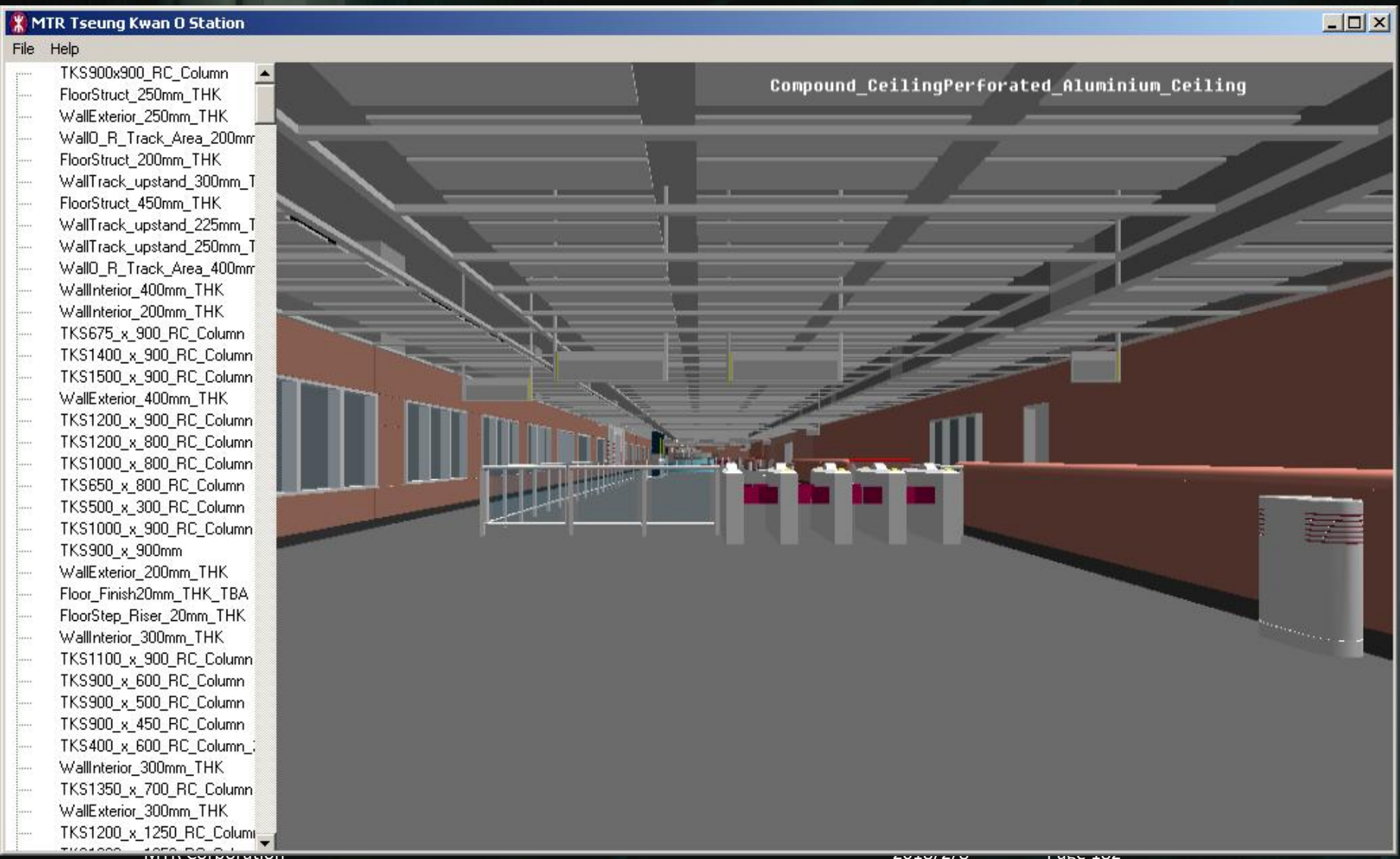
Family	Level	Type	Type Mark	Keynote	Count
GEM_MTR_Floor Care Mark Based_DimGray	PLATFORM	GEM_MTR_Floor Care Mark Based_DimGray			12
GEM_MTR_Floor Security Line Based_Yellow	PLATFORM				2
TLG-DRN-MTR-Type_A		Brick Frame Colour Khaki	A		36
TLG-DRN-MTR-Type_B		Brick Frame Colour Khaki	B		194
TLG-DRN-MTR-Type_C	PLATFORM		C		240

VOICE PCP (All types)

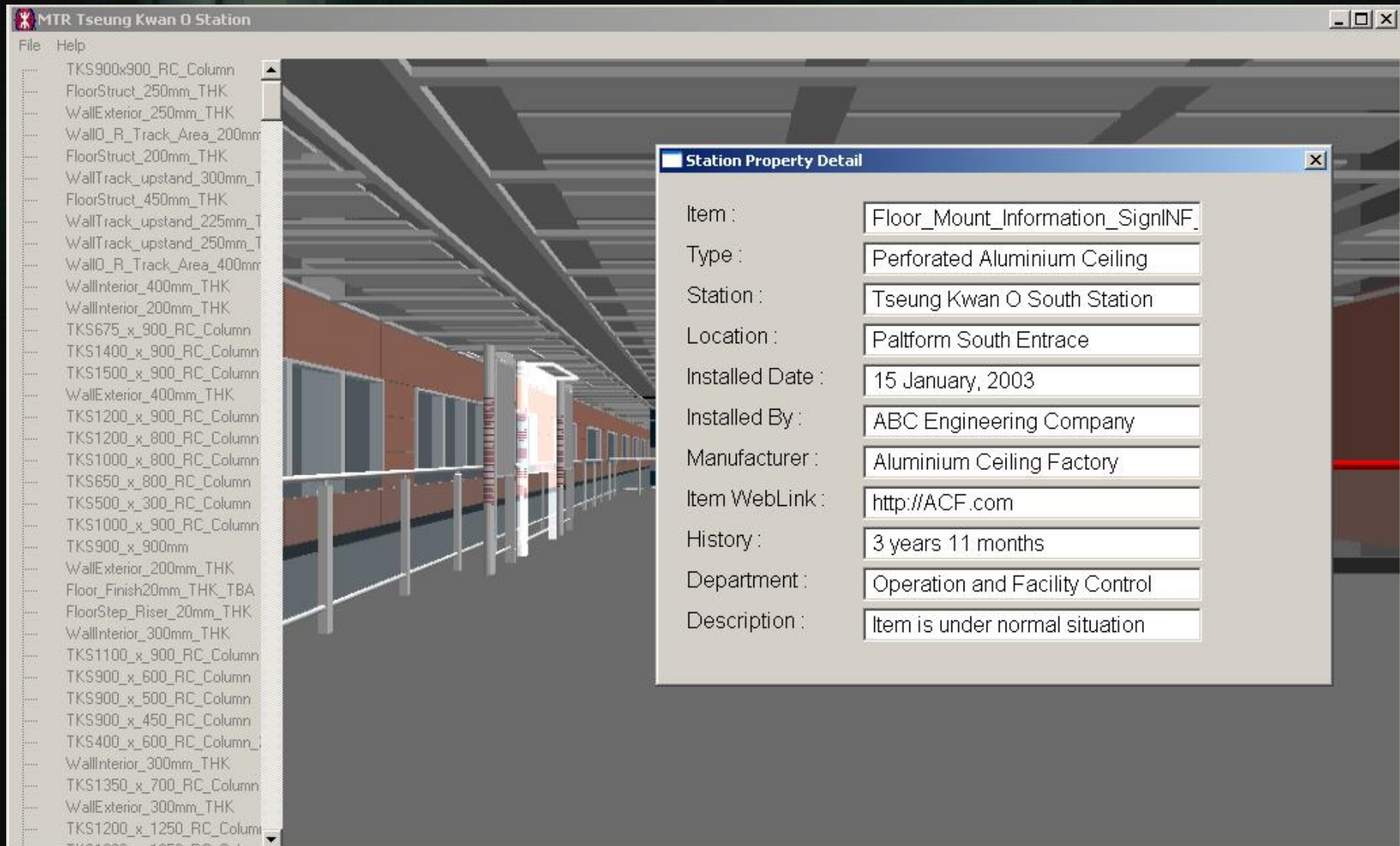
Family	Mark	Type Mark
ELF-ARC-MTR-PCP	xxxx	E
ELF-ARC-MTR-PCP	xxxx	E
ELF-ARC-MTR-PCP	xxxx	E
ELF-ARC-MTR-PCP-Ext_Voice	xxxx	E
ELF-ARC-MTR-PCP-Ext_Voice	xxxx	E
ELF-ARC-MTR-PCP	xxxx	X
ELF-ARC-MTR-PCP	xxxx	X
ELF-ARC-MTR-PCP	xxxx	X
ELF-ARC-MTR-PCP	xxxx	X
ELF-ARC-MTR-PCP	xxxx	X
ELF-ARC-MTR-PCP	xxxx	X
ELF-ARC-MTR-PCP-Ext_Voice	xxxx	X
ELF-ARC-MTR-PCP-Ext_Voice	xxxx	X
ELF-ARC-MTR-PCP-Ext_Voice	xxxx	X
ELF-ARC-MTR-PCP-Ext_Voice	xxxx	X
ELF-ARC-MTR-PCP-Ext_Voice	xxxx	X
ELF-ARC-MTR-PCP-Ext_Voice	xxxx	X
Grand total:	15	

A14		1530141			
A	J	K		L	
Id	FamilyName	TypeName		TypeMark	C
1	7848	Model Text		600mm Arial	
2	1148899	Model Text		200mm - wood	
3	1148901	Model Text		300mm - black	
4	1148904	Model Text		50mm - steel	
5	1193027	GEM_MTR_Floor Care Mark Based_DimGray		GEM_MTR_Floor Care Mark Based_DimGray	
6	1194842	GEM_MTR_Floor Security Line Based_Yellow		Security Line_MTR_Floor Based_Yellow	
7	1206709	GEM_MTR_Floor Security Line Based_Yellow		Security Line_MTR_Floor Based_Yellow W39600mm	
8	1282975	GEM_MTR_Floor Security Line Based_Yellow		Security Line_MTR_Floor Based_Yellow W39500mm	
9	1528388	TLG-DRN-MTR-Type_A		Brick Frame Colour Khaki	A
10	1528390	TLG-DRN-MTR-Type_A		Brick Frame Colour DimGray	
11	1529337	TLG-DRN-MTR-Type_B		Brick Frame Colour Khaki	B
12	1529335	TLG-DRN-MTR-Type_B		Brick Frame Colour DimGray	
13	1530141	TLG-DRN-MTR-Type_C		Brick Frame Colour Khaki	C
14	1530143	TLG-DRN-MTR-Type_C		Brick Frame Colour DimGray	
15	1532279	TLG-DRN-MTR-Type_C		Brick Frame Colour Khaki W200mm	C
16	1606926	TRN-TRN-MTR-LRL-Headstock		TRN-TRN-MTR-LRL-Headstock	
17	1618524	TRN-TRN-MTR-LRL-Coach		TRN-TRN-MTR-LRL-Coach	
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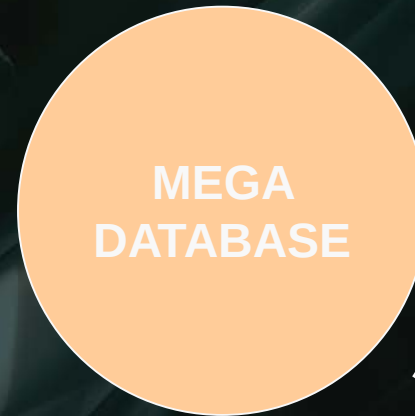
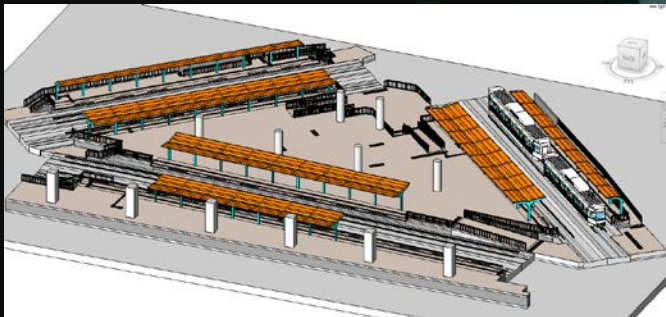
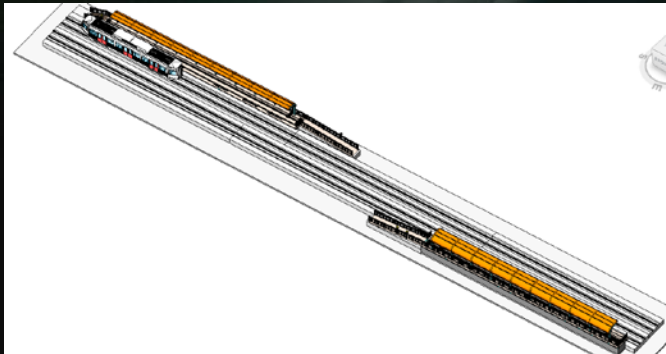
BIM FACILITY MANGEMENT



BIM FACILITY MANGEMENT



FACILITY MANAGEMENT ACROSS PROJECTS



APPLICATION



APPLICATION



APPLICATION

E.G.
REPLACEMENT PROGRAM

BEYOND BIM

VTT TECHNICAL RESEARCH CENTRE OF FINLAND

Building & Construction



ARScaleModel



ARWebCam



ARPhone



ARonPDA



Google Earth
"on Earth"



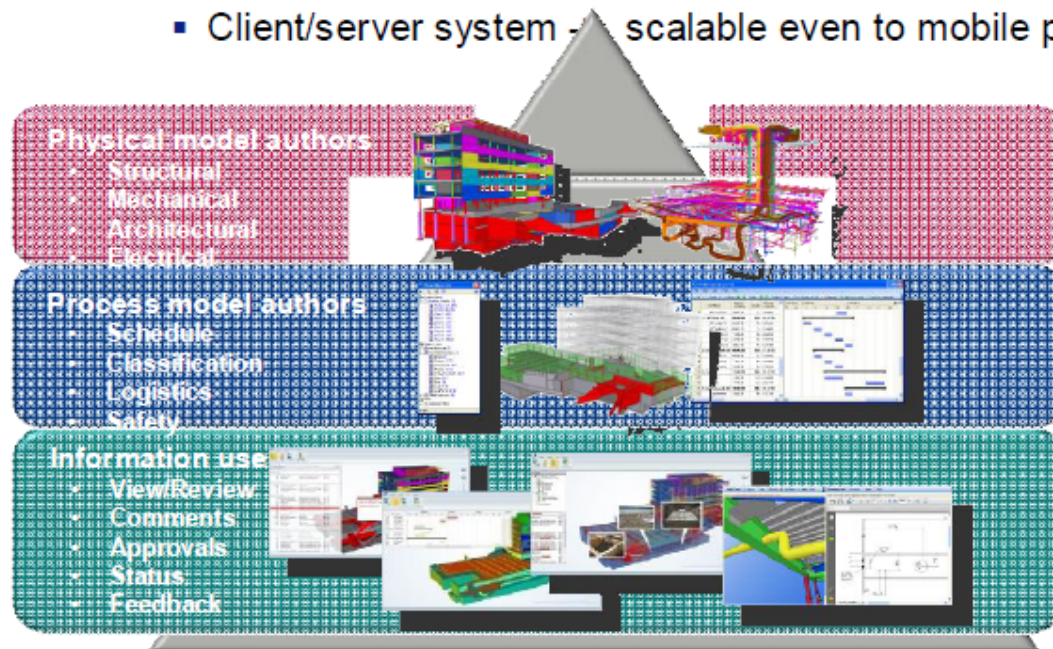
AROnSite



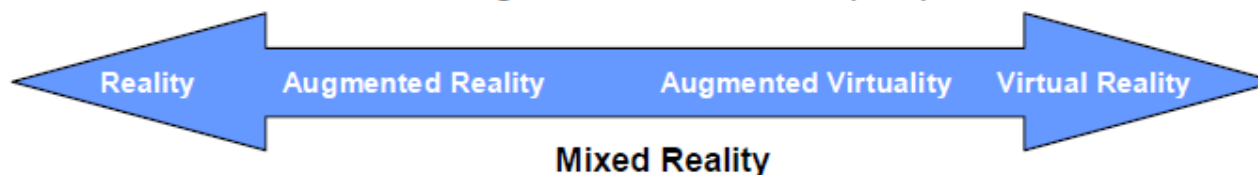
Project "AR4BC"

Augmented Reality for Building and Construction

- Compare project plans (4D BIM) with situation on site
- Provide real time mobile feedback from site to BIM system
- Client/server system - scalable even to mobile phones

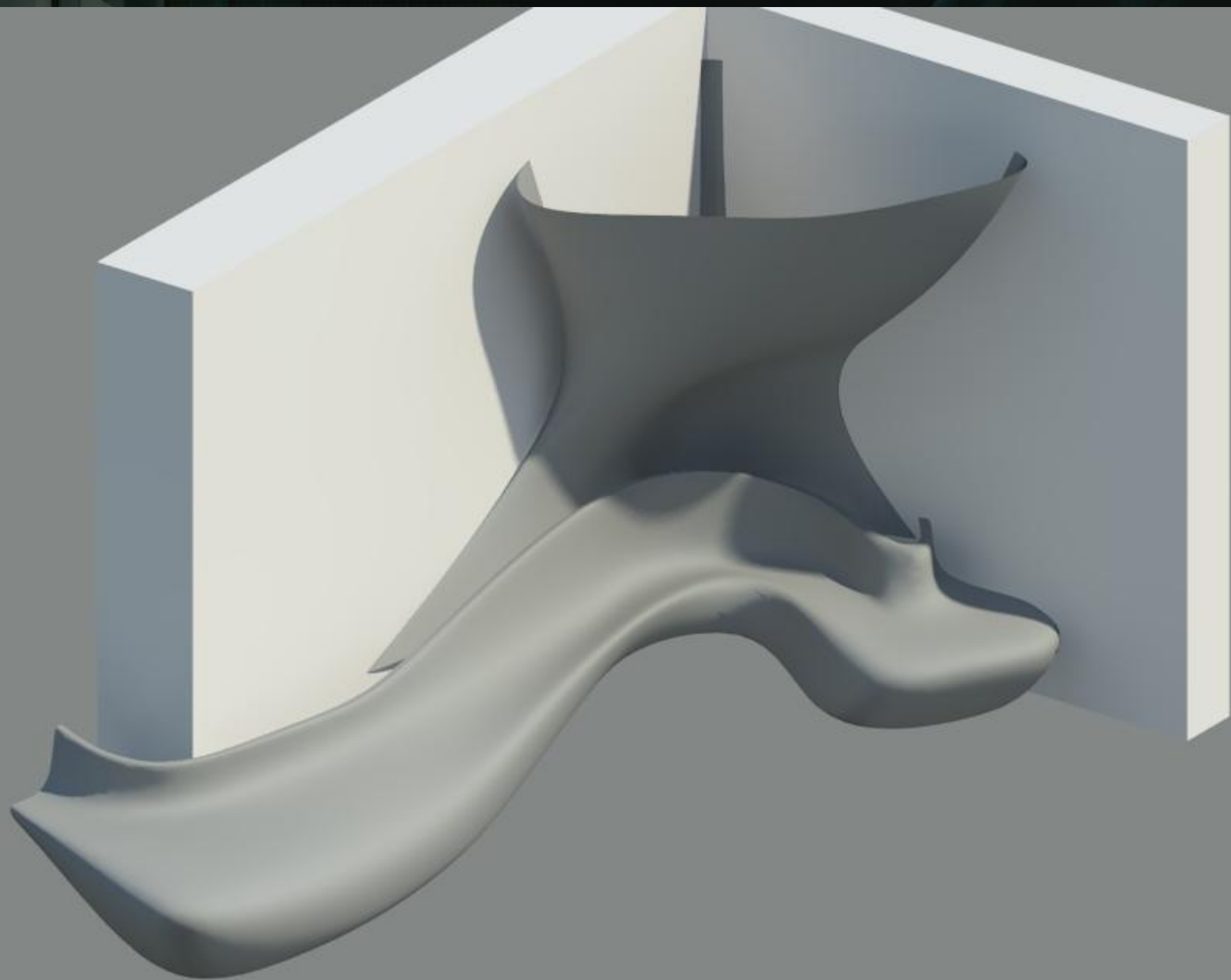


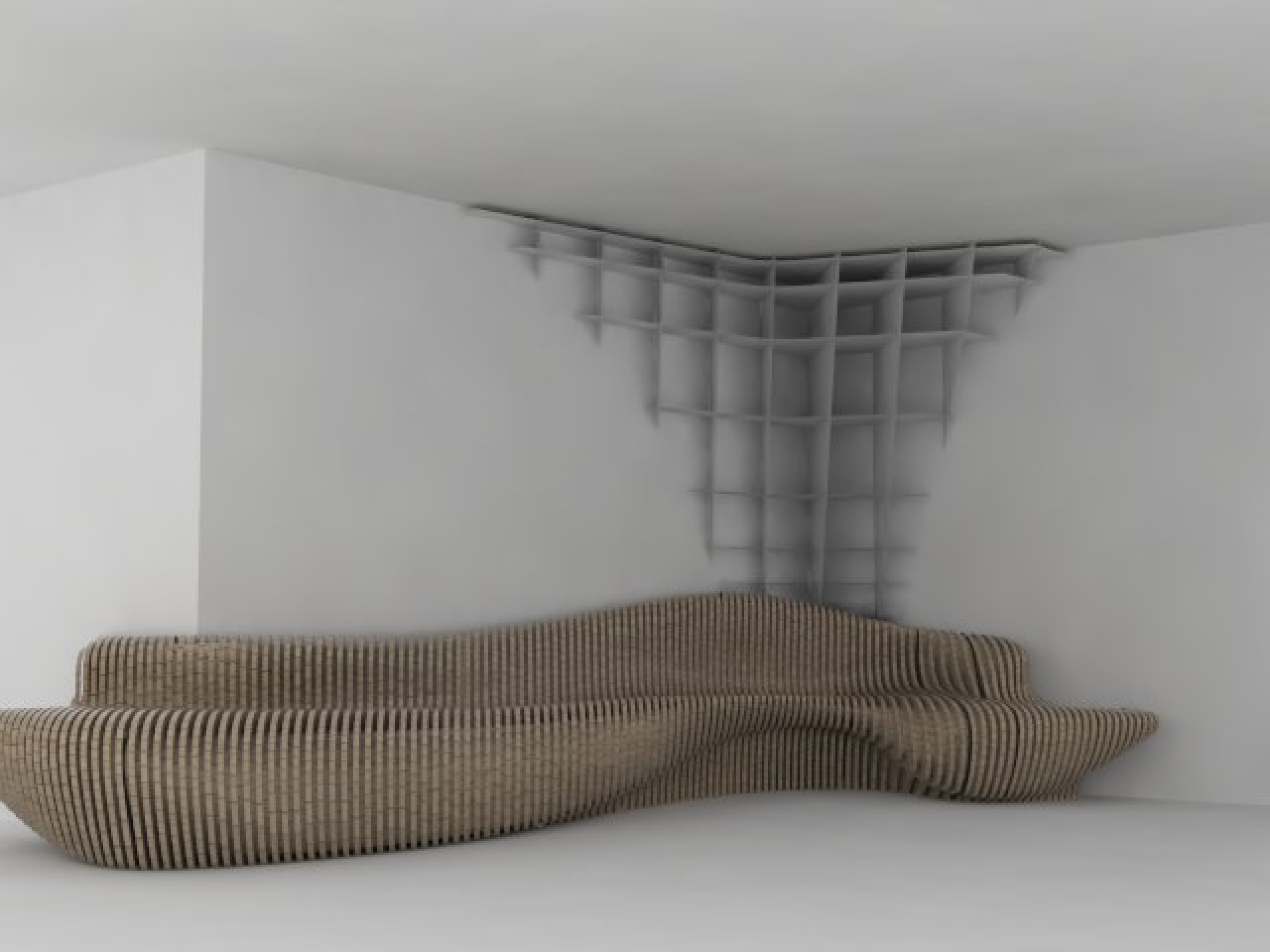
Building Information Models (BIM)



BIM in Organic Design Manufacturing

Direct from Design to Manufacturing / Construction





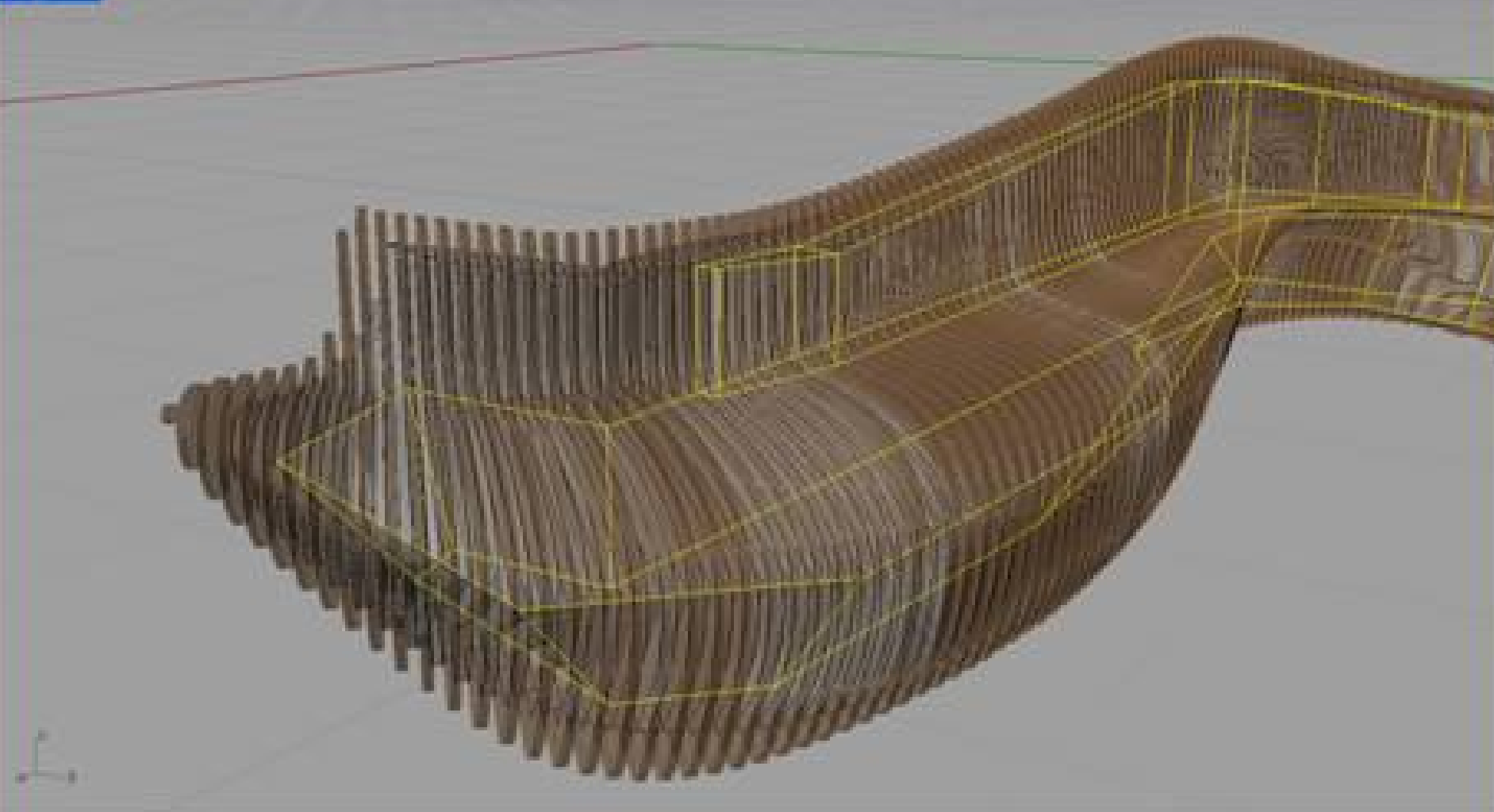


Choose attributes for selected objects (Model/Shaded): None
None +Shaded+ Wireframe Shaded Rendered Object View Camera (IsView) Shaded
124 polygons, 1 surface added to selection
Command: Properties

Command:



Perspective





Unable to cap at least one object. The openings did not have closed, planar loops of edges.

Creating meshes... Press Esc to cancel

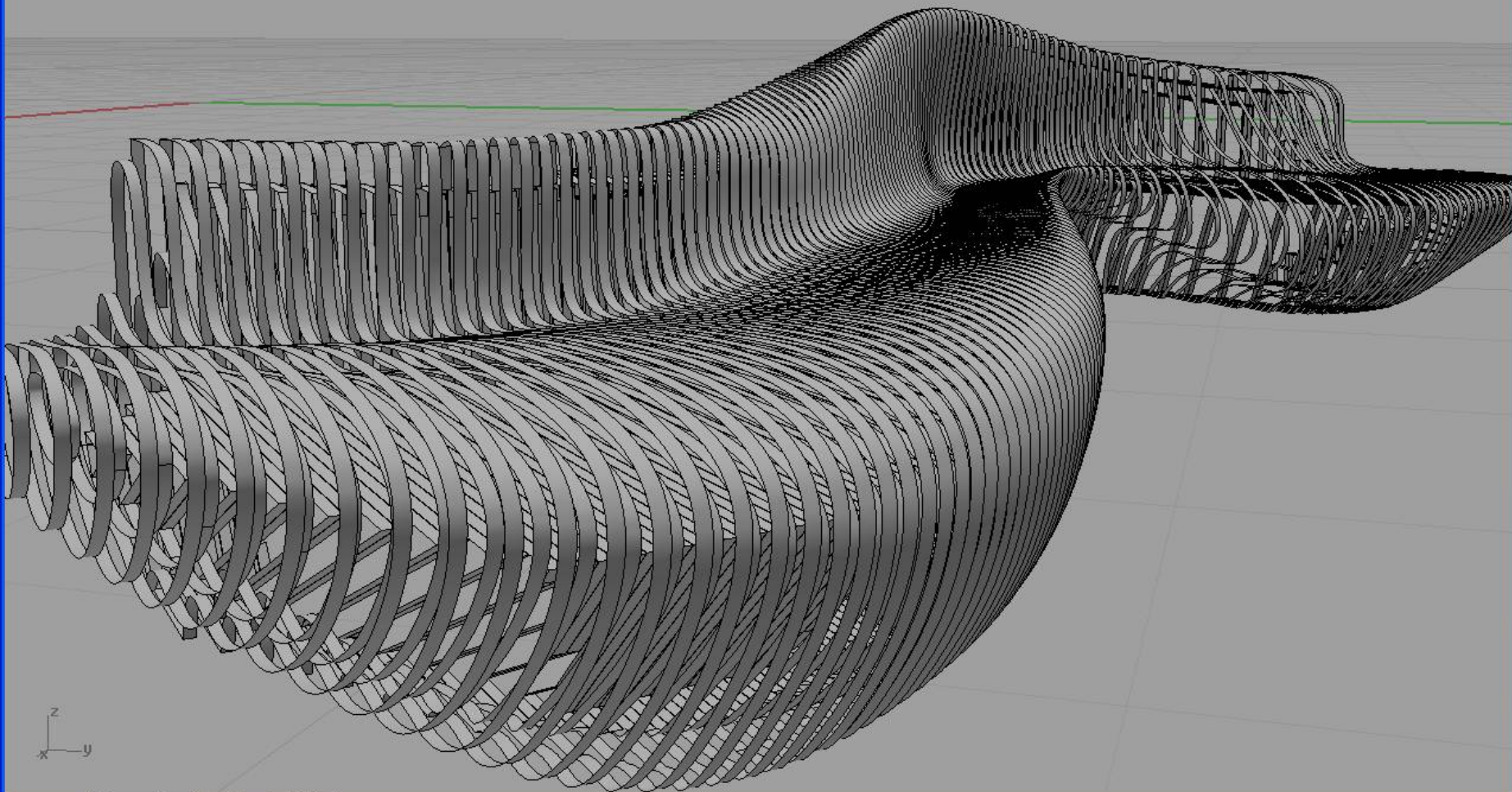
Command: _Undo

Undoing Cap

Command:



Perspective

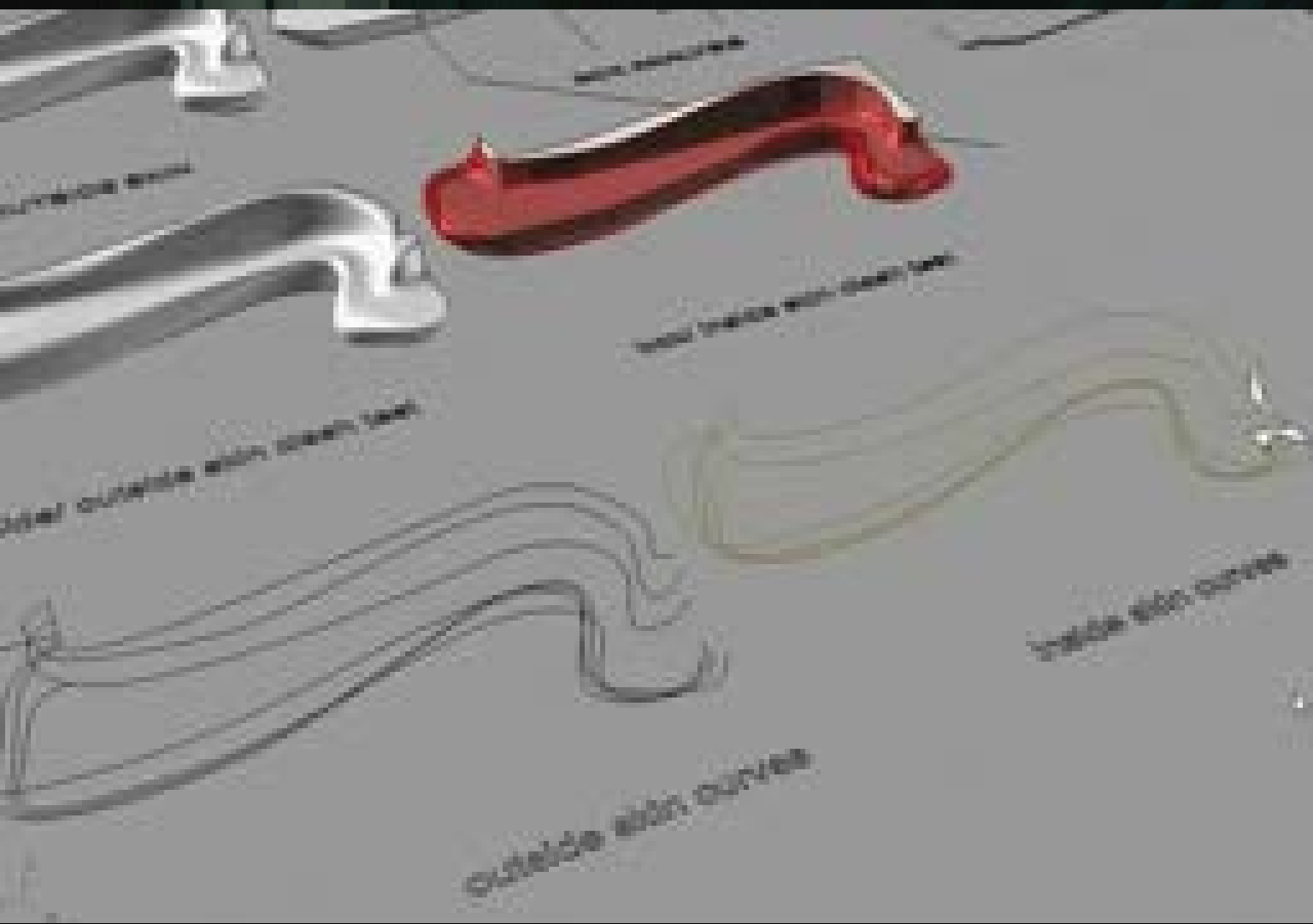


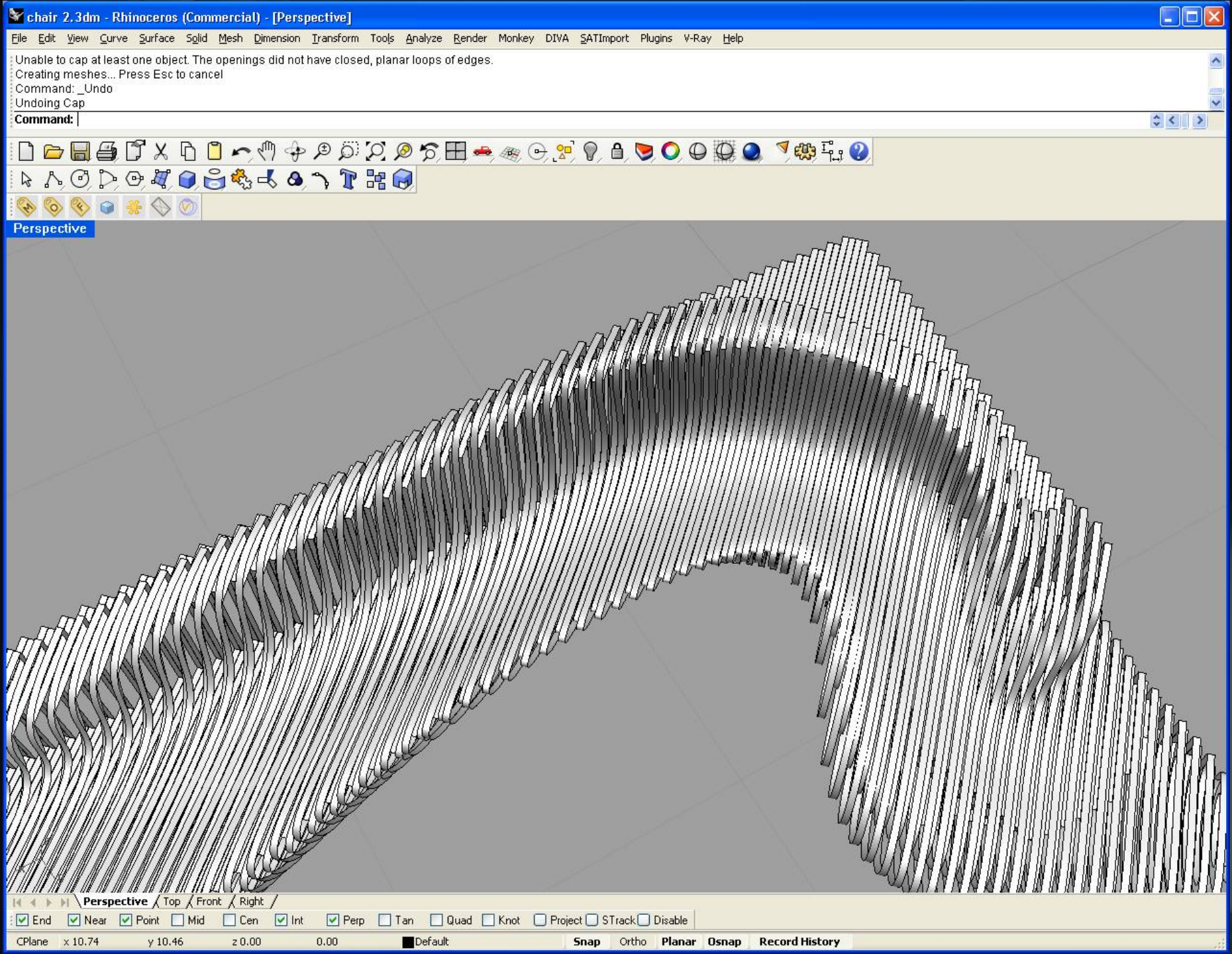
⏮ ⏪ ⏩ ⏭ Perspective / Top / Front / Right /

☒ End ☒ Near ☒ Point ☐ Mid ☐ Cen ☒ Int ☒ Perp ☐ Tan ☐ Quad ☐ Knot ☐ Project ☐ STrack ☐ Disable

CPlane x 12.08 y 9.64 z 0.00 0.00 Default

Snap Ortho Planar Osnap Record History





Unable to cap at least one object. The openings did not have closed, planar loops of edges.

Creating meshes... Press Esc to cancel

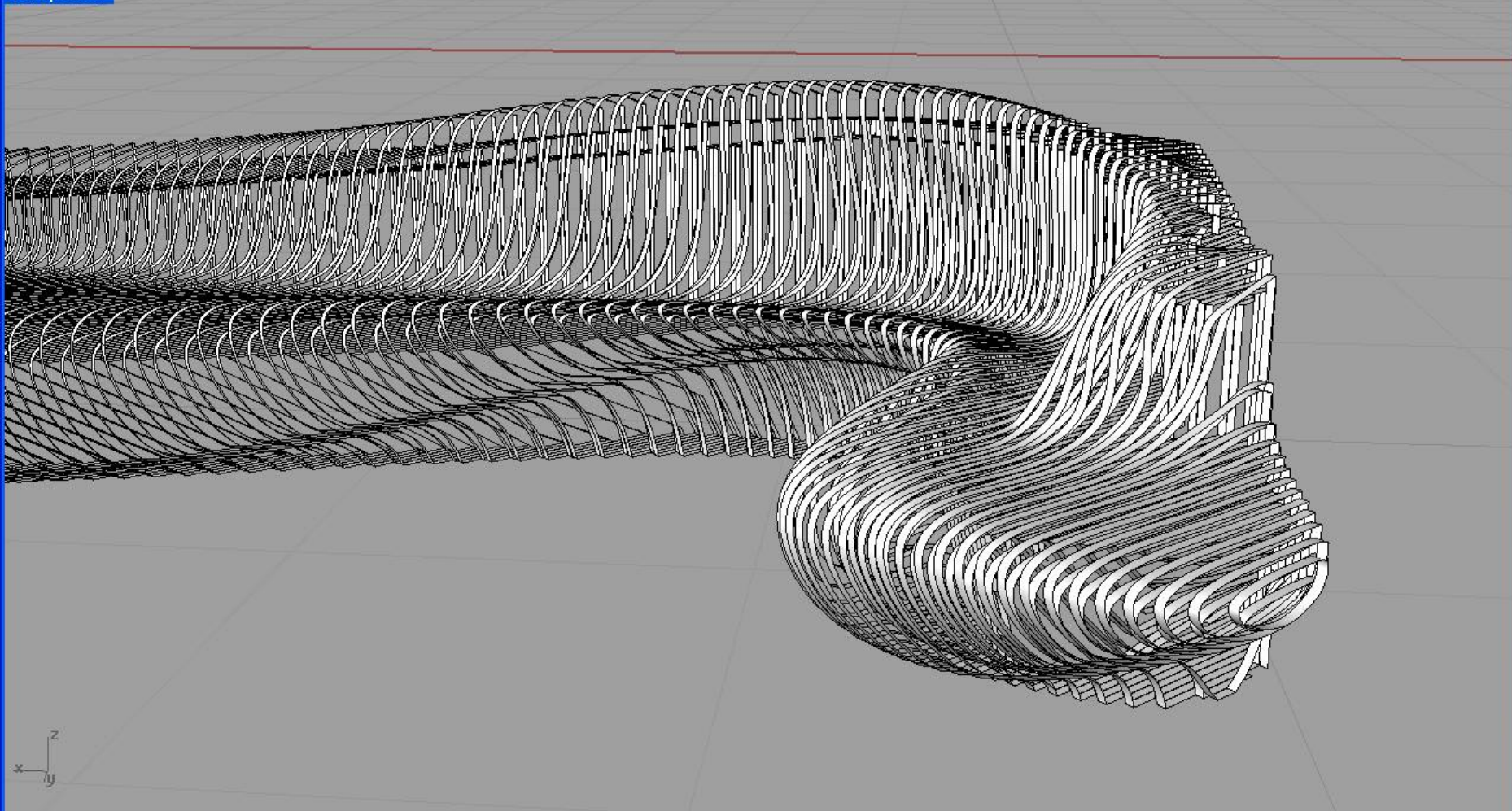
Command: _Undo

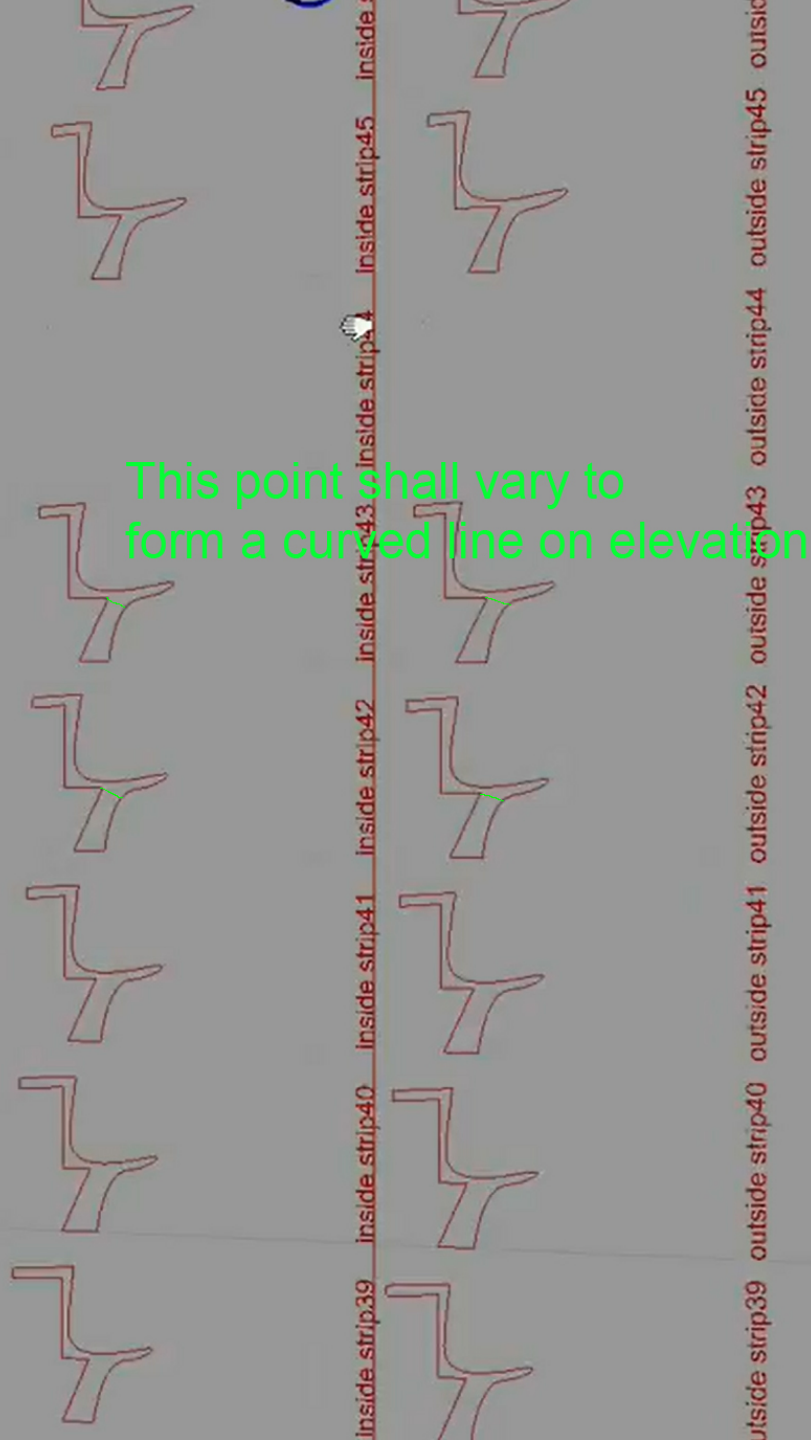
Undoing Cap

Command:



Perspective

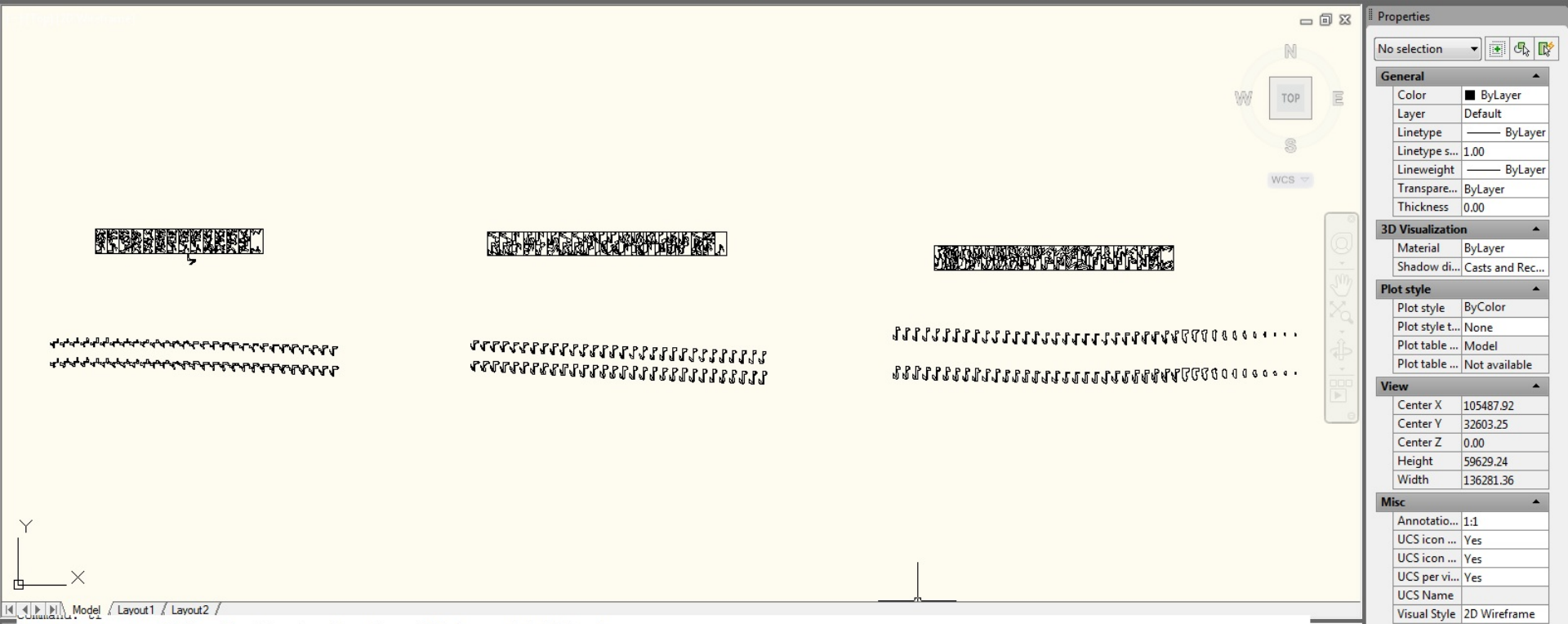
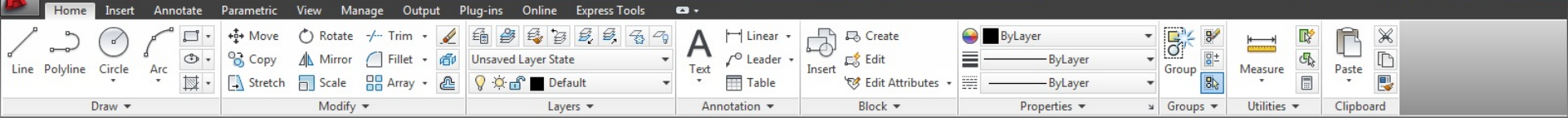




1:13

1:10 / 1:38





Properties

No selection

General

Color	ByLayer
Layer	Default
Linetype	ByLayer
Linetype s...	1.00
Lineweight	ByLayer
Transpare...	ByLayer
Thickness	0.00

3D Visualization

Material	ByLayer
Shadow di...	Casts and Rec...

Plot style

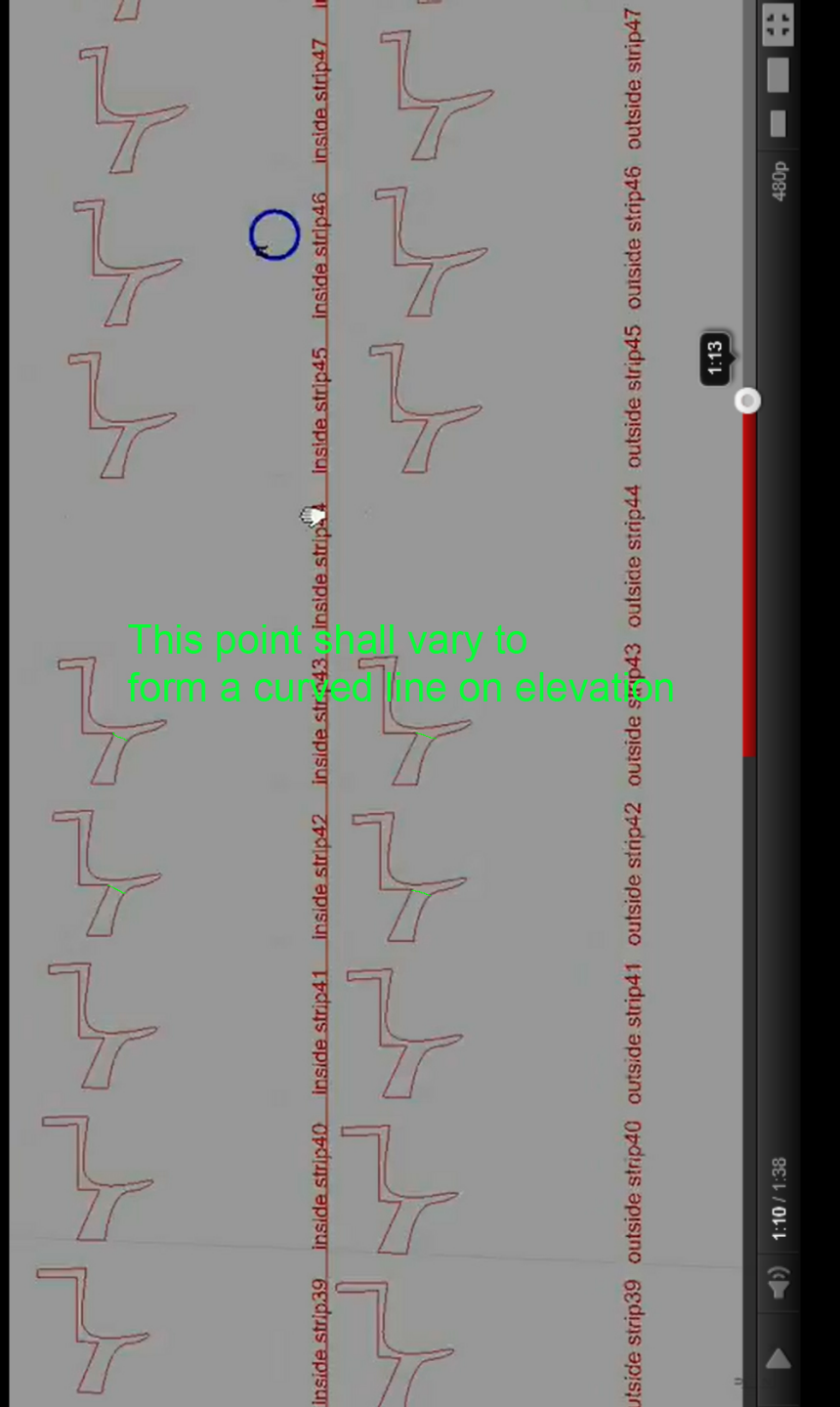
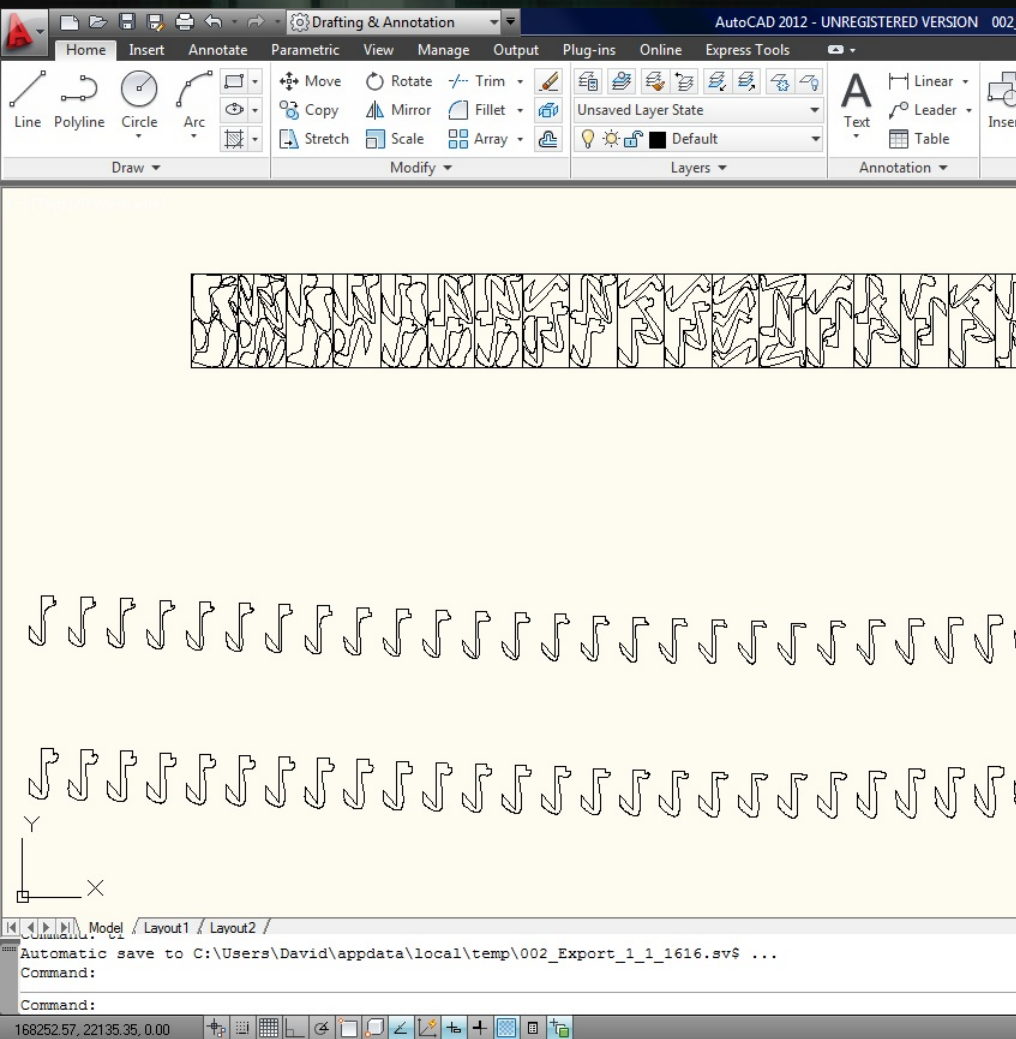
Plot style	ByColor
Plot style t...	None
Plot table ...	Model
Plot table ...	Not available

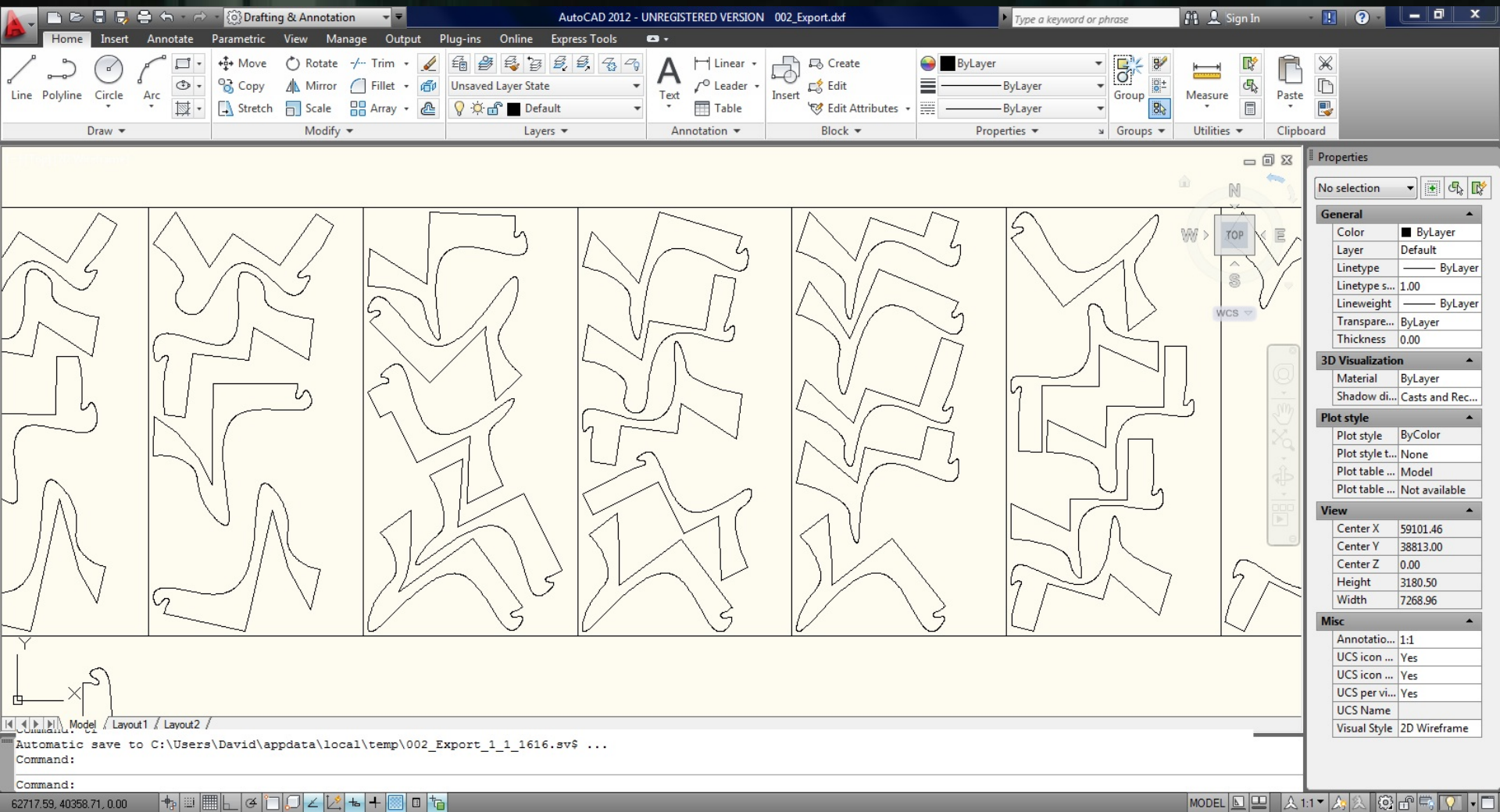
View

Center X	105487.92
Center Y	32603.25
Center Z	0.00
Height	59629.24
Width	136281.36

Misc

Annotatio...	1:1
UCS icon ...	Yes
UCS icon ...	Yes
UCS per vi...	Yes
UCS Name	
Visual Style	2D Wireframe





Sheet 1 E130 0.472m	Sheet 2 N82A 3.144m	Sheet 3 E116A 3.276m
Sheet 1 N1 0.714m	Sheet 2 E121 3.127m	Sheet 3 E122 2.664m
Sheet 1 N24B 1.754m	Sheet 2 N120 3.205m	Sheet 3 E11 2.754m
Sheet 1 N121 2.78m	Sheet 2 N119 3.321m	Sheet 2 N128 0.786m
Sheet 1 N0 0.413m	Sheet 1 N2 0.97m	Sheet 2 N58B 1.437m
Sheet 1 E120 3.459m	Sheet 1 N30B 1.489m	Sheet 2 E15B 1.187m
Sheet 1 E119 3.599m	Sheet 1 N124 1.908m	Sheet 2 N123 2.173m

Label Sheet 1

Sheet 4 E82A 3.312m	Sheet 4 E89B 1.4m	Sheet 5 E57A 2.685m
Sheet 4 E85A 3.316m	Sheet 4 E49A 2.87m	Sheet 5 E72A 3.204m
Sheet 3 E51B 1.467m	Sheet 4 E73A 3.221m	Sheet 5 E81A 2.306m
Sheet 3 N129 0.786m	Sheet 4 E83A 3.373m	Sheet 5 N42B 1.169m
Sheet 3 E118B 2.124m	Sheet 4 N130 0.768m	Sheet 5 E86A 2.321m
Sheet 3 E115A 3.29m	Sheet 4 N40B 1.193m	Sheet 5 E114A 2.267m
Sheet 3 E117A 3.259m	Sheet 4 E84A 3.376m	Sheet 5 E87A 3.329m

Label Sheet 2

Sheet 6 E112B 1.625m	Sheet 7 N41B 1.193m
Sheet 6 E114B 1.84m	Sheet 7 E78A 3.284m
Sheet 6 E118A 3.226m	Sheet 7 E90A 3.119m
Sheet 6 E79A 3.281m	Sheet 7 E89A 3.327m
Sheet 6 E80A 2.289m	Sheet 6 E57B 1.819m
Sheet 6 E88A 3.324m	Sheet 6 E113B 1.736m
Sheet 5 E19B 1.36m	Sheet 6 E74A 3.237m

Label Sheet 3





labels.jpg



sheet_1_preview_thumb.jpg



sheet_2_preview_thumb.jpg



sheet_3_preview_thumb.jpg



sheet_4_preview_thumb.jpg



sheet_5_preview_thumb.jpg



sheet_6_preview_thumb.jpg



sheet_7_preview_thumb.jpg



sheet_8_preview_thumb.jpg



sheet_9_preview_thumb.jpg



sheet_10_preview_thumb.jpg



sheet_11_preview_thumb.jpg



sheet_12_preview_thumb.jpg



sheet_13_preview_thumb.jpg



sheet_14_preview_thumb.jpg



sheet_15_preview_thumb.jpg



sheet_16_preview_thumb.jpg



sheet_17_preview_thumb.jpg



sheet_18_preview_thumb.jpg



sheet_19_preview_thumb.jpg



sheet_20_preview_thumb.jpg



sheet_21_preview_thumb.jpg



sheet_22_preview_thumb.jpg



sheet_23_preview_thumb.jpg



sheet_24_preview_thumb.jpg



sheet_25_preview_thumb.jpg



sheet_26_preview_thumb.jpg



sheet_27_preview_thumb.jpg



sheet_28_preview_thumb.jpg



sheet_29_preview_thumb.jpg



sheet_30_preview_thumb.jpg



sheet_31_preview_thumb.jpg



sheet_32_preview_thumb.jpg



sheet_33_preview_thumb.jpg

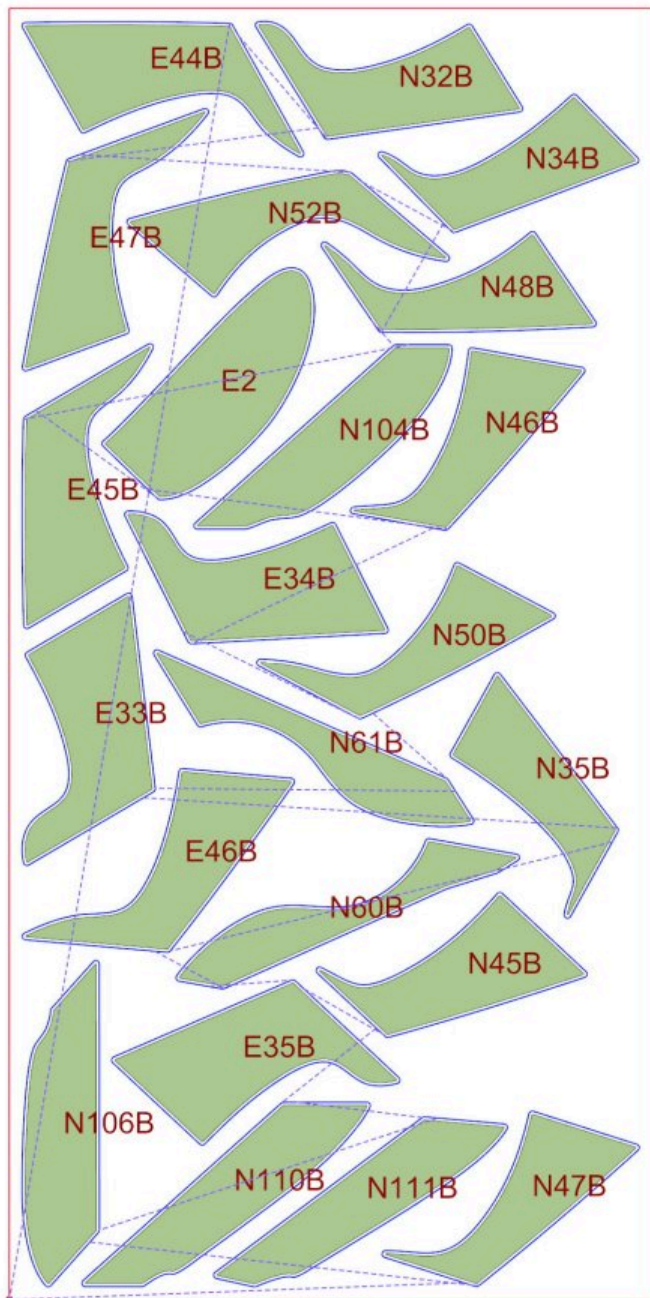


sheet_34_preview_thumb.jpg

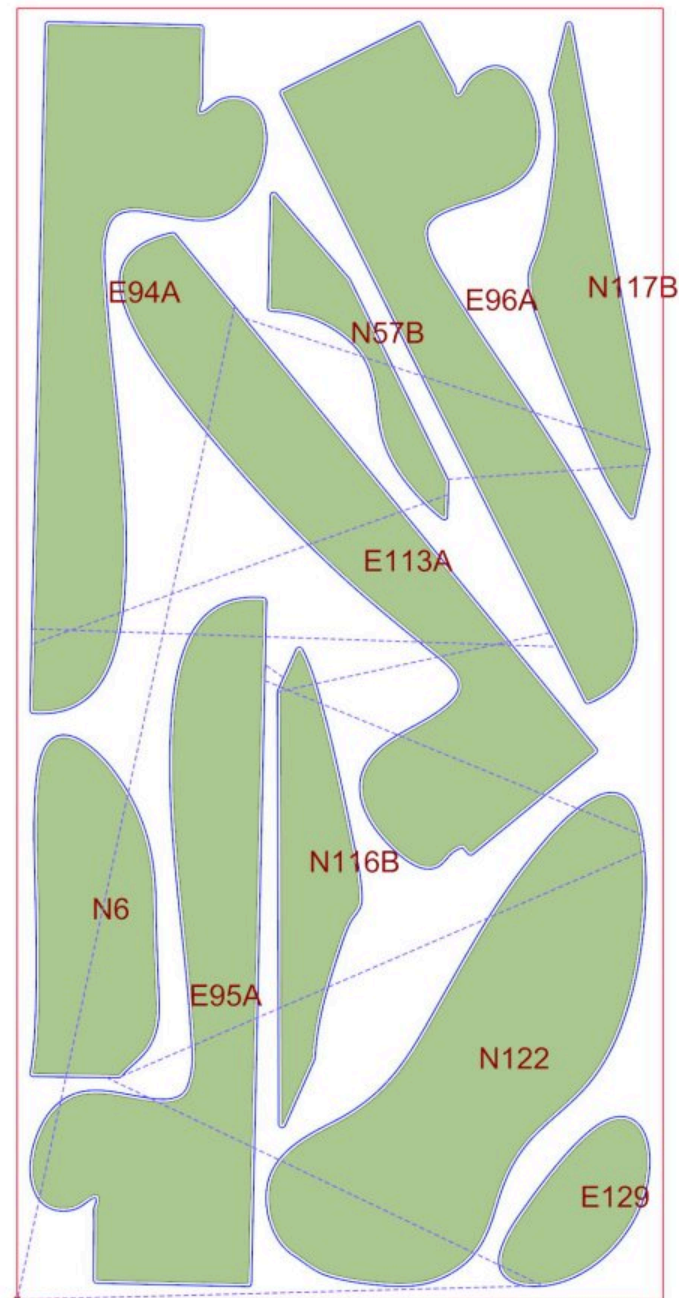


sheet_35_preview_thumb.jpg





Sheet43



Sheet9















Sheet 42
N99B
1.94m

N17A

~~A10-1~~ N18A

(1) N19A

N20A

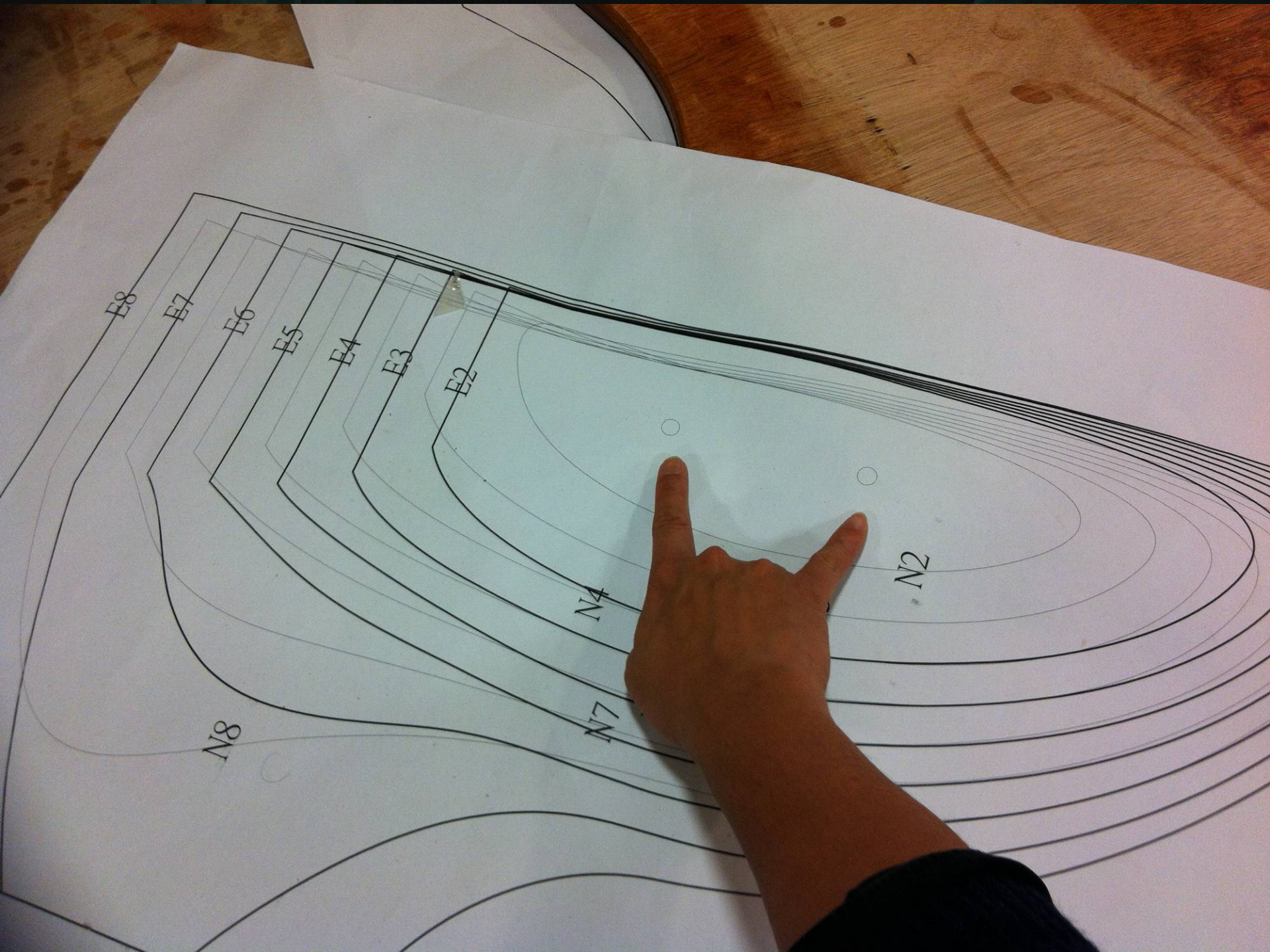




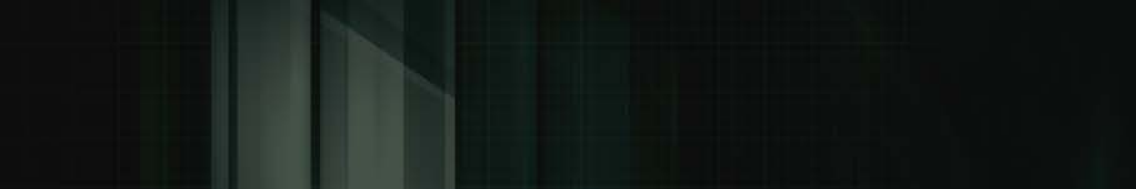














Conclusion

- Organic Architecture is far more common due to technology.
- Organic architecture extends beyond the traditional design/ documentation/ construction methodology
- BIM facilitates all processes



THANK YOU