



BIM 標準

BIM 於流線型建築的高級應用

HKIBIM

www.hkibim.org



The Hong Kong Institute of
Building Information Modelling
香港建築信息模擬學會

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The Hong Kong Institute of Building Information Modelling
香港建築信息模擬學會

HKIBIM Launch on 8th Jan 2010

Hong Kong Institute of Building Information Modelling (HKIBIM) was established in Jan 2009. After one year's preparation, it is proud to announce the launch of HKIBIM. On 8 Jan, 2010, the Launch was successfully held at the Hong Kong Club Building.

After opening speech by Ir Francis Leung, the Chairman of HKIBIM, the first fellow member of HKIBIM, Ms Ada Fung, made her speech followed by Architect Mr David Fung, Vice Chairman, sharing the membership application method and further direction of HKIBIM.

The launch ended with cocktail and networking until late night.



Click [here](#) to view the event photos.

Search for: 

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HKIBIM Launch on 8th Jan 2010
Official Launch of The Hong Kong
Institute of Building Information
Modelling (HKIBIM)

Useful Links

Membership Application Form:



PDF format



Link: www.hkibim.org

香港 BIM 標準

Hong Kong Institute of
Building Information Modelling

BIM Project Specification



MTR CORPORATION

OPERATIONS DIVISION

BUILDING INFORMATION MODELING MANUAL

**Building Information Modelling (BIM)
Standards Manual
for
Development and Construction Division
of
Hong Kong Housing Authority**



(Version 1.0)
November 2009

Prepared by Business Information Technology Unit
Development & Construction Division
Housing Department

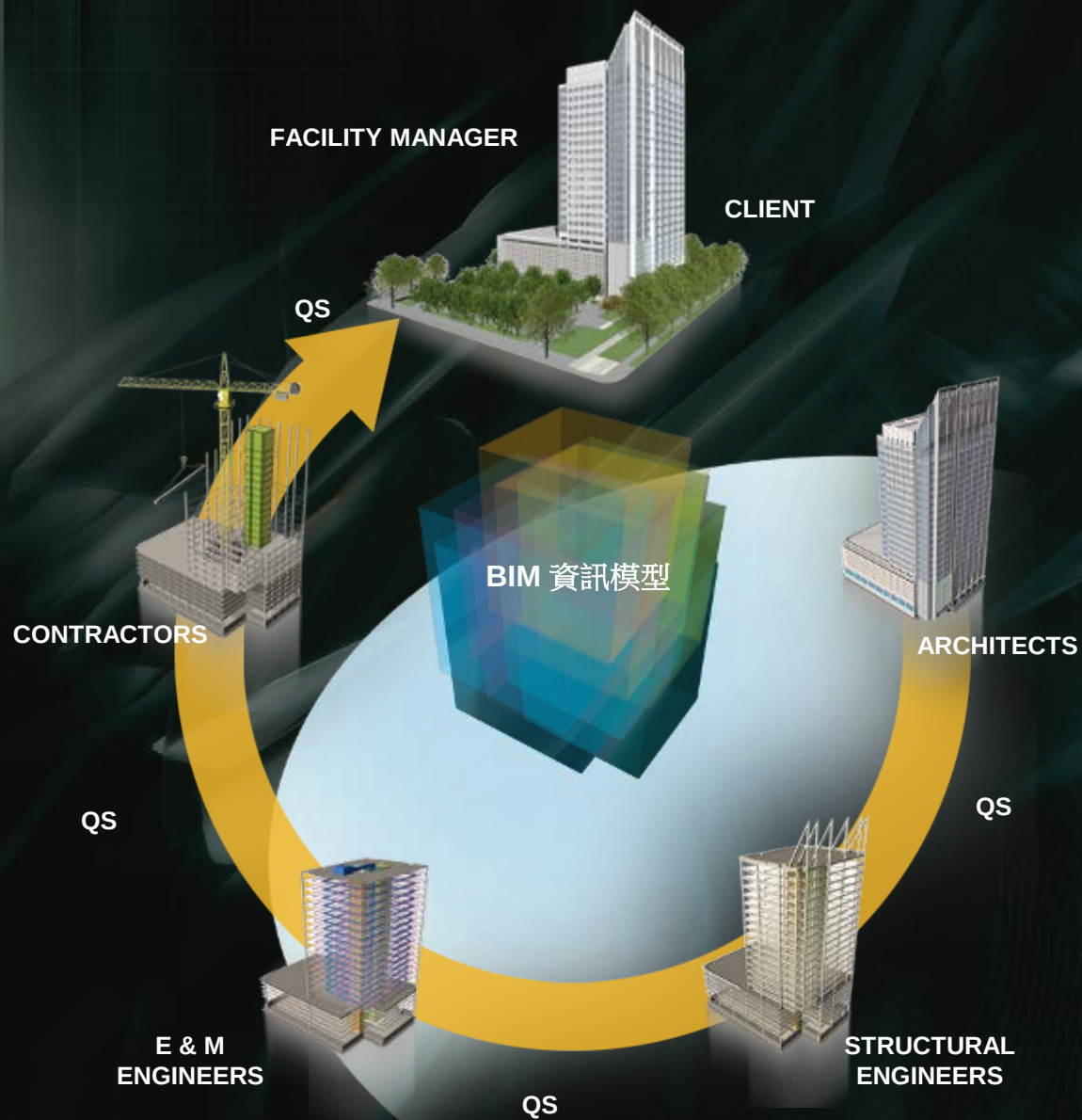
標準的作用

標準 = 協同

• 若只有一個BIM 單位, 就不需要標準

- 單一專業
- 不同專業
- 第三方 (審批方)
- 不同項目
- 資料的再用性

BIM – 資訊流程



BIM 的應用範圍 (HKIBIM)

2.0 BIM Project Objective

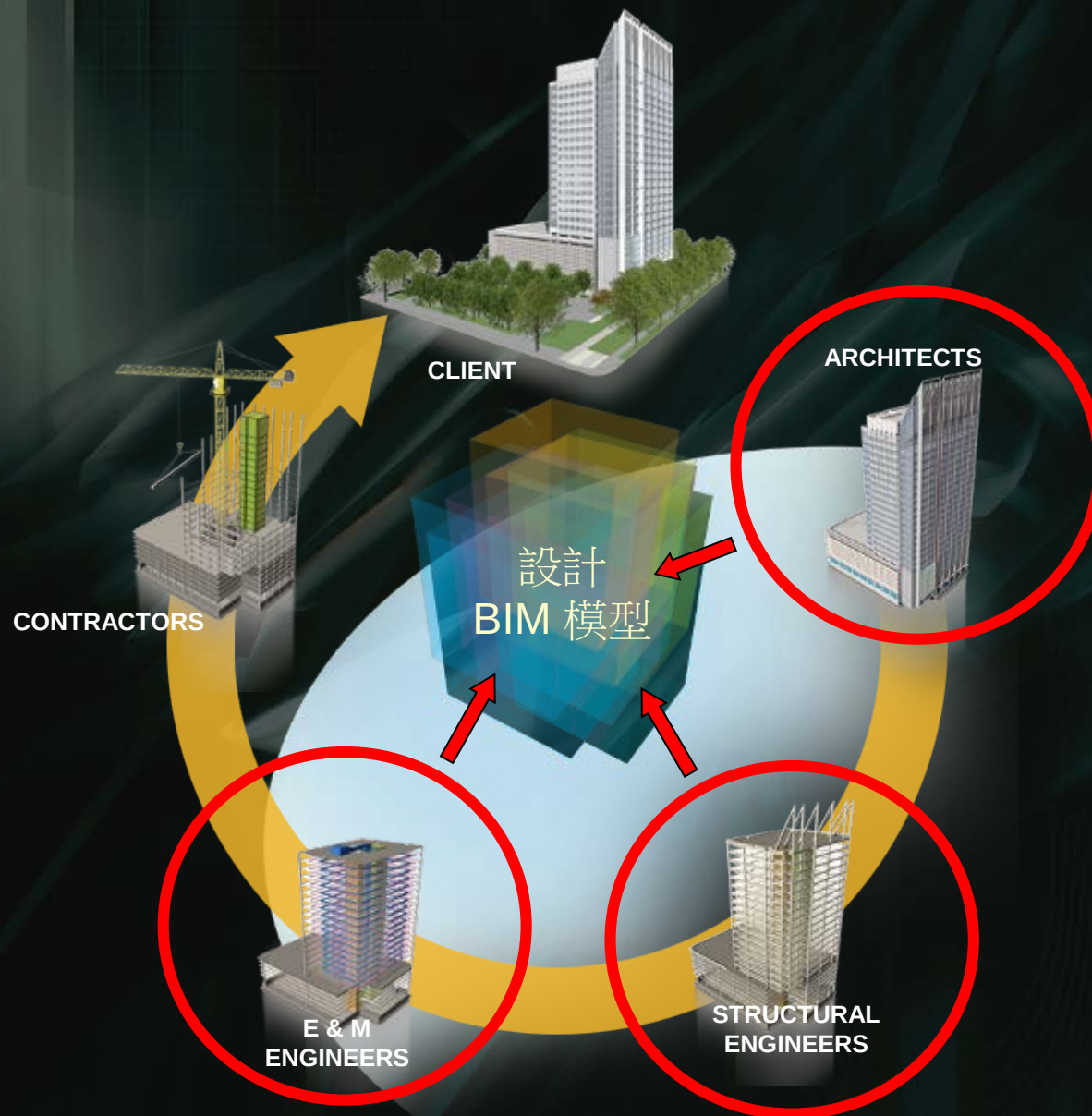
The client, architect and BIM Project Manager should define and agree the purpose of the BIM process at the beginning of a project. It will be difficult to implement additional functionality in the BIM models at a later date.

The purpose for the BIM on a project can be selected from the requirements and objectives listed in Table 1. For each objective, an individual organisation should be appointed to manage the task. This role may change at different stages of the project life-cycle and should be reviewed at key milestones.

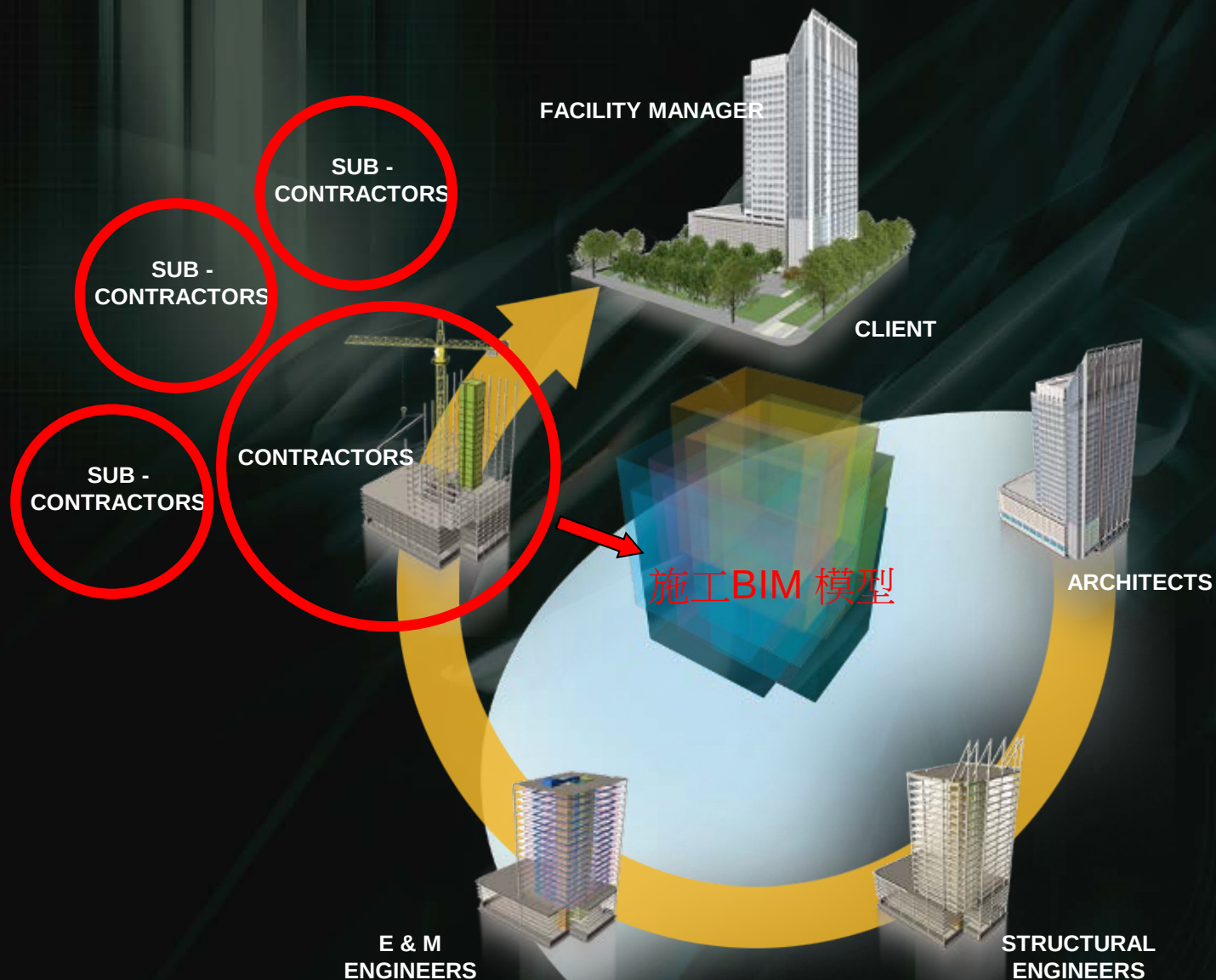
BIM Project Objective		REQ	Arc	Str	MEP	Con	FM	BIM
1	Use BIM Models for Master plan site study at Feasibility analysis stage							
2	Create architectural BIM.							
3	Maintain and update architectural BIM.							
4	Create structural BIM.							
5	Maintain and update structural BIM.							
6	Create MEP building services BIM.							
7	Maintain and up date MEP building services BIM.							
8	Create and maintain parametric models							
9	Produce design drawings and documentation including plans, elevations and sections directly from the BIM applications.							
10	Produce drawings for statutory submissions							

11	Produce a Bill of Quantities in accordance with the standard method of measurement							
12	Digitally link the BIM to the project specifications							
13	Include spatial validation checks for headroom and working spaces for building operations and maintenance activities.							
14	Produce visualisation walk-through, animations and rendered images.							
15	Implement clash analysis systems to detect and identify conflicts and interferences between different model elements.							
16	Link the BIM models to environmental analysis software for solar, heating and cooling and life-cycle analysis to support building design accreditation and building performance assessment.							
17	Produce schedules of materials, areas and quantities from the BIM databases.							
18	Link the BIM models to the construction programme to produce 4D Virtual Construction simulations							
19	Produce shop drawings, fabrication drawings, combined services drawings (CSD's), individual services drawings (ISD's) from the BIM applications							
20	Produce Purchase Orders as part of contractor procurement systems							
21	Incorporate as-built equipment information in the BIM model elements for provision to the building facility							

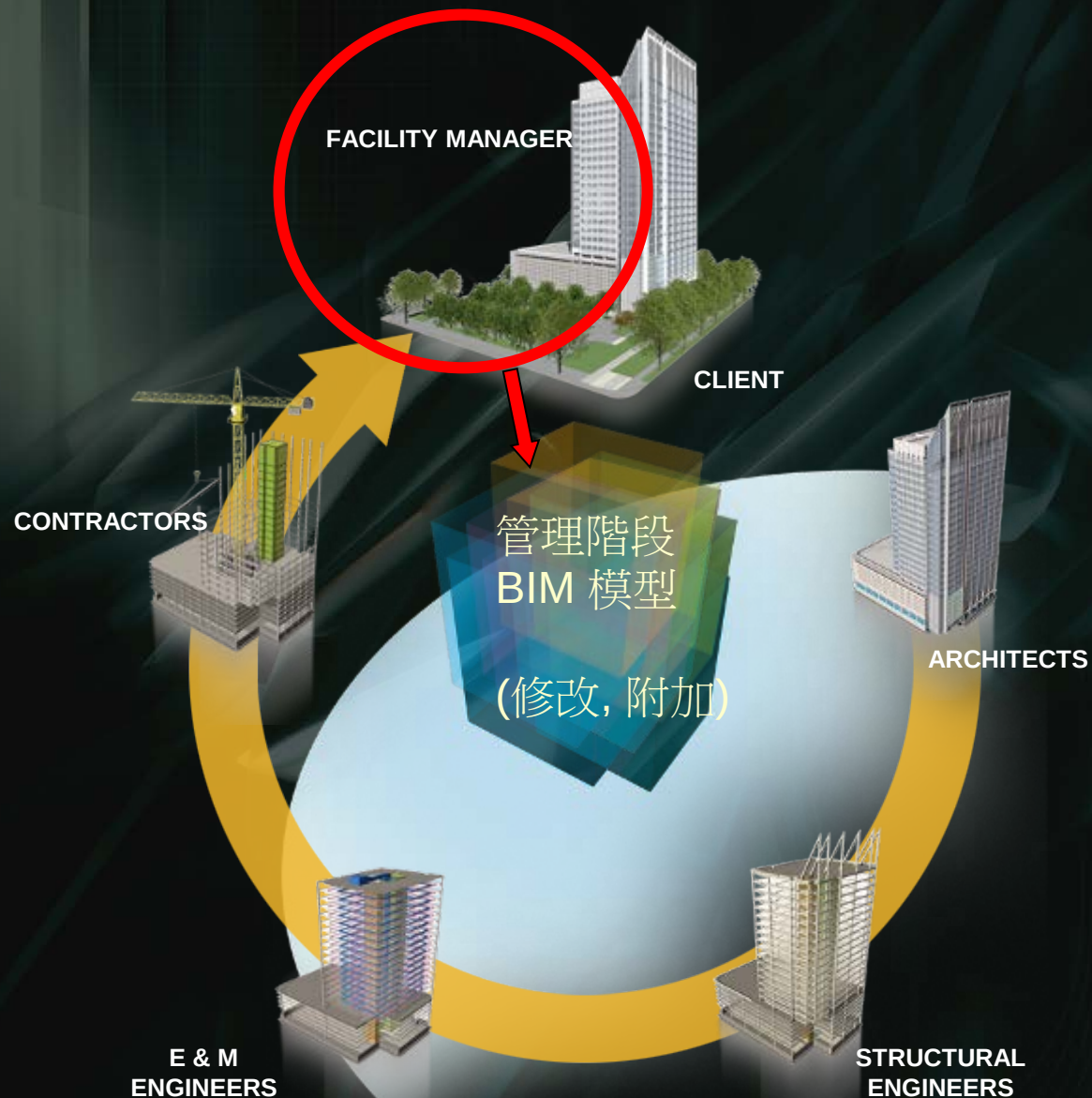
標準 – 設計BIM 模型



標準 – 施工BIM 模型



標準 — 管理階段BIM 模型



1. 單一專業協同

-  BIM Standards
-  Common Families
-  Fonts
-  Keynotes
-  Maps
-  References
-  Shortcut
-  Template
-  Titleblock

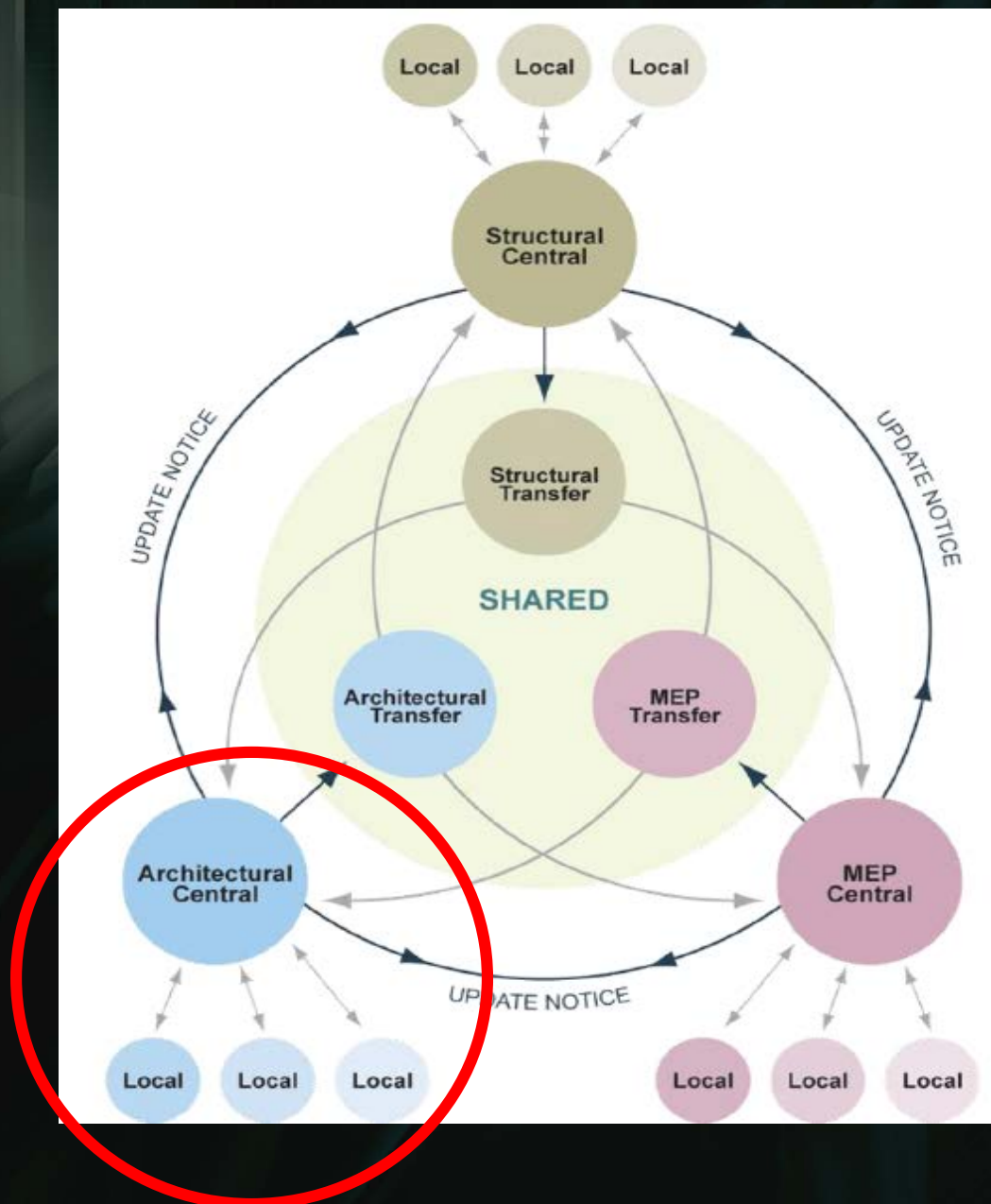
BIM 設定工作夾定義

Name

-  Archive
-  Background
-  Central File
-  Incoming
-  Photo
-  Presentation
-  Project Specific BIM Admin
-  Project Specific Families

BIM 項目工作夾定義

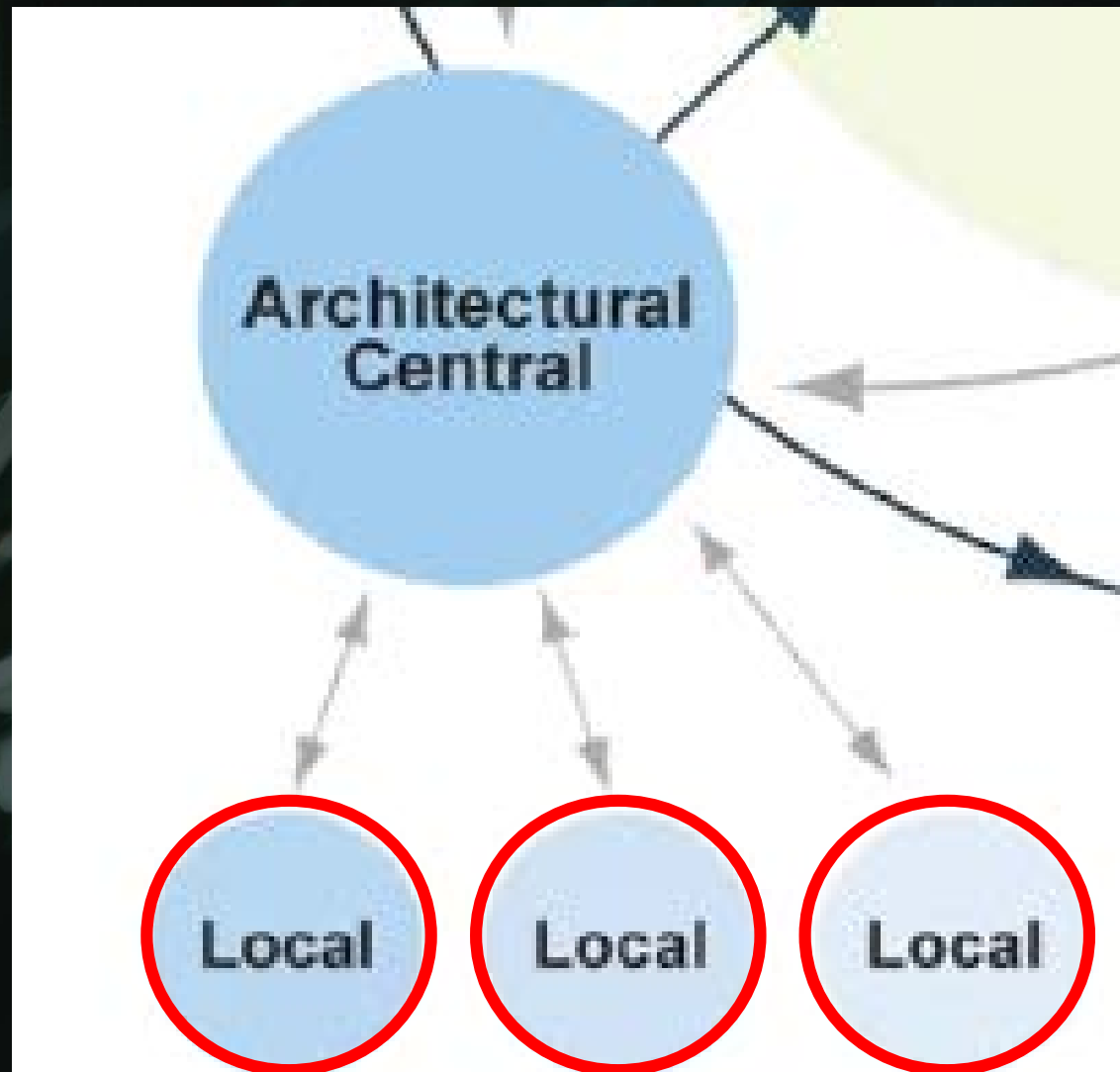
1. 單一專業協同



1. 單一專業協同 (工作集)

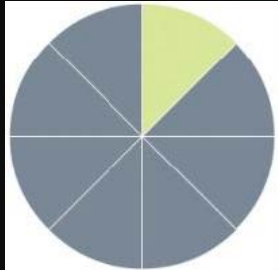
父

子

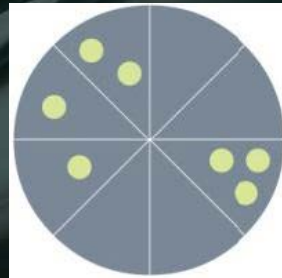


1. 單一專業協同（權限）

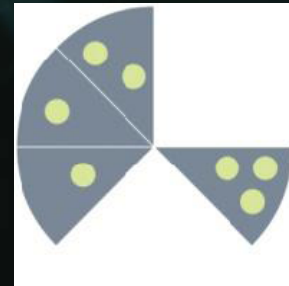
Take **OWNERSHIP** of an entire
workset



BORROW elements from workset as required



**NB/ Users only need to open required
worksets**



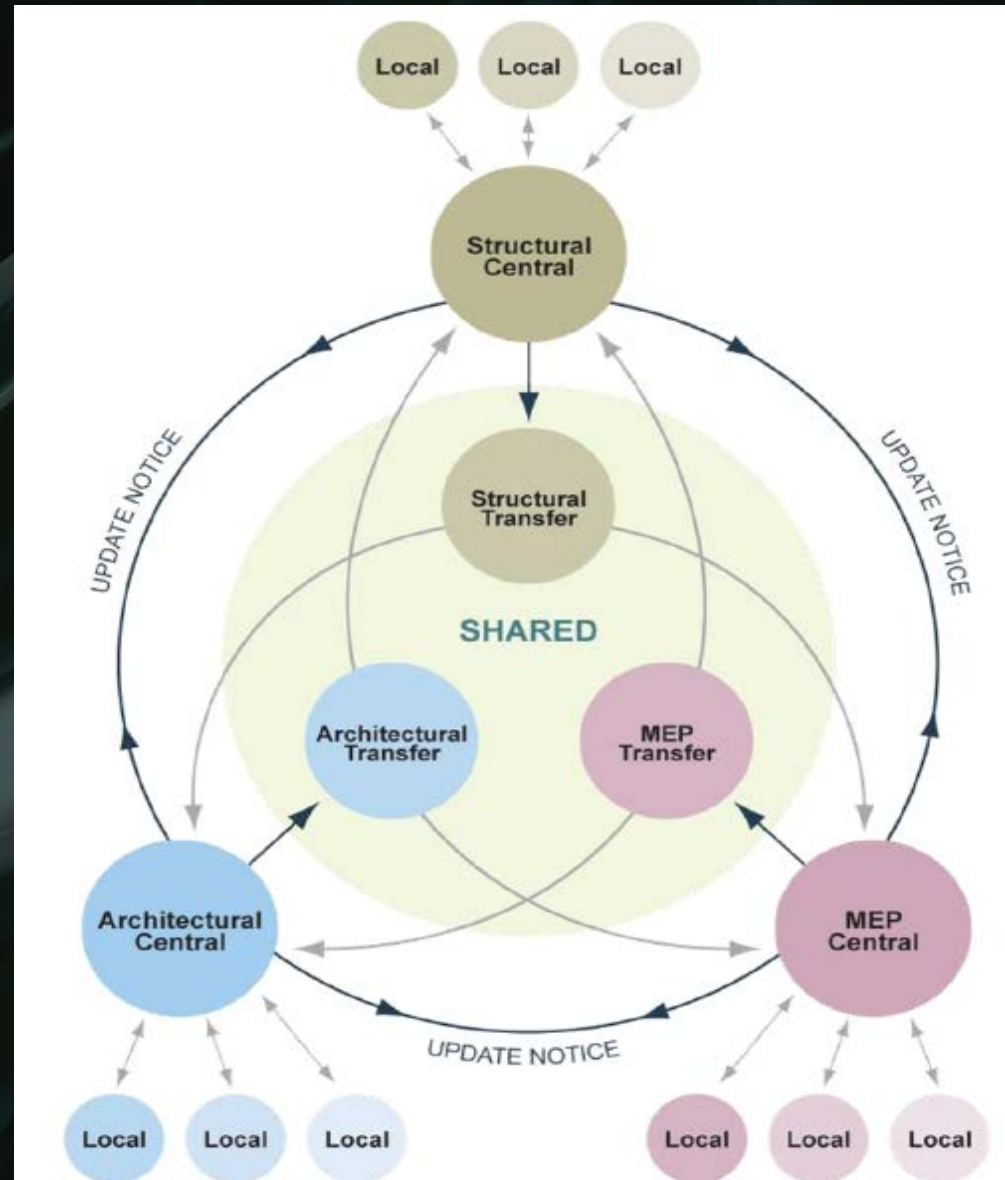
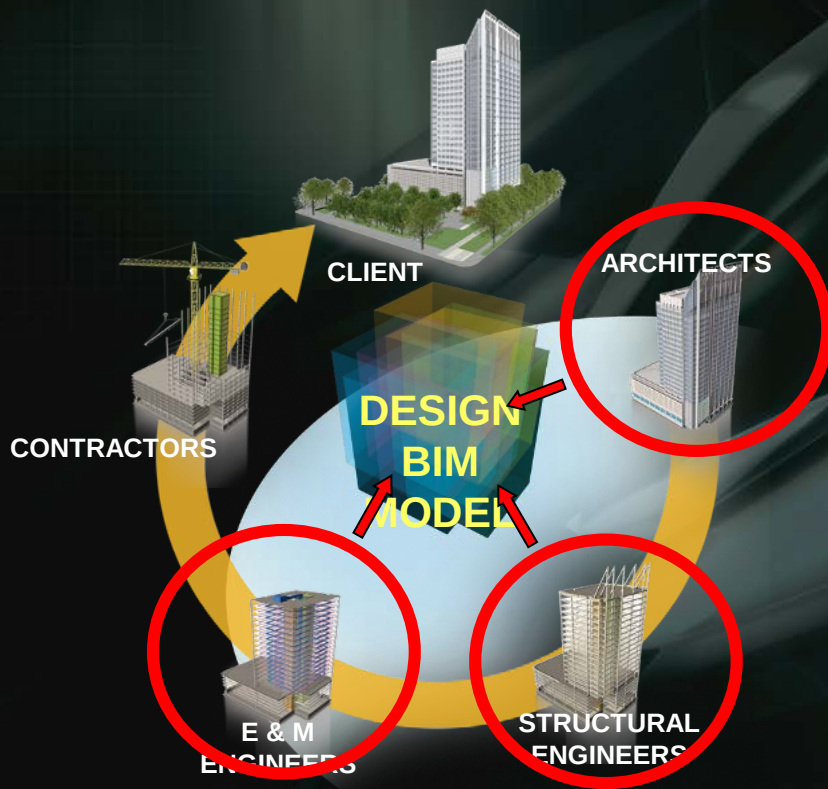
1. 單一專業協同 (工作集)

	Workset	Note
Architectural	Shared Levels and Grids	Default Levels and Gridlines
	Area & Room	Room, Area object, Colour pathes
		Base Map, Existing drawings, in AutoCAD or

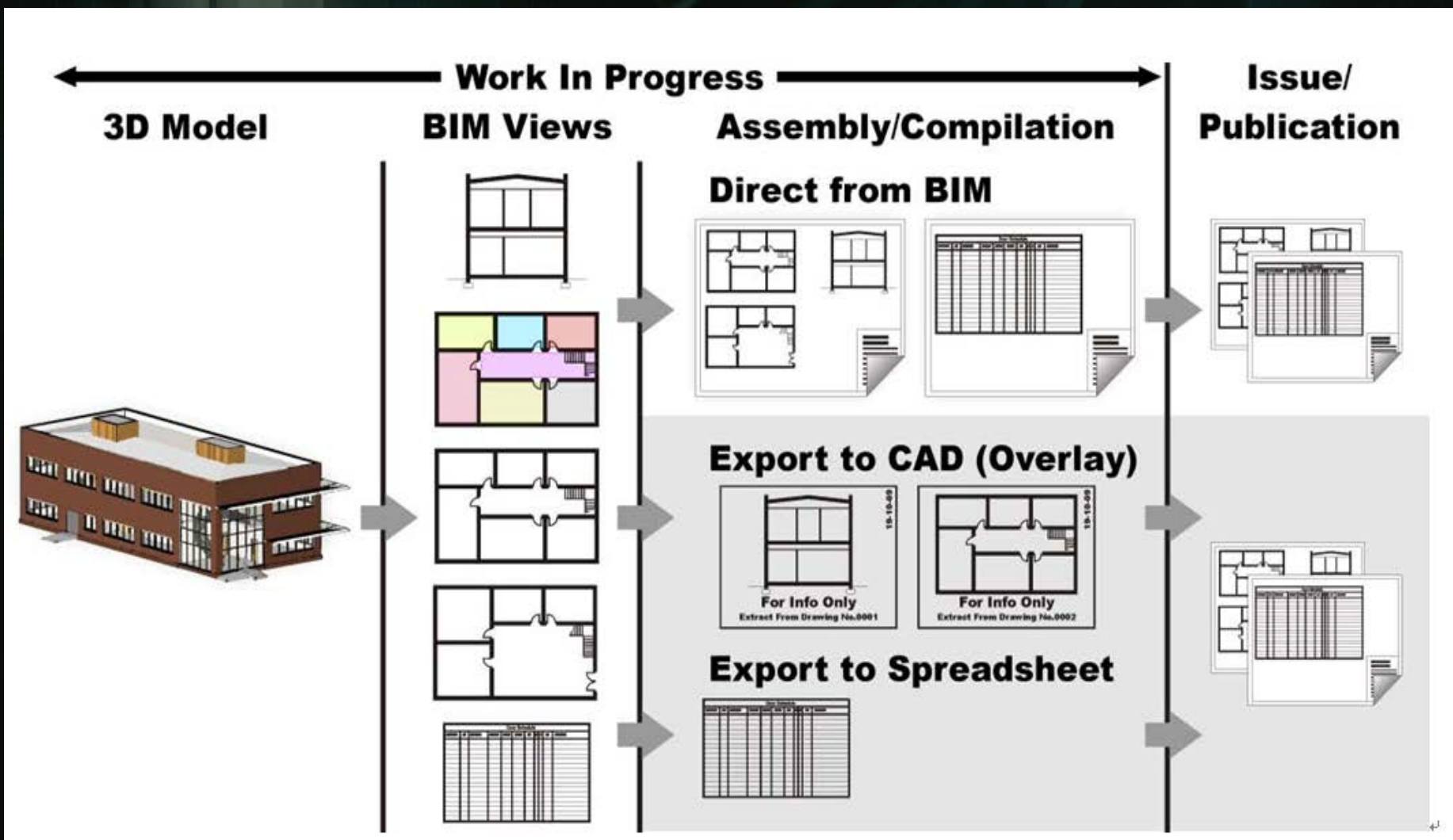
Structure		
	Shared Levels and Grid	
	Site	Site reference files, typography, Building blocks, above ground structures, roads etc
Mechanical Elements	EAD - Exhaust air ducts	gs, dimension,
	FAD - Fresh air ducts	ap, Existing drawings, in AutoCAD or
	SAD - Supply air ducts	ation Format.
Electrical Elements	CAB - Cable tray, trunking, cable containment, Electrical risers, conduit, Busduct, power feeds	
	BRD - HV & LV switch boards, switchgear, MCCB boards, MCCB boards	
Plumbing & Drainage Elements	FWP - Fresh water piping	
	RWP - Rainwater & stormwater piping	
	SWP - Sewerage water piping	
Fire Protection Elements	TRP - Grease trap piping	
	PMP - Pump piping	
	PIT - Sum	
	TNK - Storage vessels	
	UGR - External drainage	
	WSD - Ur	

Fire Protection Elements	SPR - System piping, droppers, fittings
	PMP - fire sprinkler pumps
	TNK - Sprinkler tanks
	HYD - Hydrants and hose reels
	GAS - Gas piping for suppression systems
	PAN - Heat or smoke detectors
	EXT - Fire extinguishers
	SHT - Fire shutters & hoods above
	BG - Fire alarm gongs & break glass
	AFA - AFA control & monitoring

2. 不同專業



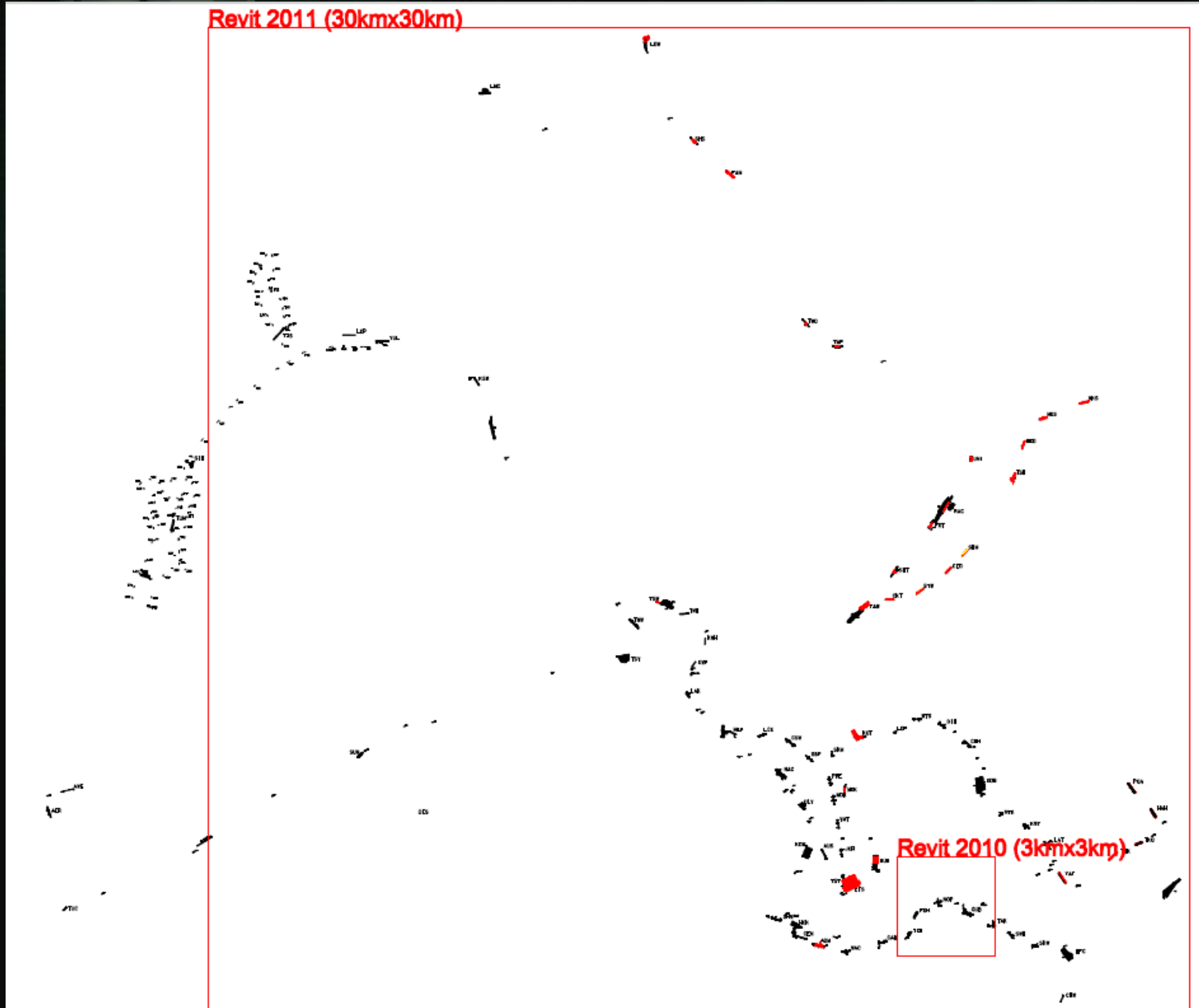
圖紙製作



地理位置定位

Revit 2011 (30kmx30km)

Revit 2010 (3kmx3km)

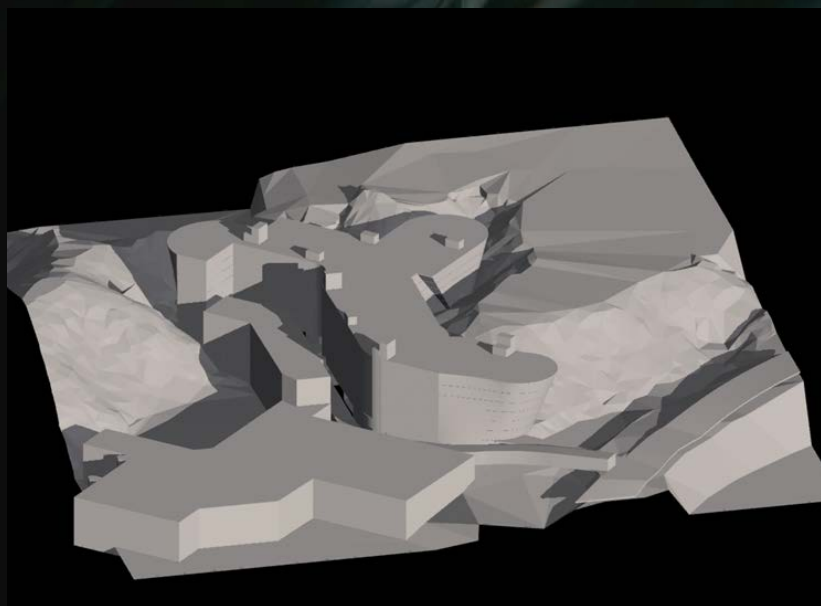
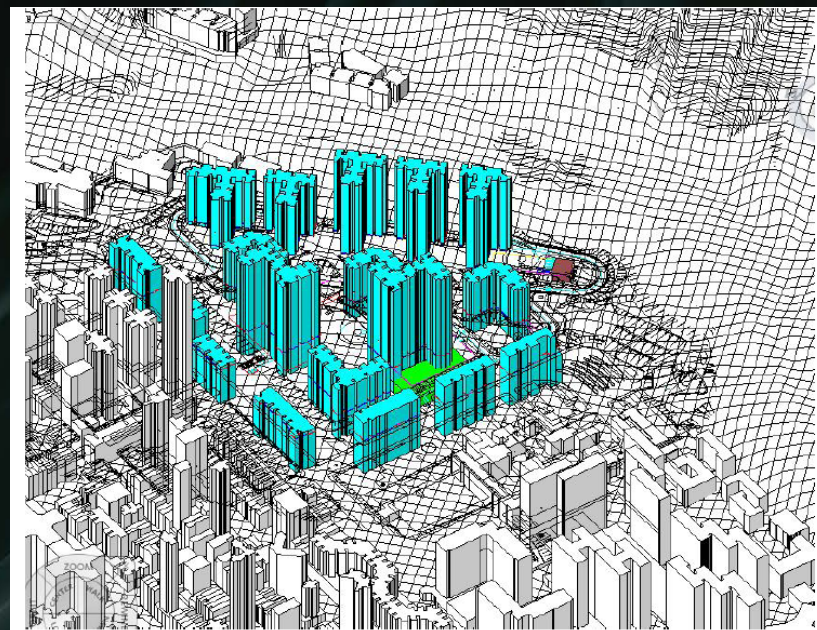


地理位置定位

同一座標 (X, Y)

同一高度 (mPD) (Z)

- 日照運算
- GIS 定位
- 跟別專業協同

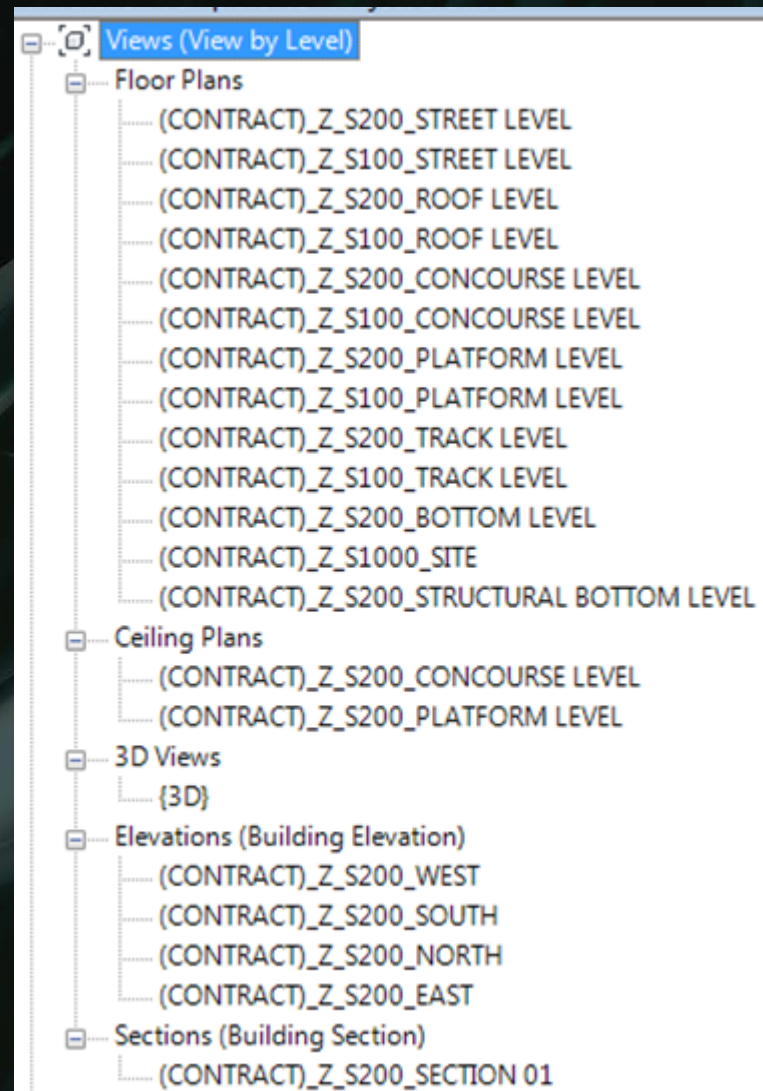


Authority Submission	Drainage Services Department	YES	NO	NO	NO	YES	NO	NO	DSD Colour Code	
	Water Authority	YES	NO	NO	NO	YES	NO	NO	B&W	
	STIC	YES	NO	NO	NO	NO	NO	NO	STIC Colour Code	Location, Area
	SSCC1	YES	NO	NO	NO	NO	NO	NO	SSCC Colour Code	Fire Safety, Area
	SSCC2	YES	NO	YES	YES	NO	NO	NO	SSCC Colour Code	Fire Services Provision
	SSCC3	YES	NO	YES	YES	NO	NO	NO	SSCC Colour Code	Smoke Extraction
	CLP/ HKE/ Gas/ Telcommunication	NO	NO	NO	NO	NO	YES	YES	B&W	
Tender		YES	YES	YES	YES	YES	YES	YES	B&W	Quantity, Specifications, Cost
Construction		YES	YES	YES	YES	YES	YES	YES	B&W	Dimension and Material
CSD		YES	YES	YES	YES	YES	YES	YES	CSD Colour	Clashes
Shop Drawing		YES	NO	YES	YES	YES	YES	YES	B&W	Construction Details
As-Built Drawings		YES	YES	YES	YES	YES	YES	YES	B&W	
Demolition		YES	YES	YES	YES	YES	NO	NO	Dotted lines	Area of demolition

視圖定義

[illegible]

視圖定義



BIM 標準

單位, 尺寸標註 Units and Measurement

Folder Structure

Model Naming Convention

Sheet Naming Convention

Parameter Naming Convention

View Naming

Project Browser Organization

Presentation Styles

Templates

Annotation

Text Assignment

Line Weight

Line Pattern

Line Style

Hatching & Fill Regions

View Templates and Filters

Dimensioning

Title block

Symbology

Family

3. 第三方 (審批方)

SSCC Submission Stage 1

	Pantone No.	R	G	B	Colour
Extent of SSCC Submission	179 U	226	61	40	
Gazettal Boundary for Railway Development	293 U	0	81	186	
Station Boundary	130 U	234	175	15	
Design Year Incoming Passenger (PPH)AM (PM) Peak	286 U	0	56	168	
Design Year Outcoming Passenger (PPH)AM (PM) Peak	390 U	186	196	5	
Fireman's Access Route	286 U	0	56	168	
Emergency Vehicular Access	485 U2X	216	30	5	
Station Emergency Evacuation Route	368 U2X	91	191	33	
Disabled Access Route	239 U2X	224	33	158	
Station Public Area	607 U	242	234	188	
Station Public area, Open 24 Hours	623 U	165	191	170	
Non-Public Area, Operation	155 U	244	219	170	
Non-Public Area, E&M	453 U	214	204	175	

SSCC SUBMISSION STAGE 1

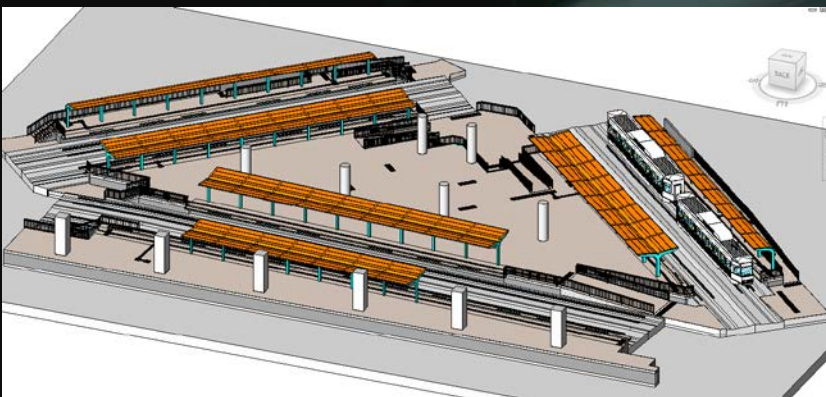
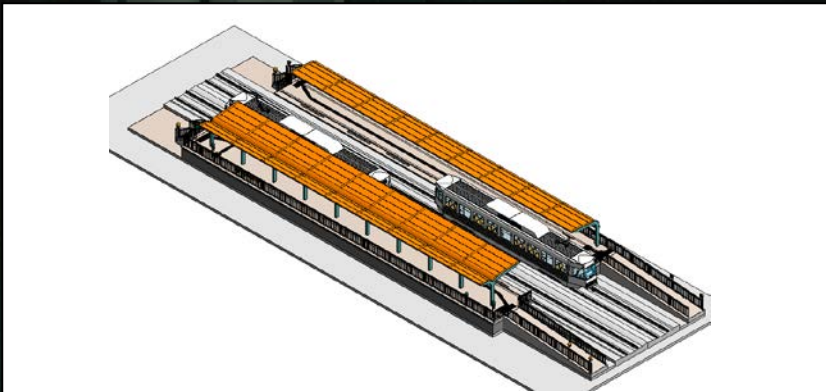
PANTONE NO.		
179 U		EXTENT OF SSCC SUBMISSION
293 U		GAZETTAL BOUNDARY FOR RAILWAY DEVELOPMENT
130 U		STATION BOUNDARY
286 U		DESIGN YEAR INCOMING PASSENGER (PPH) AM(PM) PEAK
390 U		DESIGN YEAR OUTGOING PASSENGER (PPH) AM(PM) PEAK
286 U		FIREMAN'S ACCESS ROUTE
485 U2X		EMERGENCY VEHICULAR ACCESS
368 U2X		STATION EMERGENCY EVACUATION ROUTE
239 U2X		DISABLED ACCESS ROUTE
607 U		STATION PUBLIC AREA
623 U		STATION PUBLIC AREA, OPEN 24 HOURS
155 U		NON-PUBLIC AREA - OPERATION

3. 第三方 (審批方)

12.23 Drawing Colour Coding^u

Material	Design	SSCC Submission	BD Submission (Practice Notes AGM)					
			Preferred Colour	BS5252 Identification Code	Colour	R	G	B
Earth (unexcavated)			Fawn	06 C 33		245	217	144
Hardcord or dry fill			Brown	06 C 39		65	44	13
Brick			Red	04 E 55		230	36	11
Concrete (plain or reinforced)			Green	14 E 53		0	134	67
Solid Concrete Blocks			Blue	20 E 56		1	52	135
Hollow Concrete Blocks			Mauve	24 E 53		110	67	113
Lightweight Partition (e.g. Plasterboard)			Orange	06 E 55		255	66	10
Plaster or Cement Rendering			Magnolia	08 E 49		255	251	201
Mosaic or other non-absorbent floor tiles			Pink	02 C 33		255	217	218
Mosaic or other non-absorbent wall tiles			Lemon	10 E 50		254	253	67

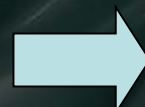
4.不同項目, 同一標準



同族 **SAME FAMILIES**

同模版 **SAME TEMPLATES**

生產明細表
GENERATE SCHEDULES

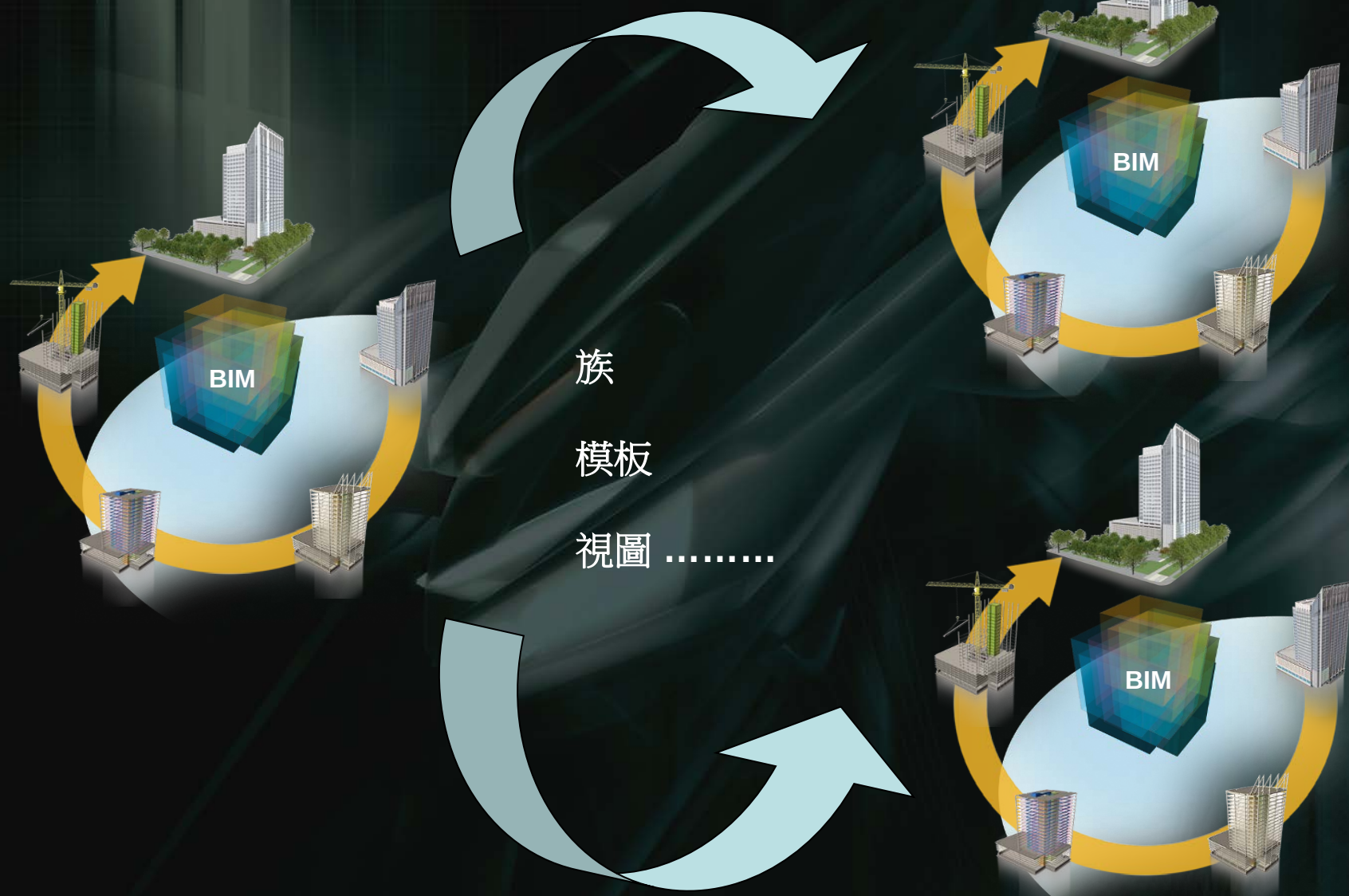


比較, 分析
COMPARABLE ANALYSIS

物業管理
FACILITY MANAGERMENTS



5. 資料的再用



5. 資料的再用

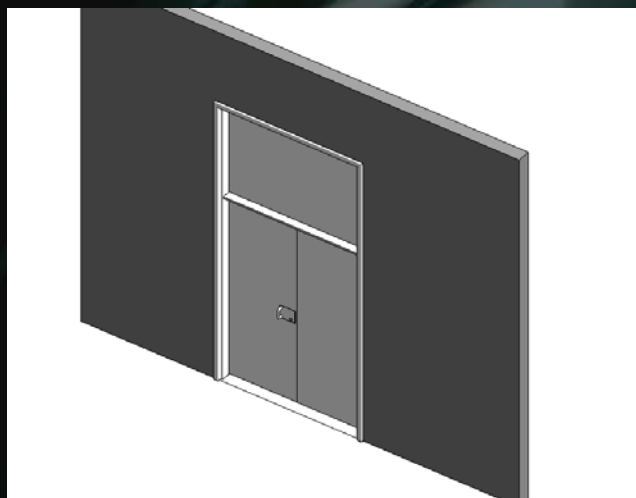
類型 — 副類型 — 創作單位 — 描述1 — 描述2

Category .	Code .
Air Terminals .	AIR .
Annotations .	ANN .
Ceilings .	CLG .
Columns .	COL .
Communication Devices .	COM .
Casework .	CSW .
CUC .	CUC .
Curtain Wall Mullions .	CTM .
Curtain Panels .	CTP .
Curtain Systems .	CTS .
Data Devices .	DAT .
Duct Accessories .	DCA .
Duct Fittings .	DCF .
Duct Insulations .	DCI .
Duct Linings .	DCL .
Ducts .	DCT .
Detail Items .	DET .
Doors .	DOR .
- Door .	DOR .

Category .	Code .
Mass .	MAS .
Mechanical Equipment .	MEC .
Nurse Call Devices .	NRS .
People .	PEP .
Pipe Fittings .	PIF .
Plumbing Fixtures .	PLM .
Planting .	PLN .
Profile .	PRF .
Pipe Accessories .	PPA .
Pipe Fittings .	PPF .
Pipes .	PPS .
Parking .	PRK .
PSB .	PSB .
PSD .	PSD .
Roads .	RDS .
Roof and Ceiling .	RFC .
Railings .	RLG .
Ramps .	RMP .
Roofs .	ROF .

ADP_(Advertising Panel)
ANN_(Annotations)
CLG_(Ceilings)
COL_(Column)
CSW_(Casework)
CTP_(Curtain_Panels)
CUC_(CUC)
DOR_(Door)
ECS_(Environmental_Control_System)
ELF_(Electrical_Fixture)
ESC_(Escalator)
FIF_(Fire_Fixture)
FLR_(Floor)
FRN_(Furniture)
FRS_(Furniture_Systems)
KOK_(Kiosks)
LFT_(Lift)
LGF_(Lighting_Fixtures)
LOU_(Louvre)
PEP_(People)
PIF_(Pipe_Fittings)
PLM_(Plumbing_Fixtures)
PLN_(Planting)

5. 資料的再用



-  DOR-DBL-HK-Curtain Wall.rfa
-  DOR-DBL-HK-Metal.rfa
-  DOR-DBL-HK-Metal-full swing.rfa
-  DOR-DBL-HK-Metal-self closing.rfa
-  DOR-DBL-HK-Metal-Transformer Room.0001.rfa
-  DOR-DBL-HK-Metal-Transformer Room.rfa
-  DOR-DBL-HK-Metal-vision panel self closing.rfa
-  DOR-DBL-HK-Timber-self closing.rfa
-  DOR-DBL-HK-Timber-vision panel self closing(unsy...
-  DOR-DBL-HK-Timber-vision panel self closing.rfa
-  DOR-DBL-HK-Timber-vision panel.rfa
-  DOR-DBL-HK-Timber-vision panel-self closing.rfa
-  DOR-DBL-HR-Metal-Tx Leaf & Lock.rfa
-  DOR-DBL-MTR- Hinge & Handle.rfa
-  DOR-DBL-MTR-C101 & P029.rfa
-  DOR-DBL-MTR-Cabinet-MTR-for Water Meters.rfa
-  DOR-DBL-MTR-Curtain Wall Type T.rfa
-  DOR-DBL-MTR-Fixed Panel & Handle.rfa
-  DOR-DBL-MTR-Frame and Panel-MTR-With Handle....

標準 = 協同

- 單一專業
- 不同專業
- 第三方 (審批方)
- 不同項目
- 資料的再用

BIM 於流線型建築的高級應用

Frank O. Gehry



Frank O. Gehry



Sketches of Frank Gehry
DG Bank Berlin, Germany
Photos from Sketches of Frank Gehry by Urban Gullikje / courtesy of Sony Pictures Classics Inc. © 2006 CTS Film Company

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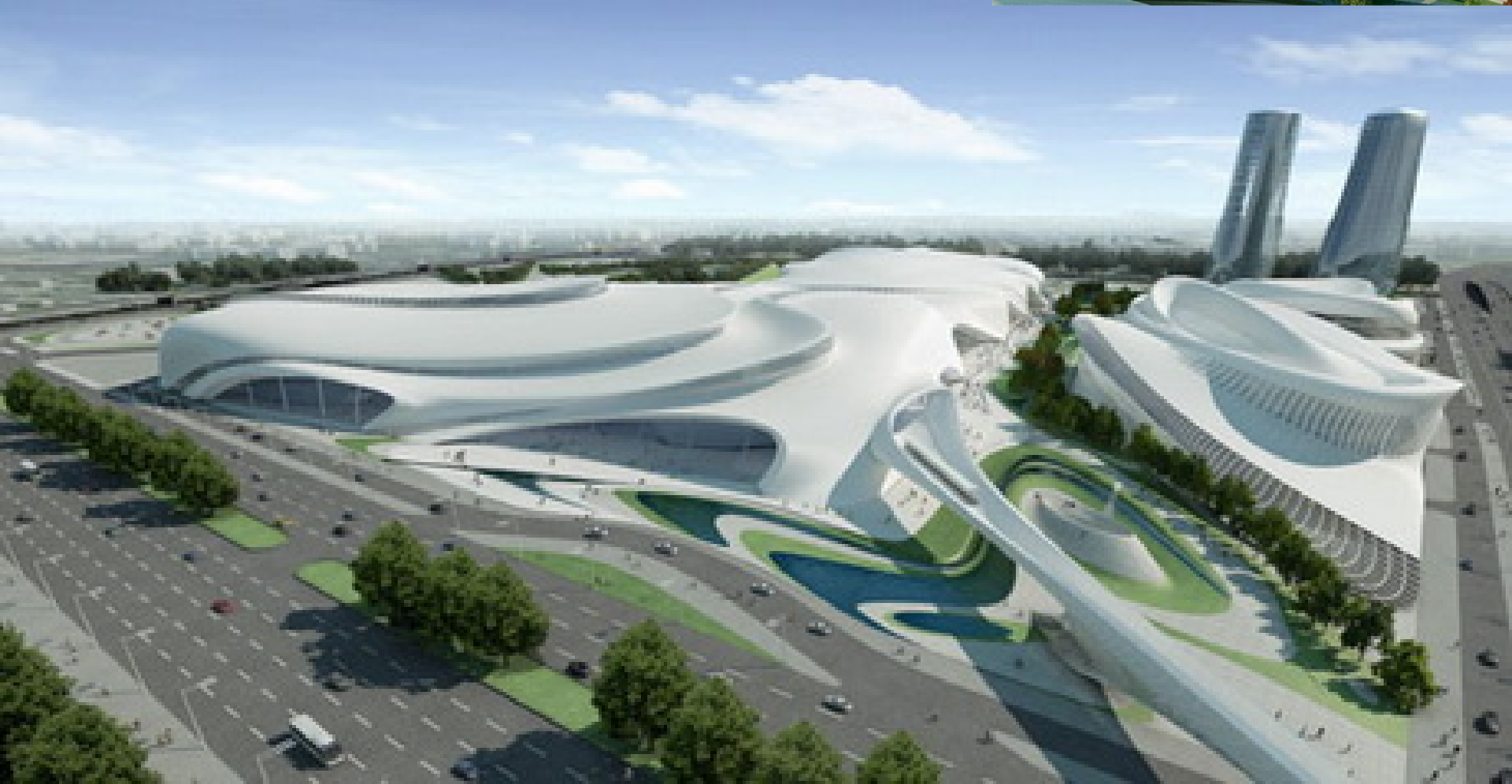
Frank O. Gehry



Santiago Calatrava



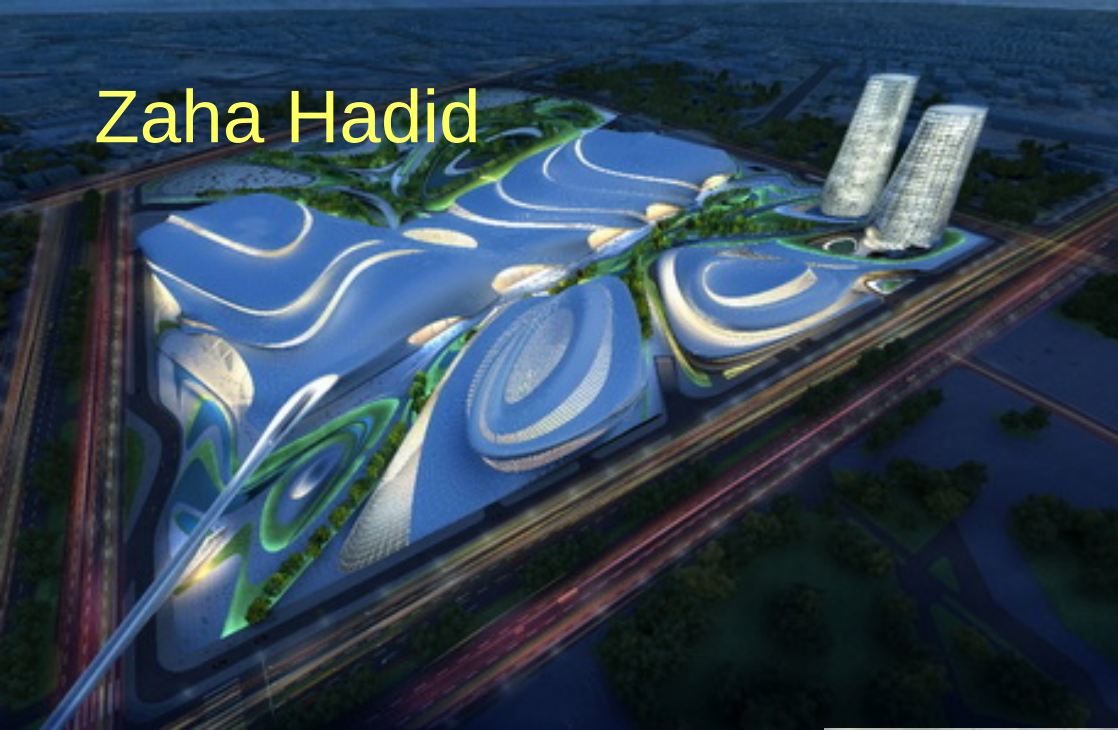
Zaha Hadid



Zaha Hadid



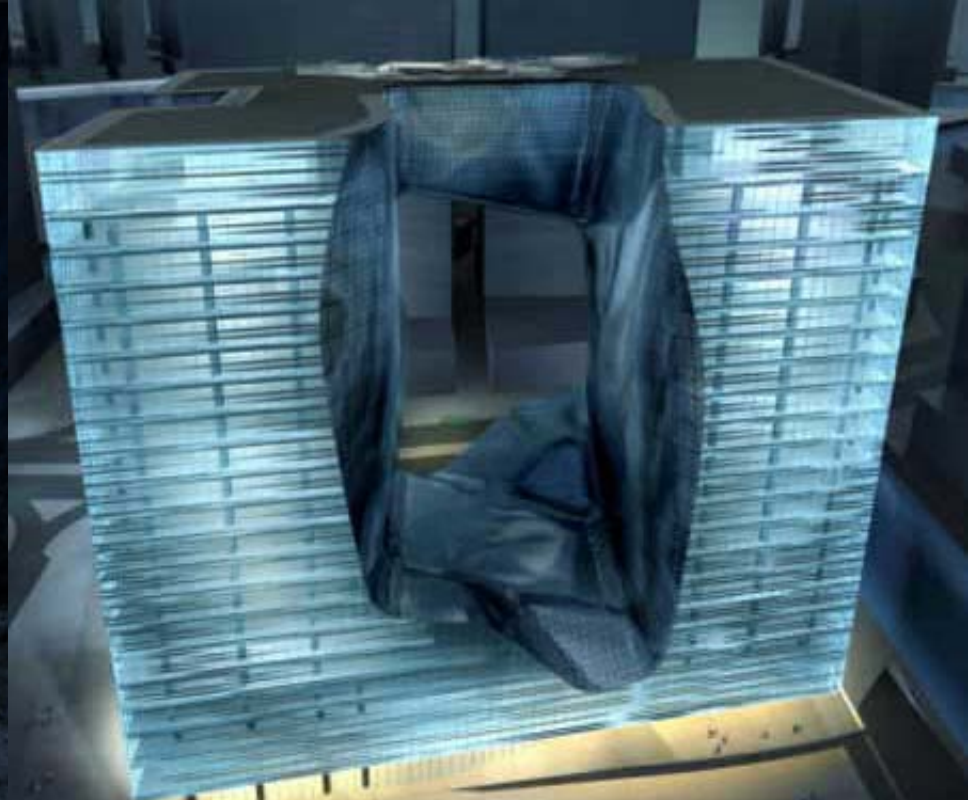
Zaha Hadid



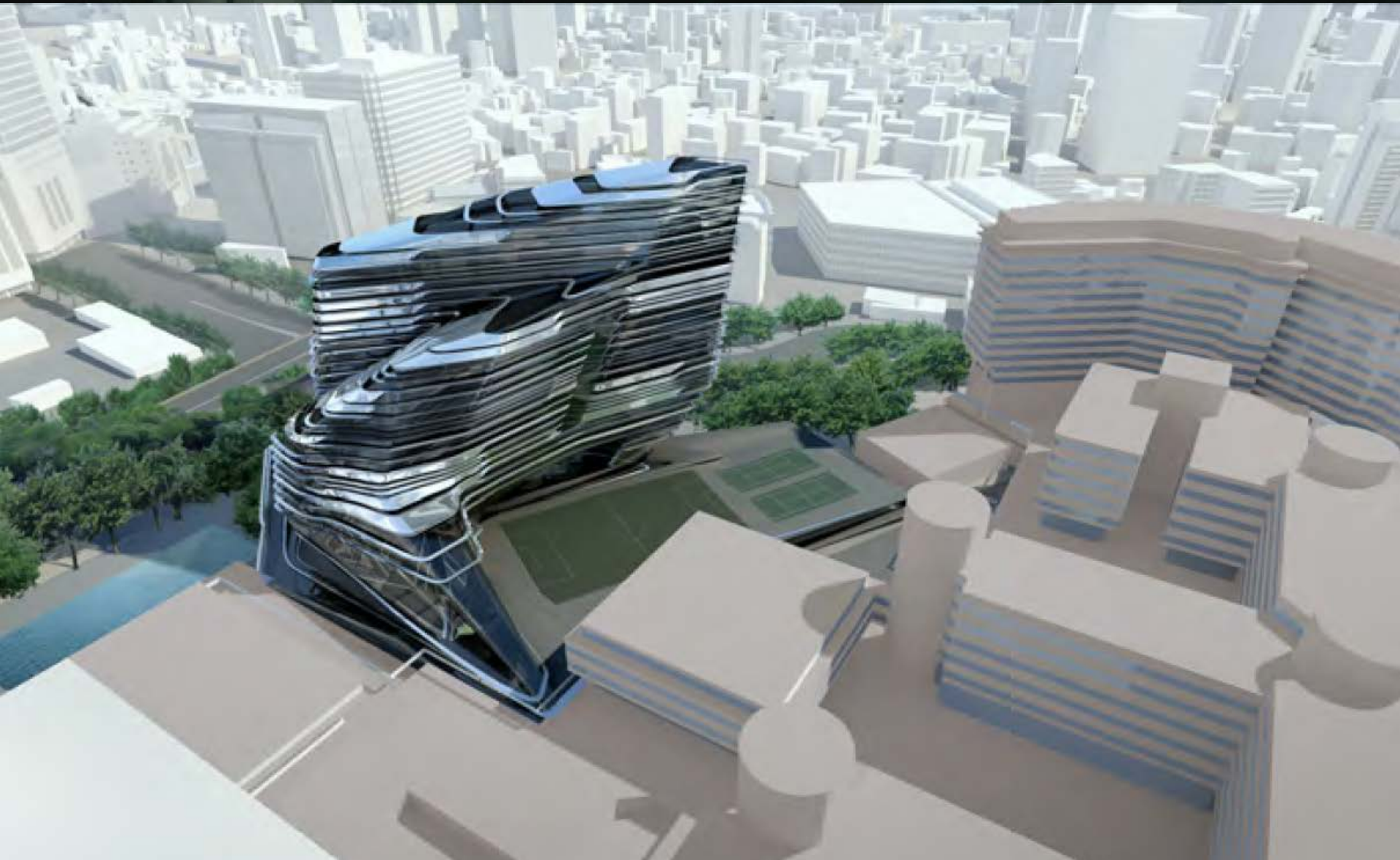
Zaha Hadid



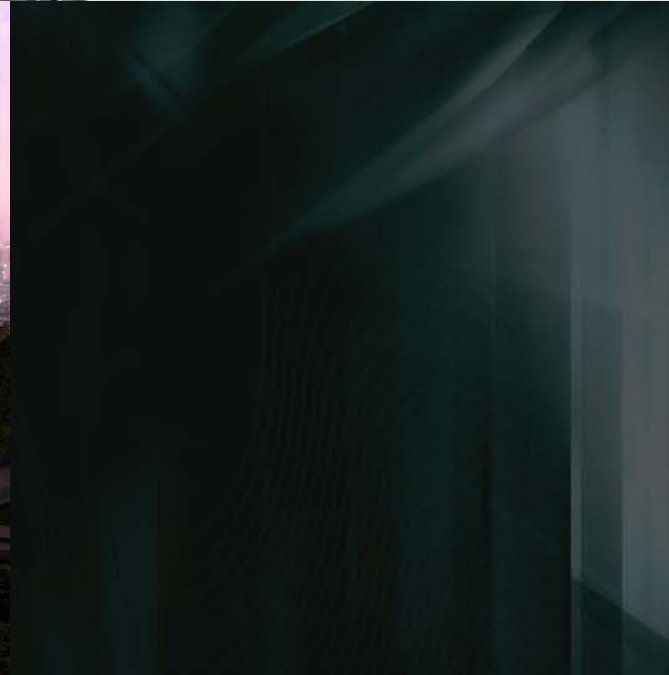
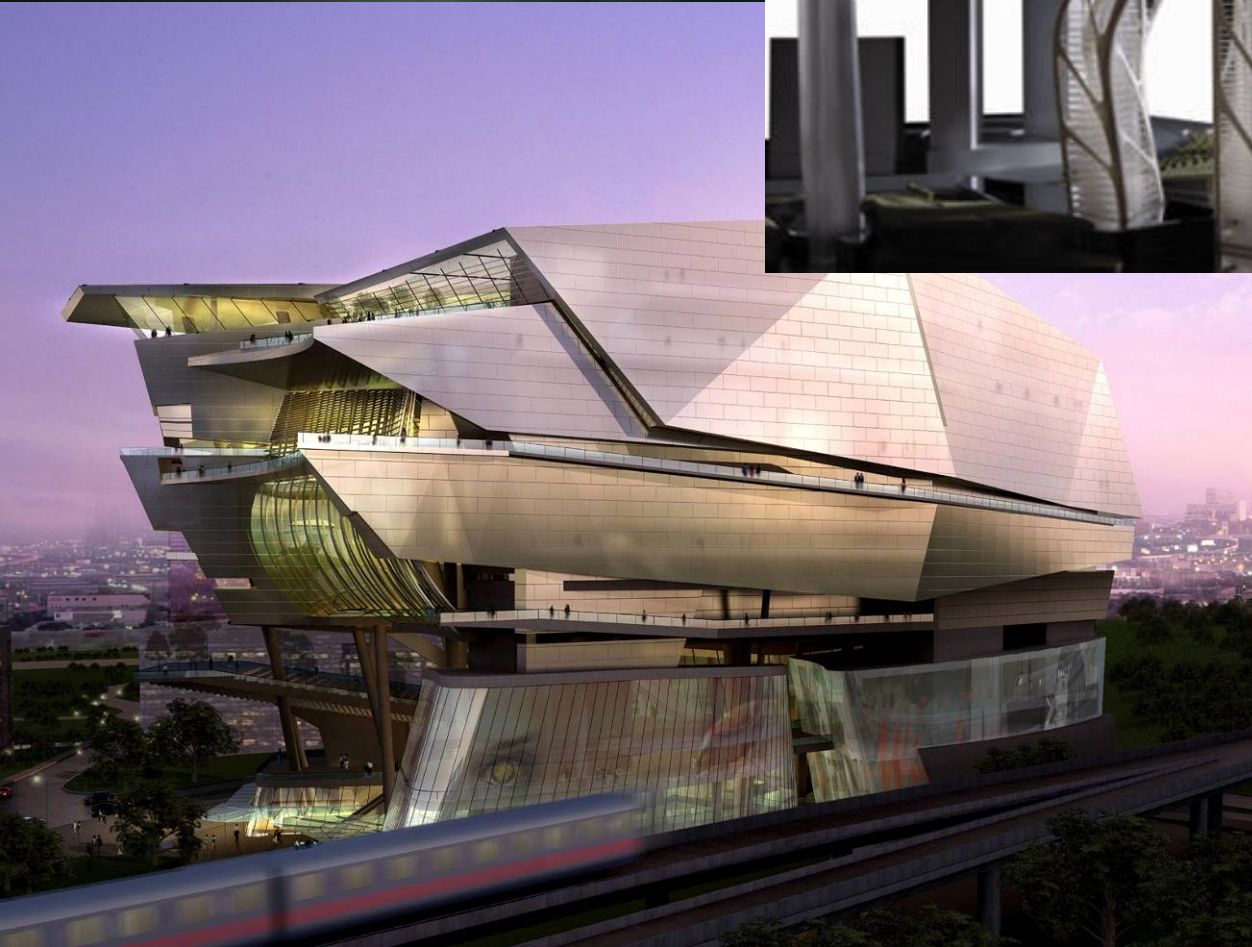
Zaha Hadid



Zaha Hadid - HONG KONG POLYTECHNIC UNIVERSITY



Aedas



Aedas

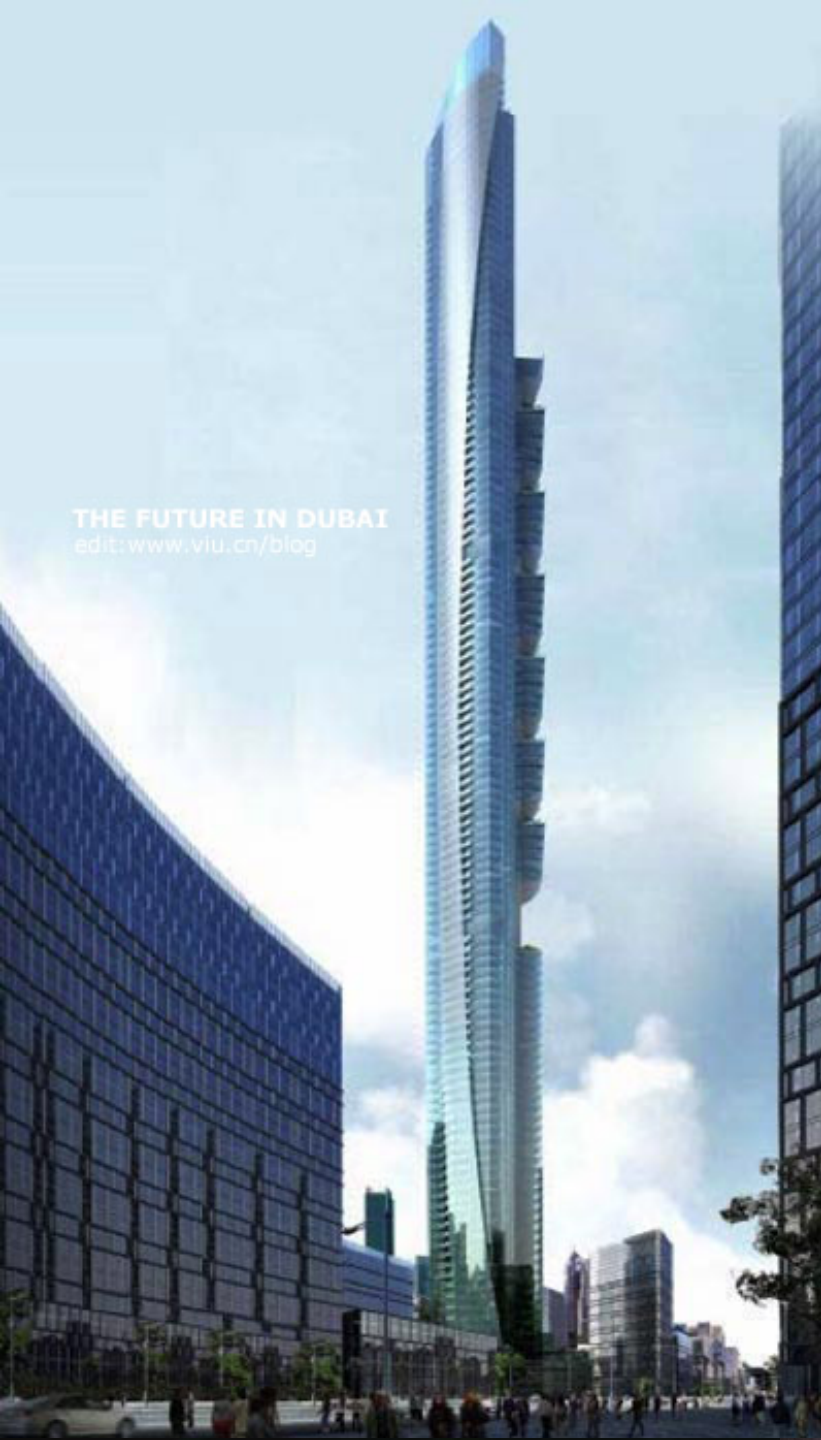


Aedas

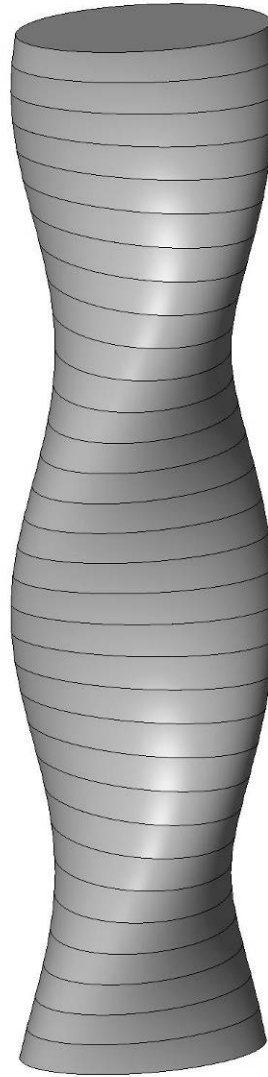
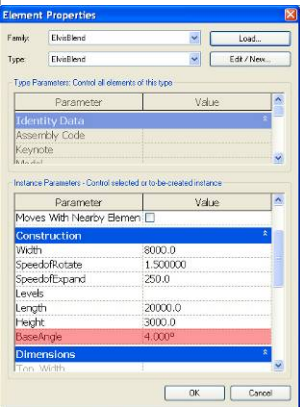
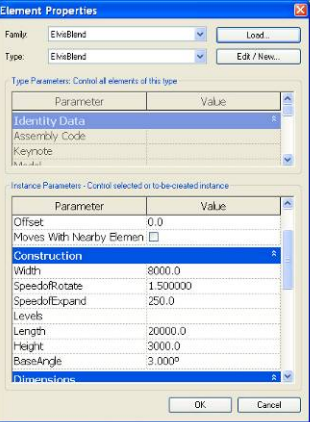


Aedas

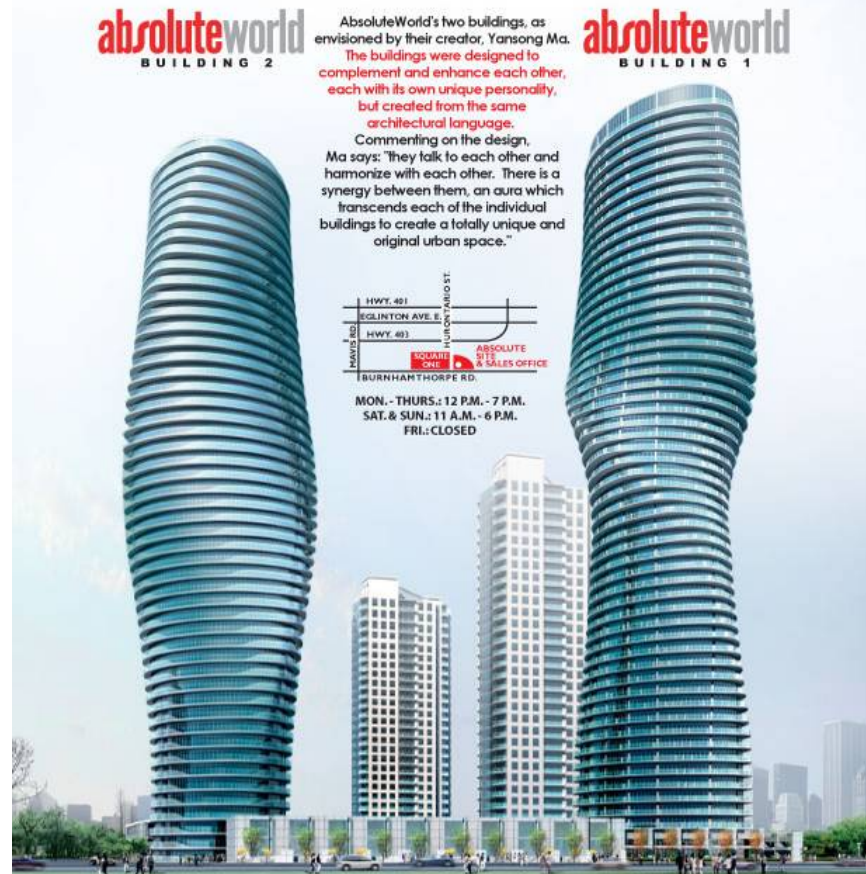
THE FUTURE IN DUBAI
edit: www.viu.cn/blog



BIM in Organic Design



Parametric Modelling



IDEA → MODEL → TEST → MODIFY → DECISION





Student Parametric Design Works

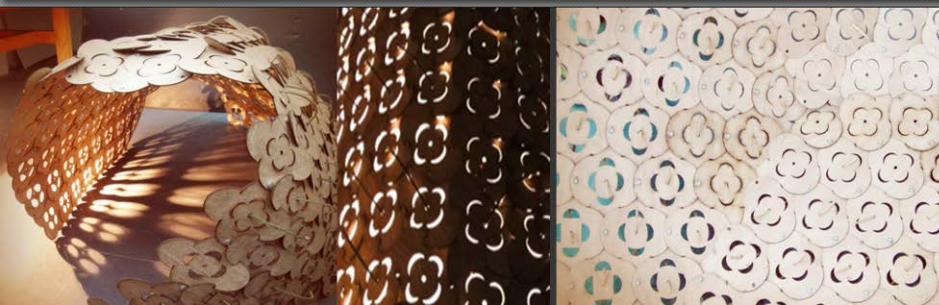
Shenzhen University,
Department of Architecture, 2012



Team 5



Team 2



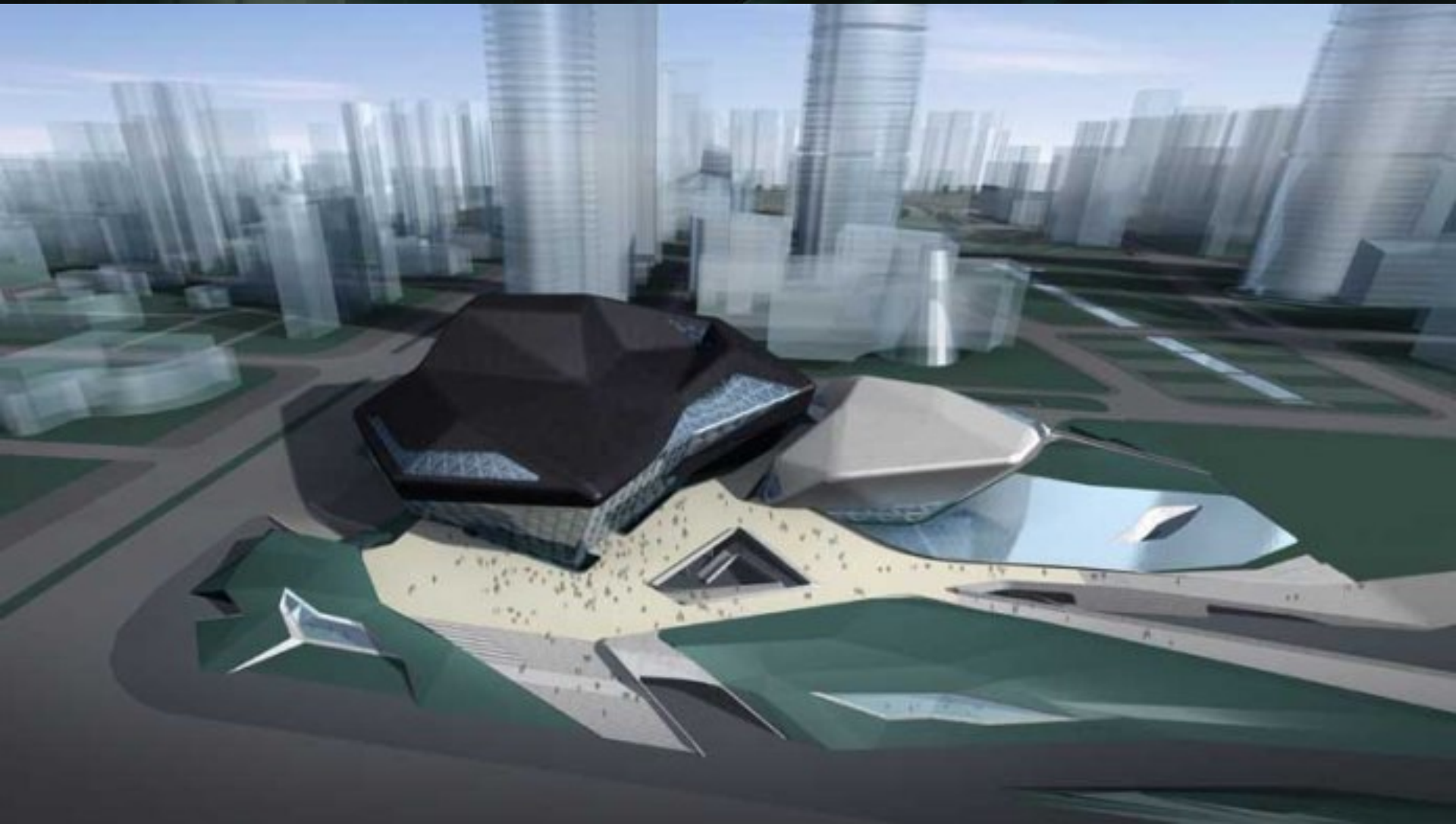
Team 3



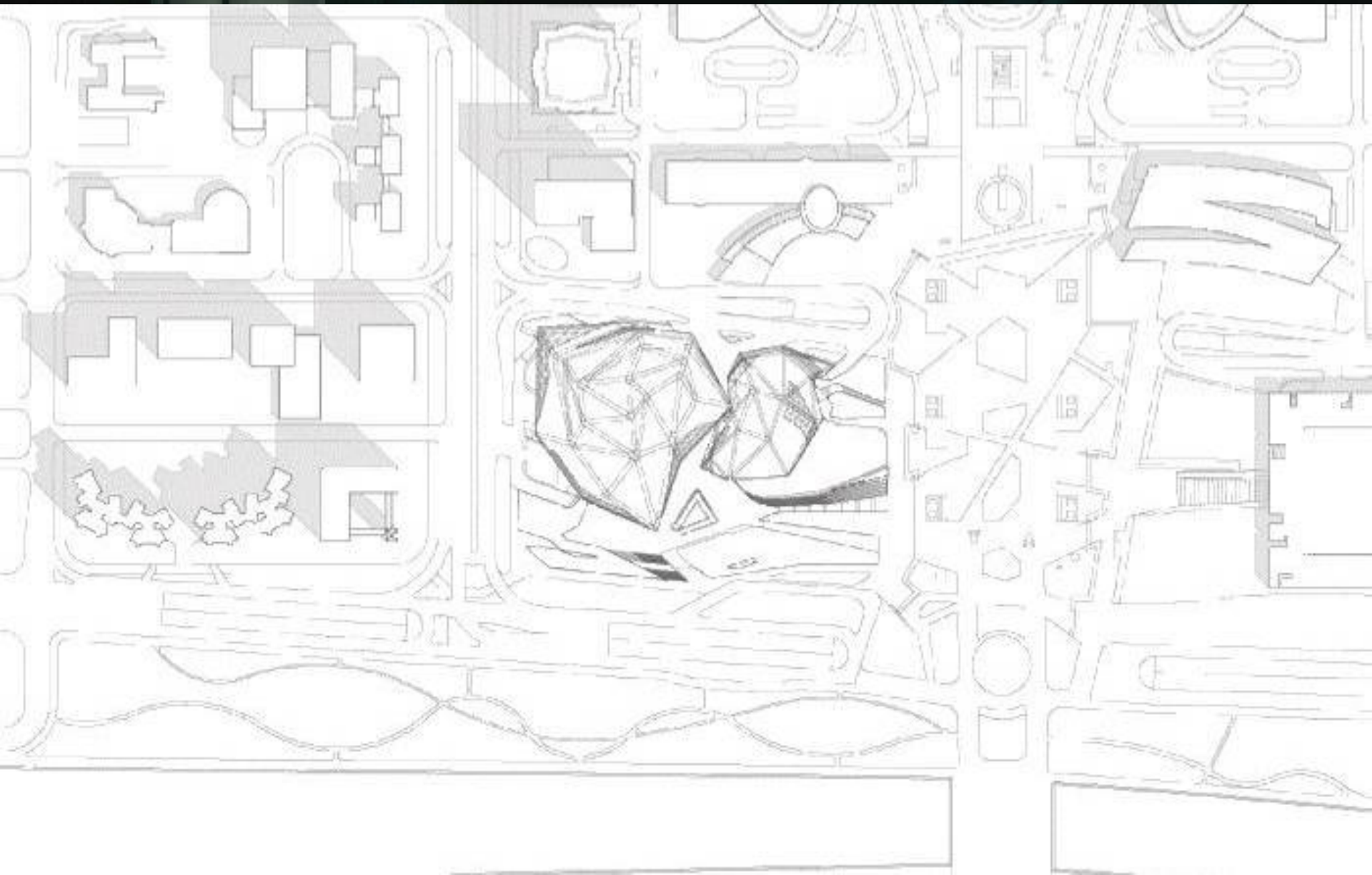
Zaha Hadid Guangzhou Opera House



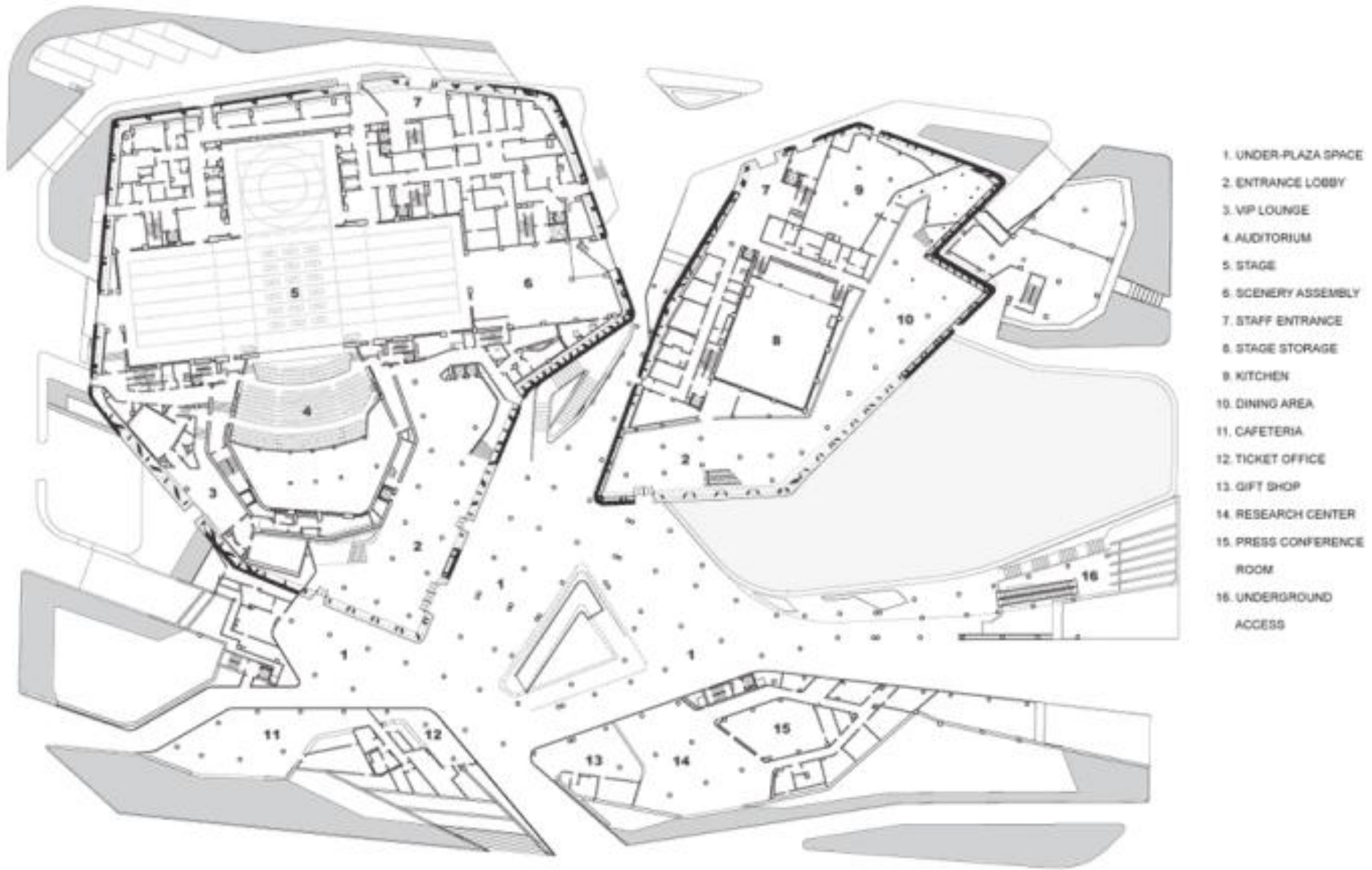
Zaha Hadid Guangzhou Opera House



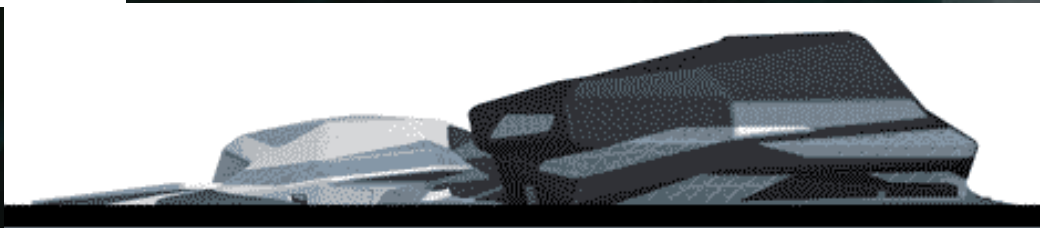
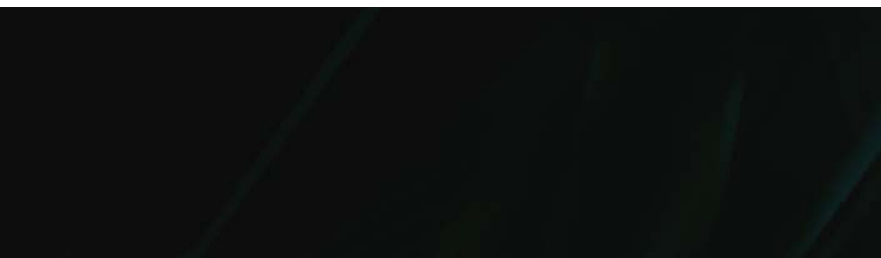
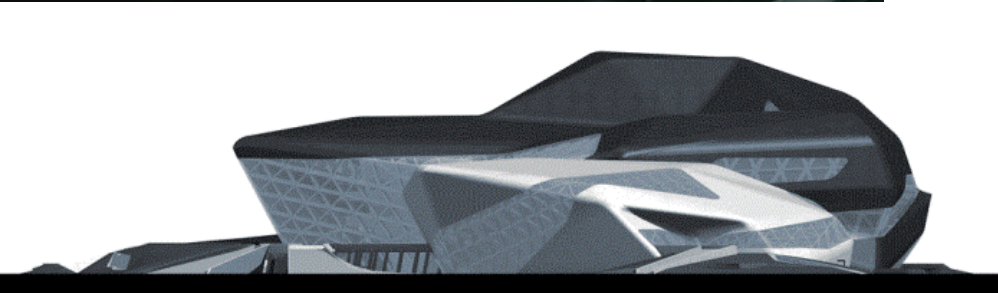
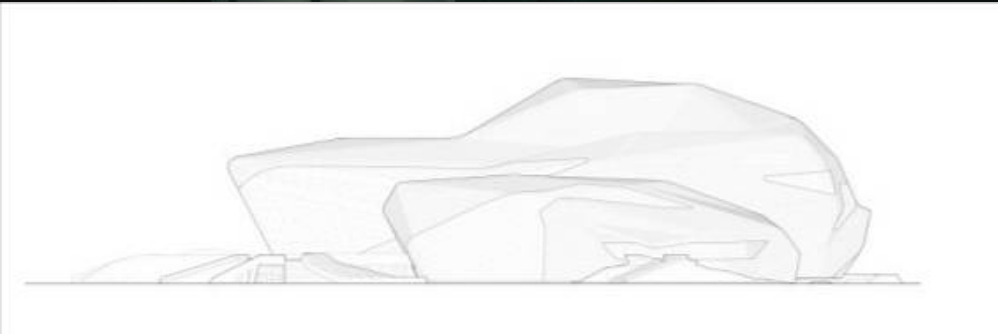
Zaha Hadid Guangzhou Opera House

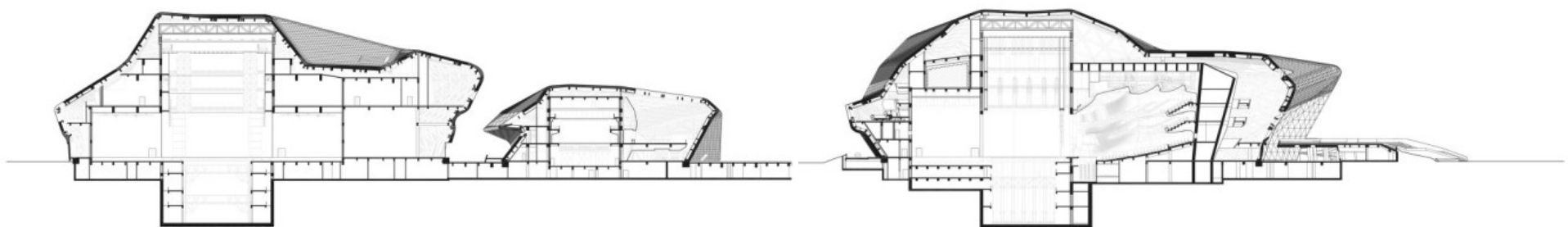
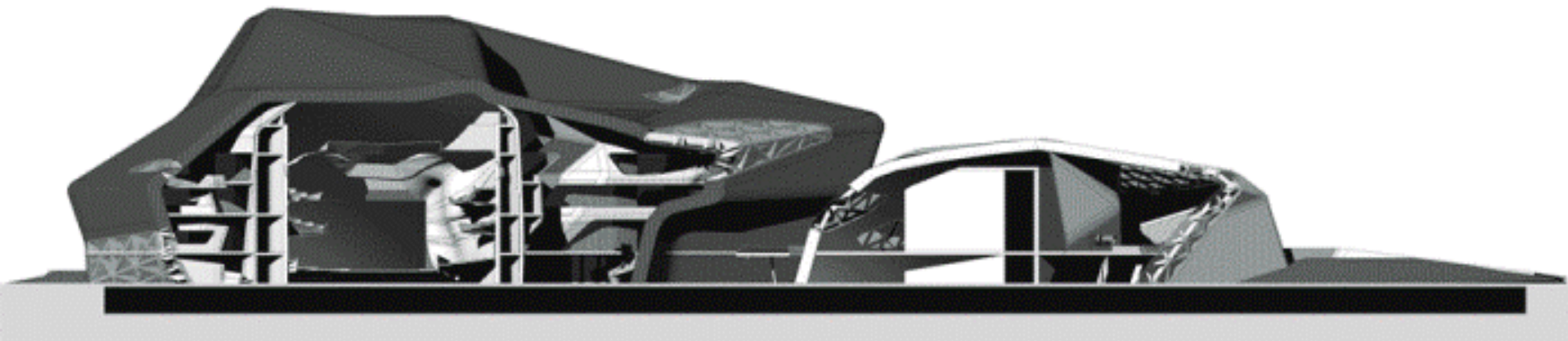


Zaha Hadid Guangzhou Opera House

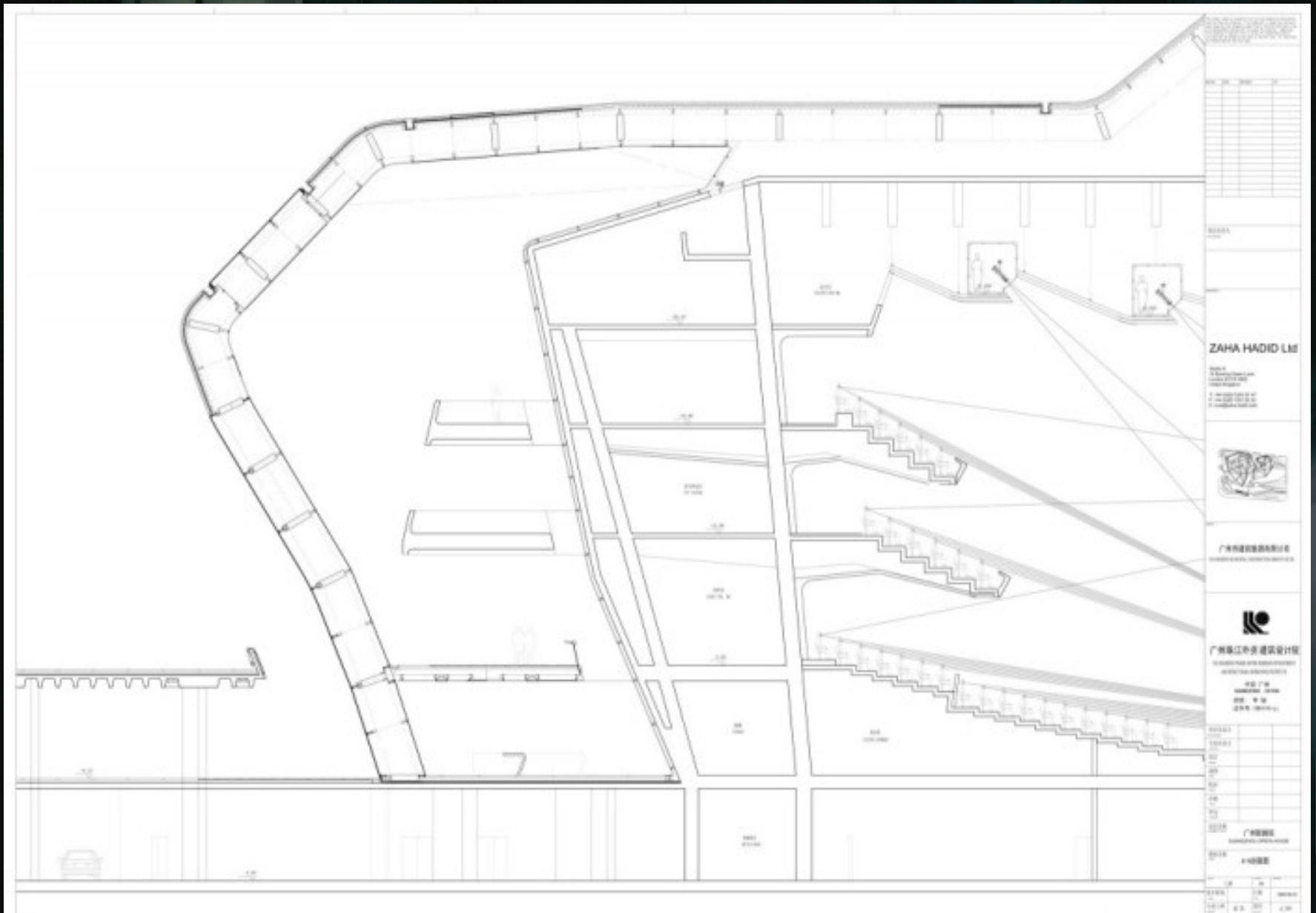


Zaha Hadid Guangzhou Opera House





Zaha Hadid Guangzhou Opera House



Zaha Hadid Guangzhou Opera House



Zaha Hadid Guangzhou Opera House



Zaha Hadid Guangzhou Opera House

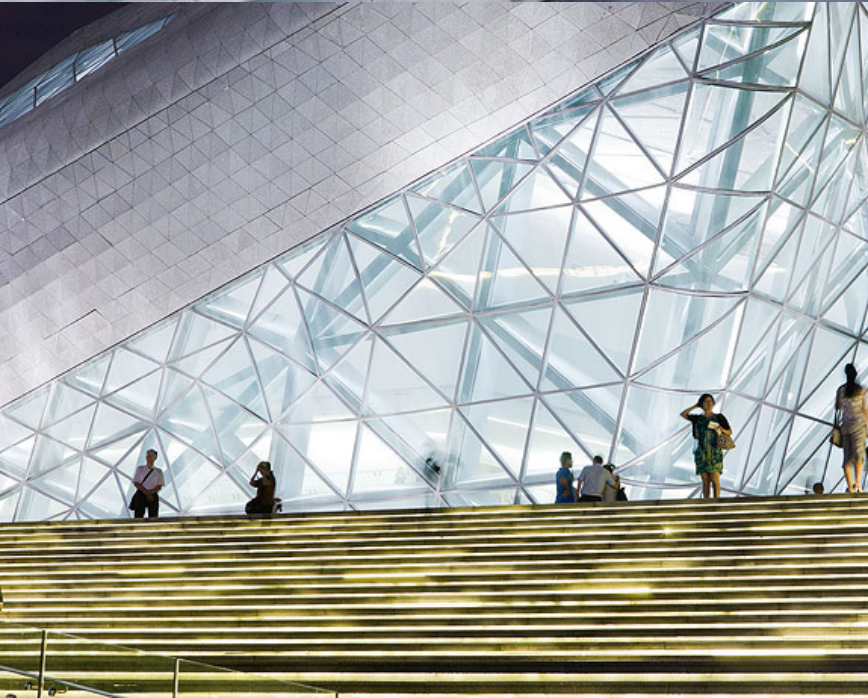


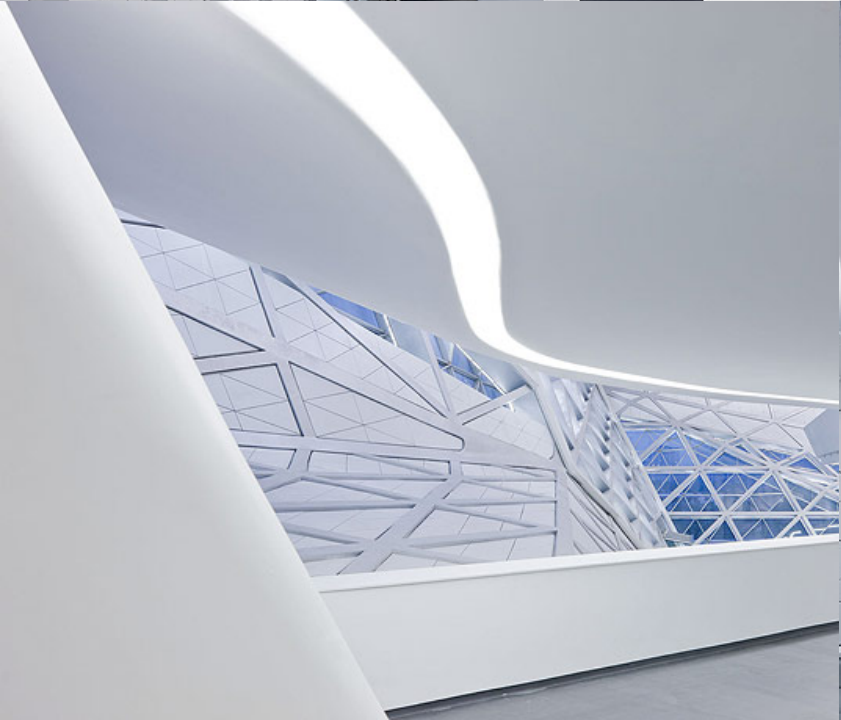
Zaha Hadid Guangzhou Opera House

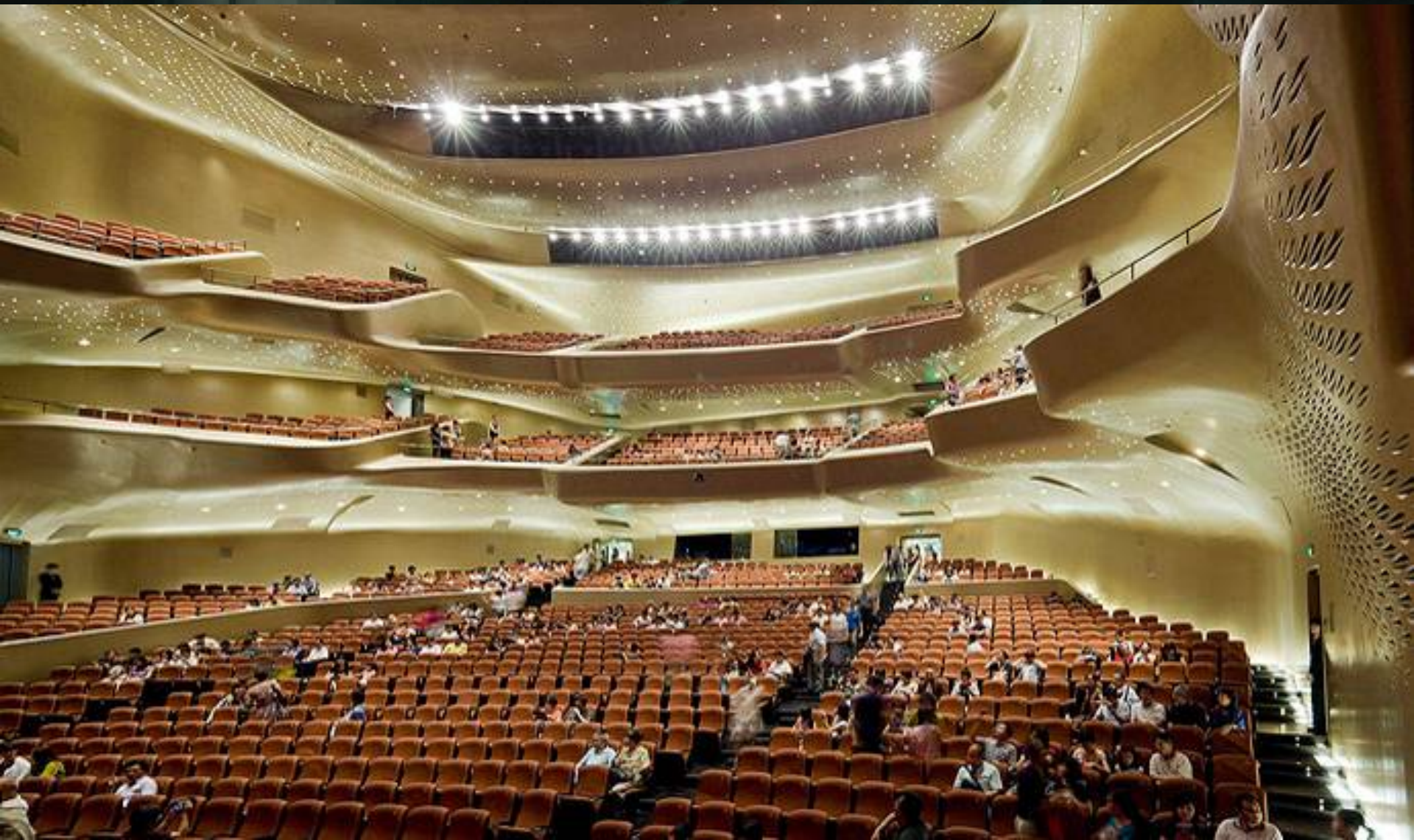


Zaha Hadid Guangzhou Opera House









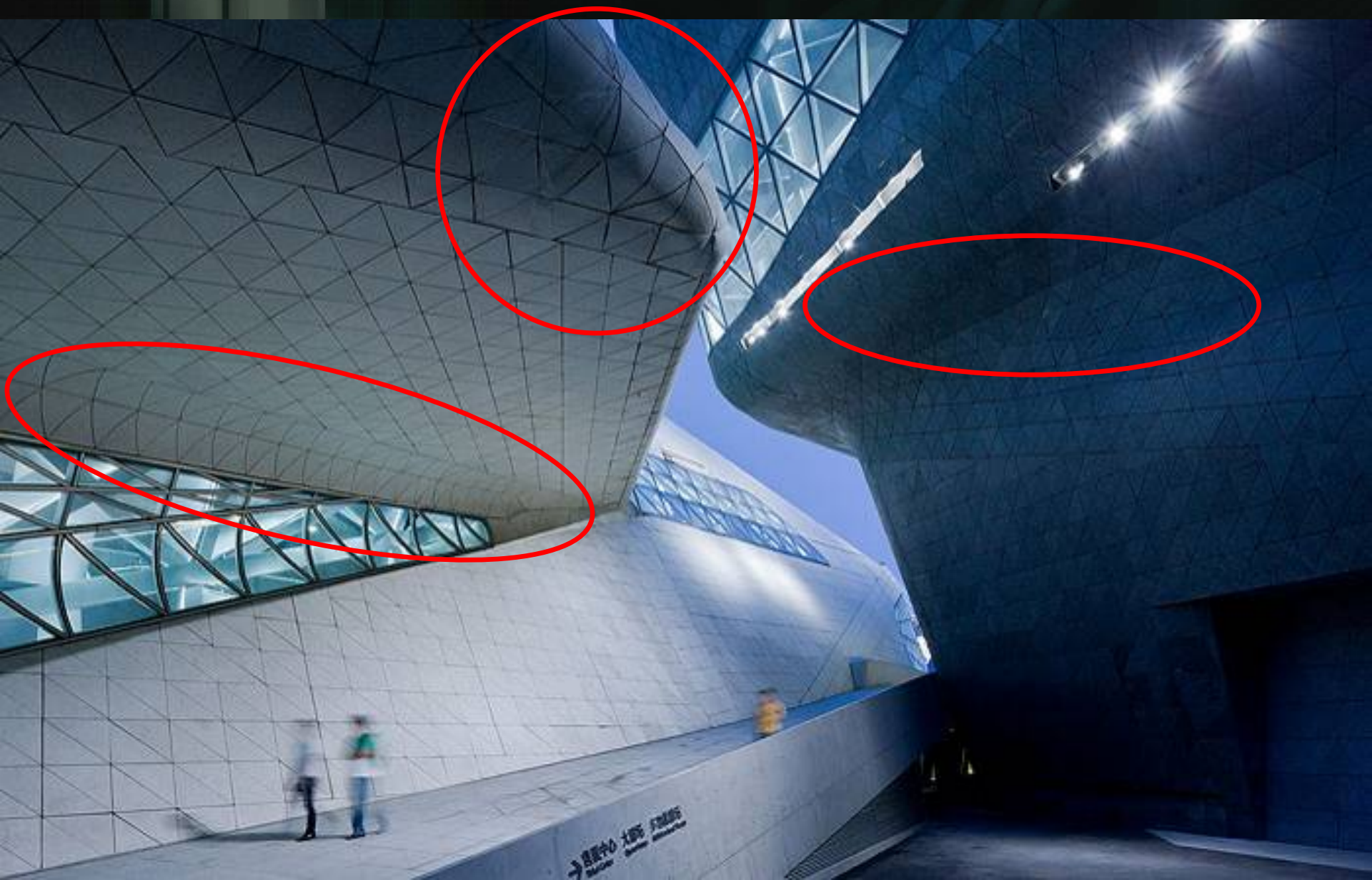




Excited? But wait.....

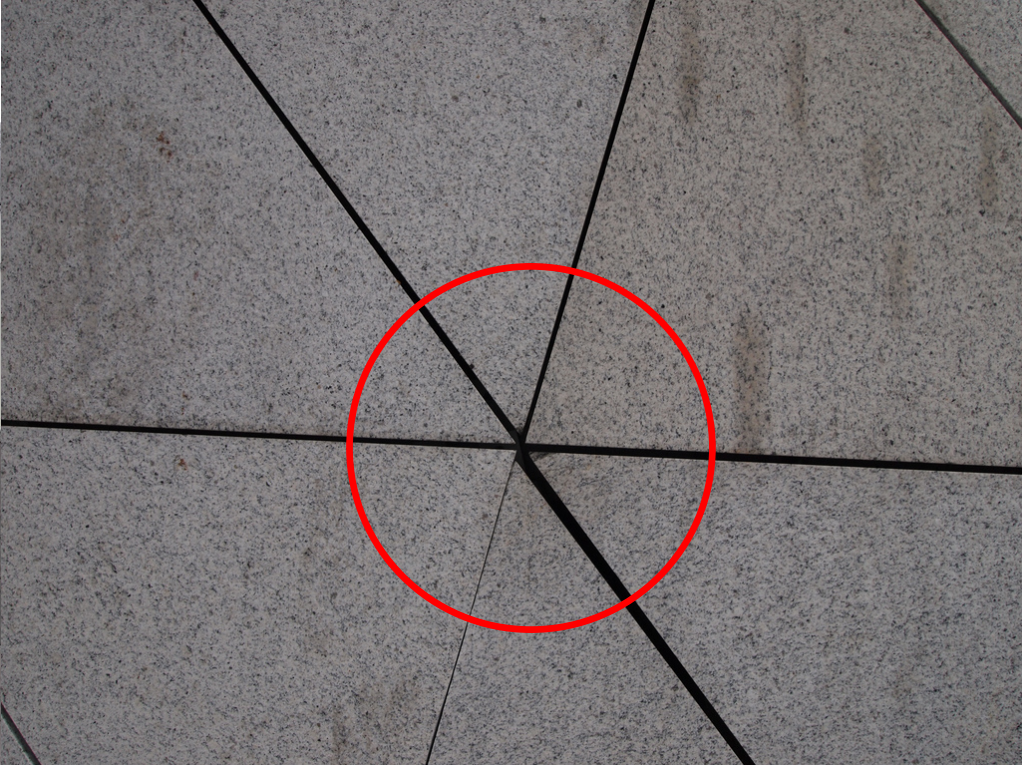
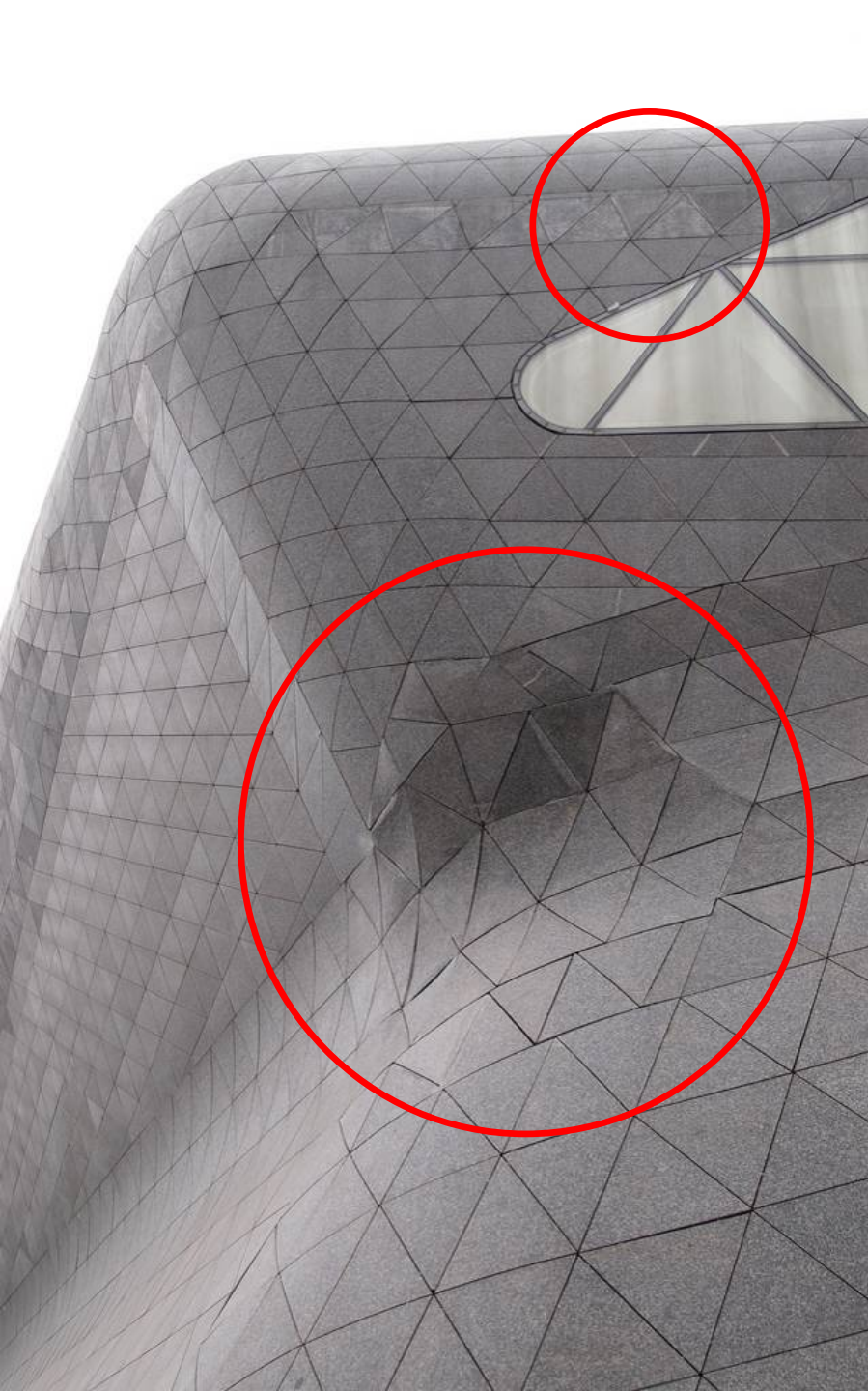


Zaha Hadid Guangzhou Opera House









SCULPTURE

vs

ARCHITECTURE



Purely decorative, NO accommodation

Built by Sculptor (Designer)

Materials freedom of choice - malleable

Direct production

Changes as sculptor thinks fit

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

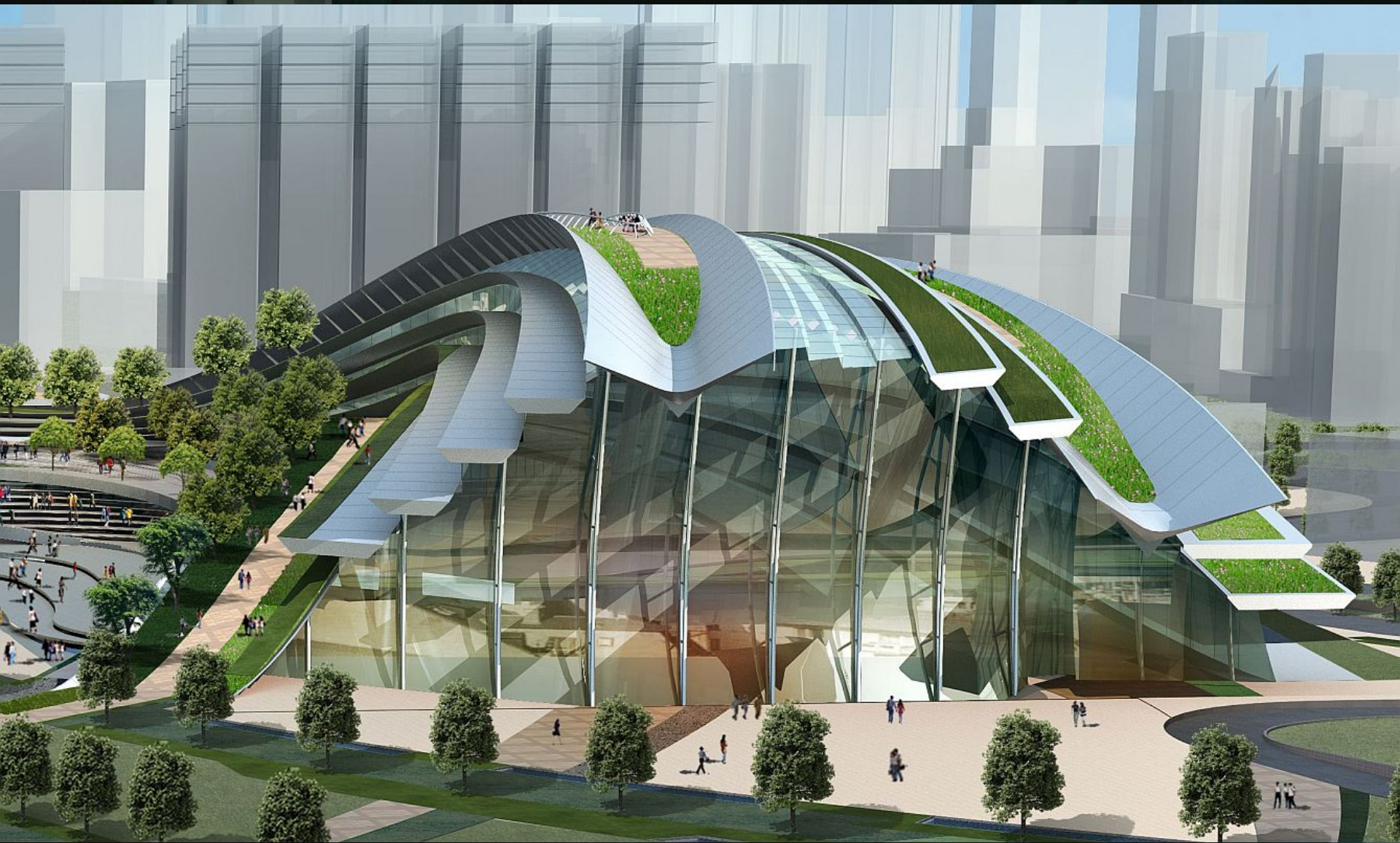
Built by Workers (Not Designer)

Large size, material built up by sticks, sheets

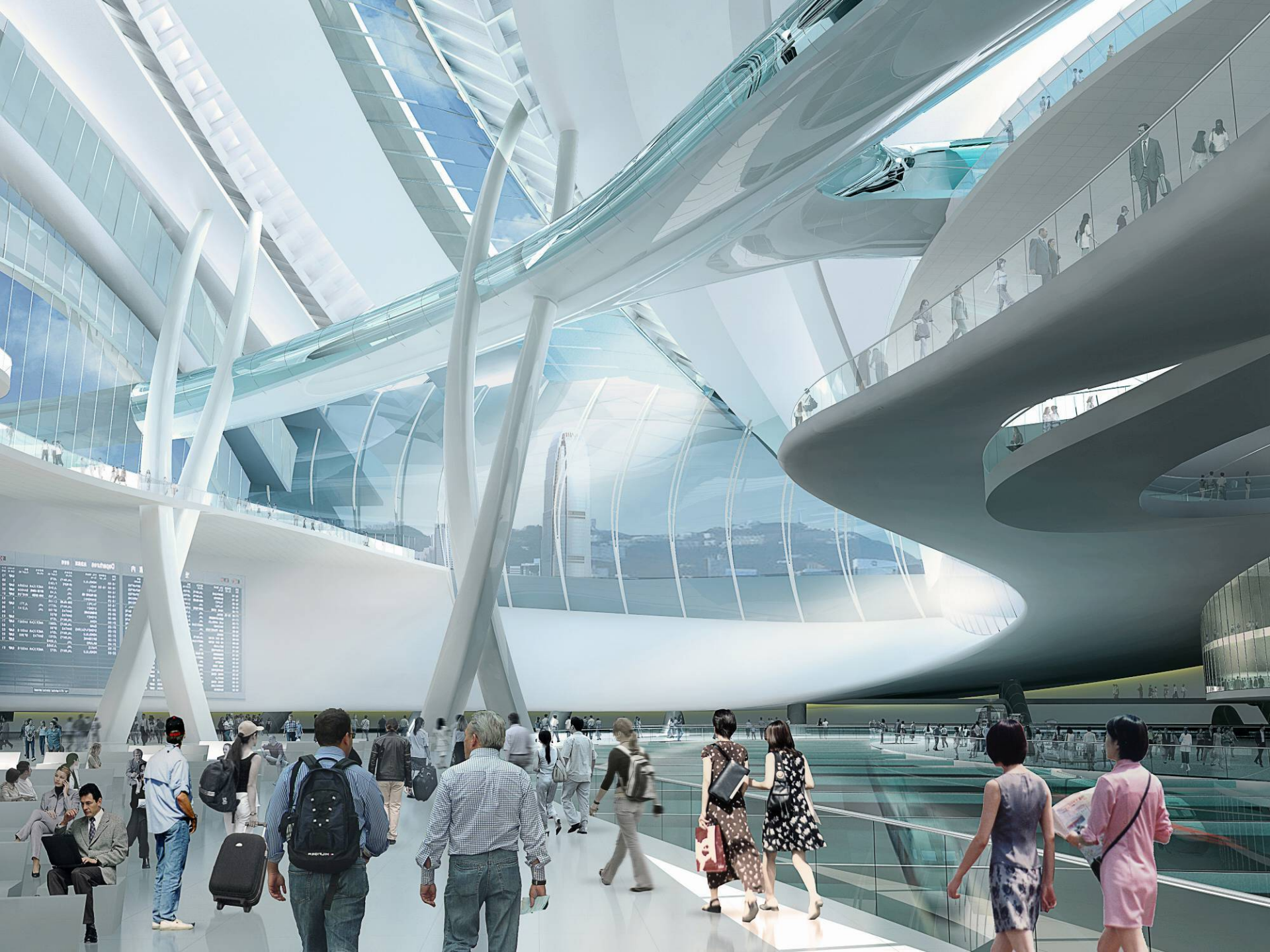
Drawings – form of communications

Record of Changes => \$ and Time

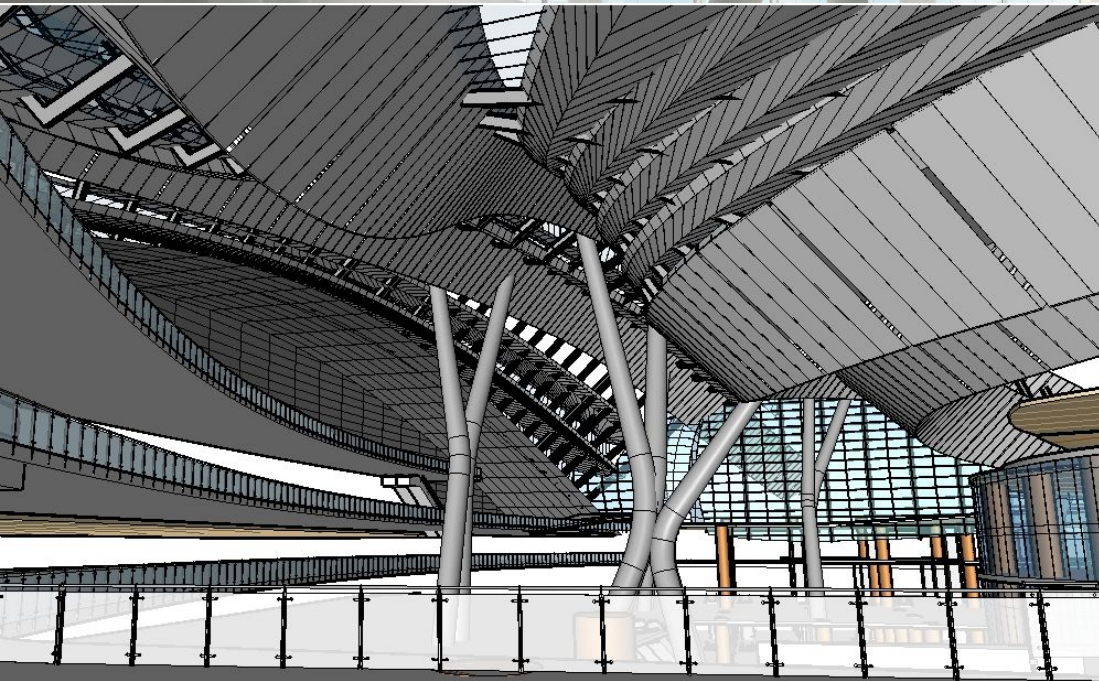
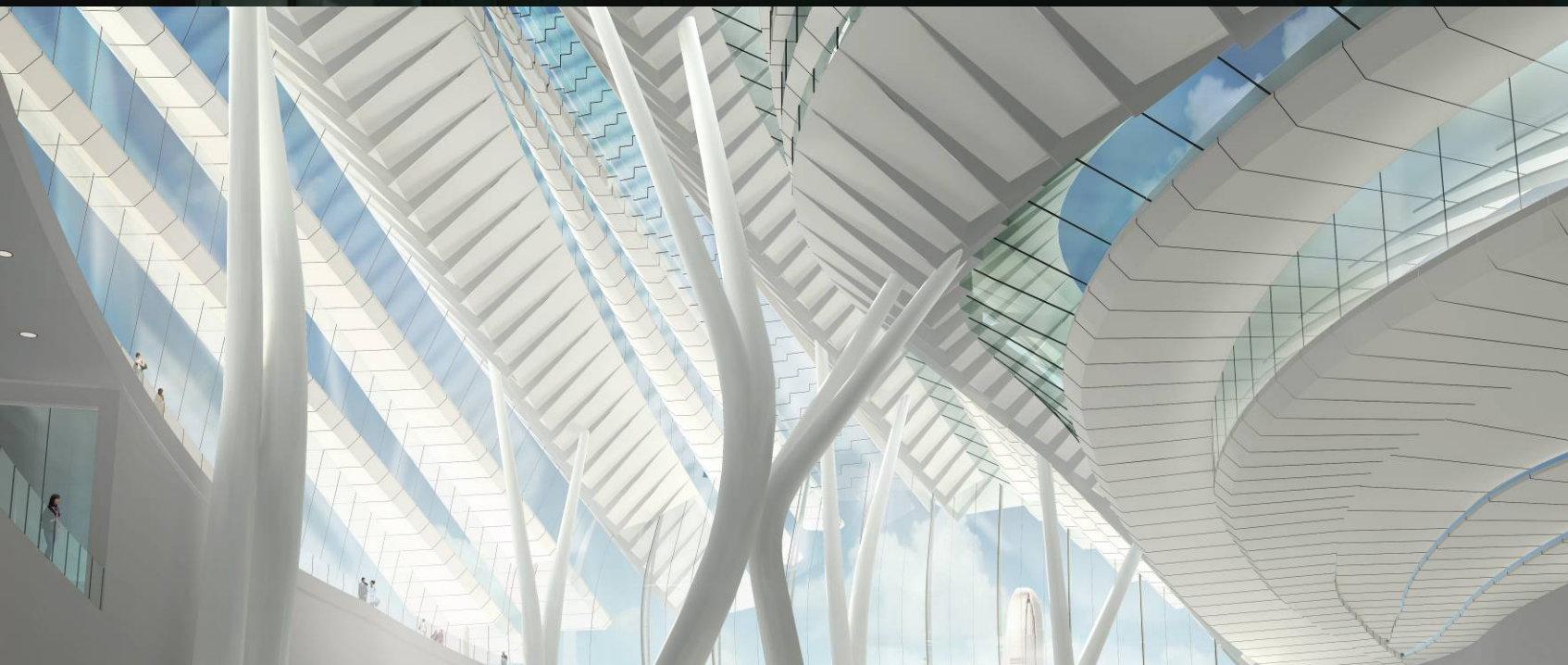


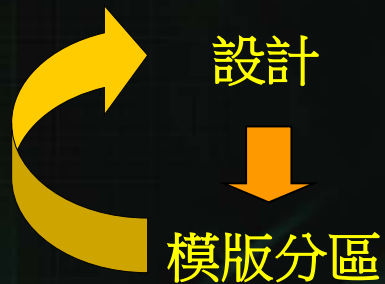












設計

RHINO

模版分區

GRASSHOPPER



匯出

數字庫

REVIT API/ EXCEL



IMPORT

理性化

REVIT API



自動 **BIM** 建模

REVIT

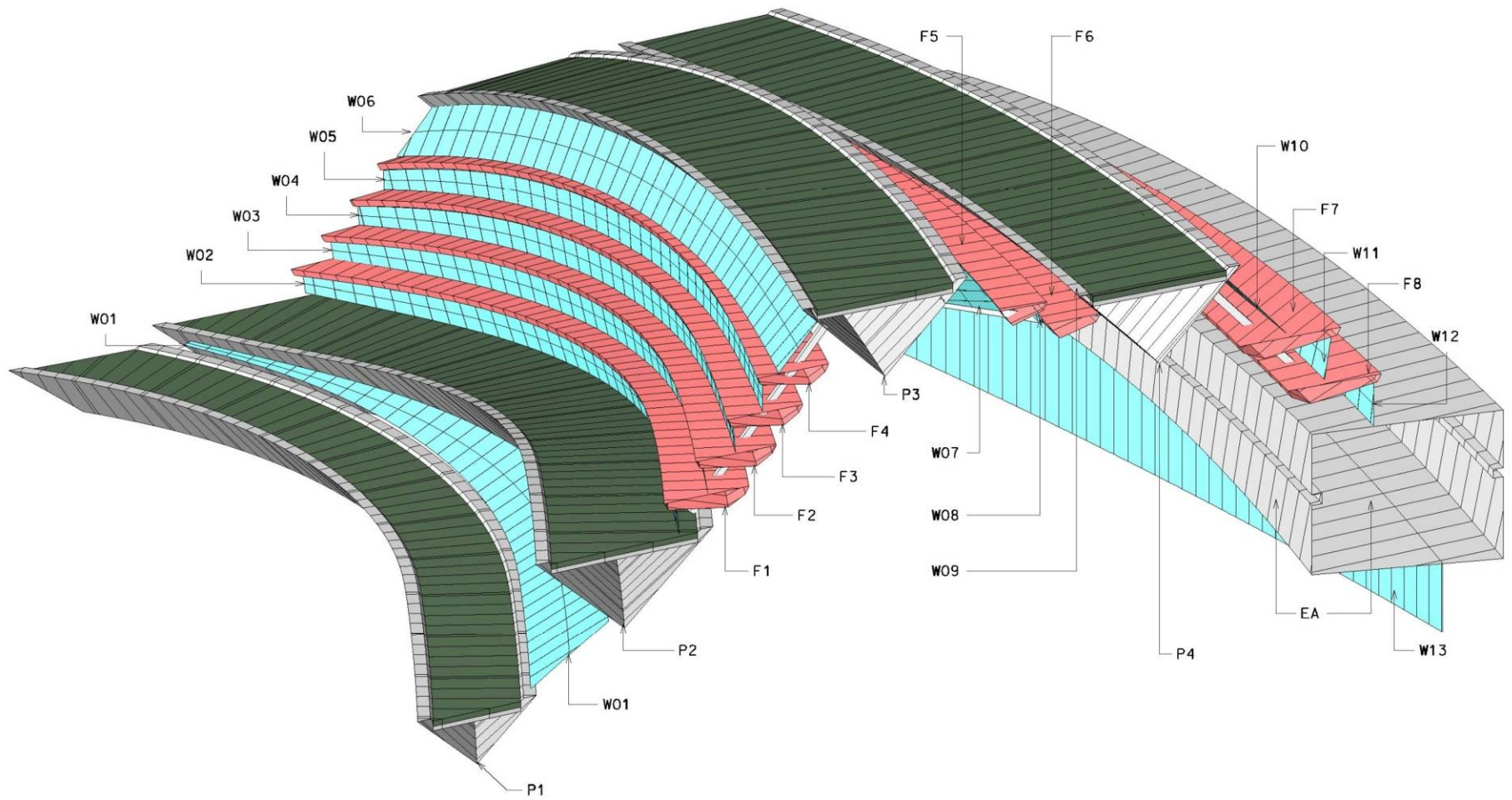


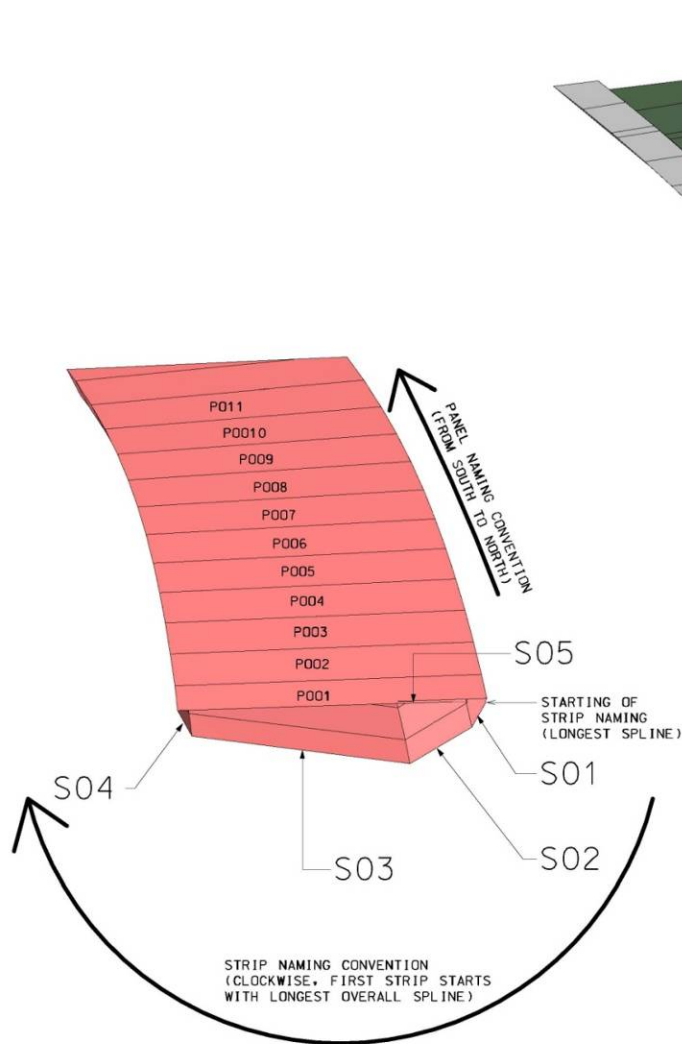
出圖

REVIT



生產/ 建造

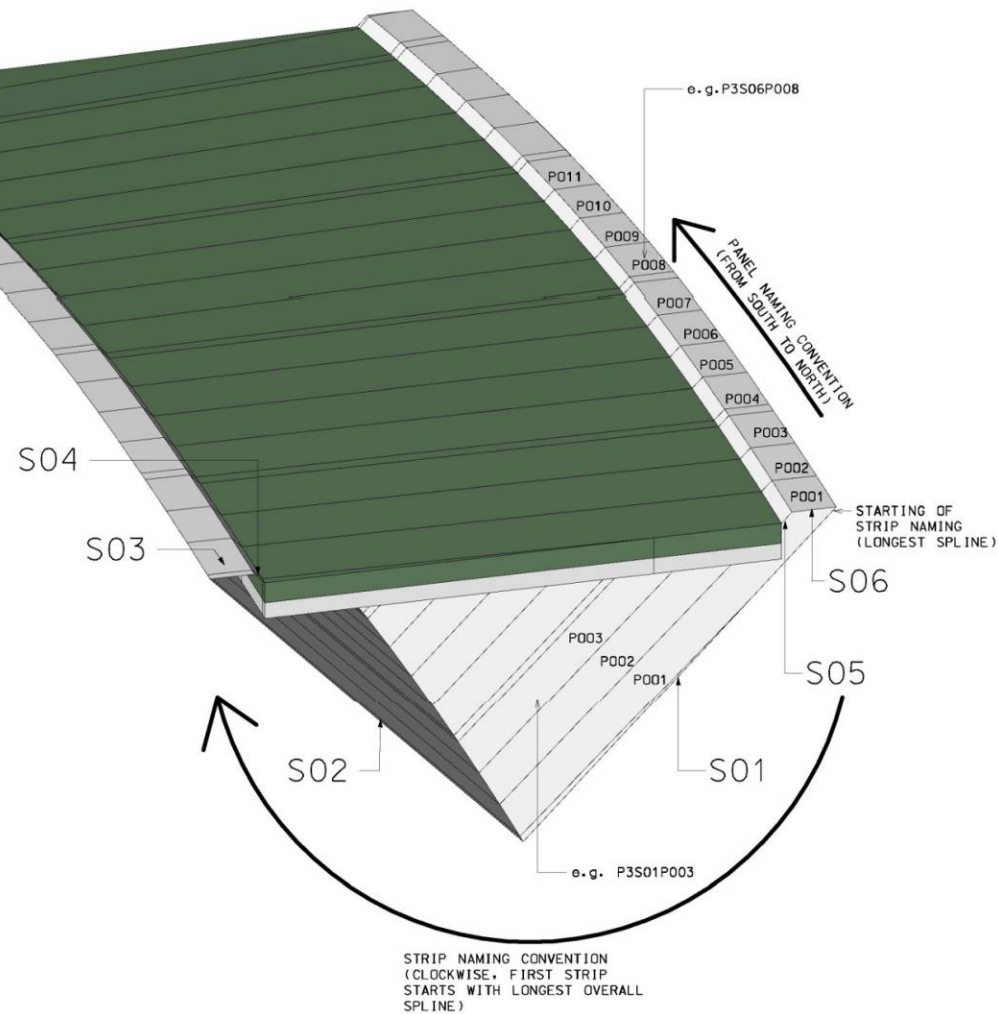




Nomenclature - Fin Cladding

2 e.g. F1

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

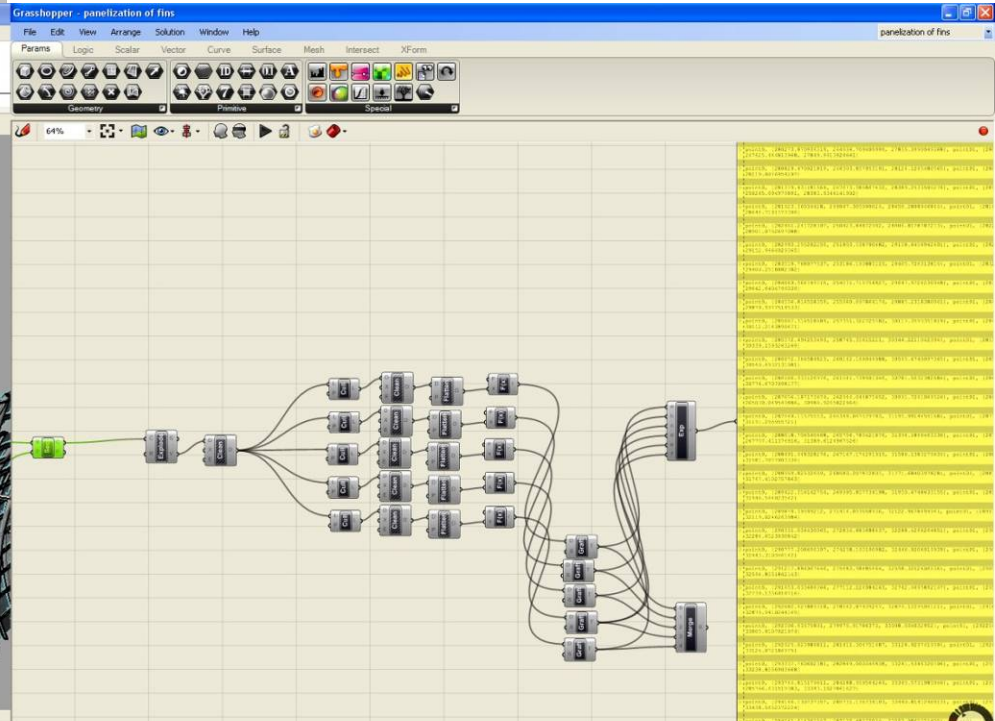
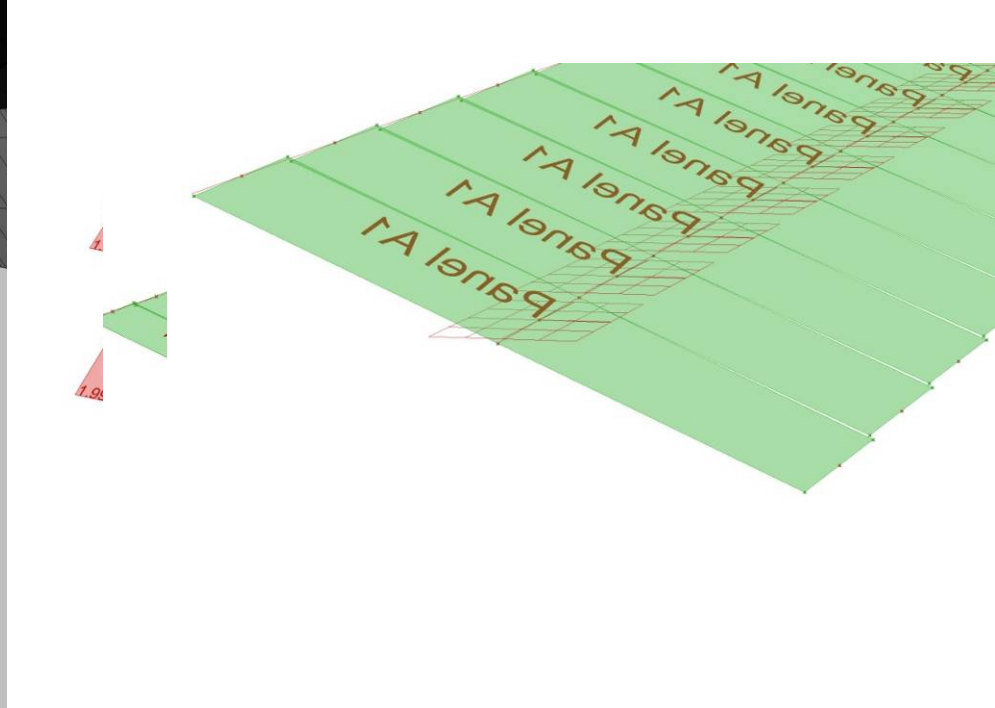
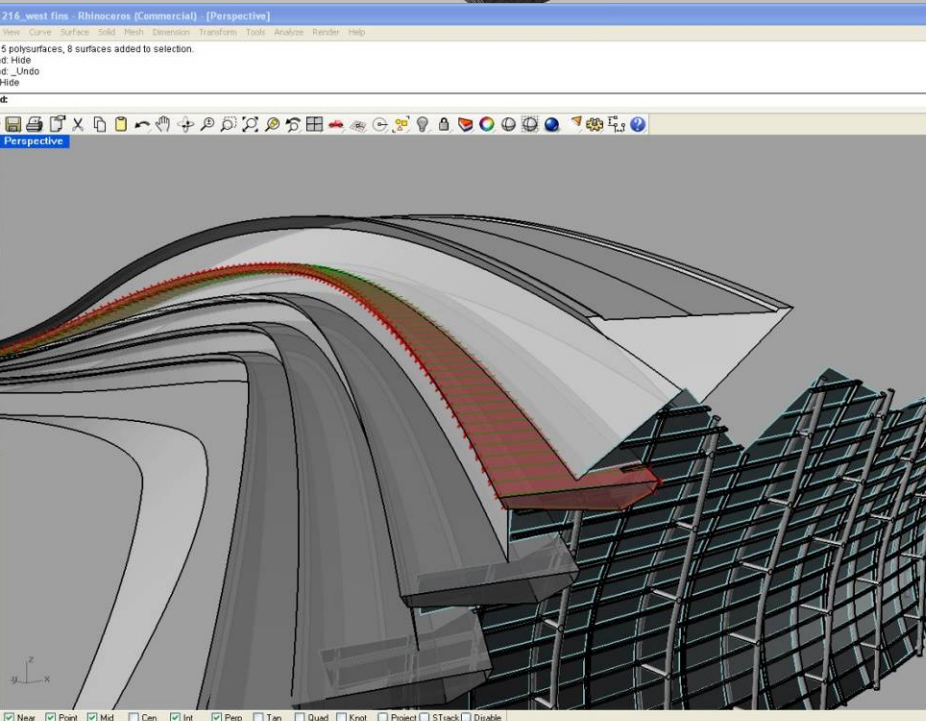
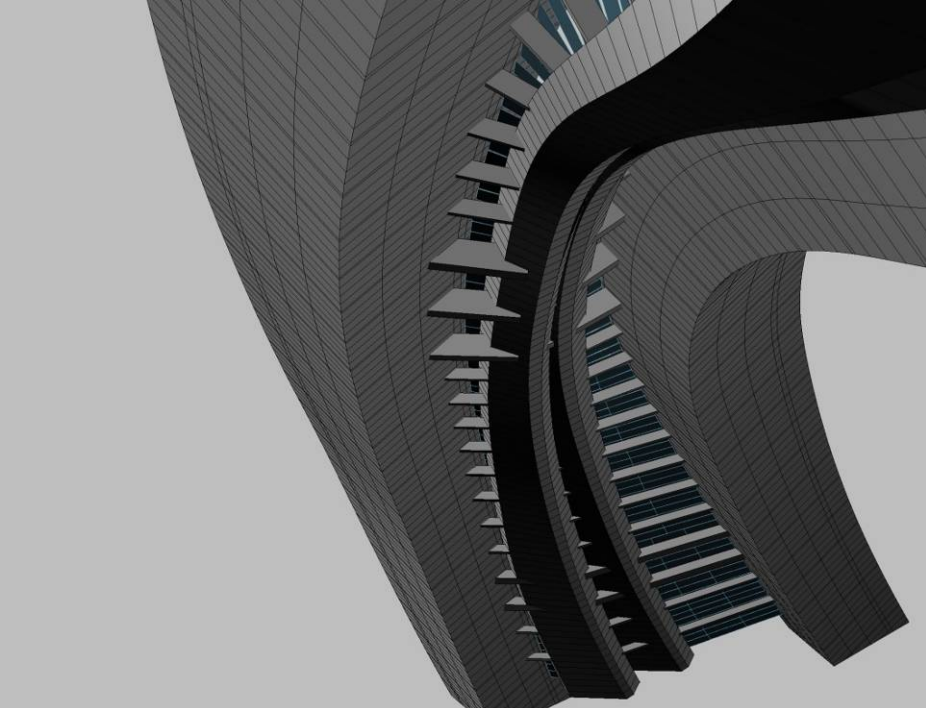


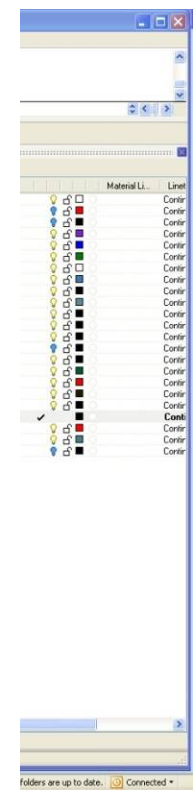
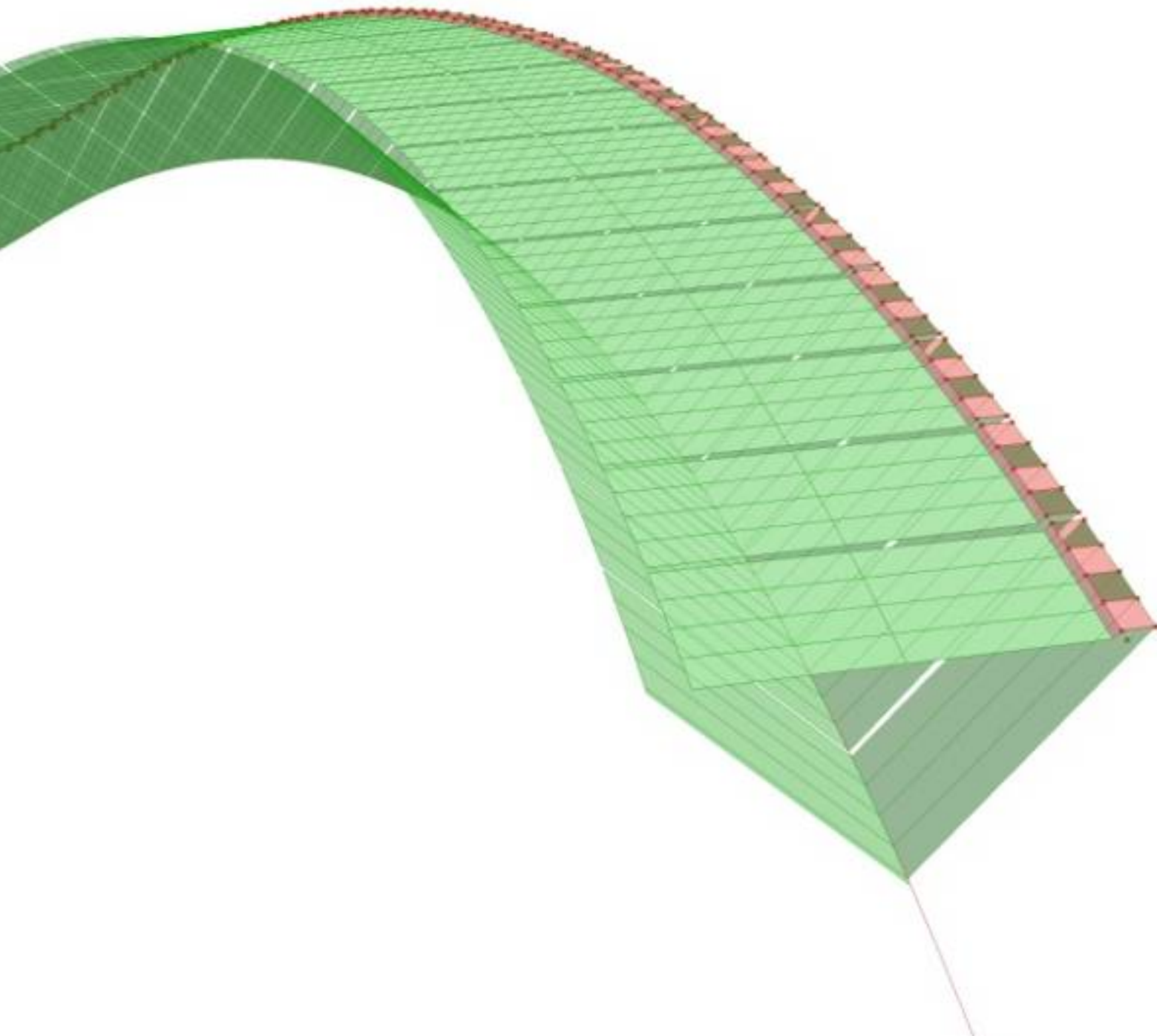
Nomenclature - V Cladding

1 e.g. P3

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







	A	B	C	D	E	F	G	H	I	J	K	L	M	N
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###tot
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	P3S06


```

        {
            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 cl = new CladdingPanel(p, PanelCounter); // new panel created from list of points.
double Area_m2 = cl.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(cl); // new panel inserted into the array of panels

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

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

```

```

    {
        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

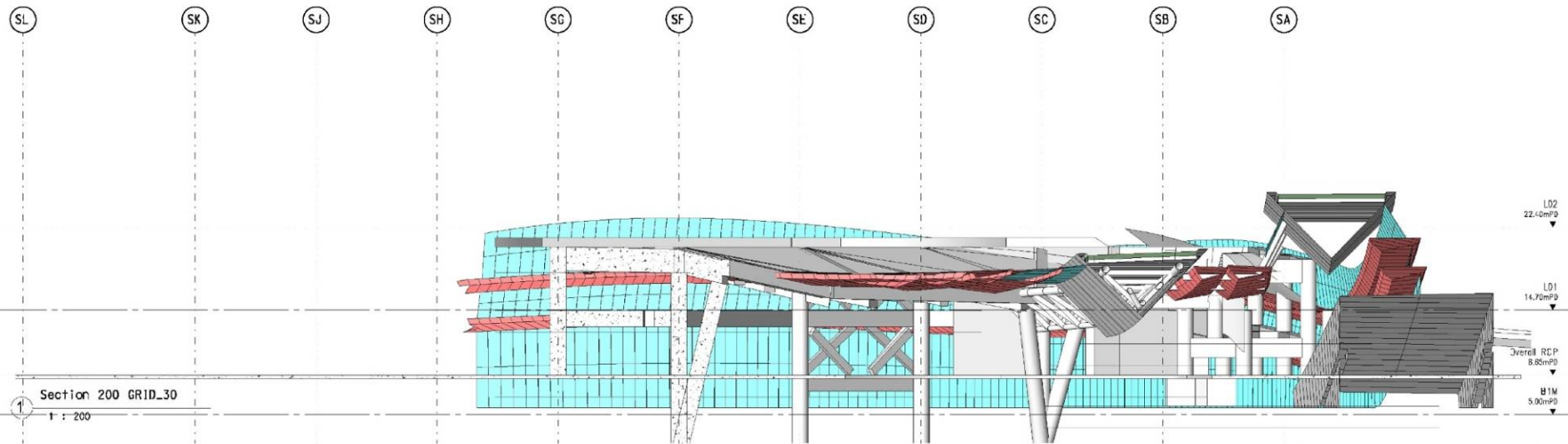
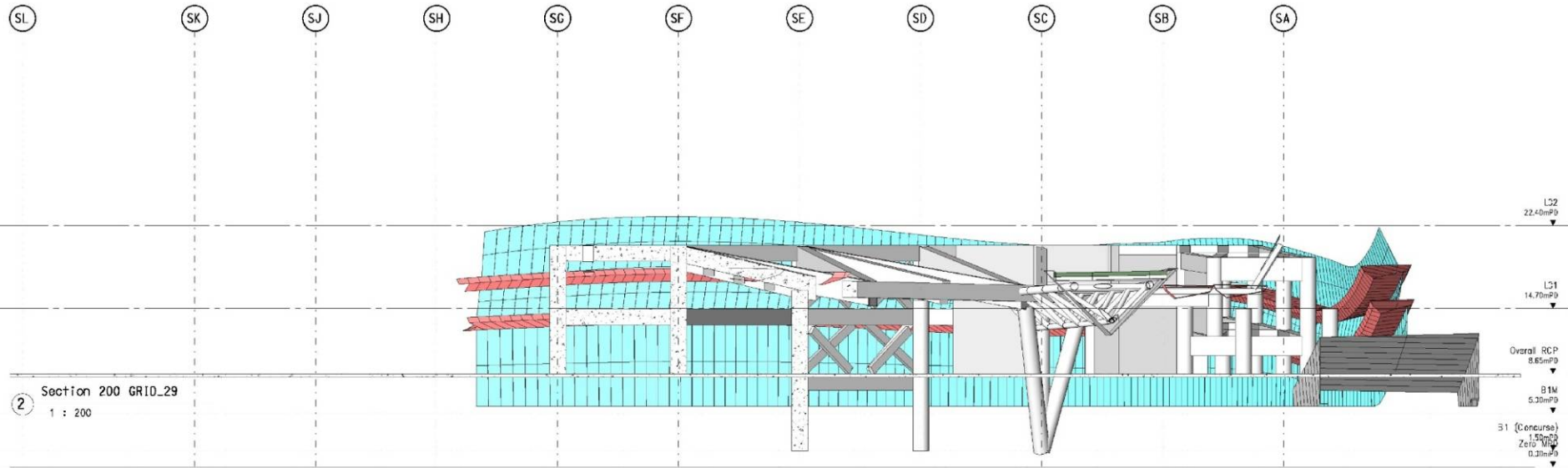
public class Group
{
    public int GroupNumber;
    public double[] Edge; //array of lengths of groups's edges.
    public double Diagonal; //length of group's diagonal.
    public double Area; //area of a grouped panel;
}

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



SK SJ SH SG SF SE SD SC SB SA

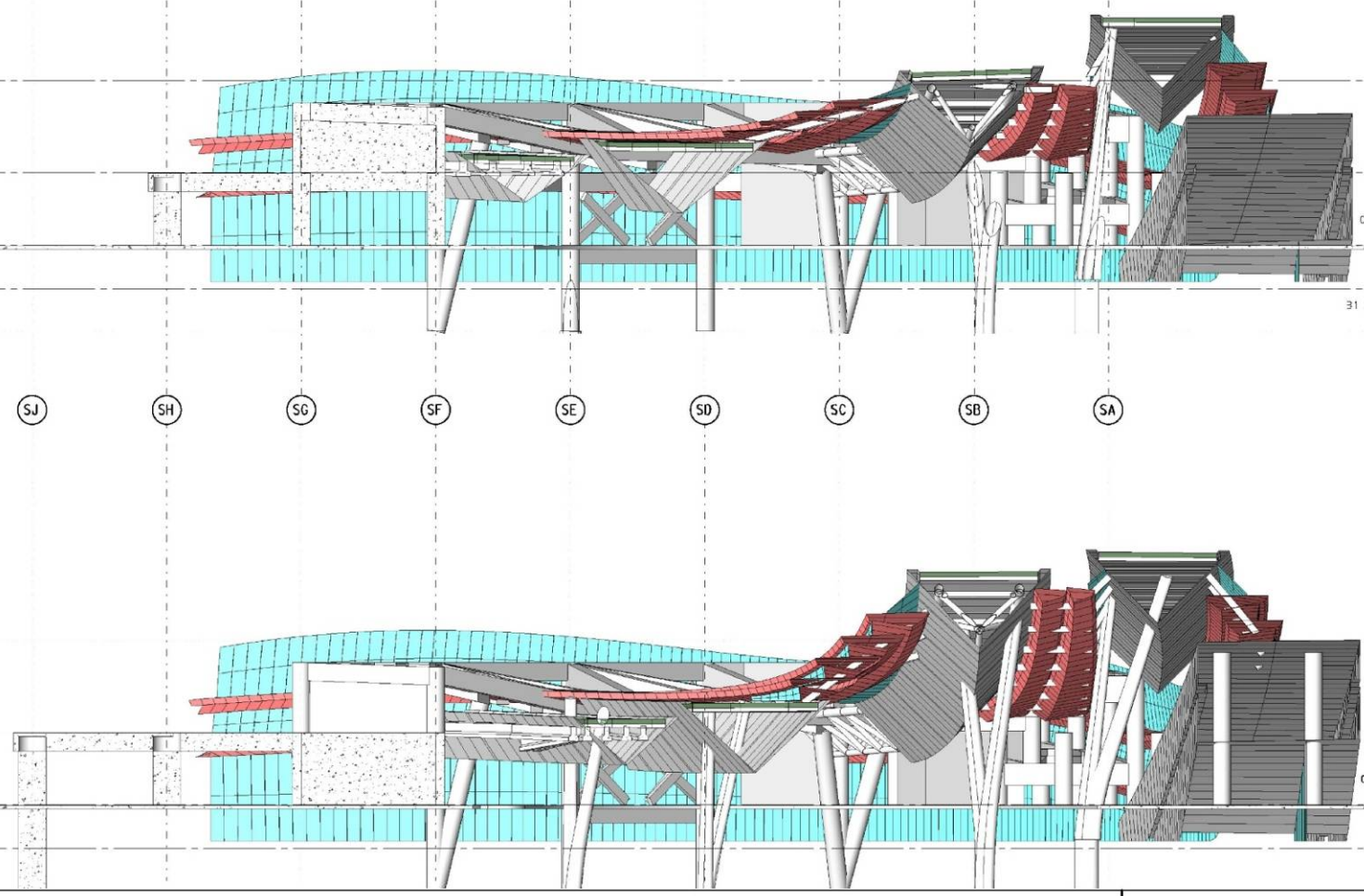
L22
22.40mP0
▼
L21
14.70mP0
▼
Overall RCP
8.85mP0
▼
BIM
5.30mP0
▼
31 (Concourse)
1.50mP0
▼

1 Section 200 GRID_31
1 : 200

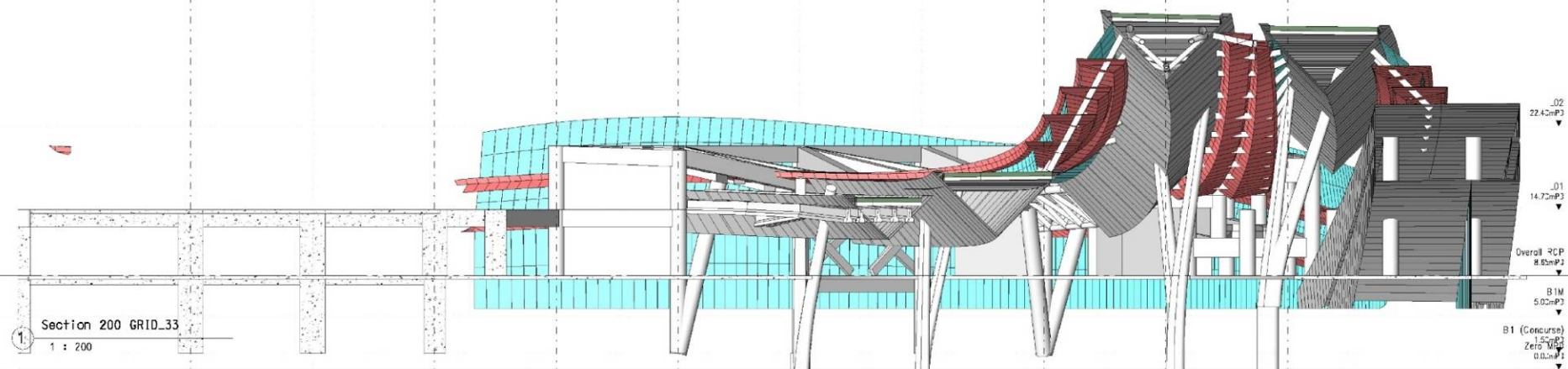
SK SJ SH SG SF SE SD SC SB SA

L02
22.40mP2
▼
L01
14.70mP2
▼
Overall RCP
8.85mP2
▼
BIM
5.00mP2
▼

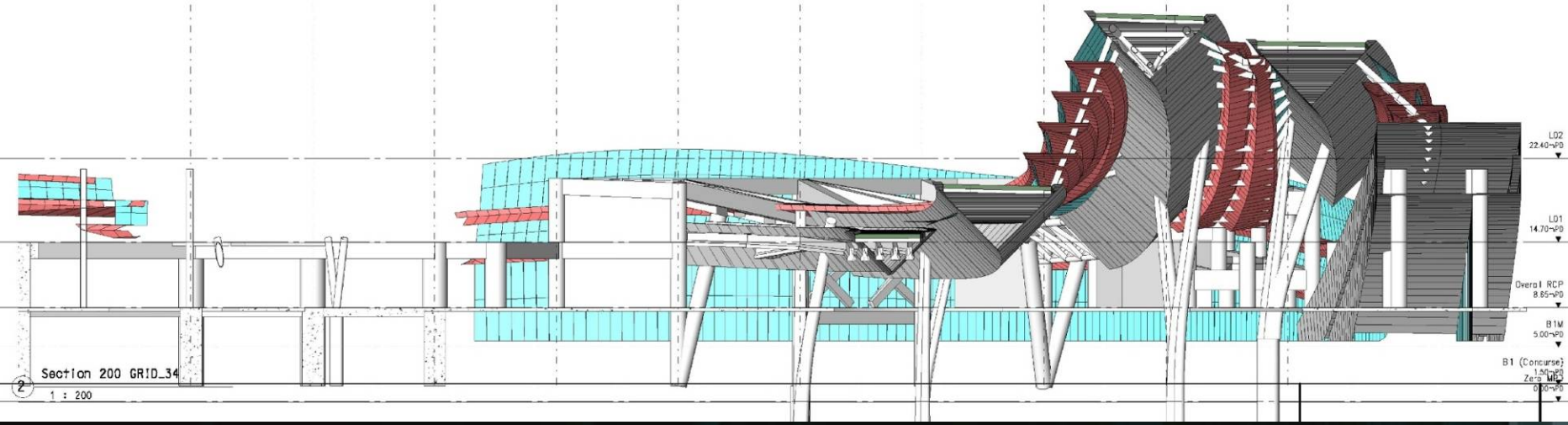
2 Section 200 GRID_32
1 : 200



SK SJ SH SG SF SE SD SC SB SA

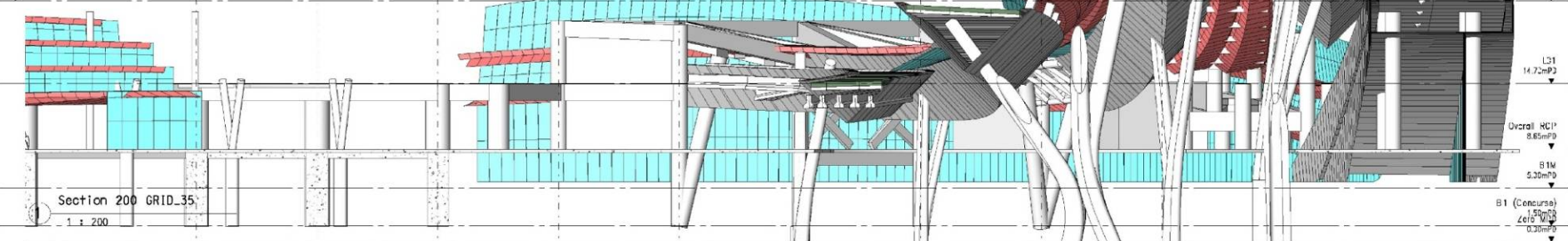


SK SJ SH SG SF SE SD SC SB SA

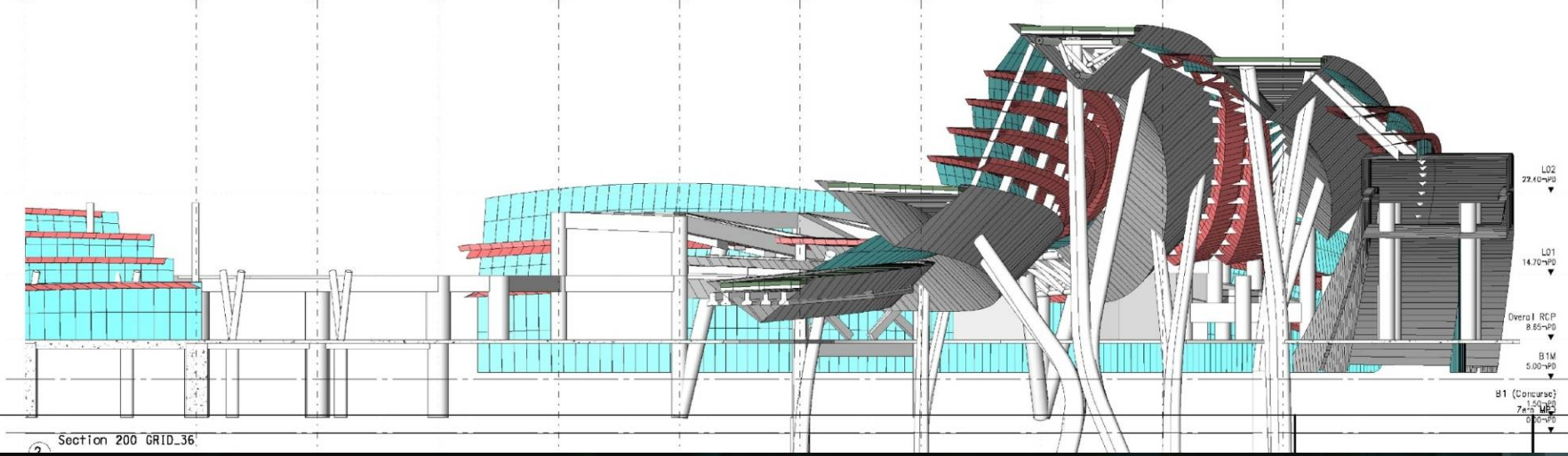


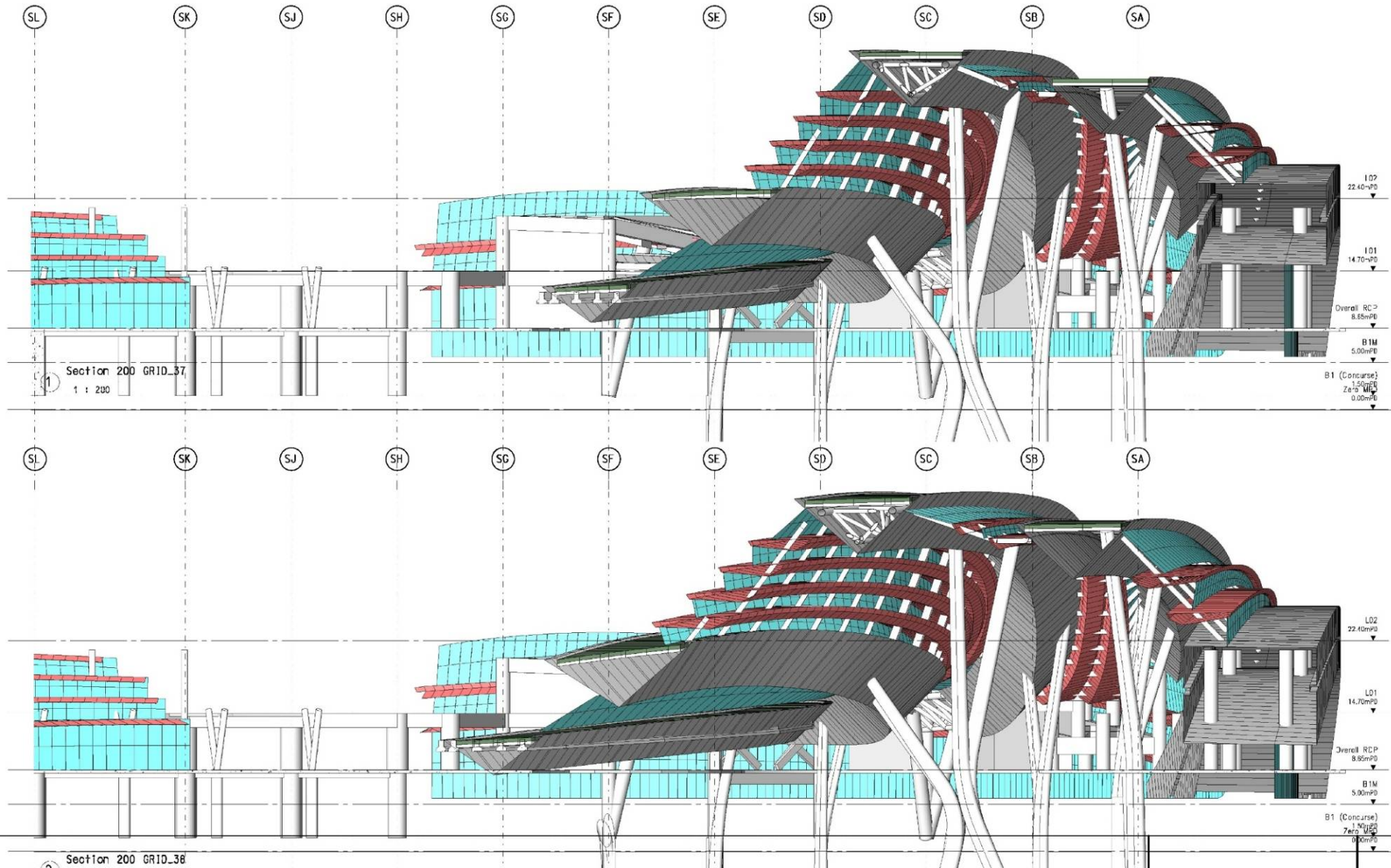
SK SJ SH SG SF SE SD SC SB SA

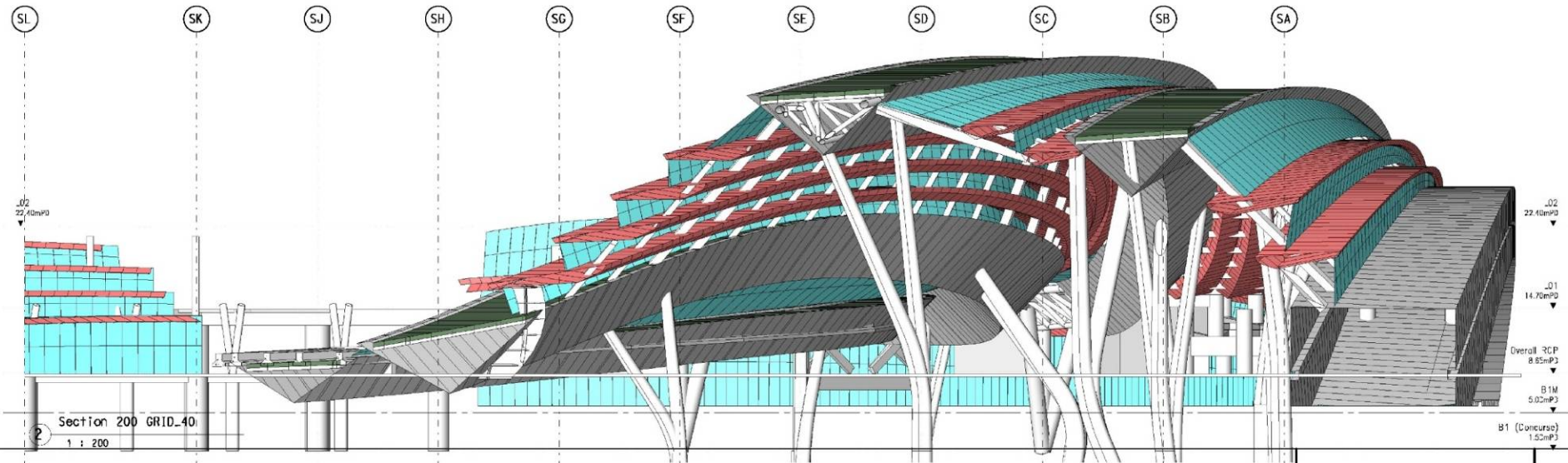
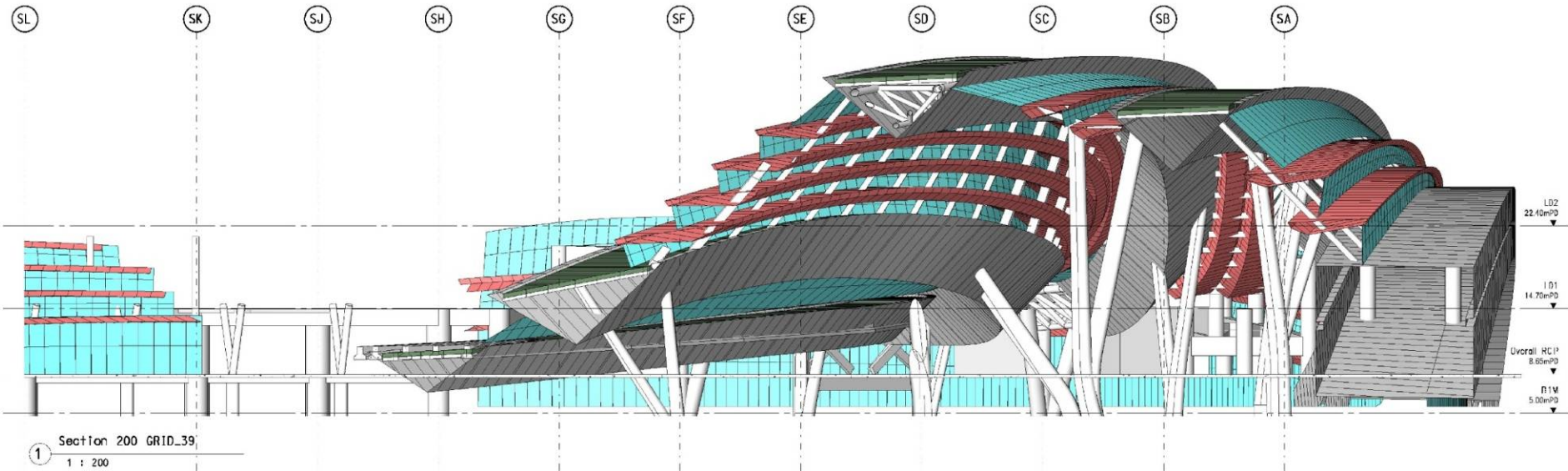
L02
22.10mPD

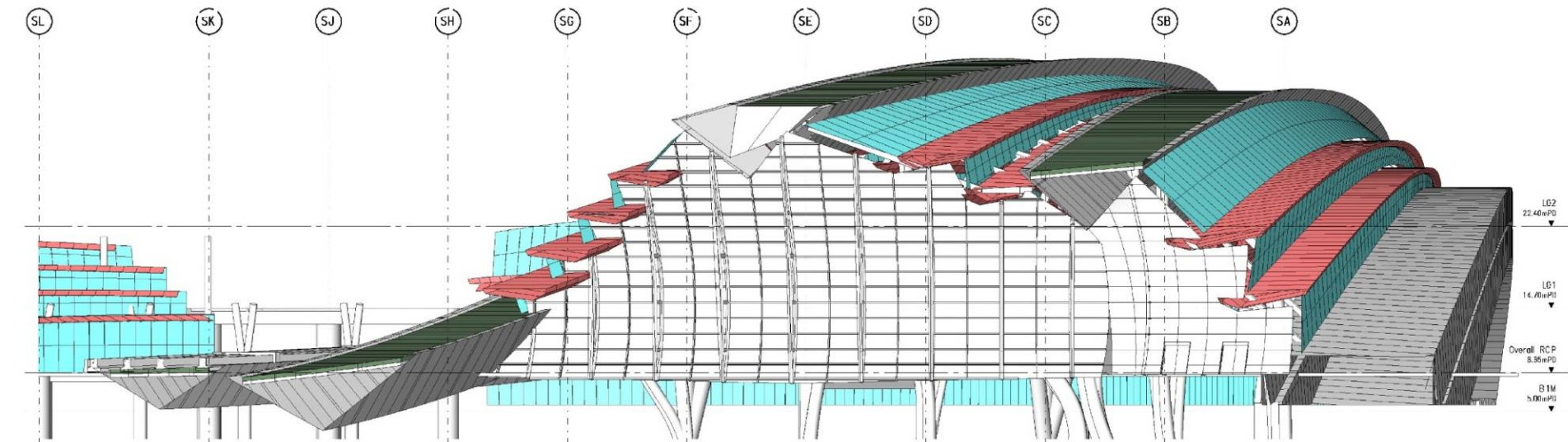


SL SK SJ SH SG SF SE SD SC SB SA

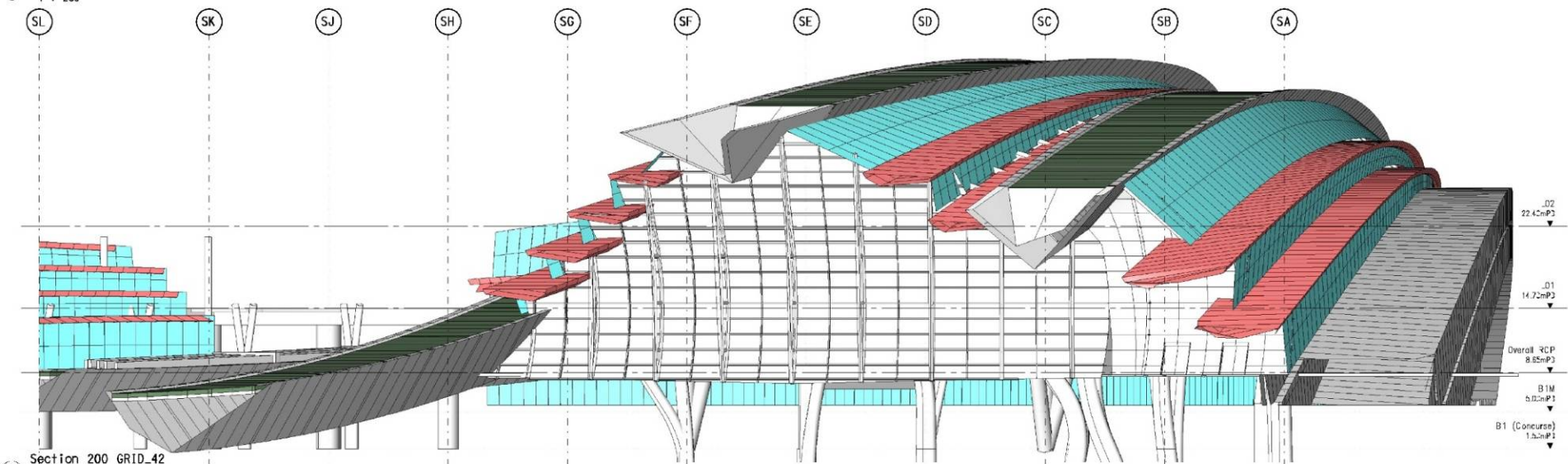




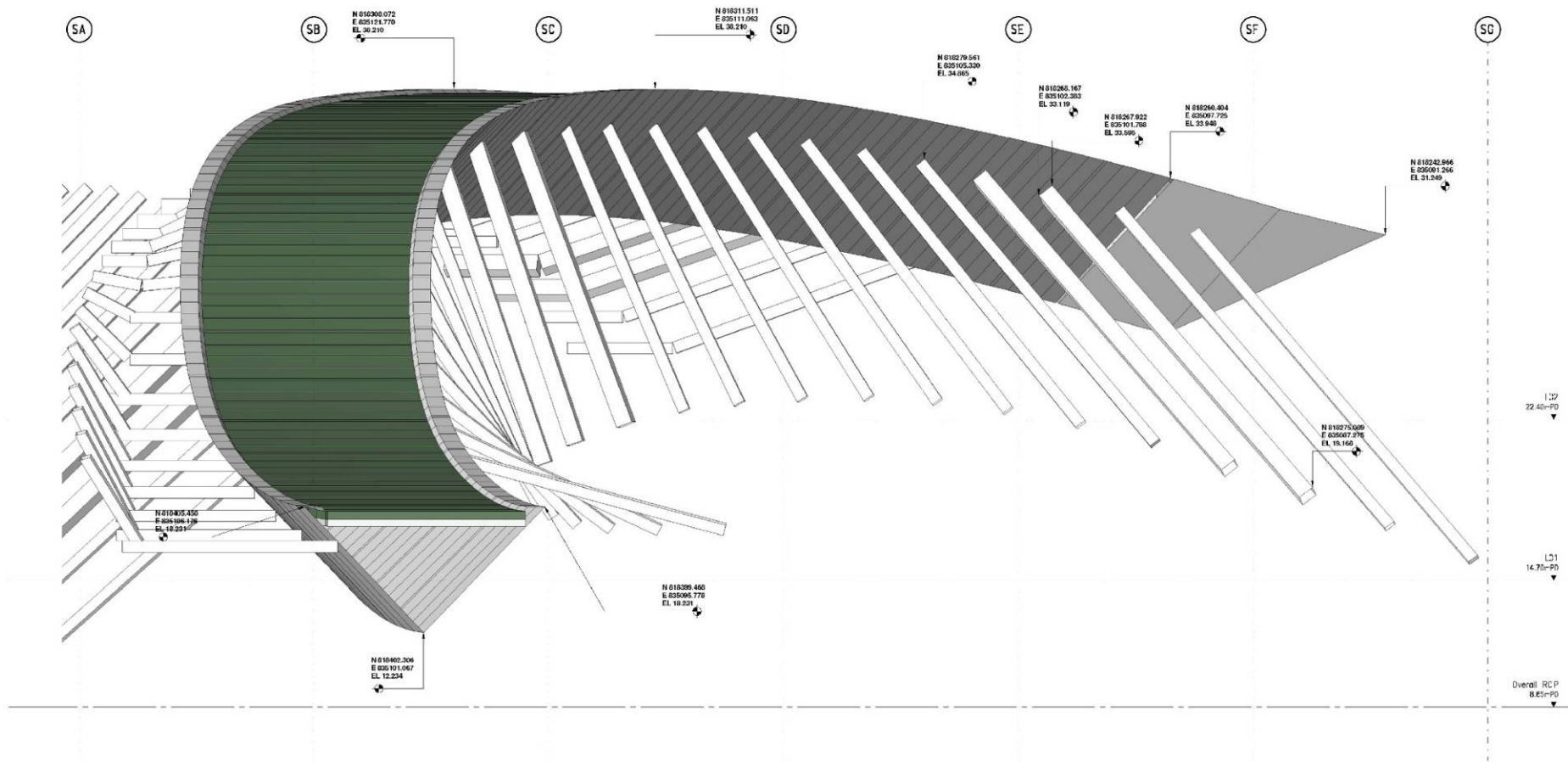




1 Section 200 GRID.41
1 : 200

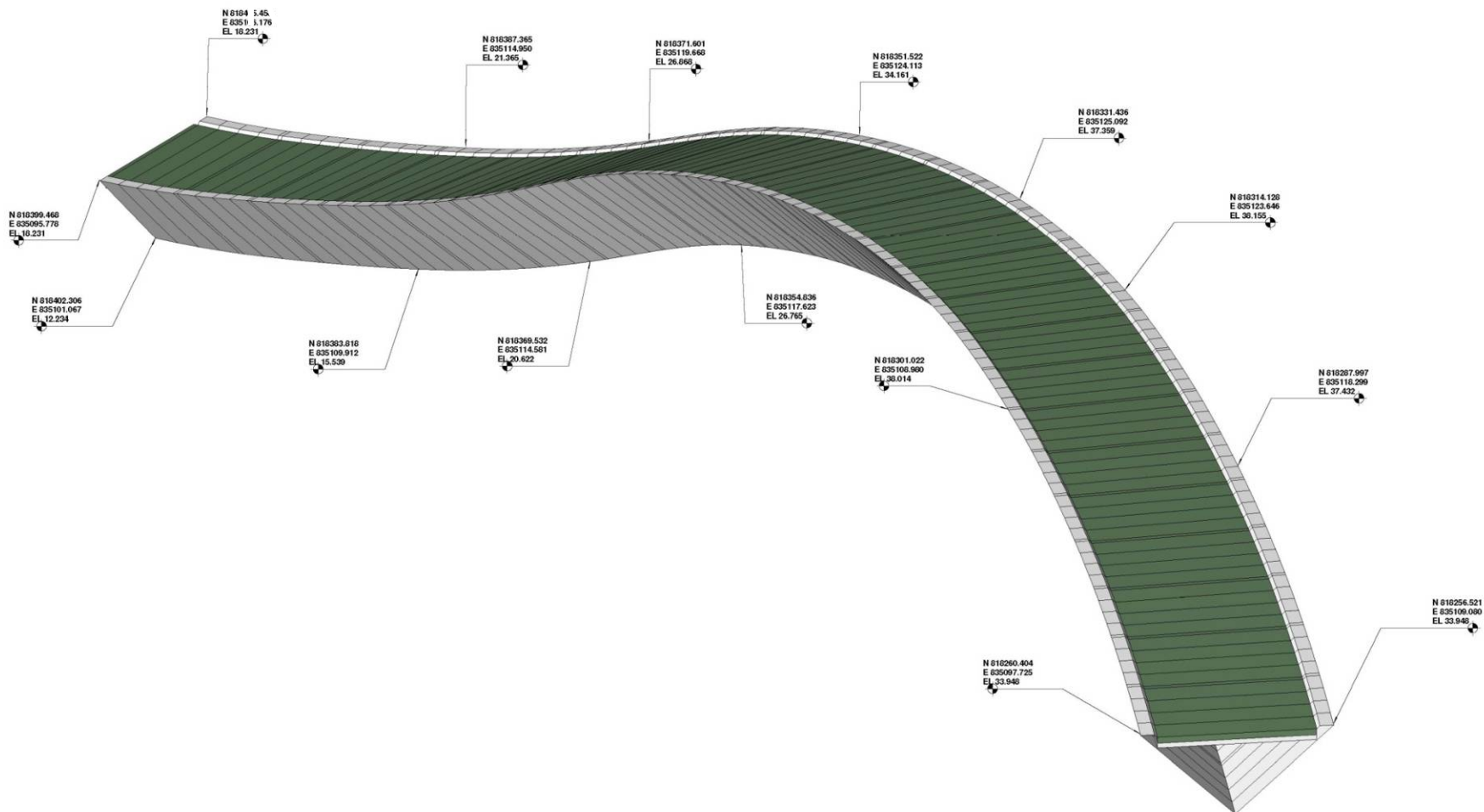


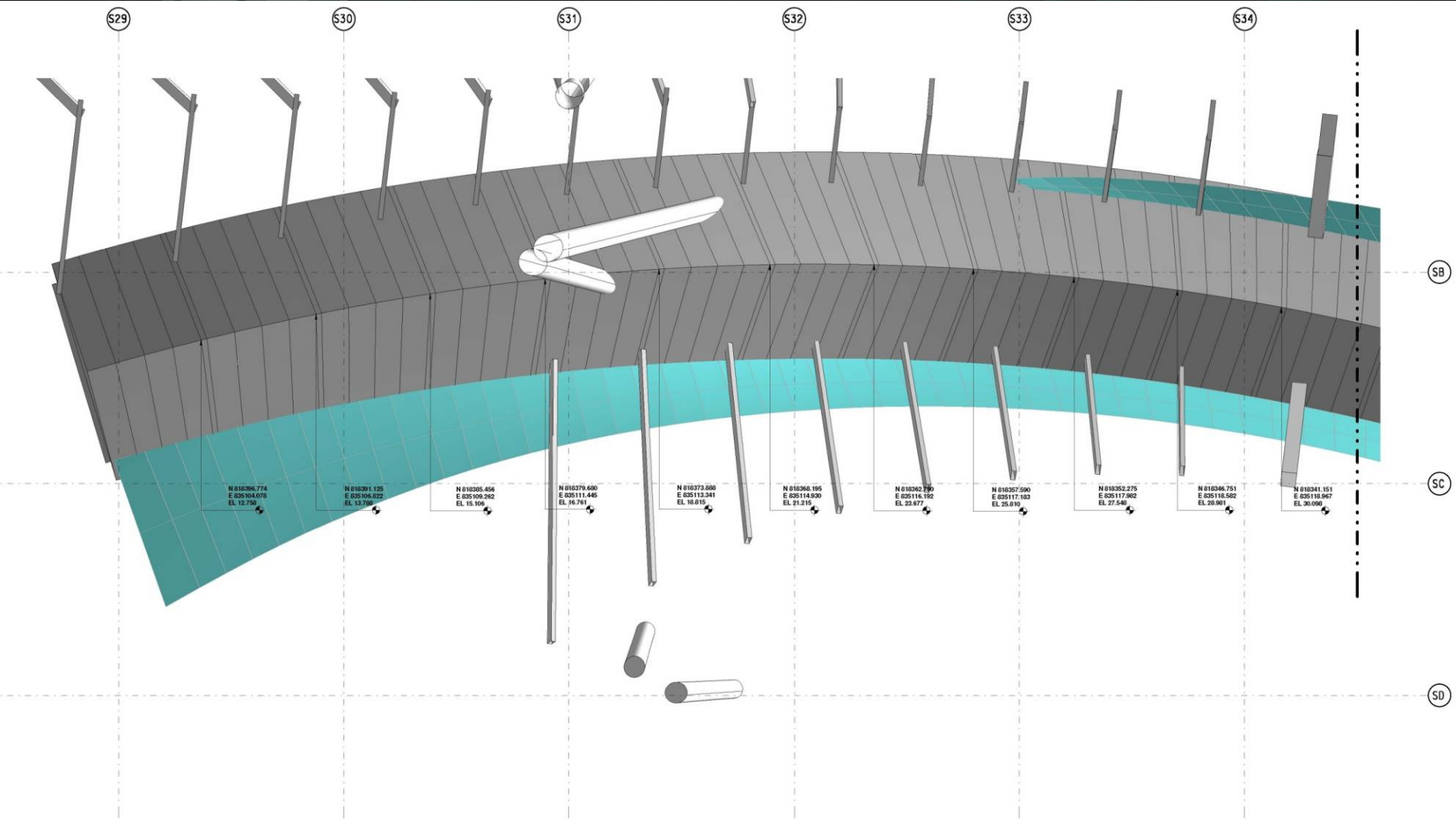
2 Section 200 GRID.42
1 : 200



Component Elevation P3 North

1 : 100





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

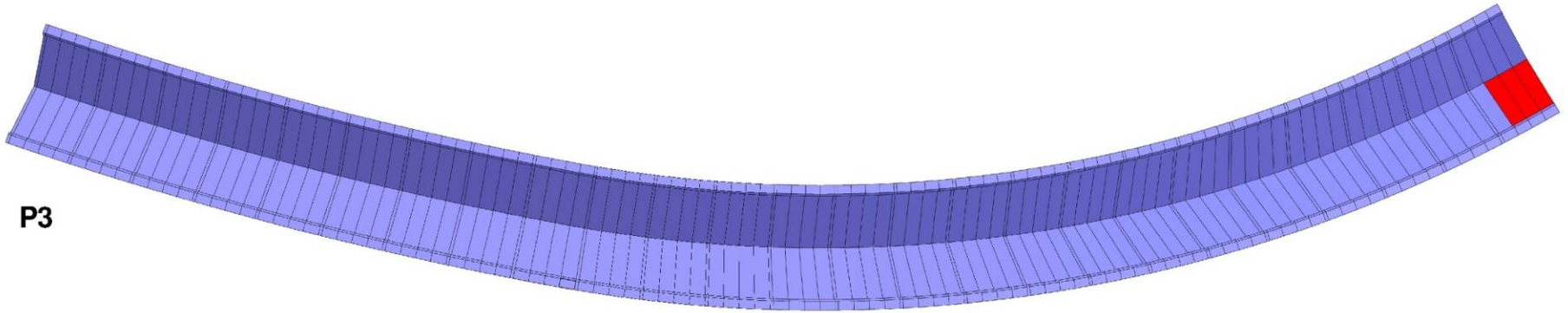
Panel P3S02P078

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

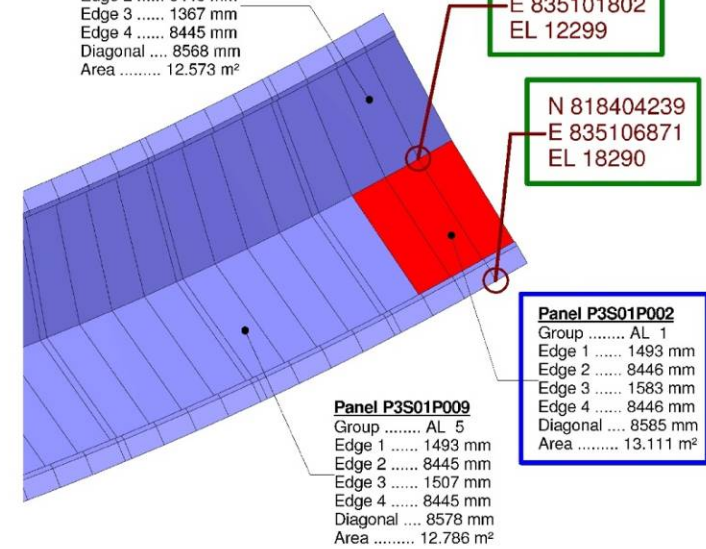
P3



Schedule of panels																								
Panel	Point 1				Point 2				Point 3				Point 4				Center of weight				Edges			
	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	Edge 4
P3S01P001	8351061129	8184055541	18298	835101017	818402394	12231	835106871	818404239	18290	835101802	818401012	12299	835103955	818403297	15262	1493	8446	1583	8446	8565	13.111 m²	AL 1		
P3S01P002	835106871	818404239	18290	835101802	818401012	12299	835107598	818402931	18391	835102588	818399625	12410	835104710	818401952	15347	1493	8446	1583	8446	8565	13.111 m²	AL 1		
P3S01P003	835107598	818402931	18391	835102588	818399625	12410	835108310	818401617	18528	835103312	818398241	12560	835105447	818400604	15472	1493	8446	1583	8446	8565	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	8446	1559	8446	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	835109336	818392833	16760	294	8313	305	8313	8318	2.594 m²	AL 3		
P3S01P015	835114256	818398075	20334	835109228	818385543	15084	835114368	818388805	21001	835109337	818395271	15154	835111797	818387174	18043	294	8313	305	8313	8318	2.594 m²	AL 3		
P3S01P020	835116476	818393392	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			
P3S01P035	835109144	818400036	18736	835104175	818396588	12786	835109622	818398714	18942	835104883	818390527	13005	835107001	818397641	16867	1493	8446	1534	8446	8581	12.901 m²	AL 4		
P3S01P018	835115454	818386100	21710	835110405	818382531	15899	835115973	818384746	22094	835110918	818381150	16305	835113167	818383632	19002	1493	8446	1534	8446	8581	12.901 m²	AL 4		
P3S01P019	835115973	818384746	22094	835110918	818381150	16305	835116476	818383392	22499	835114124	818379769	16734	835113995	818382833	19648	1493	8446	1534	8446	8581	12.901 m²	AL 4		
P3S01P021	835116575	818383121	22582	835111511	818379492	16822	835117059	818381769	23013	835111987	818378111	17278	835114283	818380623	19924	1493	8446	1534	8446	8581	12.901 m²	AL 4		
P3S01P022	835117059	818381769	23013	835111987	818378111	17278	835117528	818380417	23465	835112447	818376730	17757	835114755	818379257	20378	1493	8446	1534	8446	8581	12.901 m²	AL 4		
P3S01P023	835117528	818380417	23465	835112447	818376730	17757	835117980	818379088	23938	835112890	818375351	18258	835115211	818377891	20855	1493	8446	1534	8446	8581	12.901 m²	AL 4		
P3S01P024	835117980	818379088	23938	835112890	818375351	18258	835118417	818377721	24432	835113315	818373075	16781	835115906	818376629	21353	1493	8446	1534	8446	8581	12.901 m²	AL 4		
P3S01P026	835118503	818373975	16781	835113398	818373701	16888	835118921	818376710	24534	835113392	818372392	19436	835116156	818374988	21978	1493	8446	1534	8446	8581	12.901 m²	AL 4		
AL 4.8																					103.208 m²			
P3S01P007	835109822	818398714	18942	835104883	818390527	13005	835110485	818397388	19170	835105522	818393885	13245	835107673	818396303	16090	1493	8445	1507	8445	8578	12.786 m²	AL 5		
P3S01P008	835110485	818397388	19170	835105522	818393885	13245	835111132	818396057	19414	835109161	818392551	13500	835106325	818394070	16332	1493	8445	1507	8445	8578	12.786 m²	AL 5		
P3S01P009	835111132	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	818385543	15084	835112504	818393115	20006	835107510	818386599	14716	835108702	818382028	16919	1493	8445	1507	8445	8578	12.786 m²	AL 5		
P3S01P012	835112504	818393115	20006	835107510	818386599	14716	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	835110280	818389357	17519	1493	8445	1507	8445	8578	12.786 m²	AL 5		
P3S01P014	835113688	818390425	20609	835108670	818386600	14745	835114256	8183893075	20934	835109228	818385543	15084	835111450	818387968	17943	1493	8445	1507	8445	8578	12.786 m²	AL 5		
P3S01P016	835114368	818388805	21001	835109337	818382531	15899	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	18818	1493	8445	1507	8445	8578	12.786 m²	AL 5		
P3S01P027	835118921	818376106	25052	835113802	818372332	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	835114559	818369618	20585	835116948	818372196	23081	1493	8445	1507	8445	8578	12.786 m²	AL 5		
P3S01P029	835119711	818373428	26145	835114559	818369618	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

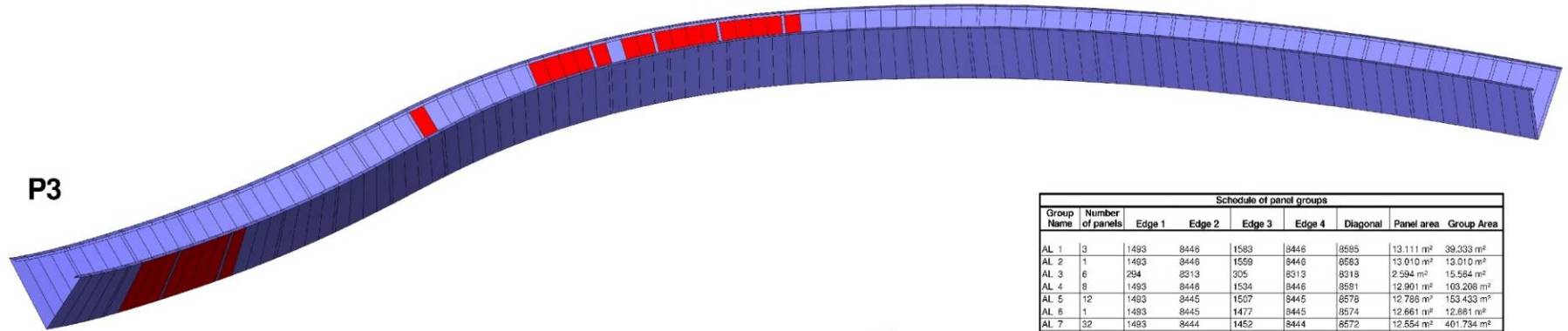
N 818404239
E 835106871
EL 18290

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

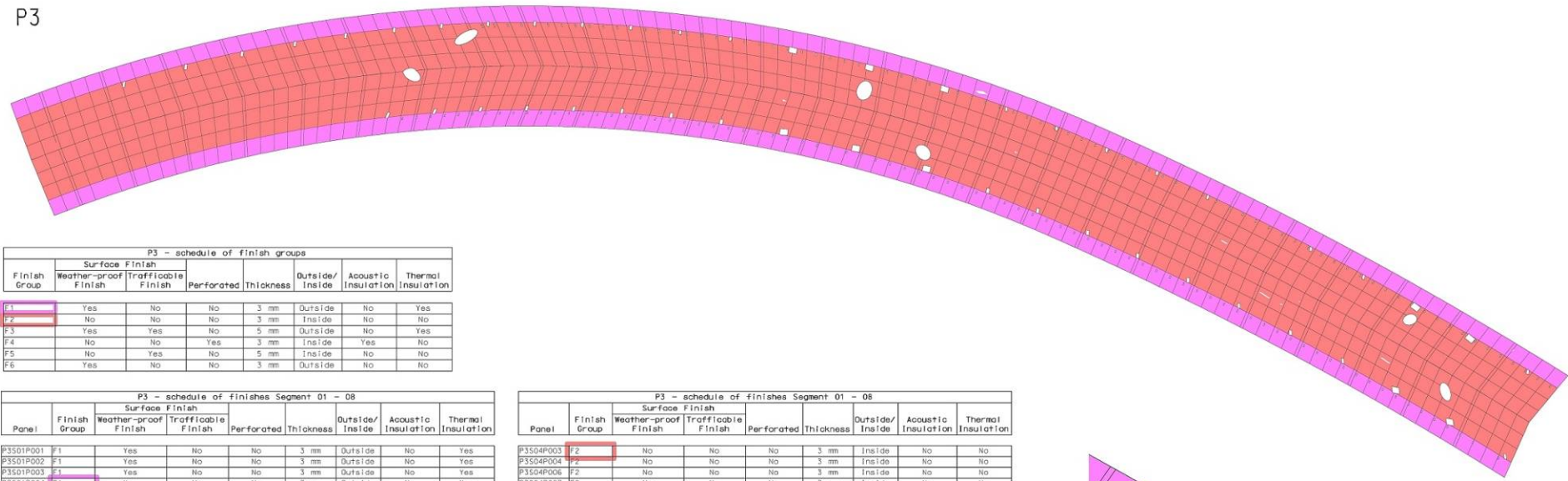
N 818405541
E 835106129
EL 18228

N 818402394
E 835101017
EL 12231

N 818398353
E 835096414
EL 18290

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 m²	39.333 m²
AL 2	1	1493	8446	1599	8446	8583	13.010 m²	13.010 m²
AL 3	6	284	8313	305	8313	8318	2.594 m²	15.564 m²
AL 4	8	1493	8446	1534	8446	8581	12.901 m²	103.208 m²
AL 5	12	1493	8445	1507	8445	8578	12.786 m²	153.433 m²
AL 6	1	1493	8445	1477	8445	8574	12.661 m²	12.661 m²
AL 7	32	1493	8444	1452	8444	8572	12.554 m²	401.734 m²
AL 8	5	1493	8444	1424	8444	8569	12.436 m²	62.180 m²
AL 9	13	1493	8444	1398	8444	8567	12.325 m²	160.227 m²
AL 10	13	284	8303	272	8302	8307	2.453 m²	80.933 m²
AL 11	25	1493	8443	1389	8443	8564	12.199 m²	304.979 m²
AL 12	3	1493	8443	1354	8443	8562	12.139 m²	60.676 m²
AL 13	3	1493	8443	1338	8443	8560	12.069 m²	36.208 m²
AL 14	3	1583	8445	1367	8445	8568	12.673 m²	37.718 m²
AL 15	1	1559	8445	1368	8445	8560	12.479 m²	12.479 m²
AL 16	6	1533	8445	1389	8445	8556	12.372 m²	98.979 m²
AL 17	3	1513	8445	1374	8445	8547	12.311 m²	36.932 m²
AL 18	1	1497	8446	1385	8445	8536	12.290 m²	12.290 m²
AL 19	1	1477	8445	1387	8445	8534	12.209 m²	12.209 m²
AL 20	1	1452	8445	1387	8445	8531	12.102 m²	12.102 m²
AL 21	1	1424	8445	1387	8445	8529	11.984 m²	11.984 m²
AL 22	1	1388	8444	1386	8444	8527	11.871 m²	11.871 m²
AL 23	11	272	8298	272	8298	8298	2.361 m²	25.974 m²
AL 24	6	1569	8444	1385	8444	8524	11.742 m²	70.452 m²
AL 25	7	1254	8444	1384	8444	8524	11.674 m²	81.716 m²
AL 26	3	1338	8443	1381	8443	8524	11.595 m²	34.786 m²
AL 27	6	1362	8442	1389	8442	8539	11.648 m²	69.186 m²
AL 28	3	1380	8442	1387	8442	8543	11.714 m²	35.143 m²
AL 29	10	1400	8443	1367	8443	8551	11.801 m²	118.005 m²
AL 30	1	1412	8443	1400	8443	8559	11.992 m²	11.992 m²
AL 31	10	1427	8444	1431	8444	8564	12.187 m²	121.867 m²
AL 32	24	1440	8444	1453	8444	8568	12.334 m²	296.014 m²
AL 33	62	1358	839	1366	839	1607	1.169 m²	66.791 m²
AL 34	16	267	824	269	824	867	0.294 m²	3.748 m²
AL 35	13	1372	839	1379	839	1611	1.181 m²	15.348 m²
AL 36	1	1391	839	1398	839	1628	1.197 m²	1.197 m²
AL 37	31	1422	839	1426	839	1653	1.222 m²	37.880 m²
AL 38	3	1444	839	1447	839	1671	1.240 m²	3.720 m²
AL 39	34	284	825	285	825	873	0.248 m²	8.446 m²
AL 40	54	1347	276	1354	276	1379	0.392 m²	21.163 m²
AL 41	24	265	271	266	271	361	0.078 m²	1.883 m²
AL 42	11	1361	276	1366	276	1396	0.396 m²	4.353 m²
AL 43	1	1378	276	1378	276	1405	0.400 m²	0.400 m²
AL 44	32	1406	276	1408	276	1432	0.408 m²	13.052 m²
AL 45	2	1426	276	1425	276	1452	0.414 m²	0.827 m²
AL 46	26	281	271	281	271	390	0.083 m²	2.154 m²
AL 47	100	1456	276	1458	276	1481	0.422 m²	42.209 m²
AL 48	100	1474	839	1483	839	1700	1.269 m²	126.892 m²
Grand total:	750							2923.908 m²

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

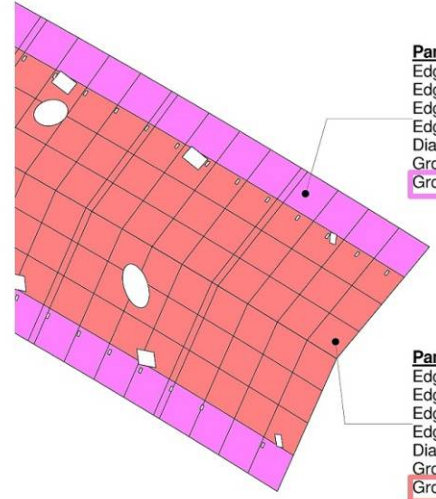
P3 - schedule of finishes Segment 01 - 08								
Panel	Finish Group	Surface Finish		Perforated	Thickness	Outside/ Inside	Acoustic Insulation	Thermal Insulation
		Weather-proof Finish	Trafficable Finish					

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								
P3503P005	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
P3506P003	F2	No	No	No	3 mm	Inside	No	No
P3506P004	F2	No	No	No	3 mm	Inside	No	No
P3506P005	F2	No	No	No	3 mm	Inside	No	No
P3506P006	F2	No	No	No	3 mm	Inside	No	No
P3506P007	F2	No	No	No	3 mm	Inside	No	No
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

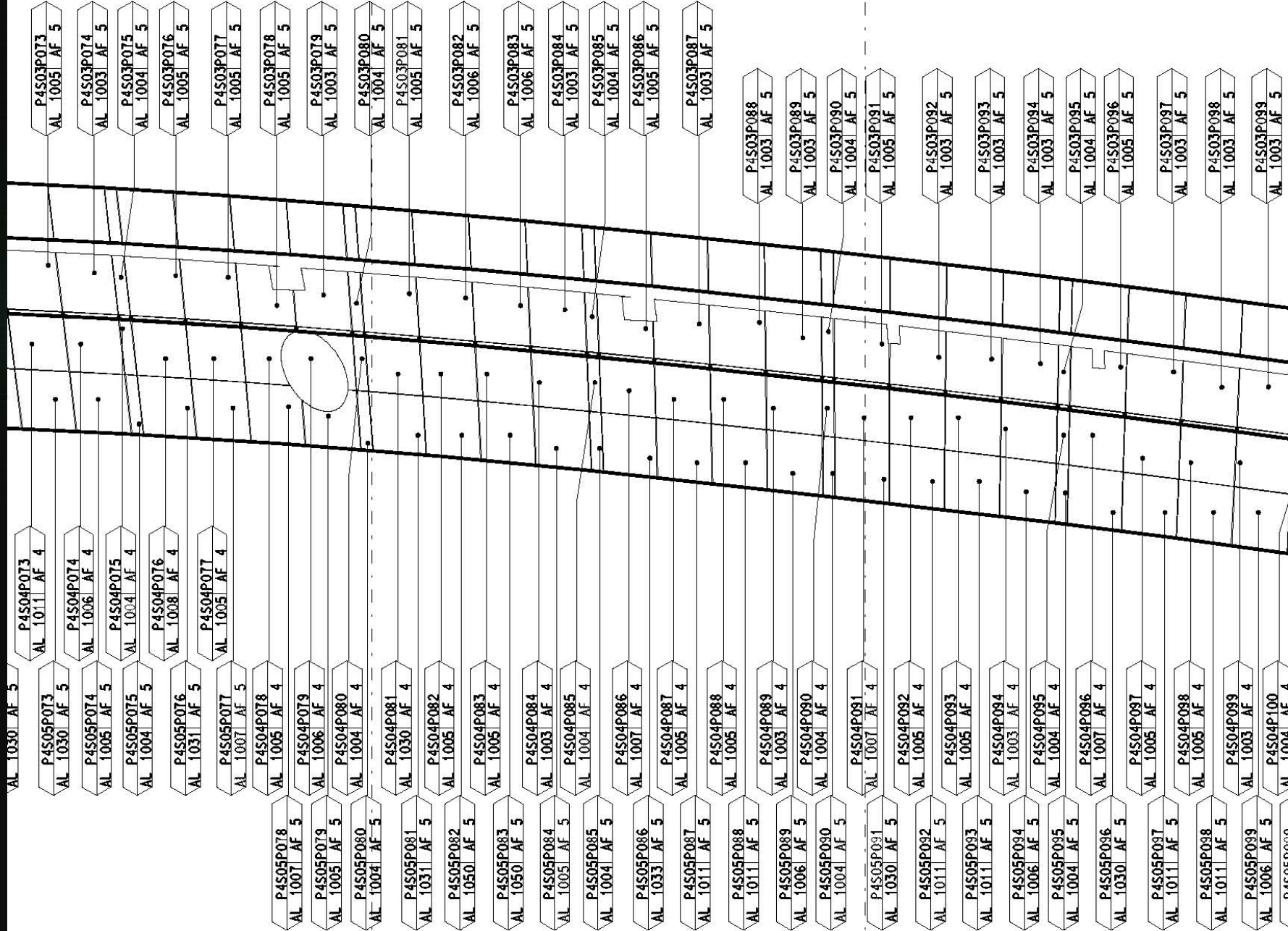
F 6: 29

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

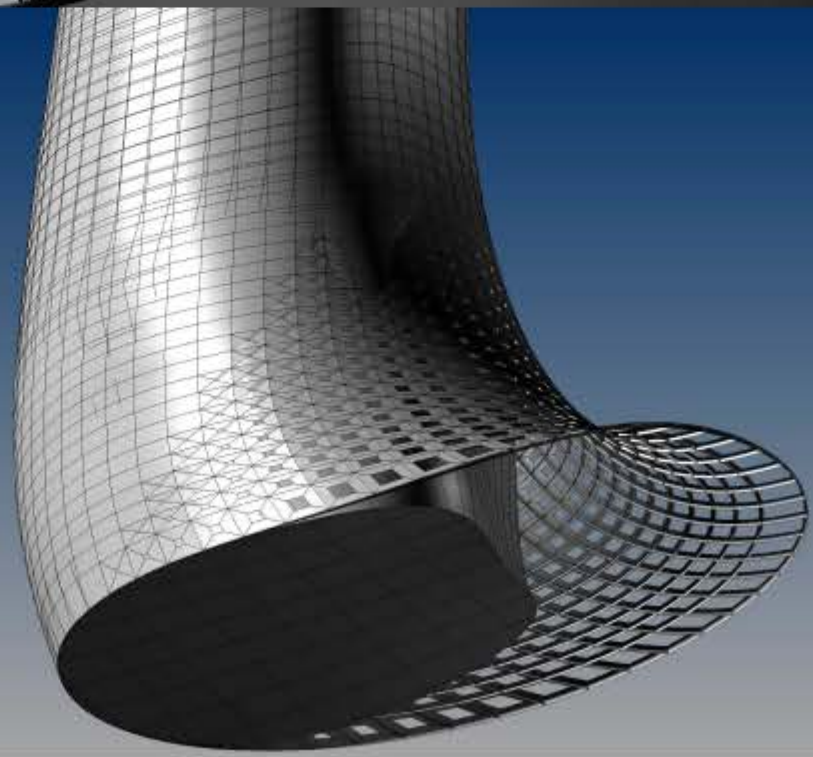
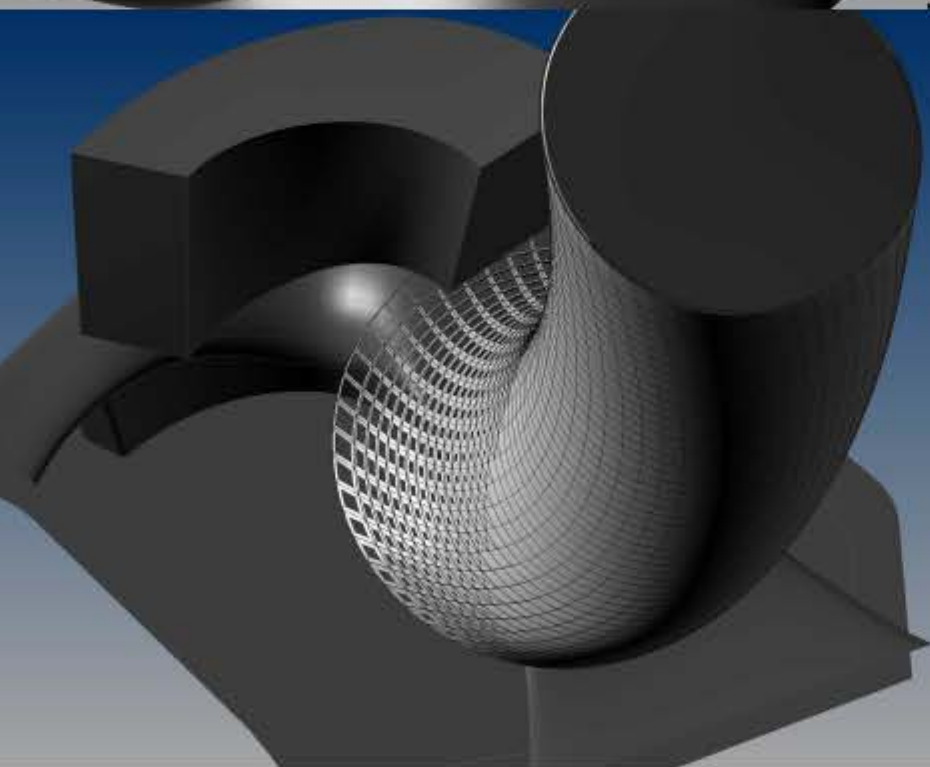
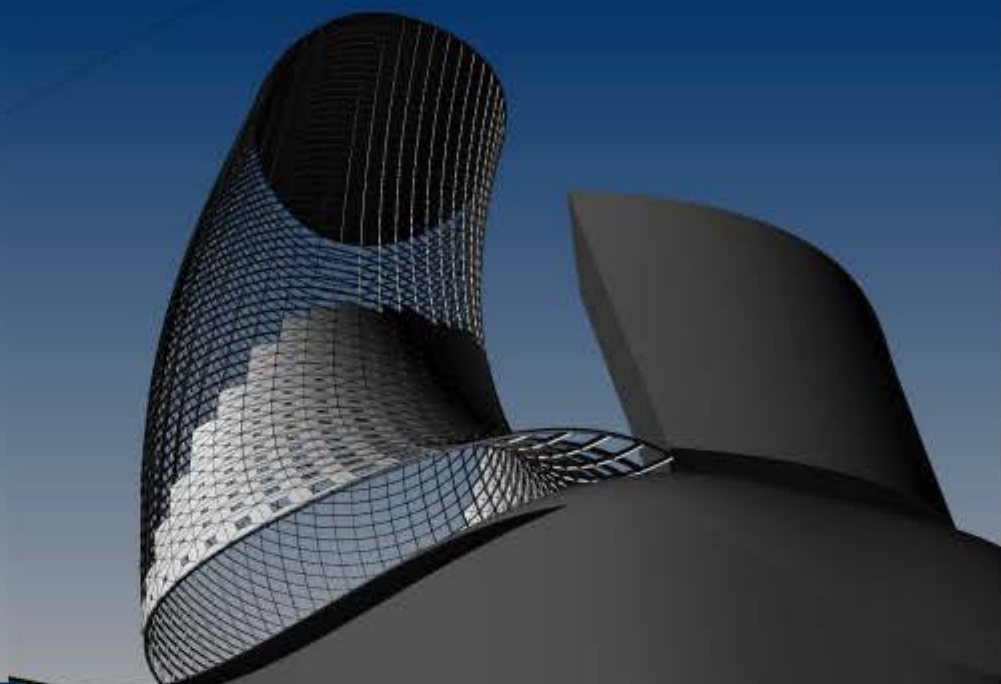
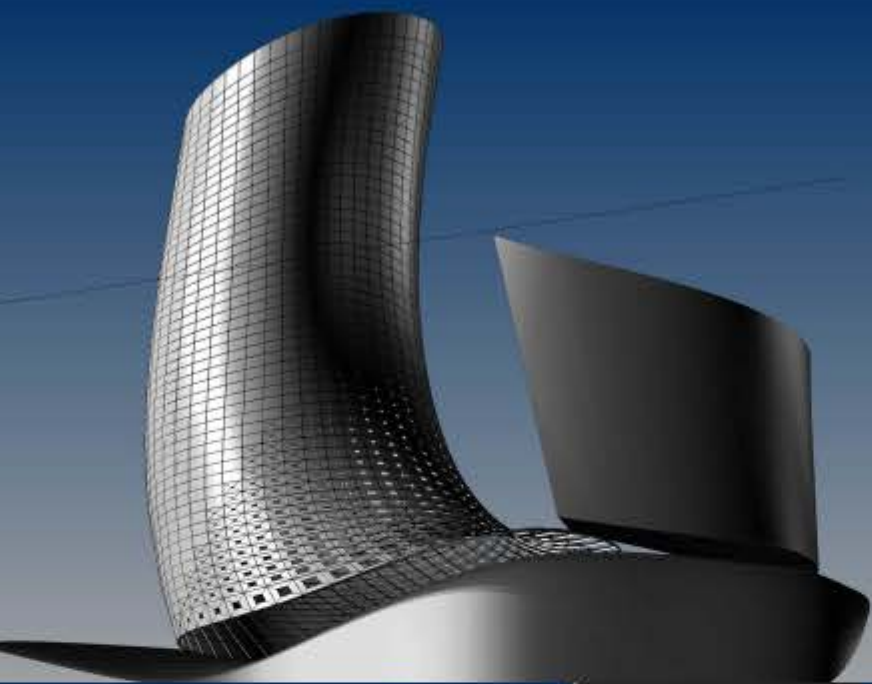


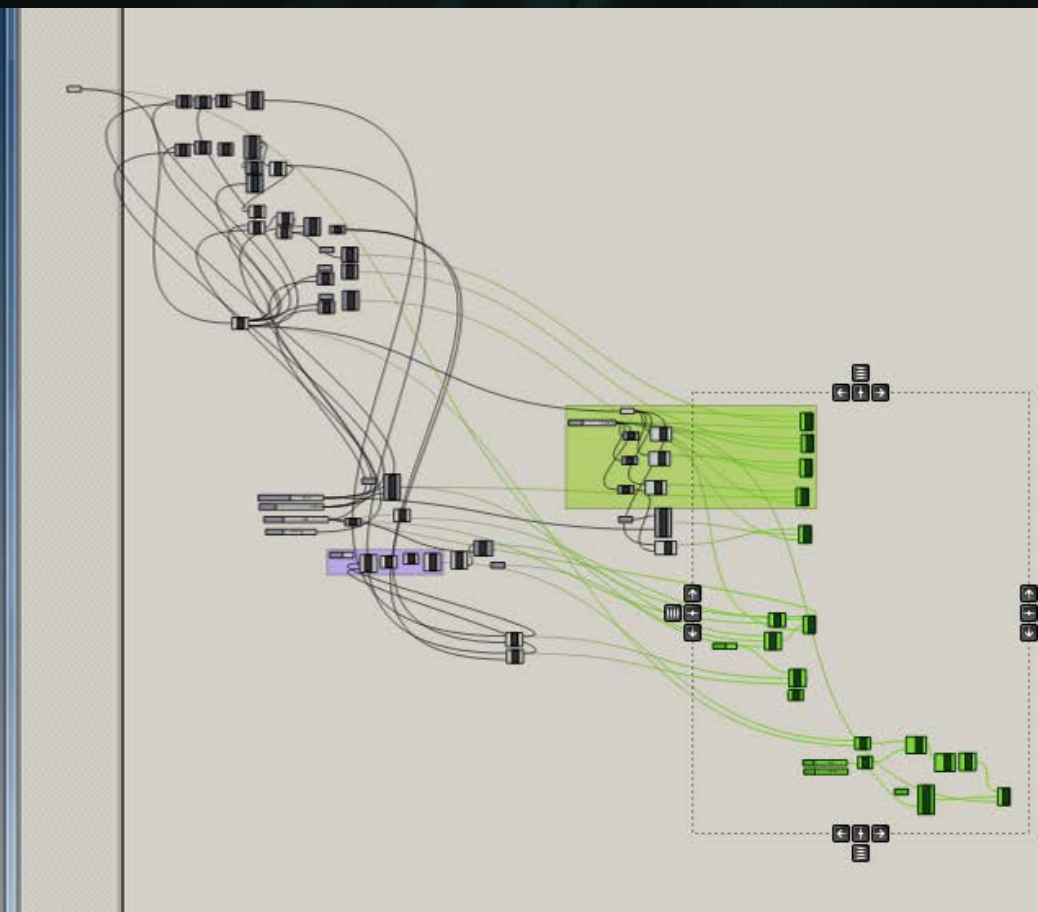
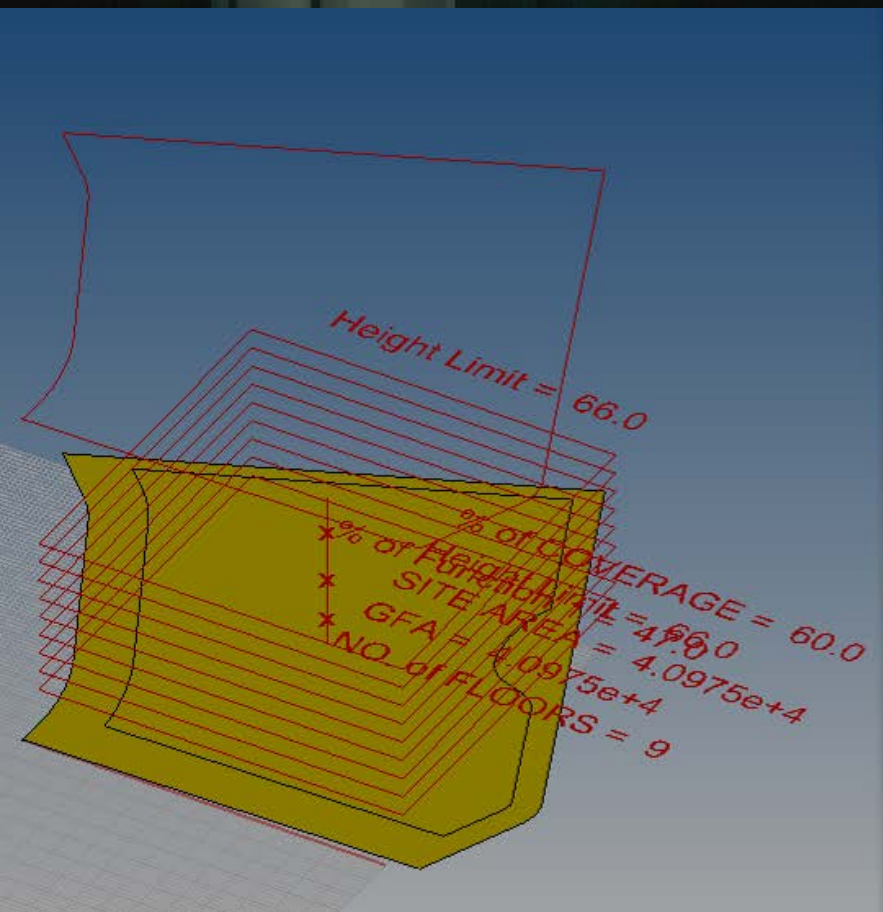
Panel P3S01P004
 Edge 1 1488 mm
 Edge 2 2279 mm
 Edge 3 1476 mm
 Edge 4 2279 mm
 Diagonal 2720 mm
 Group(Size) A 1
 Group(Finish)... F 1

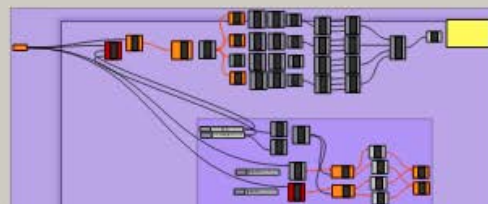
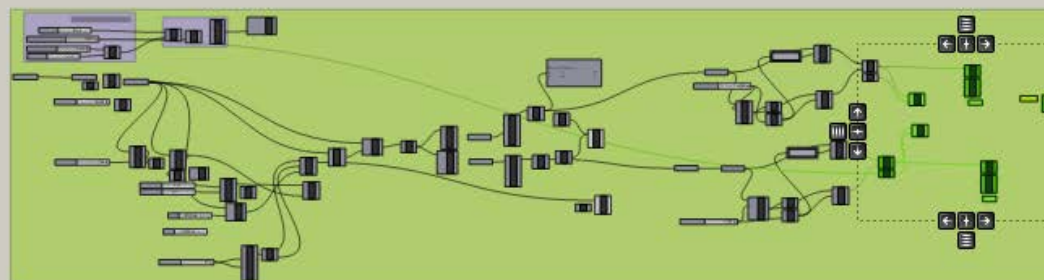
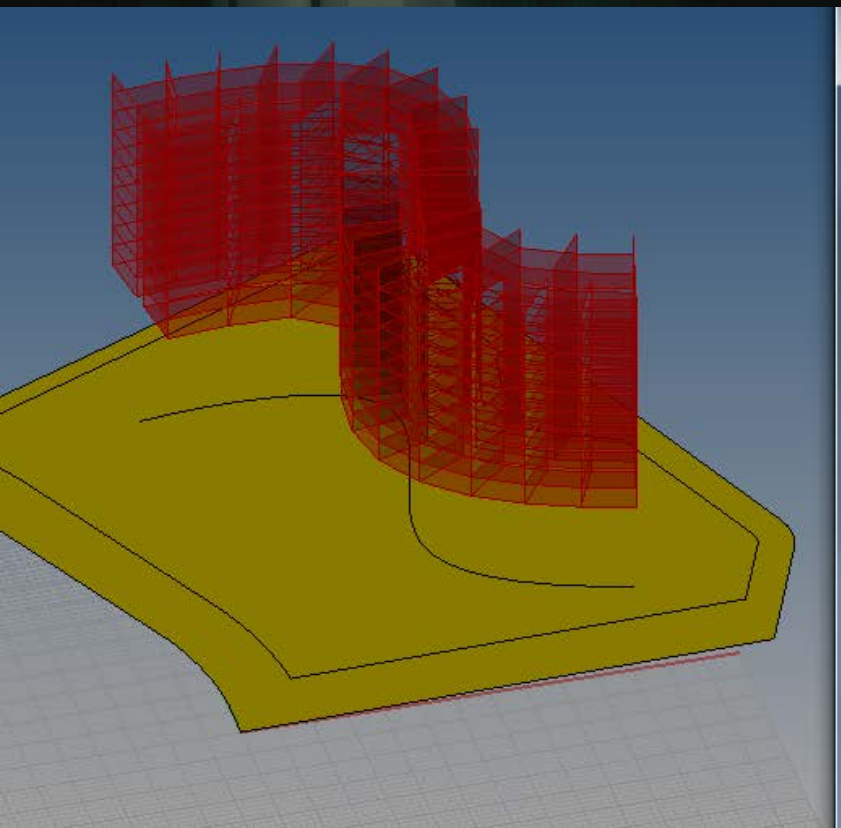
Panel P3S04P001
 Edge 1 1460 mm
 Edge 2 2042 mm
 Edge 3 1445 mm
 Edge 4 2042 mm
 Diagonal 2508 mm
 Group(Size) A 13
 Group(Finish)... F 2

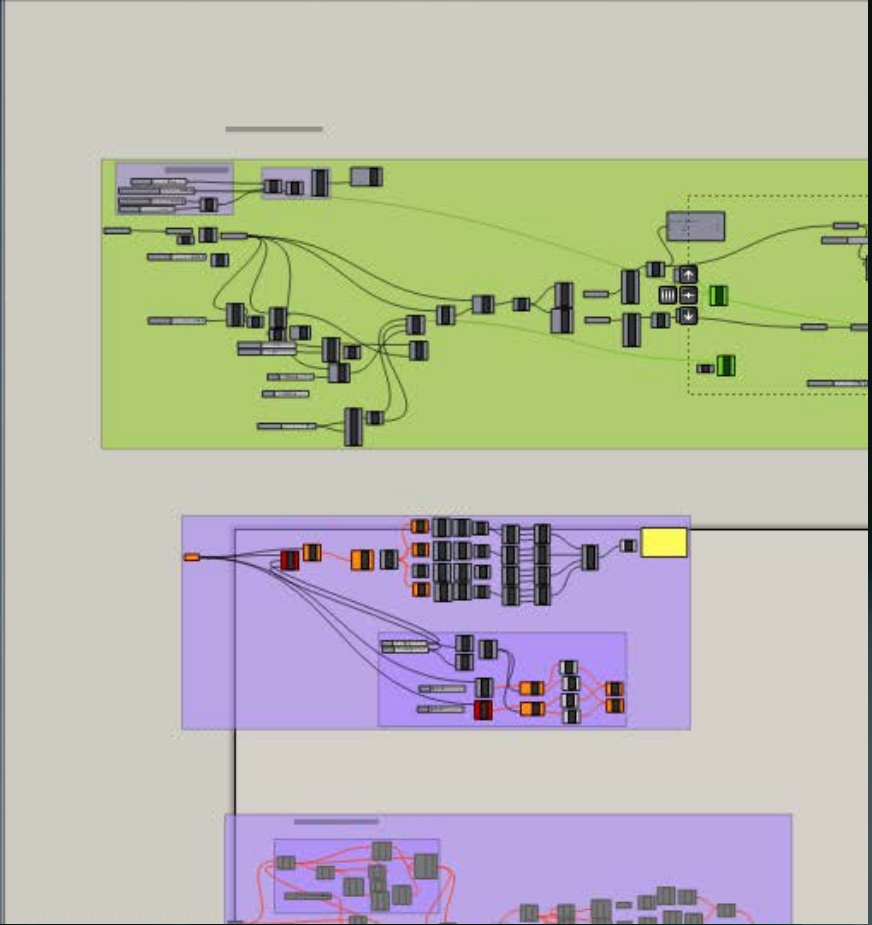
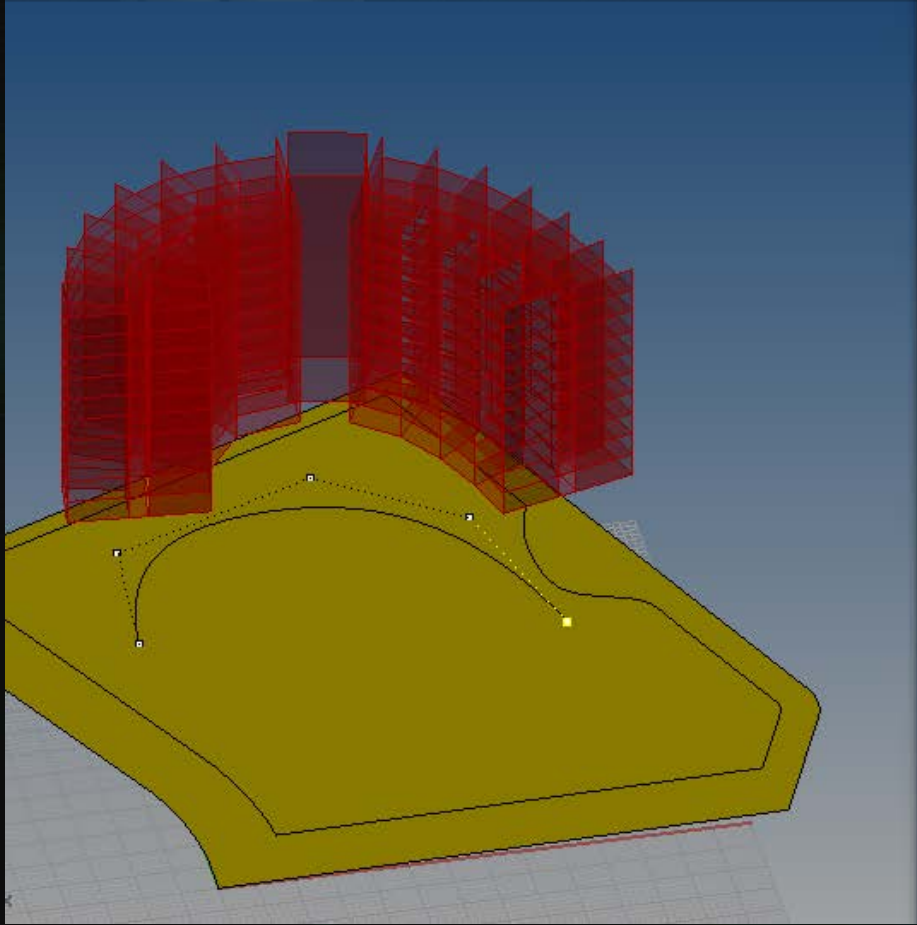


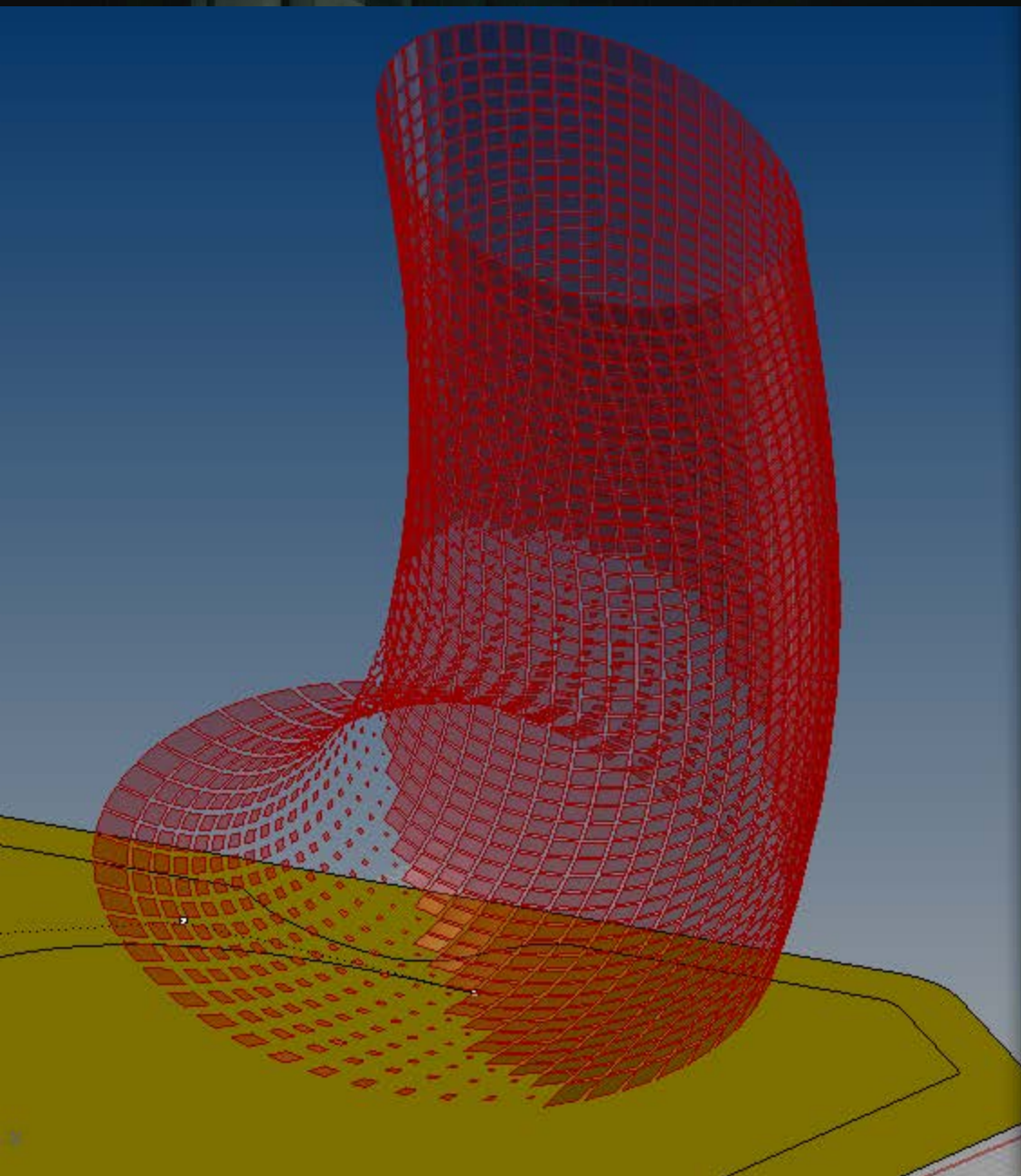
BIM 流程的再用











File Edit View Arrange Solution Window Help

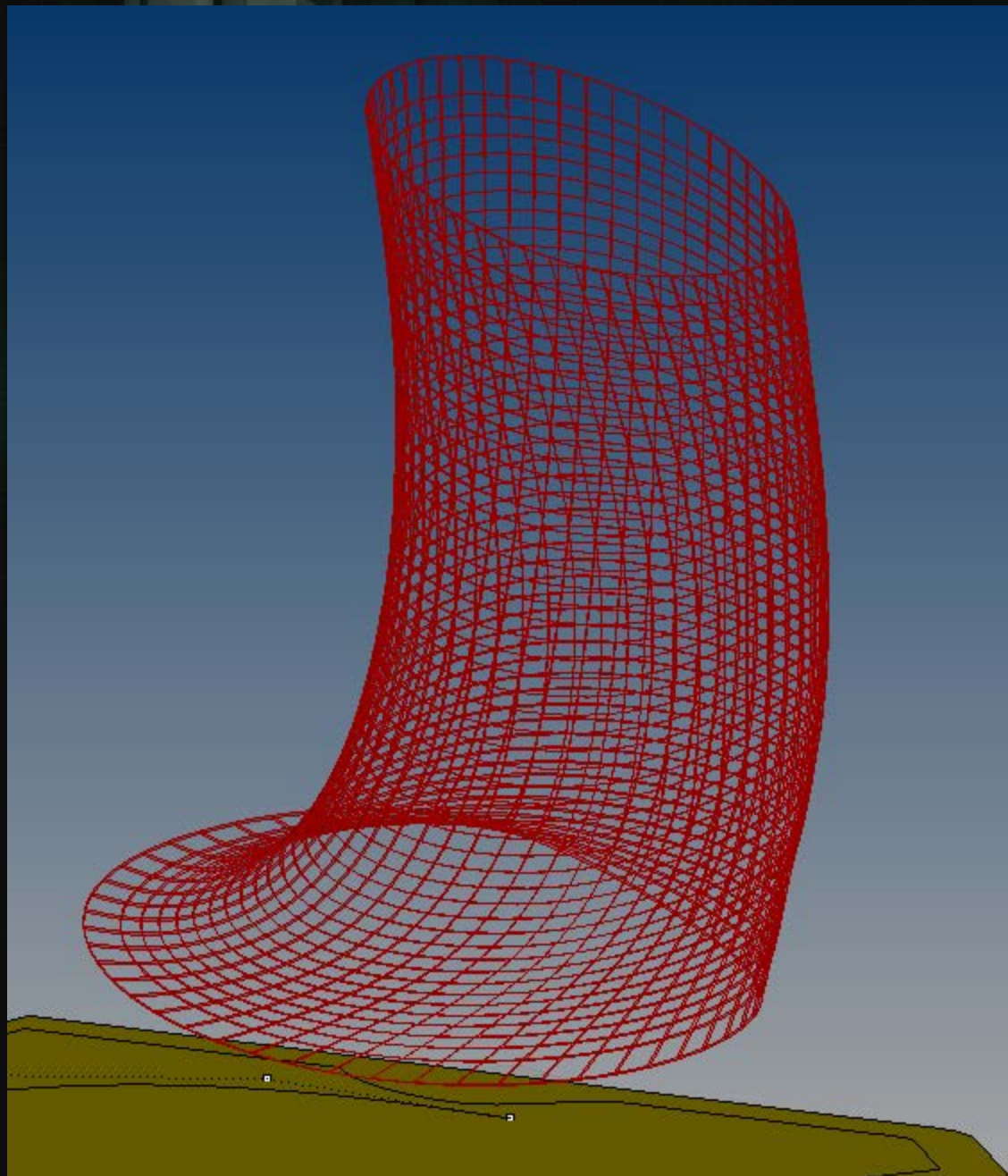
Params Math Sets Vector Curve Surface Mesh

Geometry Primitive

21%

Solution completed in ~24.9 seconds (140 seconds ago)

The screenshot shows a software interface with a 3D visualization on the left and a complex node-based diagram on the right. The 3D visualization shows a red mesh surface, likely representing a fluid flow simulation, over a yellowish-brown ground plane. The node-based diagram on the right is a complex network of interconnected nodes and lines, representing a computational graph or a simulation setup. The interface includes a menu bar at the top with options like File, Edit, View, Arrange, Solution, Window, and Help. Below the menu bar is a toolbar with various icons for different functions, categorized into Geometry and Primitive. A status bar at the bottom indicates that the solution was completed in approximately 24.9 seconds, 140 seconds ago.



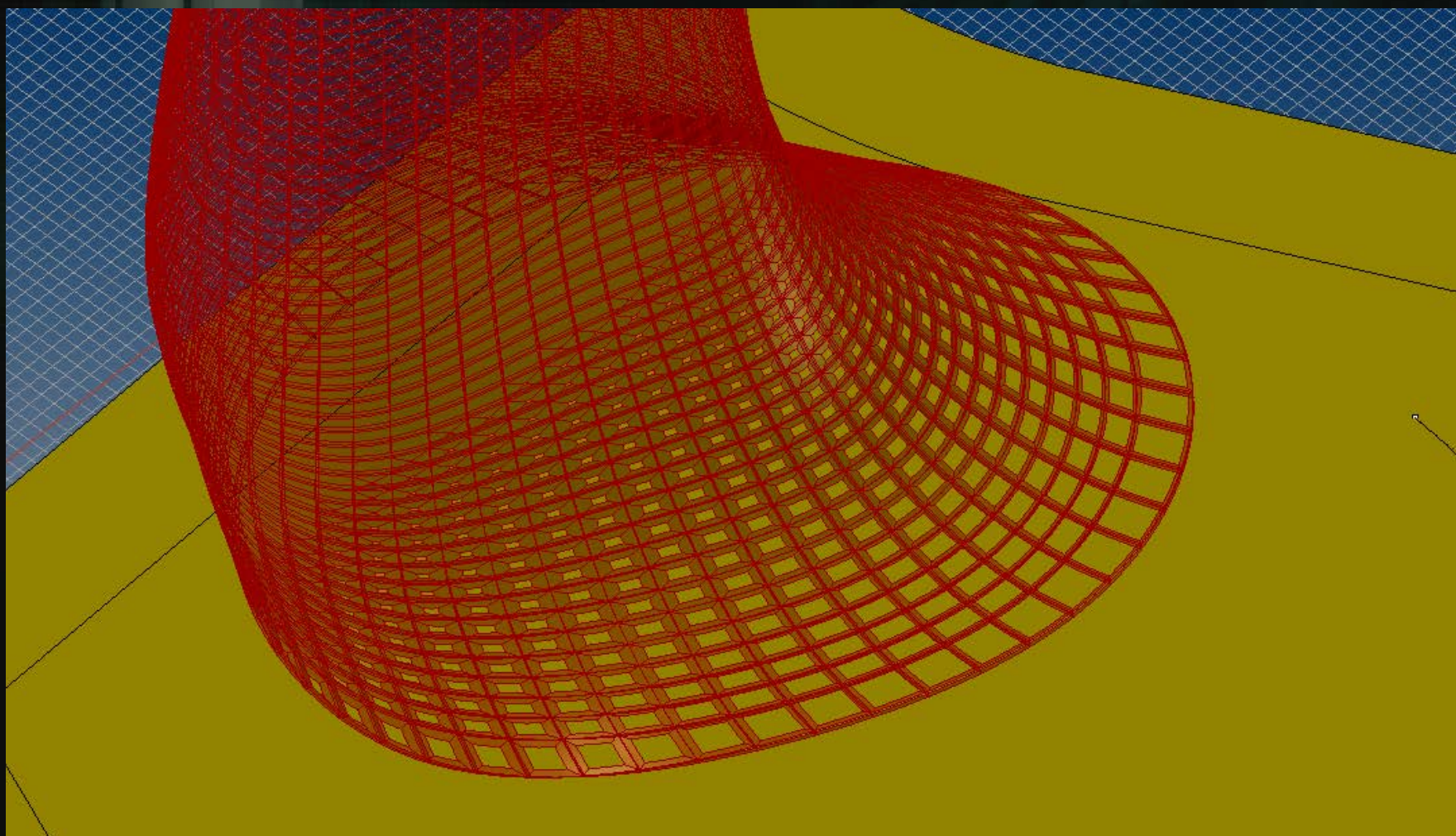
File Edit View Arrange Solution Window

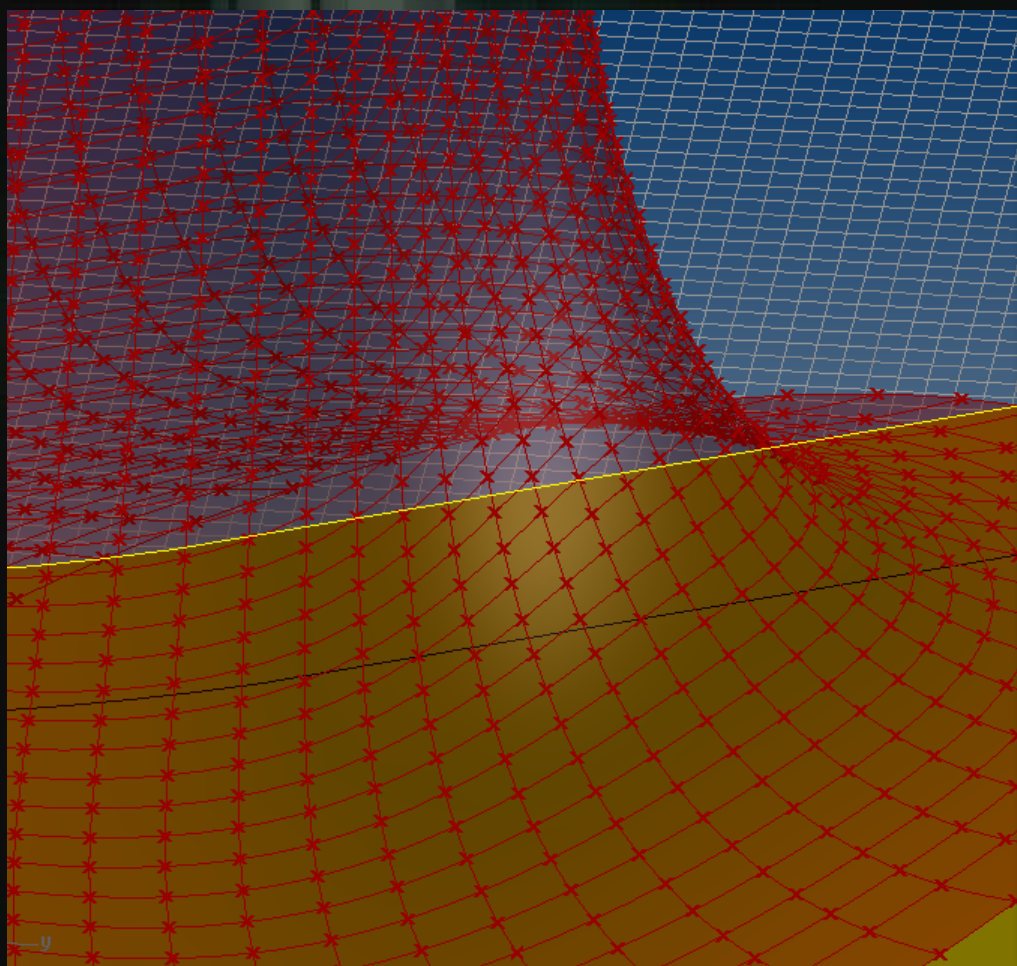
Params Math Sets Vector Curve Surface

Geometry Primitive

64%

Solution completed in ~24.9 seconds (250 seconds ago)





Params Math Sets Vector Curve Surface Mesh Intersect Transform

Geometry Primitive Special

125%

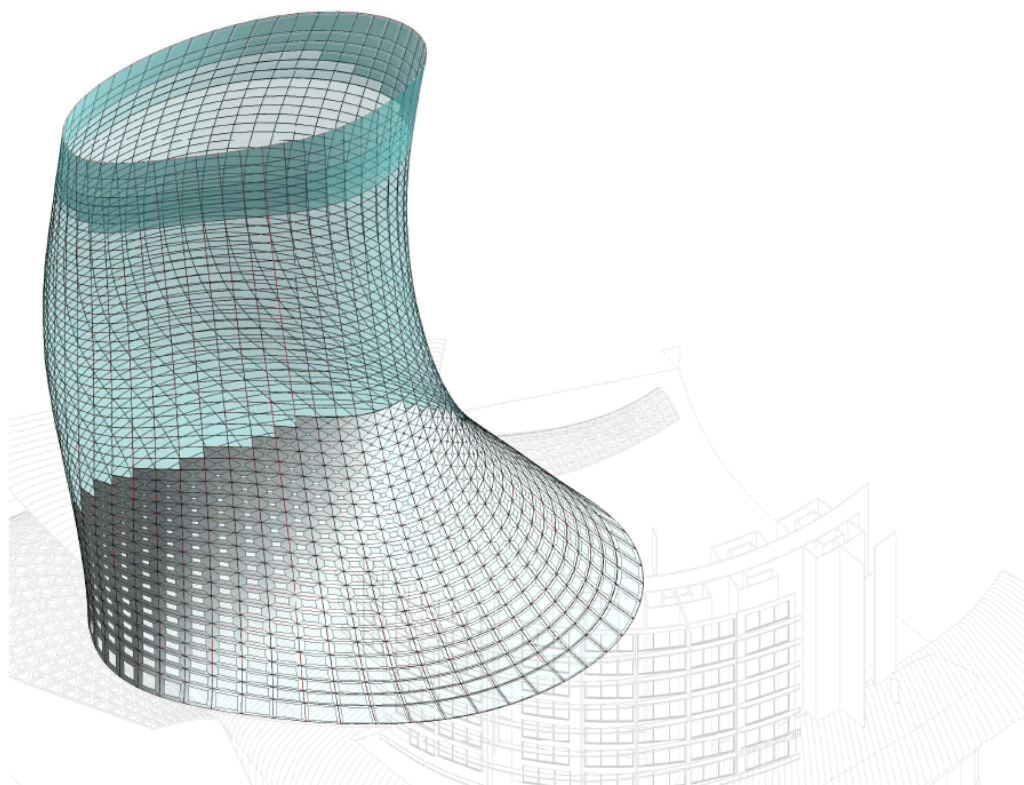
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0.8.0050



① TOWER FACADE

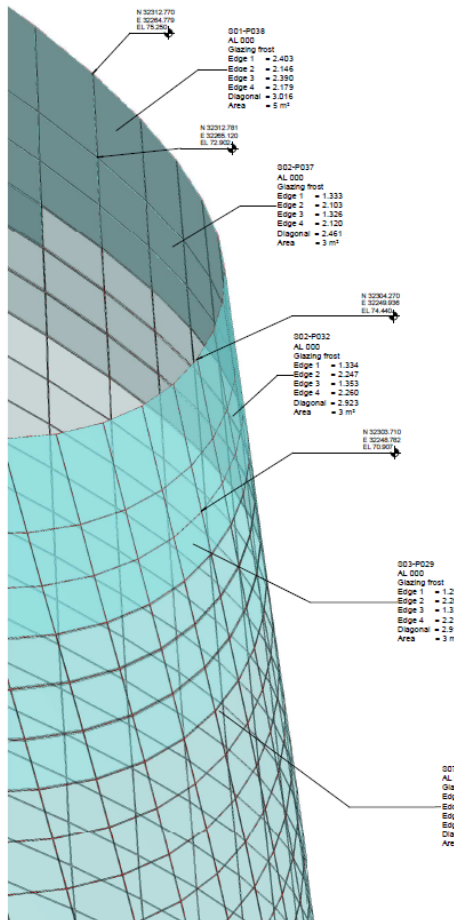
BIM EVANGELIST



PROJECT NAME **KALLANG RIVERSIDE
HOTEL DEVELOPMENT**

DRAWING TITLE **TOWER ON
PANELISATION**

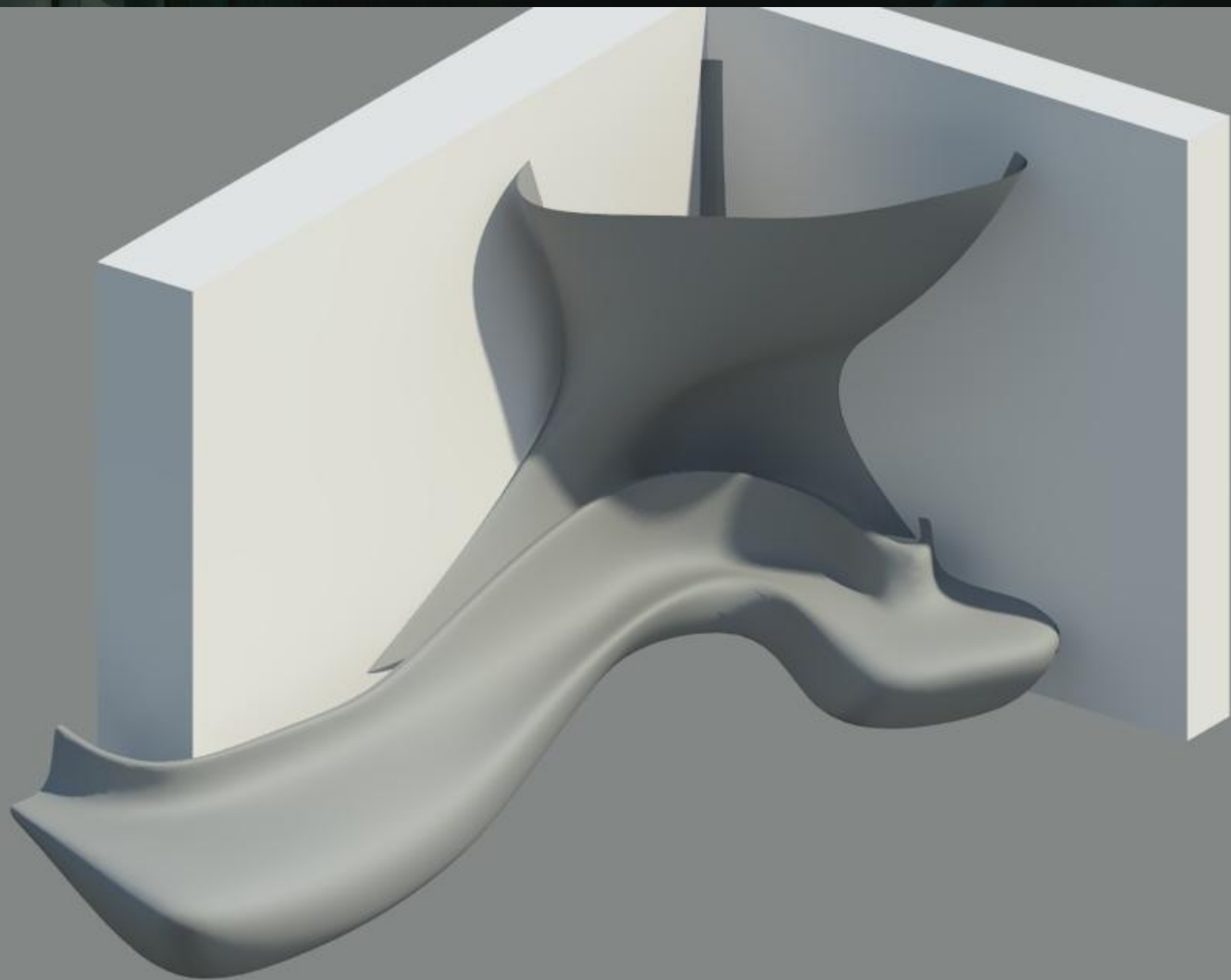
FILE Project Name		SCALE @ A1
DRAWN Author	CHECK Checker	DATE 10_SEPT.2011
DRAWING NO. BIM_A101		REVISION

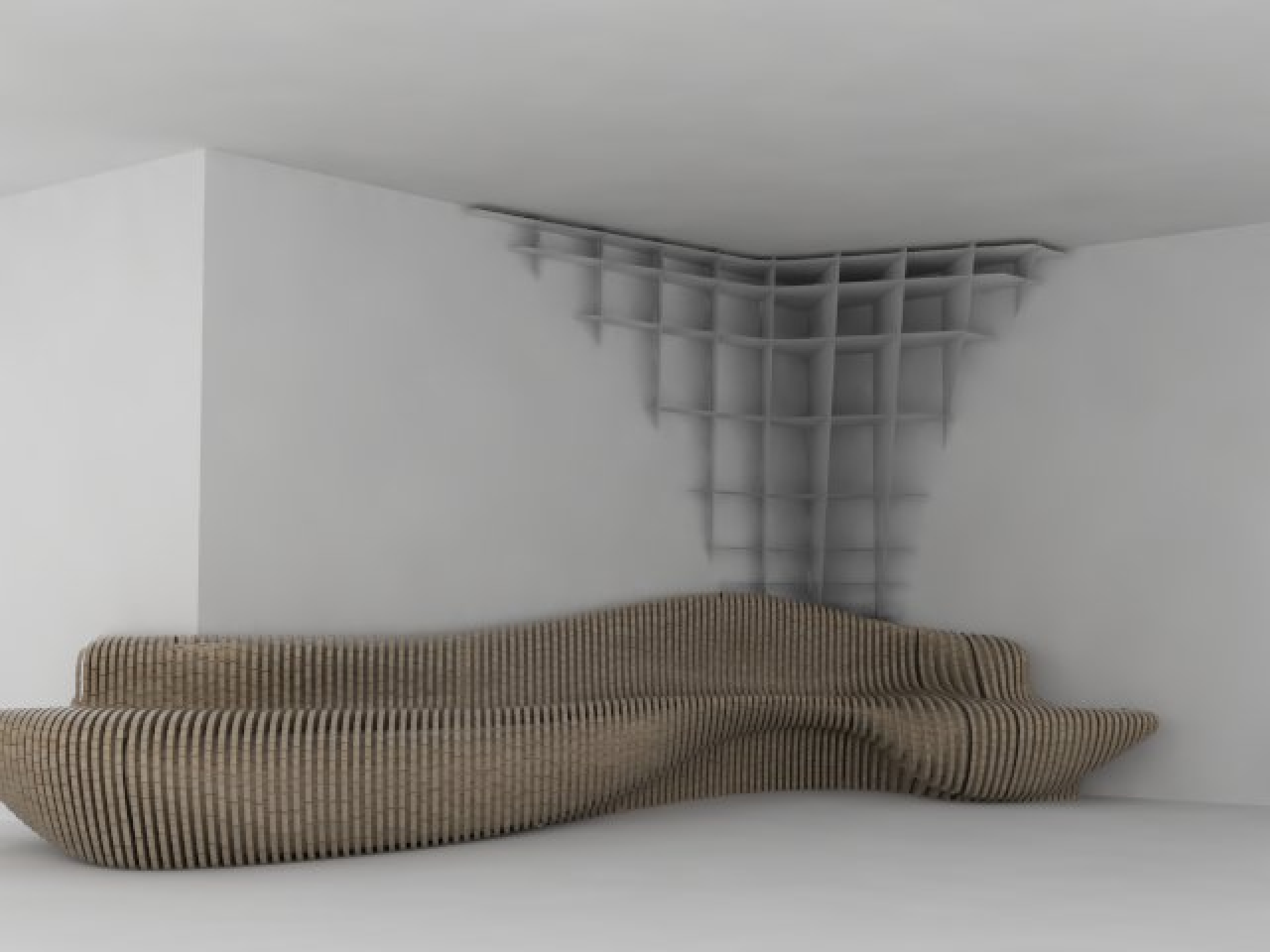


Panelisation Schedule (Partial)																													
Panel Type	Material	P01x	P01y	P01z	P02x	P02y	P02z	P03x	P03y	P03z	P04x	P04y	P04z	Edge 1	Edge 2	Edge 3	Edge 4	Diagonal	Area										
004-P001	Glazing b	41.228	19.163	71.590	41.563	18.877	70.124	43.351	17.800	69.607	42.999	18.063	71.034	1.491	2.130	1.529	2.157	1.304	2.787 m²										
004-P002	Glazing b	42.299	19.053	71.034	43.351	17.800	69.607	42.970	18.069	69.189	44.908	17.051	70.575	1.451	2.131	1.491	2.140	1.319	2.787 m²										
004-P003	Glazing b	44.908	17.051	70.575	42.970	18.069	69.189	47.293	16.420	68.877	45.328	16.297	69.362	1.406	2.120	1.451	2.131	1.303	2.742 m²										
004-P004	Glazing b	46.928	16.620	70.222	47.293	16.420	68.877	49.394	16.126	68.558	49.032	16.297	69.363	1.365	2.133	1.406	2.145	1.262	2.736 m²										
004-P005	Glazing b	48.032	16.297	69.963	49.394	16.126	68.558	51.548	16.069	68.512	51.194	16.213	69.780	1.365	2.134	1.406	2.146	1.272	2.714 m²										
004-P006	Glazing b	51.194	16.213	69.780	51.548	16.069	68.512	53.730	16.231	68.418	53.388	16.347	69.652	1.286	2.190	1.324	2.202	1.164	2.727 m²										
004-P007	Glazing b	53.730	16.347	69.652	53.730	16.231	68.418	55.917	16.590	68.357	55.589	16.681	69.564	1.254	2.166	1.286	2.227	1.081	2.708 m²										
004-P008	Glazing b	55.917	16.681	69.564	55.917	16.590	68.357	58.082	17.124	68.309	57.769	17.193	69.495	1.229	2.231	1.254	2.240	1.056	2.679 m²										
004-P009	Glazing b	57.769	17.193	69.495	58.082	17.124	68.309	60.307	17.817	68.256	59.901	17.868	69.431	1.214	2.229	1.229	2.238	1.056	2.643 m²										
004-P010	Glazing b	59.901	17.868	69.431	60.307	17.817	68.256	62.730	18.351	68.558	62.393	18.126	69.363	1.286	2.190	1.324	2.202	1.164	2.618 m²										
004-P011	Glazing b	61.953	18.703	69.385	62.730	18.666	68.212	64.159	19.680	68.205	63.888	19.705	70.362	1.207	2.171	1.207	2.179	1.268	2.576 m²										
004-P012	Glazing b	63.888	19.706	69.382	64.159	19.680	68.212	66.923	20.867	68.267	65.669	20.865	69.450	1.210	2.127	1.207	2.171	1.268	2.551 m²										
004-P013	Glazing b	65.669	20.865	69.450	66.923	20.867	68.267	69.242	22.338	68.421	67.280	22.244	69.615	1.217	2.089	1.210	2.101	1.243	2.523 m²										
004-P014	Glazing b	67.240	22.244	69.615	69.242	22.338	68.421	70.422	23.649	68.633	67.463	23.563	69.823	1.223	2.092	1.223	2.099	1.248	2.498 m²										
004-P015	Glazing b	69.242	23.649	69.831	70.422	23.798	68.633	72.660	25.007	68.628	69.724	25.256	70.344	1.229	2.102	1.223	2.104	1.264	2.466 m²										
004-P016	Glazing b	70.344	25.256	70.344	69.800	25.557	69.724	72.678	27.482	69.780	70.539	27.177	70.934	1.234	2.156	1.229	2.168	1.241	2.558 m²										
004-P017	Glazing b	72.678	27.482	70.539	72.678	27.482	69.780	74.811	28.845	69.411	73.877	28.416	71.728	1.239	2.159	1.234	2.171	1.248	2.536 m²										
004-P018	Glazing b	74.811	28.845	71.728	74.811	28.845	69.411	77.044	30.025	69.189	76.195	29.681	73.193	1.243	2.162	1.239	2.174	1.251	2.517 m²										
004-P019	Glazing b	77.044	30.025	73.193	77.044	30.025	69.189	79.261	31.197	68.357	78.416	30.862	74.365	1.243	2.162	1.243	2.174	1.251	2.497 m²										
004-P020	Glazing b	79.261	31.197	74.365	79.261	31.197	68.357	81.332	32.269	67.546	80.489	31.938	75.519	1.243	2.162	1.243	2.174	1.251	2.478 m²										
004-P021	Glazing b	81.332	32.269	75.519	81.332	32.269	67.546	83.353	33.269	66.724	82.516	32.993	76.519	1.243	2.162	1.243	2.174	1.251	2.459 m²										
004-P022	Glazing b	83.353	33.269	76.519	83.353	33.269	66.724	85.364	34.269	65.909	84.567	33.723	77.519	1.243	2.162	1.243	2.174	1.251	2.440 m²										
004-P023	Glazing b	85.364	34.269	77.519	85.364	34.269	65.909	87.375	35.269	65.099	86.678	34.593	78.519	1.243	2.162	1.243	2.174	1.251	2.421 m²										
004-P024	Glazing b	87.375	35.269	78.519	87.375	35.269	65.099	89.386	36.269	64.290	88.687	35.922	79.519	1.243	2.162	1.243	2.174	1.251	2.402 m²										
004-P025	Glazing b	89.386	36.269	79.519	89.386	36.269	64.290	91.397	37.269	63.481	90.688	36.651	80.519	1.243	2.162	1.243	2.174	1.251	2.383 m²										
004-P026	Glazing b	91.397	37.269	80.519	91.397	37.269	63.481	93.408	38.269	62.672	92.693	37.980	81.519	1.243	2.162	1.243	2.174	1.251	2.364 m²										
004-P027	Glazing b	93.408	38.269	81.519	93.408	38.269	62.672	95.419	39.269	61.863	94.714	38.709	82.519	1.243	2.162	1.243	2.174	1.251	2.345 m²										
004-P028	Glazing b	95.419	39.269	82.519	95.419	39.269	61.863	97.430	40.269	61.114	96.719	39.498	83.519	1.243	2.162	1.243	2.174	1.251	2.326 m²										
004-P029	Glazing b	97.430	40.269	83.519	97.430	40.269	61.114	99.441	41.269	60.365	98.736	40.287	84.519	1.243	2.162	1.243	2.174	1.251	2.307 m²										
004-P030	Glazing b	99.441	41.269	84.519	99.441	41.269	60.365	101.452	42.269	59.616	100.743	41.076	85.519	1.243	2.162	1.243	2.174	1.251	2.288 m²										
004-P031	Glazing b	101.452	42.269	85.519	101.452	42.269	59.616	103.463	43.269	58.867	102.754	42.076	86.519	1.243	2.162	1.243	2.174	1.251	2.269 m²										
004-P032	Glazing b	103.463	43.269	86.519	103.463	43.269	58.867	105.474	44.269	58.118	104.765	43.076	87.519	1.243	2.162	1.243	2.174	1.251	2.250 m²										
004-P033	Glazing b	105.474	44.269	87.519	105.474	44.269	58.118	107.485	45.269	57.369	106.756	43.876	88.519	1.243	2.162	1.243	2.174	1.251	2.231 m²										
004-P034	Glazing b	107.485	45.269	88.519	107.485	45.269	57.369	109.496	46.269	56.620	108.047	44.676	89.519	1.243	2.162	1.243	2.174	1.251	2.212 m²										
004-P035	Glazing b	109.496	46.269	89.519	109.496	46.269	56.620	111.507	47.269	55.871	110.348	45.476	90.519	1.243	2.162	1.243	2.174	1.251	2.193 m²										
004-P036	Glazing b	111.507	47.269	90.519	111.507	47.269	55.871	113.518	48.269	55.122	112.389	46.276	91.519	1.243	2.162	1.243	2.174	1.251	2.174 m²										
004-P037	Glazing b	113.518	48.269	91.519	113.518	48.269	55.122	115.529	49.269	54.373	114.390	47.076	92.519	1.243	2.162	1.243	2.174	1.251	2.155 m²										
004-P038	Glazing b	115.529	49.269	92.519	115.529	49.269	54.373	117.540	50.269	53.624	116.251	47.876	93.519	1.243	2.162	1.243	2.174	1.251	2.136 m²										
004-P039	Glazing b	117.540	50.269	93.519	117.540	50.269	53.624	119.551	51.269	52.875	118.102	48.676	94.519	1.243	2.162	1.243	2.174	1.251	2.117 m²										
004-P040	Glazing b	119.551	51.269	94.519	119.551	51.269	52.875	121.562	52.269	52.126	120.363	49.476	95.519	1.243	2.162	1.243	2.174	1.251	2.098 m²										
004-P041	Glazing b	121.562	52.269	95.519	121.562	52.269	52.126	123.573	53.269	51.377	122.414	50.276	96.519	1.243	2.162	1.243	2.174	1.251	2.079 m²										
004-P042	Glazing b	123.573	53.269	96.519	123.573	53.269	51.377	125.584	54.269	50.628	124.415	51.076	97.519	1.243	2.162	1.243	2.174	1.251	2.060 m²										
004-P043	Glazing b	125.584	54.269	97.519	125.584	54.269	50.628	127.595	55.269	49.879	126.416	51.876	98.519	1.243	2.162	1.243	2.174	1.251	2.041 m²										
004-P044	Glazing b	127.595	55.269	98.519	127.595	55.269	49.879	129.606	56.269	49.130	128.417	52.676	99.519	1.243	2.162	1.243	2.174	1.251	2.022 m²										
004-P045	Glazing b	129.606	56.269	99.519	129.606	56.269	49.130	131.617	57.269	48.381	130.418	53.476	100.519	1.243	2.162	1.243	2.174	1.251	2.003 m²										
004-P046	Glazing b	131.617	57.269	100.519	131.617	57.269	48.381	133.628	58.269	47.632	132.419	54.276	101.519	1.243	2.162	1.243	2.174	1.251	1.984 m²										
004-P047	Glazing b	133.628	58.269	101.519	133.628	58.269	47.632	135.639	59.269	46.883	134.220	55.076	102.519	1.243	2.162	1.243	2.174	1.251	1.965 m²										
004-P048	Glazing b	135.639	59.269	102.519	135.639	59.269	46.883	137.650	60.269	46.134	136.021	55.876	103.519	1.243	2.162	1.243	2.174	1.251	1.946 m²										
004-P049	Glazing b	137.650	60.269	103.519	137.650	60.269	46.134	139.661	61.269	45.385	138.822	56.676	104.519	1.243	2.162	1.243	2.174	1.251	1.927 m²										
004-P050	Glazing b	139.661	61.269	104.519	139.661	61.269	45.385	141.672	62.269	44.636	140.623	57.476	105.519	1.243	2.162	1.243	2.174	1.251	1.908 m²										
004-P051	Glazing b	141.672	62.269	105.519	141.672	62.269	44.636	143.683	63.269	43.887	142.824	58.276	106.519	1.243	2.162	1.243	2.174	1.251	1.889 m²										
004-P052	Glazing b	143.683	63.269	106.519	143.683	63.269	43.887	145.694	64.269	43.138	144.625	59.076	107.519	1.243	2.162	1.243	2.174	1.251	1.870 m²										
004-P053	Glazing b	145.694	64.269	107.519	145.694	64.269	43.138	147.705	65.269	42.389	146.626	59.876	108.519	1.243	2.162	1.243	2.174	1.251	1.851 m²										
004-P054	Glazing b	147.705	65.269	108.519	147.705	65.269	42.389	149.716	66.269	41.640	148.627	60.676	109.519	1.243	2.162	1.243	2.174	1.251	1.832 m²										
004-P055	Glazing b	149.71																											

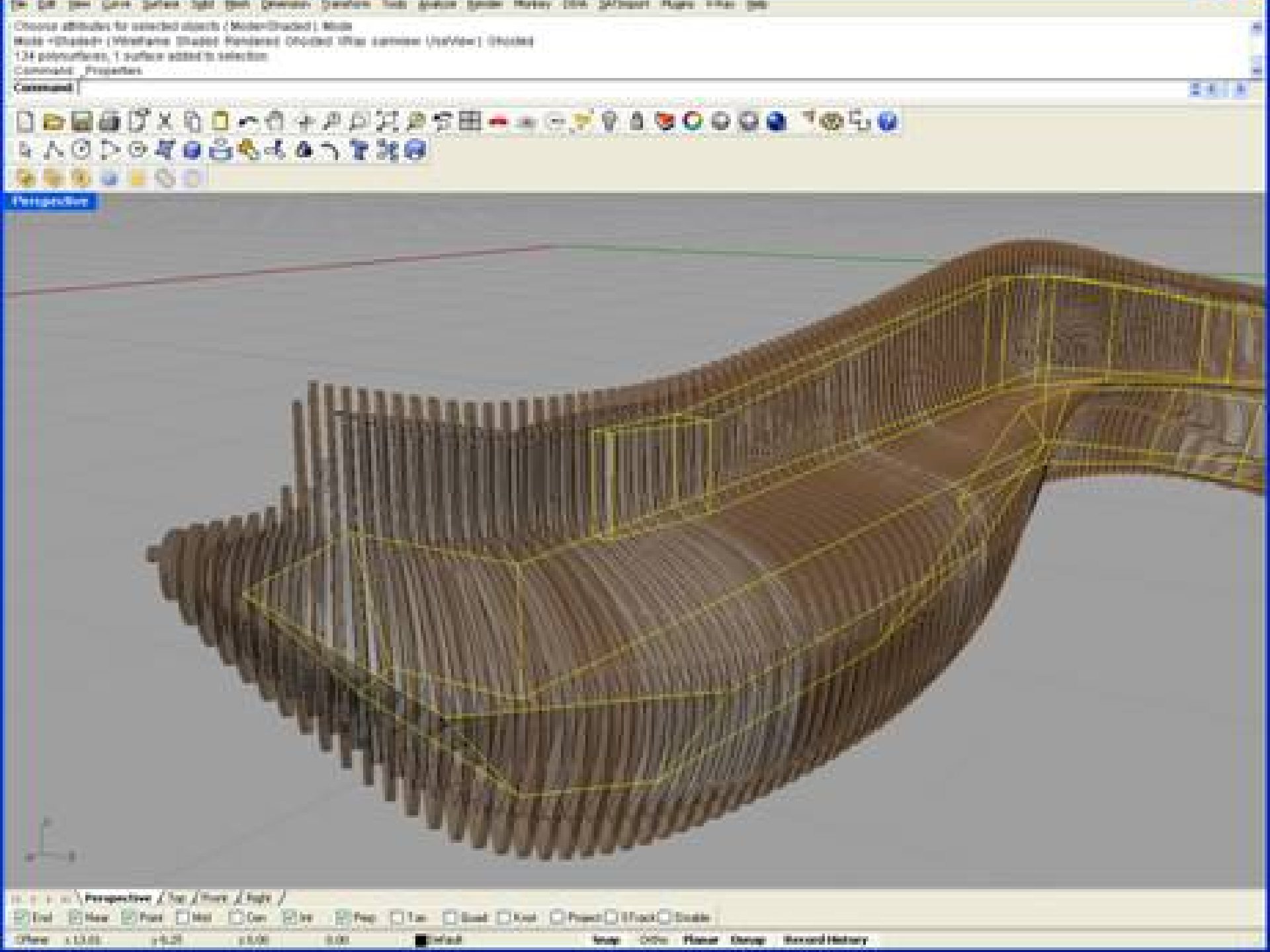
BIM in Organic Design Manufacturing

Direct from Design to Manufacturing / Construction











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

Creating meshes... Press Esc to cancel

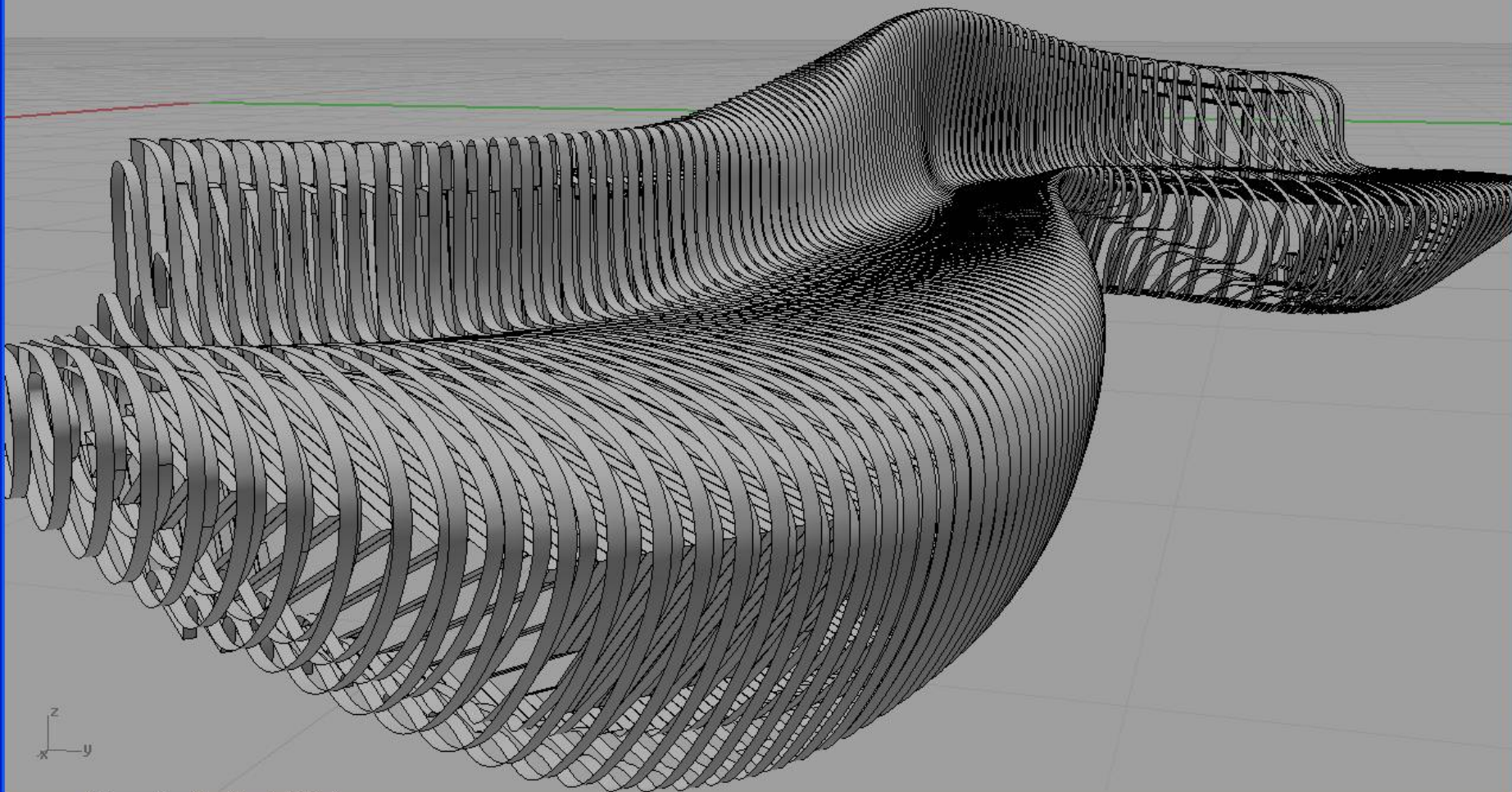
Command: _Undo

Undoing Cap

Command:



Perspective

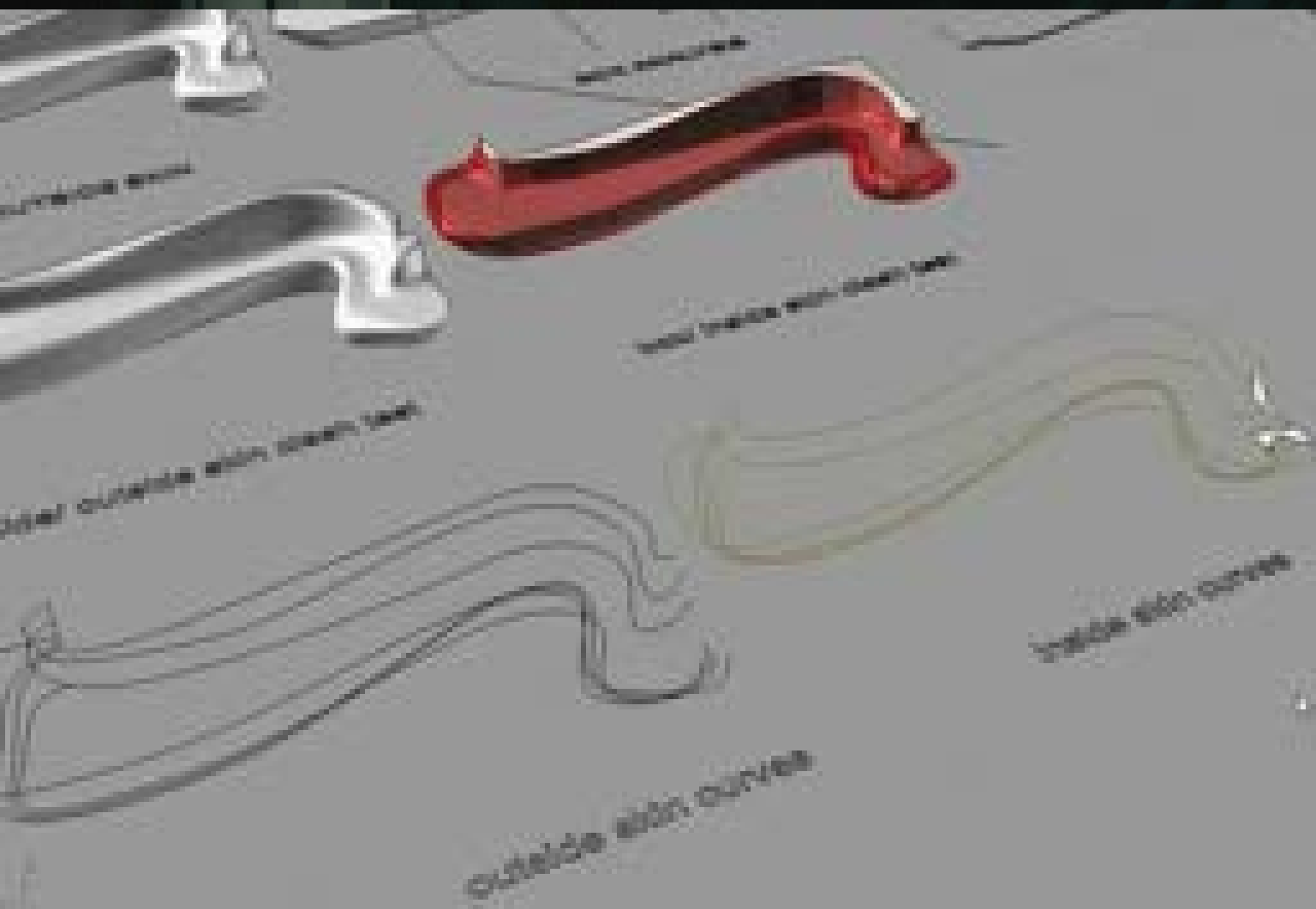


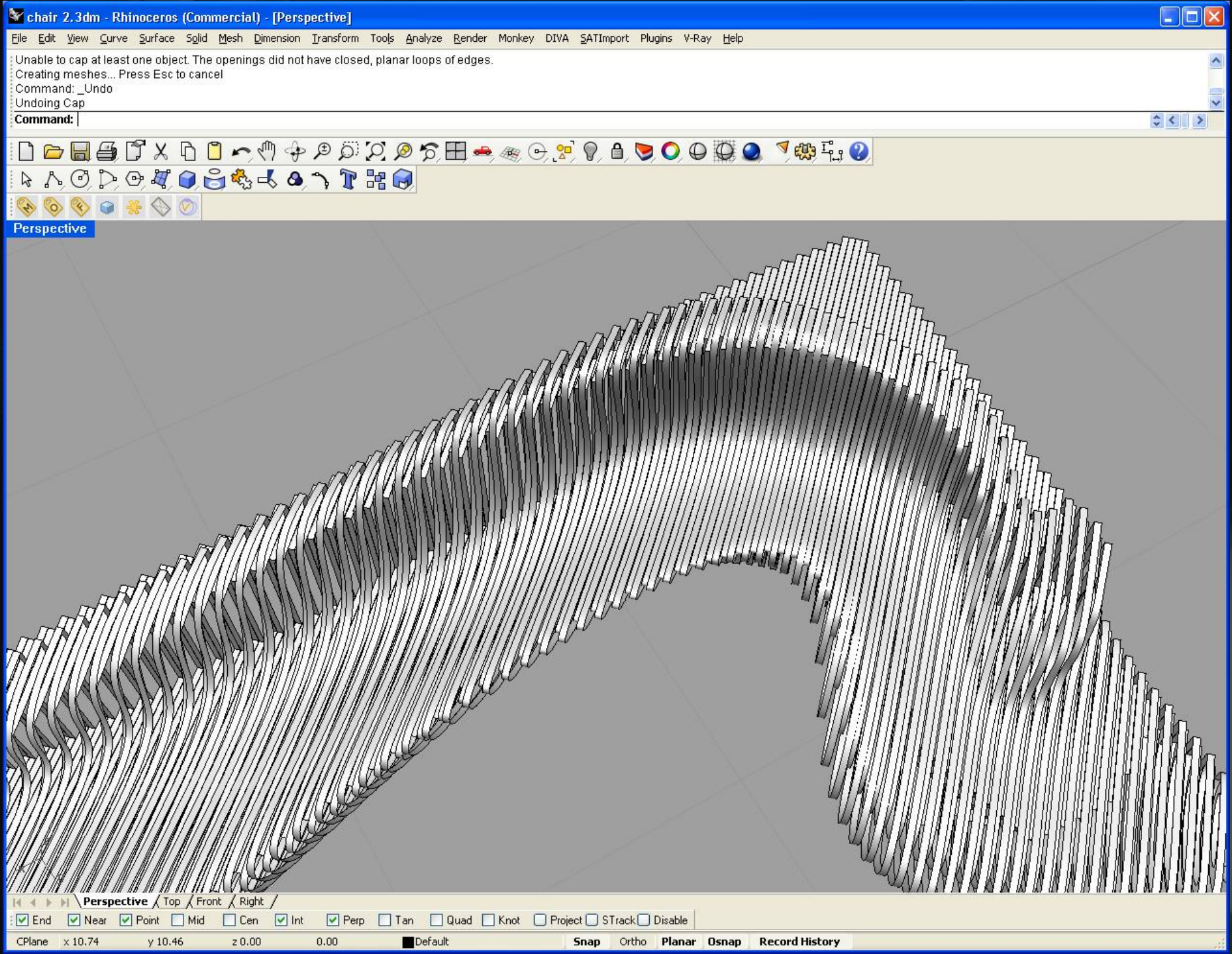
Perspective / Top / Front / Right /

☒ 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

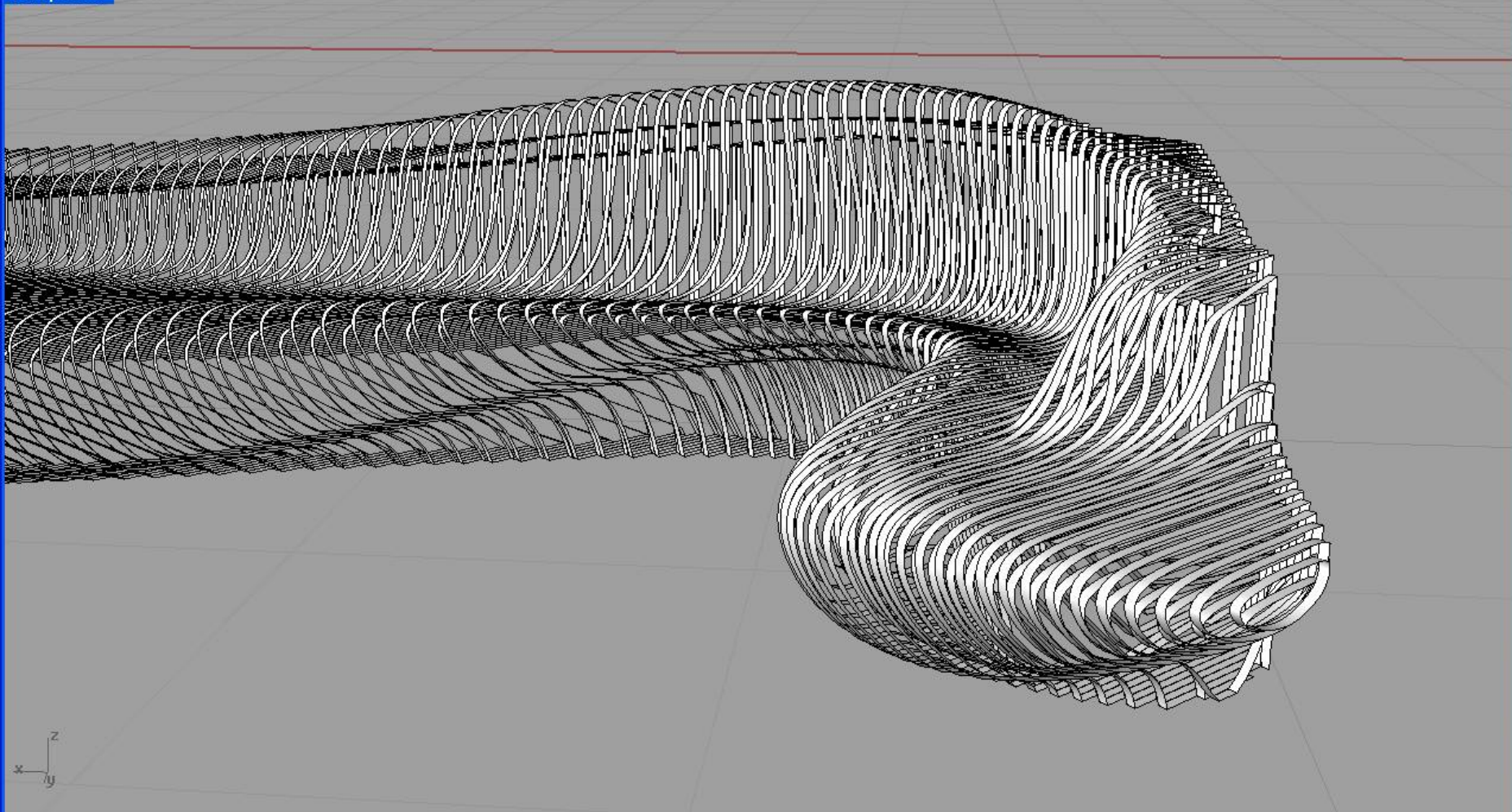
Command: _Undo

Undoing Cap

Command:



Perspective

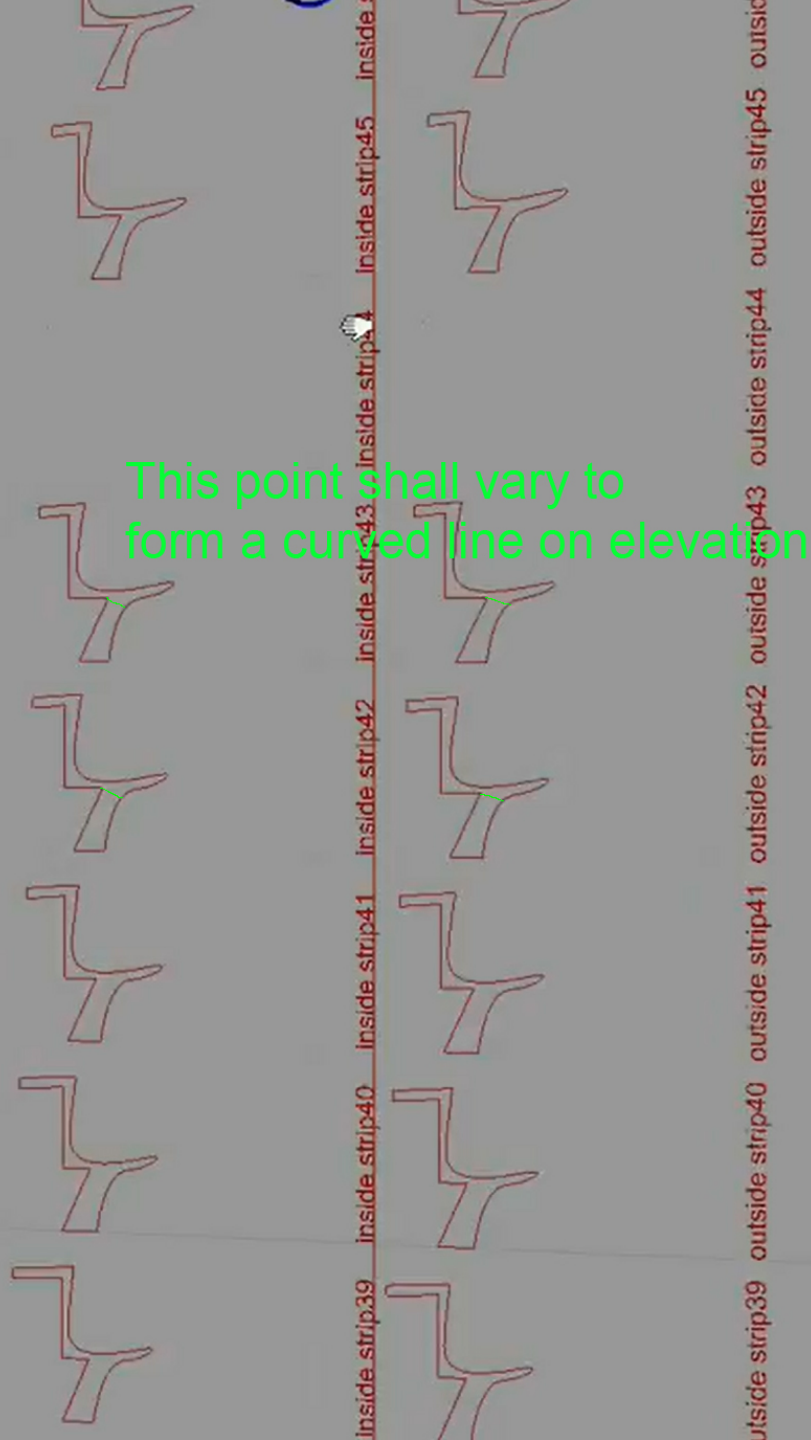


Perspective / Top / Front / Right

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

CPlane x 10.62 y 9.55 z 0.00 0.00 Default

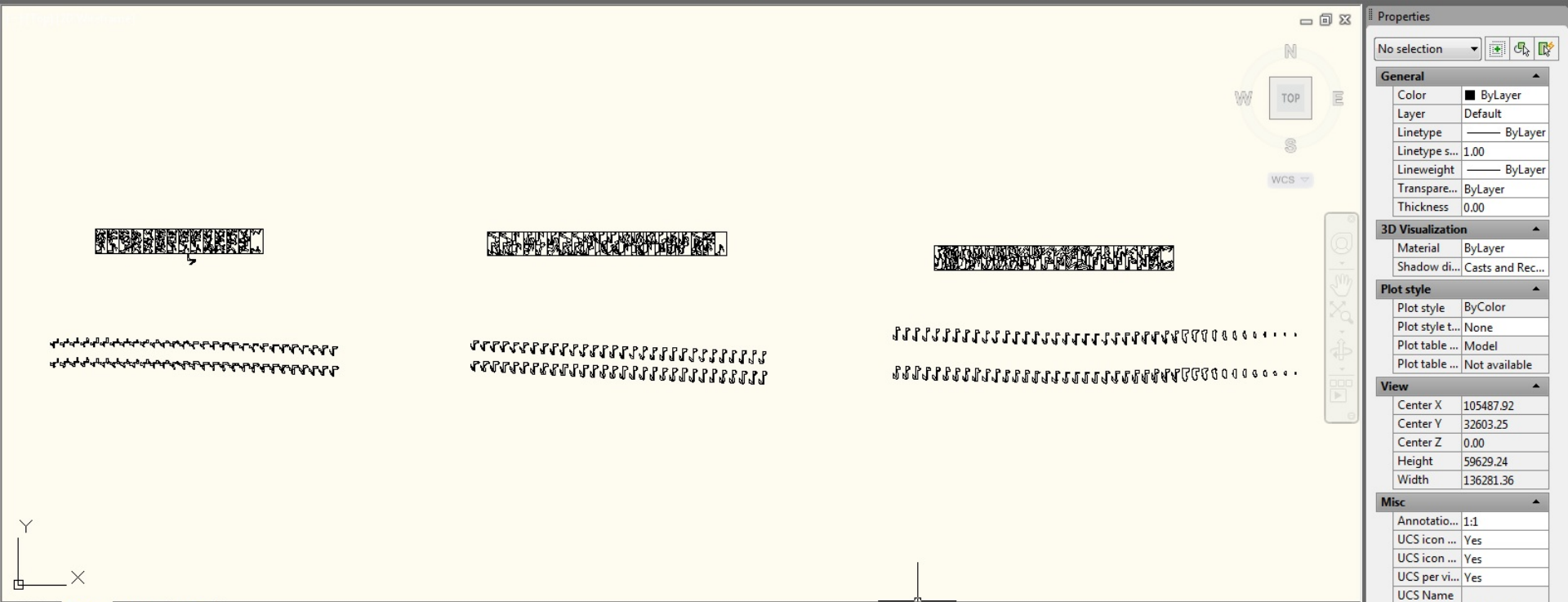
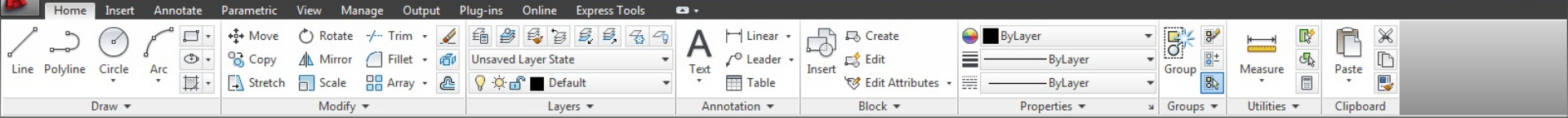
Snap Ortho Planar Osnap Record History



1:13

1:10 / 1:38





Properties

No selection

General

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Layer	Default
Linetype	ByLayer
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Transpare...	ByLayer
Thickness	0.00

3D Visualization

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

Plot style

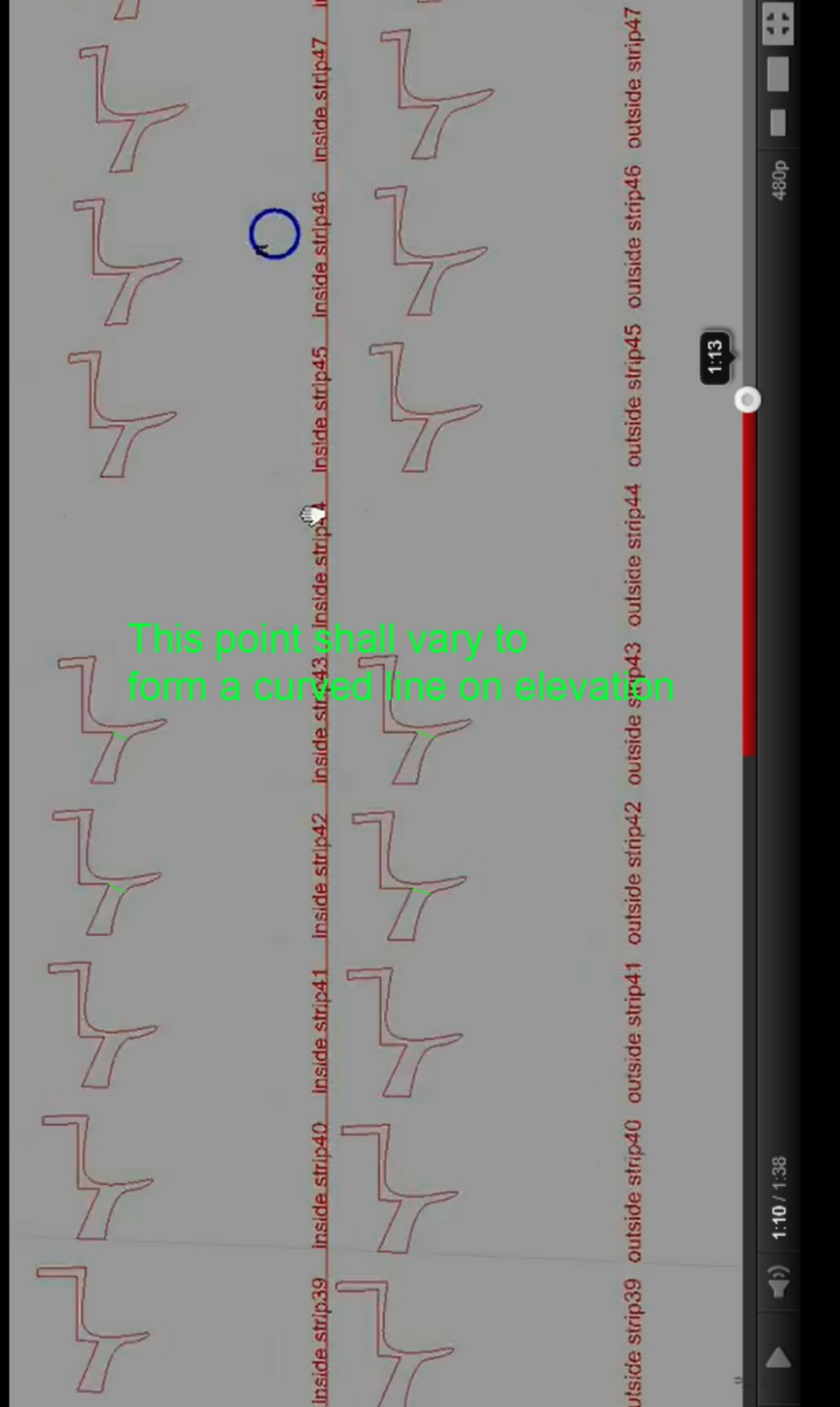
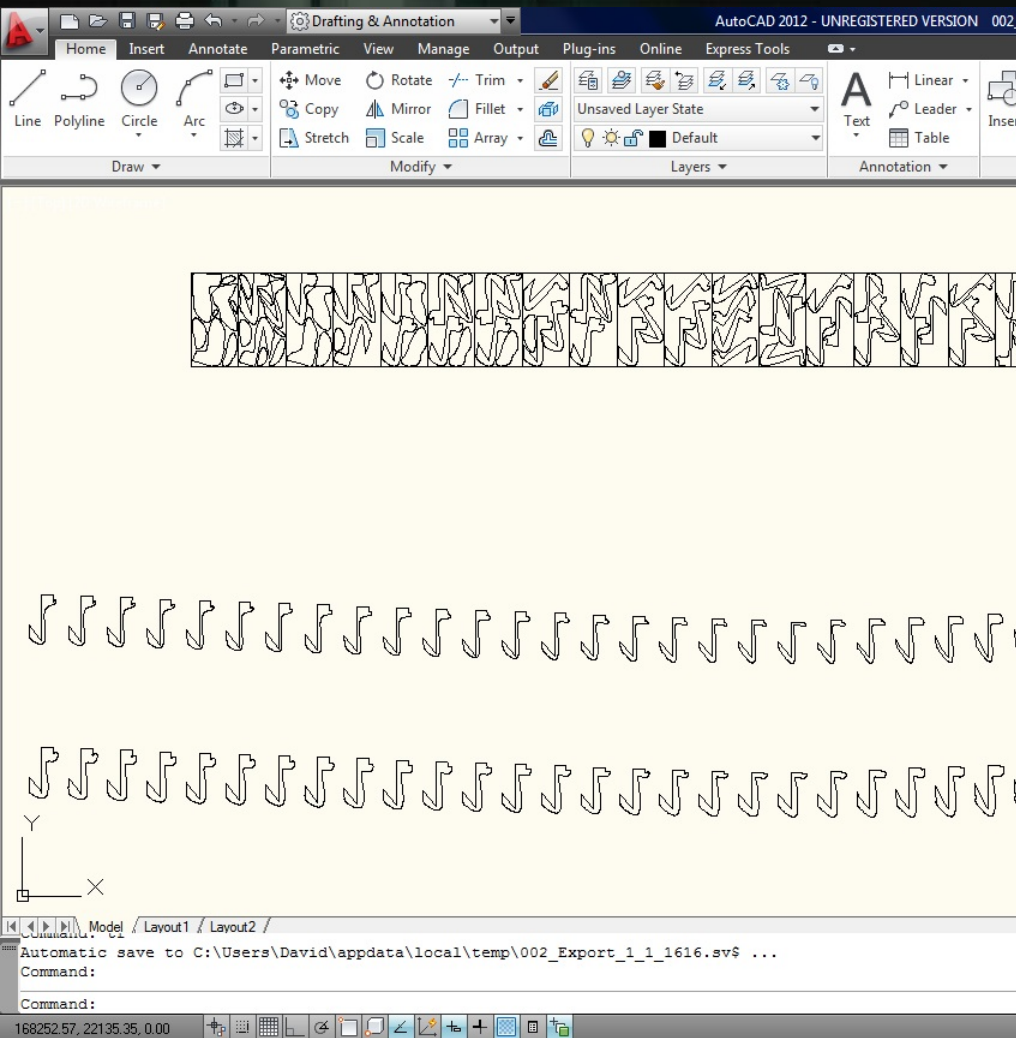
Plot style	ByColor
Plot style t...	None
Plot table ...	Model
Plot table ...	Not available

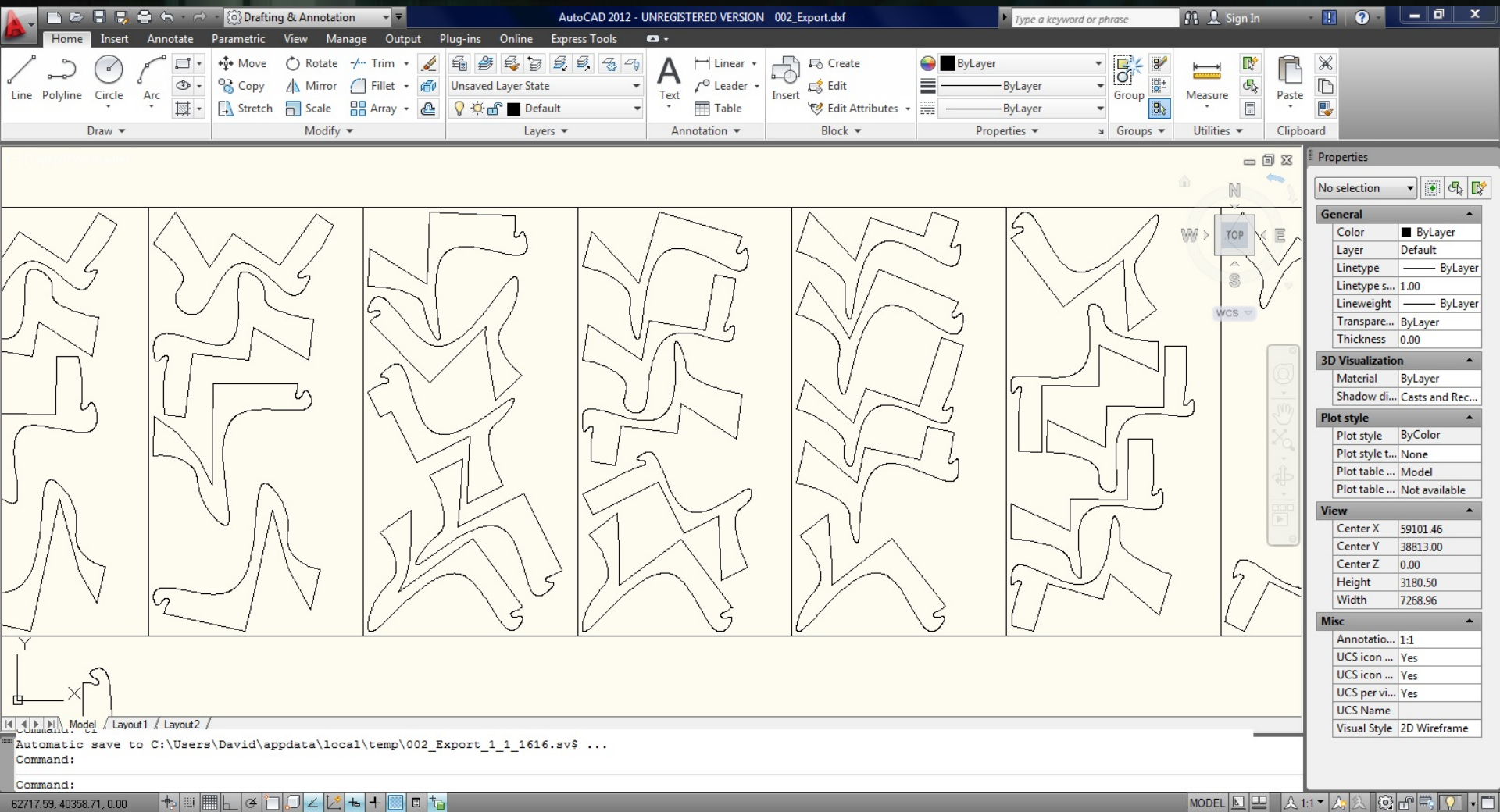
View

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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 2.654m
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 2.4m	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 1.769m
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



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sheet_30_preview_thumb.jpg



sheet_31_preview_thumb.jpg



sheet_32_preview_thumb.jpg



sheet_33_preview_thumb.jpg

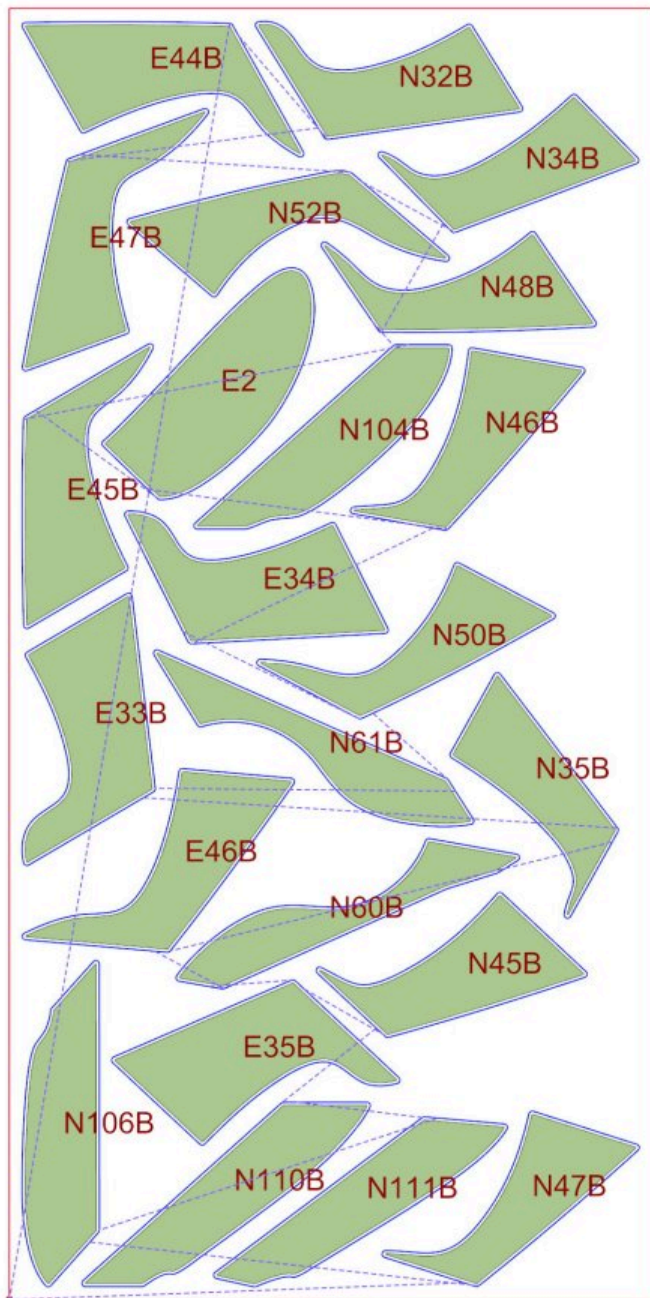


sheet_34_preview_thumb.jpg

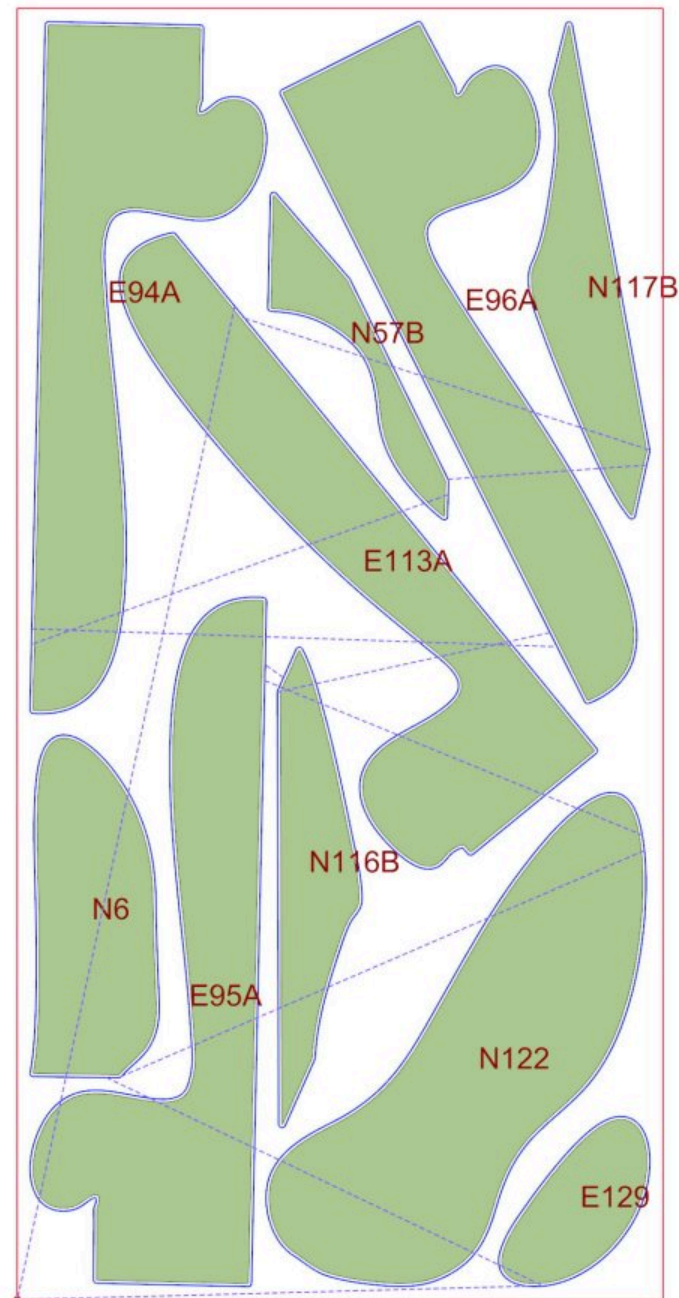


sheet_35_preview_thumb.jpg





Sheet43



Sheet9















Sheet 42
N99B
1.94m

N17A

~~A10-1~~ N18A

(1) N19A

N20A

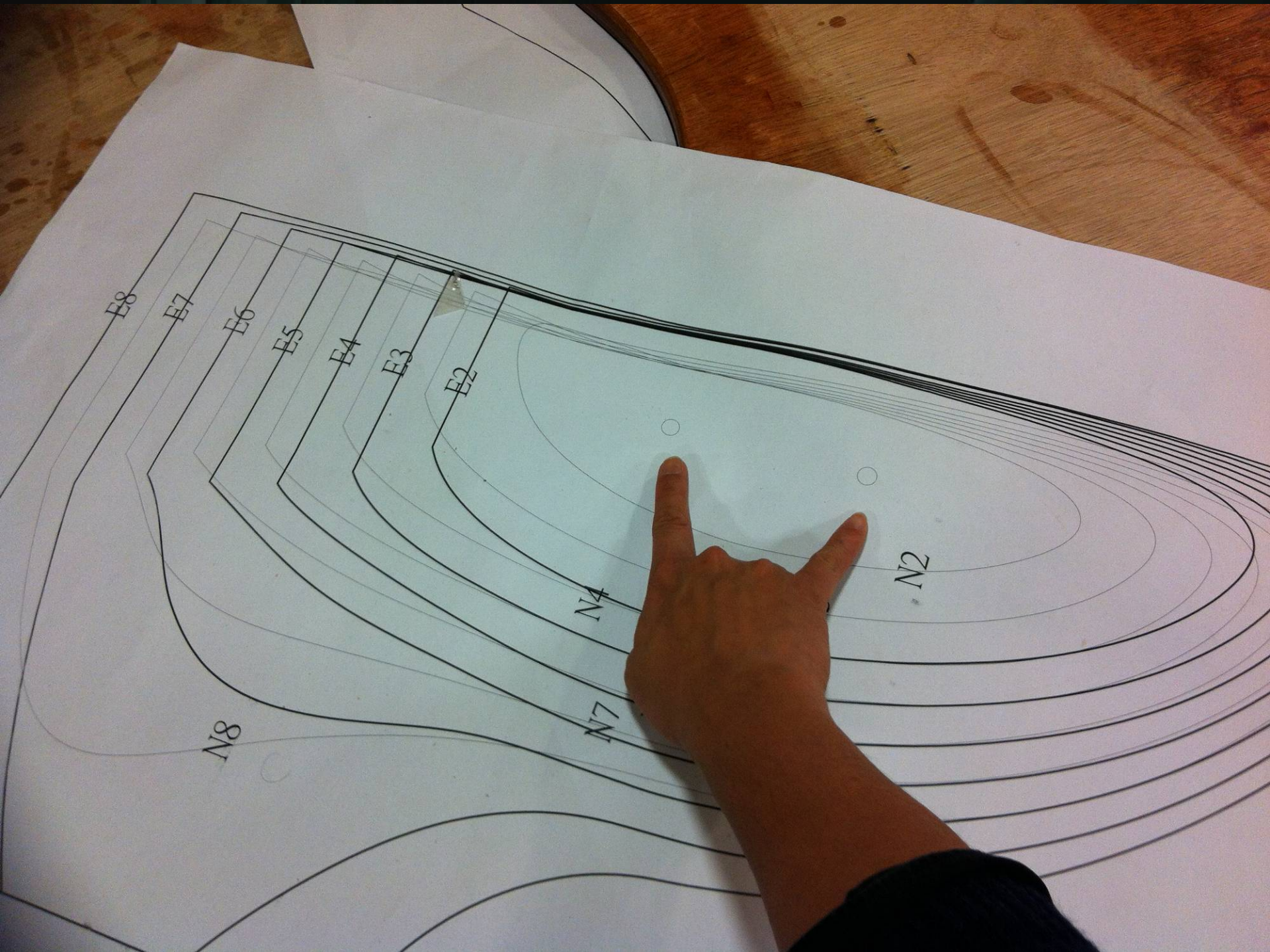




















• Thank You !