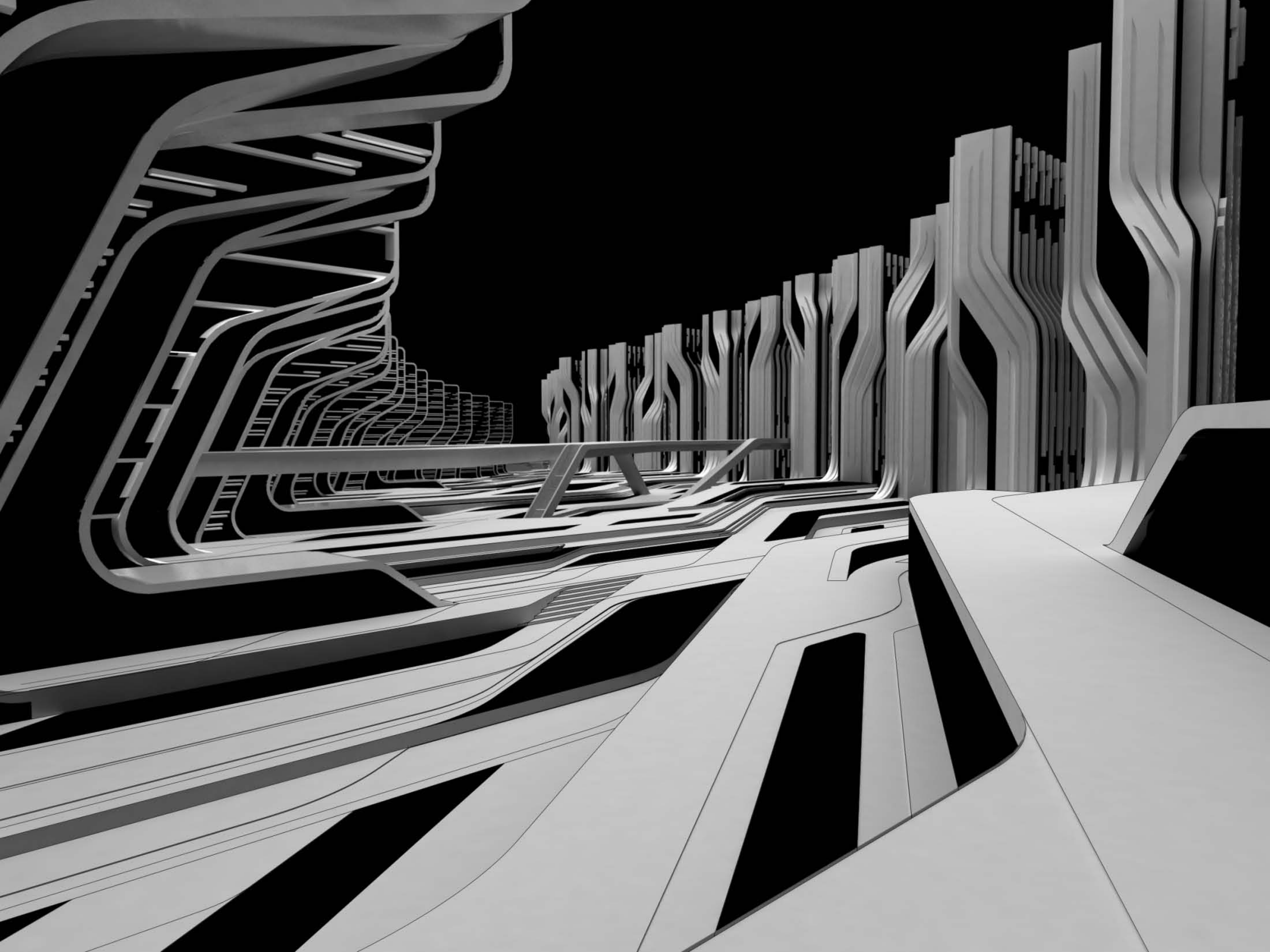
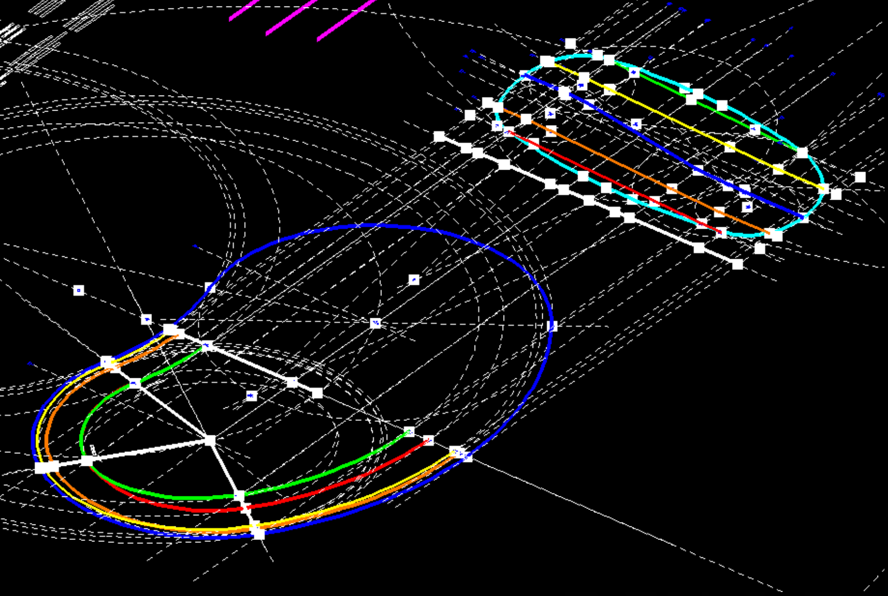
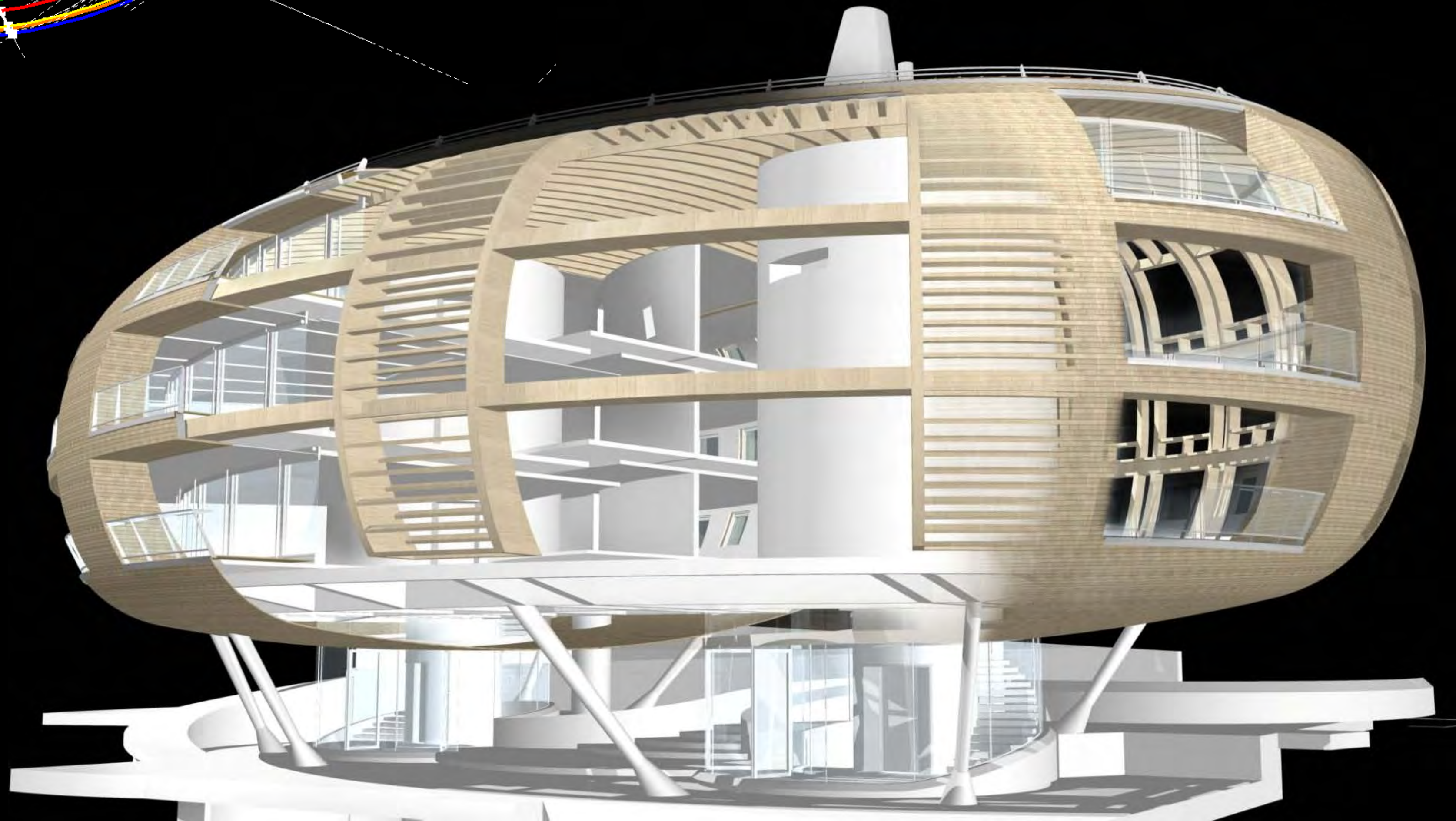
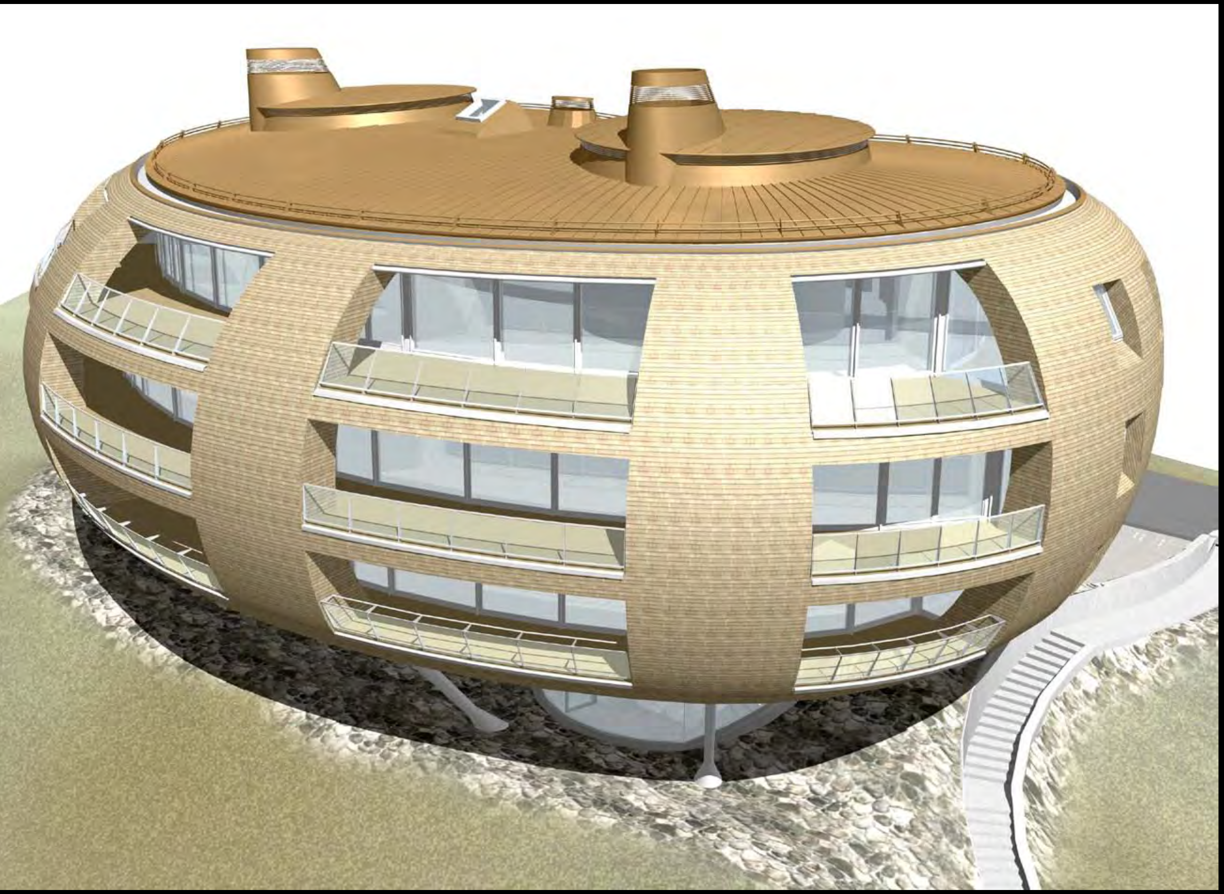


INTEROPERABILITY

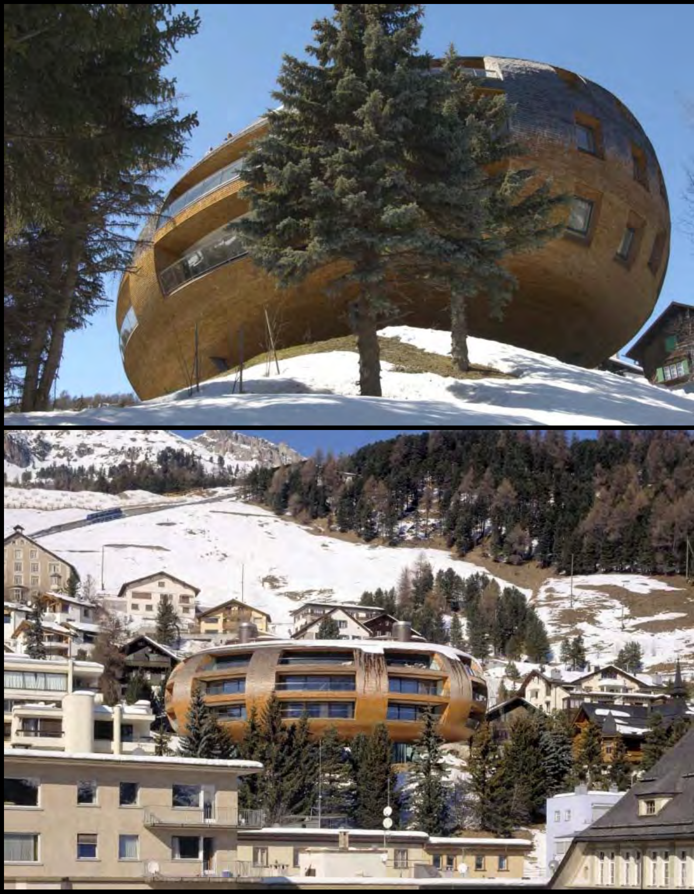
Case Study Explorations of Digital Design with Combined Software Approach



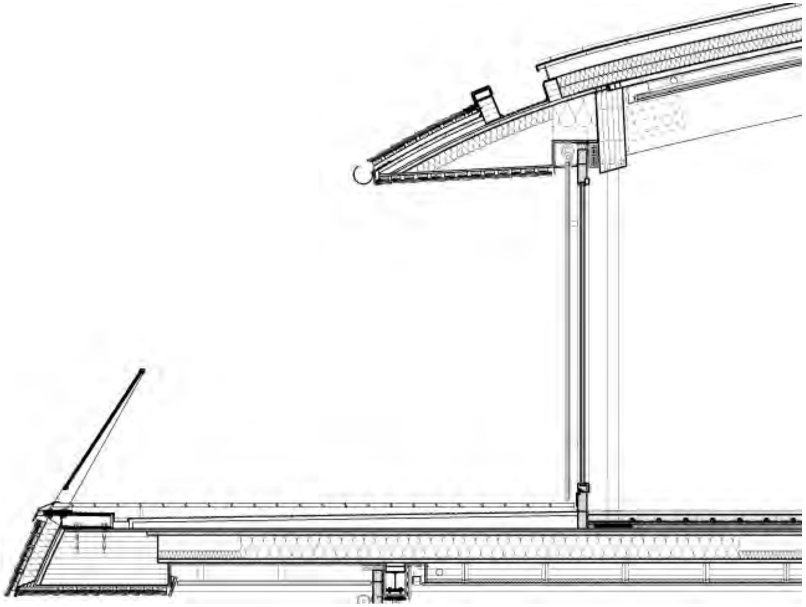
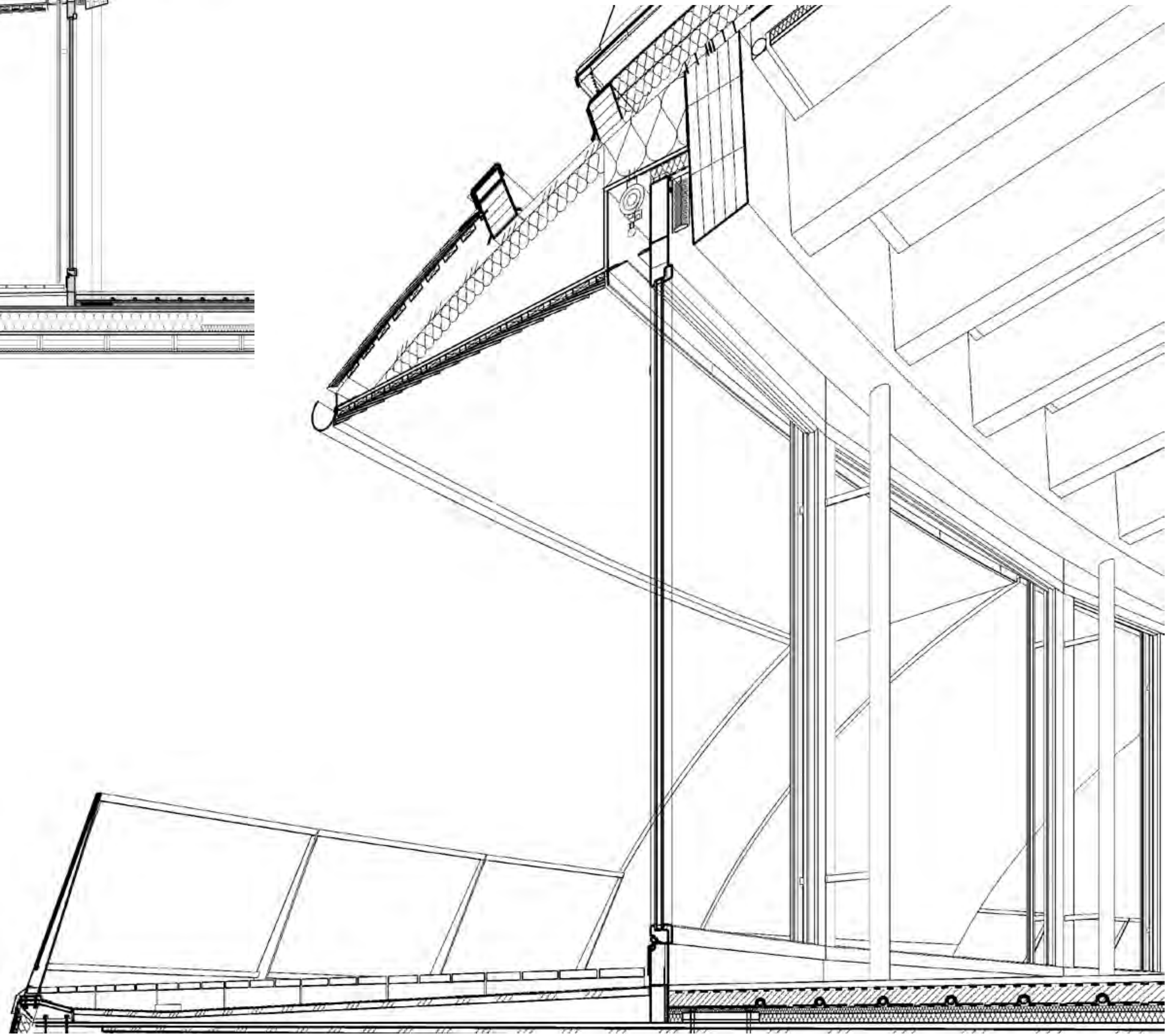


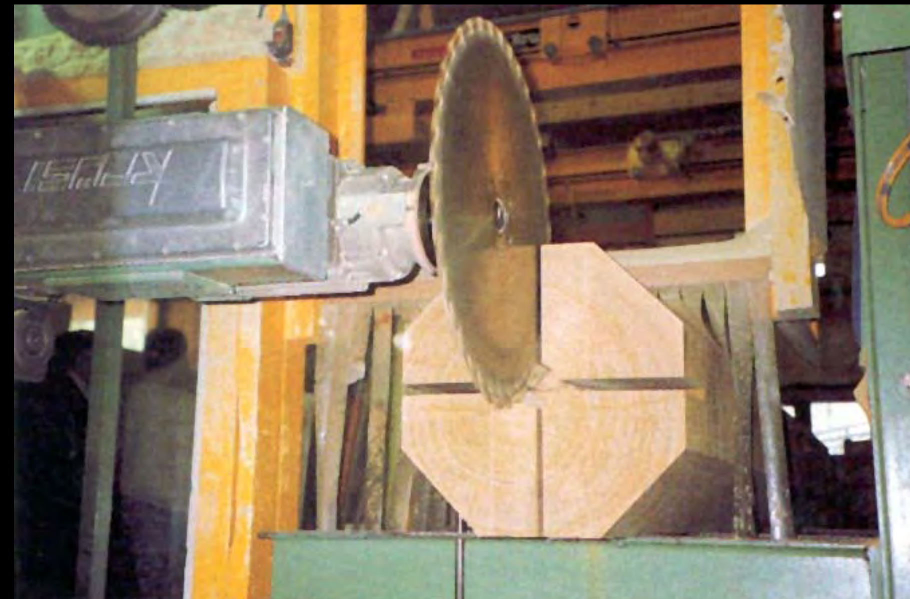
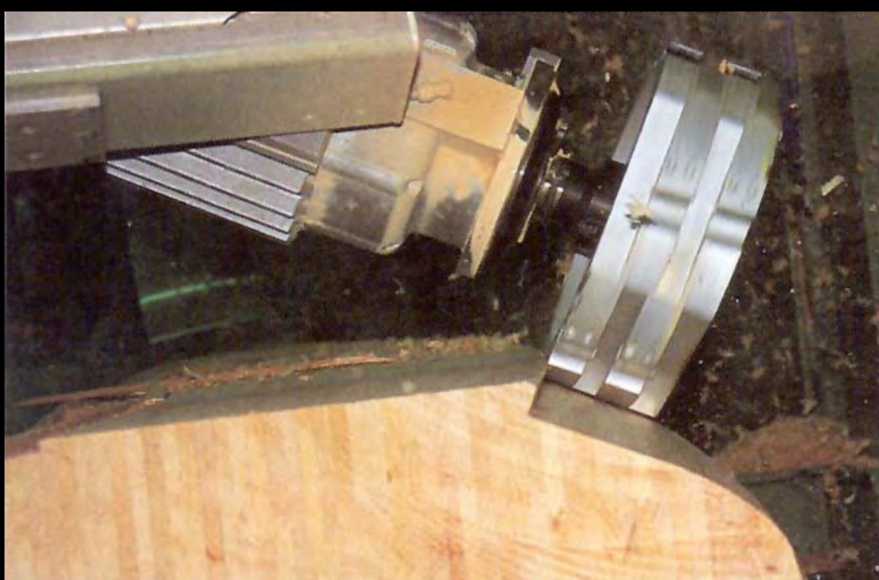


Rendered View – early design study



Site Photos

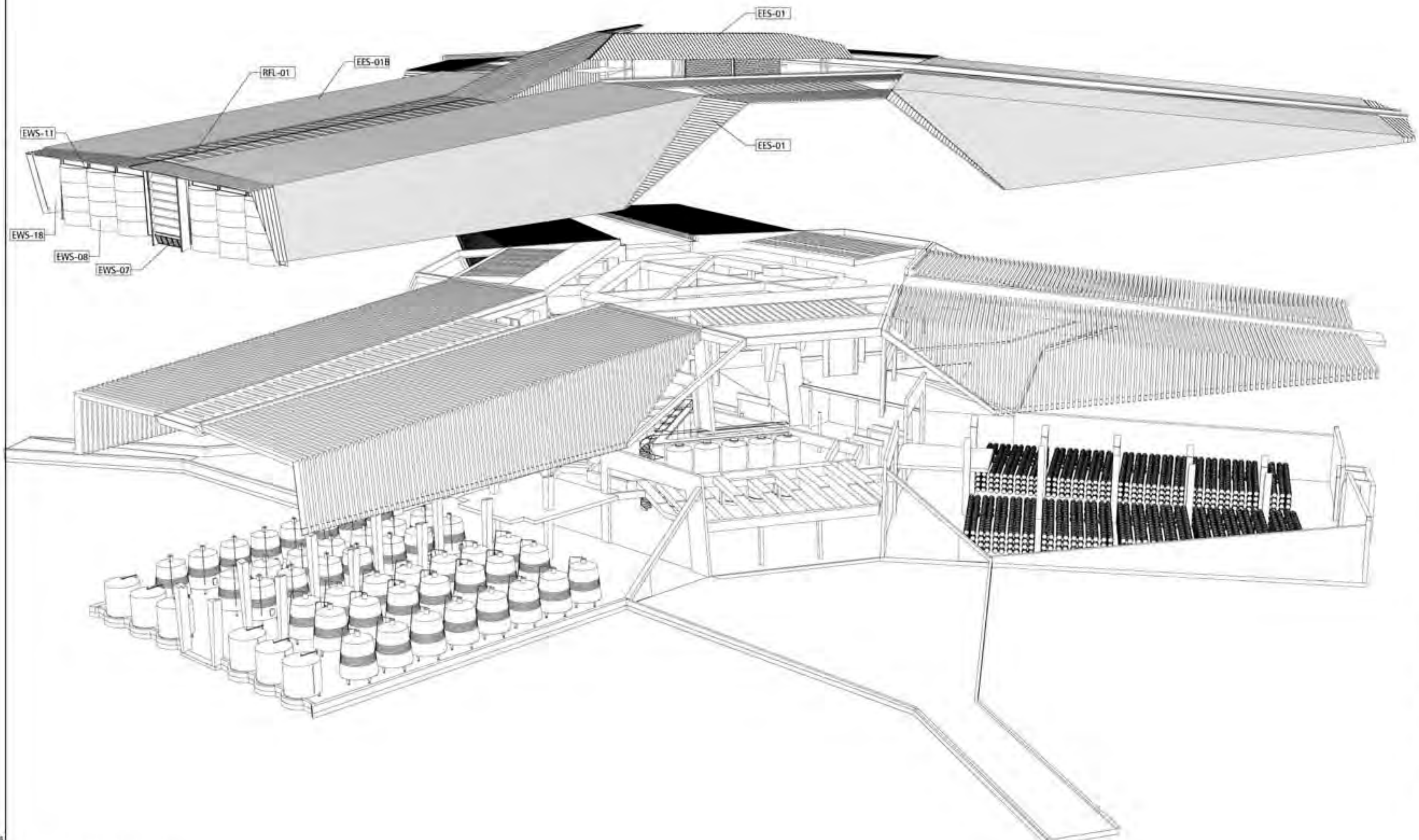



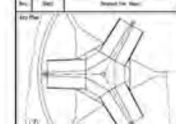


30 5 2002


20 8 2002



01 Persopectiva en capas



Foster and Partners

Agroindus

GRUPO FAUSTINO

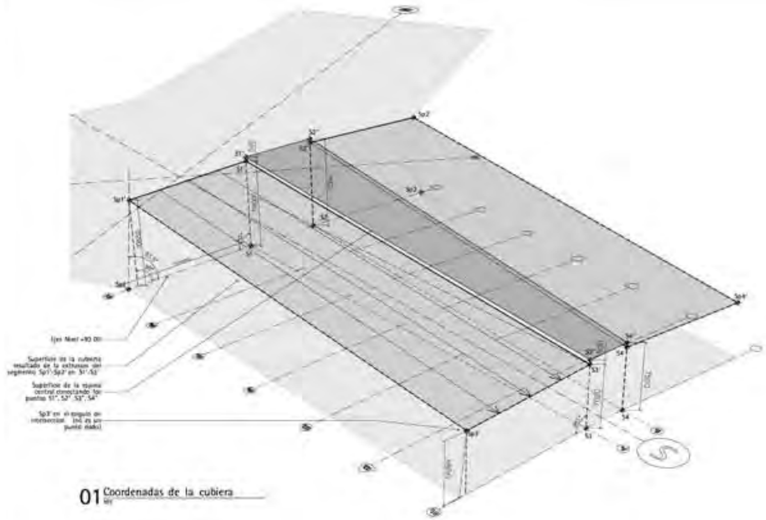
BODEGAS PORTIA

AXONOMETRIA

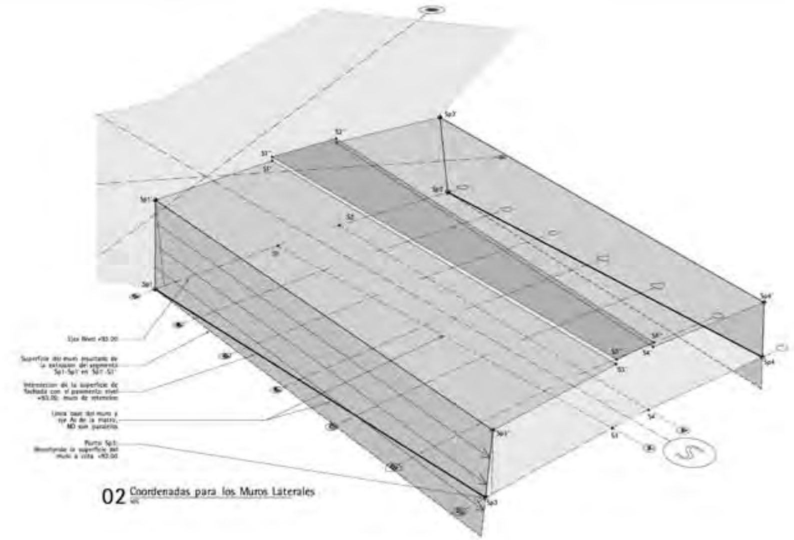
1327	F&P	NTS		02
20/02/06	00000	CL	A1250	



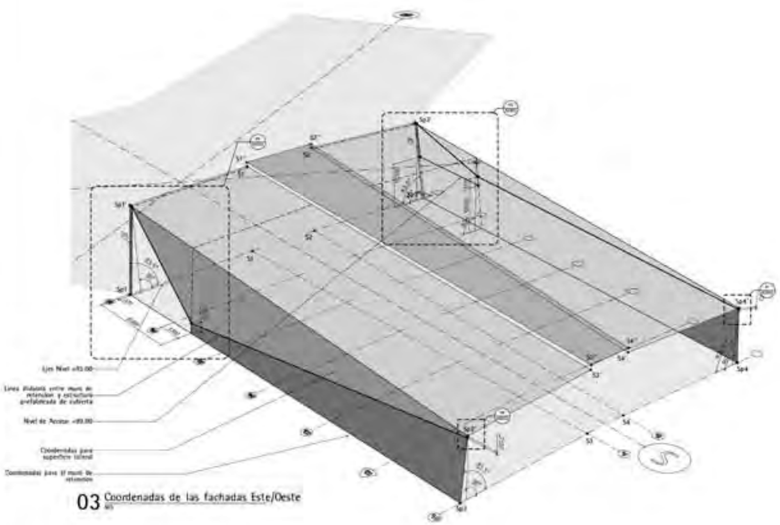




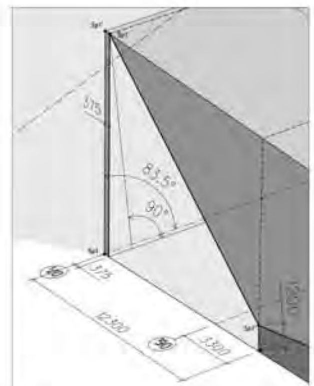
01 Coordenadas de la cubiera



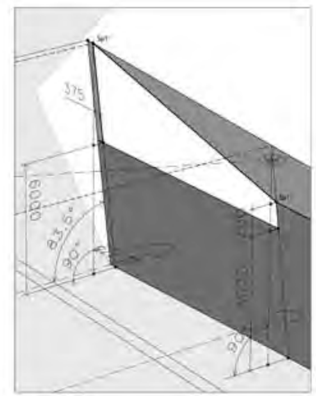
02 Coordenadas para los Muros Laterales



03 Coordenadas de las fachadas Este/Oeste

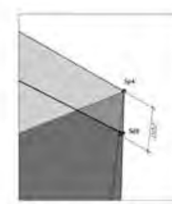


04 Muro Oeste



05 Muro Este

06 Extremo Muro Oeste



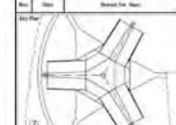
07 Extremo Muro Este

NB

Coordenadas para las superficies de cubierta simétricas

Coordenadas para las superficies laterales simétricas

Todas las cotas verticales son calculadas perpendicularmente a la superficie de pavimento



Foster and Partners

Agroindus

Client

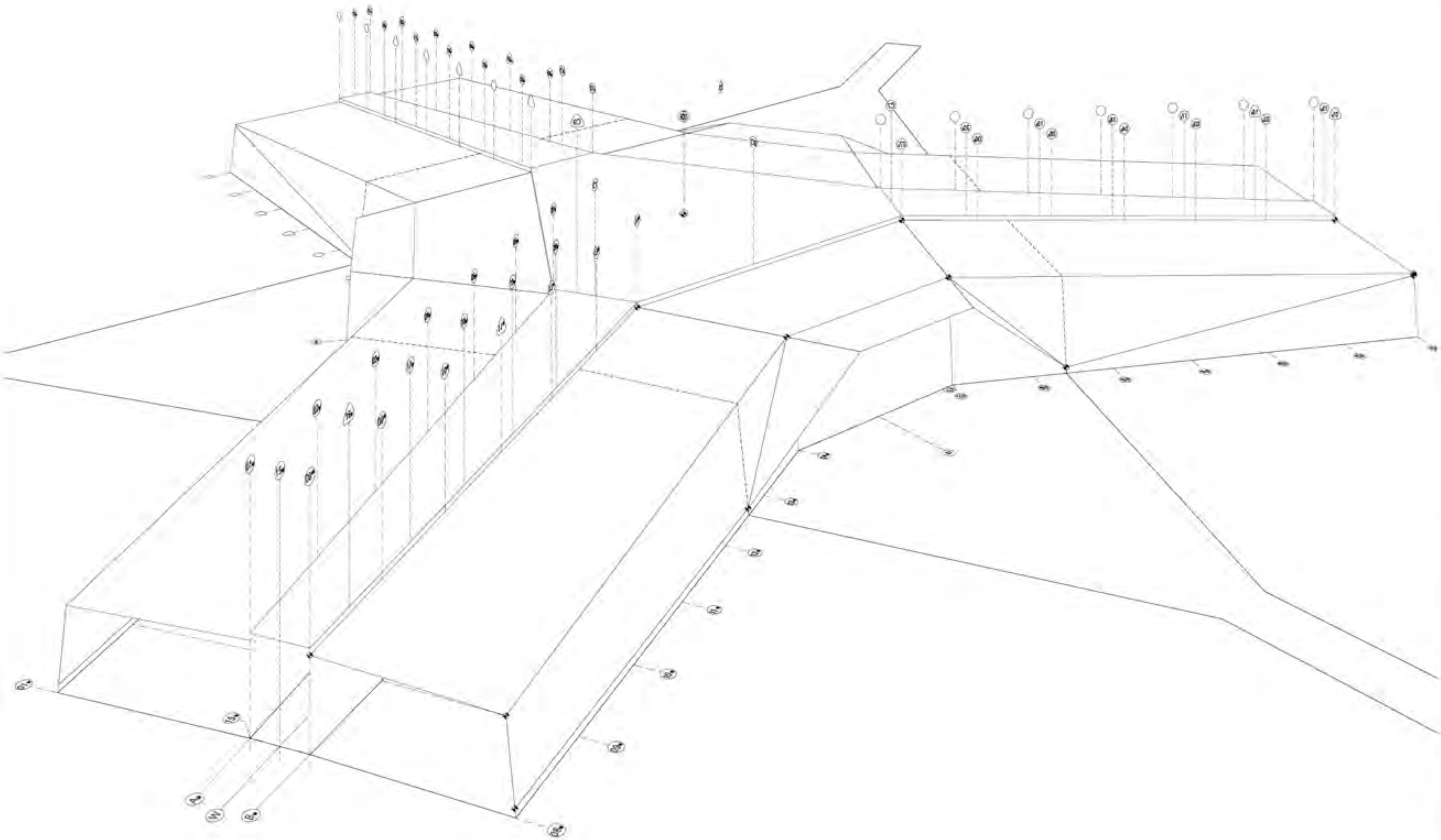
GRUPO FAUSTINO

Project

BODEGAS PORTIA

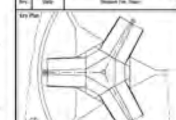
NAVE SUR
COORDENADAS PARA SUPERFICIES

1327	F&P	NTS		02
	00000		A2515	



01 Perspectiva

Key Plan



Foster and Partners

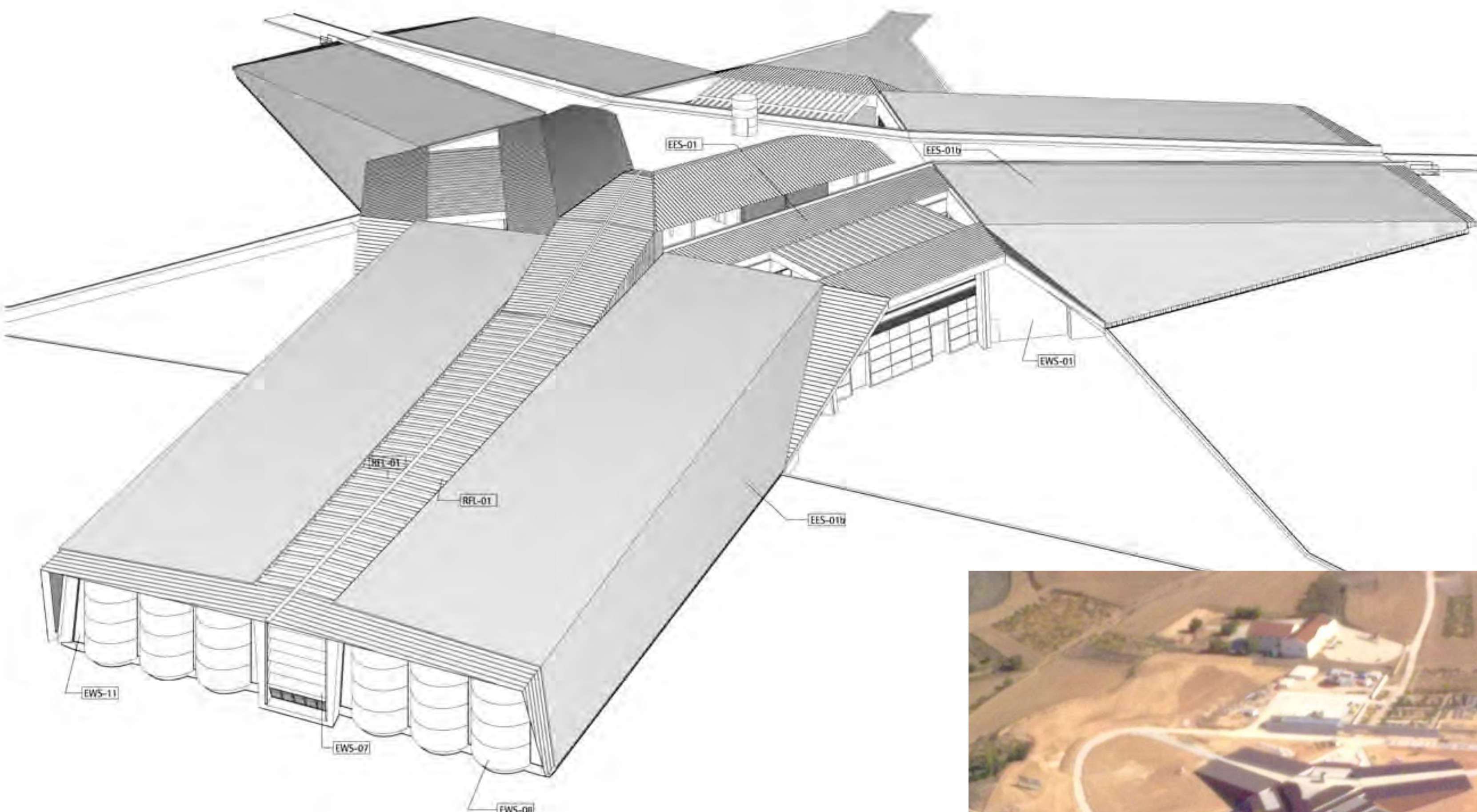
Agroindus

GRUPO FAUSTINO

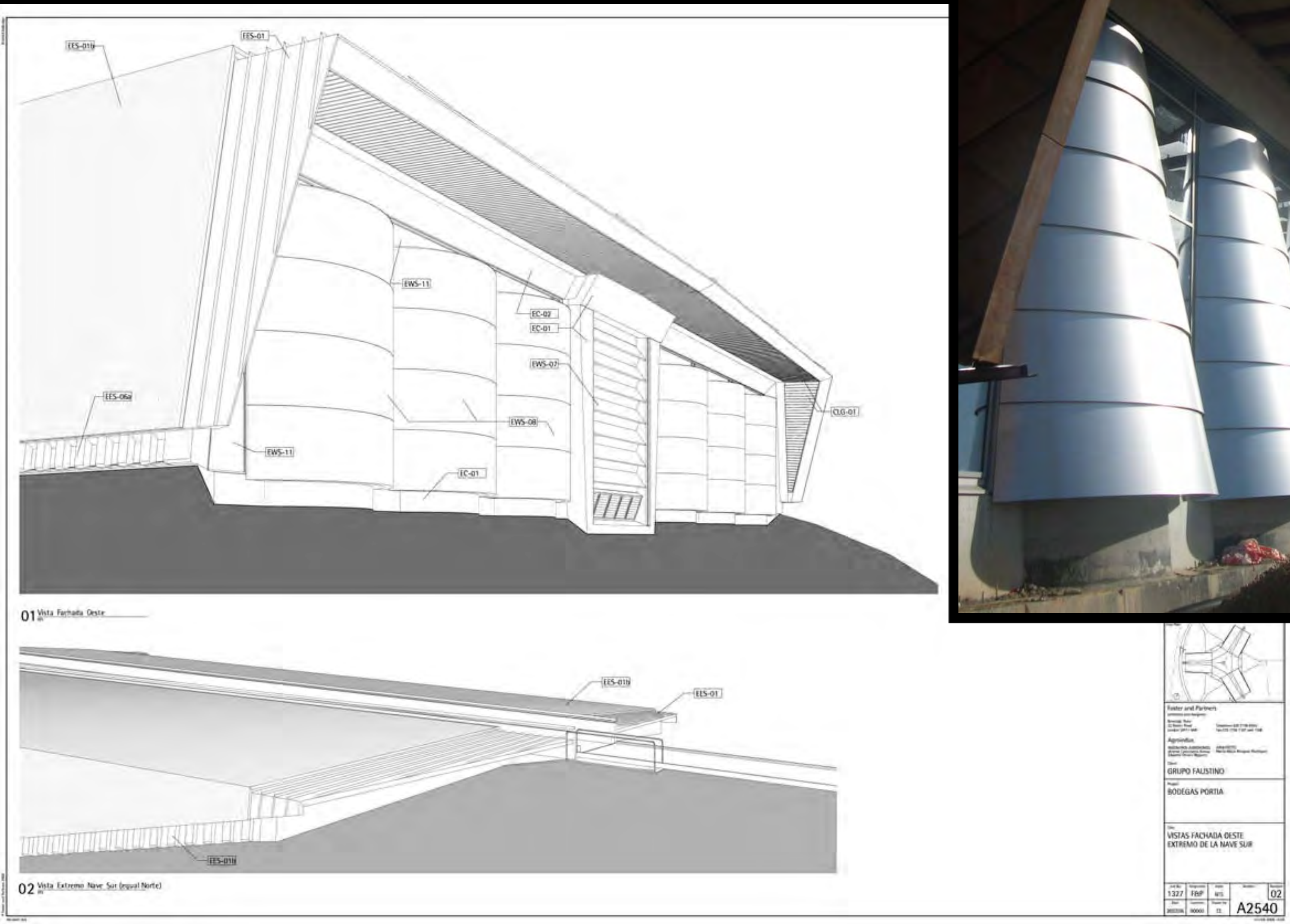
BODEGAS PORTIA

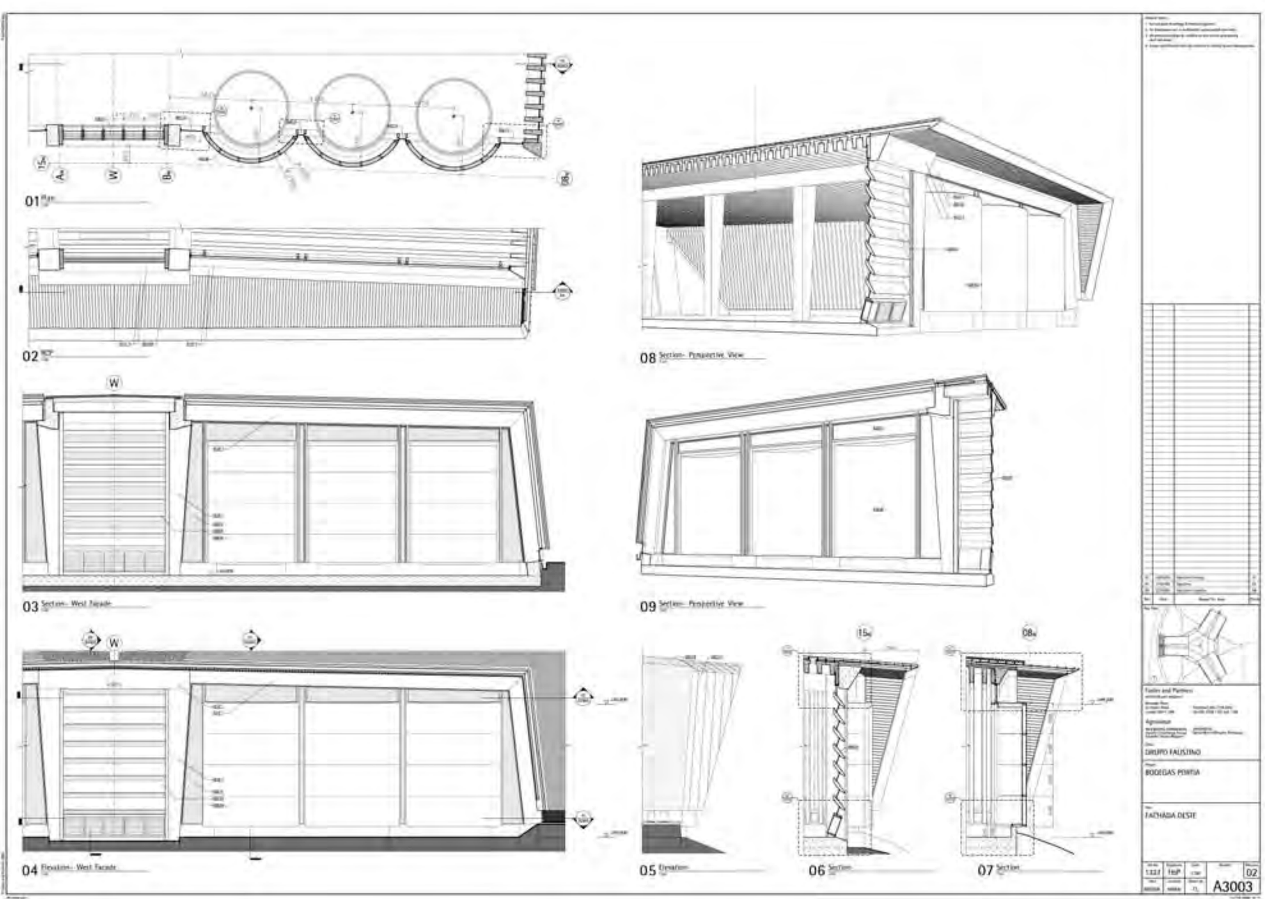
Envolvente :
Geometria Coordenadas (Set-Out)

1327	F&P	NTS		02
20/02/06	00000	CL	A2510	



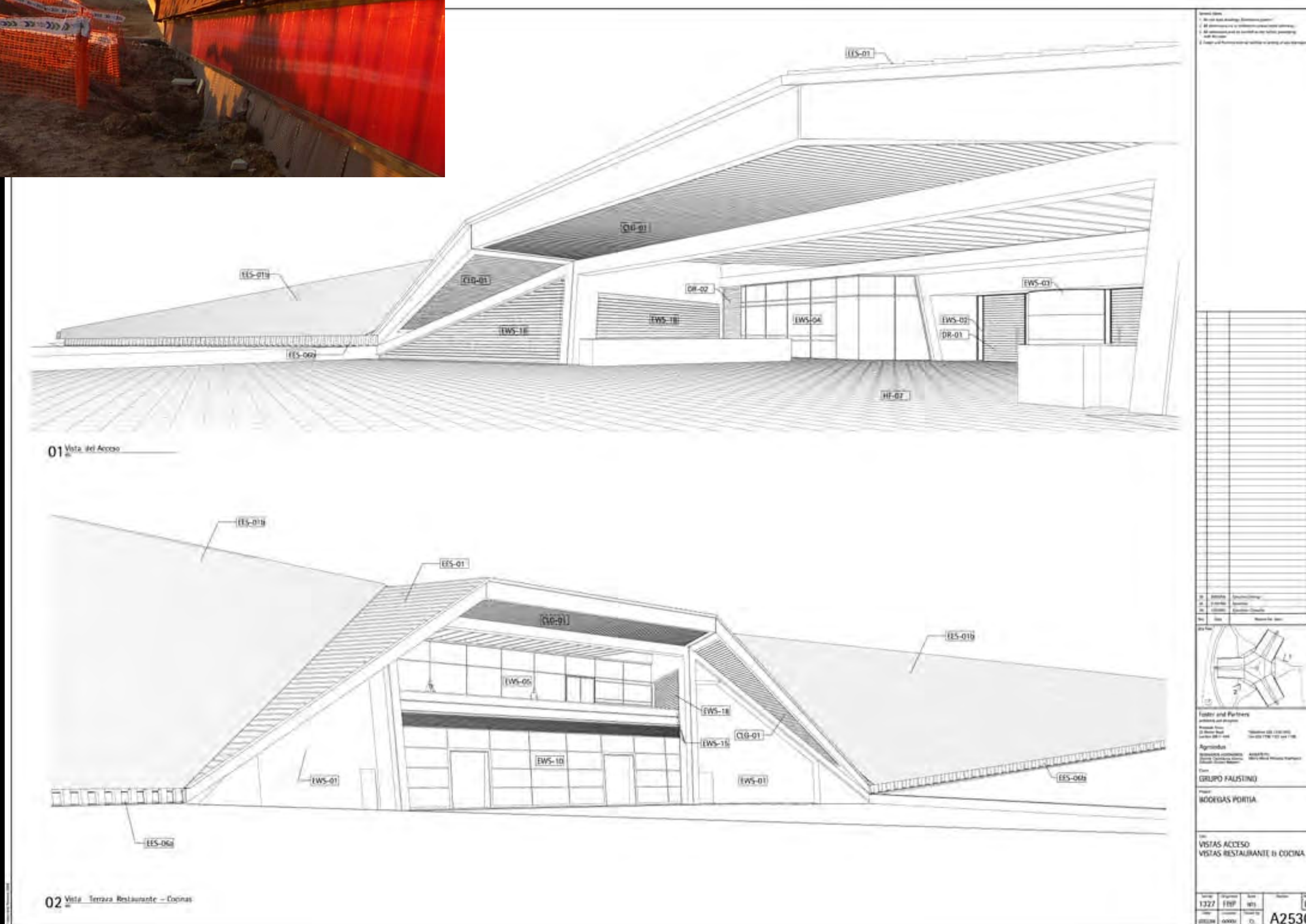
01 Prespectiva


EES-01b
EES-01
EWS-11
EC-02
EC-01
EWS-07
EES-06a
EWS-08
CLG-01
EWS-11
EC-01
01 Vista Fachada Oeste
EES-01b
EES-01
EES-01b
02 Vista Extremo Nave Sur (equal Norte)
Foster and Partners
Agroindus
GRUPO FAUSTINO
BODEGAS PORTIA
VISTAS FACHADA OESTE
EXTREMO DE LA NAVE SUR
1327
FBP
02
A2540


01 Plan
02
03 Section - West Facade
04 Elevation - West Facade
05 Elevation
06 Section
07 Section
08 Section - Perspective View
09 Section - Perspective View
Foster and Partners
Agronomar
GRUPO FAUSTINO
BODEGAS PORTIA
FACHADA OESTE
02
A3003



JOFE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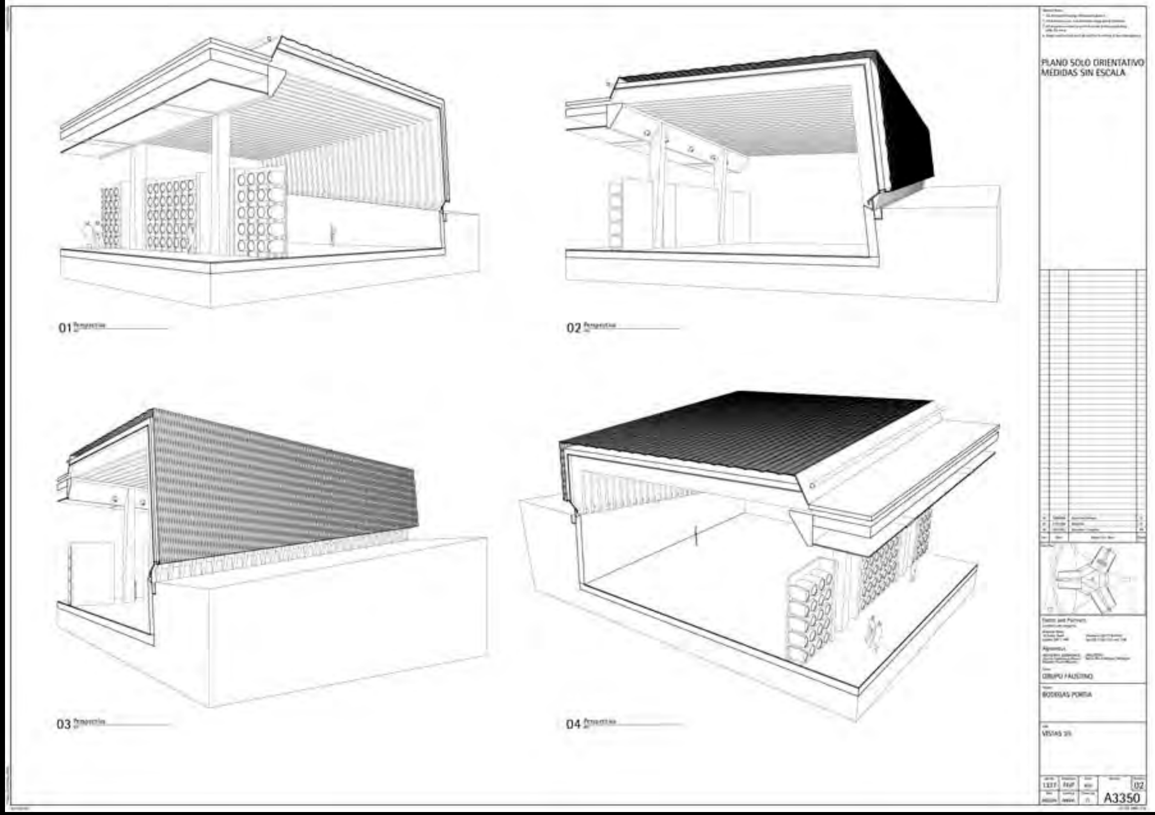
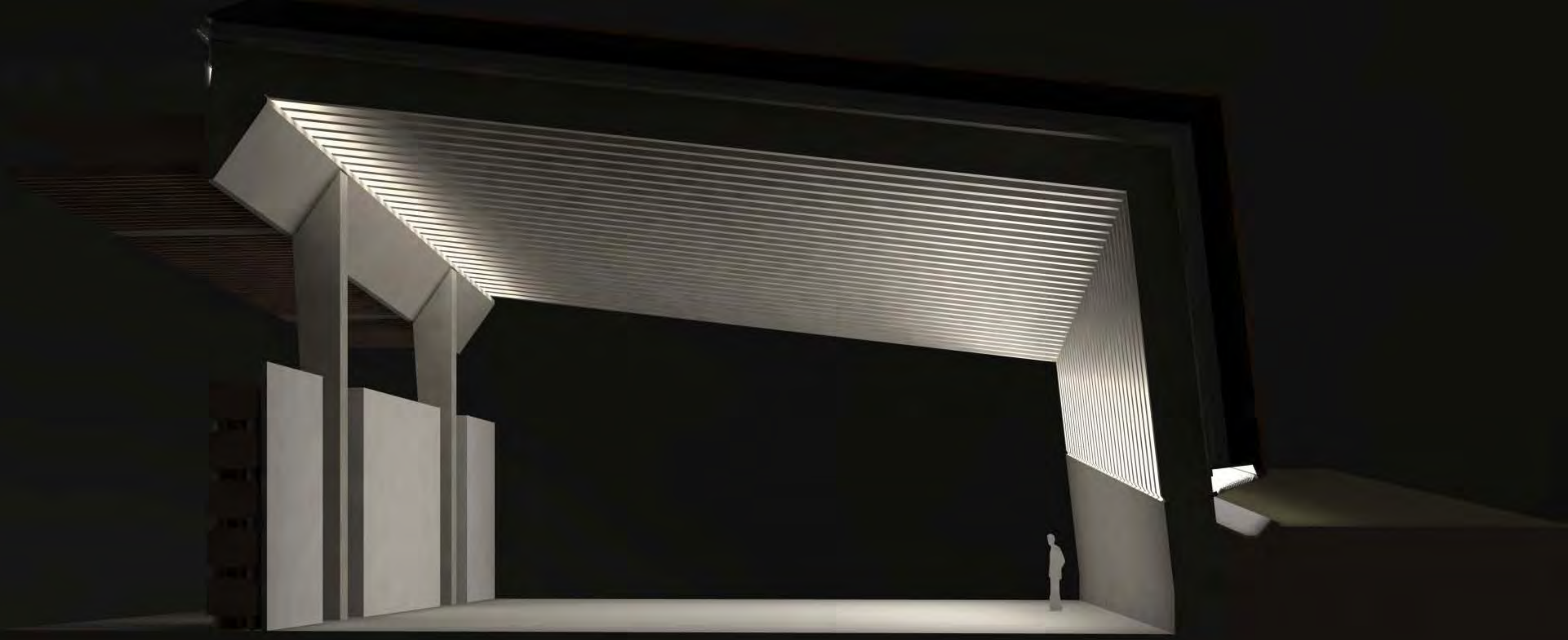
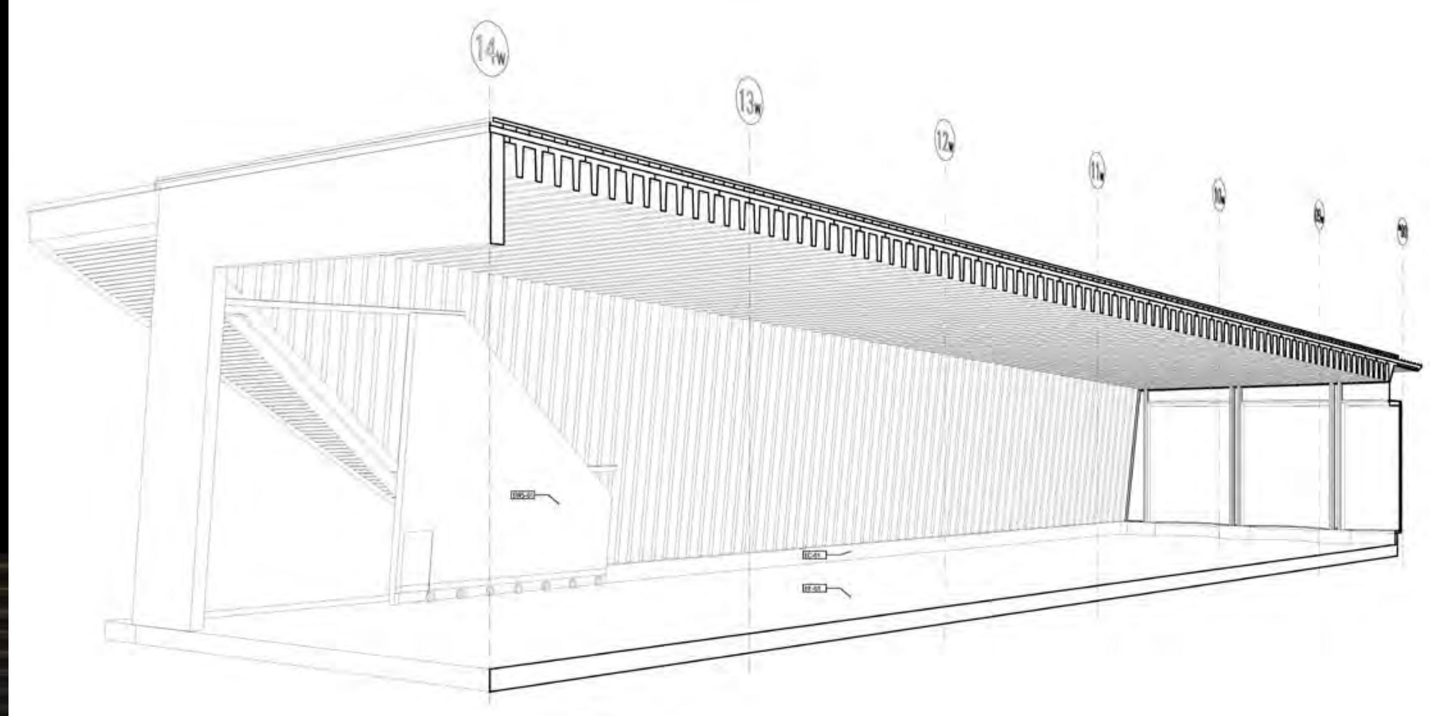
CLG-01
EES-01b
CLG-01
DR-02
EWS-03
EWS-18
EWS-18
EWS-04
EWS-02
DR-01
EES-06b
HF-02
01 Vista del Acceso
EES-01b
EES-01
CLG-01
EES-01b
EWS-05
EWS-18
EWS-15
CLG-01
EWS-10
EWS-01
EWS-01
EES-06b
EES-06a
02 Vista Terraza Restaurante – Cocinas
Foster and Partners
Agroindus
GRUPO FAUSTINO
BODEGAS PORTIA
VISTAS ACCESO
VISTAS RESTAURANTE & COCINA
1327
FNP
01
A2530



PLANO SOLO ORIENTATIVO
MEDIDAS SIN ESCALA
01
02
03
04
GRUPO FAUSTINO
BODEGAS PORTIA
A3350
02





14w
13w
12w
11w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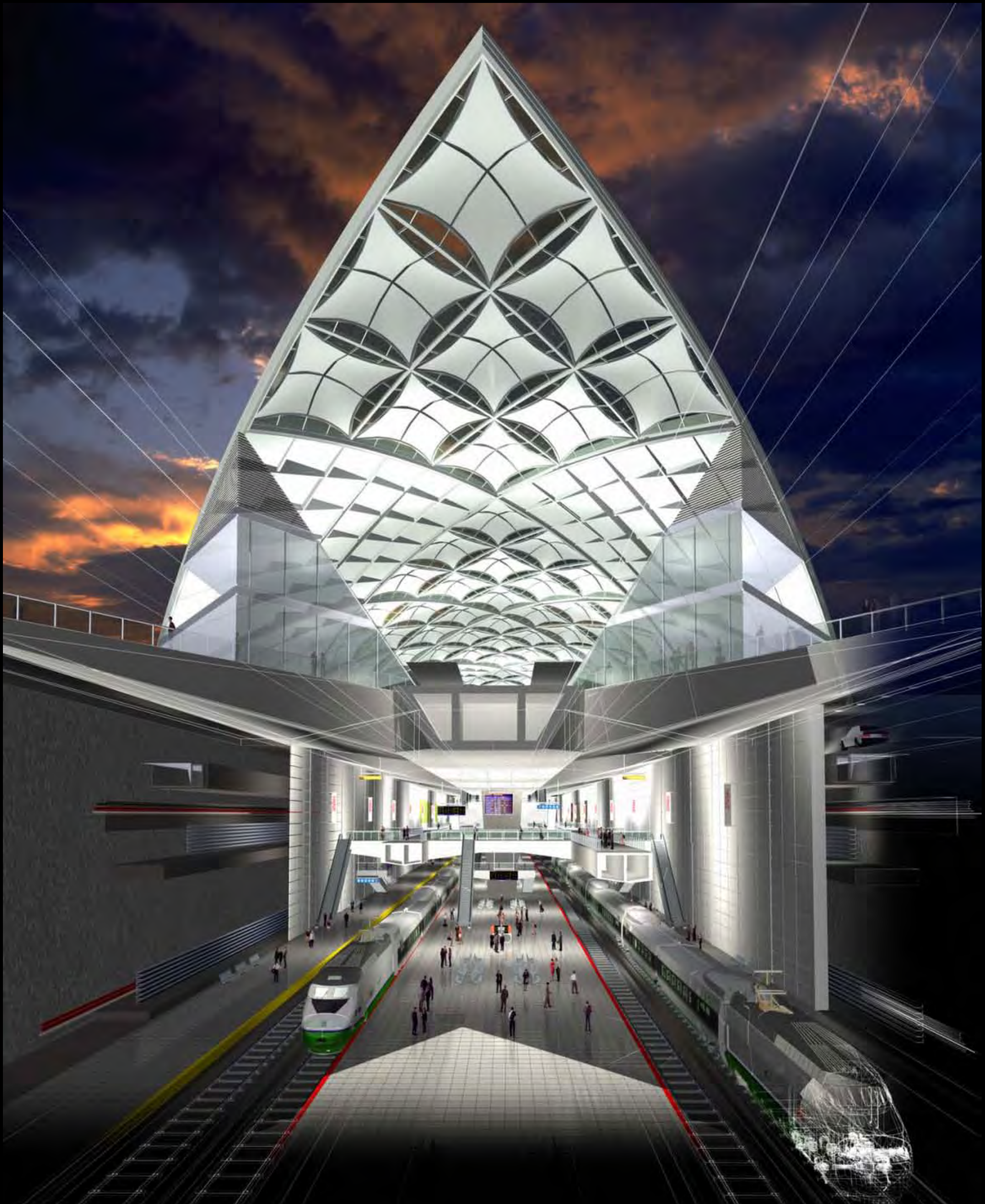

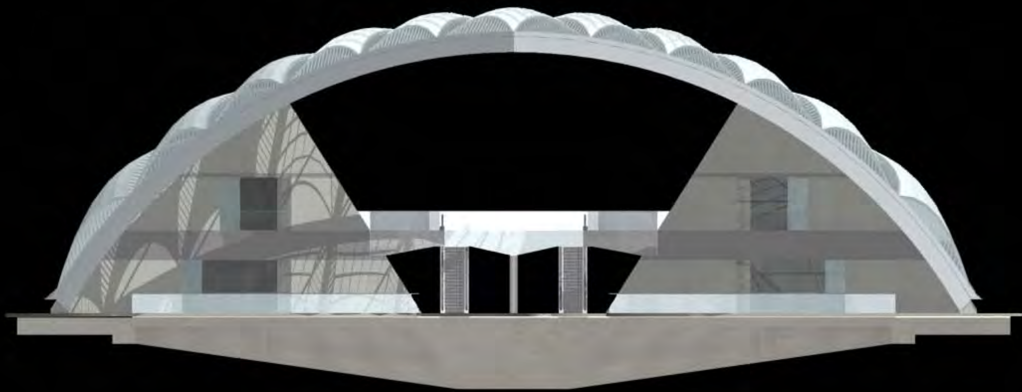

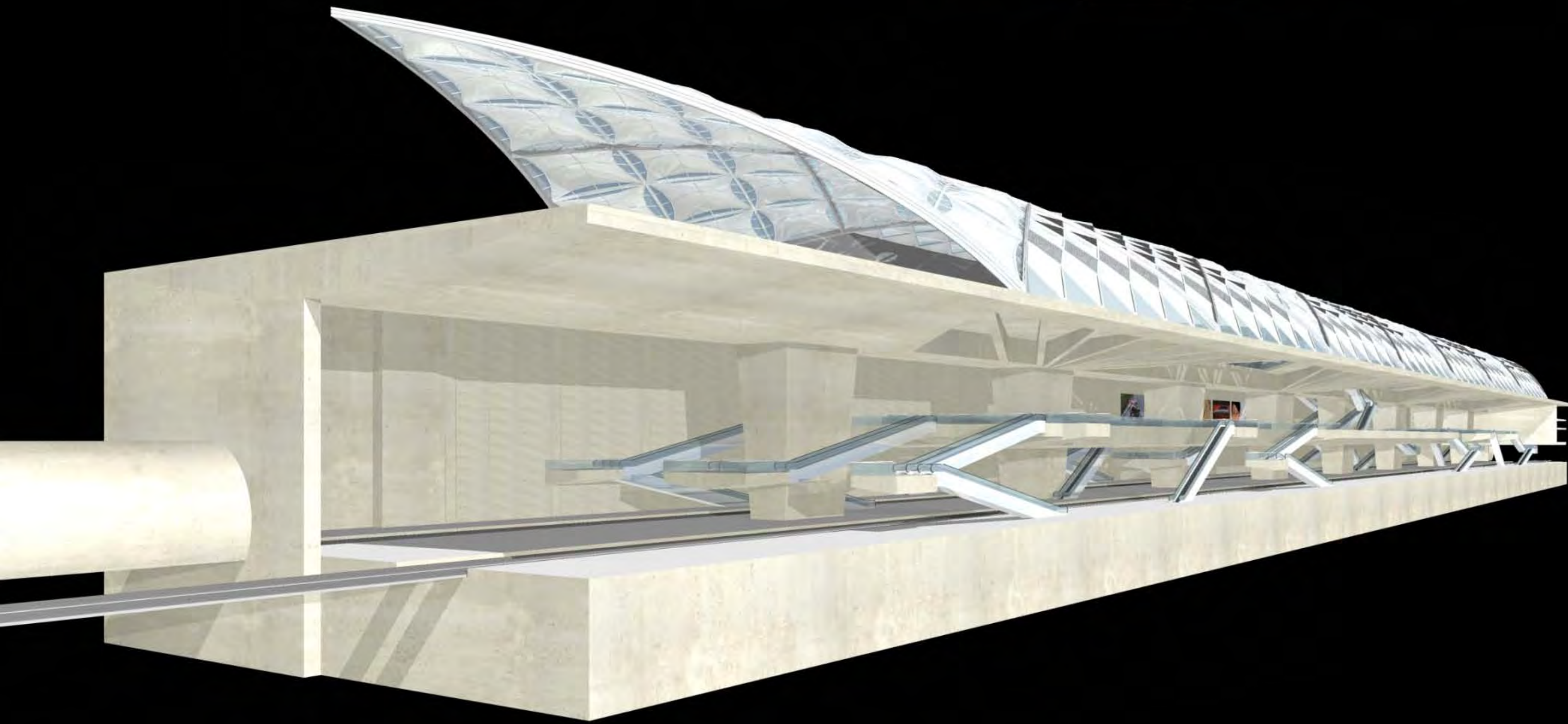

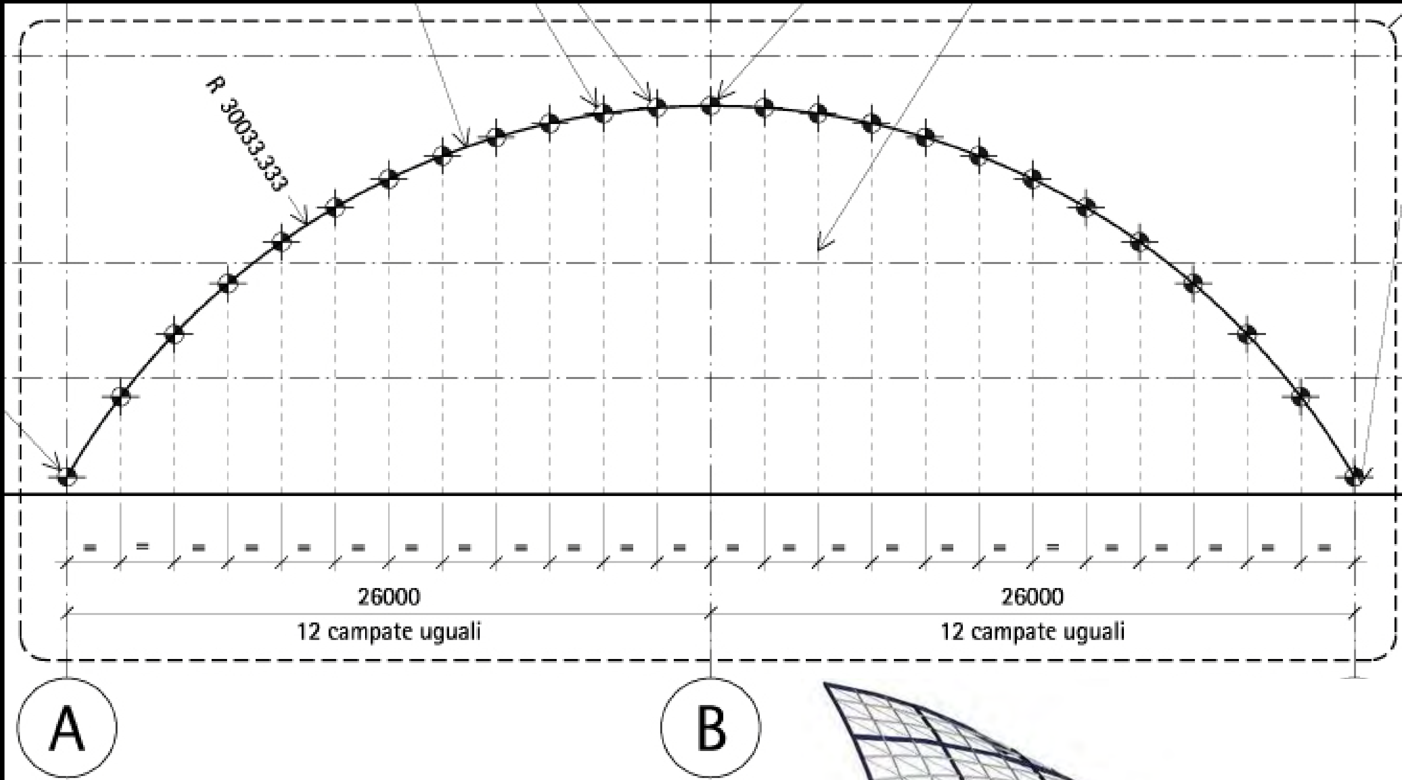
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26000
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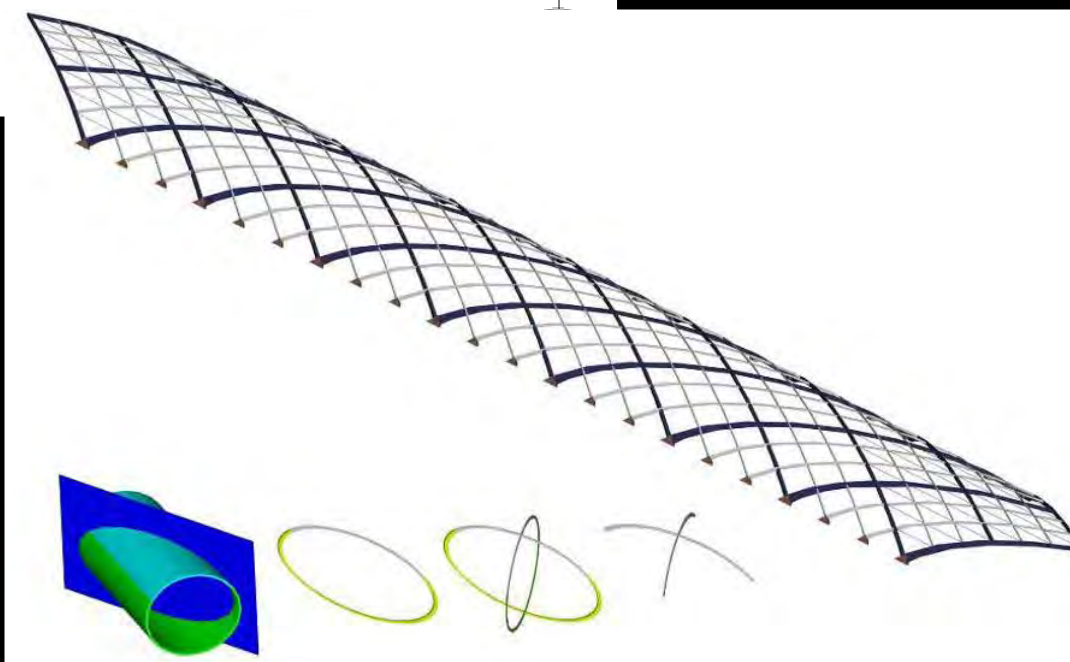
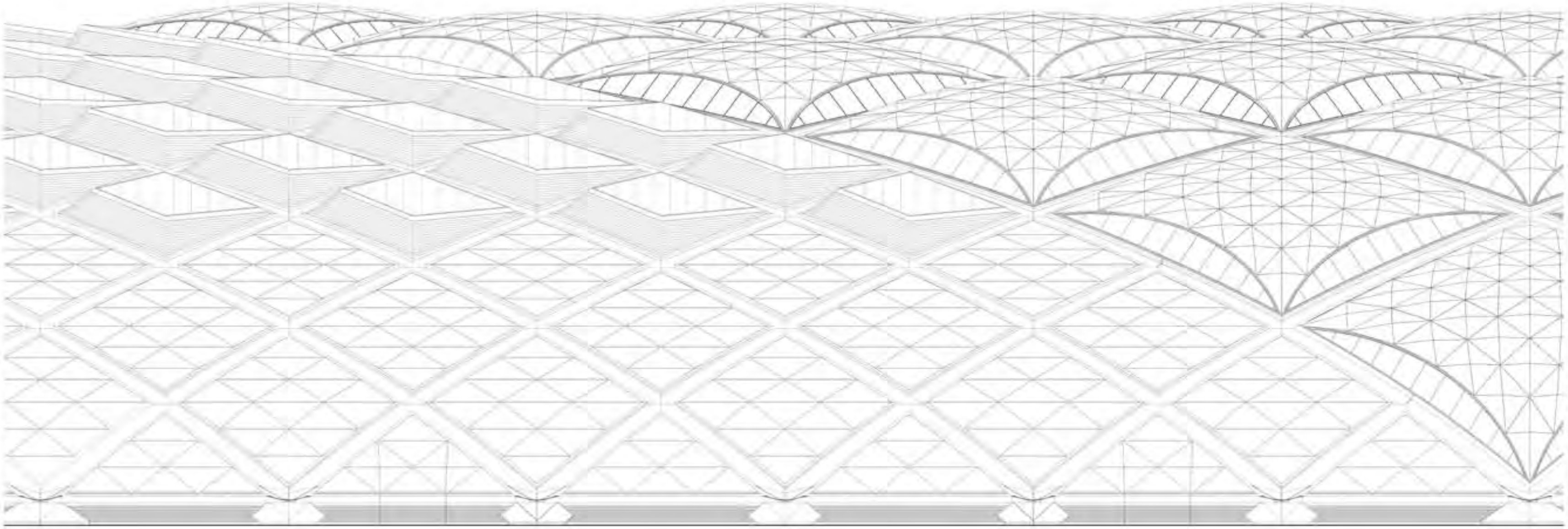
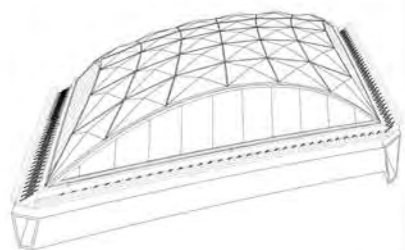
A
B





01 Prospetto



02 RCU-01

A5657 - A5674

RCU-03.1 : Tipico
RCU-03.2 : Oscurato
RCU-03.3 : Botola di accesso nella RCU-L

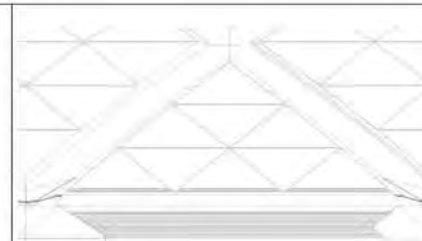
03 RCU-03

A5675 - A5682

RCU-04.1 : Tipico
RCU-04.2 : con feritoie di ventilazione

04 RCU-04

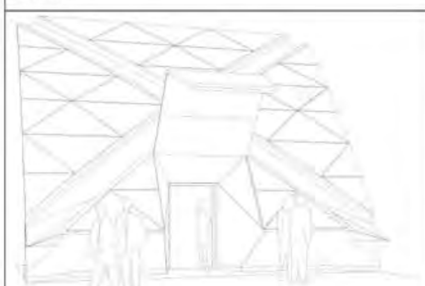
A5687 - A5691



RCU-05.1 : Tipico
RCU-05.3 : con feritoie di ventilazione

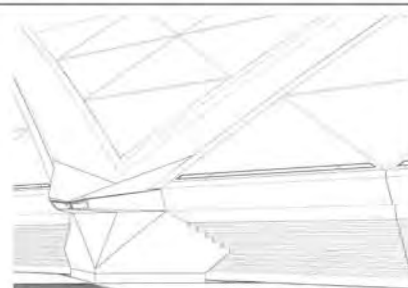
05 RCU-05

A5693 - A5697



06 RCU-05.2

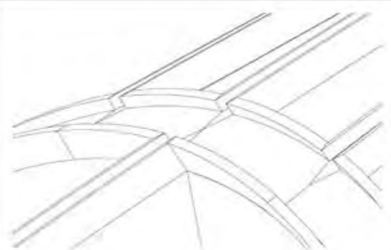
A5694 - A5696



RGT-01 : Condizione all'aggetto
RGS-02 : Tipico
RGS-03 : nel RSE-01

07 RGT-01,02,03

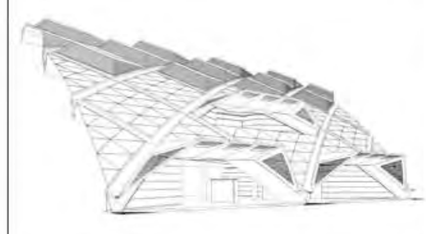
A5699 - A5701



RGS-01 : Condizione ai bordi dell'aggetto
RGS-02 : Typico
RGS-03 : con linea-vita e superficie antisdrucciolo

08 RGS-01,02,03

A5702 - A5706



09 RSE-01

A5711 - A5717

Note Generali

1. I disegni non devono essere scalati. Fanno fede le dimensioni scritte.
2. Tutte le dimensioni sono in millimetri dove non specificato altrimenti.
3. Tutte le dimensioni devono essere controllate in cantiere prima di procedere con i lavori.
4. Foster and Partners deve essere informata per iscritto di qualsiasi incongruenza.

Foster and Partners

ARUP

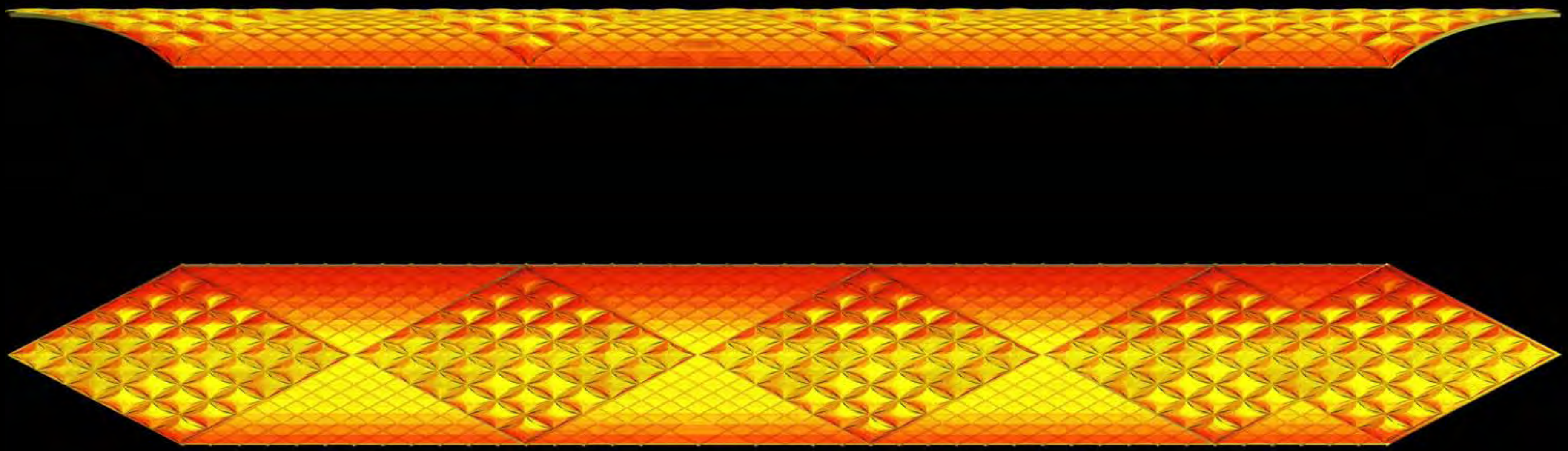
RETE FERROVIARIA
ITALIANA S.P.A
STAZIONE AV DI FIRENZE

PROGETTO ESECUTIVO

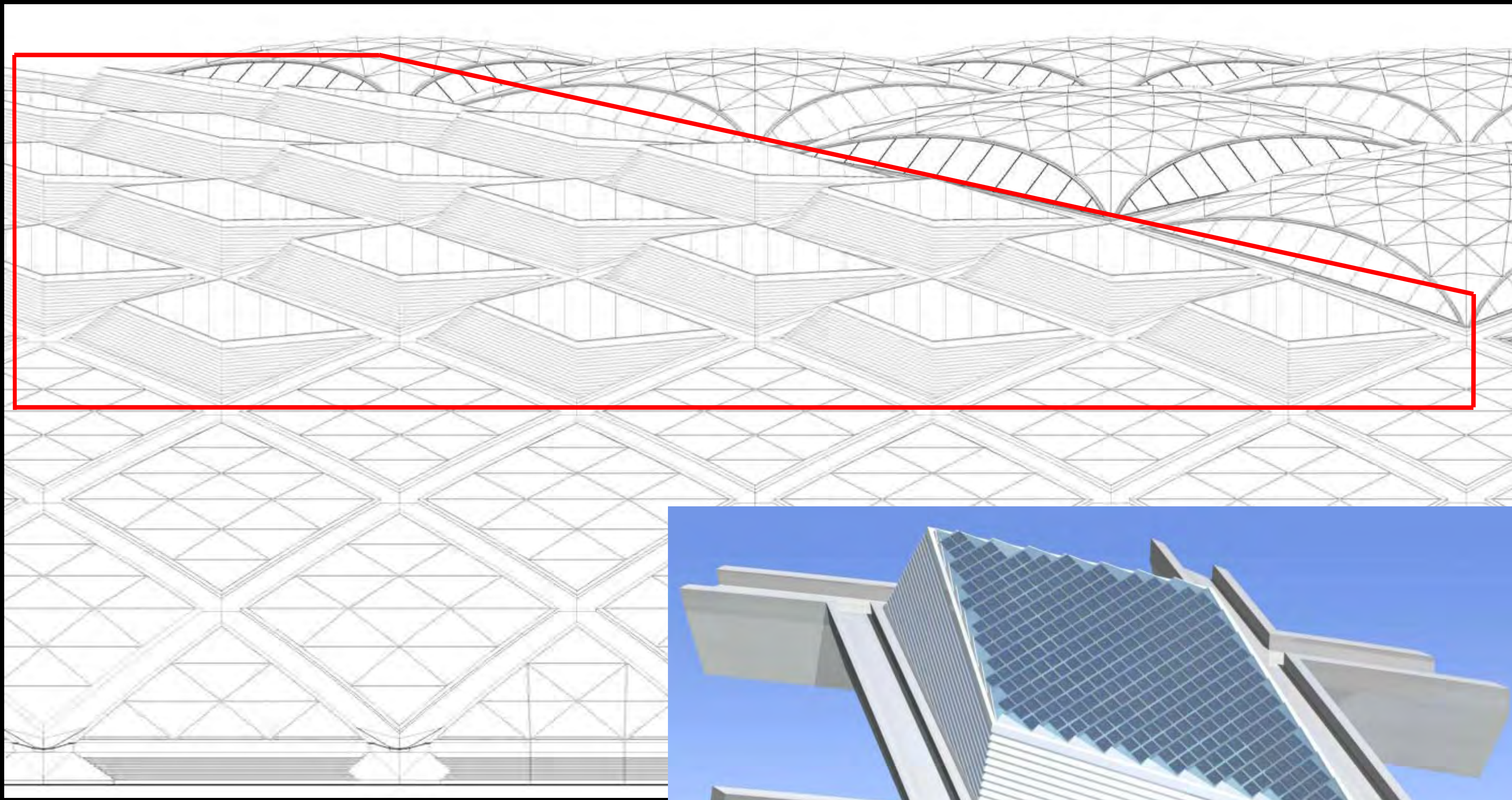
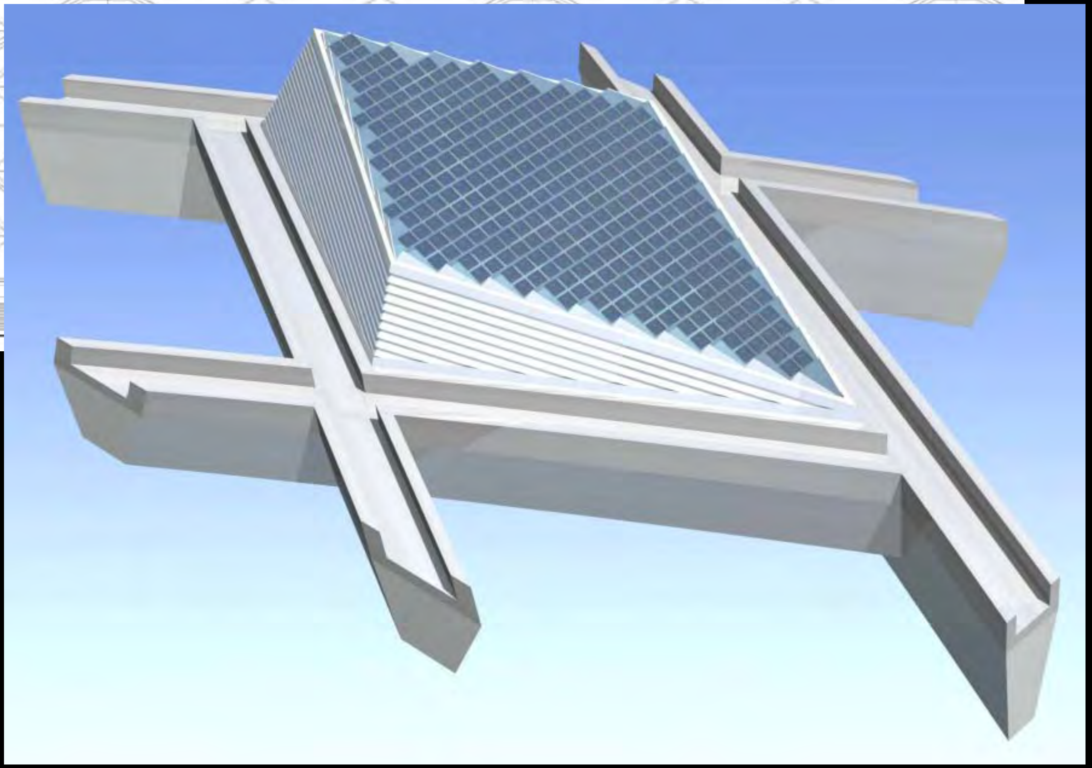
Stazione AV

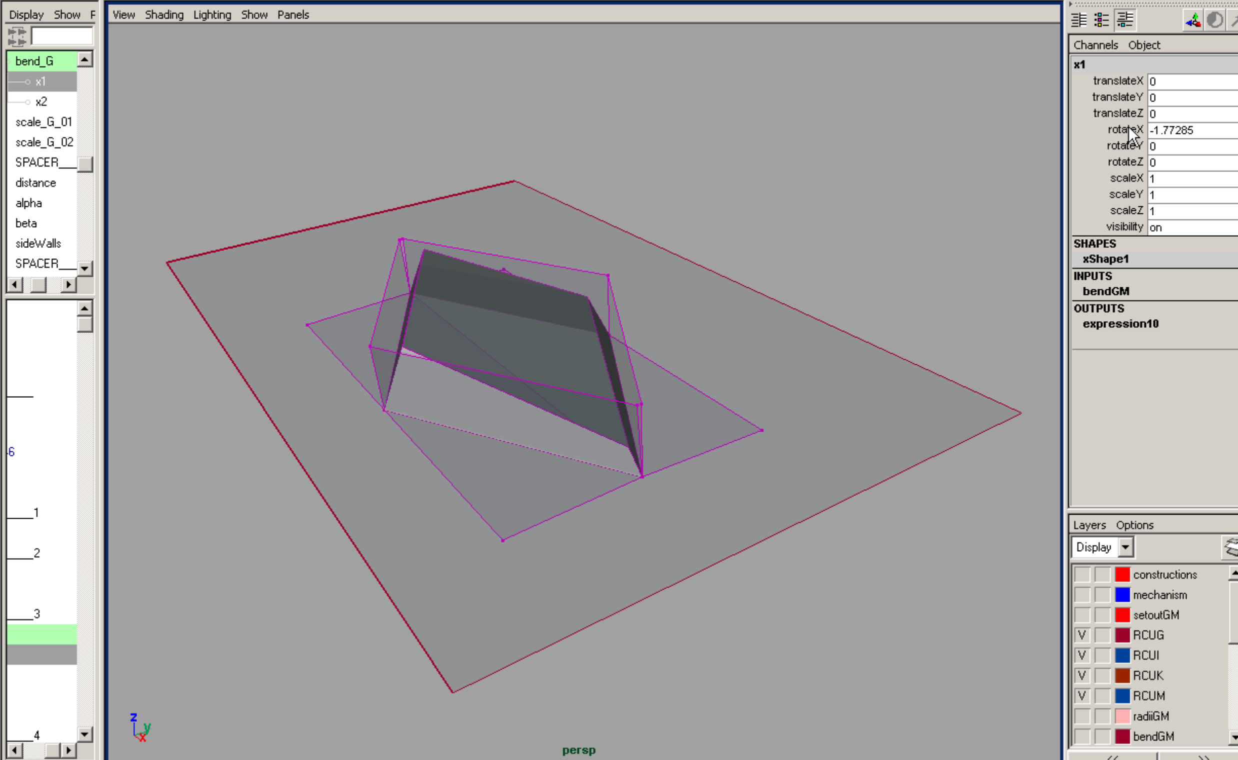
Copertura 3D Legenda
tipologie degli RCU

AV-FLO-01	1:50	F&P	11
21.04.06			A5653



Solar Radiation Analysis to Determine PV Placement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View Shading Lighting Show Panels
bend_G
x1
x2
scale_G_01
scale_G_02
SPACER
distance
alpha
beta
sideWalls
SPACER
persp
Channels Object
x1
translateX 0
translateY 0
translateZ 0
rotateX -1.77285
rotateY 0
rotateZ 0
scaleX 1
scaleY 1
scaleZ 1
visibility on
SHAPES
xShape1
INPUTS
bendGM
OUTPUTS
expression10
Layers Options
Display
constructions
mechanism
setoutGM
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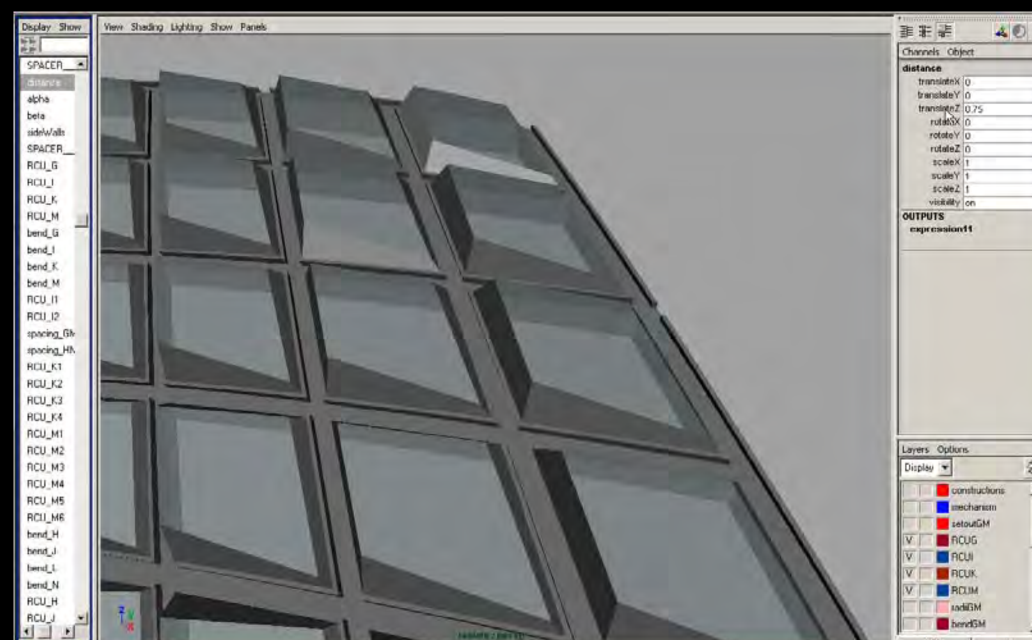
RCUI
RCUK
RCUM
radiiGM
bendGM


Display Show
View Shading Lighting Show Panels
SPACER
alpha
beta
sideWalls
SPACER
RCU_G
RCU_I
RCU_K
RCU_M
bend_G
bend_I
bend_K
bend_M
Channels Object
distance
translateX 0
translateY 0
translateZ 0.75
rotateX 0
rotateY 0
rotateZ 0
scaleX 1
scaleY 1
scaleZ 1
visibility on
OUTPUTS
expression11
Layers Options
Display
constructions
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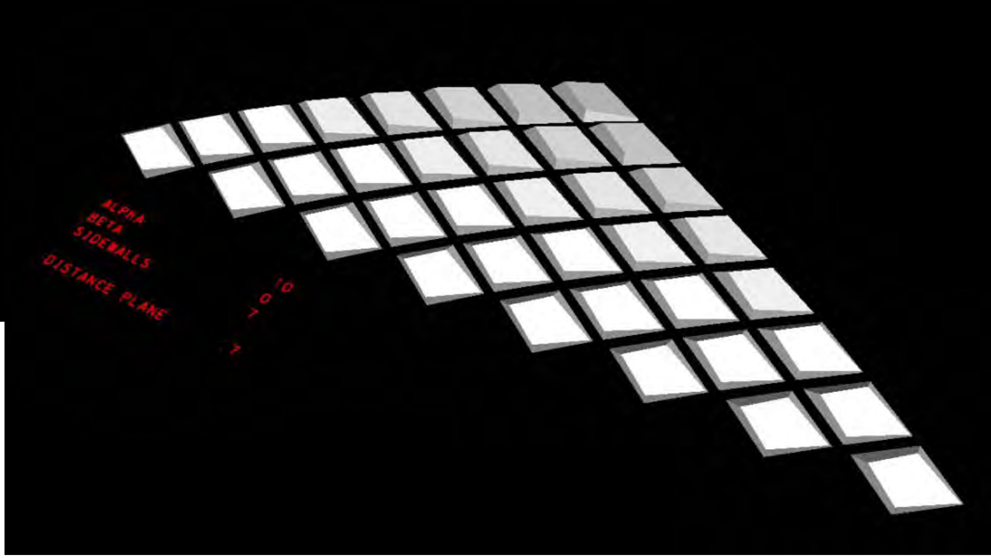
RCUM
radiiGM
bendGM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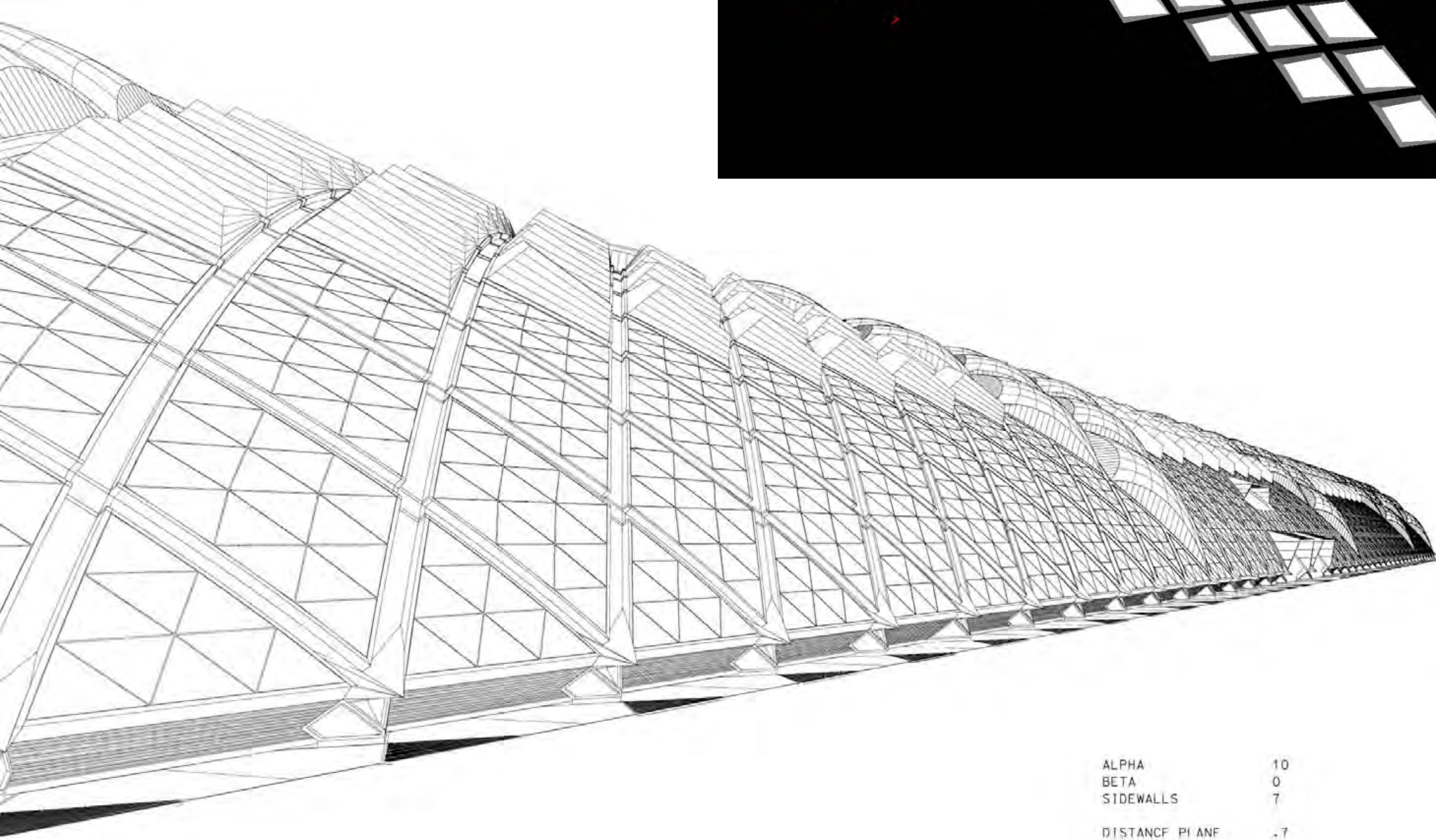
BETA 0
SIDEWALLS 7
DISTANCE PLANE .7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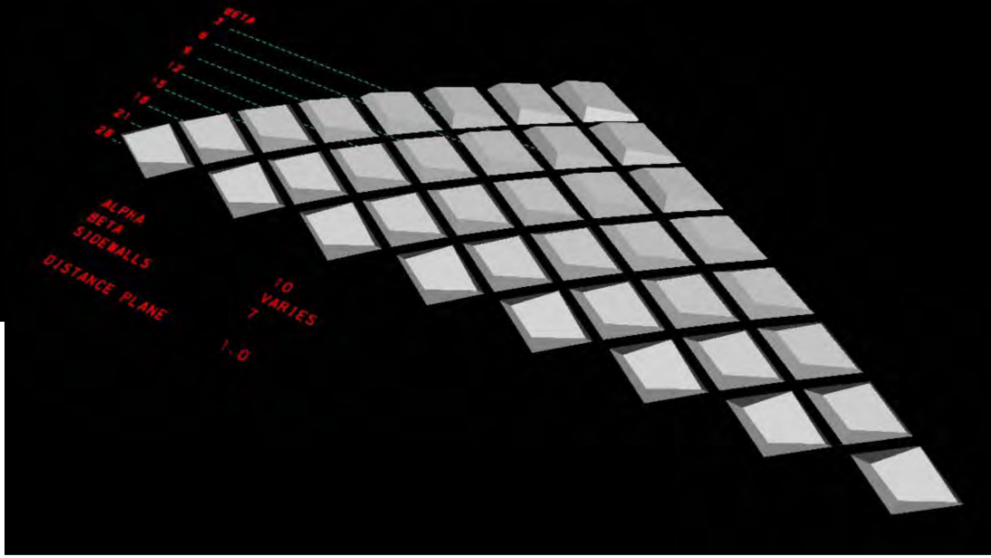
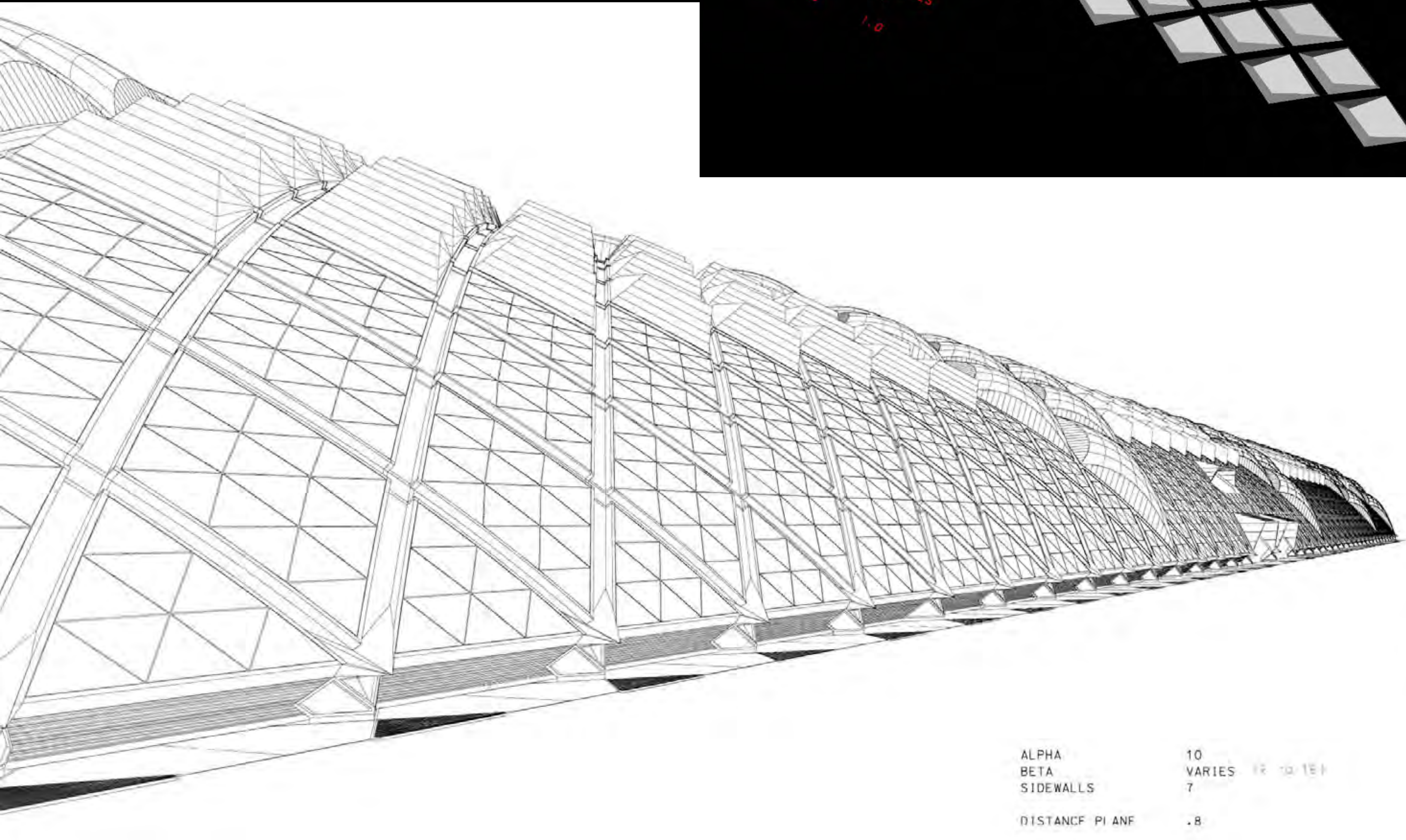
DISTANCE PLANE .7


BETA
21
28
ALPHA
BETA
SIDEWALLS
DISTANCE PLANE
10
VARIES
7
1.0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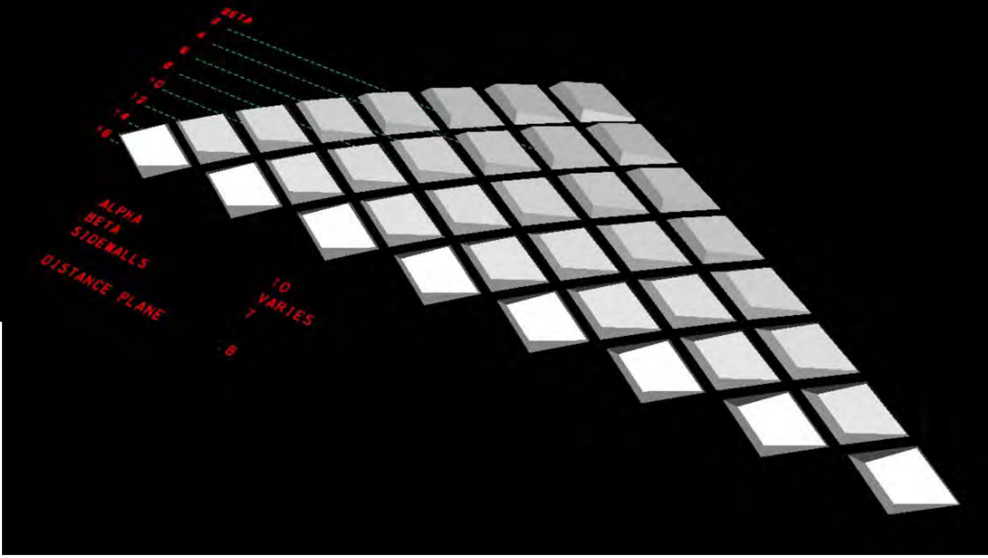
BETA VARIES
SIDEWALLS 7
DISTANCE PLANE .8


BETA
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DISTANCE PLANE
10
VARIES
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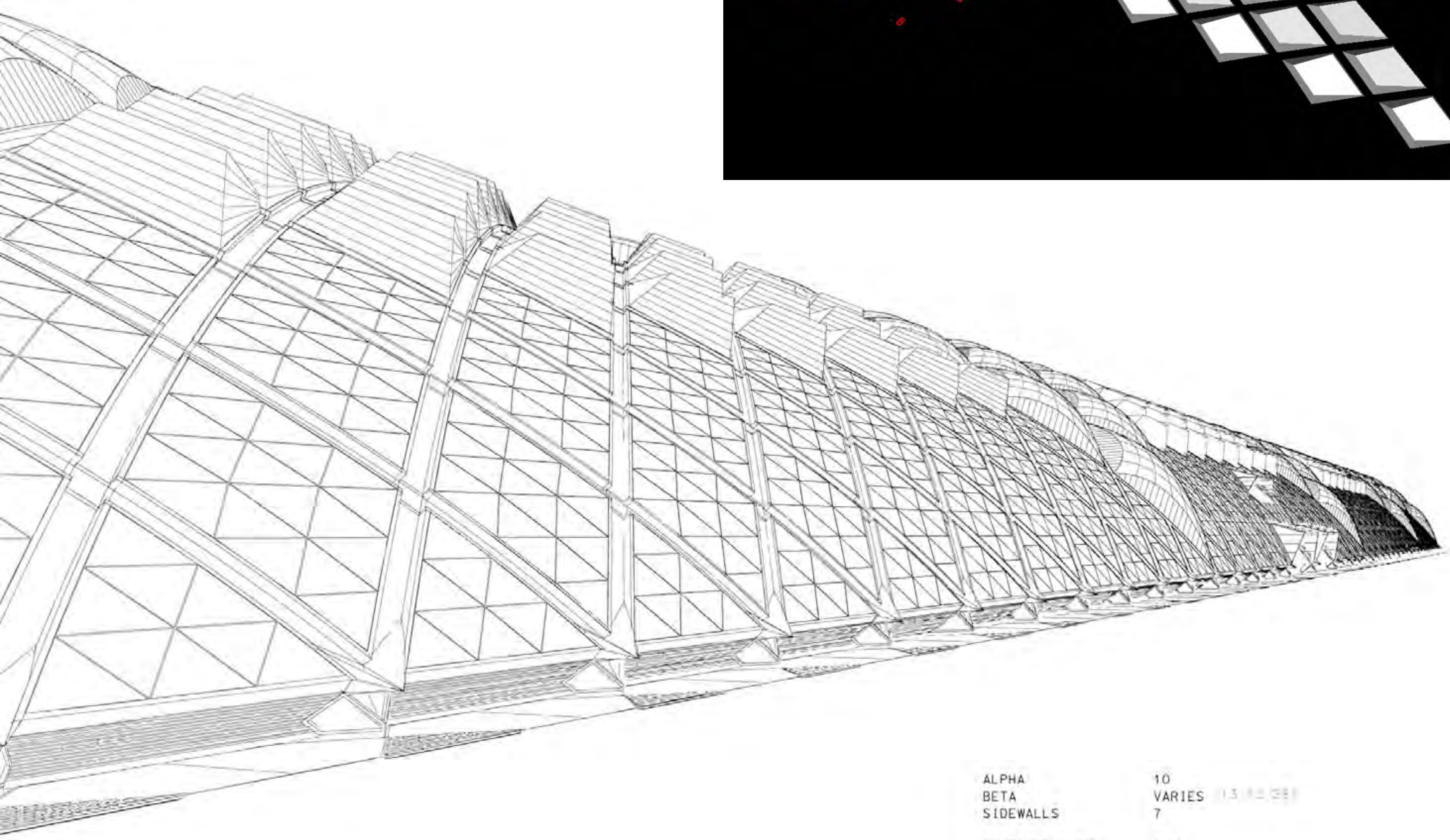
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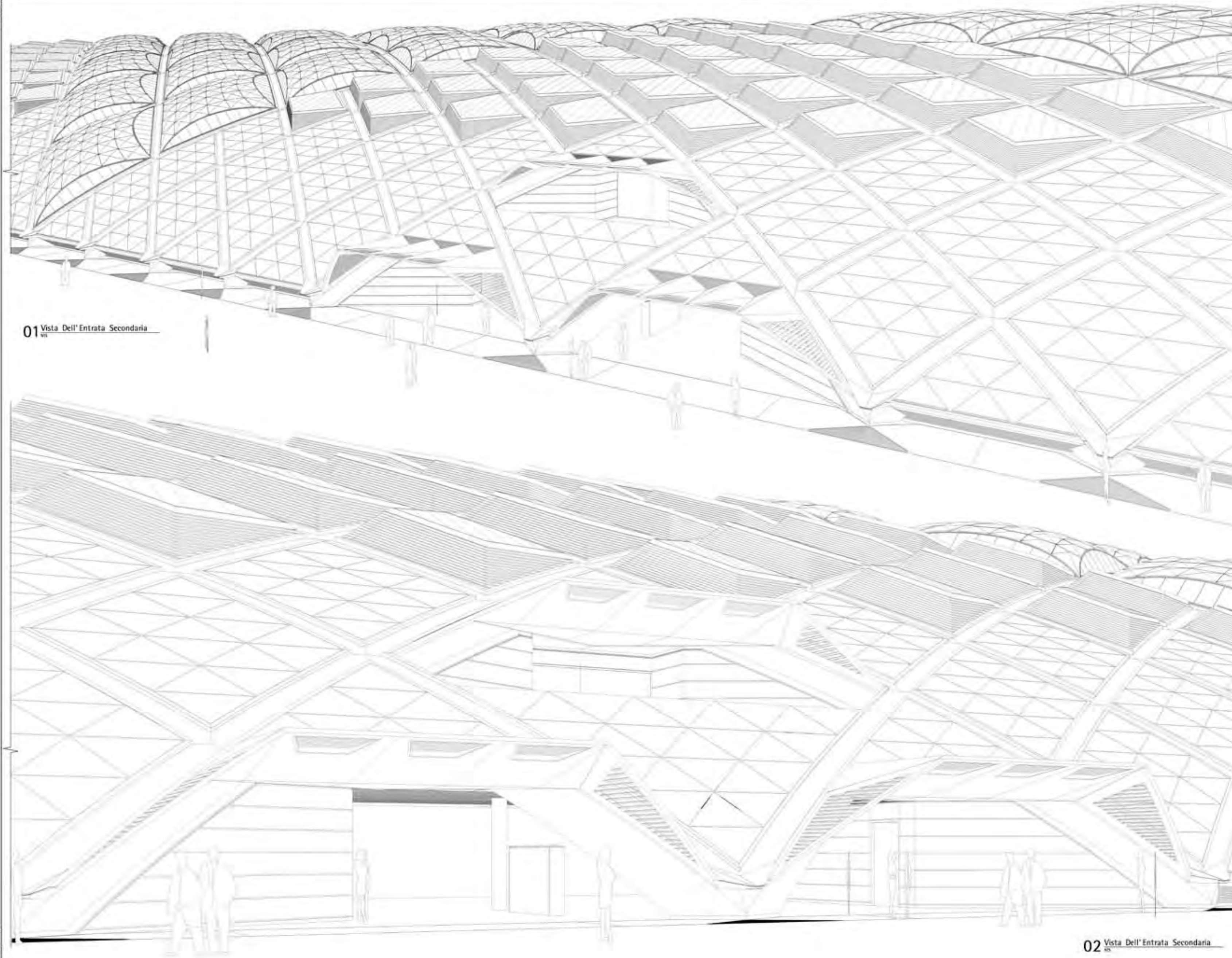
DISTANCE PLANE 1.0



01 Vista Dell' Entrata Secondaria

02 Vista Dell' Entrata Secondaria

Rev.	Data	Motivo dell'Emissione	
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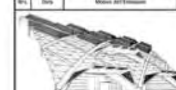
10	[illegible]	[illegible]	[illegible]



RFI

Foster and Partners

ARUP

RETE FERROVIARIA
ITALIANA S.P.A
STAZIONE AV DI FIRENZE

PROGETTO ESECUTIVO

Stazione AV

RSE-01 Viste

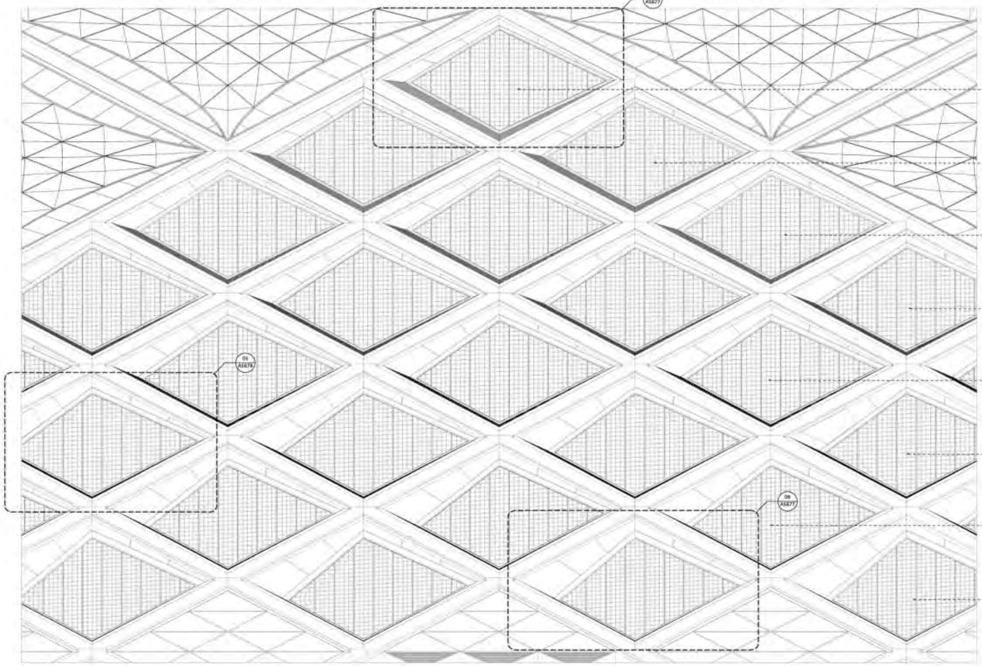
AV-FLO-01

21.04.06

11

A5717

Unita' Geom.	α	β	γ	d(mm)
G	8°	4.00°	19.5°	720
H	8°	4.85°	20.0°	720
I	8°	5.70°	21.0°	720
J	8°	6.55°	22.5°	720
K	8°	7.40°	24.5°	720
L	8°	8.25°	27.0°	720
M	8°	9.10°	30.0°	720
N	8°	9.95°	33.5°	720



01 Planimetria
1:50

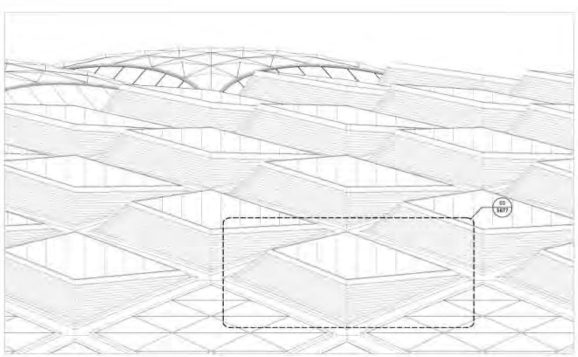
Celle Fotovoltaiche

Celle non funzionanti tagliate a misura ai bordi del pannello

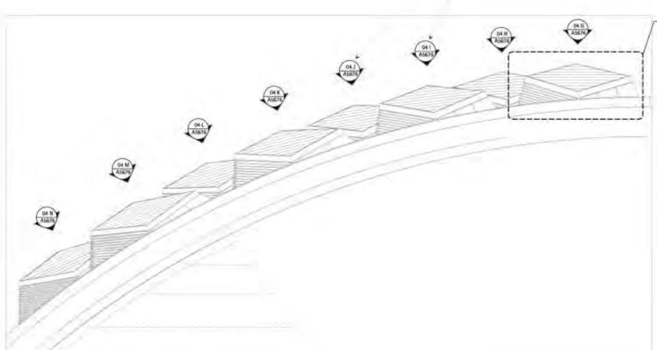
NB: fare riferimento alla relazione specialistica per l'impianto fotovoltaico

Le quote riportate sono puramente indicative. Le dimensioni e geometrie reali vanno ricavate dal metodo di costruzione

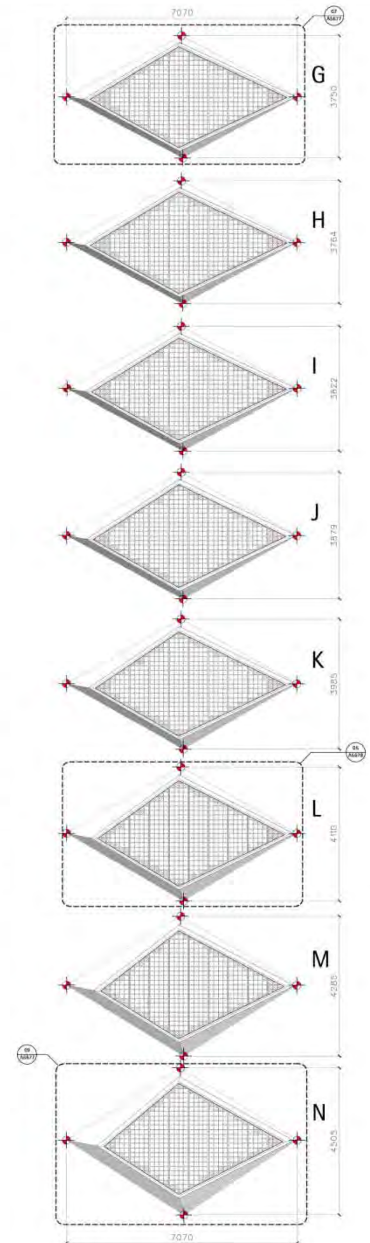
Proiezioni normali al Piano Superiore di Costruzione



02 Prospetto Frontale
1:50



03 Prospetto Laterale
1:50

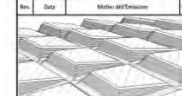


04 Posizionamento elementi fotovoltaici
1:50

Note Generali

1. I disegni non devono essere scalati. Fanno fede le dimensioni scritte.
2. Tutte le dimensioni sono in millimetri dove non specificato altrimenti.
3. Tutte le dimensioni devono essere controllate in cantiere prima di procedere con i lavori.
4. Foster and Partners deve essere informata per iscritto di qualsiasi incongruenza.

Rev.	Data	Motivo dell'Emissione	Verif.
11	18.05.05	Progetto Esecutivo Aggiornato	GE
10	21.04.05	Emissione Progetto Esecutivo	GE



RFI

Foster and Partners

ARUP

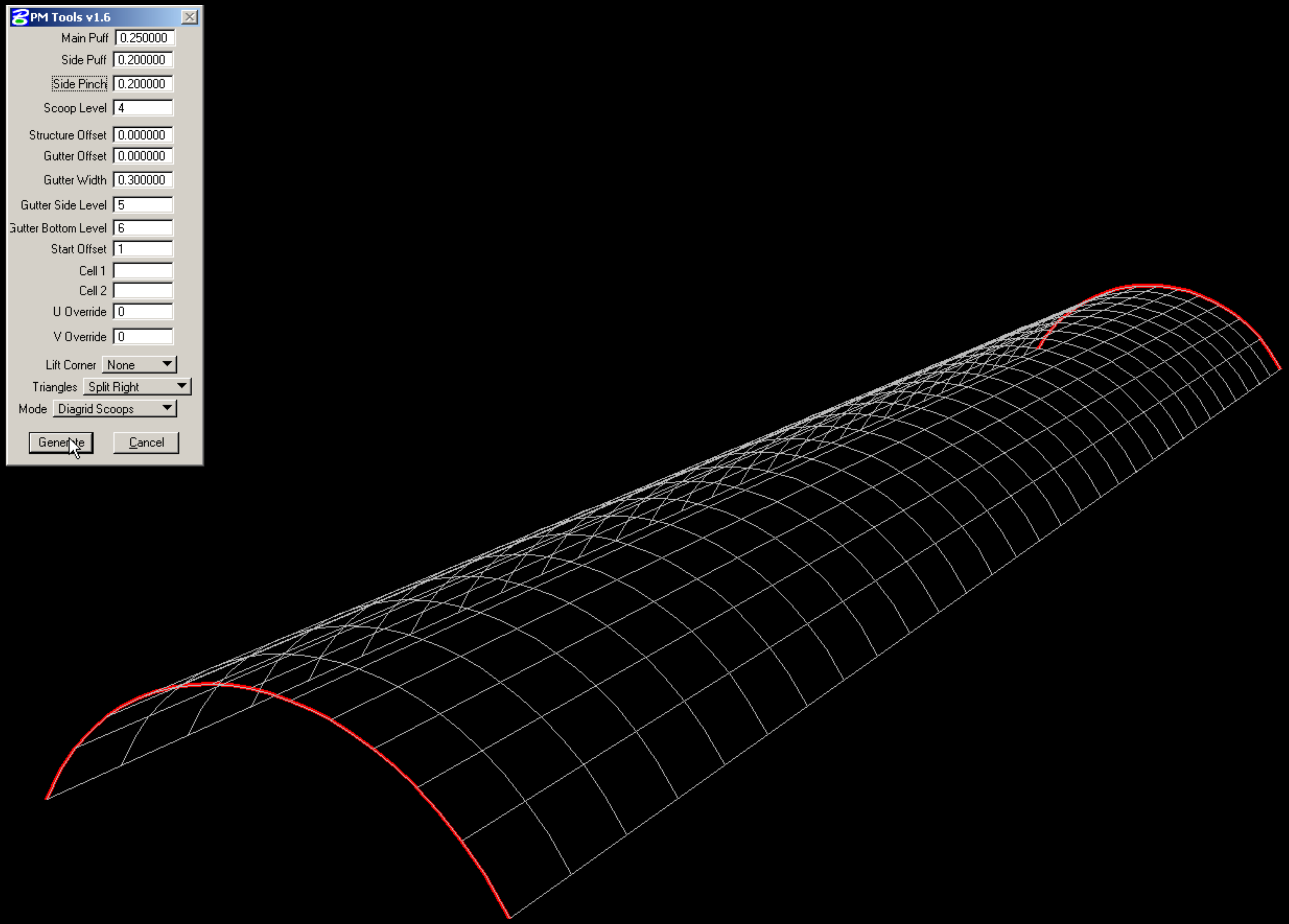
RETE FERROVIARIA
ITALIANA S.P.A
STAZIONE AV DI FIRENZE

PROGETTO ESECUTIVO

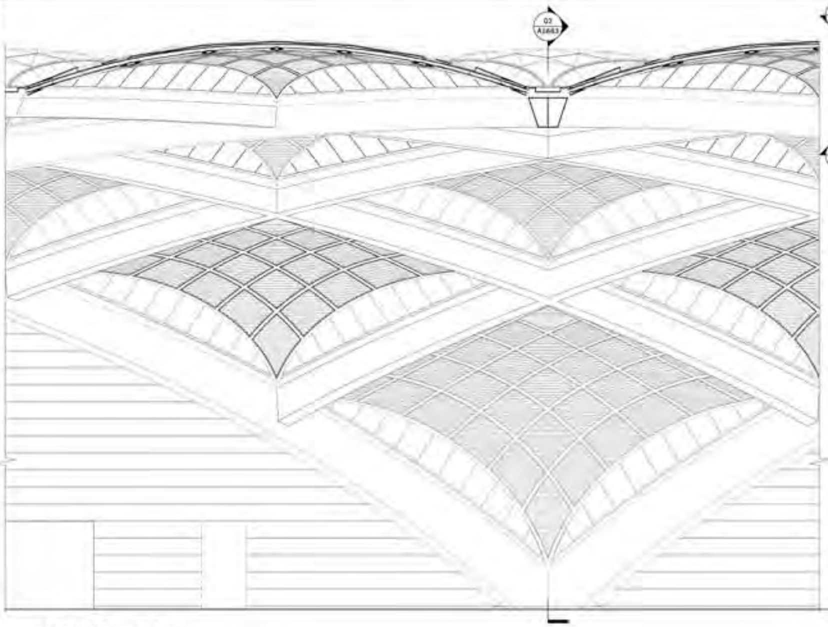
Stazione AV - RCU.03

Pianta e Prospetti
Posizionamento celle fotovoltaiche

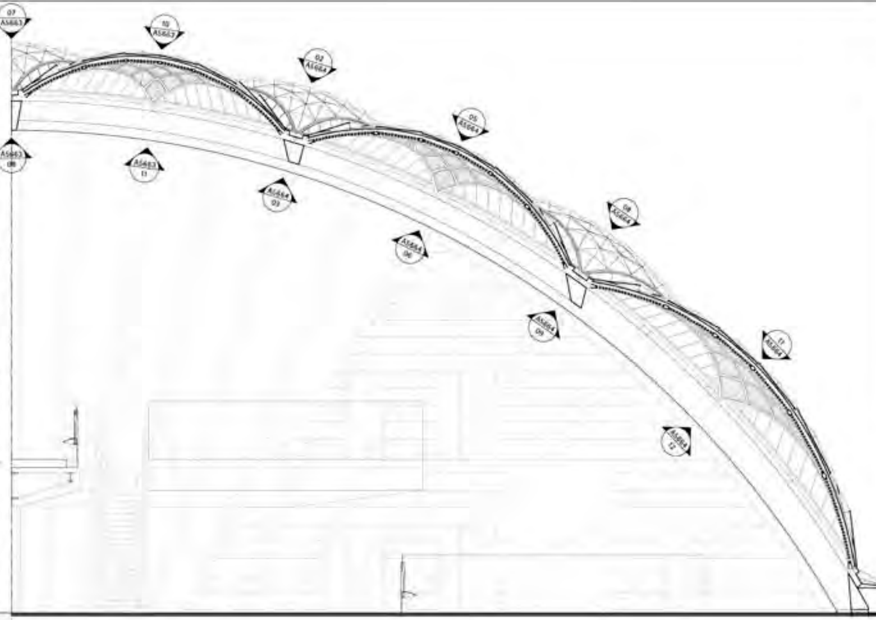
JV-FLO-01	1:50	F&P	11
21.04.05			A5676



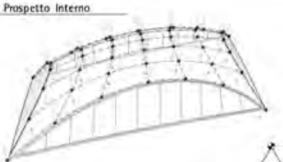
‘Scoop’ Generation



01 RCU-01 Prospetto Interno



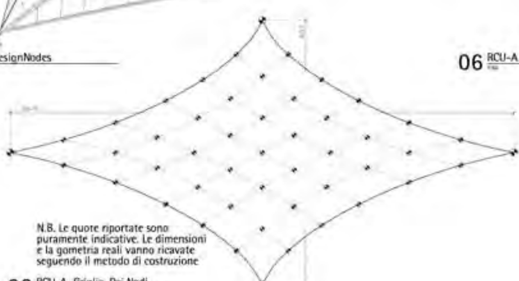
02 RCU-01 Sezione Trasversale



05 RCU-A DesignNodes

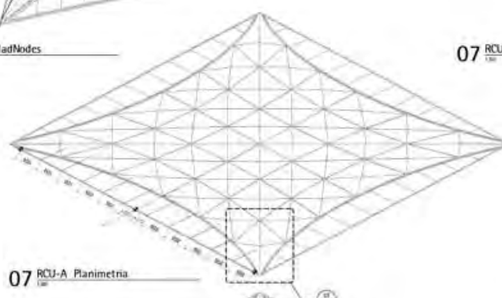
06 RCU-A CladNodes

07 RCU-A StructNodes

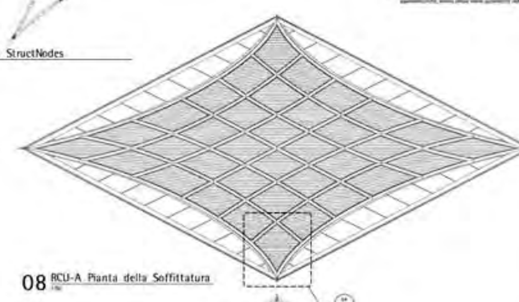


N.B. Le quote riportate sono puramente indicative. Le dimensioni e la gometria reali vanno ricavate seguendo il metodo di costruzione

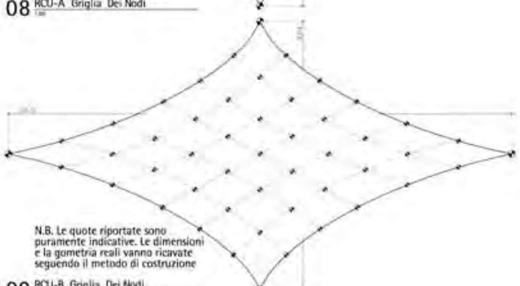
08 RCU-A Griglia Dei Nodi



07 RCU-A Planimetria

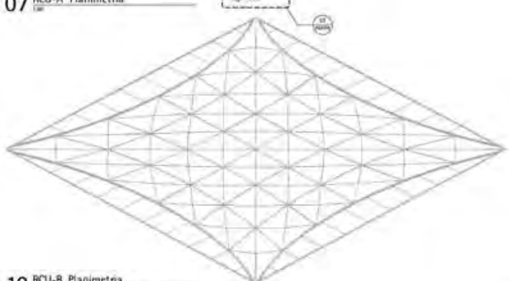


08 RCU-A Pianta della Soffittatura

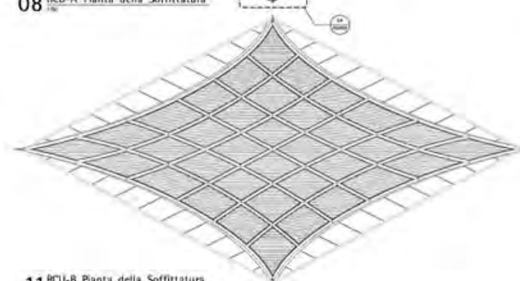


N.B. Le quote riportate sono puramente indicative. Le dimensioni e la gometria reali vanno ricavate seguendo il metodo di costruzione

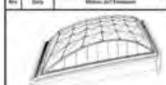
09 RCU-B Griglia Dei Nodi



10 RCU-B Planimetria



11 RCU-B Pianta della Soffittatura



ARUP

RETE FERROVIARIA
ITALIANA S.P.A
STAZIONE AV DI FIRENZE

PROGETTO ESECUTIVO

Stazione AV

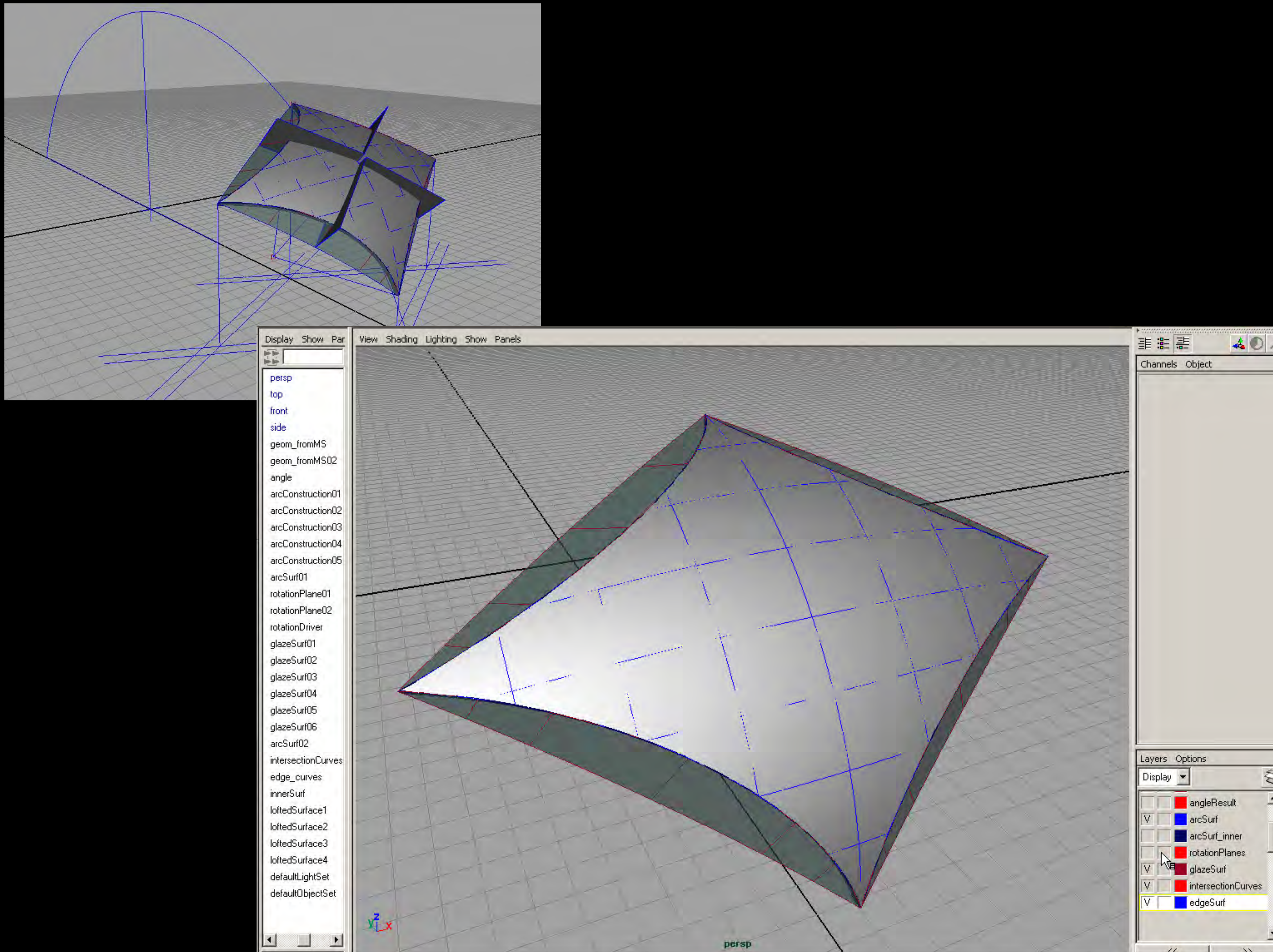
RCU-01

1:50

21.04.06

11

A5663



Display Show Par
persp
top
front
side
geom_fromMS
geom_fromMS02
angle
arcConstruction01
arcConstruction02
arcConstruction03
arcConstruction04
arcConstruction05
arcSurf01
rotationPlane01
rotationPlane02
rotationDriver
glazeSurf01
glazeSurf02
glazeSurf03
glazeSurf04
glazeSurf05
glazeSurf06
arcSurf02
intersectionCurves
edge_curves
innerSurf
loftedSurface1
loftedSurface2
loftedSurface3
loftedSurface4
defaultLightSet
defaultObjectSet
View Shading Lighting Show Panels
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Layers Options
Display
angleResult
arcSurf
arcSurf_inner
rotationPlanes
glazeSurf
intersectionCurves
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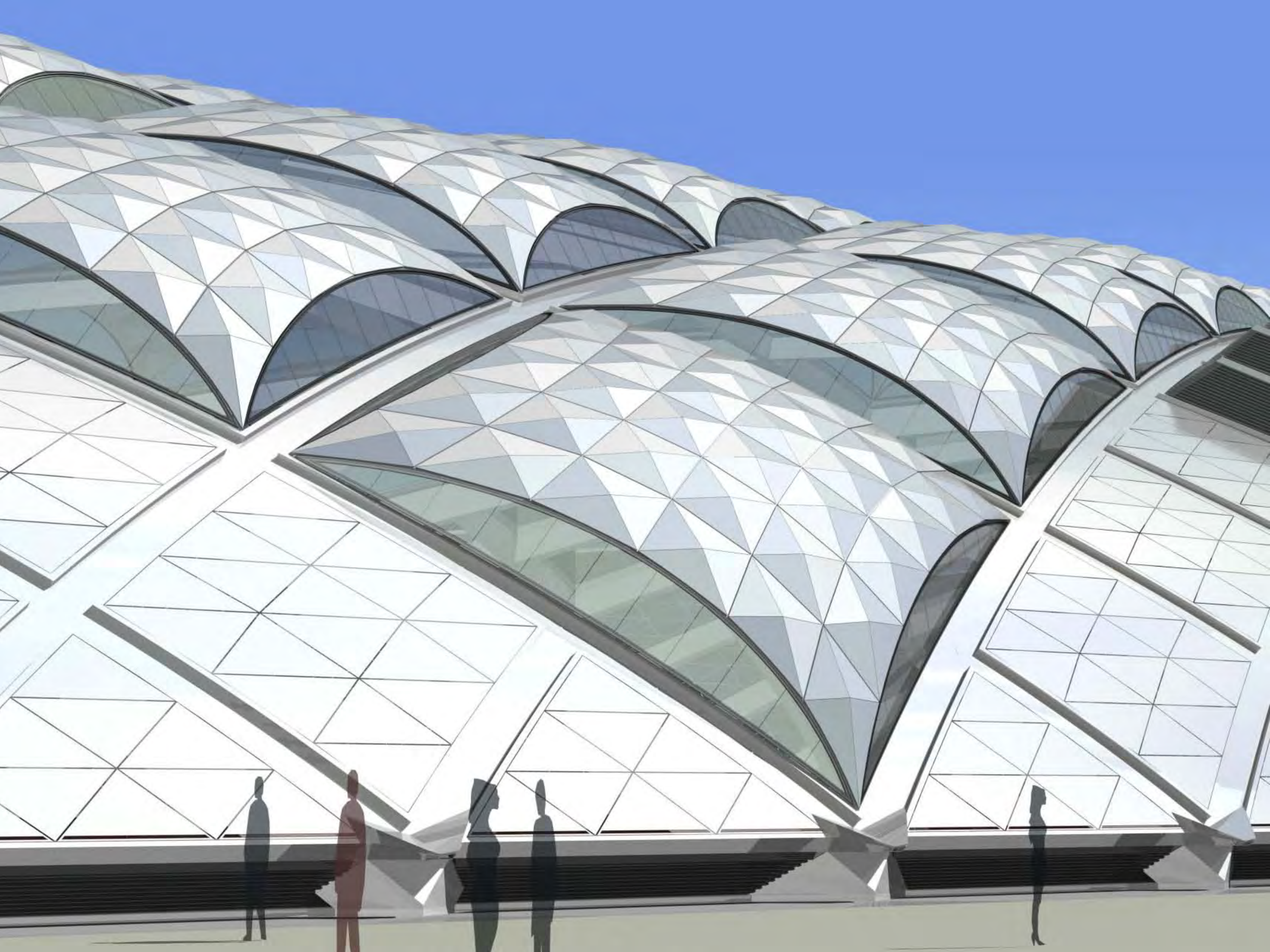
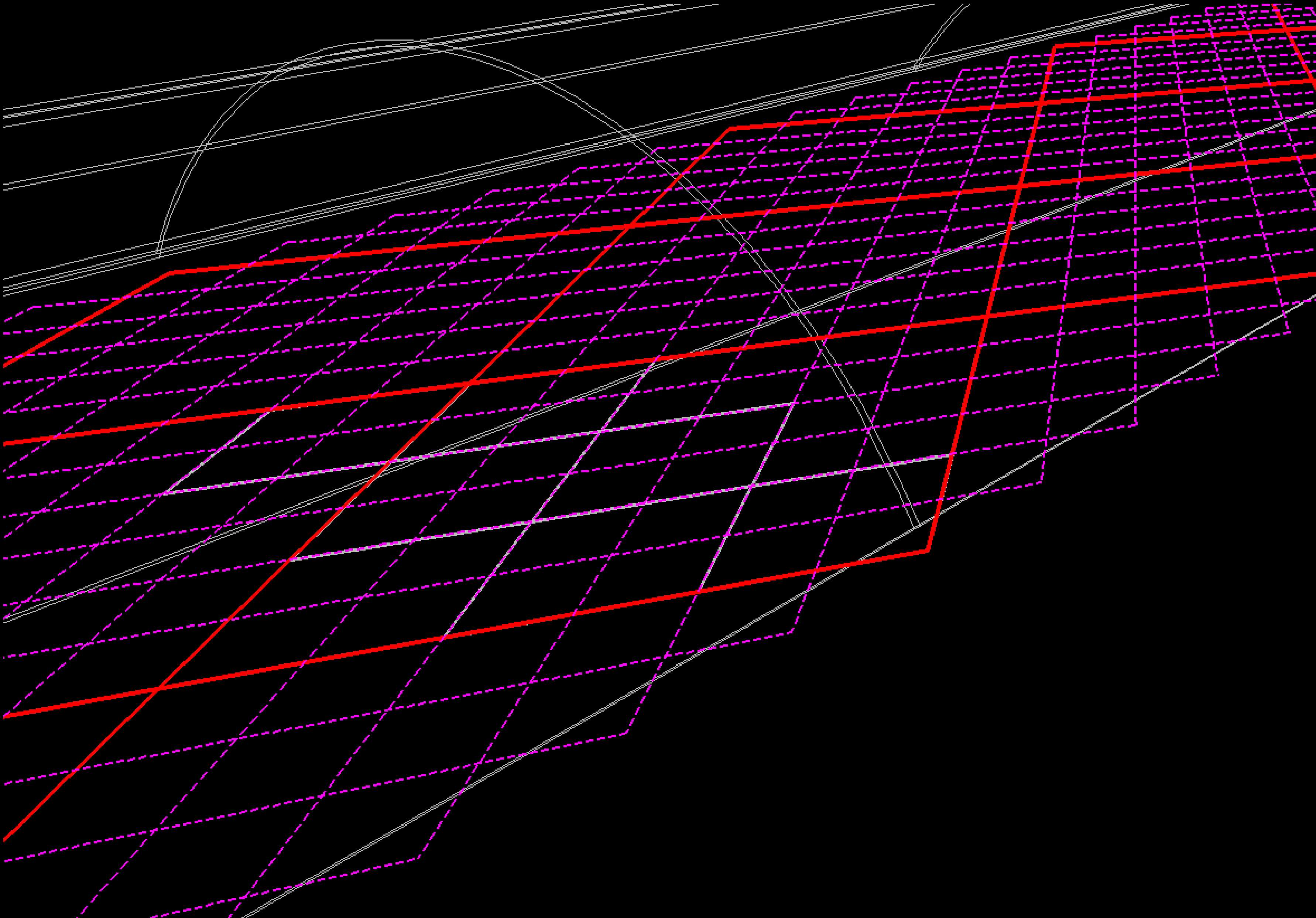
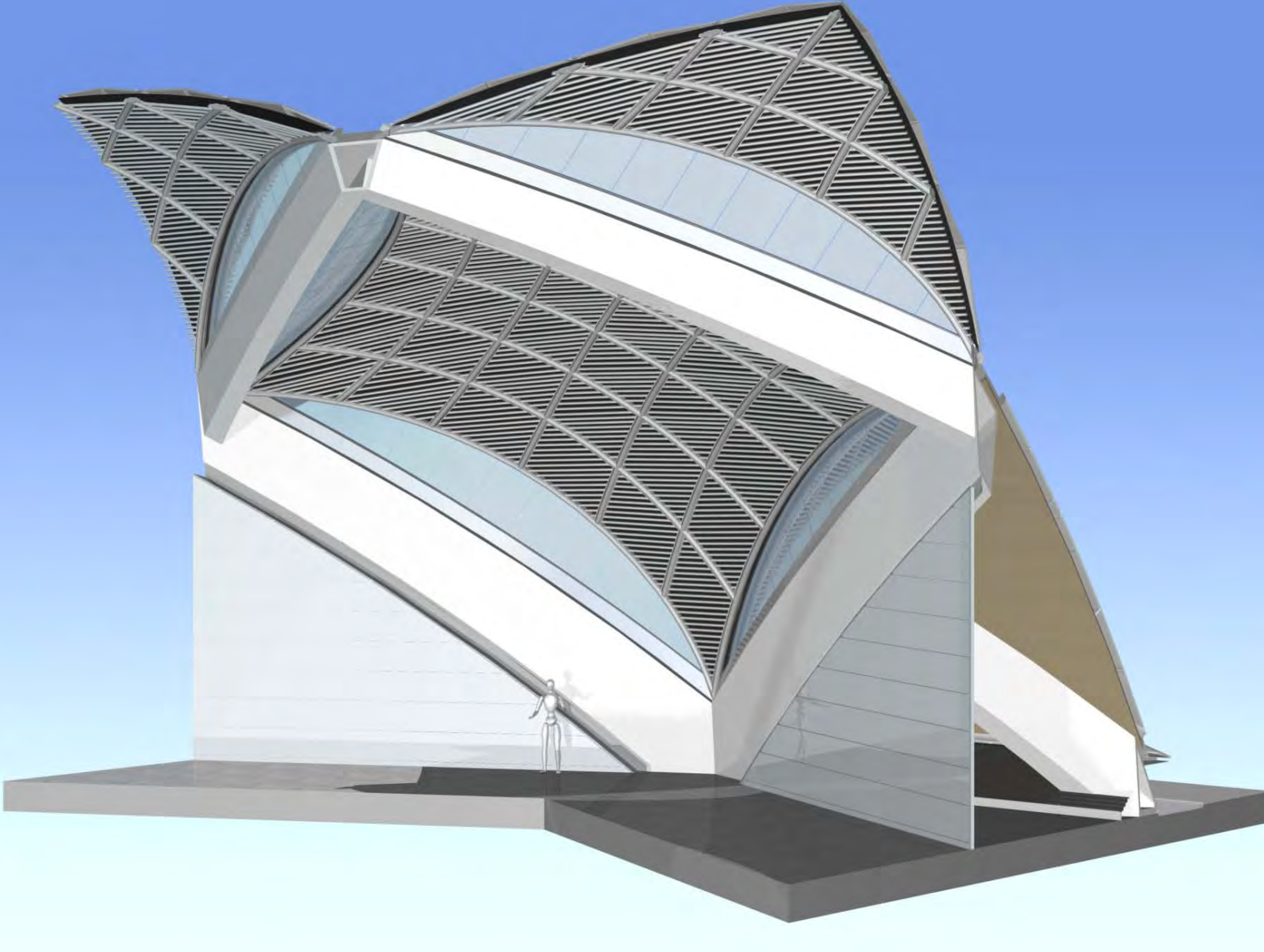
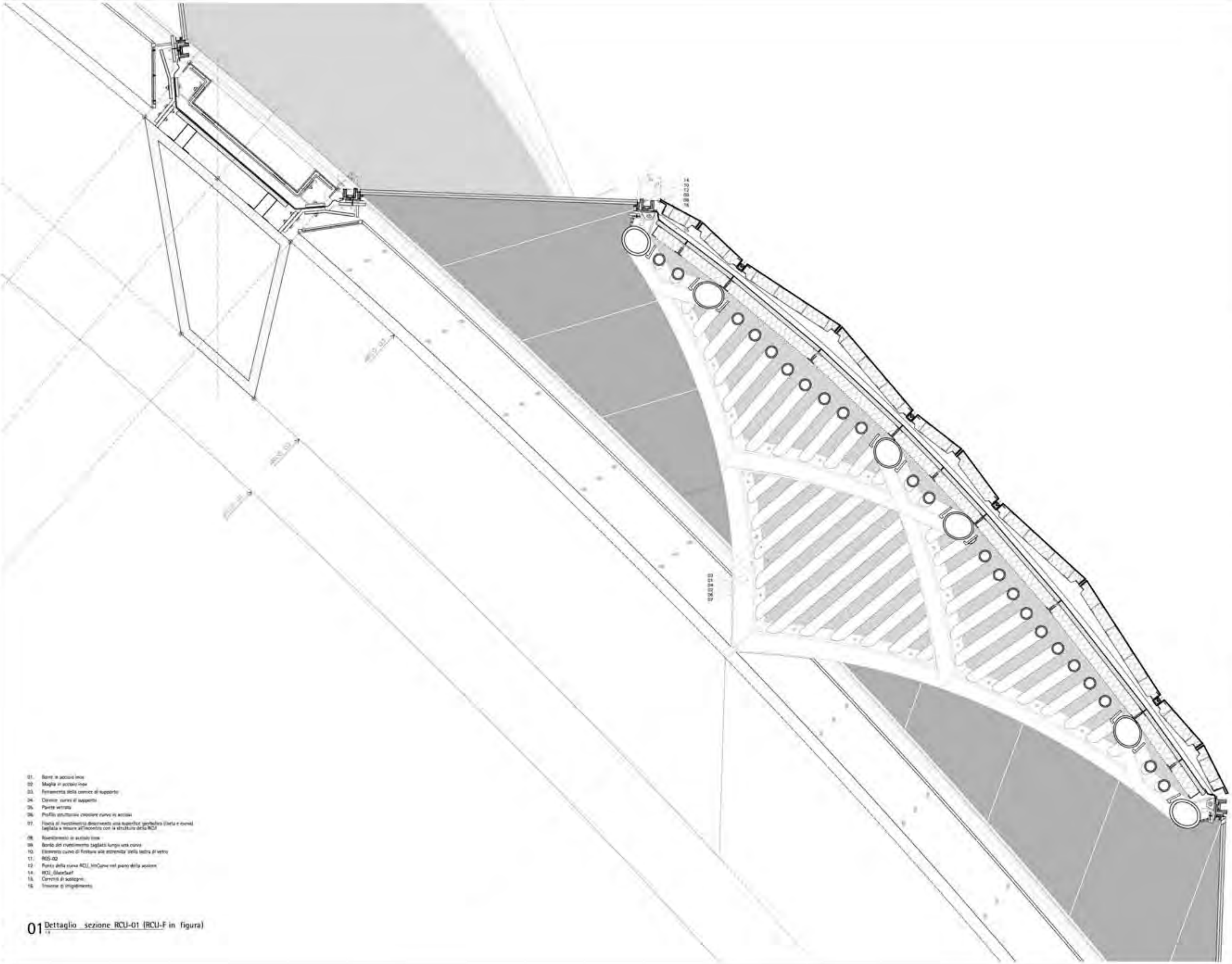




Arc based Definition for RCU A-F - script to find workpoints





01. Barre in acciaio inox
02. Maglia in acciaio inox
03. Ferramenta della cornice di supporto
04. Cornice curva di supporto
05. Parete vetrata
06. Profilo strutturale cellulare curvo in acciaio
07. Fascia di rivestimento descrivendo una superficie geodetica (retta e curva) tagliata a misura all'incontro con la struttura della RCU
08. Rivestimento in acciaio inox
09. Bordo del rivestimento tagliato lungo una curva
10. Elemento curvo di finitura alle estremita' della lastra di vetro
11. RGS-02
12. Punto della curva RCU_IntCurve nel piano della sezione
14. RCU_GlassSurf
15. Cornici di sostegno
16. Traverse di irrigidimento

01 Dettaglio sezione RCU-01 (RCU-F in figura)

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PROGETTO ESECUTIVO

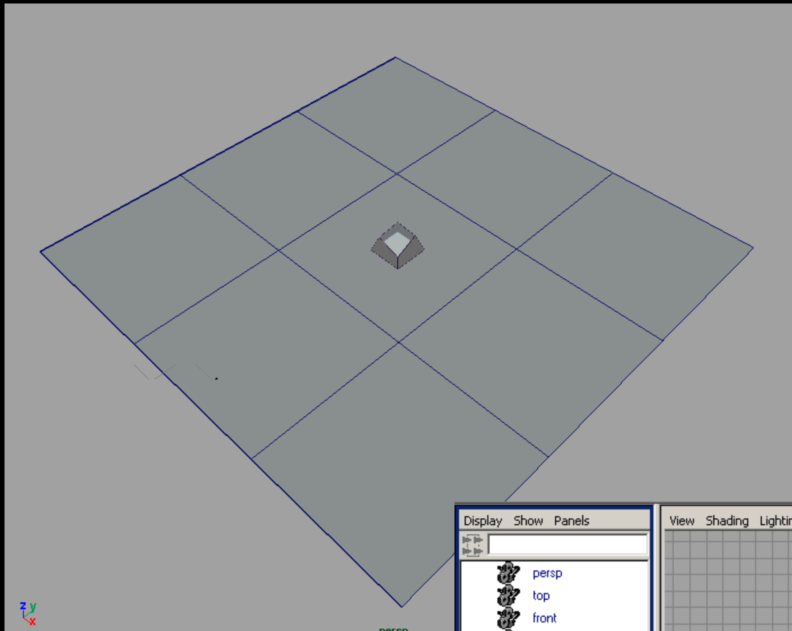
Stazione AV

RCU-01 Dettagli

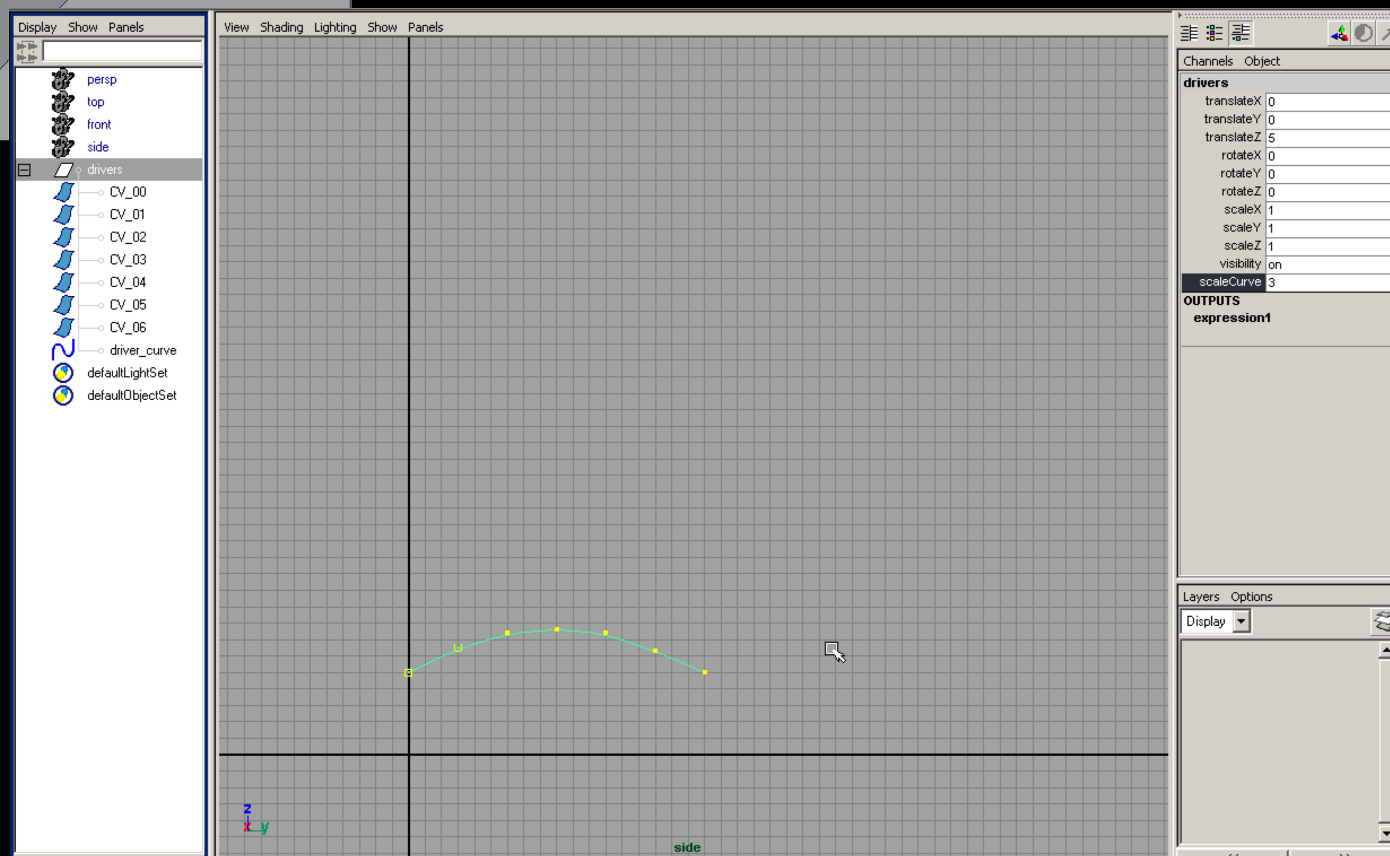
N-RU-01 1:5 F&P 11

21.04.00

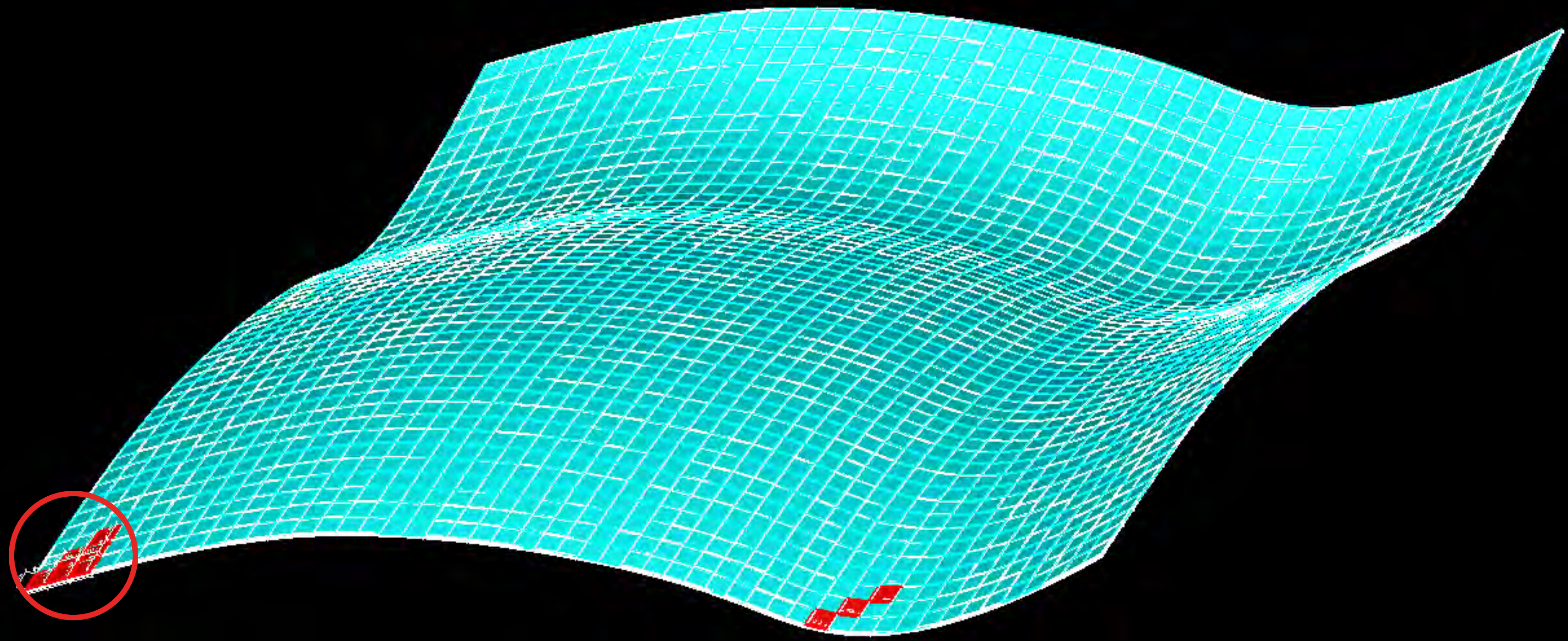
A5667

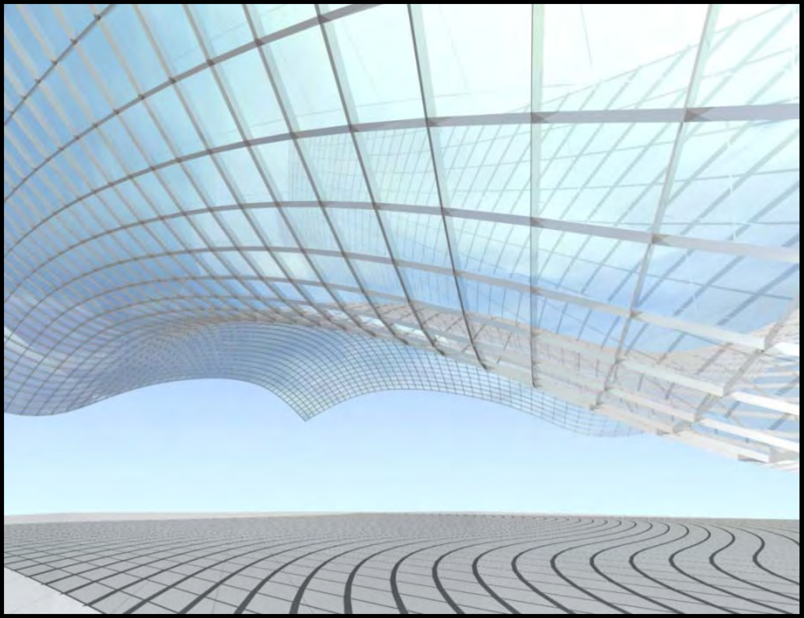


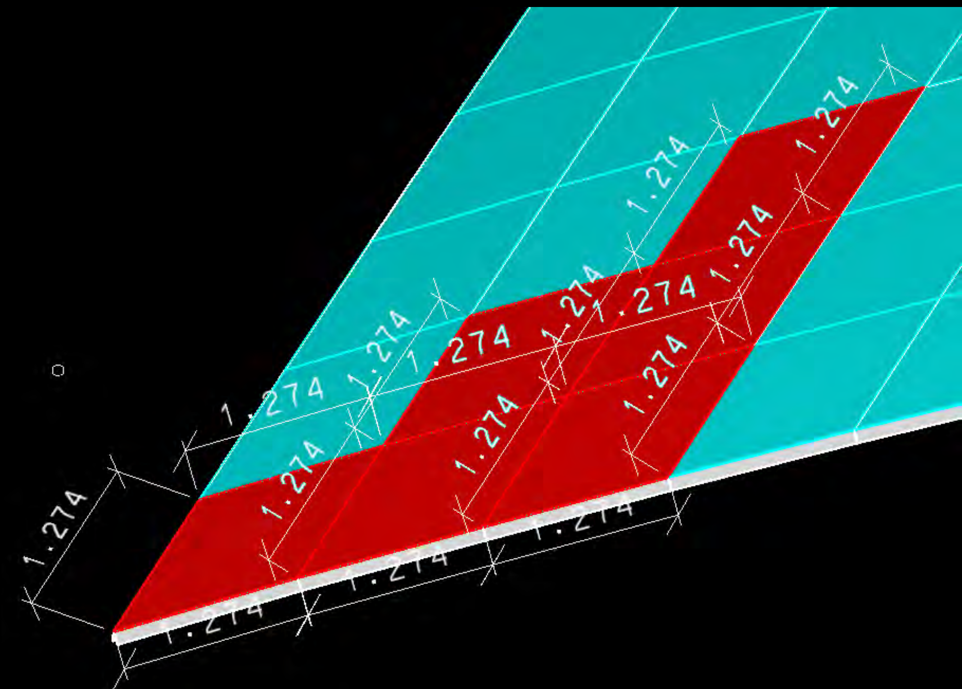
Arrayed Parametric Element



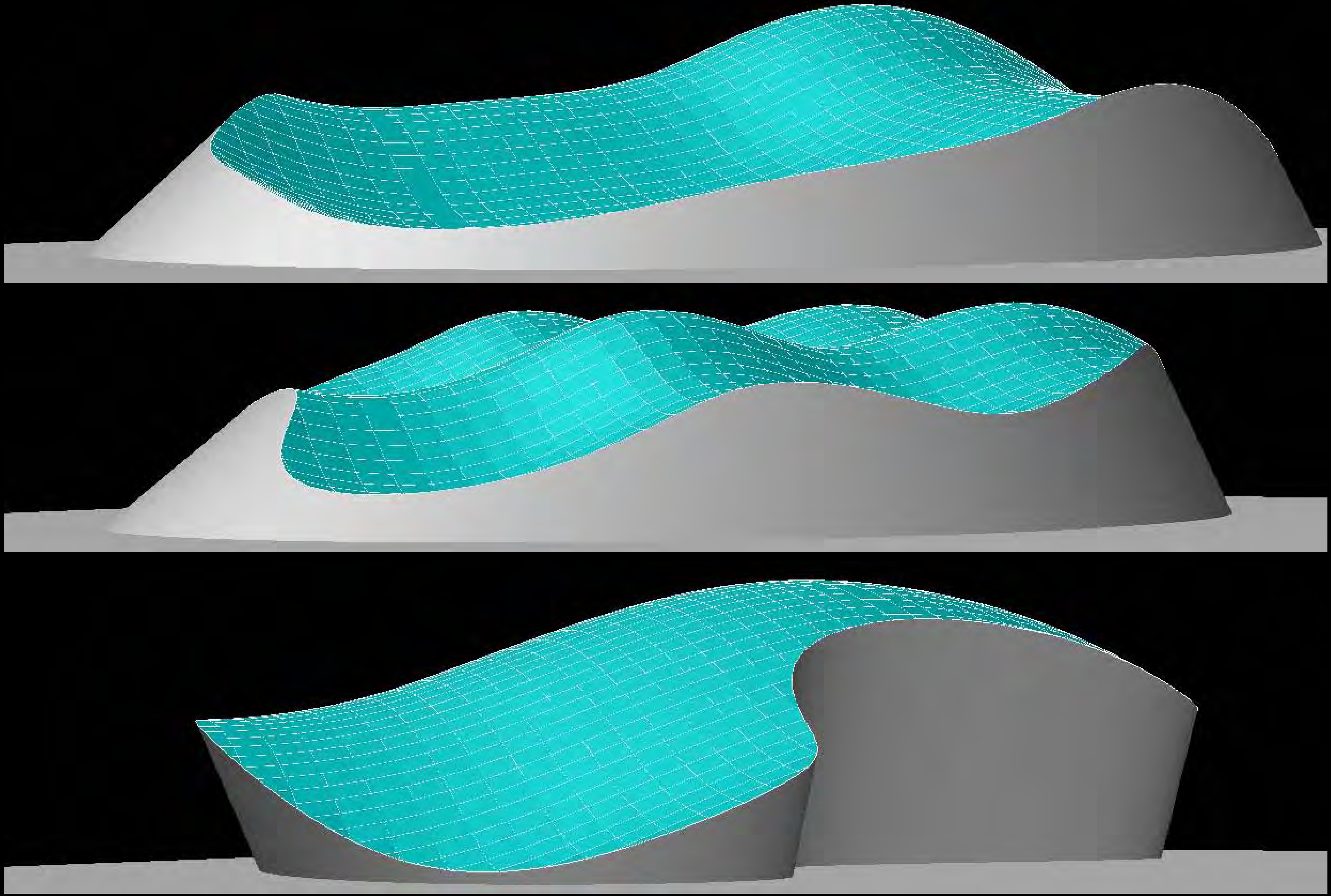
Parametric, Flat Panel Form Explorations with MEL Script



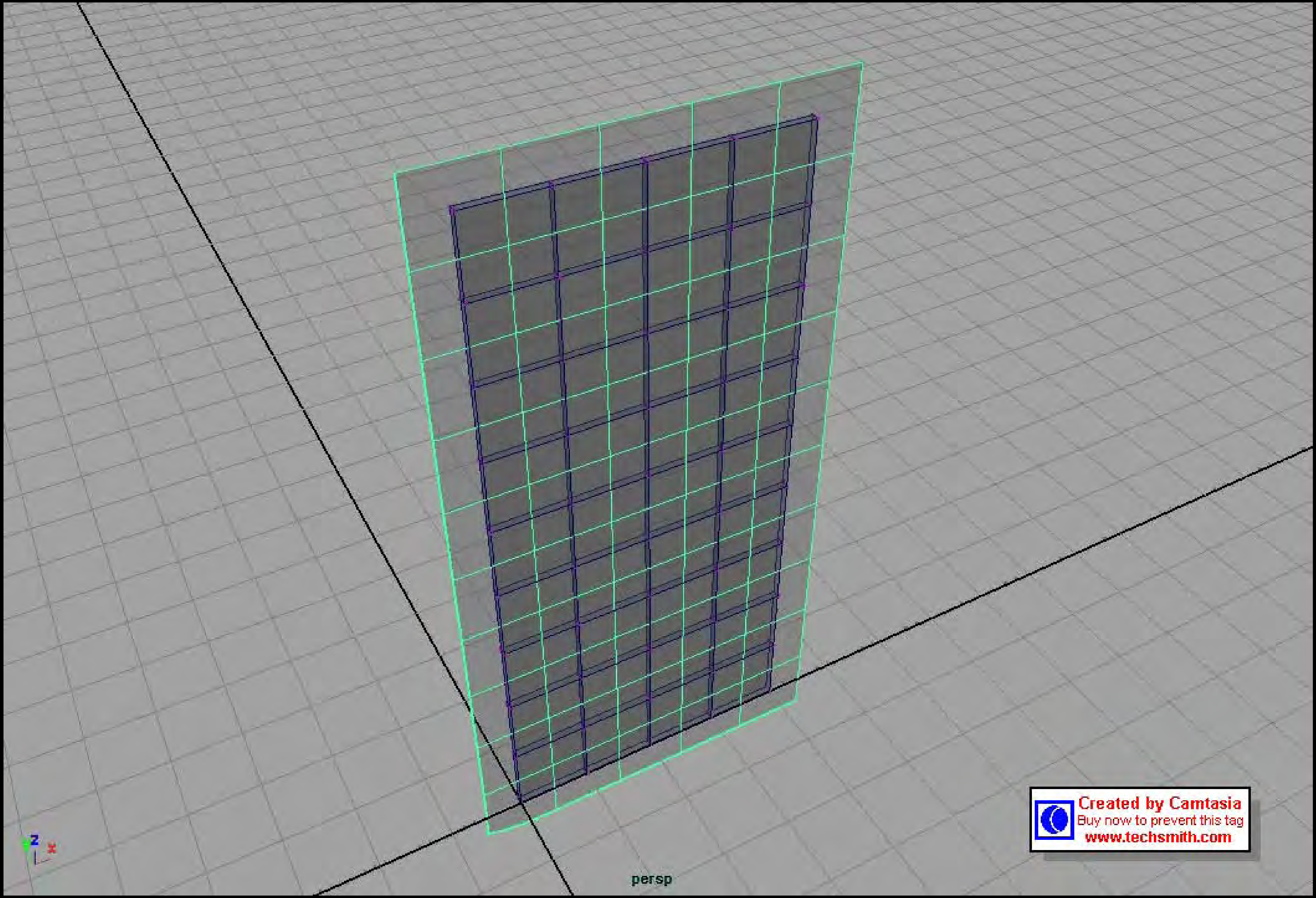




Import and Further Analysis in Microstation



Variations studied using the same parametric model



persp
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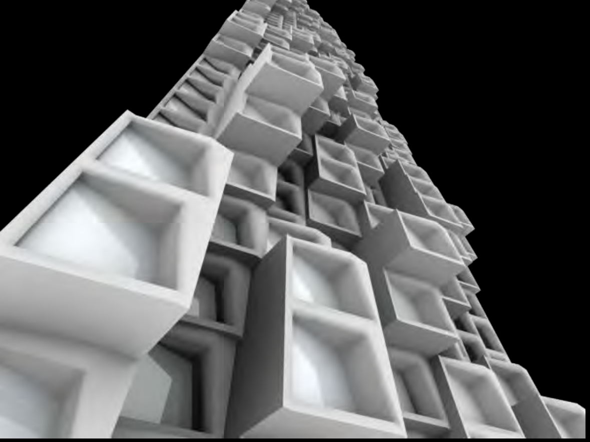
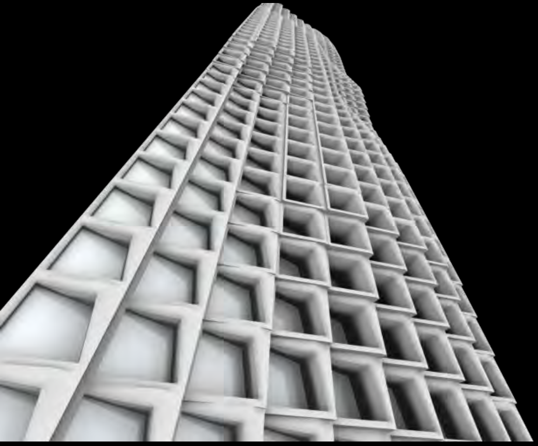
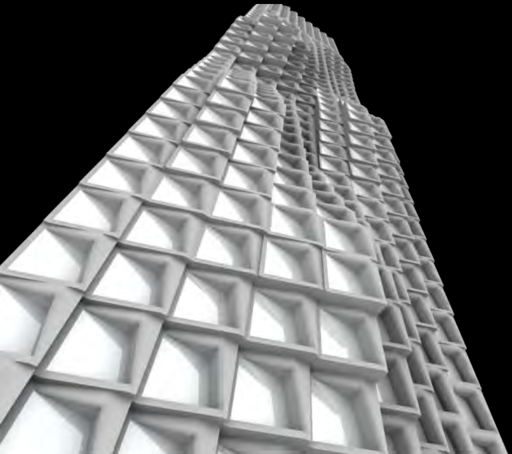
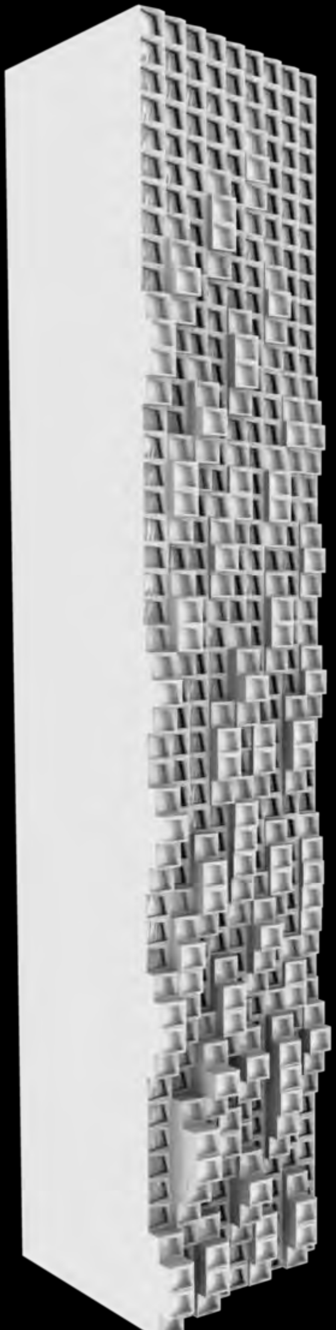
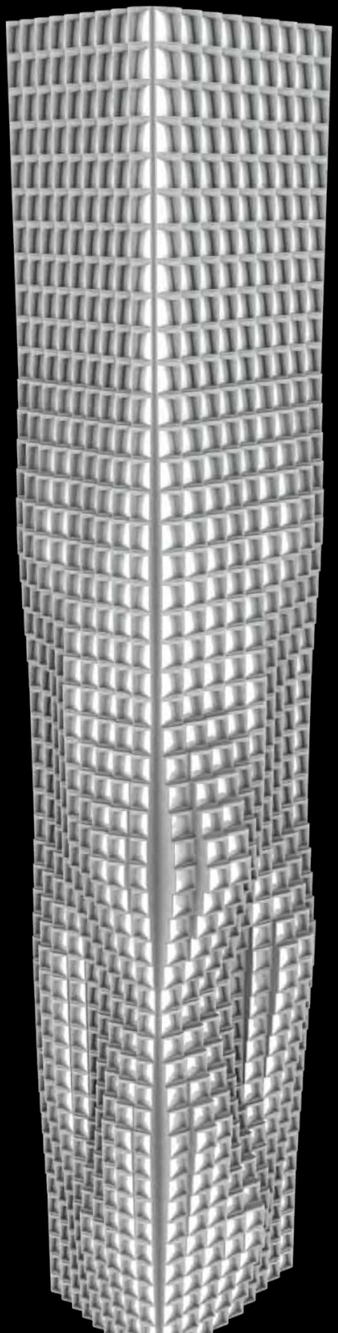
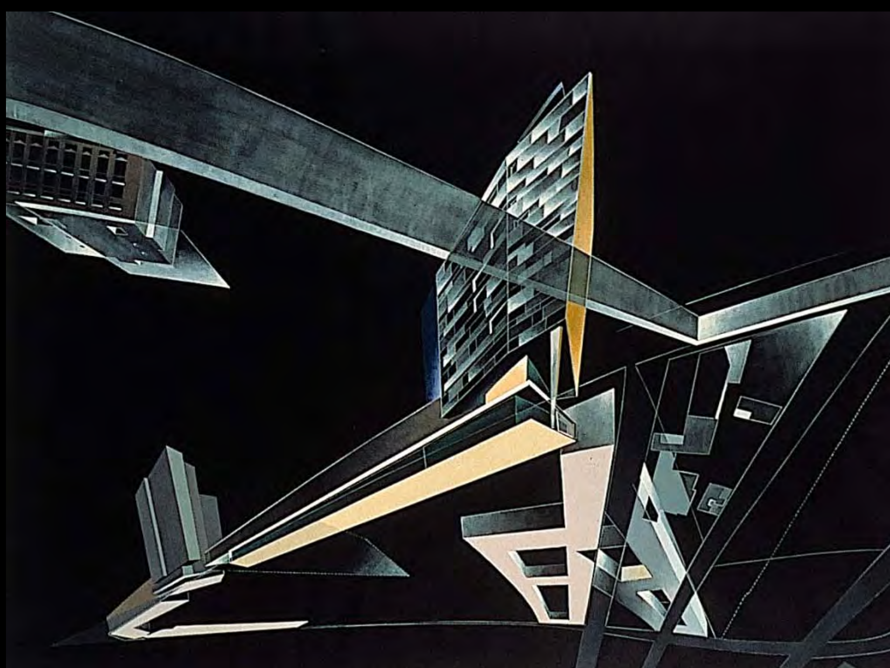
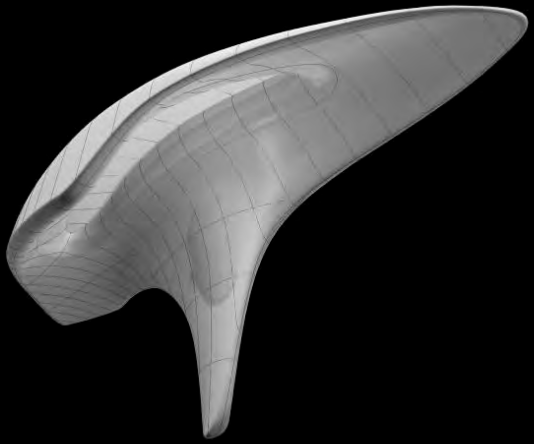






ZHA

Graphic representation and drawing experimentation that has contributed to the exploration of Fluid, Dynamic and Complex forms.




Formal explorations continue to develop through certain tools and modelling techniques. Rhino and Maya have become essential digital design tools within the office



Maya

Parametric Modelling
Powerful deformation tools

Rhino

Unparalleled Surface Modelling

One way 3D flow

2D Package

Limited 3D – receives flattened 3D information from other packages
2D documentation only

Maya

Parametric Modelling
Powerful deformation tools

Rhino

Unparalleled Surface Modelling

Interoperability!
Two way 3D flow

Microstation

Powerful Solid and Surface Modelling
Powerful 3D and 2D capabilities
Umbrella software linking all studies
Concept to Construction Documentation

INTEROPERABILITY

- **Combined strengths of 3D software design packages**
- **Integrated 3D and 2D workflows**
- **Flexibility combining staff expertise and abilities**

Rhino

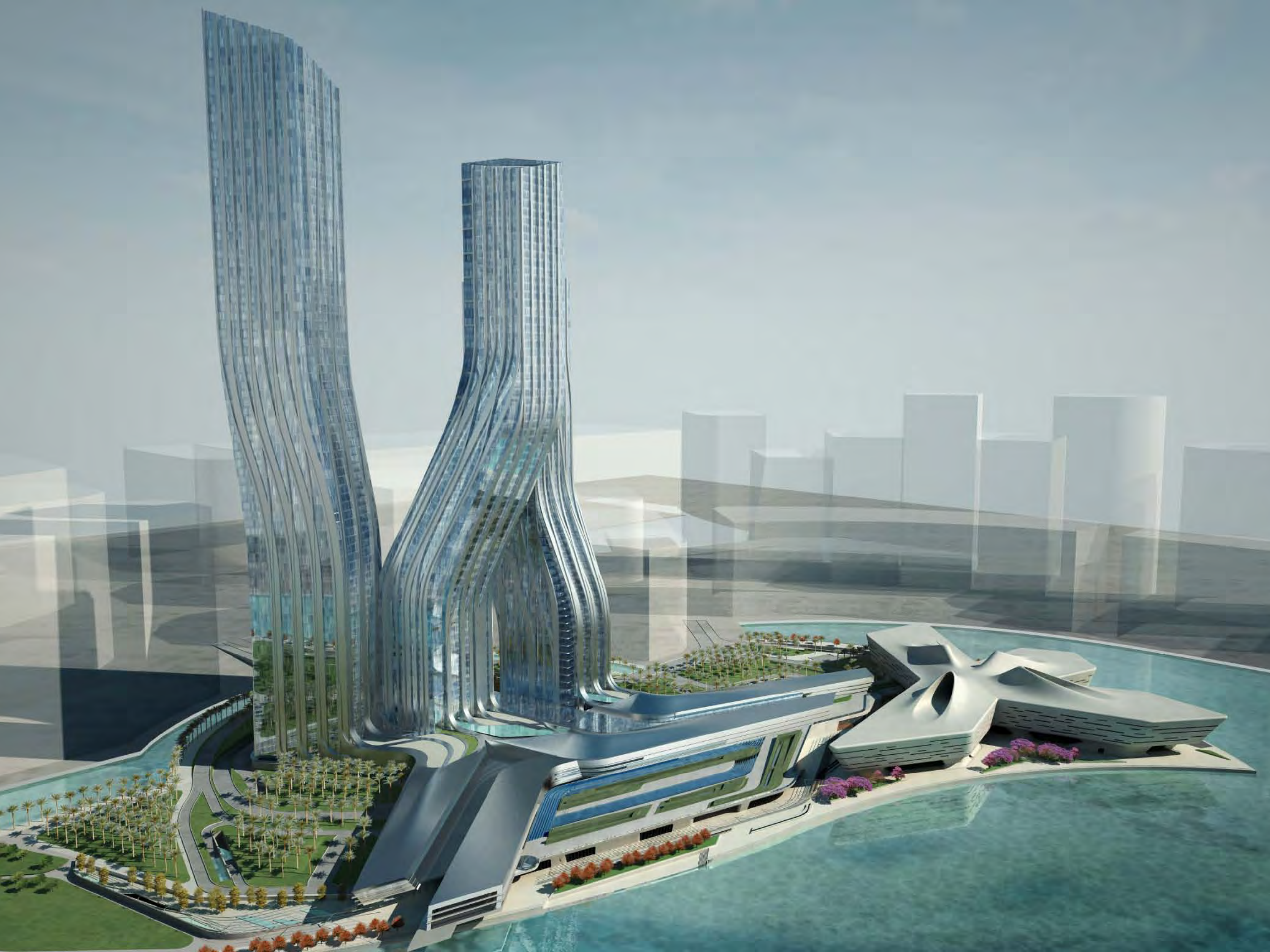
- Widest array of highly effective and user friendly surface modelling tools

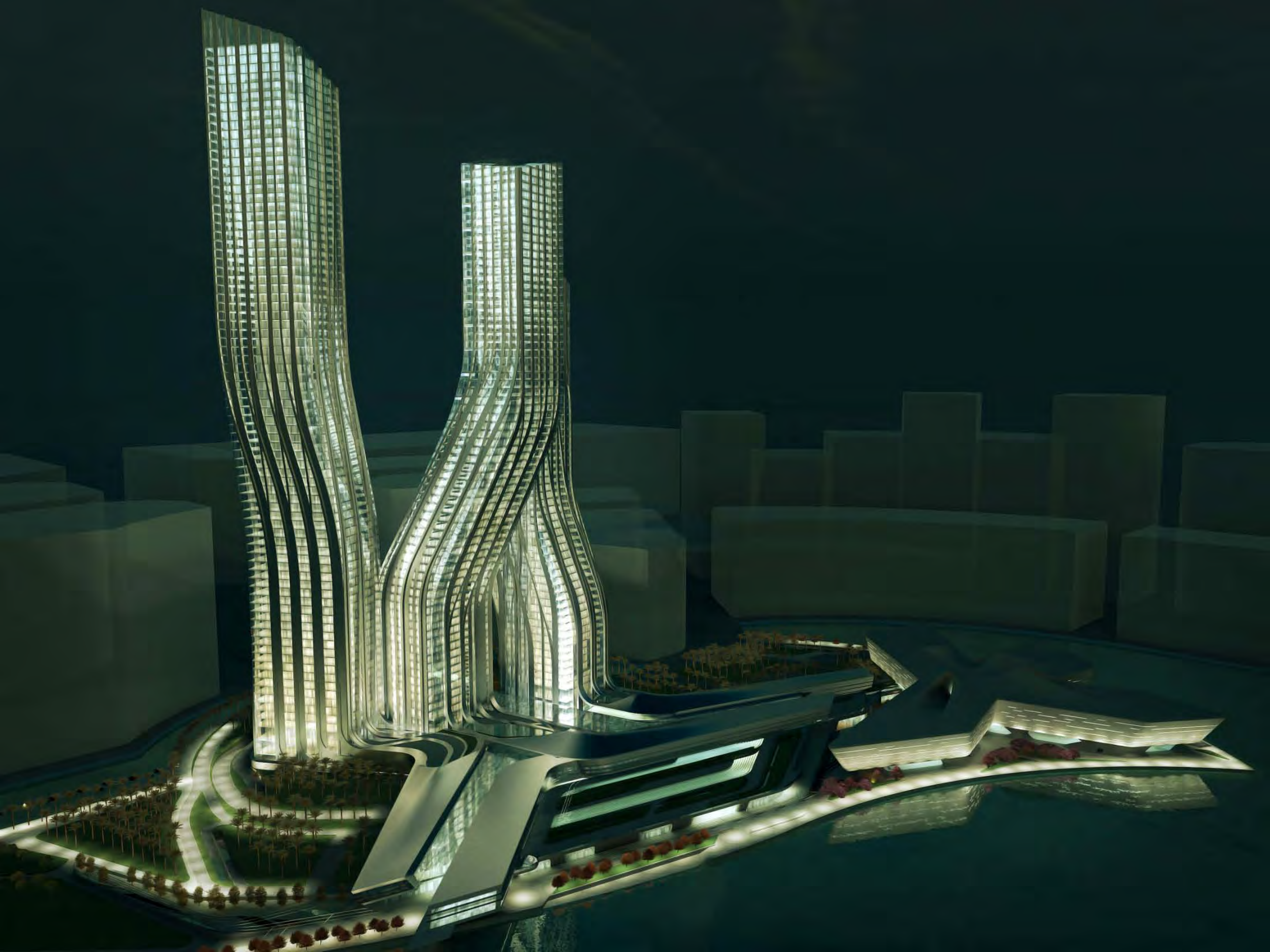
Maya

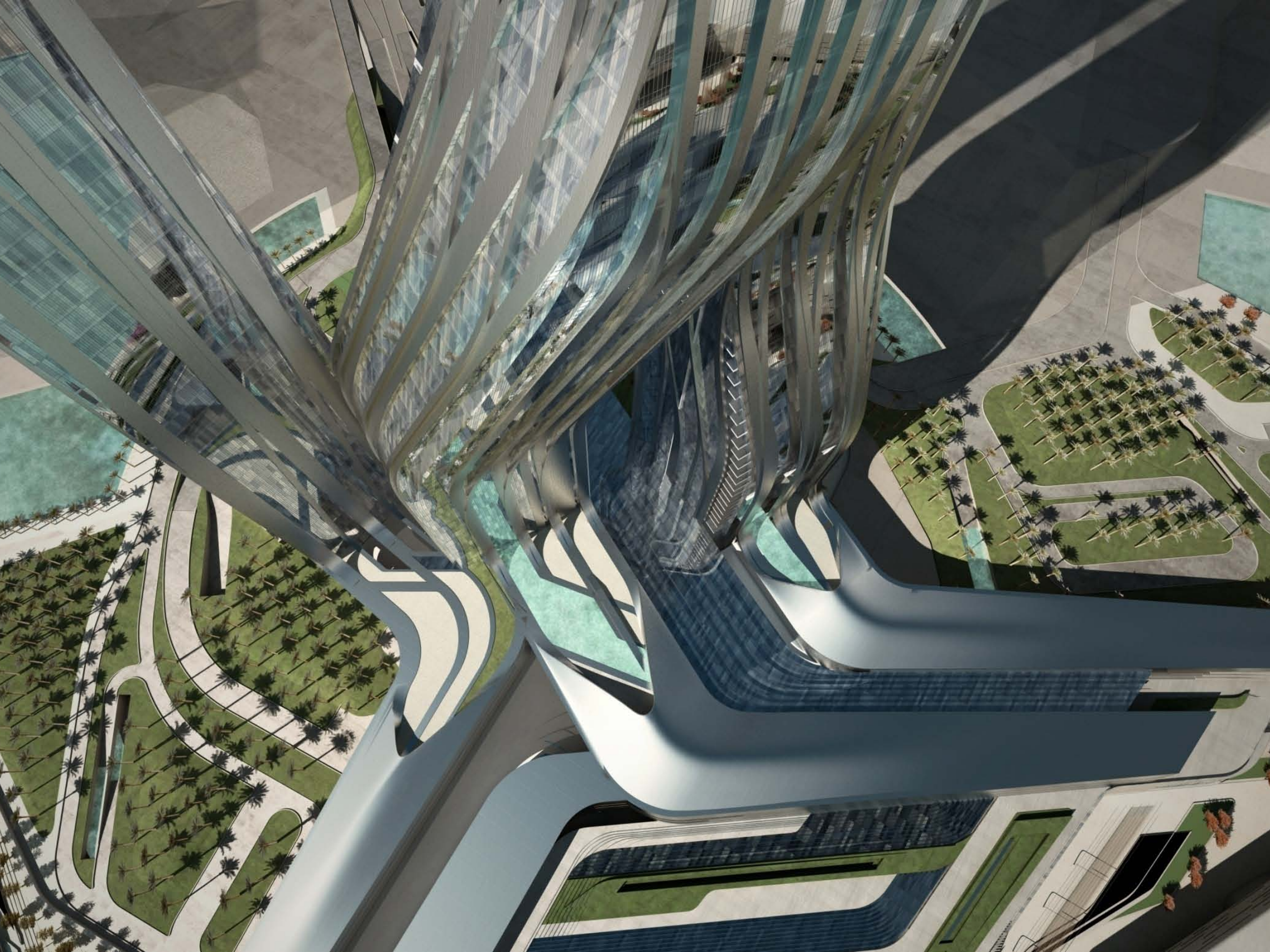
- User friendly animation package with powerful deformation tools
- Design History and Parametric Modelling capabilities
- MEL – Scripting language that is very easy to begin using

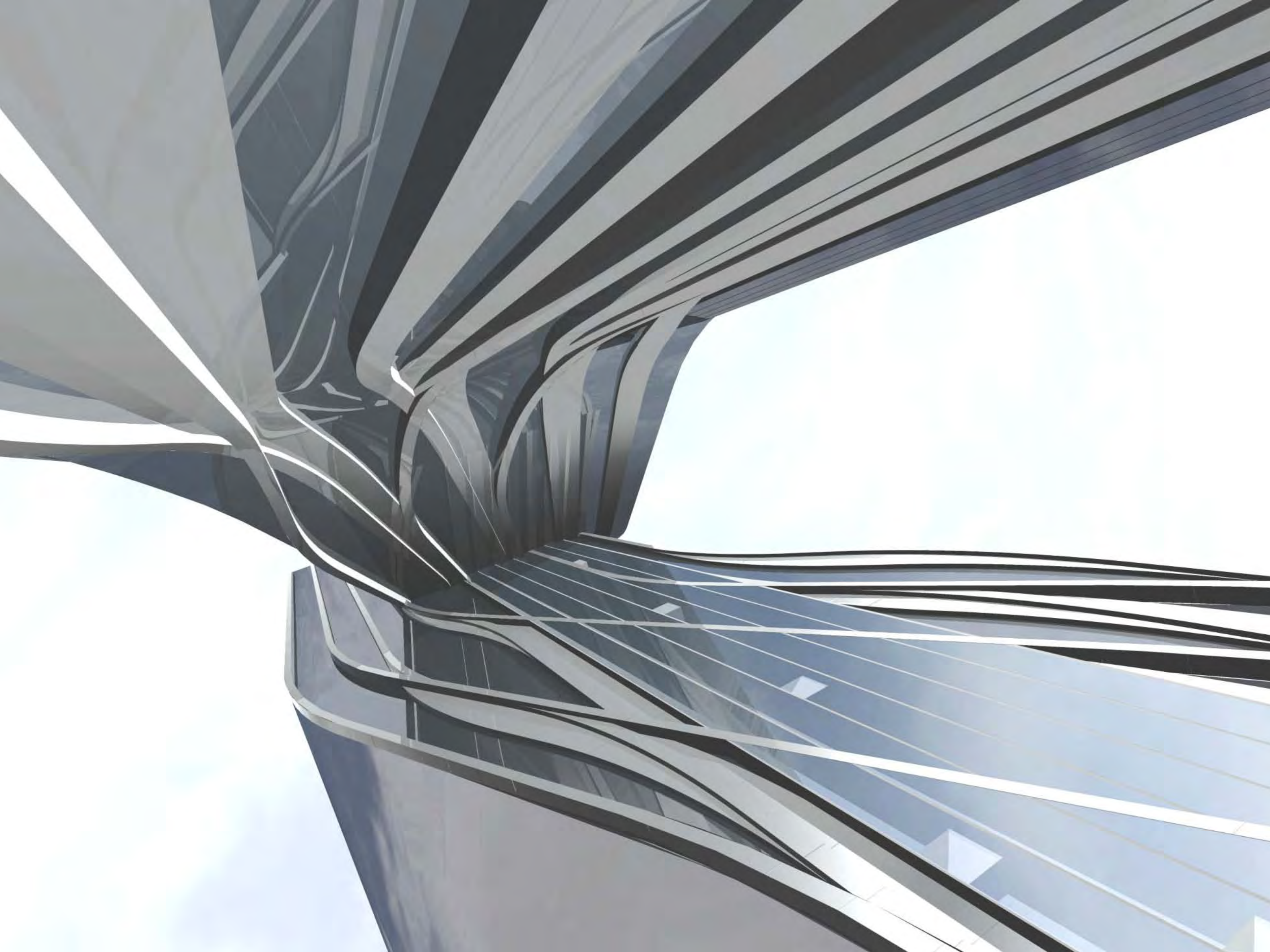
Microstation

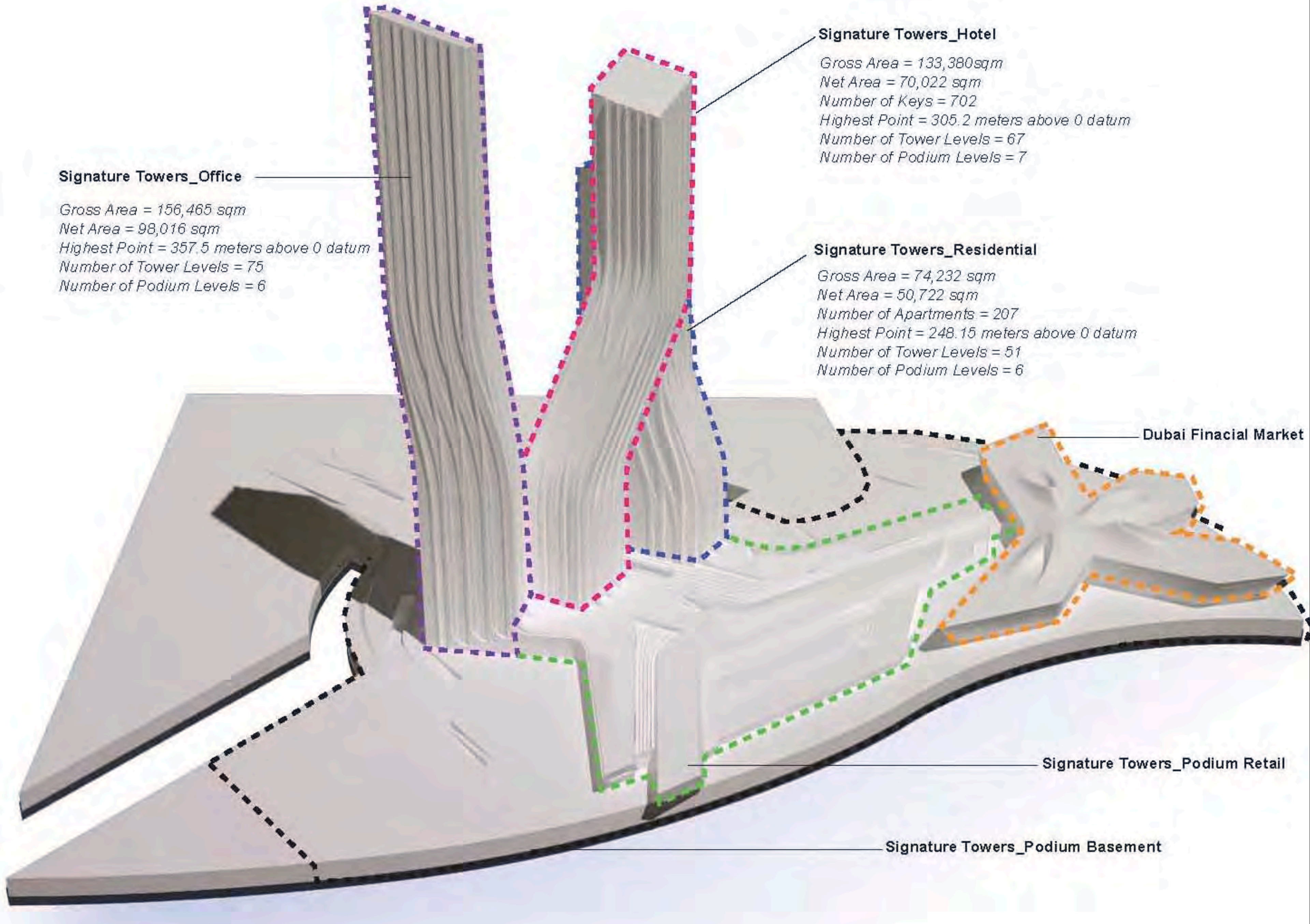
- Broad range of surface and solid modelling tools
- Geometric precision
- Nurbs geometry works seamlessly with Rhino and Maya
- 3D and 2D within the same platform
- Advanced Referencing system
- Referencing logic the same in 2D and 3D – facilitates collaboration on large models
- Tool can be used from conceptual stages to completion



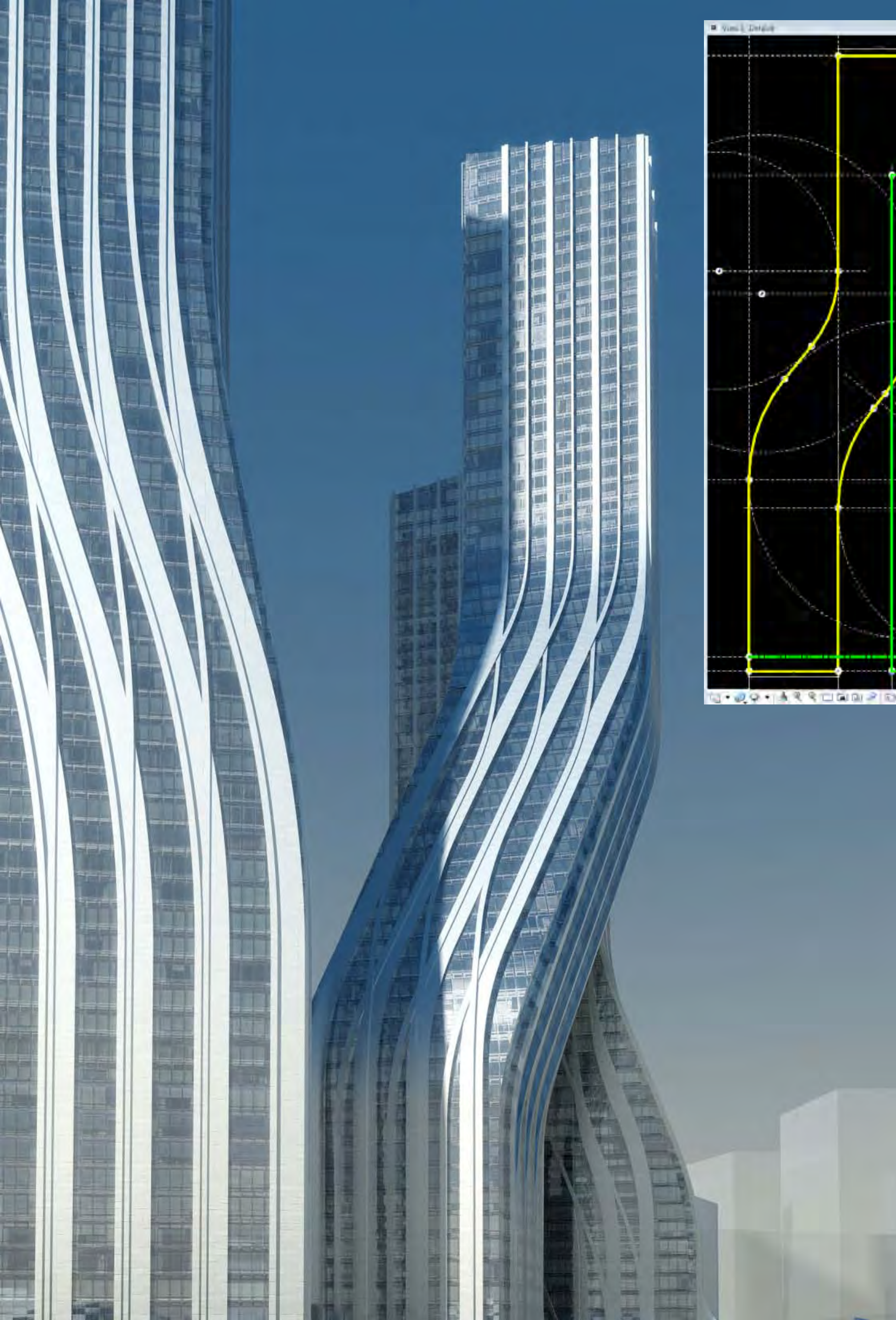


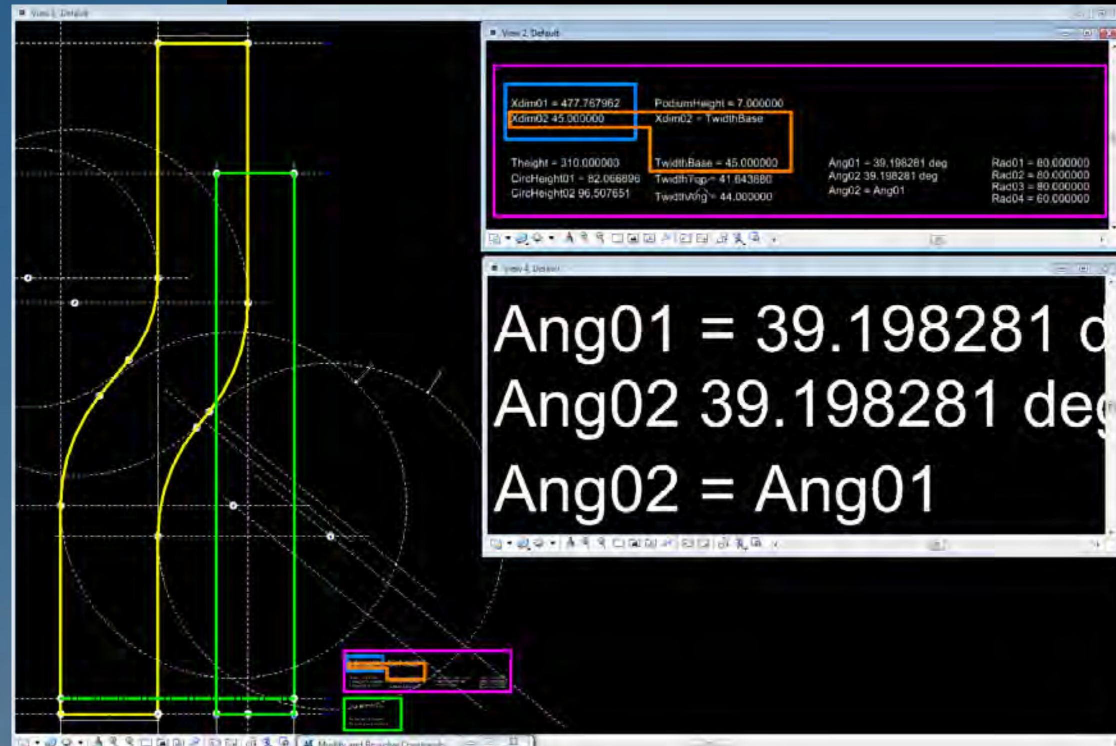






Signature Towers_Hotel
Gross Area = 133,380sqm
Net Area = 70,022 sqm
Number of Keys = 702
Highest Point = 305.2 meters above 0 datum
Number of Tower Levels = 67
Number of Podium Levels = 7
Signature Towers_Office
Gross Area = 156,465 sqm
Net Area = 98,016 sqm
Highest Point = 357.5 meters above 0 datum
Number of Tower Levels = 75
Number of Podium Levels = 6
Signature Towers_Residential
Gross Area = 74,232 sqm
Net Area = 50,722 sqm
Number of Apartments = 207
Highest Point = 248.15 meters above 0 datum
Number of Tower Levels = 51
Number of Podium Levels = 6
Dubai Finacial Market
Signature Towers_Podium Retail
Signature Towers_Podium Basement




View 2, Default
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Xdim02 45.000000
PodiumHeight = 7.000000
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Theight = 310.000000
CircHeight01 = 82.066896
CircHeight02 96.507651
TwidthBase = 45.000000
TwidthTop = 41.643680
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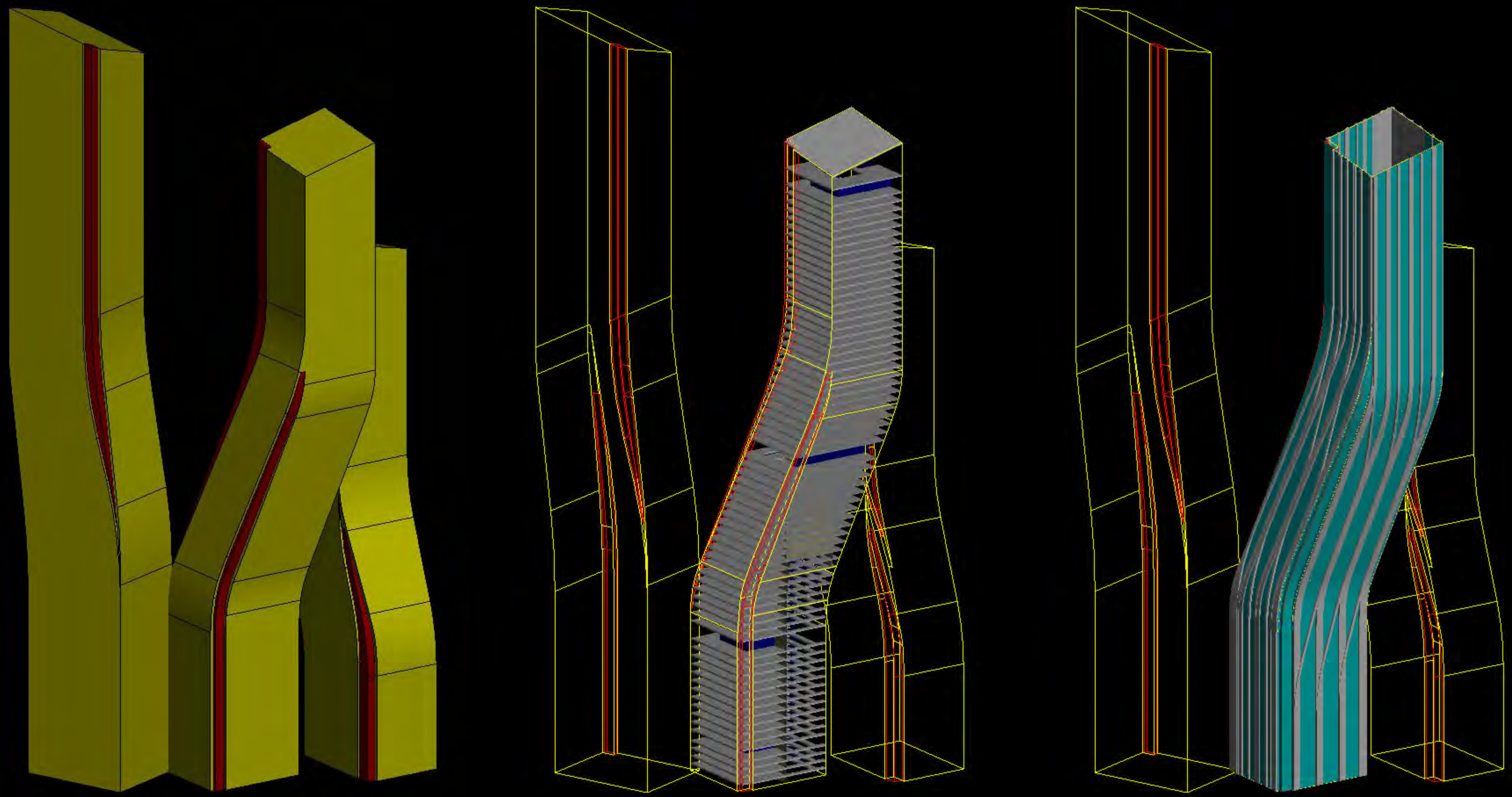
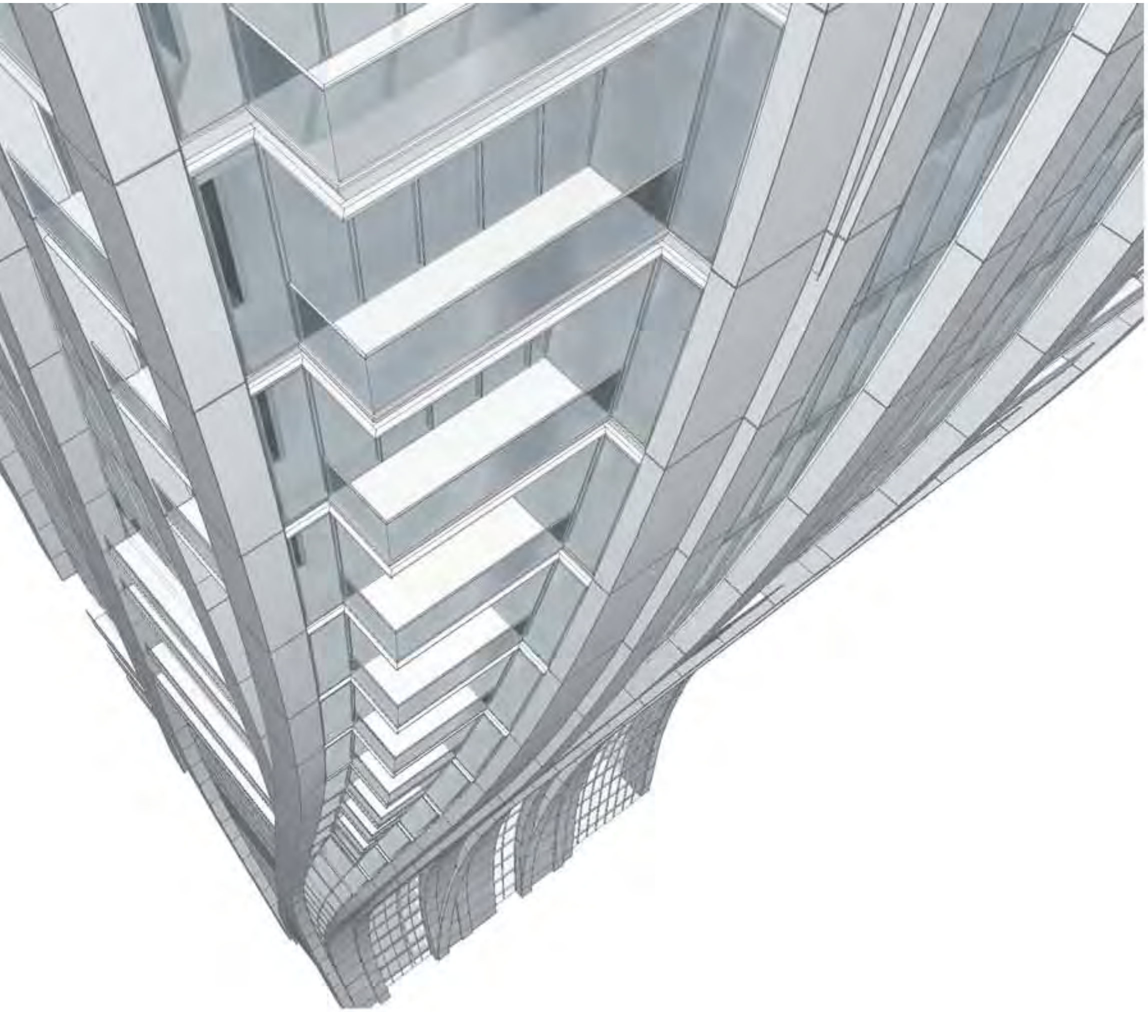
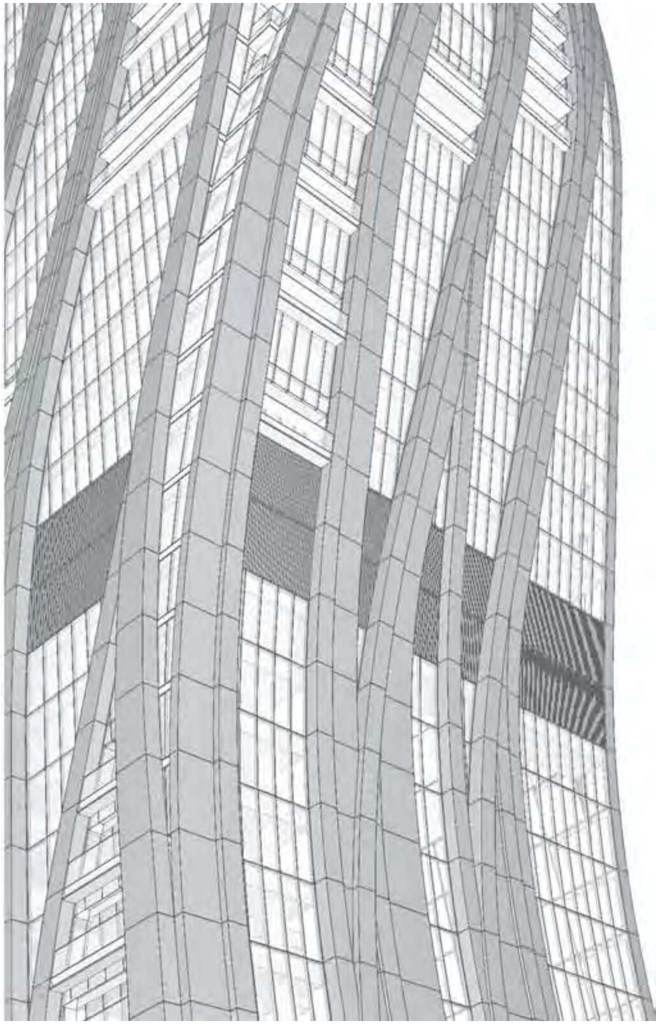
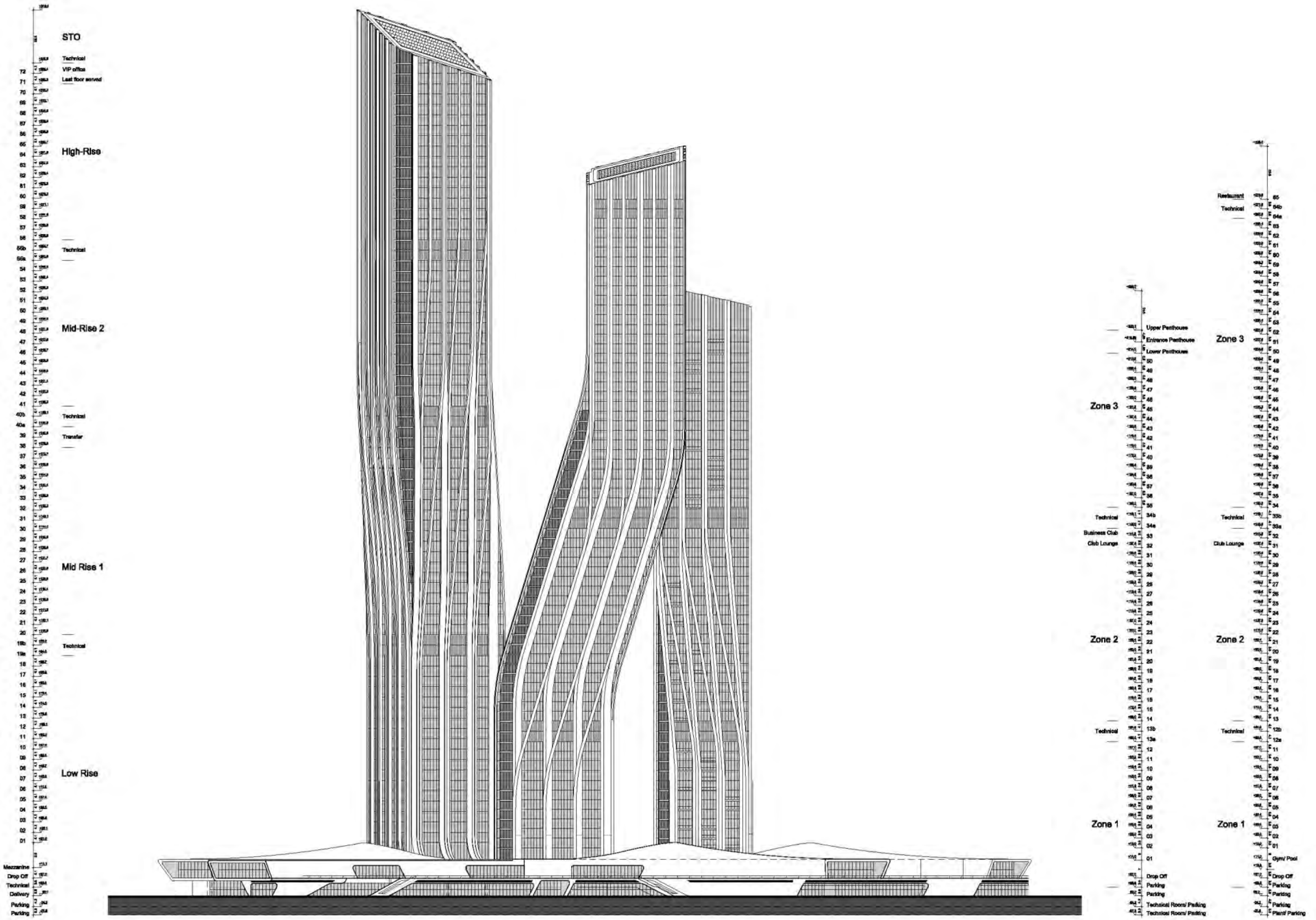
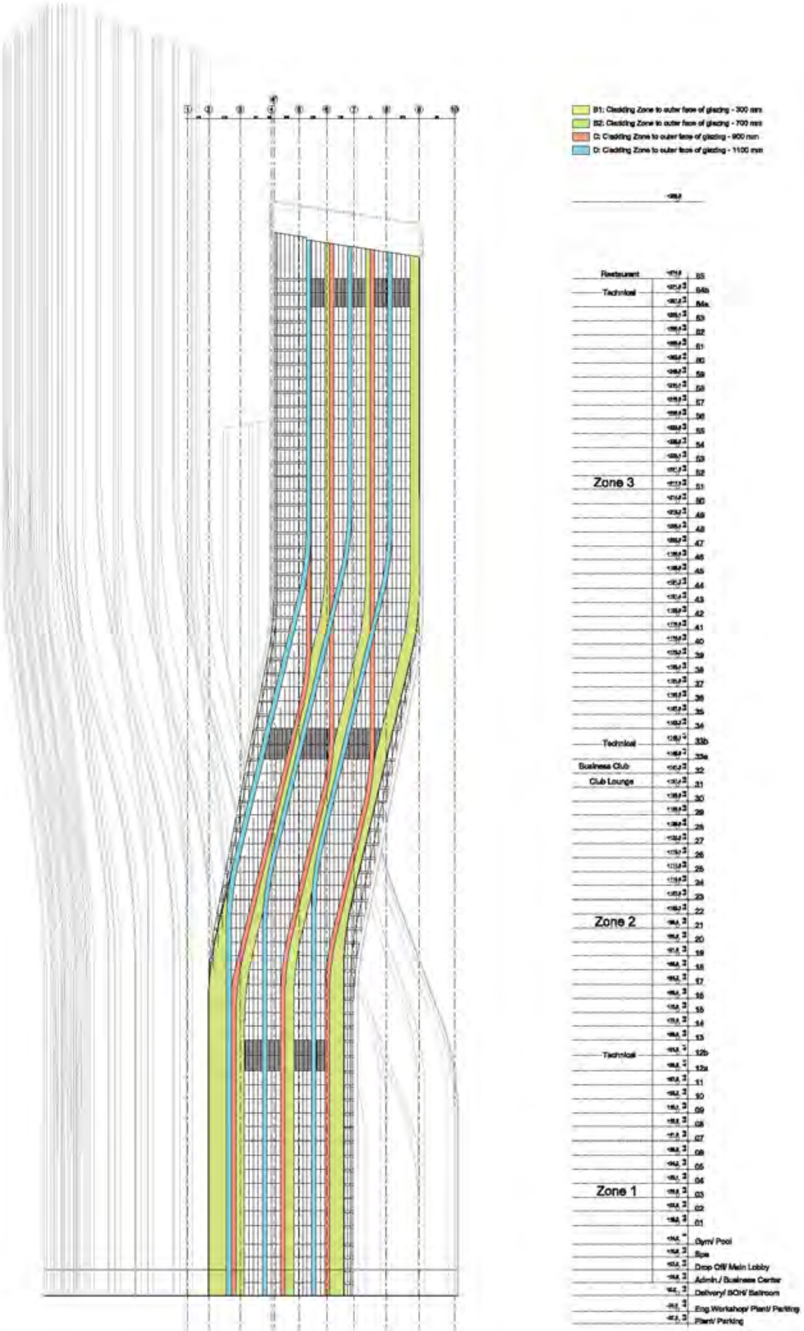
Ang01 = 39.198281 deg
Ang02 39.198281 deg
Ang02 = Ang01
Rad01 = 80.000000
Rad02 = 80.000000
Rad03 = 80.000000
Rad04 = 60.000000
Ang01 = 39.198281 d
Ang02 39.198281 deg
Ang02 = Ang01
Modify and Resolve Comments

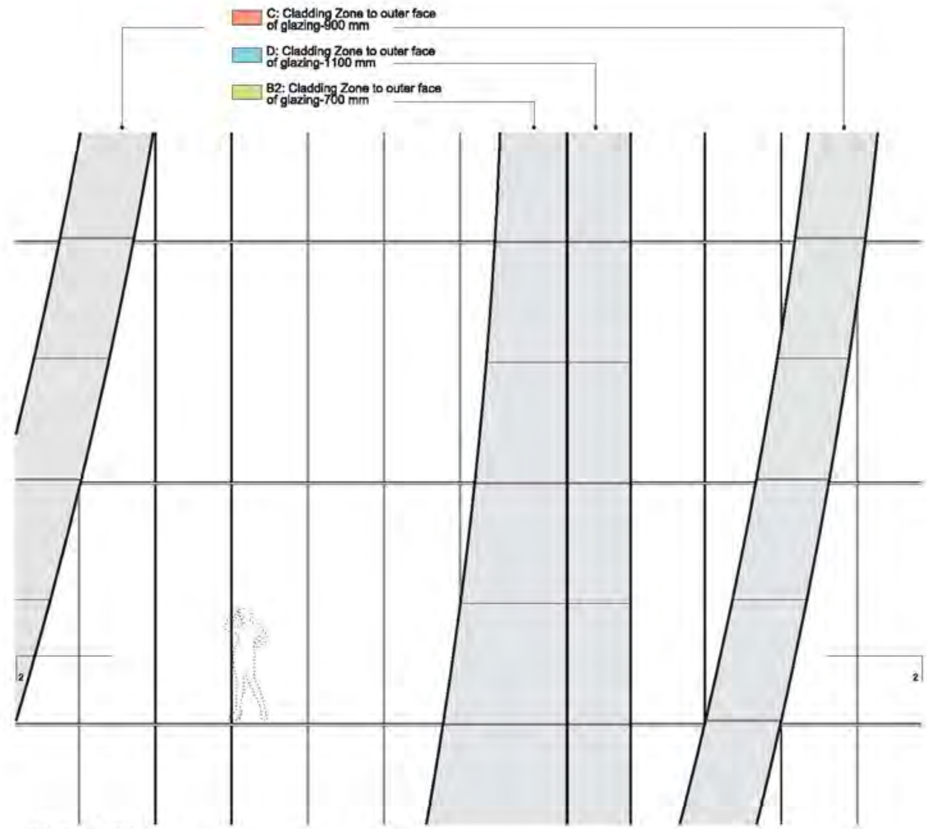




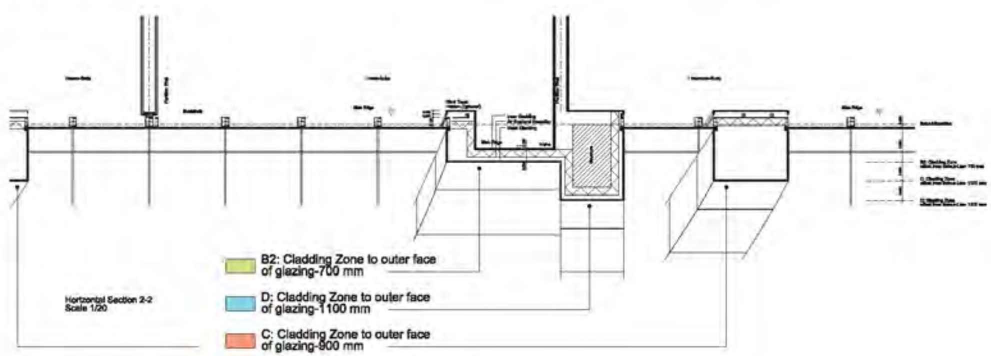



STO
Technical
VIP office
Last floor served
High-Rise
Technical
Mid-Rise 2
Technical
Transfer
Mid Rise 1
Technical
Low Rise
Mezzanine
Drop Off
Technical
Delivery
Parking
Parking
Upper Penthouse
Entrance Penthouse
Lower Penthouse
Zone 3
Technical
Business Club
Club Lounge
Zone 2
Technical
Zone 1
Drop Off
Parking
Parking
Technical Room/ Parking
Technical Room/ Parking
Restaurant
Technical
Zone 3
Technical
Club Lounge
Zone 2
Technical
Zone 1
Gym/ Pool
Drop Off
Parking
Parking
Parking
Plant/ Parking

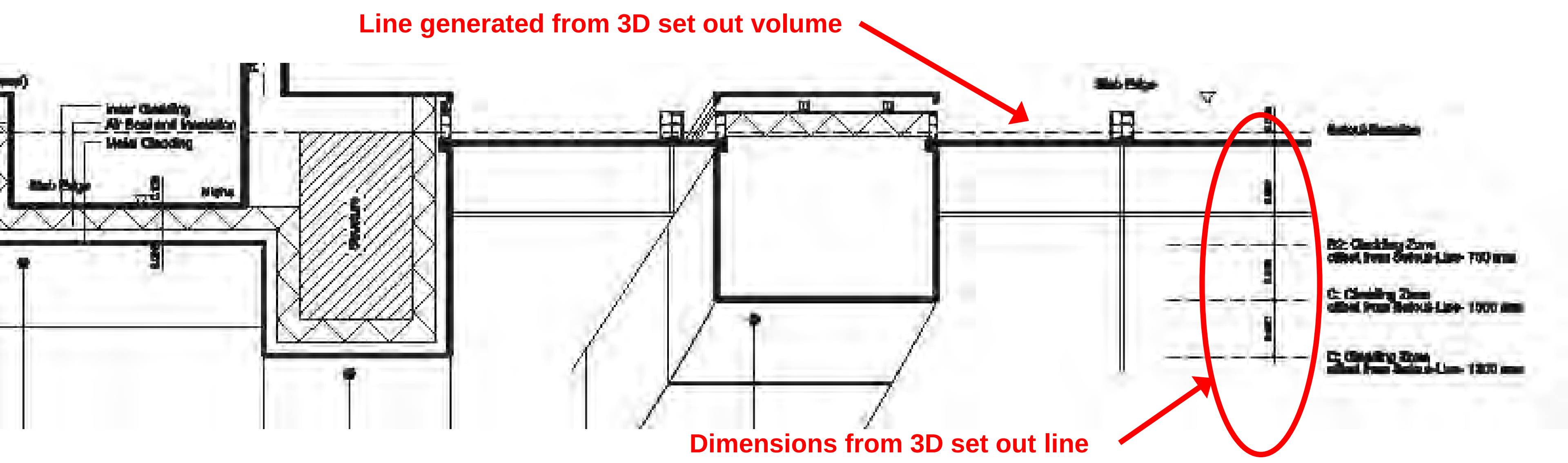


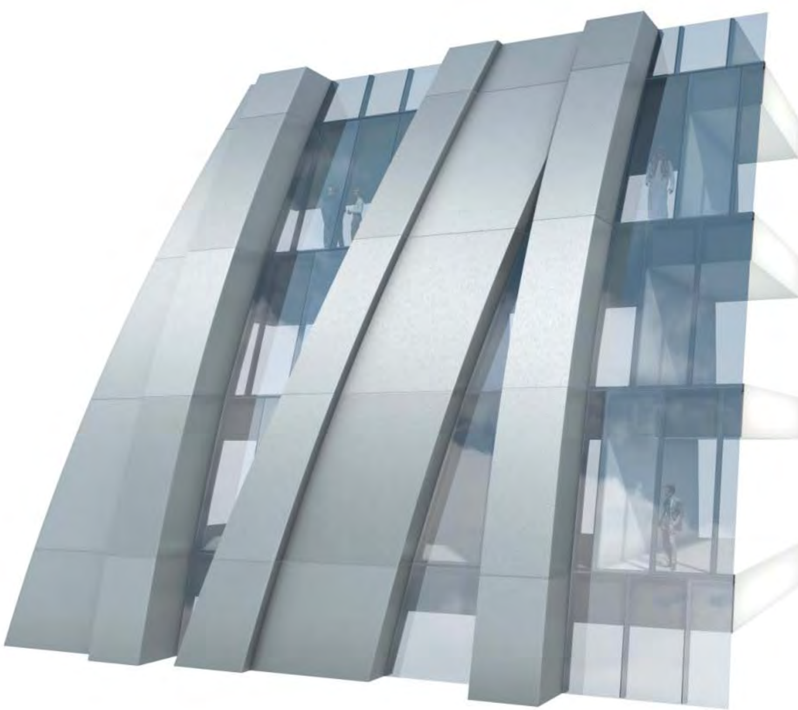


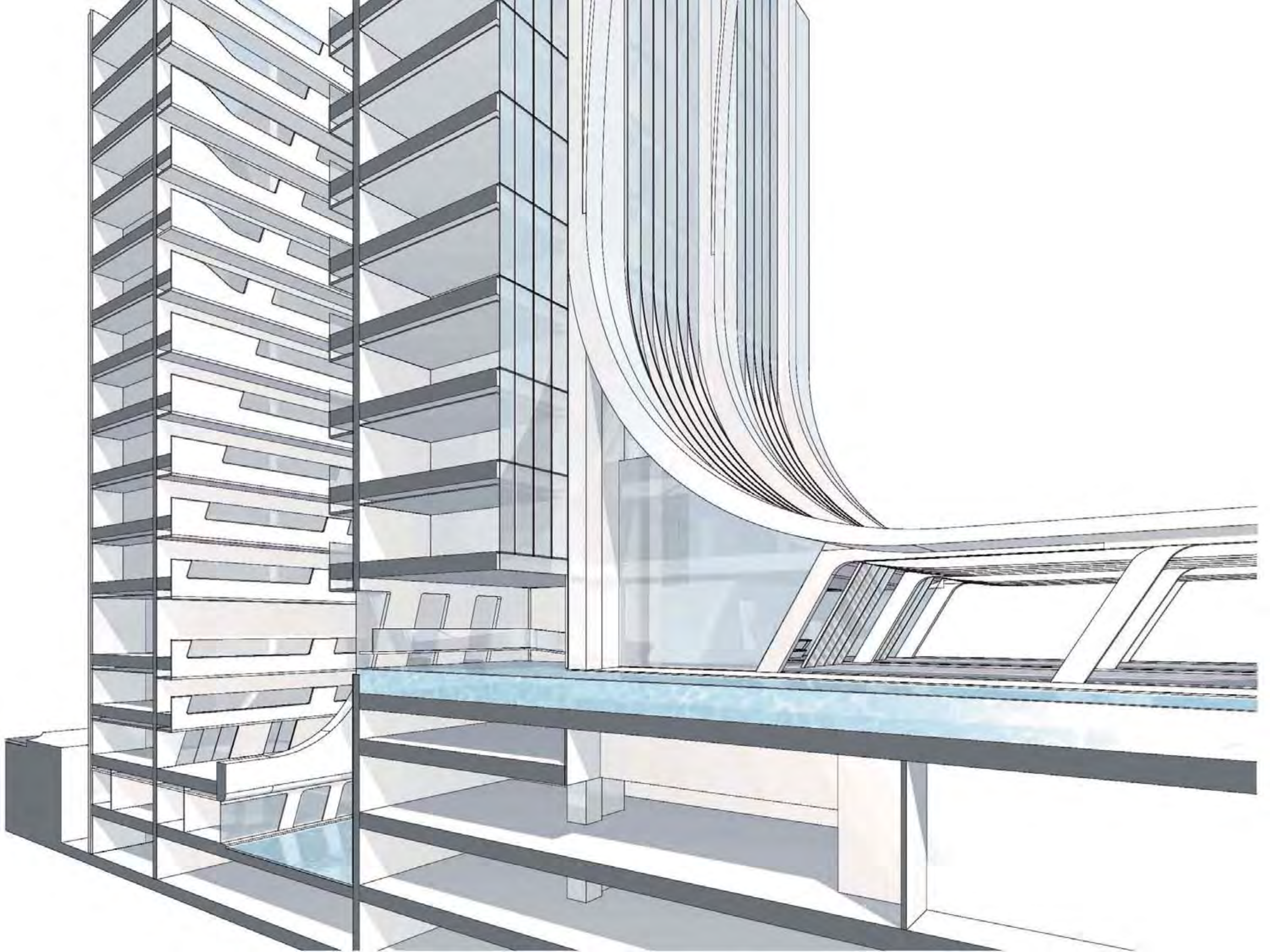
Portion Elevation - STH Southside
Scale 1/20

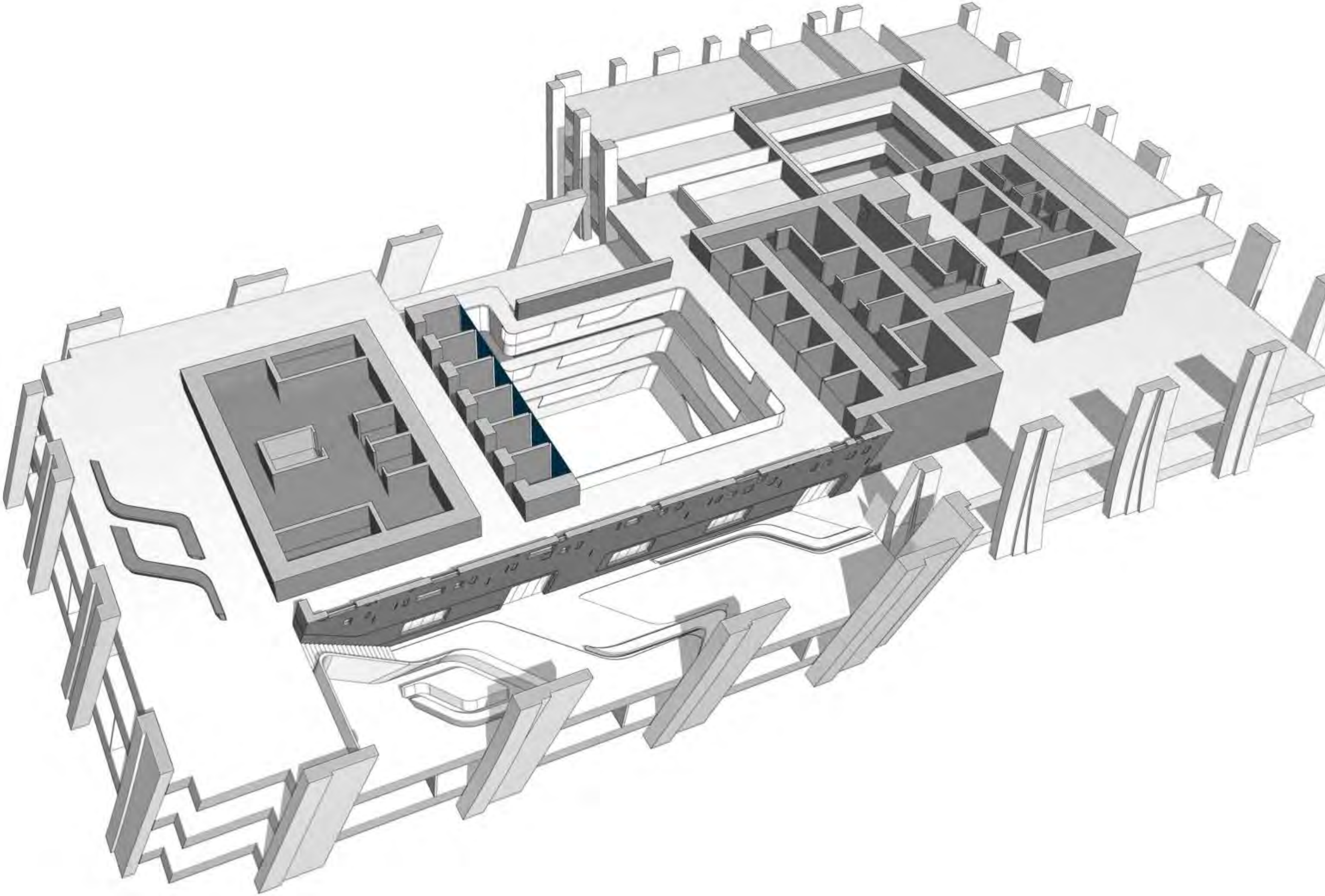


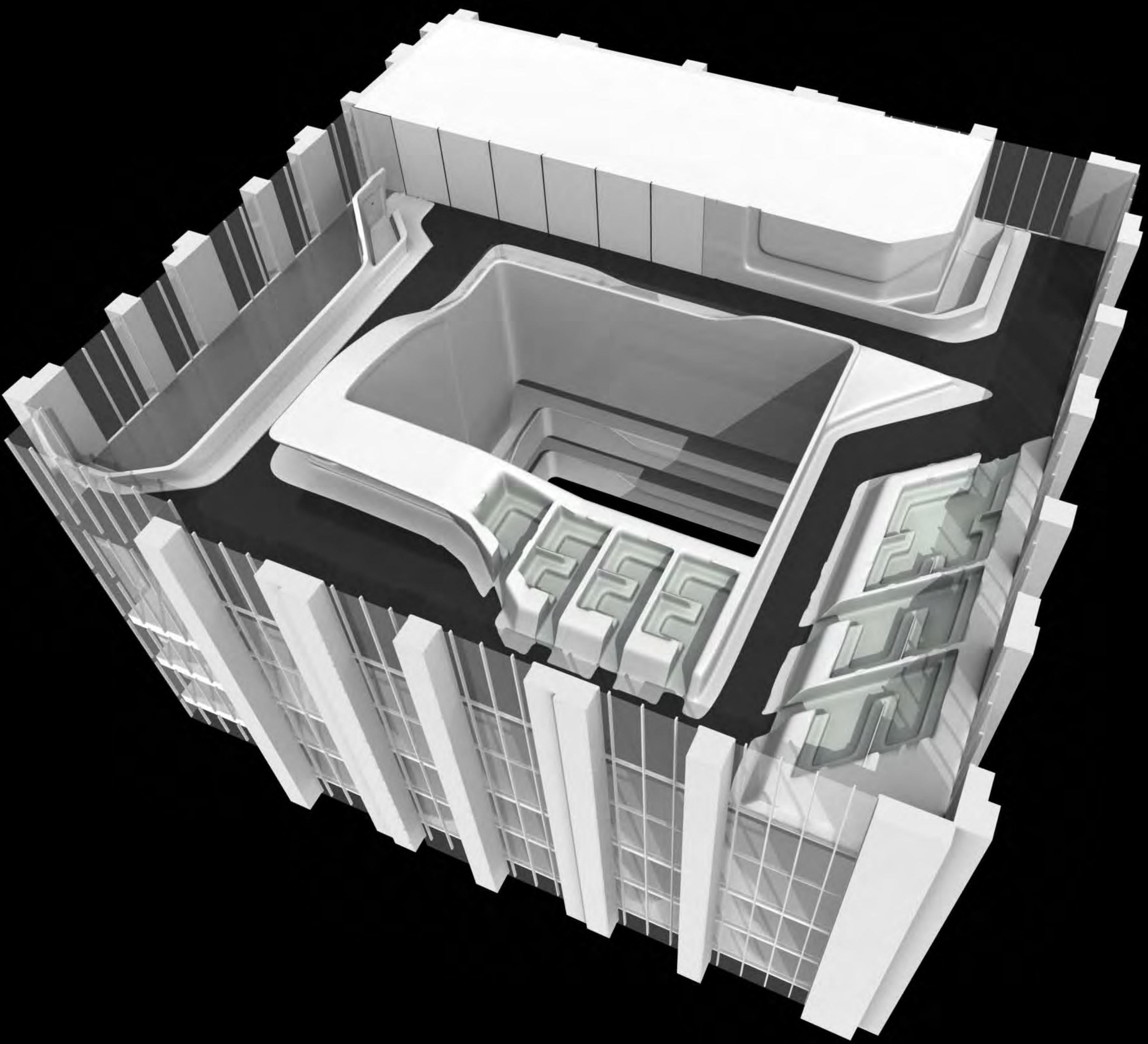
Horizontal Section 2-2
Scale 1/20

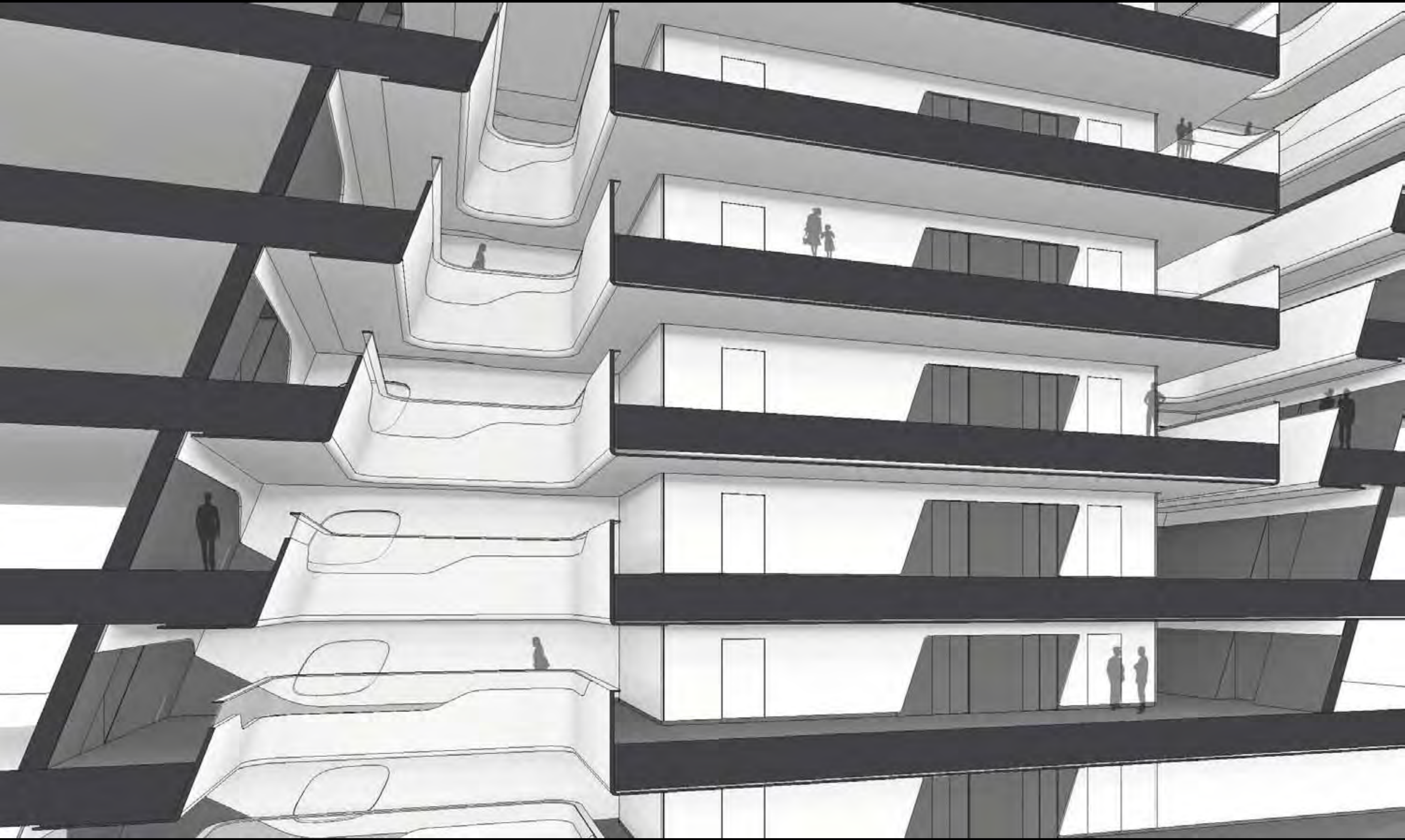

Line generated from 3D set out volume
Dimensions from 3D set out line

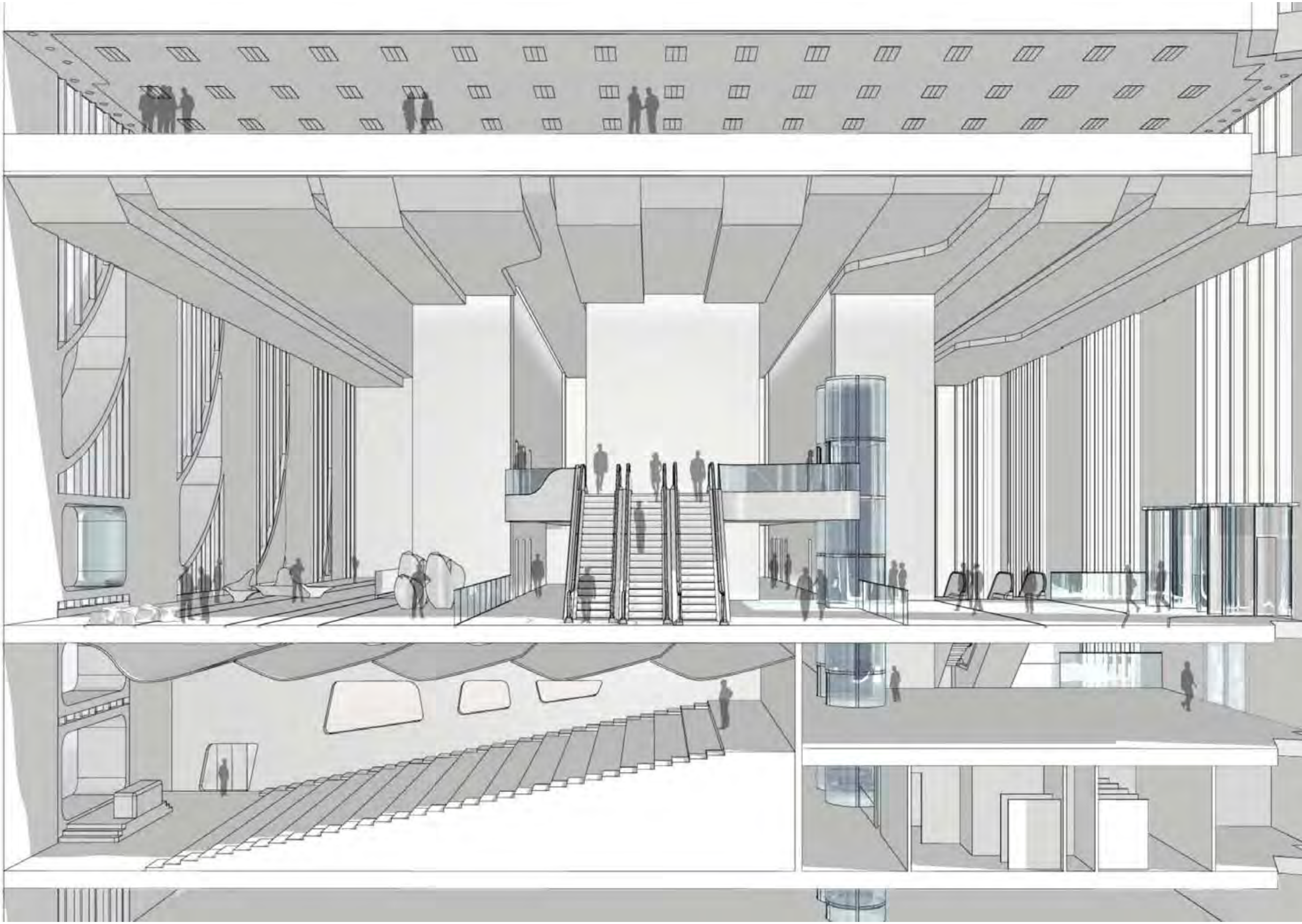


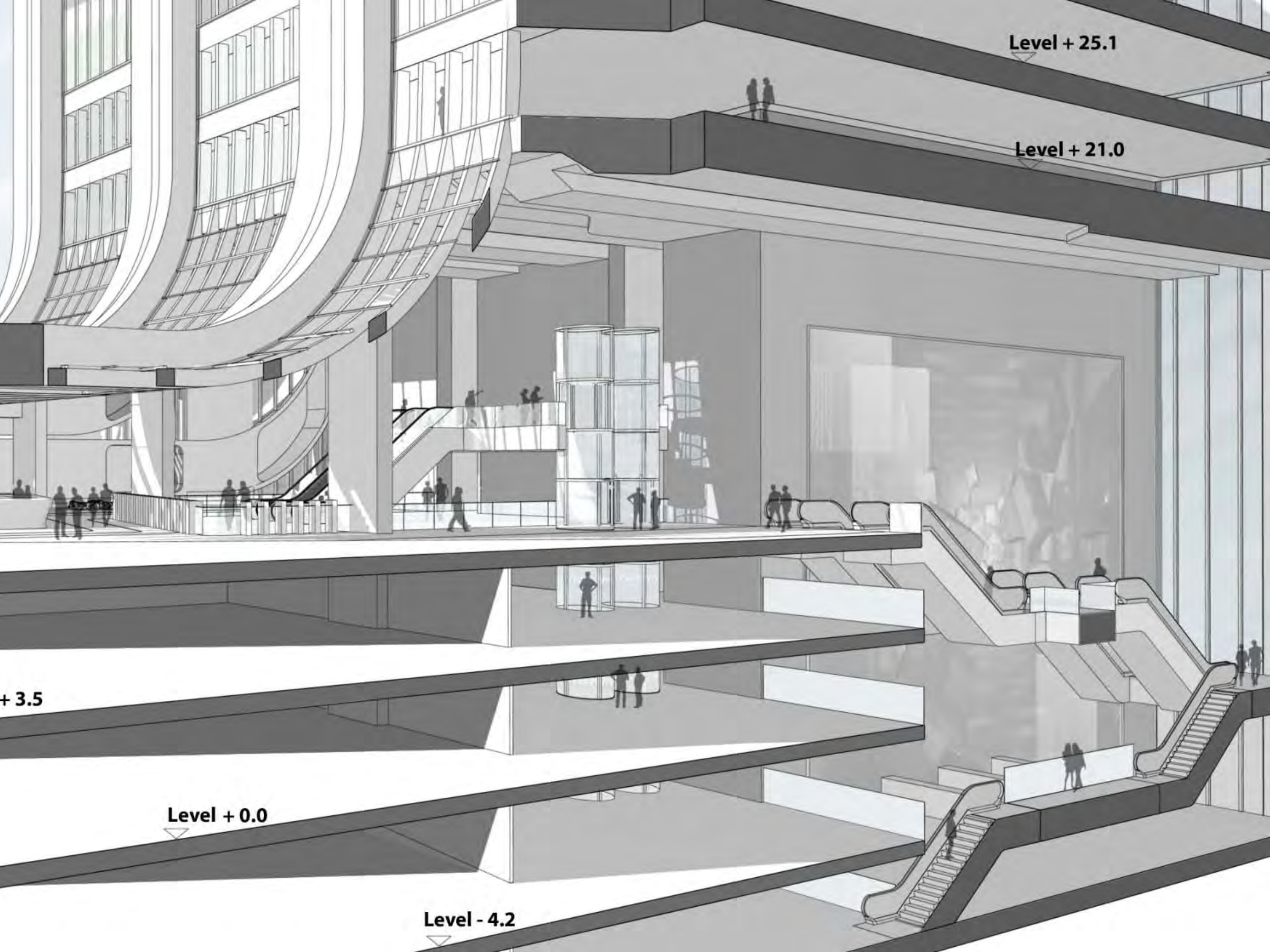


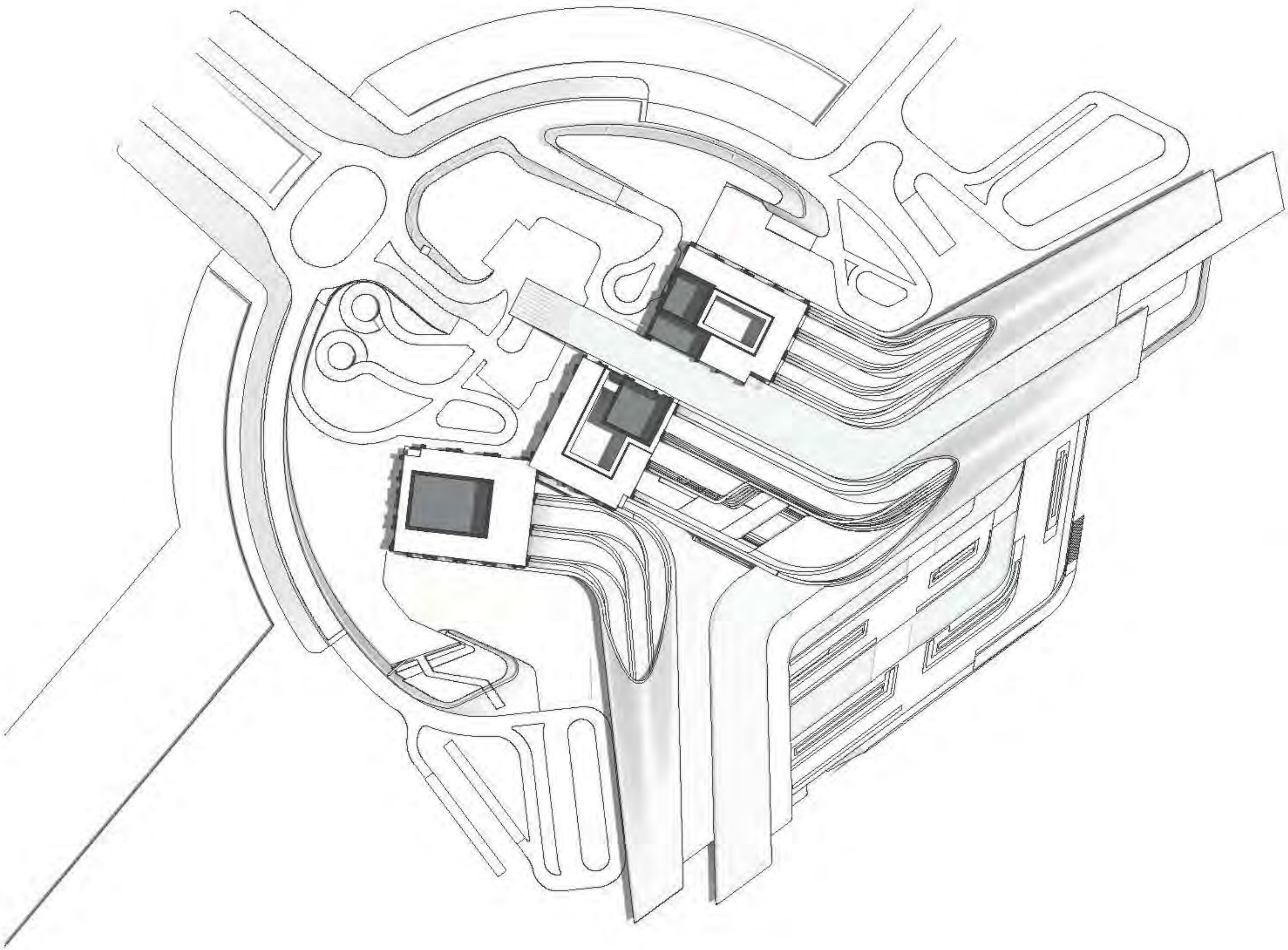


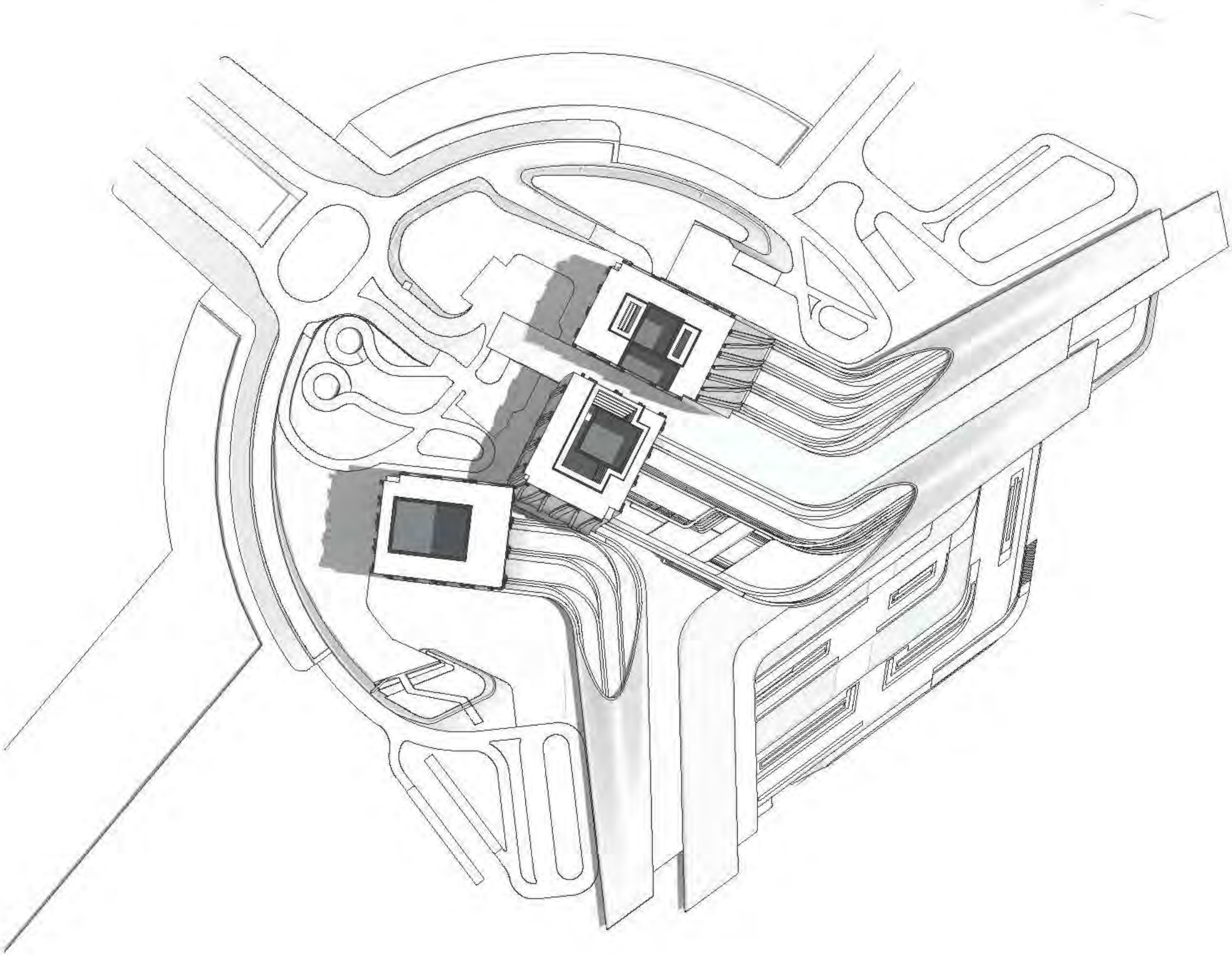


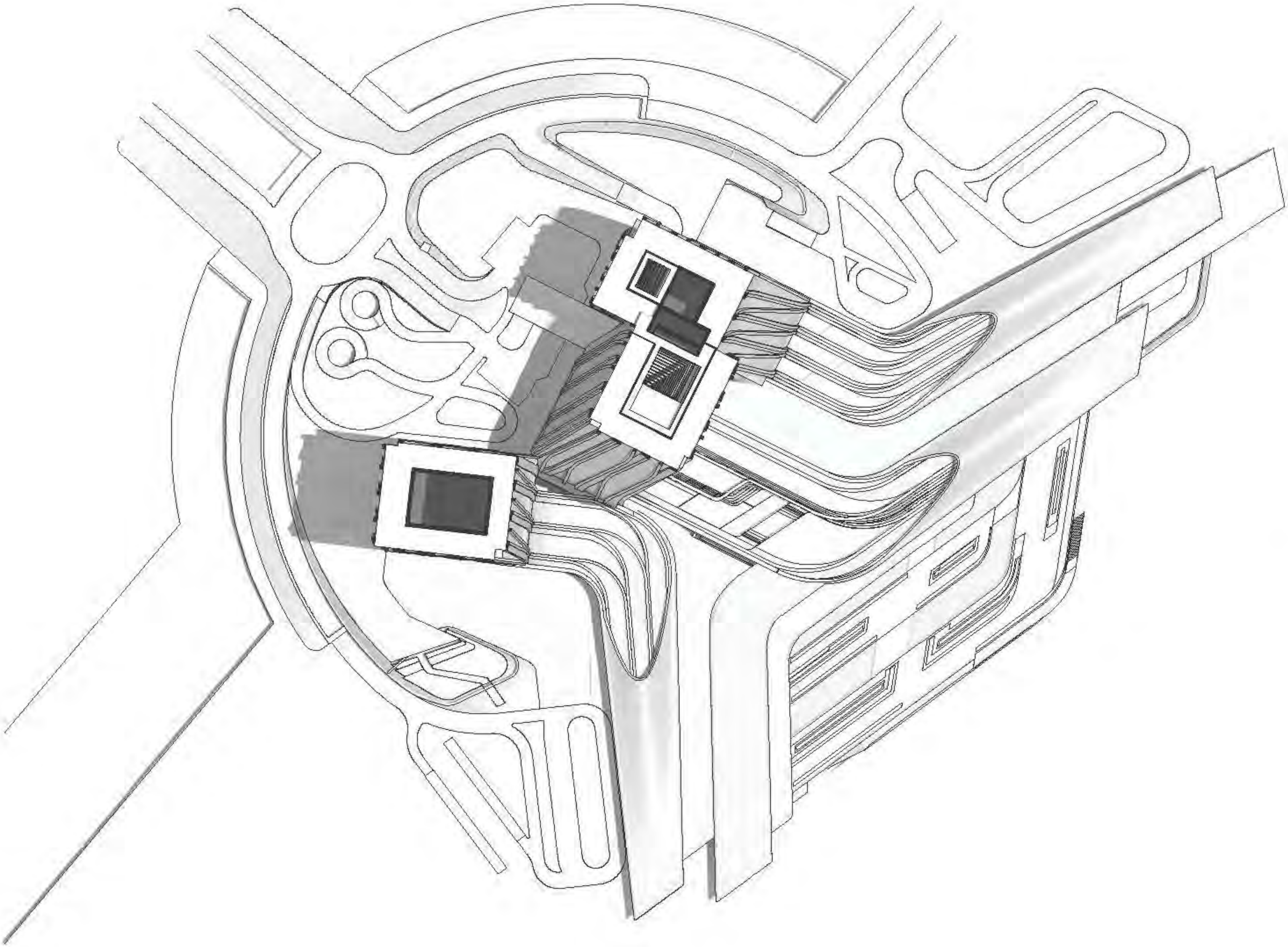


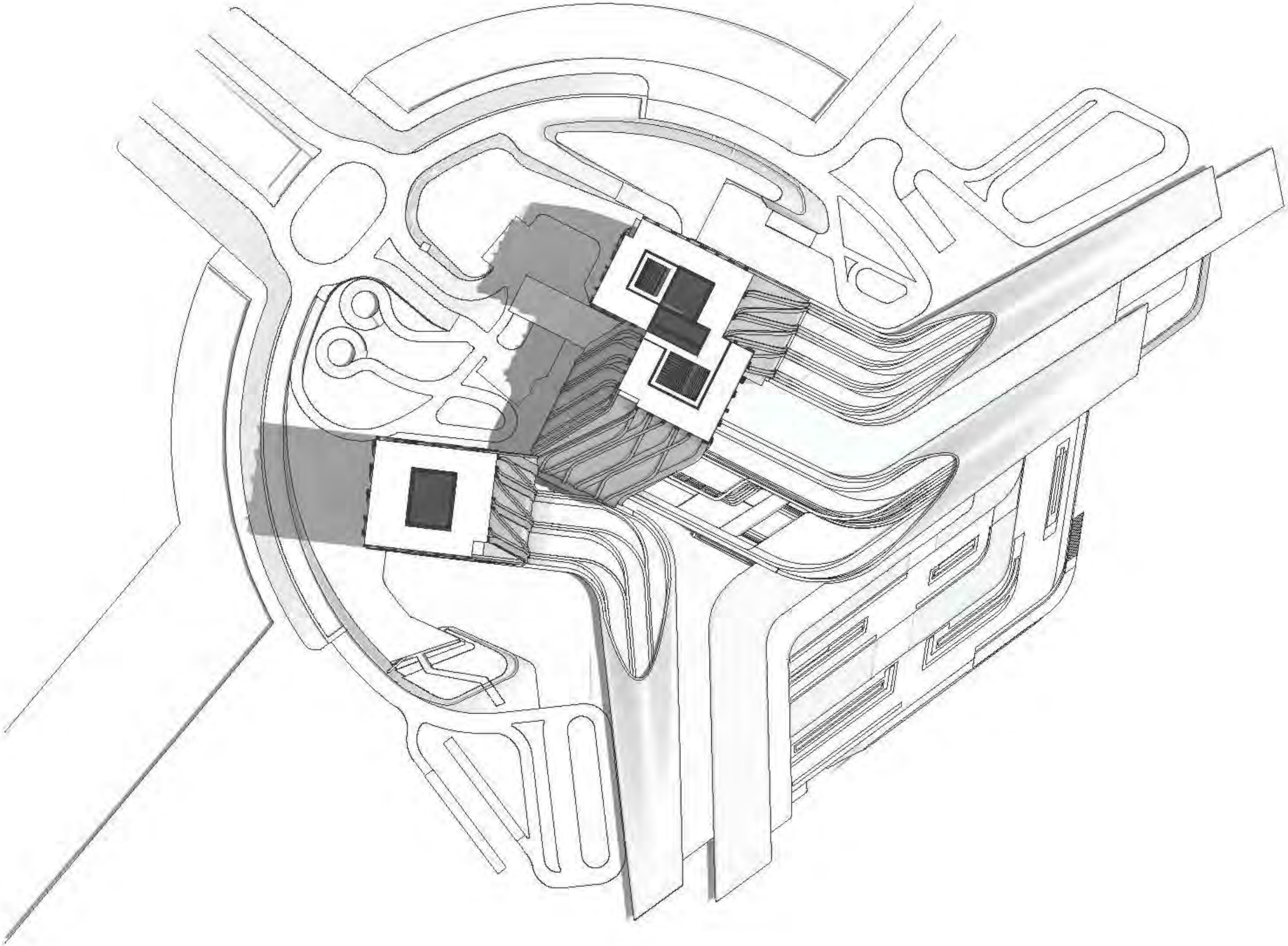


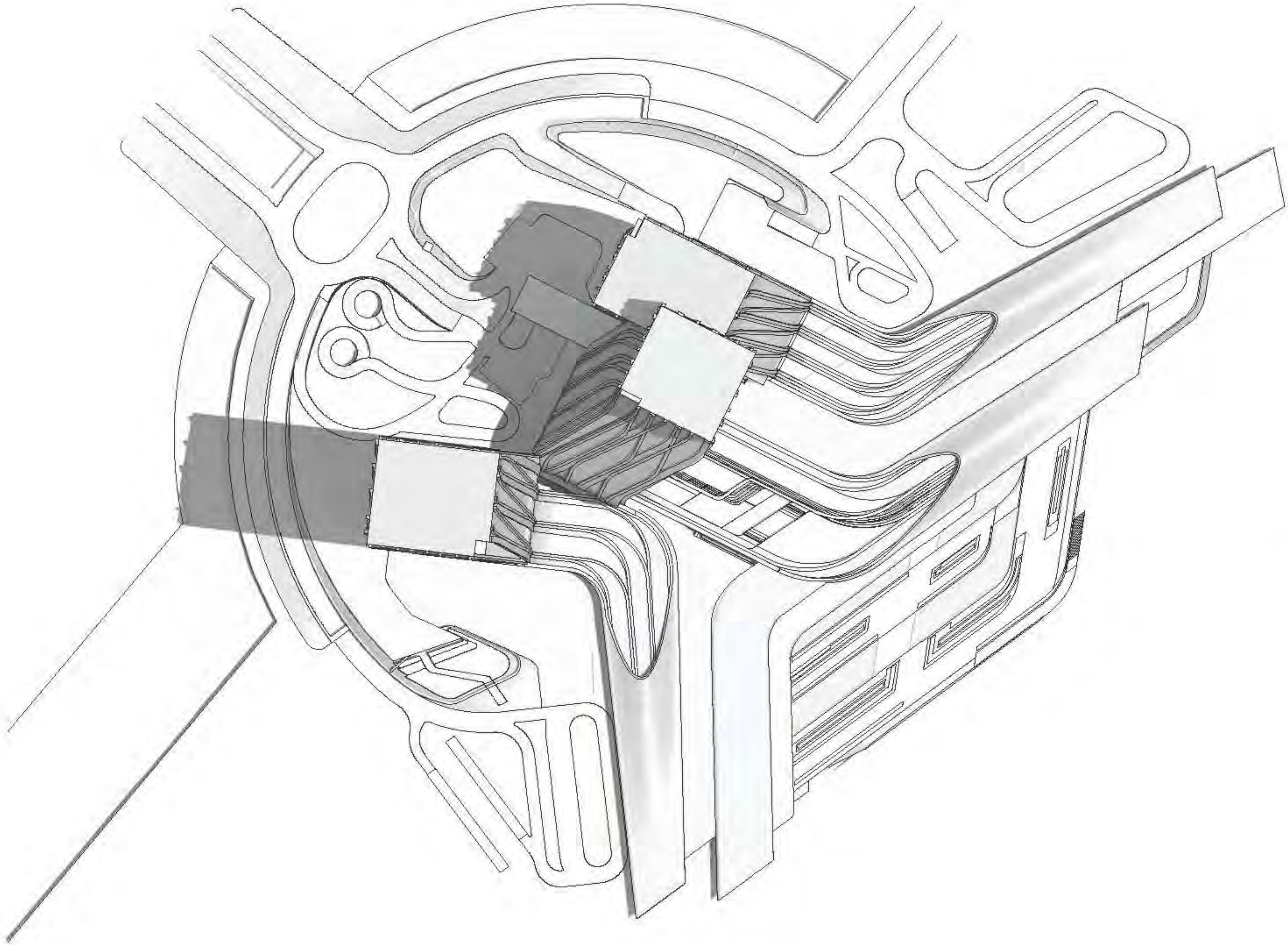

Level + 25.1
Level + 21.0
+ 3.5
Level + 0.0
Level - 4.2

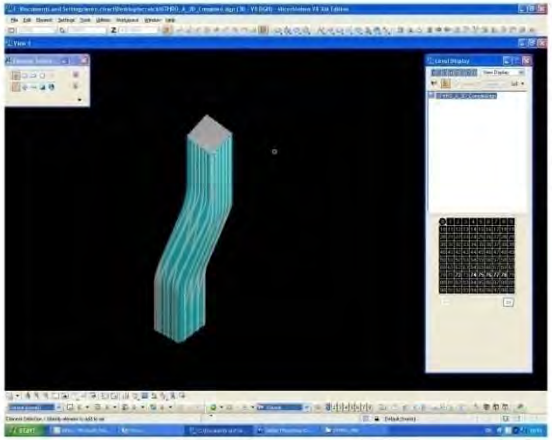












STEP 1 :

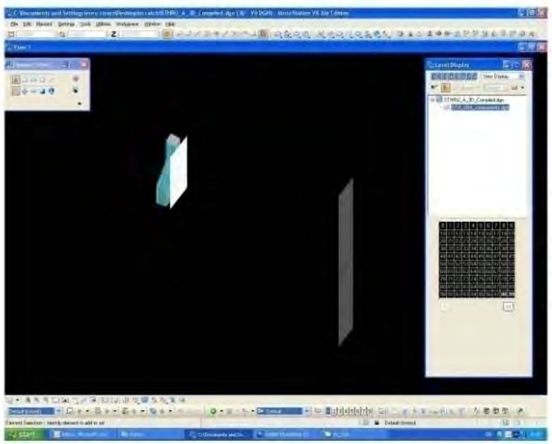
Open your 3d compiled file.

Make sure that all objects in the model have the proper level numbers and colors. For reference take a look at:

STHRO_legend.dgn

in:

\\ZH-BGL-SAN2\SAN2_F_Projects$\1281 Signature Towers Dubai\1281_Production\1281_model_3D\1281_MS



STEP 2 :

Reference the relative vba_component.dgn file in:

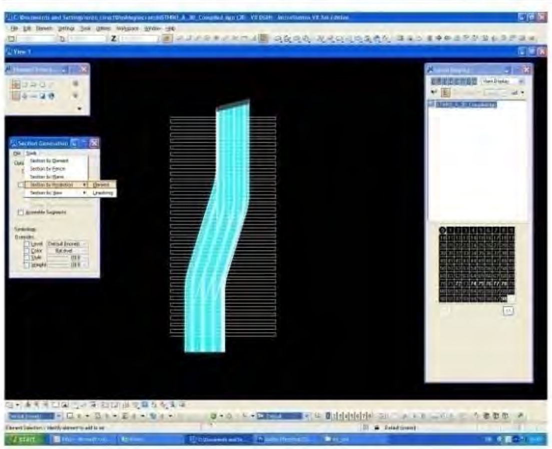
\\ZH-BGL-SAN2\SAN2_F_Projects$\1281 Signature Towers Dubai\1281_Production\1281_model_3D\1281_MS\STHRO_VBA

There are three files in this folder, one for each tower:

STH_VBA_components.dgn
STR_VBA_components.dgn
STO_VBA_components.dgn

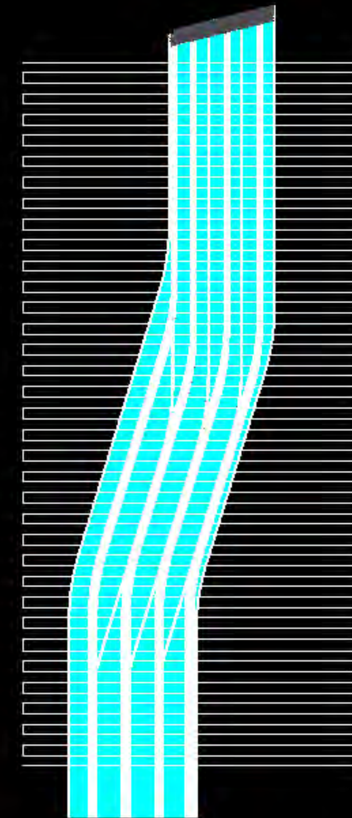
Copy the contents of the reference into your compiled 3d file. There are only 2 objects to be copied, do not modify, move or change the level of these objects.

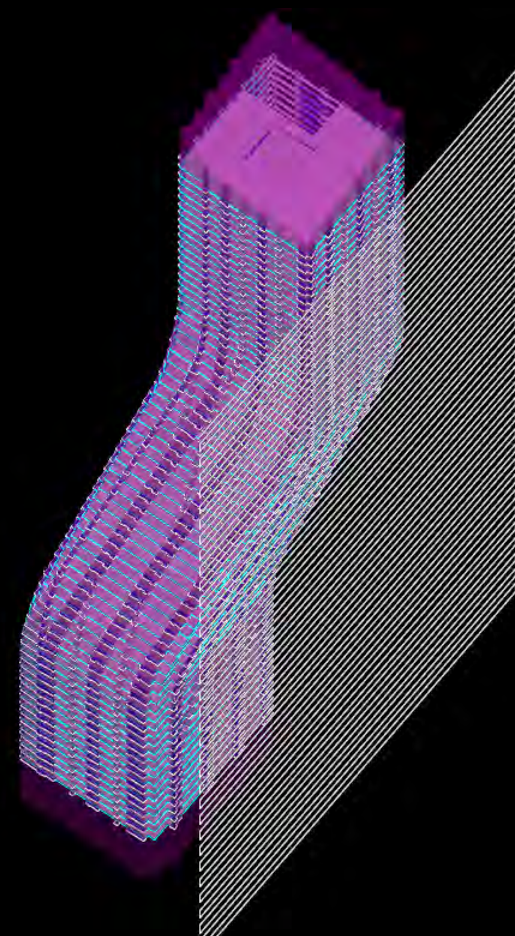
Detach the reference.

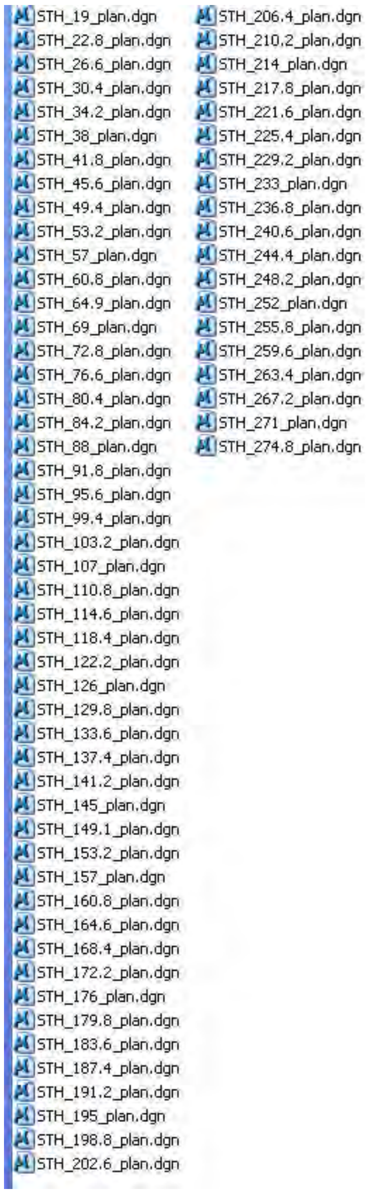


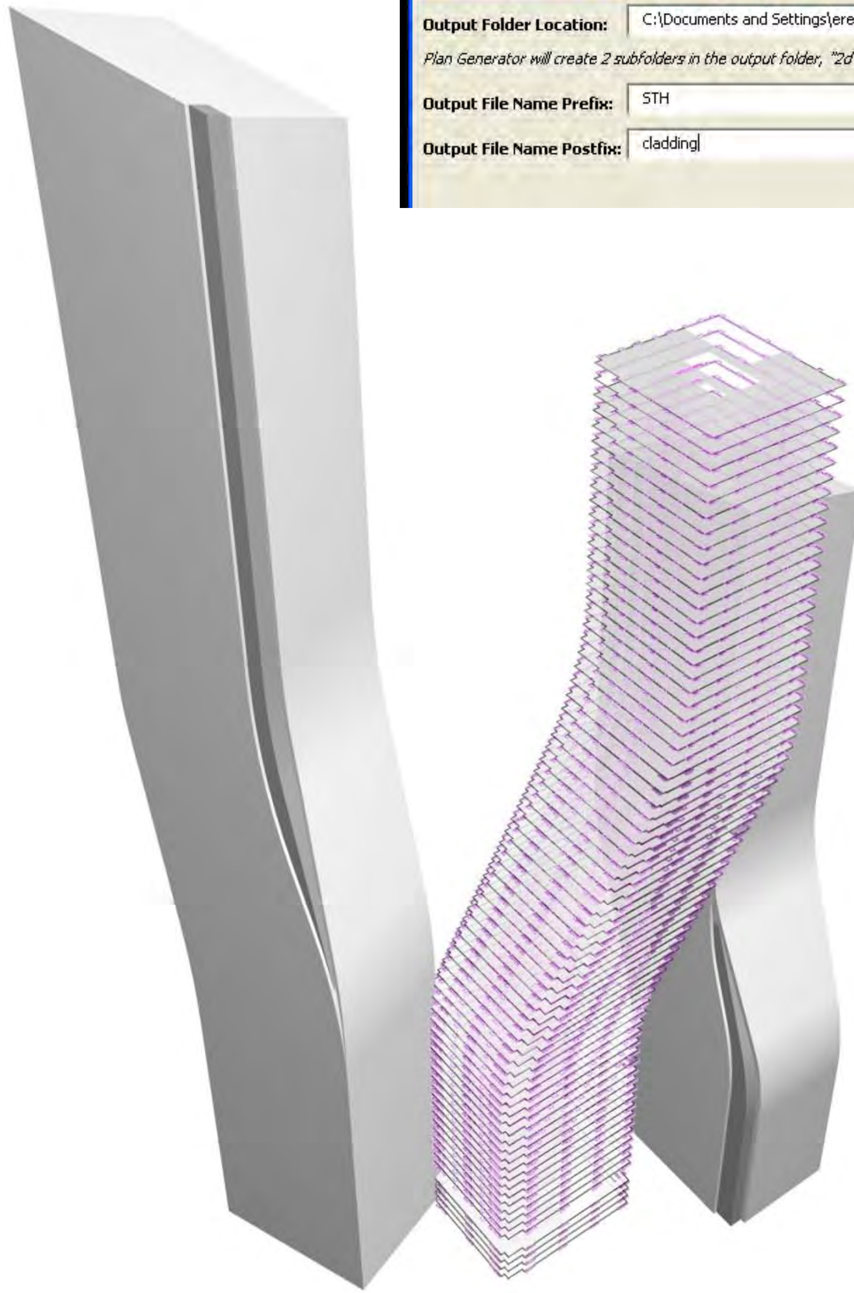
STEP 3 :

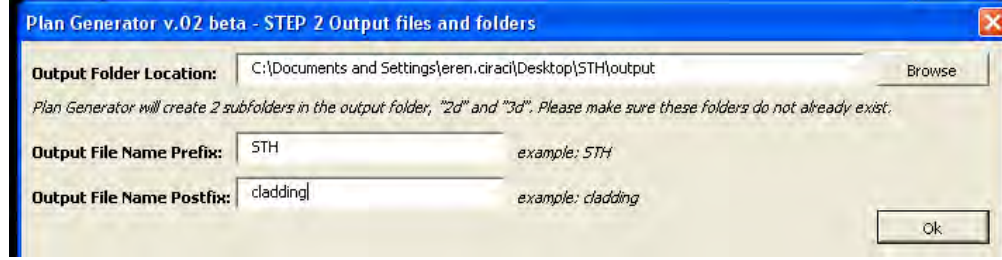
Use the line string in level 98 to slice the 3d objects using the Generate Section utility under the Utilities menu.

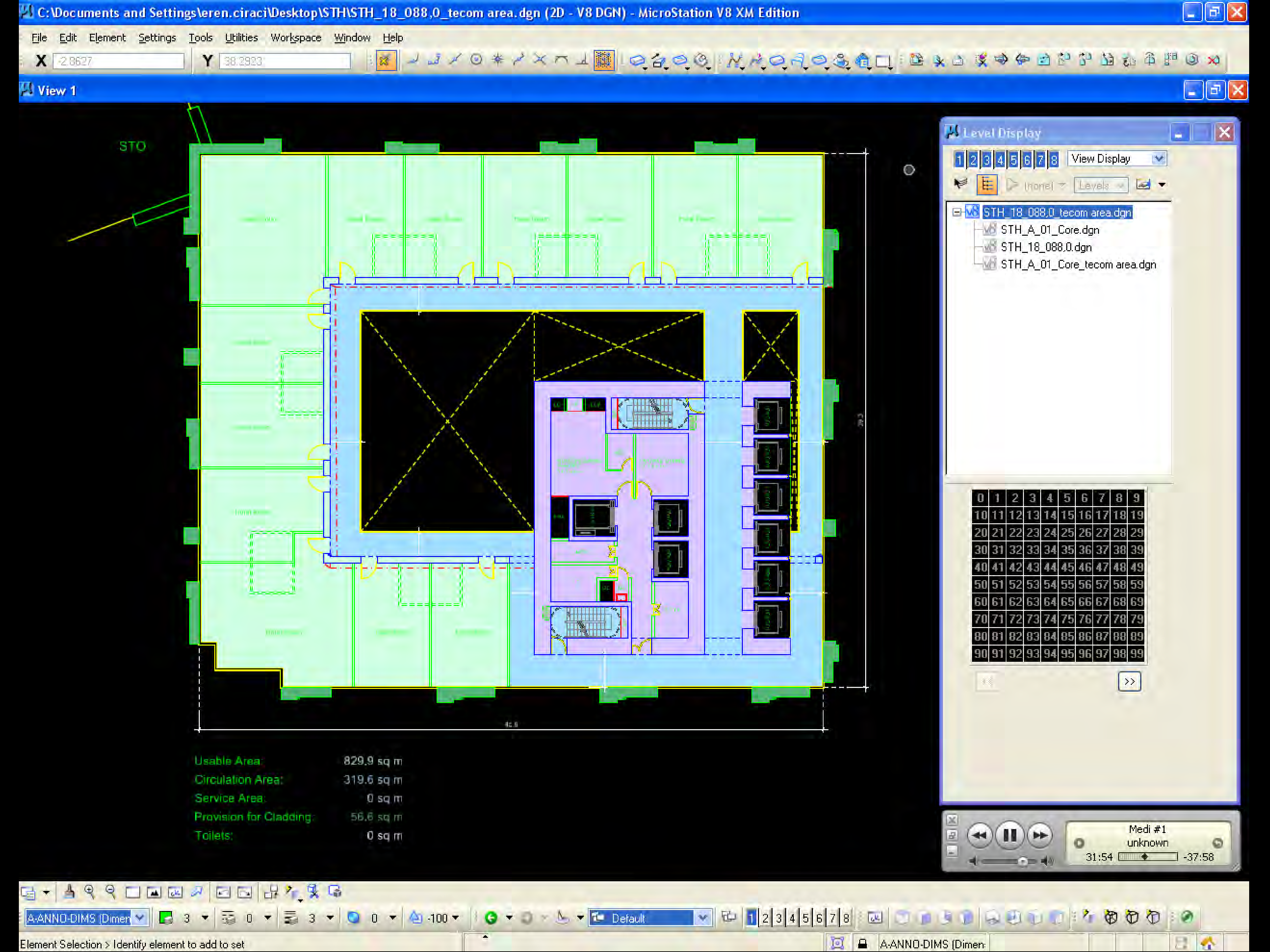




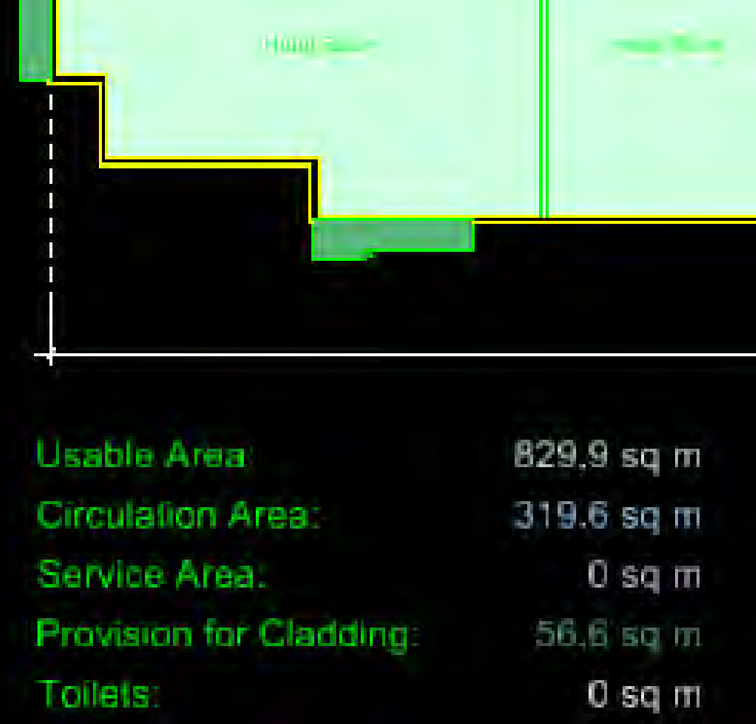

STH_19_plan.dgn
STH_22.8_plan.dgn
STH_26.6_plan.dgn
STH_30.4_plan.dgn
STH_34.2_plan.dgn
STH_38_plan.dgn
STH_41.8_plan.dgn
STH_45.6_plan.dgn
STH_49.4_plan.dgn
STH_53.2_plan.dgn
STH_57_plan.dgn
STH_60.8_plan.dgn
STH_64.9_plan.dgn
STH_69_plan.dgn
STH_72.8_plan.dgn
STH_76.6_plan.dgn
STH_80.4_plan.dgn
STH_84.2_plan.dgn
STH_88_plan.dgn
STH_91.8_plan.dgn
STH_95.6_plan.dgn
STH_99.4_plan.dgn
STH_103.2_plan.dgn
STH_107_plan.dgn
STH_110.8_plan.dgn
STH_114.6_plan.dgn
STH_118.4_plan.dgn
STH_122.2_plan.dgn
STH_126_plan.dgn
STH_129.8_plan.dgn
STH_133.6_plan.dgn
STH_137.4_plan.dgn
STH_141.2_plan.dgn
STH_145_plan.dgn
STH_149.1_plan.dgn
STH_153.2_plan.dgn
STH_157_plan.dgn
STH_160.8_plan.dgn
STH_164.6_plan.dgn
STH_168.4_plan.dgn
STH_172.2_plan.dgn
STH_176_plan.dgn
STH_179.8_plan.dgn
STH_183.6_plan.dgn
STH_187.4_plan.dgn
STH_191.2_plan.dgn
STH_195_plan.dgn
STH_198.8_plan.dgn
STH_202.6_plan.dgn
STH_206.4_plan.dgn
STH_210.2_plan.dgn
STH_214_plan.dgn
STH_217.8_plan.dgn
STH_221.6_plan.dgn
STH_225.4_plan.dgn
STH_229.2_plan.dgn
STH_233_plan.dgn
STH_236.8_plan.dgn
STH_240.6_plan.dgn
STH_244.4_plan.dgn
STH_248.2_plan.dgn
STH_252_plan.dgn
STH_255.8_plan.dgn
STH_259.6_plan.dgn
STH_263.4_plan.dgn
STH_267.2_plan.dgn
STH_271_plan.dgn
STH_274.8_plan.dgn




Plan Generator v.02 beta - STEP 2 Output files and folders
Output Folder Location:
C:\Documents and Settings\eren.ciraci\Desktop\STH\output
Browse
Plan Generator will create 2 subfolders in the output folder, "2d" and "3d". Please make sure these folders do not already exist.
Output File Name Prefix:
STH
example: STH
Output File Name Postfix:
cladding
example: cladding
Ok



C:\Documents and Settings\eren.ciraci\Desktop\STH\STH_18_088,0_tecom area.dgn (2D - V8 DGN) - MicroStation V8 XM Edition
File Edit Element Settings Tools Utilities Workspace Window Help
X -2.8627
Y 38.2923
View 1
STO
Usable Area: 829.9 sq m
Circulation Area: 319.6 sq m
Service Area: 0 sq m
Provision for Cladding: 56.6 sq m
Toilets: 0 sq m
Level Display
View Display
STH_18_088,0_tecom area.dgn
STH_A_01_Core.dgn
STH_18_088,0.dgn
STH_A_01_Core_tecom area.dgn
Medi #1
unknown
31:54
-37:58
A-ANNO-DIMS (Dimen
Default
Element Selection > Identify element to add to set



Microsoft Excel - Book1

File Edit View Insert Format Tools Data Window Help Adobe PDF

M12

	A	B	C	D	E	F	G	H
1	Filename	Usable Area	Balcony Area	Services Area	Circulation Area	Provision for Cladding	Toilet Area	
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12	STH_65_274,8_tecom area.dgn	882.2		145.6	28.7	49.6	0	
13	STH_64a-64b_(267,2-271,0)_tecom area.dgı	0		1079.7	28.7	49.6	0	
14	STH_63_263,4_tecom area.dgn	697.7		200.8	243.8	49.6	0	
15	STH_62_259,6_tecom area.dgn	697.7		200.7	243.8	49.6	0	
16	STH_61_255,8_tecom area.dgn	697.7		200.7	243.8	49.6	0	
17	STH_60_252,0_tecom area.dgn	697.7		200.7	243.8	49.6	0	
18	STH_59_248,2_tecom area.dgn	698.4		200.7	243.1	50.4	0	
19	STH_58_244,4_tecom area.dgn	697.7		200.7	243.8	50.4	0	
20	STH_51-57_(217,8-240,6)_tecom area.dgn	697.7		200.7	243.9	31.7	0	
21	STH_50_214,0_tecom area.dgn	697.8		215.6	244.6	31.7	0	
22	STH_49_210,2_tecom area.dgn	701.1		215.4	246.8	31.8	0	
23	STH_48_206,4_tecom area.dgn	707.7		215.4	249.7	32.1	0	
24	STH_47_202,6_tecom area.dgn	717.8		215.4	253.3	32.5	0	
25	STH_46_198,8_tecom area.dgn	731.6		215.4	257.5	35.4	0	
26	STH_45_195,0_tecom area.dgn	749.2		215.4	262.5	34.3	0	
27	STH_44_191,2_tecom area.dgn	770.5		215.4	268.2	35.5	0	
28	STH_43_187,4_tecom area.dgn	793.2		215.4	272.8	36.6	0	
29	STH_42_183,6_tecom area.dgn	816.4		215.4	279.4	36.9	0	
30	STH_41_179,8_tecom area.dgn	838.1		215.4	284.2	37.6	0	
31	STH_40_176,0_tecom area.dgn	857.7		215.4	287.1	39.4	0	
32	STH_39_172,2_tecom area.dgn	876.2		215.4	287.8	41.3	0	
33	STH_38_168,4_tecom area.dgn	1780.7		215.4	285.4	43.8	0	
34	STH_37_164,6_tecom area.dgn	903.3		85.3	254.1	42.2	0	
35	STH_36_160,8_tecom area.dgn	914.4		215.4	281.6	42.9	0	
36	STH_35_157,0_tecom area.dgn	917.4		245.7	289.7	43.8	0	
37	STH_34_153,2_tecom area.dgn	791.8		367.9	544.1	44.1	0	
38	STH_33a-33b_(145,0-149,1)_tecom area.dgı	0		1553.1	27	41.3	0	
39	STH_32_141,2_tecom area.dgn	1028.6		534.4	454.9	0	0	
40	STH_31_137,4_tecom area.dgn	1502.7		916.7	447	38.1	0	
41	STH_30_133,6_tecom area.dgn	986.2		219.3	301.6	45.4	0	
42	STH_29_129,8_tecom area.dgn	947.7		219.3	343.3	44.2	0	
43	STH_28_126,0_tecom area.dgn	980.3		219.3	303	45.3	0	
44	STH_27_122,2_tecom area.dgn	871.9		327.8	302.5	45.3	0	
45	STH_26_118,4_tecom area.dgn	969.5		219.3	313	45.4	0	
46	STH_25_114,6_tecom area.dgn	957.7		219.3	324.4	45.7	0	
47	STH_24_110,8_tecom area.dgn	940.7		219.3	341	46.2	0	

Sheet1 / Sheet2 / Sheet3 /

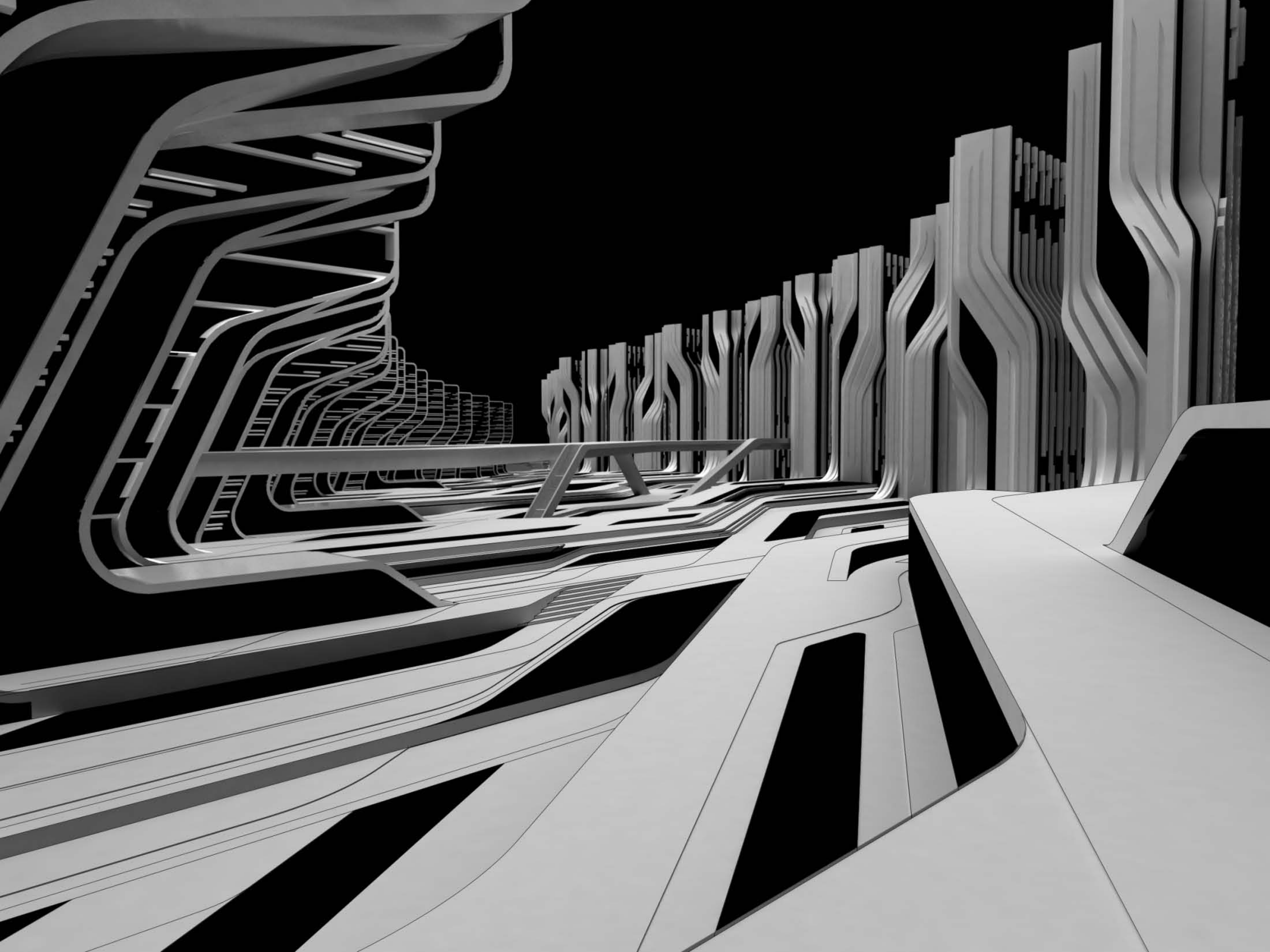
Ready NUM SCRL

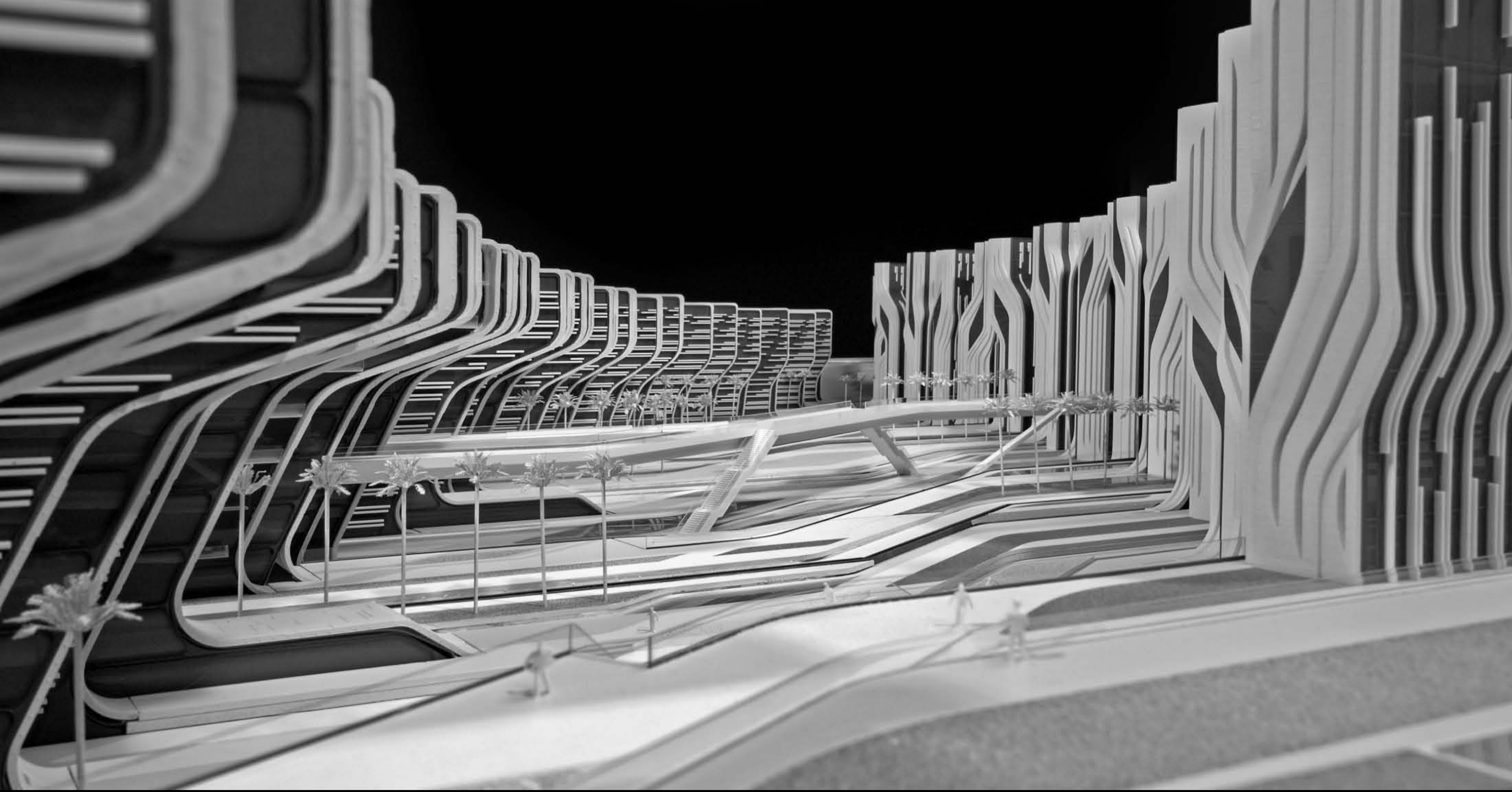
2008-04-23

Signature Towers- Hotel

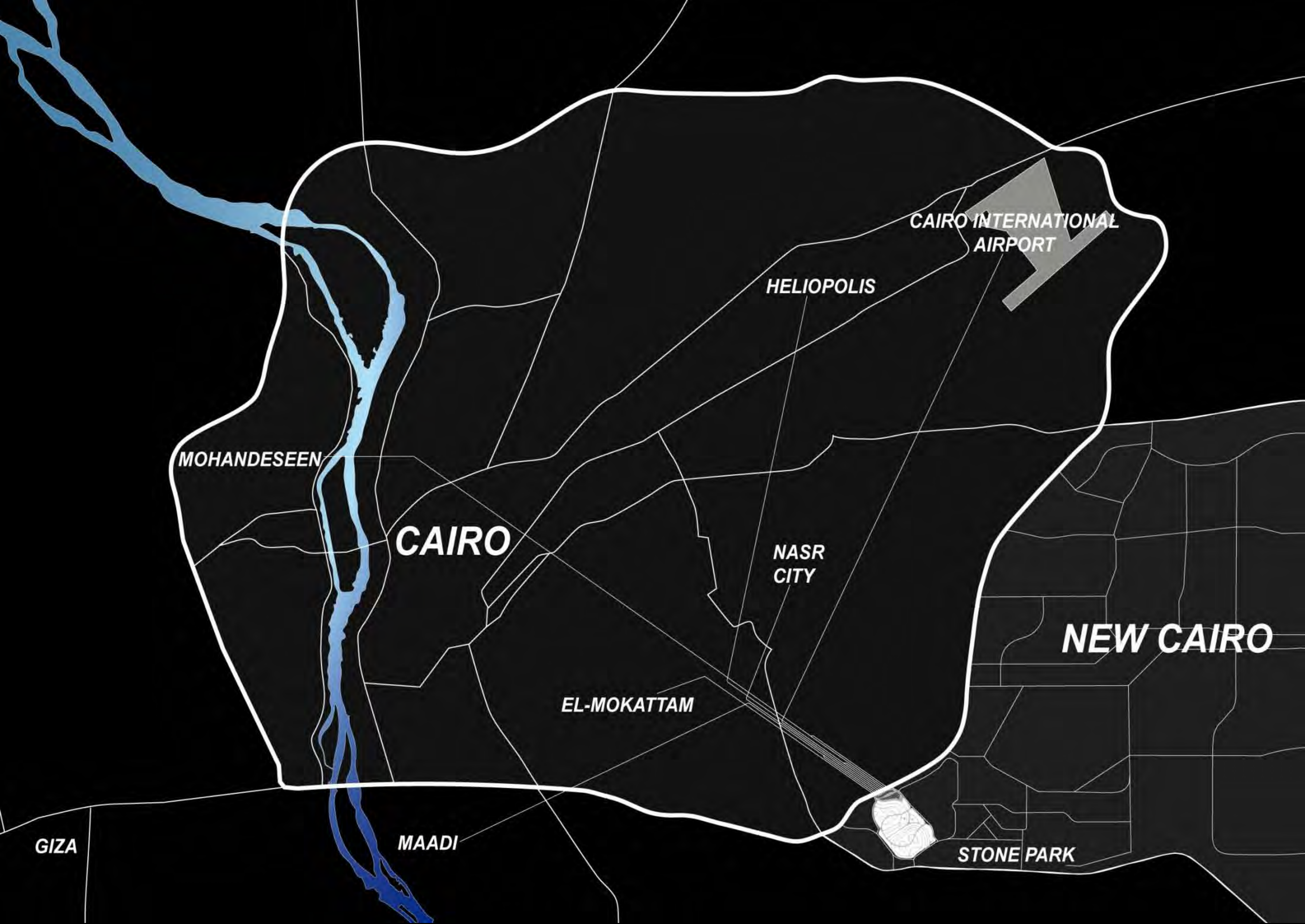
GEOMETRIC ZONE 4 / GEOMETRIC ZONE 3 / GEOMETRIC ZONE 2 / GEOMETRIC ZONE 1

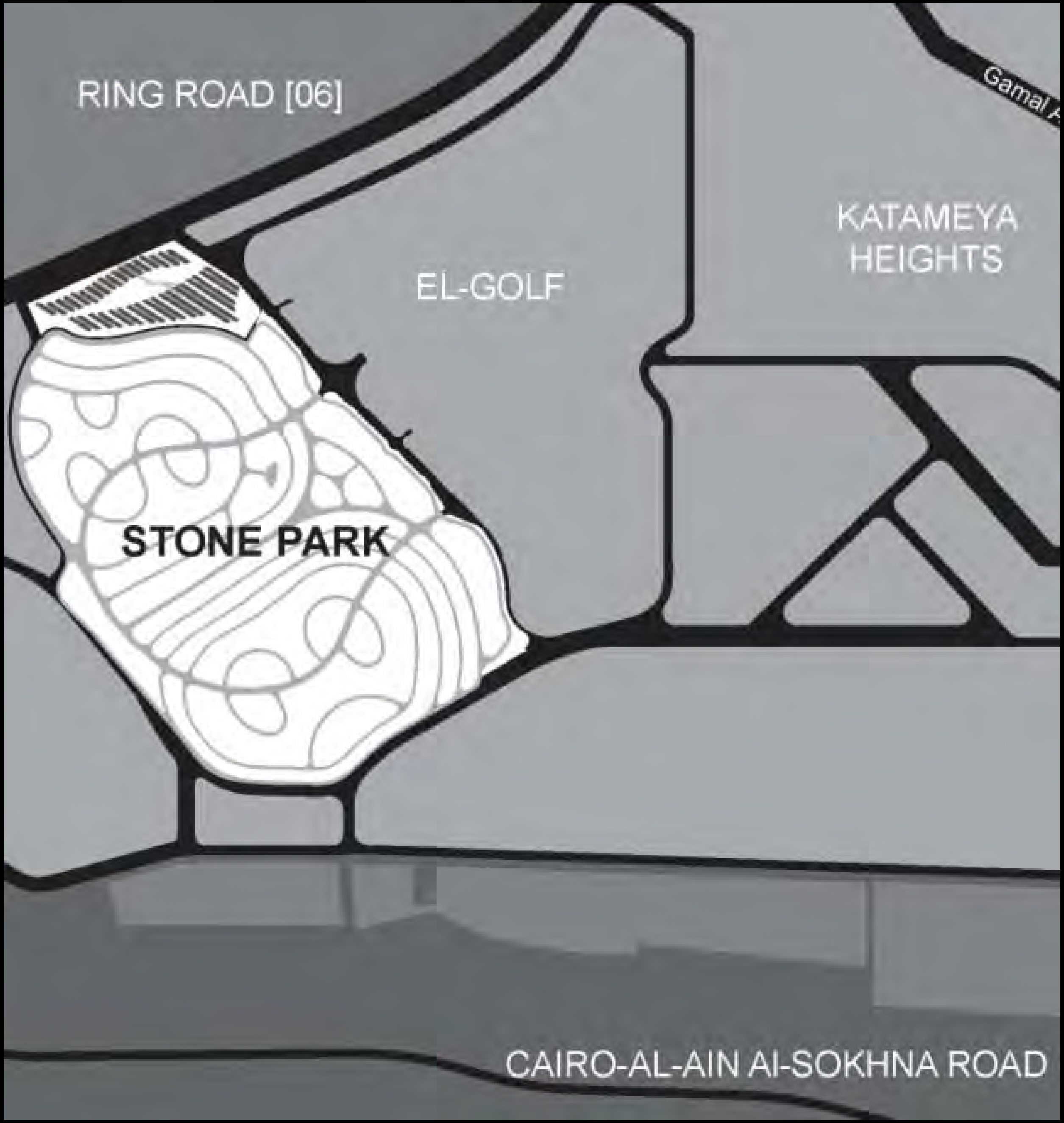
Zone	Elevation Height	Floor	Function	D_a	D_b	C_a	C_b	1 BR	2 BR	3 BR	PH	PR	A Usable Area m²	B Balcony Area m²	C* DP Services Area m²	Q BOH	D Circulation Area m²	E=A+B+H NSA m²	F=A+D+H Effective Built-up Area m²	G=E+C+D+Q BUA m²	E/G Gross Efficency	H Provision for Cladding (m²)	K* Non-Usable Floor Area (m²)	M=A+D+H+K+Q (DP) GFA Area m²	E/M (DP) Design Efficiency
				50 m²	55 m²	70 m²	55 m²	95 m²	190 m²	290 m²	300 m²	300 m²													
	274.8	TH_T_65	Feature Restaurant 4										878.1	0	175.3	0.0	0	912.4	912.4	1087.7	83.9%	34.3	88.6	1,001.0	91.15%
	271.0	TH_T_64b	Technical																						
	267.2	TH_T_64a	Technical										0.0	0.0	924.5	0.0	0.0	0.0	0.0	924.5	0.0%	0.0	0.0	0.0	N/A
ZONE 3	263.4	TH_T_63	Hotel								2		714.2	0.0	204.1	55.8	208.9	748.5	957.4	1,217.3	61.5%	34.3	89.0	1,046.4	71.53%
	259.6	TH_T_62	Hotel									2	713.4	0.0	204.1	55.8	208.9	747.7	956.6	1,216.5	61.5%	34.3	89.0	1,046.6	71.51%
	255.8	TH_T_61	Hotel			1				2			713.4	0.0	204.1	55.8	208.9	747.7	956.6	1,216.5	61.5%	34.3	89.0	1,046.6	71.51%
	252.0	TH_T_60	Hotel			2			1	1			714.2	0.0	204.1	55.8	208.9	748.5	957.4	1,217.3	61.5%	34.3	89.0	1,046.4	71.53%
	248.2	TH_T_59	Hotel			1			3				714.2	0.0	148.3	55.8	208.9	748.5	957.4	1,161.5	64.4%	34.3	89.0	1,046.4	71.53%
	244.4	TH_T_58	Hotel			2	2		2				713.4	0.0	148.3	55.8	208.9	747.7	956.6	1,160.7	64.4%	34.3	89.0	1,046.6	71.51%
	240.6	TH_T_57	Hotel			7	1	1					713.4	0.0	148.3	55.8	208.9	747.7	956.6	1,160.7	64.4%	34.3	89.0	1,046.6	71.51%
	236.8	TH_T_56	Hotel			7	1	1					713.4	0.0	148.3	55.8	208.9	747.7	956.6	1,160.7	64.4%	34.3	89.0	1,046.6	71.51%
	233.0	TH_T_55	Hotel			7	1	1					713.4	0.0	148.3	55.8	208.9	747.7	956.6	1,160.7	64.4%	34.3	89.0	1,046.6	71.51%
	229.2	TH_T_54	Hotel			7	1	1					713.4	0.0	165.4	55.8	208.9	747.7	956.6	1,177.8	63.5%	34.3	95.9	1,052.5	71.04%
	225.4	TH_T_53	Hotel			7	1	1					713.4	0.0	165.4	55.8	208.9	747.7	956.6	1,177.8	63.5%	34.3	95.9	1,052.5	71.04%
	221.6	TH_T_52	Hotel			7	1	1					713.4	0.0	165.4	55.8	208.9	747.7	956.6	1,177.8	63.5%	34.3	95.9	1,052.5	71.04%
	217.8	TH_T_51	Hotel			7	1	1					713.4	0.0	165.4	55.8	208.9	747.7	956.6	1,177.8	63.5%	34.3	95.9	1,052.5	71.04%
	214.0	TH_T_50	Hotel			7	1	1					713.8	0.0	165.4	55.8	209.0	748.1	957.1	1,178.3	63.5%	34.3	95.9	1,053.0	71.04%
	210.2	TH_T_49	Hotel			4	5	1					716.9	0.0	165.4	55.8	211.4	751.2	962.6	1,183.8	63.5%	34.3	95.9	1,058.5	70.97%
	206.4	TH_T_48	Hotel			4	5	1					724.2	0.0	165.4	55.8	214.3	758.5	972.8	1,194.0	63.5%	34.3	95.9	1,068.7	70.97%
	202.6	TH_T_47	Hotel			1	9	1					734.3	0.0	165.4	55.8	217.9	768.6	986.5	1,207.7	63.6%	34.3	95.9	1,138.2	67.53%
	198.8	TH_T_46	Hotel			2	8	1					747.4	0.0	165.4	55.8	222.1	781.7	1,003.8	1,225.0	63.8%	34.3	95.9	1,155.5	67.65%
	195.0	TH_T_45	Hotel			3	7	1					765.5	0.0	165.4	55.8	227.4	799.8	1,027.2	1,248.4	64.1%	34.3	95.9	1,178.9	67.84%
	191.2	TH_T_44	Hotel			4	6	1					786.2	0.0	165.4	55.8	232.9	820.5	1,053.4	1,274.6	64.4%	34.3	95.9	1,205.1	68.08%
	187.4	TH_T_43	Hotel			2	9	1					809.6	0.0	165.4	55.8	237.4	843.9	1,081.3	1,302.5	64.8%	34.3	95.9	1,233.0	68.44%
	183.6	TH_T_42	Hotel			0	12	1					832.8	0.0	165.4	55.8	243.9	867.1	1,111.0	1,332.2	65.1%	34.3	95.9	1,262.7	68.67%
	179.8	TH_T_41	Hotel			2	10	1					854.6	0.0	165.4	55.8	248.6	888.9	1,137.5	1,358.7	65.4%	34.3	95.9	1,289.2	68.95%
	176.0	TH_T_40	Hotel			3	9	1					874.2	0.0	165.4	55.8	251.0	908.5	1,159.5	1,380.7	65.8%	34.3	95.9	1,311.2	69.29%
	172.2	TH_T_39	Hotel			3	9	1					891.8	0.0	165.4	55.8	251.4	926.1	1,177.5	1,398.7	66.2%	34.3	95.9	1,329.2	69.67%
	168.4	TH_T_38	Hotel			3	9	1					906.8	0.0	165.4	55.8	247.6	941.1	1,188.7	1,409.9	66.7%	34.3	95.9	1,340.4	70.21%
	164.6	TH_T_37	Hotel			5	7	1					919.7	0.0	165.4	55.8	244.2	954.0	1,198.2	1,419.4	67.2%	34.3	95.9	1,349.9	70.67%
	160.8	TH_T_36	Hotel			3	10	1					930.8	0.0	165.4	55.8	241.8	965.1	1,206.8	1,428.0	67.6%	34.3	95.9	1,358.5	71.04%
	157.0	TH_T_35	Hotel			3	10	1					933.2	0.0	165.4	55.8	255.0	967.5	1,222.5	1,443.7	67.0%	34.3	95.9	1,374.2	70.40%
	153.2	TH_T_34	Hotel			5	3	2					1122.6	0.0	246.4	55.8	261.6	1,156.9	1,418.5	1,719.7	67.3%	34.3	95.9	1,570.2	73.68%
		Total Zone 3		0	0	109	138	25	6	3	2	2	24,419.10	0.00	6,211.05	1,674.00	6,733.16	25,481.47	32,214.63	40,099.68	63.5%	1,062.4	2,903.5	35,898.3	71.0%
	149.1	33b	Technical																						
	145.0	33a	Technical										0.0	0.0	1,688.5	0.0	0.0	0.0	0.0	1,688.5	0.0%	0.0	0.0	0.0	N/A
	141.2	32	Executive Business Center										1,188.2	0.0	354.4	0.0	381.9	1,298.2	1,680.1	2,034.5	63.8%	110.0	179.1	1,859.2	69.8%
	137.4	31	Exe. Lounge / F.Restaurant 3										2,117.3	0.0	354.4	0.0	351.0	2,227.3	2,578.3	2,932.7	75.9%	110.0	179.1	2,757.4	80.8%
ZONE 2	133.6	TH_T_30	Hotel	7	7			2					994.5	0.0	301.2	53.2	286.3	1,049.5	1,335.8	1,690.2	62.1%	55.0	179.1	1,568.1	66.93%
	129.8	TH_T_29	Hotel	9	4			2					966.5	0.0	301.2	53.2	316.3	1,021.5	1,337.8	1,692.2	60.4%	55.0	179.1	1,570.1	65.06%
	126.0	TH_T_28	Hotel	3	10			2					999.9	0.0	301.2	53.2	276.1	1,054.9	1,331.0	1,685.4	62.6%	55.0	179.1	1,563.3	67.48%
	122.2	TH_T_27	Hotel	10	2			2					892.0	0.0	401.2	53.2	275.8	947.0	1,222.8	1,677.2	56.5%	55.0	179.1	1,455.1	65.08%
	118.4	TH_T_26	Hotel	7	8			1					989.0	0.0	301.2	53.2	286.0	1,044.0	1,330.0	1,684.4	62.0%	55.0	179.1	1,562.3	66.83%
	114.6	TH_T_25	Hotel	9	6			1					975.2	0.0	301.2	53.2	299.5	1,030.2	1,329.7	1,684.1	61.2%	55.0	179.1	1,562.0	65.96%
	110.8	TH_T_24	Hotel	7	6			2					960.2	0.0	301.2	53.2	314.0	1,015.2	1,329.2	1,683.6	60.3%	55.0	179.1	1,561.5	65.02%
	107.0	TH_T_23	Hotel	7	7			1					943.2	0.0	301.2	53.2	298.7	998.2	1,296.9	1,651.3	60.5%	55.0	179.1	1,529.2	65.28%
	103.2	TH_T_22	Hotel	5	8			1					827.9	0.0	301.2	53.2	302.7	882.9	1,185.6	1,540.0	57.3%	55.0	179.1	1,417.9	62.27%
	99.4	TH_T_21	Hotel	6	6			1					820.5	0.0	301.2	53.2	311.7	875.5	1,187.2	1,541.6	56.8%	55.0	179.1	1,419.5	61.68%
	95.6	TH_T_20	Hotel	5	7			1					831.9	0.0	301.2	53.2	309.8	886.9	1,196.7	1,551.1	57.2%	55.0	179.1	1,429.0	62.07%
	91.8	TH_T_19	Hotel	4	8			1					841.3	0.0	301.2	53.2	343.1	896.3	1,239.4	1,593.8	56.2%	55.0	179.1	1,471.7	60.90%
	88.0	TH_T_18	Hotel	5	6			2					848.1	0.0	301.2	53.2	319.6	903.1	1,222.7	1,577.1	57.3%	55.0	179.1	1,455.0	62.07%
	84.2	TH_T_17	Hotel	4	7			2					852.7	0.0	301.2	53.2	261.8	907.7	1,169.5	1,523.9	59.6%	55.0	179.1	1,401.8	64.75%
	80.4	TH_T_16	Hotel	5	6			2					855.3	0.0	301.2	53.2	253.5	910.3	1,163.8	1,518.2	60.0%	55.0	179.1	1,396.1	65.20%
	76.6	TH_T_15	Hotel	6	5			1					773.5	0.0	378.2	53.2	251.1	828.5	1,079.6	1,511.0	54.8%	55.0	179.1	1,311.9	63.15%
	72.8	TH_T_14	Hotel	9	4			1					855.2	0.0	301.2	53.2	248.8	910.2	1,159.0	1,513.4	60.1%	55.0	179.1	1,391.3	65.42%
	69.0	TH_T_13	Hotel	9	4			1					854.2	0.0	301.2	53.2	247.9	909.2	1,157.1	1,511.5	60.2%	55.0	179.1	1,389.4	65.44%
		Total Zone 2		117	111	0	0	26	0	0	0	0	19,386.6	0.0	7,995.9	956.9	5,935.6	20,596.6	26,532.2	35,485.0	58.0%	1,210.0	3,582.0	31,071.1	66.3%
	64.9	TH_T_12b	Technical																						
	60.8	TH_T_12a	Technical										0.0	0.0	1,508.9	0.0	0.0	0.0	0.0	1,508.9	0.0%	0.0	0.0	0.0	N/A
ZONE 1	57.0	TH_T_11	Hotel	6	8								845.7	0.0	301.2	53.2	251.3	910.0	1,161.3	1,515.6	60.0%	64.3	179.1	1,393.5	65.30%
	53.2	TH_T_10	Hotel	6	8								845.7	0.0	301.2	53.2	251.3	910.0	1,161.3	1,515.6	60.0%	64.3	179.1	1,393.5	65.30%
	49.4	TH_T_9	Hotel	6	8								845.7	0.0	301.2	53.2	251.3	910.0	1,161.3	1,515.6	60.0%	64.3	179.1	1,393.5	65.30%
	45.6	TH_T_8	Hotel	6	8								845.7	0.0	301.2	53.2	251.3	910.0	1,161.3	1,515.6	60.0%	64.3	179.1	1,393.5	65.30%
	41.8	TH_T_7	Hotel	6	8								845.7	0.0	301.2	53.2	251.3	910.0	1,161.3	1,515.6	60.0%	64.3	179.1	1,393.5	65.30%
	38.0	TH_T_6	Hotel	6	8								845.7	0.0	301.2	53.2	251.3	910.0	1,161.3	1,515.6	60.0%	64.3	179.1	1,393.5	65.30%
	34.2	TH_T_5	Hotel	6	8								845.7	0.0	301.2	53.2	251.3	910.0	1,161.3	1,515.6	60.0%	64.3	179.1	1,393.5	65.30%
	30.4	TH_T_4	Hotel	6	8								845.7	0.0	301.2	53.2	251.3	910.0	1,161.3	1,515.6	60.0%	64.3	179.1	1,393.5	65.30%
	26.6	TH_T_3	Hotel	6	8								845.7	0.0	301.2	53.2	251.3	910.0	1,161.3	1,515.6	60.0%	64.3	179.1	1,393.5	65.30%
	22.8	TH_T_2	Hotel	6	8								845.7	0.0	301.2	53.2	251.3	910.0	1,161.3	1,515.6	60.0%	64.3	179.1	1,393.5	65.30%
	19.0	TH_T_1	Hotel	6	8								845.7	0.0	301.2	53.2	251.3	910.0	1,161.3	1,515.6	60.0%	64.3	179.1	1,393.5	65.30%
		Total Zone 1		66	88	0	0	0	0	0	0	0	9,302.7	0.0	4,822.1	584.8	2,764.3	10,009.5	12,773.8	18,180.6	55.1%	706.8	1,970.1	15,328.6	65.3%
		Total- Hotel Only		183	199	109	138	51	6	3	2	2	53,108.4	0.0	19,029.1	3,215.6	15,433.1	56,087.5	71,520.6	93,765.3	59.8%	2,979.1	8,455.6	79,976.2	70.13%
		Total number of rooms		693																					
PODIUM	14.0	TH_P_02	Gym / Pool										4,590.2	0.0	301.2	53.2	428.4	4,644.2	5,072.6	5,427.0	85.6%	54.0	179.1	5,125.8	90.60%
	10.5	TH_P_01	Spa										1,213.4	0.0	301.2	115.7	126.6	1,277.3	1,403.9	1,820.8	70.2%	63.9	179.1	1,519.6	84.06%
	7.0	TH_P_00	Drop Off / Main Lobby										1,607.2	0.0	529.0	708.5	2,411.4	1,674.8	4,086.2	5,323.7	31.5%	67.6	529.0	4,794.7	34.93%
	3.5	TH_P_-1	Admin. / Business Center										341.3	0.0	301.2	1,415.4	313.6	395.2	708.8	2,425.4	16.3%	53.9	179.1	2,124.2	18.60%
	0.0	TH_P_-2	BOH / Ballroom										2,827.6	0.0	675.6	6,955.5	255.9	2,912.4	3,168.3	10,709.4	27.2%	84.8	179.1	10,033.8	29.03%
	-4.2	TH_P_-3	Workshop / Plant										0.0	0.0	750.2	775.7	54.6	0.0	54.6	1,581.5	0.0%	0.0	179.1	831.3	0.00%








CAIRO INTERNATIONAL
AIRPORT
HELIOPOLIS
MOHANDESEEN
CAIRO
NASR
CITY
NEW CAIRO
EL-MOKATTAM
GIZA
MAADI
STONE PARK


RING ROAD [06]
KATAMEYA HEIGHTS
EL-GOLF
STONE PARK
CAIRO-AL-AIN Al-SOKHNA ROAD

OFFICE SPACE

North Buildings

9 Buildings @ 12 Levels Each
Gross Area = 225,000 sqm

South Buildings

9 Buildings @ 9 Levels Each
Gross Area = 230,000 sqm

HOTEL

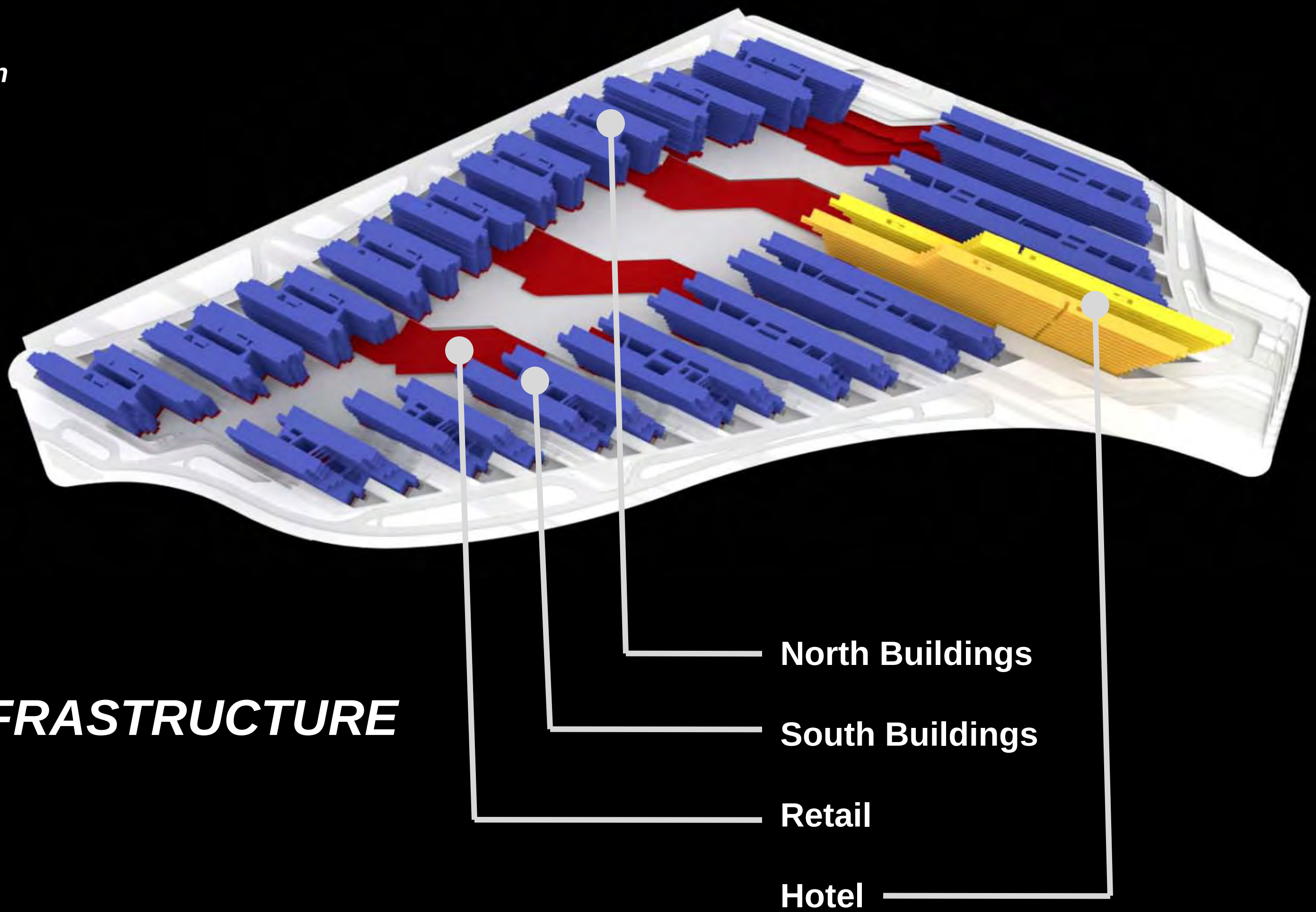
Five Star Business Hotel
480 keys
16 Levels
Gross Area = 85,000 sqm

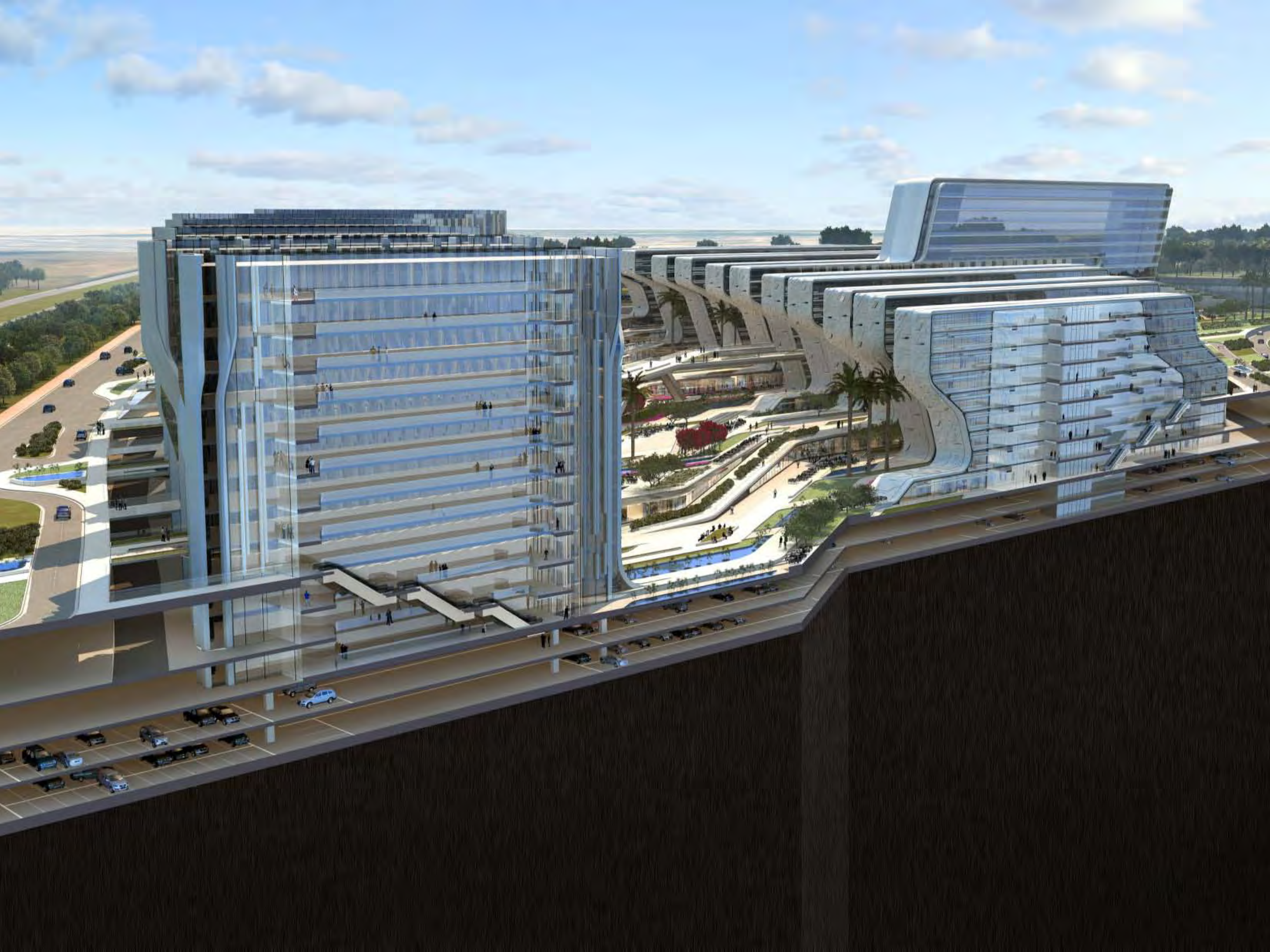
RETAIL

5 Retail Zones
Gross Area = 18,000sq.m

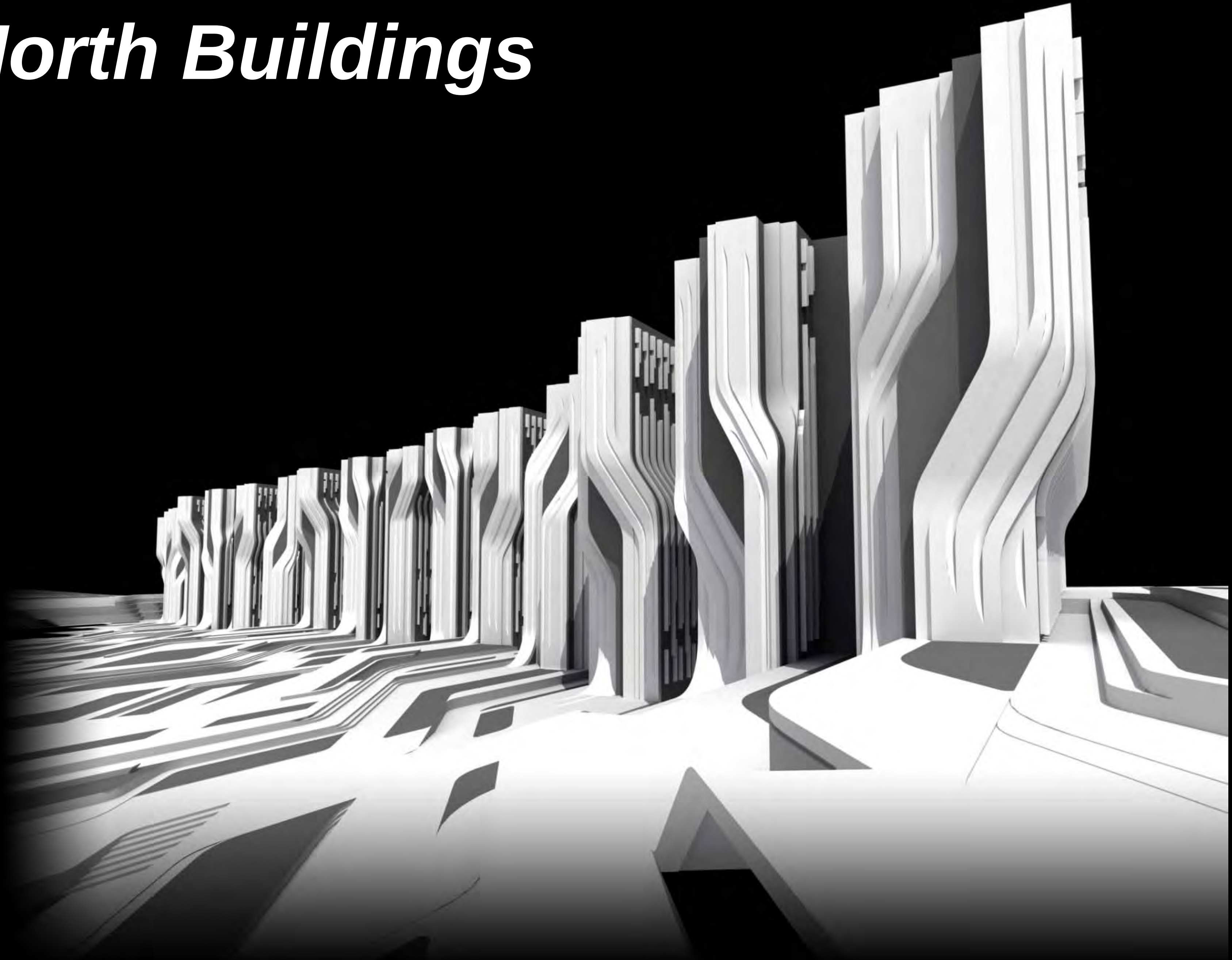
MASTERPLAN / INFRASTRUCTURE

2 Energy Centres
9,500 parking spaces
Site Area = 180,000 sqm
Gross Area = 600,000 sqm

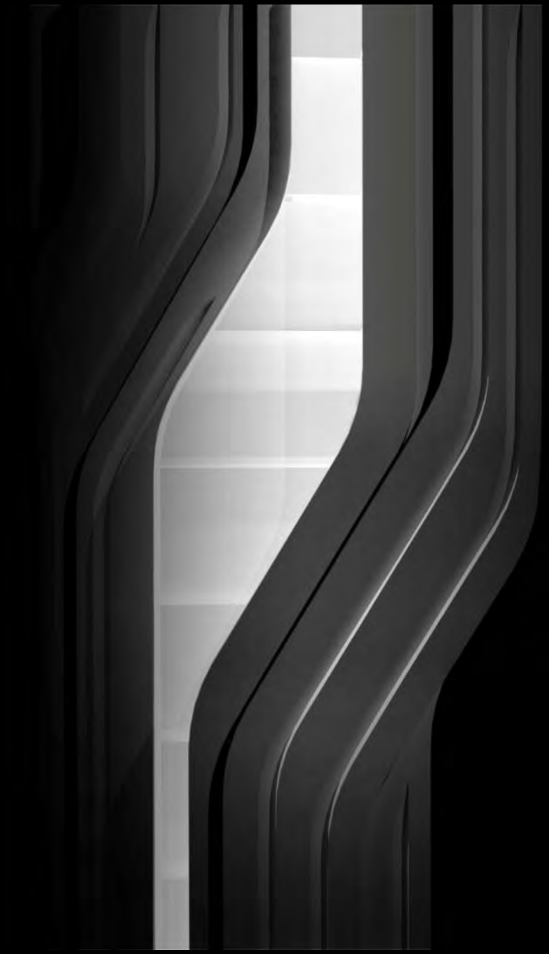




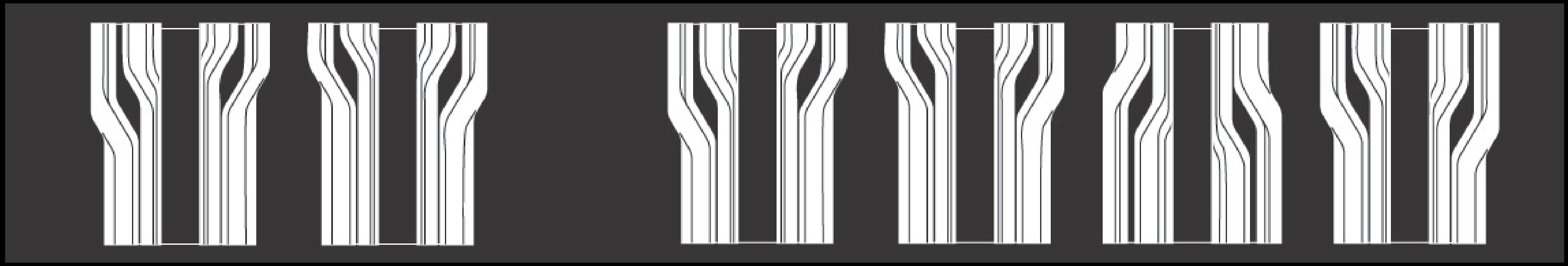
North Buildings

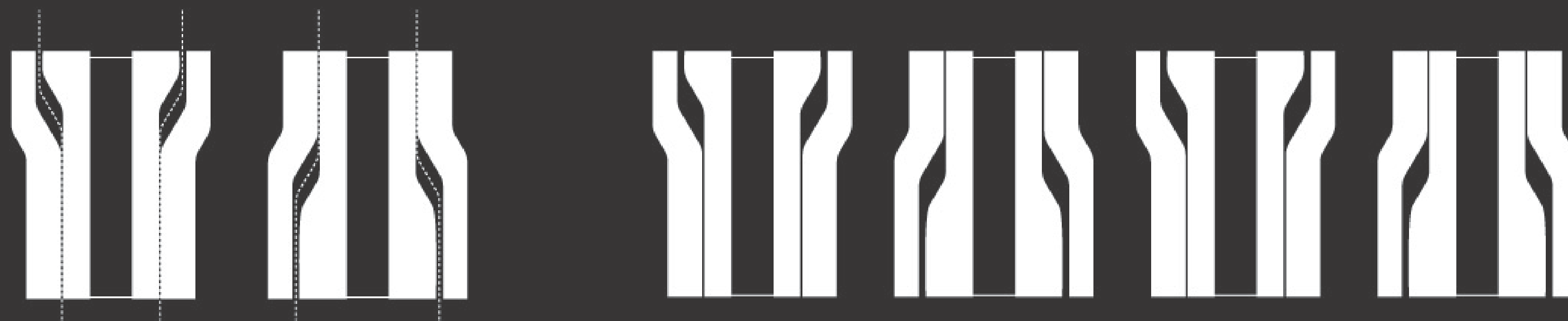


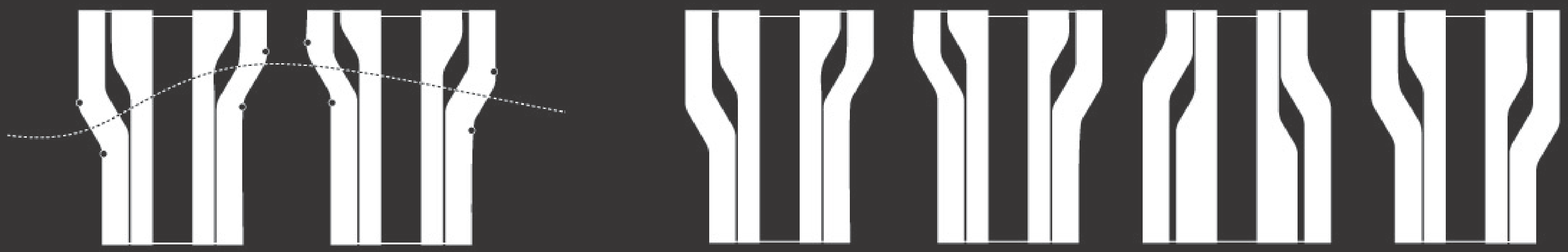
Front Elevation

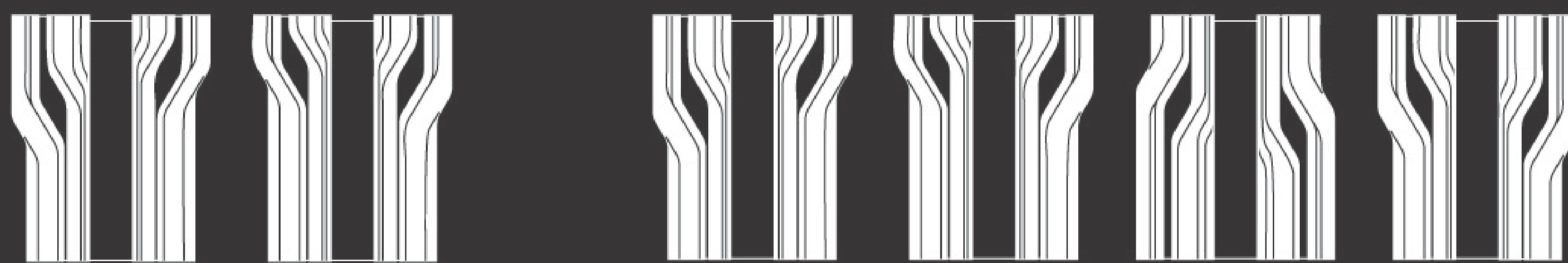


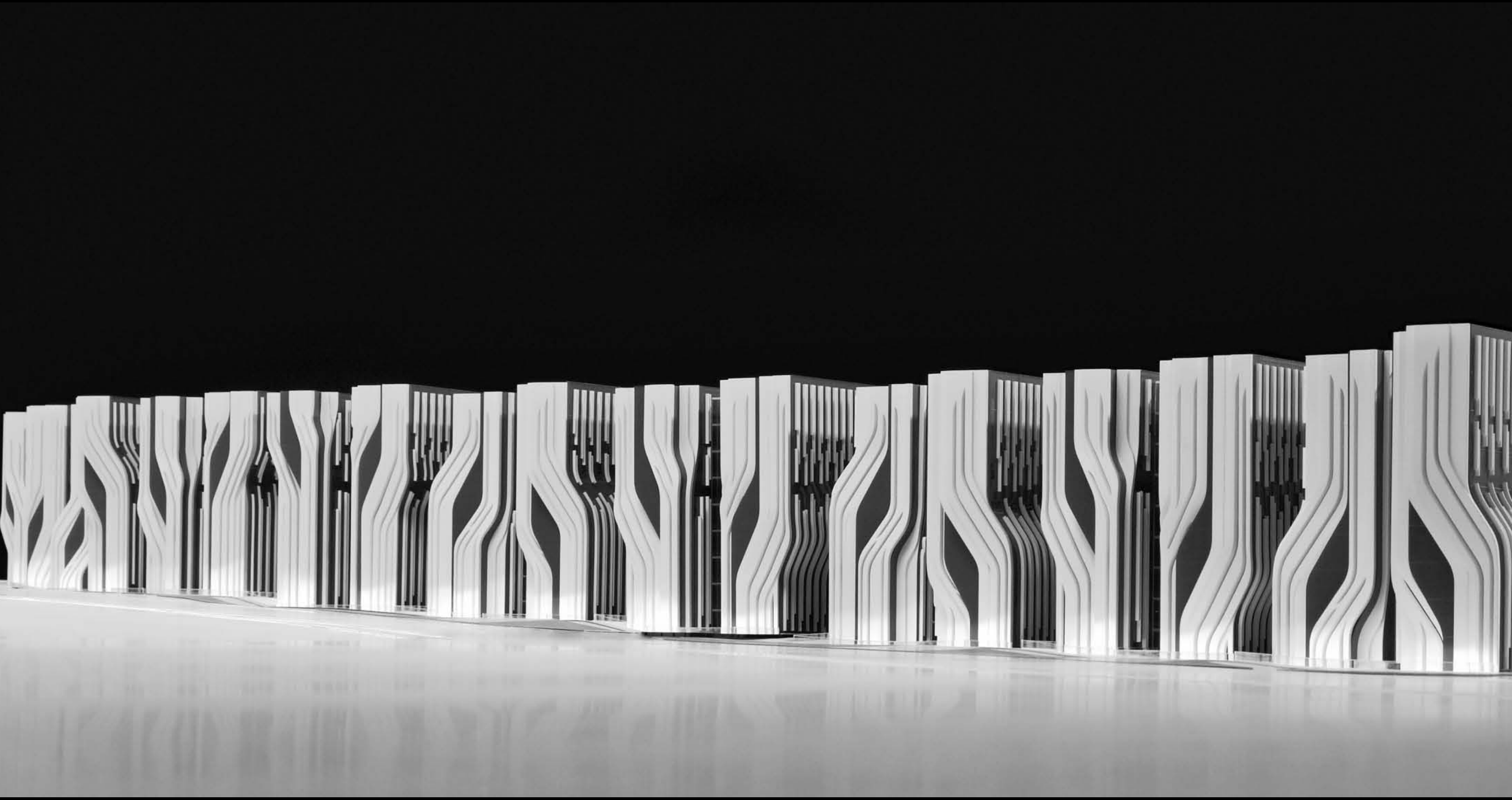
Side Elevation

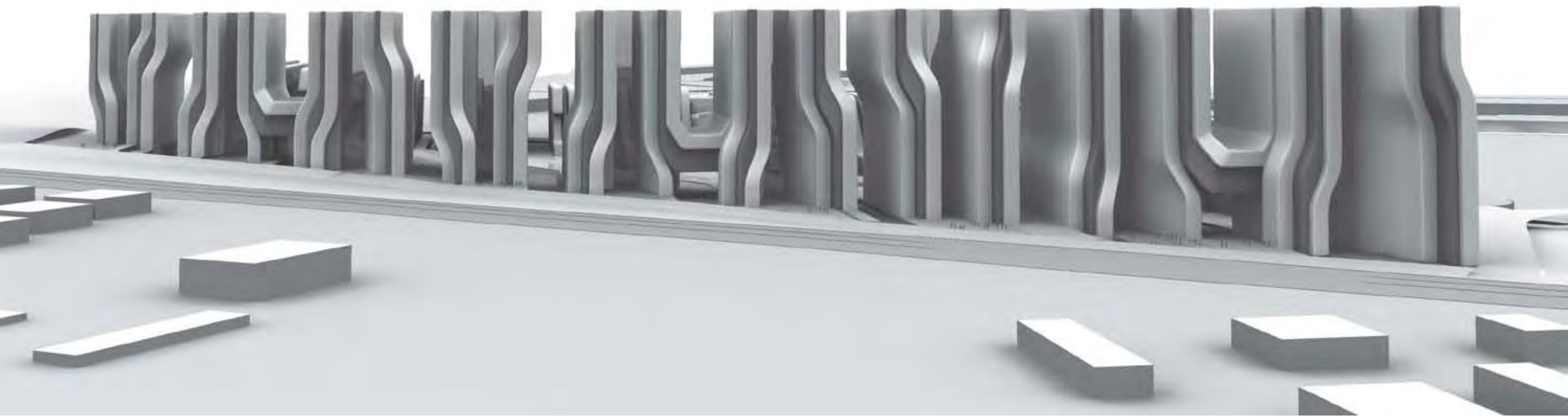


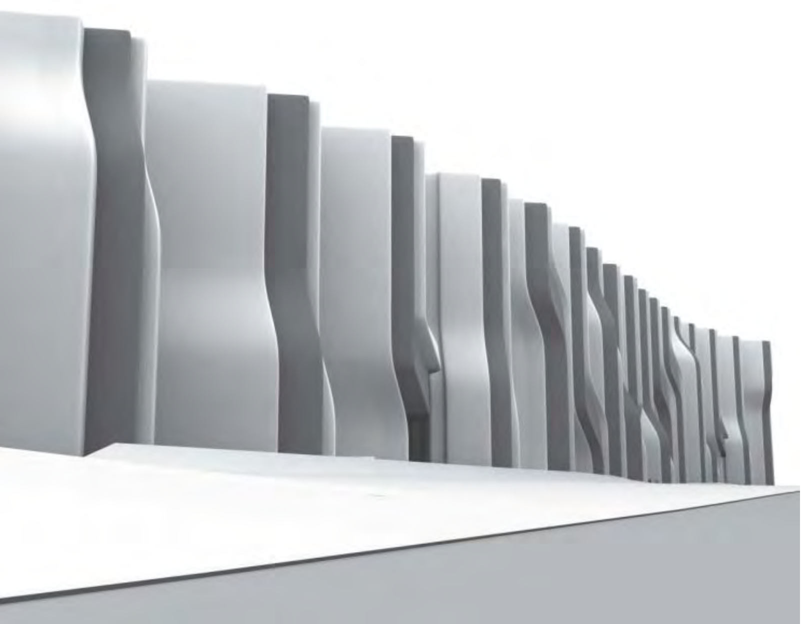


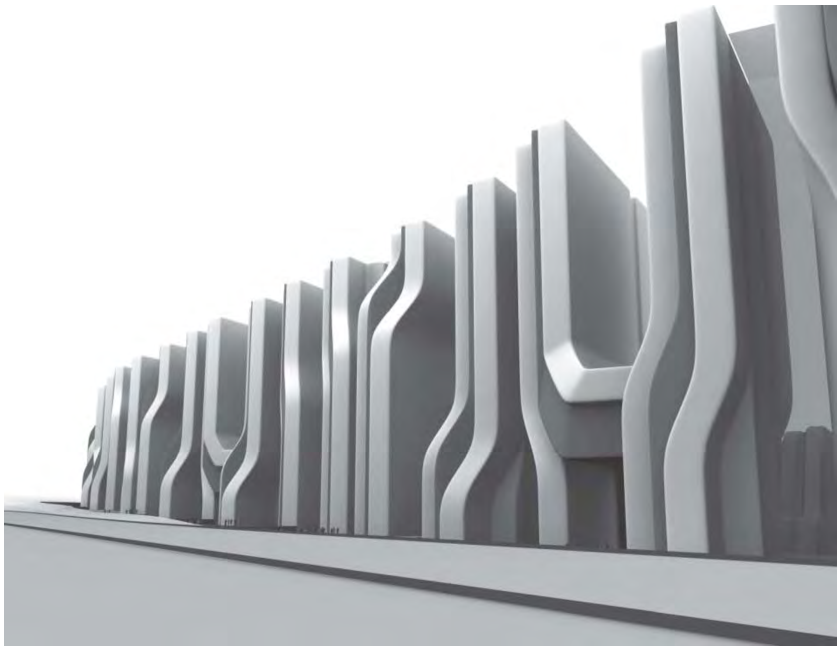


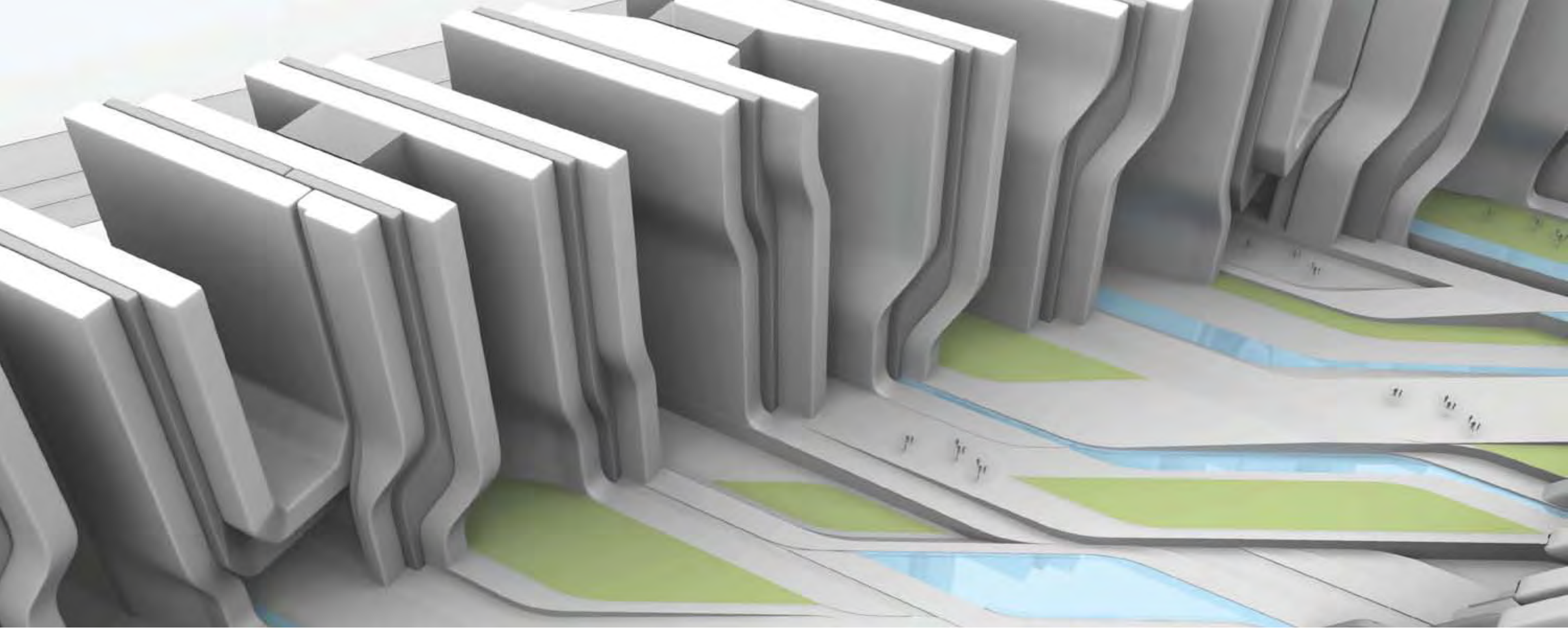
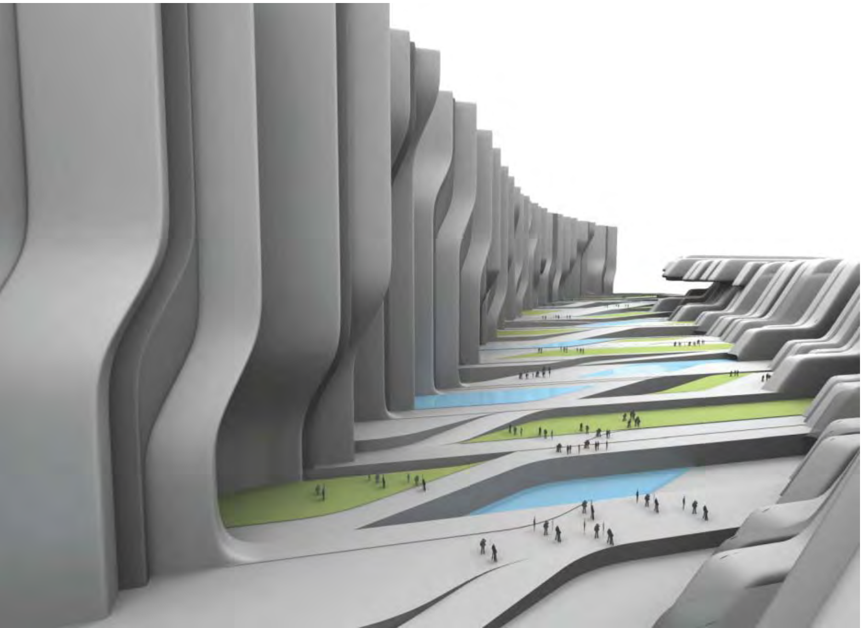
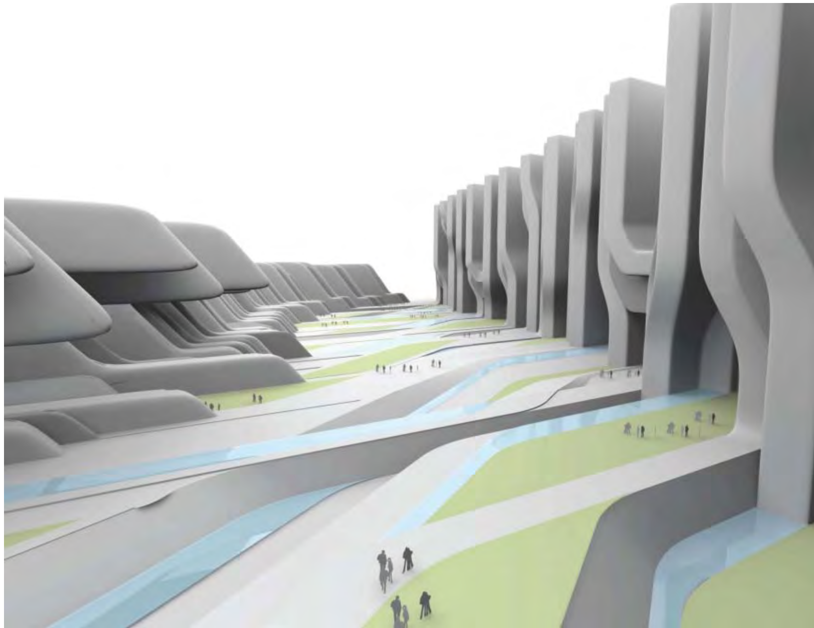




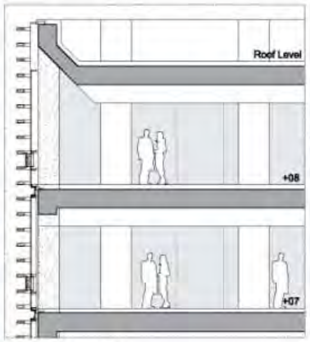






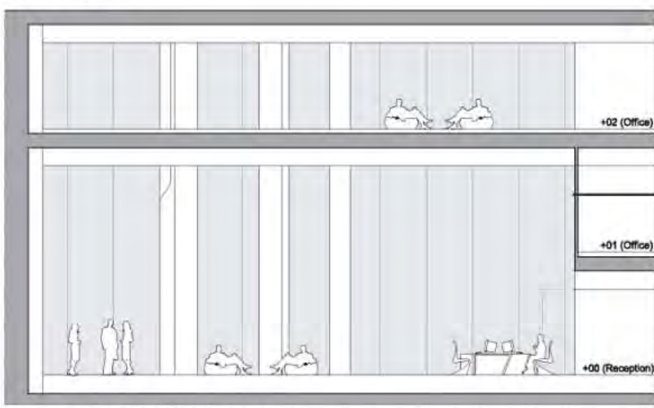




GLAZED CORNER

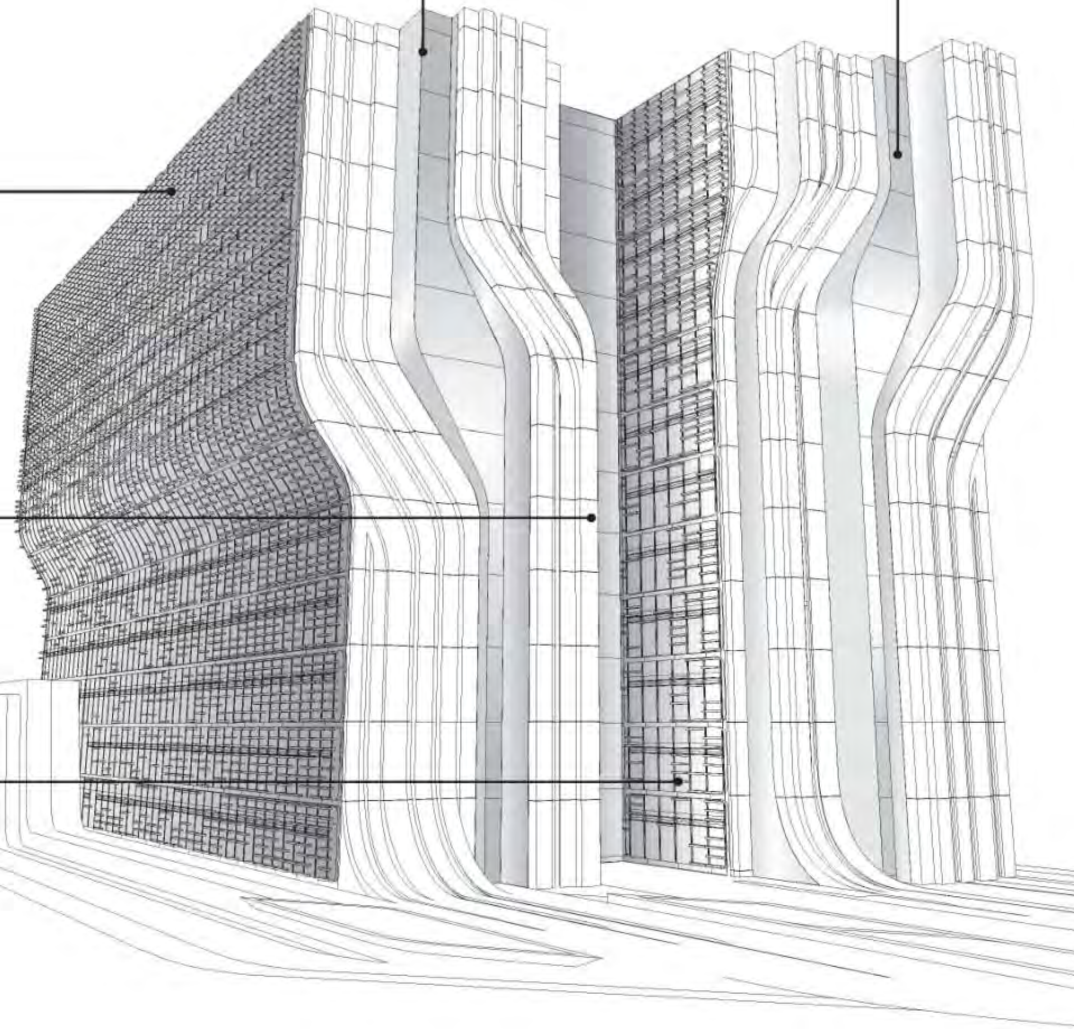


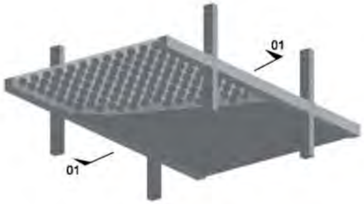
TOP FLOOR

COURTYARD

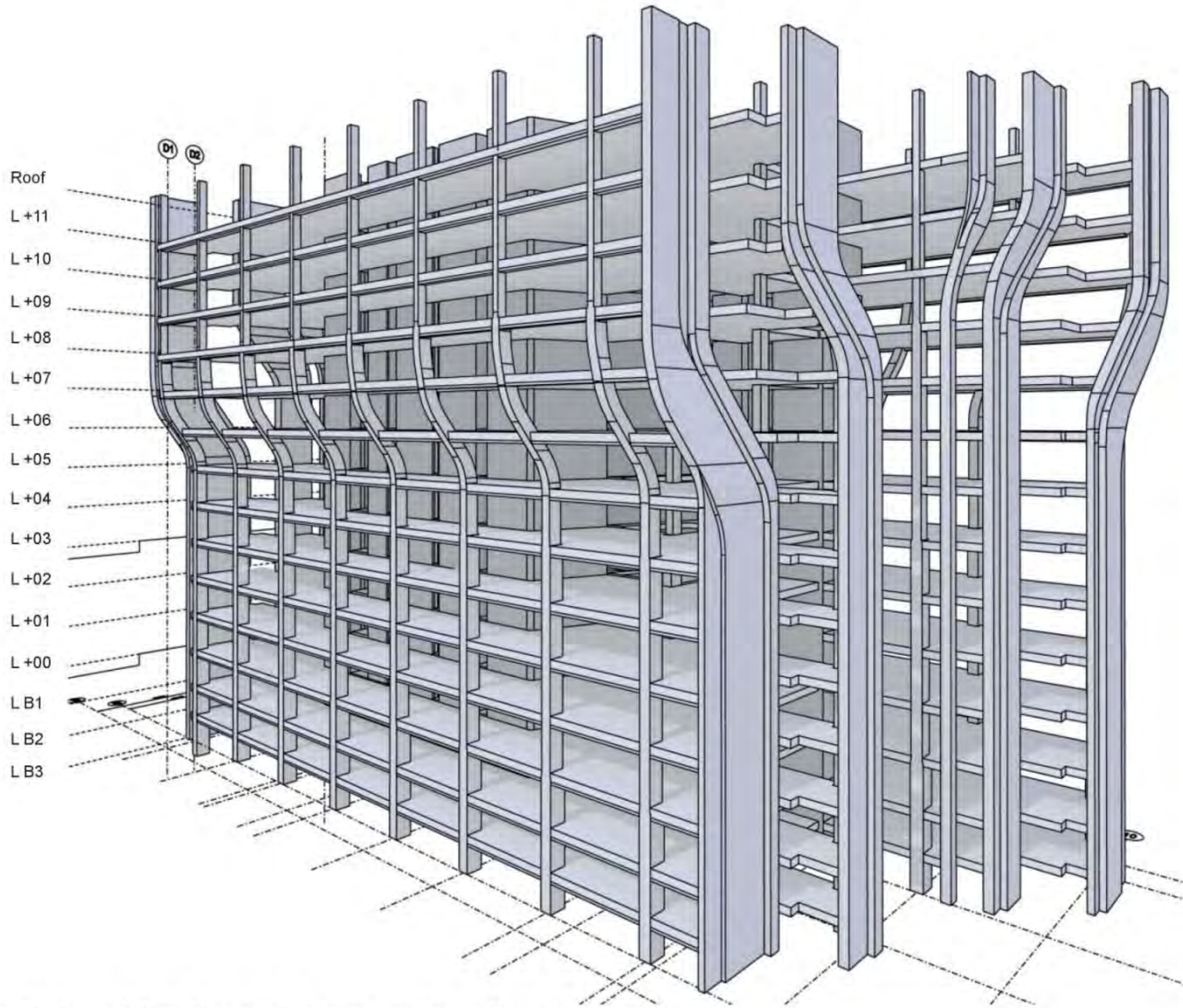


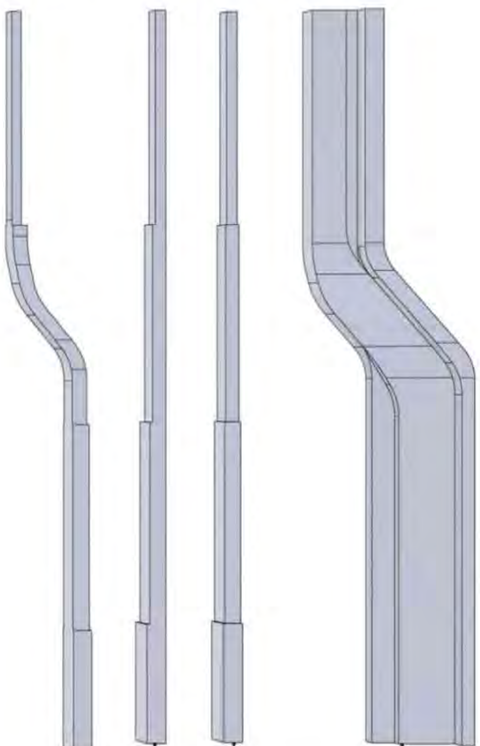
DOUBLE HEIGHT RECEPTION



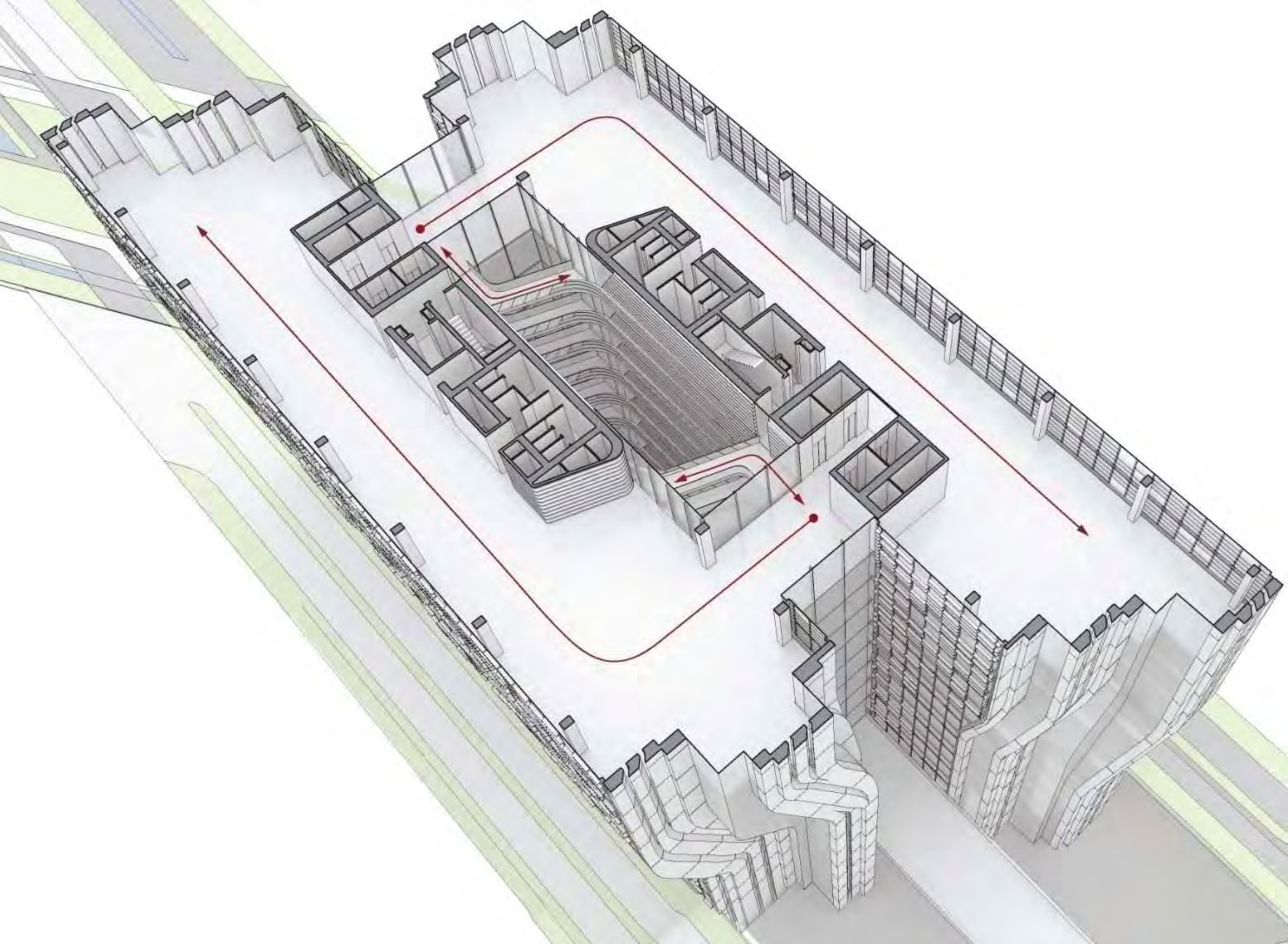


Bubble Deck Slab:
600mm Thick with 15m column span
450mm Thick with 12m column span

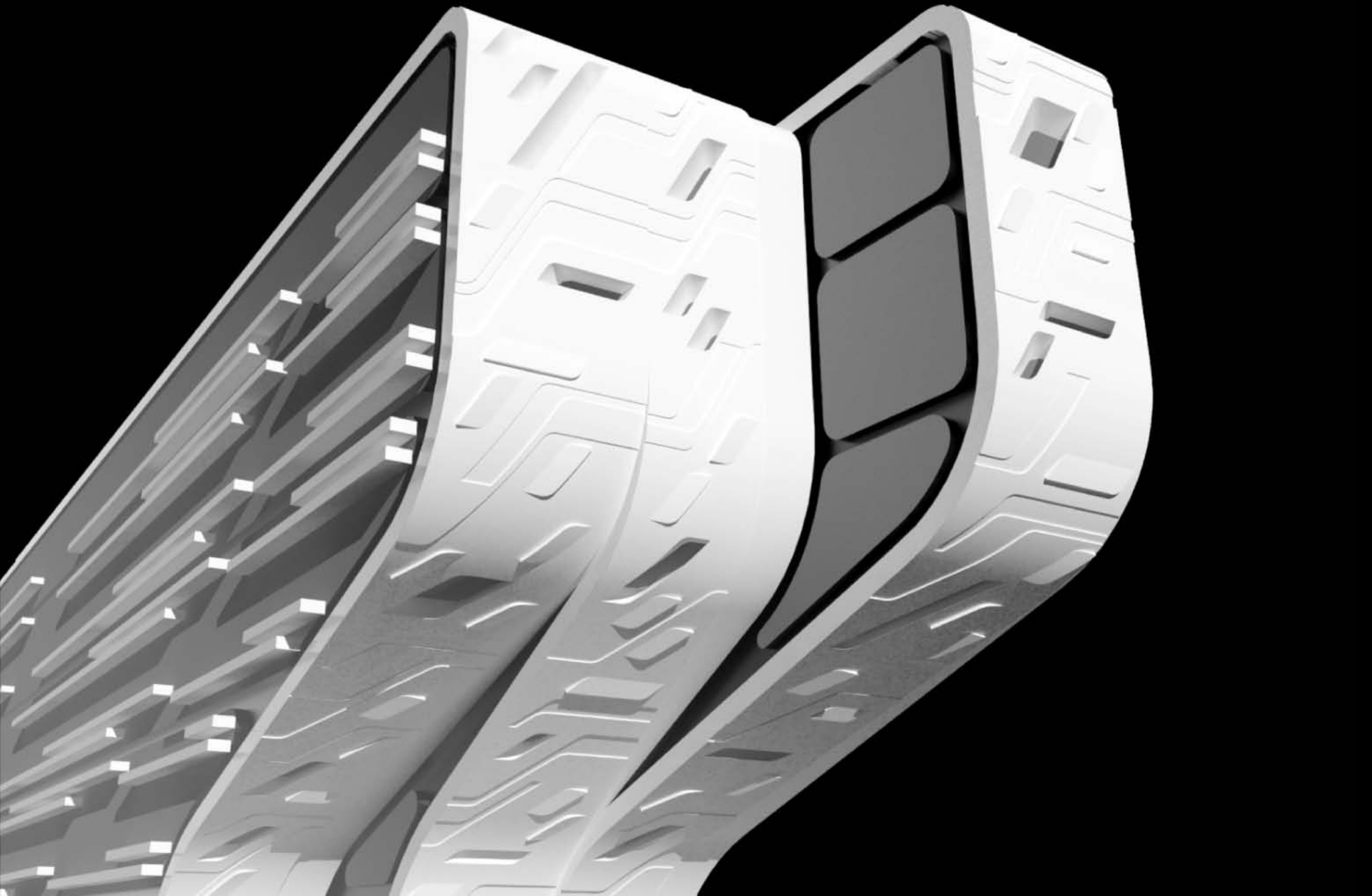


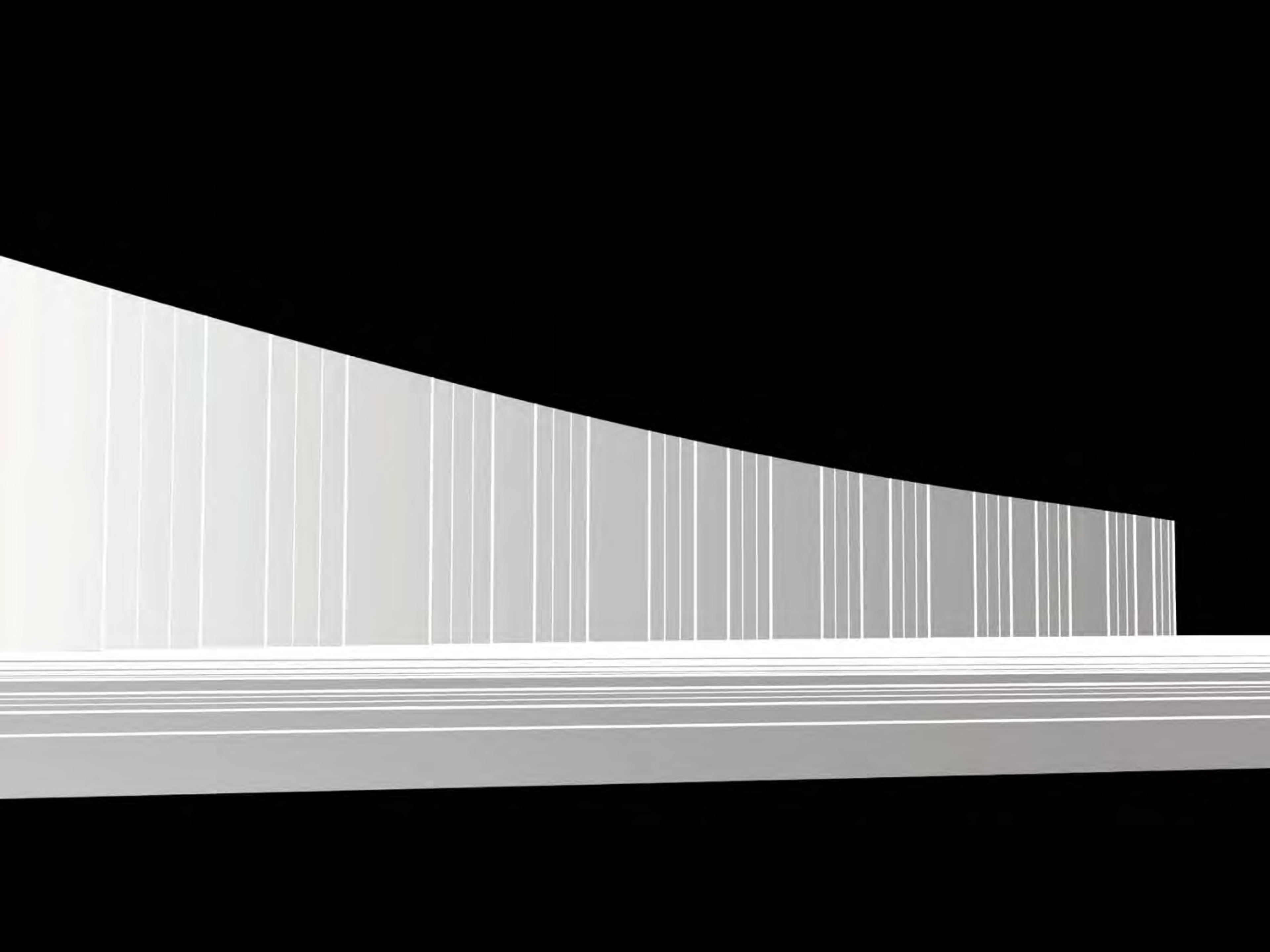


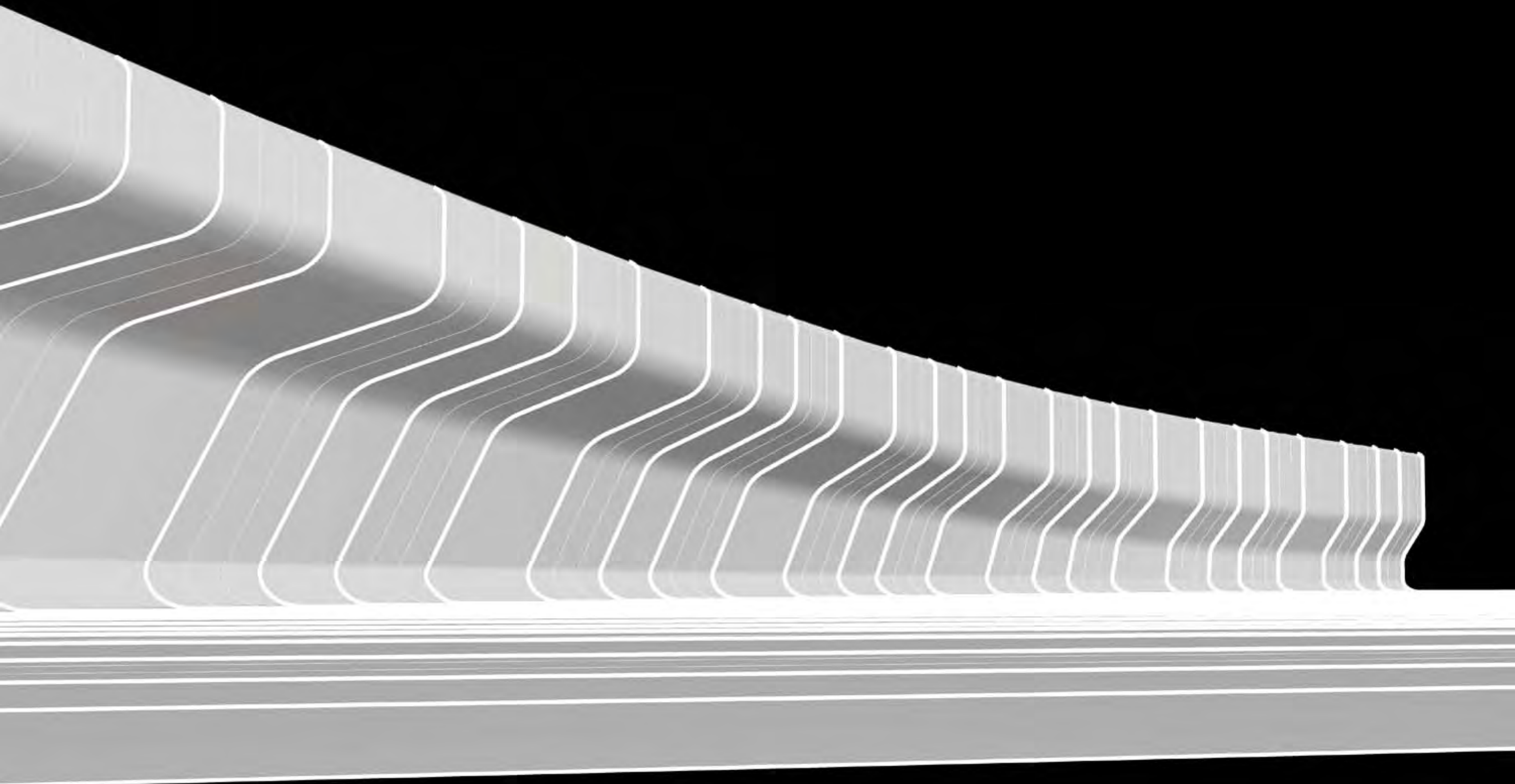
Ribbons made of: RC Wall (Min. tickness 500mm), 70mm zone for fixing and insulation, and 80mm thick exterior GRC panels
Standard Atrium RC Column: Loads centrated on one edge
Reception RC Column: Loads centrated on two edges
External facade RC Column, double curvature: Loads centrated on one edge

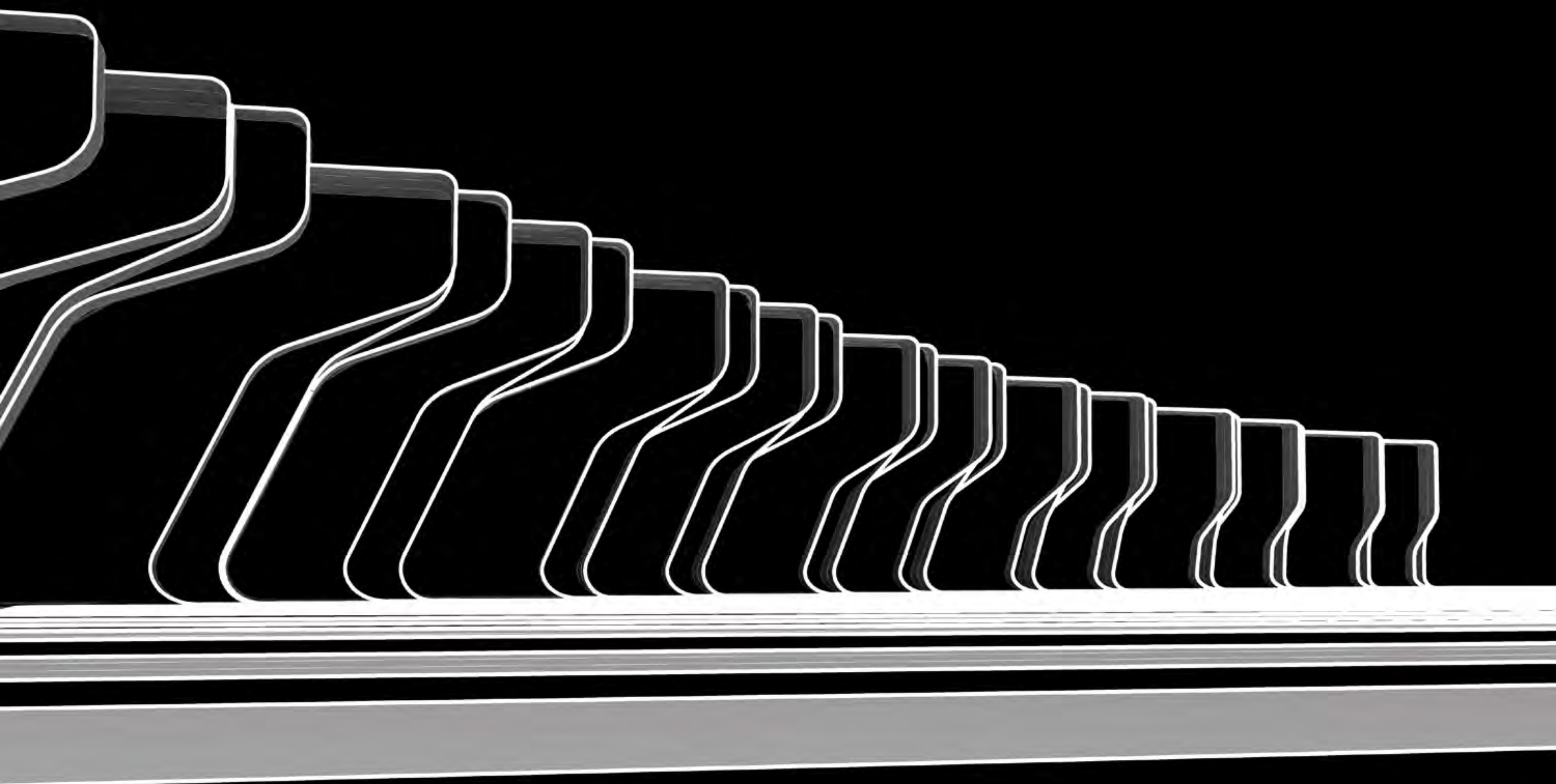


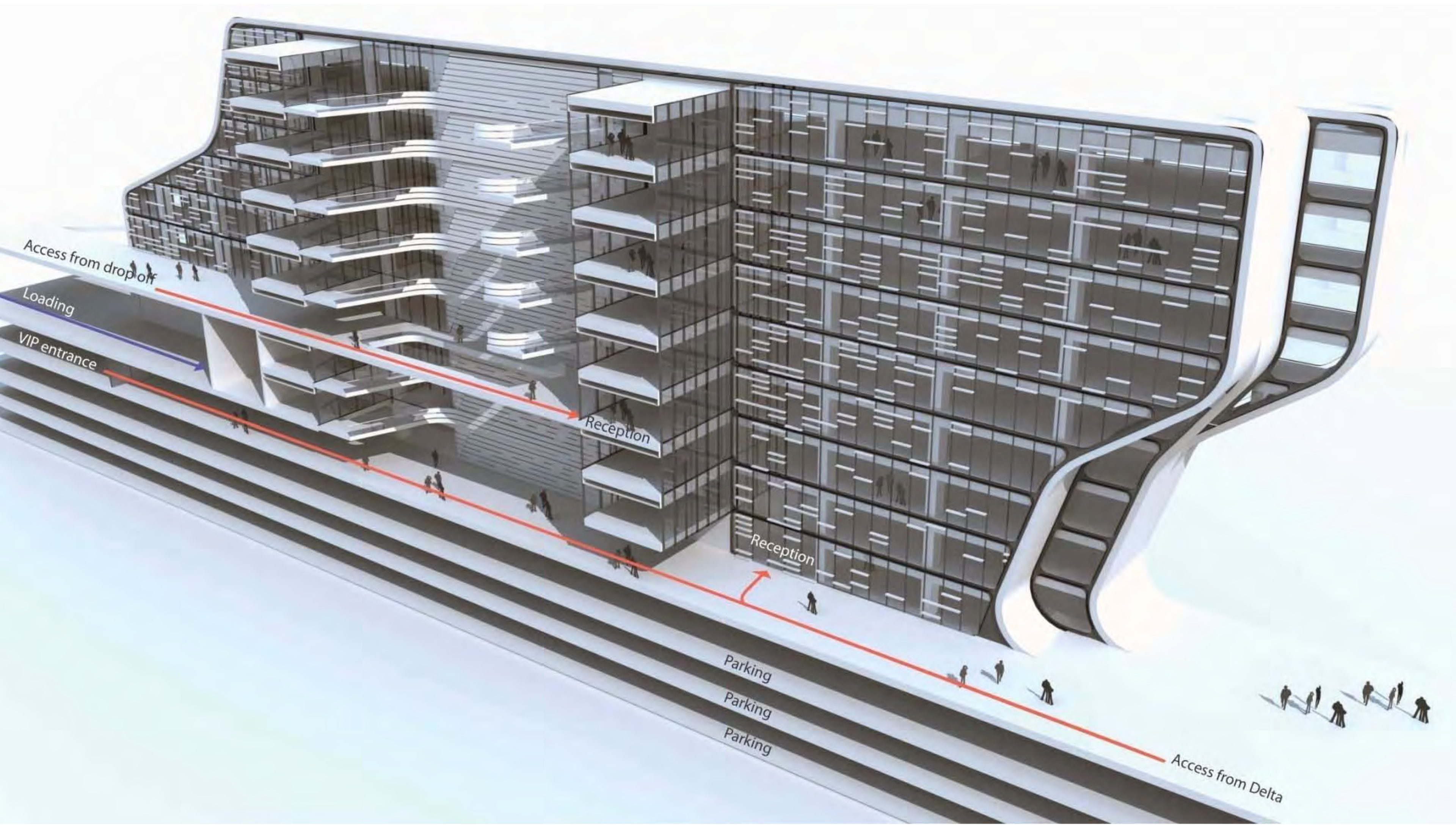
South Buildings

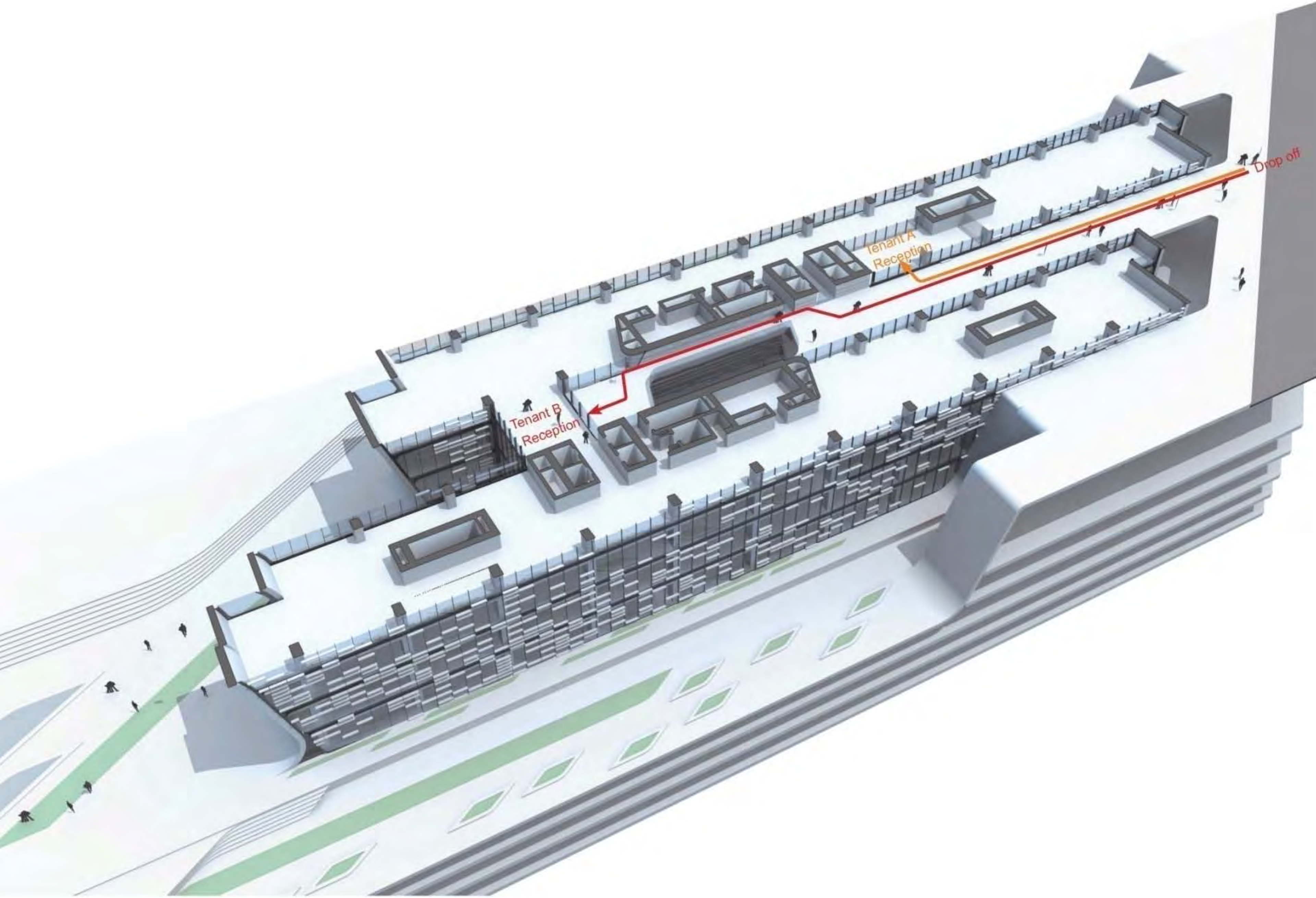




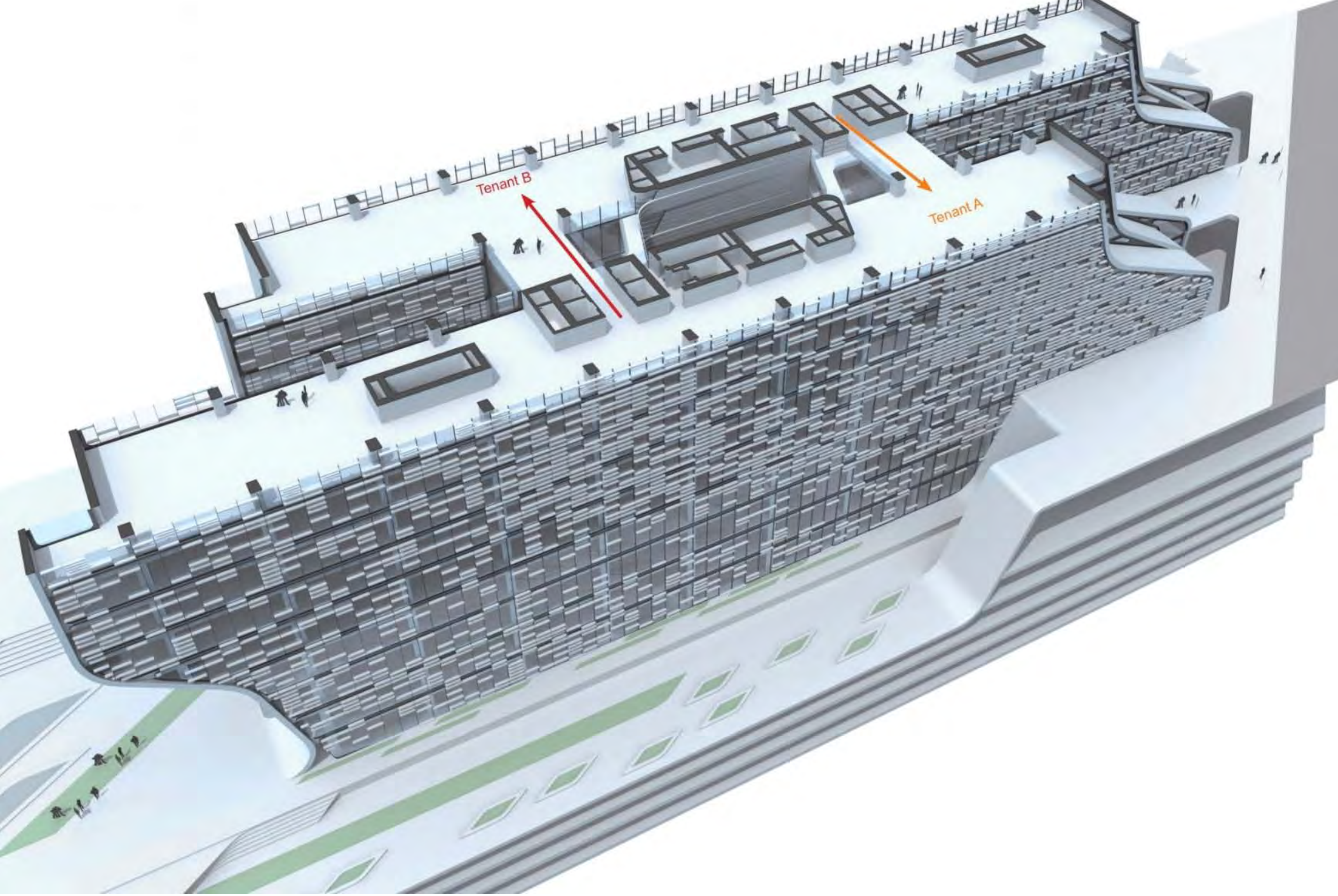


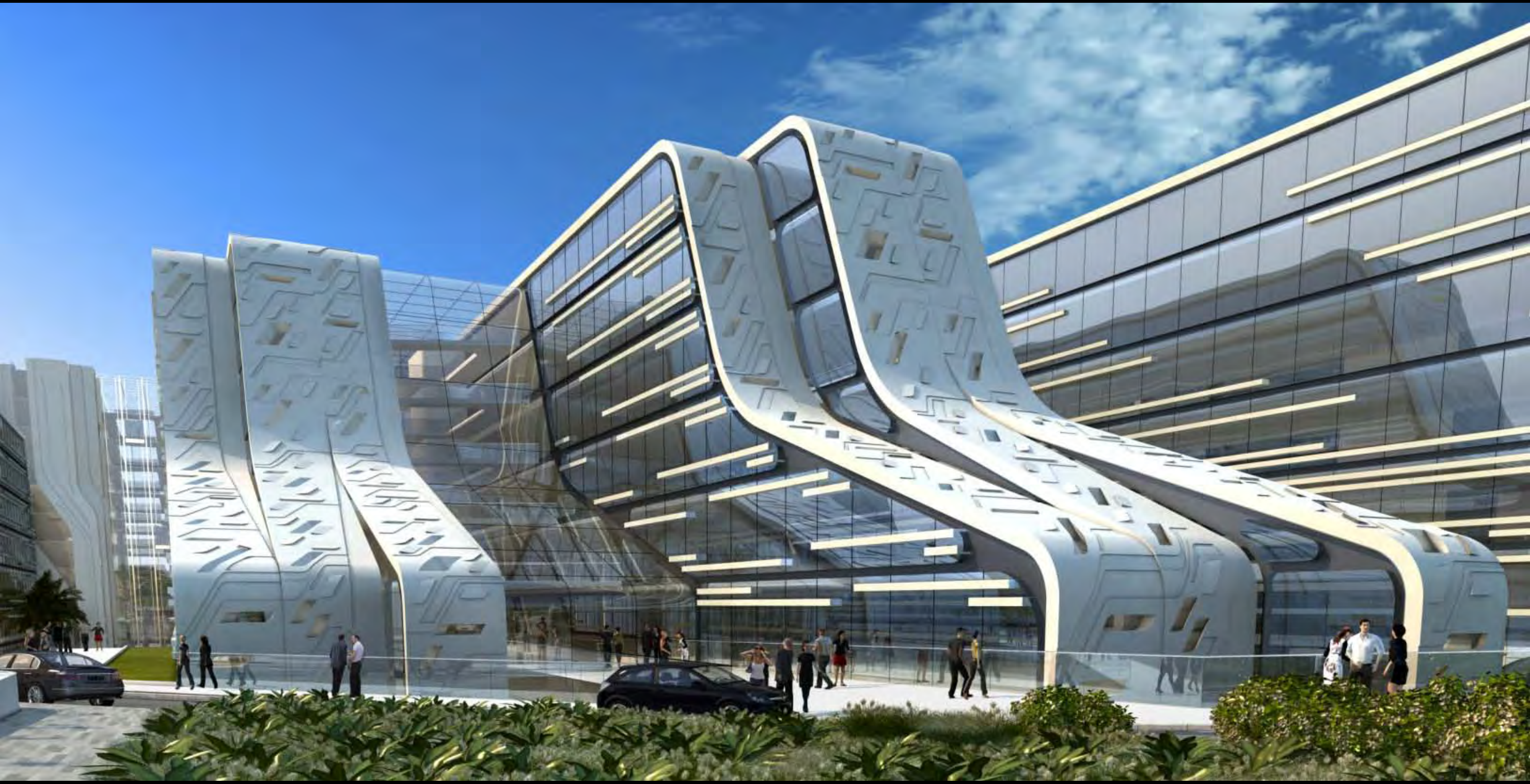


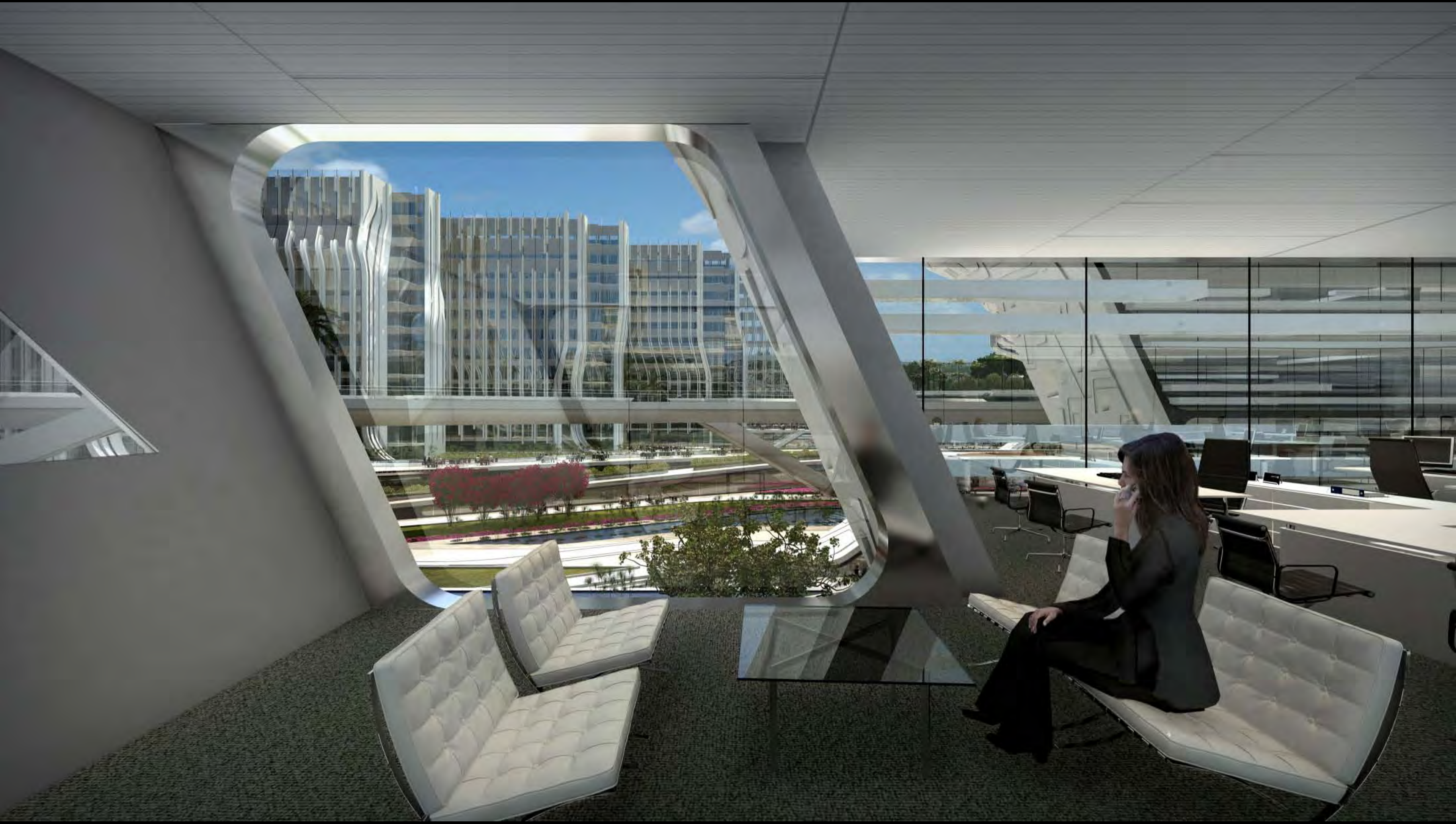

Access from drop off
Loading
VIP entrance
Reception
Reception
Parking
Parking
Parking
Access from Delta

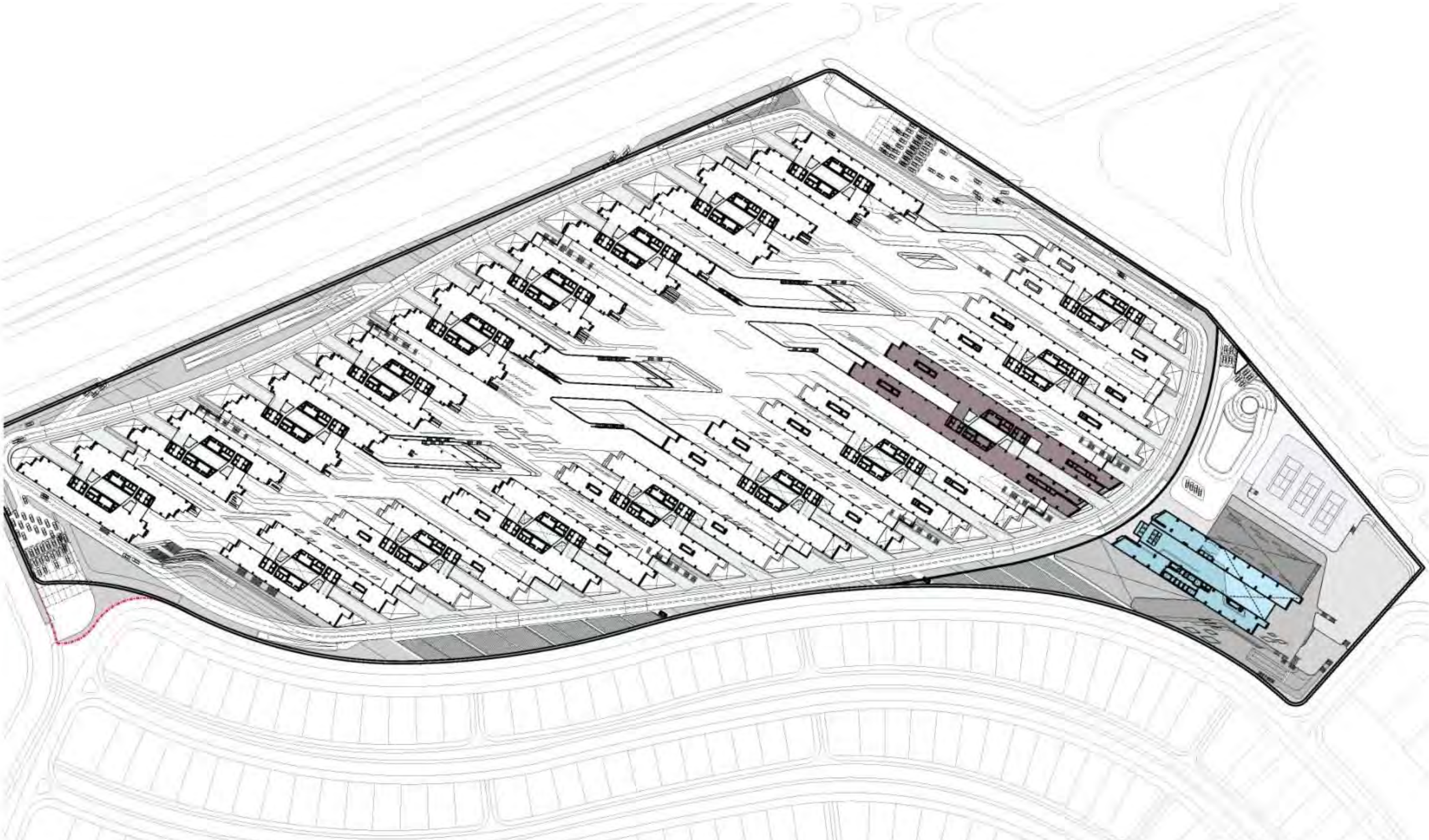


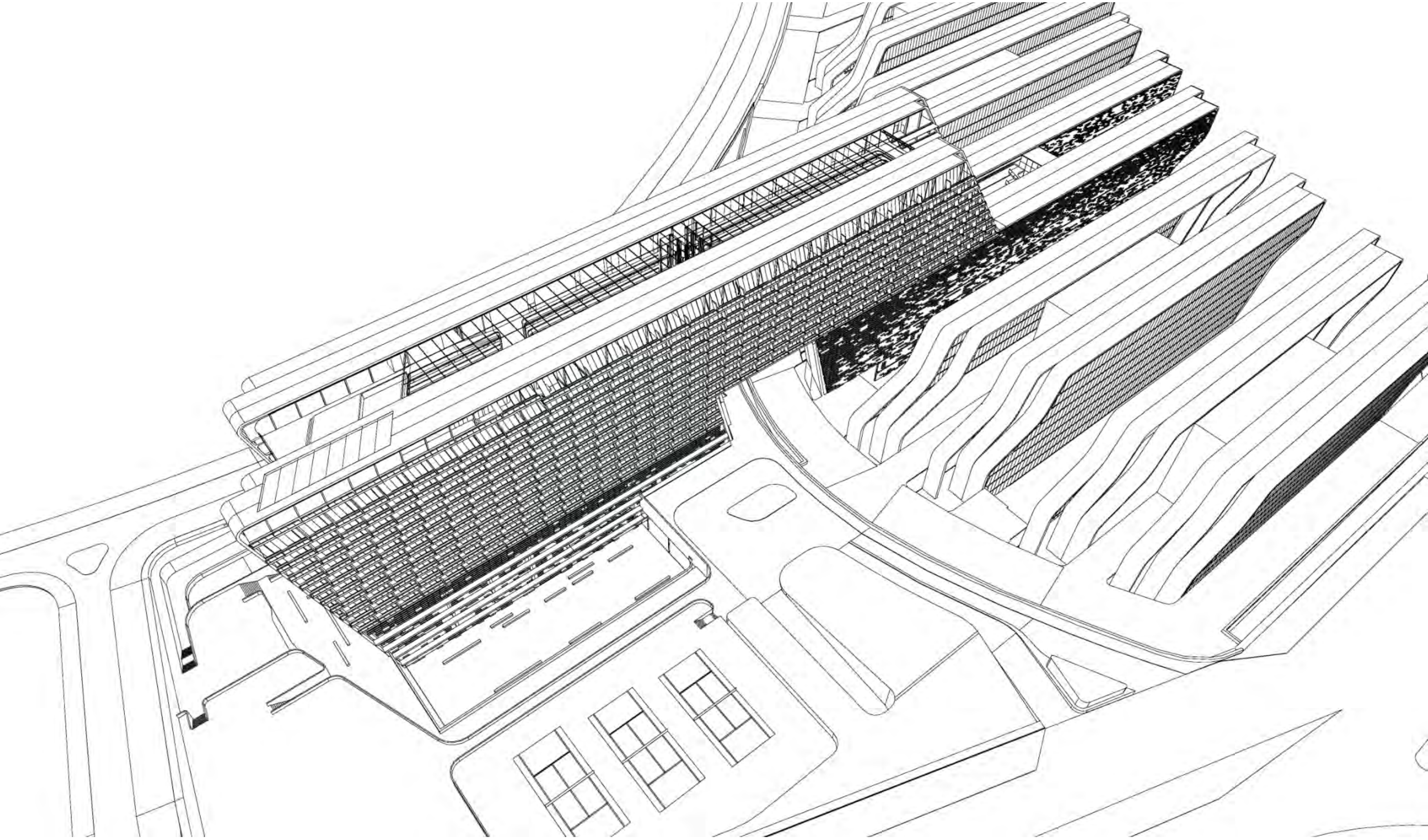
Drop off
Tenant A
Reception
Tenant B
Reception

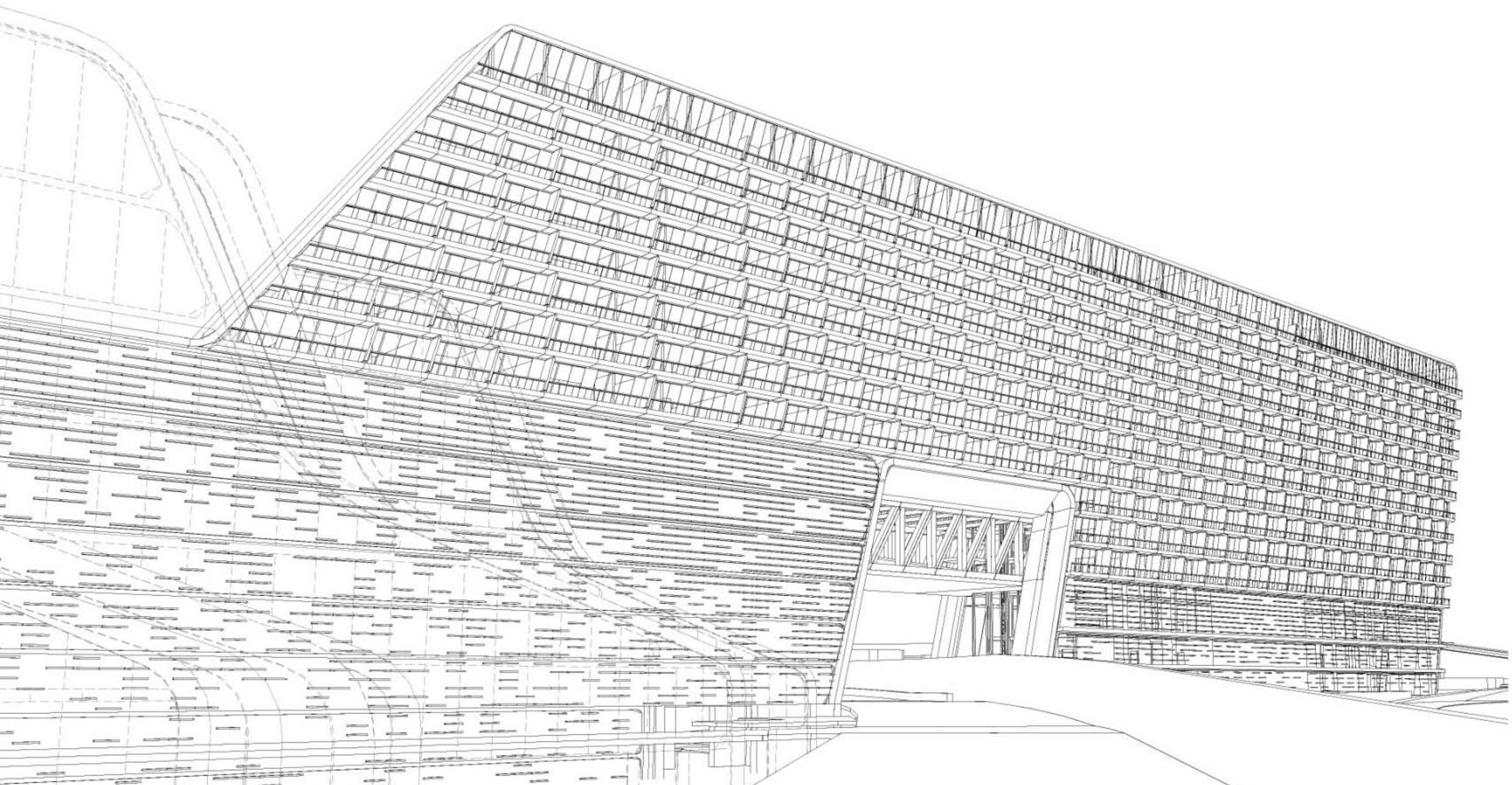

Tenant B
Tenant A

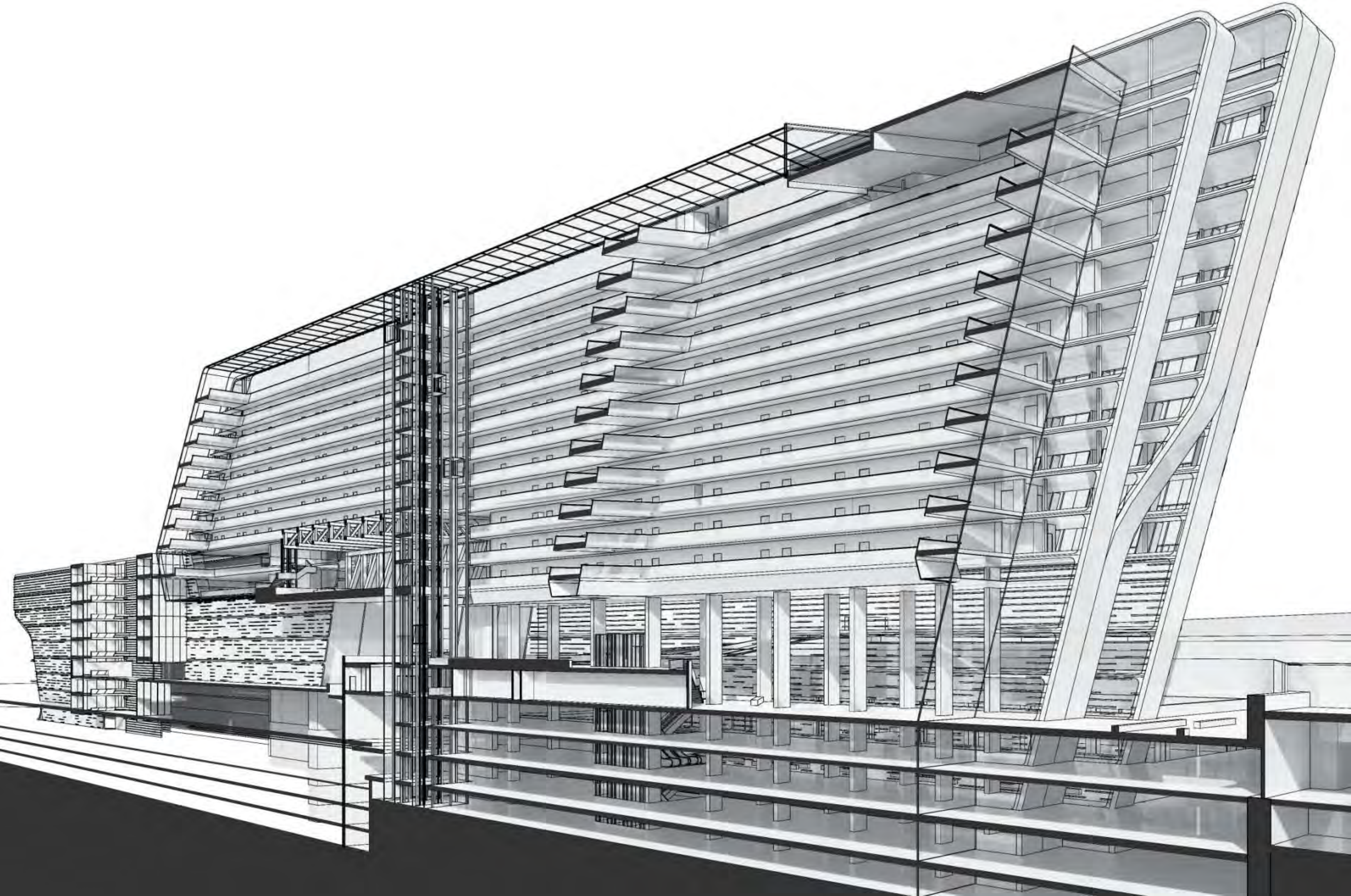


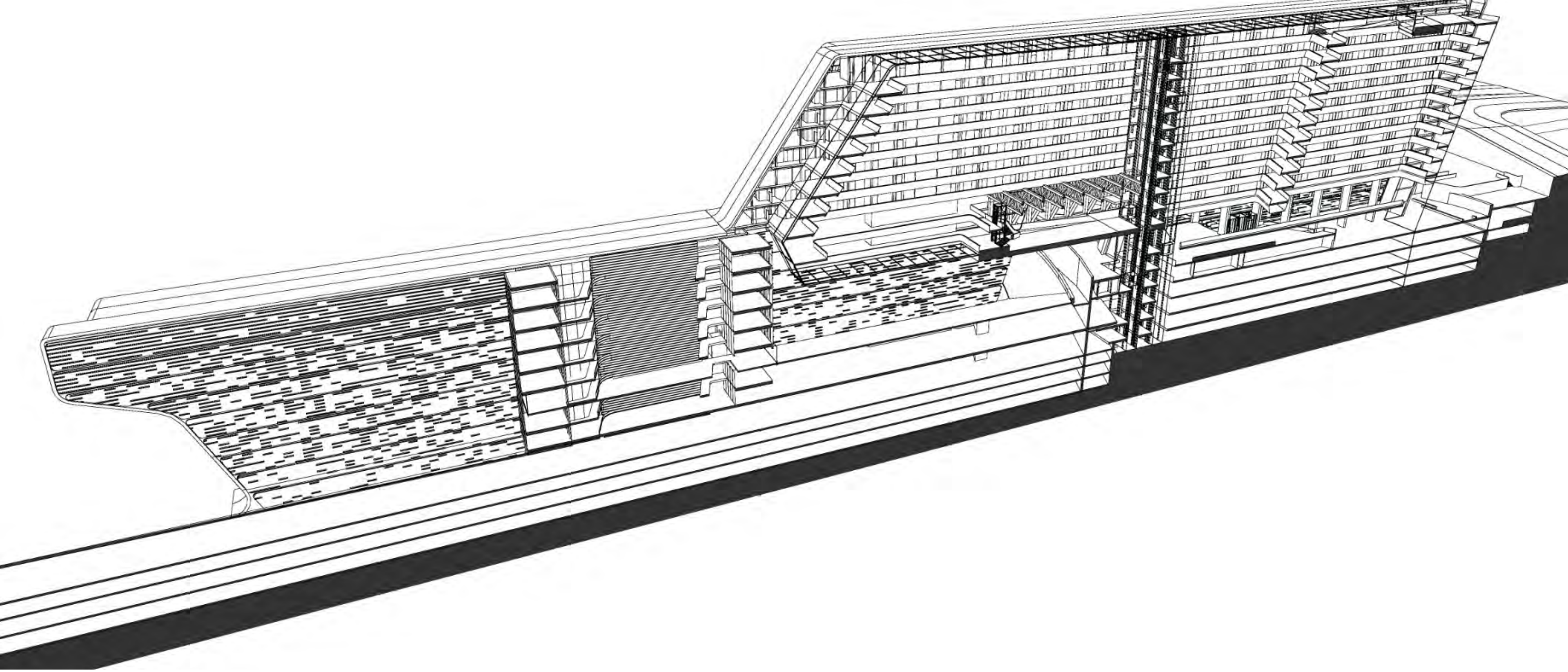


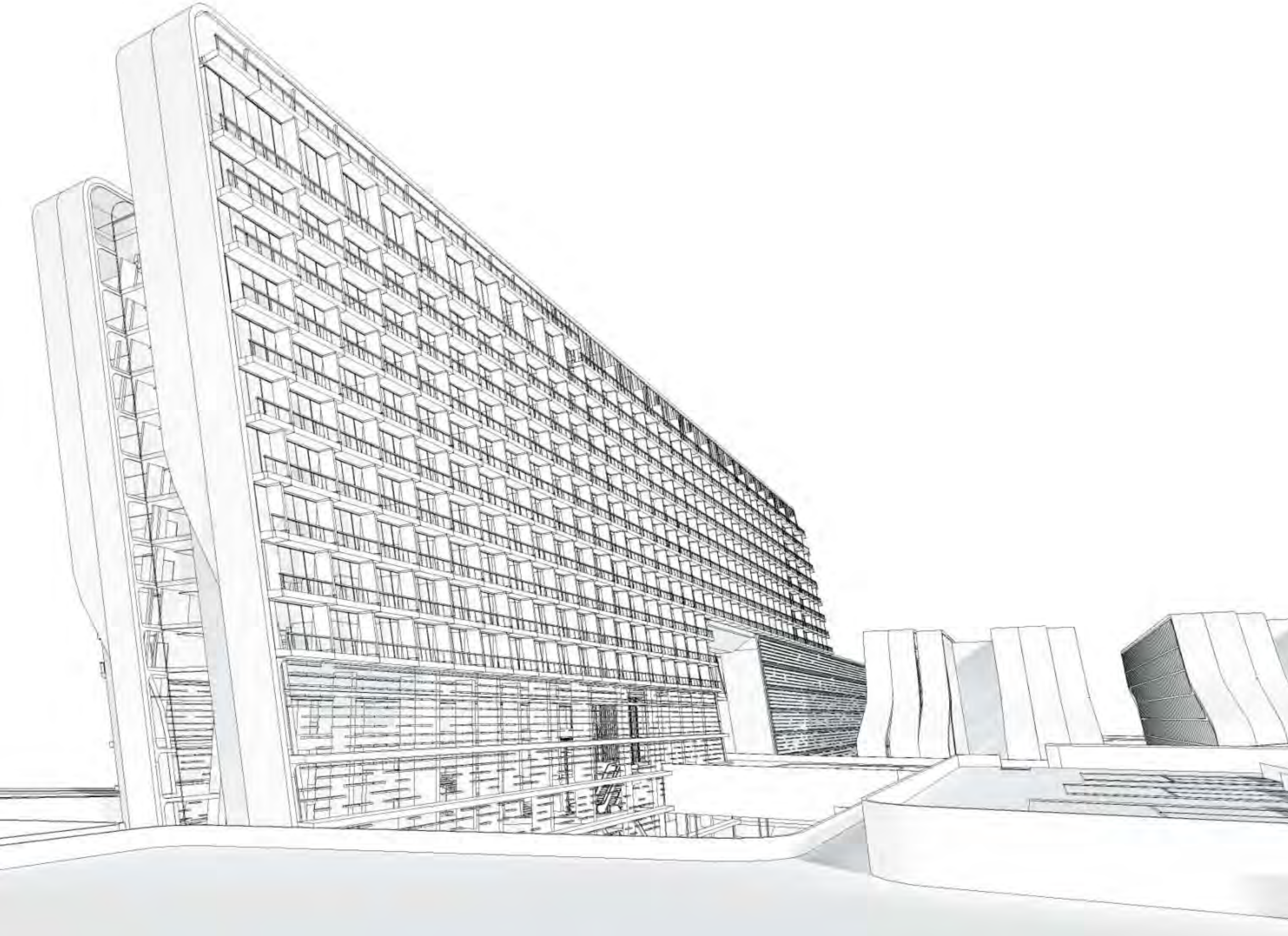


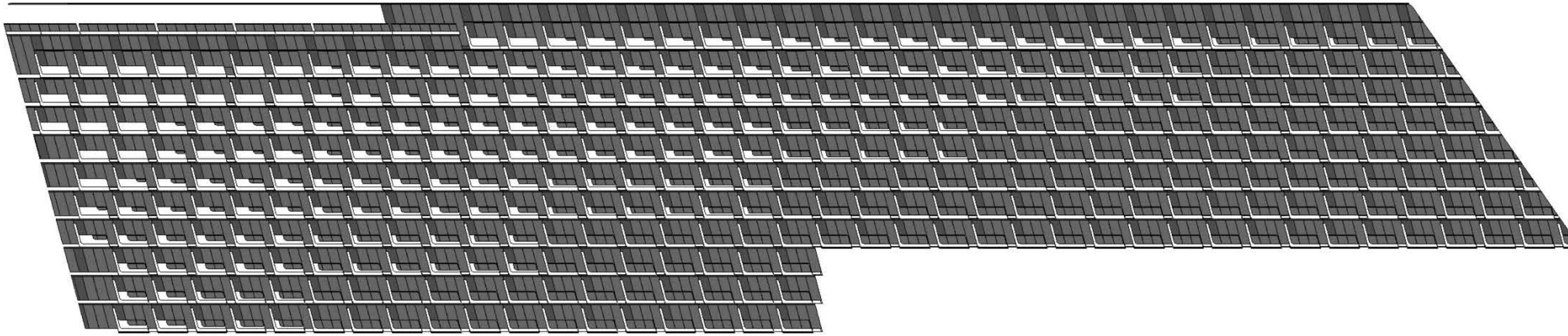


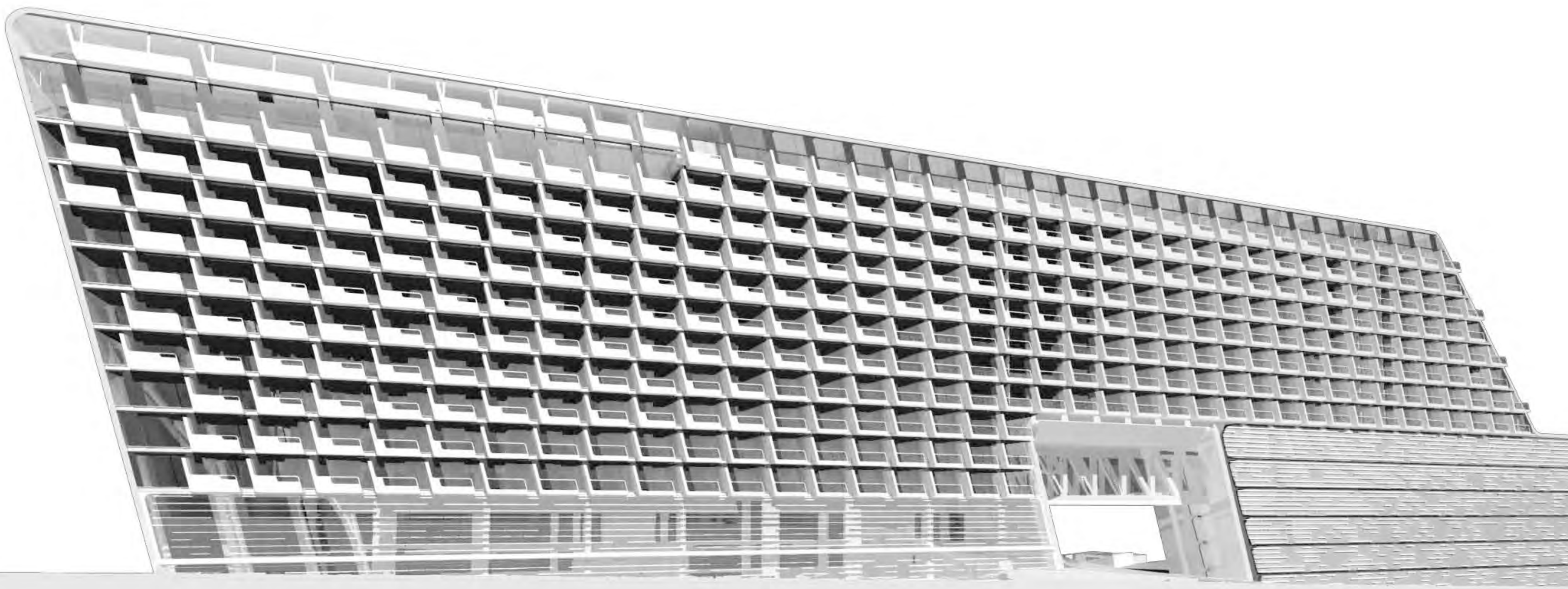


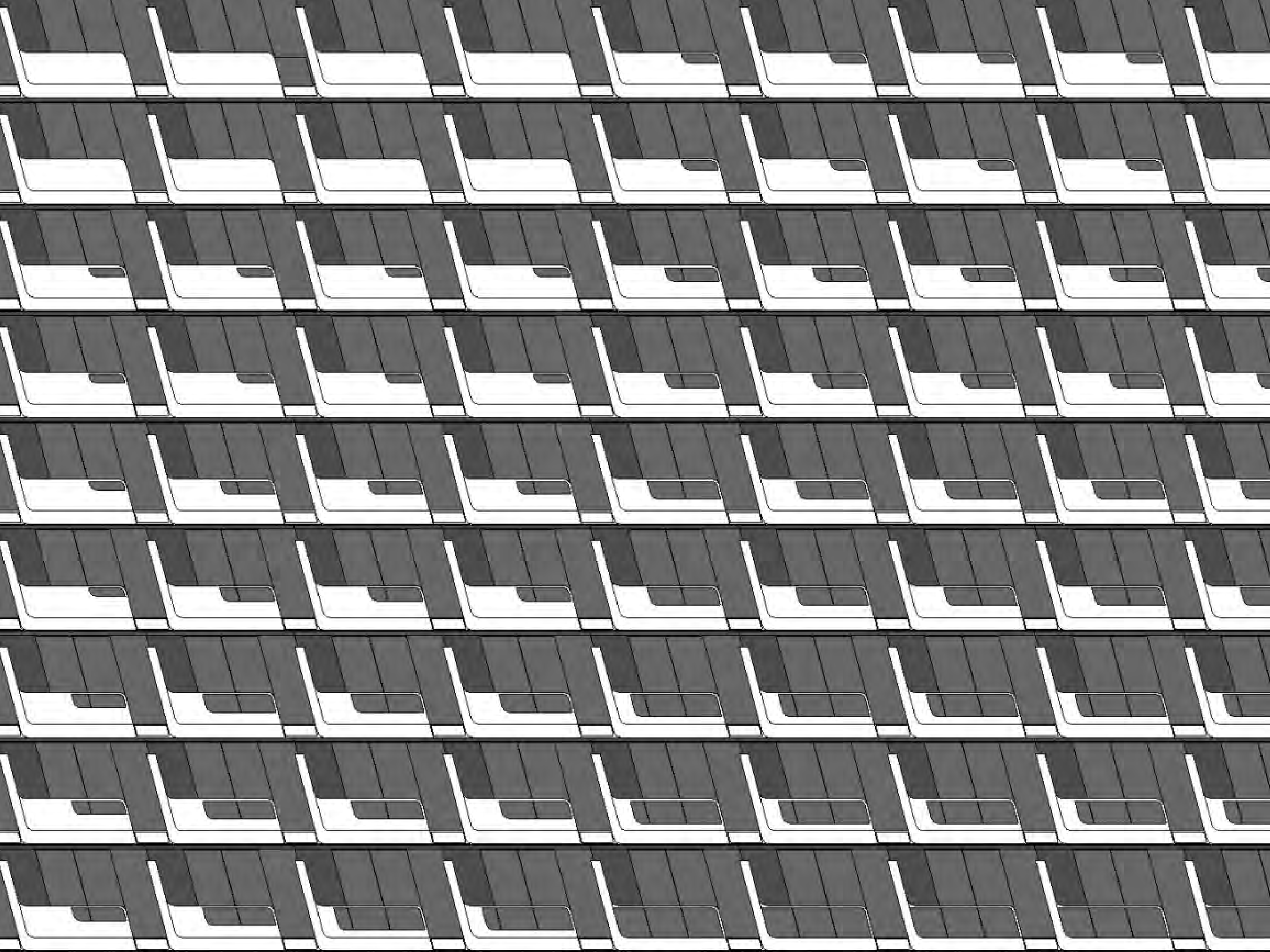


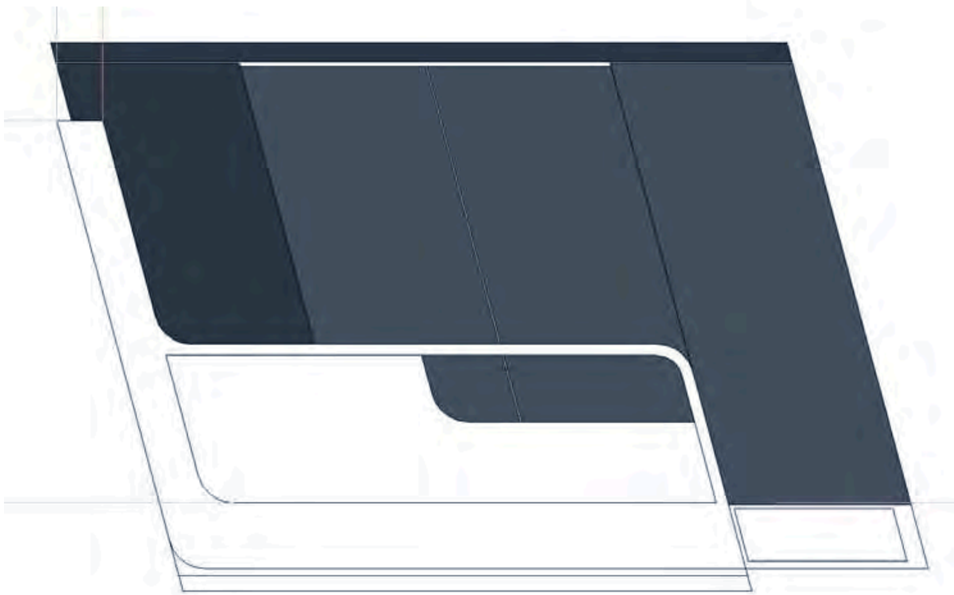




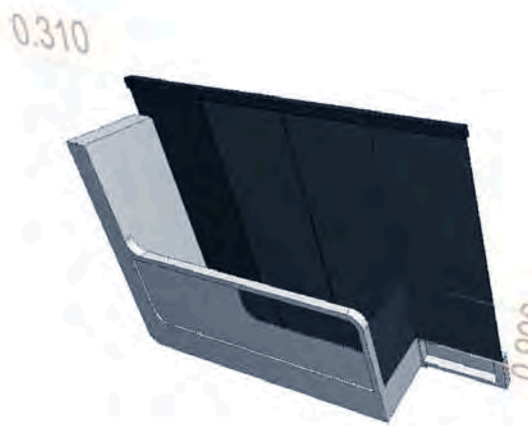









0.310
0.900
0.445
1.050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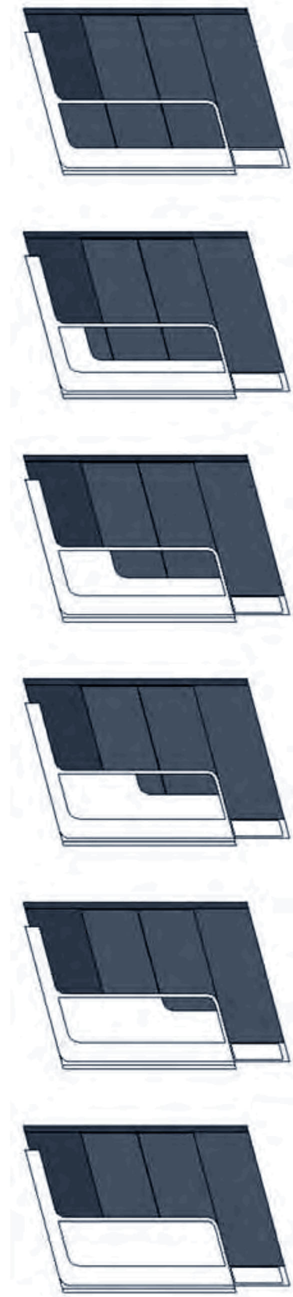
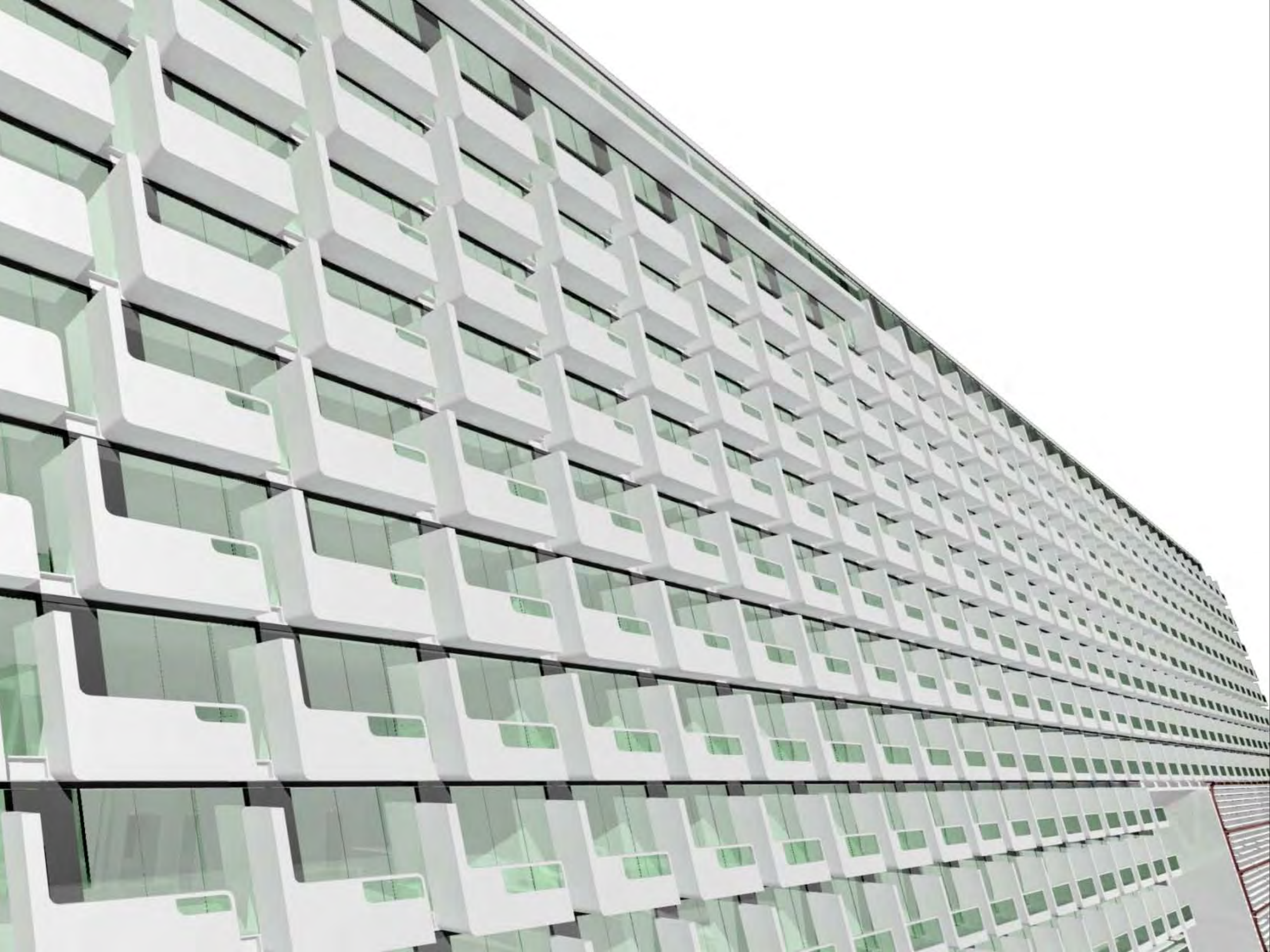
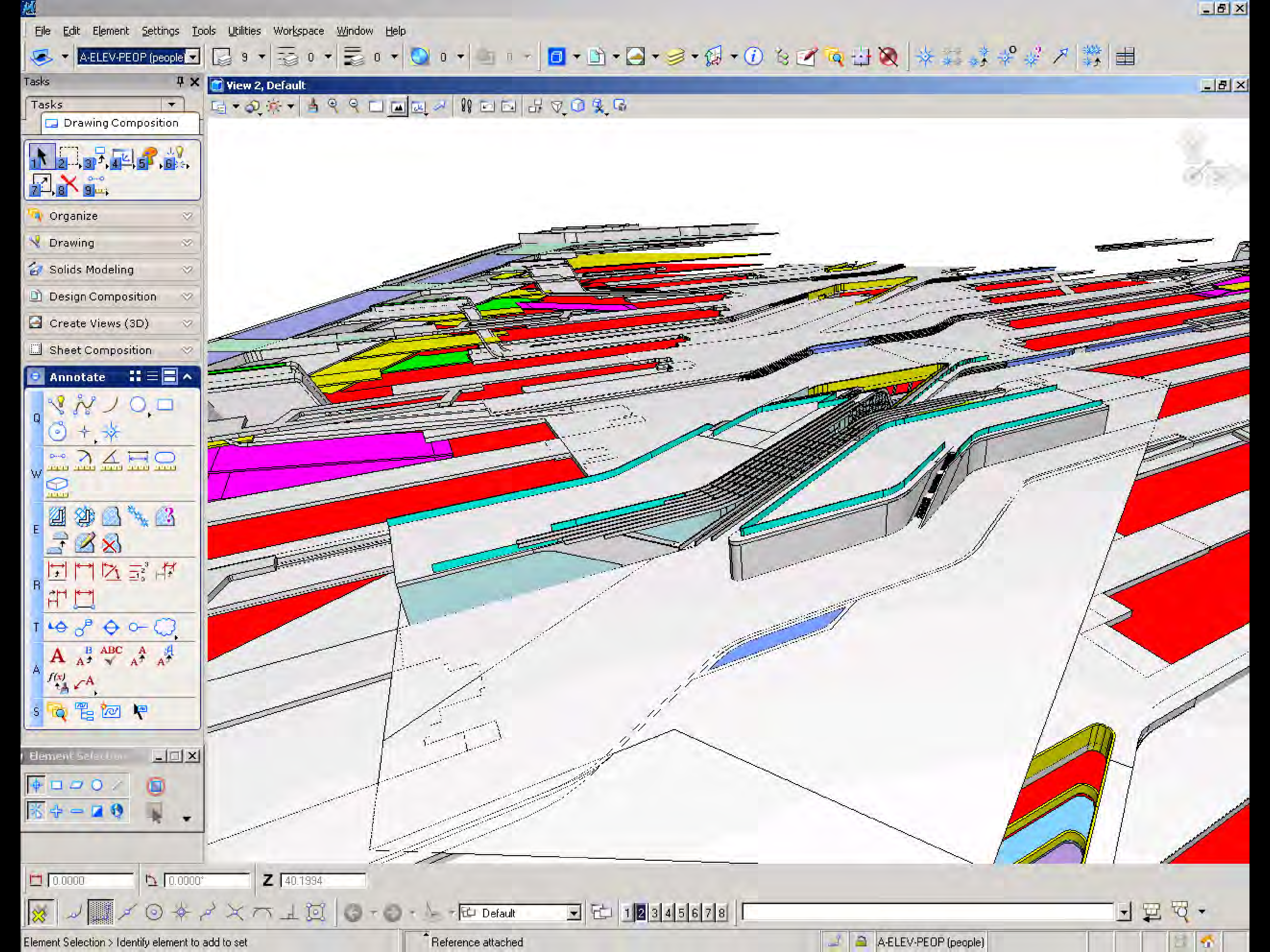
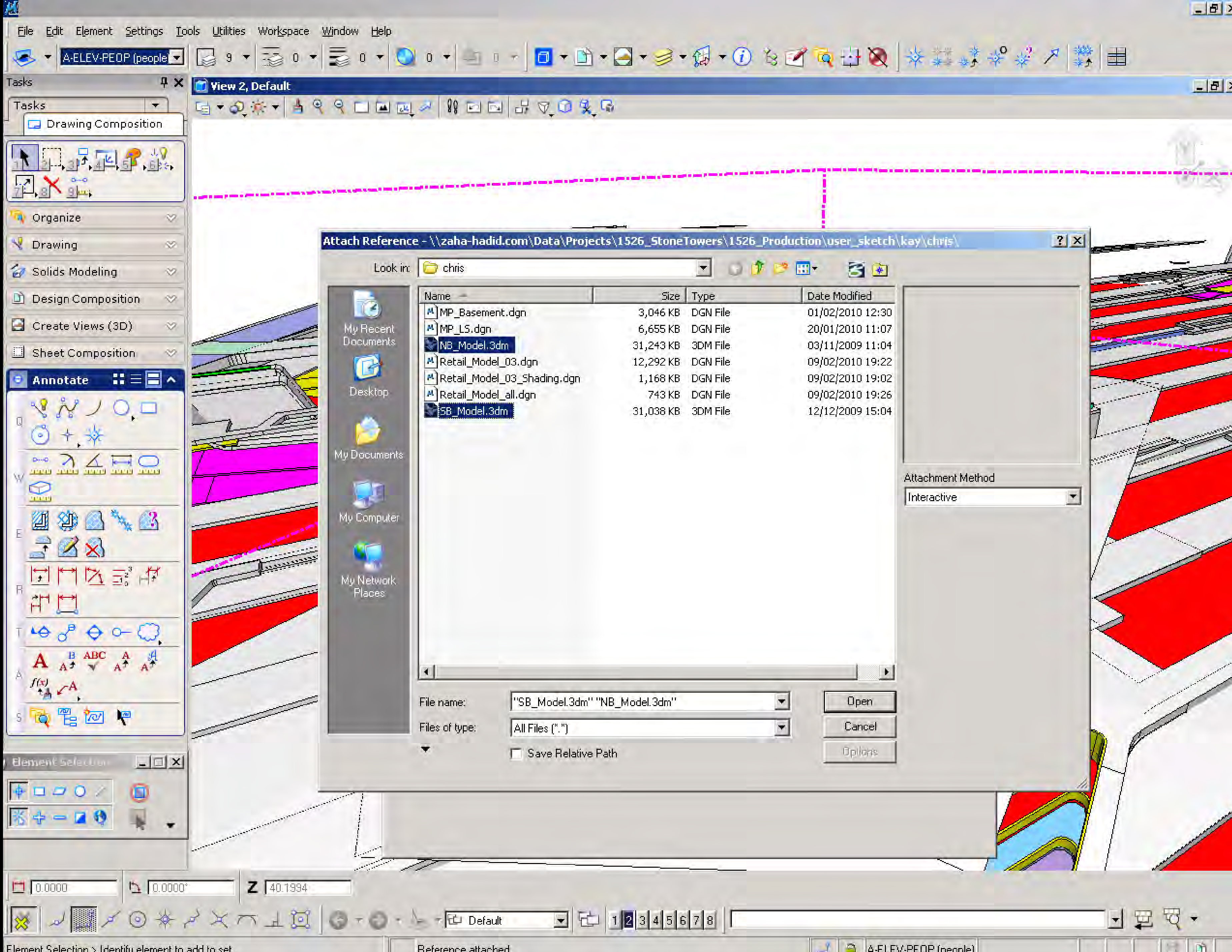
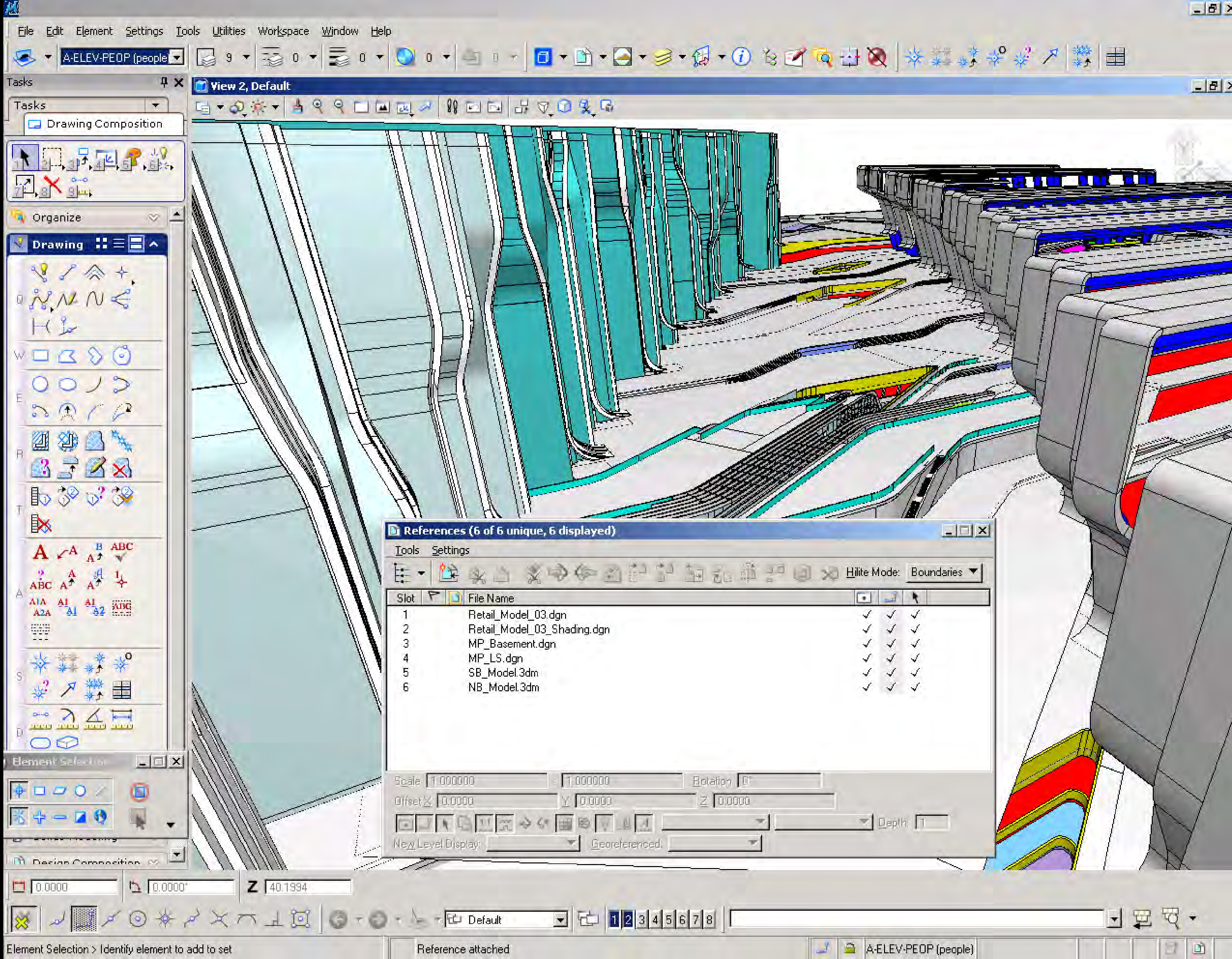


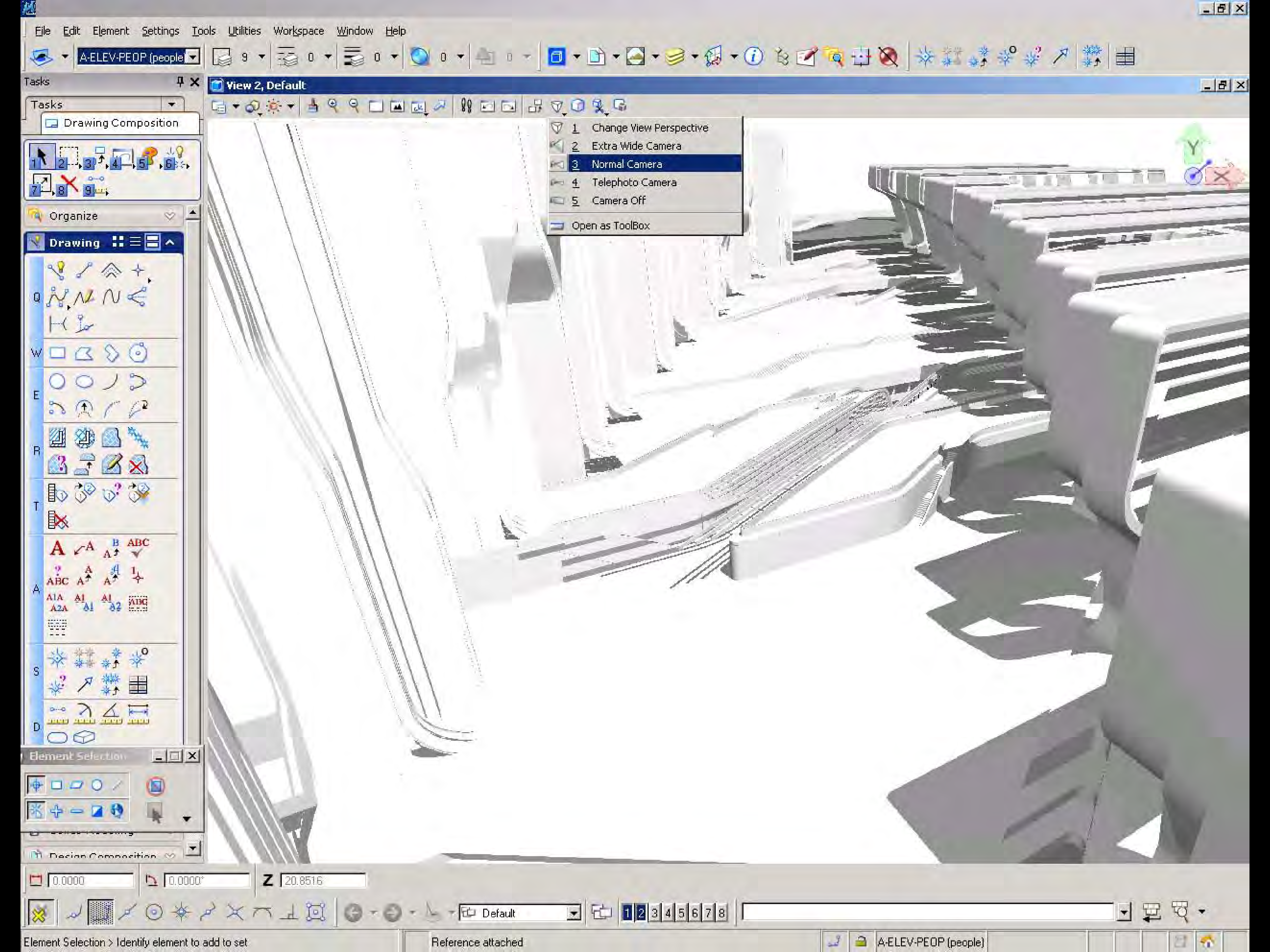


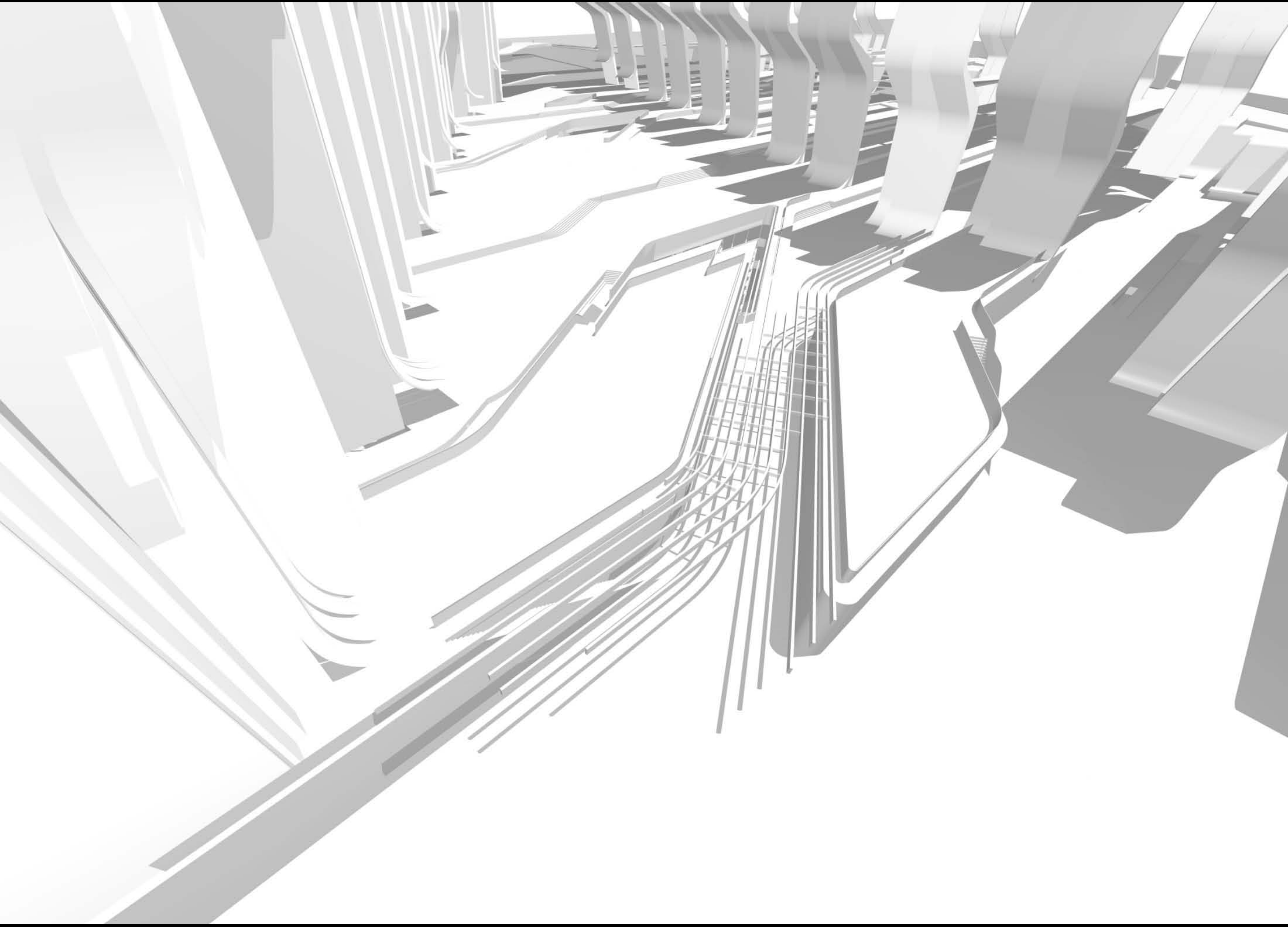

File Edit Element Settings Tools Utilities Workspace Window Help
A-ELEV-PEOP (people)
Tasks
View 2, Default
Drawing Composition
Organize
Drawing
Solids Modeling
Design Composition
Create Views (3D)
Sheet Composition
Annotate
Element Selection
0.0000
0.0000°
Z
40.1994
Default
1 2 3 4 5 6 7 8
Element Selection > Identify element to add to set
Reference attached
A-ELEV-PEOP (people)

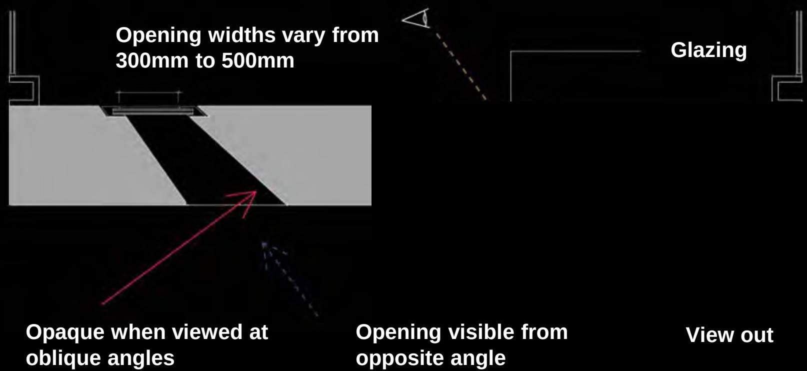


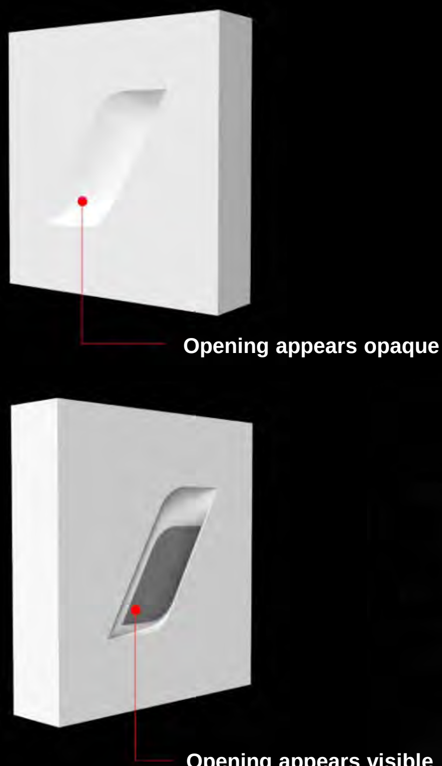
File Edit Element Settings Tools Utilities Workspace Window Help
A-ELEV-PEOP (people)
Tasks
Drawing Composition
Organize
Drawing
Solids Modeling
Design Composition
Create Views (3D)
Sheet Composition
Annotate
Element Selection
View 2, Default
Attach Reference - \\zaha-hadid.com\Data\Projects\1526_StoneTowers\1526_Production\user_sketch\kay\chris\
Look in: chris
My Recent Documents
Desktop
My Documents
My Computer
My Network Places
Name Size Type Date Modified
MP_Basement.dgn 3,046 KB DGN File 01/02/2010 12:30
MP_LS.dgn 6,655 KB DGN File 20/01/2010 11:07
NB_Model.3dm 31,243 KB 3DM File 03/11/2009 11:04
Retail_Model_03.dgn 12,292 KB DGN File 09/02/2010 19:22
Retail_Model_03_Shading.dgn 1,168 KB DGN File 09/02/2010 19:02
Retail_Model_all.dgn 743 KB DGN File 09/02/2010 19:26
SB_Model.3dm 31,038 KB 3DM File 12/12/2009 15:04
Attachment Method
Interactive
File name: "SB_Model.3dm" "NB_Model.3dm"
Files of type: All Files (*.*)
Save Relative Path
Open
Cancel
Options
0.0000
0.0000°
Z 40.1994
Default
1 2 3 4 5 6 7 8
Element Selection > Identify element to add to set
Reference attached
A-ELEV-PEOP (people)


File Edit Element Settings Tools Utilities Workspace Window Help
A-ELEV-PEOP (people
Tasks
Drawing Composition
Organize
Drawing
Element Selection
Design Composition
View 2, Default
References (6 of 6 unique, 6 displayed)
Tools Settings
Hilite Mode: Boundaries
Slot
File Name
1 Retail_Model_03.dgn
2 Retail_Model_03_Shading.dgn
3 MP_Basement.dgn
4 MP_LS.dgn
5 SB_Model.3dm
6 NB_Model.3dm
Scale 1.000000 1.000000 Rotation 0°
Offset X 0.0000 Y 0.0000 Z 0.0000
Depth 1
New Level Display
Georeferenced
0.0000
0.0000°
Z 40.1994
Default
1 2 3 4 5 6 7 8
Element Selection > Identify element to add to set
Reference attached
A-ELEV-PEOP (people)


File Edit Element Settings Tools Utilities Workspace Window Help
A-ELEV-PEOP (people
Tasks
Tasks
Drawing Composition
Organize
Drawing
View 2, Default
1 Change View Perspective
2 Extra Wide Camera
3 Normal Camera
4 Telephoto Camera
5 Camera Off
Open as ToolBox
Element Selection
0.0000
0.0000°
Z 20.8516
Default
Element Selection > Identify element to add to set
Reference attached
A-ELEV-PEOP (people)




Opening widths vary from
300mm to 500mm
Glazing
Opaque when viewed at
oblique angles
Opening visible from
opposite angle
View out


Opening appears opaque
Opening appears visible

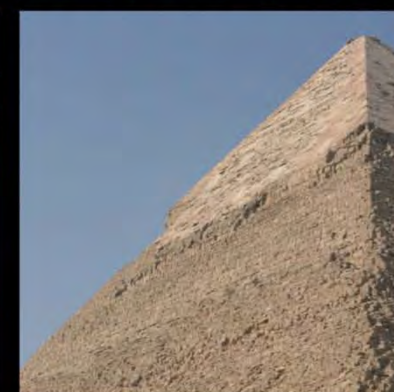
Texture and shadow play

Texture, relief and expression of joints

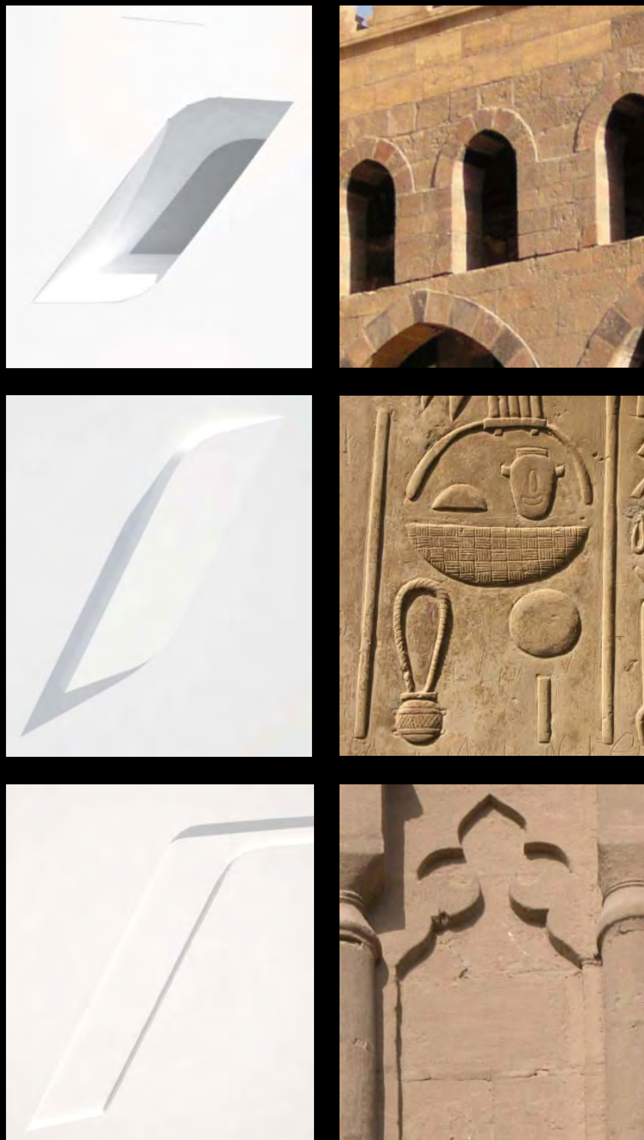






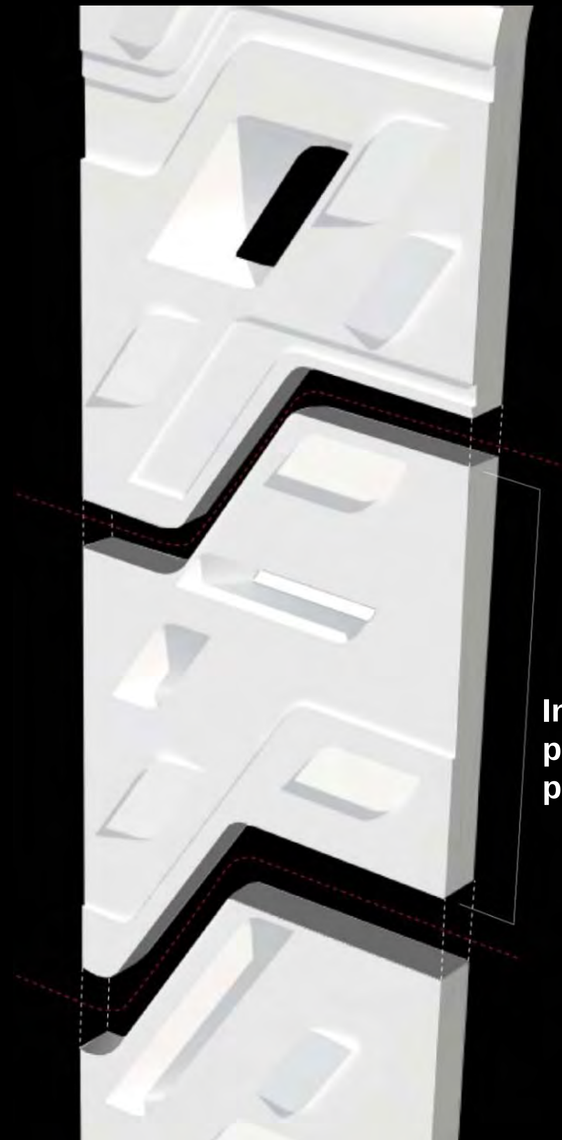

Deep Recess Shadow
Highlight
Gentle Shadow Gradients
Deep Recess Shadow Accentuating Curve Form



Opening

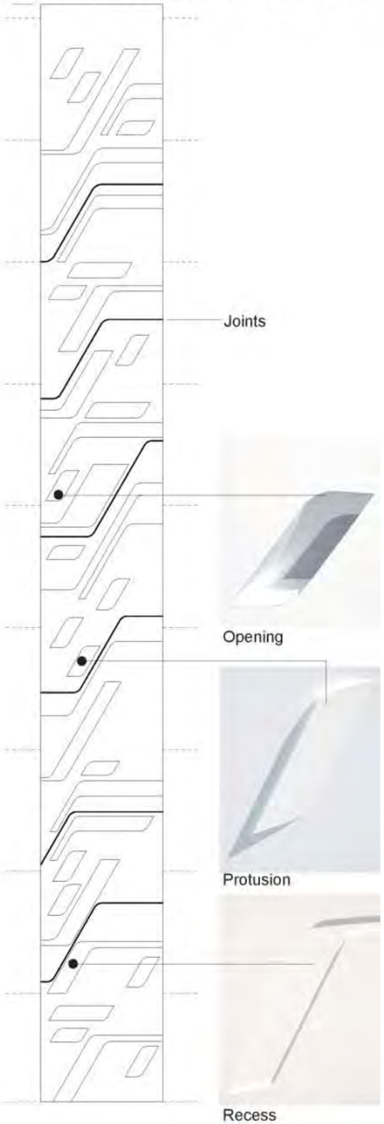
Protrusion

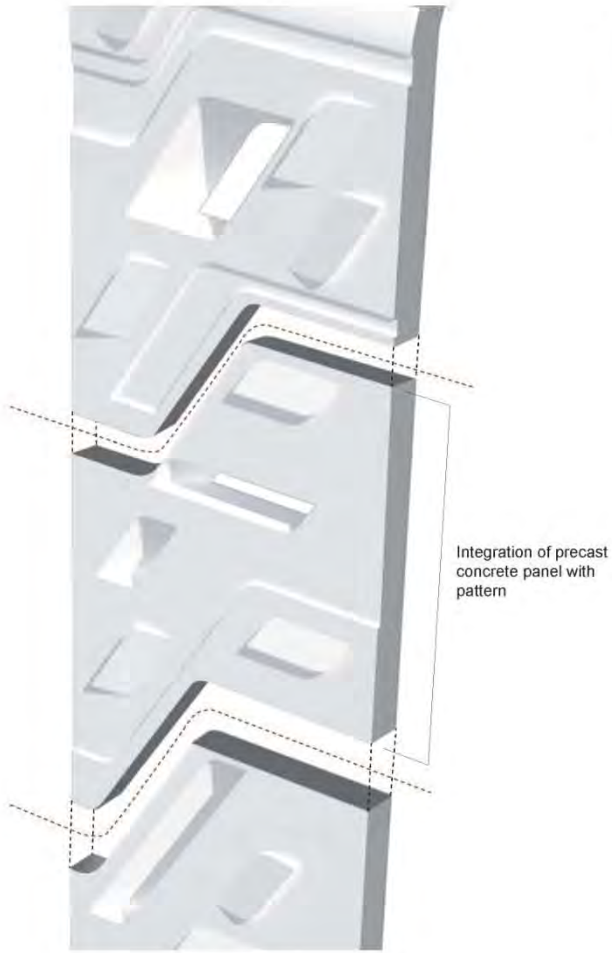
Recess

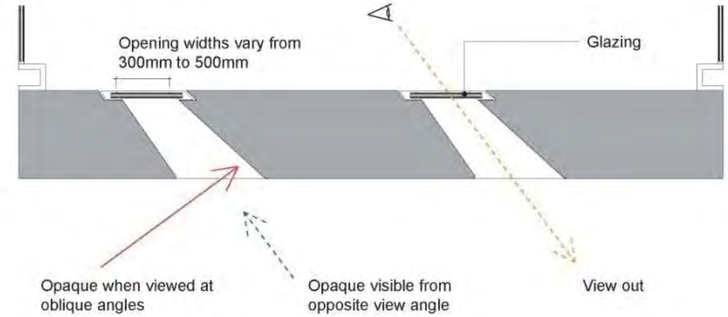


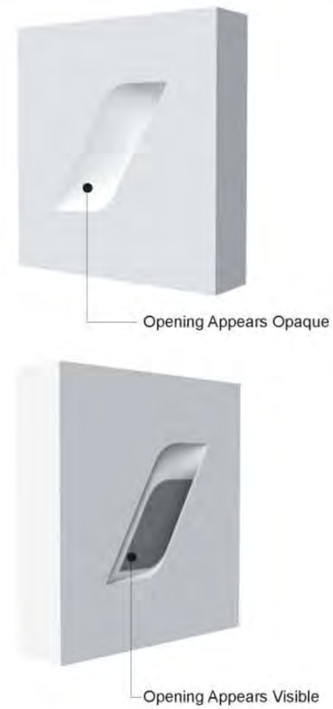
Integration of panel with pattern

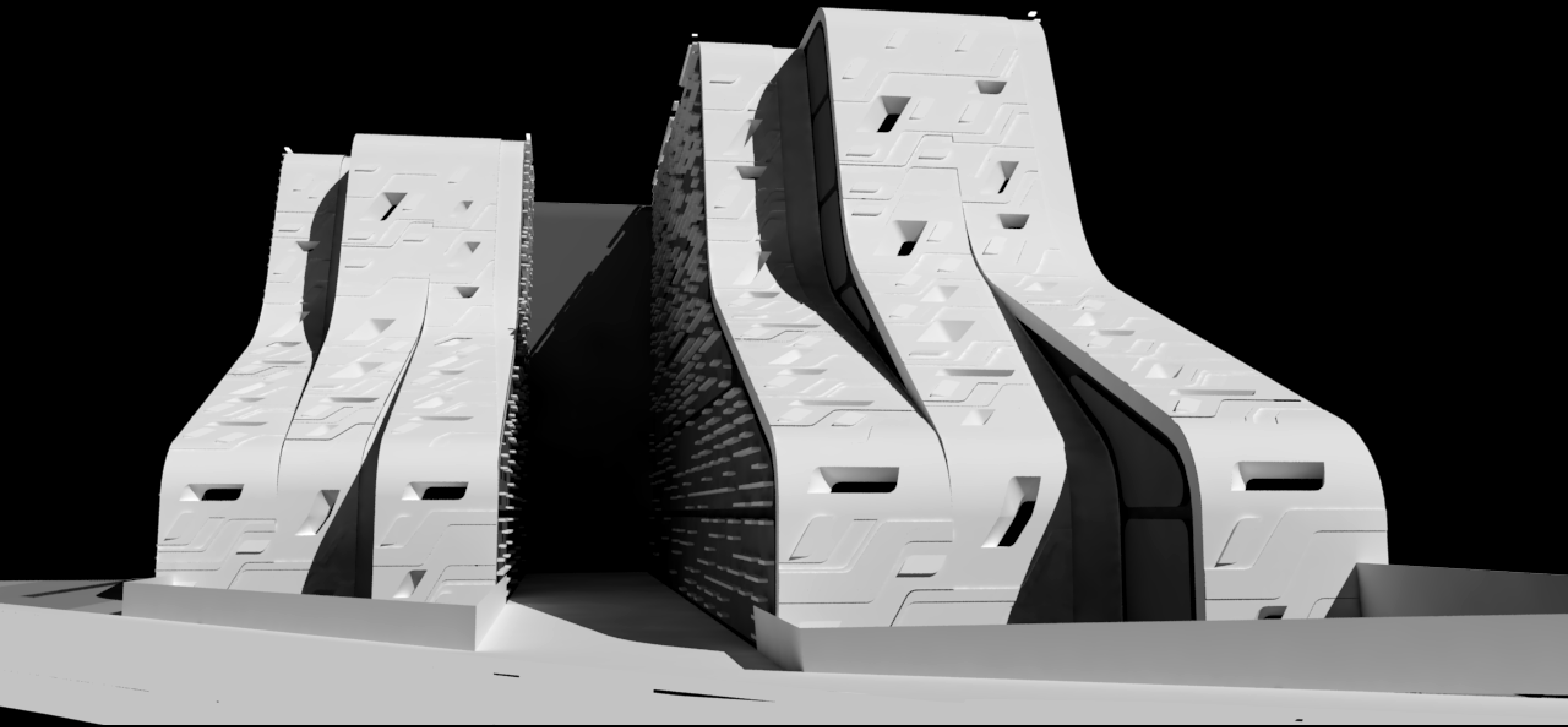
FACADES | *patterning principles* OFFICE SOLID FACADES - EW01, EW02

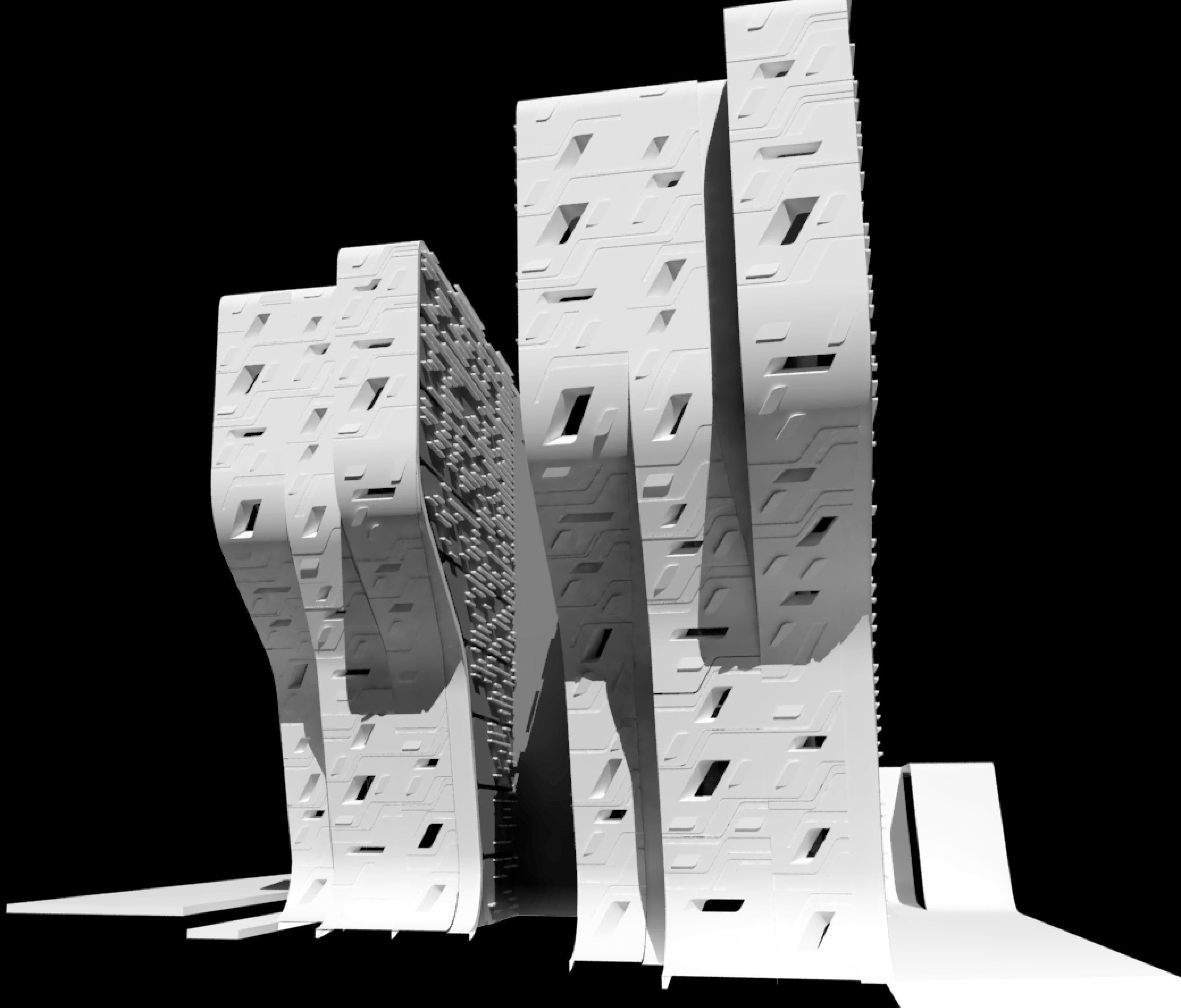


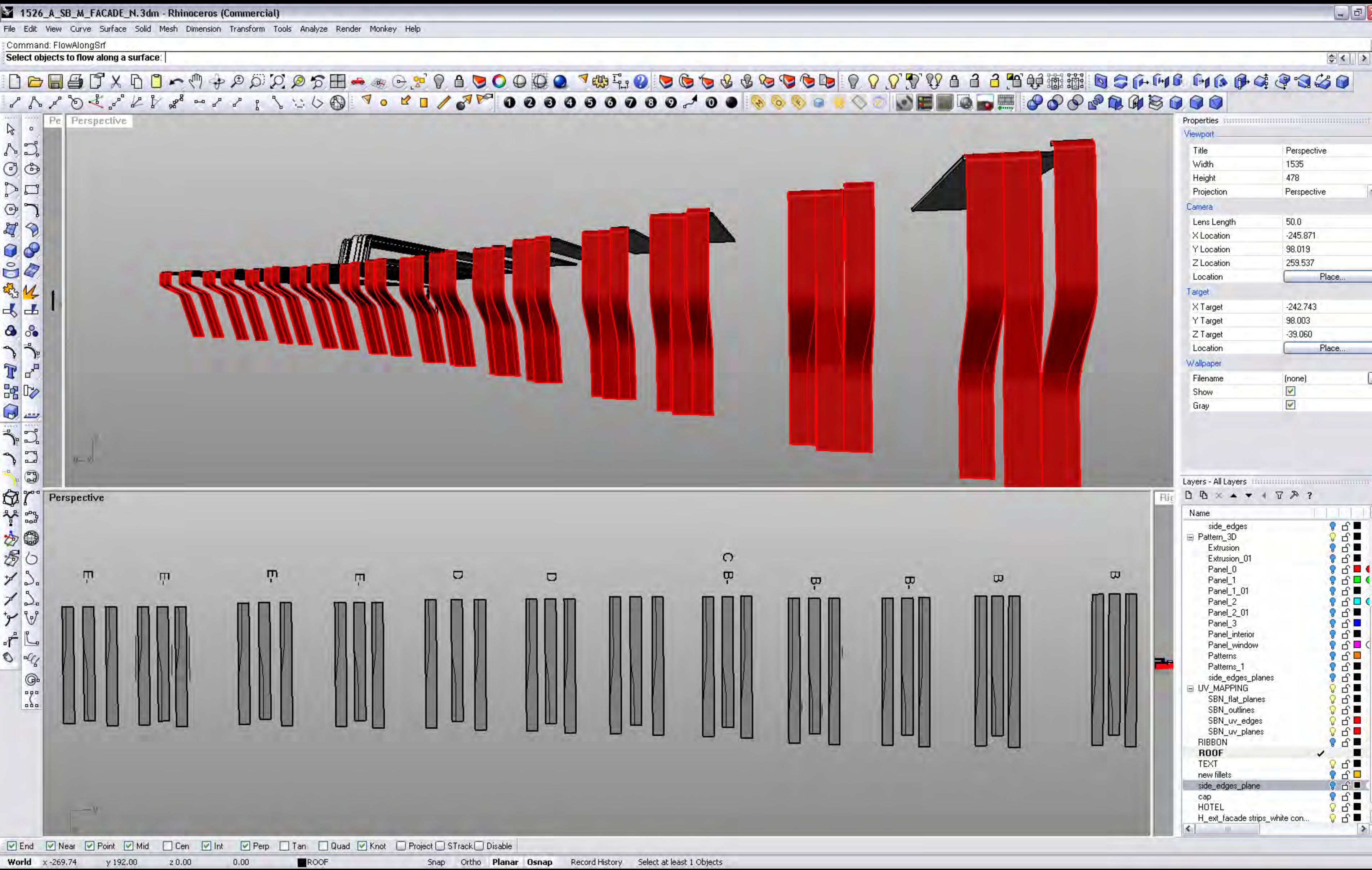


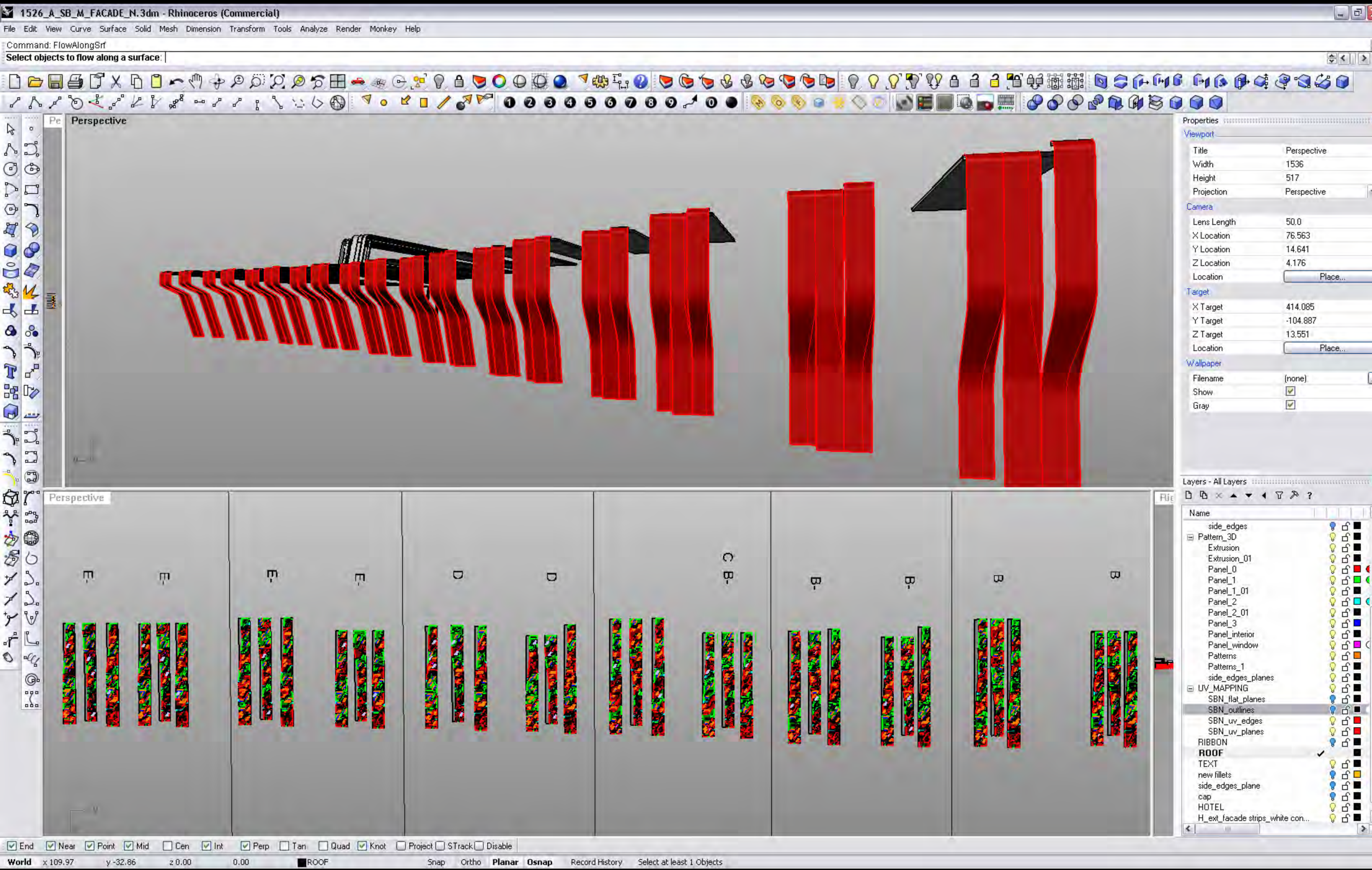


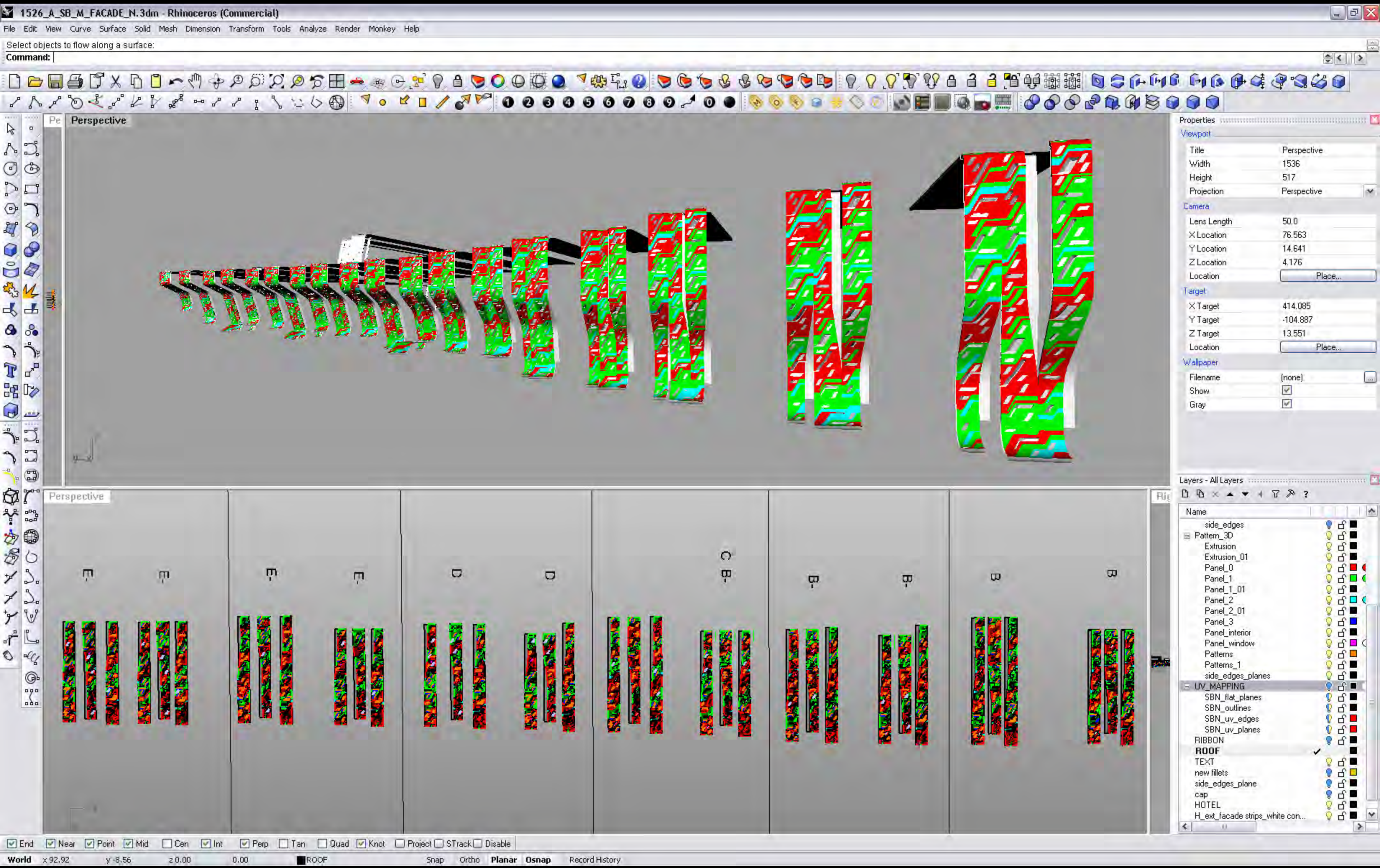


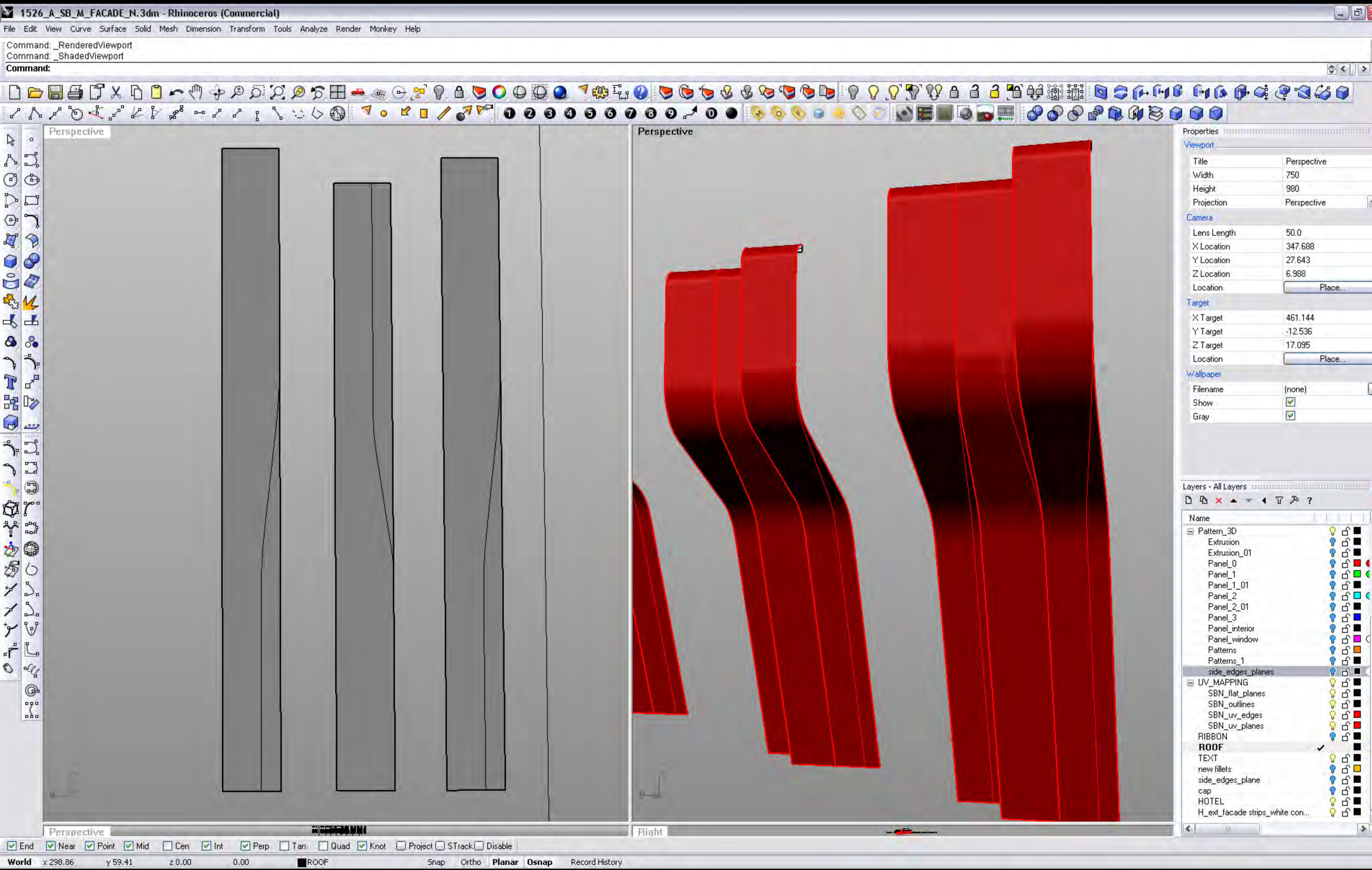


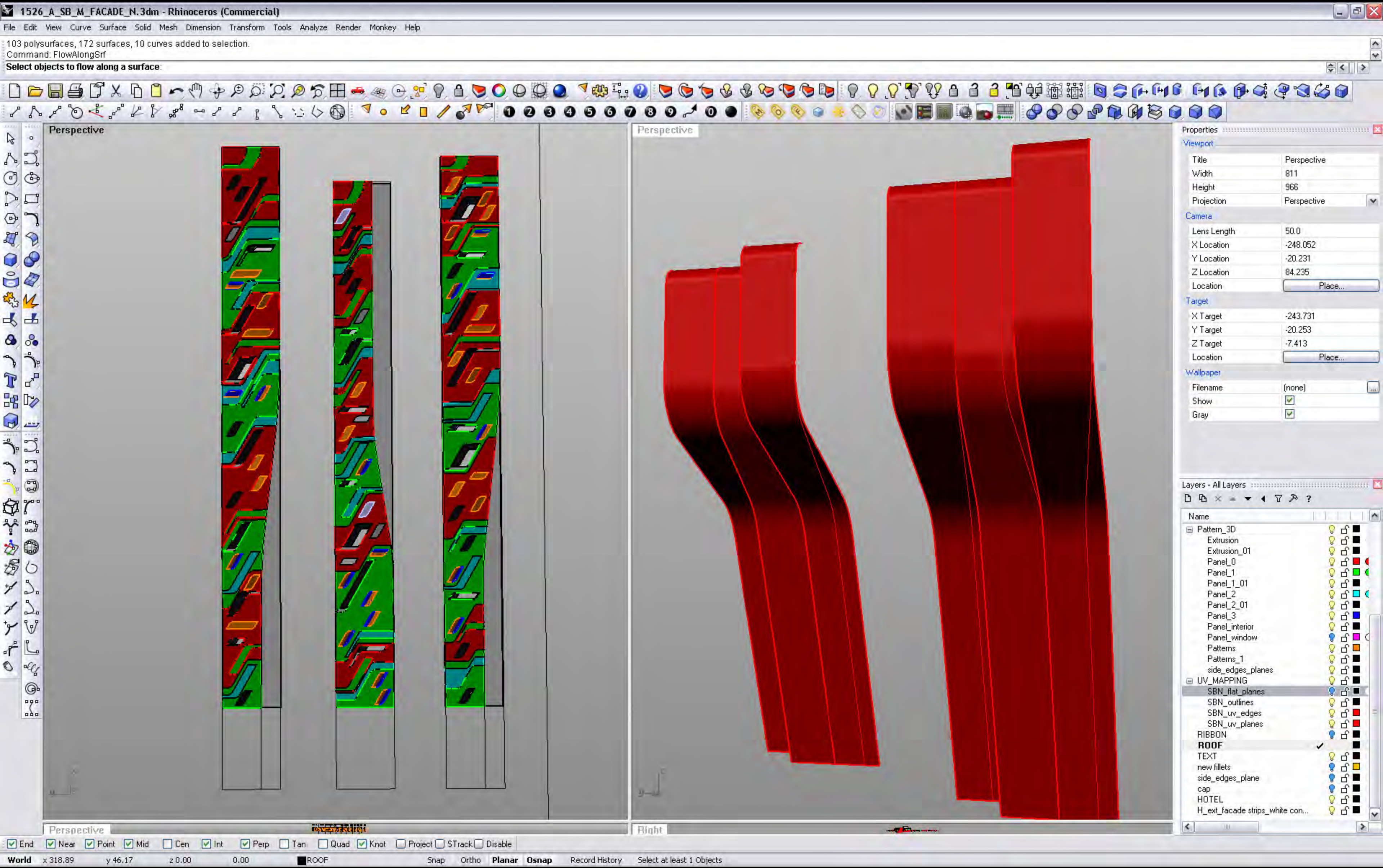


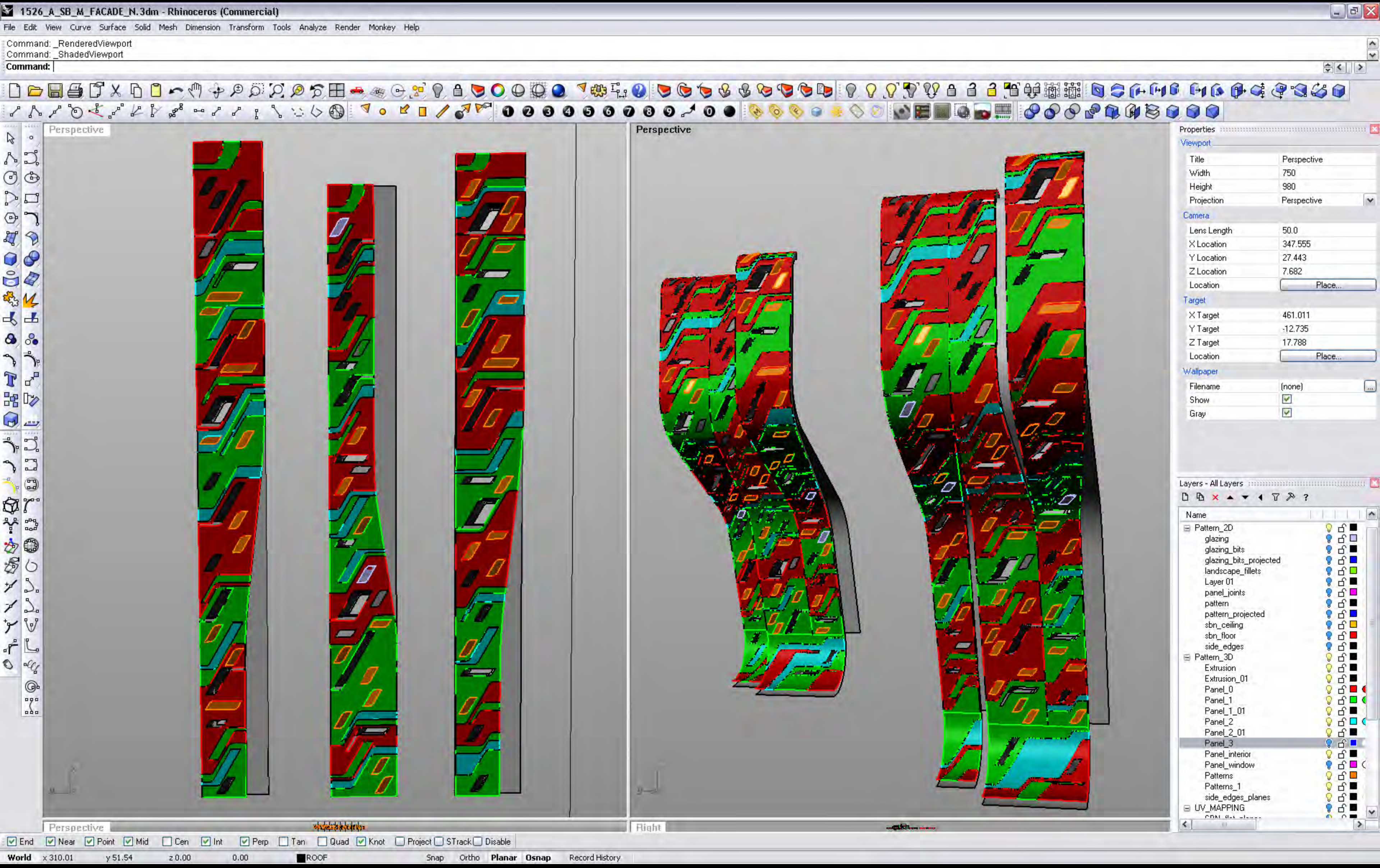

1526_A_SB_M_FACADE_N.3dm - Rhinoceros (Commercial)
File Edit View Curve Surface Solid Mesh Dimension Transform Tools Analyze Render Monkey Help
Command: FlowAlongSrf
Select objects to flow along a surface:
Perspective
Properties
Viewport
Title Perspective
Width 1535
Height 478
Projection Perspective
Camera
Lens Length 50.0
X Location -245.871
Y Location 98.019
Z Location 259.537
Location Place...
Target
X Target -242.743
Y Target 98.003
Z Target -39.060
Location Place...
Wallpaper
Filename (none)
Show
Gray
Layers - All Layers
Name
side_edges
Pattern_3D
Extrusion
Extrusion_01
Panel_0
Panel_1
Panel_1_01
Panel_2
Panel_2_01
Panel_3
Panel_interior
Panel_window
Patterns
Patterns_1
side_edges_planes
UV_MAPPING
SBN_flat_planes
SBN_outlines
SBN_uv_edges
SBN_uv_planes
RIBBON
ROOF
TEXT
new fillets
side_edges_plane
cap
HOTEL
H_ext_facade strips_white con...
End Near Point Mid Cen Int Perp Tan Quad Knot Project STrack Disable
World x -269.74 y 192.00 z 0.00 0.00 ROOF Snap Ortho Planar Osnap Record History Select at least 1 Objects

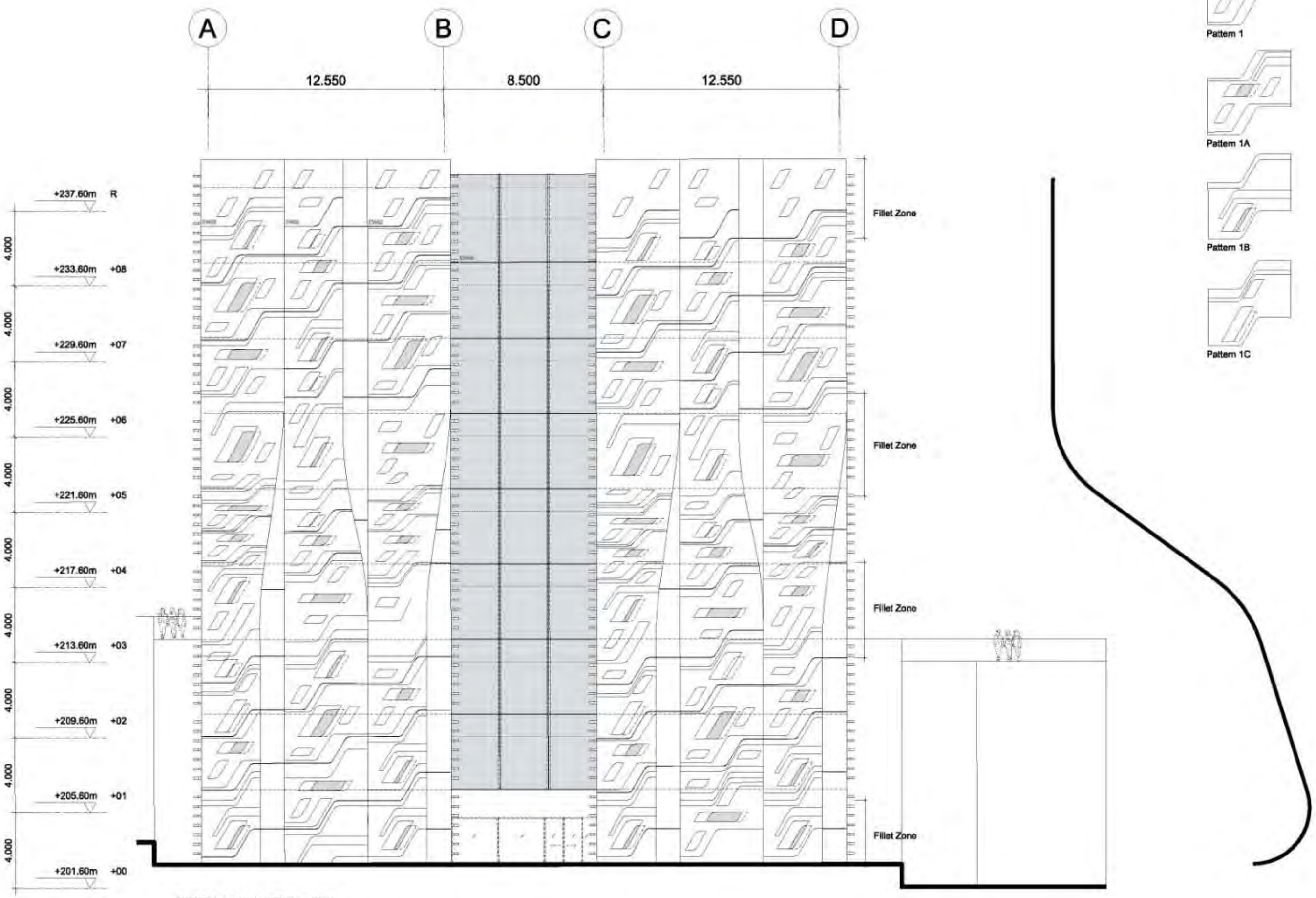

1526_A_SB_M_FACADE_N.3dm - Rhinoceros (Commercial)
File Edit View Curve Surface Solid Mesh Dimension Transform Tools Analyze Render Monkey Help
Command: FlowAlongSrf
Select objects to flow along a surface:
Perspective
Properties
Viewport
Title Perspective
Width 1536
Height 517
Projection Perspective
Camera
Lens Length 50.0
X Location 76.563
Y Location 14.641
Z Location 4.176
Location Place...
Target
X Target 414.085
Y Target -104.887
Z Target 13.551
Location Place...
Wallpaper
Filename (none)
Show
Gray
Layers - All Layers
Name
side_edges
Pattern_3D
Extrusion
Extrusion_01
Panel_0
Panel_1
Panel_1_01
Panel_2
Panel_2_01
Panel_3
Panel_interior
Panel_window
Patterns
Patterns_1
side_edges_planes
UV_MAPPING
SBN_flat_planes
SBN_outlines
SBN_uv_edges
SBN_uv_planes
RIBBON
ROOF
TEXT
new fillets
side_edges_plane
cap
HOTEL
H_ext_facade strips_white con...
End Near Point Mid Cen Int Perp Tan Quad Knot Project STrack Disable
World x 109.97 y -32.86 z 0.00 0.00 ROOF Snap Ortho Planar Osnap Record History Select at least 1 Objects


1526_A_SB_M_FACADE_N.3dm - Rhinoceros (Commercial)
File Edit View Curve Surface Solid Mesh Dimension Transform Tools Analyze Render Monkey Help
Select objects to flow along a surface:
Command:
Perspective
Properties
Viewport
Title Perspective
Width 1536
Height 517
Projection Perspective
Camera
Lens Length 50.0
X Location 76.563
Y Location 14.641
Z Location 4.176
Location Place...
Target
X Target 414.085
Y Target -104.887
Z Target 13.551
Location Place...
Wallpaper
Filename (none)
Show
Gray
Layers - All Layers
Name
side_edges
Pattern_3D
Extrusion
Extrusion_01
Panel_0
Panel_1
Panel_1_01
Panel_2
Panel_2_01
Panel_3
Panel_interior
Panel_window
Patterns
Patterns_1
side_edges_planes
UV_MAPPING
SBN_flat_planes
SBN_outlines
SBN_uv_edges
SBN_uv_planes
RIBBON
ROOF
TEXT
new fillets
side_edges_plane
cap
HOTEL
H_ext_facade strips_white con...
End Near Point Mid Cen Int Perp Tan Quad Knot Project STrack Disable
World x 92.92 y -8.56 z 0.00 0.00 ROOF Snap Ortho Planar Osnap Record History

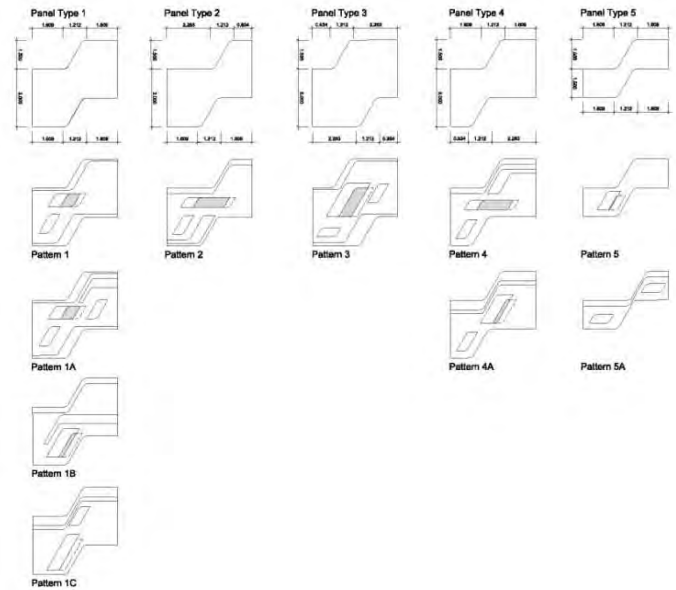

1526_A_SB_M_FACADE_N.3dm - Rhinoceros (Commercial)
File Edit View Curve Surface Solid Mesh Dimension Transform Tools Analyze Render Monkey Help
Command: _RenderedViewport
Command: _ShadedViewport
Command:
Perspective
Perspective
Properties
Viewport
Title Perspective
Width 750
Height 980
Projection Perspective
Camera
Lens Length 50.0
X Location 347.688
Y Location 27.643
Z Location 6.988
Location Place...
Target
X Target 461.144
Y Target -12.536
Z Target 17.095
Location Place...
Wallpaper
Filename (none)
Show
Gray
Layers - All Layers
Name
Pattern_3D
Extrusion
Extrusion_01
Panel_0
Panel_1
Panel_1_01
Panel_2
Panel_2_01
Panel_3
Panel_interior
Panel_window
Patterns
Patterns_1
side_edges_planes
UV_MAPPING
SBN_flat_planes
SBN_outlines
SBN_uv_edges
SBN_uv_planes
RIBBON
ROOF
TEXT
new fillets
side_edges_plane
cap
HOTEL
H_ext_facade strips_white con...
Perspective
Right
End Near Point Mid Cen Int Perp Tan Quad Knot Project STrack Disable
World x 298.86 y 59.41 z 0.00 0.00 ROOF Snap Ortho Planar Osnap Record History

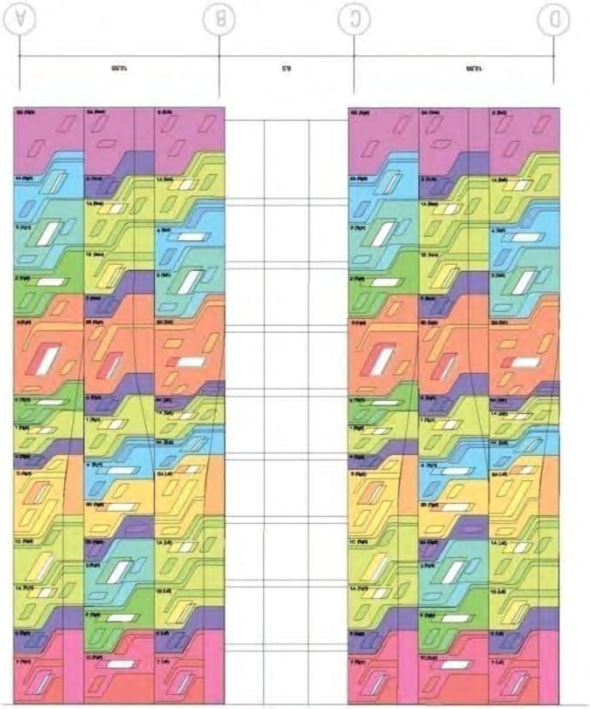

1526_A_SB_M_FACADE_N.3dm - Rhinoceros (Commercial)
File Edit View Curve Surface Solid Mesh Dimension Transform Tools Analyze Render Monkey Help
103 polysurfaces, 172 surfaces, 10 curves added to selection.
Command: FlowAlongSrf
Select objects to flow along a surface:
Perspective
Perspective
Properties
Viewport
Title Perspective
Width 811
Height 966
Projection Perspective
Camera
Lens Length 50.0
X Location -248.052
Y Location -20.231
Z Location 84.235
Location Place...
Target
X Target -243.731
Y Target -20.253
Z Target -7.413
Location Place...
Wallpaper
Filename (none)
Show
Gray
Layers - All Layers
Name
Pattern_3D
Extrusion
Extrusion_01
Panel_0
Panel_1
Panel_1_01
Panel_2
Panel_2_01
Panel_3
Panel_interior
Panel_window
Patterns
Patterns_1
side_edges_planes
UV_MAPPING
SBN_flat_planes
SBN_outlines
SBN_uv_edges
SBN_uv_planes
RIBBON
ROOF
TEXT
new fillets
side_edges_plane
cap
HOTEL
H_ext_facade strips_white con...
Perspective
Right
End Near Point Mid Cen Int Perp Tan Quad Knot Project STrack Disable
World x 318.89 y 46.17 z 0.00 0.00 ROOF Snap Ortho Planar Osnap Record History Select at least 1 Objects

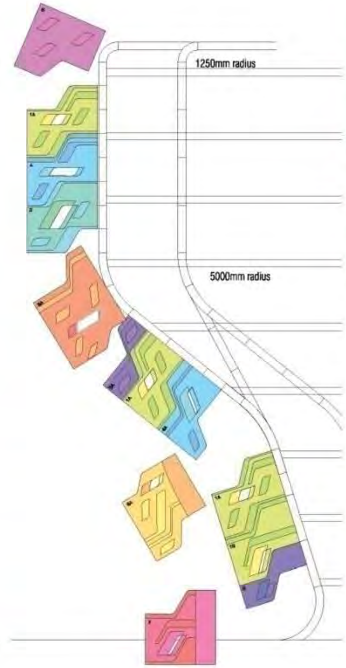

1526_A_SB_M_FACADE_N.3dm - Rhinoceros (Commercial)
File Edit View Curve Surface Solid Mesh Dimension Transform Tools Analyze Render Monkey Help
Command: _RenderedViewport
Command: _ShadedViewport
Command:
Perspective
Perspective
Properties
Viewport
Title Perspective
Width 750
Height 980
Projection Perspective
Camera
Lens Length 50.0
X Location 347.555
Y Location 27.443
Z Location 7.682
Location Place...
Target
X Target 461.011
Y Target -12.735
Z Target 17.788
Location Place...
Wallpaper
Filename (none)
Show
Gray
Layers - All Layers
Name
Pattern_2D
glazing
glazing_bits
glazing_bits_projected
landscape_fillets
Layer 01
panel_joints
pattern
pattern_projected
sbn_ceiling
sbn_floor
side_edges
Pattern_3D
Extrusion
Extrusion_01
Panel_0
Panel_1
Panel_1_01
Panel_2
Panel_2_01
Panel_3
Panel_interior
Panel_window
Patterns
Patterns_1
side_edges_planes
UV_MAPPING
Perspective
Right
End Near Point Mid Cen Int Perp Tan Quad Knot Project STrack Disable
World x 310.01 y 51.54 z 0.00 0.00 ROOF Snap Ortho Planar Osnap Record History

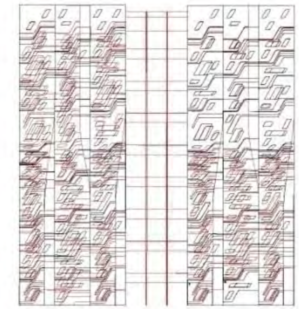


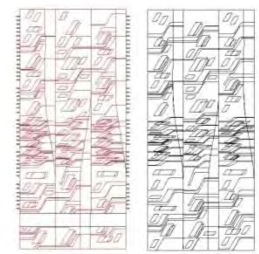
SB04 North Elevation

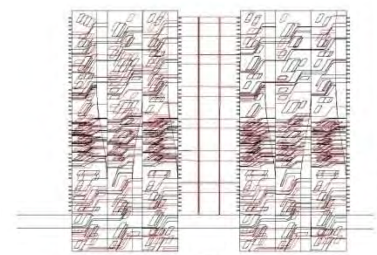


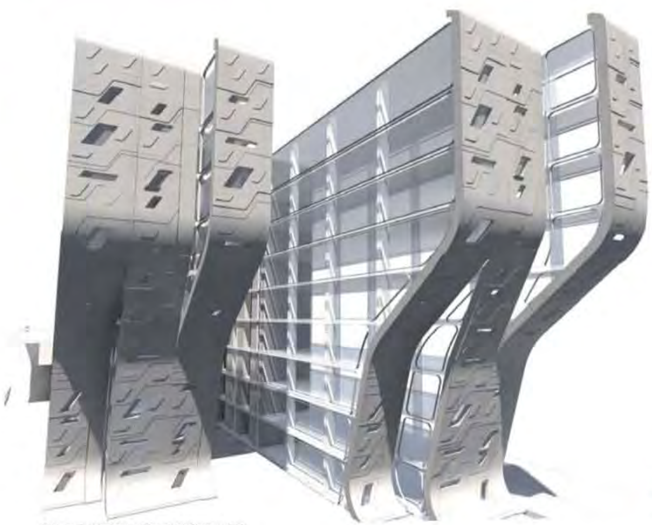




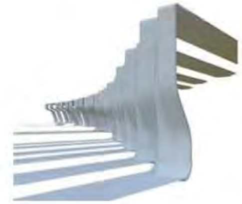








EW02: OPTIMISED PROFILES



EW02: OPTIMISED PROFILES

General Notes
1. Do not scale drawings. Dimensions govern.
2. All dimensions shall be verified on site before proceeding with the work.

DRAFT

For Information Only

Rev	Date	Reason For Issue	Check
03	18.12.09	Stage D Report	
02	20.11.09	Interim Report issue	
01	30.10.09	Floor slab width amended to 12250/15250mm	

Key Plan

Client
Rooya Group
1180 / 4 Al Akademya
El Baharia Street, Sheraton Buildings
Heliopolis, Cairo

Architect
Zaha Hadid Architects
10 Bowling Green Lane
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MEP Consultant
Hoare Lea

Facade Consultant
newtecnic

Landscape Consultant
GROSS.MAX.

General Local Consultant (Architecture - Landscape)
ÖKOPLAN

General Local Consultant (Architecture - Landscape)
CONCEPT Arch. Consultants

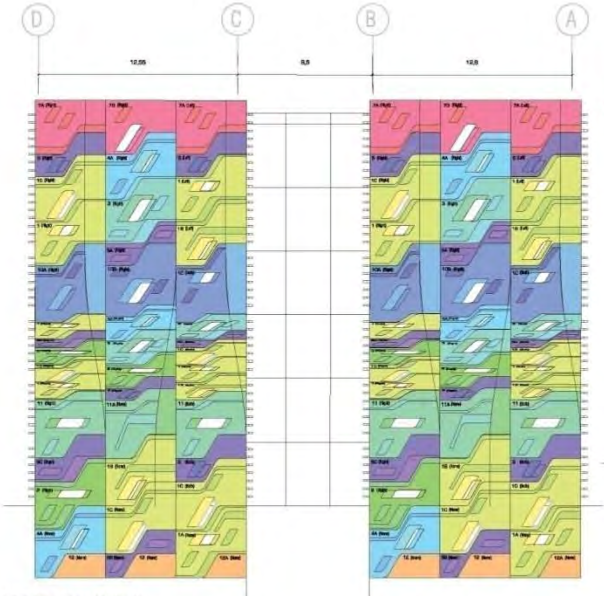
Structural Local Consultant
ÖKOPLAN Structures

MEP Local Consultant
Integrated Consulting Group (I.C.G.)

Project
Stone Towers Project Cairo

Title
SB04 North & South Elevations

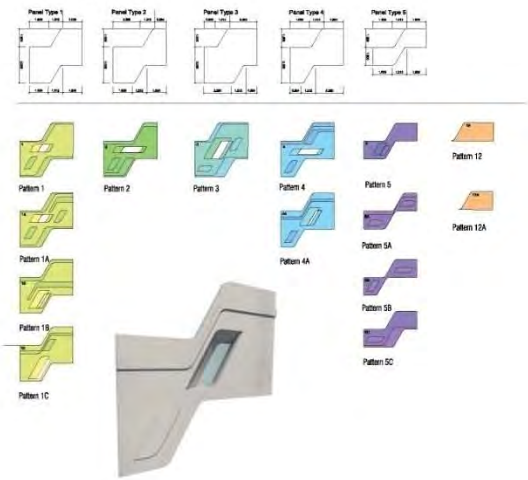
Job No	Originator	Scale	Number	Revision
	NT	1:200/A0		03
Date		Drawn by		
12/09/2009			F02_2161A	



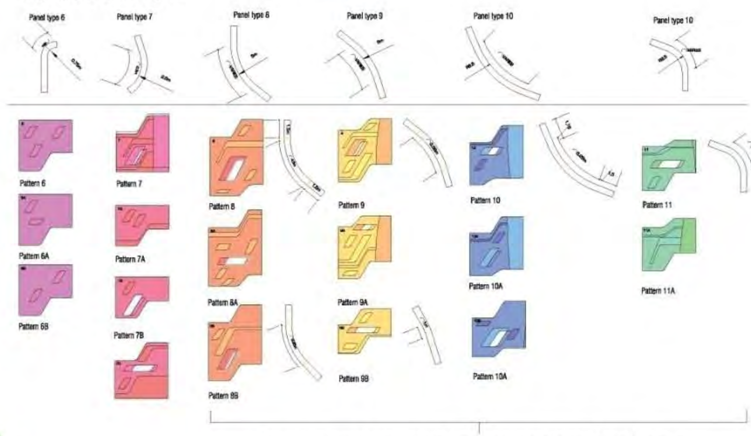
NORTH ELEVATION

SB04

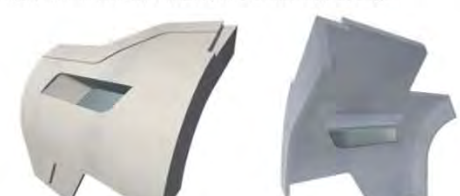
Flat Panels



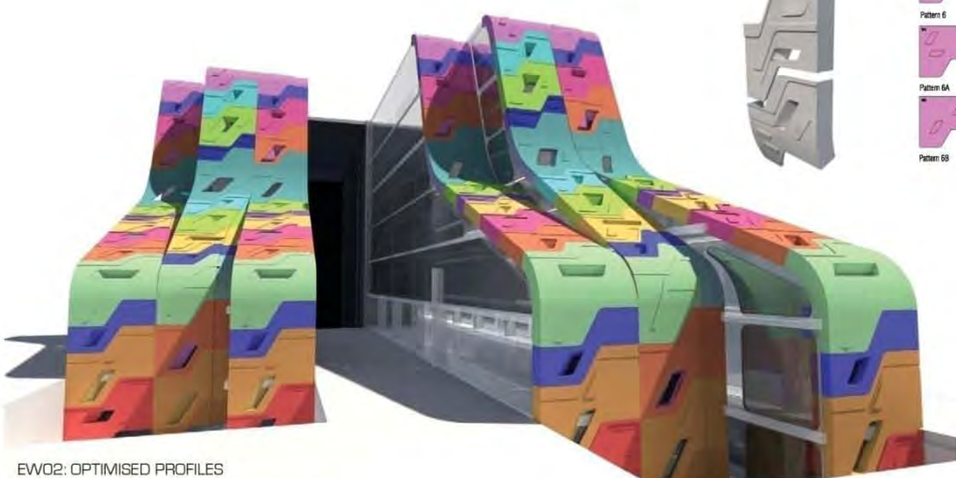
Curved Panels



Other length panels of these radii will be required for other South Buildings



Return Types



EW02: OPTIMISED PROFILES

CURVED PANELS

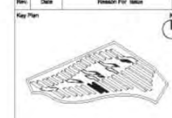
General Notes
1. Do not scale drawings. Dimensions govern.
2. All dimensions shall be verified on site before proceeding with the work.

DRAFT

For Information Only

Rev.	Date	Reason For Issue	Check
03	16.12.09	Stage D Report	
02	20.11.09	Interim Report Issue	
01	20.10.09	Floor slab width amended to 12250/15250mm.	

Key Plan



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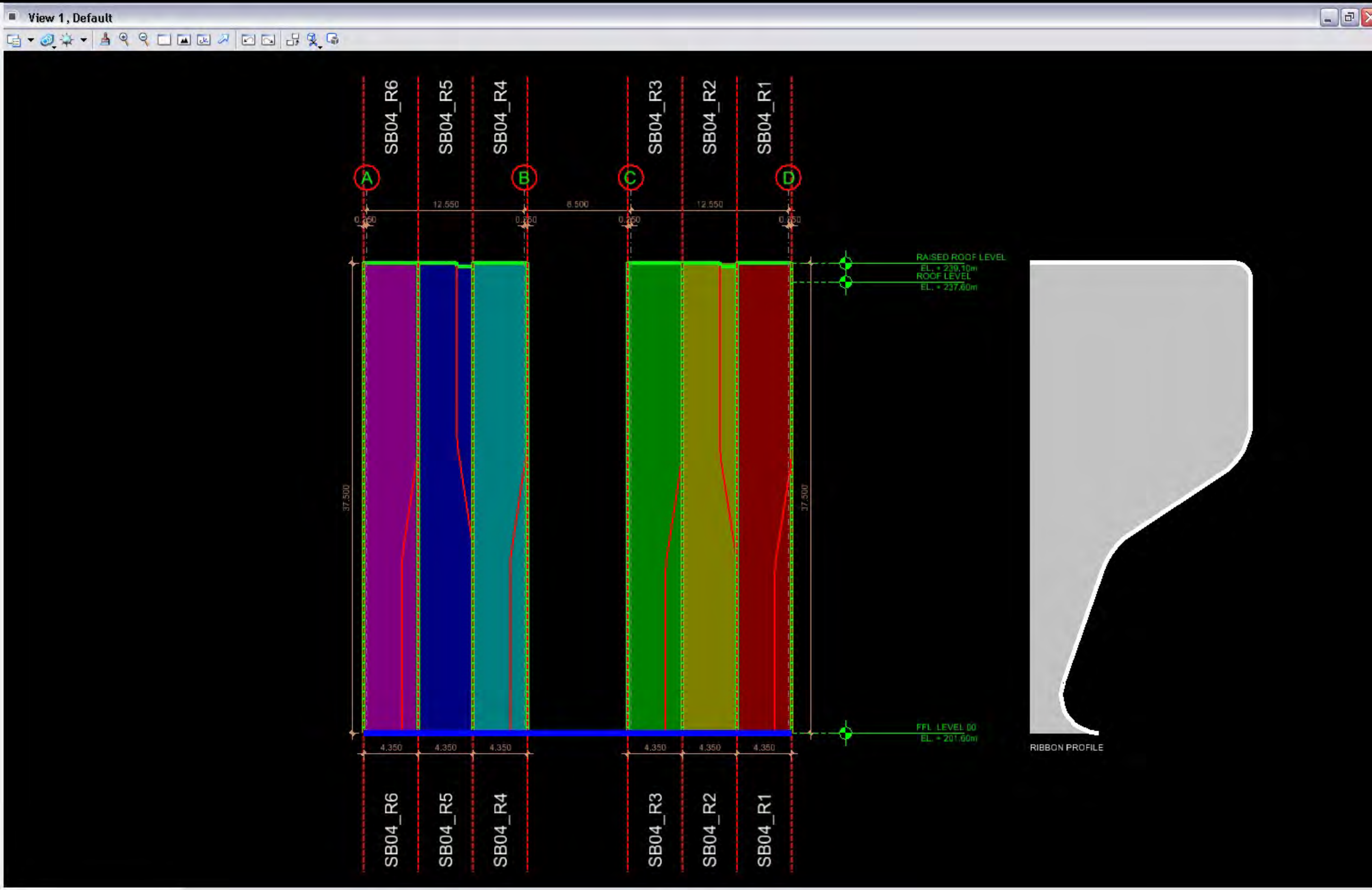
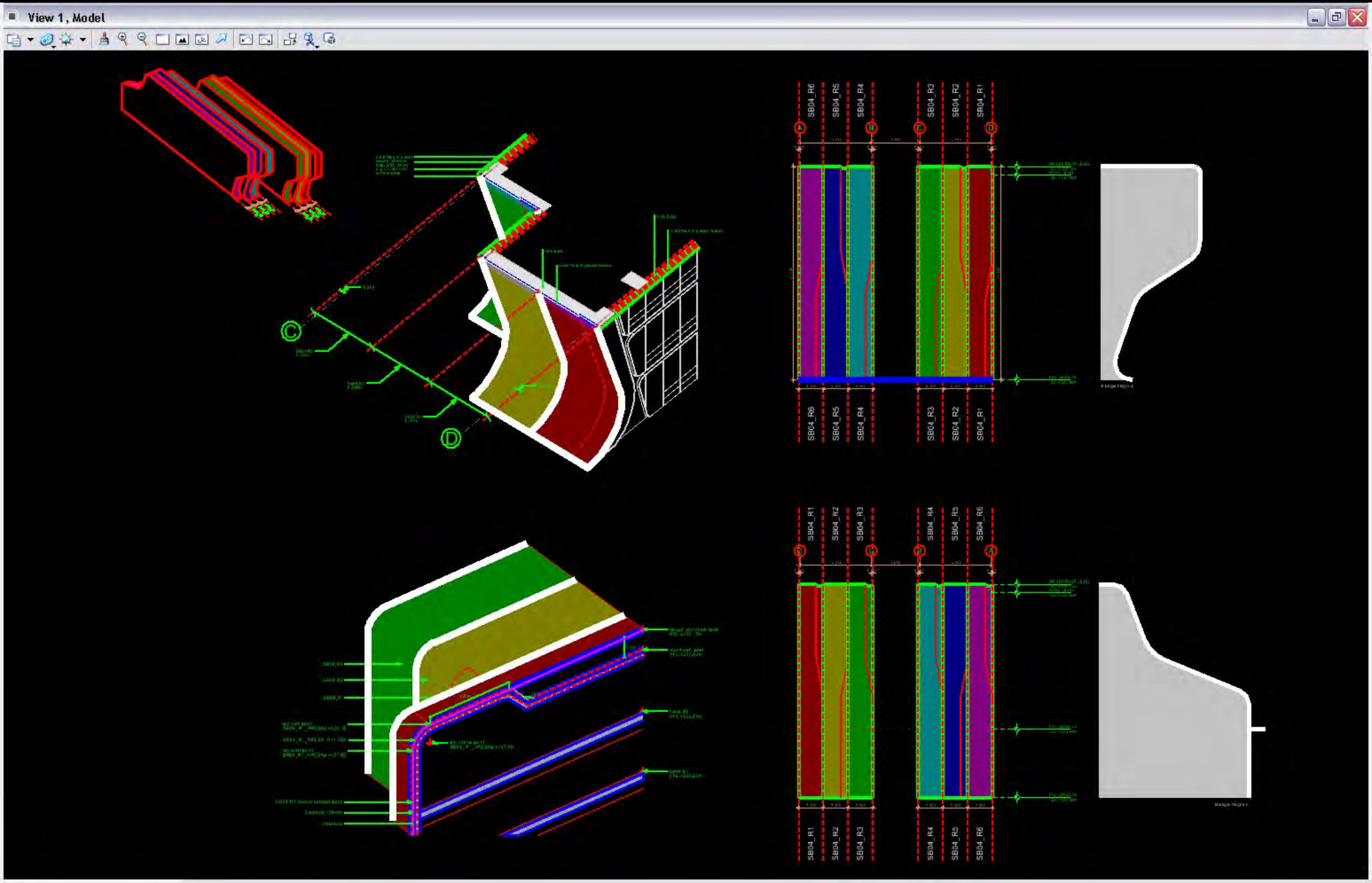
Project
Stone Towers Project Cairo

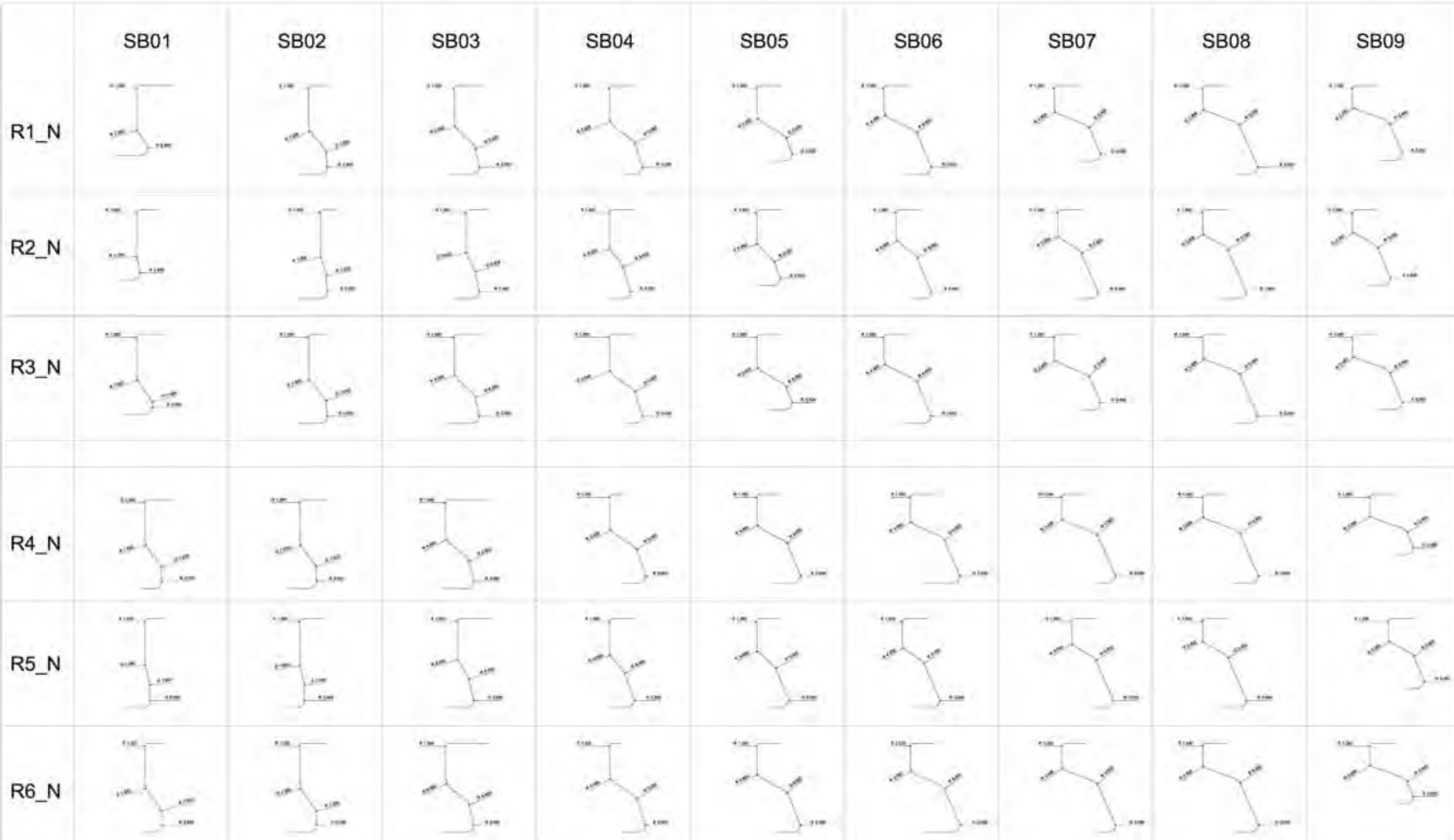
Title
SB04 North & South Elevations

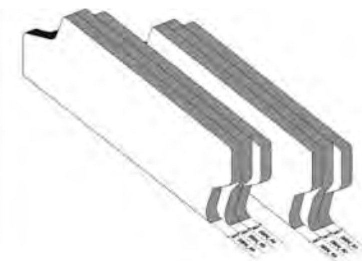
Job No	Originator	Scale	Number	Revision
	NT	1:200/A0		03
Date		Drawn by		
12/06/2009			F02_21618	


View 1, Default
SB04_R6
SB04_R5
SB04_R4
SB04_R3
SB04_R2
SB04_R1
A
B
C
D
12.550
8.500
12.550
37.500
37.500
RAISED ROOF LEVEL
EL. + 239.10m
ROOF LEVEL
EL. + 237.60m
FFL LEVEL 00
EL. + 201.60m
4.350
4.350
4.350
4.350
4.350
4.350
SB04_R6
SB04_R5
SB04_R4
SB04_R3
SB04_R2
SB04_R1
RIBBON PROFILE



View 1, Model
SB04_R6
SB04_R5
SB04_R4
SB04_R3
SB04_R2
SB04_R1
C
D



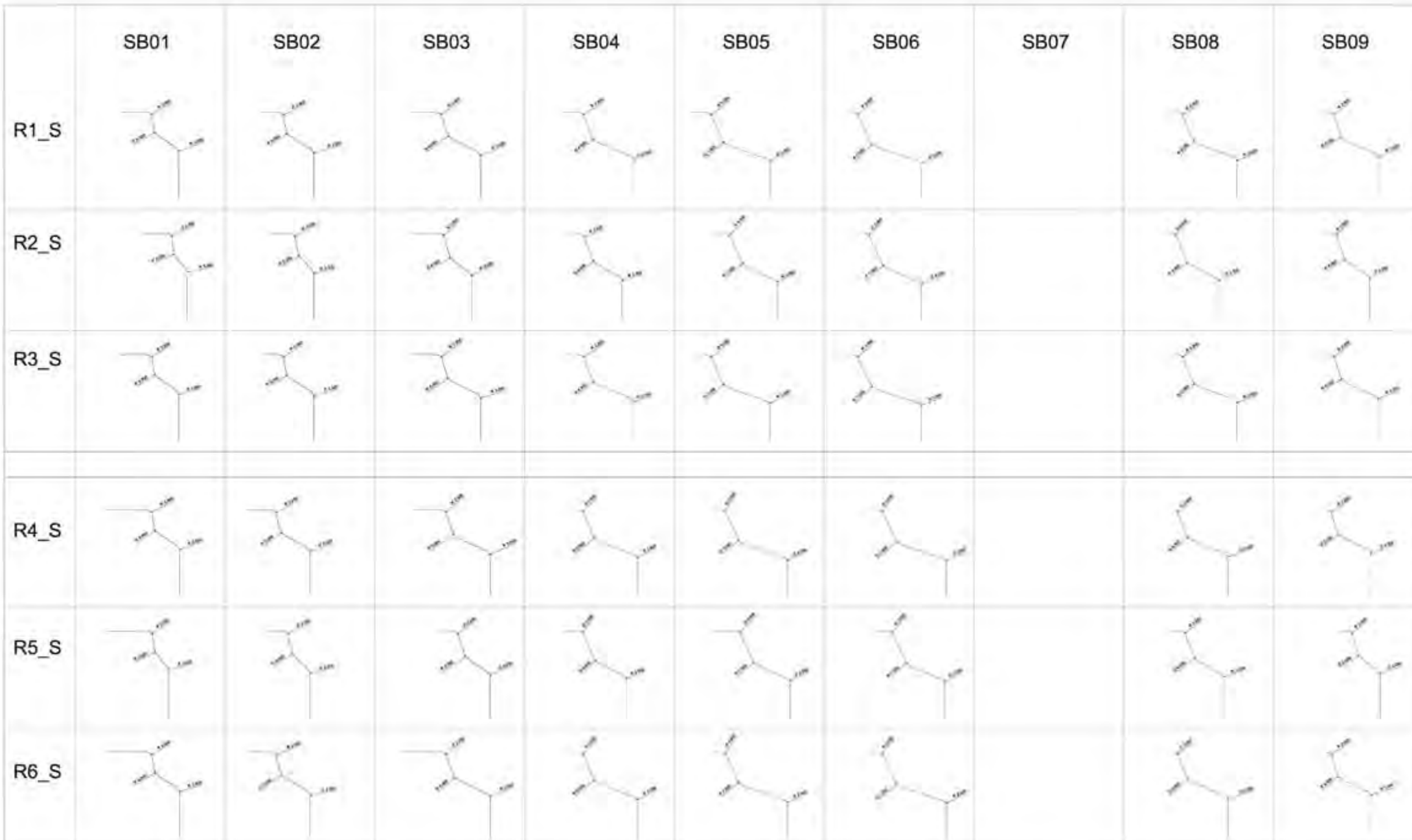


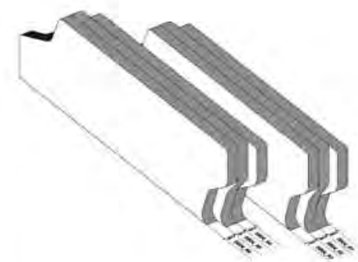
North 214 fillets

54 x R = 1.25m
6 x R = 2.0m
9 x R = 2.5m
57 x R = 3.0m
0 x R = 3.5m
6 x R = 4.0m
3 x R = 4.5m
18 x R = 5.0m
9 x R = 5.5m
21 x R = 6.0m
9 x R = 6.5m
22 x R = 7.0m

TOTAL 358 fillets

54 x R = 1.25m
30 x R = 2.0m
45 x R = 2.5m
81 x R = 3.0m
12 x R = 3.5m
6 x R = 4.0m
3 x R = 4.5m
30 x R = 5.0m
9 x R = 5.5m
33 x R = 6.0m
21 x R = 6.5m
34 x R = 7.0m



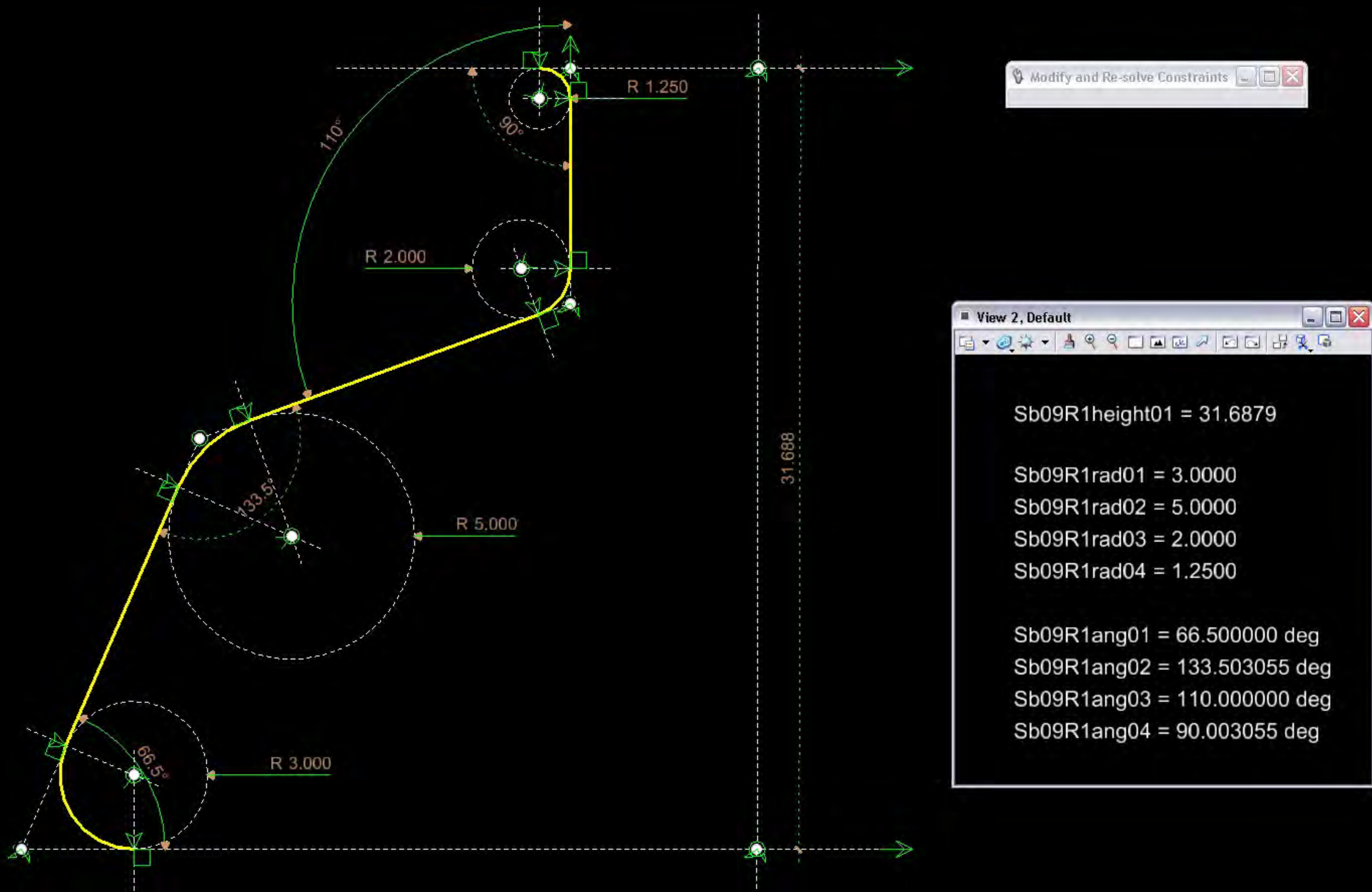


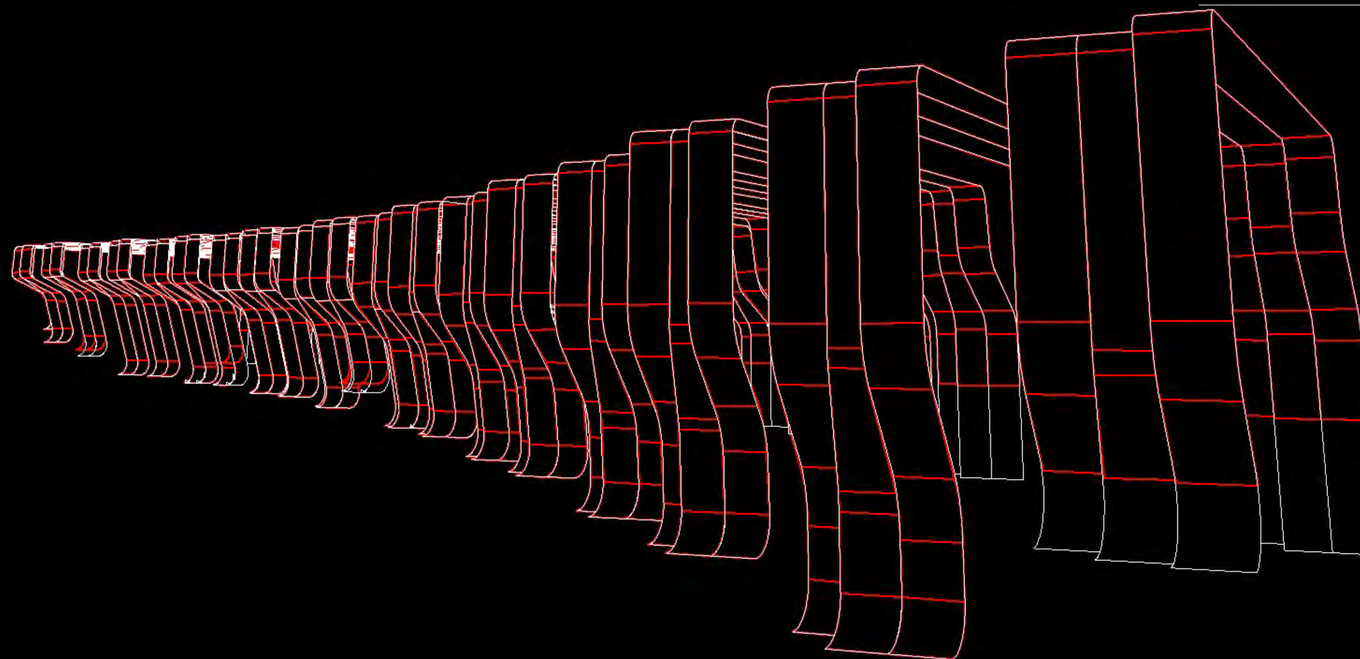
South 144 fillets

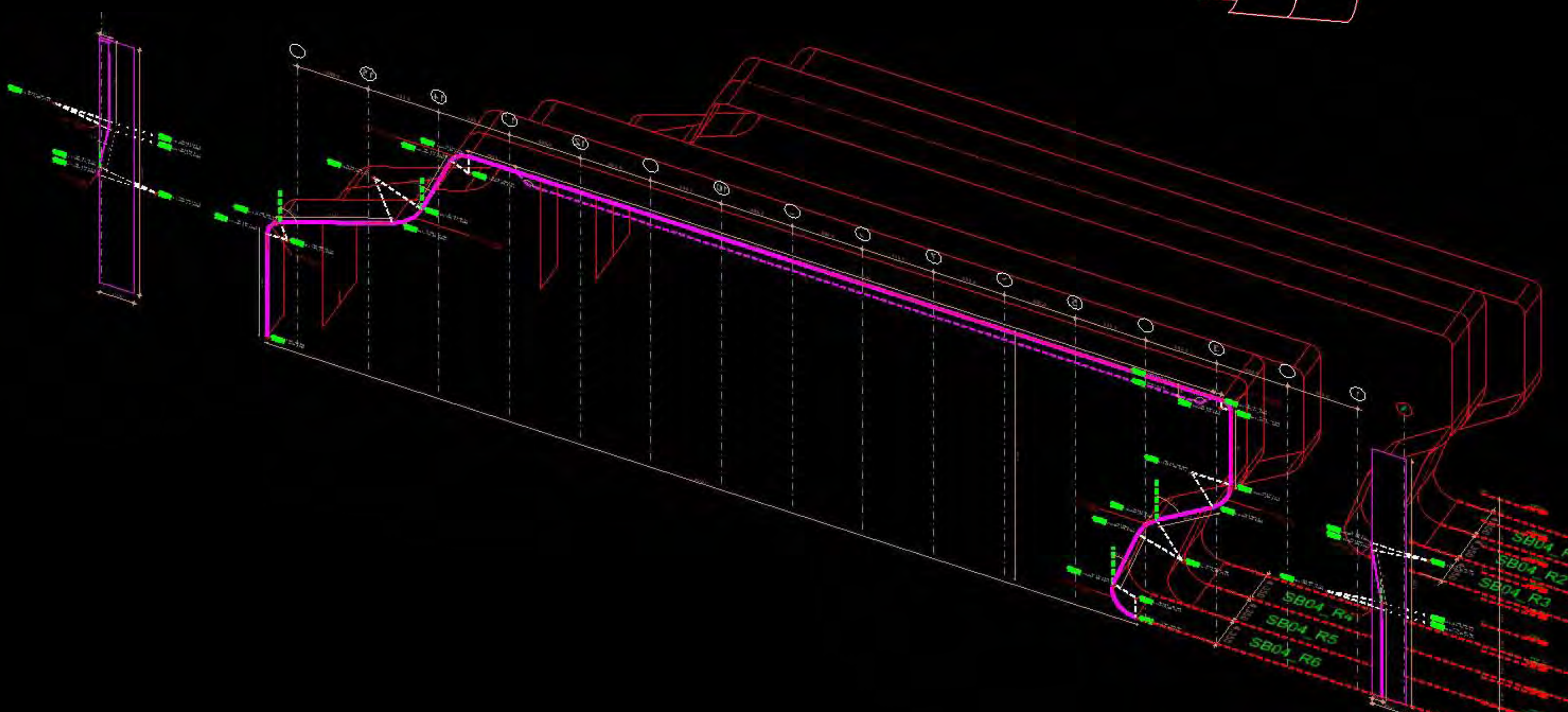
0 x R = 1.25m
24 x R = 2.0m
36 x R = 2.5m
24 x R = 3.0m
12 x R = 3.5m
0 x R = 4.0m
0 x R = 4.5m
12 x R = 5.0m
0 x R = 5.5m
12 x R = 6.0m
12 x R = 6.5m
12 x R = 7.0m

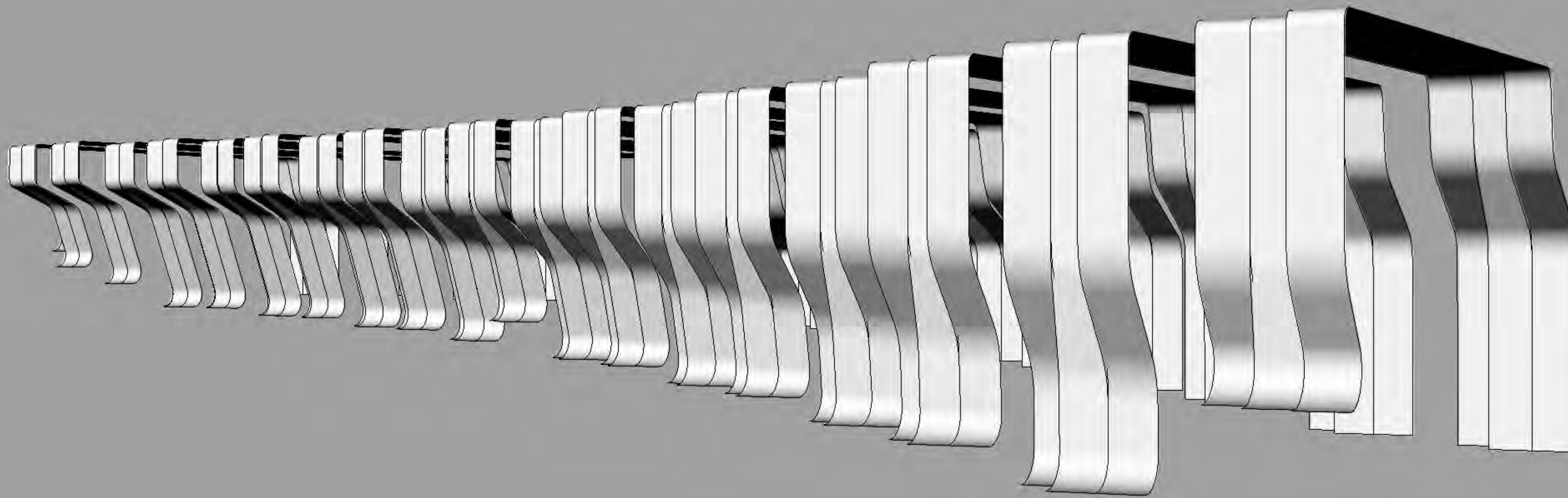
TOTAL 358 fillets

54 x R = 1.25m
30 x R = 2.0m
45 x R = 2.5m
81 x R = 3.0m
12 x R = 3.5m
6 x R = 4.0m
3 x R = 4.5m
30 x R = 5.0m
9 x R = 5.5m
33 x R = 6.0m
21 x R = 6.5m
34 x R = 7.0m

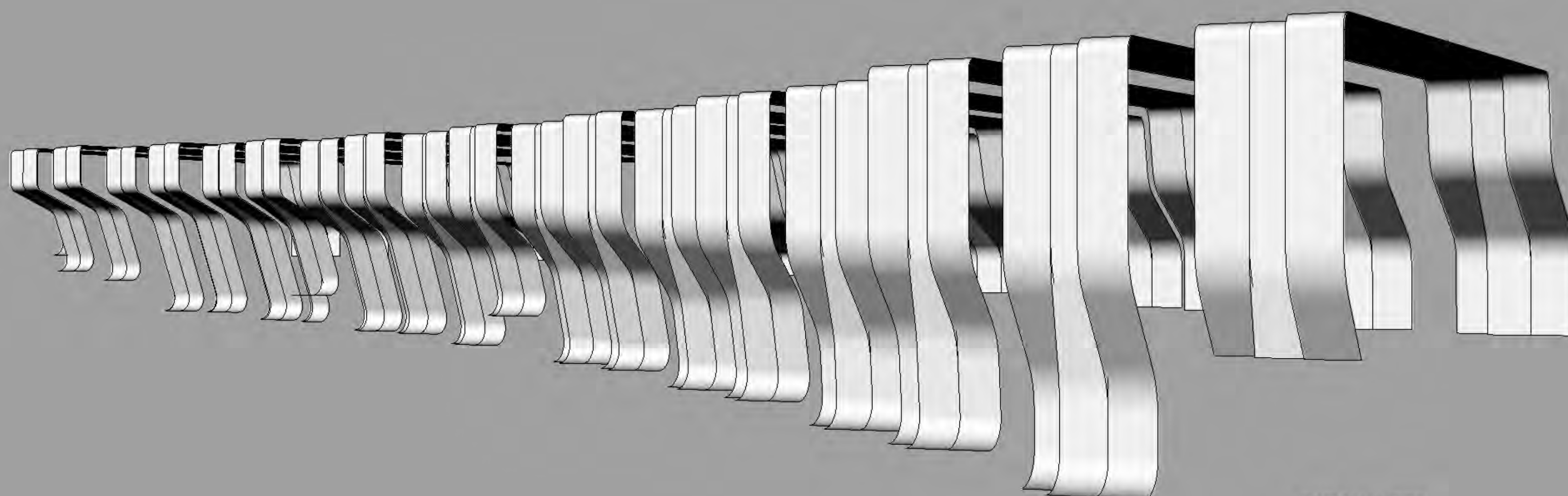

110°
90°
R 1.250
R 2.000
133.5°
R 5.000
31.688
66.5°
R 3.000
Modify and Re-solve Constraints
View 2, Default
Sb09R1height01 = 31.6879
Sb09R1rad01 = 3.0000
Sb09R1rad02 = 5.0000
Sb09R1rad03 = 2.0000
Sb09R1rad04 = 1.2500
Sb09R1ang01 = 66.500000 deg
Sb09R1ang02 = 133.503055 deg
Sb09R1ang03 = 110.000000 deg
Sb09R1ang04 = 90.003055 deg



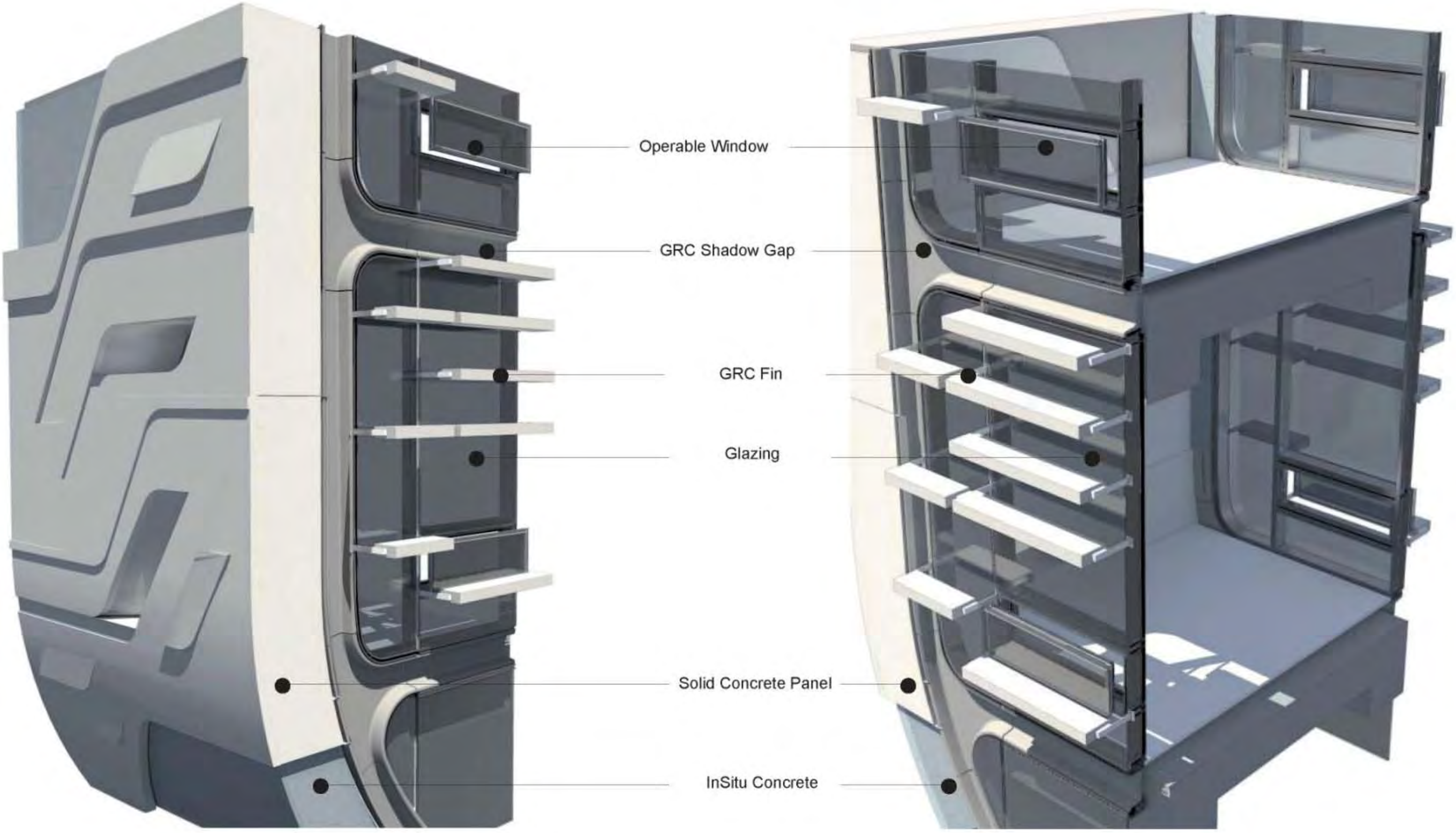

SB04_R
SB04_R2
SB04_R3
SB04_R4
SB04_R5
SB04_R6

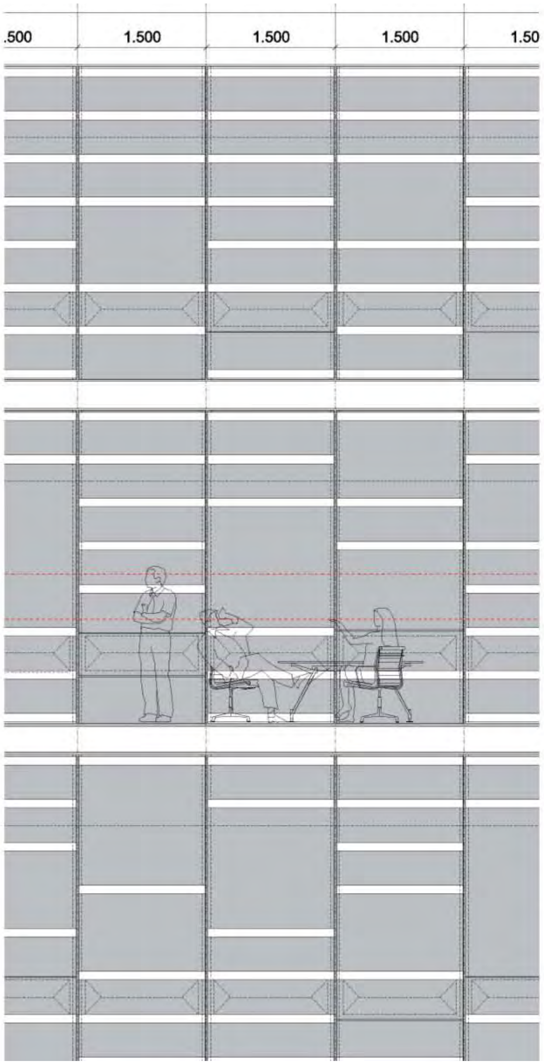


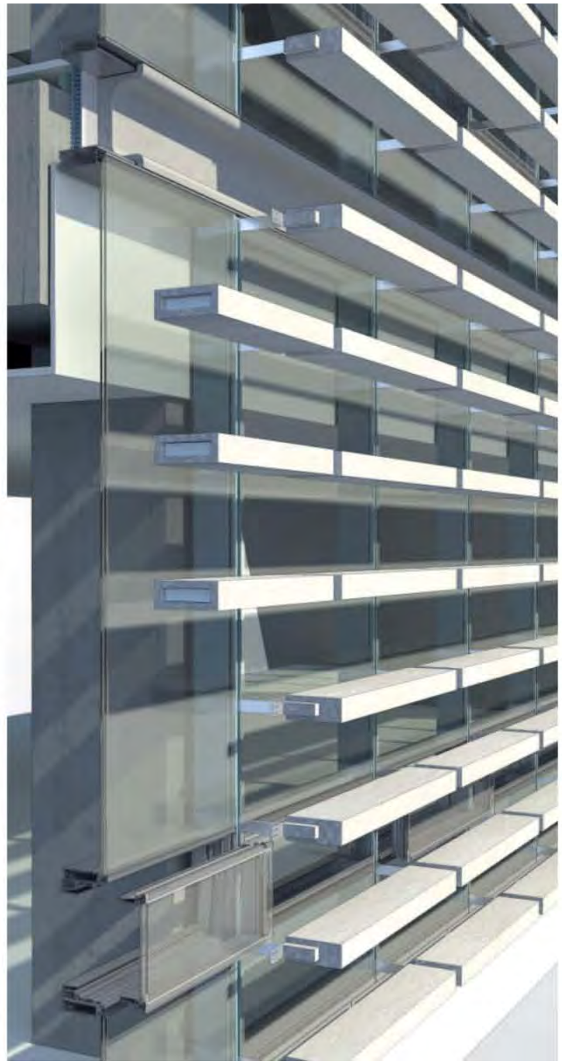
ORIGINAL



RATIONALIZED


Operable Window
GRC Shadow Gap
GRC Fin
Glazing
Solid Concrete Panel
InSitu Concrete





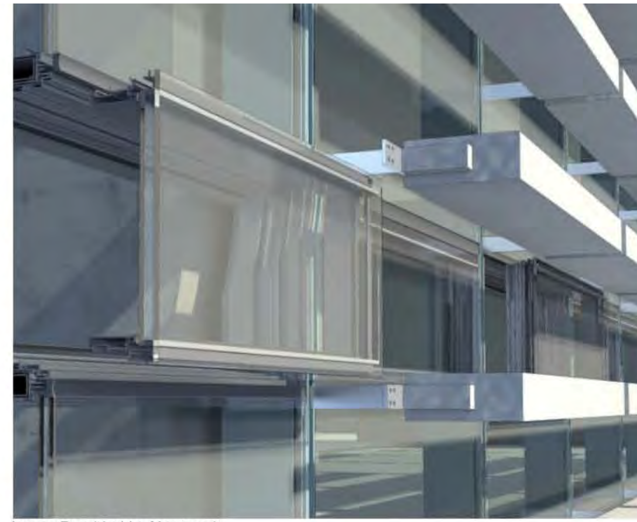
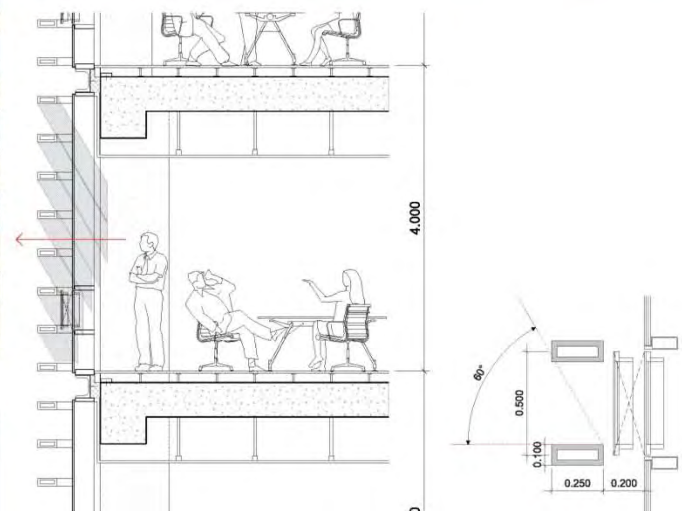
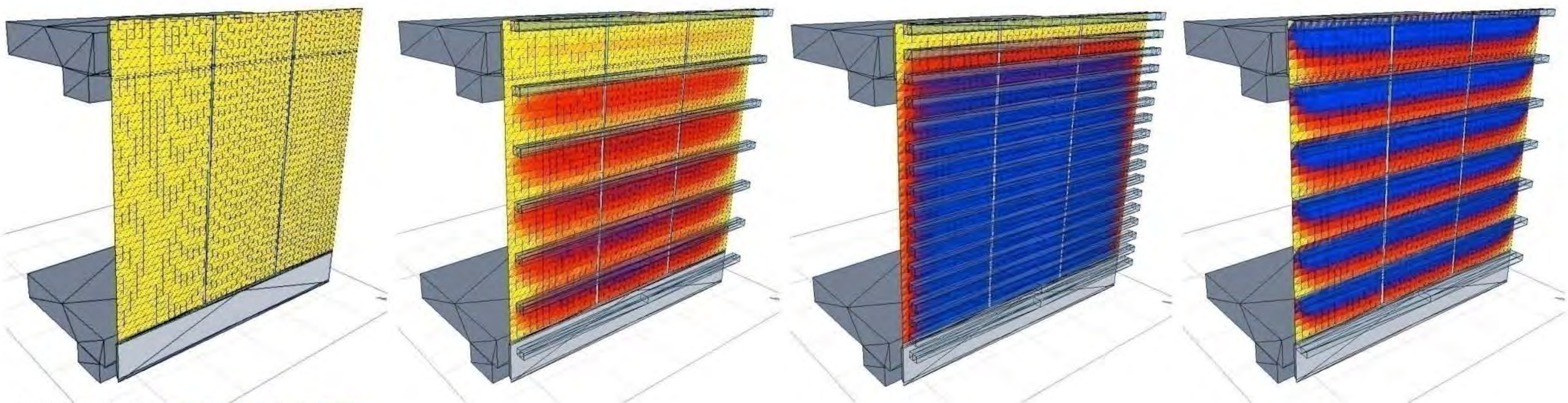


Image Provided by Newtecnic

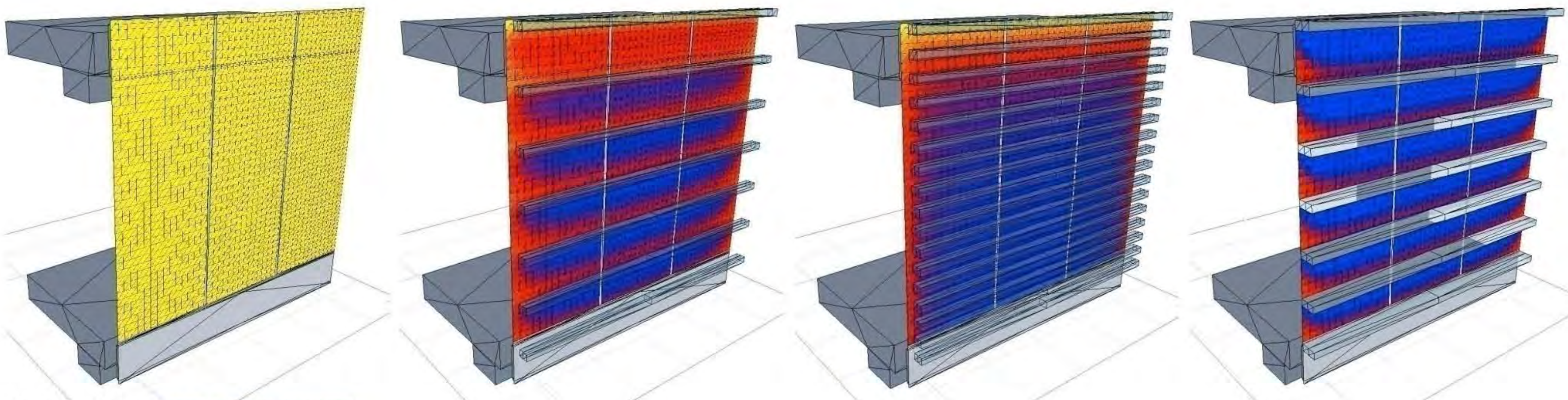


PEAK ANNUAL RADIATION

No Shading	Shading Option 01	Shading Option 02	Shading Option 03



South West Elevation: ANNUAL PEAK RADIATION

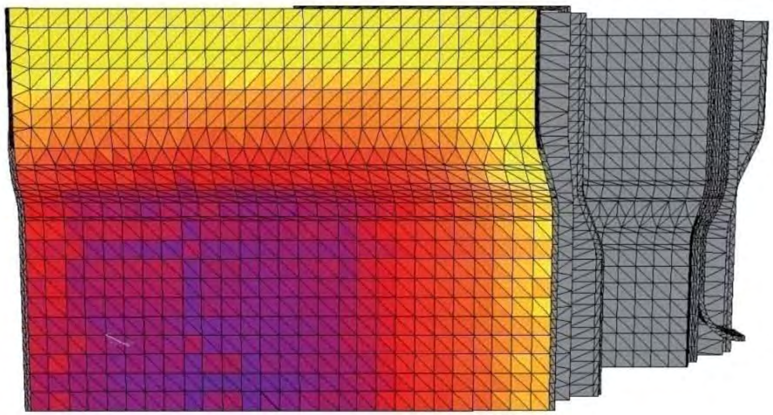


North East Elevation: ANNUAL PEAK RADIATION

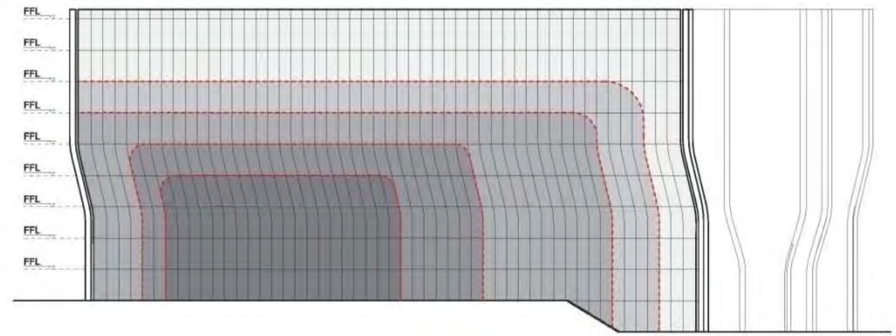
This analysis shows how effective each shading system is at reducing peak levels of solar radiation hitting the facade. All of the shading systems help reduce this peak value although it is apparent that some systems are more effective than others

KEY	50	57	64	71	78	85	92	99	106	113	120	Wh/m²

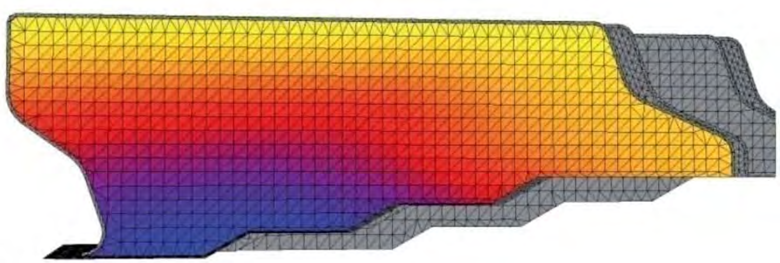
newtecnic
facade architecture+technology



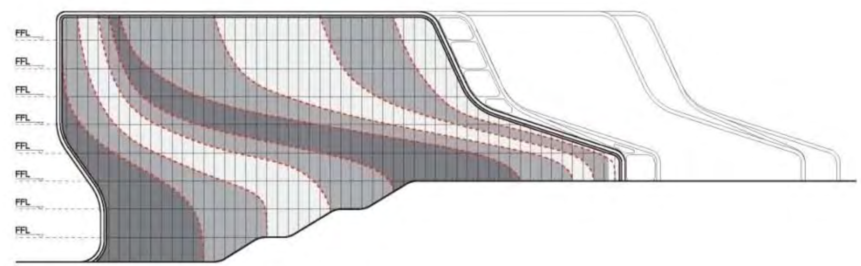
North Building Ecotoect Analysis



North Building Shading Density Analysis



South Building Ecotoect Analysis



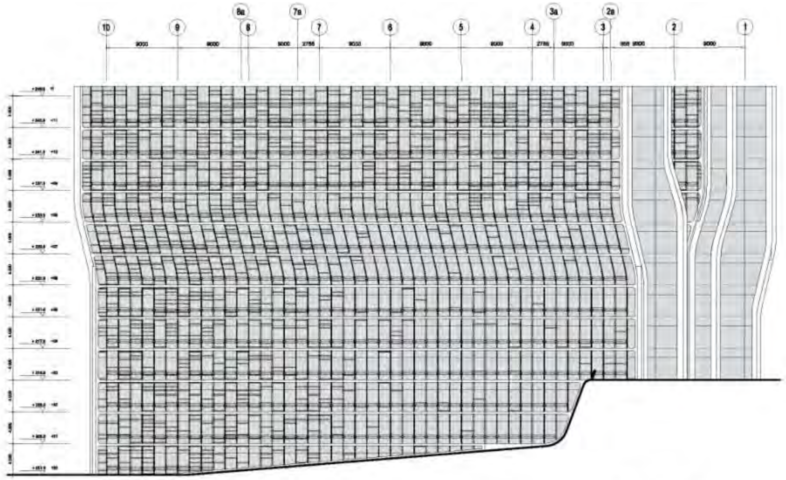
South Building Ecotoect Density Analysis

Area with most direct sunlight received over the course of 1 year

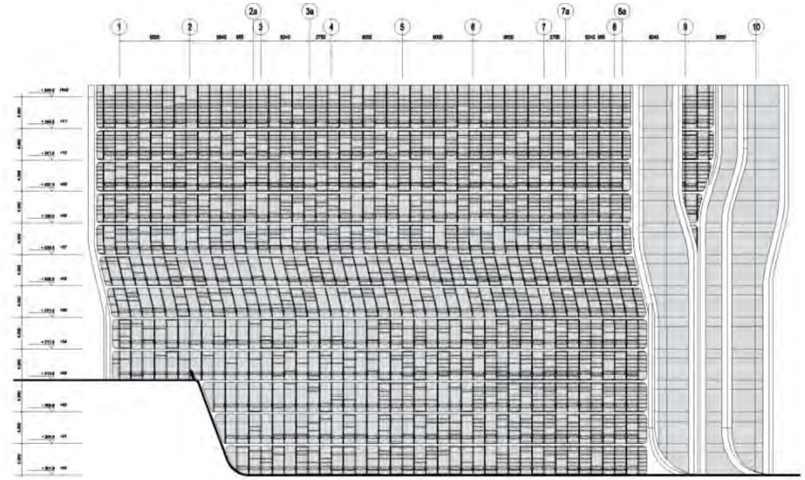
Area with least direct sunlight received over the course of 1 year

Densely shaded area

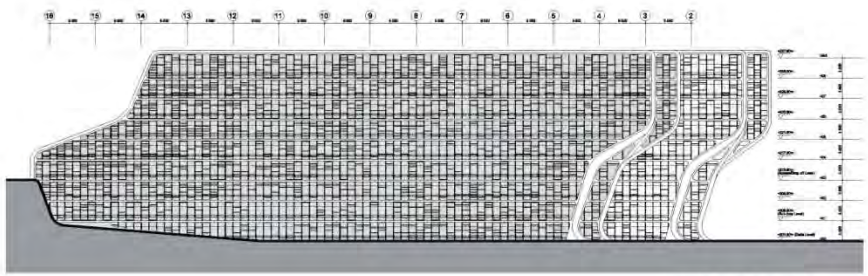
Least dense shaded area



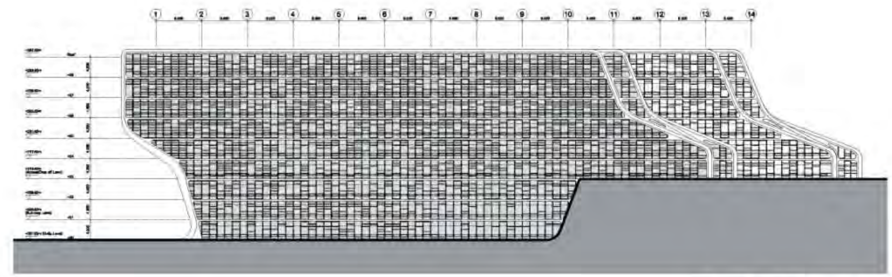
NB04 East Elevation



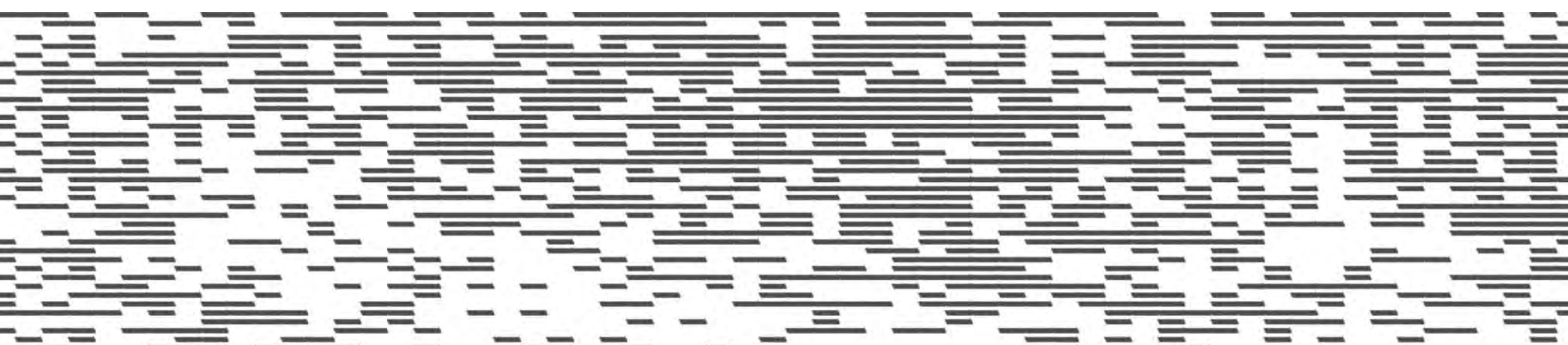
NB04 West Elevation

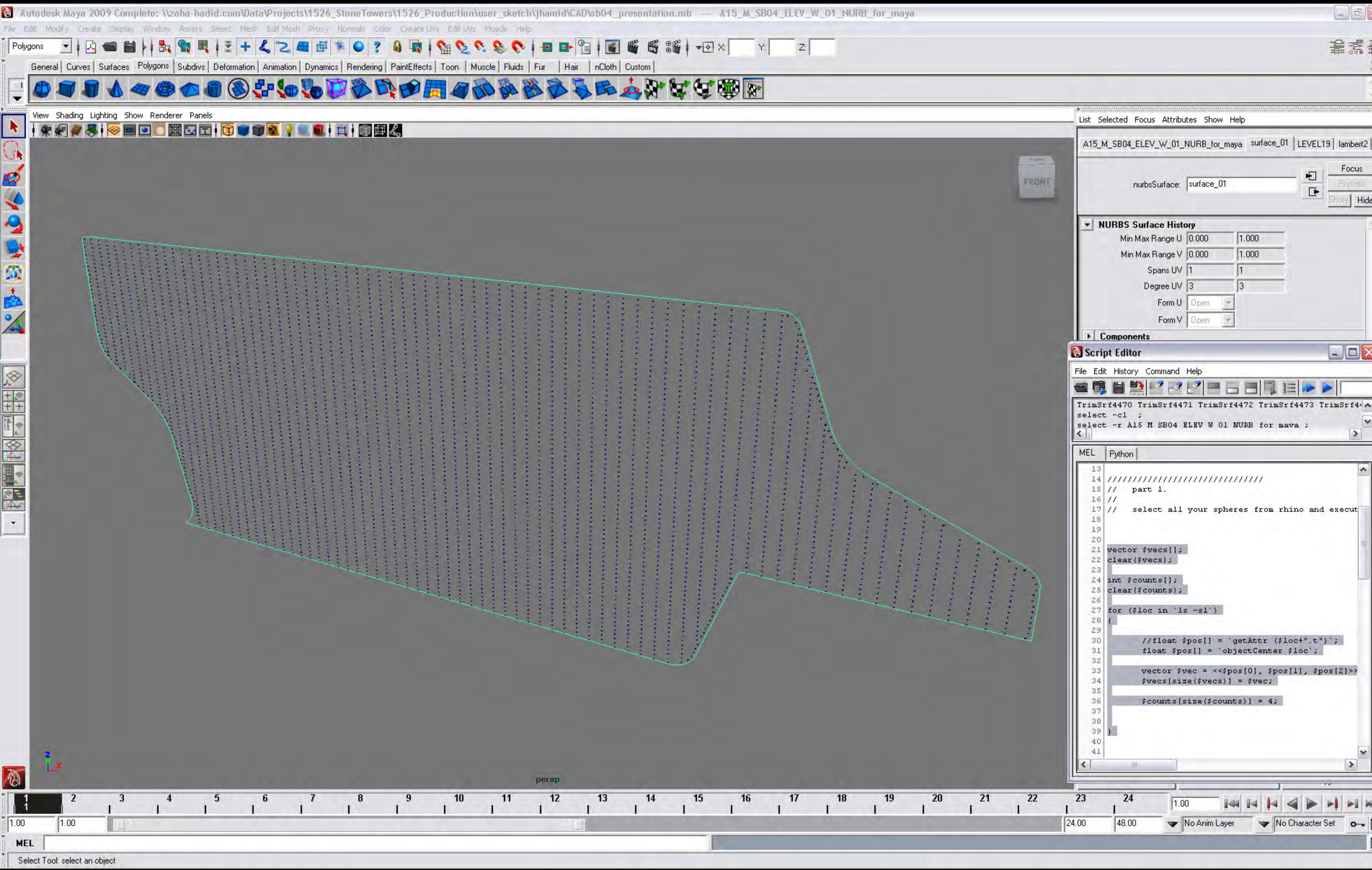


SB04 East Elevation



SB04 West Elevation





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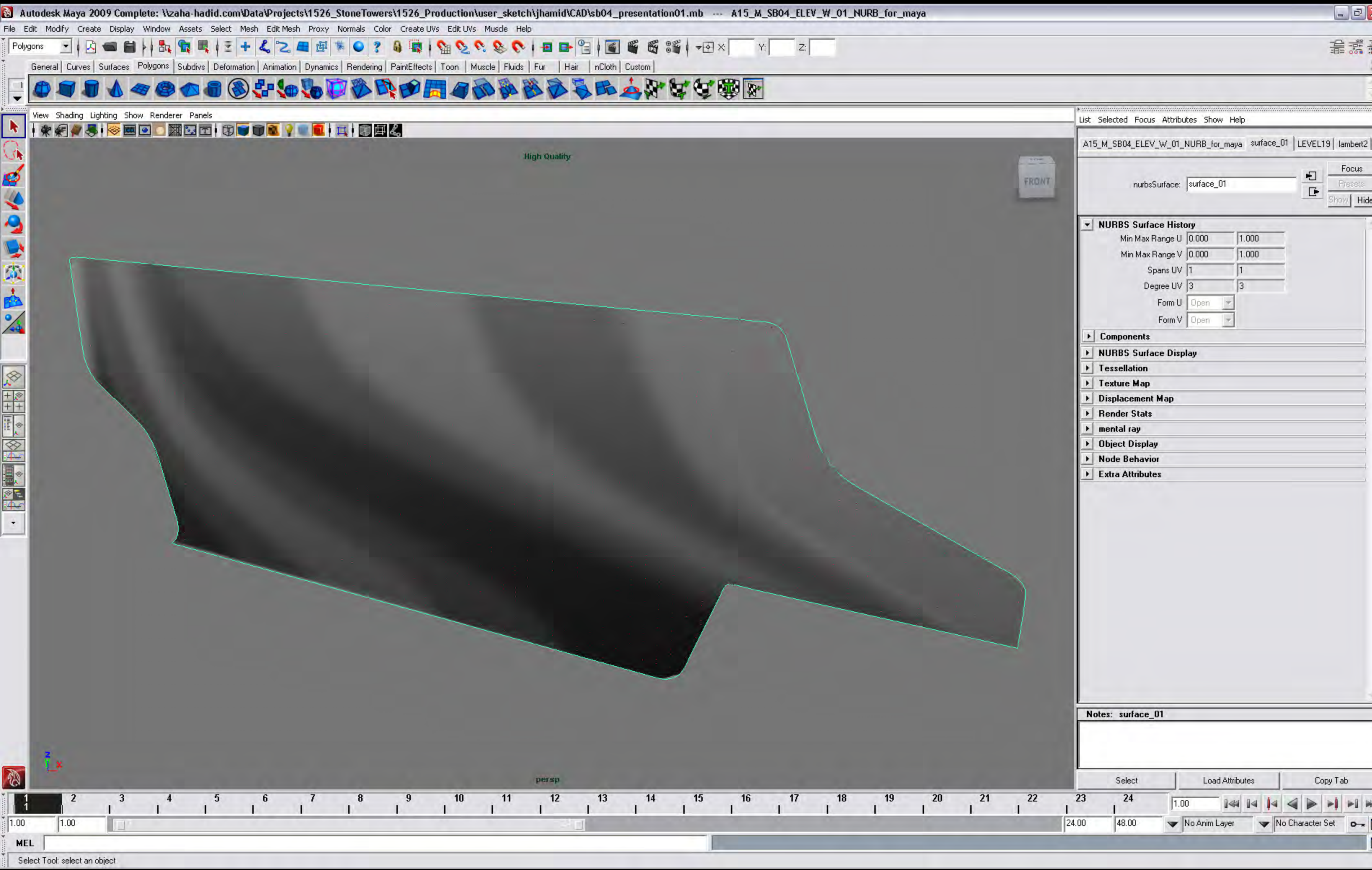
File Edit Modify Create Display Window Assets Select Mesh Edit Mesh Proxy Normals Color Create UVs Edit UVs Muscle Help
Polygons
General Curves Surfaces Polygons Subdivs Deformation Animation Dynamics Rendering PaintEffects Toon Muscle Fluids Fur Hair nCloth Custom
View Shading Lighting Show Renderer Panels
FRONT
persp
List Selected Focus Attributes Show Help
A15_M_SB04_ELEV_W_01_NURB_for_maya surface_01 LEVEL19 lambert2
nurbsSurface: surface_01
Focus
Presets
Show Hide
NURBS Surface History
Min Max Range U 0.000 1.000
Min Max Range V 0.000 1.000
Spans UV 1 1
Degree UV 3 3
Form U Open
Form V Open
Components
Script Editor
File Edit History Command Help
TrimSrf4470 TrimSrf4471 TrimSrf4472 TrimSrf4473 TrimSrf4
select -cl ;
select -r A15 M SB04 ELEV W 01 NURB for maya ;
MEL Python
////////////////////////////////
// part 1.
//
// select all your spheres from rhino and execut
vector $vecs[];
clear($vecs);
int $counts[];
clear($counts);
for ($loc in `ls -sl`)
{
//float $pos[] = `getAttr ($loc+".t")`;
float $pos[] = `objectCenter $loc`;
vector $vec = <<$pos[0], $pos[1], $pos[2]>>
$vecs[size($vecs)] = $vec;
$counts[size($counts)] = 4;
}
1.00 1.00 24.00 48.00 No Anim Layer No Character Set
MEL
Select Tool: select an object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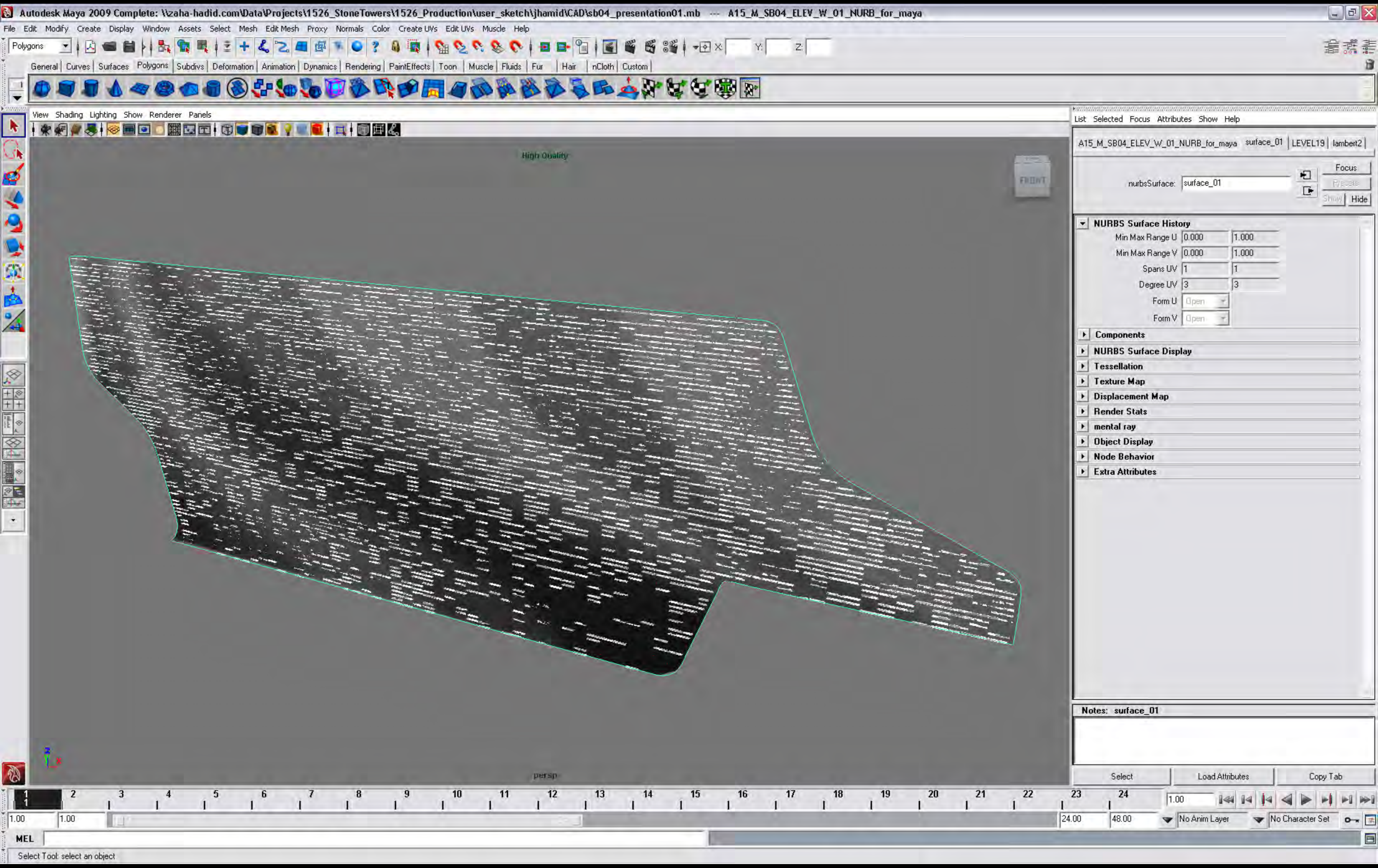
File Edit Modify Create Display Window Assets Select Mesh Edit Mesh Proxy Normals Color Create UVs Edit UVs Muscle Help
Polygons
General Curves Surfaces Polygons Subdivs Deformation Animation Dynamics Rendering PaintEffects Toon Muscle Fluids Fur Hair nCloth Custom
View Shading Lighting Show Renderer Panels
High Quality
FRONT
persp
List Selected Focus Attributes Show Help
A15_M_SB04_ELEV_W_01_NURB_for_maya surface_01 LEVEL19 lambert2
nurbsSurface: surface_01
Focus
Presets
Show Hide
NURBS Surface History
Min Max Range U 0.000 1.000
Min Max Range V 0.000 1.000
Spans UV 1 1
Degree UV 3 3
Form U Open
Form V Open
Components
NURBS Surface Display
Tessellation
Texture Map
Displacement Map
Render Stats
mental ray
Object Display
Node Behavior
Extra Attributes
Notes: surface_01
Select Load Attributes Copy Tab
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
1.00
1.00 1.00
24.00 48.00
No Anim Layer No Character Set
MEL
Select Tool: select an object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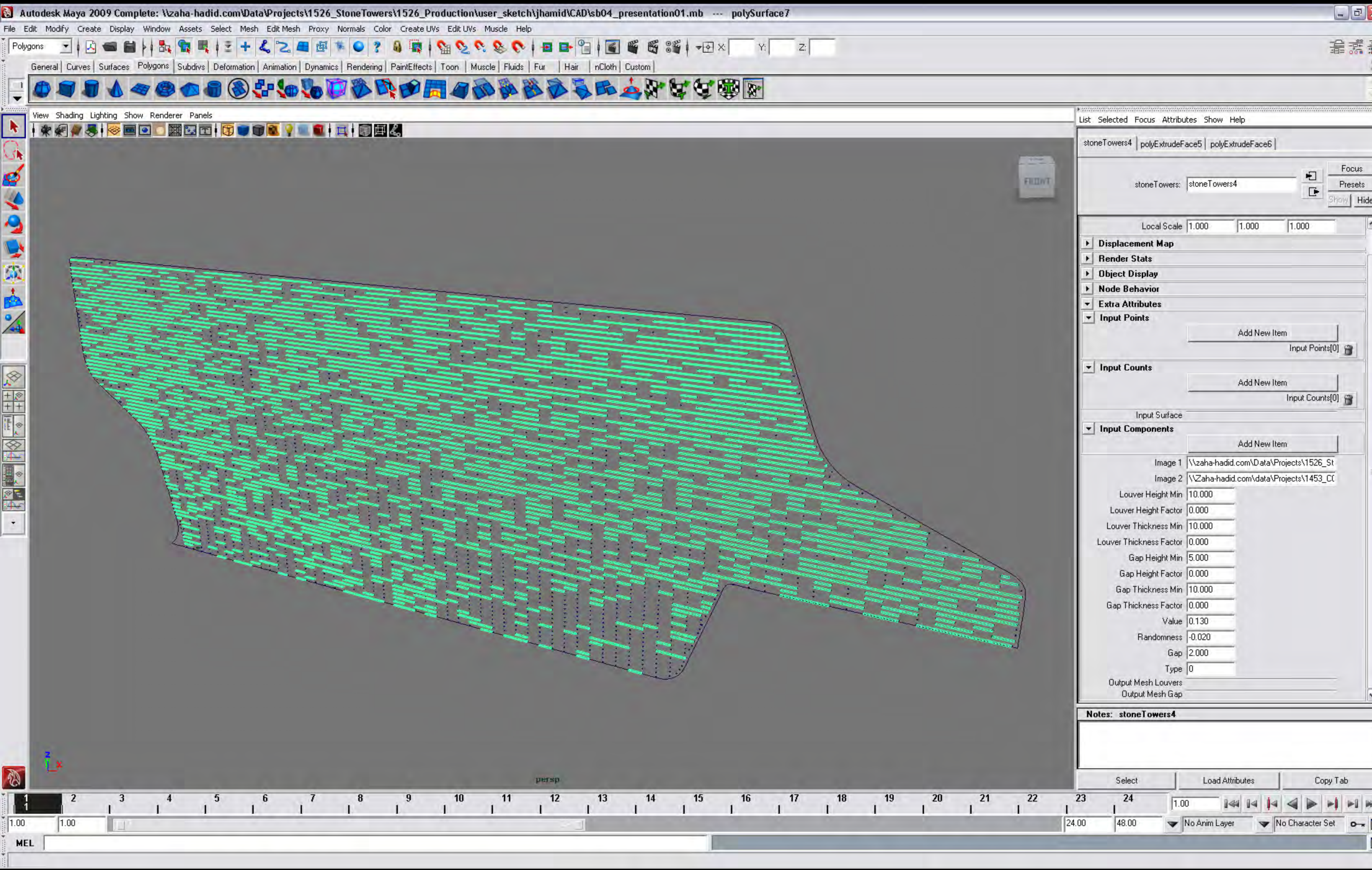
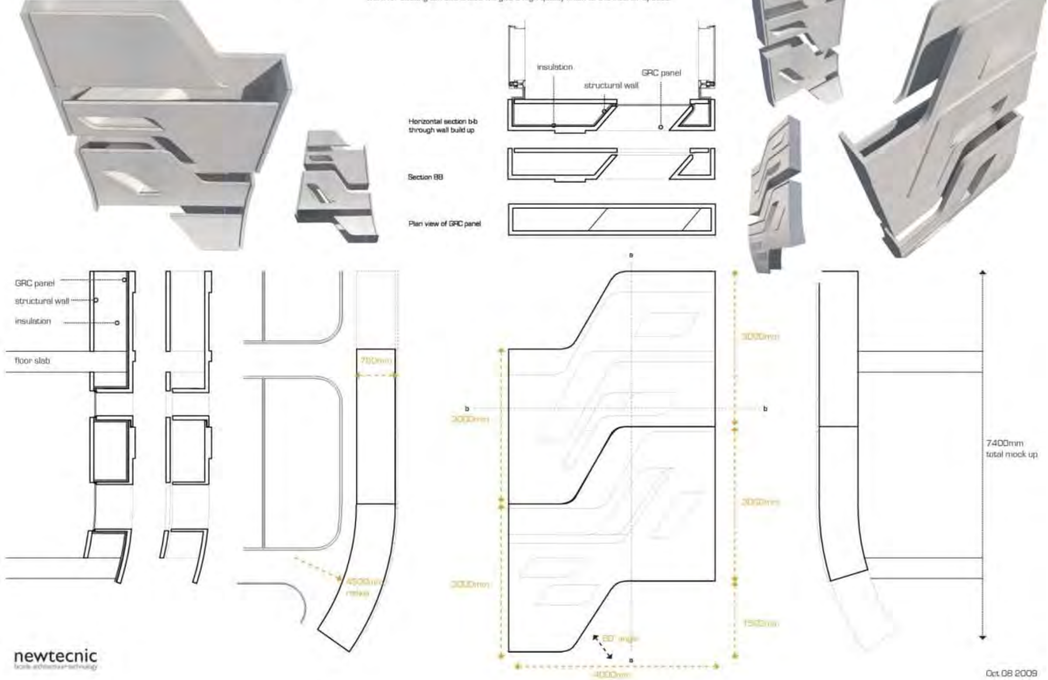
File Edit Modify Create Display Window Assets Select Mesh Edit Mesh Proxy Normals Color Create UVs Edit UVs Muscle Help
Polygons
General Curves Surfaces Polygons Subdivs Deformation Animation Dynamics Rendering PaintEffects Toon Muscle Fluids Fur Hair nCloth Custom
View Shading Lighting Show Renderer Panels
High Quality
FRONT
persp
List Selected Focus Attributes Show Help
A15_M_SB04_ELEV_W_01_NURB_for_maya surface_01 LEVEL19 lambert2
nurbsSurface: surface_01
Focus
Hide
NURBS Surface History
Min Max Range U 0.000 1.000
Min Max Range V 0.000 1.000
Spans UV 1 1
Degree UV 3 3
Form U Open
Form V Open
Components
NURBS Surface Display
Tessellation
Texture Map
Displacement Map
Render Stats
mental ray
Object Display
Node Behavior
Extra Attributes
Notes: surface_01
Select Load Attributes Copy Tab
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
1.00
1.00 1.00 24.00 48.00 No Anim Layer No Character Set
MEL
Select Tool: select an object

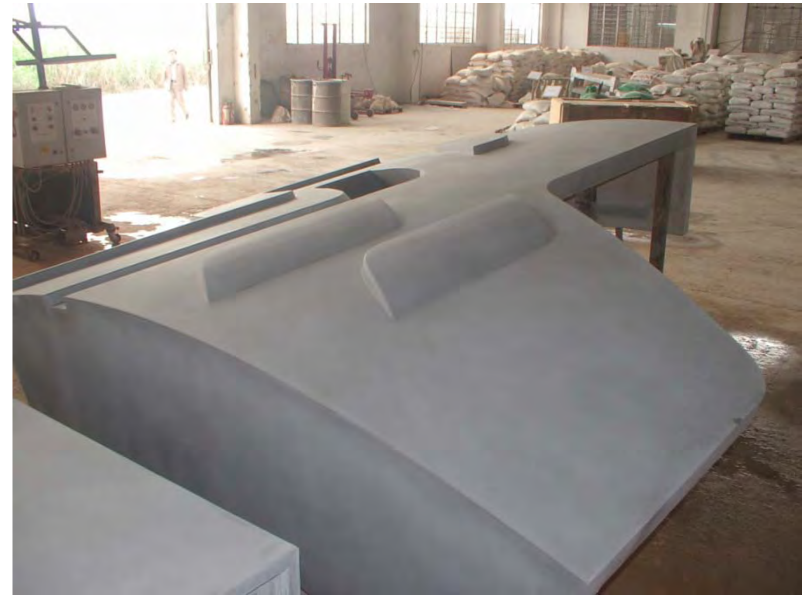

Autodesk Maya 2009 Complete: \\zaha-hadid.com\Data\Projects\1526_StoneTowers\1526_Production\user_sketch\jhamid\CAD\sb04_presentation01.mb --- polySurface7
File Edit Modify Create Display Window Assets Select Mesh Edit Mesh Proxy Normals Color Create UVs Edit UVs Muscle Help
Polygons
General Curves Surfaces Polygons Subdivs Deformation Animation Dynamics Rendering PaintEffects Toon Muscle Fluids Fur Hair nCloth Custom
View Shading Lighting Show Renderer Panels
persp
List Selected Focus Attributes Show Help
stoneTowers4 polyExtrudeFace5 polyExtrudeFace6
stoneTowers: stoneTowers4
Focus
Presets
Show Hide
Local Scale 1.000 1.000 1.000
Displacement Map
Render Stats
Object Display
Node Behavior
Extra Attributes
Input Points
Add New Item
Input Points[0]
Input Counts
Add New Item
Input Counts[0]
Input Surface
Input Components
Add New Item
Image 1 \\zaha-hadid.com\Data\Projects\1526_St
Image 2 \\Zaha-hadid.com\data\Projects\1453_C
Louver Height Min 10.000
Louver Height Factor 0.000
Louver Thickness Min 10.000
Louver Thickness Factor 0.000
Gap Height Min 5.000
Gap Height Factor 0.000
Gap Thickness Min 10.000
Gap Thickness Factor 0.000
Value 0.130
Randomness -0.020
Gap 2.000
Type 0
Output Mesh Louvers
Output Mesh Gap
Notes: stoneTowers4
Select Load Attributes Copy Tab
No Anim Layer
No Character Set
MEL

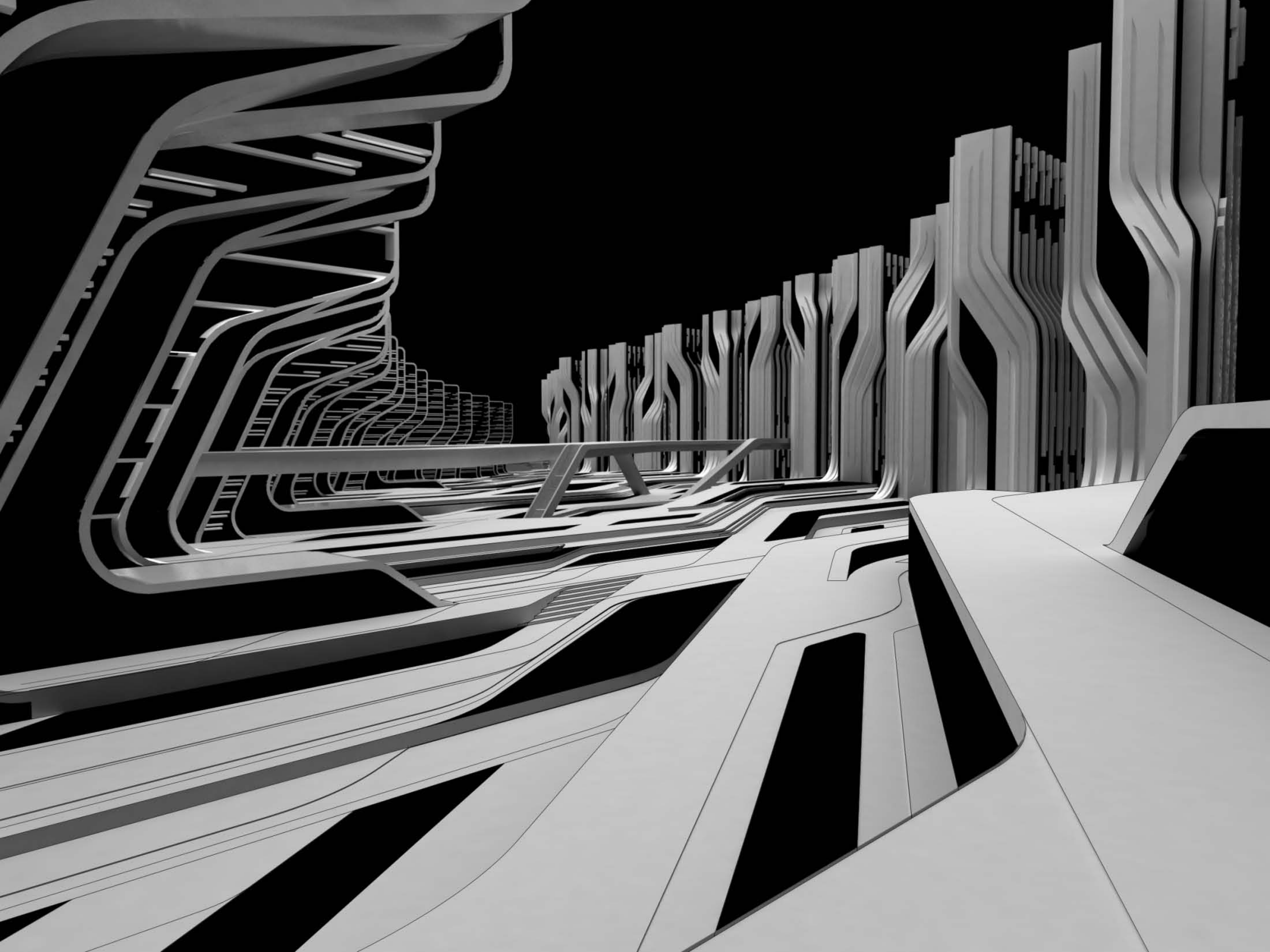


MOCK UP PANEL _ B

This option uses the GRC panel as the complete formwork for casting the backing wall. By wrapping the GRC panel around the structural wall not only will this oprovide the entire formwork for casting ton site it also will give a high quality finish to the interior spaces.







Concluding Thoughts

- Striking a Balance: Overcoming software imposed design limitations by combining strengths of multiple packages while maintaining the high degree of geometric control, 2D and 3D, essential to achieving formally complex designs.

- Software futures – directions, trends, continued interoperability?