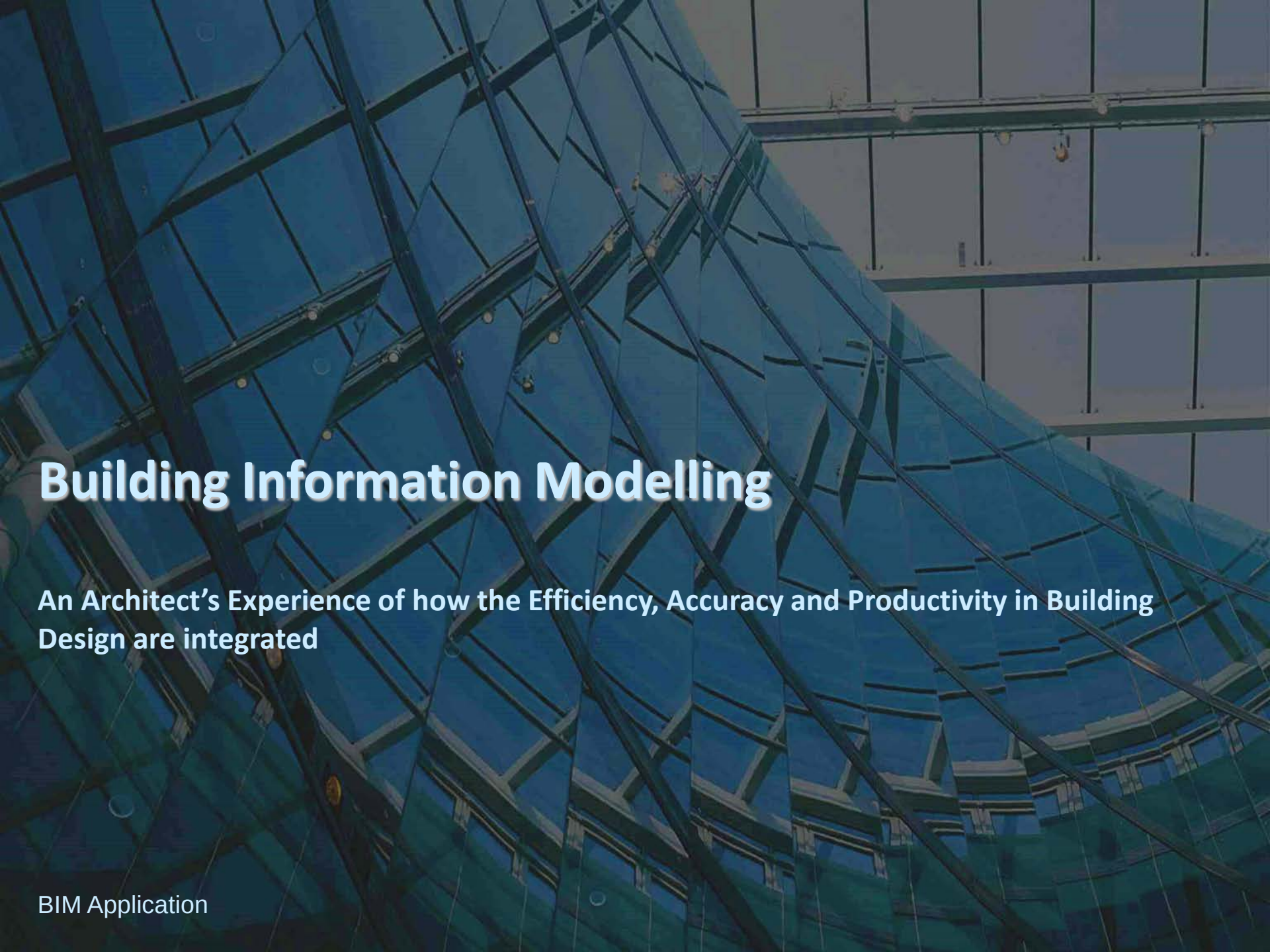
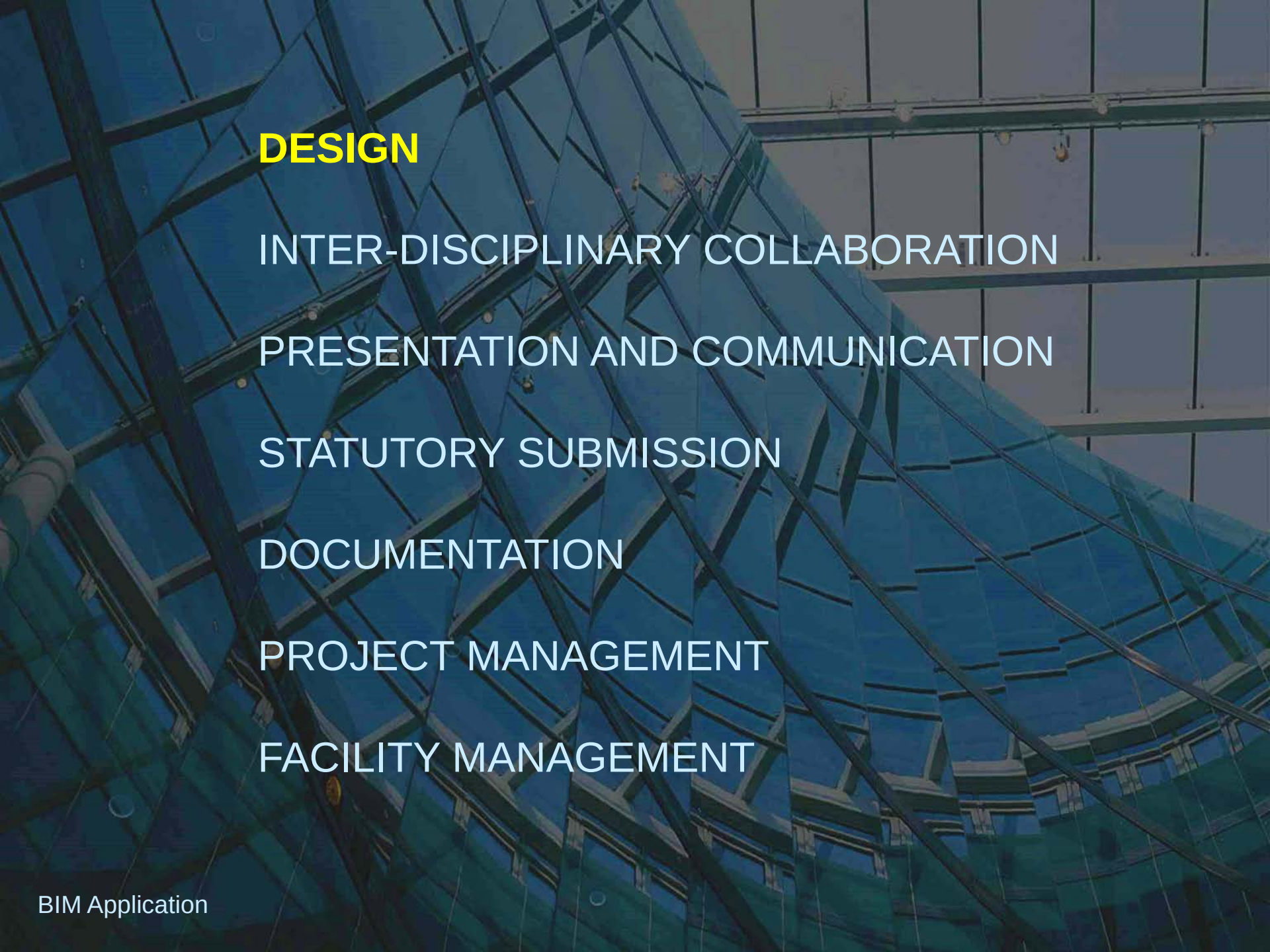




Building Information Modelling

An Architect's Experience of how the Efficiency, Accuracy and Productivity in Building Design are integrated

BIM Application



DESIGN

INTER-DISCIPLINARY COLLABORATION

PRESENTATION AND COMMUNICATION

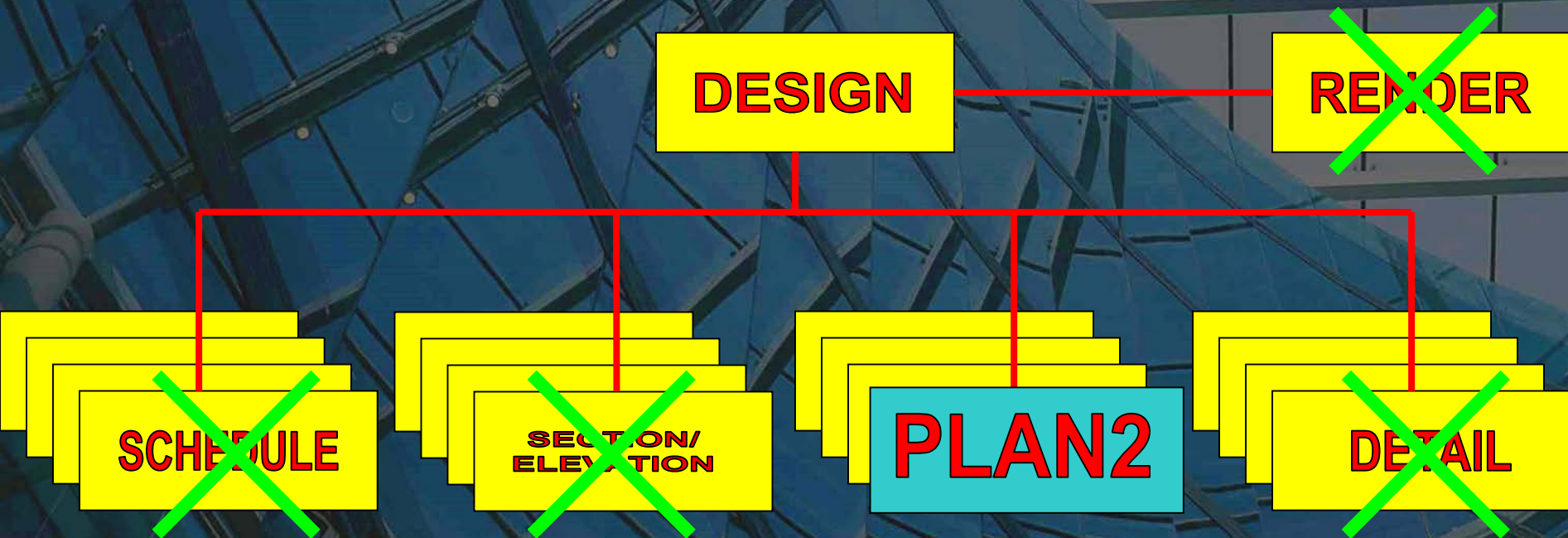
STATUTORY SUBMISSION

DOCUMENTATION

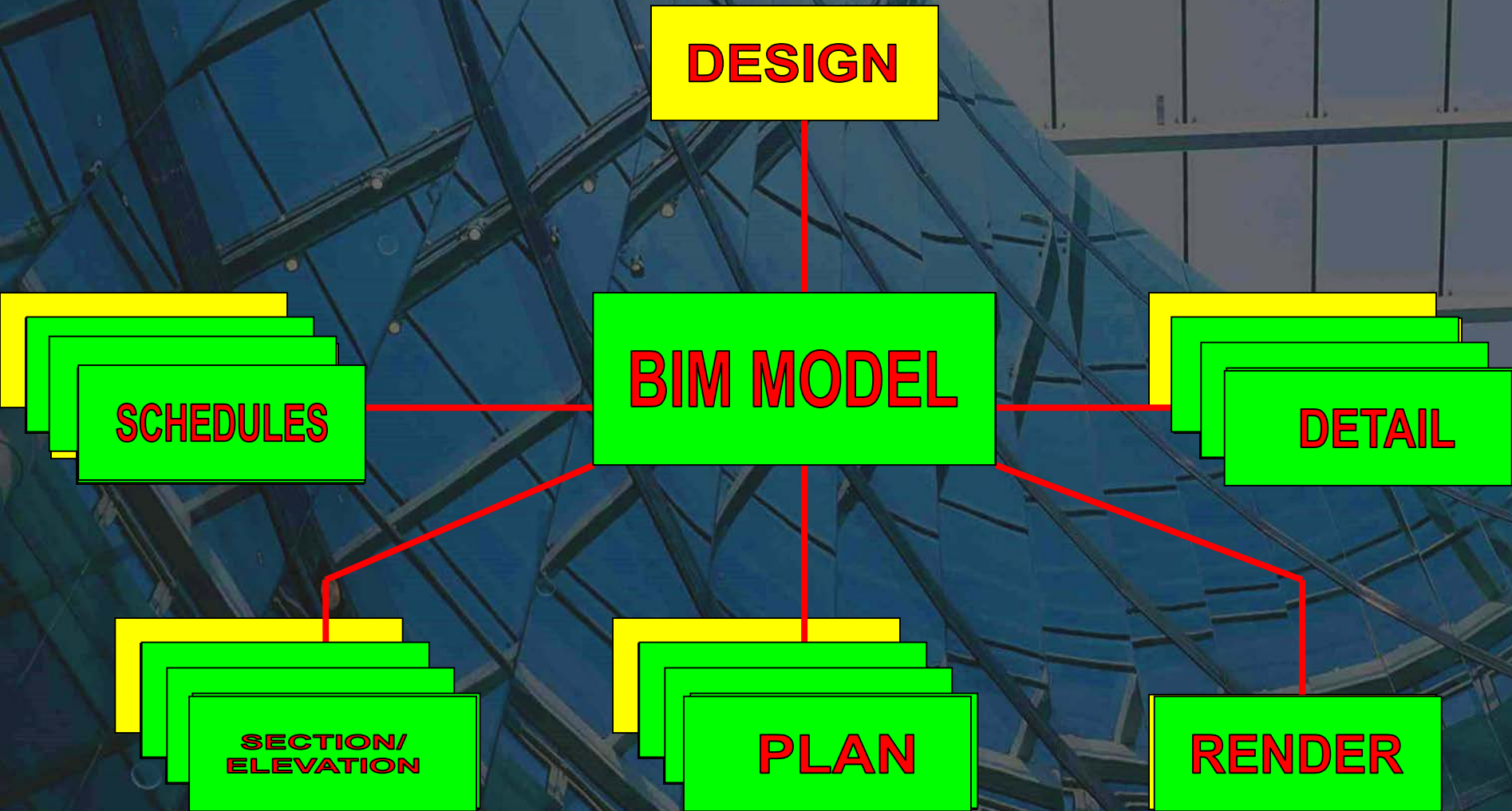
PROJECT MANAGEMENT

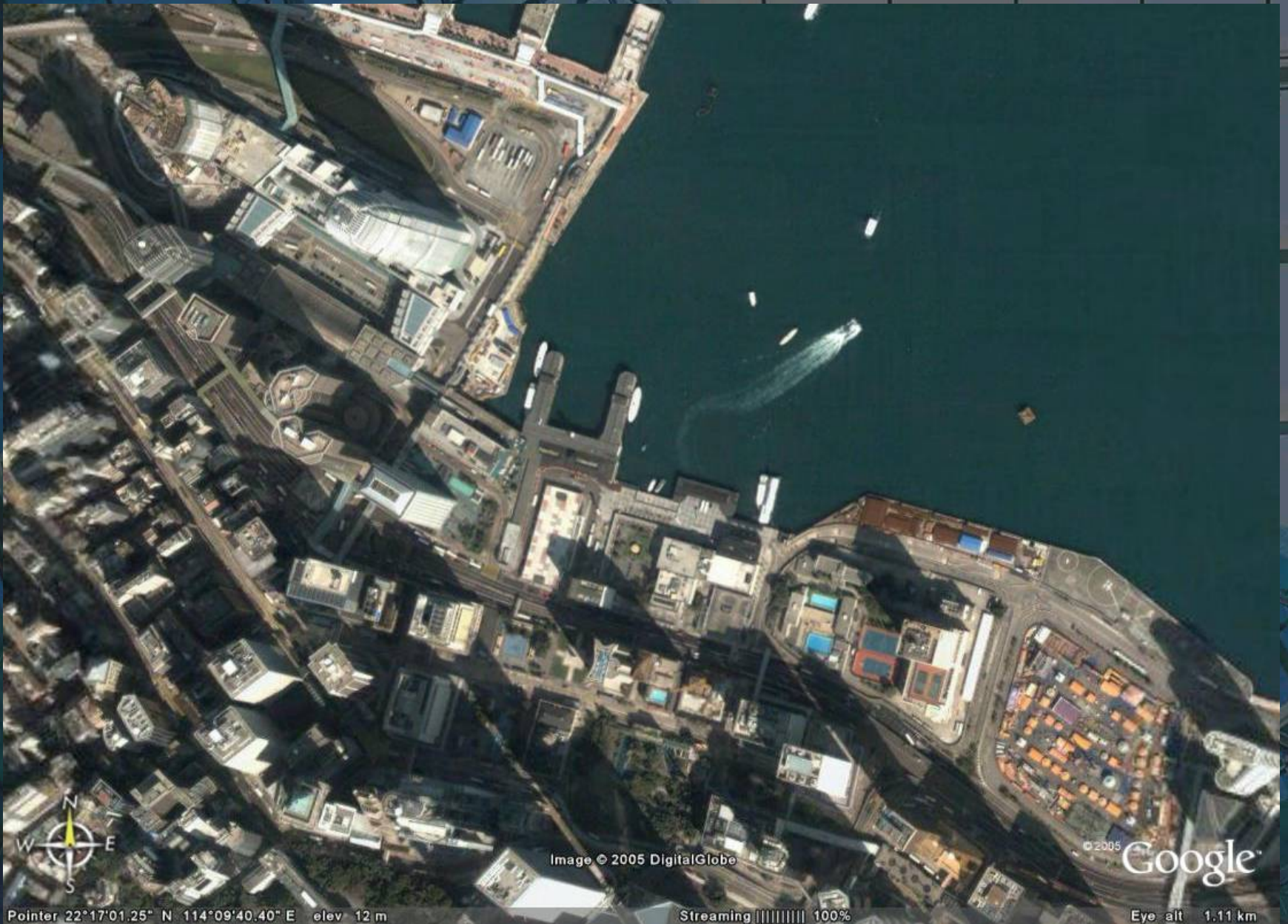
FACILITY MANAGEMENT

EXISTING DESIGN AND DRAWING PRACTICE



BIM DESIGN AND DRAWING PROCESS

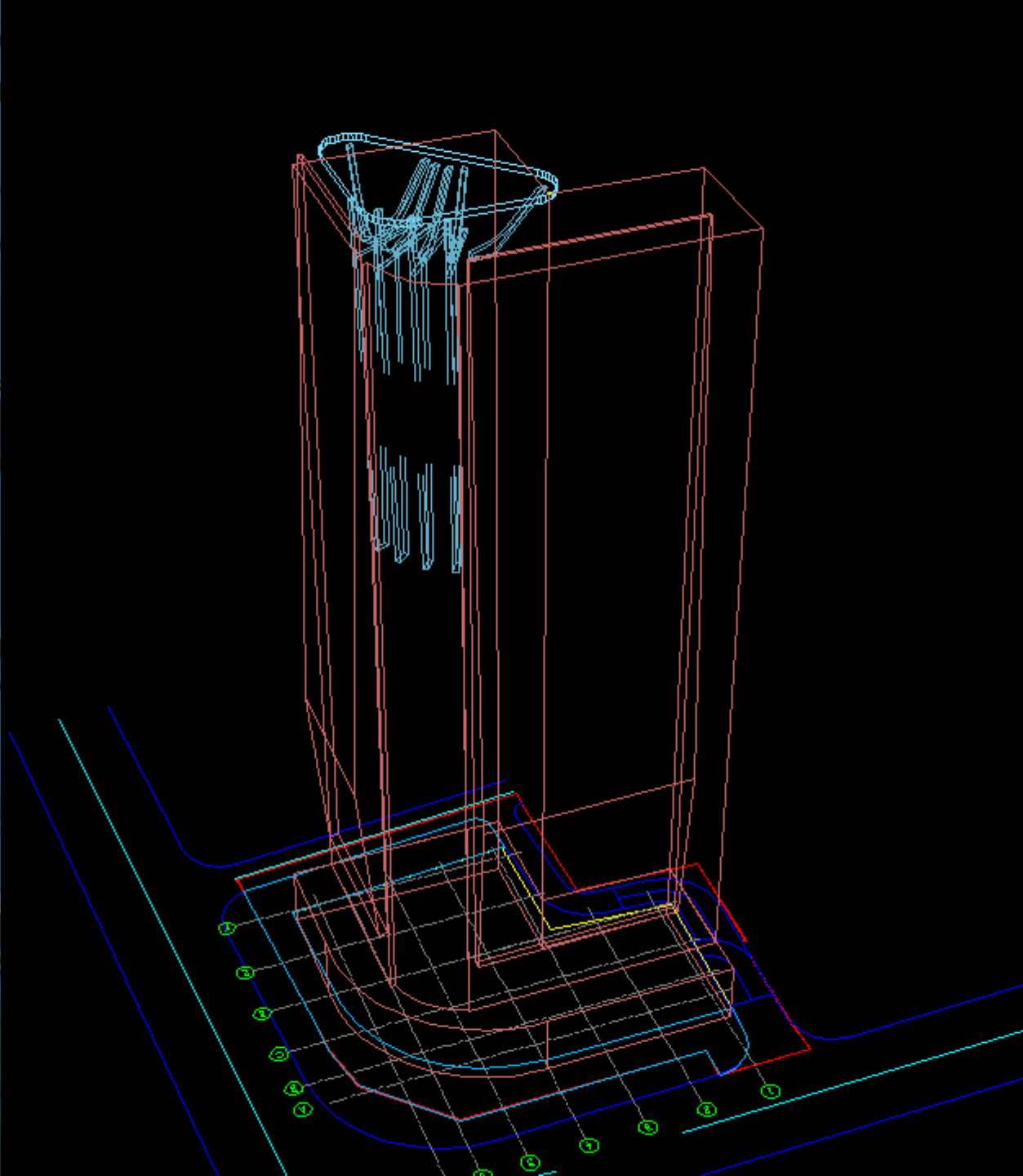






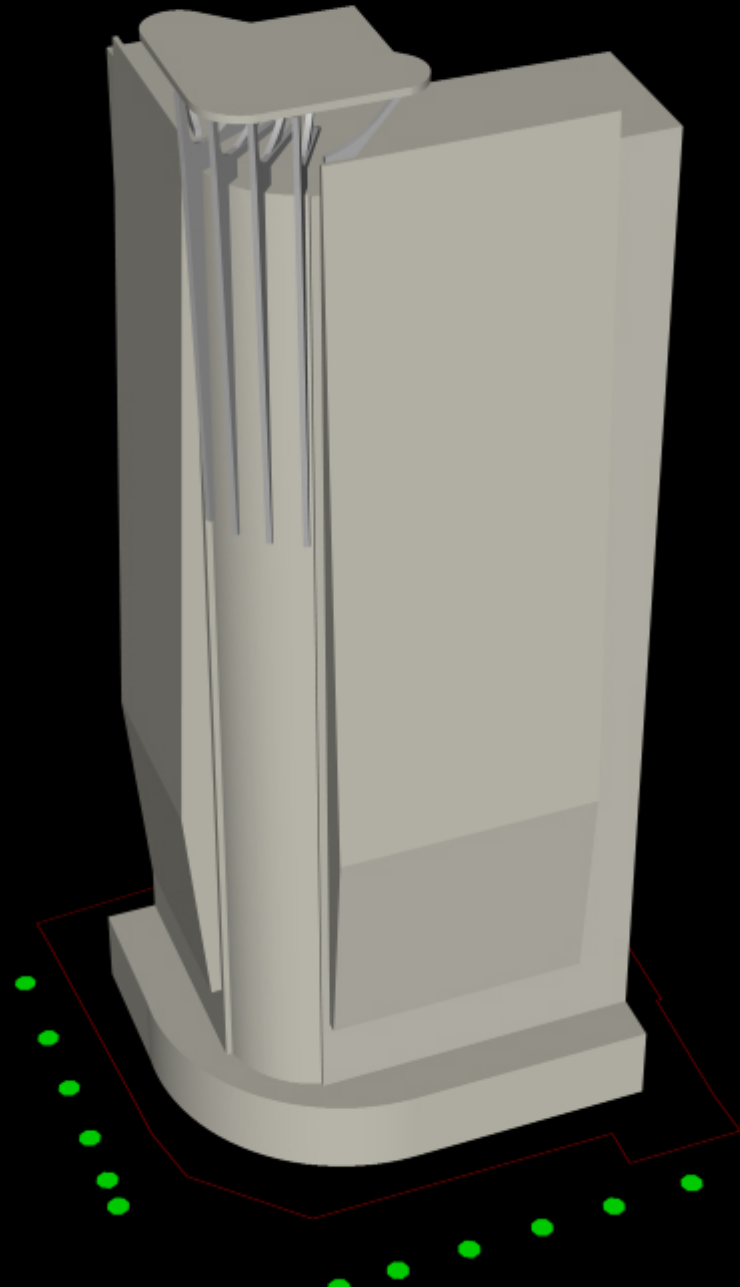
BIM MODEL

BIM Application



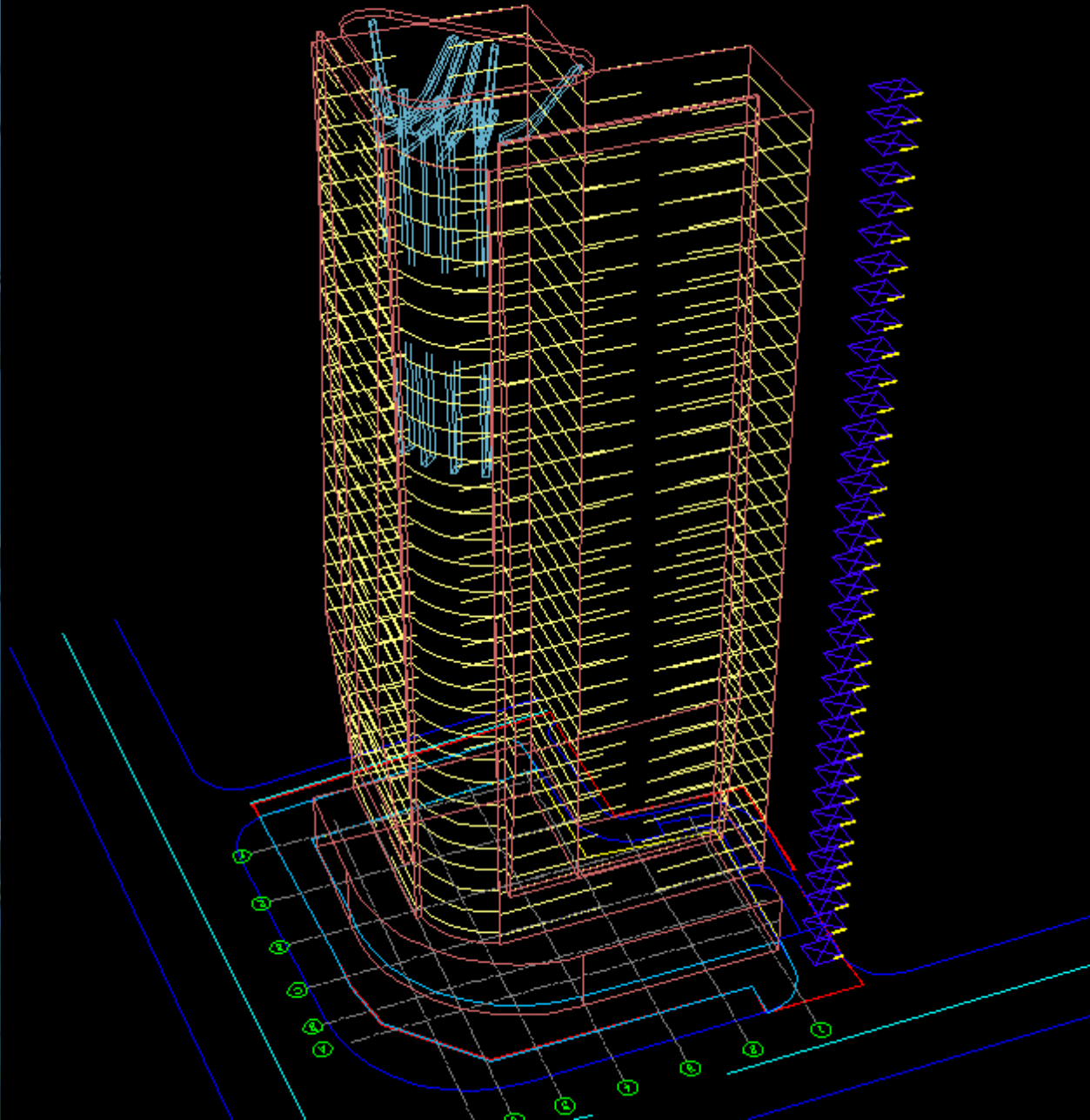
BIM MODEL

BIM Application



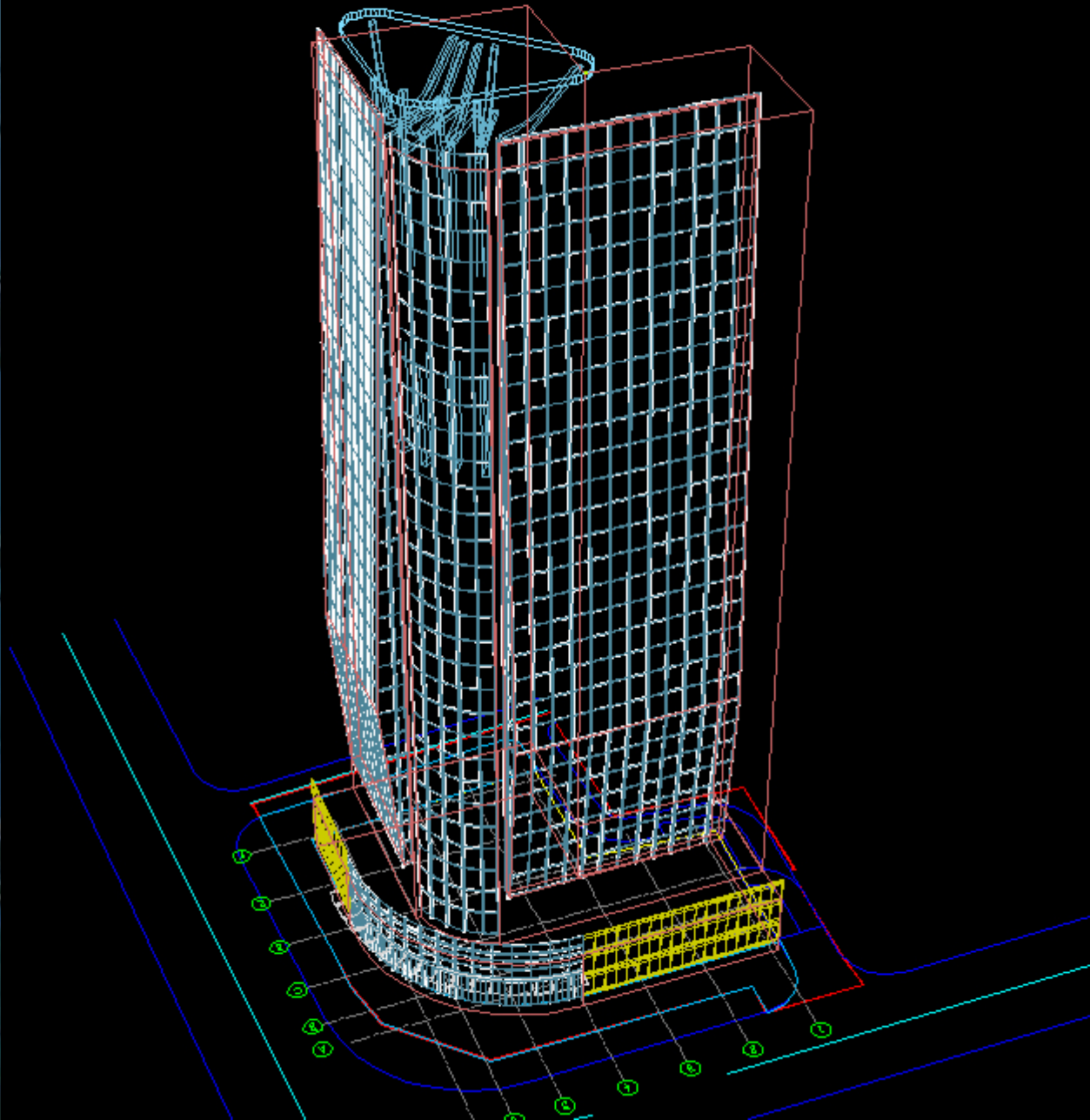
BIM MODEL

BIM Application



BIM MODEL

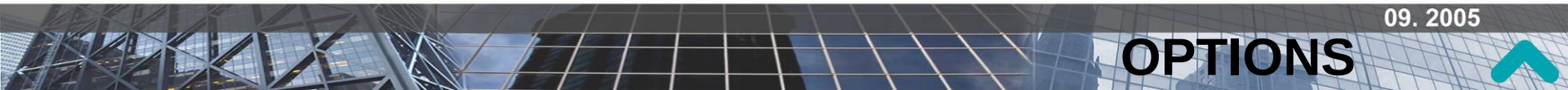
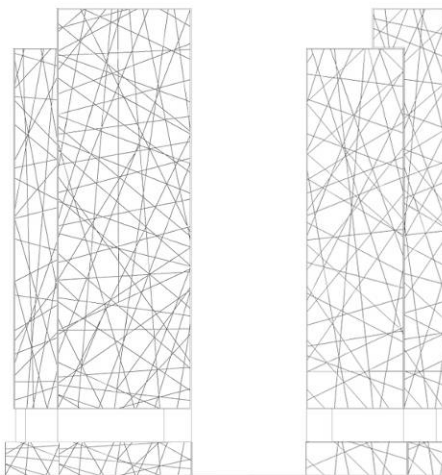
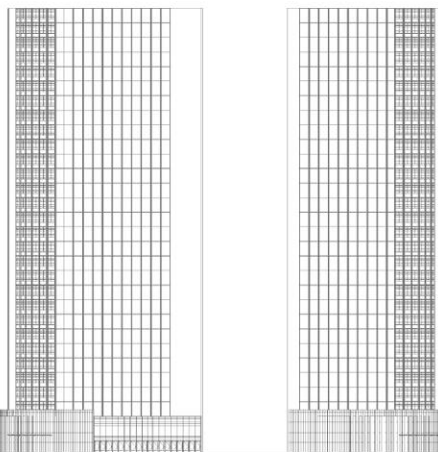
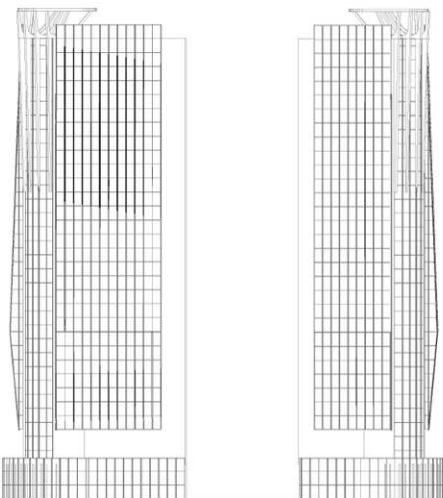
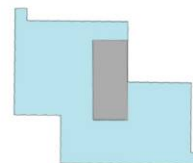
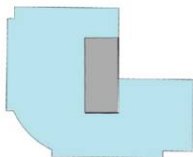
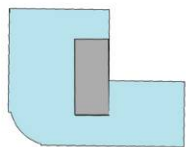
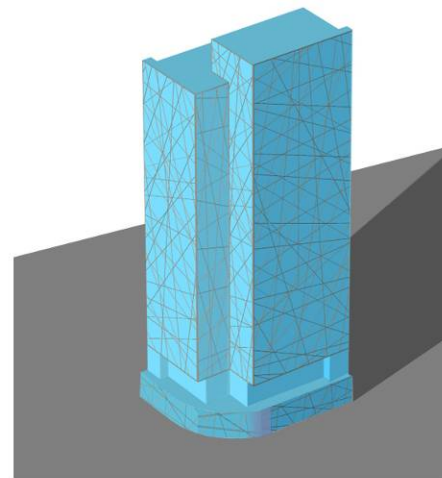
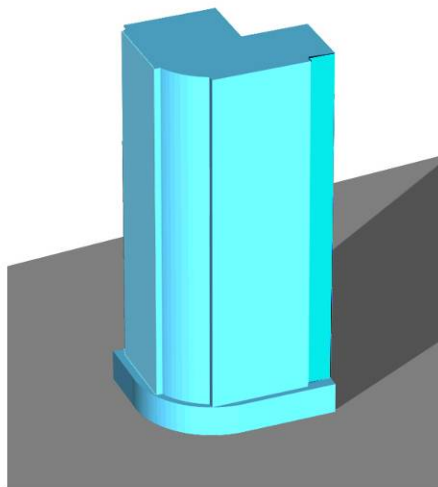
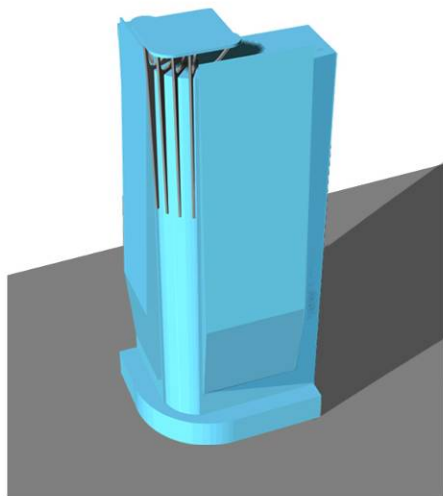
BIM Application





BIM Application

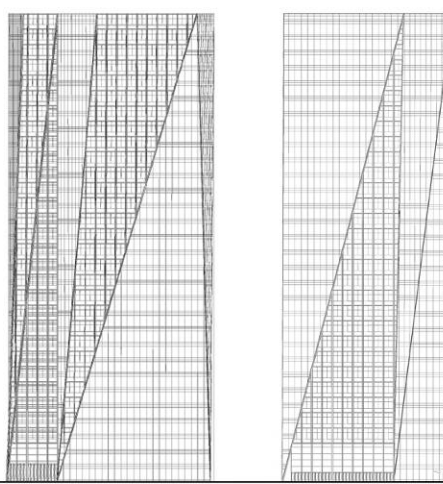
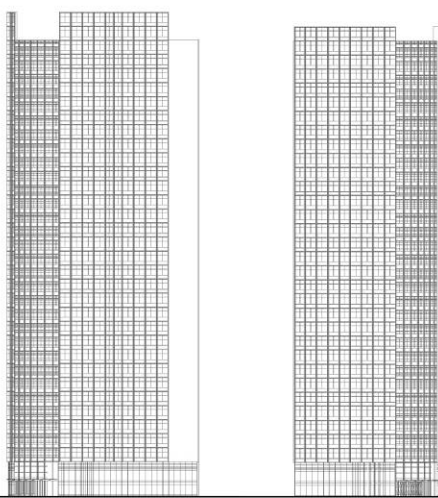
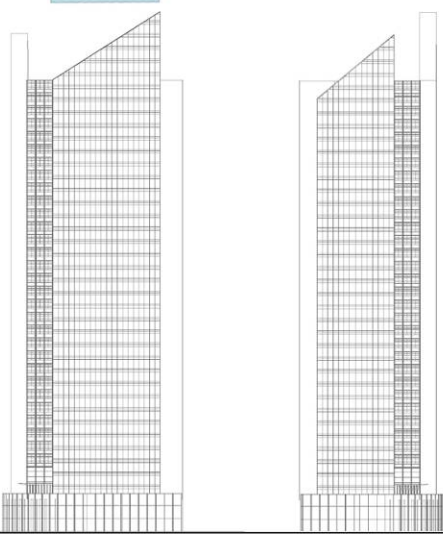
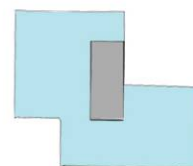
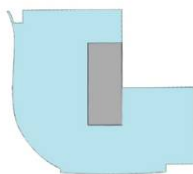
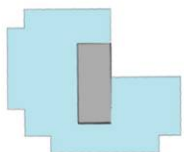
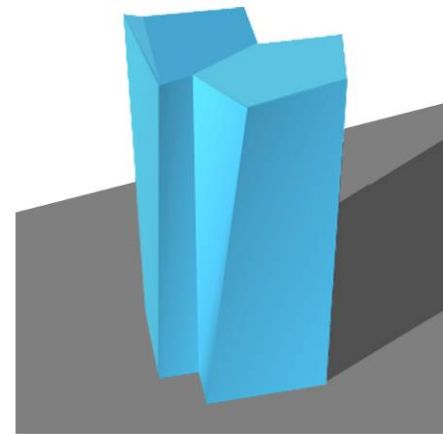
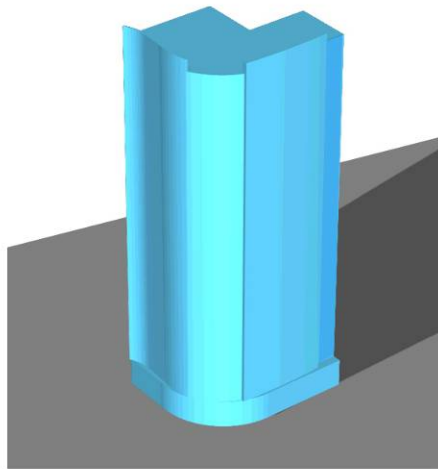
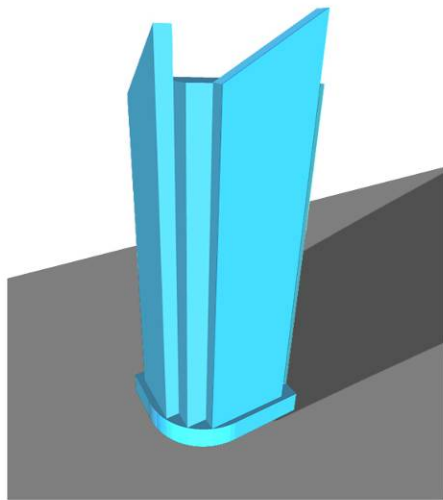




09. 2005

OPTIONS





09. 2005

OPTIONS





BIM Application



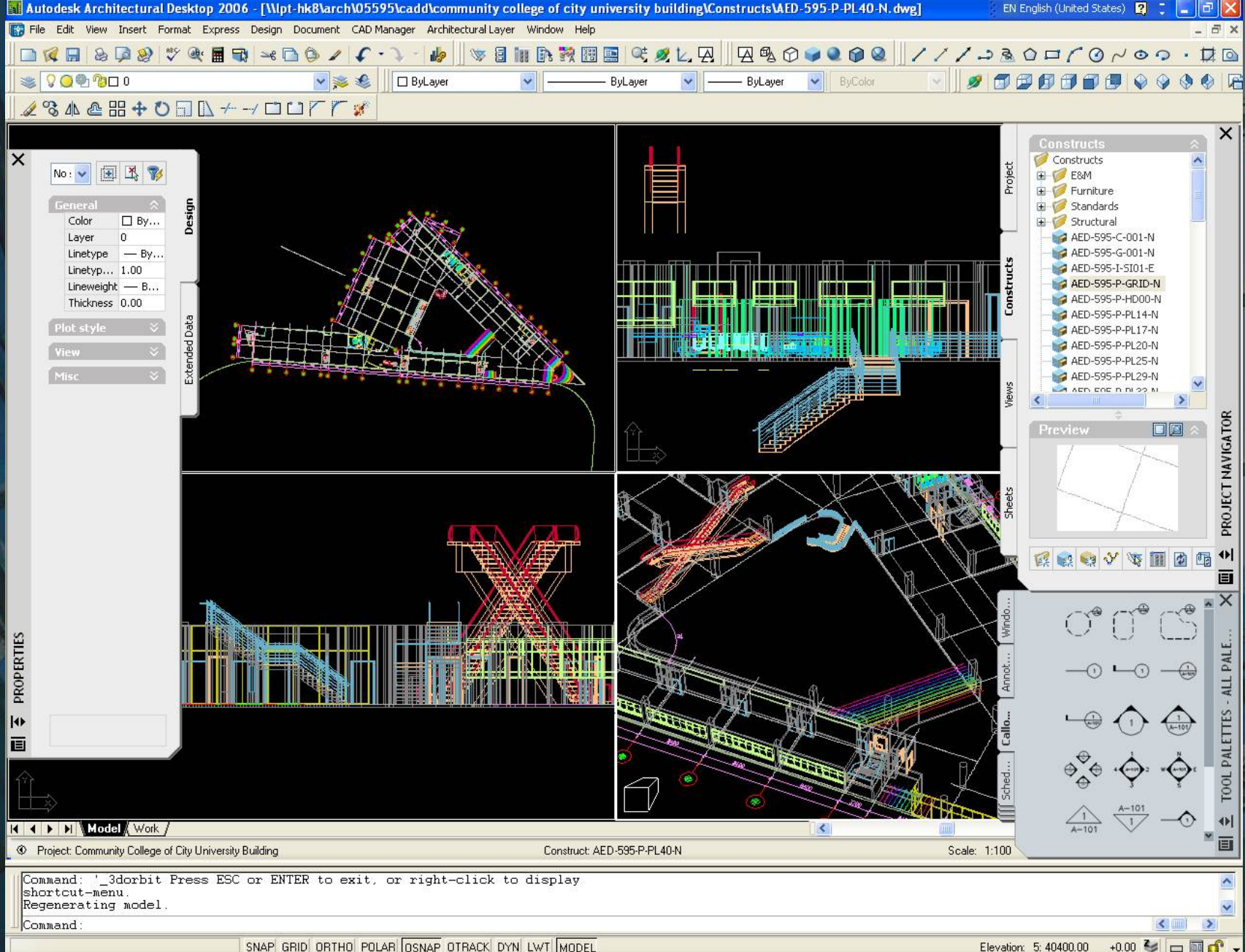
COMPLEX FORMS

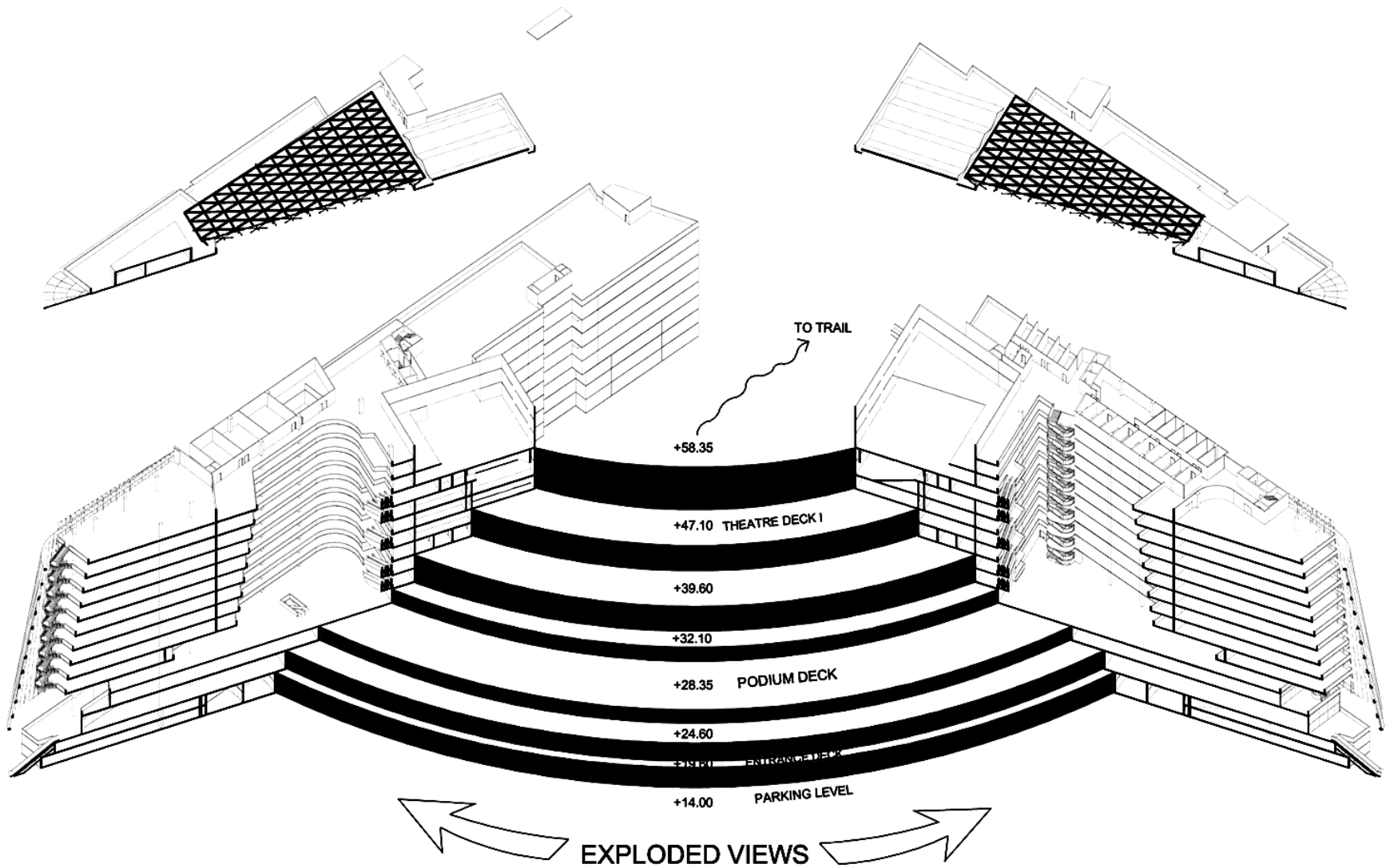


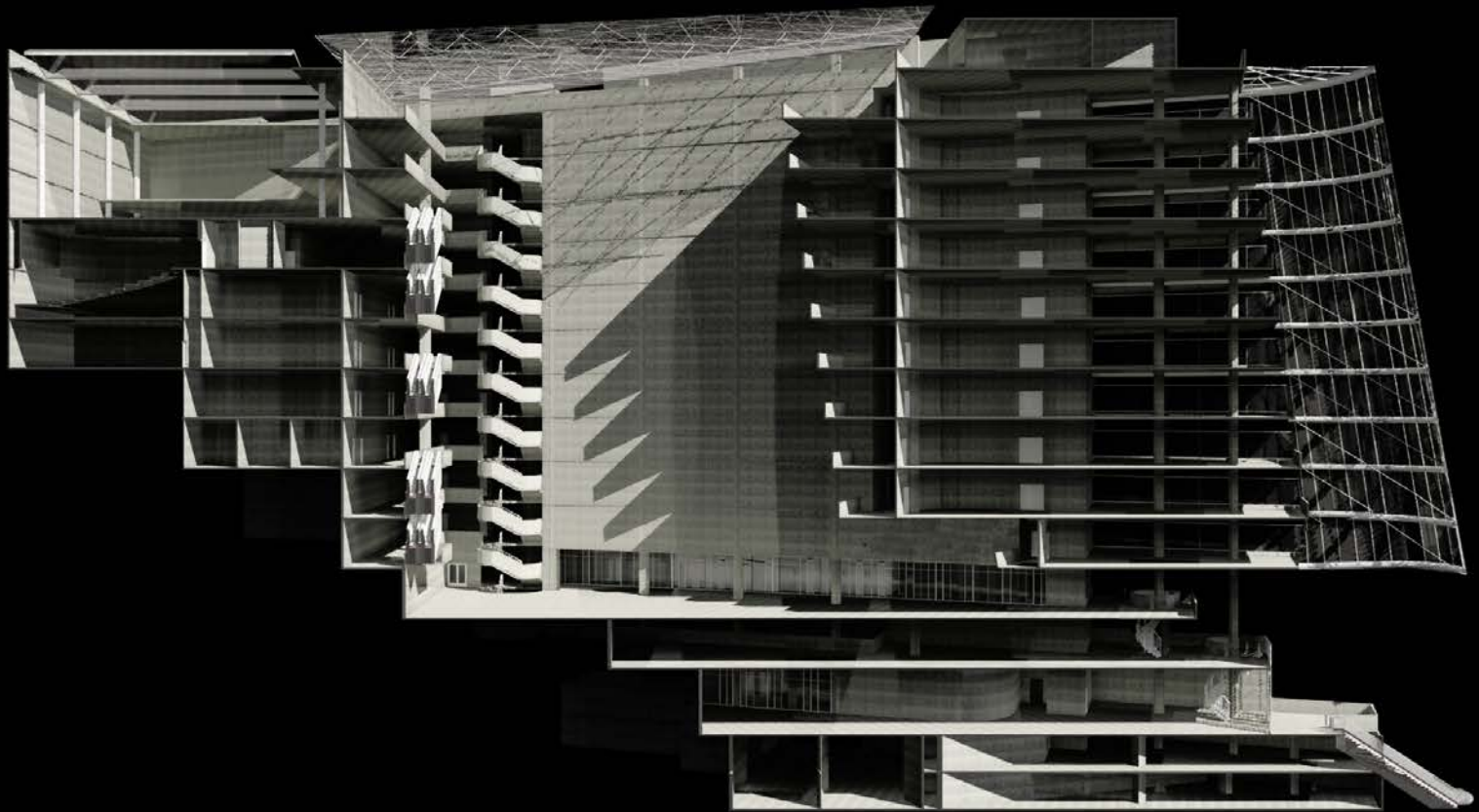
BIM Application



COMPLEX FORMS





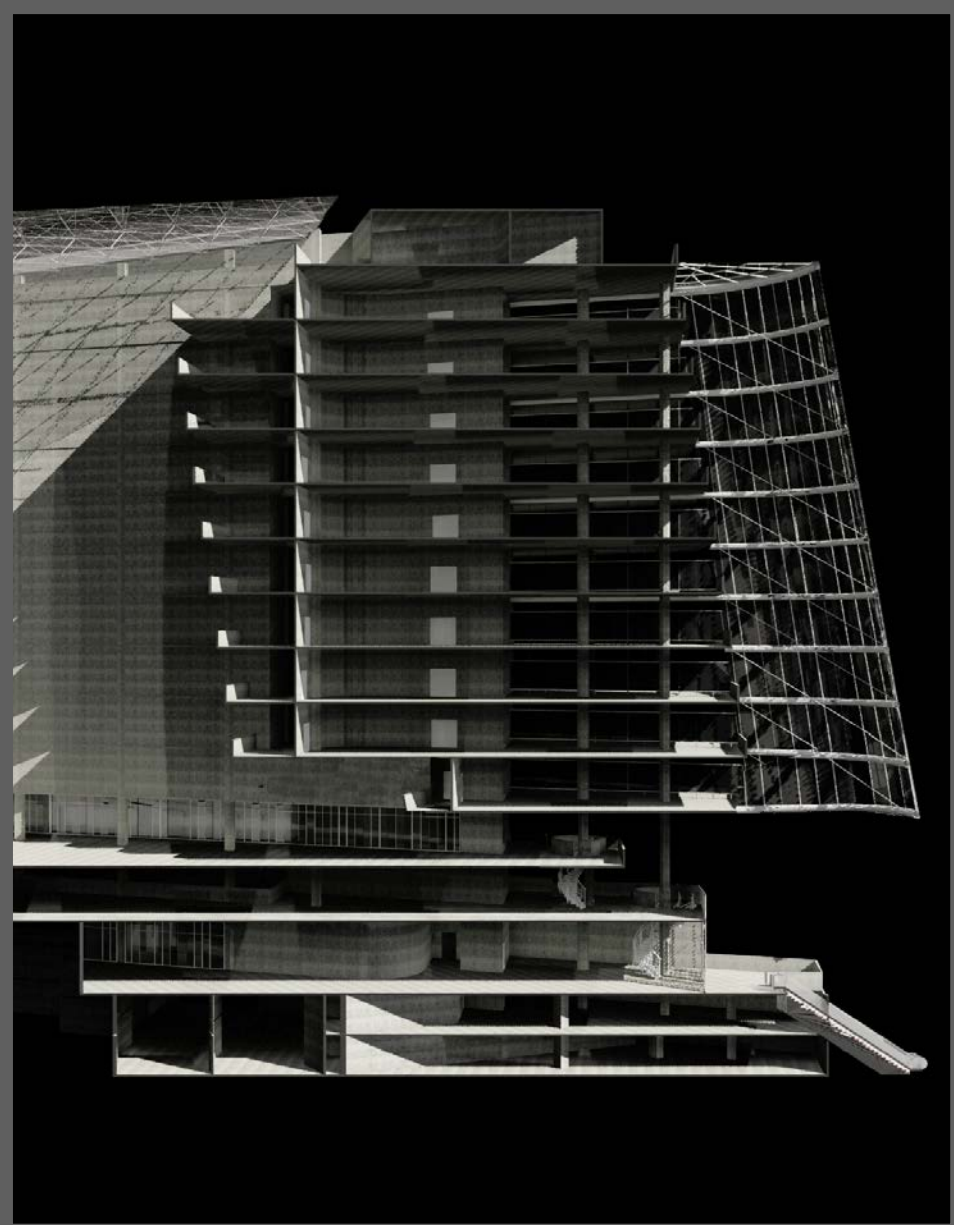


BIM Application

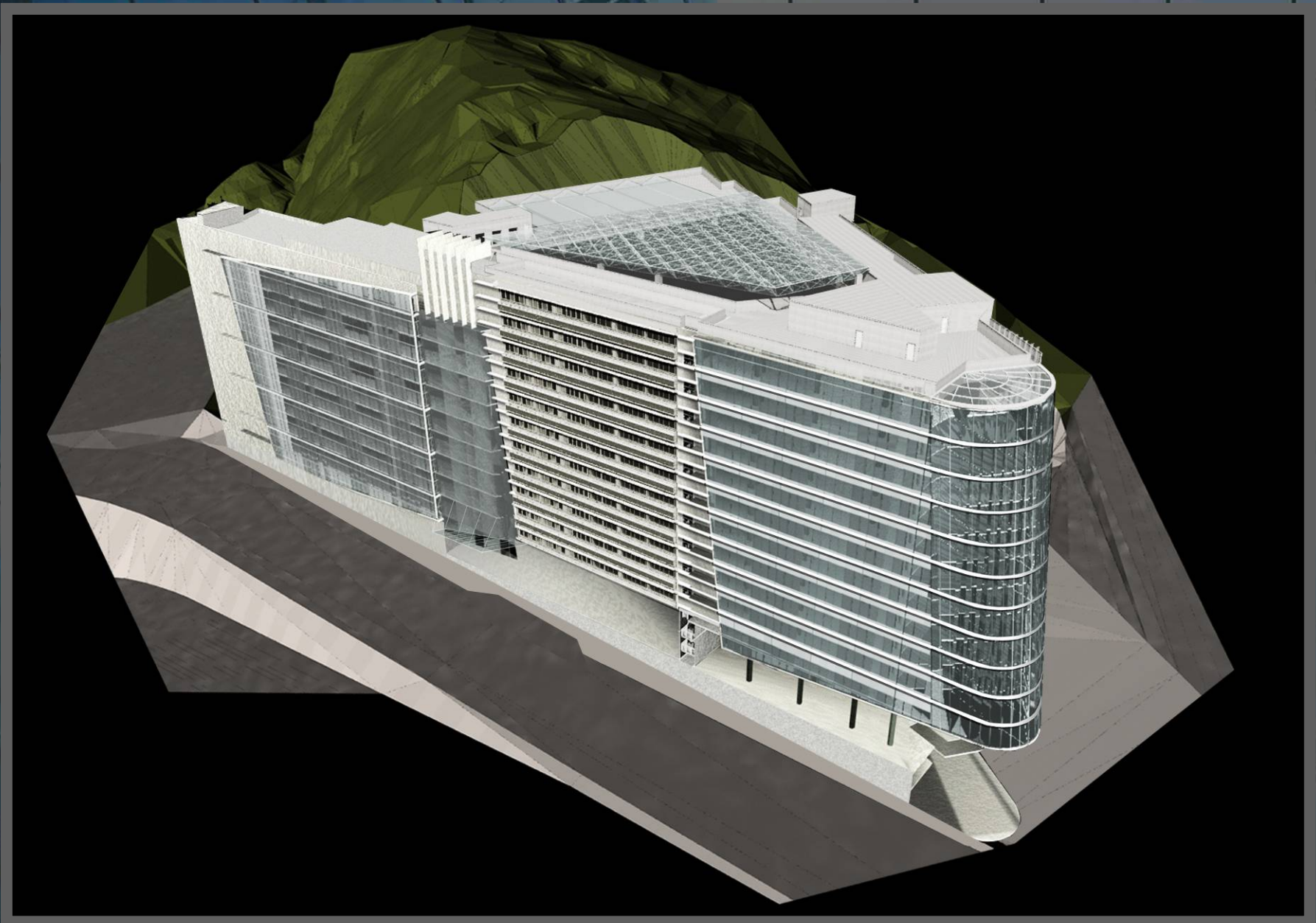
RENDERING



BIM Application

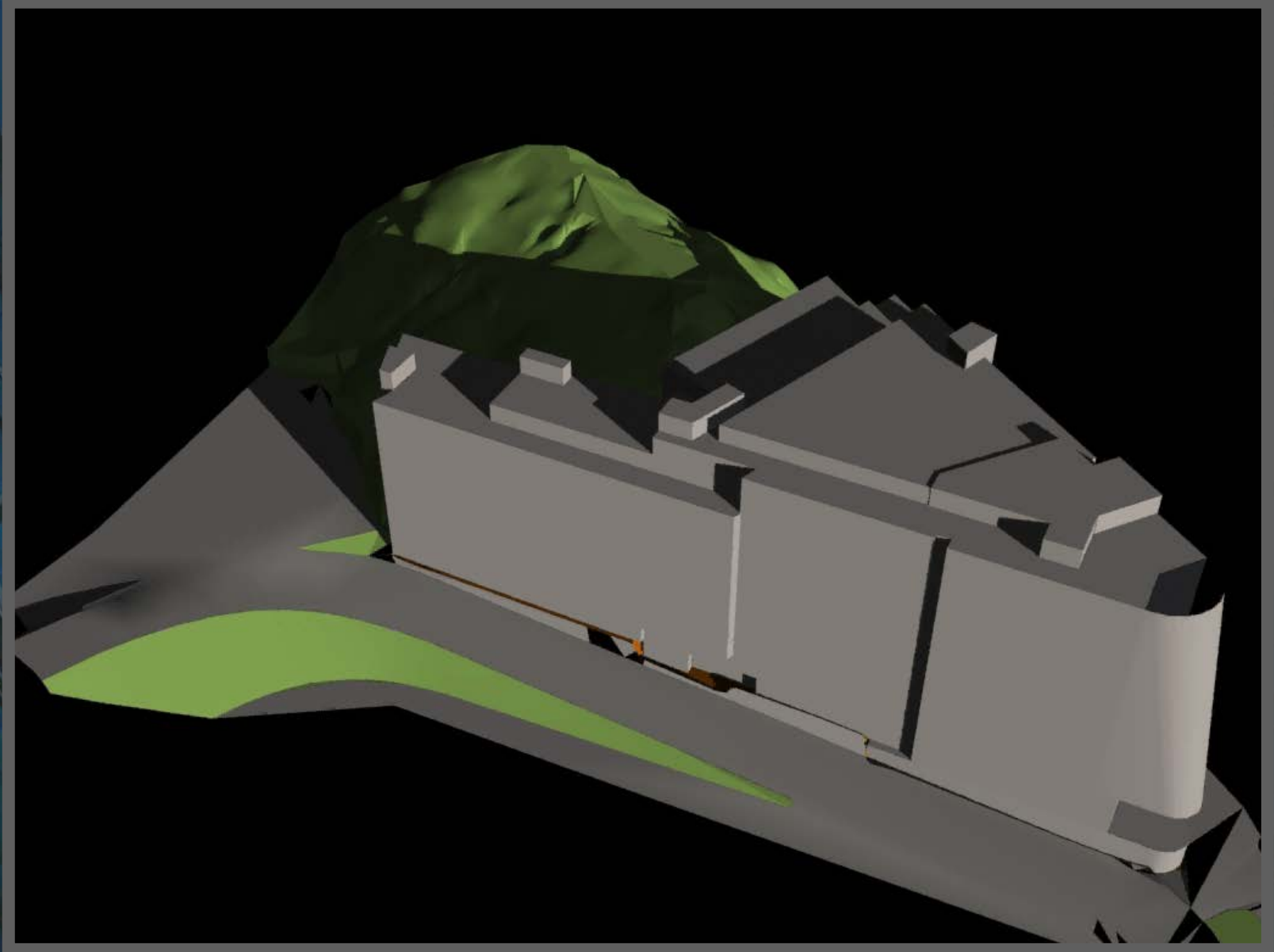


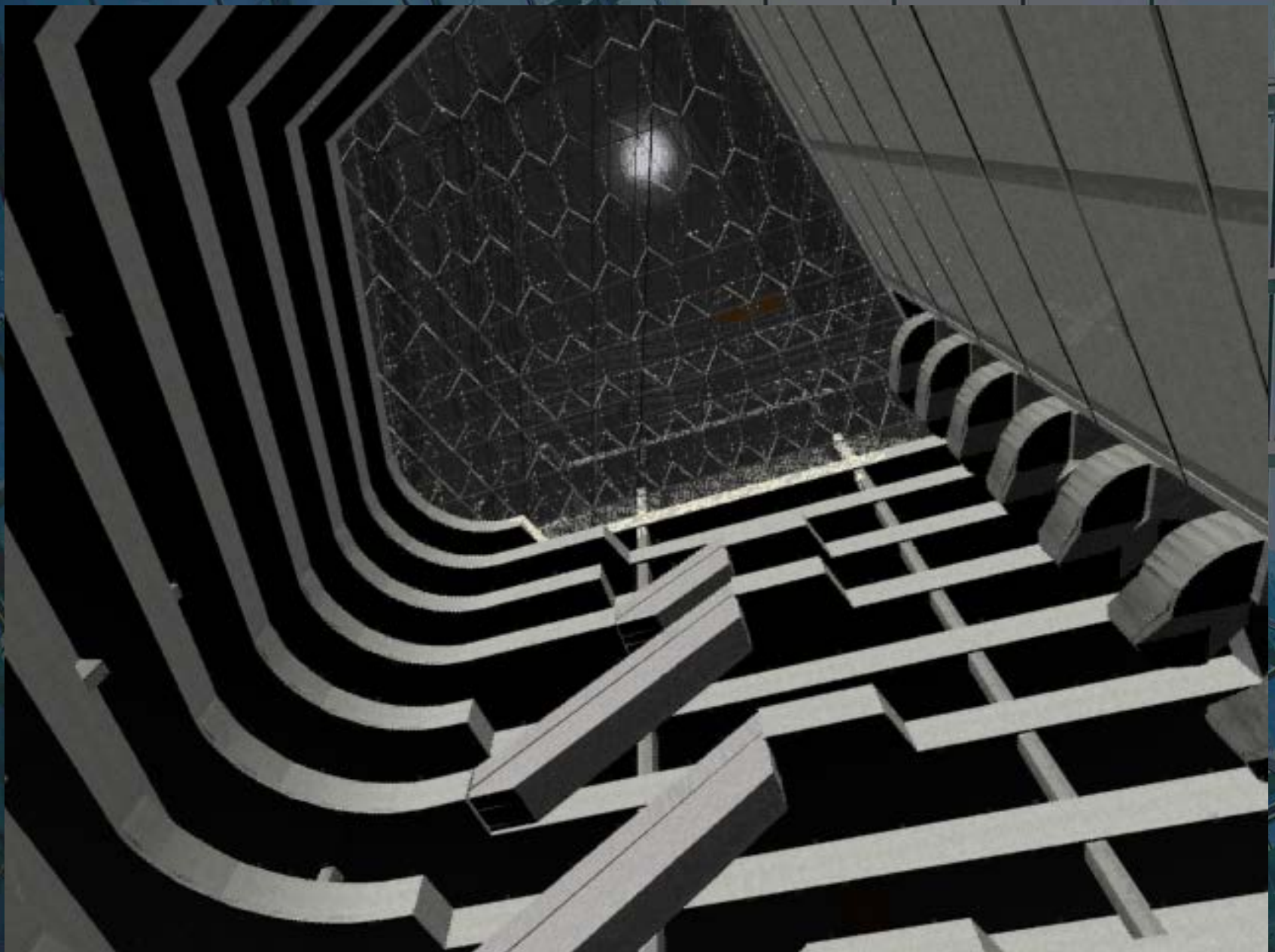
GENERATED VIEWS



BIM Application

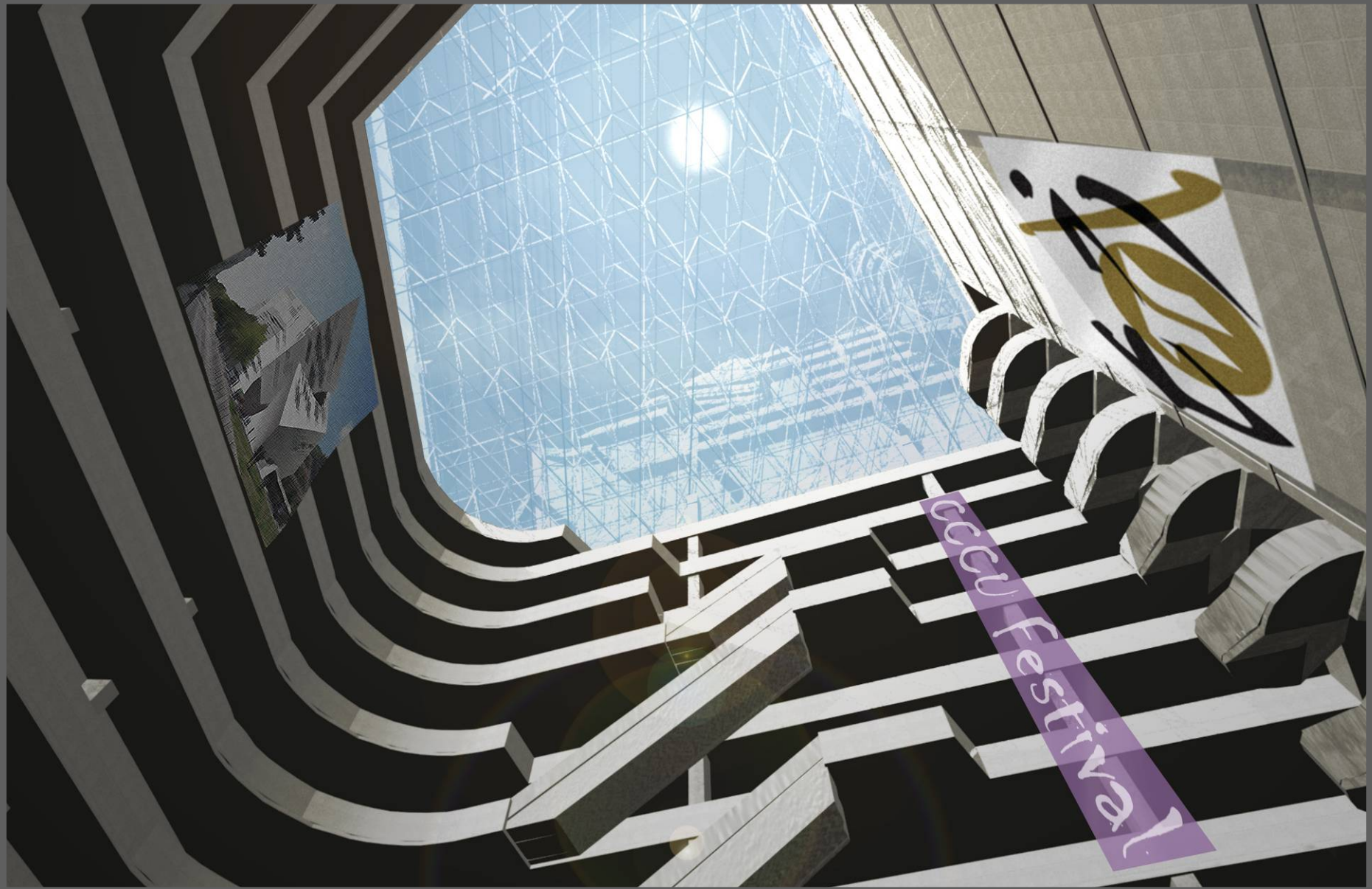
RENDERING

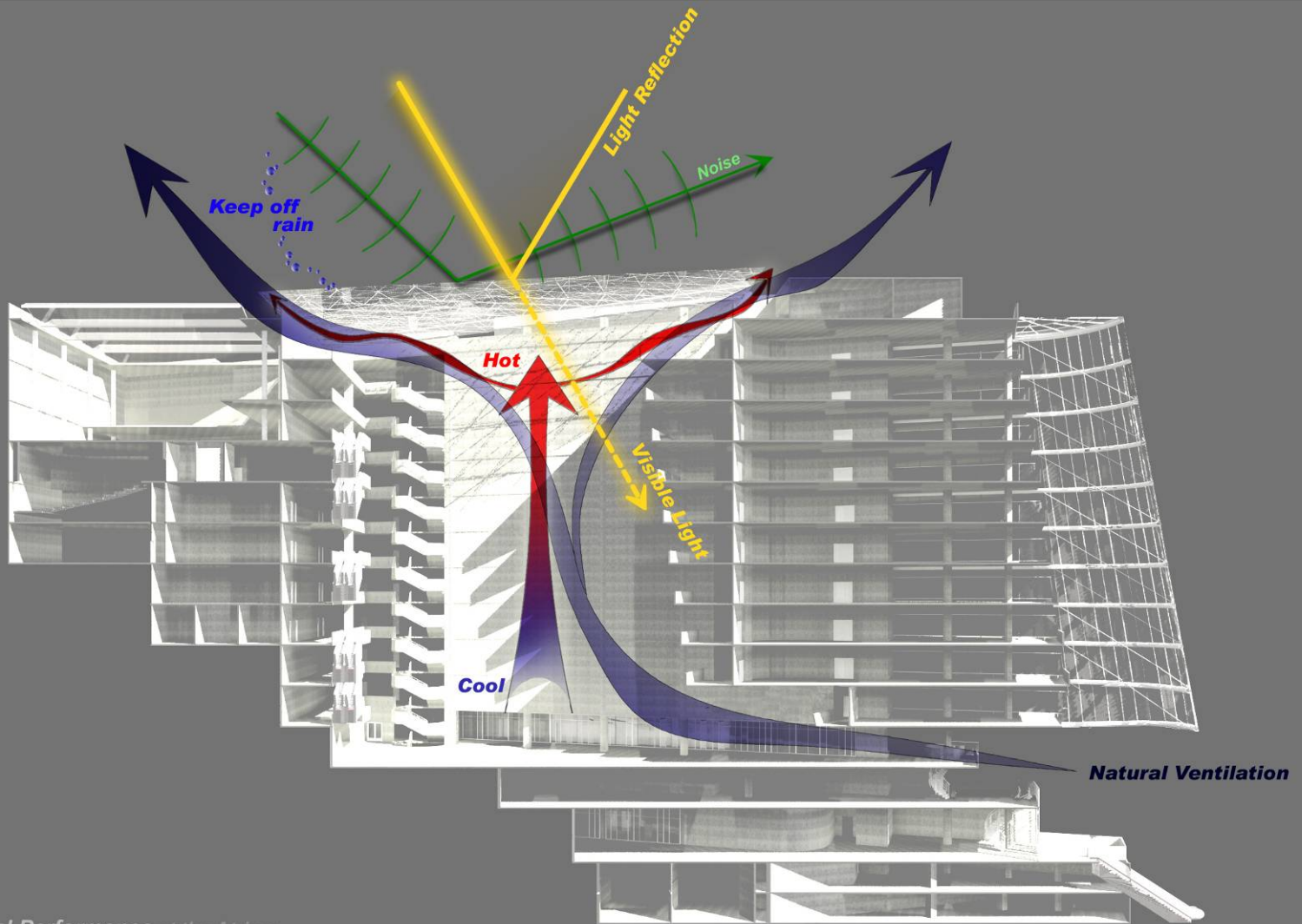




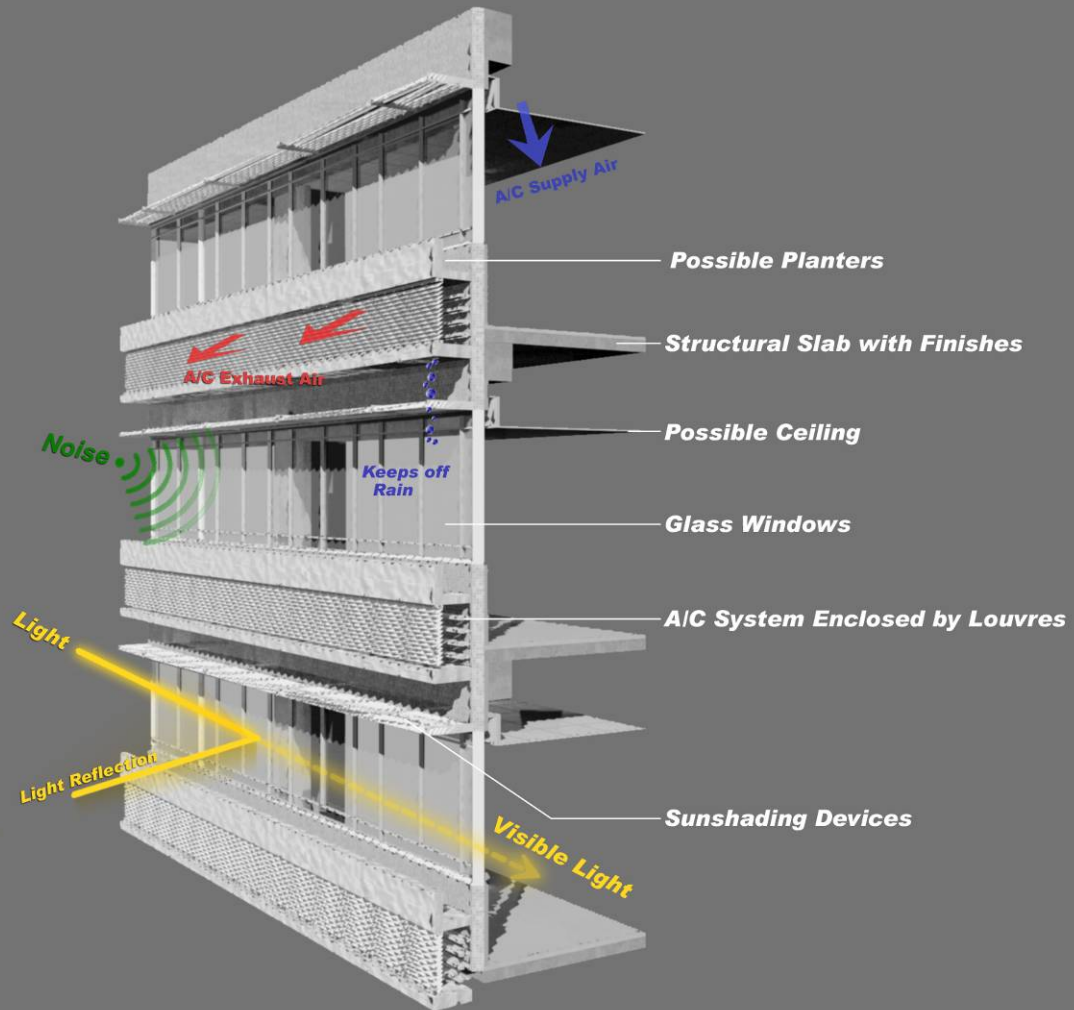
BIM Application

SOLAR STUDY 21/12/2004 7:00am – 6:00pm

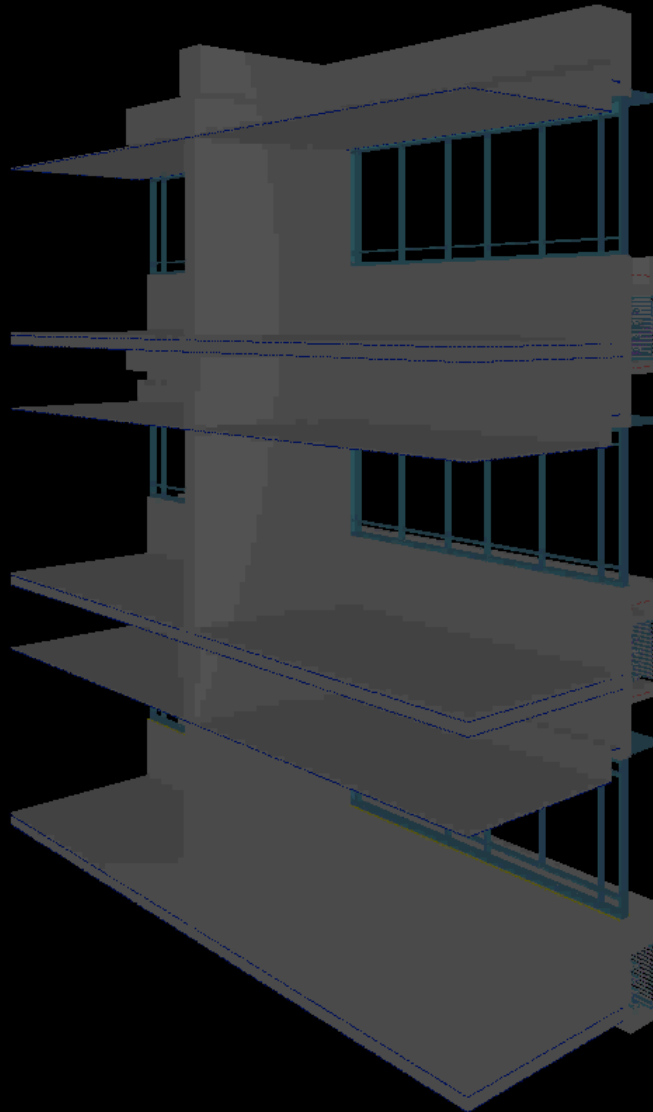


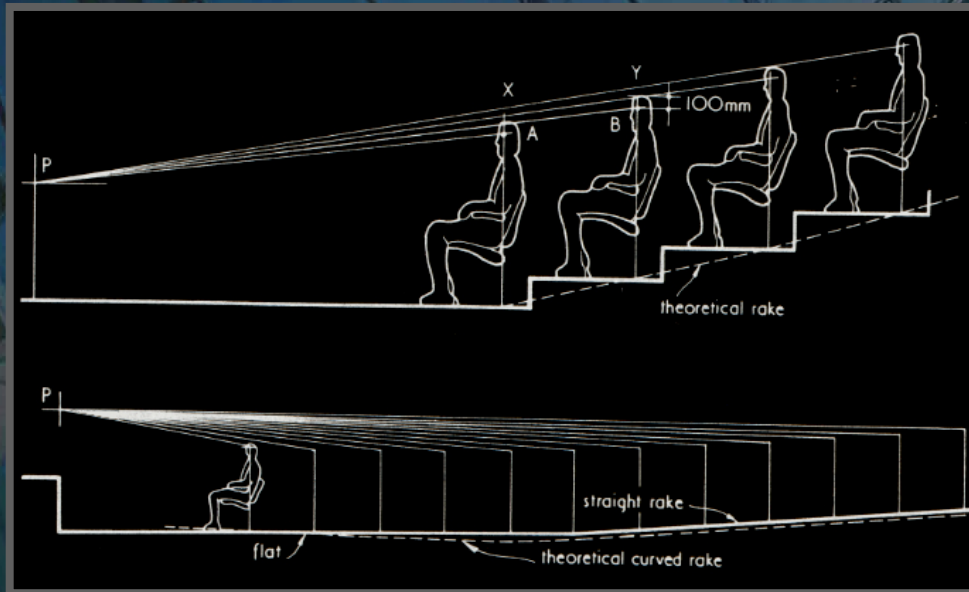


*Environmental Performance at the Atrium -
Courtyard Scheme*



*Analysis of the Facade -
Typical Classroom Modules*

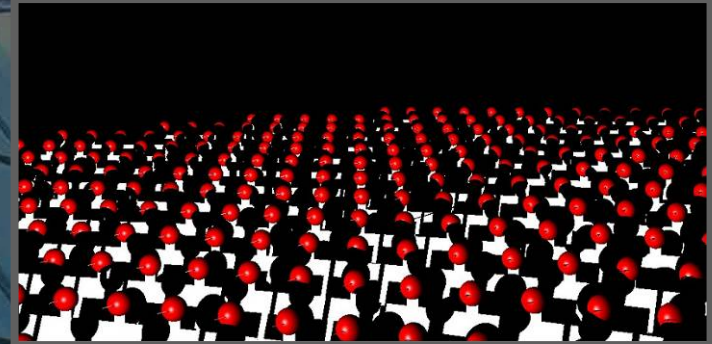
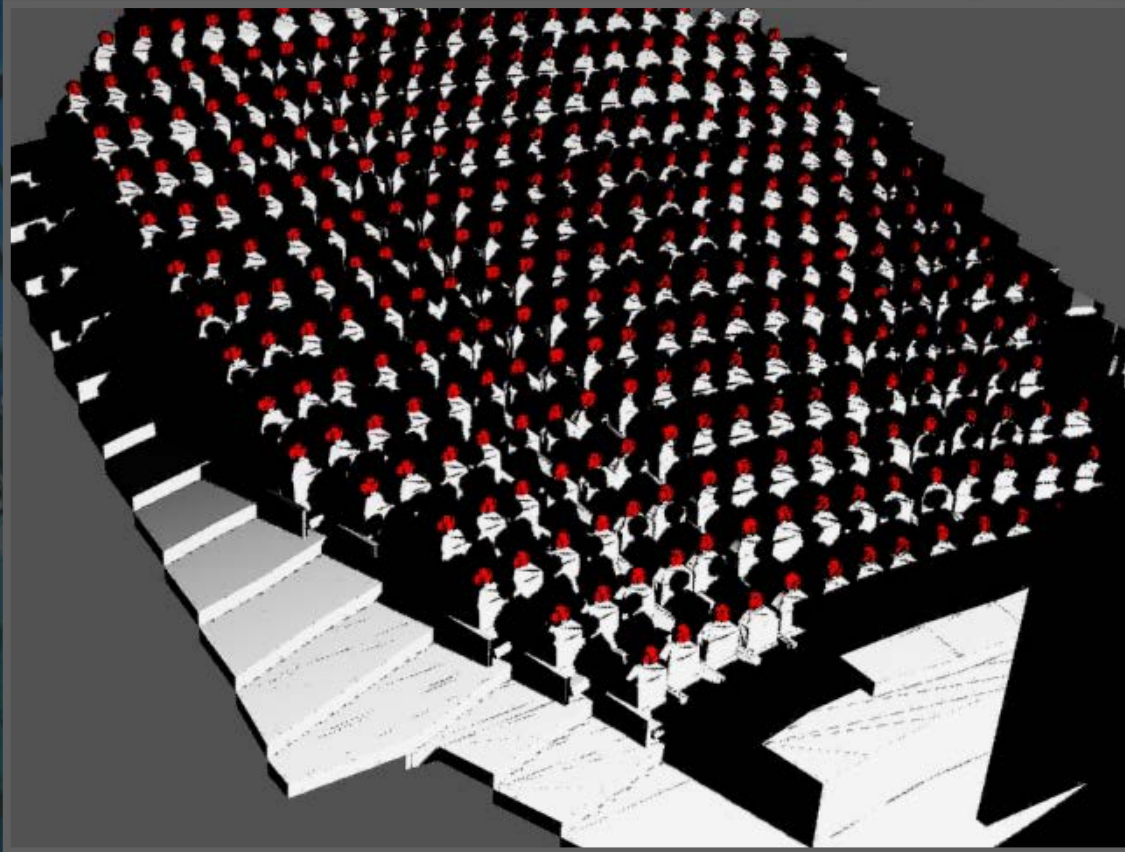




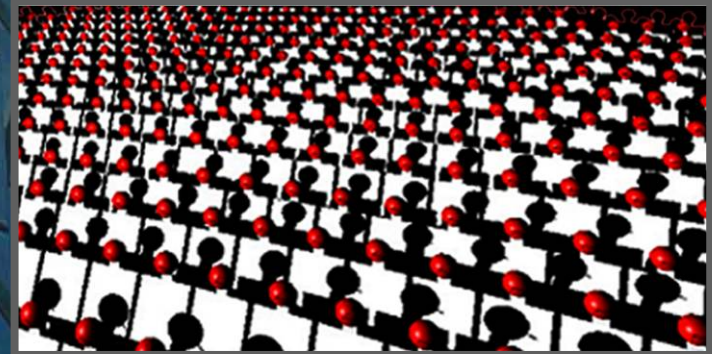
Traditional Sightline Study

Problems:

- Inaccurate measure of sight blockage.
- Cannot determine the positioning of sightlines of seats other than from the center row.



Unsatisfactory sightlines



Satisfactory sightlines

Radiating Light Method



BIM Application

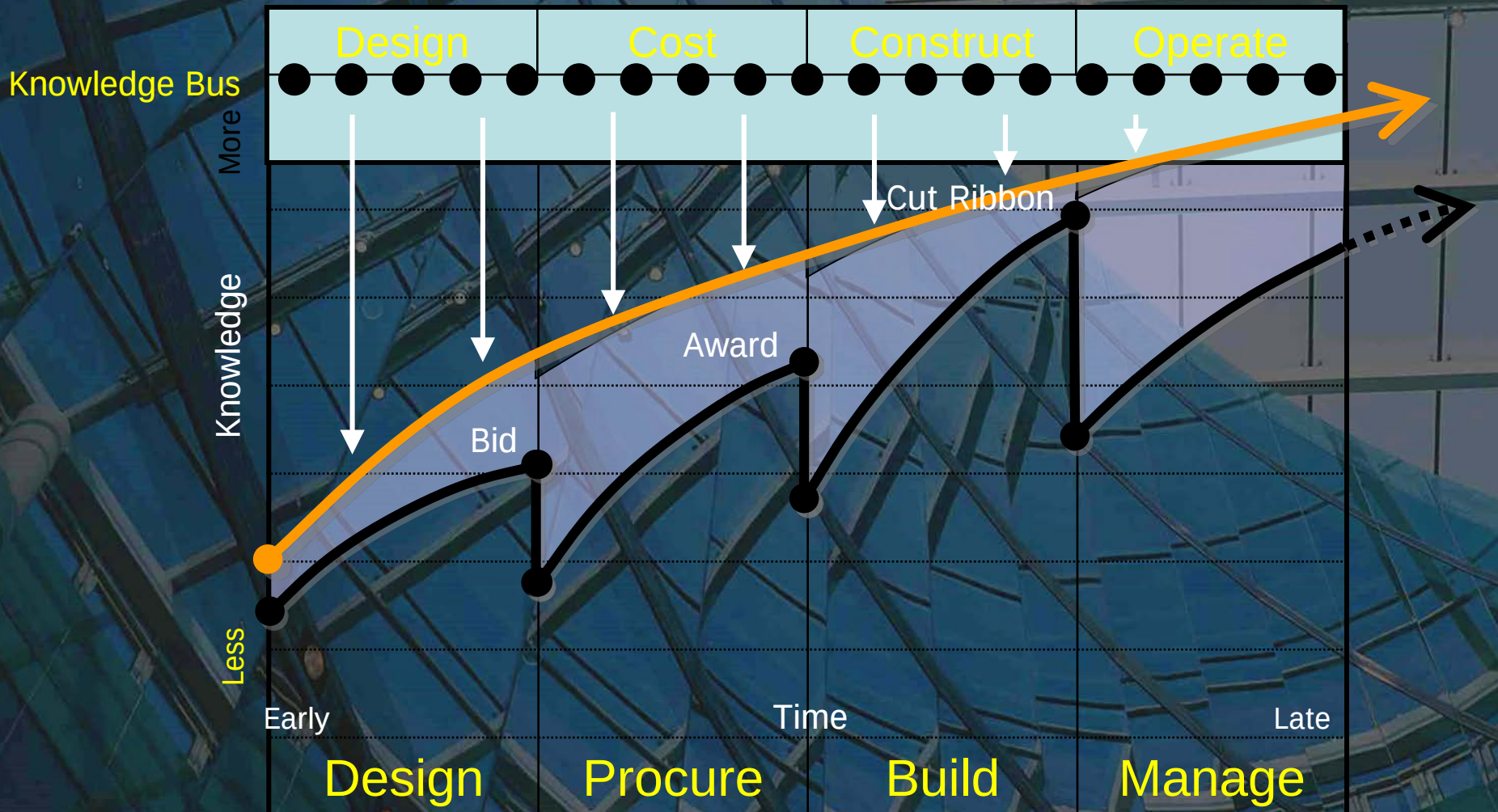
SIGHTLINE STUDIES

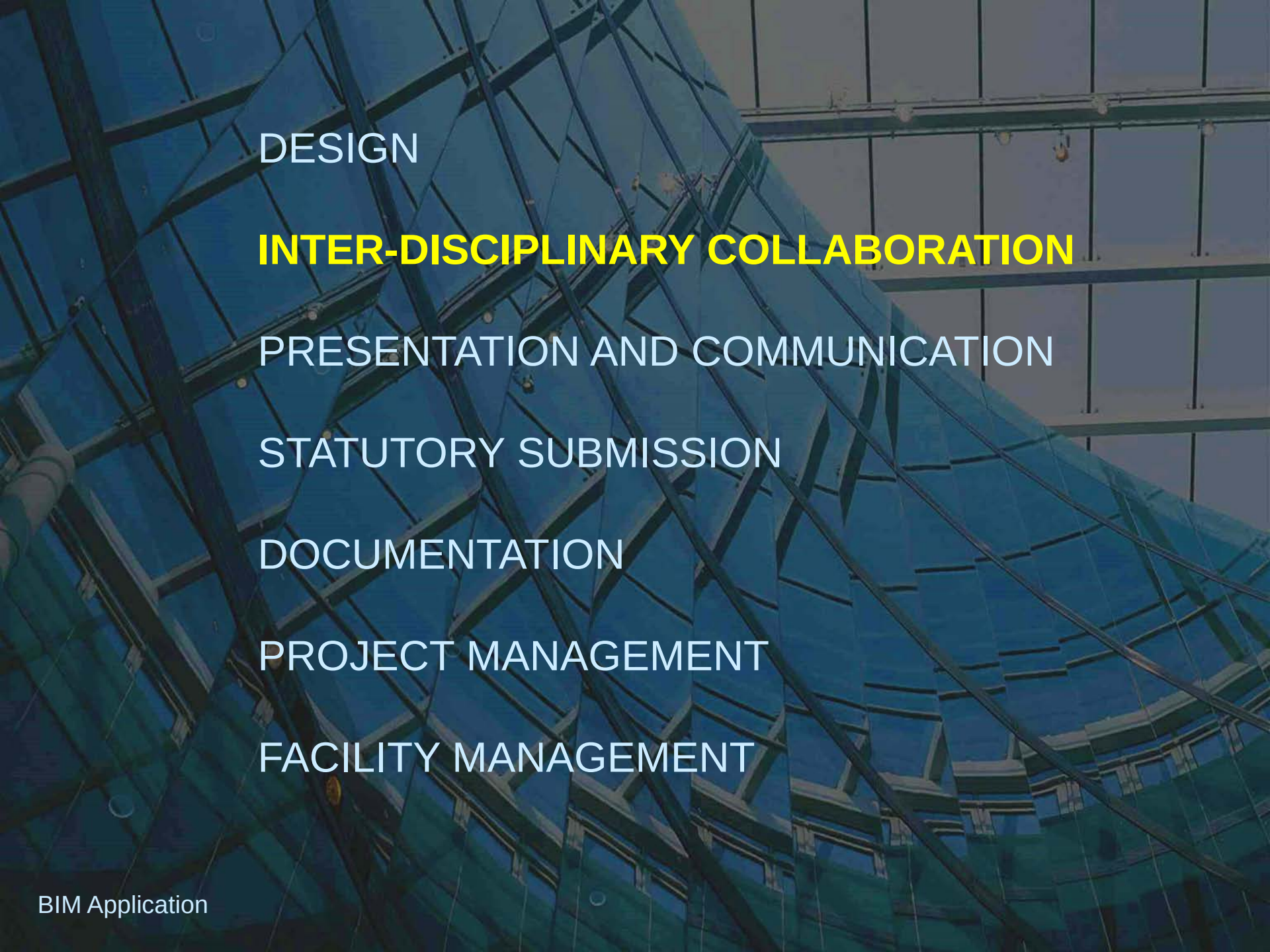




BIM Application

Knowledge Sources





DESIGN

INTER-DISCIPLINARY COLLABORATION

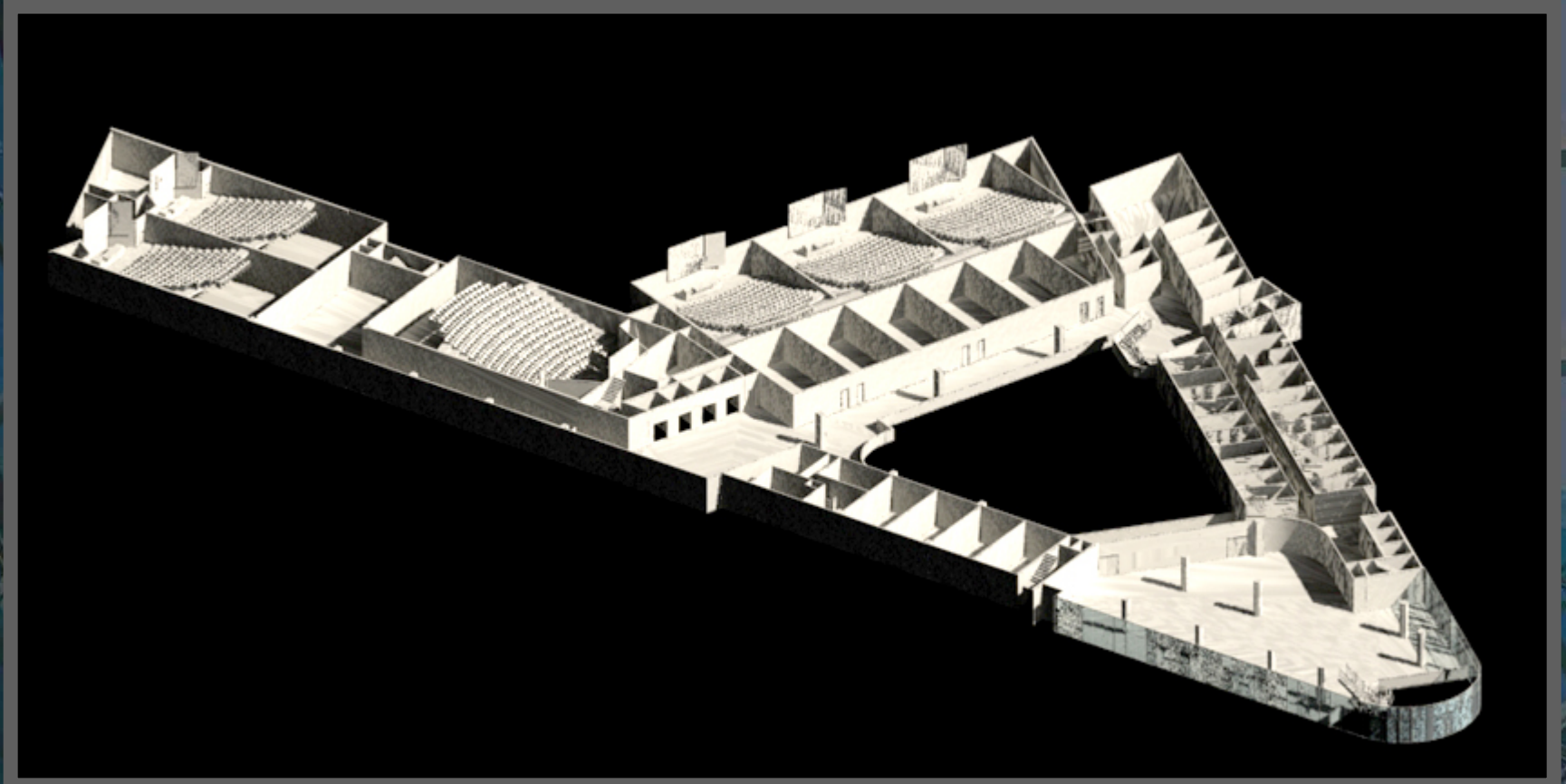
PRESENTATION AND COMMUNICATION

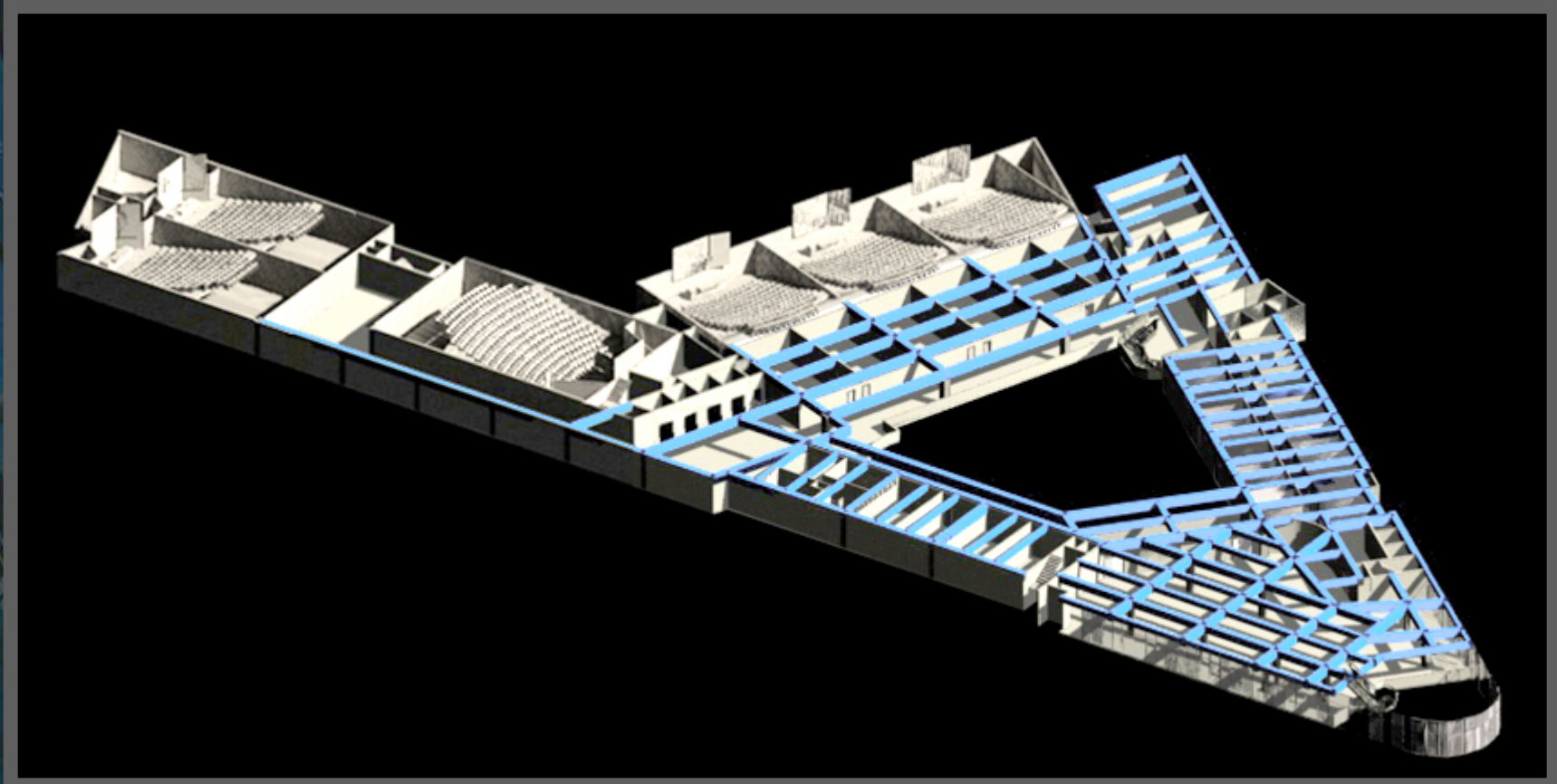
STATUTORY SUBMISSION

DOCUMENTATION

PROJECT MANAGEMENT

FACILITY MANAGEMENT

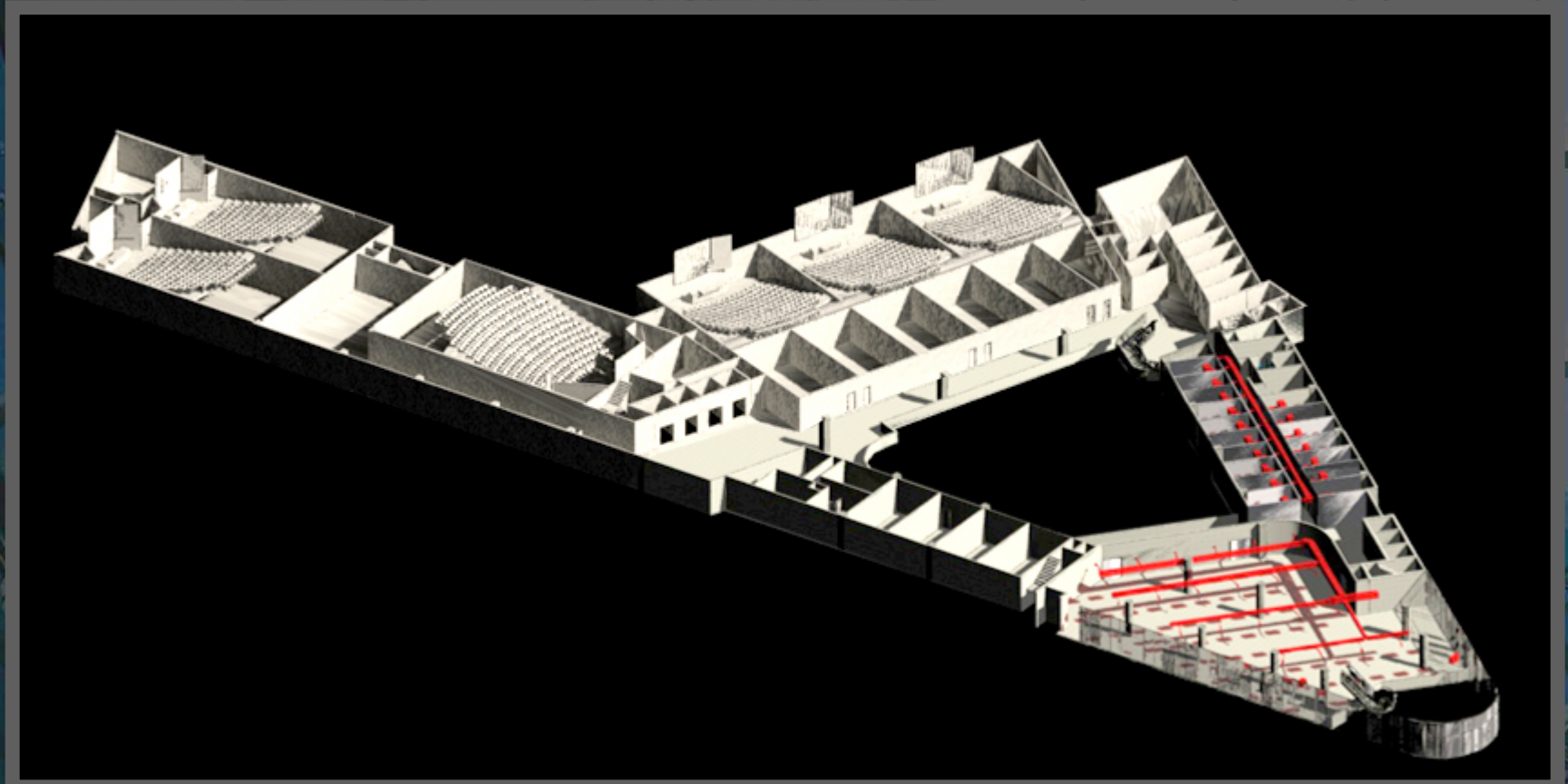




BIM Application

Architecture + Structure

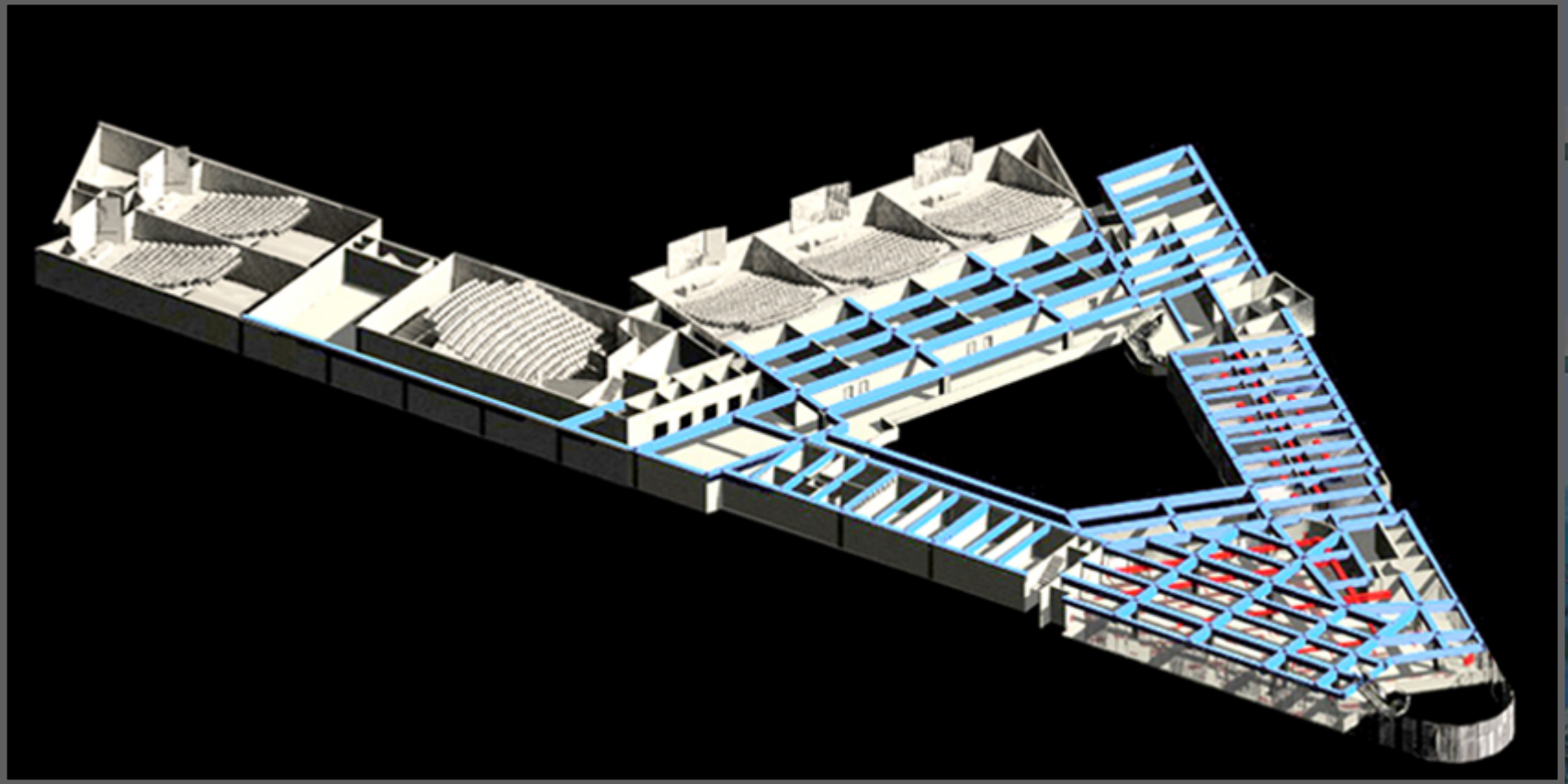
Autodesk Architectural Desktop 2006 for Structure



BIM Application

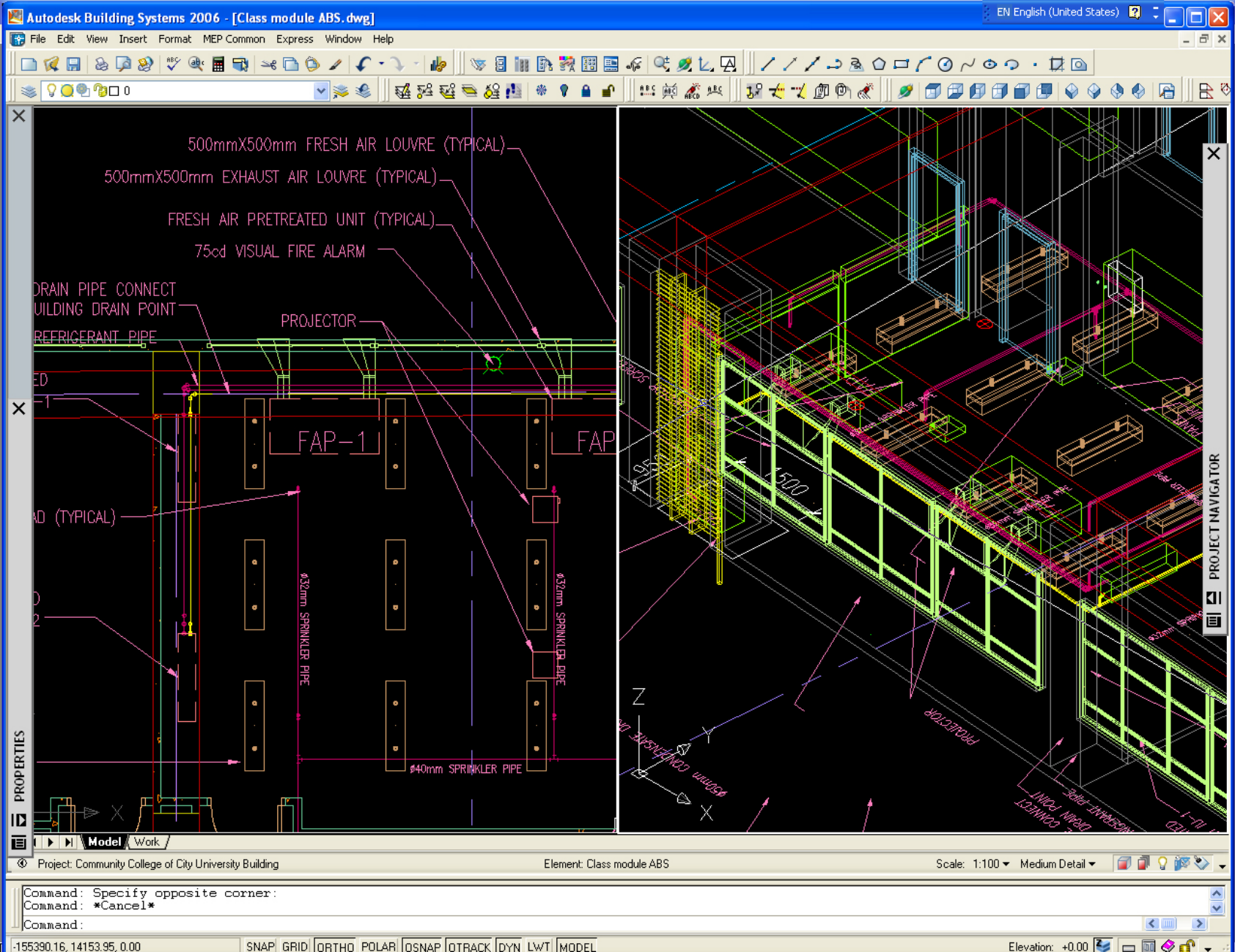
Architecture + E&M

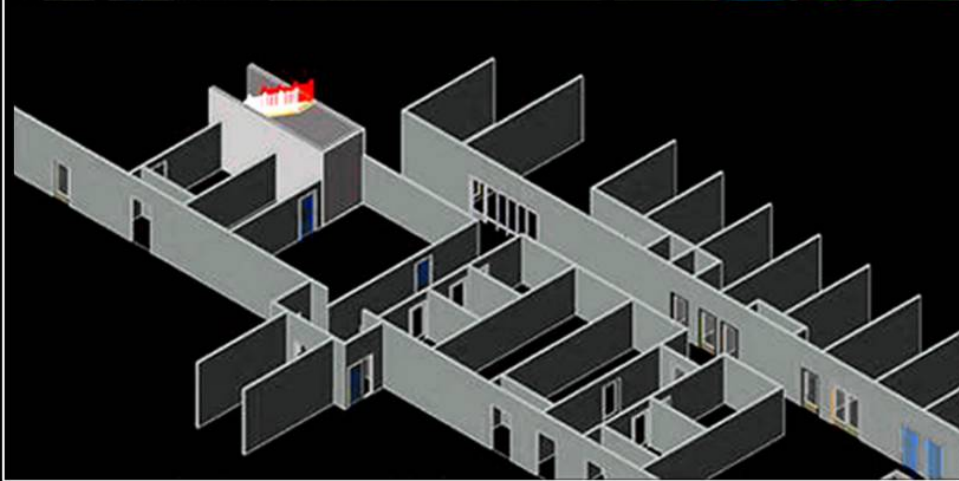
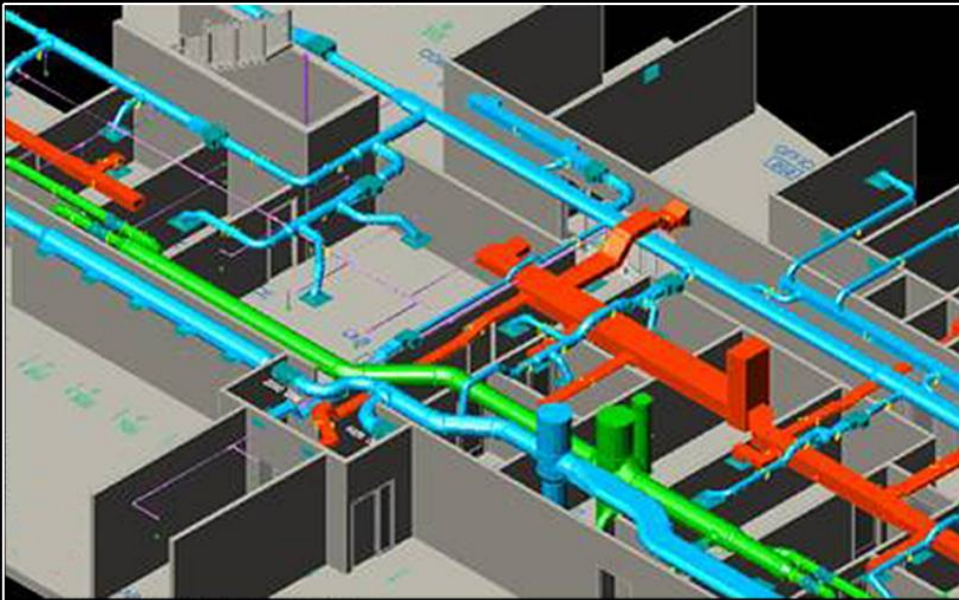
Autodesk Building Systems 2006 for E&M



BIM Application

Architecture + Structure + E&M





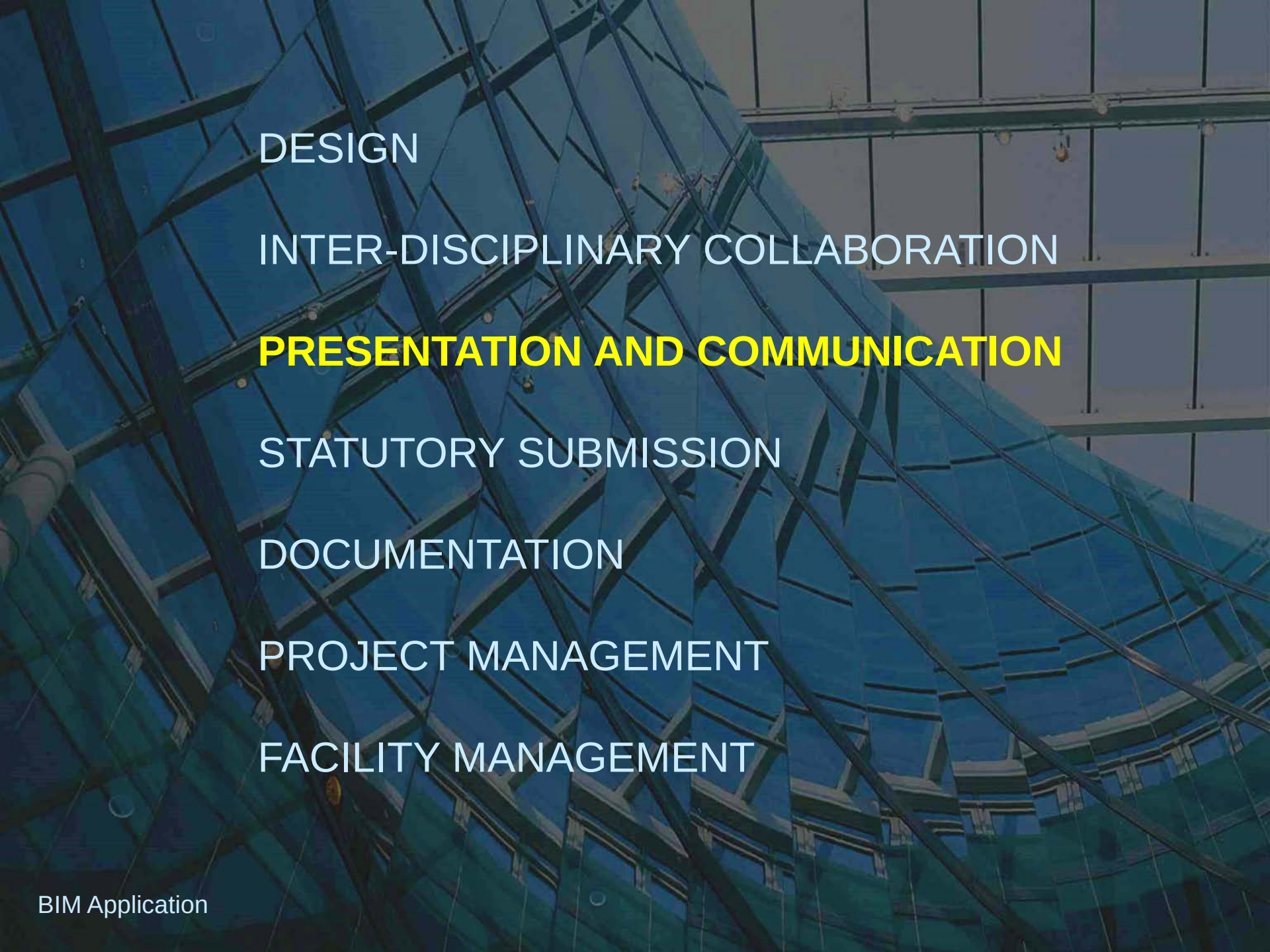
Clash Analysis

**Full set of construction
Combined Services Drawings
produced**

Close-up collaboration



INTERACTIVE COLLABORATION OF INFORMATION
COST



DESIGN

INTER-DISCIPLINARY COLLABORATION

PRESENTATION AND COMMUNICATION

STATUTORY SUBMISSION

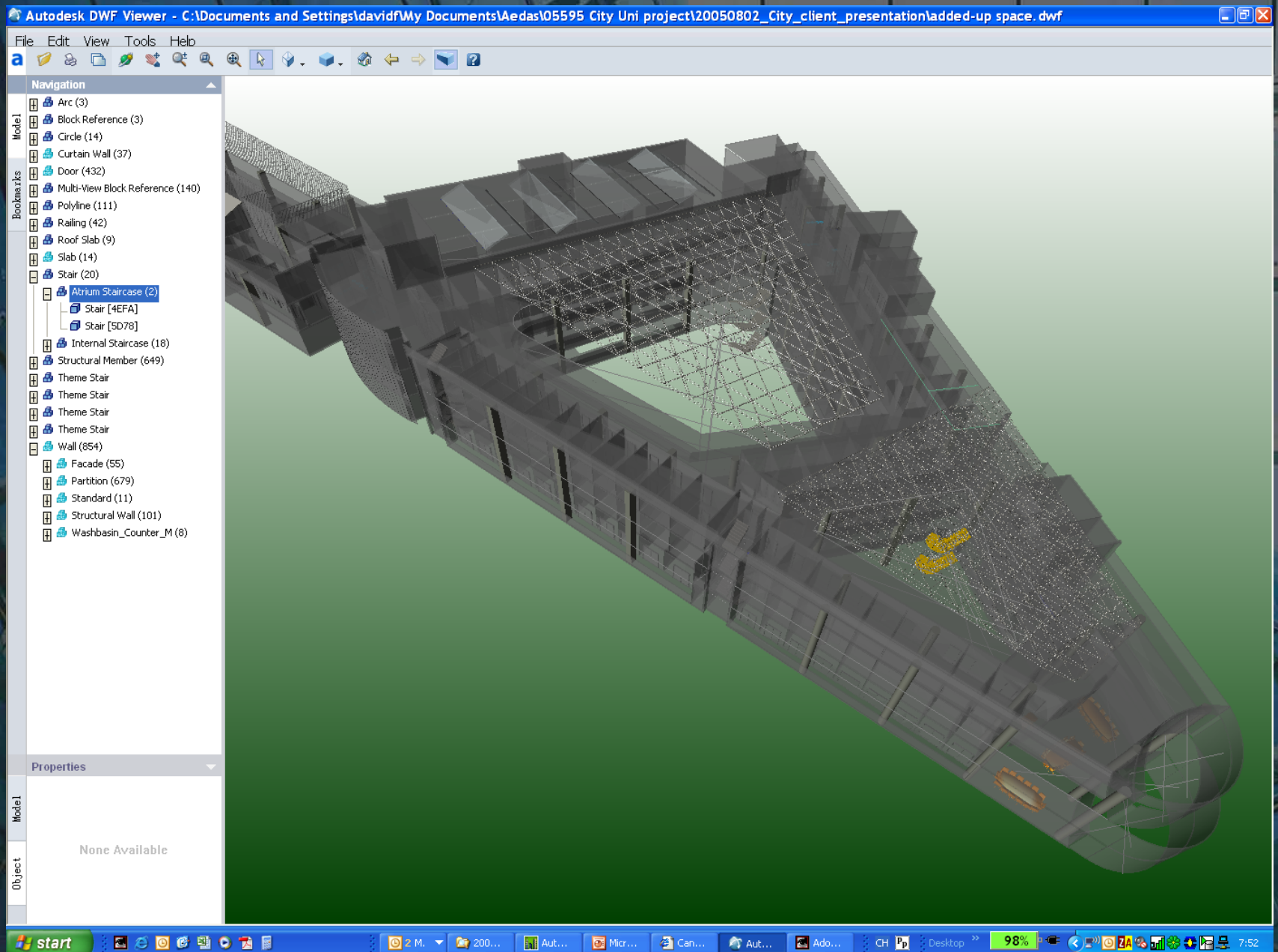
DOCUMENTATION

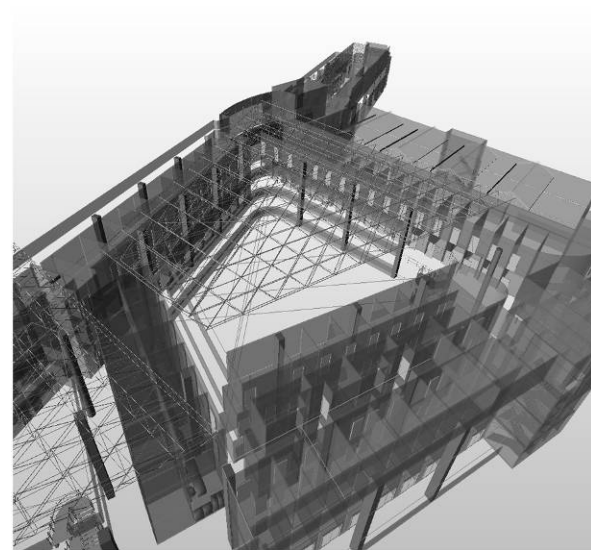
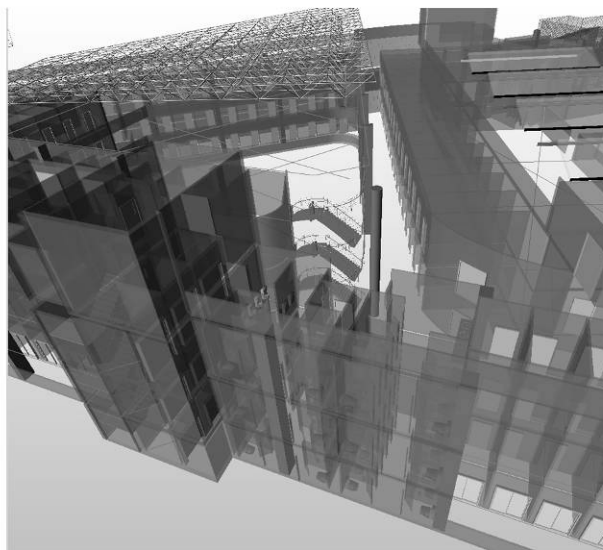
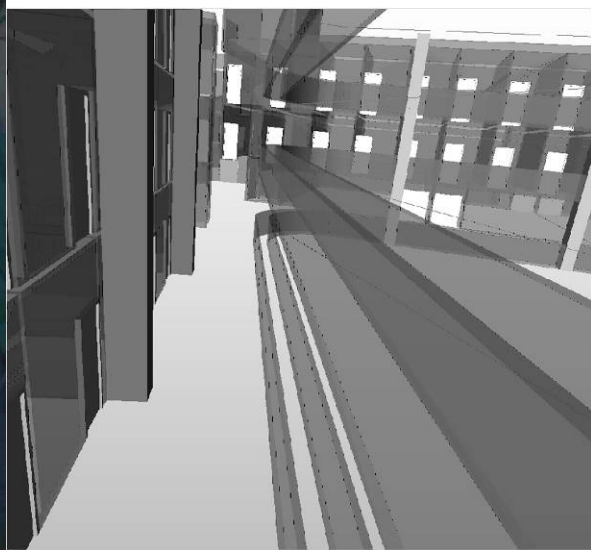
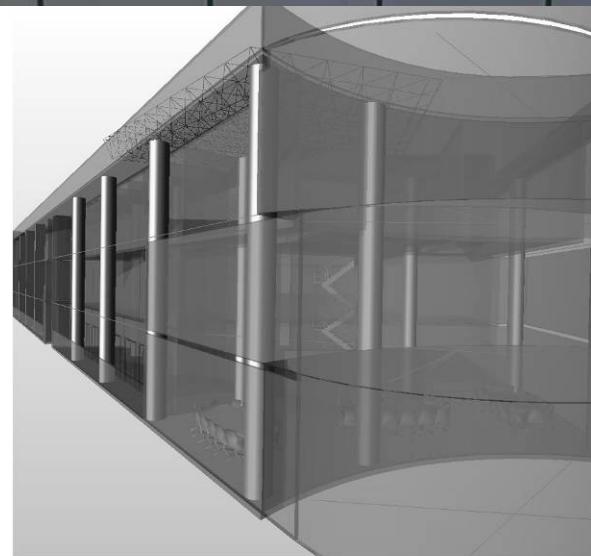
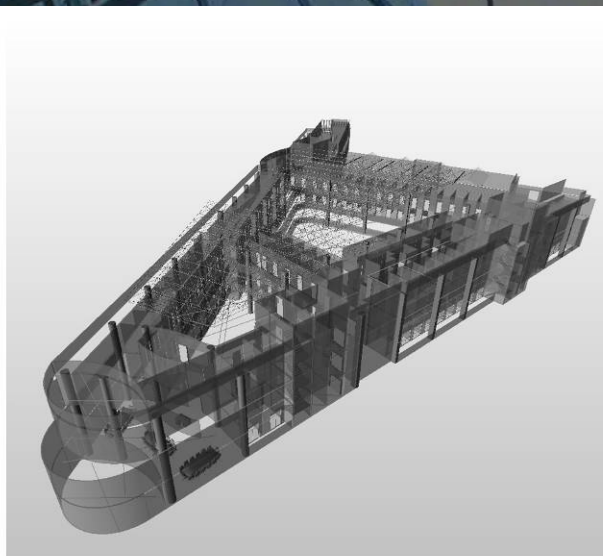
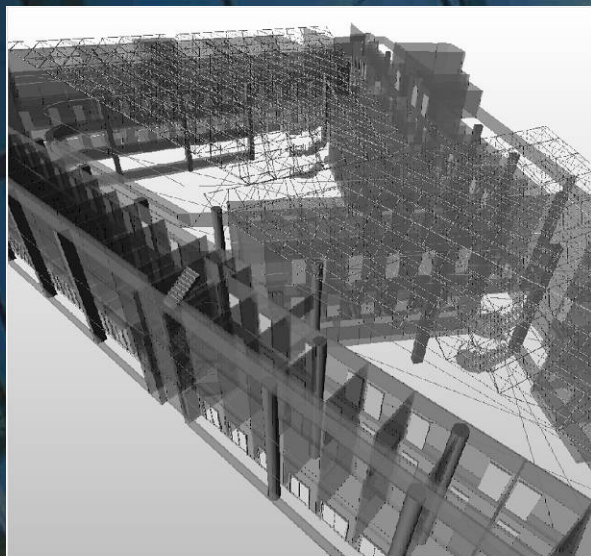
PROJECT MANAGEMENT

FACILITY MANAGEMENT



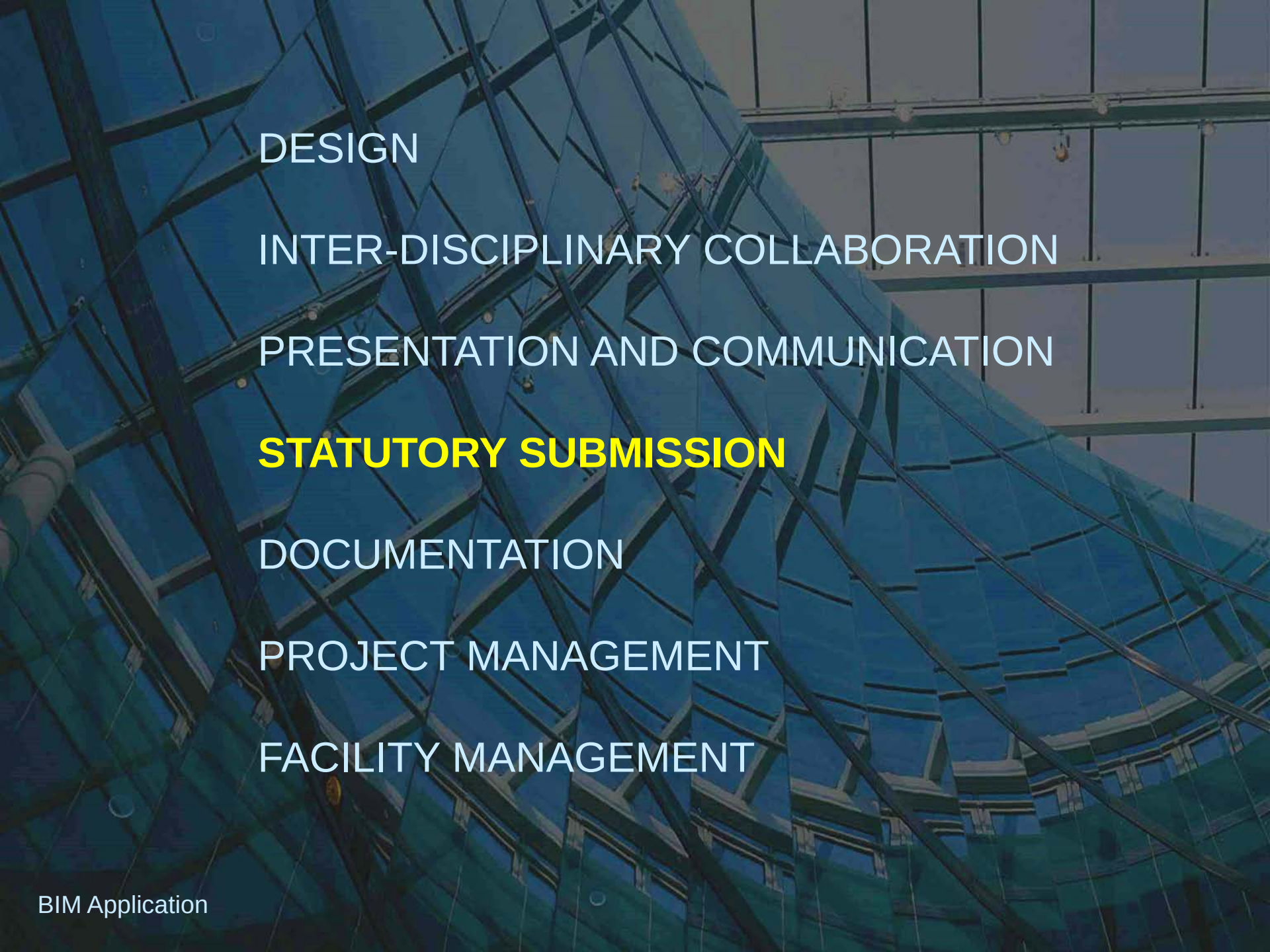
AREA SCHEDULE			
Level	Ele	Room Number	USE
5	40400	00	LIFT LOBBY
5	40400	01	AHU RM
5	40400	02	LEARNING RESOURCE CTR
5	40400	03	ELECTRICAL RM
5	40400	04	PROJECT RM
5	40400	05	PROJECT RM
5	40400	06	PROJECT RM
5	40400	07	PROJECT RM
5	40400	08	LEARNING RESOURCE CTR
5	40400	09	AHU RM
5	40400	10	LECTURE THEATRE
5	40400	11	LECTURE THEATRE
5	40400	12	LECTURE THEATRE
5	40400	13	LECTURE THEATRE
5	40400	18	PROJECT RM
5	40400	19	PROJECT RM
5	40400	501	TOILET
5	40400	502	TOILET
			Net Area
			18.672m ²
			20.000m ²
			777.008m ²
			11.366m ²
			54.911m ²
			52.730m ²
			52.722m ²
			44.485m ²
			1063.990m ²
			47.336m ²
			176.763m ²
			172.287m ²
			175.756m ²
			171.307m ²
			45.818m ²
			47.620m ²
			60.232m ²
			61.872m ²
			3054.875m ²





BIM Application

INTERACTIVE COMMUNICATION – DWF



DESIGN

INTER-DISCIPLINARY COLLABORATION

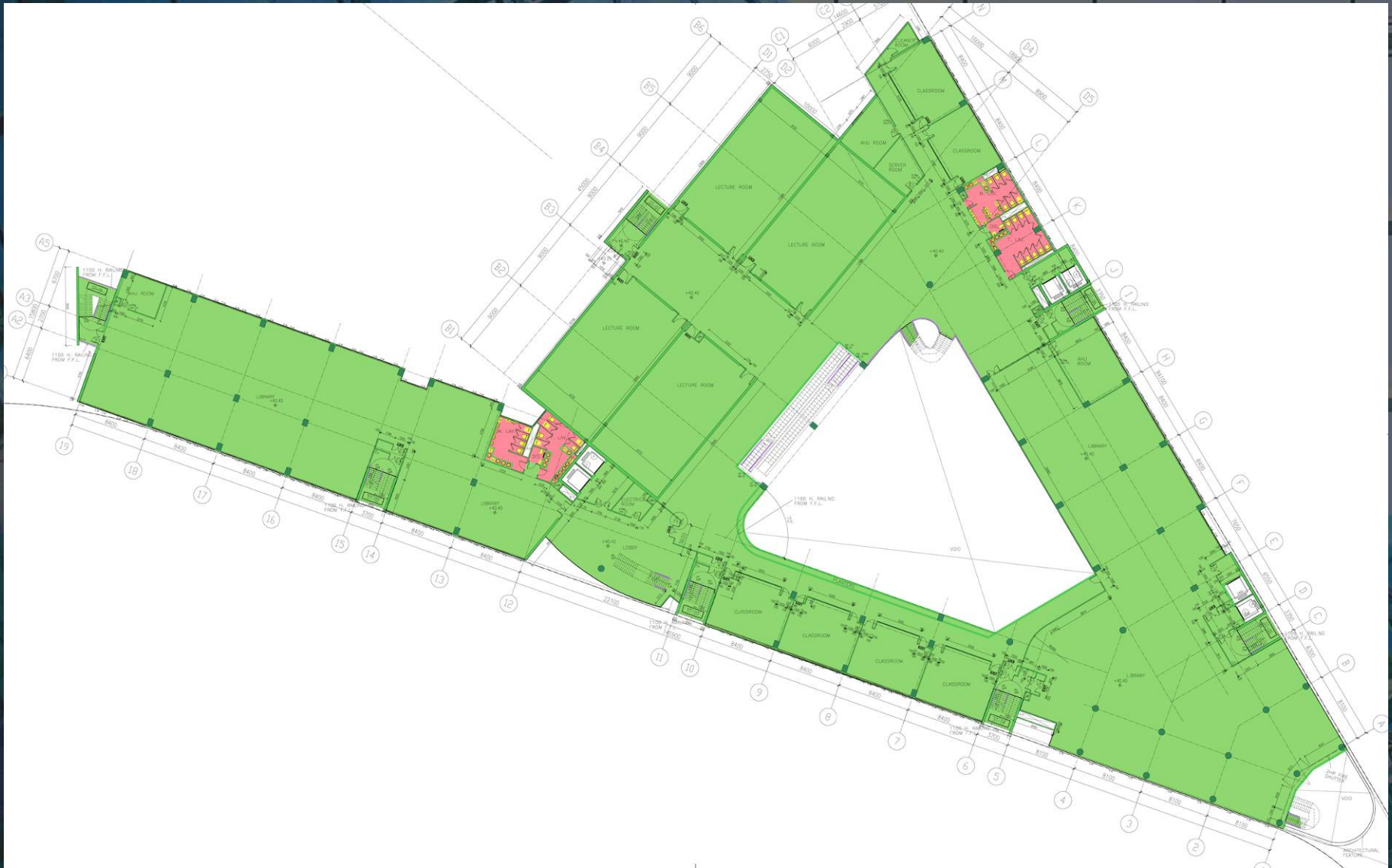
PRESENTATION AND COMMUNICATION

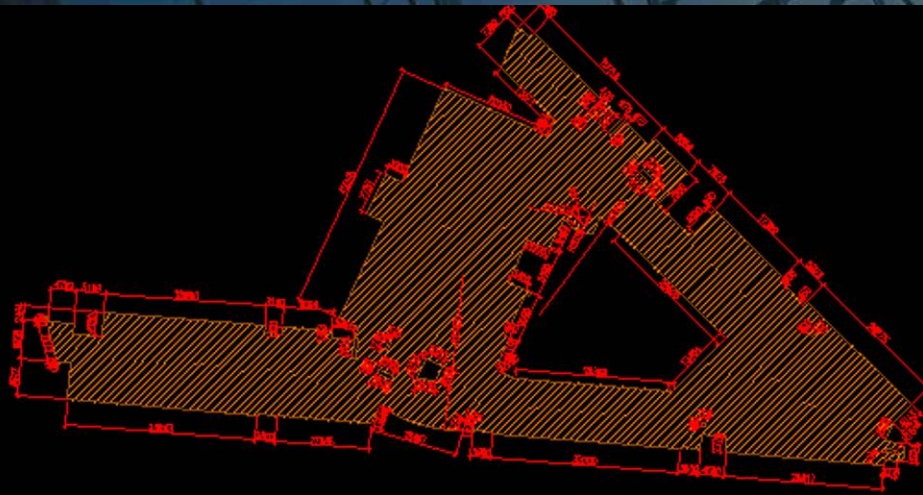
STATUTORY SUBMISSION

DOCUMENTATION

PROJECT MANAGEMENT

FACILITY MANAGEMENT

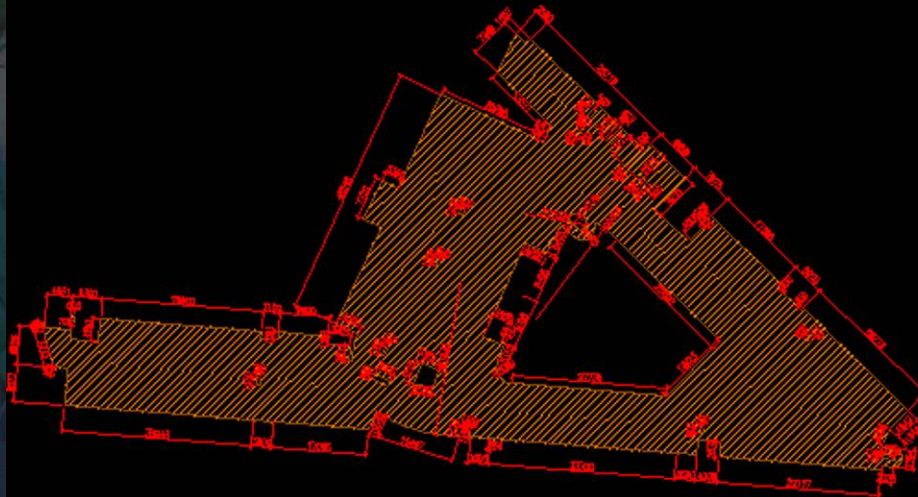




5/F (+40.40) GROSS FLOOR AREA DIAGRAM

5/F (+40.40) GROSS FLOOR AREA CALCULATION

GFA PER FLOOR		
LEVEL	ROOM	AREA (SQ.M)
LEVEL +40.40	1	4361.420
		4361.420

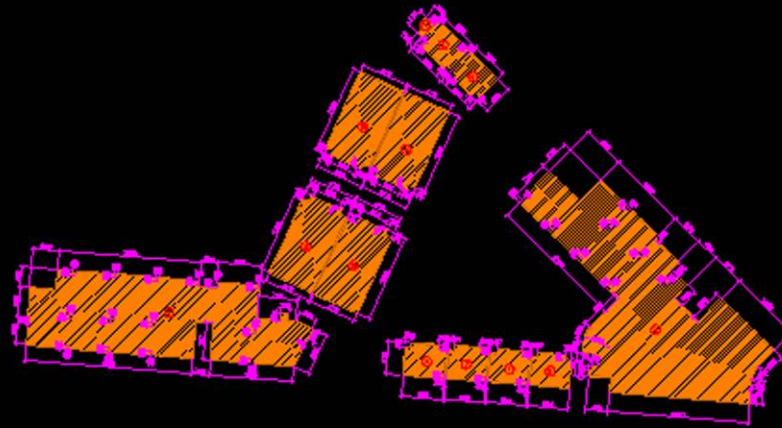


6/F (+44.25) GROSS FLOOR AREA DIAGRAM

6/F (+44.85) GROSS FLOOR AREA CALCULATION

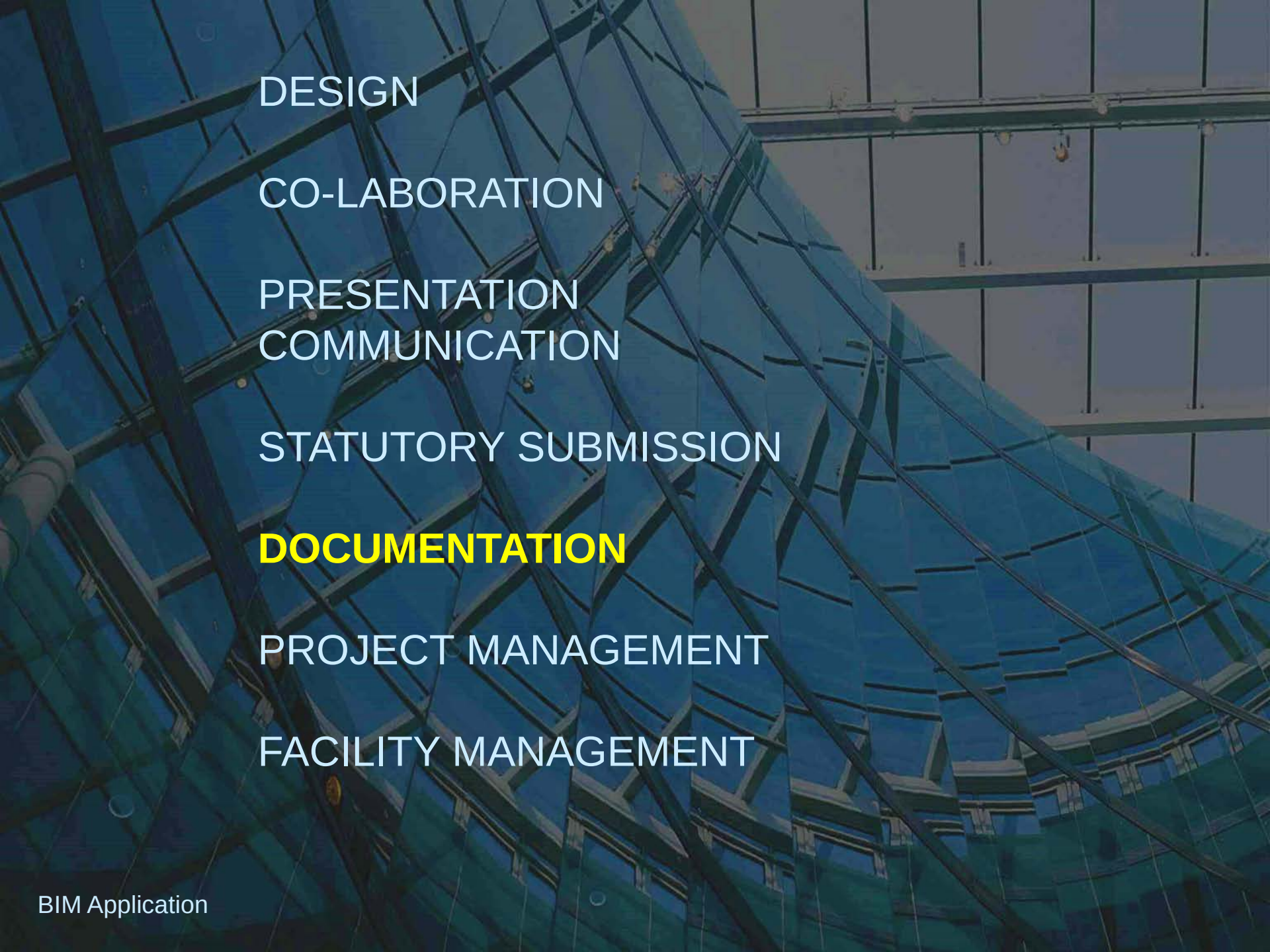
GFA PER FLOOR		
LEVEL	ROOM	AREA (SQ.M)
LEVEL +44.85	1	4332.316
		4332.316

5/F (+40.40) USABLE FLOOR AREA DIAGRAM



SCHEDULE OF PERSONS FOR MEANS OF ESCAPE														
LEVEL	ROOM	USE	USABLE FLOOR AREA (sq. m.)	FSD PERMITTED DENSITY	CAPACITY	MIN. NO. OF EXIT DOORS (FROM ROOM) OR EXIT ROUTES (FROM STOREY)	SCHEDULE MINIMUM NUMBER & WIDTH OF EXIT DOOR & EXIT ROUTE FROM EACH ROOM							
							MIN. TOTAL WIDTH OF				MIN. WIDTH OF EACH			
							REQUIRED		PROVIDED		REQUIRED		PROVIDED	
							EXIT DOORS	EXIT ROUTES	EXIT DOORS	EXIT ROUTES	EXIT DOOR	EXIT ROUTE	EXIT DOOR	EXIT ROUTE
LEVEL +40.40	1	CLEANER'S ROOM	6.049	30	1	1	—	—	—	—	—	—	—	—
LEVEL +40.40	2	STUDY ROOM	49.138	2	25	2	—	—	—	—	750	1050	750	1050
LEVEL +40.40	3	STUDY ROOM	44.458	2	23	2	—	—	—	—	750	1050	750	1050
LEVEL +40.40	4	LIBRARY	1018.305	2	510	3	4500	4500	4500	4500	1200	1200	1200	1200
LEVEL +40.40	5	STUDY ROOM	52.285	2	27	2	—	—	—	—	750	1050	750	1050
LEVEL +40.40	6	STUDY ROOM	52.296	2	27	2	—	—	—	—	750	1050	750	1050
LEVEL +40.40	7	STUDY ROOM	52.419	2	27	2	—	—	—	—	750	1050	750	1050
LEVEL +40.40	8	STUDY ROOM	54.764	2	28	2	—	—	—	—	750	1050	750	1050
LEVEL +40.40	9	LIBRARY	756.991	2	380	2	3000	3000	3000	3000	1050	1050	1050	1050
LEVEL +40.40	10	LECTURE ROOM	189.049	2	85	2	1750	2100	1750	2100	850	1050	850	1050
LEVEL +40.40	11	LECTURE ROOM	188.813	2	85	2	1750	2100	1750	2100	850	1050	850	1050
LEVEL +40.40	12	LECTURE ROOM	169.764	2	85	2	1750	2100	1750	2100	850	1050	850	1050
LEVEL +40.40	13	LECTURE ROOM	170.707	2	86	2	1750	2100	1750	2100	850	1050	850	1050
			2767.018		1389									

STATUTORY SUBMISSION – MEANS OF ESCAPE CALCULATION



DESIGN

CO-LABORATION

PRESENTATION
COMMUNICATION

STATUTORY SUBMISSION

DOCUMENTATION

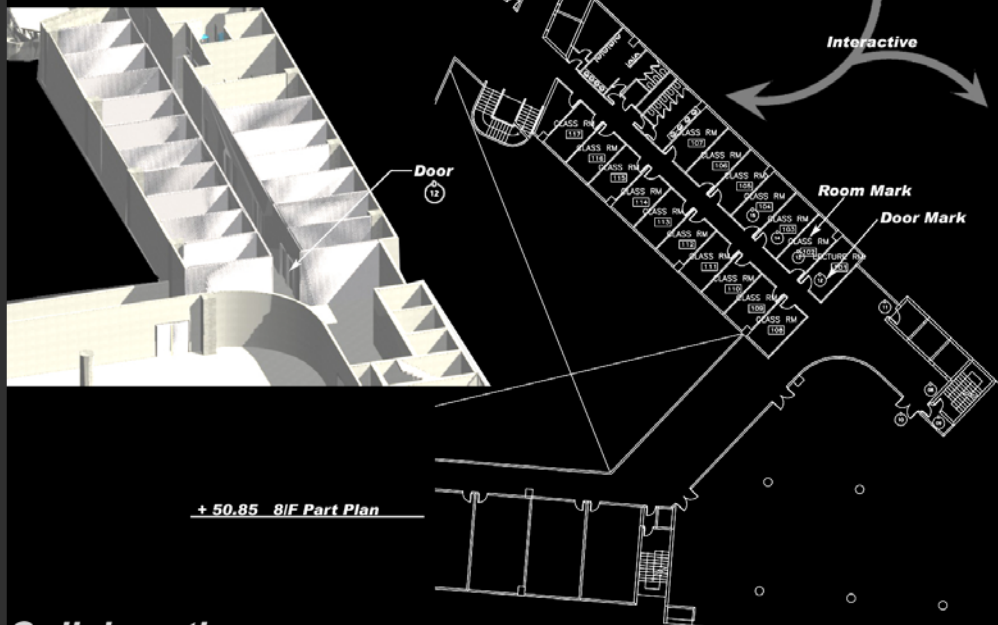
PROJECT MANAGEMENT

FACILITY MANAGEMENT

ROOM FINISH SCHEDULE																											
Room No.	Room	FLOOR		WALLS												CEILING			NOTES								
		MATL	COL	NORTH				SOUTH				EAST				WEST											
				MATL	COLOR			MATL	COLOR			MATL	COLOR			MATL	COLOR										
		ON	HT	WHITE	EP	FB	MB	RED	WHITE	YEL	EP	FB	MB	RED	WHITE	YEL	EP	FB	MB	RED	WHITE	YEL	GB	WHITE	HEIGHT		
101	LECTURE RM.																								2750	---	
102	LECTURE RM.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2750	---
103	LECTURE RM.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2750	---
104	LECTURE RM.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2750	---
105	LECTURE RM.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2750	---
106	LECTURE RM.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2750	---
107	LECTURE RM.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2750	---
108	LECTURE RM.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2750	---
109	LECTURE RM.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2750	---
110	LECTURE RM.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2750	---
111	LECTURE RM.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2750	---
112	LECTURE RM.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2750	---
113	LECTURE RM.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2750	---
114	LECTURE RM.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2750	---
115	LECTURE RM.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2750	---
116	LECTURE RM.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2750	---
117	LECTURE RM.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2750	---

AREA SCHEDULE					
Room No.	Room	Dimension			
		Net Floor Area	Length	Width	Height
101	LECTURE RM.	14m²	5641	5772	2750
102	LECTURE RM.	13m²	5315	5772	2750
103	LECTURE RM.	14m²	5677	5772	2750
104	LECTURE RM.	14m²	5677	5772	2750
105	LECTURE RM.	13m²	5315	5772	2750
106	LECTURE RM.	14m²	5677	5772	2750
107	LECTURE RM.	14m²	5677	5772	2750
108	LECTURE RM.	12m²	5334	5303	2750
109	LECTURE RM.	12m²	5230	4958	2750
110	LECTURE RM.	12m²	5230	5303	2750
111	LECTURE RM.	12m²	5334	5303	2750
112	LECTURE RM.	12m²	5230	4958	2750
113	LECTURE RM.	12m²	5303	5303	2750
114	LECTURE RM.	12m²	5334	5303	2750
115	LECTURE RM.	12m²	5230	4958	2750
116	LECTURE RM.	12m²	5302	5303	2750
117	LECTURE RM.	12m²	5334	5303	2750

Linked Schedules



By using Autodesk Architectural Desktop, all schedules eg. Area Schedule, Finish Schedule, Door Schedule, Window Schedule are related to 3D model.

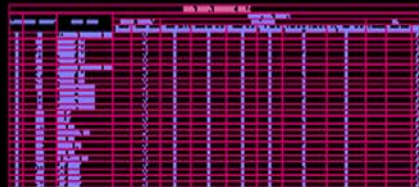
Change in model results in updating of schedules.

DOOR AND FRAME SCHEDULE																		
DOOR									FRAME						FIRE RATING LABEL		HARDWARE	
MARK	SIZE			MATL	GLAZING	LOUVER		MATL	EL	DETAIL								
	WD	HGT	THK			WD	HGT			HEAD	JAMB	SILL						
8	750	2000	50	TM	---	0	0	ST	---	T05	T06	T07	1/2HR	---	---			
9	750	2000	50	TM	---	0	0	ST	---	T05	T06	T07	1/2HR	---	---			
10	1800	2000	40	---	WG	0	0	---	---	---	---	---	2HR	---	---			
11	900	2000	50	TM	TG	0	0	ST	---	T05	T06	T07	1HR	---	---			
12	900	2000	50	TM	TG	0	0	ST	---	T05	T06	T07	1HR	---	---			
13	900	2000	50	TM	TG	0	0	ST	---	T05	T06	T07	1HR	---	---			
14	900	2000	50	TM	TG	0	0	ST	---	T05	T06	T07	1HR	---	---			
15	900	2000	50	TM	TG	0	0	ST	---	T05	T06	T07	1HR	---	---			
16	900	2000	50	TM	TG	0	0	ST	---	T05	T06	T07	1HR	---	---			
53	750	2000	50	TM	---	0	0	ST	---	T05	T06	T07	1/2HR	---	---			
54	750	2000	50	TM	---	0	0	ST	---	T05	T06	T07	1/2HR	---	---			
55	900	2000	50	TM	TG	0	0	ST	---	T05	T06	T07	1HR	---	---			
56	900	2000	50	TM	TG	0	0	ST	---	T05	T06	T07	1HR	---	---			
57	900	2000	50	TM	TG	0	0	ST	---	T05	T06	T07	1HR	---	---			
58	900	2000	50	TM	TG	0	0	ST	---	T05	T06	T07	---	---	---			
59	900	2000	50	TM	TG	0	0	ST	---	T05	T06	T07	---	---	---			
60	750	2000	50	TM	---	0	0	ST	---	T05	T06	T07	---	---	---			
61	900	2000	50	TM	TG	0	0	ST	---	T05	T06	T07	---	---	---			
62	900	2000	50	TM	TG	0	0	ST	---	T05	T06	T07	---	---	---			
63	900	2000	50	TM	TG	0	0	ST	---	T05	T06	T07	---	---	---			
64	900	2000	50	TM	TG	0	0	ST	---	T05	T06	T07	---	---	---			

Collaboration of Information in Documentation & Construction Stage

BIM Application

INTERACTIVE COLLABORATION OF INFORMATION
ARCHITECTURAL



Line	Unit	Qty	Unit Price	Total Price	Unit Price	Total Price
1	1000	1	1000	1000	1000	1000
2	1000	1	1000	1000	1000	1000
3	1000	1	1000	1000	1000	1000
4	1000	1	1000	1000	1000	1000
5	1000	1	1000	1000	1000	1000
6	1000	1	1000	1000	1000	1000
7	1000	1	1000	1000	1000	1000
8	1000	1	1000	1000	1000	1000
9	1000	1	1000	1000	1000	1000
10	1000	1	1000	1000	1000	1000
11	1000	1	1000	1000	1000	1000
12	1000	1	1000	1000	1000	1000
13	1000	1	1000	1000	1000	1000
14	1000	1	1000	1000	1000	1000
15	1000	1	1000	1000	1000	1000
16	1000	1	1000	1000	1000	1000
17	1000	1	1000	1000	1000	1000
18	1000	1	1000	1000	1000	1000
19	1000	1	1000	1000	1000	1000
20	1000	1	1000	1000	1000	1000
21	1000	1	1000	1000	1000	1000
22	1000	1	1000	1000	1000	1000
23	1000	1	1000	1000	1000	1000
24	1000	1	1000	1000	1000	1000
25	1000	1	1000	1000	1000	1000
26	1000	1	1000	1000	1000	1000
27	1000	1	1000	1000	1000	1000
28	1000	1	1000	1000	1000	1000
29	1000	1	1000	1000	1000	1000
30	1000	1	1000	1000	1000	1000
31	1000	1	1000	1000	1000	1000
32	1000	1	1000	1000	1000	1000
33	1000	1	1000	1000	1000	1000
34	1000	1	1000	1000	1000	1000
35	1000	1	1000	1000	1000	1000
36	1000	1	1000	1000	1000	1000
37	1000	1	1000	1000	1000	1000
38	1000	1	1000	1000	1000	1000
39	1000	1	1000	1000	1000	1000
40	1000	1	1000	1000	1000	1000
41	1000	1	1000	1000	1000	1000
42	1000	1	1000	1000	1000	1000
43	1000	1	1000	1000	1000	1000
44	1000	1	1000	1000	1000	1000
45	1000	1	1000	1000	1000	1000
46	1000	1	1000	1000	1000	1000
47	1000	1	1000	1000	1000	1000
48	1000	1	1000	1000	1000	1000
49	1000	1	1000	1000	1000	1000
50	1000	1	1000	1000	1000	1000
51	1000	1	1000	1000	1000	1000
52	1000	1	1000	1000	1000	1000
53	1000	1	1000	1000	1000	1000
54	1000	1	1000	1000	1000	1000
55	1000	1	1000	1000	1000	1000
56	1000	1	1000	1000	1000	1000

[illegible][illegible]

INTERACT

INTERACTIVE COLLABORATION OF INFORMATION BUILDING SERVICES



ELEC POWER SCHEDULE TABLE

ELEC POWER SCHEDULE TABLE													
Level	Room Number	Room Name	ELECTRICAL POWER										
			POWER SUPPLY		PROVISIONS							I.T.	
			Normal	Normal/Essen	13ampSocket	ComputerSocket	ShaverSocket	TeleSocket	TvSocket-FMsocket	Twln13ampSocket	Intercom	Smartcard	CCTV
5	01	LEARNING RESOURCE CTR		✓	0	0	0	0	0	0			✓
5	02	PROJECT RM		✓	0	0	0	0	0	0			✓
5	03	PROJECT RM		✓	0	0	0	0	0	0			✓
5	04	PROJECT RM		✓	0	0	0	0	0	0			✓
5	05	PROJECT RM		✓	0	0	0	0	0	0			✓
5	06	LEARNING RESOURCE CTR		✓	0	0	0	0	0	0			✓
5	07	PROJECT RM		✓	0	0	0	0	0	0			✓
5	08	PROJECT RM		✓	0	0	0	0	0	0			✓
5	09	LECTURE THEATRE		✓	0	0	0	0	0	0			✓
5	10	LECTURE THEATRE		✓	0	0	0	0	0	0			✓
5	11	LECTURE THEATRE		✓	0	0	0	0	0	0			✓
5	12	LECTURE THEATRE		✓	0	0	0	0	0	0			✓
5	501	TOILET		✓	0	0	0	0	0	0			✓
5	502	TOILET		✓	0	0	0	0	0	0			✓
5	801	AHU RM		✓	0	0	0	0	0	0			✓
5	602	ELECTRICAL RM		✓	0	0	0	0	0	0			✓
5	803	AHU RM		✓	0	0	0	0	0	0			✓
5	804	SERVER RM		✓	0	0	0	0	0	0			✓
5	605	AHU RM		✓	0	0	0	0	0	0			✓
5	606	CLEANER'S RM		✓	0	0	0	0	0	0			✓
5	701	LIFT LOBBY		✓	0	0	0	0	0	0			✓
5	702	LIFT LOBBY		✓	0	0	0	0	0	0			✓
5	703	LIFT LOBBY		✓	0	0	0	0	0	0			✓
5	704	LIFT LOBBY		✓	0	0	0	0	0	0			✓

FIRE SERVICES SCHEDULE TABLE

Level	Room Number	Room Name	FIRE SERVICES
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INTERACTIVE COLLABORATION OF INFORMATION
BUILDING SERVICES



DESIGN

CO-LABORATION

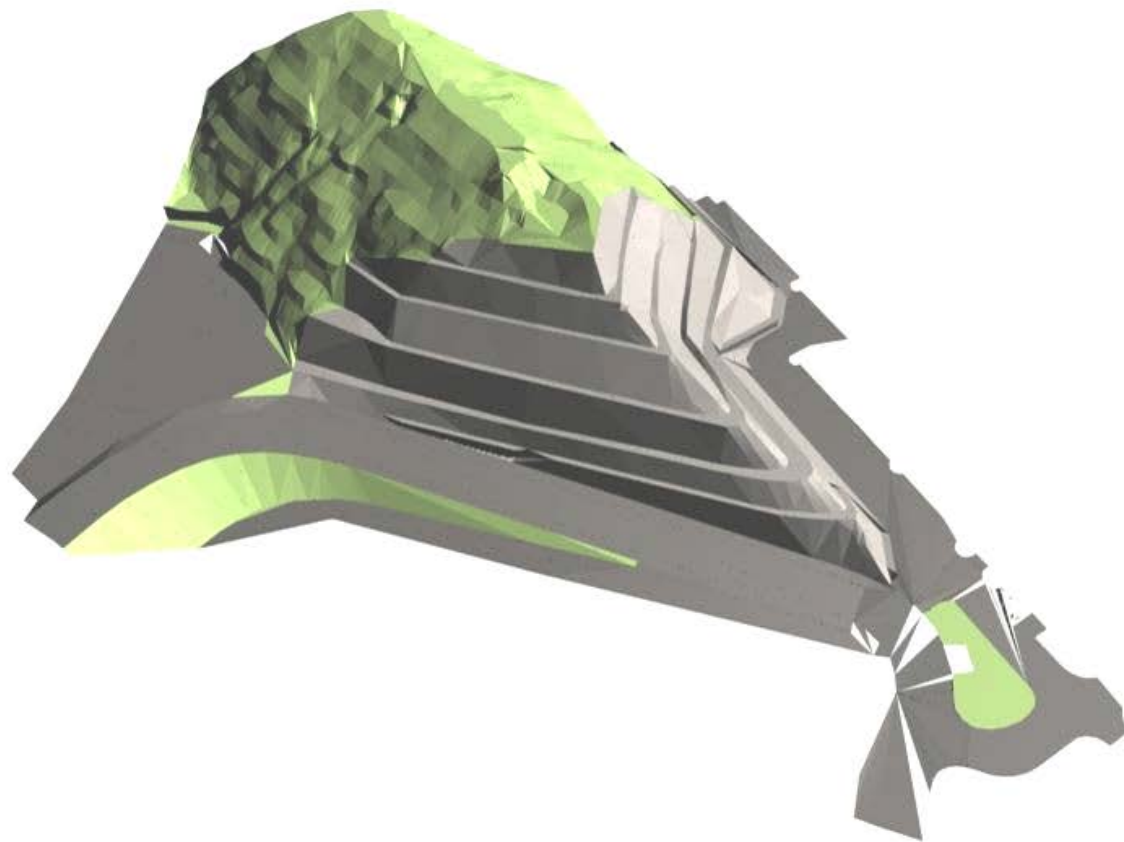
PRESENTATION
COMMUNICATION

STATUTORY SUBMISSION

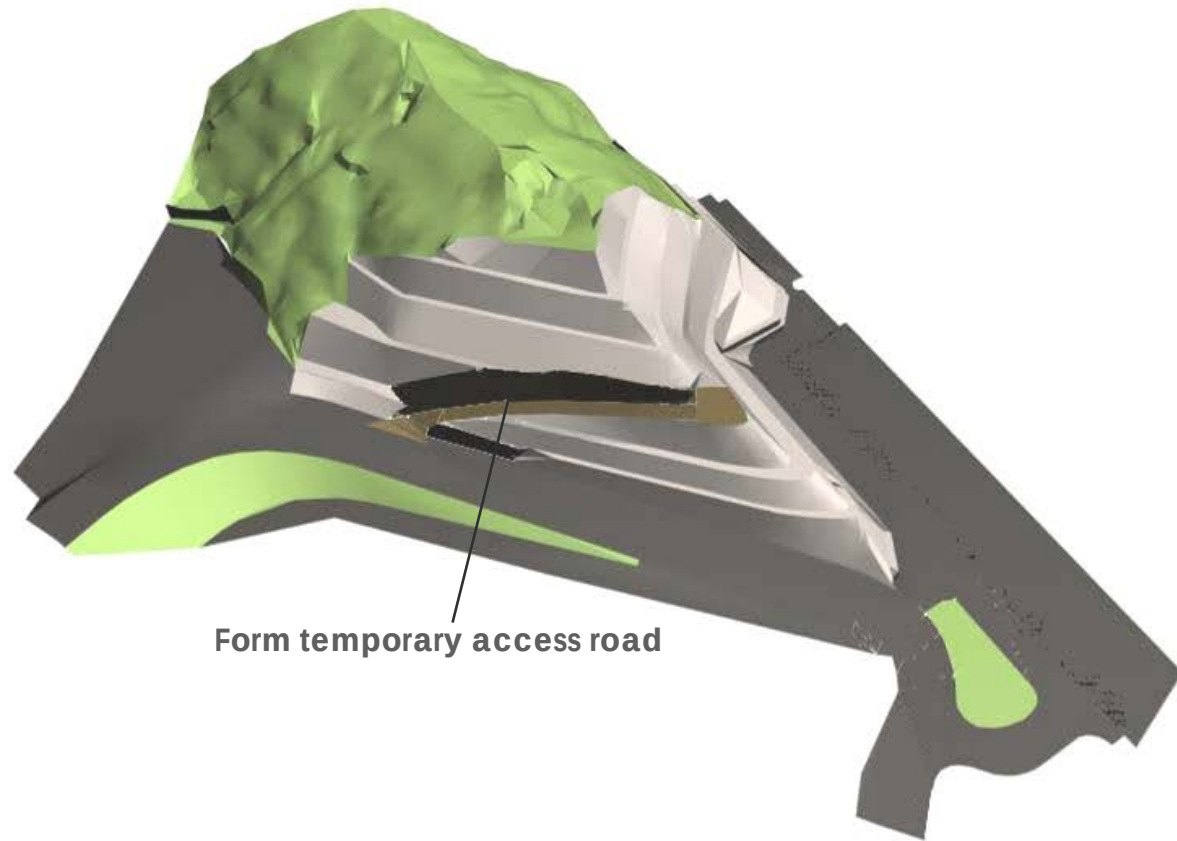
DOCUMENTATION

PROJECT MANAGEMENT

FACILITY MANAGEMENT

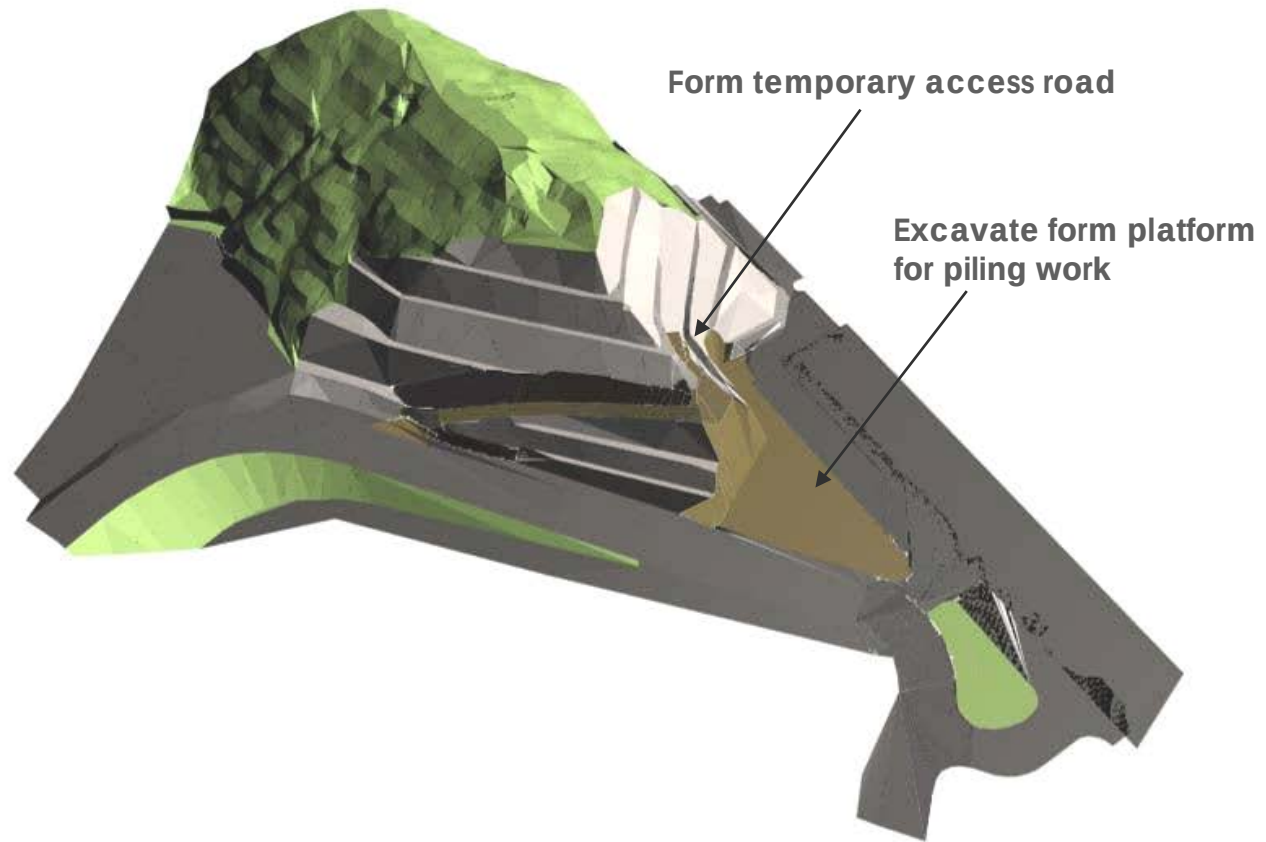


Existing Site

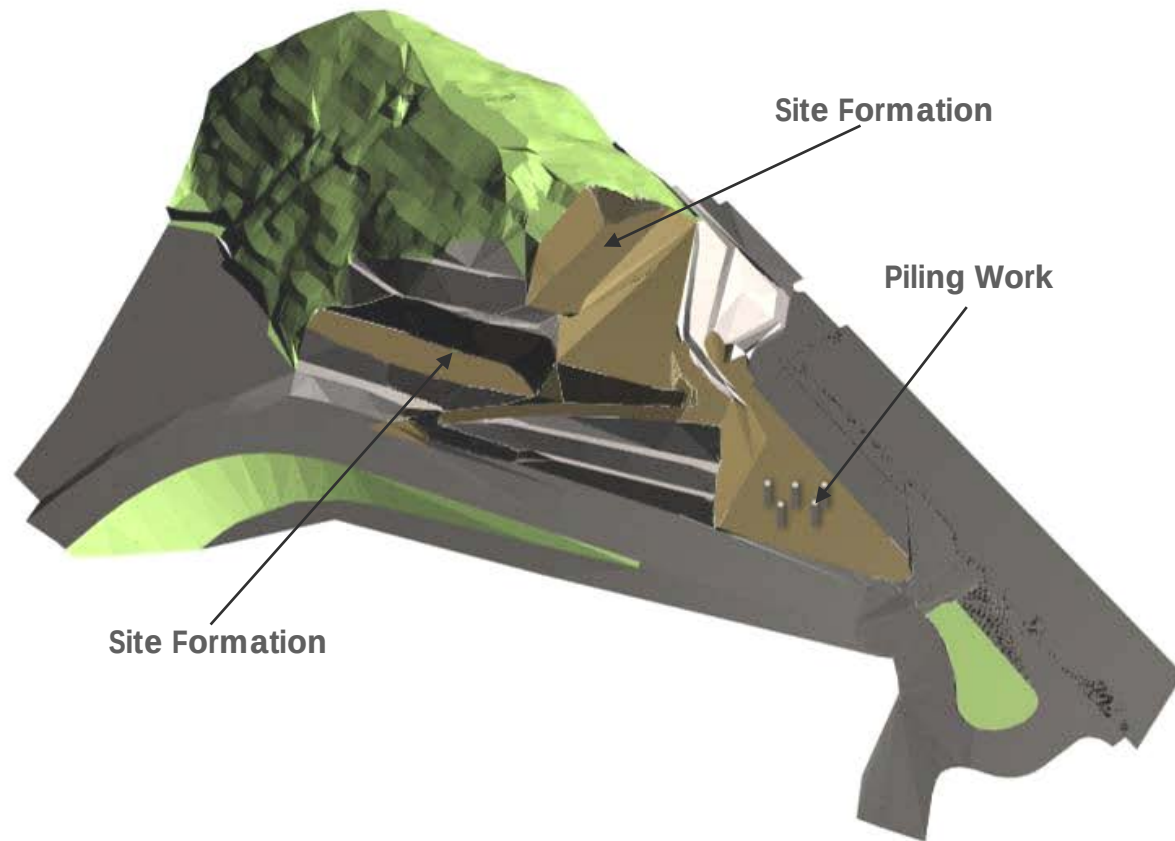


Form temporary access road

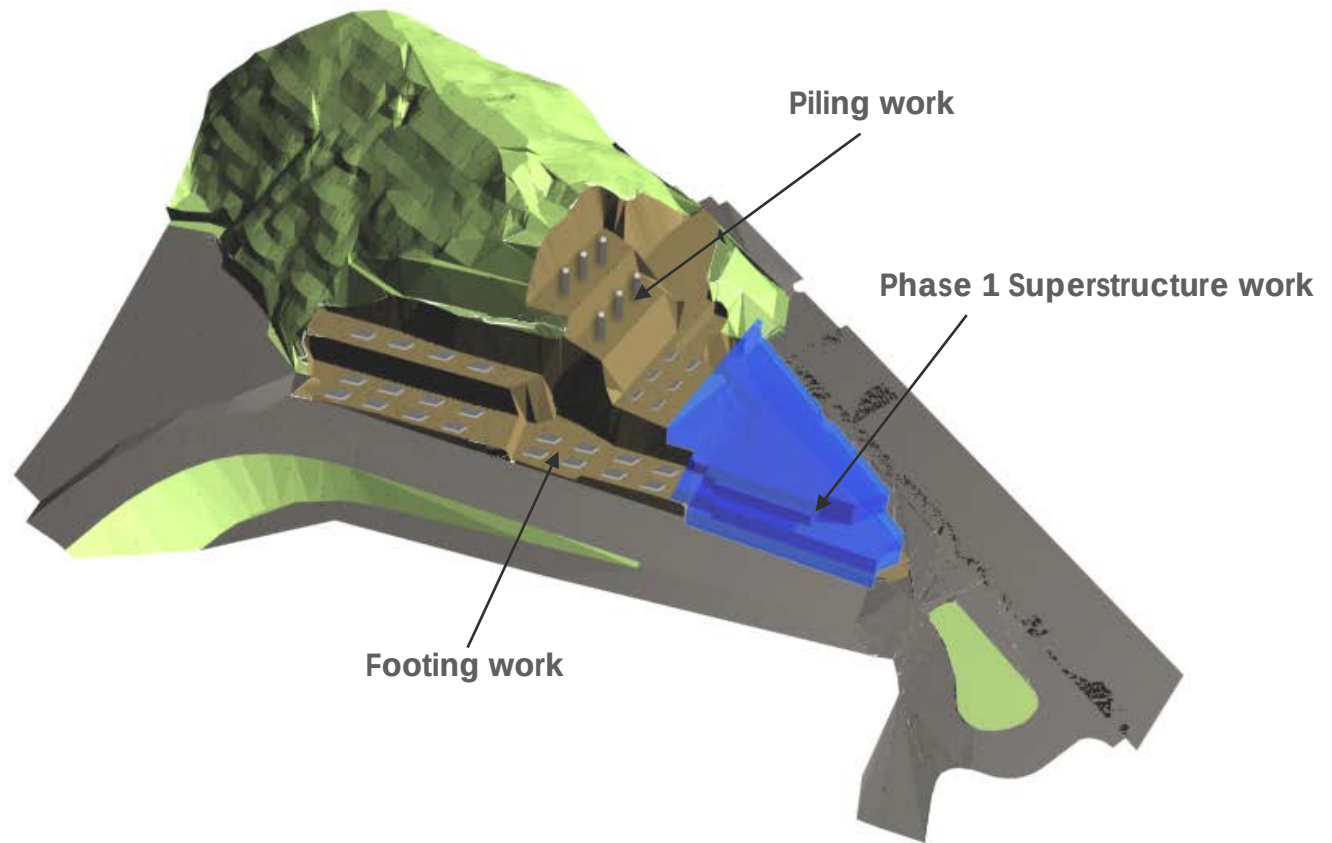
Stage 1



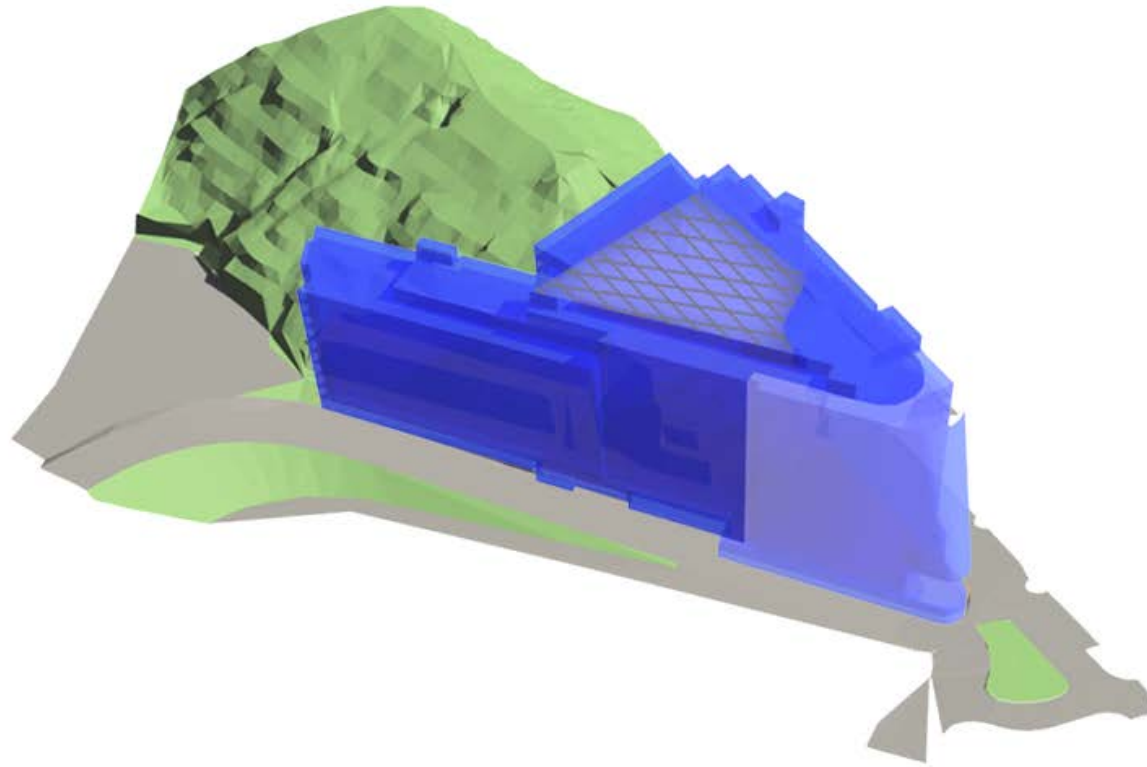
Stage 2



Stage 3



Stage 4



Completion



DESIGN

CO-LABORATION

PRESENTATION
COMMUNICATION

STATUTORY SUBMISSION

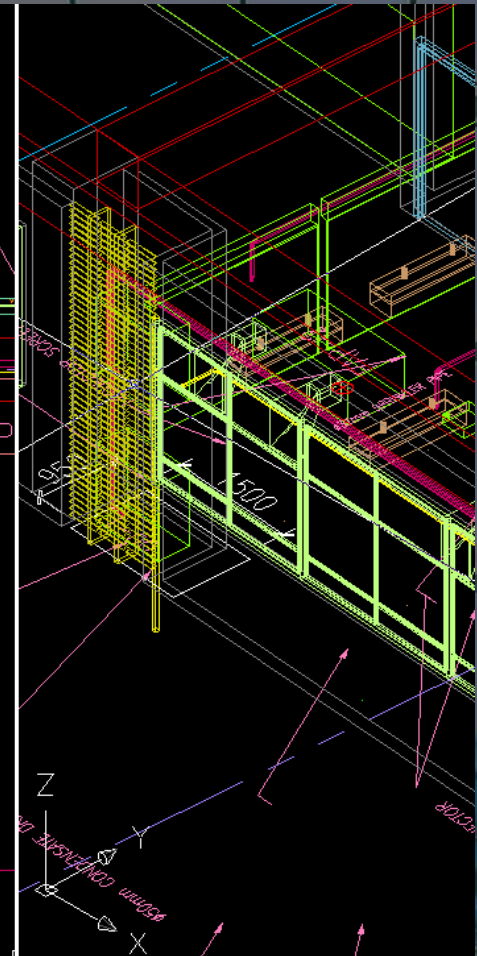
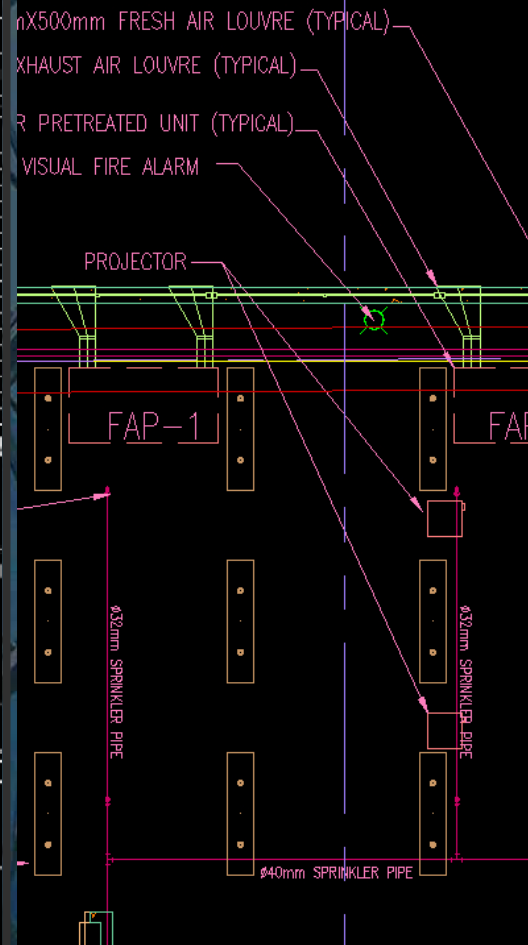
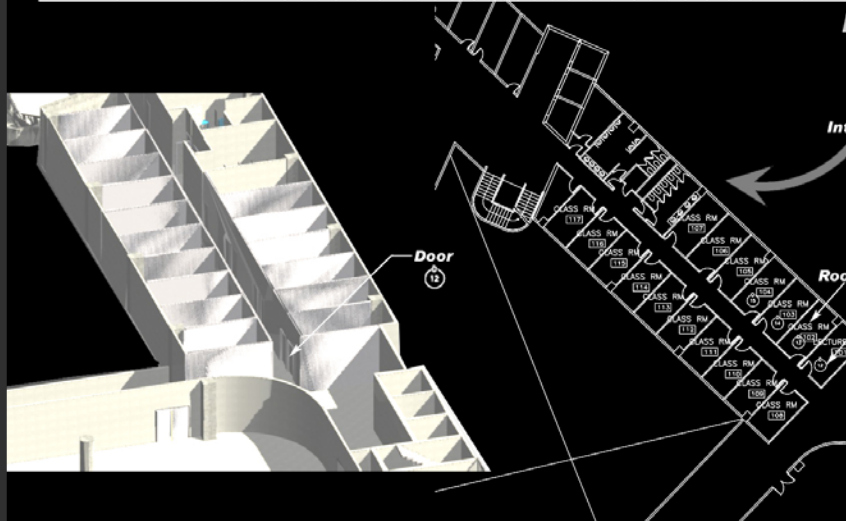
DOCUMENTATION

PROJECT MANAGEMENT

FACILITY MANAGEMENT

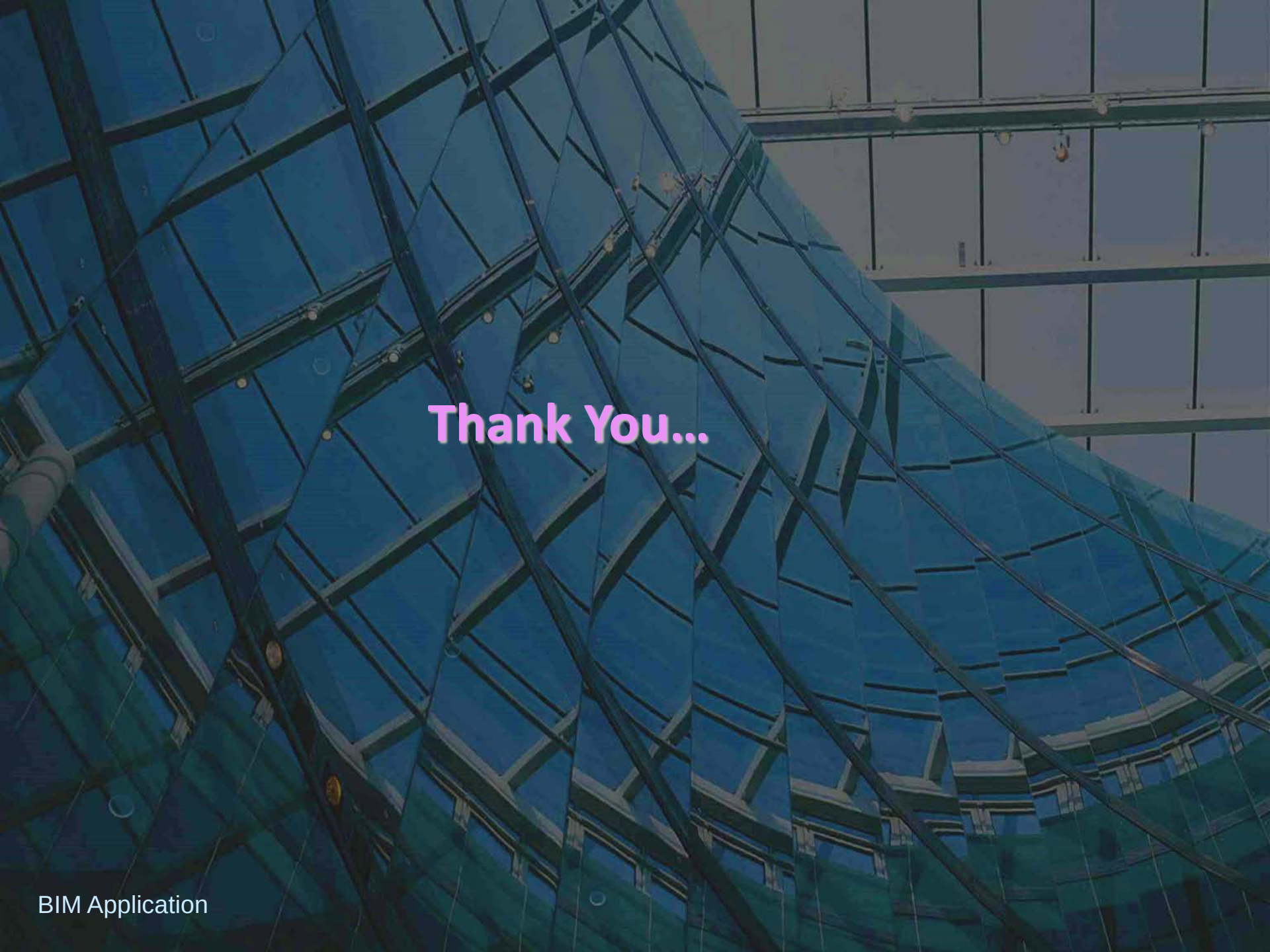
ROOM FINISH SCHEDULE

Room No.	Room	FLOOR		WALLS												CEIL								
				NORTH				SOUTH				EAST						WEST						
		MATL	COL	MATL	COLOR	MATL	COLOR	MATL	COLOR	MATL	COLOR	MATL	COLOR	MATL	COLOR	MATL	COLOR							
		CM	HT	WHITE	EP	FB	UB	RED	WHITE	YEL	EP	FB	UB	RED	WHITE	YEL	EP	FB	UB	RED	WHITE	YEL	CM	HT
101	LECTURE RM.																							
102	LECTURE RM.																							
103	LECTURE RM.																							
104	LECTURE RM.																							
105	LECTURE RM.																							
106	LECTURE RM.																							
107	LECTURE RM.																							
108	LECTURE RM.																							
109	LECTURE RM.																							
110	LECTURE RM.																							
111	LECTURE RM.																							
112	LECTURE RM.																							
113	LECTURE RM.																							
114	LECTURE RM.																							
115	LECTURE RM.																							
116	LECTURE RM.																							
117	LECTURE RM.																							



ELEC POWER SCHEDULE TABLE

Level	Room Number	Room Name	ELECTRICAL POWER PROVISIONS										I.T.		
			POWER SUPPLY												
			Normal	Normal/Even	13ampSocket	ComputerSocket	ShaverSocket	TeleSocket	TvSocket-FMsocket	Twin13ampSocket	Intercom	Smartcard	CCTV		
5	01	LEARNING RESOURCE CTR		✓	0	0	0	0	0	0			✓		
5	02	PROJECT RM		✓	0	0	0	0	0	0			✓		
5	03	PROJECT RM		✓	0	0	0	0	0	0			✓		



Thank You...