

CitA
BIM GATHERING



Building Capabilities in Complex Environments

CitA BIM Gathering 2017, Croke Park, November 23rd & 24th, 2017



Tri-varsity, Inter-disciplinary BIM Workshops

BIM Gathering 2017

Croke Park, Dublin

23rd November, 2017

Workshop Participants:

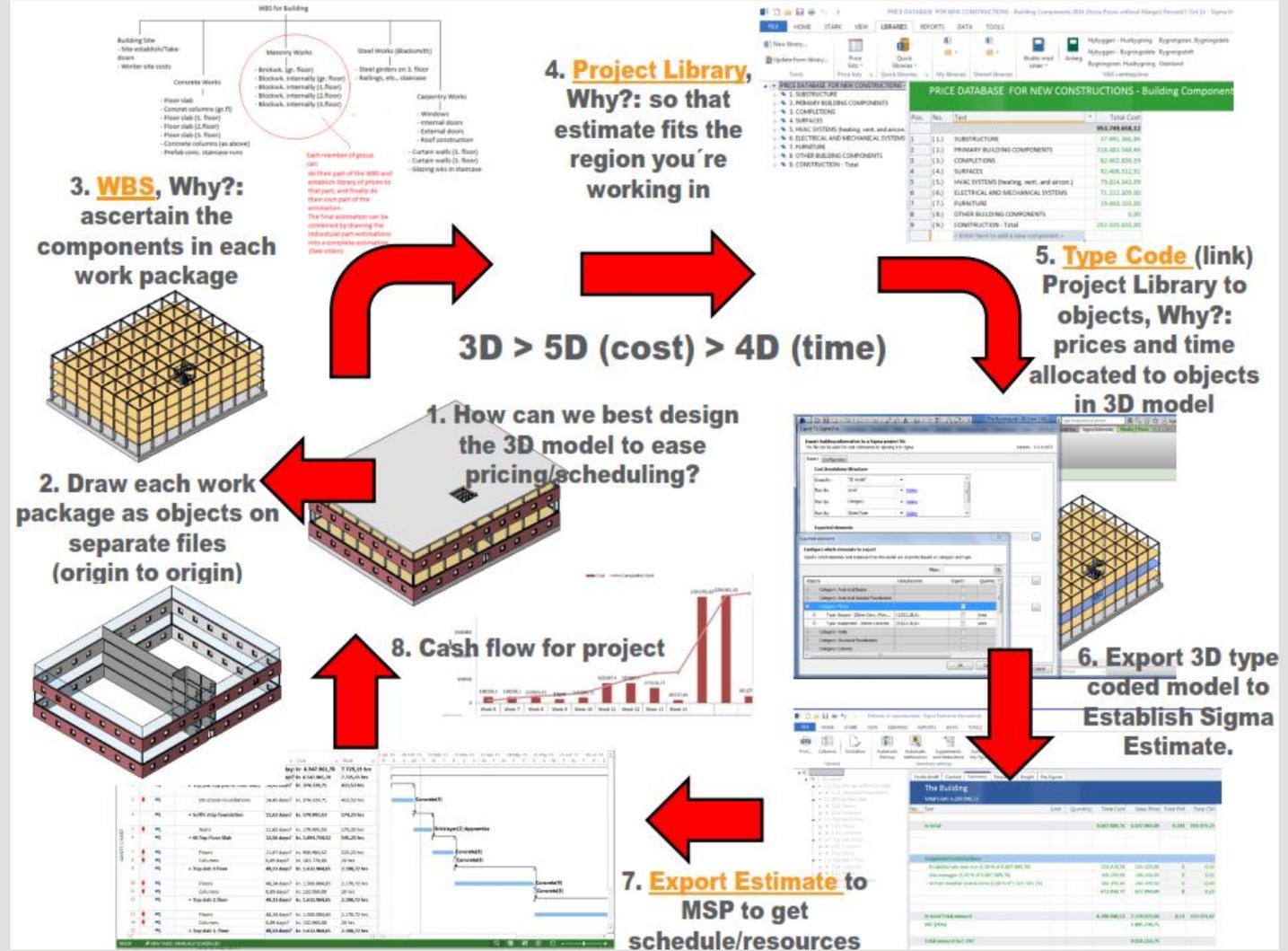
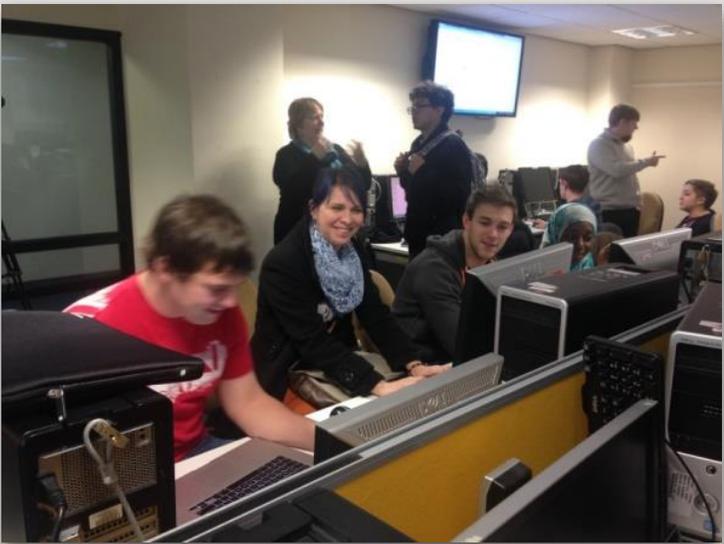
Sheffield Hallam University, England

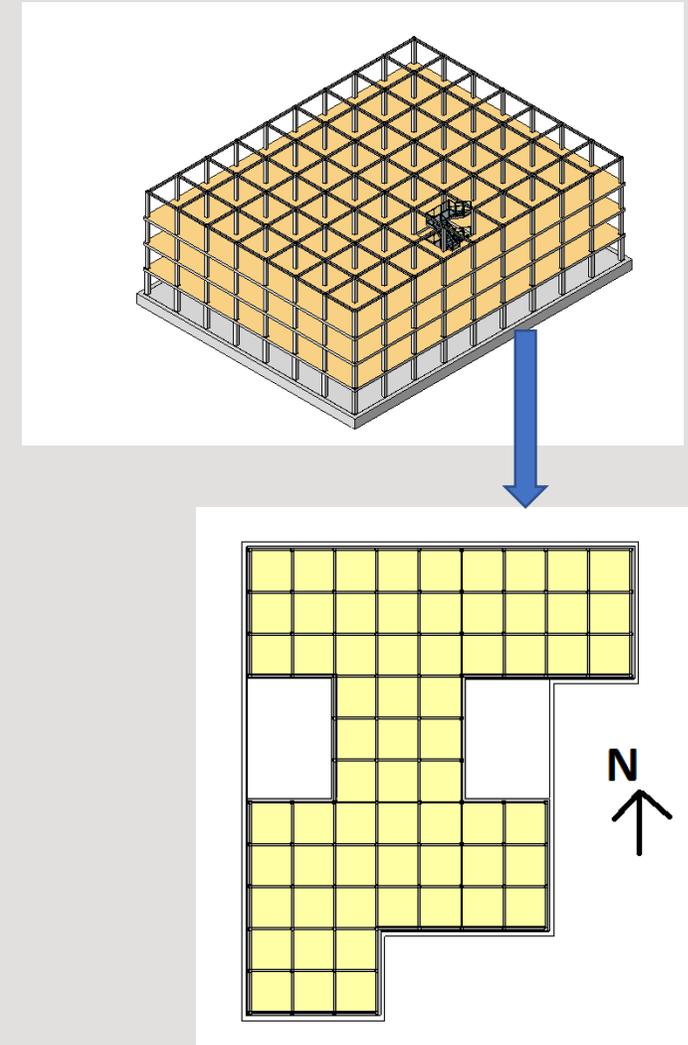
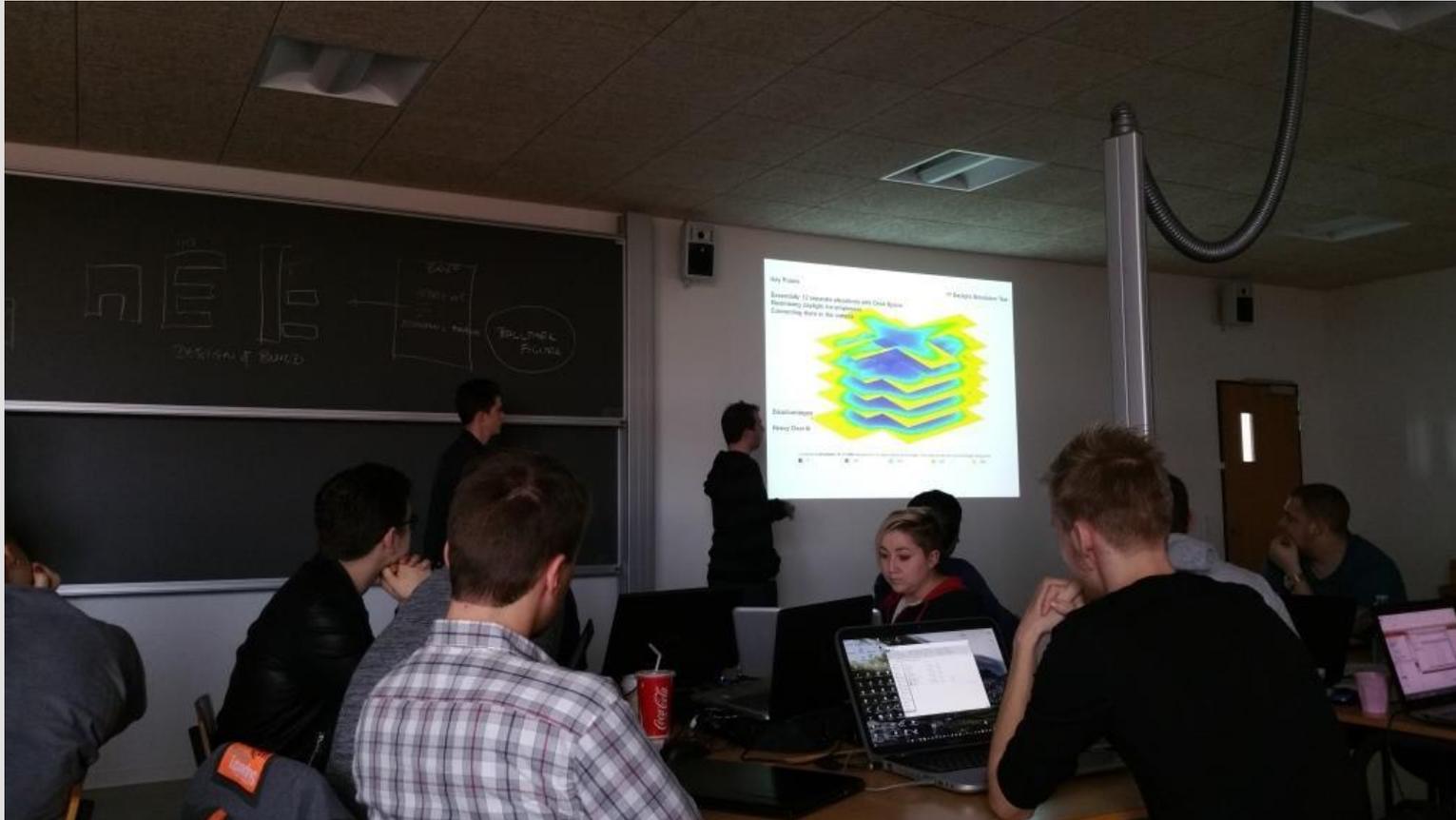
VIA University College, Horsens & Aarhus, Denmark

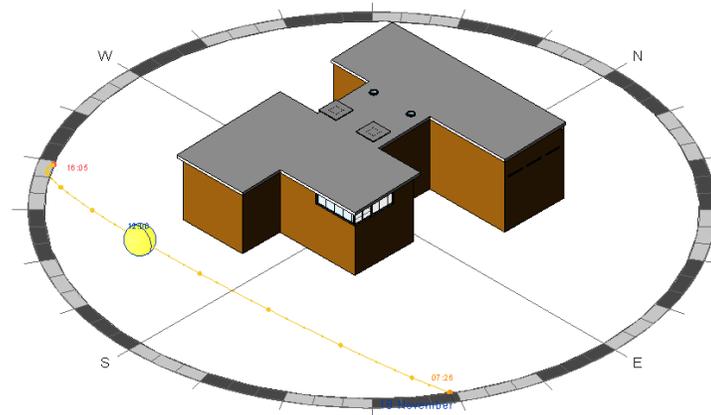
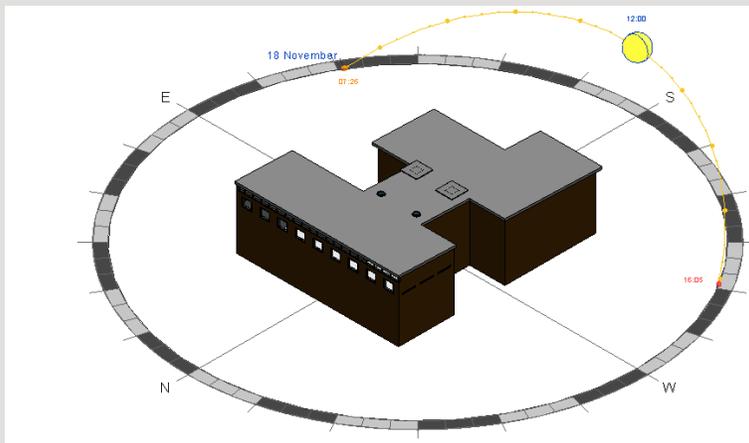
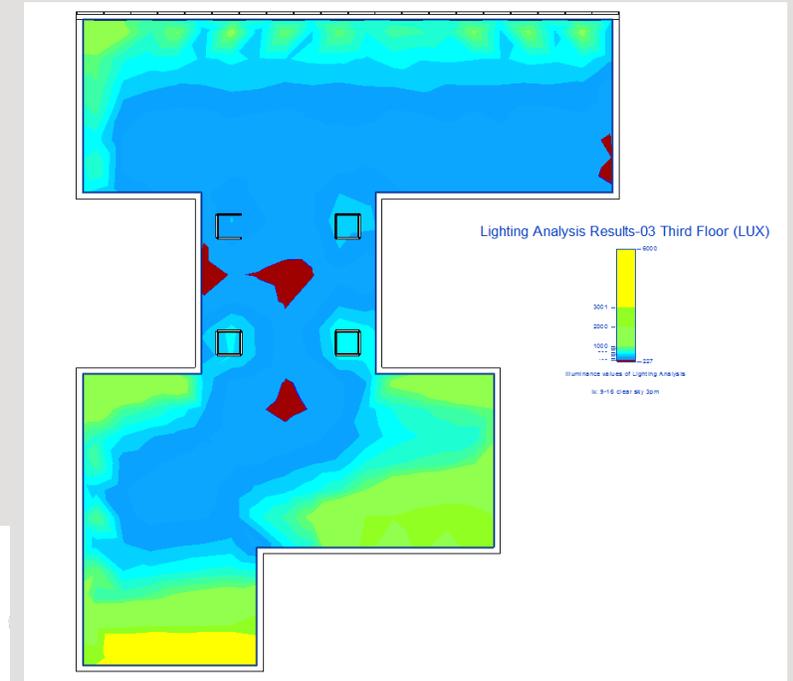
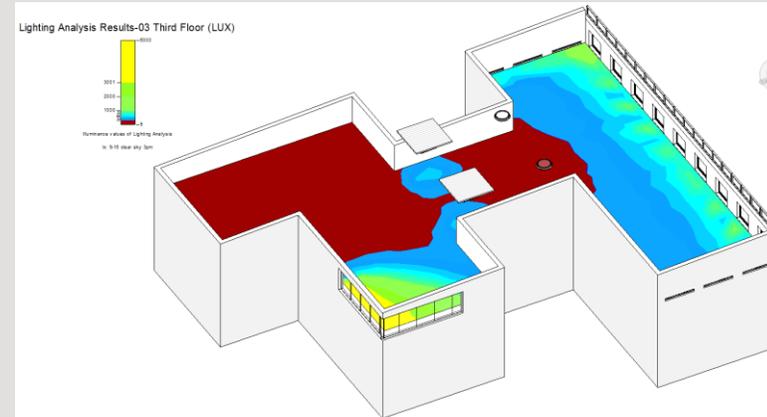
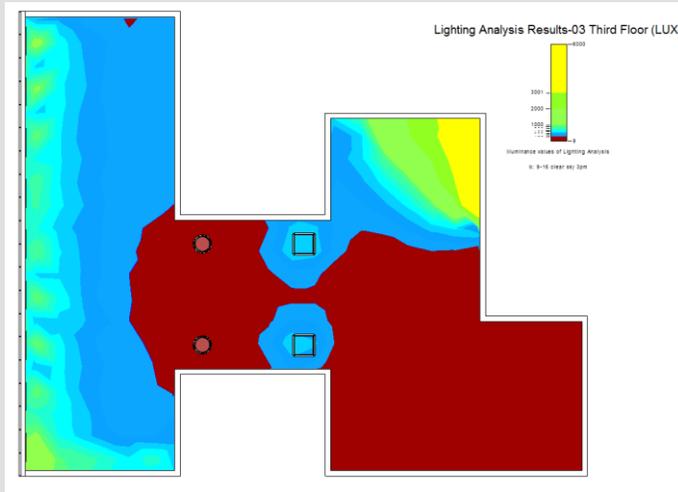
Waterford Institute of Technology, Ireland

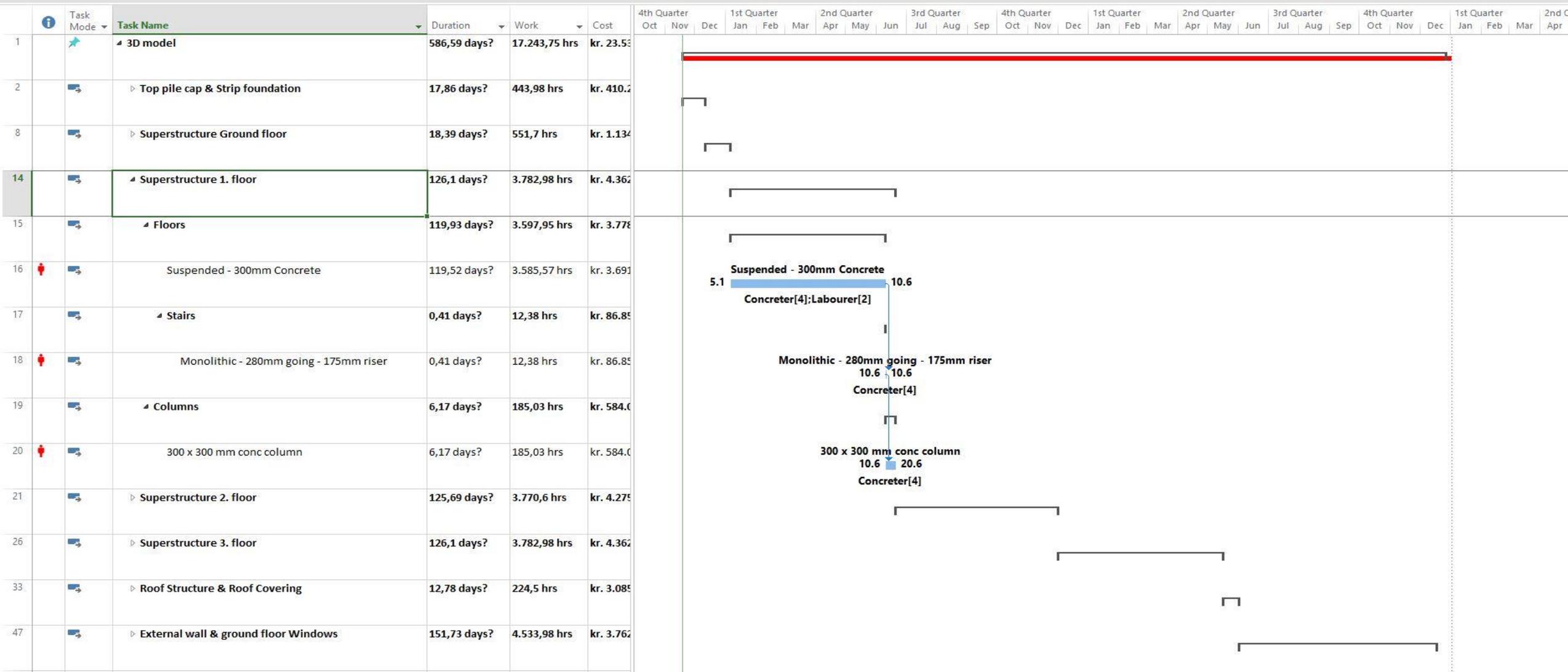














- Involvement of other disciplines
- Strengthen & Establish Erasmus Links
- Cultural Trips
- Rotate Venues
- Students Comments:
 - Prior Knowledge of Software
 - Method of Approach
 - Timescale
 - Enjoyed collaborative work & communication





Image from Munster Express



An image by Gottfried Helnwein on the Odlums mill building, part of an art installation around the city in 2010



Image from www.waterfordvikingtriangle.com



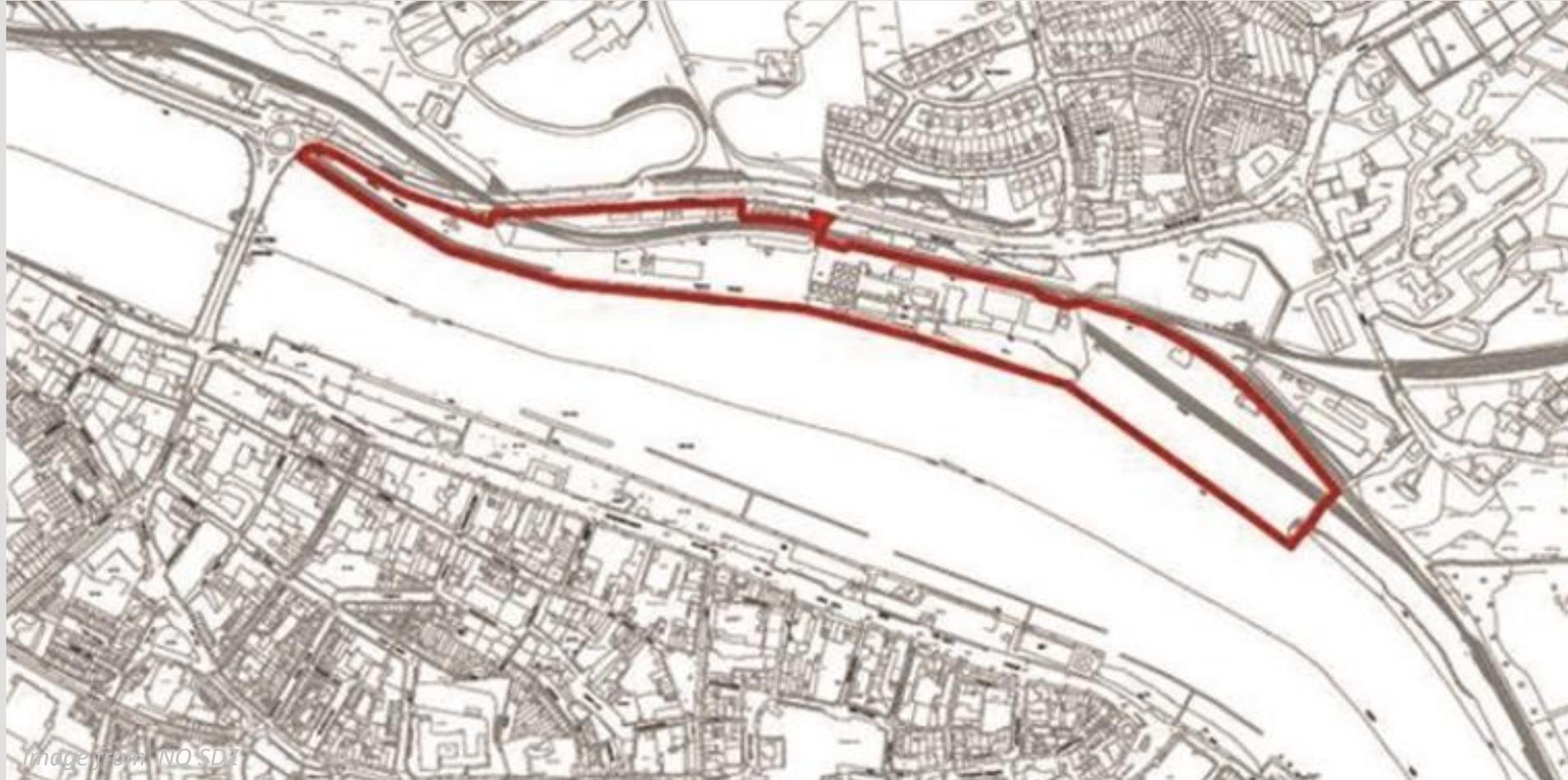


Image from NQ SDZ



STATUTORY INSTRUMENTS.

S.I. No. 30 of 2016

PLANNING AND DEVELOPMENT ACT 2000 (DESIGNATION OF
STRATEGIC DEVELOPMENT ZONE: NORTH QUAYS, WATERFORD
CITY) ORDER 2016

Came into operation 20th January 2016

A SDZ forms part of the development plan in force in the area of the scheme and it supersedes any contrary provisions of the development plan.

There is NO APPEAL opportunity to An Bord Pleanala against the decision of the Planning Authority on an individual planning application for development within an SDZ.

The Planning Authority can use any powers available to it (including Compulsory Purchase order procedures) for the purposes of providing, securing or facilitating the provision of the SDZ.

An authority may enter into agreements with landowners to facilitate the development of the SDZ.



Plot Areas:	Approx. 10,000sqM	1 Bed Apt:	min. 50sqM
Plot Ratio:	Max. 3 excluding parking (3 x Plot Area)	2 Bed Apt:	min. 75sqM
		3 Bed Apt:	min. 100sqM
Site Coverage:	Max. 25%	Public Open Space:	20sqM per Apt
Car Parking:	Office: 1 space per 100sqM	Private Open Space:	Av. 7sqM per Apt
	Apt: 1 space per Apt	<i>(this can be met with a mix of balconies, winter gardens and communal areas within the building)</i>	
Bicycle Parking:	20% of car parking		
Height restriction:	None	Plant, Refuse storage etc. to be allowed for	



The North Quays SDZ site has been divided into eight plots of approx. 10,000sqM. Each team is required to provide the following accommodation in a tower design to comply with the development standards:

- **Ground Floor: Sacrificial Use due to flooding risk**
- **50 / 50 split between office and residential**
- **Residential mix between 1,2 & 3+ bed apartments**
- **Parking provision to be designed communally across the entire SDZ site**

Design Considerations: Development mix, core design: No. of stairs / lifts, services, sustainability / renewable energy, passive solar design, wind analysis, private open space integration, structure, cost

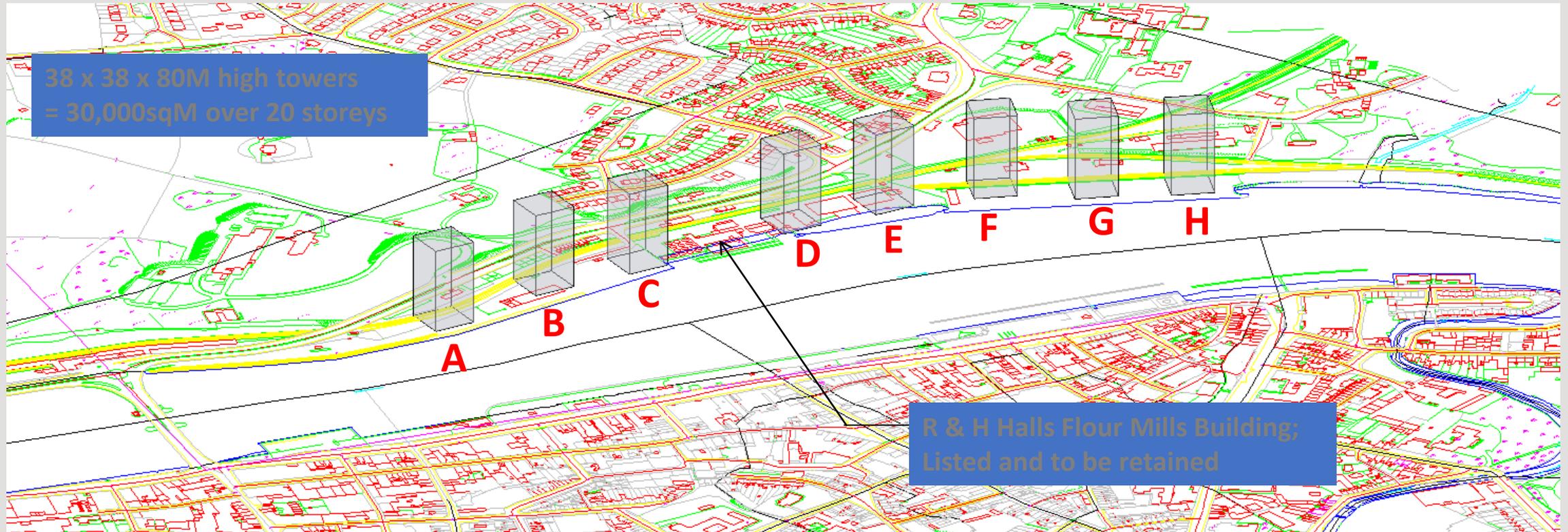


A 9th team consisting of one person from each will develop the masterplan and coordinate the overall masterplan / site model with their and all teams.

Masterplan Considerations: Parking, services, refuse, vehicular & pedestrian access / egress, public open space, flood defence, riverside amenity, renewable energy

Use the methods outlined in the blog [“1 hour tower”](#) as a basis for a sustainable / passive design for a commercial / residential tower.

The key to the project is the BIM workflow between disciplines and software's where we can develop design, analysis, cost, time frame etc. using Revit (all flavours incl. analysis), Formit, 3Ds Max, Sefaira, CostX, Navisworks.





Design: Formit – Revit Architecture
(SHU, VIA & WIT ABT)

Solar & Wind Analysis: Revit Arch, insight 360, Flow
Design: (SHU, VIA & WIT ABT)

Design Energy Analysis: Sefaira & Revit Energy Analysis
(WIT SEE4 & ABT)

Structural: Revit Arch linked into Revit Structures
(SHU, VIA & WIT ABT)

Estimating: Costx (WIT QS)

Coordination / Programming / scheduling: MS
Project, Excel, Collaboration for Revit

Common Data Environment: Autodesk BIM 360, to be
set up by WIT, prior to commencing the project all
teams will be set up, connected & live

Site Model: Revit: Managed, data drops each evening
in CDE by teams which in turn will be loaded into the
site model for update presentation the following
morning. Each group will be issued a Revit project
file with shared coordinates set up. (in addition a
sketch up model of Waterford city is available)



Team A:
ABT3 / 2: James Duggan , Donal O’Sullivan / Conor Browne
VIA: Mette Schou Daugaard, Henrik Vahle Eriksen
SHU: Aimie Allen, Matt Pratt, Jake Swales
SEE4: Wei Xing Lee

Team B:
ABT4 / 2: Daniel Farrelly / Traci Curran
VIA: ??
SHU: Mo Ali, Maisie Crafter, Garard Langley, Jesse Thompson
QS4: John Greene
SEE4: John Moloney

Team C:
ABT3 / 2: Julija Fedotova / Colin Garry
VIA: Karolina Fularczyk, Valdis Nína
SHU: Anand Bansal, Dave Wright, Nyasha Phiri
QS4: Scott Kirwan
SEE4: Adrian Porter

Team D:
ABT3 / 2: Joe Kelly / Mark Hayes
VIA: Karolina Poczobutt
SHU: Tom Holmes, Dan Miles
QS4: Rose Liao
SEE4: Abdulhamid Alrehaili

Team E:
ABT3 / 2: James Kent / Peter Jenkins
VIA: Julius Gustav Walsh Lund
SHU: Liam briggs, Zac Stretch
QS4: Deniss Moroz
SEE4: Joseph Buckley, Gerard Hogan

Team F:
ABT3 / 2: Peter Molloy
VIA: Chris Michel Gravesen, Rasmus Dyhr Damsgaard Allermann
SHU: Toms Dobby, Tahir Ramzan
QS4: Declan Stark
SEE4: Gavin Taylor, Brian Prendergast

Team G:
ABT4 / 2: Arifur Rahmanshawon / Eoin Millea
VIA: Mads Qvist, Chad Stuart Baker
SHU: Katherine Eales, Owen Nuttall, Tom Feely
QS4: Yi hui Tan
SEE4: Mateusz Baberski, Dean Murphy

Team H:
ABT3 / 2: Craig Reynolds / Patrick Thomas
VIA: Glenn Fyhn Thomsen, Daniel Kristensen
SHU: Dan Gillespie, Joe Turner, Wilberforce Kotey
SEE4: Daniel Dowd, Peter Dalton



- **Managed Common Data Environment**
- **Integrated Masterplan Model**
- **Tower Models: Revit Architecture & Structures**
- **Environmental Analysis**
- **Federated Model for linking to Masterplan**
- **Schedule of Areas and compliance with Dev. Standards**
- **Stage 1 (Sketch Design) Cost Plan**
- **Stage 2a (Developed Design) Cost Plan**
- **AV Presentation of the collaborative processes employed, design processes and project costs**





Preparation: ABT 3 & 4 students to set up and manage the CDE, invite team members to join. Team members are required to prepare for the workshop by liaising with each other, undertake precedent studies, quantify the development standards, experiment with the software, agree roles / scope of works for the project. All communication / work to be channelled through the CDE.

Sun 6th Nov: Meeting VIA & SHU in Kilkenny for Brewery tour and Lecture by Chris Bakkala; Leaving Kilkenny approx.

Mon 7th Nov: 9.15am [Medieval Museum](#); Introduction to and meet the teams. Visit to site and then to Granary;

11.15pm Teams work in the granary

Tues 8th Nov: Continue to work in Granary, lecturers to meet teams and review progress throughout the day

Wed 9th: 9.15am work in Granary, final models to be uploaded to cloud and linked into masterplan model at 2pm ready for final presentations at 5.15pm. Teams to work on final audio visual presentations

Socialise...

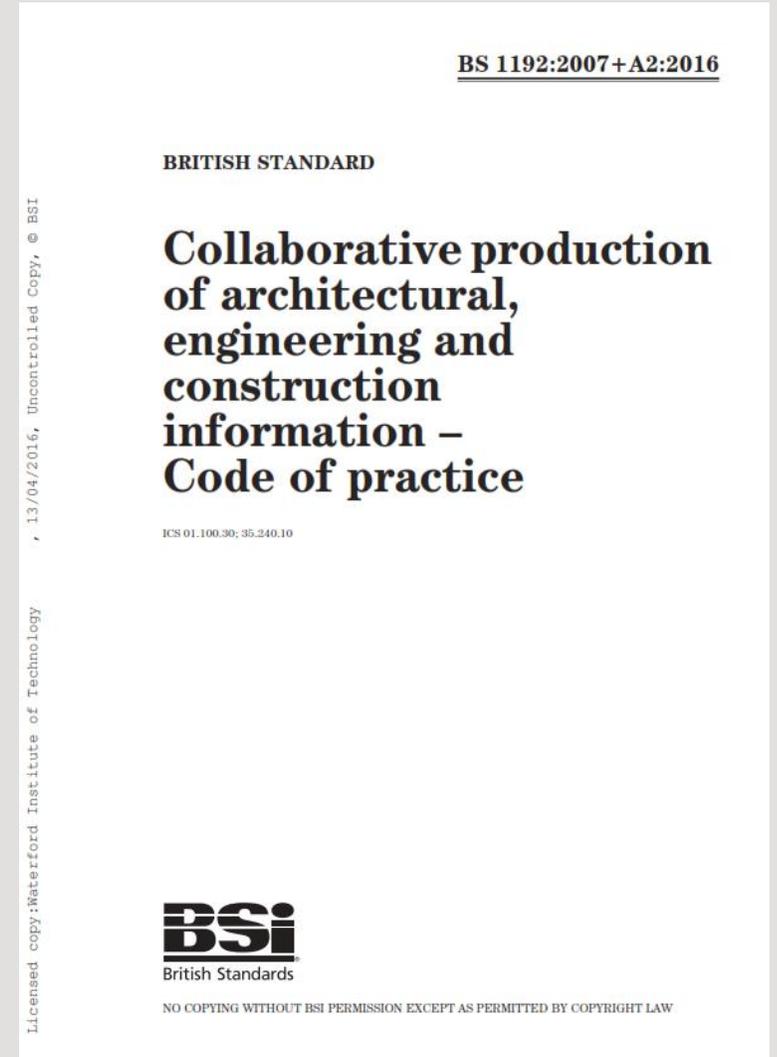
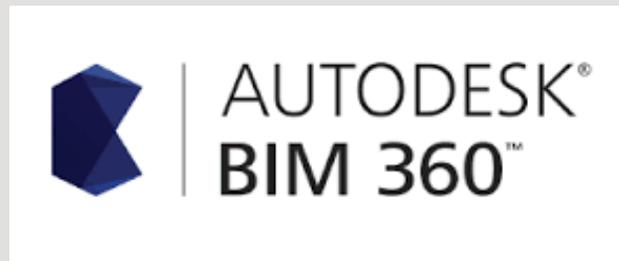


WIT ABT 3 & 4: ACB 5 Module:

- Common data Environment: Autodesk BIM 360
- File Management & Naming: BS 1192 2007+A2 2016
- BIM Execution Plan: RIAI BEP Template

WIT ABT 2: ACB 3 Module:

- Autodesk 3DS Max





Common data Environment: Autodesk BIM 360

- Teams selected and invited to join
- Roles discussed
- Software discussed
- Design precedents
- Development Standards

Team WIT
NQP Team A

Home > NQP Team A

Upload New Folder

Name	Owner	Type	Size	Last updated
Wiki Pages	Gordon Chisholm	Folder		Nov 5, 2016
1. WIP	James Duggan	Folder		Nov 14, 2016
2. Shared	James Duggan	Folder		Oct 26, 2016
3. Published	James Duggan	Folder		Nov 14, 2016
4. Archived	James Duggan	Folder		Oct 26, 2016
5. Incoming	James Duggan	Folder		Nov 14, 2016
6. Resources	James Duggan	Folder		Oct 26, 2016
7. Master Folder	James Duggan	Folder		Nov 14, 2016

Details Activity

NQP-A-XX-ZZ-M3-A-0001_TRIMMED MASTER PLAN-160911.rvt

James Duggan uploaded Nov 14, 2016

NQP-A-XX-ZZ-M3-A-0001_WIND ANALYSIS 3-160911.avi

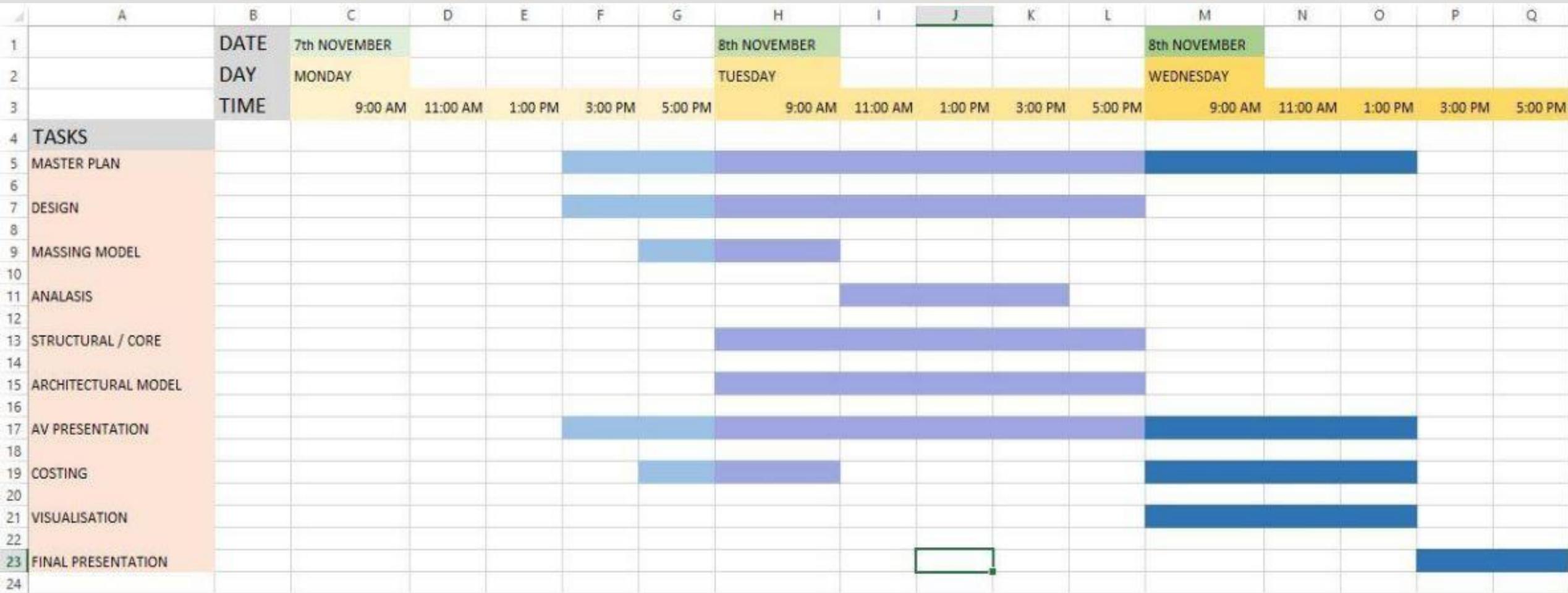
James Duggan uploaded Nov 14, 2016

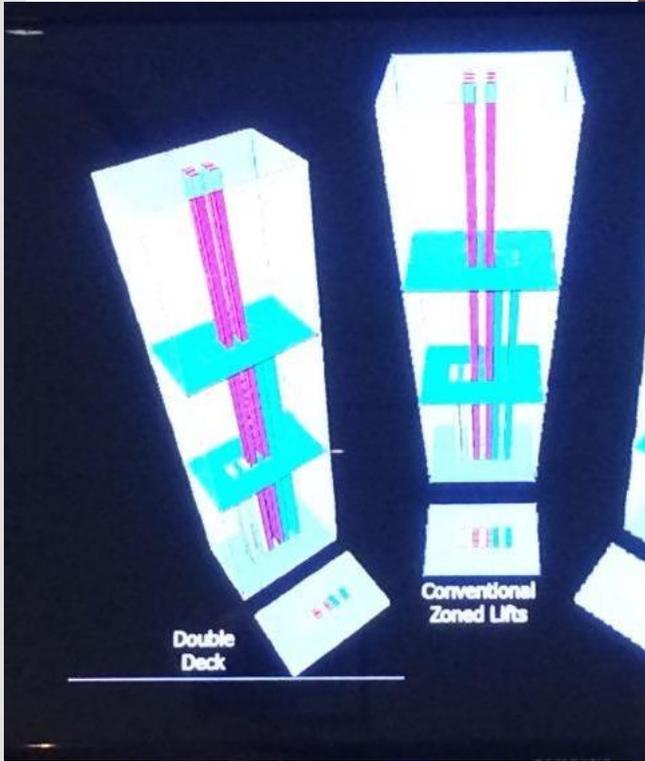
NQP-A-XX-ZZ-M3-A-0001_WIND ANALYSIS 4-160911.avi

James Duggan uploaded Nov 14, 2016

NQP-A-XX-ZZ-M3-A-0001_WIND ANALYSIS 1-160911.avi

James Duggan uploaded Nov 14, 2016





Warsaw Spire



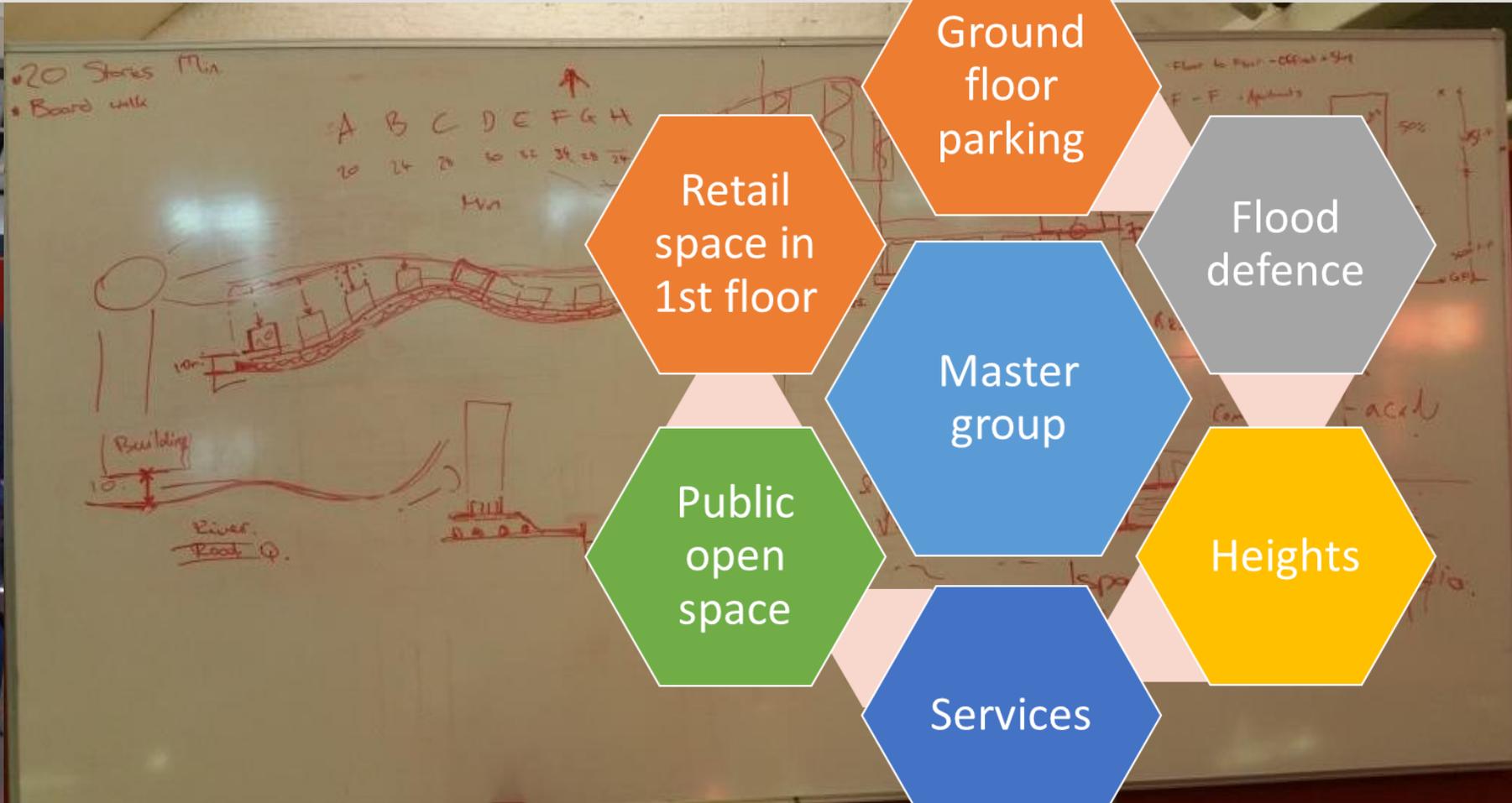
Plaza 66, Shanghai



Lamar Towers, Jeddah









GEHRY TOWER HANOVER



**TURNING TORSO,
MALMO SWEDEN**

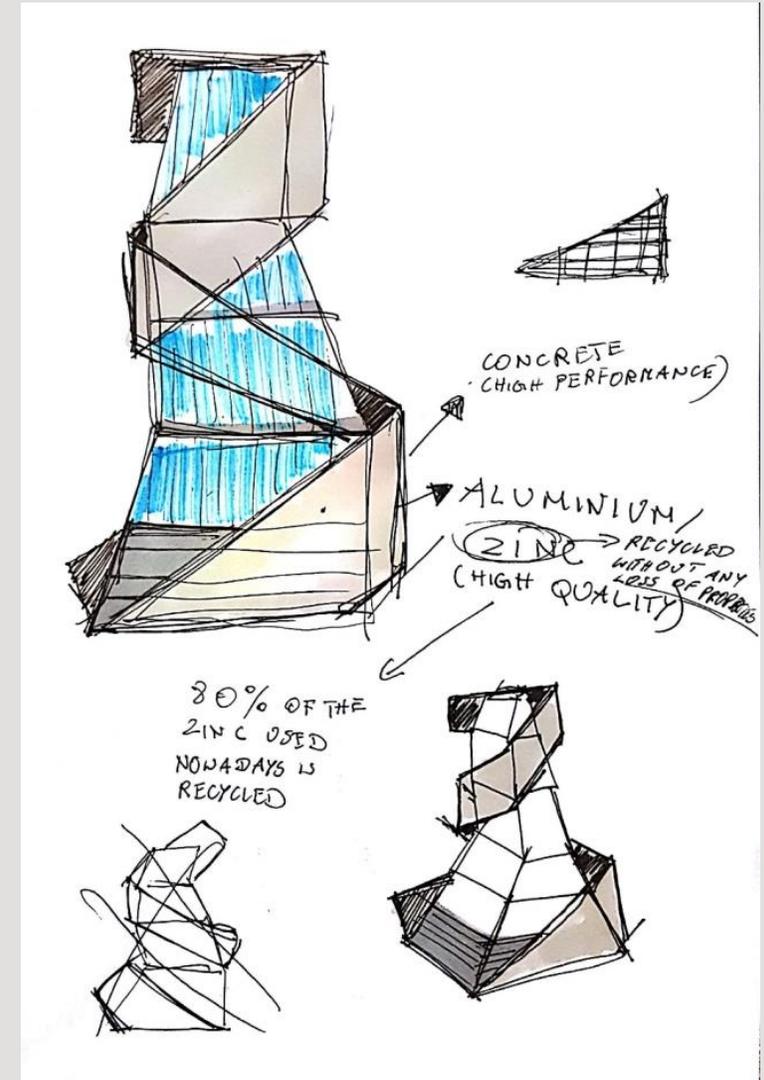
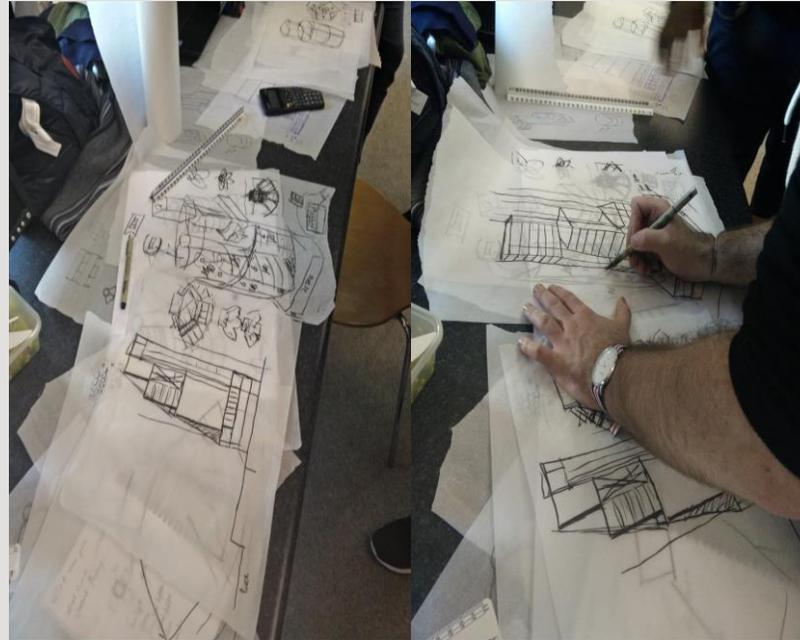
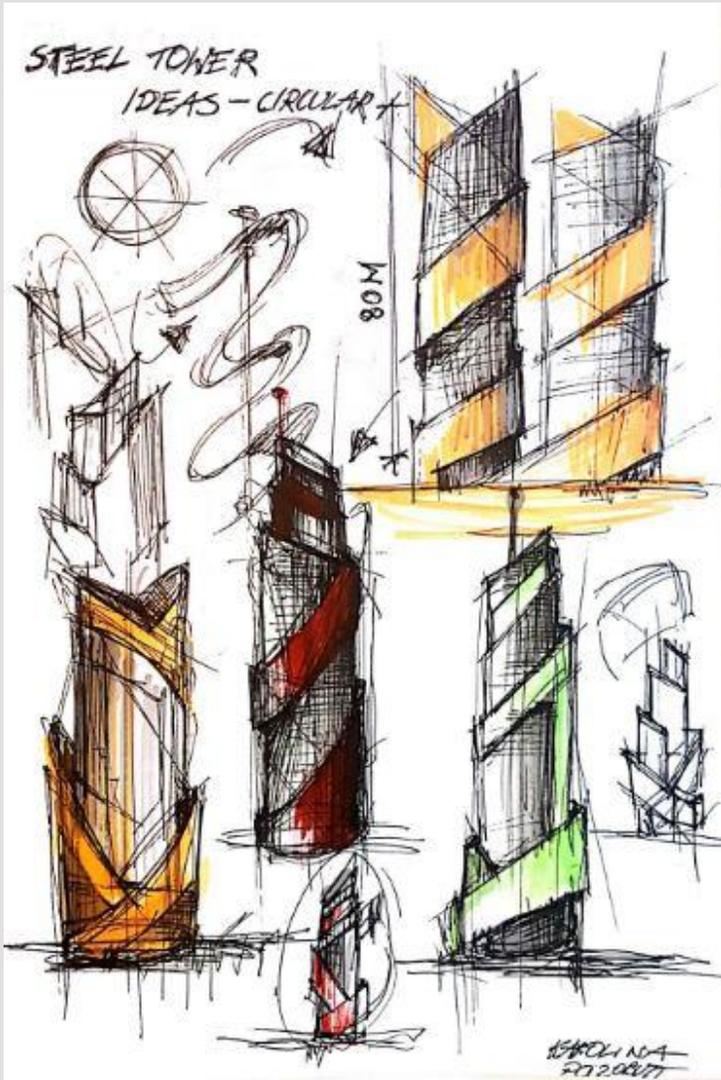


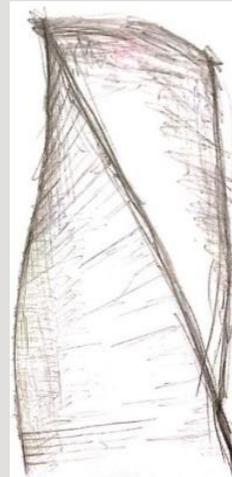
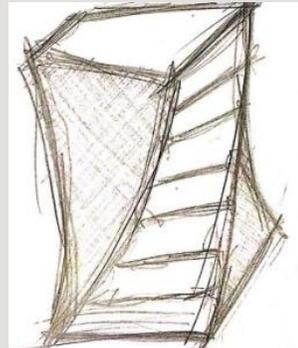
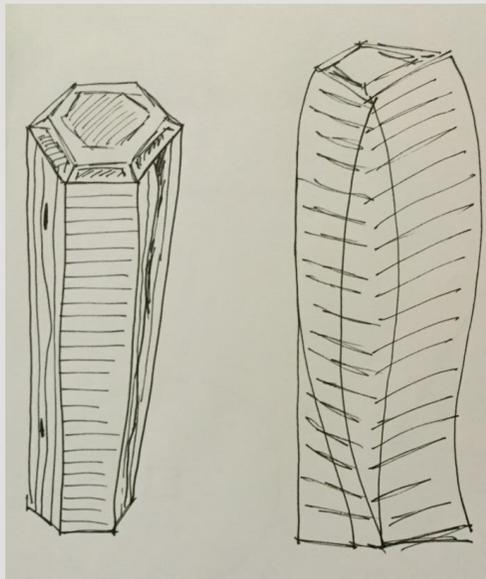
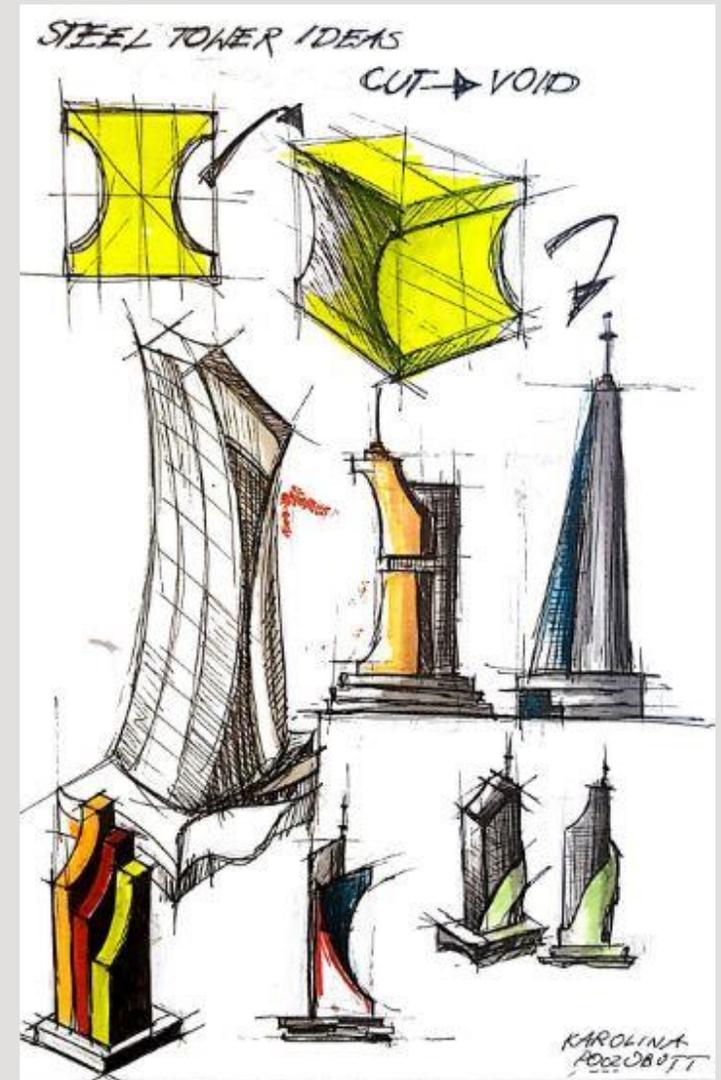
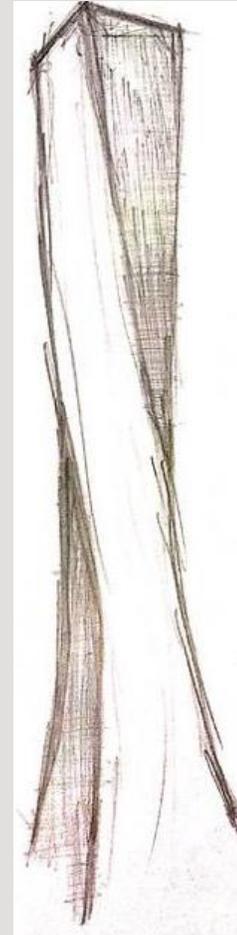
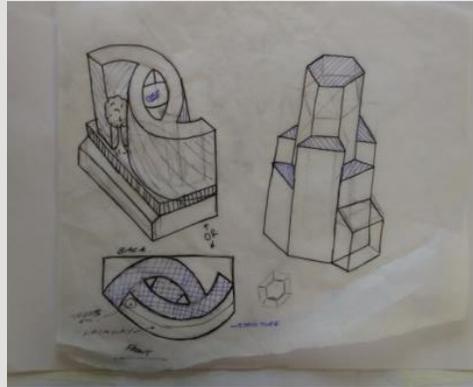
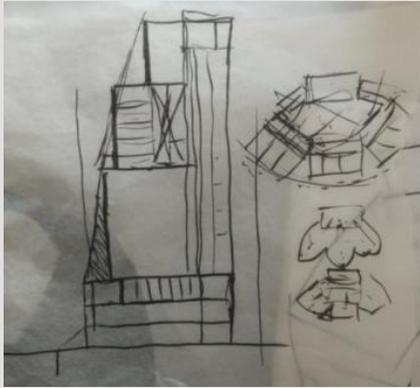
**REISER/UMEMOTO TOWER
DUBAI**

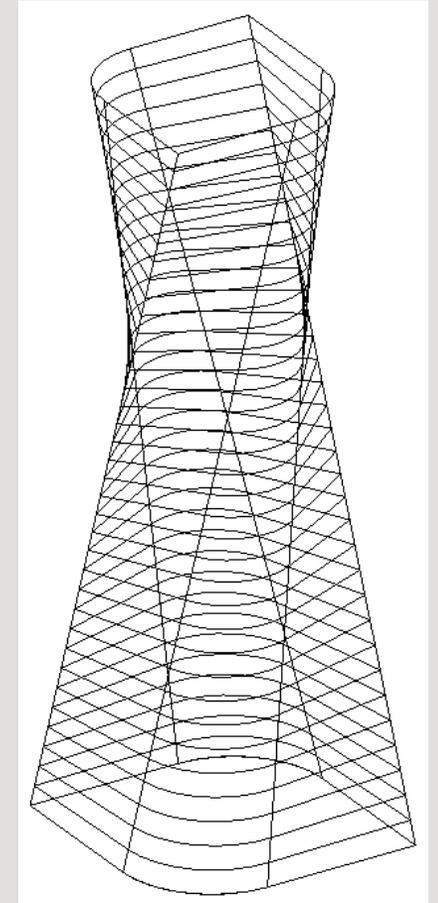
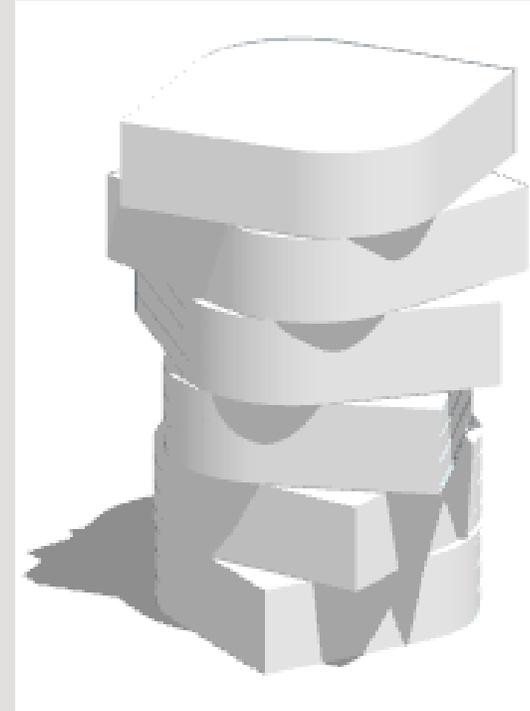
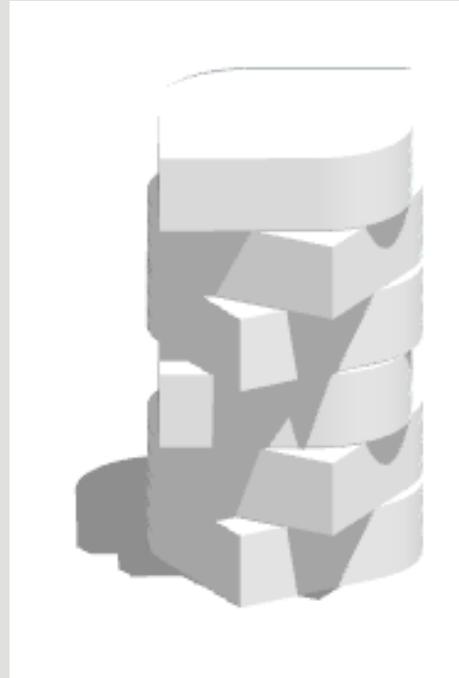
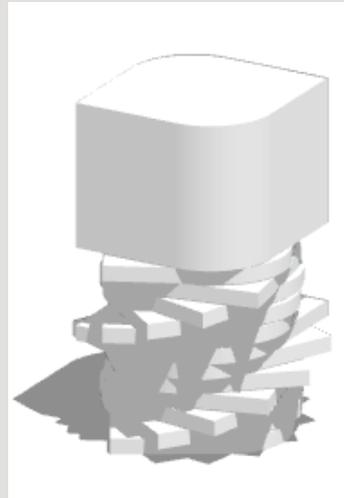
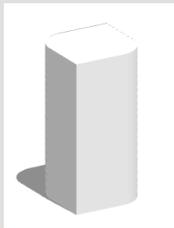


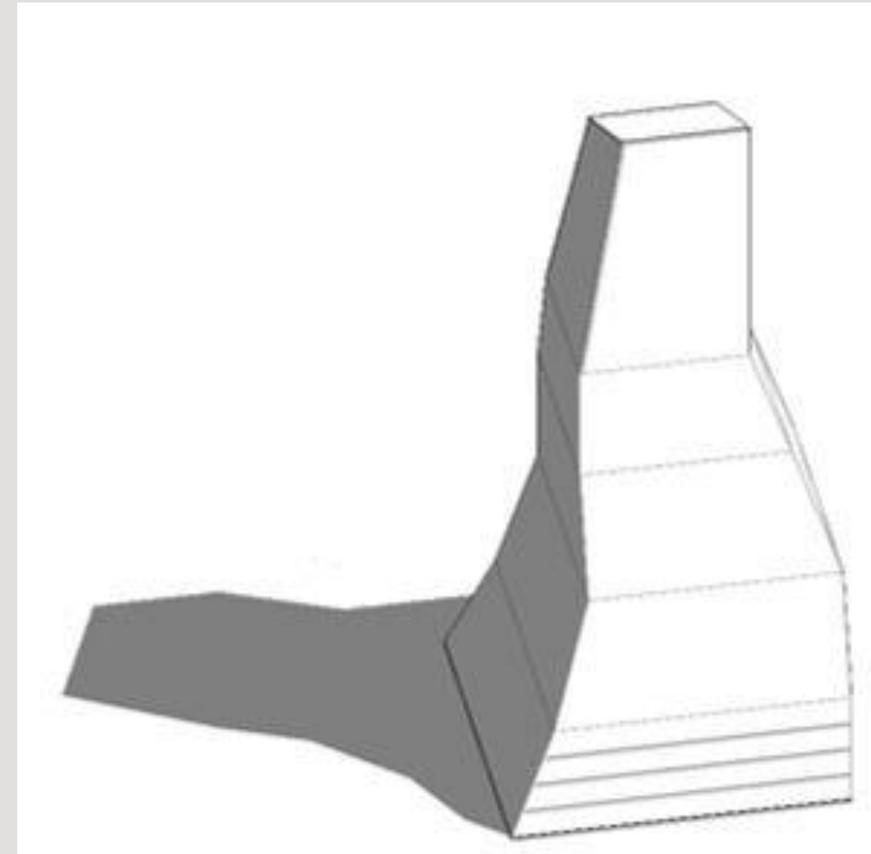
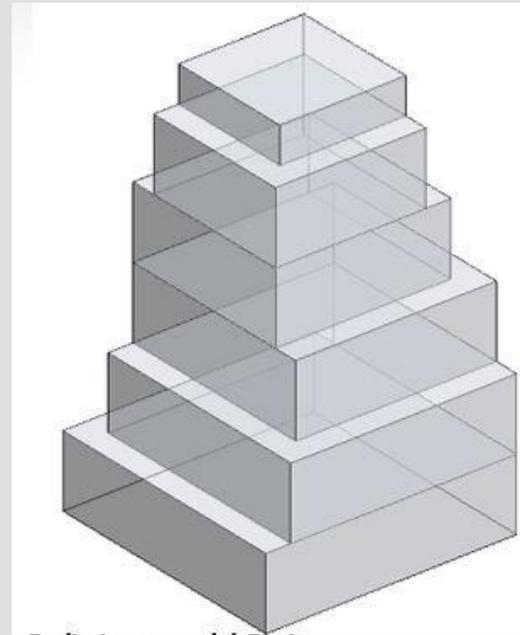
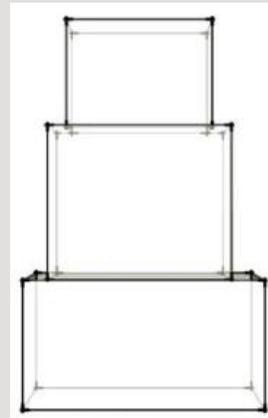
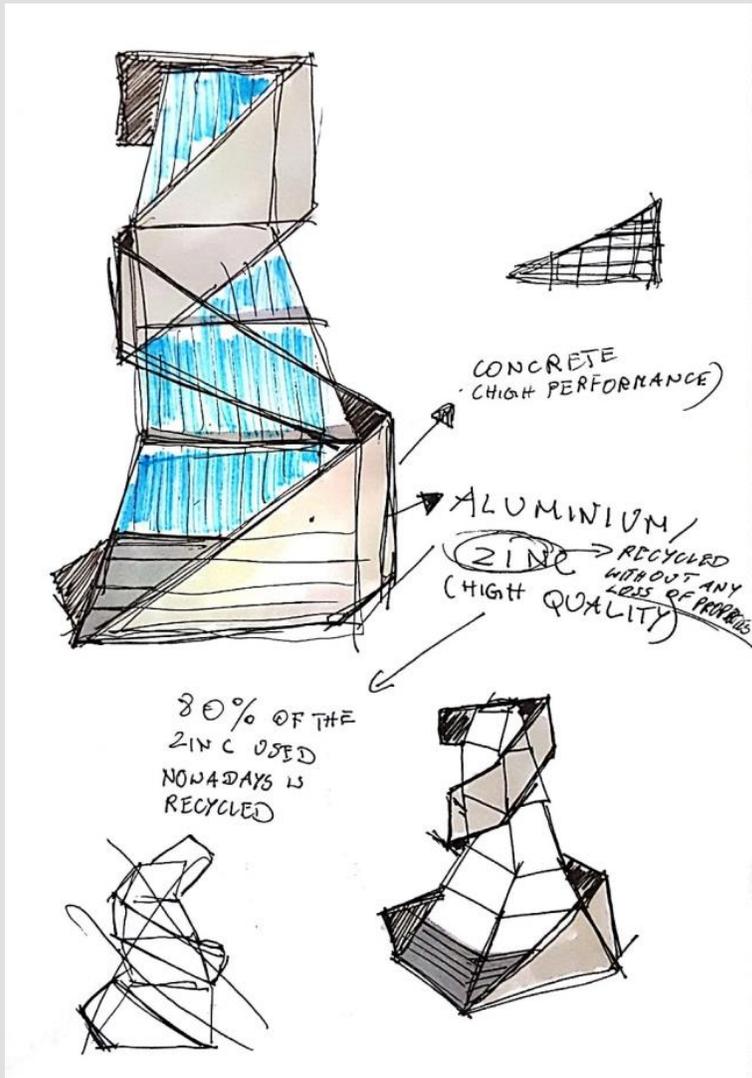
**ABSOLUTE TOWERS
MISSISSAUGA, CANADA**

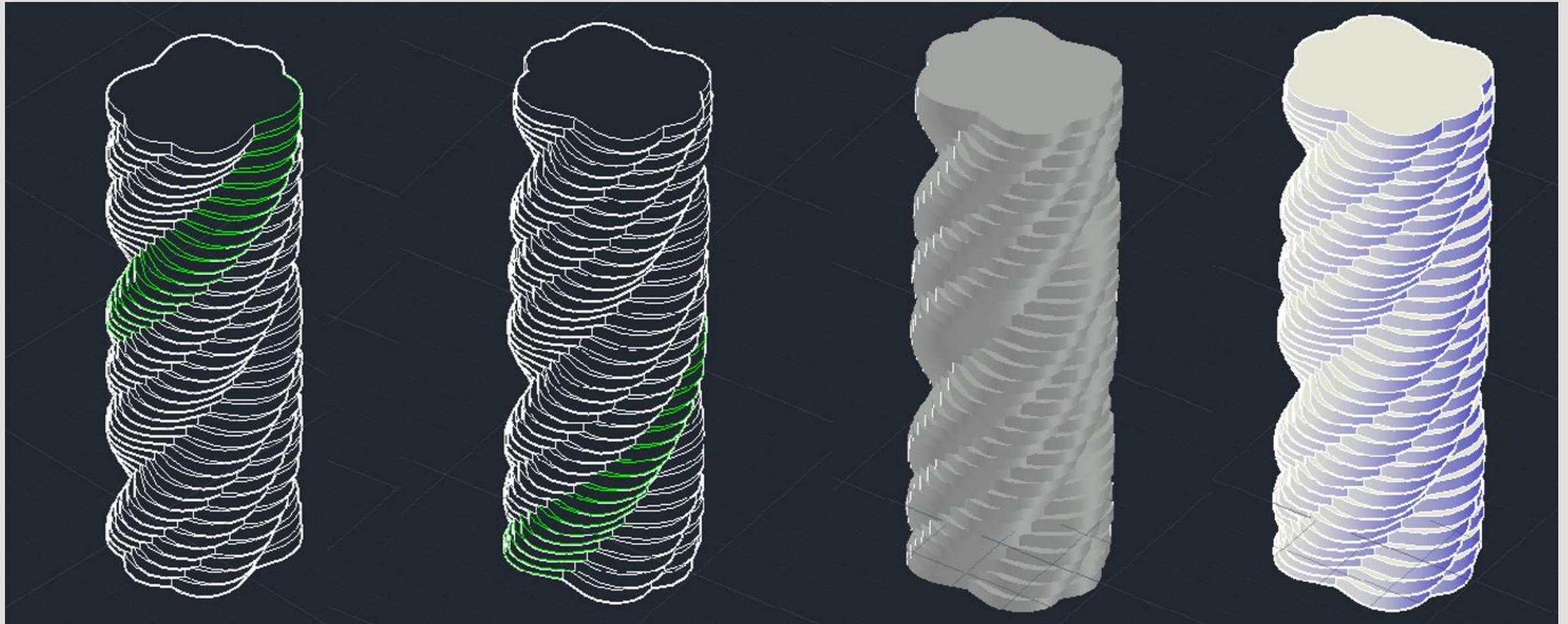


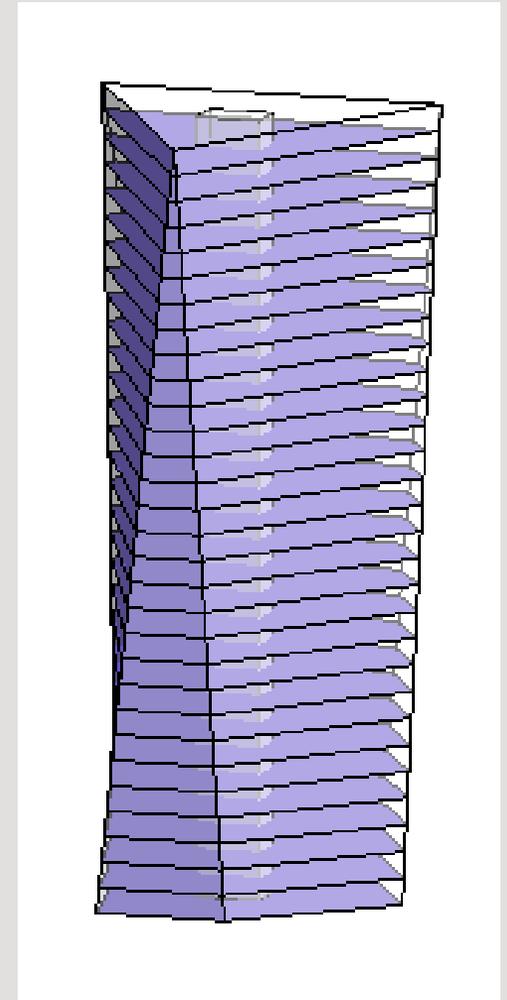
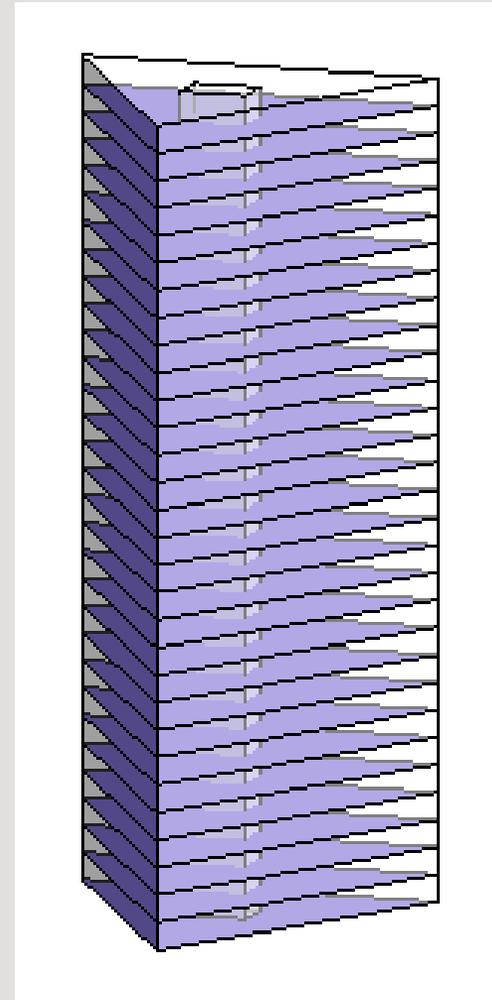
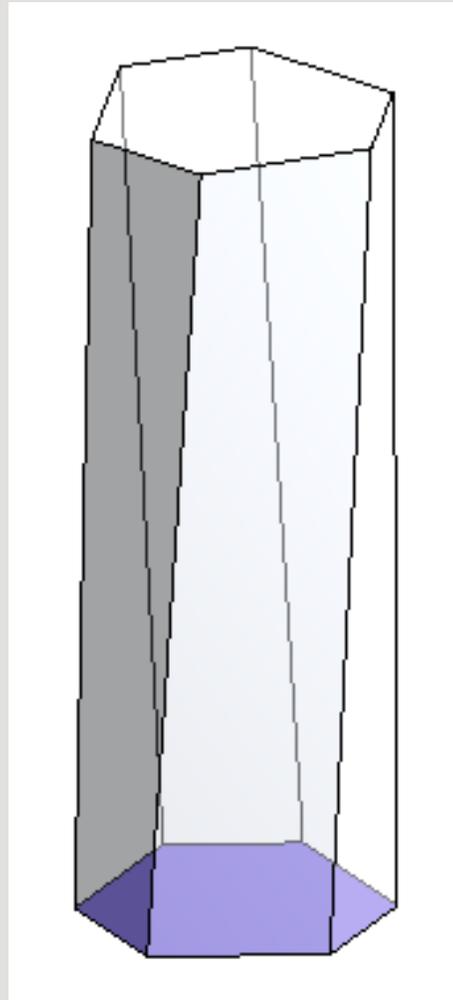
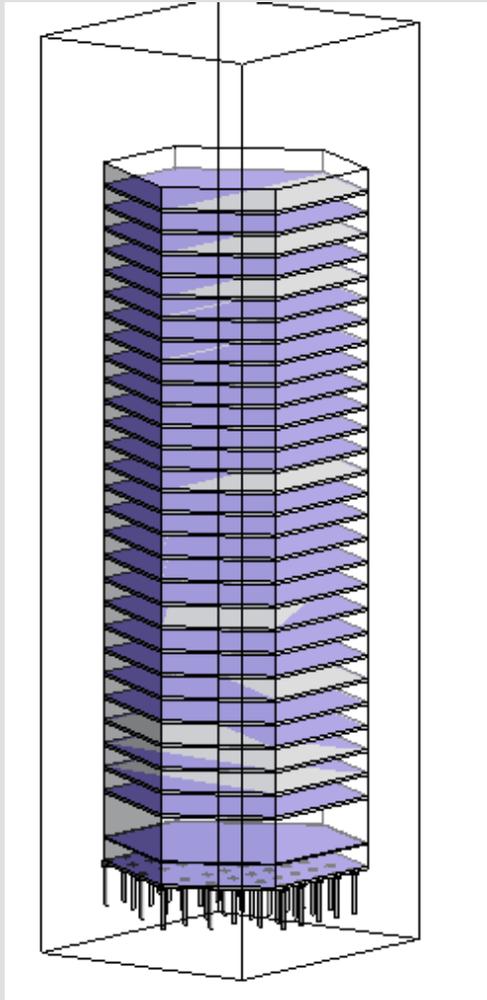


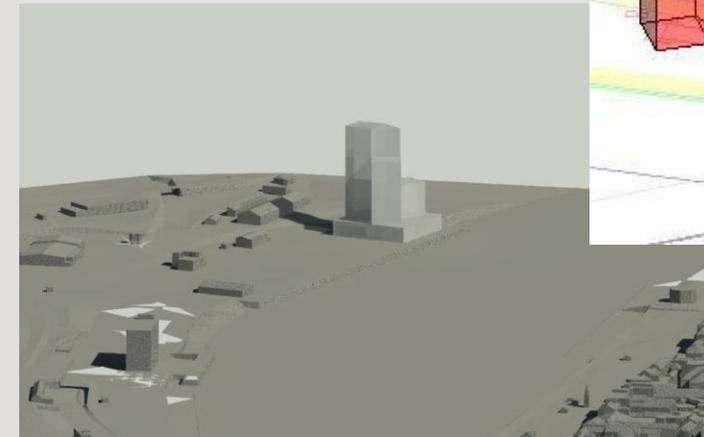
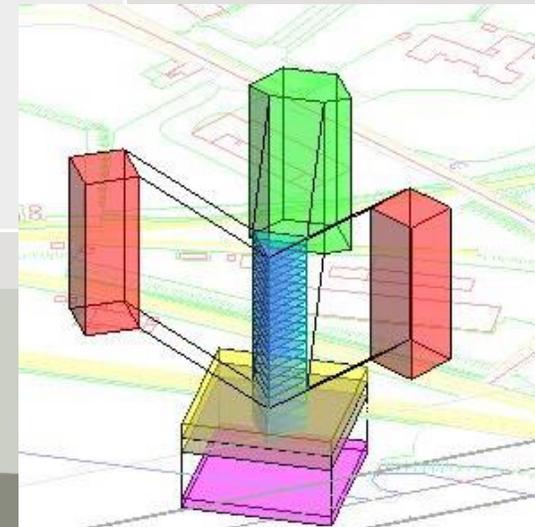
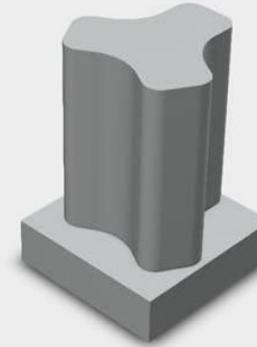
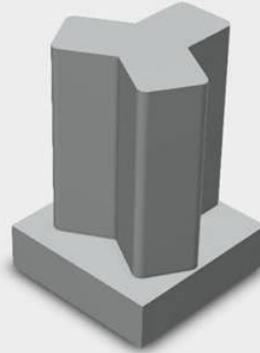
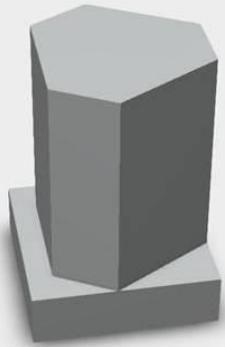


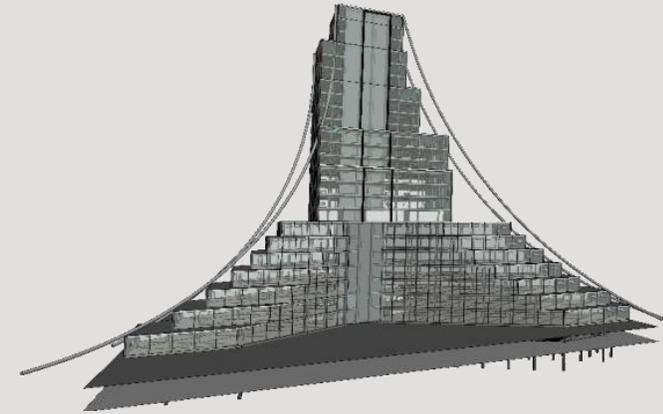
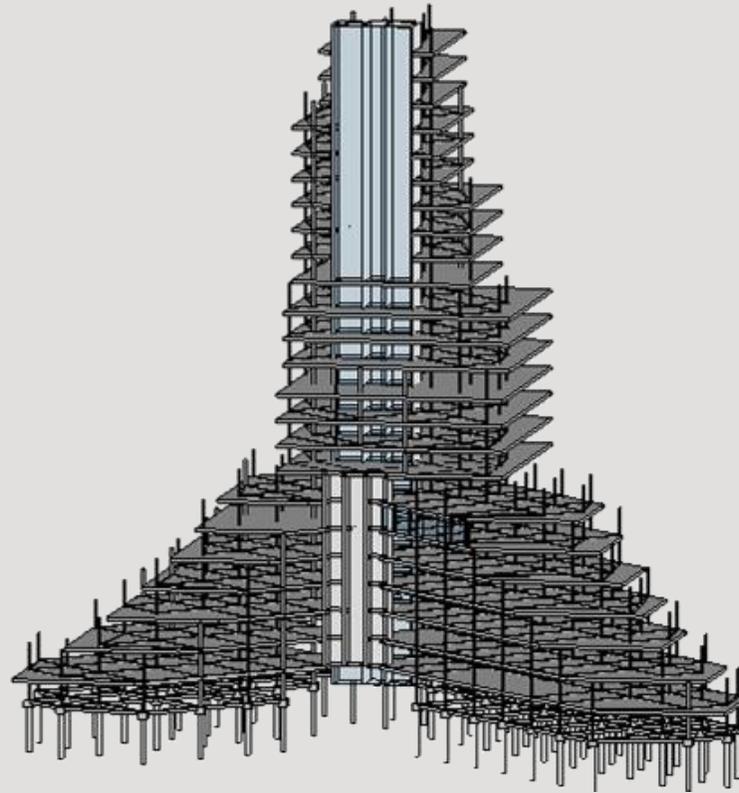
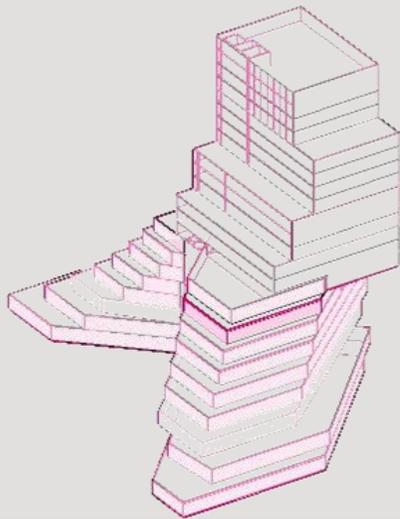
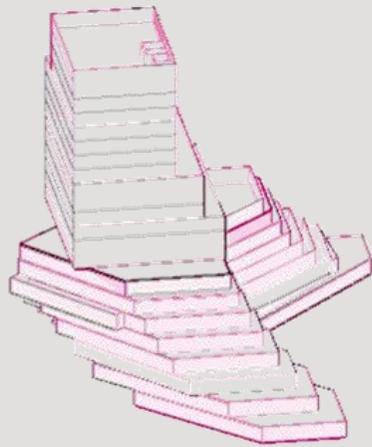
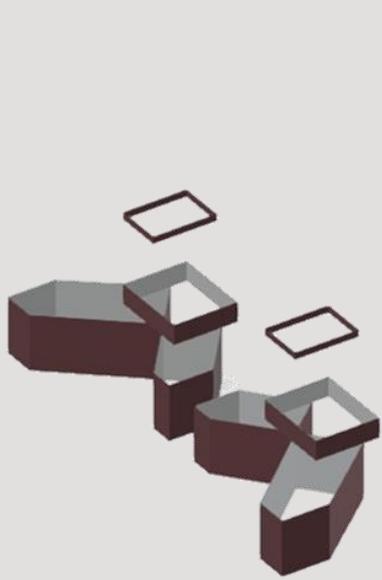


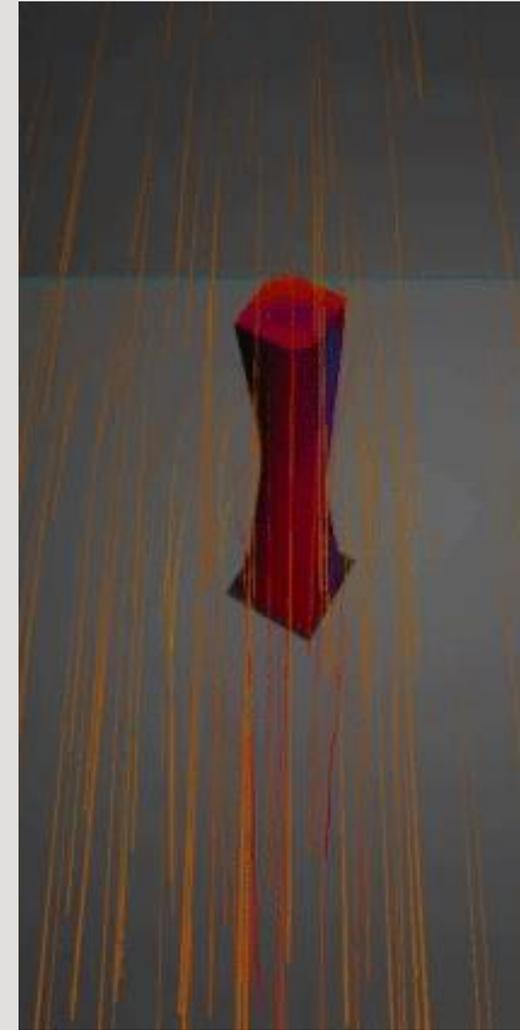
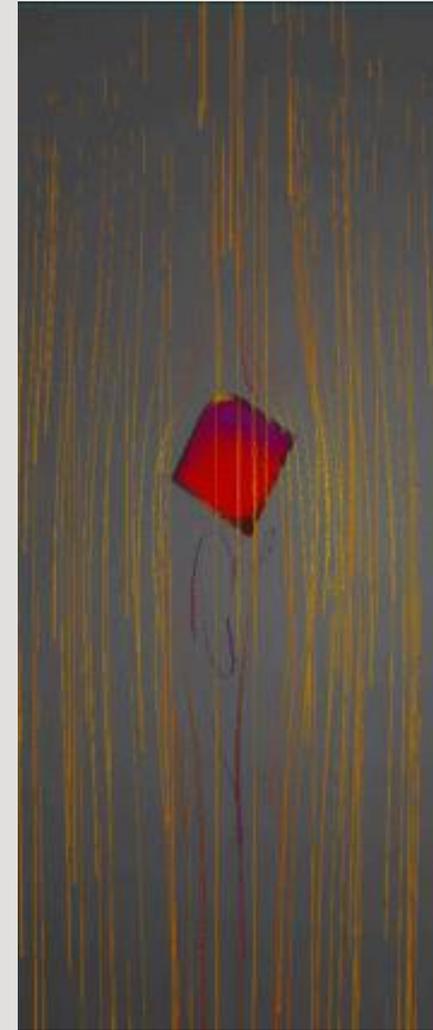
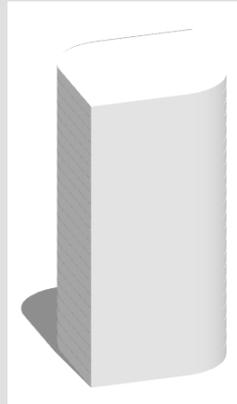
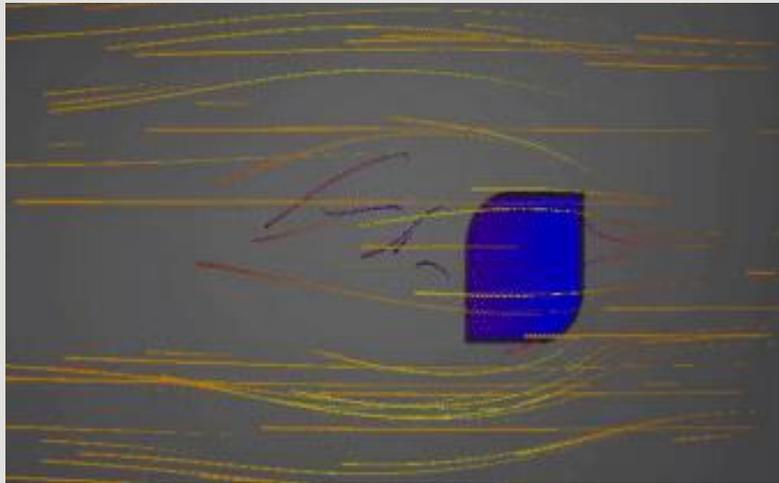
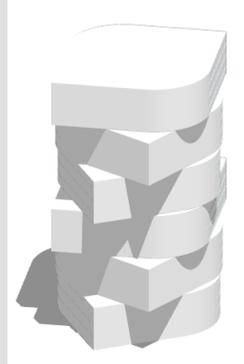
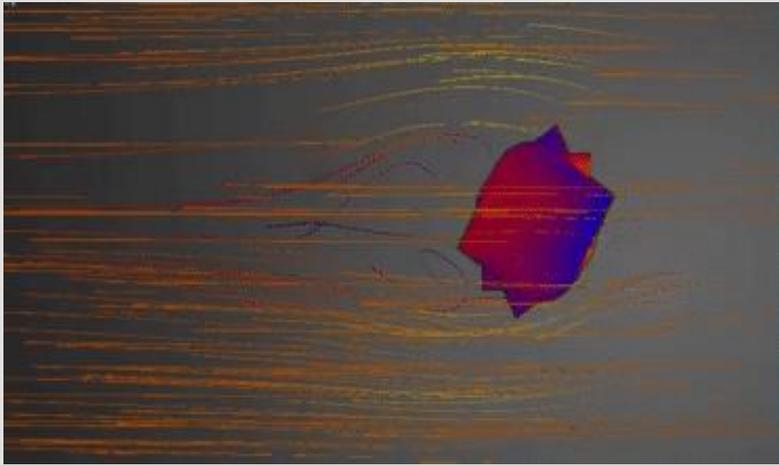


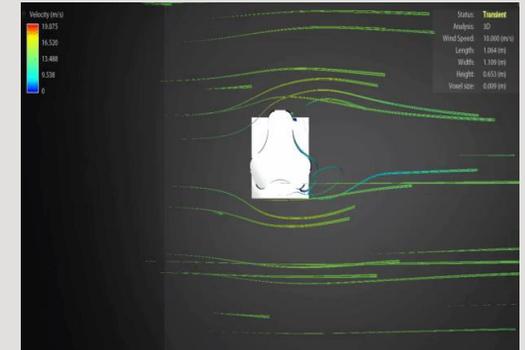
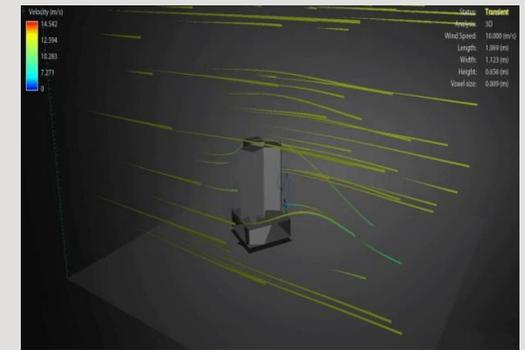
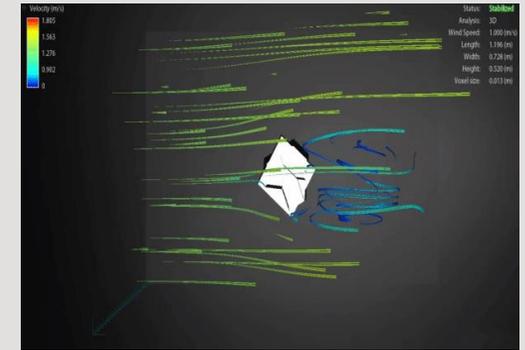
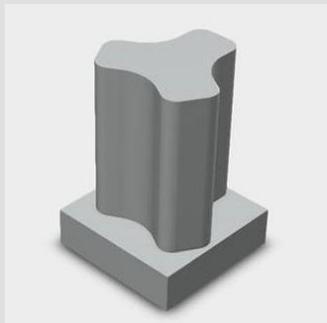
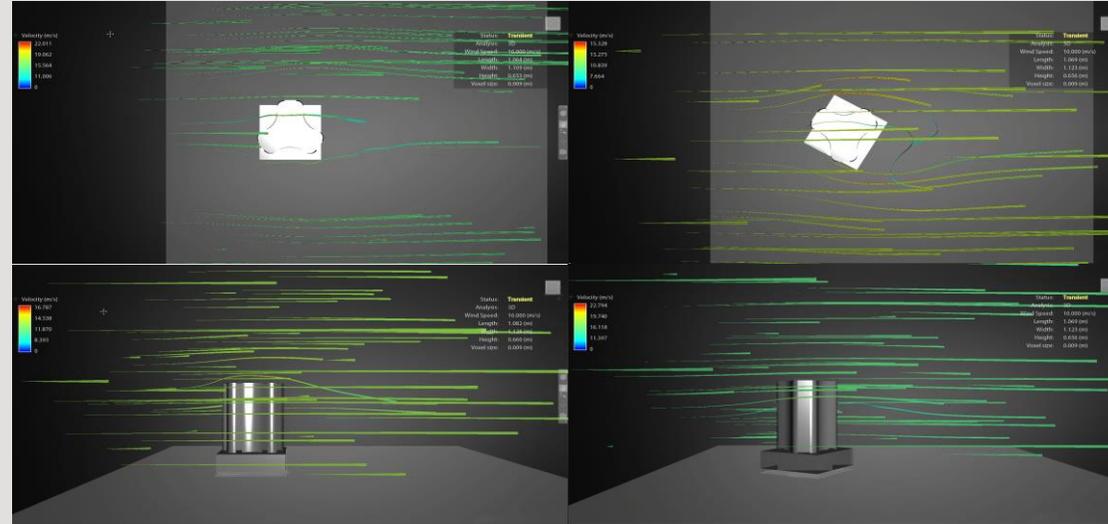
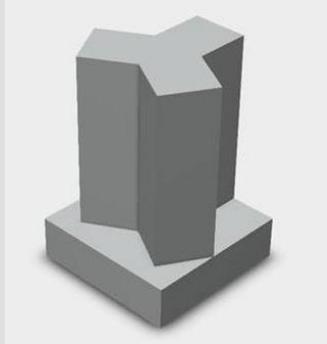
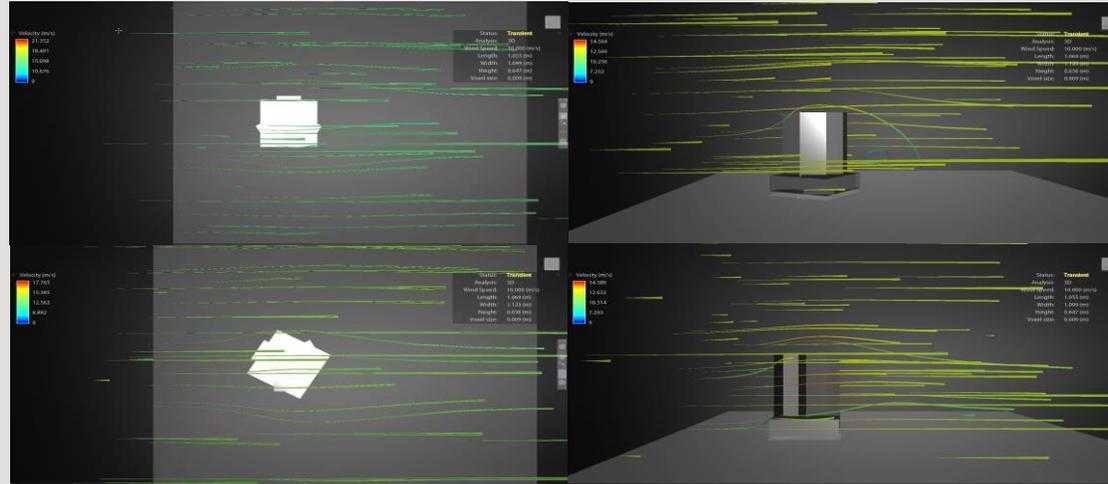
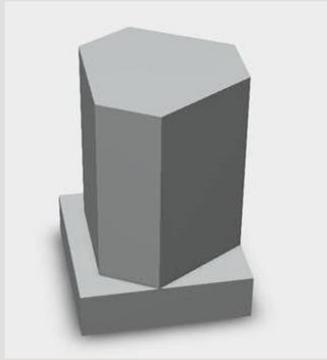


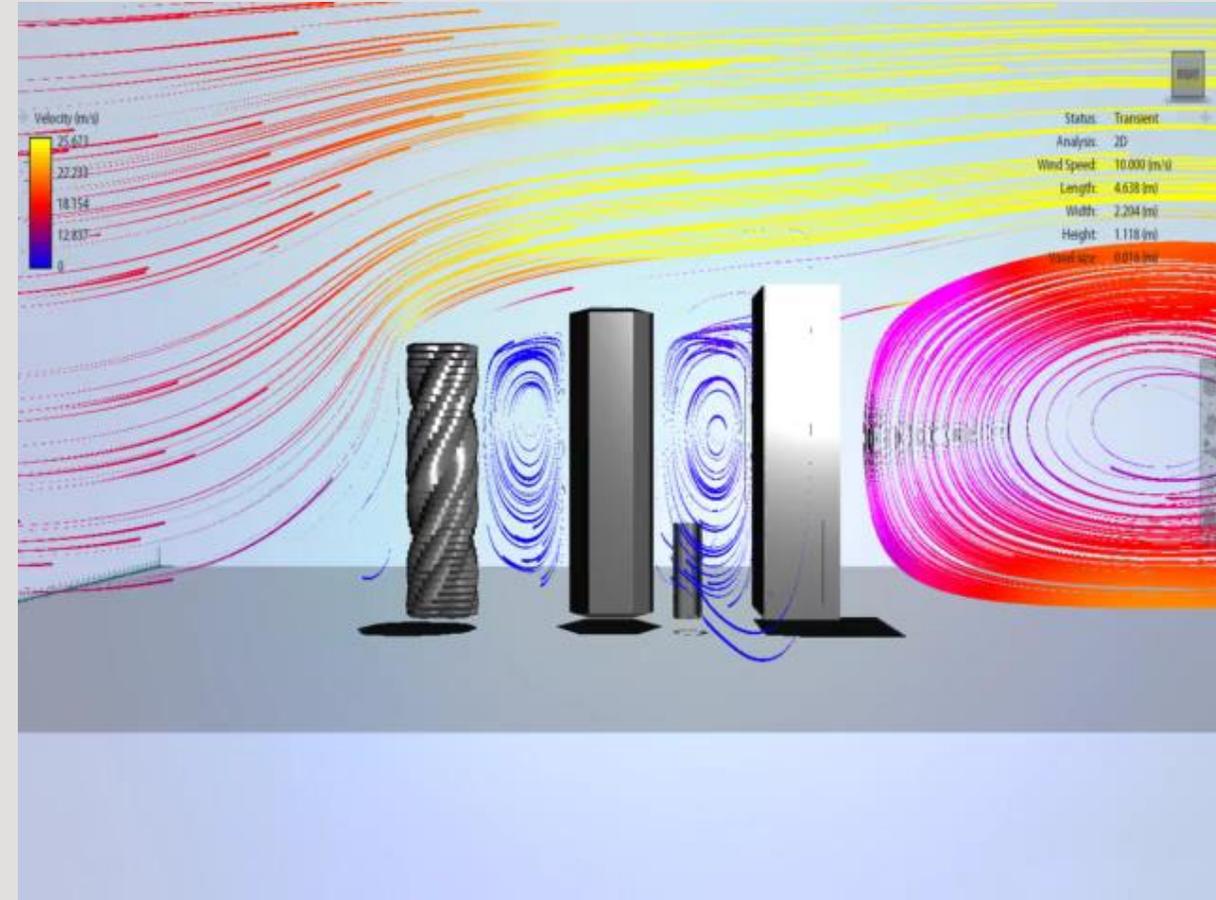
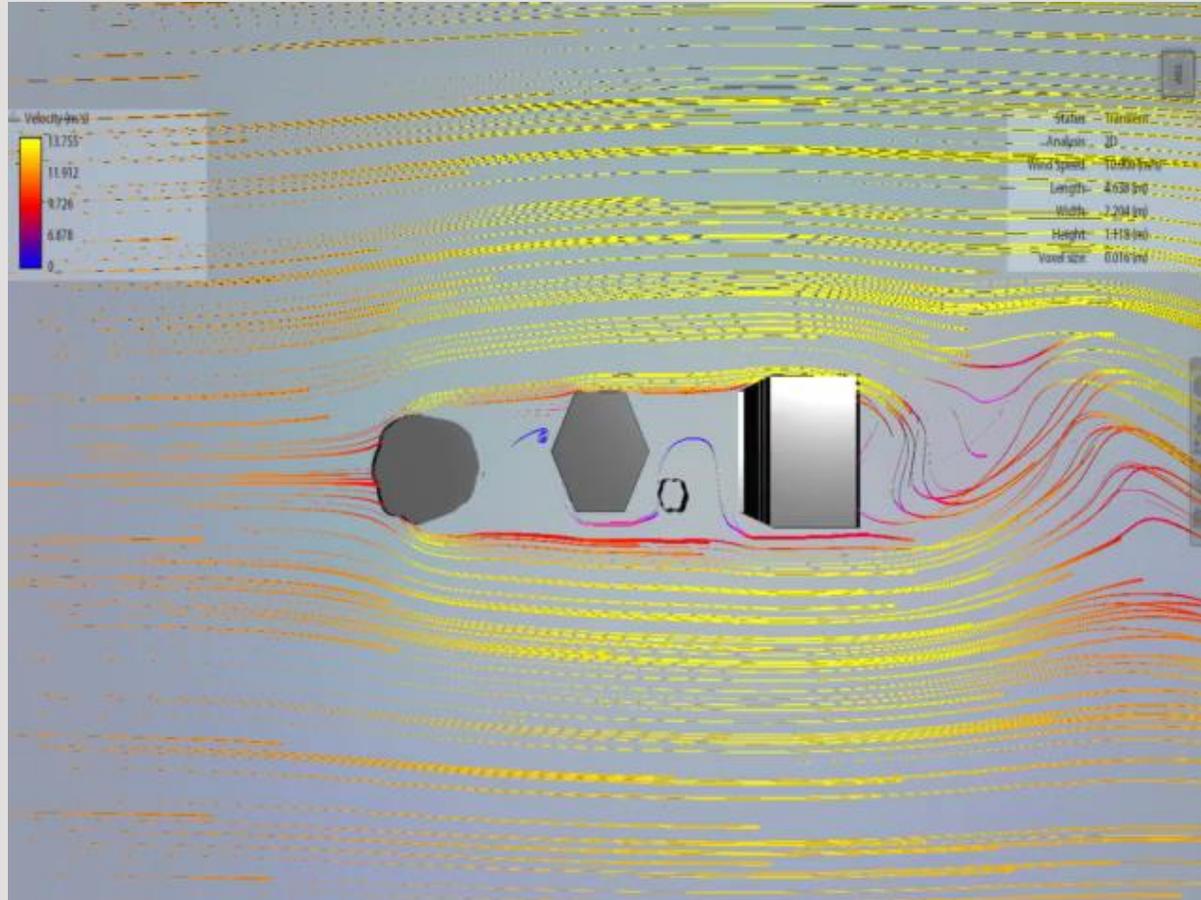


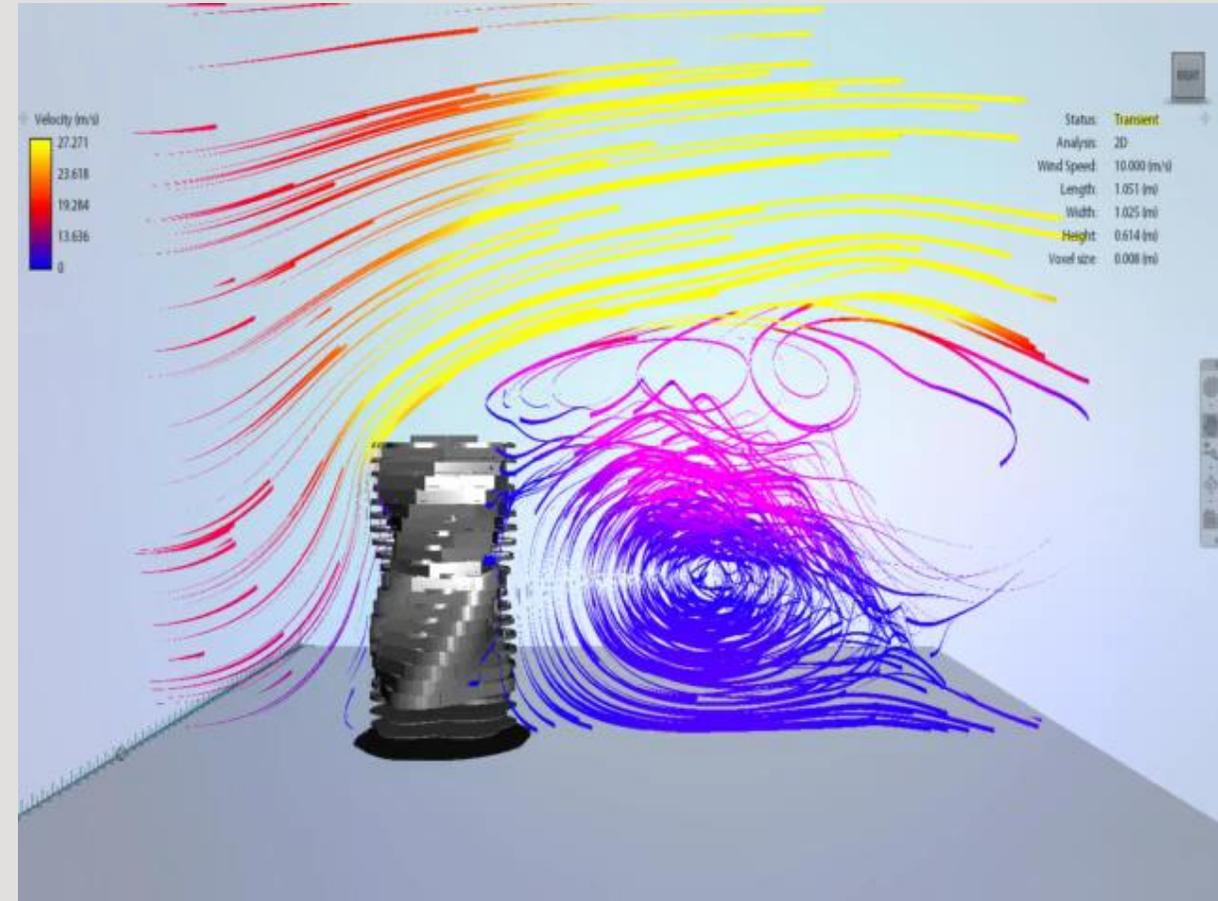
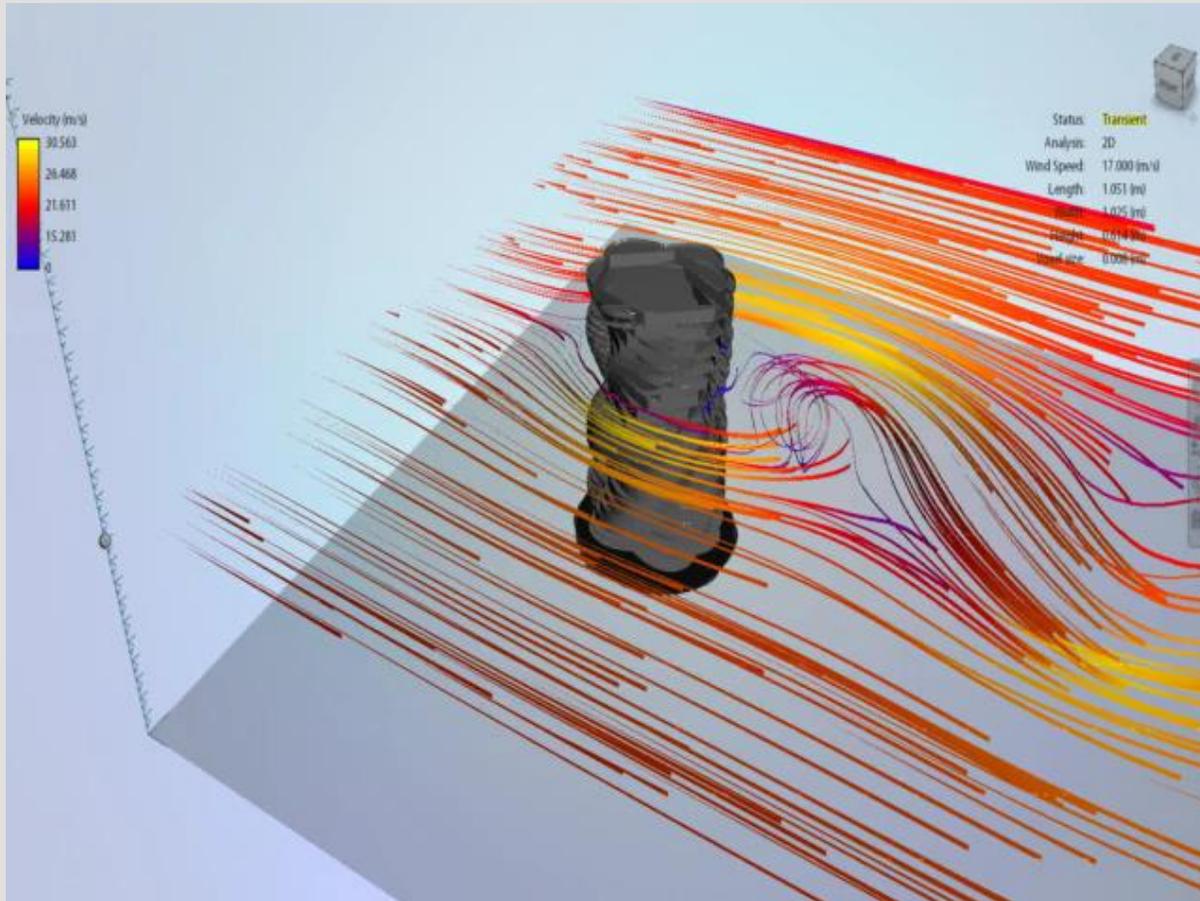


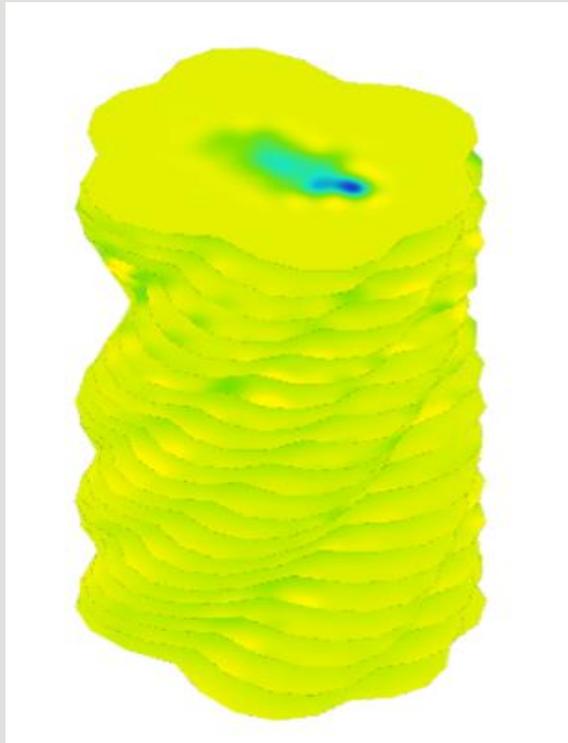












sefaira for Revit

Close Daylighting Visualization

Update Analysis

Office in Waterford, Ireland

Properties

Total Floor Area: 34,659 m²

115 kWh/m²yr

EQUIPMENT DOMINATED

MOSTLY WELL LIT

History Gains & Losses Guidance

Energy Use Overlit

Design Changes → Current Design

Daylighting Visualization

Update Visualization

Showing Sefaira Analysis...

DF

Percentage of Floor Area where Daylight Factor (DF) is measured at 0.85 meters above the floor plate. **Uniformity Ratio: 0**

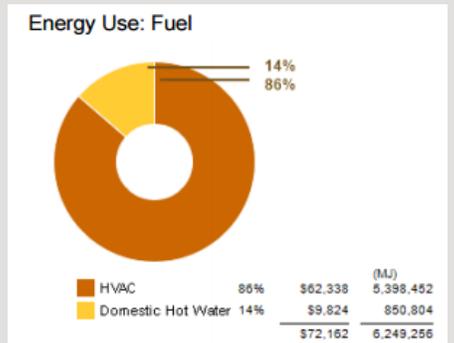
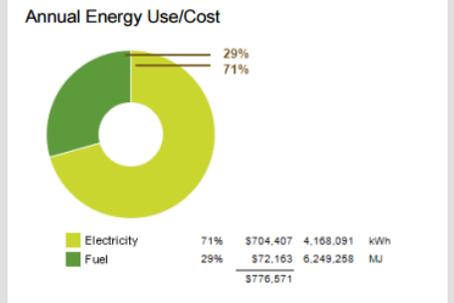
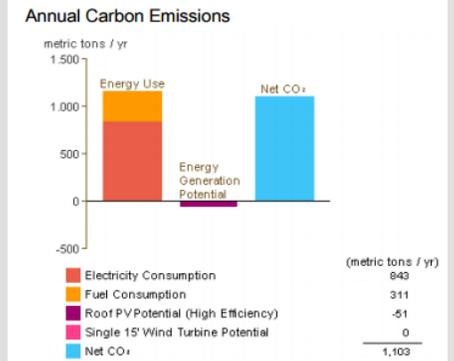
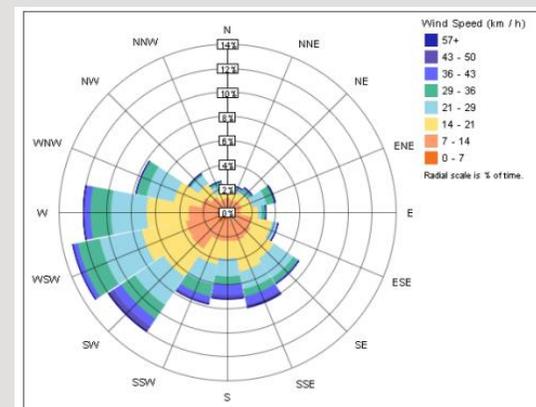
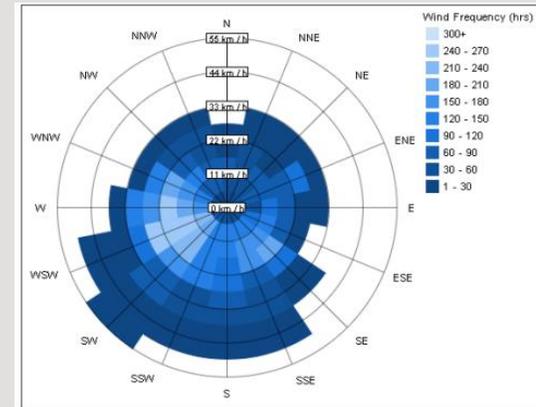
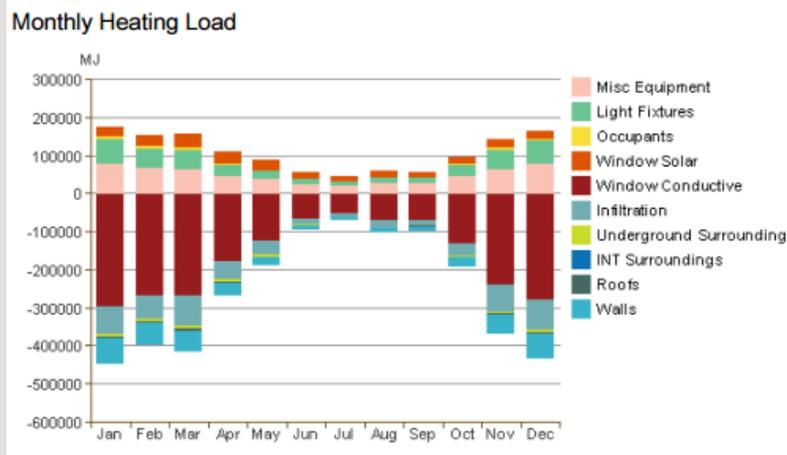
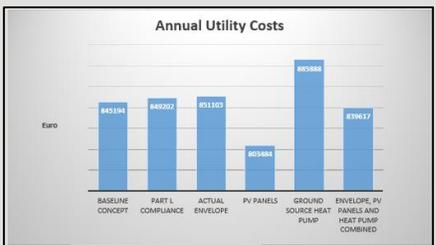
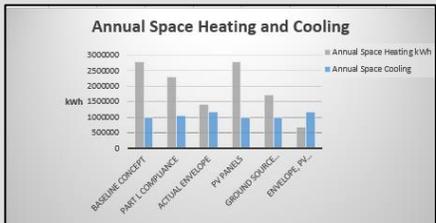
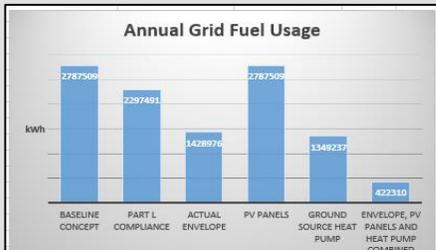
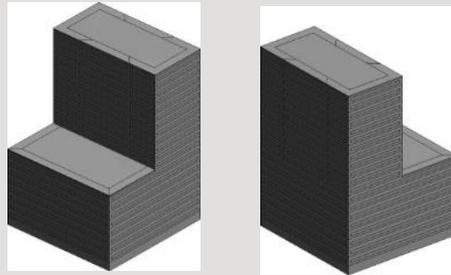
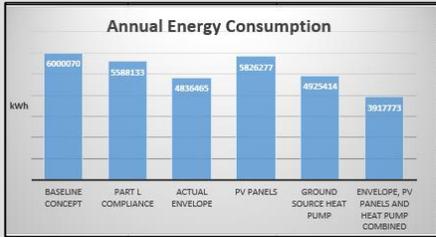
MIN PT DF: 0%

AVERAGE DF: 7.09%

Floors: 0.85 m Workplane Height

- Floor 21
- Floor 20
- Floor 19
- Floor 18
- Floor 17
- Floor 16
- Floor 15
- Floor 14
- Floor 13
- Floor 12
- Floor 11

Show All





Improvements made to the Model:

- U-values changed to comply with Part L of the Building Regulations.
- U-values changed to the actual building elements being used.
- Solar PV panels added to the Model.
- Ground source heat pump added to compensate boilers for heating load.
- Combination of envelope, PV panels and ground source heat pump.

Simulation	Annual Energy Consumption kWh	Annual Energy Use per Gross Internal Area kWh/m ²	Annual Utility Cost Euro	Annual Space Cooling kWh	Annual Space Heating kWh	Annual Grid Fuel Used kWh
Baseline Concept	6000070	204	845194	980844	2786689	2787509
Part L Compliance	5588133	190	849202	1058924	2296671	2297491
Actual Envelope	4836465	164	851103	1175772	1428156	1428976
PV Panels	5826277	198	803484	980844	2786689	2787509
Ground Source Heat Pump	4925414	168	885888	980844	1712033	1349237
Envelope, PV Panels and Heat Pump Combined	3917773	133	839617	1175772	683257	422310



Waterford

Sketch Design
Team E

The Nor

COST F

Cost Summary	Current Budget	Current Forecast	Previous
100 Construction	€65,000,000	€59,933,377	€63,21
200 Preliminaries	€6,500,000	€7,192,005	€8,85
300 Contingency	€4,550,000	€4,794,670	€9,48
400 Inflation	€3,900,000	€3,596,003	€3,79
500 Fees	€6,500,000	€4,794,670	€6,95
600 VAT	€10,270,000	€9,193,780	€10,1
TOTAL SUM	€96,720,000	€89,504,505	€102,4

Cost Summary Chart

COST REPORT

Waterford City Council

Bilding C: North Quay Project

Stage: Sketch Design
Revision: N/A

Section 5 - Elemental Summary

Ref	Elemental Summary	Total Cost (€)	€/m²	Analysis & Graphics
0	DEMOLITIONS	N/A	N/A	
1	EXTERNAL ENVELOPE (Façade + Roof)	€1,489,627	ALLOWANCE	
2	FOUNDATION	€540,000	ALLOWANCE	
3	RESIDENTIAL (High-End + Affordable)	€21,942,750	€ 1,657	
4	OFFICES	€22,016,000	€ 2,000	
5	RETAIL	€2,918,000	€ 1,000	
6	SERVICES FLOORS	€1,607,000	€ 1,000	
7	CARPARK	€6,820,000	€ 1,100	
BUILDING SUB TOTAL		€57,333,377	€ 6,757	
8	EXTERNAL WORKS	€2,600,000	ALLOWANCE	
9	PRELIMINARIES	€7,192,005	12% of Gross	
TOTAL (less contingencies)		€67,125,382	€ 6,757	
10	CONTINGENCIES	€4,794,670	8% of Gross	
TOTAL (less FEES)		€71,920,052	€ 6,757	
11	FEES	€4,794,670	8 % of Gross	
TOTAL		€76,714,722	€ 6,757	

GFA 28,704

m²

GIFA 26,471

NSA 22,400

Wall to Floor Ratio

54%

Section 5 - Elemental Summary

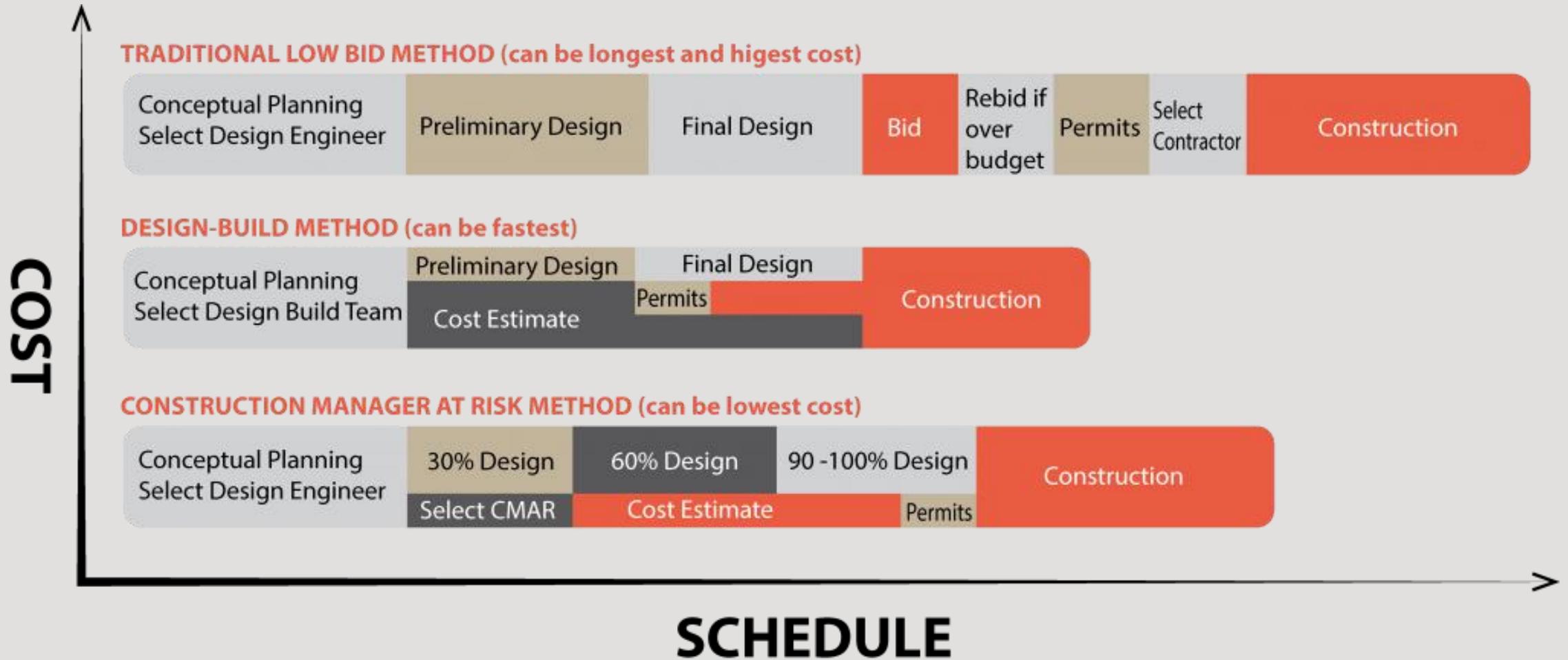




Table 1.3 Minimum number of

Number of persons accommodated	M of
1 to 500	
More than 500	

Table 1.1 Occupancy load factor

Accommodation (1)	Occupancy facto
1. Standing area in assembly and recreation building	0.3
2. Bar, lounge bar	0.5
3. Restaurant, dining room, meeting room, committee room, staff room	1.0(2)
4. Factory production area, open plan offices	5.0
5. Bedroom or study bedroom	8.0(3)
6. Offices, kitchen	7.0
7. Storage building, car park	30.0(4)

KONE Quick Traffic Elevator Traffic Calculation

Need help or more information?
Please contact us

Dedicated to People Flow



Destination Control

Enter your planning information to get your required elevator solution

Metric | Imperial

Building information

Use of passenger elevator

Type:

Usage:

Zone information

Number of Stops:

Travel for the zone (m):

Population in the zone:

Applied parameters

Edit

Up peak handling capacity (% of population/5 minutes):

Acceleration rate (m/s²):

Time To Destination (s):

Travel time (s):

System parameters

Acceleration:

Speed (m/s): Estimated 2 Actual

Elevator size (persons): Minimum: 44

Select number of elevators

Elevators	Minimum elevator size (persons)	Time to Destination (s)
8	24.9	104.4
7	32.2	118.4
6	44.0	137.5
5	61.2	167.8
4	98.7	227.1
3	229.2	424.4

Actual results

Maximum Handling Capacity (%)	1	-
Average Transit Time (s) at 14% SHC	1	-
Average Waiting Time (s) at 14% SHC	1	-
Average Time to Destination (s) at 14% SHC	1	-



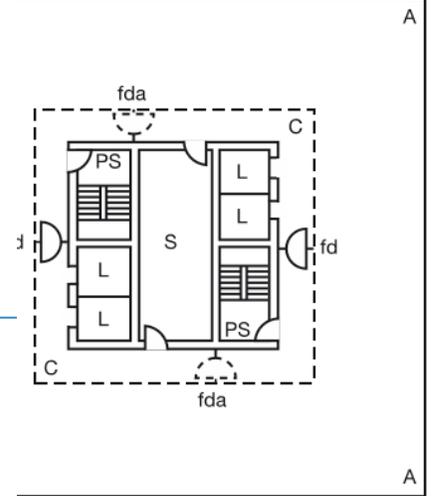
KONE shall not accept any liability for the data used and the results thereof. Any calculations made with the program are based on the input data and the parameter values, and should not be interpreted as any kind of representation of warranty of the performance of any actual elevator installation.

KONE Quick Traffic 2.4

Switch to Conventional Control | Front page

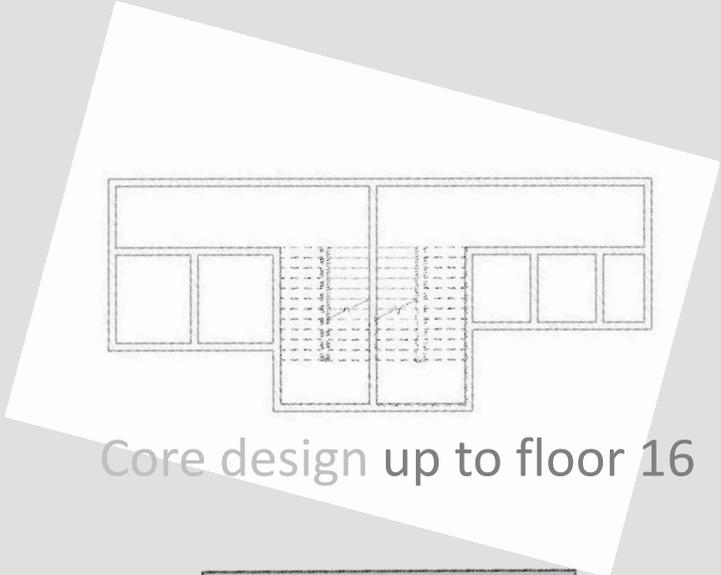
Copyright © KONE Corporation, All rights reserved

13 Exits in a central core

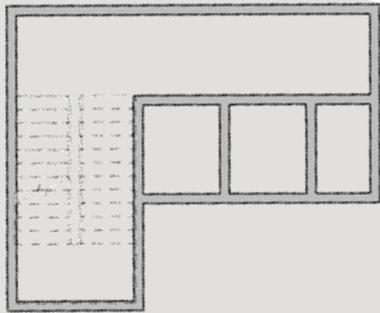
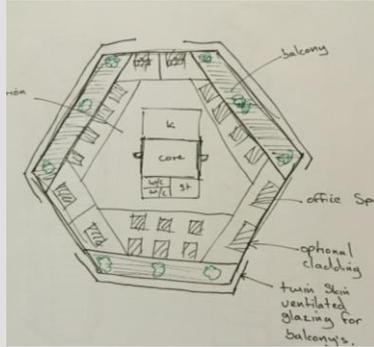


doors at both ends of the area marked 'S' must be self-closing fire doors unless the area is divided such that any fire in that area will not be prejudicial to both sections of corridor at the same time. If that area is a lift lobby, doors should be provided as shown in Figure 8 in BS 5588: Part 11: 1997.

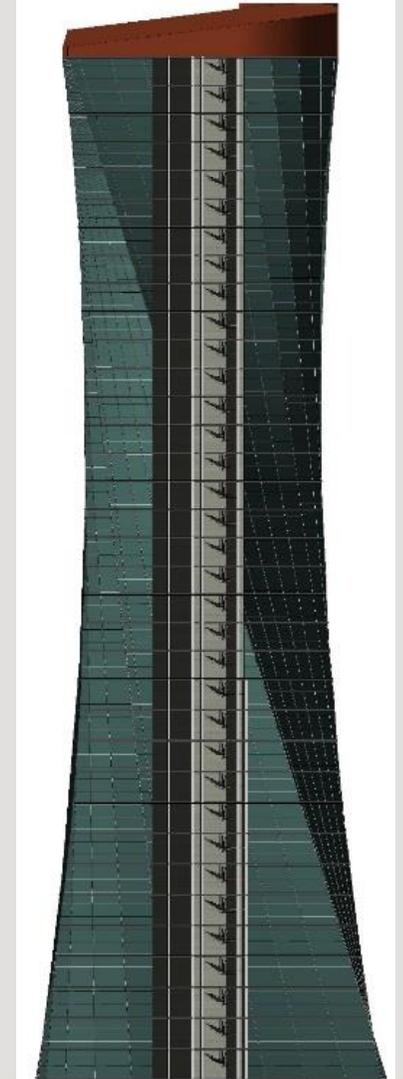
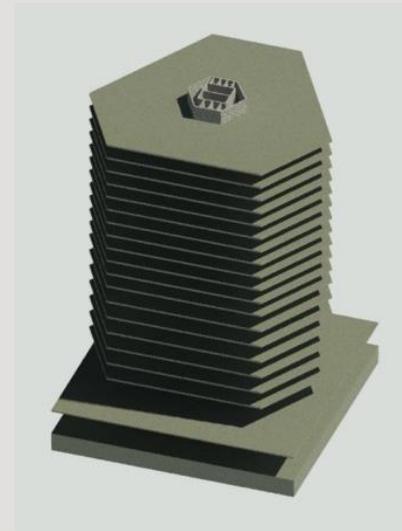
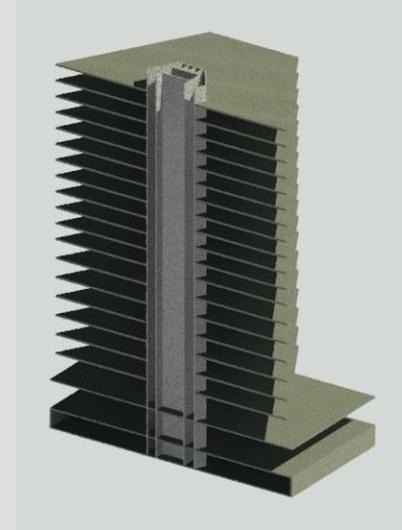
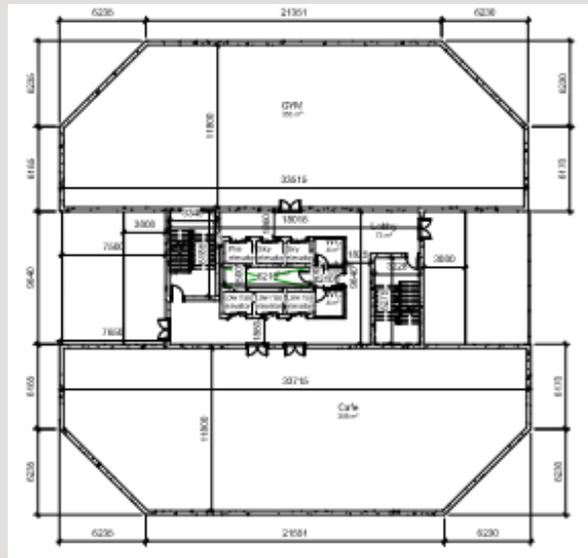
toilets, etc.
using FD20S fire doors
alternative position for fire door
off which accommodation opens
directly to a staircase
accommodation (e.g. office space)

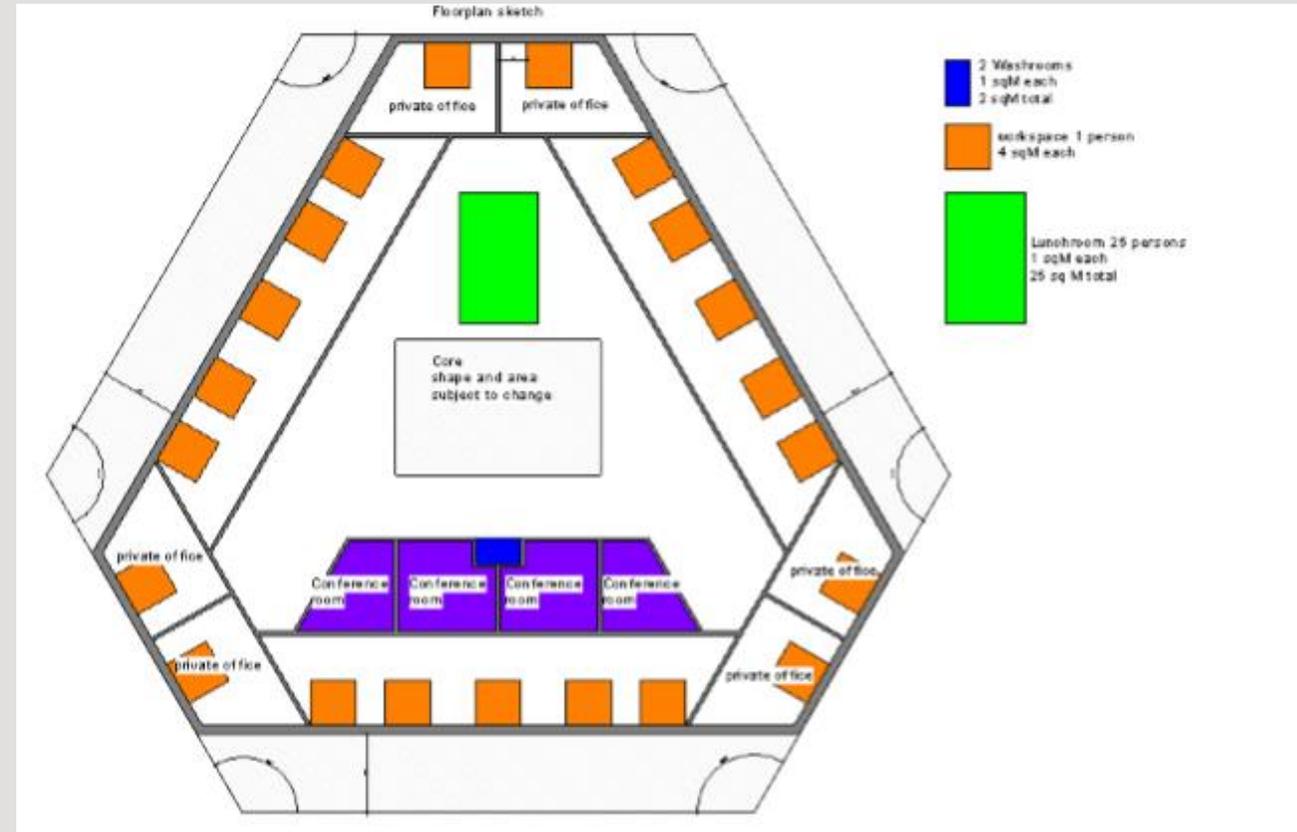
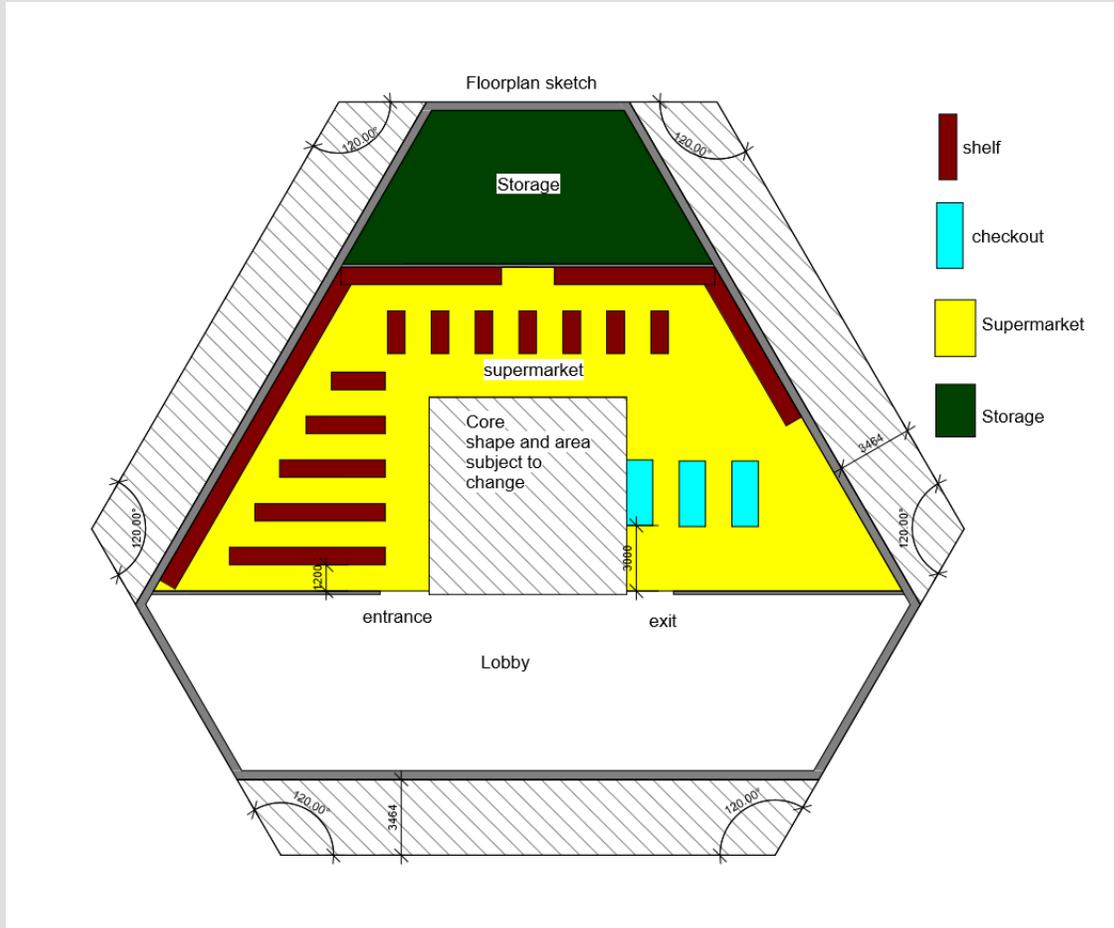


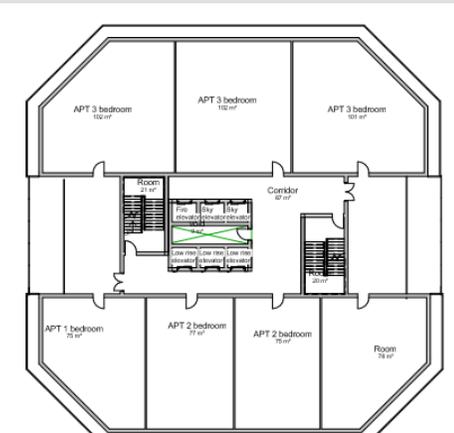
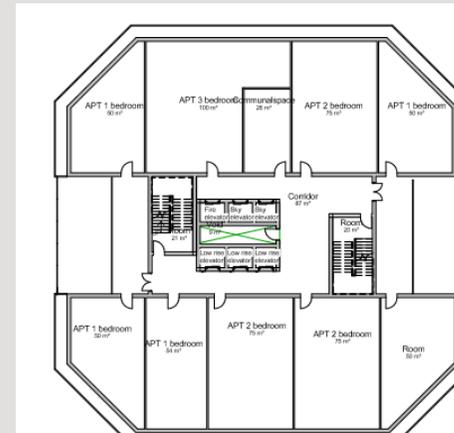
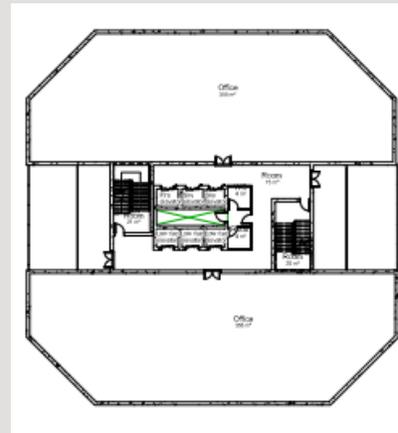
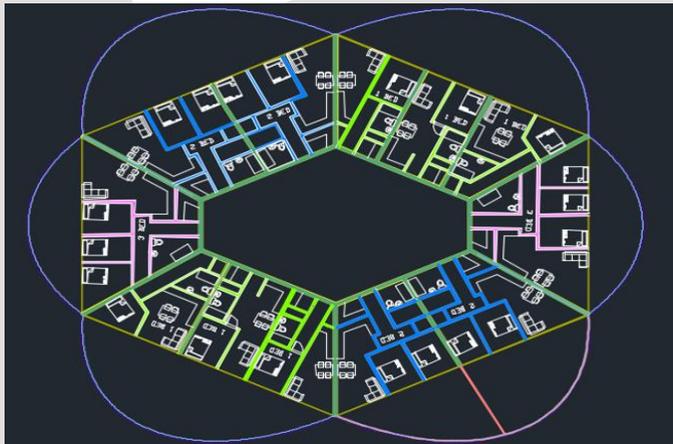
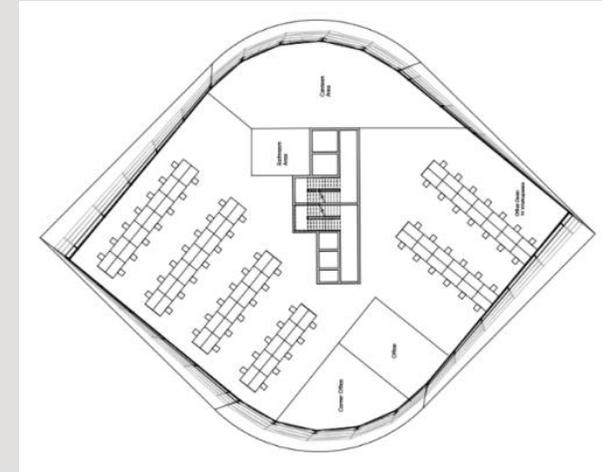
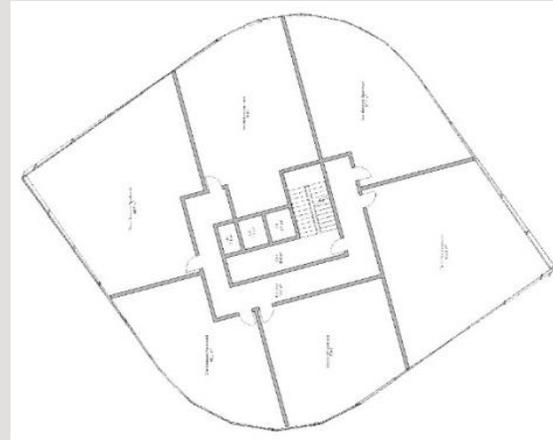
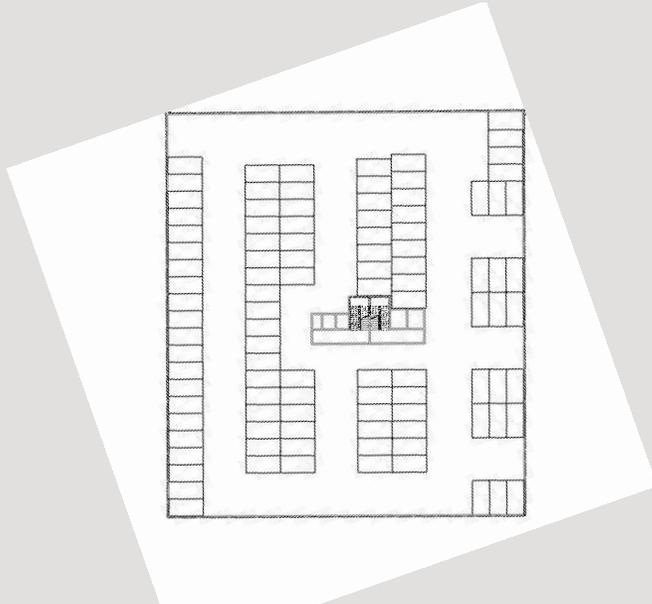
Core design up to floor 16

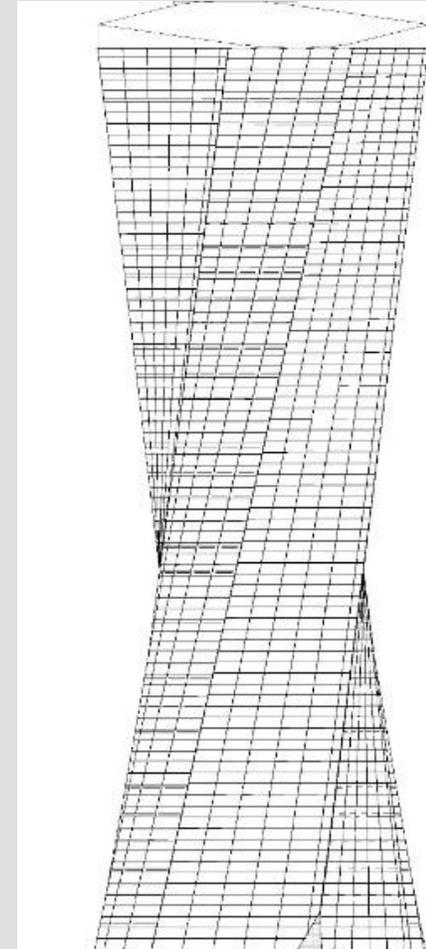
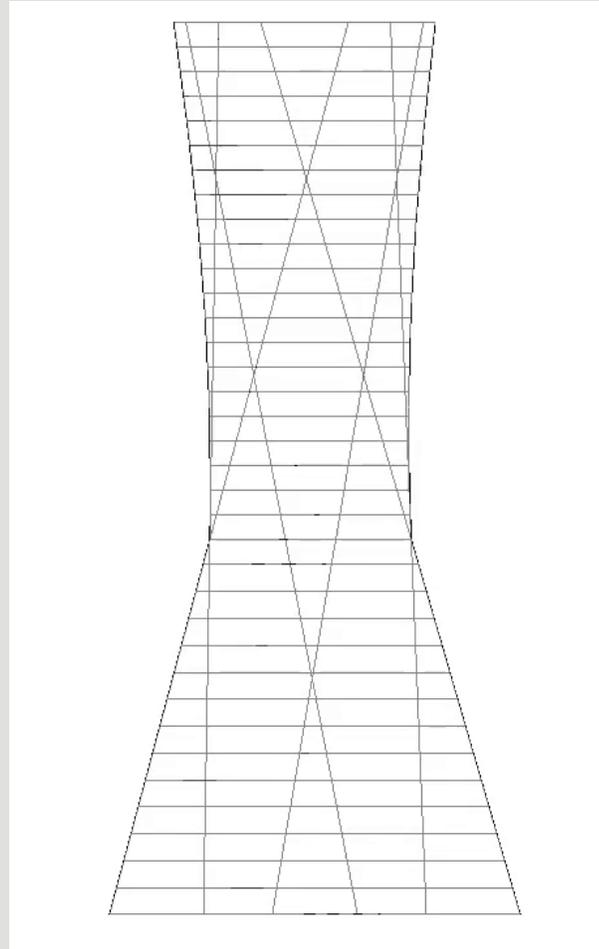
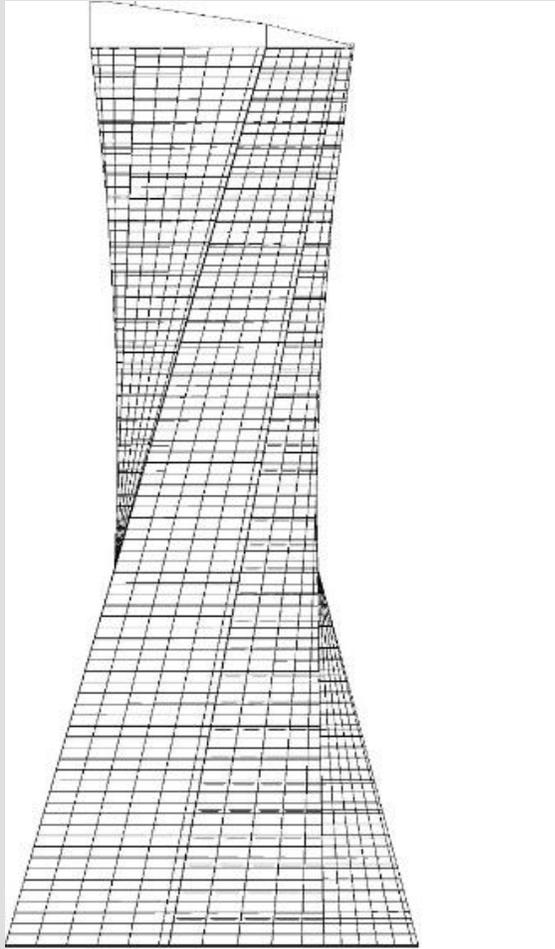


Core design up to floor 36

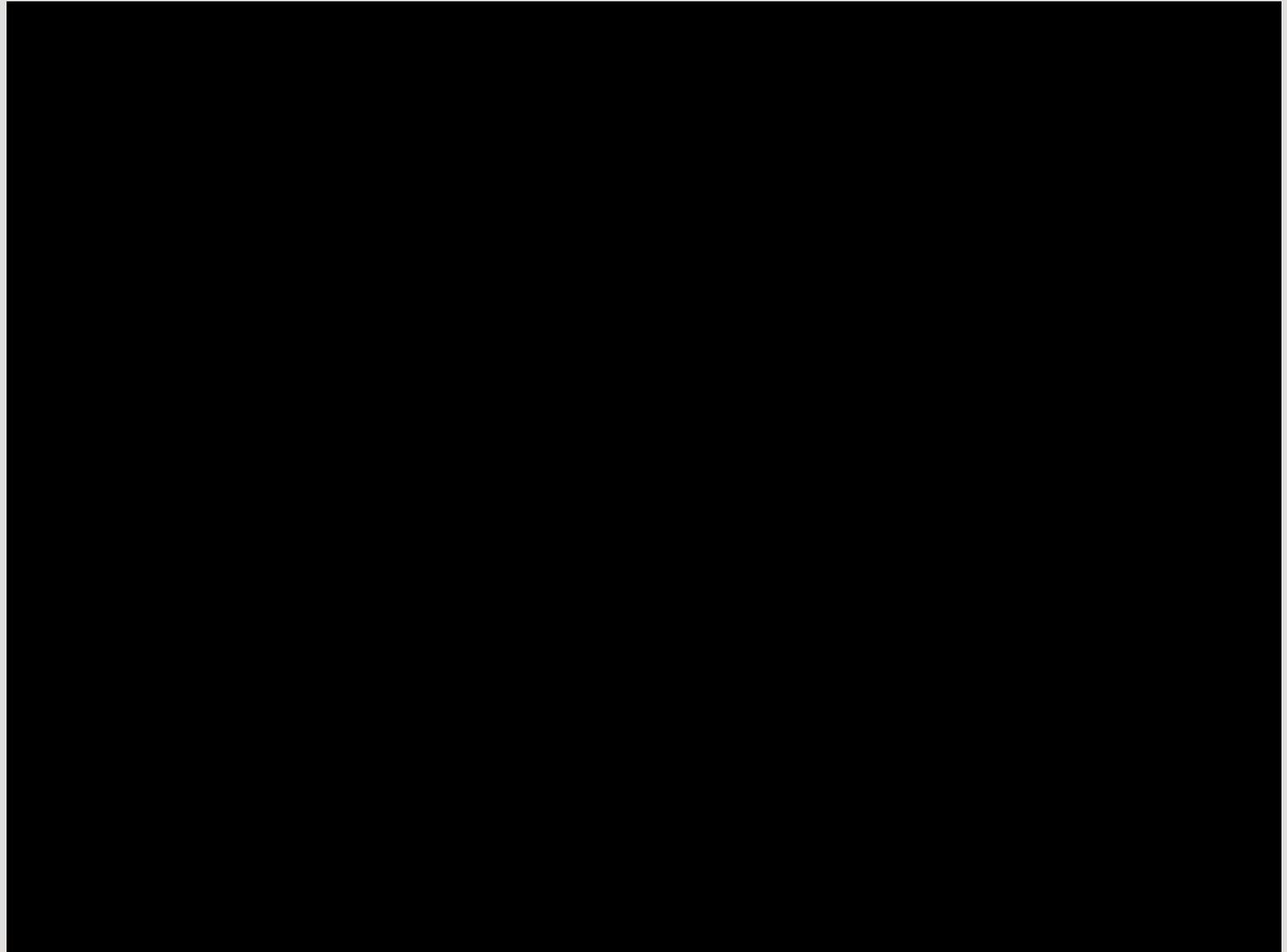
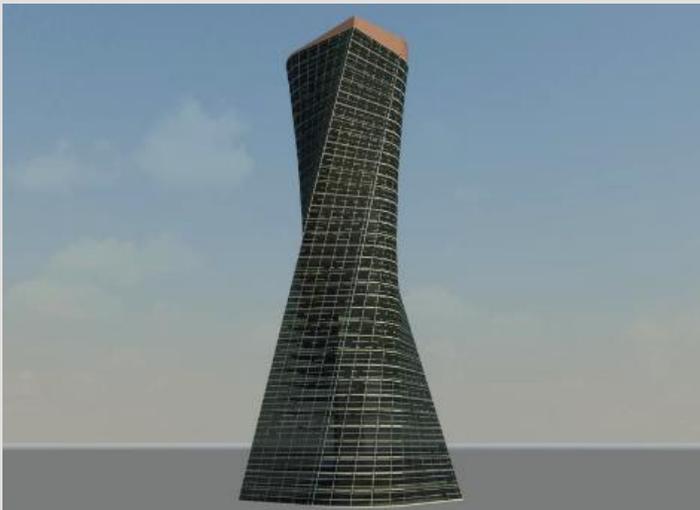
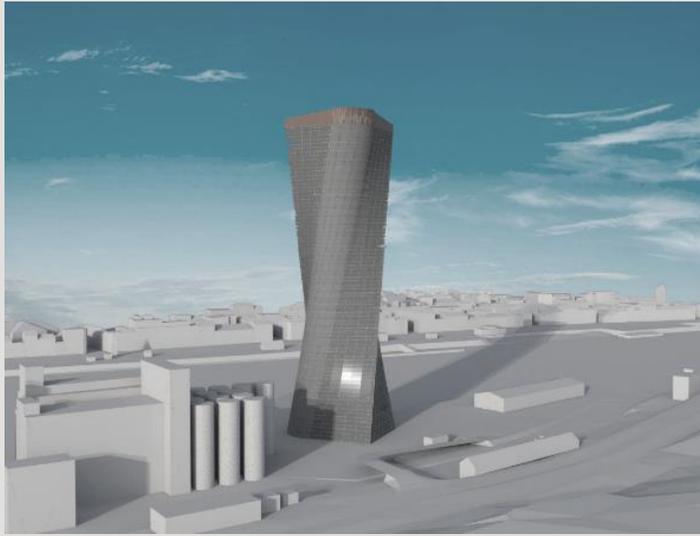




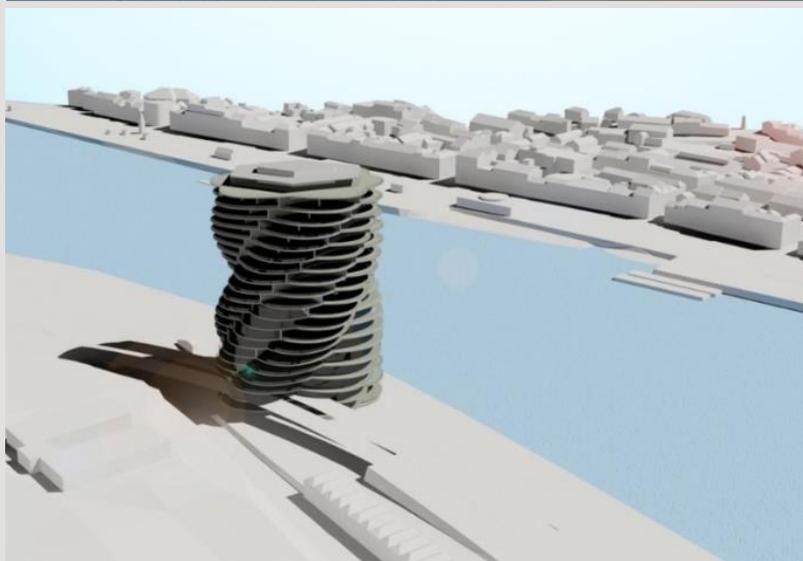
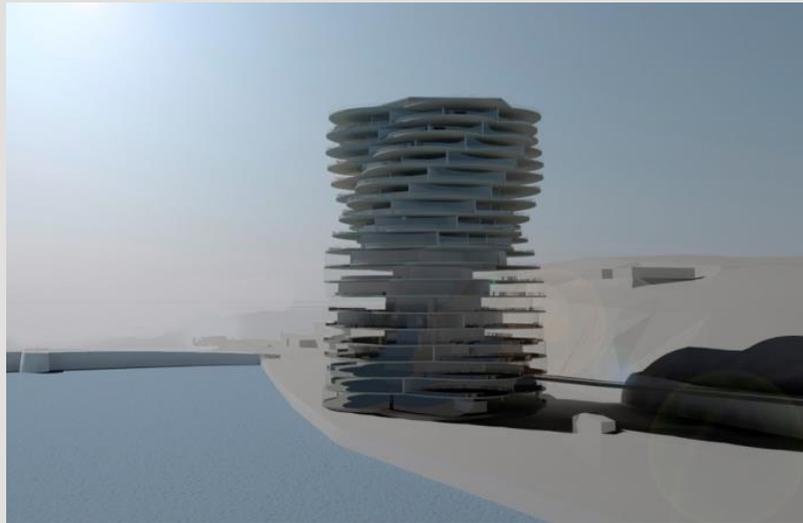


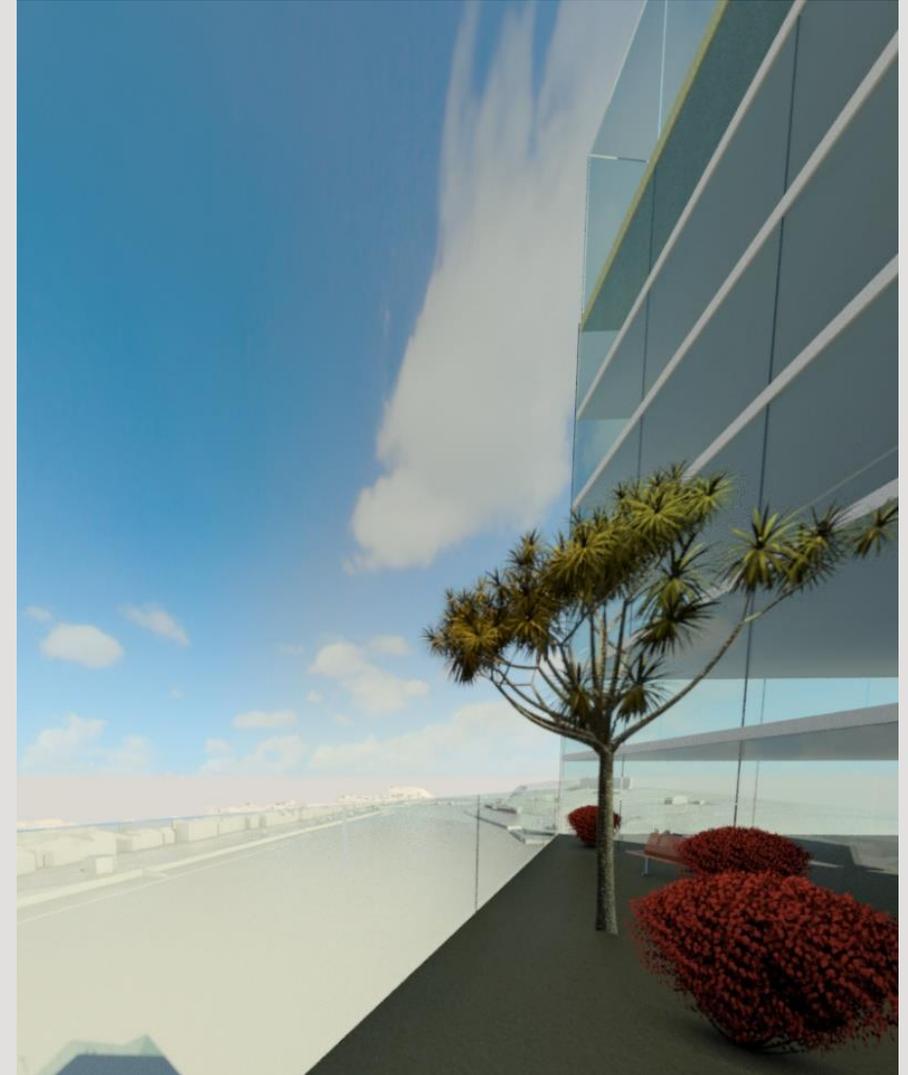
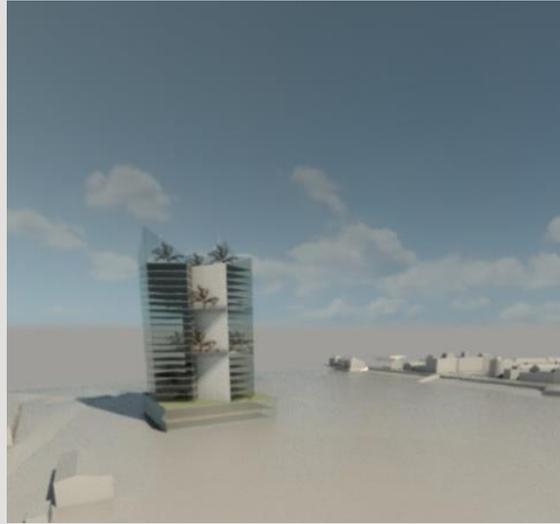


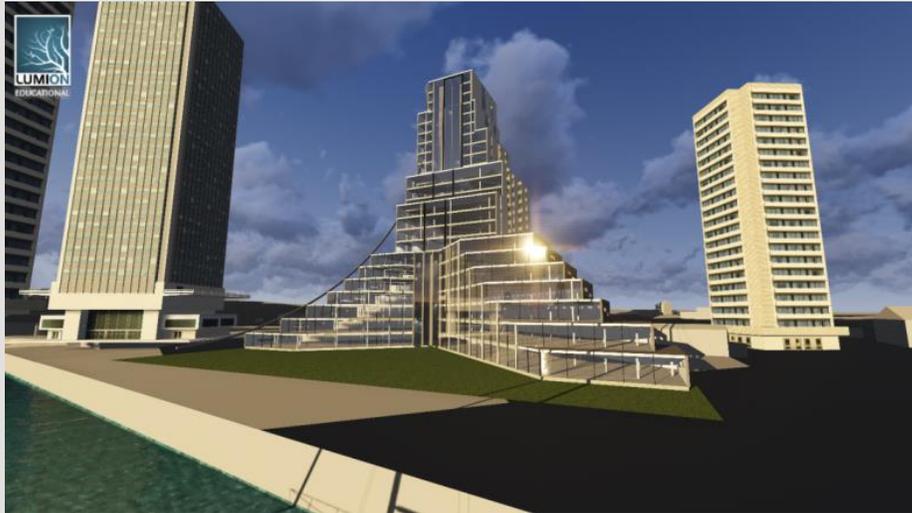


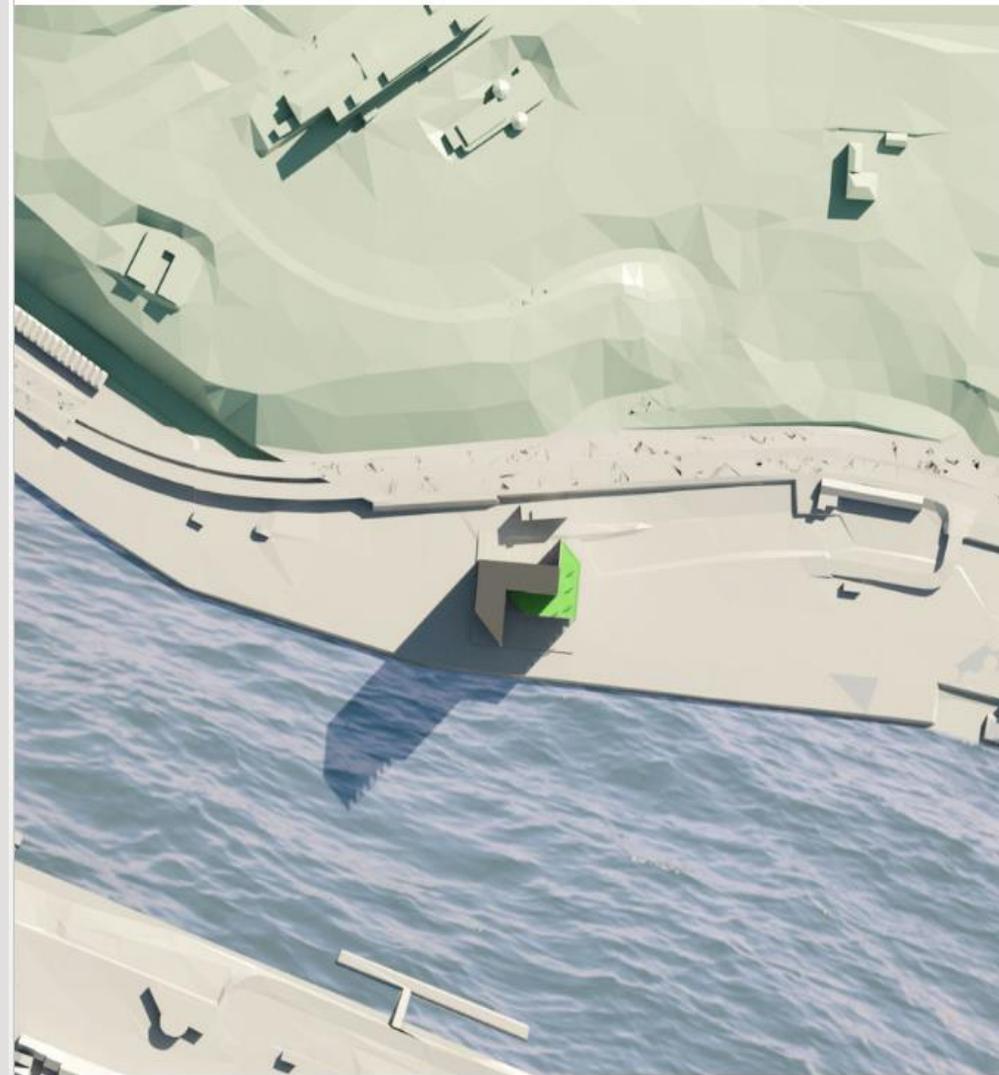


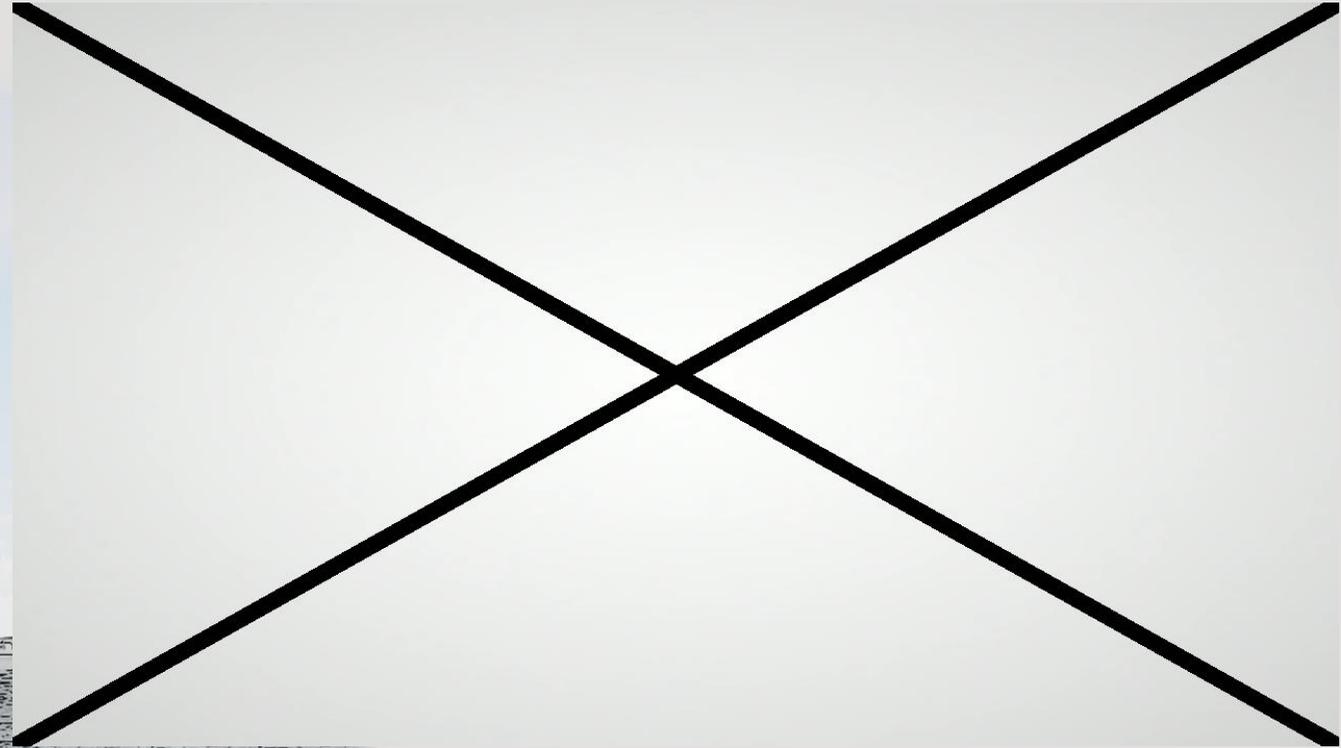


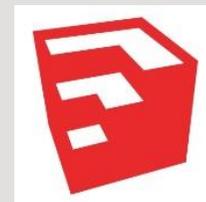


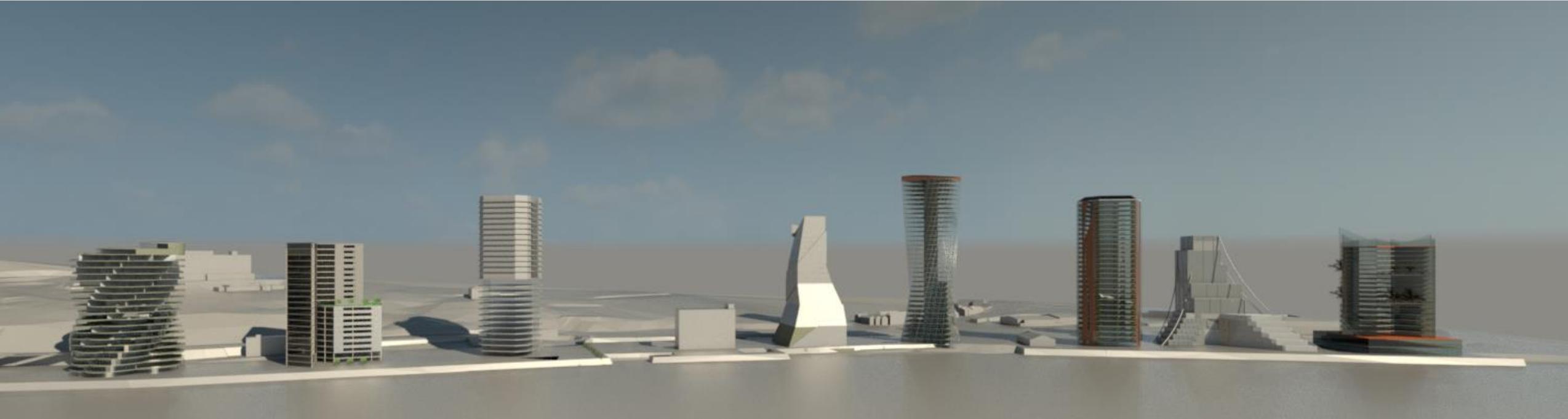
















CitA
BIM GATHERING



Thank you

Gordon Chisholm & Frances Robertson