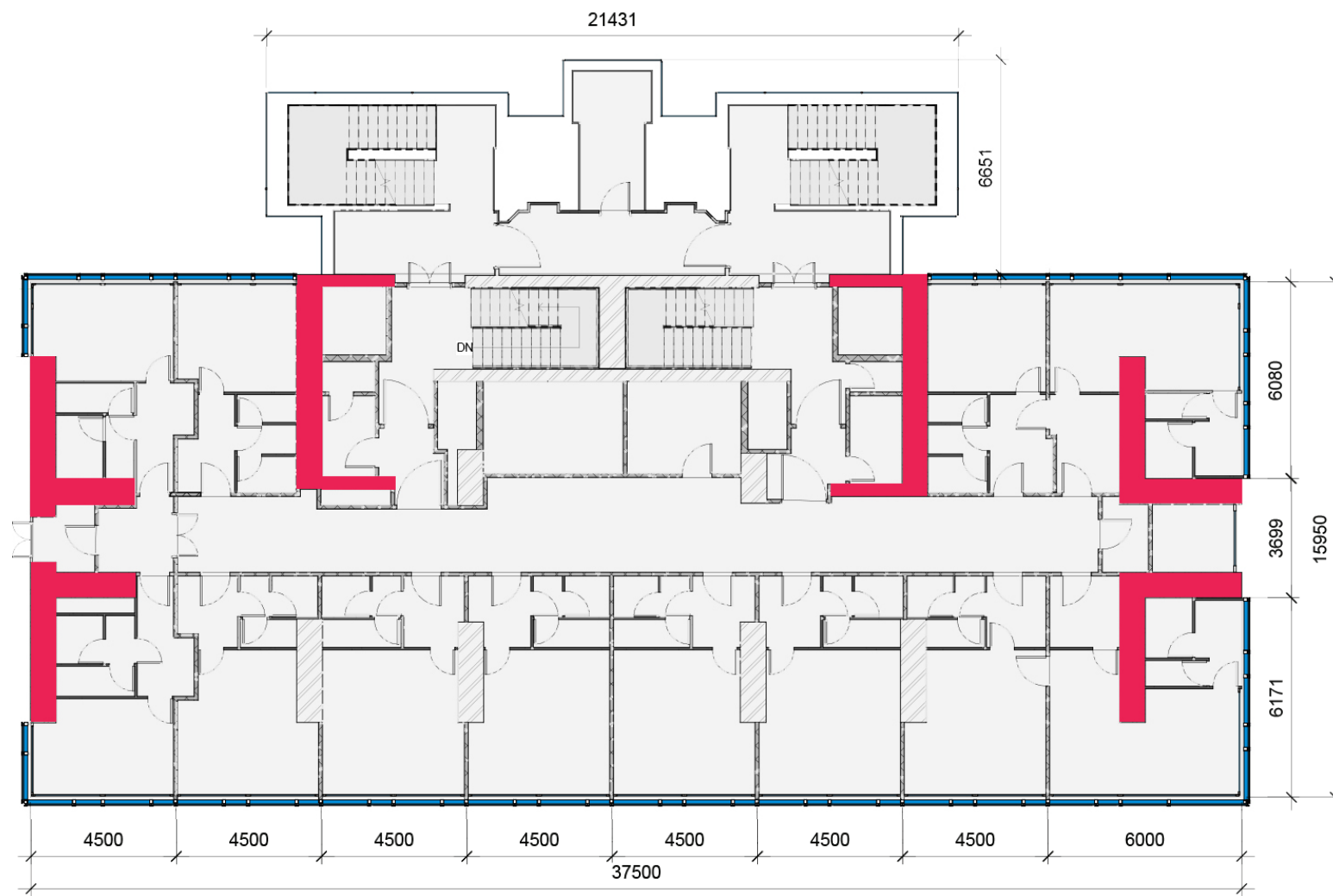
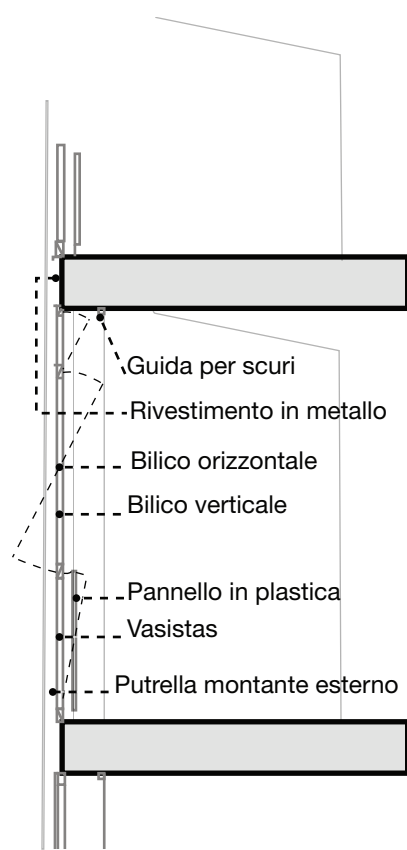


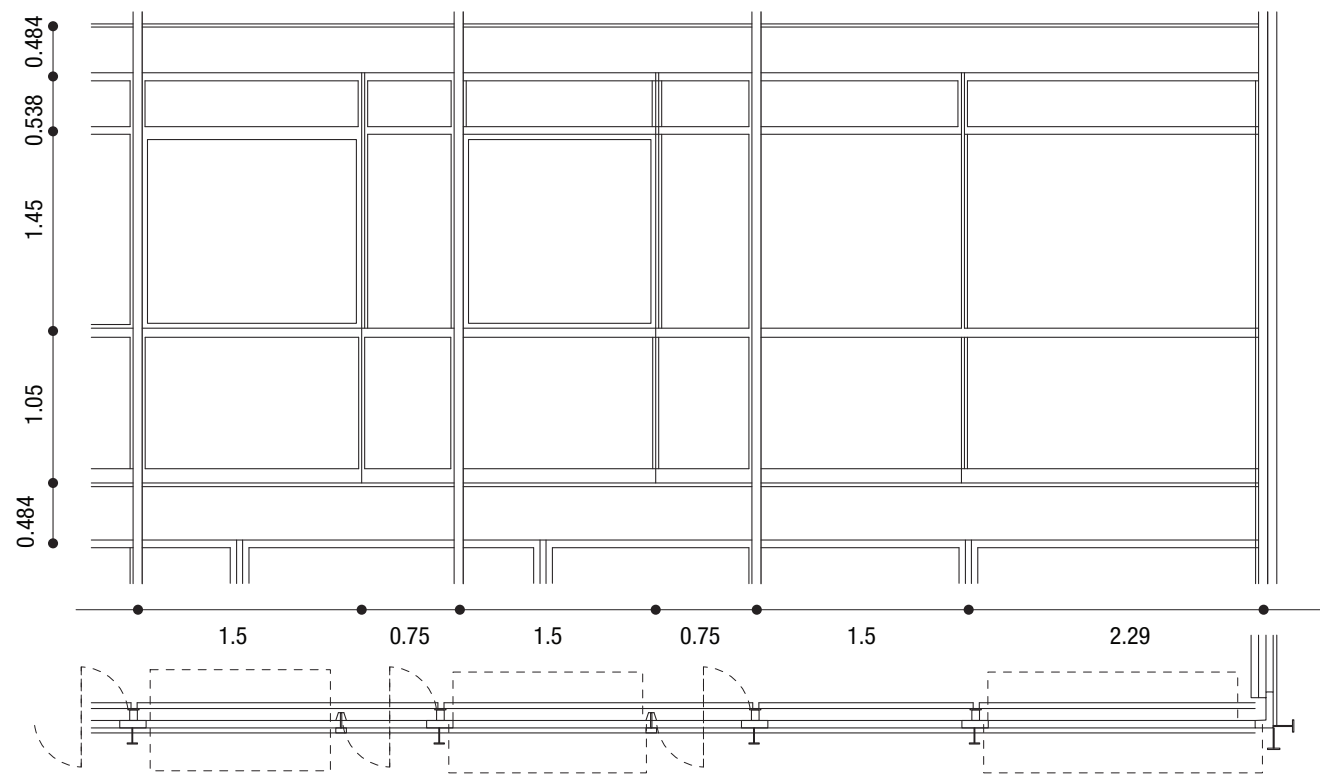
Torre GALFA
Technical drawings



1. Floor plan of original design of Torre GALFA showing the 6 wings of the load bearing structure 1:200



2. Section of the glass facade of Torre GALFA original design 1:50



3. Plan/Elevation of the glass facade of Torre GALFA original design 1:50

SHEET 01

Sheet title: Torre GALFA Original design

Energy assesment and green retrofitting methodology redrawing

SCALE 1:200/1:50

Torre GALFA
Technical drawings

Professor:
Nastri Massimiliano

Student:
Awad Ahmed

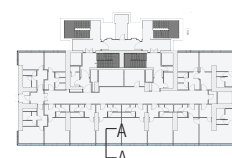
Drawings name:

1. Floor plan of old design of Torre GALFA
2. Section of the glass facade of Torre GALFA old design
3. Plan/Elevation of the glass facade of Torre GALFA old design

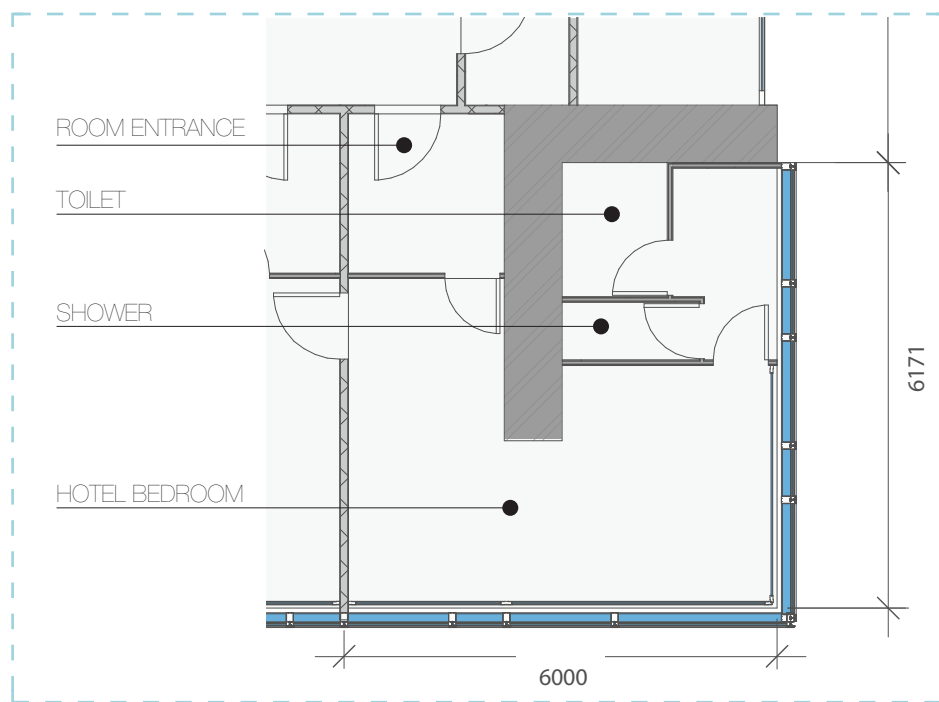


POLITECNICO
MILANO 1863

Scuola di Architettura Urbanistica
Ingegneria delle Costruzioni



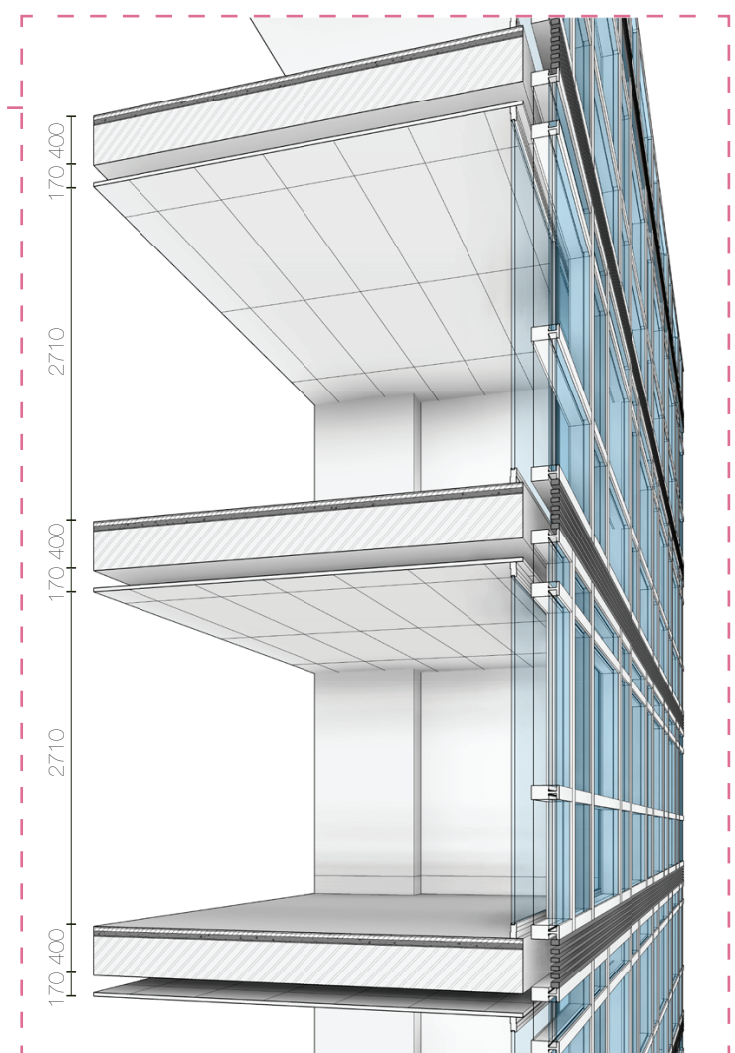
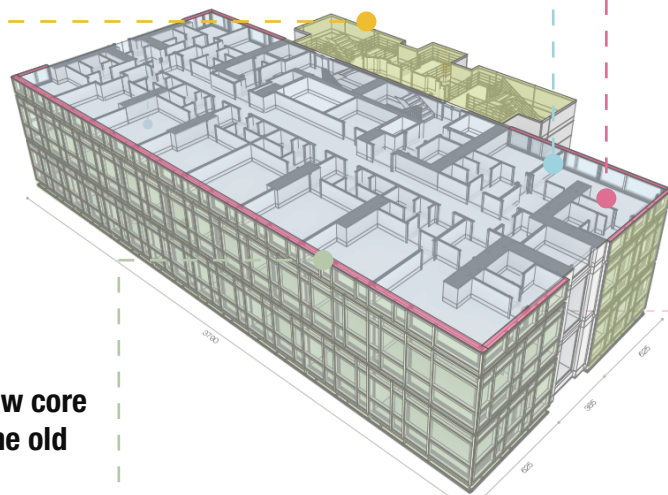
Torre GALFA
Technical drawings



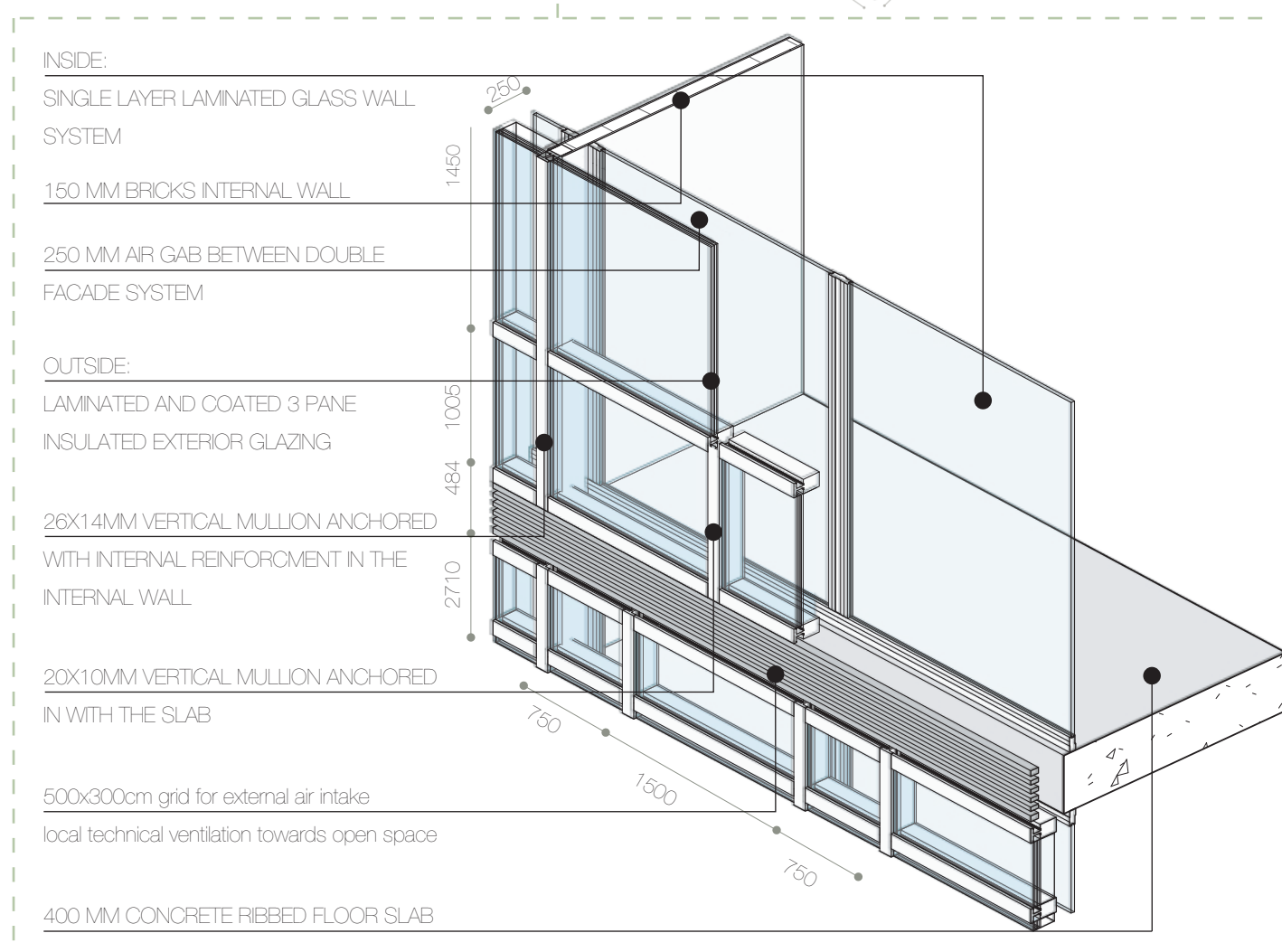
1. Typical floor plan configuration changed from office building to be a hotel
1:100



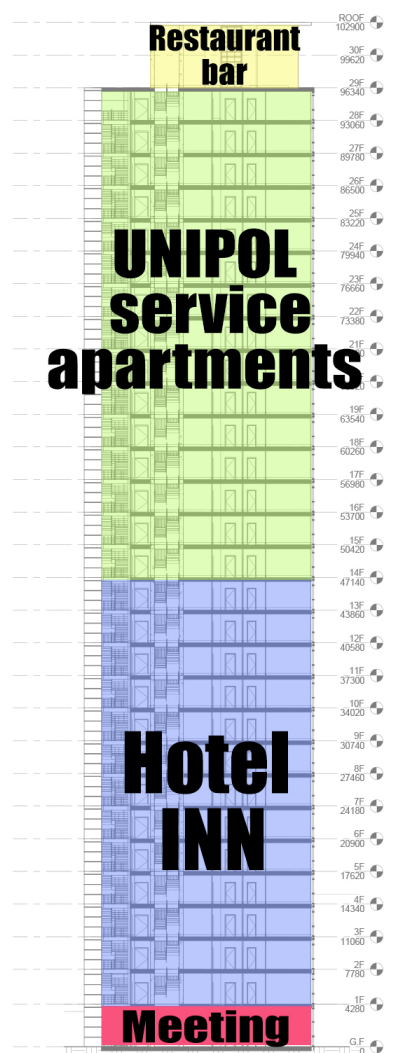
2. 2.113 Sqm new core attached to the old one



3. Outward-facing bedrooms are ventilated directly through HVAC closed loop water system using a double-skin façade system to fasten the air speed



4. Triple Glazed panes in the curtain walls instead of two panes with a mechanical ventilation system works through the linear C/S louvers



5. New functions by floor according to the new design

SHEET 02

Sheet title: Torre GALFA Refurbishment

Energy assesment and green retrofitting methodology redrawing

SCALE 1:50

Torre GALFA
Technical drawings

Professor:
Nastri Massimiliano

Student:
Awad Ahmed

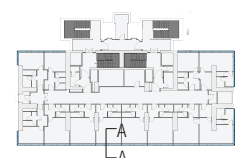
Drawings titles:

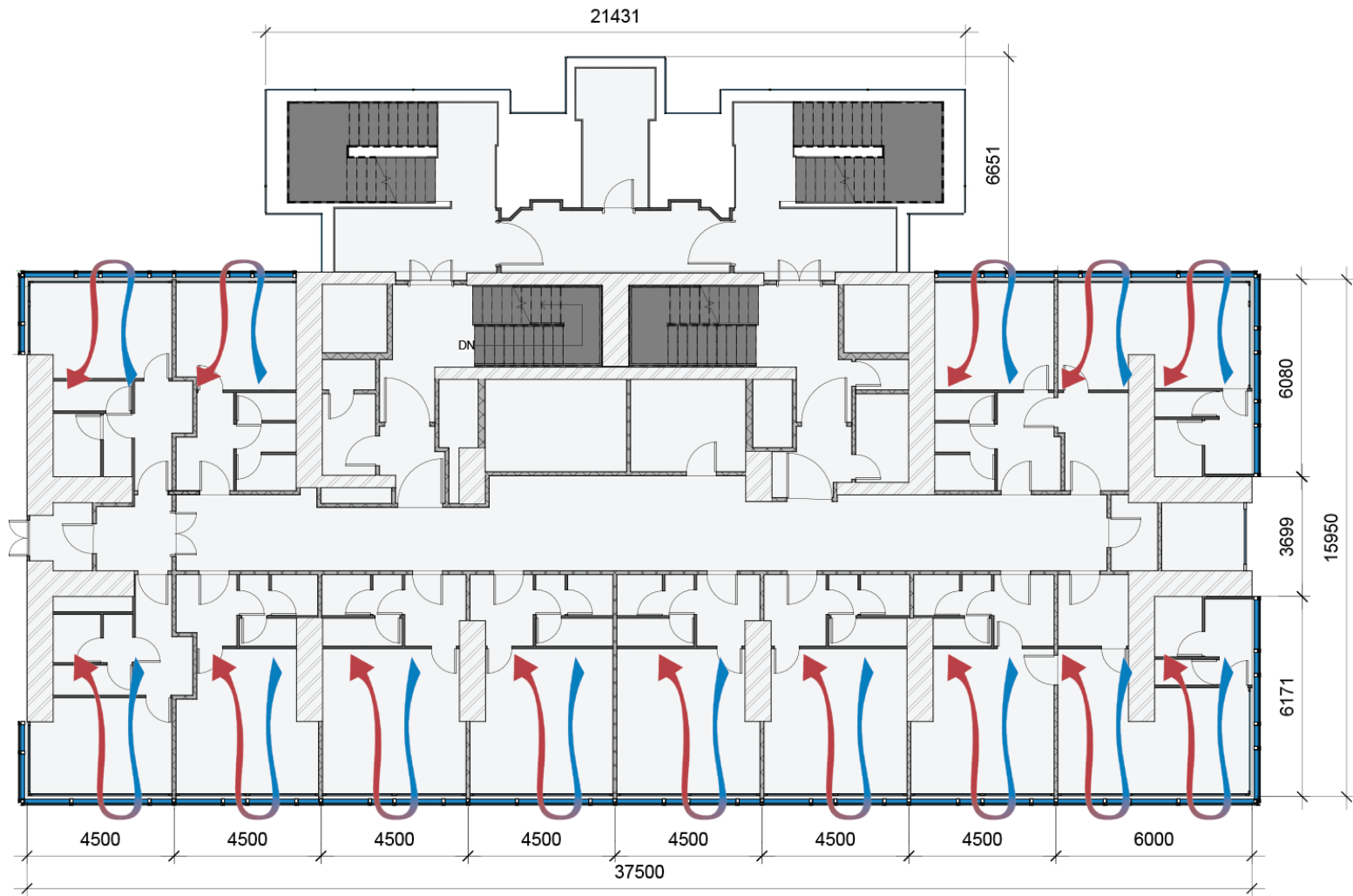
1. Typical floor plan configuration
2. 2.113 Sqm new core attached to the old one
3. Double-skin façade system to fasten the air speed
4. Triple Glazed panes in the curtain walls
5. New functions by floor according to the new design



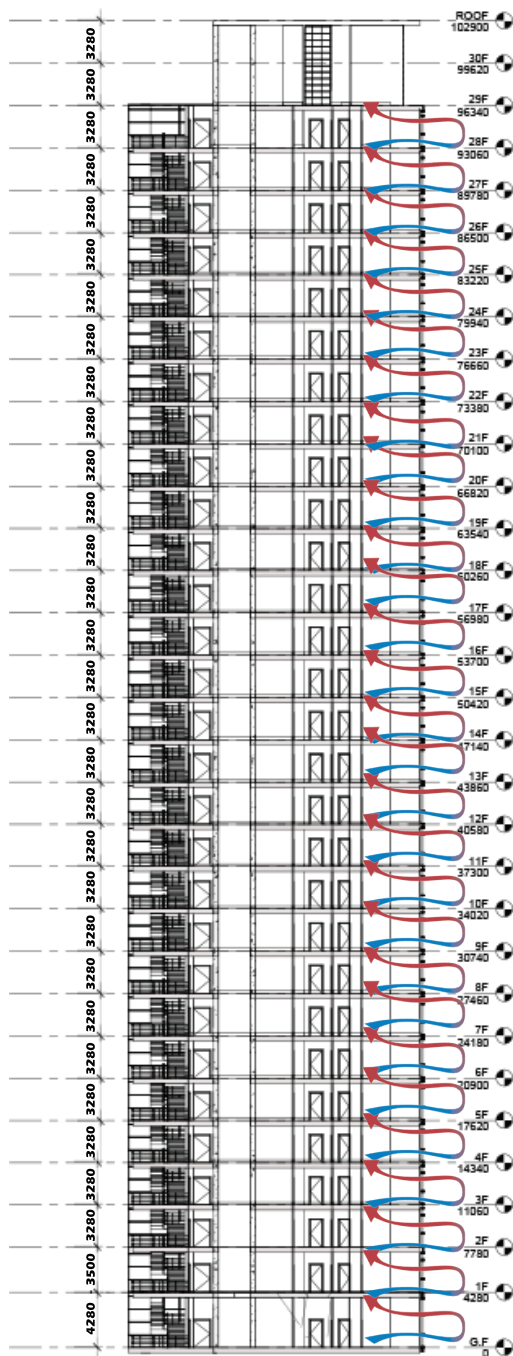
POLITECNICO
MILANO 1863

Scuola di Architettura Urbanistica
Ingegneria delle Costruzioni

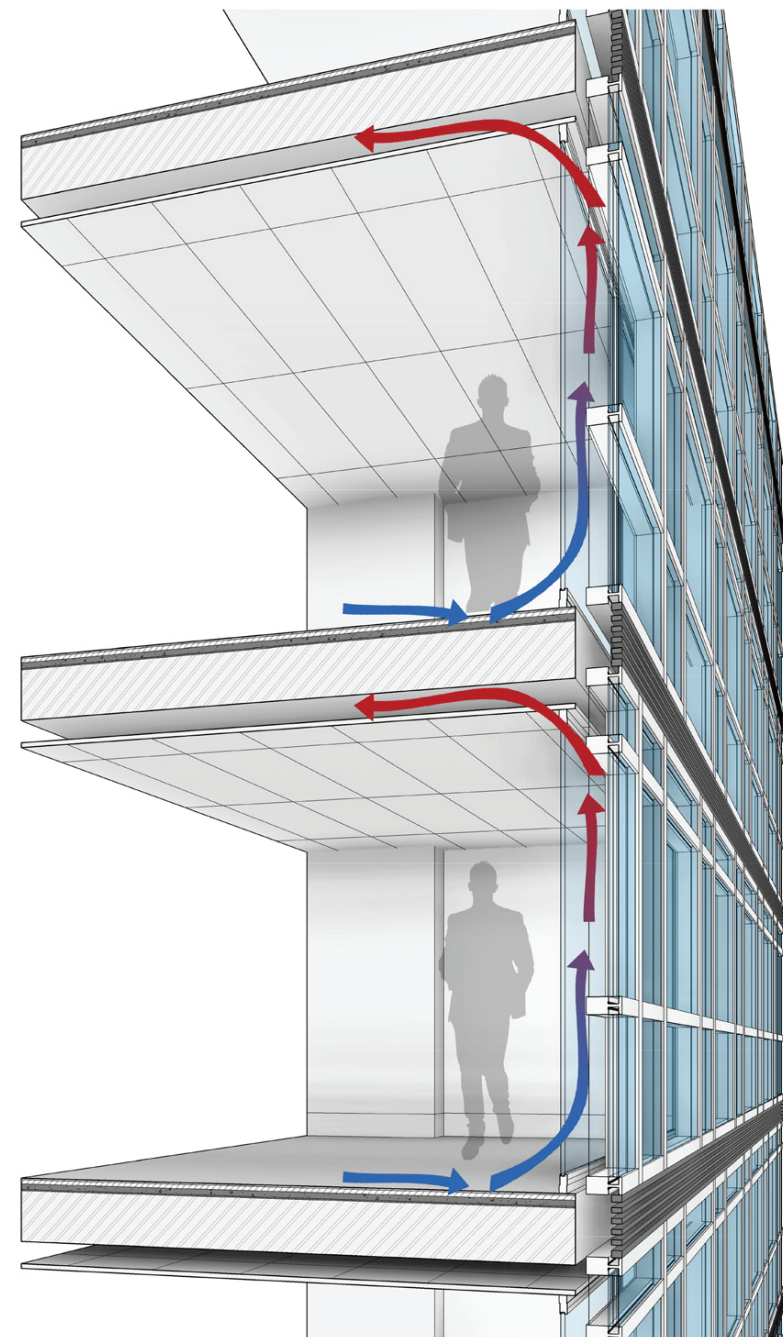




1. Typical floor plan showing the outward-facing bedrooms are ventilated directly through a double-skin façade system
1:200



2. Vertical section A-A showing the inward-facing bedrooms are ventilated via rising stack buoyancy in the double facade, assisted by wind flowing from the HVAC system 1:500



3. 3d section of the glass double facade showing there is always a windward in each room which is ventilated through air moving from the closed loop water system

SHEET 03

Sheet title: Torre GALFA Cross ventilation studies
Energy assesment and green retrofitting methodology redrawing

SCALE 1:50

Torre GALFA
Technical drawings

Professor: Nastri Massimiliano
Student: Awad Ahmed

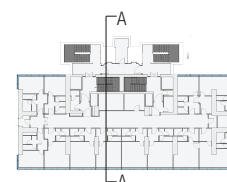
Drawings titles:

1. Typical floor plan showing the cross-ventilation through a double-skin façade system 1:200
2. Vertical section A-A showing the cross-ventilation through the double-skin Facade 1:500
3. 3d section of the glass double facade

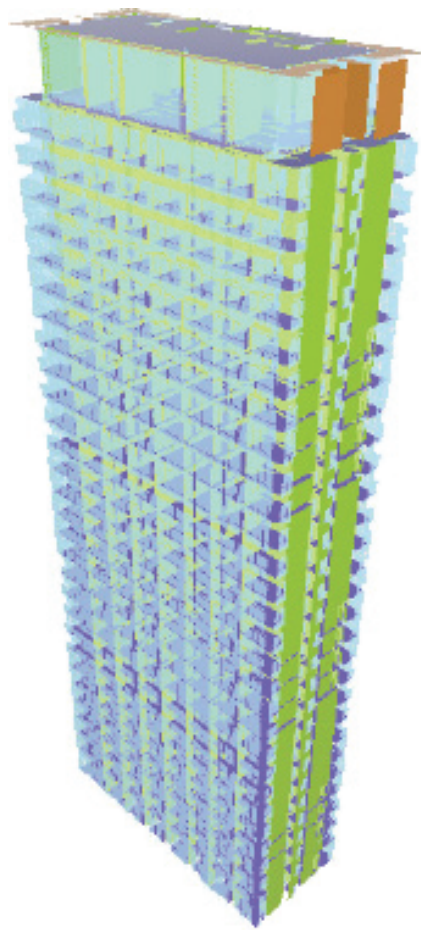


POLITECNICO
MILANO 1863

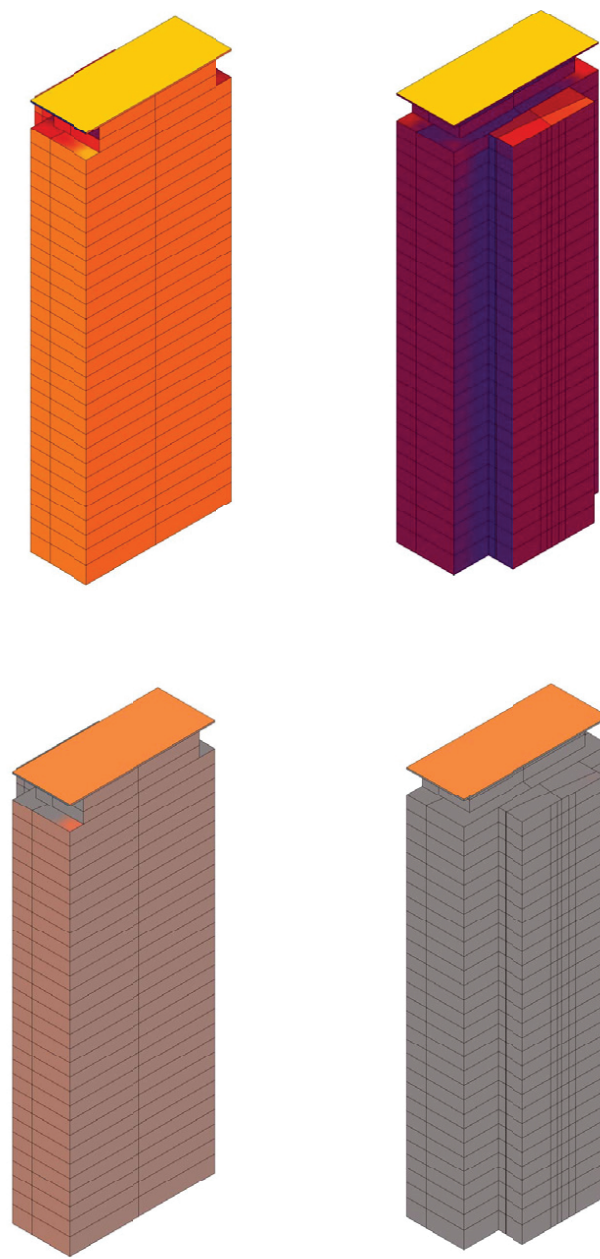
Scuola di Architettura Urbanistica
Ingegneria delle Costruzioni



Torre GALFA
Technical drawings



1. Energy simulation for torre GALFA



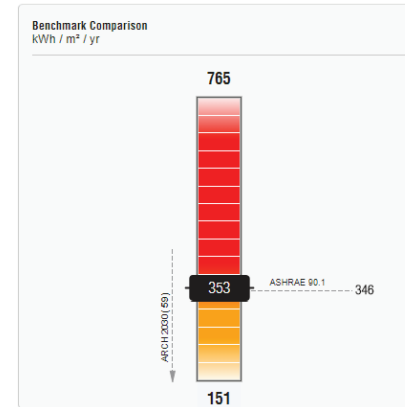
4. Solar shades analysis for external mass



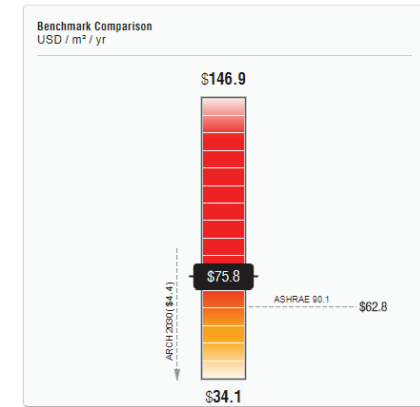
2. Energy Use Intensity



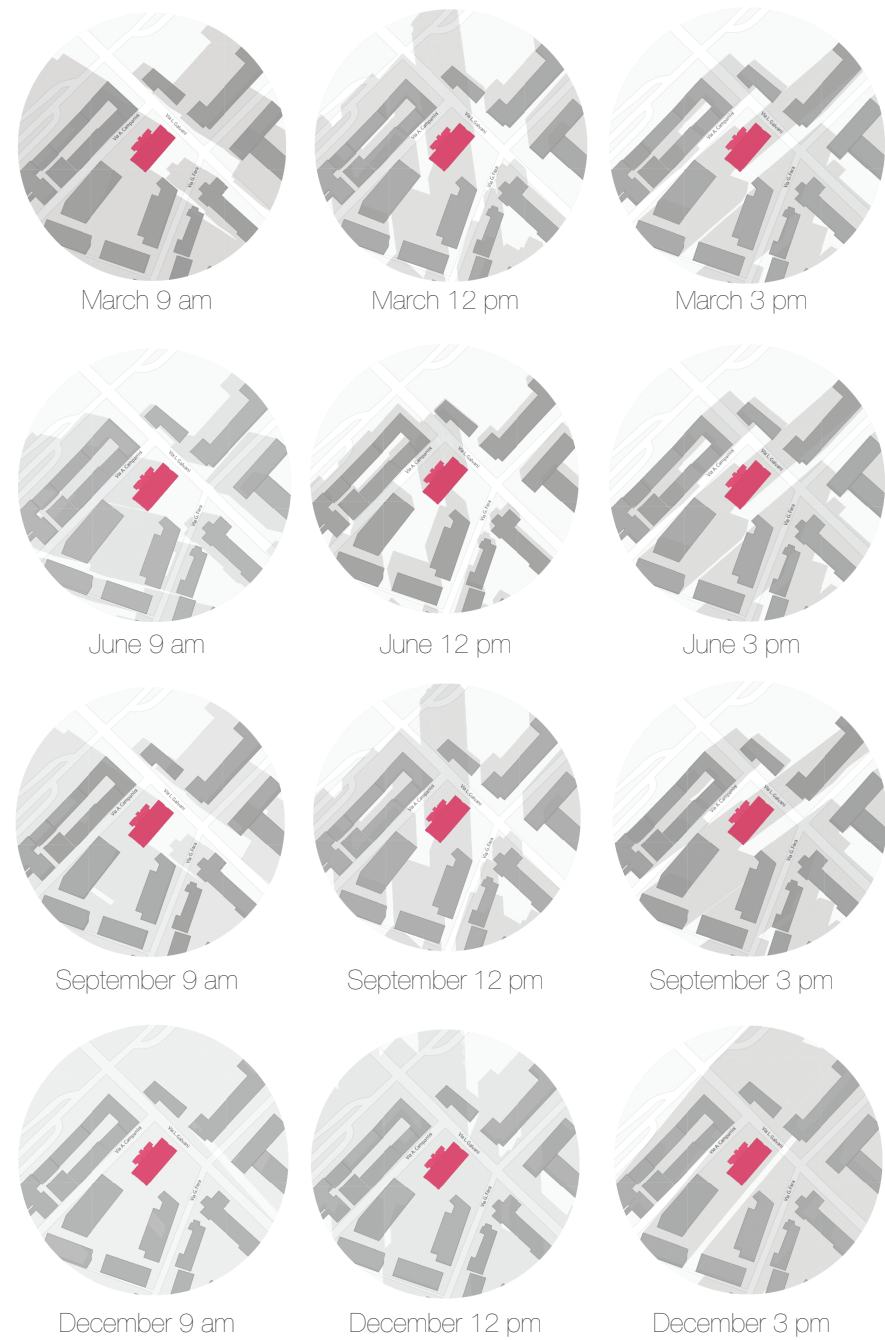
Energy Use cost



3. Energy Use Intensity compared with ASHRAE 90.1 benchmark



Energy Use cost compared with ASHRAE 90.1 benchmark



5. Shadow and shade studies for Torre galfa

SHEET 04

Sheet title: Torre GALFA performance analysis 01
Energy assesment and green retrofitting methodology redrawing

SCALE N/A

Torre GALFA
Technical drawings

Professor: Nastri Massimiliano
Student: Awad Ahmed

Drawings titles:

1. Energy simulation for torre GALFA
2. Energy Use Intensity and cost
3. Energy Use Intensity and cost compared with ASHRAE 90.1 benchmark
4. Solar shades analysis for external mass
5. Shadow and shade studies for Torre galfa

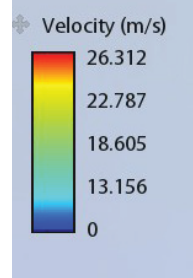
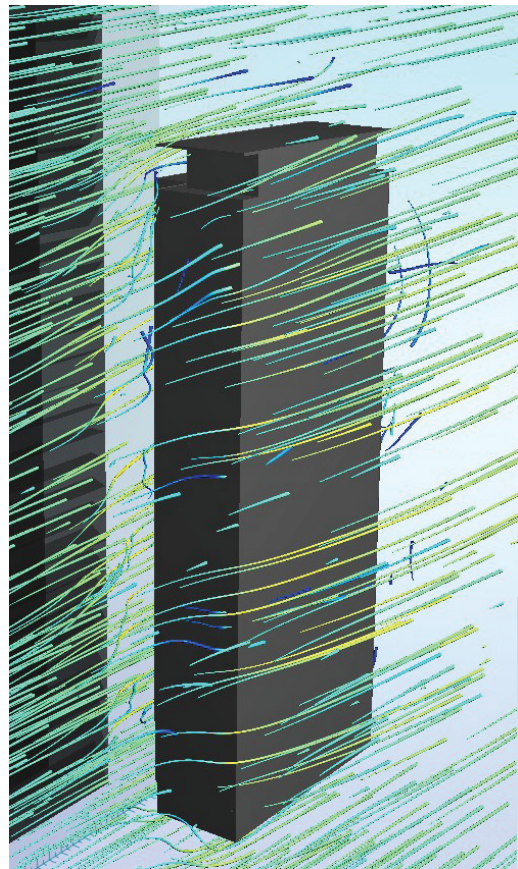


POLITECNICO MILANO 1863

Scuola di Architettura Urbanistica
Ingegneria delle Costruzioni



Torre GALFA
Technical drawings

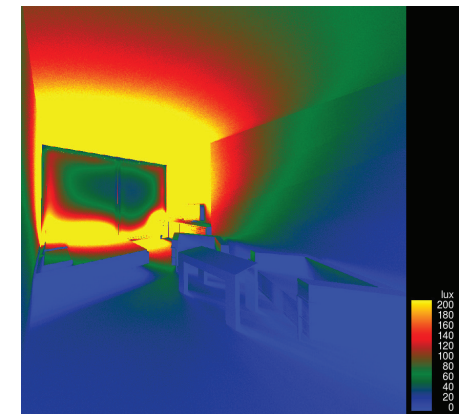
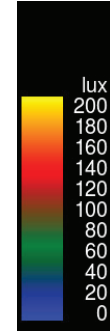


Status: **Stabilized**
 Analysis: 3D
 Wind Speed: 15.000 (m/s)
 Length: 298.690 (m)
 Width: 647.162 (m)
 Height: 337.409 (m)
 Voxel size: 5.531 (m)

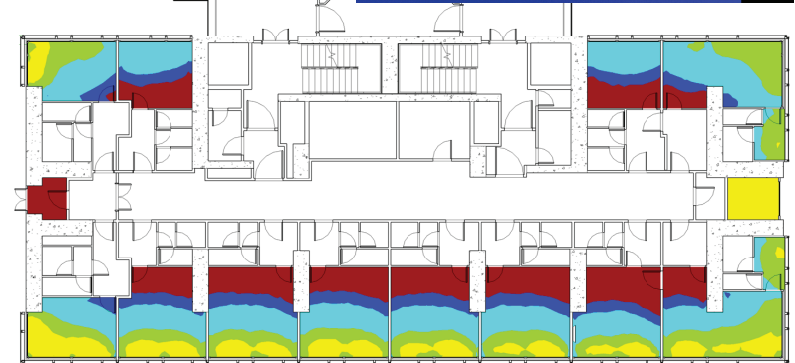


1. CFD modelling used to predict air flow pattern around Torre GALFA

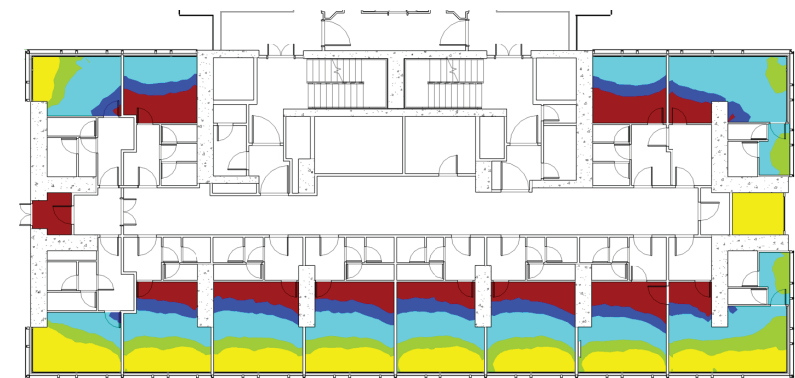
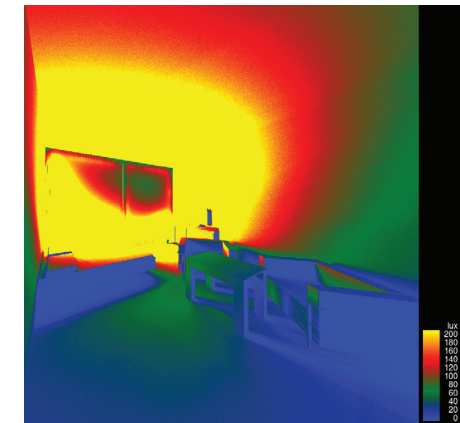
June 21 12 pm



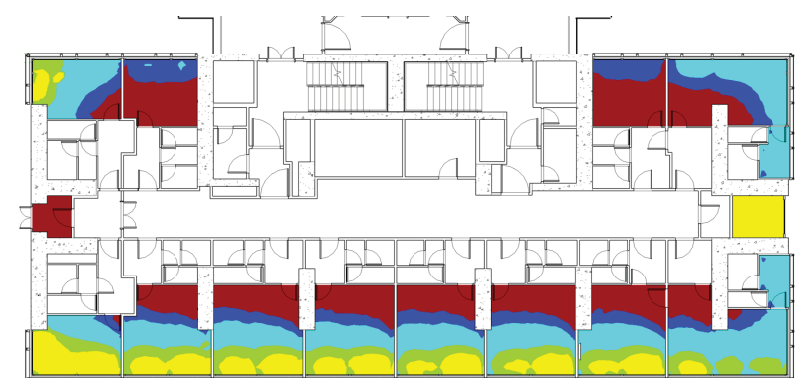
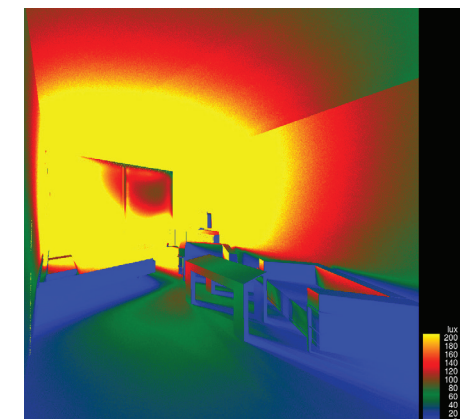
(LUX)



September 21 12 pm



December 21 12 pm



2. Daylighting studies for Torre galfa in different peak points for the sun direction and intensity

SHEET 05

Sheet title: Torre GALFA performance analysis 02
 Energy assesment and green retrofitting methodology redrawing

SCALE N/A

Torre GALFA
Technical drawings

Professor: Nasti Massimiliano
Student: Awad Ahmed

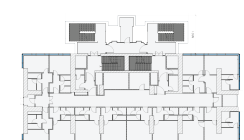
Drawings titles:

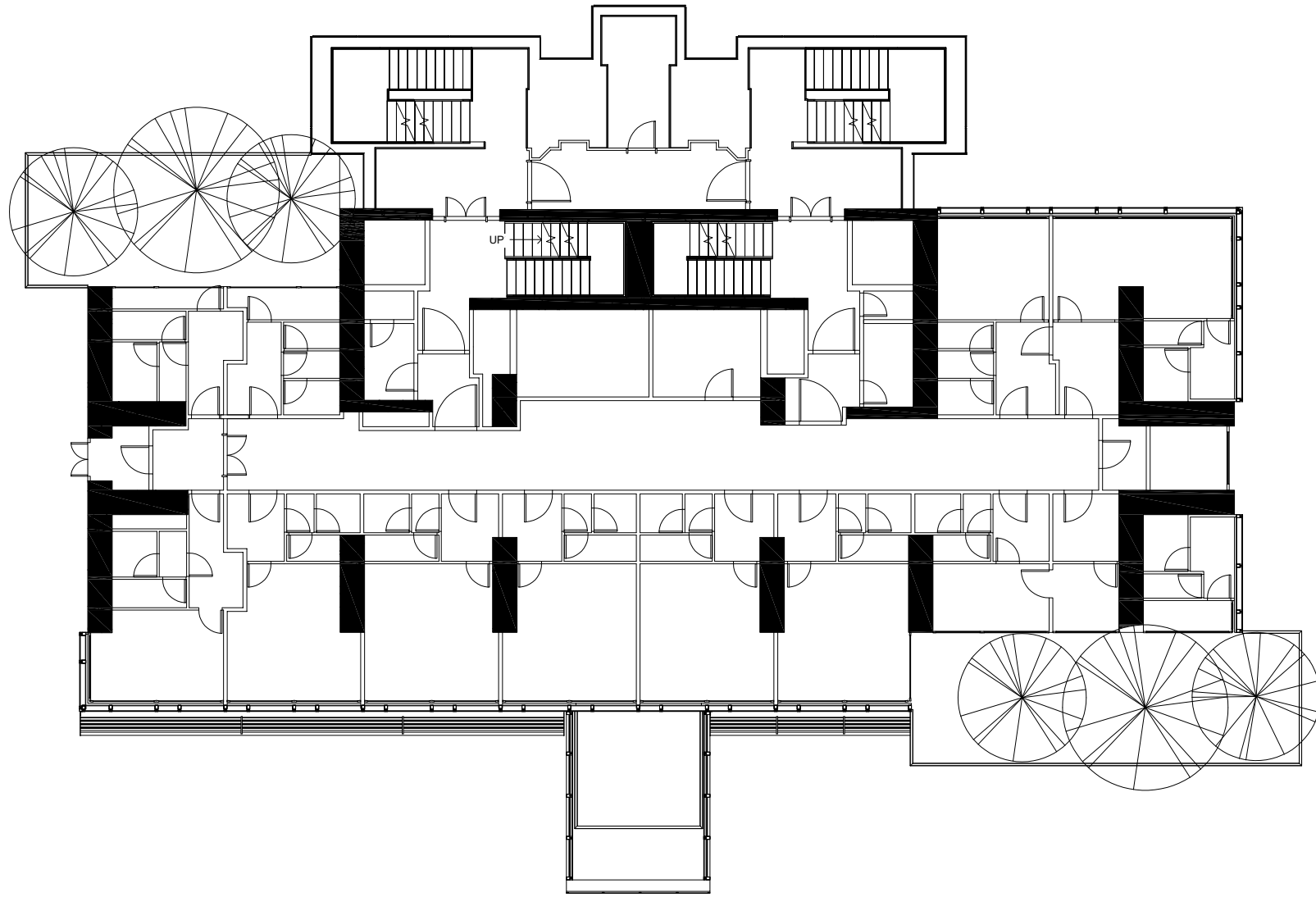
1. CFD modelling used to predict air flow pattern around Torre GALFA
2. Daylighting studies for Torre galfa in different peak points for the sun direction and intensity



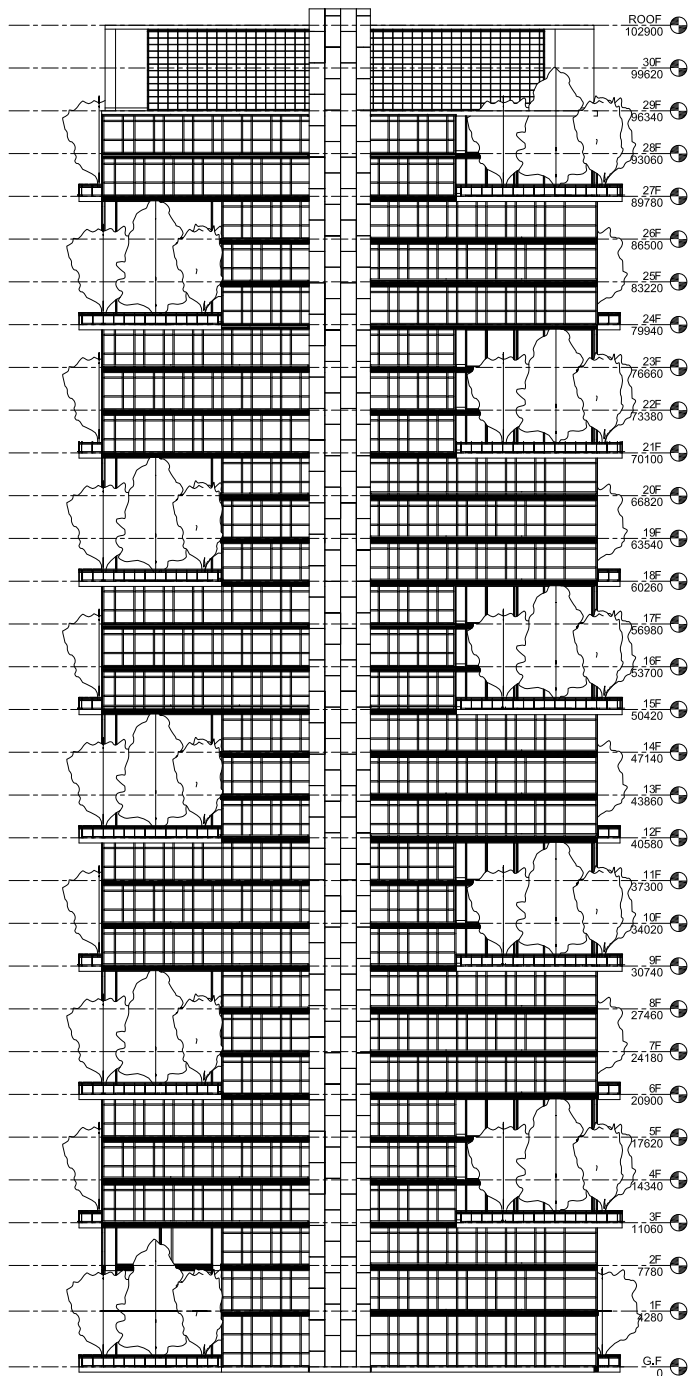
POLITECNICO
MILANO 1863

Scuola di Architettura Urbanistica
 Ingegneria delle Costruzioni

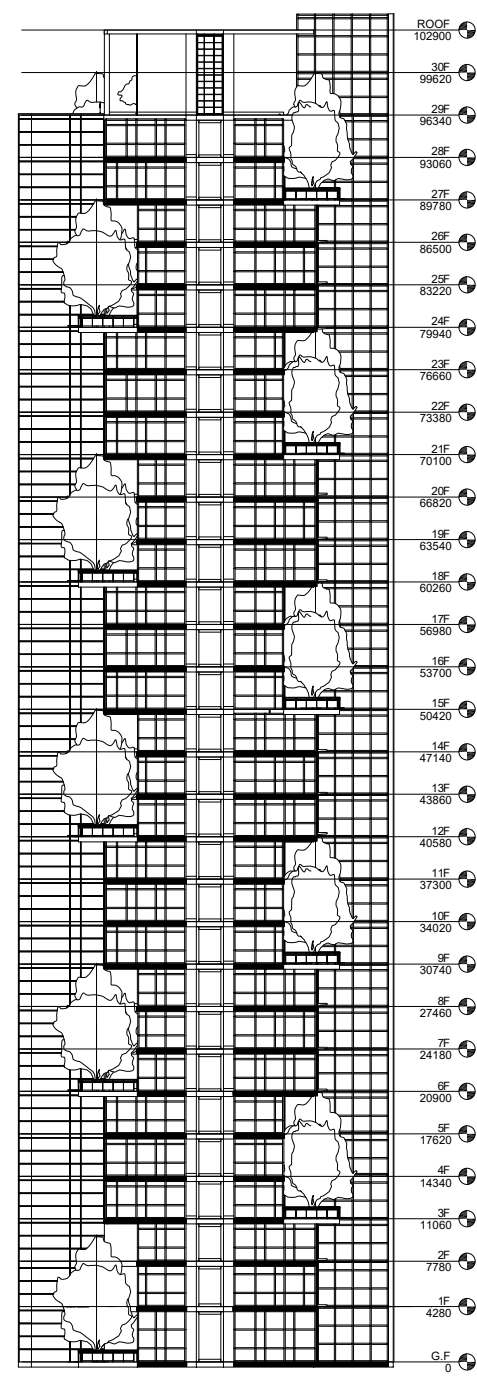




Typical floor plan 1:200



South Elevation 1:500



Section B-B 1:500

SHEET 06

Sheet title: Final design plan and Elevations

Energy assesment and green retrofitting methodology redrawing

SCALE 1:200/1:500

Torre GALFA
Technical drawings

Professor:
Nastri Massimiliano

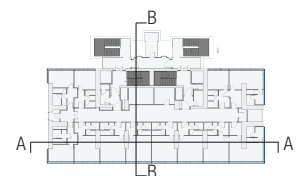
Student:
Awad Ahmed

Drawings name:
1. Typical floor plan 1:200
2. South Elevation 1:500
3. East Elevation 1:500

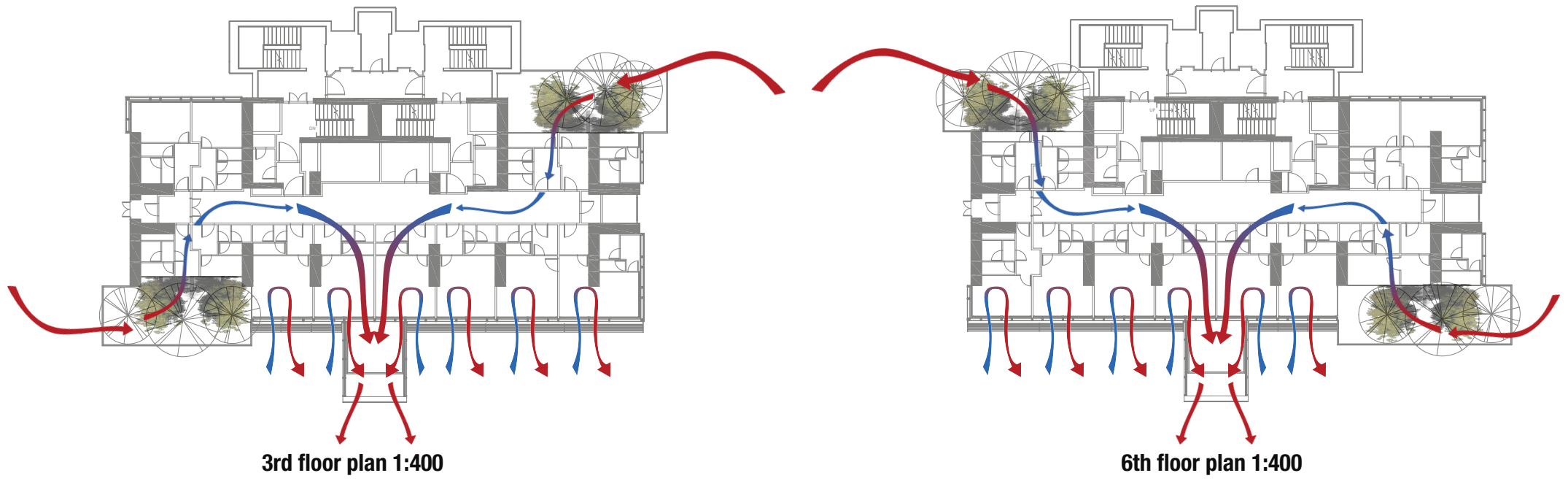


POLITECNICO
MILANO 1863

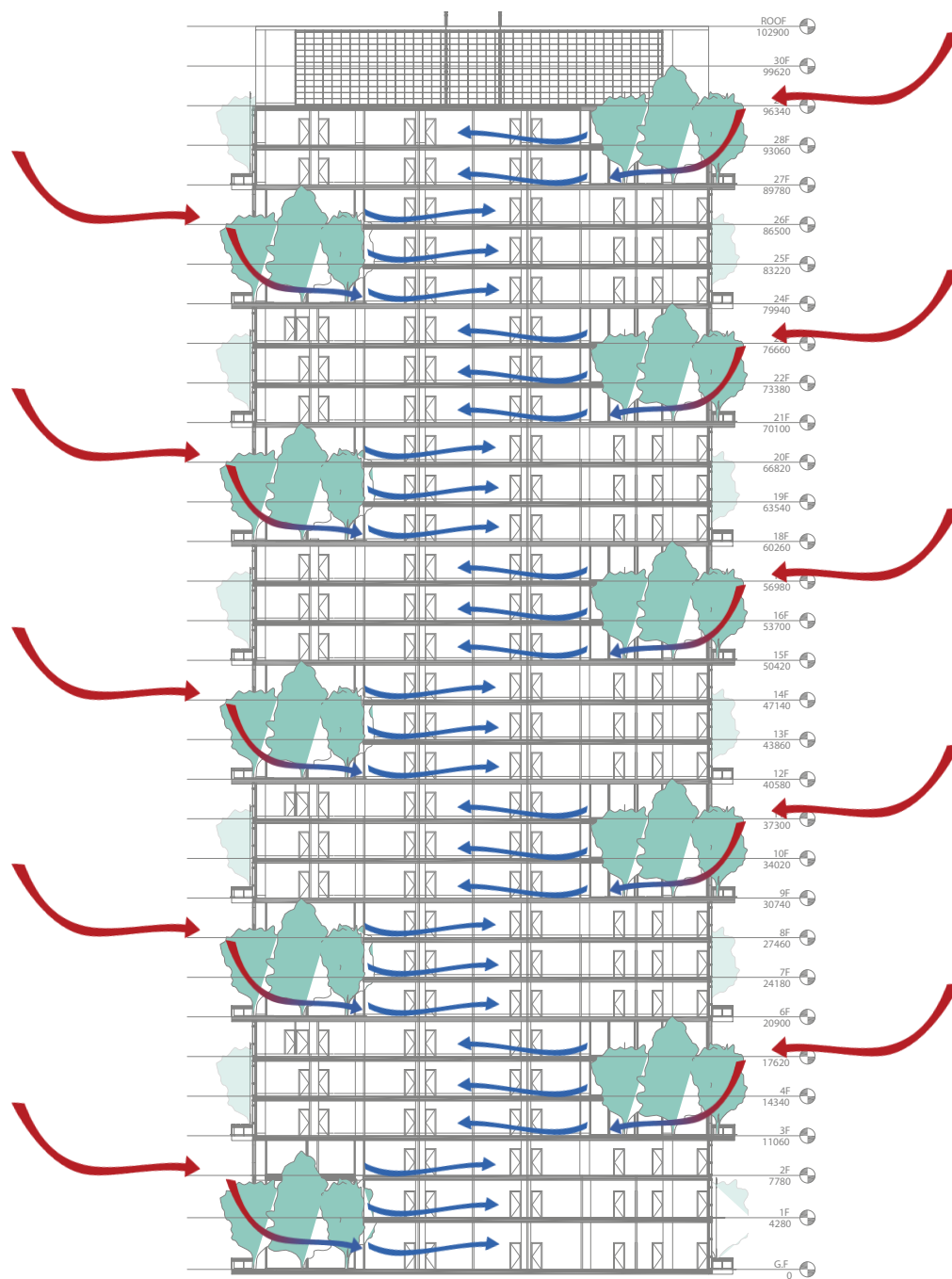
Scuola di Architettura Urbanistica
Ingegneria delle Costruzioni



Torre GALFA
Technical drawings



Typical floor plans showing the changes of temperature and air flow through the winter garden and the solar chimney



Horizontal Section A-A 1:500



Transversal Section B-B 1:500

SHEET 07

Sheet title: Final design plan and sections with environmental studies

Energy assesment and green retrofiting methodology redrawing

SCALE 1:200/1:500

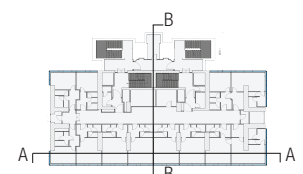
Torre GALFA
Technical drawings

Professor:
Nastri Massimiliano **Student:**
Awad Ahmed

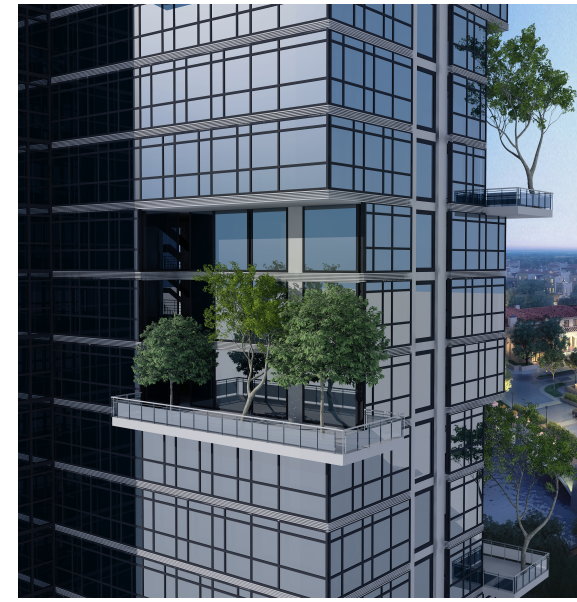
- Drawings name:**
1.3rd floor plan 1:400
2. 6th floor plan 1:400
3.HorizontalSection A-A 1:500
4.Transversal Section B-B 1:500



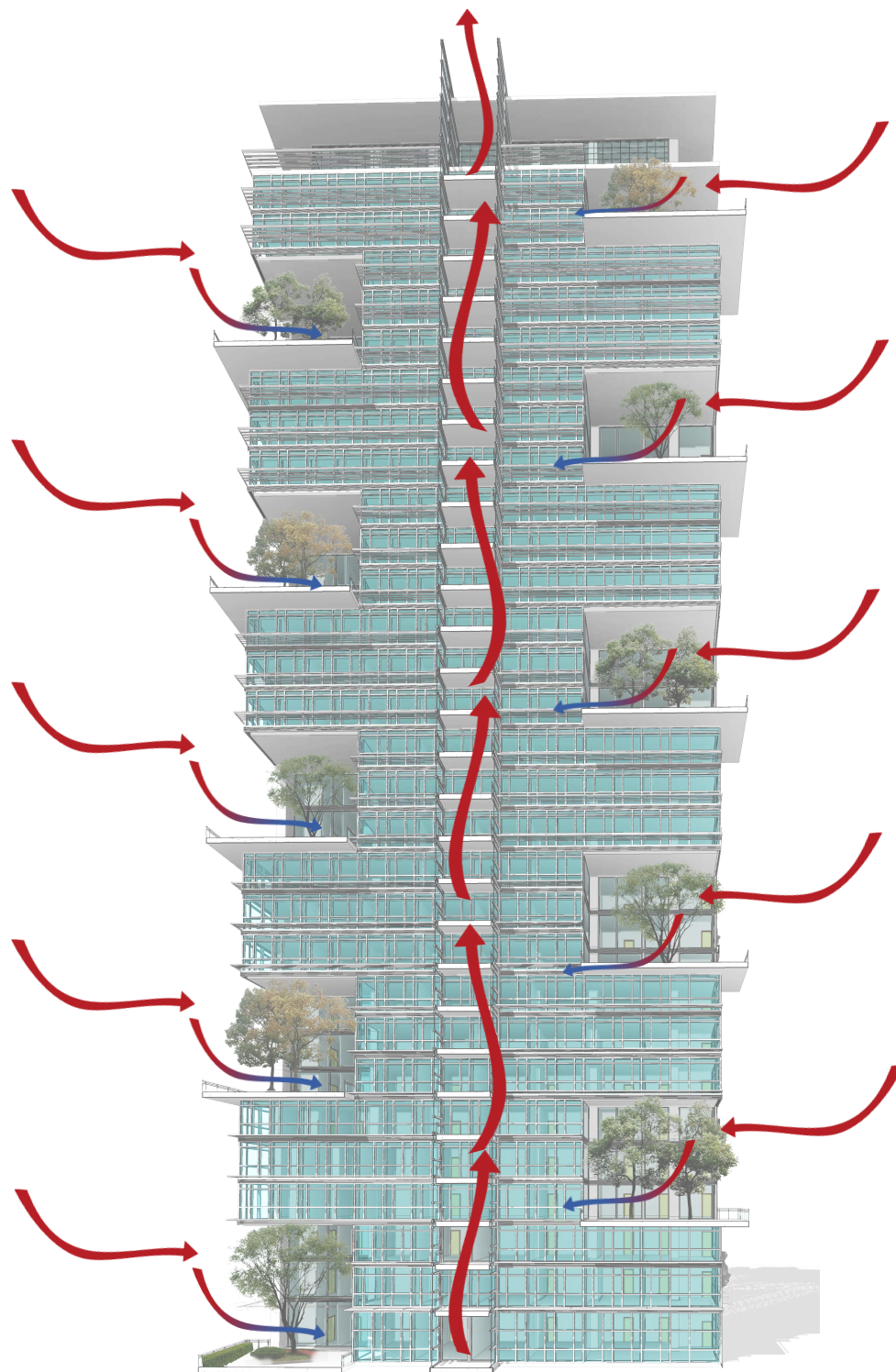
Scuola di Architettura Urbanistica
Ingegneria delle Costruzioni



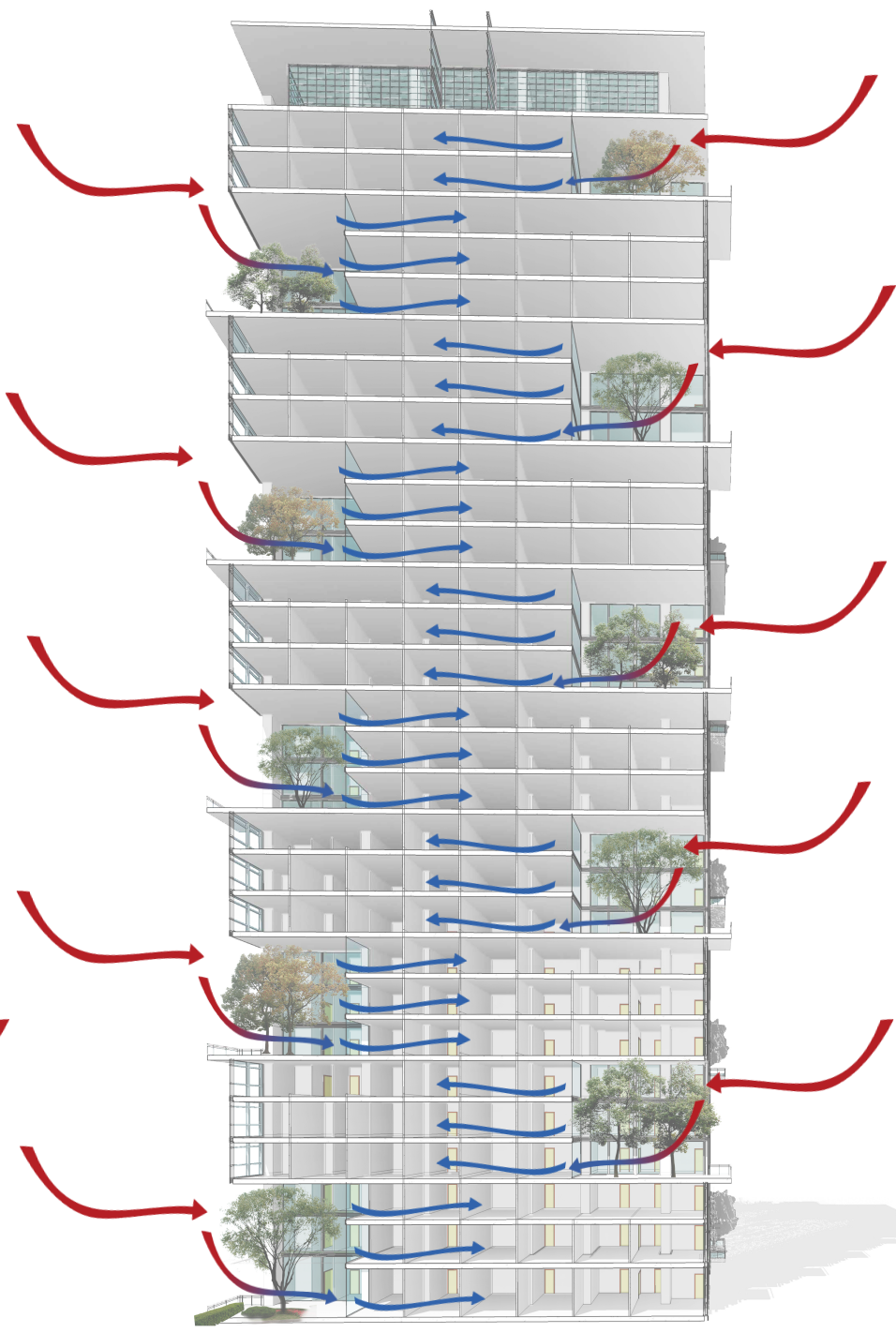
Torre GALFA
Technical drawings



1.3d shots showing the shape of the winter garden and how the whole image of Torre GALFA with all the winter garden



3D Section A-A 1:500
describing the Air flow
inside the building



3D Section B-B 1:500
describing the Air flow
inside the building

SHEET 08

Sheet title: Final design 3D
environmental studies

Energy assesment and green retrofiting
methodology redrawing

SCALE 1:200/1:500

Torre GALFA
Technical drawings

Professor:
Nastri Massimiliano

Student:
Awad Ahmed

Drawings name:

1.3d shots showing the winter garden
inside Torre GALFA

3.HorizontalSection A-A 1:500

4.Transversal Section B-B 1:500

describing the Air flow inside the building



POLITECNICO
MILANO 1863

Scuola di Architettura Urbanistica
Ingegneria delle Costruzioni

