ISOVER MULTI COMFORT STUDENT CONTEST 2019

MILAN, ITALY

TOMSK STATE UNIVERSITY OF ARCHITECTURE AND BUILDING

Team «CRESCENDO»:
- Kuzmenko Timofey
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Advisor:
- Stakheev Oleg

DESIGN CONCEPT FOR «CRESCENZAGO»:
«URBAN VILLA»

PRIVATE PROPERTY

PAST

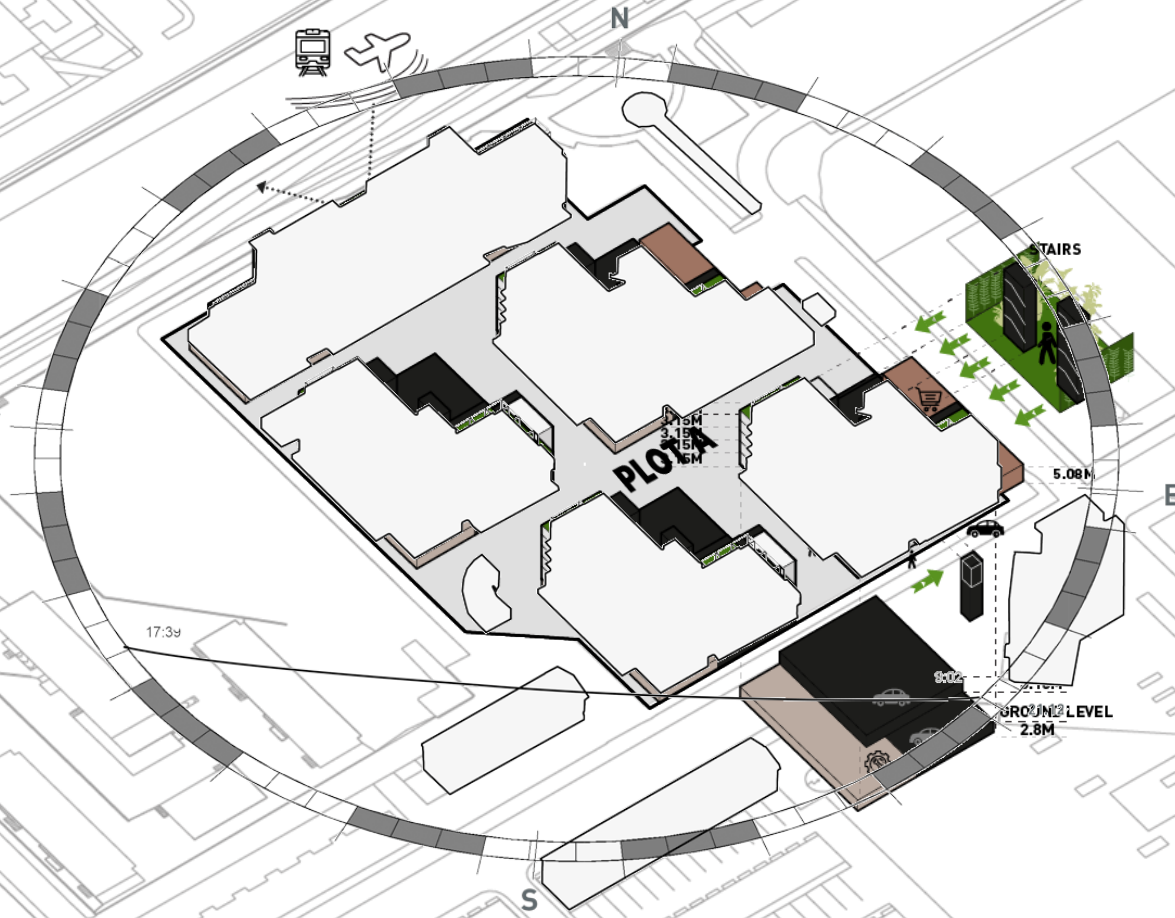
PUBLIC SPACE

PRESENT

NEIGHBORHOOD

FUTURE

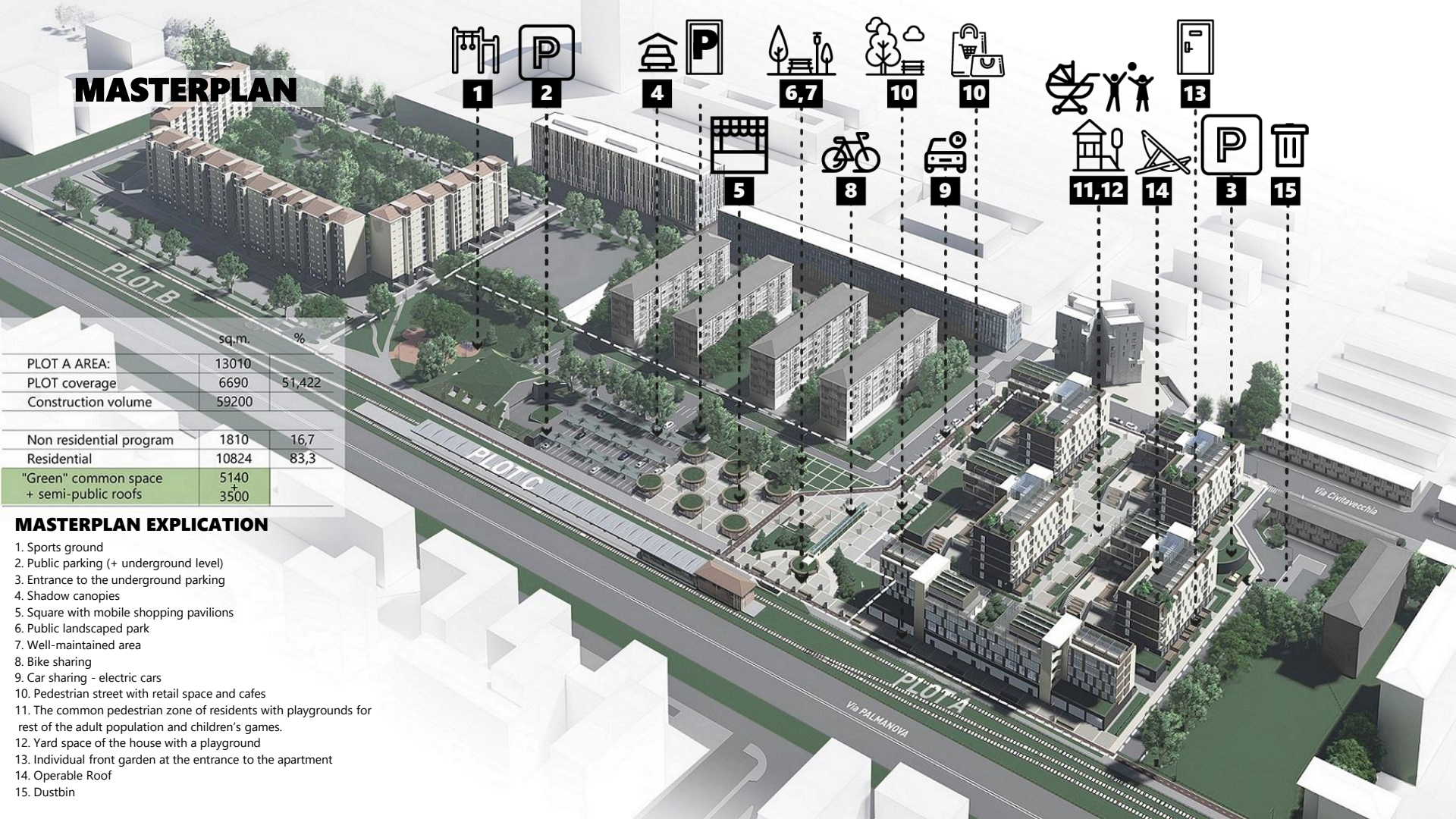
FUNCTIONAL SOLUTION



RESIDENTIAL
COMMERCIAL
STORAGE ROOMS
COMMUNICATIONS, TECHNICAL, PARKING
GREEN SPACES

3 HOUR

MASTERPLAN

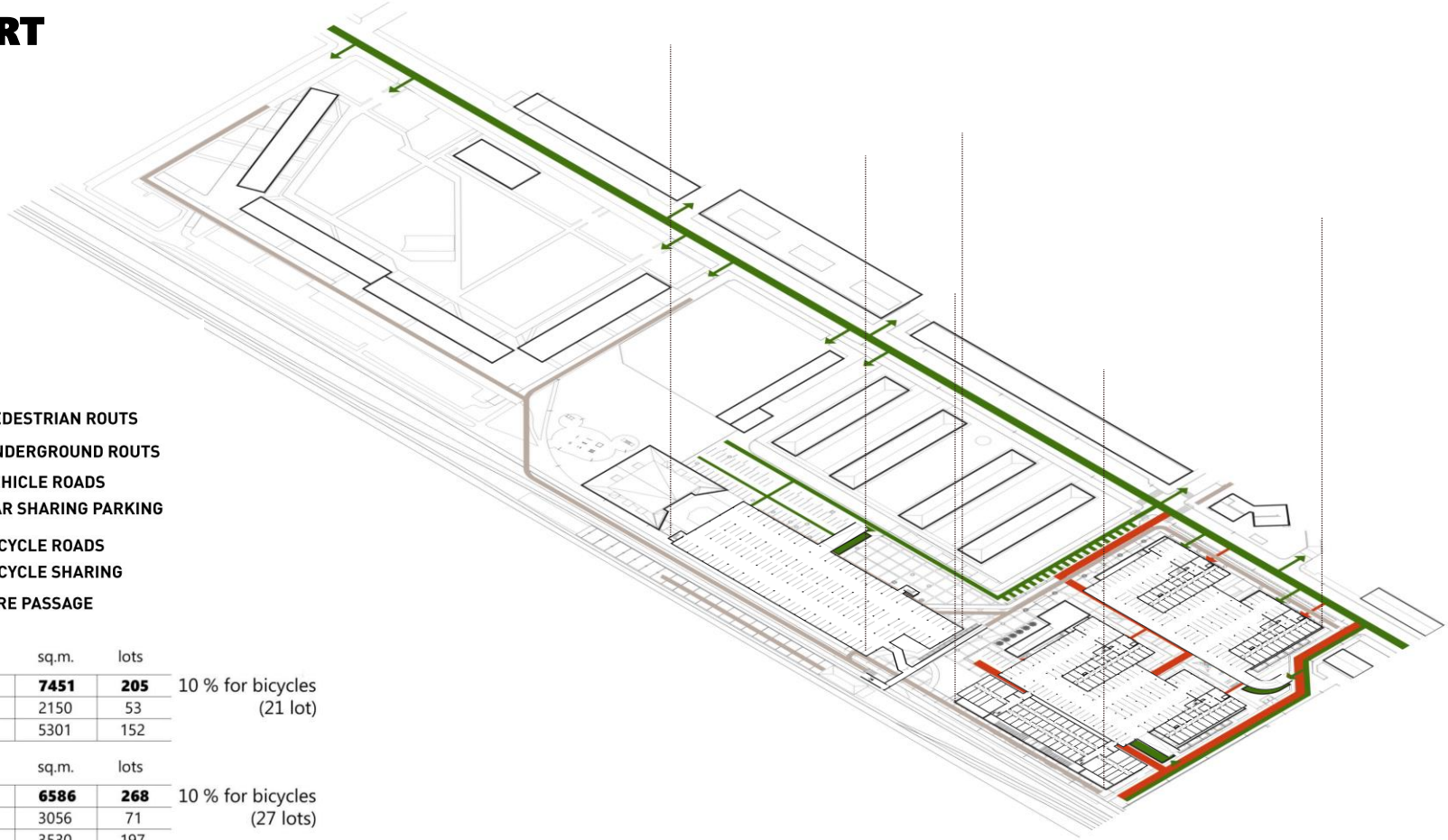


	sq.m.	%
PLOT A AREA:	13010	
PLOT coverage	6690	51,422
Construction volume	59200	
Non residential program	1810	16,7
Residential	10824	83,3
"Green" common space + semi-public roofs	5140 + 3500	

MASTERPLAN EXPLICATION

1. Sports ground
2. Public parking (+ underground level)
3. Entrance to the underground parking
4. Shadow canopies
5. Square with mobile shopping pavilions
6. Public landscaped park
7. Well-maintained area
8. Bike sharing
9. Car sharing - electric cars
10. Pedestrian street with retail space and cafes
11. The common pedestrian zone of residents with playgrounds for rest of the adult population and children's games.
12. Yard space of the house with a playground
13. Individual front garden at the entrance to the apartment
14. Operable Roof
15. Dustbin

TRANSPORT



PEDESTRIAN ROUTS
UNDERGROUND ROUTS
VEHICLE ROADS
CAR SHARING PARKING
BICYCLE ROADS
BICYCLE SHARING
FIRE PASSAGE

	sq.m.	lots	
PLOT A PARKING AREA:	**7451**	**205**	10 % for bicycles
above ground	2150	53	(21 lot)
underground	5301	152	

	sq.m.	lots	
PUBLIC PARKING AREA:	**6586**	**268**	10 % for bicycles
above ground	3056	71	(27 lots)
underground	3530	197	

«URBAN VILLA» SOLUTIONS

FACADE MATERIALS

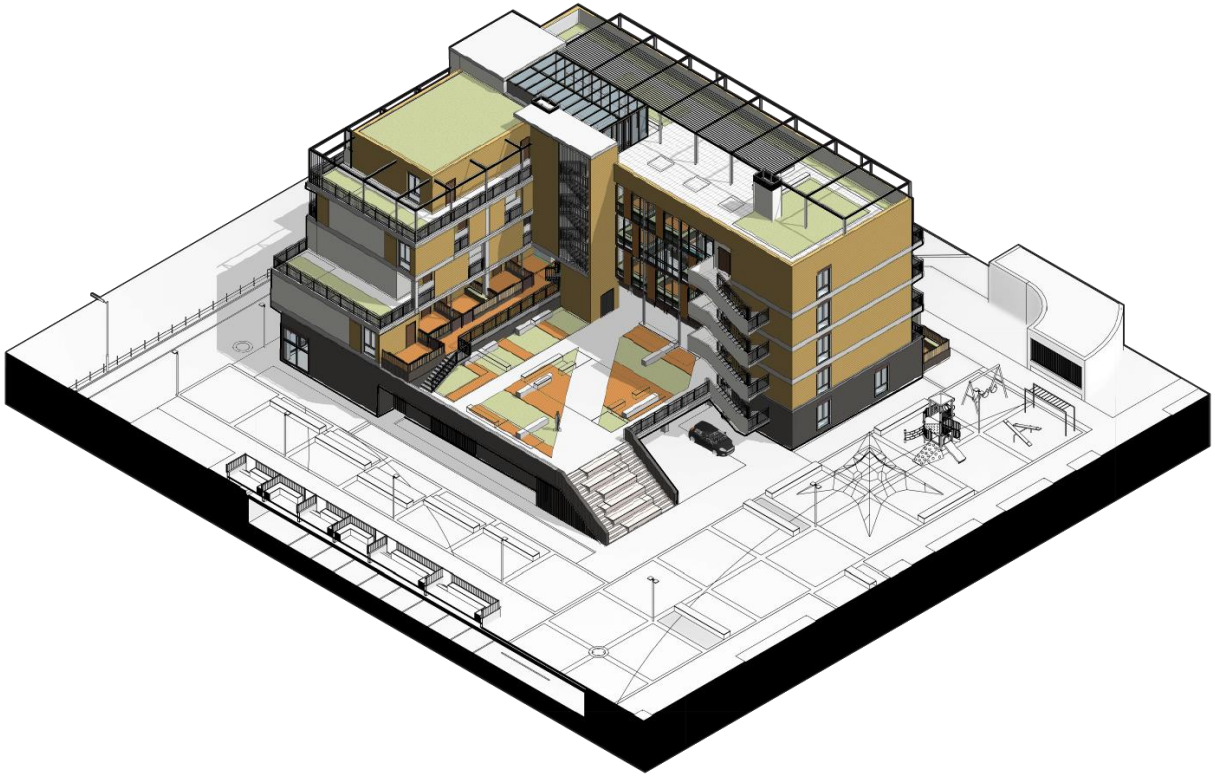
PROFILIT GLAZING

VENTILATED
FACADE HPL SLATS

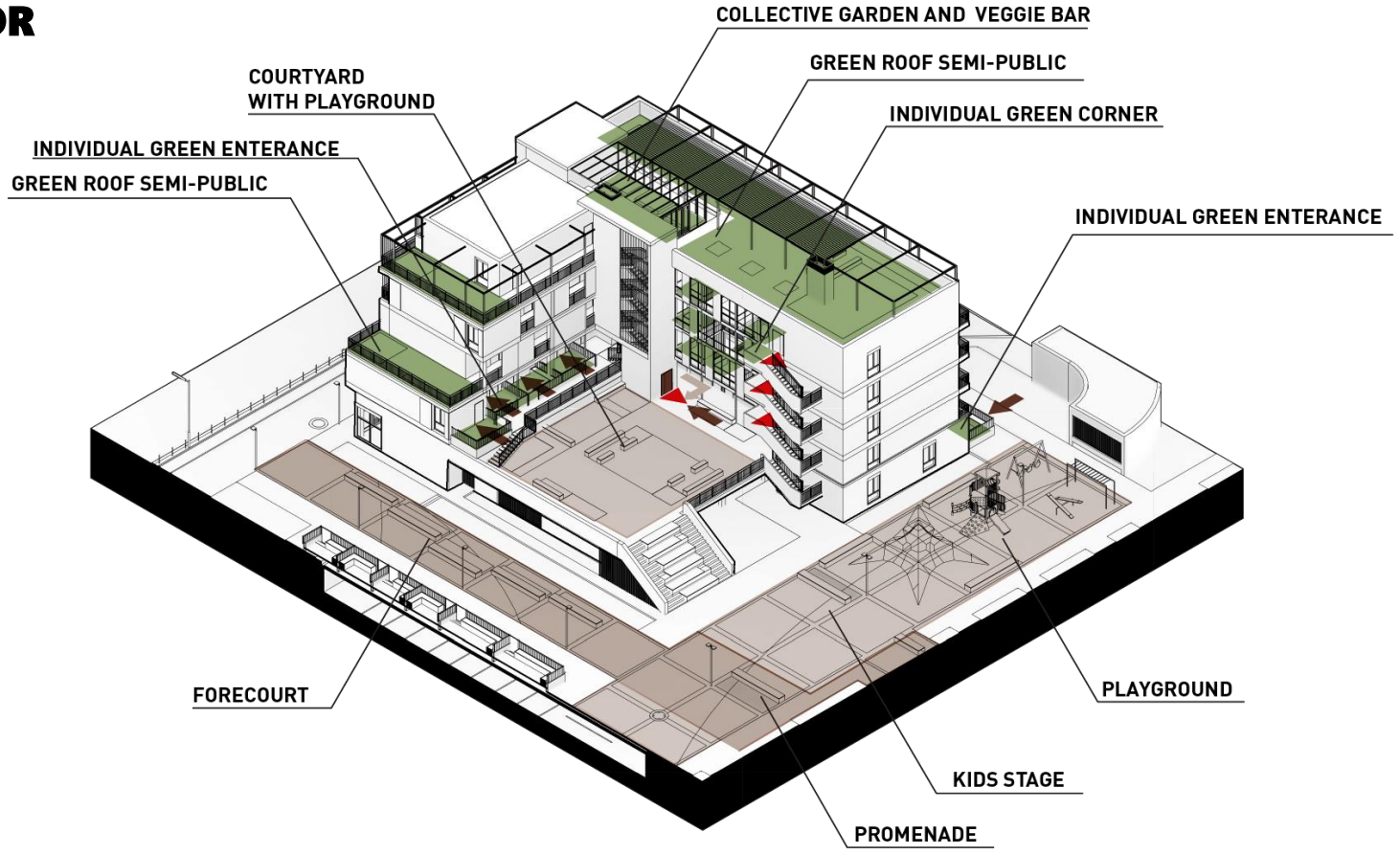
PLASTER:
FINE/BRIGRT

FLOOR-TO-CEILING
WINDOWS

STONE TILE



SOCIAL OUTDOOR COMFORT AND SOCIAL SAFETY AND PRIVACY



ENTERANCE TO RESIDENCE

TROUGH PASSAGE TO COURTYARD

EVAQUATION GATE

PLANS

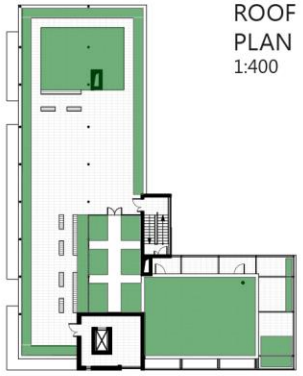
1-ST FLOOR PLAN
1:200

2-ND
FLOOR PLAN
1:400

3-RD
FLOOR PLAN
1:400

4-TH
FLOOR PLAN
1:400

ROOF
PLAN
1:400



UNIT TYPOLOGY

86 UNITS

STUDIO | 29 м²	86 UNITS

55 UNITS

STUDIO | 29 м²	37 UNITS	41 UNITS
STUDIO | 40 м²	4 UNITS	
I-ROOM | 42 м²	4 UNITS	5 UNITS
I-ROOM | 61 м²	1 UNIT	
II-ROOM | 62 м²	4 UNIT	9 UNITS
II-ROOM | 77 м²	4 UNIT	
II-ROOM | 79 м²	1 UNIT	

59 UNITS

STUDIO | 29 м²	41 UNITS	45 UNITS
STUDIO | 40 м²	4 UNITS	
I-ROOM | 42 м²	4 UNITS	5 UNITS
I-ROOM | 61 м²	1 UNIT	
II-ROOM | 62 м²	4 UNIT	9 UNITS
II-ROOM | 77 м²	4 UNIT	
II-ROOM | 79 м²	1 UNIT	

54 UNITS

STUDIO | 29 м²	36 UNITS	40 UNITS
STUDIO | 40 м²	4 UNITS	
I-ROOM | 42 м²	4 UNITS	5 UNITS
I-ROOM | 61 м²	1 UNIT	
II-ROOM | 62 м²	4 UNIT	9 UNITS
II-ROOM | 77 м²	4 UNIT	
II-ROOM | 79 м²	1 UNIT	

50 UNITS

STUDIO | 29 м²	32 UNITS	36 UNITS
STUDIO | 40 м²	4 UNITS	
I-ROOM | 42 м²	4 UNITS	5 UNITS
I-ROOM | 61 м²	1 UNIT	
II-ROOM | 62 м²	4 UNIT	9 UNITS
II-ROOM | 77 м²	4 UNIT	
II-ROOM | 79 м²	1 UNIT	

304 UNITS

STUDIO | 29 м²	232 UNITS	248 UNITS
STUDIO | 40 м²	16 UNITS	
I-ROOM | 42 м²	16 UNITS	20 UNITS
I-ROOM | 61 м²	4 UNIT	
II-ROOM | 62 м²	16 UNIT	36 UNITS
II-ROOM | 77 м²	16 UNIT	
II-ROOM | 79 м²	4 UNIT	

STUDIO 29 м²

1. Entrance - 4.5 м²
2. Bathroom - 4.3 м²
3. Living room + Kitchen - 20.3 м²

STUDIO 40 м²

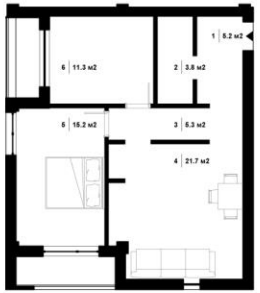
1. Entrance - 3.5 м²
2. Kitchen - 5.4 м²
3. Living room - 21 м²
4. Distribution - 1.8 м²
5. Wardrobe - 3.8 м²
6. Bathroom - 4.2 м²

I-ROOM 42 м²

1. Entrance - 4 м²
2. Distribution - 4.6 м²
3. Bathroom - 4.2 м²
4. Bedroom - 17.3 м²
5. Kitchen - 12.2 м²

I-ROOM 61 м²

1. Entrance - 6 м²
2. Living room - 21.3 м²
3. Bedroom - 14.4 м²
4. Kitchen - 6 м²
5. Distribution - 2 м²
6. Wardrobe - 7.4 м²
7. Bathroom - 4.2 м²



II-ROOM 62 м²

1. Entrance - 5.2 м²
2. Bathroom - 3.8 м²
3. Distribution - 5.3 м²
4. Living room + Kitchen - 21.7 м²
5. Bedroom - 15.2 м²
6. Bedroom - 11.3 м²

II-ROOM 77 м²

1. Entrance - 6.6 м²
2. Bathroom - 4 м²
3. Living room + Kitchen - 32.6 м²
4. Wardrobe - 4.4 м²
5. Bedroom - 15.6 м²
6. Distribution - 1.6 м²
7. Bedroom - 12 м²

II-ROOM 79 м²

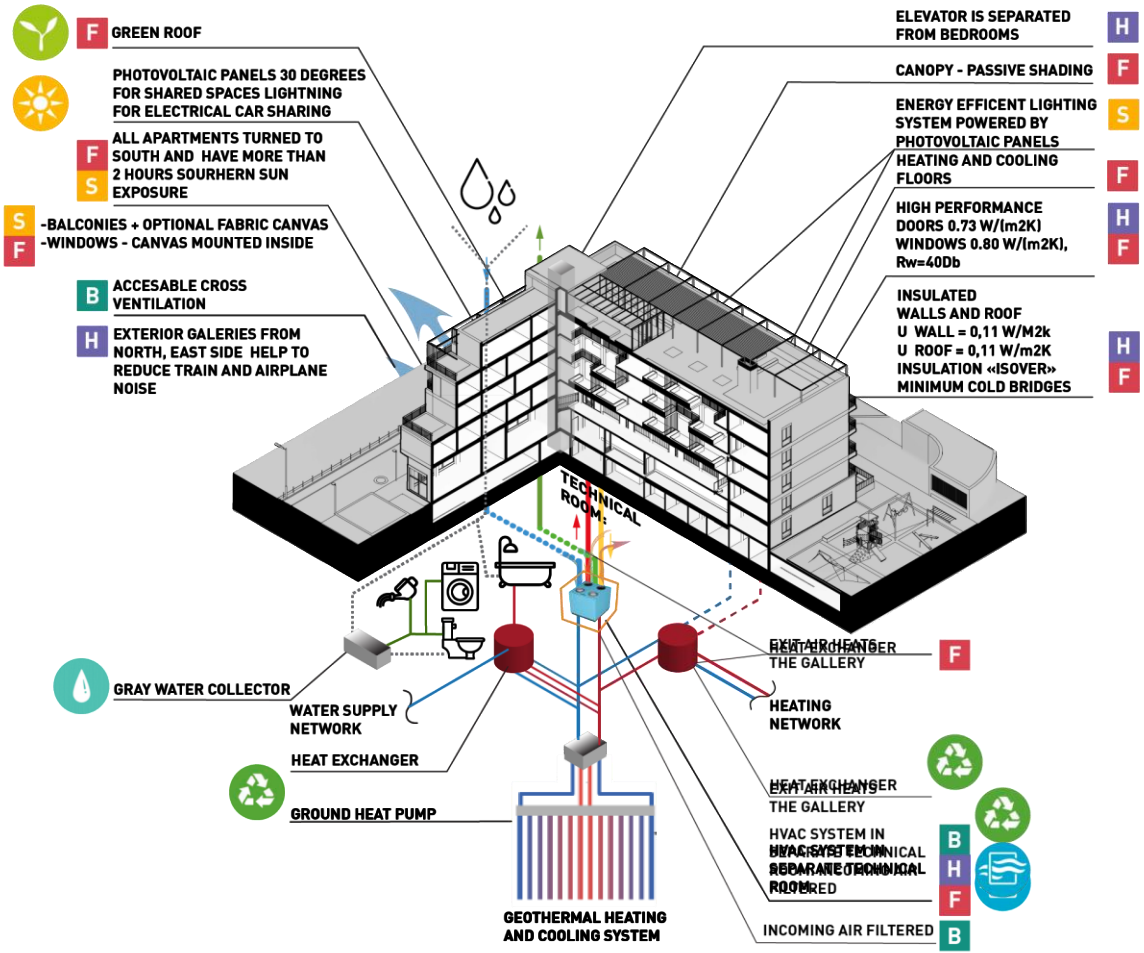
1. Entrance - 6.6 м²
2. Bedroom - 13 м²
3. Living room + Kitchen - 30 м²
4. Distribution - 1.3 м²
5. Laundry - 1.7 м²
6. Bathroom - 5.4 м²
7. Wardrobe - 4.7 м²
8. Bedroom - 16.5 м²

TECHNICAL SOLUTIONS

MULTICOMFORT+ SUSTAINABILITY

[illegible]

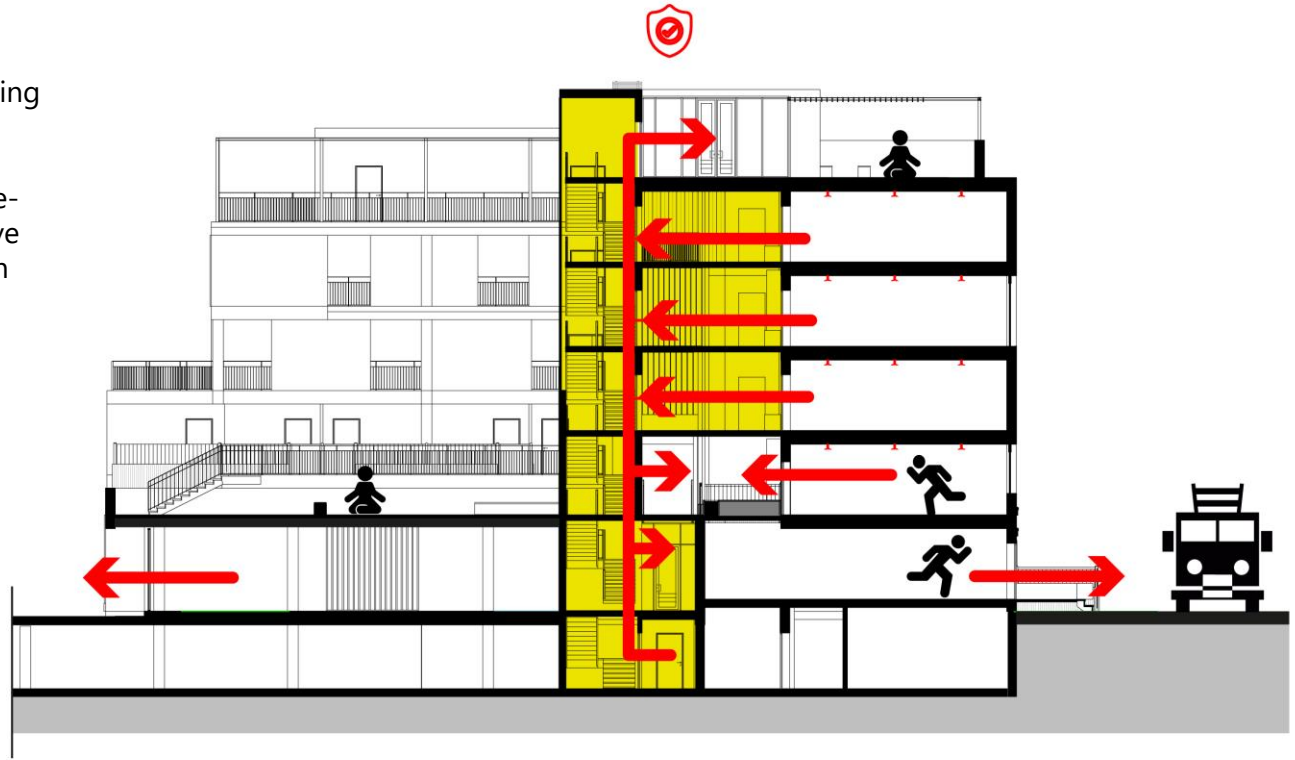
- Feel — THERMAL COMFORT
- WATER EFFICENCY
- See — VISUAL COMFORT
- ENERGY & ATMOSPHERE
- Hear — ACOUSTIC COMFORT
- SUSTAINABLE SITES
- Breathe — INDOOR AIR QUALITY
- MATERIAL & RESOURCES
- INDOOR ENVIRONMENT QUALITY



FIRE SAFETY

-Annunciators
-Sensors
-Automatic fire extinguishing system

First, the system should de-energize the building, leave the smoke removal system and fire alarm (evacuation routes) on the emergency power supply)

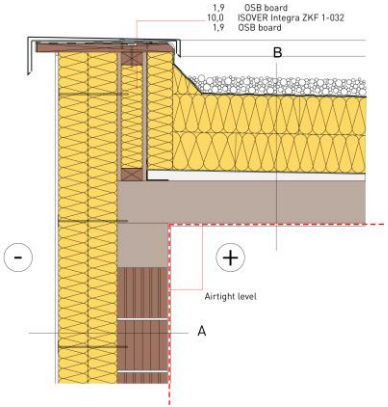


SECTION


1
+19,050
OPERATED ROOF
TECHNICAL
GREEN ROOF
OPERATED ROOF
+17,540
+14,150
2
3
4
OPERATED ROOF
+7,800
GREEN COMMON SPACE
UNITS
5
-0,450
OFFICE
SHOP
SHOP
STORAGE
TECHNICAL
PARKING
2995
3155
3150
3150
3150
3150
3150
3150
2300
350
3150
3150
3150
5080
4600
3580
2920
2910
2600
3900
4350
3200
2550
7800
7800
3900
33500
1
2
3
4
5
6
7
8

STRUCTURAL DETAILS

DETAIL 1



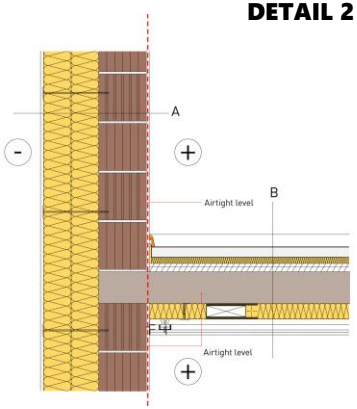
Build-up A in cm

1,5	Interior plaster
24,0	Vertically perforated brick HLzW
14,0	ISOVER Sillatherm WVP 1-035
14,0	ISOVER Sillatherm WVP 1-035
1,5	Thick plaster

Build-up B in cm

8,0	Pebbles
0,8	Double layer roof and sealing sheeting, bonded or scorched
18,0	ISOVER Metac FLP 1 Duratec
18,0	ISOVER Metac FLP 1 Duratec
	Vapour retarder
	Levelling layer, bitumen perforated glass-mat sheeting
	Preliminary coat bonding course
	Concrete laid at inclination of at least 2%
20,0	Reinforced concrete ceiling
1,5	Interior plaster

DETAIL 2



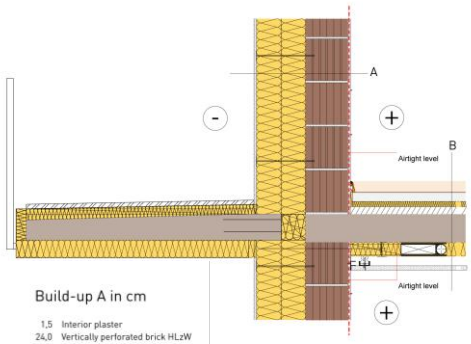
Build-up A in cm

1,5	Interior plaster
24,0	Vertically perforated brick HLzW
14,0	ISOVER Sillatherm WVP 1-035
14,0	ISOVER Sillatherm WVP 1-035
1,5	Thick plaster

Build-up B in cm

	Floor covering
5,0	Screed
	Separating layer
3,0	ISOVER Akustic EP 3
4,0	ISOVER Exporit EPS 100/035 as compensation for height of tube
16,0	Reinforced concrete ceiling
8,0	Installation level with ISOVER Akustik TP 1
2,7	Rigips Ceiling profile CD 60/27 as basic profile
2,7	Rigips Ceiling profile CD 60/27 as supporting profile
2,5	Rigips Rigidur H double layer, each layer 12.5 mm

DETAIL 3



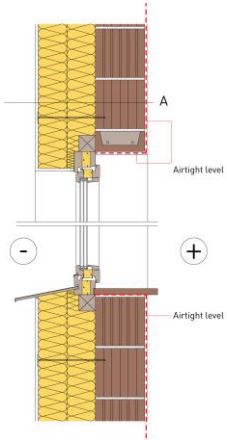
Build-up A in cm

1,5	Interior plaster
24,0	Vertically perforated brick HLzW
14,0	ISOVER Sillatherm WVP 1-035
14,0	ISOVER Sillatherm WVP 1-035
1,5	Thick plaster

Build-up B in cm

	Floor covering
5,0	Screed
	Vapour retarder and separating layer
4,0	ISOVER Exporit EPS 100/035
3,0	ISOVER Akustic EP 1
16,0	Reinforced concrete ceiling
12,0	ISOVER Topdec DP 1-032 ULTIMATE

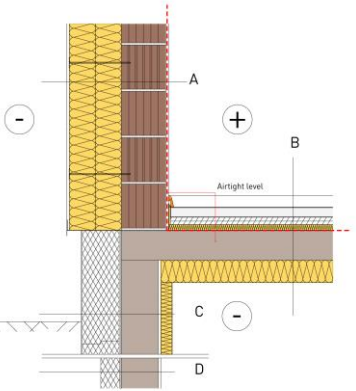
DETAIL 4



Build-up A in cm

1,5	Interior plaster
24,0	Vertically perforated brick HLzW
14,0	ISOVER Sillatherm WVP 1-035
14,0	ISOVER Sillatherm WVP 1-035
1,5	Thick plaster

DETAIL 5



Build-up A in cm

1,5	Interior plaster
24,0	Vertically perforated brick HLzW
14,0	ISOVER Sillatherm WVP 1-035
14,0	ISOVER Sillatherm WVP 1-035
1,5	Thick plaster

Build-up B in cm

	Floor covering
5,0	Screed
	Vapour retarder and separating layer
4,0	ISOVER Exporit EPS 100/035
3,0	ISOVER Akustic EP 1
16,0	Reinforced concrete ceiling
12,0	ISOVER Topdec DP 1-032 ULTIMATE

Build-up C in cm (Plinth insulation)

6,0	ISOVER Topdec DP 1-032 ULTIMATE
1,5	Interior plaster
20,0	Concrete wall
0,1	Bitumen preliminary coating
0,5	Sealing against moisture
20,0	ISOVER Exporit EPS PDP 1 (up to 3m installation depth) or PDP 2 (up to 6 m installation depth)
0,6	Thin plaster coat

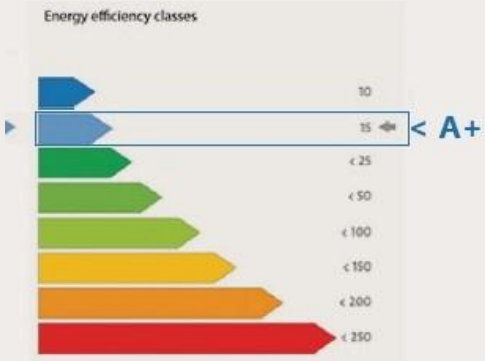
Build-up D in cm (Perimeter insulation)

1,5	Interior plaster
20,0	Concrete wall
0,1	Bitumen preliminary coating
0,5	Sealing against moisture
10,0	ISOVER Exporit EPS PDP 1 (up to 3m installation depth) or PDP 2 (up to 6 m installation depth)
	Backfill with drainage tube

PLOT A
CALCULATIONS

J. Cooling Demand Calculations

Negative Heat Loads:	18949.94
Ventilation Heat Losses:	79697.61
Total Heat Losses:	98647.56
Internal Heat Gains:	74088.00
Available Solar Heat Gains:	3240.88
Usefull Heat Losses:	55568.43
Usefull Cooling Demand:	43079.12
Specific Annual Cooling Dema...	**10.34**



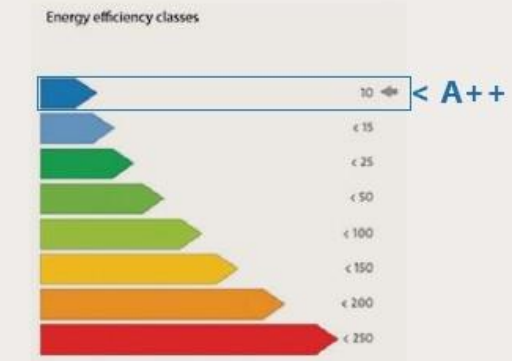
K. Overheating Calculations

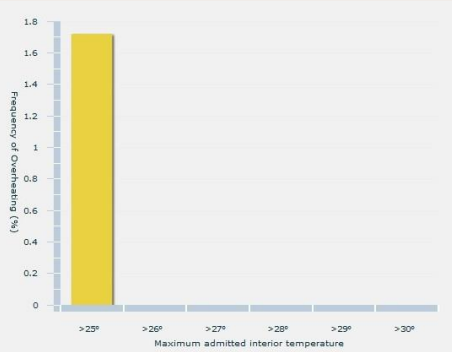
Exterior Thermal Transmittan...	382.81
Ground Thermal Transmittance:	85.44
Ventilation Transmittion Ambi...	462.92
Ventilation Transmission Gro...	0.00
Solar Aperture:	17.70
Frequency of Overheating:	1.72

CALCULATIONS

Specific Heat Demand

Transmission Heat Losses:	90745.14	kWh/a
Ventilation Heat Losses:	36782.73	kWh/a
Total Heat Losses:	127527.86	kWh/a
Internal Heat Gains:	88726.61	kWh/a
Solar Heat Gains:	43865.91	kWh/a
Total Heat Gains:	108287.70	kWh/a
Annual Heat Demand:	19240.16	kWh/a
Specific Heat Demand:	3.72	kWh/(m2a)





PLOT B SOLUTIONS

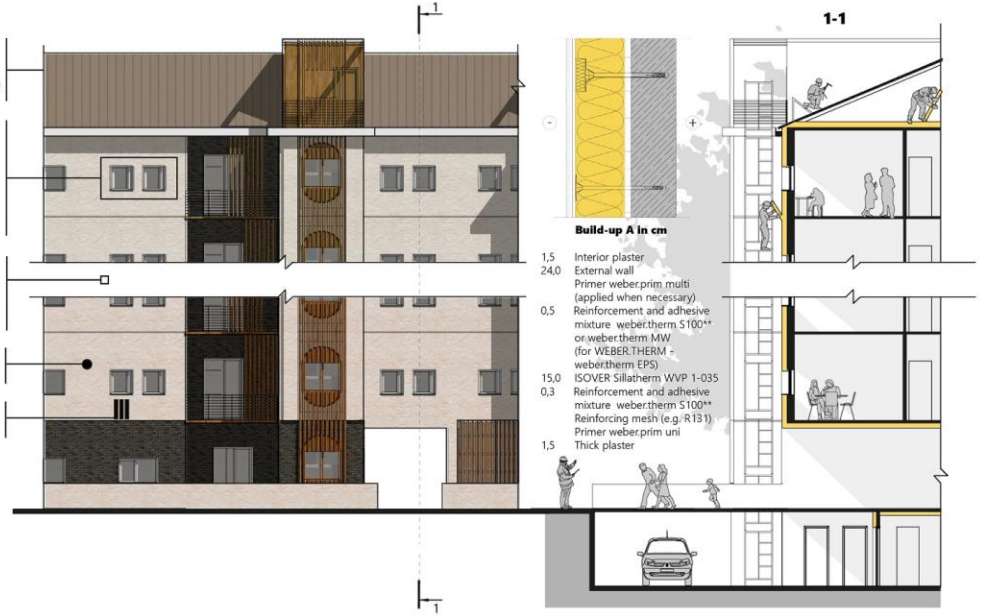
Attic
- Install a collector on exhaust ventilation, which will be supplied to the staircase
- Dismantling of hydro and thermal imaging on the coating
- Laying insulation - **200mm** (Isover extruded polystyrene)

Windows:
For noise protection proposed to make separate bindings:
- In the outer **1 glass - 8mm**
- In the internal **2 - chamber glass** with heat-reflecting coating
- Between bindings 150
- Sound insulation will be approximately **64 dB**
- Can be arranged in glass air plates so that they do not air, they are with recuperators
- **R** window equal to **1.2**
- Glaze staircase openings

Restoration of the protective layer of reinforcement:
- Clearing with removed concrete in places of cracks
- Cleaning of reinforcement by treating with rust remover cleaner
- Restore the protective layer of concrete with cement-sand mortar

Ventilation
- Air Exchange Hygro-adjustable Valves
- Or air exchange device with recuperators

Heating system
- Thermostats with heat energy meter
- Used facade control flow of coolant



PLOT B
CALCULATIONS

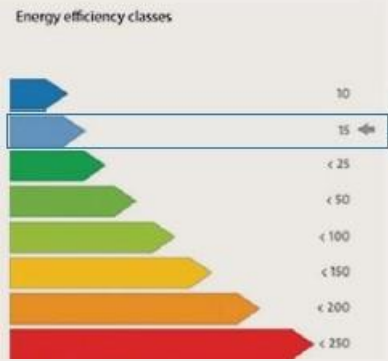
J. Cooling Demand Calculations

Negative Heat Loads:	45987.59
Ventilation Heat Losses:	205858.20
Total Heat Losses:	251845.79
Internal Heat Gains:	182672.43
Available Solar Heat Gains:	43865.91
Usefull Heat Losses:	178132.91
Usefull Cooling Demand:	73712.88
Specific Annual Cooling Dema...	**14.24**

CALCULATIONS

Specific Heat Demand

Transmission Heat Losses:	90745.14	kWh/a
Ventilation Heat Losses:	36782.73	kWh/a
Total Heat Losses:	127527.86	kWh/a
Internal Heat Gains:	88726.61	kWh/a
Solar Heat Gains:	43865.91	kWh/a
Total Heat Gains:	108287.70	kWh/a
Annual Heat Demand:	19240.16	kWh/a
Specific Heat Demand:	3.72	kWh/(m2a)



K. Overheating Calculations

Exterior Thermal Transmittan...	1259.79
Ground Thermal Transmittance:	120.57
Ventilation Transmittion Ambi...	1076.46
Ventilation Transmission Gro...	0.00
Solar Aperture:	230.36
Frequency of Overheating:	0.00

THANK YOU FOR YOUR ATTENTION!

TOMSK STATE UNIVERSITY OF ARCHITECTURE AND BUILDING

Team «CRESCENDO»:
- Kuzmenko Timofey
- Diyanov Artem
- Budyuk Anna

Advisor:
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SAINT-GOBAIN