SAINT-GOBAIN

Architecture Student Contest 2022

heARTensity

ARCHITECTURE STUDENT CONTEST

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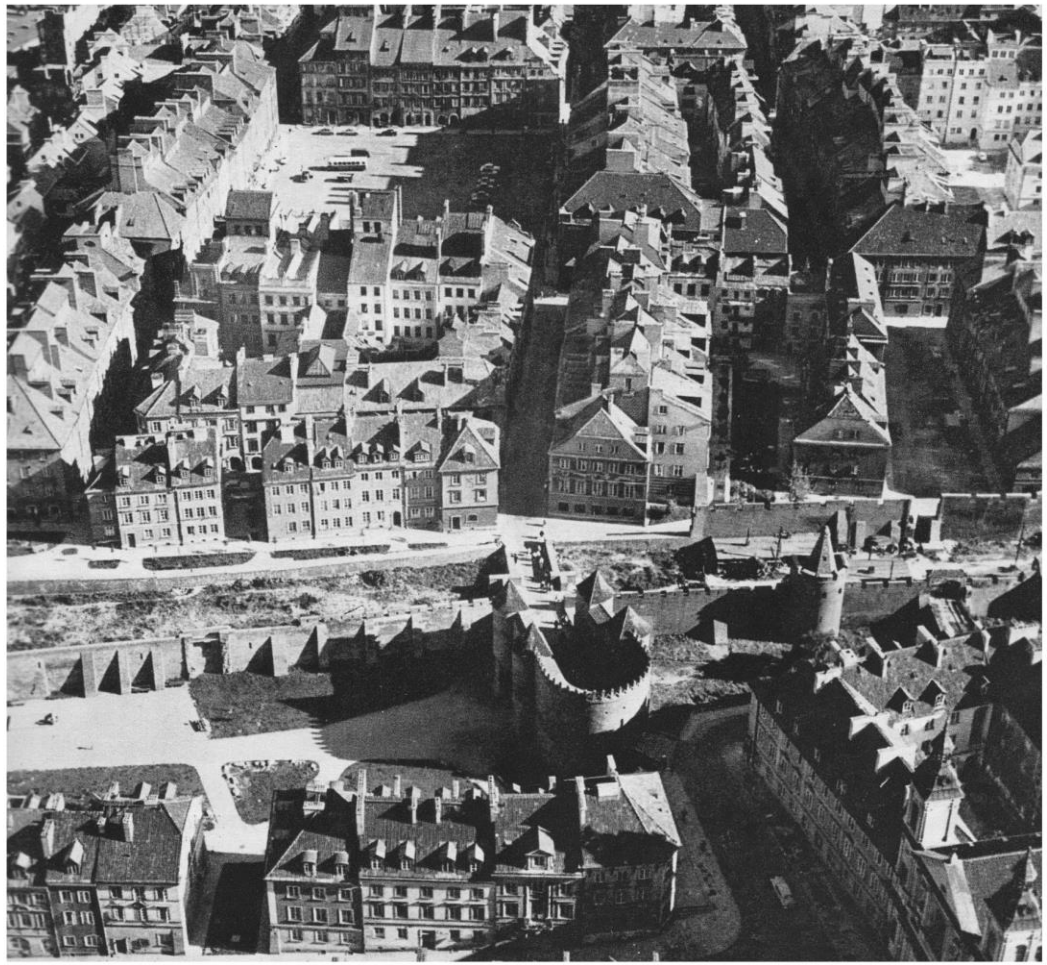
Estonia

Presentation number 36

LOCATION

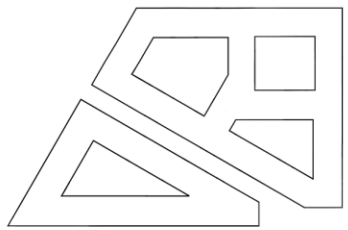

TRANSPORT STATION
(Warszawa Wschodnia)
BUS STATION
(Dworzec Wschodni)
heARTensity
STUDENT
APARTMENTS
VOCATIONAL
TRAINING
CENTER
SWPS
UNIVERSITY
WARSAW
OLD TOWN
Wisla river
PGE
NARODOWY
PARK SKARYSZEWSKI

WARSAW
OLD TOWN

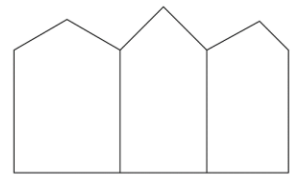


CONCEPT

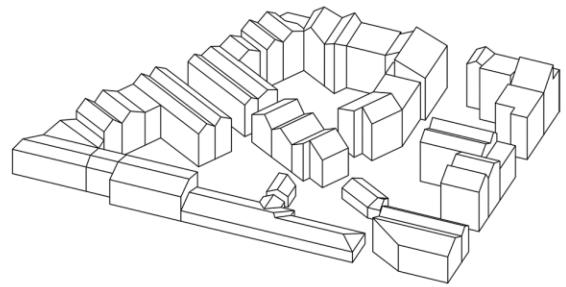
HISTORICAL WARSAW



OLD TOWN STRUCTURE
& DENSITY



NARROW BUILDING
VOLUMES



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STUDENT APARTMENTS

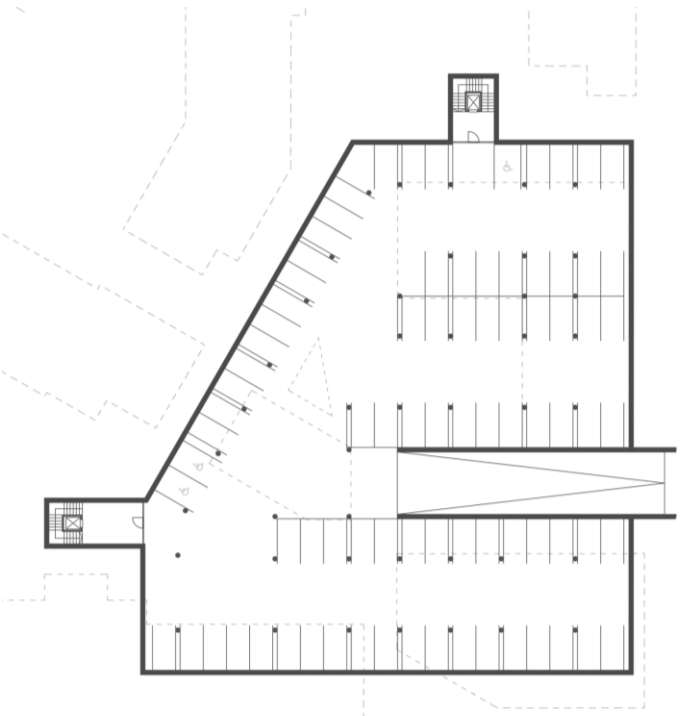
PEDESTRIAN ACCESS

PUBLIC SPACES

TRANSPORTATION NOISE

CARS ACCESS

UNDERGROUND PARKING



DIVISION OF WHOLE AREA

STUDENT DORMITORY

OLD FACTORY BUILDING

COMMERCIAL & COMMUNAL SPACES

FAMILY APARTMENTS

GYM

UNDERGROUND PARKING ACCESS


Lubelska
Lubelska
Lubelska
HEART SQUARE
MIND SQUARE
SOUL SQUARE
STORE-ROOM
LAUNDRY
STOREROOM
GYM
12 x 16 m
Andrzeja Frycza-Modrzewskiego
Berka Joselewicza
N

OLD FACTORY BUILDING

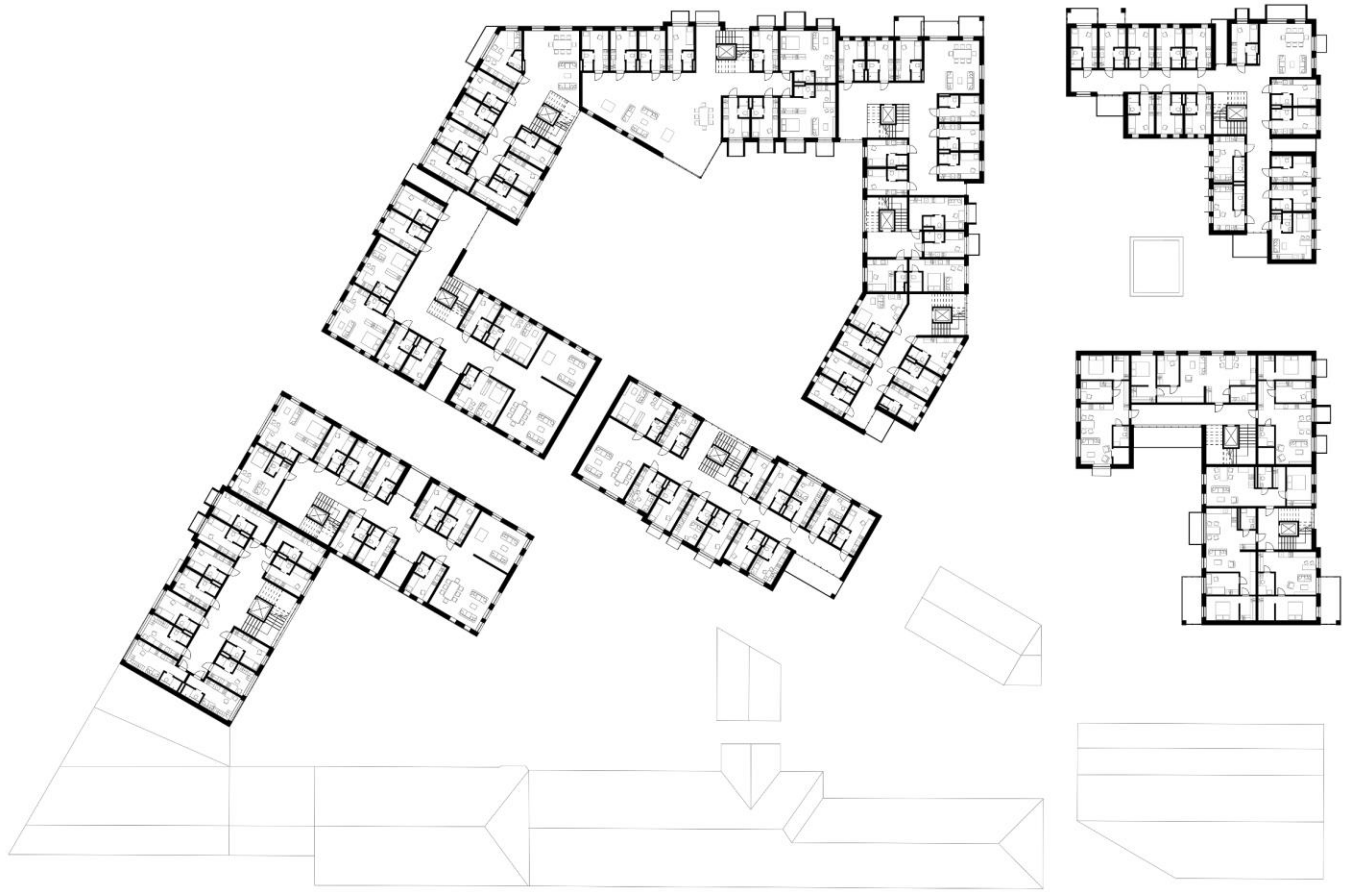
FIRST FLOOR

GROUND FLOOR

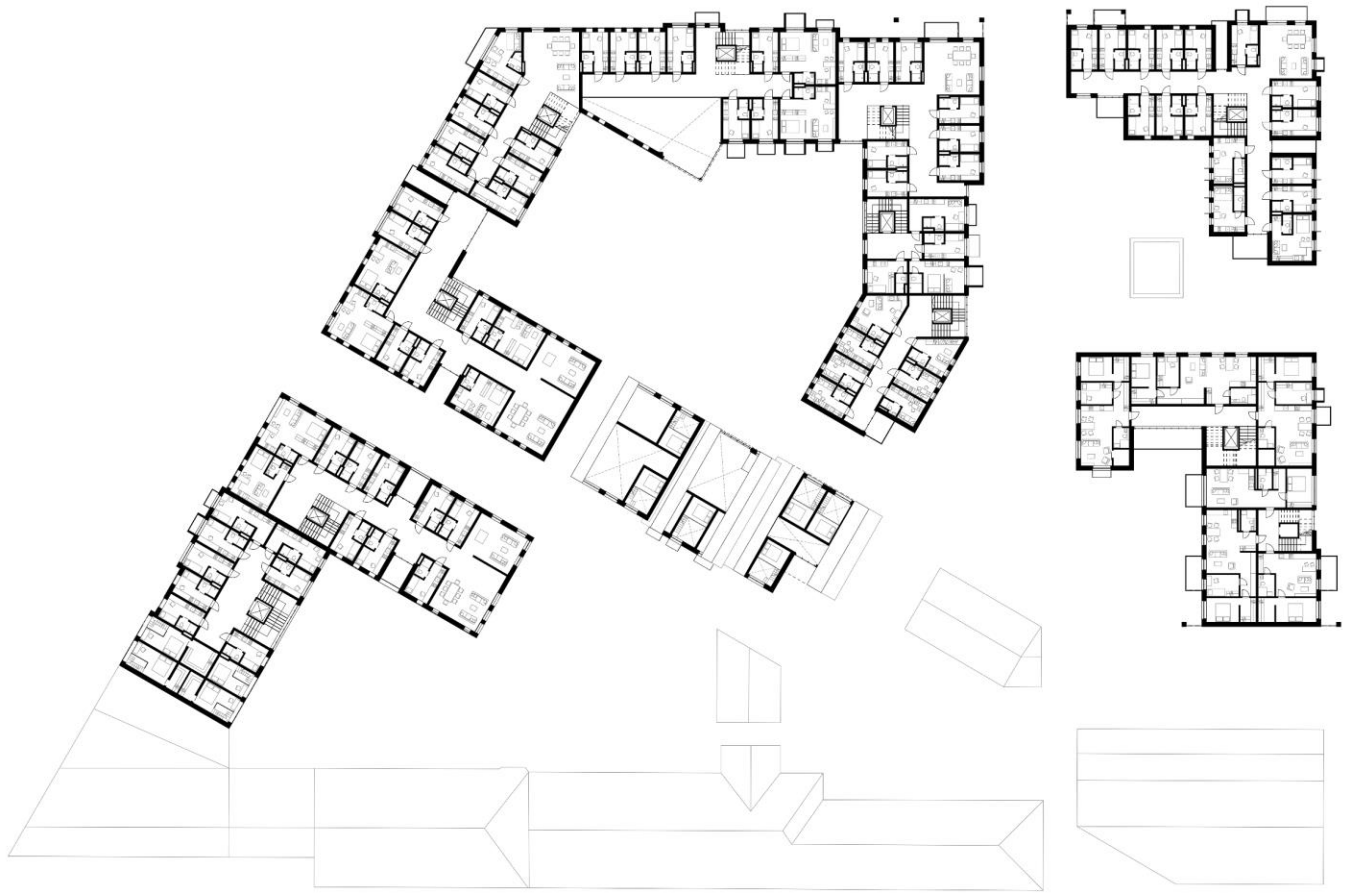
FIRST FLOOR


Lubelska
Lubelska
Berka Joselewicza
LIBRARY STUDY AREA
LIBRARY
GALLERY
GYM

SECOND FLOOR

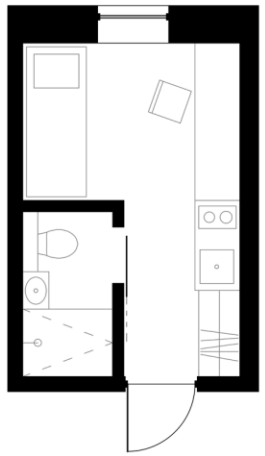


THIRD FLOOR



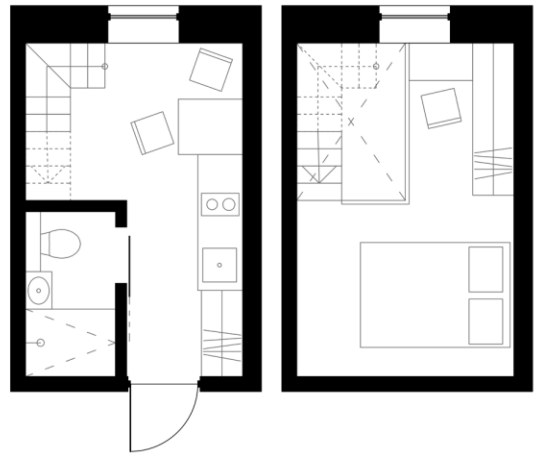
FOURTH FLOOR

MAIN APARTMENT TYPES



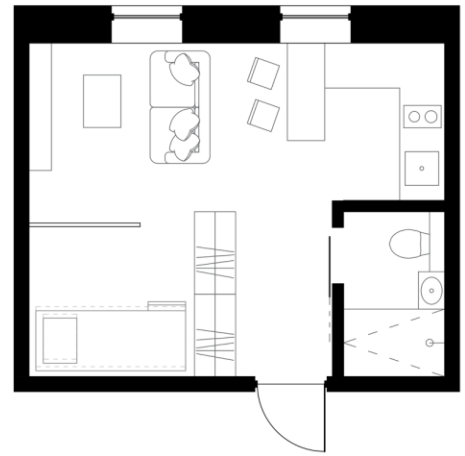
APARTMENT FOR ONE

12,8 m²



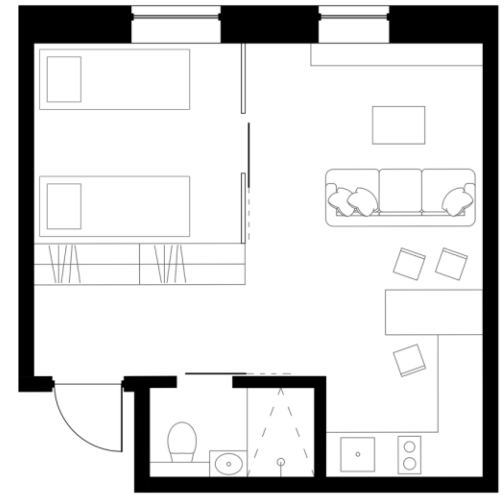
LOFT FOR TWO

22,5 m²



APARTMENT FOR TWO

24,5 m²



CORNER APARTMENT FOR TWO

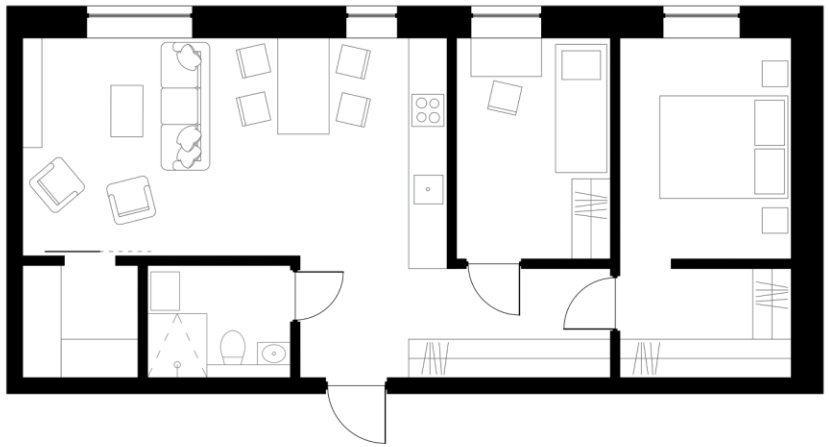
32,5 m²

STUDENT DORMITORY.
HEART SQUARE

GROUND FLOOR

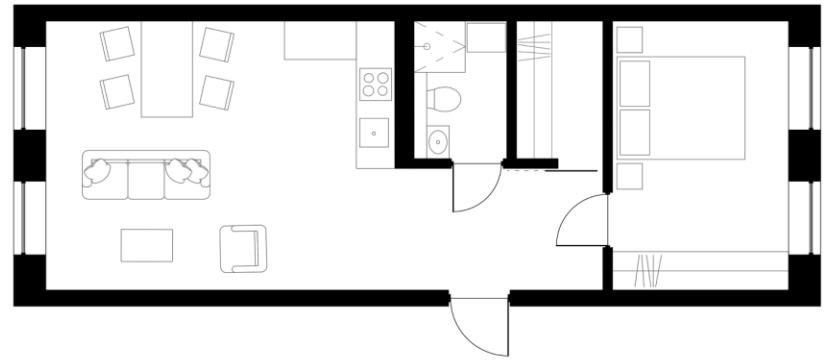
FIRST FLOOR

MAIN APARTMENT TYPES



BIGGER APARTMENT
FOR FAMILY

63,5 m²

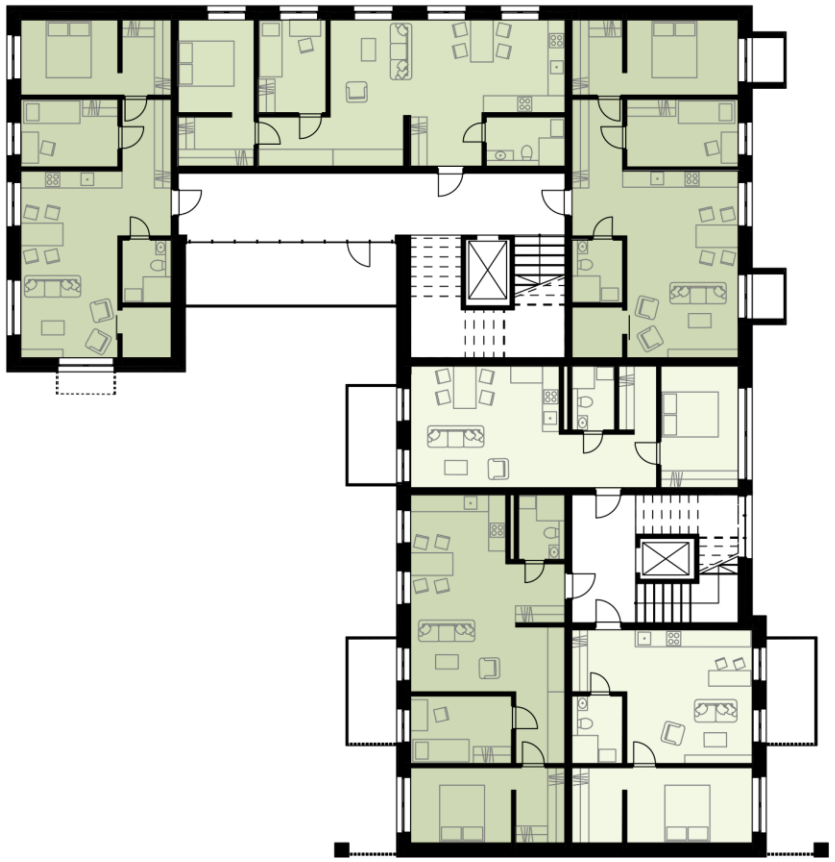


SMALLER APARTMENT
FOR FAMILY

48,7 m²

FAMILY APARTMENT BUILDING

GROUND FLOOR



FIRST FLOOR

ELEVATIONS.
LUBELSKA STREET

North elevation

West elevation

SUSTAINABILITY STRATEGIES

THERMAL INSULATION
External wall U = 0,14 W/(m²*K)
Roof U = 0,09 W/(m²*K)
Ground slab U = 0,11 W/(m²*K)
Windows U = 0,7 W/(m²*K)

TREES ALLEY
Trees between the roadway and the buildings reduce noise and create more comfortable space for pedestrians

ACOUSTIC COMFORT
Partition wall 1 R'_w = 56 dB
Partition wall 2 R'_w = 60 dB
Partition wall 3 R'_w = 48 dB
Windows R'_w = 47 dB
Ceiling R'_w = 56 dB
L'_n = 47 dB

FIRE PROTECTION
Conrete construction, Isover insulation and Gyproc gypsulum products protects against the spread of fire

SOLAR PANELS
Photovoltaic cells to suport energy demand

21 June

PASSIVE SHADING
Balconies and passive shadings avoid overheating during summer time

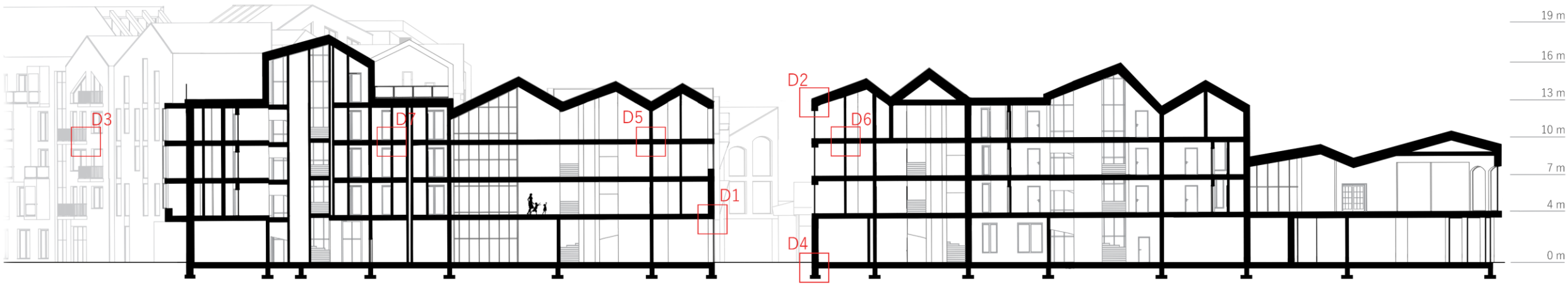
21 December

RAINWATER COLLECTOR
Recycling waste and stormwater on site and using it for irrigation reduces water demand

COURTYARDS
Courtyards facilitate cross ventilation and maximize daylight within units, as well as provide shaded communal areas

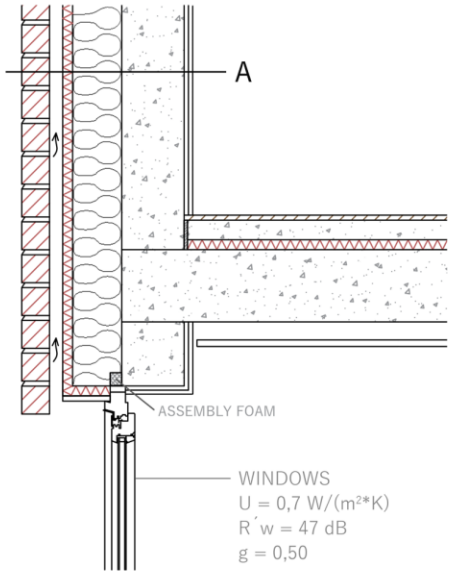
VENTILATION
Natural ventilation during summer time
& forced ventilation with heat recovery during winter time

SECTION



CONSTRUCTION I

detail D1

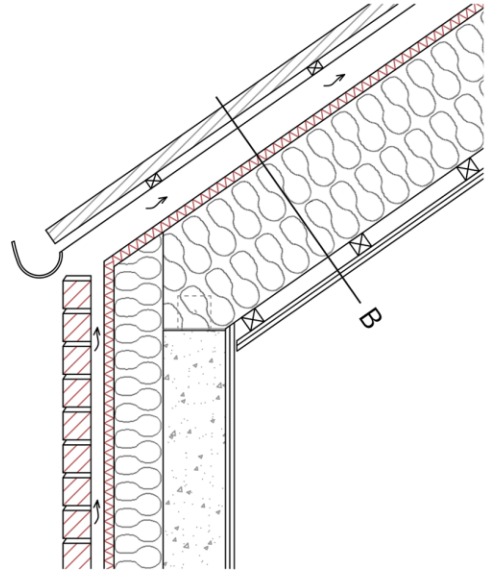


A. EXTERIOR WALL
* EXTERIOR FINISH (brick, plaster, shingles, facade panels)
* AIR GAP 40 mm
* ISOVER RKL FACADE 30 mm
* ISOVER PREMIUM 33 150 mm
* CONCRETE 200 mm
* 2x GYPROC GN13

U = 0,14 W/(m²*K)

WINDOWS U = 0,7 W/(m²*K)

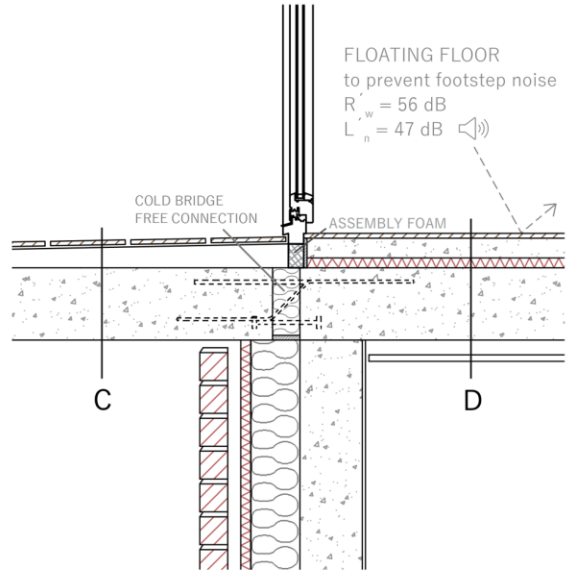
detail D2



B. ROOF
* GROOVES AND ROOFING WITH UNDER-LAYMENT 80 mm
* AIR GAP 100 mm
* ISOVER RKL FACADE 30 (between the rafters) 30 mm
* ISOVER PREMIUM 33 350 mm (U = 0,09 W/(m²*K)
* ISOVER VARIO XTRA
* ISOVER PREMIUM 33 + batten 50 mm
* 2x GYPROC GN13

U = 0,09 W/(m²*K)

detail D3

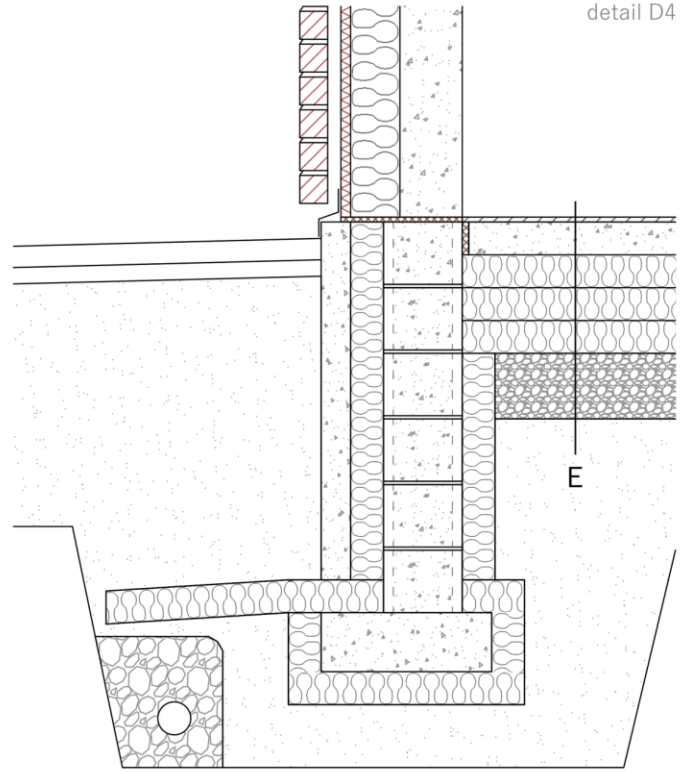


C. BALCONY
* FLOOR FINISH (wood) 30 mm
* AIR GAP (wood frame) 30...50 mm
* CONCRETE SLAB 220 mm

D. CEILING
* FLOOR FINISH
* FLOATING FLOOR, CONCRETE > 60 mm
* ISOVER FLO 30 mm
* CONCRETE 250 mm
* SUSPENDED CEILING SYSTEM 80 mm

R´ > 56 dB L´ < 47 dB

detail D4

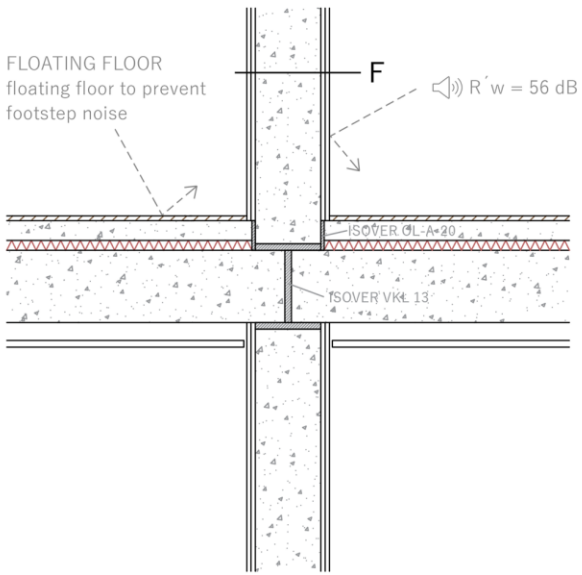


E. GROUND SLAB
* FLOOR FINISH
* MONOLITIC REINFORCED CONCRETE >100mm
* ISOVER XPS FOAM SL 300mm
* SEALED SOIL 300mm

U = 0,11 W/(m²*K)

CONSTRUCTION II

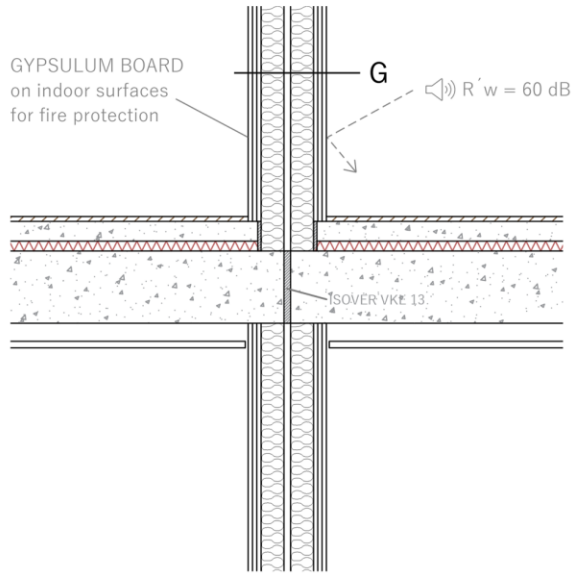
detail D5



F. PARTITION WALL 1
* 2x GYPROC GN 13
* CONCRETE 200mm
* 2x GYPROC GN 13

$R'_w > 56$ dB

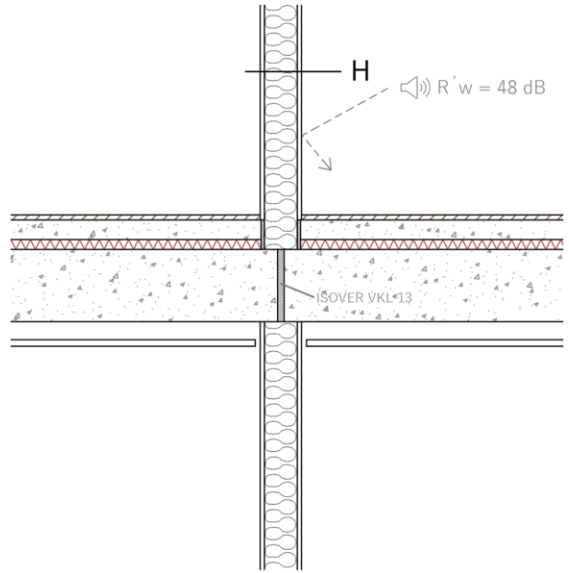
detail D6



G. PARTITION WALL 2
* 3x GYPROC GN 13
* ISOVER ACOUSTIC 70mm
* AIR GAP 20mm
* ISOVER ACOUSTIC 70mm
* 3x GYPROC GN 13

$R'_w > 60$ dB

detail D7



H. WALL BETWEEN ROOMS OF ONE APARTMENT
* 1x GYPROC GN 13
* ISOVER ACOUSTIC 100mm
* 1x GYPROC GN 13

$R'_w > 48$ dB

CALCULATION RESULTS

PROJECT DATA
Object: STUDENT APARTMENT COMPLEX
Climate zone: WARSAW, POLAND
Construction: NEW BUILDING
Usage: RESIDENTIAL, COMMERCIAL
Design temperature: 21,0 °C

ELEMENTS U-VALUES (W/(m²*K)
Roof: 0,09
Exterior wall: 0,14
Ground slab: 0,11
Windows: 0,8
Doors: 0,8

ENERGY SYSTEMS
Renewable energy system: solar power
Heating system: subsoil heat exchanger
Ventilation system: heat recovery ventilation system
Heat recovery temperature ratio: 0,8

MEAN SHADING FACTORS
North: g = 0,7
West: g = 0,7
South: g = 0,5
East: g = 0,5

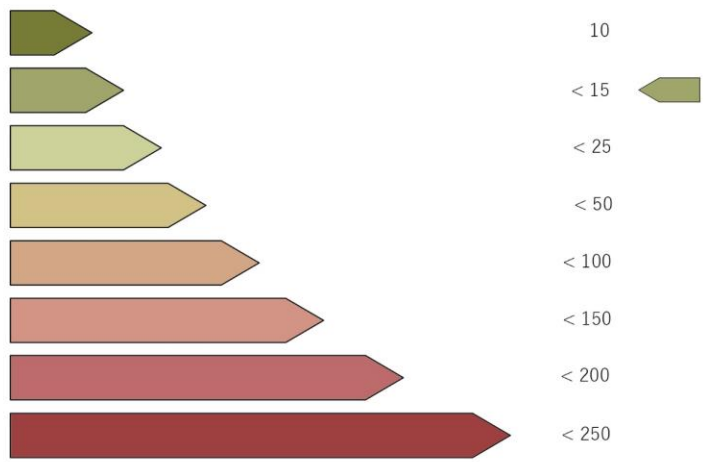
ENERGY CALCULATIONS:
Transmission heat losses: 14,6 kWh/m²*y
Ventilation heat losses: 2,8 kWh/m²*y
Domestic water heat losses: 6,6 kWh/m²*y
Ventilators & pumps: 7,4 kWh/m²*y
Lightning: 5,3 kWh/m²*y
Equipment: 15,6 kWh/m²*y

Locally produced renewable electricity: 46,4 kWh/m²*y
Sum: 5,9 kWh/m²*y
Weighted energy use: 11,5 kWh/m²*y (A+)

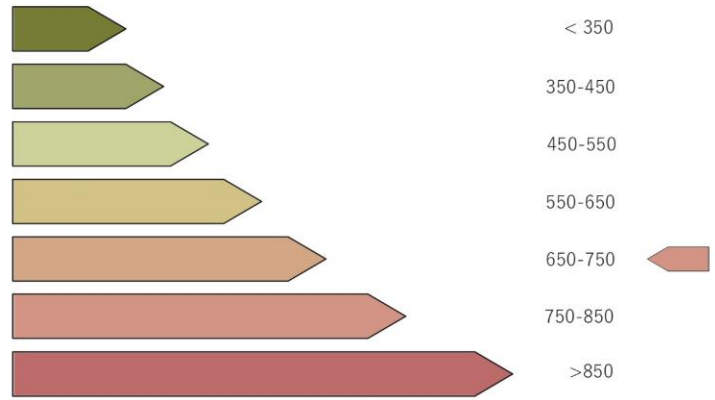
CO_2 FOOTPRINT CALCULATIONS:
A1-A3 Materials: 60.4%
A4 Transportation: 1.2%
A5 Construction: 3.9%
B4-B5 Replacement: 28.8%
C1-C4 End of life: 5.7%

Embodied carbon benchmark: 713 kg CO_2e/m² (E)

ENERGY LABEL



CARBON FOOTPRINT



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