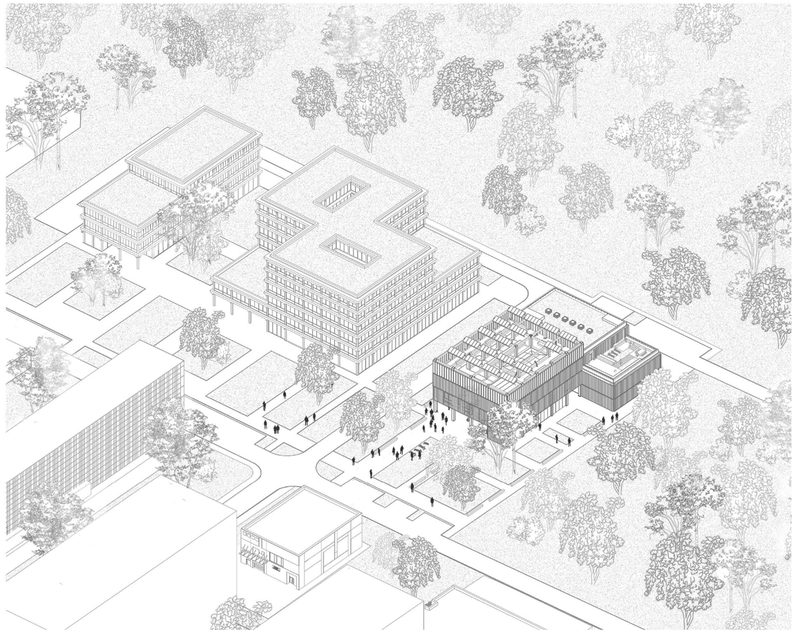
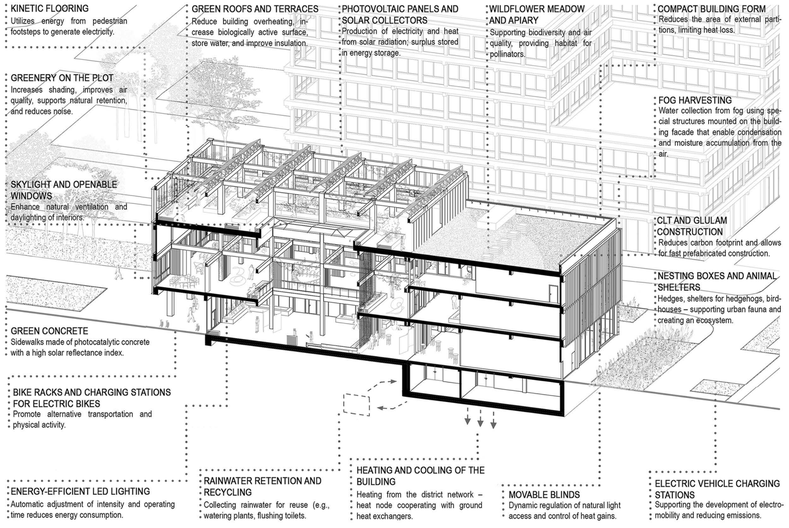
ECOLOGICAL EDUCATION CENTER AT THE CRACOW UNIVERSITY OF TECHNOLOGY CAMPUS IN CZYŻYNY



AXONOMETRY



SUSTAINABILITY DIAGRAM

SITE PLAN 1:500

PROJECT IDEA

The Ecological Education Center at the Cracow University of Technology Campus in Czyżyny is conceived as an architectural response to the growing need for spaces that support ecological awareness not only through theoretical knowledge, but also through direct experience. The project is based on the idea that architecture should no longer remain a neutral background for education, but should become an active educational tool itself. The building is designed as a spatial manifesto of sustainable development, where ecological systems, natural processes and responsible use of resources are made visible, understandable and accessible to users. Through its form, structure and technological solutions, the center transforms everyday movement through the building into a process of observation, learning and reflection. It creates a place where students, researchers, visitors and the local community can experience ecology as a practical and tangible part of daily life, rather than as an abstract concept.

PROJECT DESCRIPTION

Located on the Cracow University of Technology campus in Czyżyny, the Environmental Education Center is thoughtfully integrated into the existing urban fabric. Based on thorough urban analyses, the architectural form respects local spatial development plans, existing greenery, and communication pathways, ensuring a harmonious relationship with its surroundings. A defining feature of the building is its exceptional functional flexibility, achieved through a modular structure that allows interior spaces to be easily adapted to evolving educational needs. The building's roof serves as an integral extension of the center, designed as an active research and recreational space featuring a public garden, a flower meadow, and an apiary. This zone not only improves the local microclimate and water retention but also acts as a living laboratory for urban flora and fauna, while the overall design actively promotes sustainable mobility through dedicated bicycle infrastructure and electric vehicle charging stations.

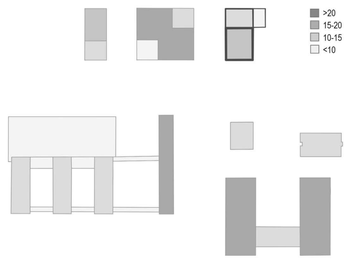
TECHNICAL INFORMATION

The facility is designed with a strong emphasis on low-carbon construction and innovative environmental engineering, featuring a modular structural system based on a column grid and solid communication cores that ensure high interior adaptability. The primary load-bearing construction is made of engineered mass timber, specifically Cross-Laminated Timber and GLULAM, which is complemented by an advanced water management system including comprehensive rainwater retention, recycling, and an innovative fog harvesting structure integrated into the facade to collect water directly from the air. This visually exposed system strengthens the educational message of the facility alongside renewable energy sources, such as photovoltaic panels and solar collectors installed on the roof. Additionally, the project incorporates sustainable materials like green concrete for exterior pathways, follows inclusive design principles to ensure complete barrier-free accessibility, and strictly complies with rigorous fire safety regulations through the strategic implementation of specialized fire separation walls.

LEGEND

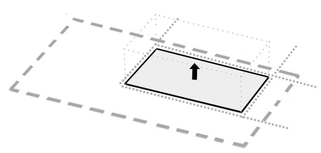
1. PROPOSED BUILDING
2. MAIN ENTRANCES
3. SECONDARY ENTRANCES
4. ASPHALT SURFACE
5. GREEN CONCRETE PAVERS
6. WOODEN SEATING
7. BICYCLE RACKS
8. CAR PARKING SPACES
9. OUTDOOR RESTAURANT AREA
10. SOLAR LIGHTING
11. LAWN
12. RAIN GARDENS
13. TALL ORNAMENTAL GRASSES
14. WATER RETENTION TANKS
- kd — STORMWATER DRAINAGE SYSTEM
- ks — SANITARY SEWER CONNECTION
- eN — ELECTRICAL INSTALLATION
- DISTRICT HEATING CONNECTION
- w — WATER SUPPLY CONNECTION
- SITE BOUNDARY
- OVERHANG PROJECTION
- FLOOR OUTLINE
- (1) NUMBER OF STOREYS
- GREENERY PROTECTION ZONE

URBAN LAYOUT



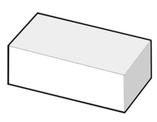
BUILDING HEIGHT DIAGRAM

URBAN DIAGRAMS



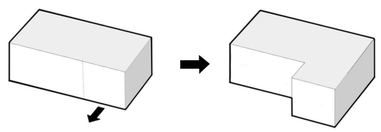
LOCATION

The project's location is defined by building lines derived from the existing urban fabric. This approach respects spatial relations with neighboring structures while ensuring optimal pedestrian and vehicular access. Additionally, sun exposure analysis was crucial to maximize natural light and enhance the site's spatial qualities.



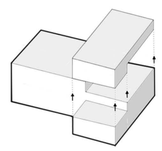
BASE VOLUME

The scale of the base volume responds directly to the existing spatial context. Its height derives from adjacent buildings, ensuring urban and compositional coherence.



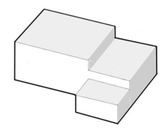
VOLUME EXTRUSION

The horizontal volume extrusion serves as a key driver for the functional and compositional layout. This architectural gesture houses the conference zone, providing a clear functional definition through spatial separation. The varied massing naturally organizes the internal program while enhancing exterior legibility.



TERRACE CARVING

Volume subtractions create usable green terraces integral to the concept. Roof gardens, flower meadows, and outdoor zones actively support the building's eco-educational functions.

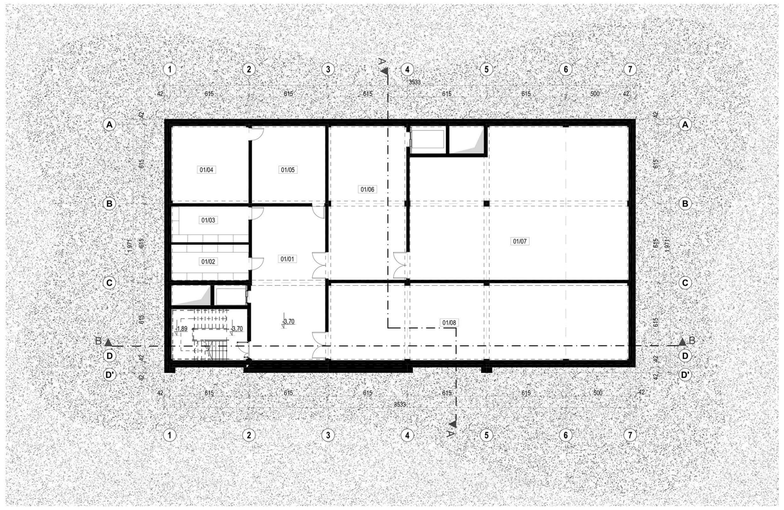


FINAL FORM

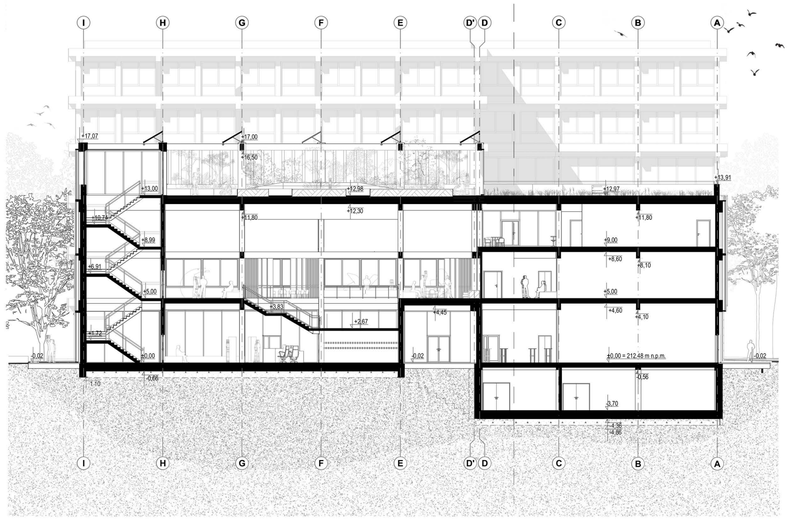
The final massing reflects both functional and contextual requirements. Differentiated volumes, featuring a distinct conference zone and a system of green terraces, define the building's unique character.

MASSING DIAGRAM

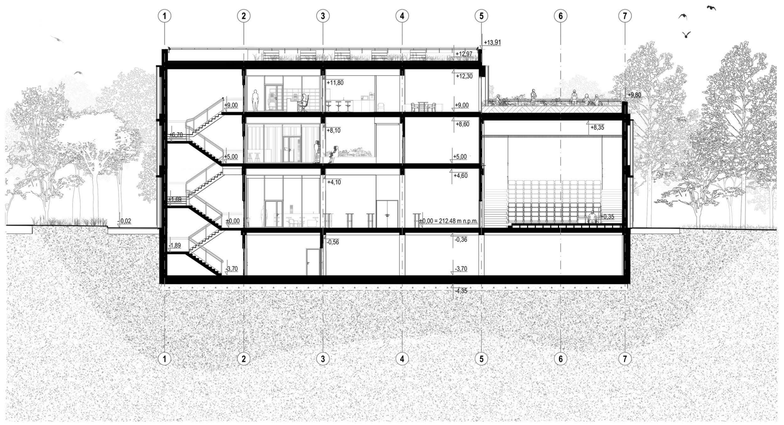
ECOLOGICAL EDUCATION CENTER AT THE CRACOW UNIVERSITY OF TECHNOLOGY CAMPUS IN CZYŻYNY



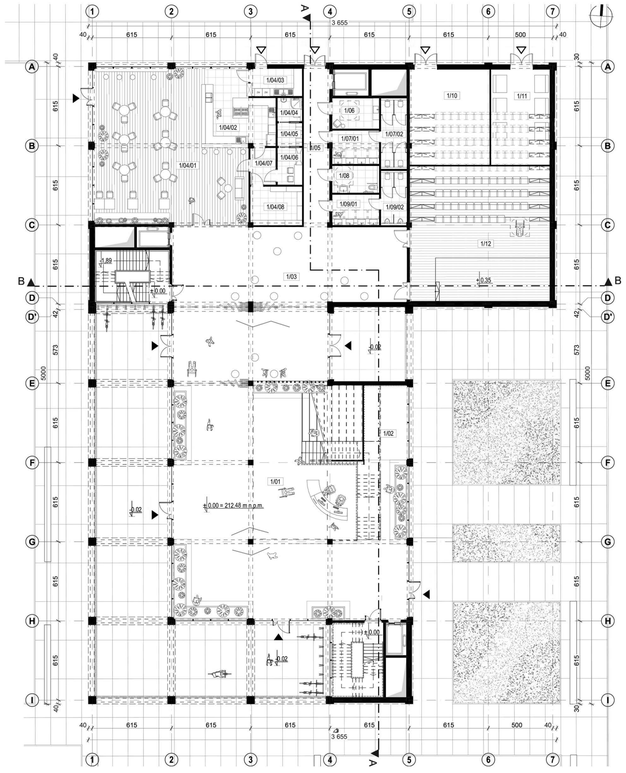
LEVEL -1 FLOOR PLAN 1:200



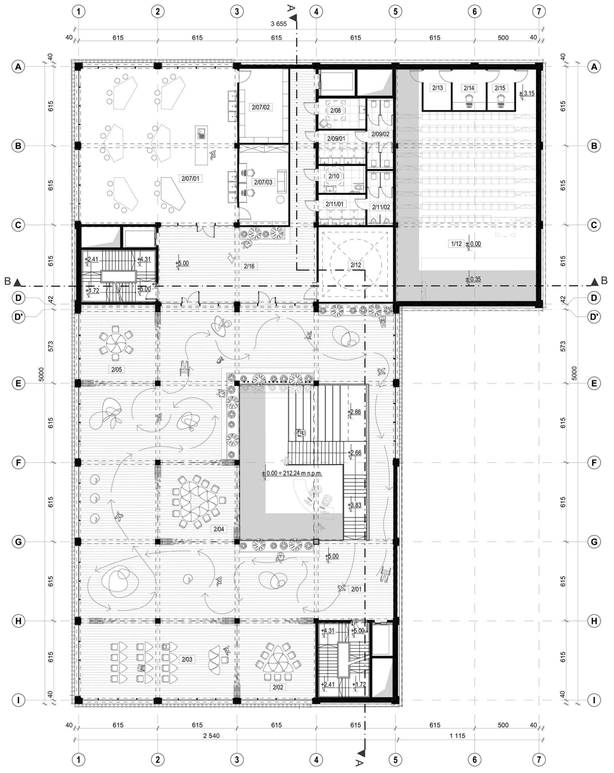
SECTION A-A 1:200



SECTION B-B 1:200



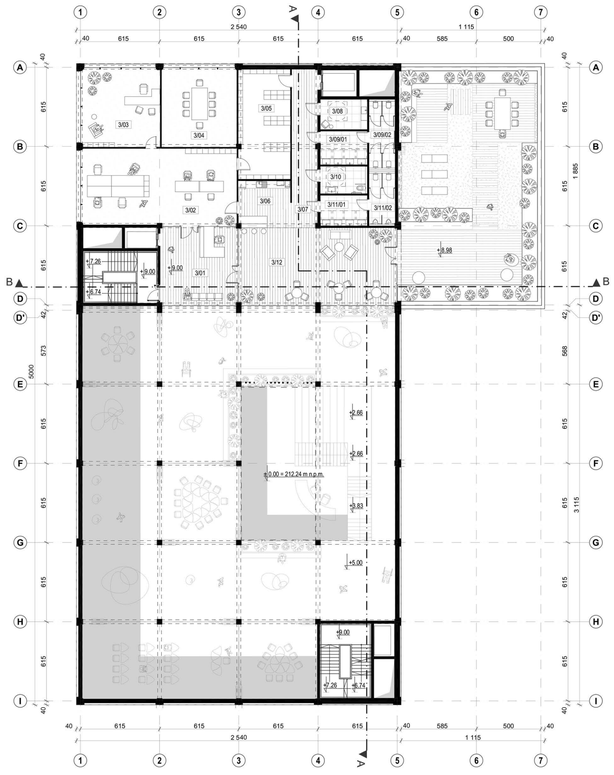
GROUND FLOOR PLAN 1:200



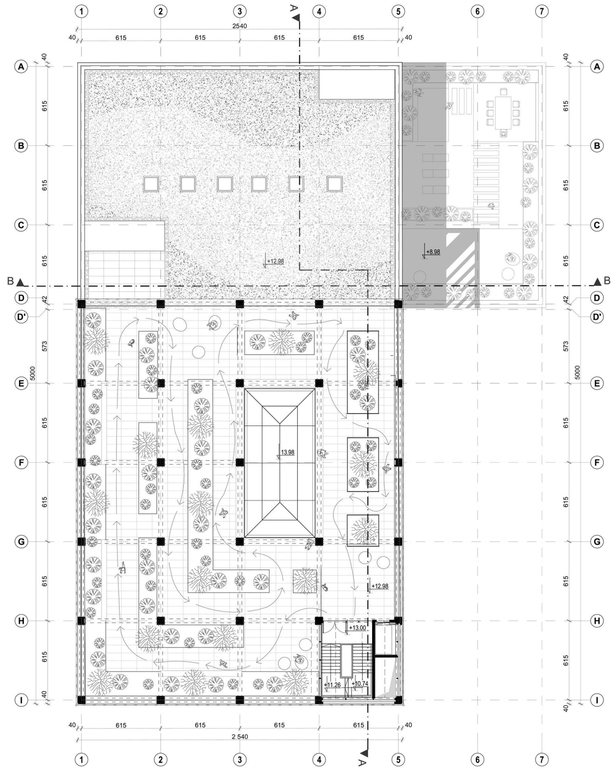
LEVEL +1 FLOOR PLAN 1:200

ROOM SCHEDULE

	No.	Room name	Area [m2]
LEVEL -1			
	01/01	CIRCULATION	68,87
	01/02	BMS ROOM	16,81
	01/03	SERVER ROOM	16,83
	01/04	UTILITY CONNECTION ROOM I	36,03
	01/05	UTILITY CONNECTION ROOM II	34,33
	01/06	UNLOADING AREA	72,52
	01/07	STORAGE ROOM	189,10
	01/08	VENTILATION AND AIR-CONDITIONING PLANT ROOM	139,69
			574,18 m²
GROUND FLOOR			
	1/01	ENTRANCE HALL	364,46
	1/02	CLOAKROOM	19,86
	1/03	FOYER	107,19
	1/04/01	DINING AREA	125,52
	1/04/02	KITCHEN	28,39
	1/04/03	DISHWASHING ROOM	9,28
	1/04/04	STAFF WC	3,43
	1/04/05	CLOAKROOM	3,46
	1/04/06	UTILITY ROOM	5,43
	1/04/07	CIRCULATION	5,63
	1/04/08	PANTRY	12,17
	1/05	CIRCULATION	24,44
	1/06	PARENT AND CHILD ROOM	8,88
	1/07/01	WC LOBBY	10,18
	1/07/02	WOMEN'S WC	10,93
	1/08	ACCESSIBLE WC	8,15
	1/09/01	WC LOBBY	9,22
	1/09/02	MEN'S WC	8,61
	1/10	STORAGE ROOM	41,03
	1/11	WASTE ROOM	31,48
	1/12	AUDITORIUM	173,51
			1 011,25 m²
LEVEL +1			
	2/01	EXHIBITION SPACE	391,43
	2/02	WORKSHOP SPACE I	39,93
	2/03	WORKSHOP SPACE II	73,70
	2/04	WORKSHOP SPACE III	41,92
	2/05	WORKSHOP SPACE IV	37,98
	2/07/01	LABORATORY ROOM	144,04
	2/07/02	LAB SUPPORT ROOM I	22,28
	2/07/03	LAB SUPPORT ROOM II	24,08
	2/08	PARENT AND CHILD ROOM	8,88
	2/09/01	WC LOBBY	10,18
	2/09/02	WOMEN'S WC	10,93
	2/10	ACCESSIBLE WC	8,15
	2/11/01	WC LOBBY	9,22
	2/11/02	MEN'S WC	8,61
	2/12	AR VISUALISATION ROOM	35,32
	2/13	STORAGE ROOM	6,81
	2/14	PROJECTION BOOTH	8,24
	2/15	OPERATOR'S ROOM	6,65
	2/16	CIRCULATION	97,92
			986,27 m²
LEVEL +2			
	3/01	WAITING AREA	35,90
	3/02	OPEN-SPACE OFFICE	68,99
	3/03	DIRECTOR'S OFFICE	36,48
	3/04	CONFERENCE ROOM	35,26
	3/05	ARCHIVE	34,64
	3/06	KITCHEN	14,78
	3/07	CIRCULATION	22,68
	3/08	PARENT AND CHILD ROOM	8,88
	3/09/01	WC LOBBY	10,18
	3/09/02	WOMEN'S WC	10,93
	3/10	ACCESSIBLE WC	8,15
	3/11/01	WC LOBBY	9,22
	3/11/02	MEN'S WC	8,61
	3/12	RELAXATION AREA	72,76
			377,46 m²
			2 949,16 m²



LEVEL +2 FLOOR PLAN 1:200



LEVEL +3 FLOOR PLAN 1:200

FUNCTIONAL DIAGRAMS

ROOM SCHEDULE

No.	Room name	Area [m2]
GROUND FLOOR		
1/01	ENTRANCE HALL	364,46
1/02	CLOAKROOM	19,86
1/03	FOYER	107,19
1/04/01	DINING AREA	125,52
1/04/02	KITCHEN	28,39
1/04/03	DISHWASHING ROOM	9,28
1/04/04	STAFF WC	3,43
1/04/05	CLOAKROOM	3,46
1/04/06	UTILITY ROOM	5,43
1/04/07	CIRCULATION	5,83
1/04/08	PANTRY	12,17
1/05	CIRCULATION	24,44
1/06	PARENT AND CHILD ROOM	8,88
1/07/01	WC LOBBY	10,18
1/07/02	WOMEN'S WC	10,93
1/08	ACCESSIBLE WC	8,15
1/09/01	WC LOBBY	9,22
1/09/02	MEN'S WC	8,61
1/10	STORAGE ROOM	41,03
1/11	WASTE ROOM	31,48
1/12	AUDITORIUM	173,51
		1 011,25 m²

EXTERNAL WALLS

Sz1
- Timber cladding 2 cm
- Timber substructure 3 cm
- Vapour-permeable membrane 0,25 cm
- Mineral wool / timber substructure 20 cm
- Cross-laminated timber (CLT) 10 cm

Sz2
- Cross-laminated timber (CLT) 20 cm
- Mineral wool, 0.042 W/mK 20 cm
- Timber substructure / mineral wool, 0.042 W/mK 5 cm
- Vapour-permeable membrane 0,25 cm
- Timber substructure 3 cm
- Timber cladding 2 cm

INTERNAL WALLS

Sw1
- Cross-laminated timber (CLT) 20 cm

Sw2
- Fire- and moisture-resistant gypsum plasterboard, type DFH2 1,25 cm
- Cross-laminated timber (CLT) 10 cm

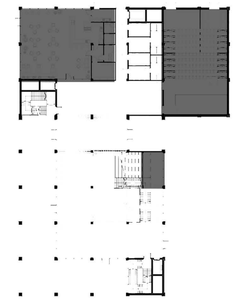
Sw3
- Fire- and moisture-resistant gypsum plasterboard, type DFH2 1,25 cm
- Mineral wool / timber frame 10 cm
- Fire- and moisture-resistant gypsum plasterboard, type DFH2 1,25 cm

Sw4
- Fire- and moisture-resistant gypsum plasterboard, type DFH2 1,25 cm
- Cross-laminated timber (CLT) 20 cm

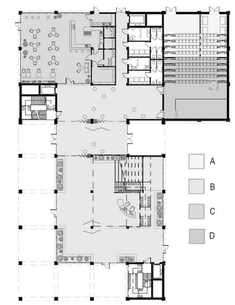
Sw5
- Cross-laminated timber (CLT) 10 cm

NOTES

1) Door dimensions are given in the clear opening of the frame.
2) Room dimensions are given without finishes.
3) To achieve the required fire resistance, timber elements must be protected with a fire-retardant treatment.



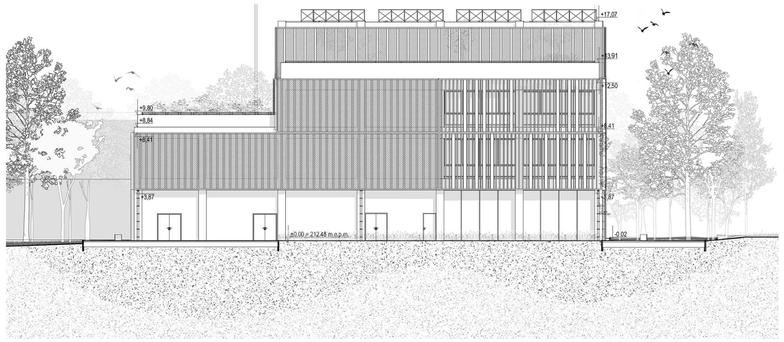
FLOOR PLAN STRUCTURE



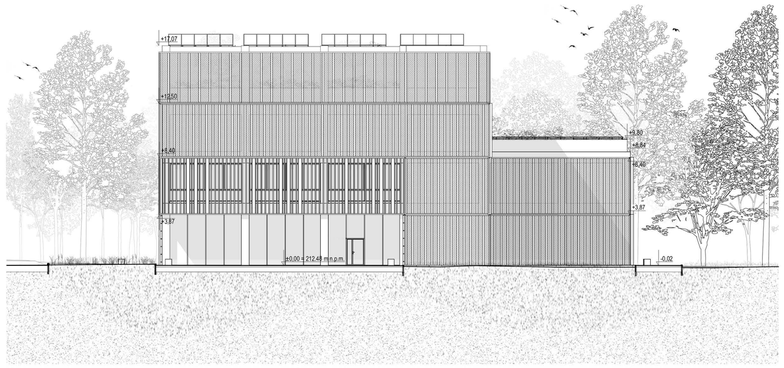
FUNCTIONAL DIAGRAM

GROUND FLOOR PLAN FRAGMENT 1:50

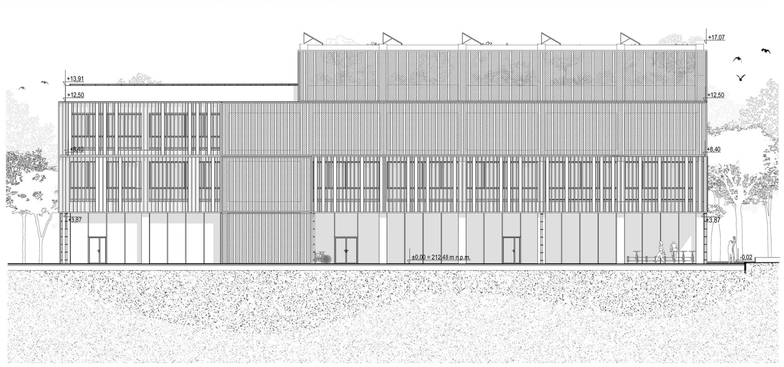
ECOLOGICAL EDUCATION CENTER AT THE CRACOW UNIVERSITY OF TECHNOLOGY CAMPUS IN CZYŻYNY



NORTH ELEVATION 1:200

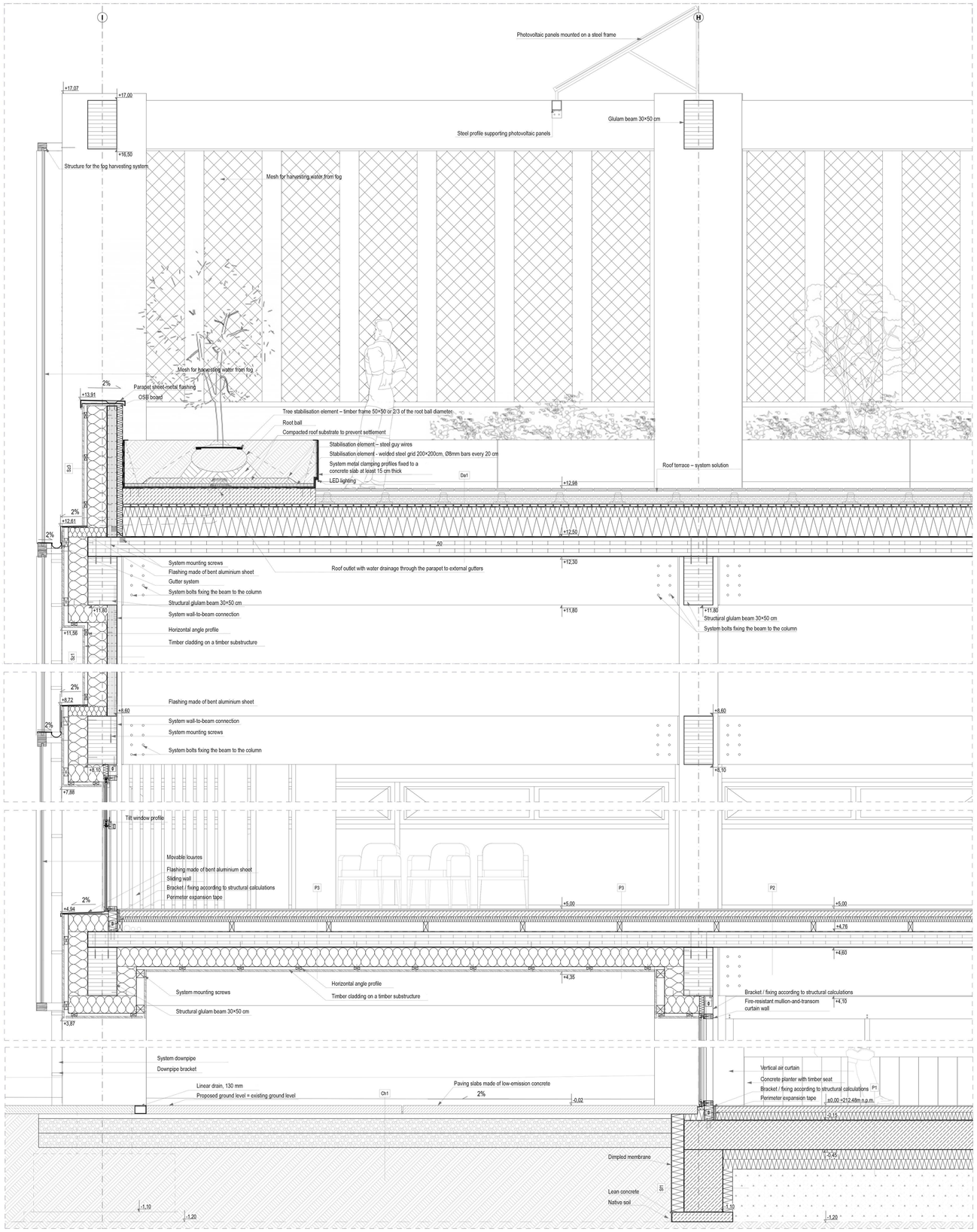


SOUTH ELEVATION 1:200



WEST ELEVATION 1:200

EAST ELEVATION 1:200



DETAIL 1:20

FOUNDATION WALL

St1

Dimpled membrane	0,8 cm
Extruded polystyrene insulation XPS, 0.035 W/mK	12 cm
2× bituminous felt on adhesive	0,5 cm
Reinforced concrete — reinforcement according to technical design	40 cm
Extruded polystyrene insulation XPS, 0.035 W/mK	10 cm
Waterproofing membrane	0,25 cm

EXTERNAL WALLS

Sz1

Timber cladding	2 cm
Timber substructure	3 cm
Vapour-permeable membrane	0,25 cm
Mineral wool / timber substructure	20 cm
Cross-laminated timber (CLT)	10 cm

Sz3

Timber cladding	2 cm
Timber substructure	3 cm
Vapour-permeable membrane	0,25 cm
Mineral wool, 0.042 W/mK	20 cm
Waterproofing membrane	0,5 cm
Cross-laminated timber (CLT)	10 cm
Waterproofing membrane	0,5 cm
Extruded polystyrene insulation XPS, 0.035 W/mK	5 cm
Waterproofing membrane	0,5 cm

FOUNDATION SLAB

P1

Floor finish	1 cm
Screed	6 cm
EPS insulation, 0.037 W/mK	8 cm
PE foil	0,25 cm
Waterproofing membrane	0,25 cm
Reinforced concrete — reinforcement according to technical design	30 cm
Extruded polystyrene insulation XPS, 0.035 W/mK	10 cm
Extruded polystyrene insulation XPS, 0.035 W/mK	10 cm
Waterproofing membrane	0,25 cm
Backfill sand, fraction 1.4–2.5 mm	55 cm

FLOORS

P2

Floor finish	2 cm
Screed	6 cm
PE foil	0,25 cm
EPS insulation, 0.037 W/mK	5 cm
Timber substructure / installation void	10 cm
PE foil	0,25 cm
Cross-laminated timber (CLT)	16 cm

P3

Floor finish	2 cm
Screed	6 cm
PE foil	0,25 cm
EPS insulation, 0.037 W/mK	5 cm
Timber substructure / installation void	10 cm
PE foil	0,25 cm
Cross-laminated timber (CLT)	16 cm
Mineral wool / timber substructure	20 cm
Vapour-permeable membrane	0,25 cm
Timber substructure	3 cm
Timber cladding	2 cm

FLAT ROOF

Da1

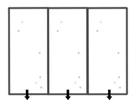
Terrace slabs	5 cm
Timber substructure	3 cm
Gravel	8 cm
Filter geotextile	0,5 cm
Drainage mat	2 cm
Protective geotextile	0,5 cm
Waterproofing membrane	0,5 cm
Extruded polystyrene insulation XPS, 0.035 W/mK	10 cm
Extruded polystyrene insulation XPS, 0.035 W/mK	20 cm
Waterproofing membrane	0,5 cm
Vapour barrier foil	0,25 cm
Cross-laminated timber (CLT)	20 cm

PAVEMENT

Ch1

Concrete paving slabs	8 cm
Compacted sand bedding	5 cm
Gravel, fraction 0–31.5 mm	15 cm
Gravel, fraction 16–32 mm	15 cm

ELEMENTS OF THE FOG HARVESTING SYSTEM



MESH

A special mesh stretched over a wooden structure captures water particles from fog and condenses them on its surface.

GUTTER

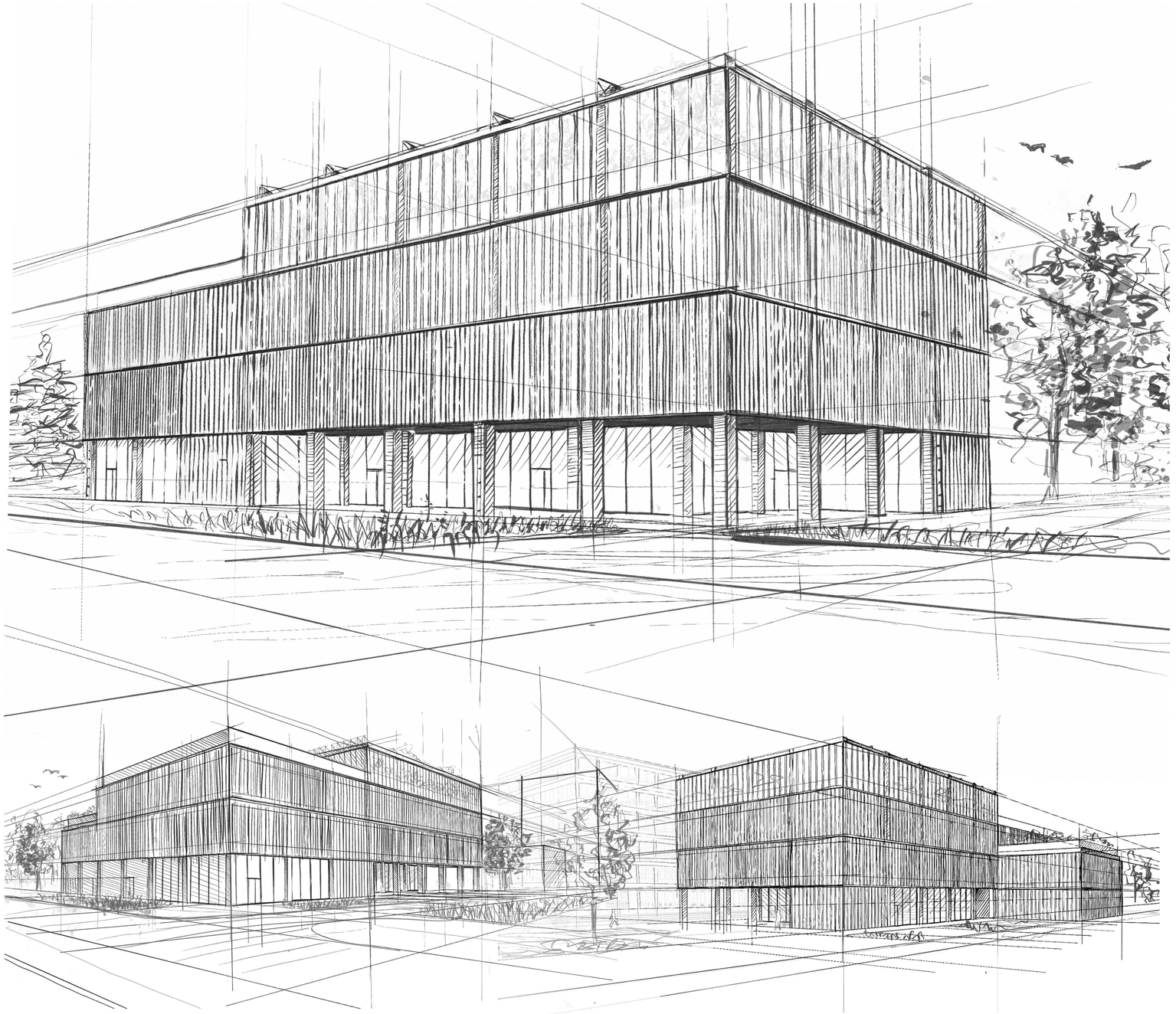
Collects condensed water from the lower edge of the mesh and directs it to the downpipe system.

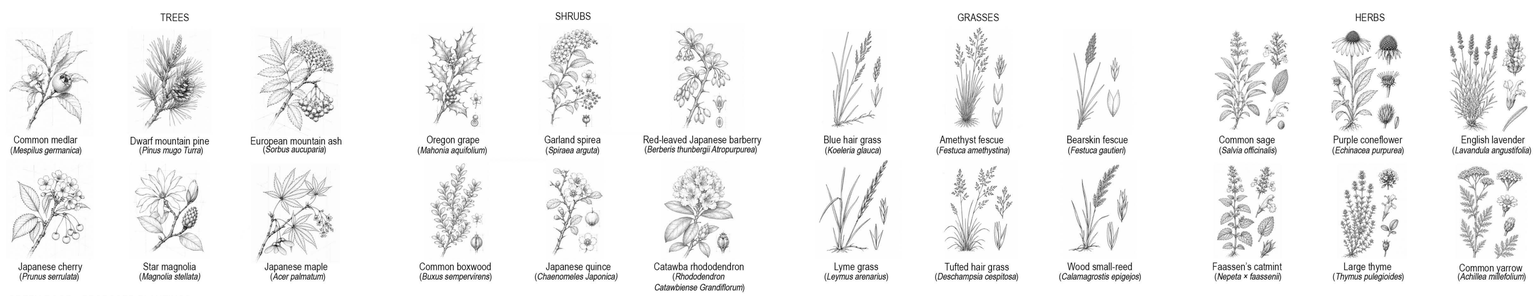
DOWNPIPE

Transports water from the gutter down to the storage system.

RETENTION TANK

An underground concrete tank stores water collected from fog.





GREEN ROOF – PROPOSED PLANTINGS