

Architectural Design Proposal for the Renewable Energy Institute, Chişinău City

Centre of Excellence in Construction,
Republic of Moldova

Author: Iuraşco Alina
Supervisor: Usataia Marina

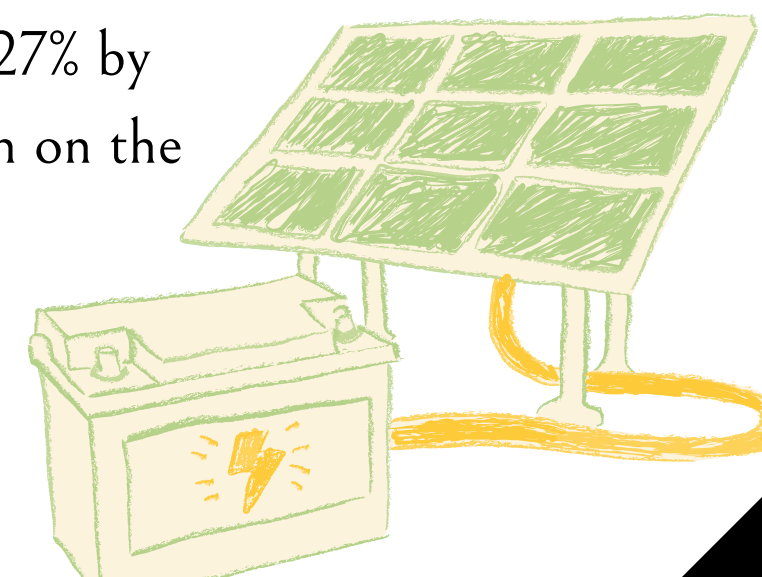
RESEARCH PROJECT UPDATE

The study of renewable energy is essential for reducing carbon emissions, increasing energy independence, and creating new jobs. It provides us with the solutions needed to combat climate change and ensure sustainable economic development without depleting the planet's resources.

Exploring this field brings major benefits on multiple fronts:

- **Environmental Protection:** Replacing fossil fuels with sources such as solar, wind, or hydroelectric power drastically reduces greenhouse gas emissions and air pollution.
- **Energy Independence:** Local energy production prevents dependence on imports of conventional resources, providing stability and resilience in the face of crises.
- **Economic Development:** The energy transition stimulates innovation and generates a wide range of new employment opportunities in engineering, installation, and maintenance.
- **Energy Efficiency:** It enables the implementation of smart technologies and storage solutions tailored to current needs.

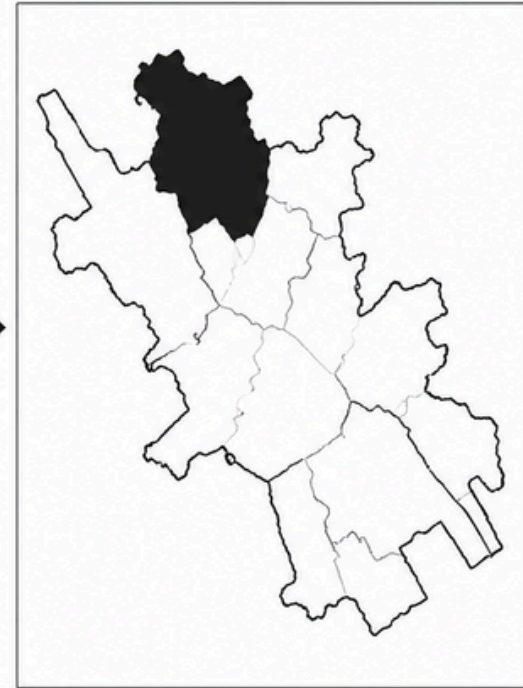
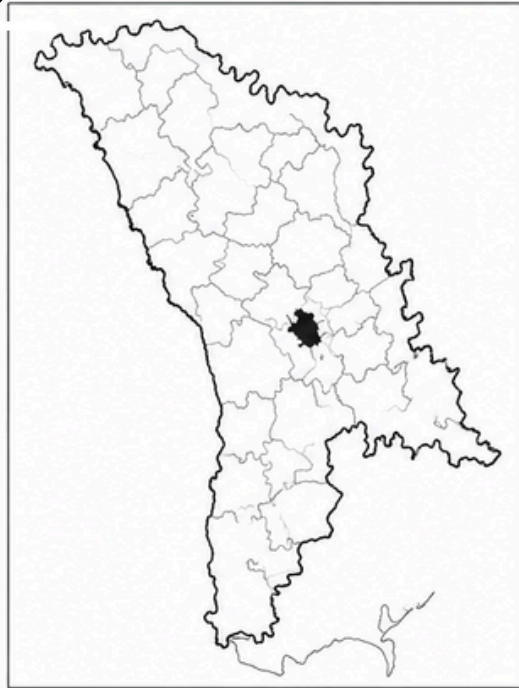
According to the Ministerial Council's decision of February 2022, the share of renewable energy in gross final energy consumption is expected to be at least 27% by 2030. In this context, the Government is drafting and approving the Regulation on the organization and operation of renewable energy communities.



REPUBLICA MOLDOVA

CHIȘINĂU

SECTORUL RĂȘCANI

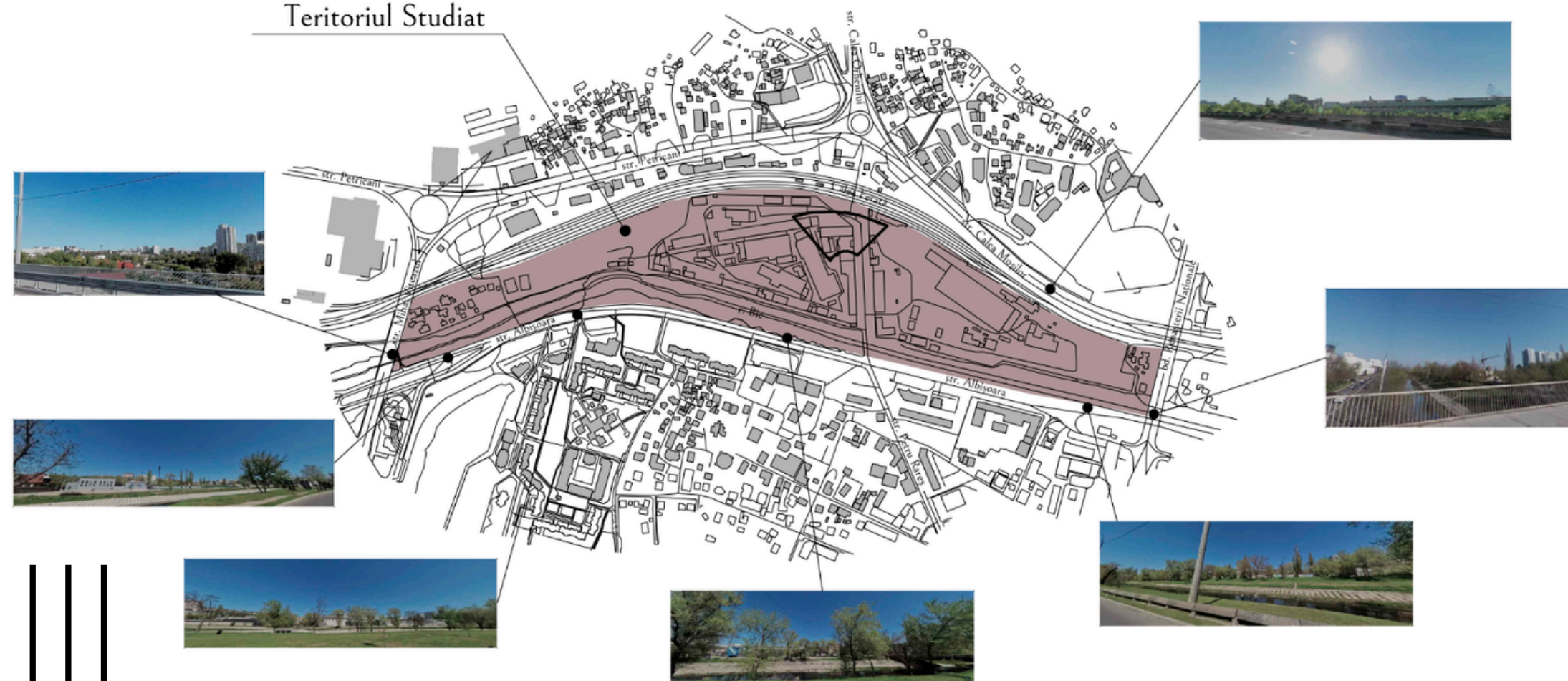


Harta Republicii Moldova cu evidențierea municipiului Chișinău

Harta municipiului Chișinău cu evidențierea sectorului Râșcani

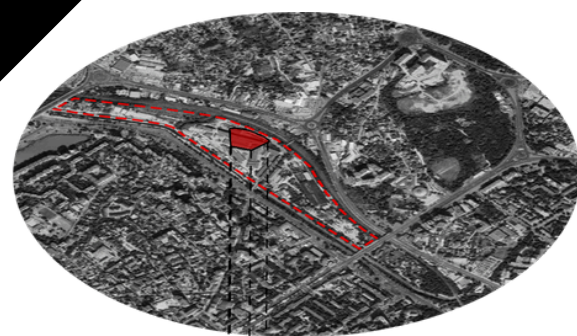
Harta sectorului Râșcani al municipiului Chișinău

Teritoriul Studiat

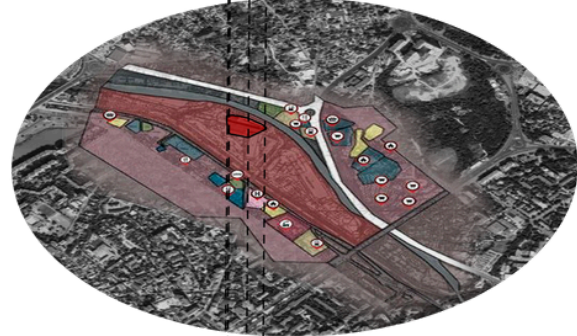


Plan Situație Existent Sc. 1:5000

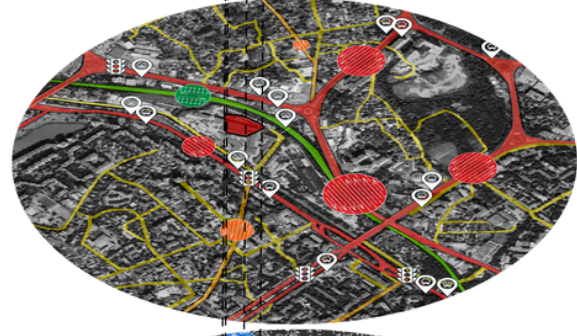
This project proposes a center dedicated to renewable energy, located within an active urban setting in Chișinău, where research, education, and public space converge. The site benefits from strong connections to the city but requires a clear functional and spatial reorganization



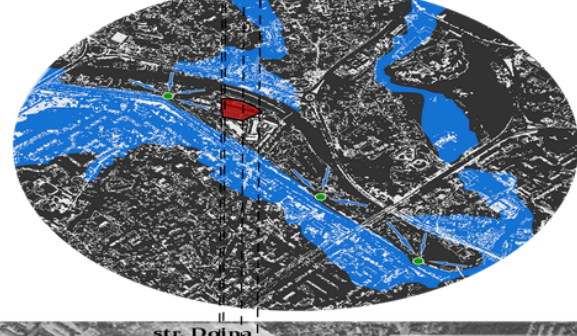
Study Area
 Diagram



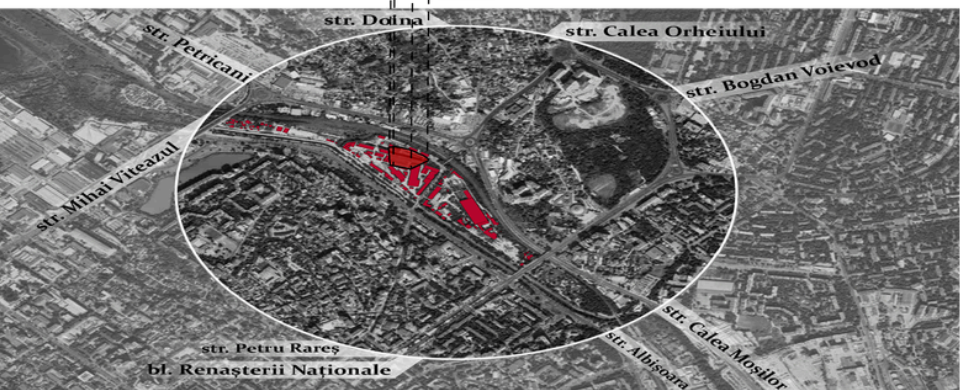
Existing Functional
 Zoning Diagram



Road and Transport
 Network Diagram



Bîc River Flood
 Risk Diagram



Existing Buildings
 Demolition diagram

The site analysis highlights the influence of prevailing winds, solar orientation, and air currents on the building's location. This data informed decisions regarding the building's orientation, protection from external factors, and the use of natural light.

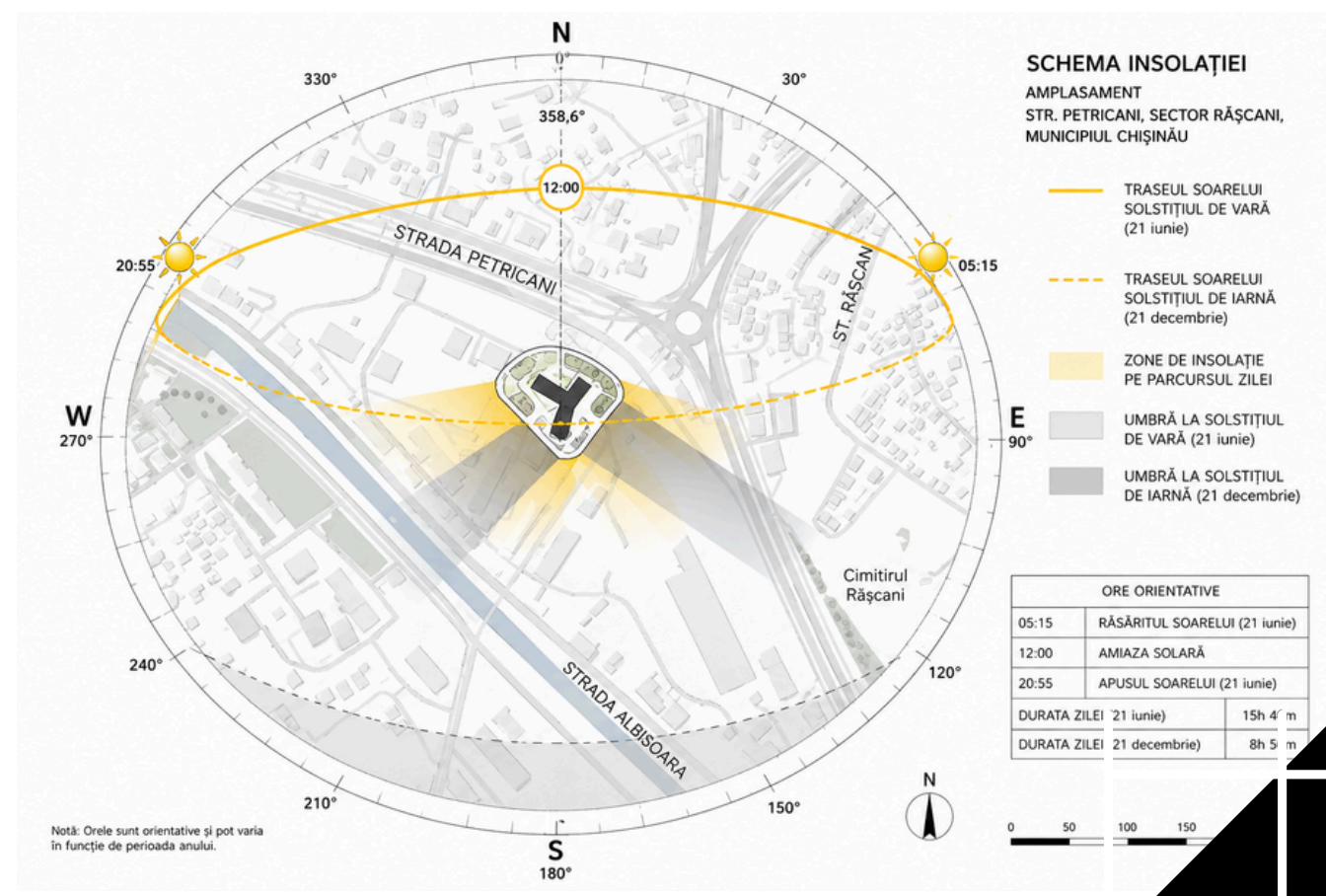
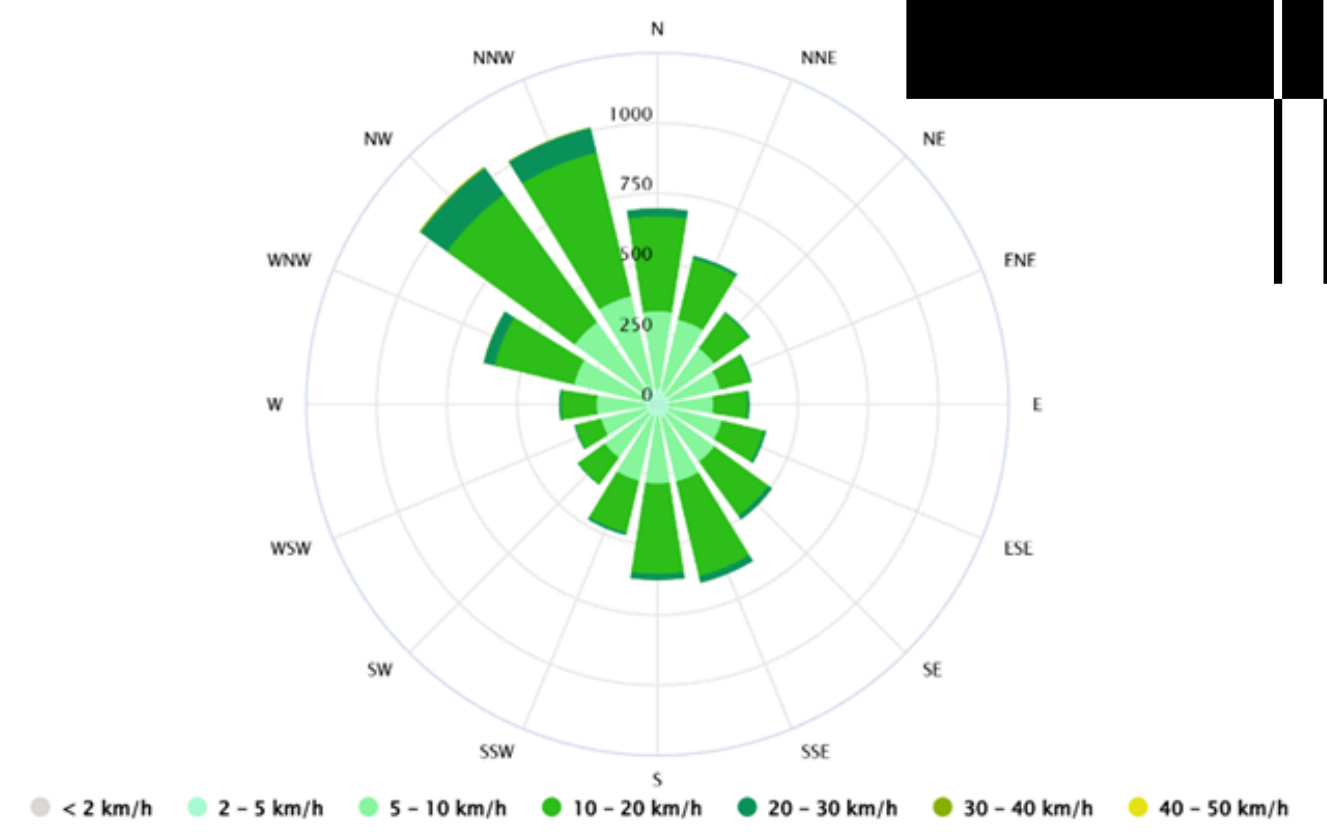


Diagram of Sunstroke

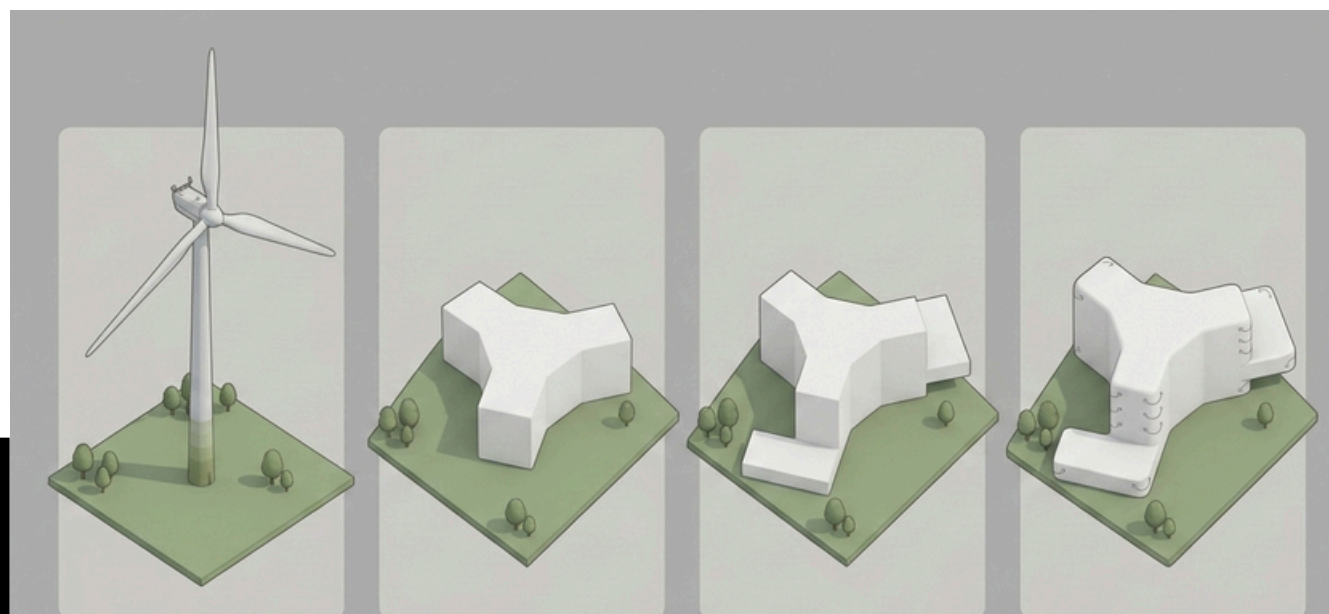
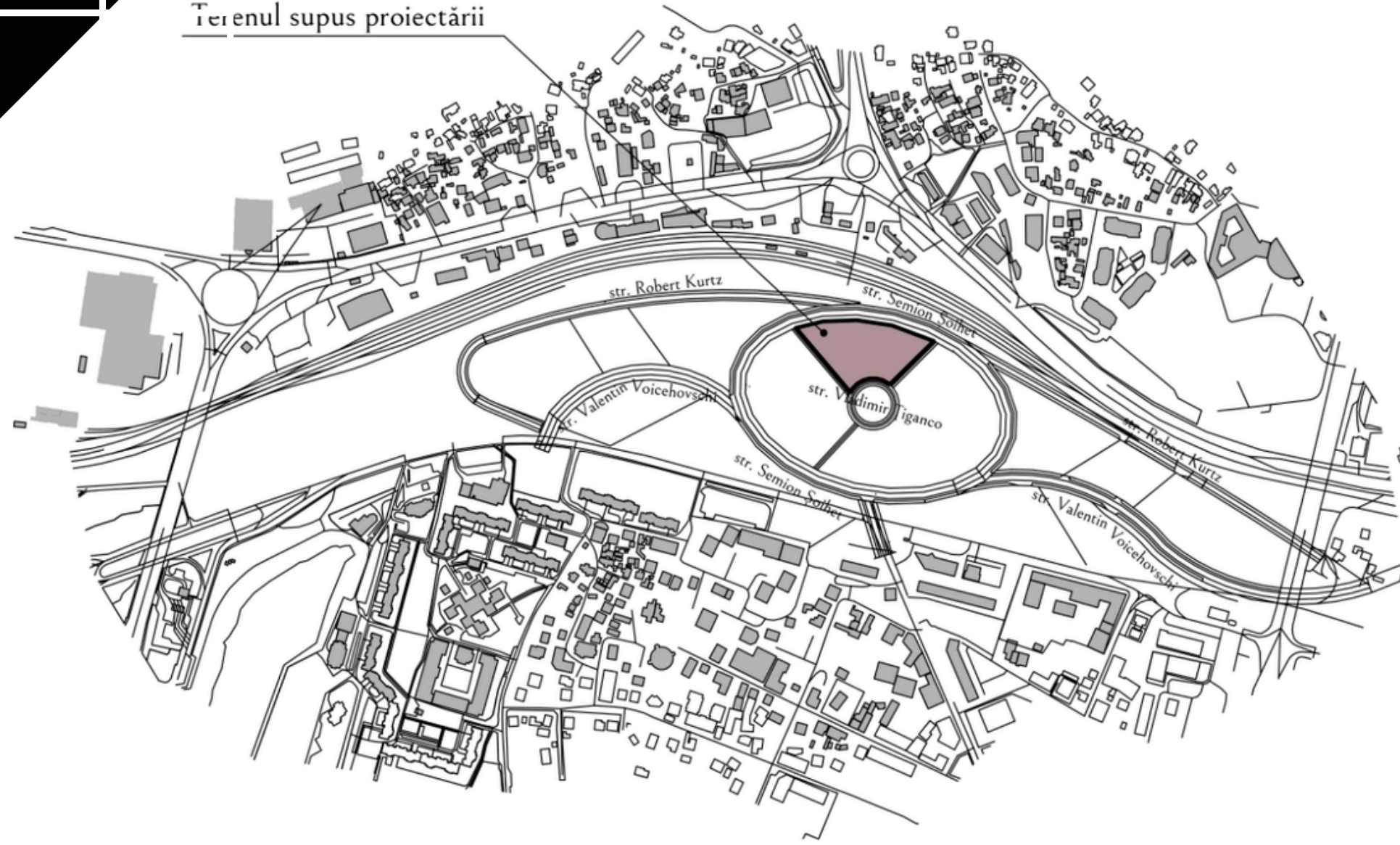
The institute is conceived as an urban energy hub: it collects light, filters flows, generates knowledge, and transforms sustainability into a public experience.

The project proposes a contemporary landmark, in which the built volume acts as a filter between the city, nature, and research processes dedicated to renewable energy. Through its orientation, transparency, active facades, and integrated public spaces, the building expresses the idea of sustainability as an architectural principle and a spatial experience.

Furthermore, the project meets current requirements for sustainable urban development, which entail the rational use of natural resources, environmental protection, and the integration of buildings into the existing context.

The project's core concept involves compensating for green areas affected by construction by creating equivalent public green spaces integrated into the site and the building.

Terenul supus proiectării

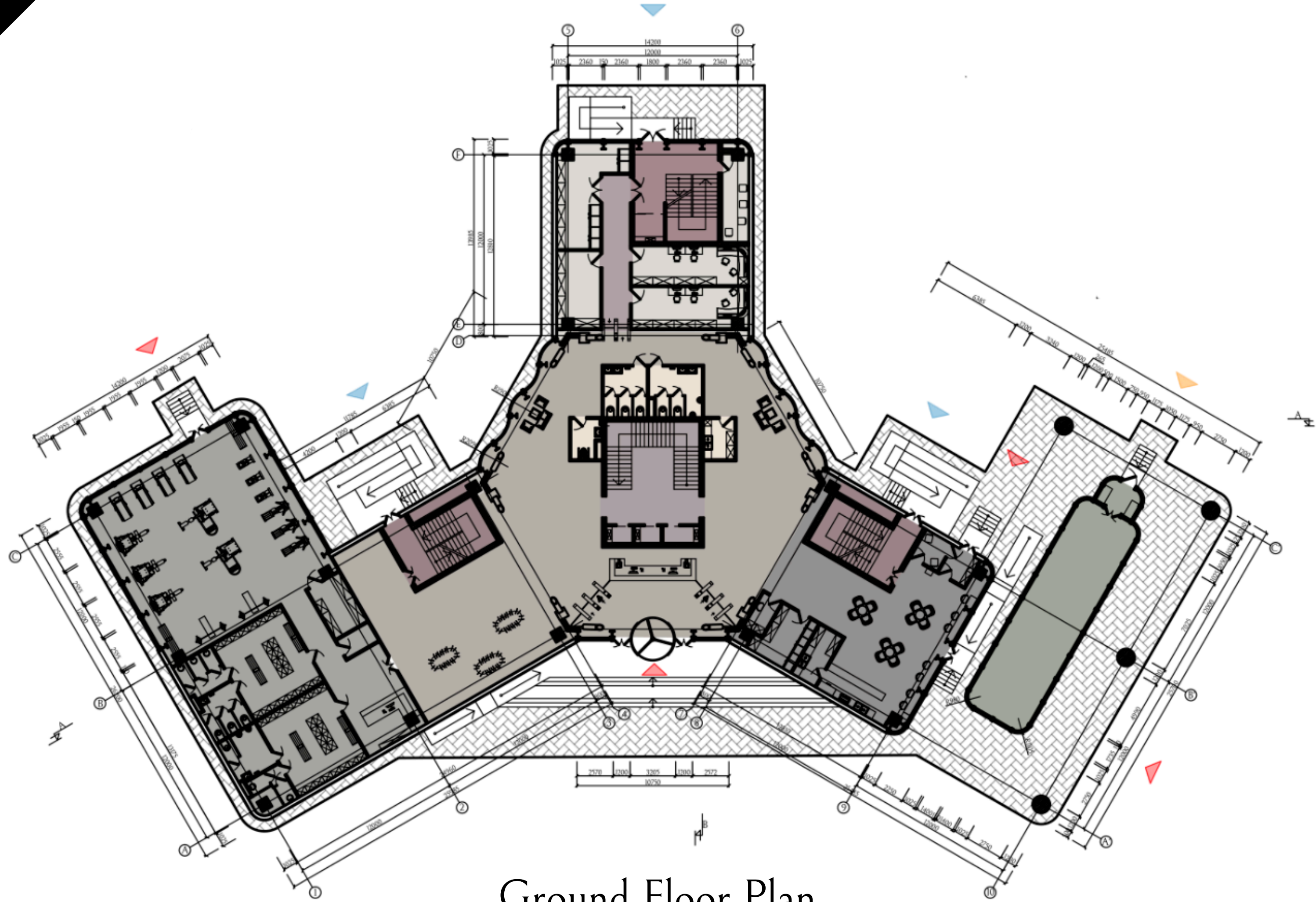




Master Plan

The master plan organizes the site by clearly separating pedestrian, vehicular, and service traffic flows, ensuring efficient accessibility and the logical operation of the institute. The building is integrated into a sustainable urban setting, featuring green spaces, public recreational areas, organized parking, and direct connections to key neighborhoods surrounding the site.

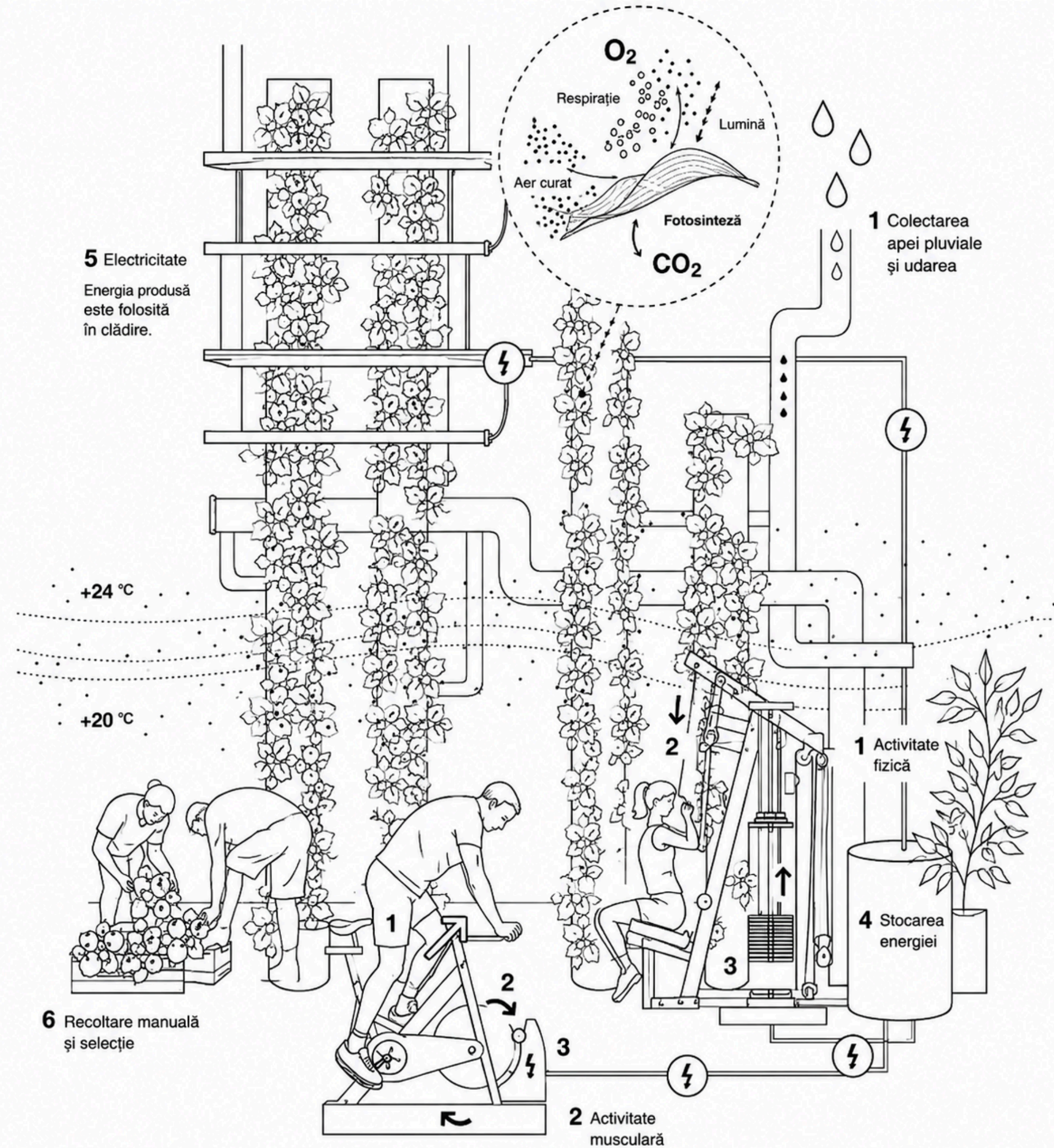
The building is located in the central area of the site and faces south, an orientation that is energy-efficient. This positioning allows for the use of solar radiation to provide natural lighting for interior spaces, to ensure the efficient operation of photovoltaic panels, and to reduce energy consumption during operation. The building's shape and its placement on the site allow the outdoor spaces to be organized into several functional zones: the public access area, the parking area, the green area, the technology and demonstration area, and the vehicular traffic area.

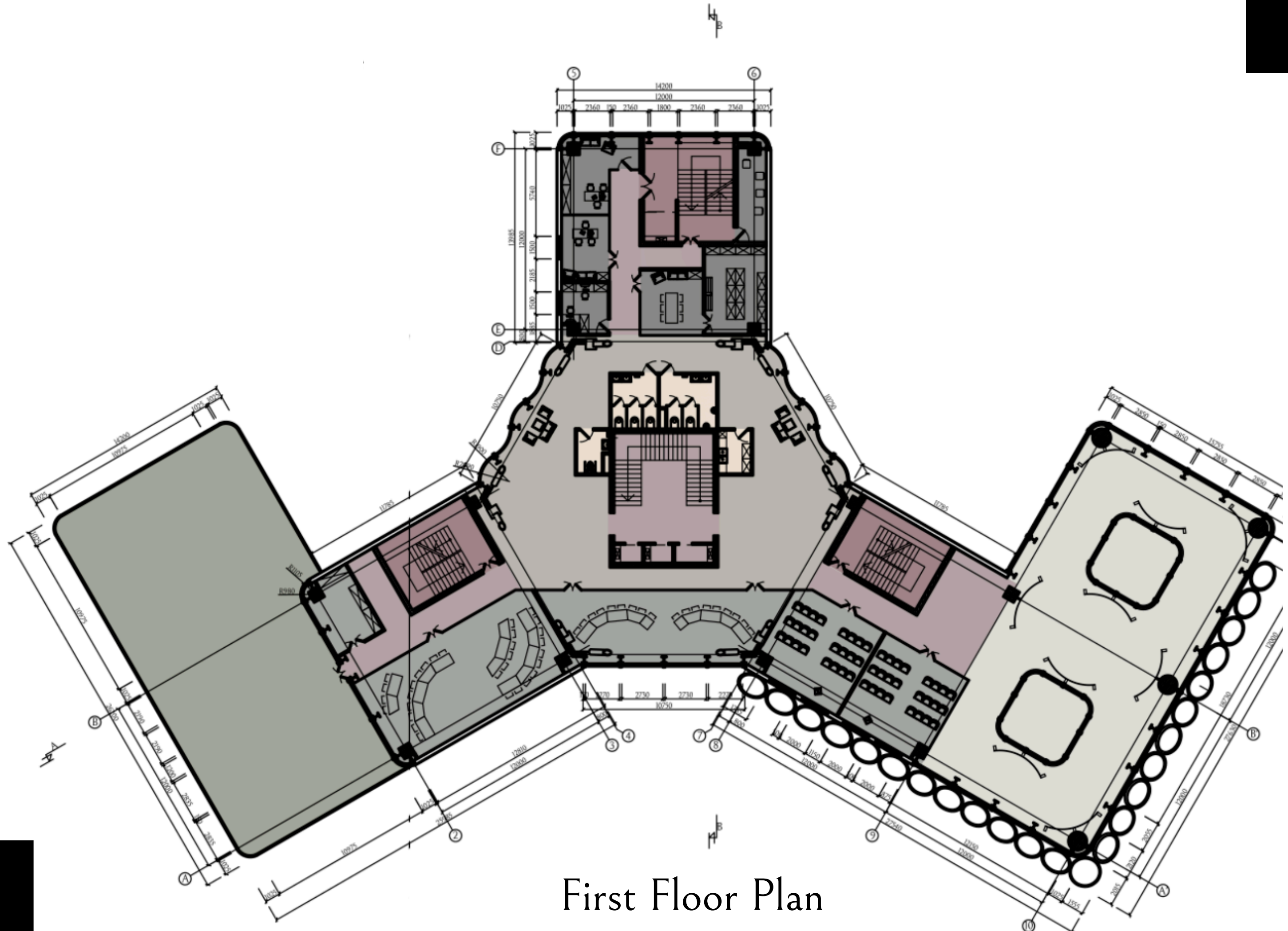


Ground Floor Plan

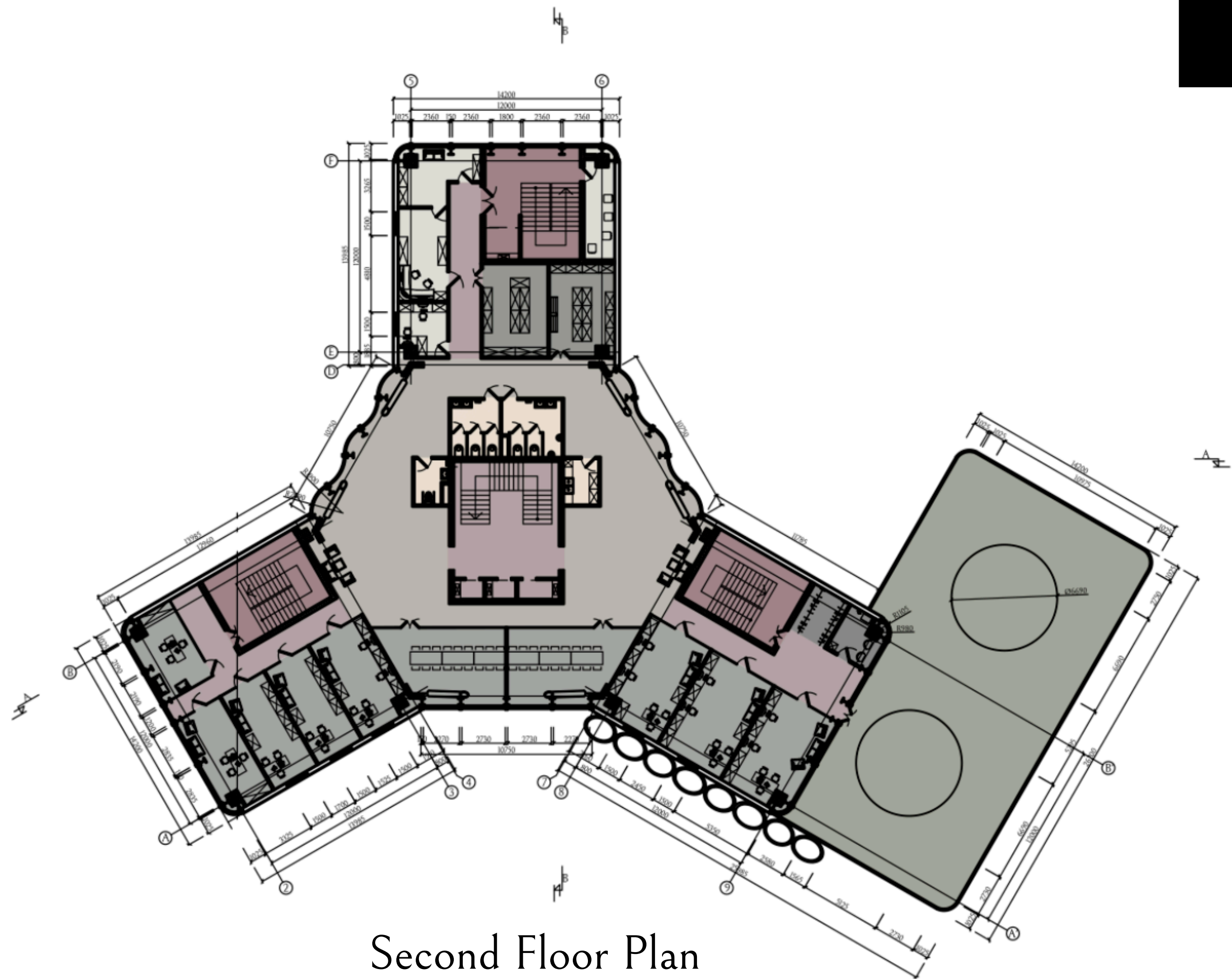
HUMAN ENERGY SOURCE

The concept aims to reinterpret physical exercise as an active energy generator, transforming bodily movement into a sustainable resource. Thus, human movement is transformed into an active energy resource, integrating physical exercise into the building's sustainable concept. The space becomes a participatory mechanism that educates the user and directly involves them in the production of their own energy.

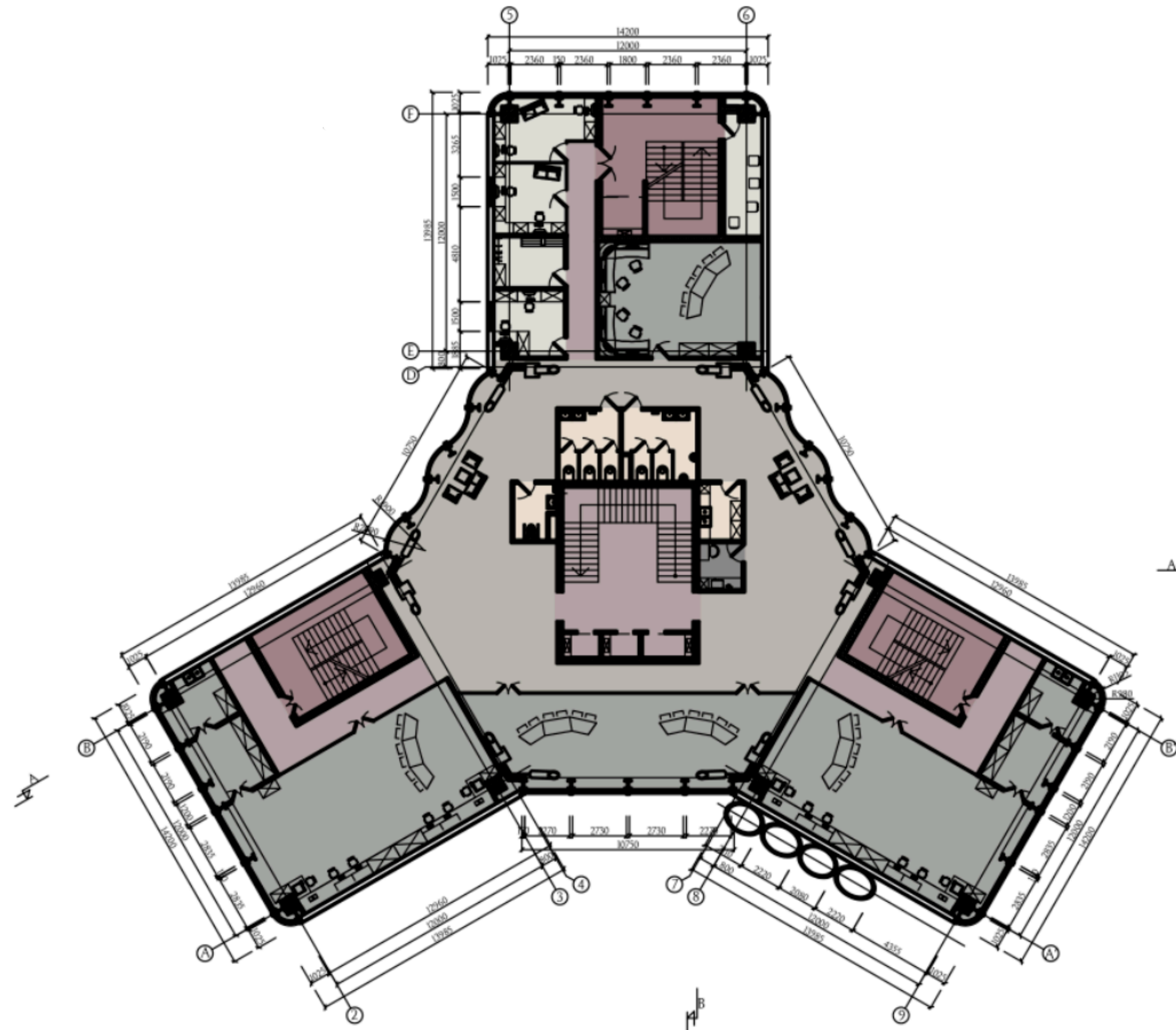




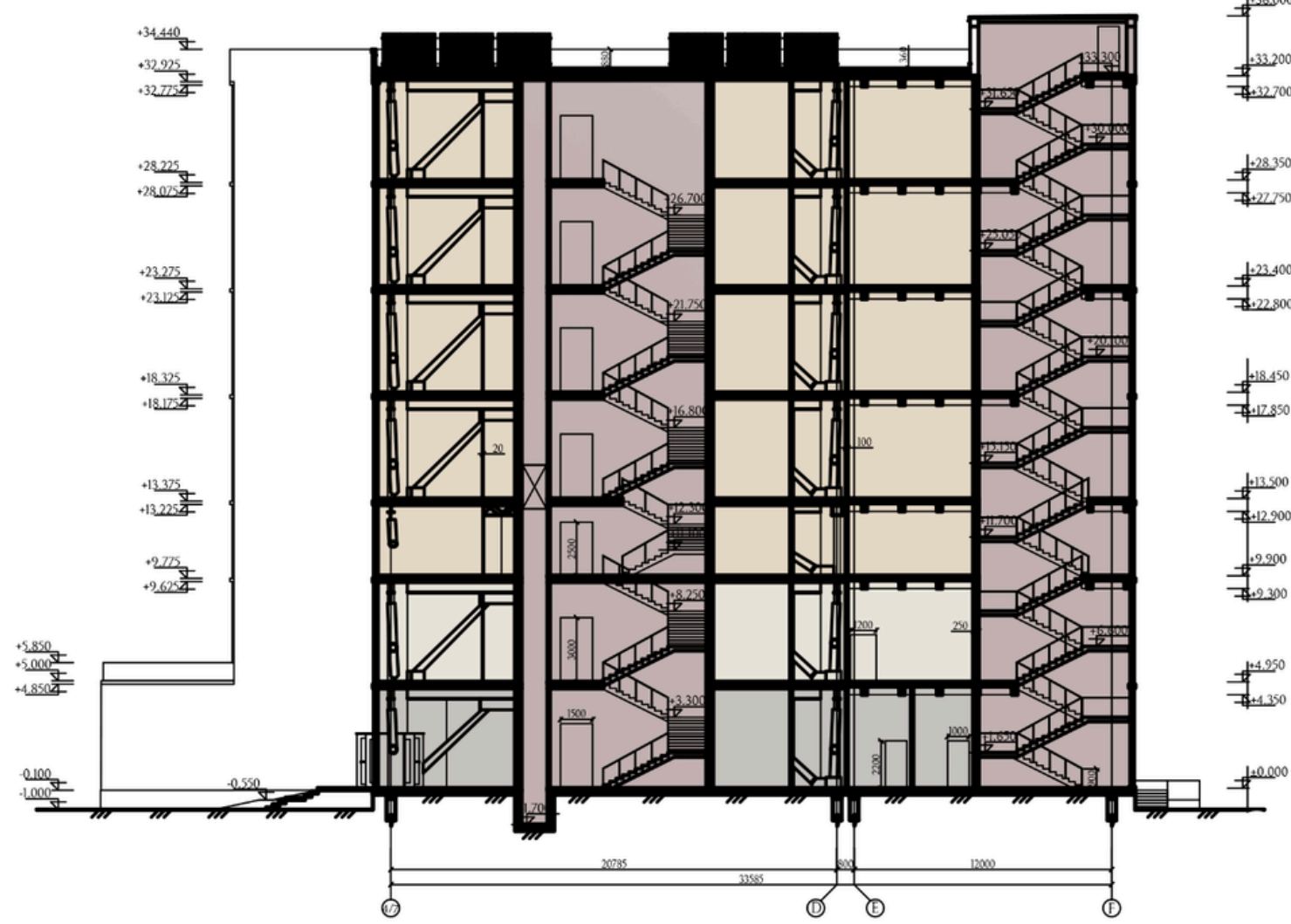
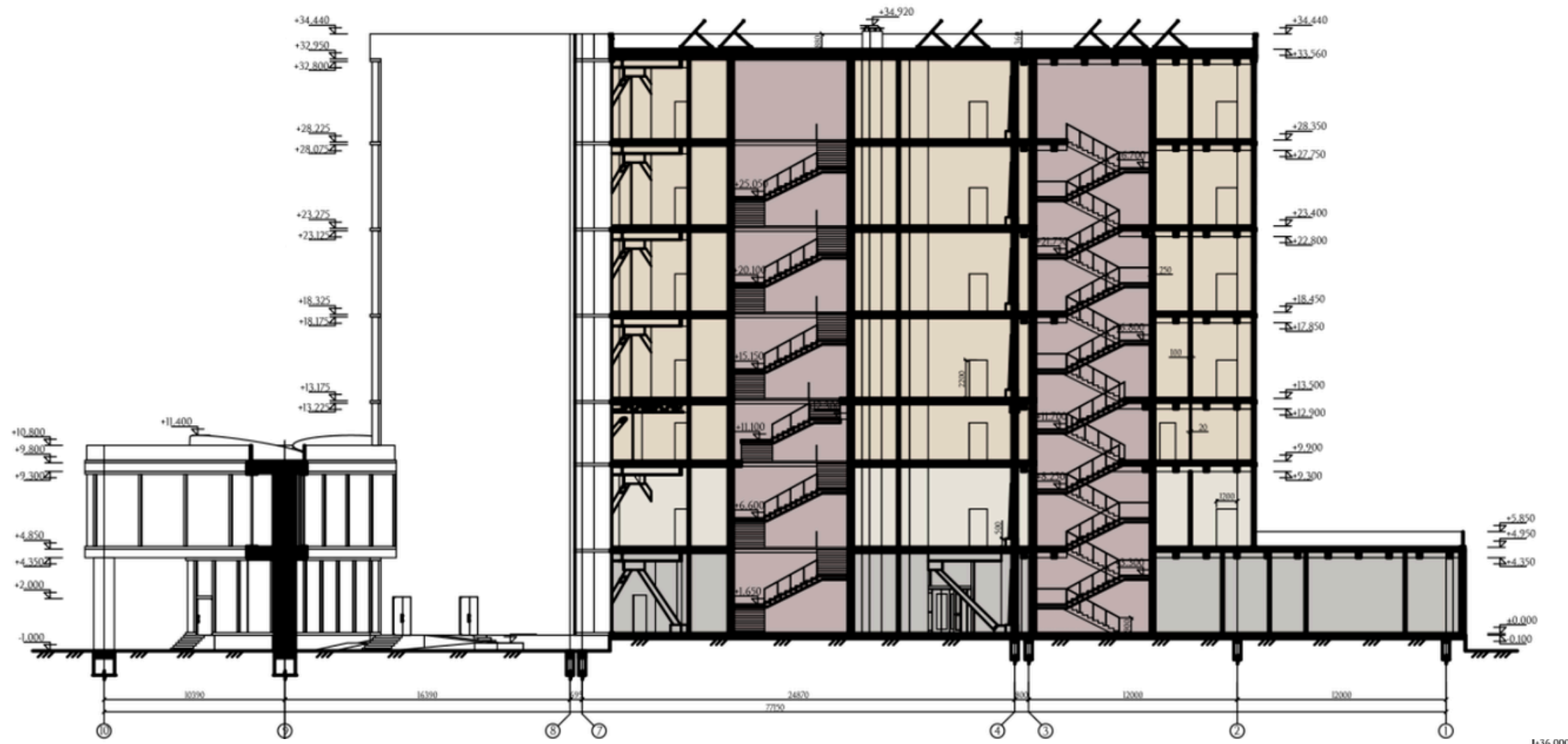
First Floor Plan



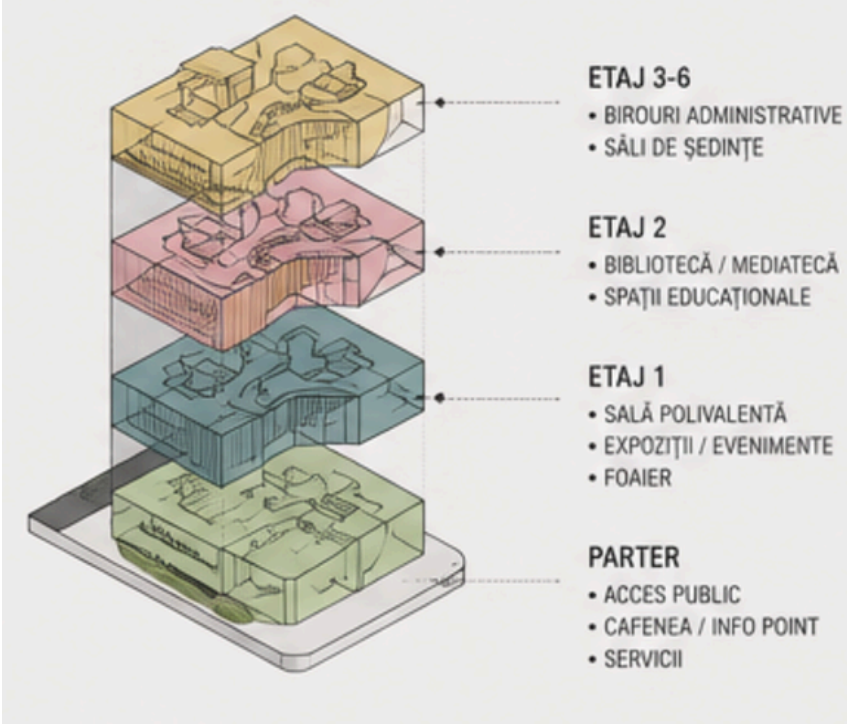
Second Floor Plan



Typical Floor Plan Levels 3-6

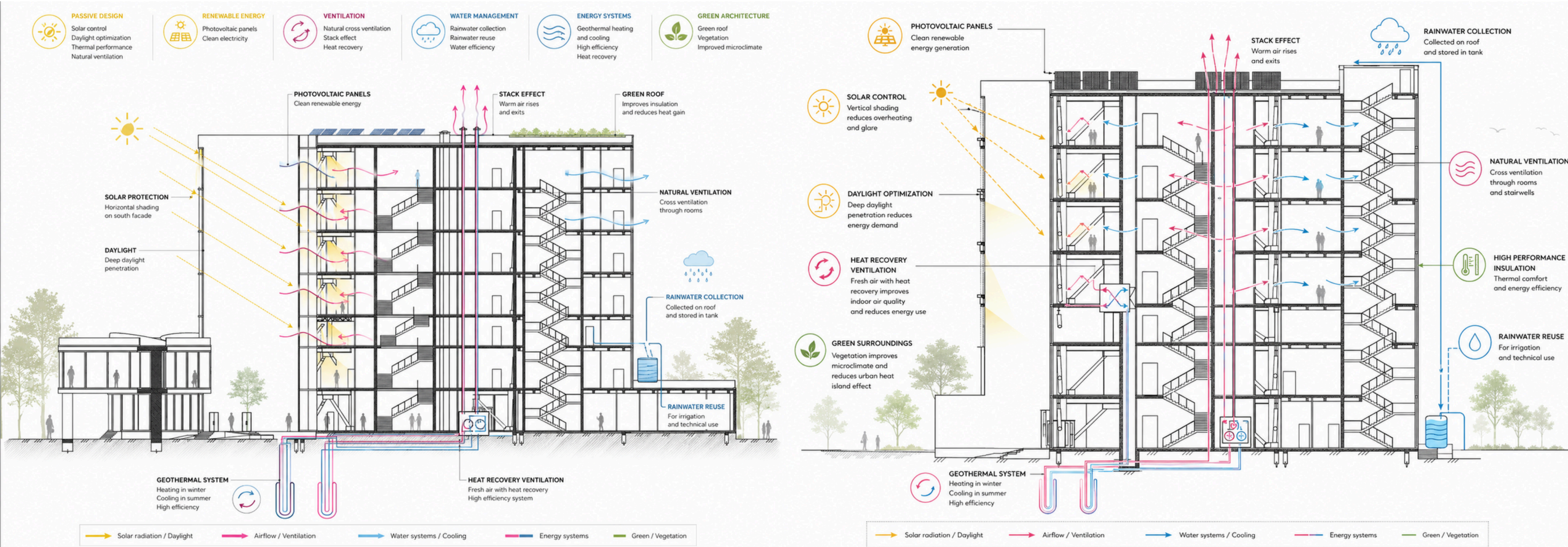


SCHEMA FUNCȚIONALĂ

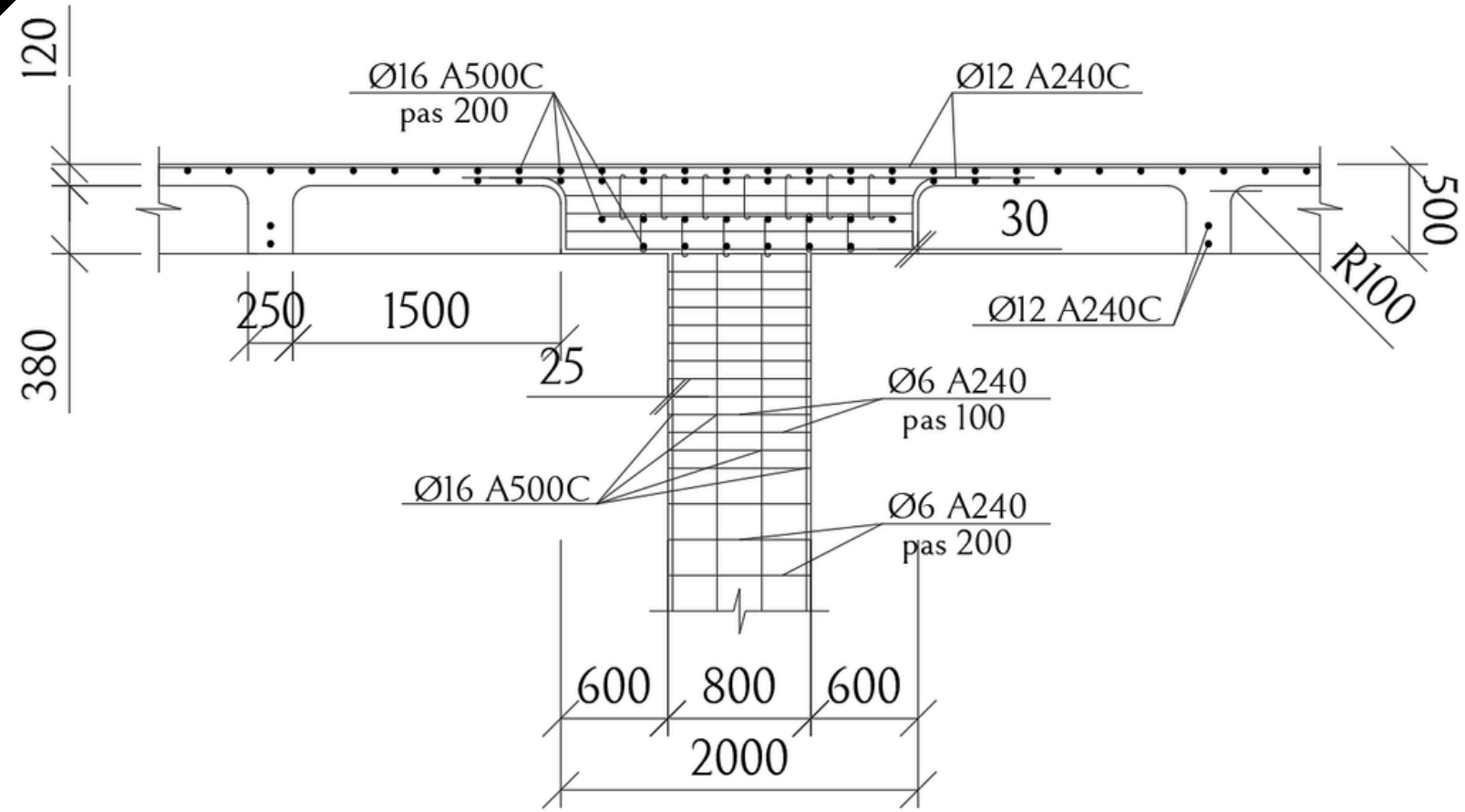


INTEGRATED SUSTAINABLE STRATEGIES

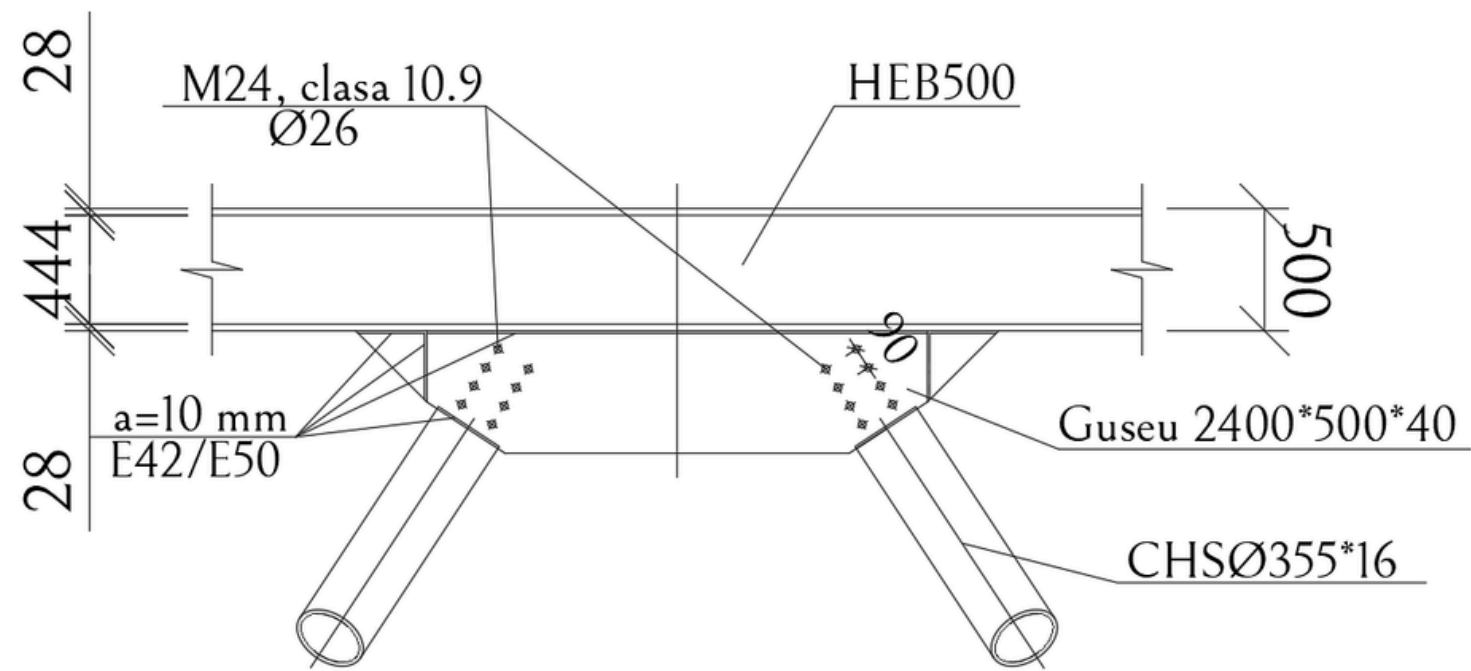
This section highlights the passive and active principles through which the building optimizes its energy consumption: solar control, natural lighting, ventilation, heat recovery, and the use of renewable resources. The proposed solutions transform the building into an efficient system capable of responding to climatic conditions and reducing its environmental impact.



Solar shading, Natural lighting, Photovoltaic panels, Natural ventilation, Heat recovery, Vegetation, Rainwater harvesting

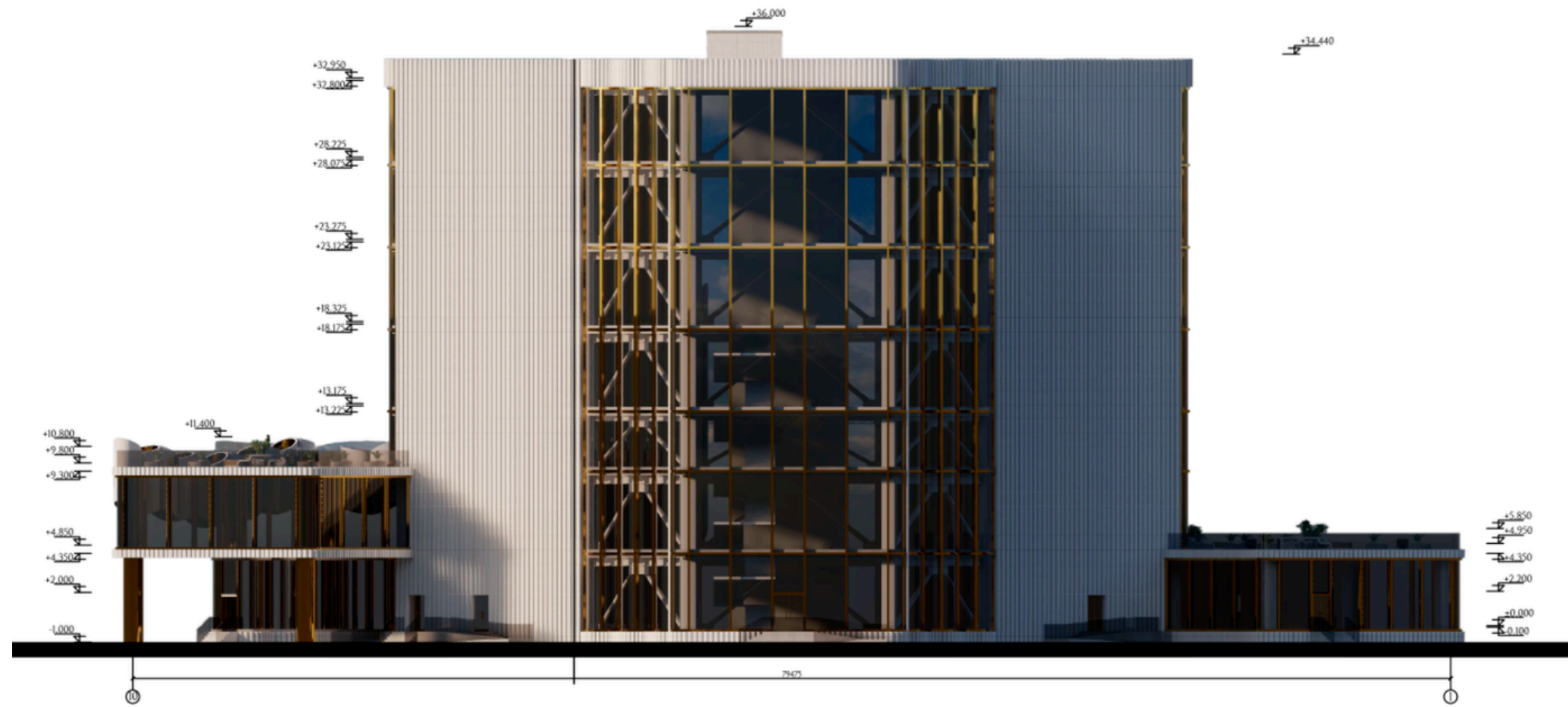


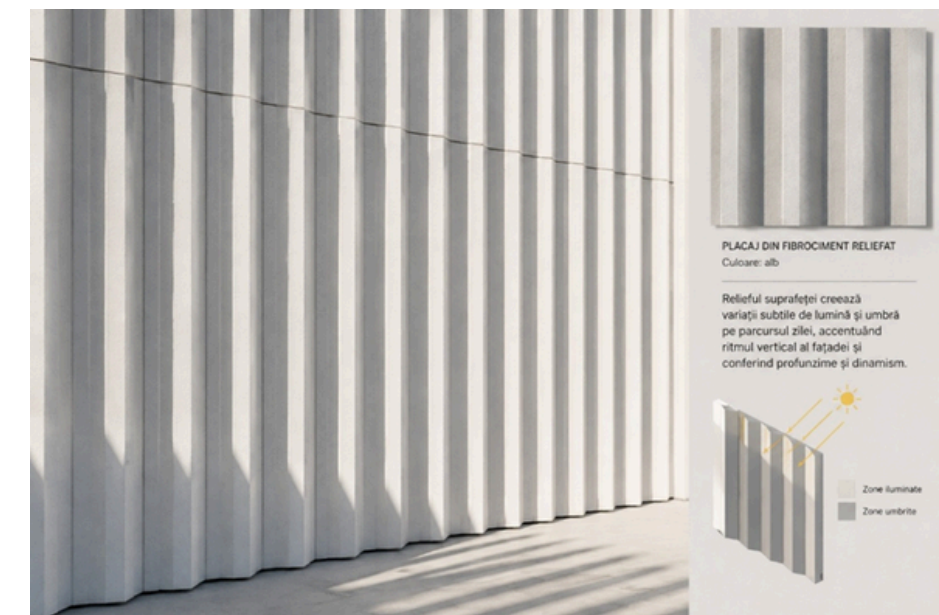
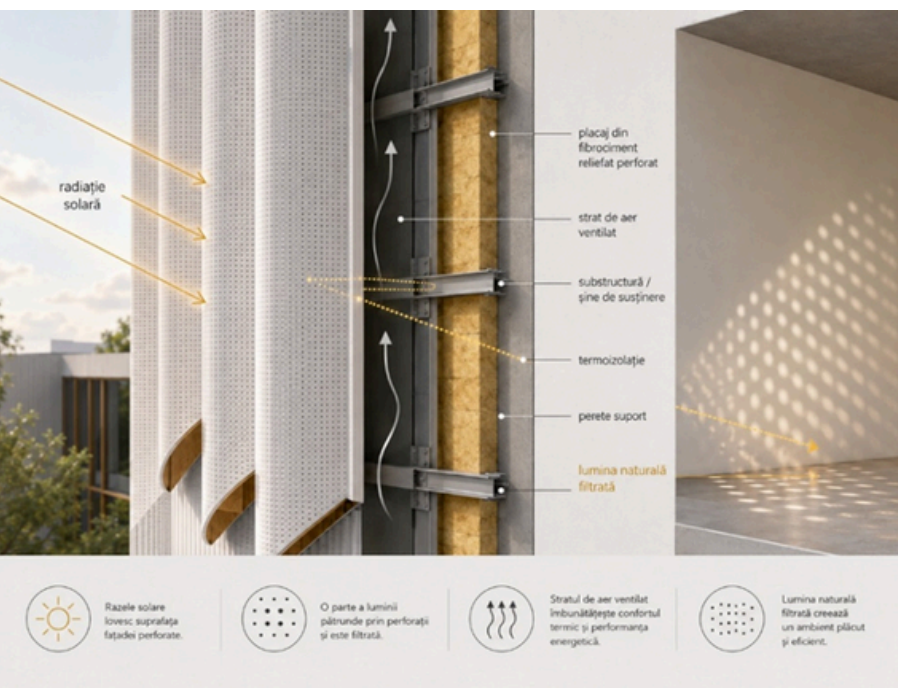
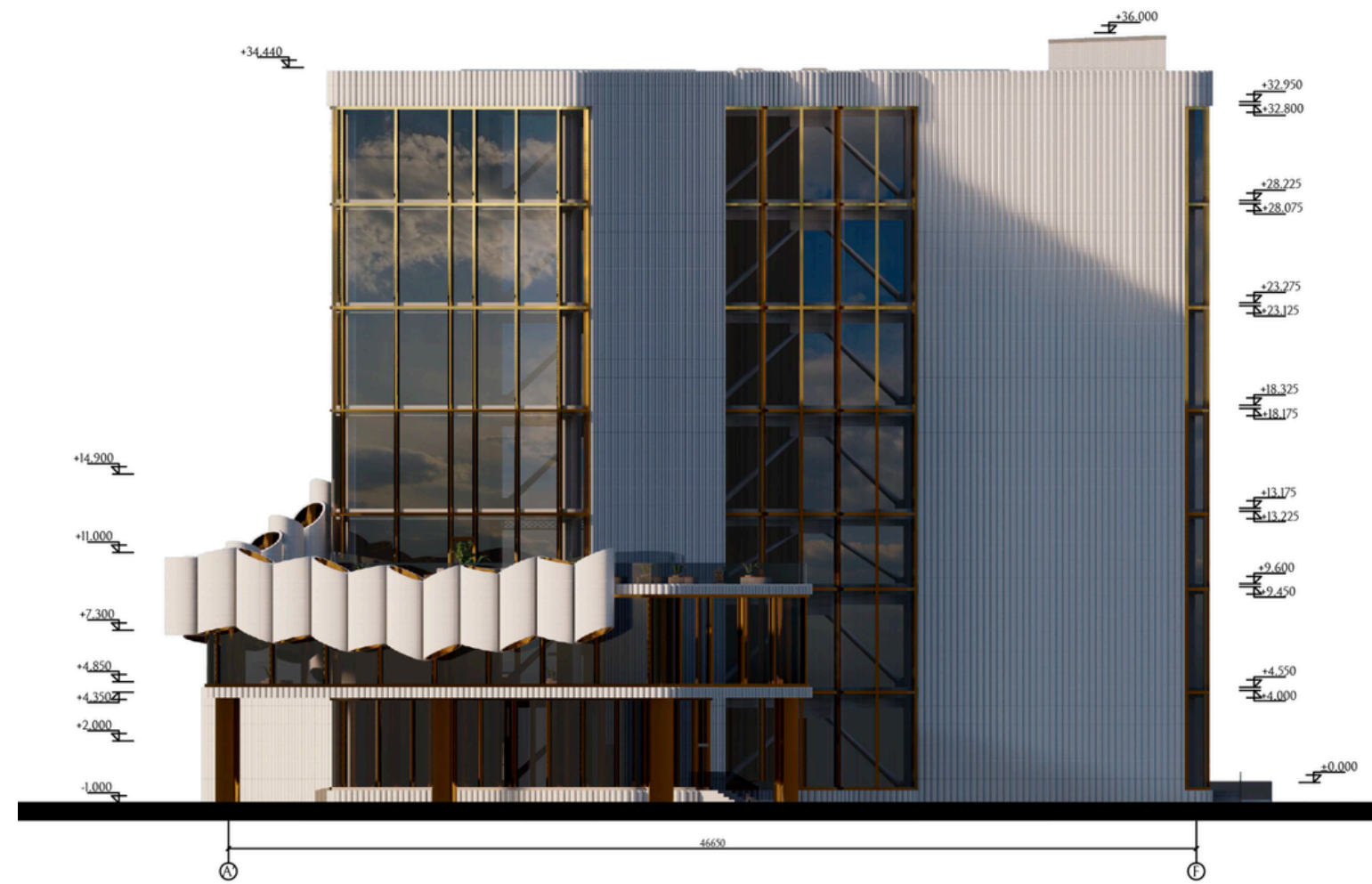
Structural Detail



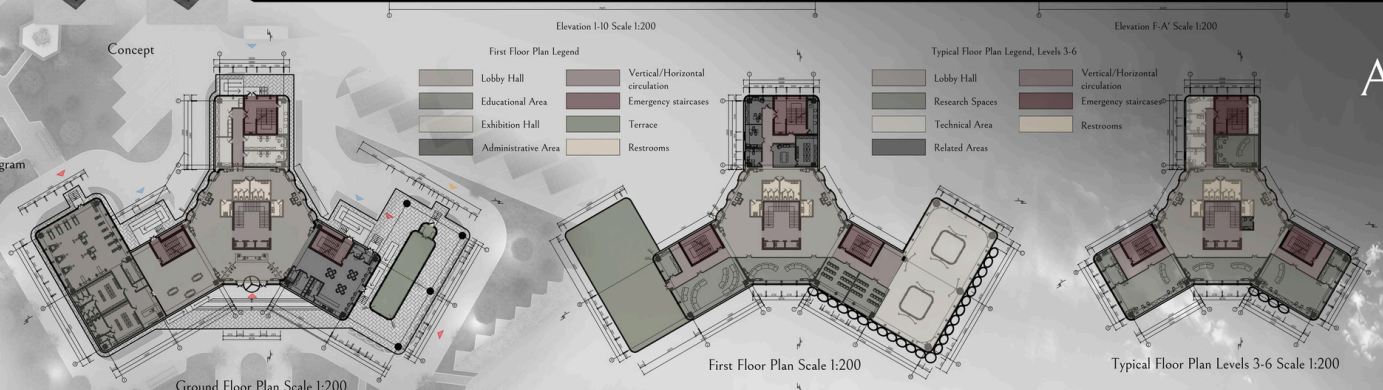
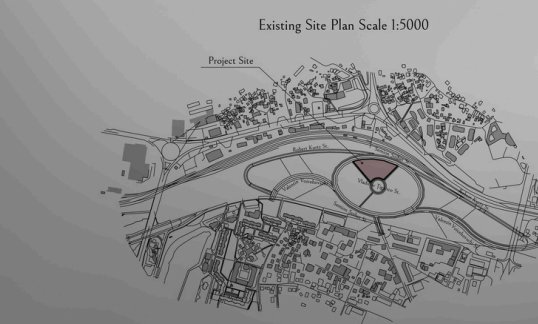
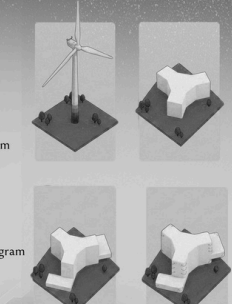
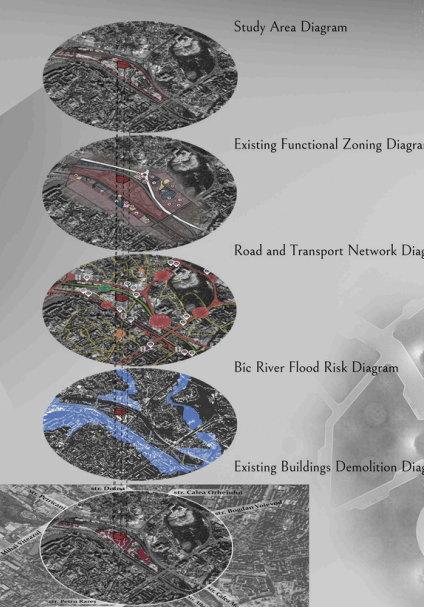
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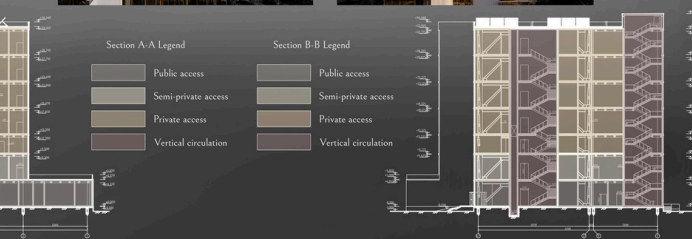
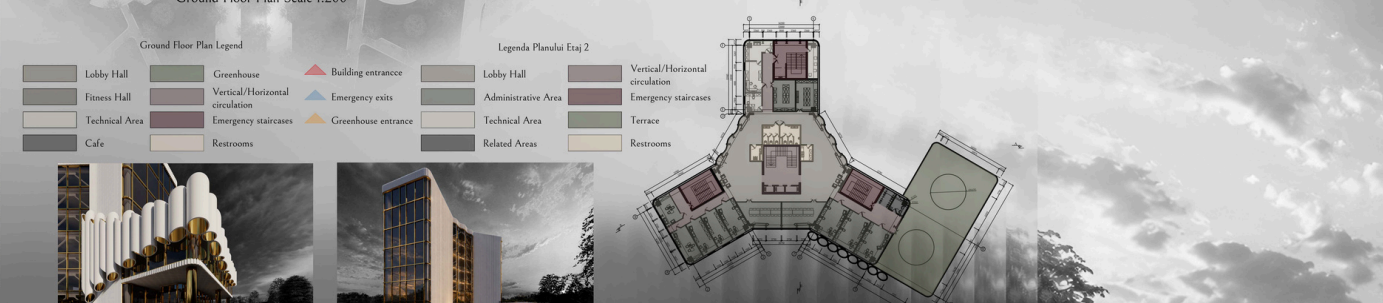
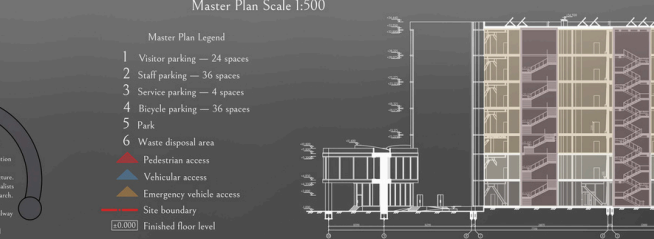
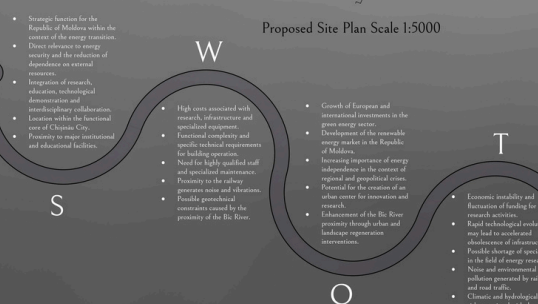








Architectural Design Proposal for the Renewable Energy Institute, Chişinău City



Strategic location for the Republic of Moldova within the context of the energy transition. Direct exposure to energy security and the reduction of dependence on external resources.

Integration of research, education, technological development and interdisciplinary collaboration. Location within the functional core of Chişinău City. Potential to create institutional and educational facilities.

High access associated with research, education and technological development. Functional complexity and specific technical requirements for building operations.

Need for highly qualified staff and specialized infrastructure. Proximity to the railway provides state and international. Possible potential services offered by the proximity of the Bic River.

Creation of European and international connections in the general energy sector. Development of the renewable energy sector in the Republic of Moldova.

Increasing importance of energy independence in the context of regional and geopolitical issues. Potential for the development of urban centers for innovation and research.

Enhancement of the Bic River promenade through urban and landscape regeneration interventions.

Economic viability and financial sustainability. Research and technological innovation may lead to cost-effective production of alternative energy sources. In the field of energy research, the project is intended for urban and landscape regeneration interventions. Climate and technological integration with the proximity of the watercourse.