

REBUILDING UKRAINE

Kyiv Center of Reconstruction and Ecological Restoration/Kyiv, Ukraine

The goal of the project is to create a concept of a typical project of a regional center for the development of technologies for the reconstruction of buildings destroyed as a result of the Russian-Ukrainian war, based on the remains of the materials from which these buildings were made. Built according to general indicators, as of the beginning of 2023, more than 12 million tons of construction debris were recorded as a result of the Russian-Ukrainian war. The majority of construction waste in Ukraine is not processed, but is only transported outside the city limits to a landfill. This has become a major challenge that can be overcome by studying building material reuse strategies in regional workshops.

Therefore, the solution will be regional centers of reconstruction and eco-restoration, which calculate the damage caused to the ecology and property of a certain region, assess risks and create a strategy for restoring ecosystems, recycle the debris of buildings destroyed during the war, teach residents how to deal with the environment and garbage, popularize narratives of smart consumption and cooperate with non-governmental environmental organizations related to a particular region to research and solve problems. Such a building itself is an example of this concept, as its exterior displays a catalog of materials collected from one region from shelled areas.

This concept of repurposing or reusing objects continues in everyday life after researching the conditions of recycling and enlightening society, collecting materials that can be sorted in the building material storage warehouse opposite the designed object. Such material collection points are planned to be located near the centers so that, if necessary, materials can be quickly delivered to the workshop located on the ground floor.

Most of the residential buildings of the 20th century and commercial premises of the 21st century were damaged by shelling and are not subject to restoration in the territory of the city of Kyiv and the Kyiv region.

Therefore, in this version, the building is designed on the site of a destroyed residential building of the Austro-Hungarian era, which is not subject to reconstruction, using the materials of panel houses, the so-called Khrushchovkas, and the remains of collapsed structures, thus not replacing, but complementing the rhythmicity of the vertical rhythm on the facade.

The left side of the previous building actually remained, the central stairwell collapsed, only the walls of the basement and the ground floor survived on the right side of the building. During the redevelopment, the demolition of the original brick walls is avoided, the stairwells are moved from the center to the perimeters of the building. In general, the building contains the following program blocks: workshop, employees' offices, exhibition gallery, lecture hall, study room, communal premises, etc.

Such a project in itself is a fresh look at the needs of the city and the region, a response to events and problems that need to be solved by involving society in them.

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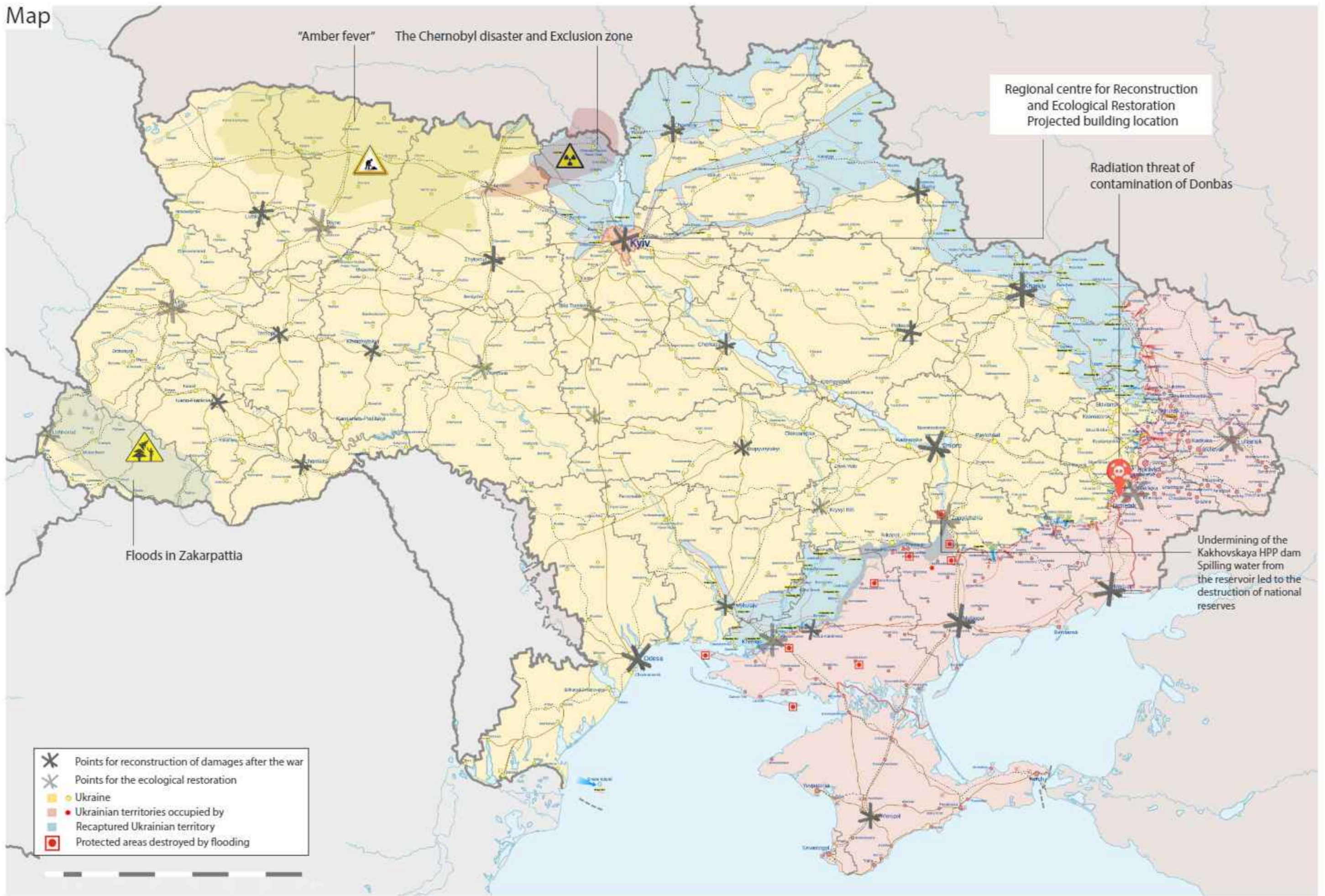
Kyiv Centre for the Reconstruction
and Ecological Restoration



ЦЕНТР РЕКОНСТРУКЦІЇ
ТА ЕКОЛОГІЧНОГО ВІДНОВЛЕННЯ



Map



Ecocrime/Ecocide of Ukraine



– Arbitrary deforestation (excavation of mountain massifs) and the lack of a root system that holds water bodies, unauthorized mining of rocks, changing riverbeds and cementing roads have led to devastating floods.

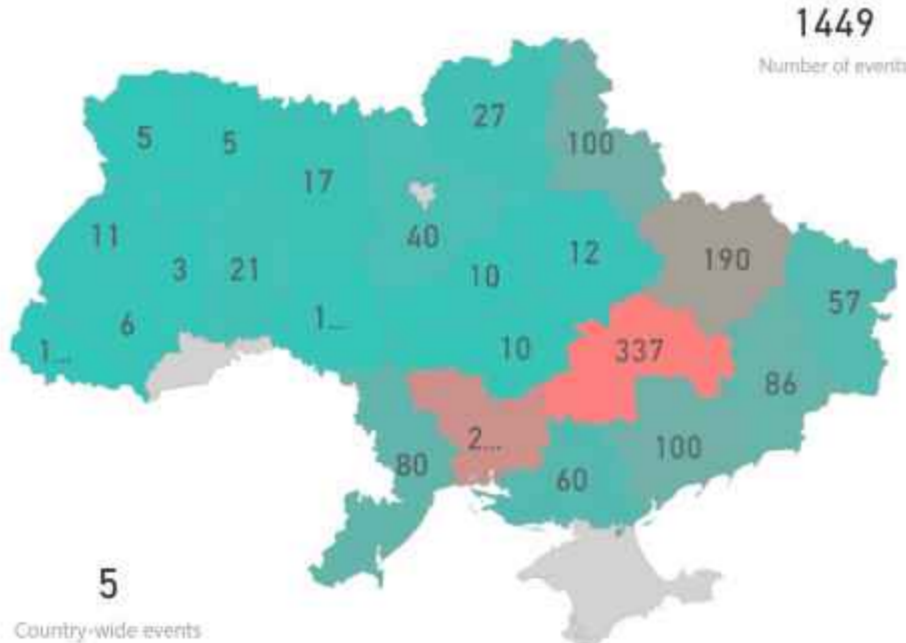
– As a result of uncontrolled amber mining (amber mafia) 3.5 thousand hectares of forest have already been damaged, the microclimate in the forests of Volyn, Rivne and Zhytomyr regions has changed.



– A man-made ecological and humanitarian disaster caused by two thermal explosions and the subsequent destruction of the fourth power unit of the Chernobyl NPP, on April 26, 1986. A 30-kilometer exclusion zone was created around the Chernobyl NPP.

The "Styrol" enterprise was producing ammonia, urea, ammonium nitrate, polystyrene, as well as inorganic salts and organic resins. After the beginning of occupation, underground water from the mines stopped being pumped out, chemicals began to seep into the aquifers.

The destruction Ukraine suffered as a result of the war



– Almost 200 thousand buildings and structures were destroyed in Ukraine due to Russian aggression, more than 3.2 thousand educational and more than 800 medical institutions were destroyed.

– In the summer of 2023, the Ministry of Natural Resources noted that since the beginning of the full-scale invasion of Russia in Ukraine, about 10-12 million tons of garbage have been generated.

Undermining the dam of the Kakhovskaya HPP and the dam of the Kakhovka Reservoir



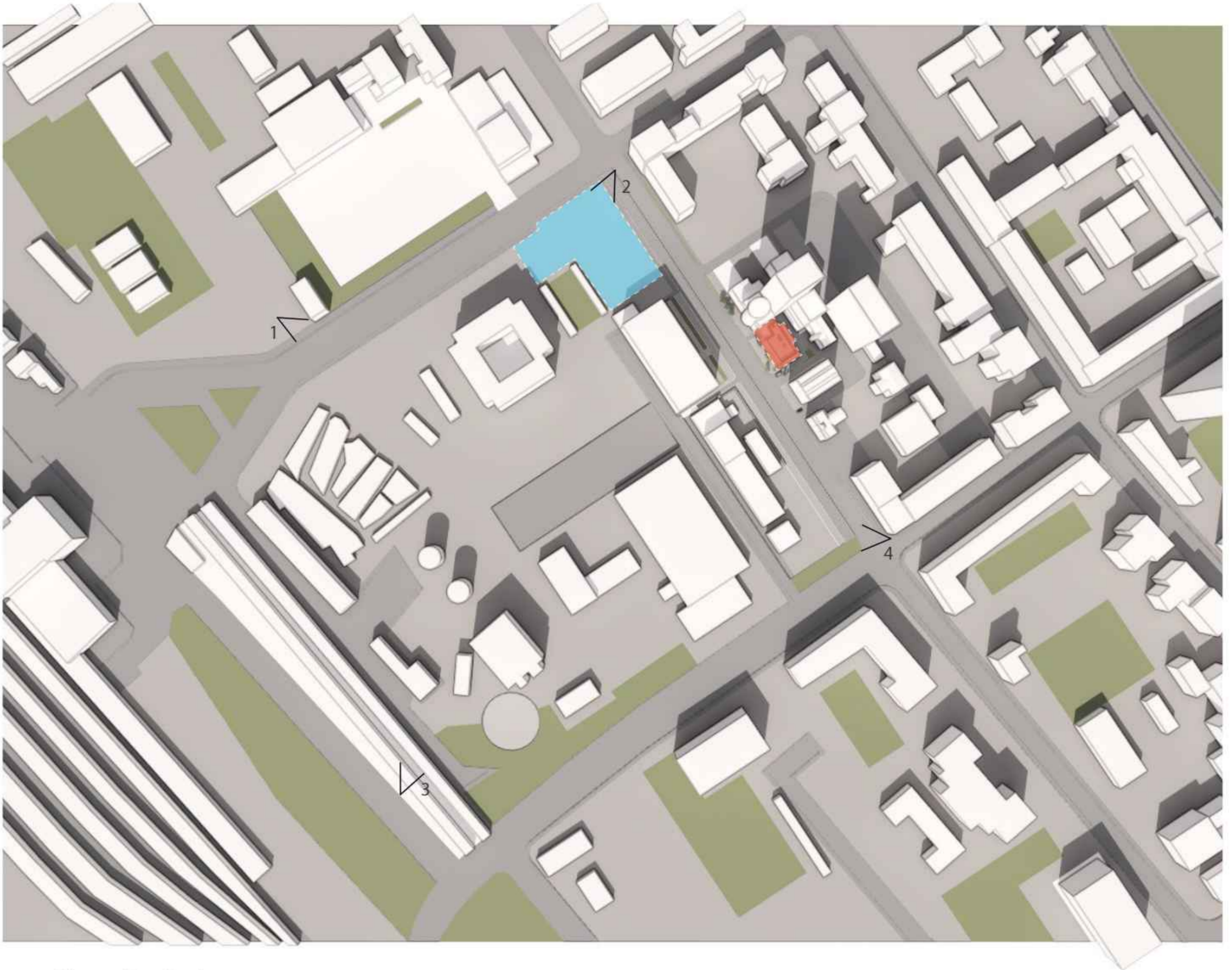
– Damaged property, the threat of infectious diseases, problems with access to drinking water, destroyed protected areas with thousands of unique plants and animals, pollution of water bodies with silt, everything from landfills, cemeteries, corpses of dead animals was washed away by flooding.



– "Lower Dnieper", "White Bank of Svyatoslav", "Oleshkiy Sands", "Kinburn Spit", "Great and Small Kuchugur Archipelago", "Seven Lighthouses Floodplain" and "Dzharylgatsky National Natural Park".

– More than 80 species of animals are on the verge of extinction. More than 10,000,000 animals were killed during the war.

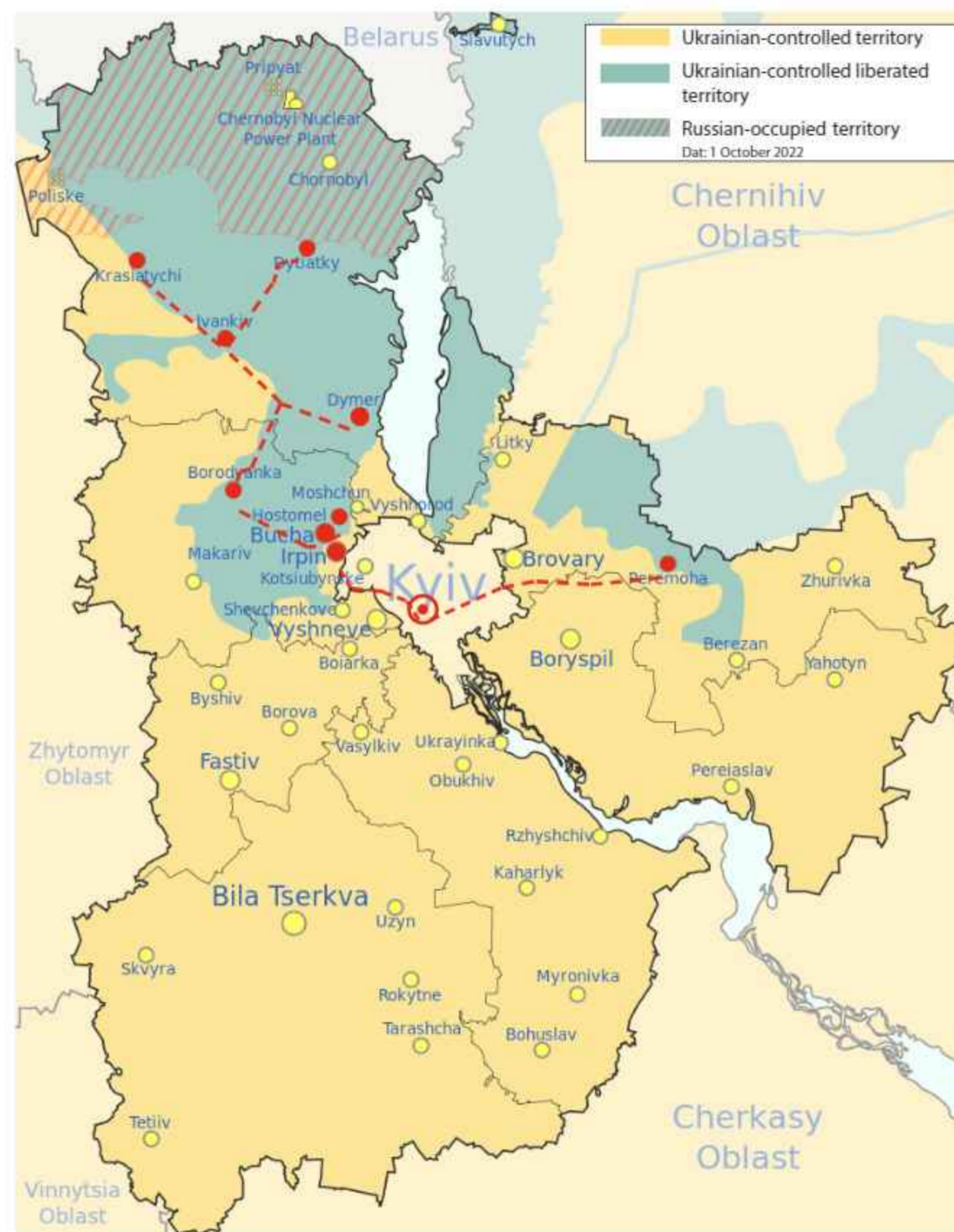
A site for temporary storage of trucks and warehouses of collected materials



Views of the neighbourhood



The route of supplying materials



Map of buildings damaged by shelling in Kyiv/Materials which might be reused



Steel structure



Reinforced concrete floor

1 - Pravda Avenue, 47

On March 20, 2022, the armed forces of the Russian Federation bombed the "Retroville" shopping center located in Kyiv. The "Retroville" shopping center had dimensions of 120,334 cubic meters, an area of 86,000 m2 and contained more than 250 stores.



Brick

2 - St. Berkovetska, 1

On March 17, 2022, the Russian occupiers shelled the Sviatoshyn district of Kyiv, as a result of which several fires broke out, including in the warehouses of the "Ardis" bicycle factory, where a projectile hit, resulting in a fire on an area of about 10,000 m2.



Steel



Brick

3 - St. Almaty, 74

On the morning of June 5, five rockets landed on the left bank of Kyiv. Four of them got to the Darnytskyi Wagon Repair Plant at DVRZ. According to Russian statements, the targets of the strikes were allegedly "T-72 tanks supplied by Eastern European countries and other armored vehicles located in the buildings of the carriage repair enterprise.



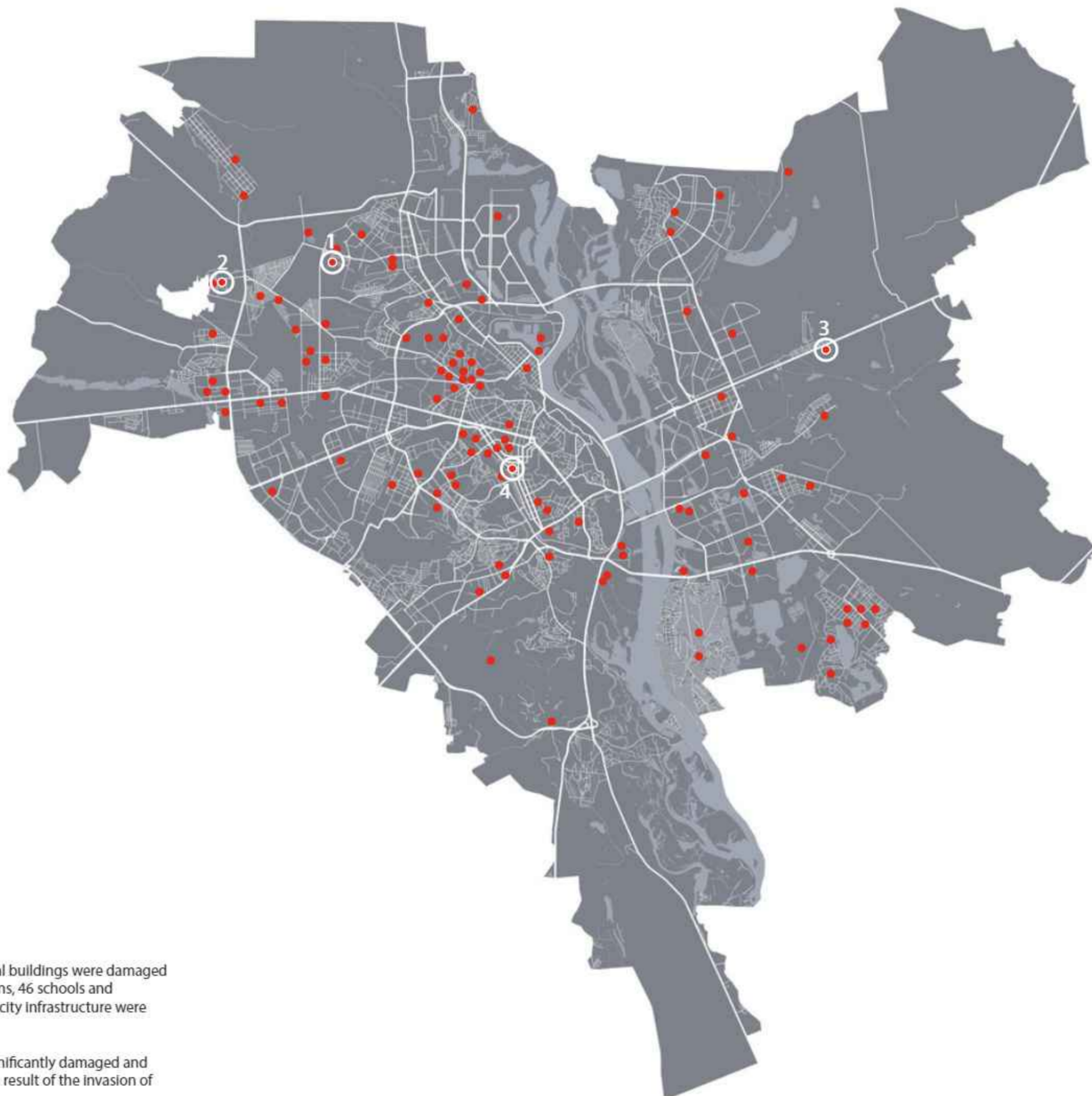
Concrete panels



Tiles

5 - St. Kudryashova, 7

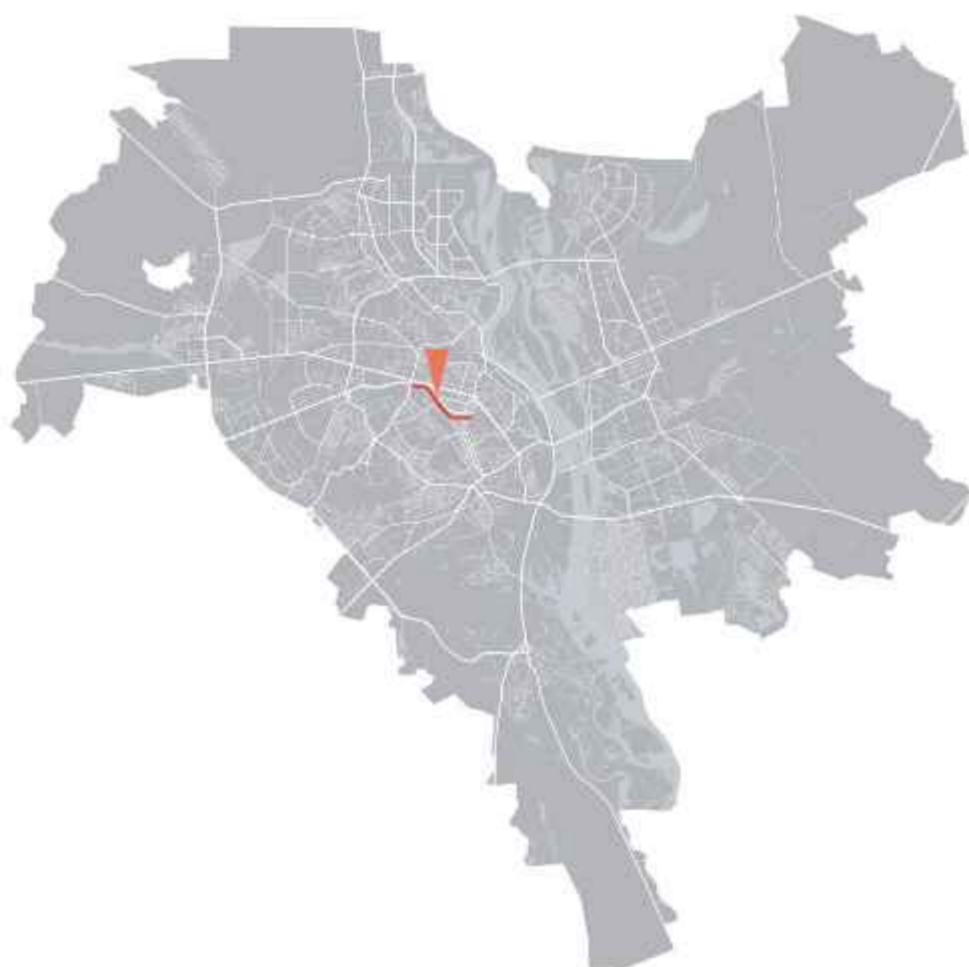
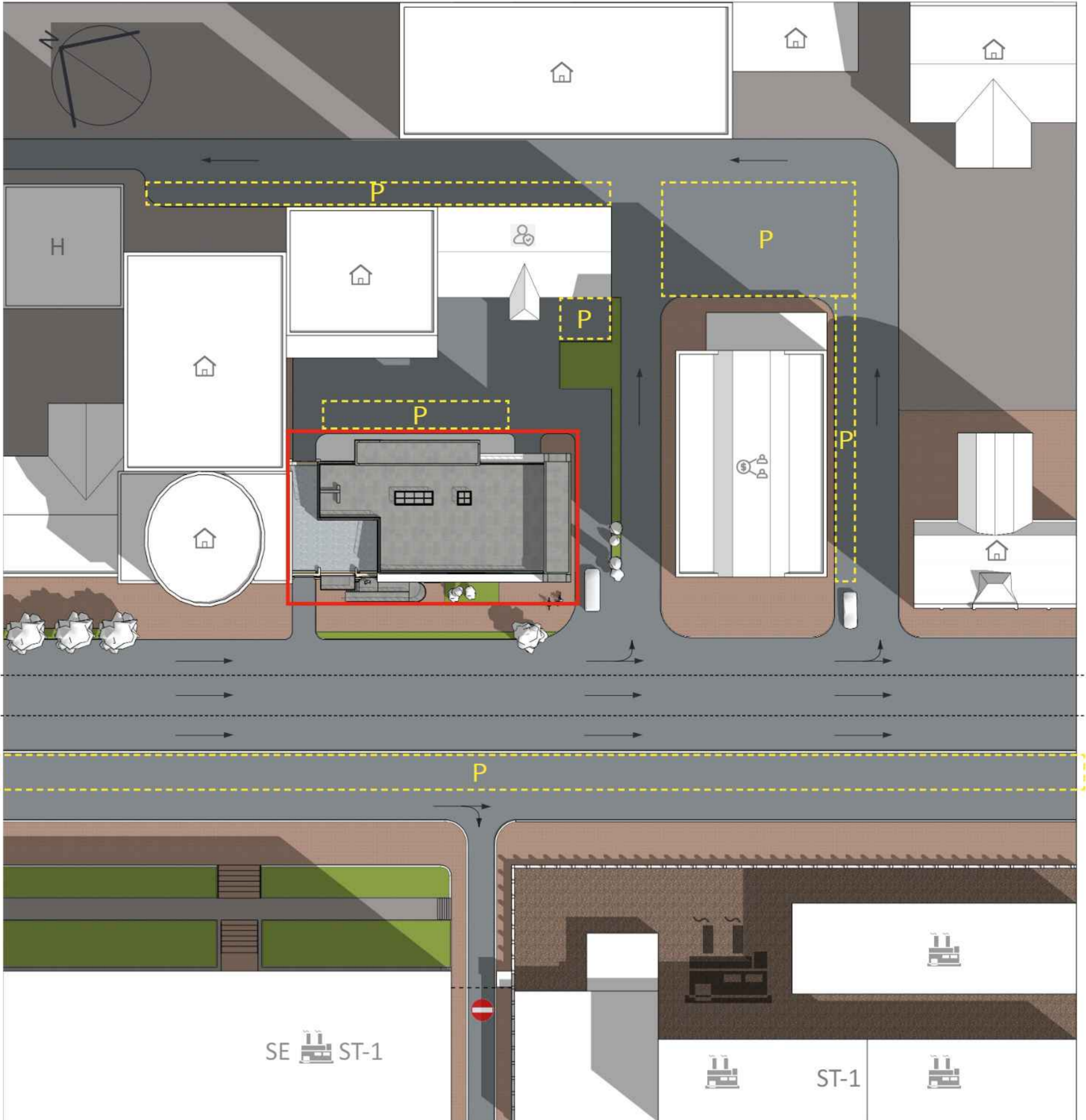
On January 2, 2024, the Russian invaders attacked the capital of Ukraine with massive rocket fire. The three entrances of the residential apartment building, which are completely burnt out, are uninhabitable.



In Kyiv, more than 200 residential buildings were damaged by shelling. Also, 30 kindergartens, 46 schools and more than 70 objects of various city infrastructure were destroyed.

A total of 2,541 objects were significantly damaged and destroyed in the Kyiv region as a result of the invasion of the Russian Federation.

Site plan



LEGEND

- | | | | |
|---|--------------------------------|---|---------------------------|
|  | Design area |  | Factory |
|  | Parking zone |  | Joint stock company |
|  | Asphalt road surface |  | Dwelling |
|  | Old asphalt pavement |  | Educational institution |
|  | Grass |  | Insurance Company |
|  | Pedestrian zone in cobblestone |  | State Enterprise |
|  | Traffic direction |  | Heat supply station No. 1 |
| | |  | Hotel |

Site and building analysis



The facade of the building at Zhilyanska street in the environment, 2019

The house on Zhilyanska Street, 116-A is a residential building in the Shevchenkiv district of Kyiv, on Zhilyanska Street. It was built at the end of the 19th and the beginning of the 20th centuries, but, despite some architectural and historical value, it does not have a protective status.



St. Zhilyanska 120, 118, 116A, 1979. 2-story building (118) demolished in 1988

The plot on which house No. 116 stands has belonged to a merchant of Jewish origin, J. Lev, since at least 1899. Yosyp Isakovich (real name - loselian Itskovich) Lev was a Kyiv merchant of the 1st guild and in 1871 he founded an enterprise (factory) for the production of bent iron furniture and other metal products, the factory itself was located on the same Zhilyanska Street at No. 87.



1980, St. Zhilyanska, the beginning. Steam compression station



Brick facade with risalites, decorated with pilasters

The house was built in the popular at that time "brick style". The front facade has a symmetrical three-axis composition inherent in the brick style, formed by risalites, decorated with pilasters. The facade is quite richly decorated with stucco neo-Gothic inserts above, below and between the windows, a toothed cornice and inter-floor belts. The space between the risalites is occupied by two rows of balconies, from the second to the fourth floor. The windows are rectangular, in the side bays — narrow, paired.



The building after the shelling, front view, 2020

The building suffered significant damage on the morning of October 17, 2022, when Shahed-136 kamikaze drones attacked Kyiv, hitting the building caused a fire and the collapse of part of the structure. The mayor of Kyiv declared that the building was recognized an emergency and could not be restored.



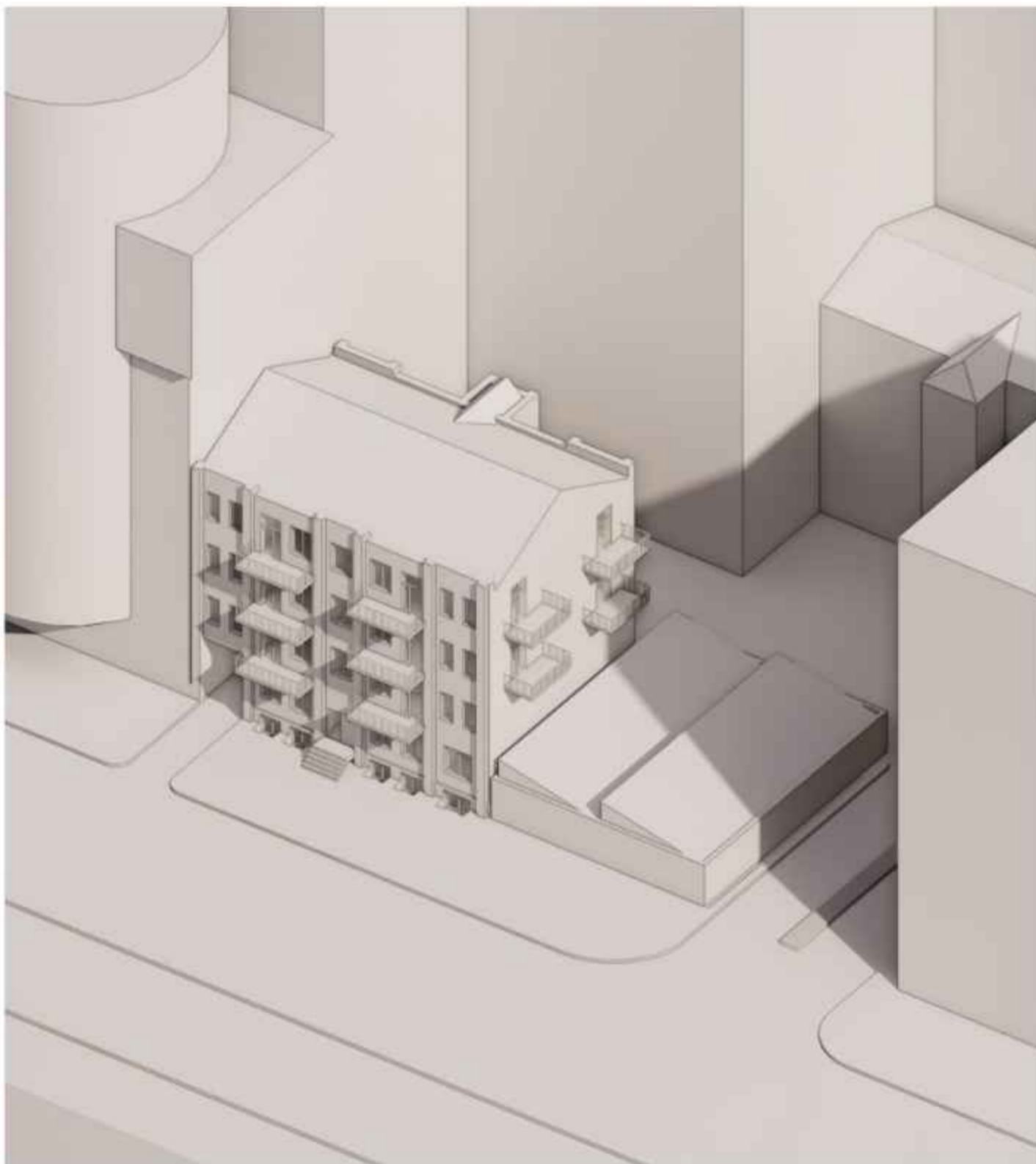
The building after the shelling, lower part of the building, 2021

The 1st, 2nd, and 3rd floors of the right part of the building were destroyed, the back wall was preserved, and the outer wall of the building on the right side partially collapsed. Garages and boiler rooms to the right of the building were destroyed by the impact.



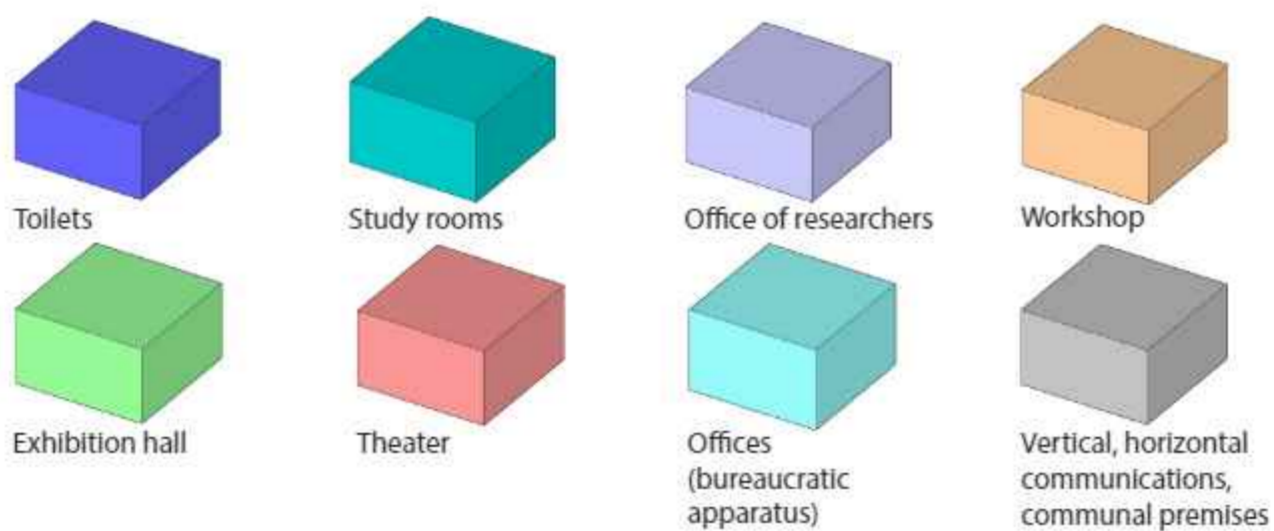
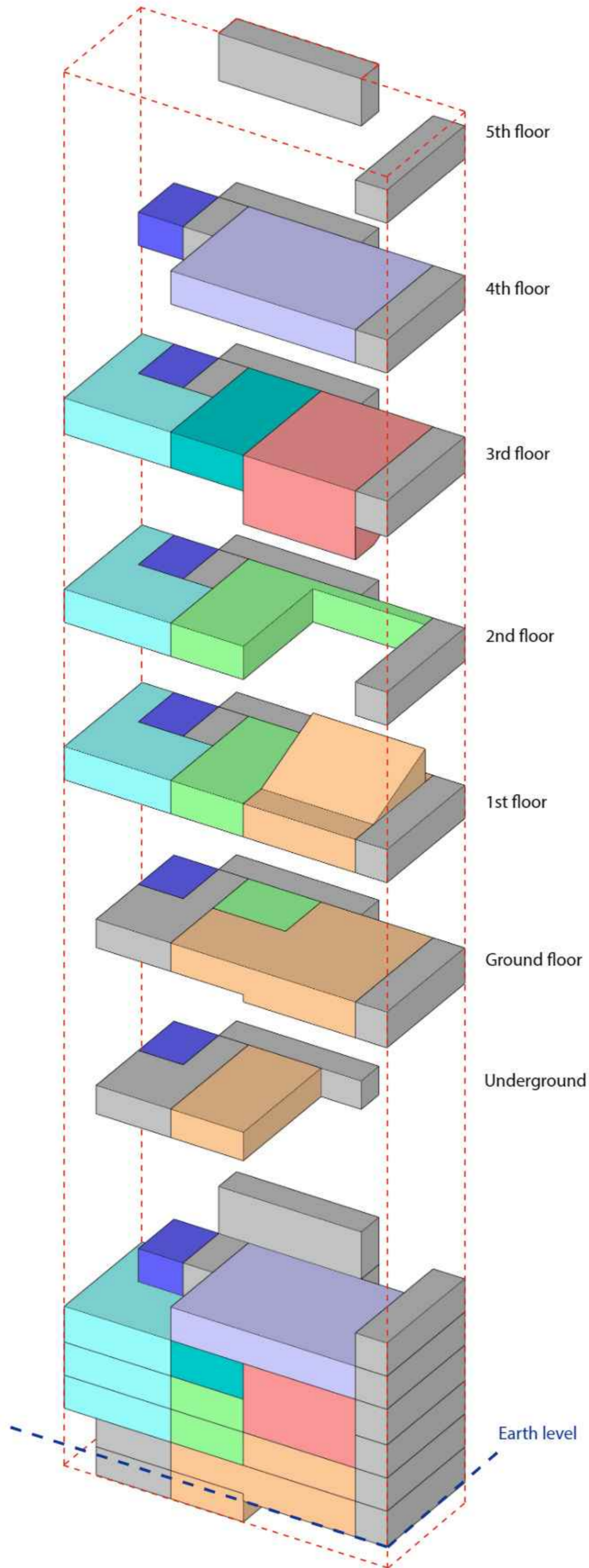
The building after the shelling, upper part of the building, 2021

Internal structures that have endured. The stairwell collapsed, there is no access to the surviving apartments. There are original wooden floor beams, in some apartments the floor structures have been reinforced or replaced with hollow concrete slabs. The roof lining has collapsed, the attic floor is missing. The roof structure is wooden with zinc roofing.

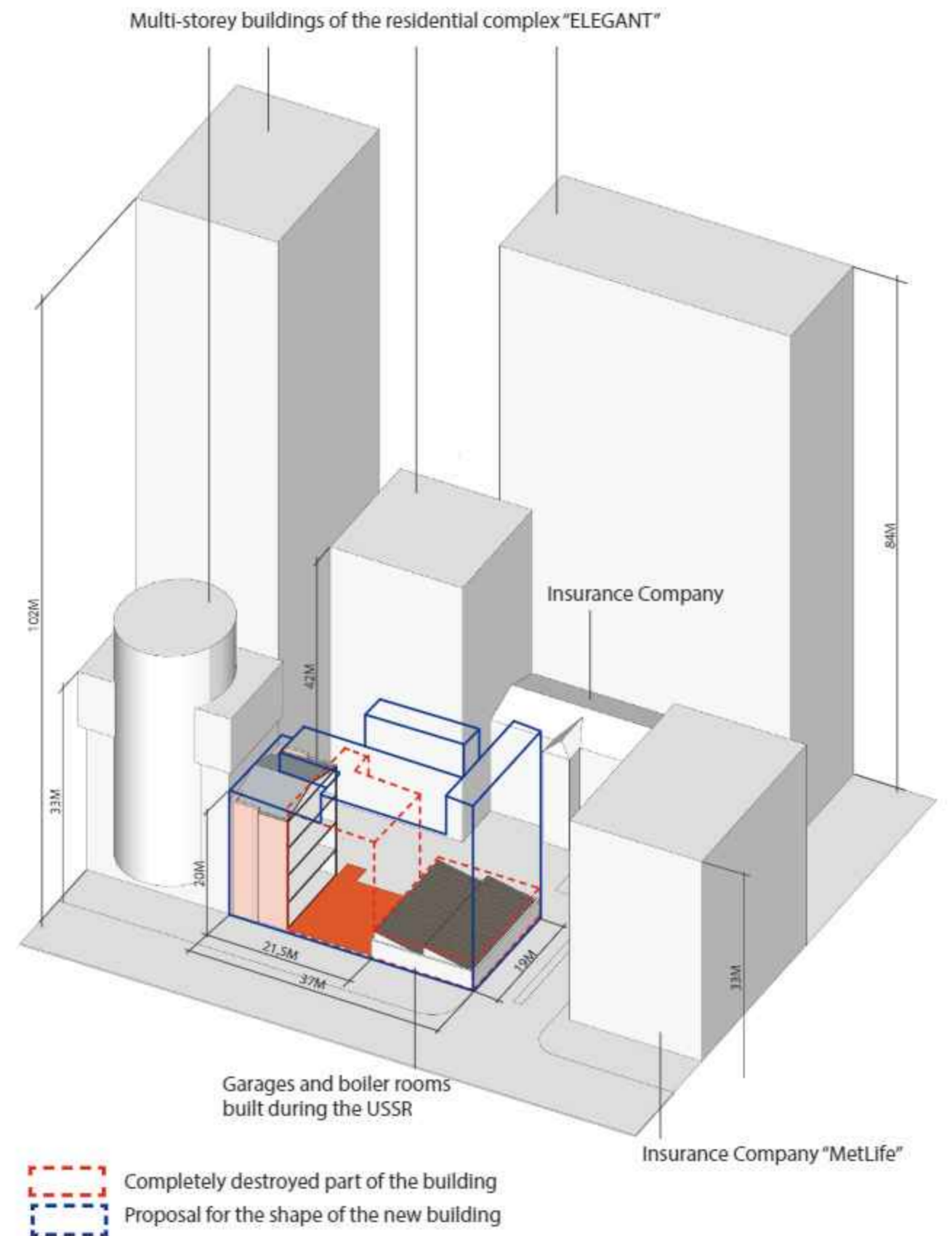


The building before/after destruction

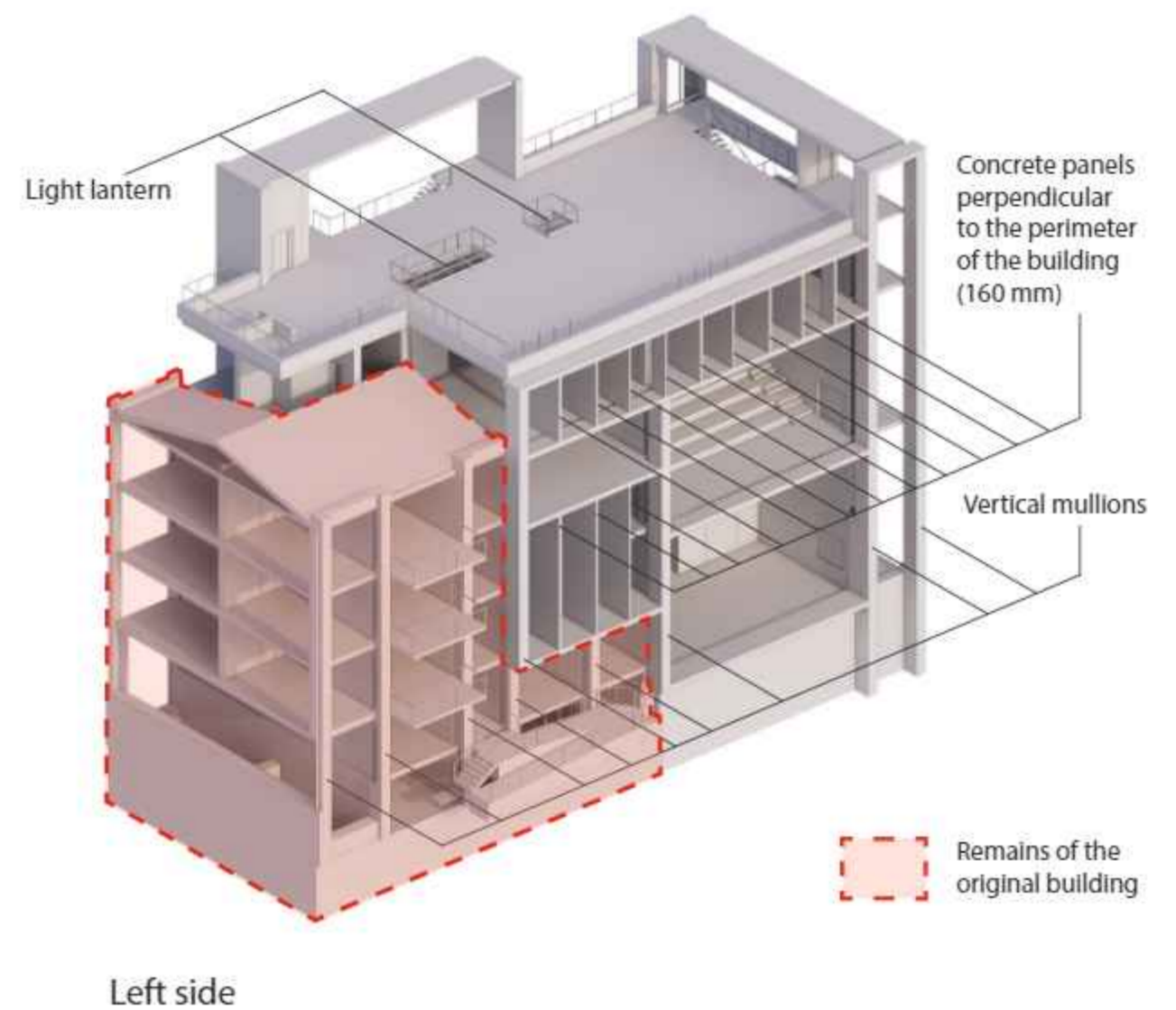
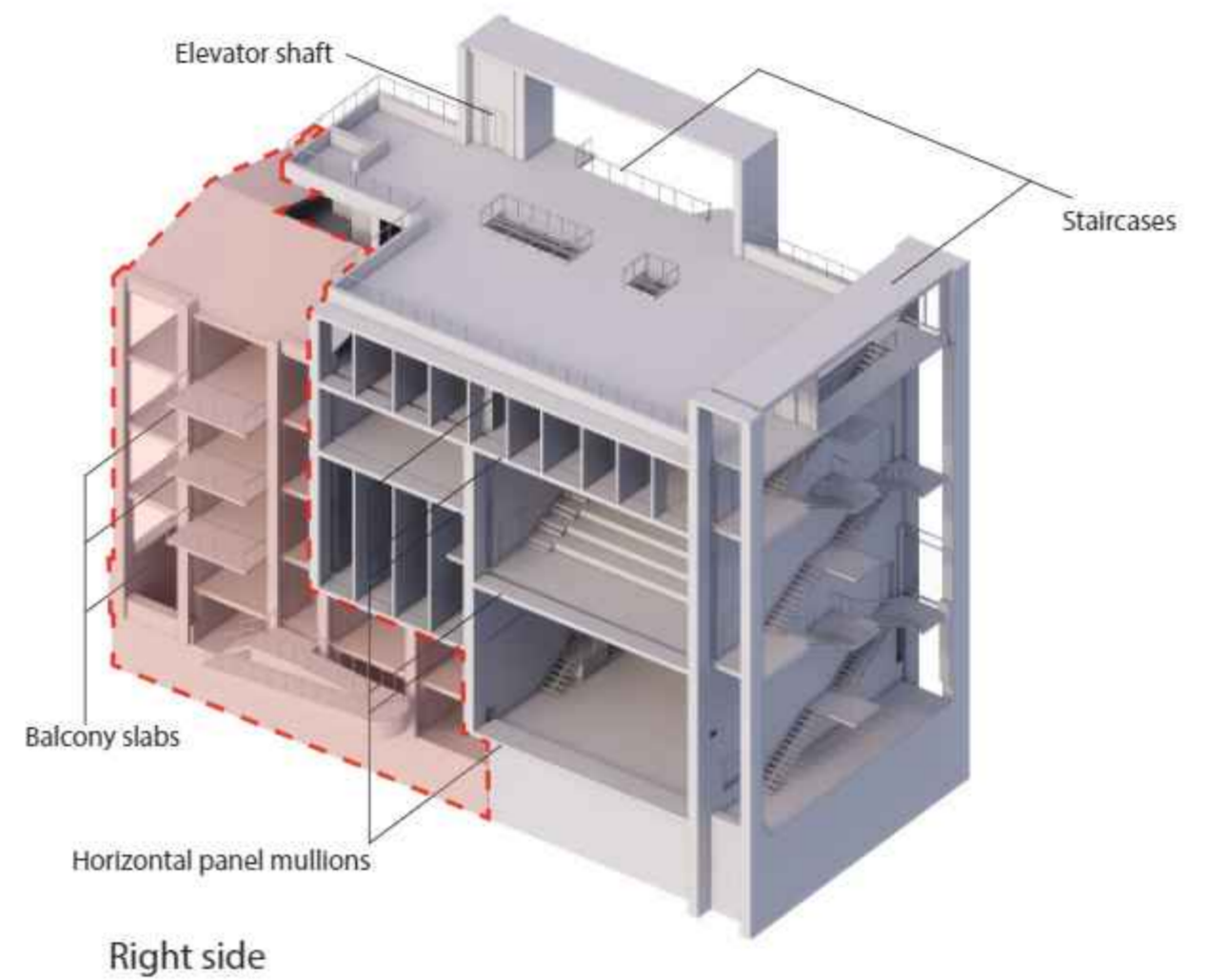
Programme



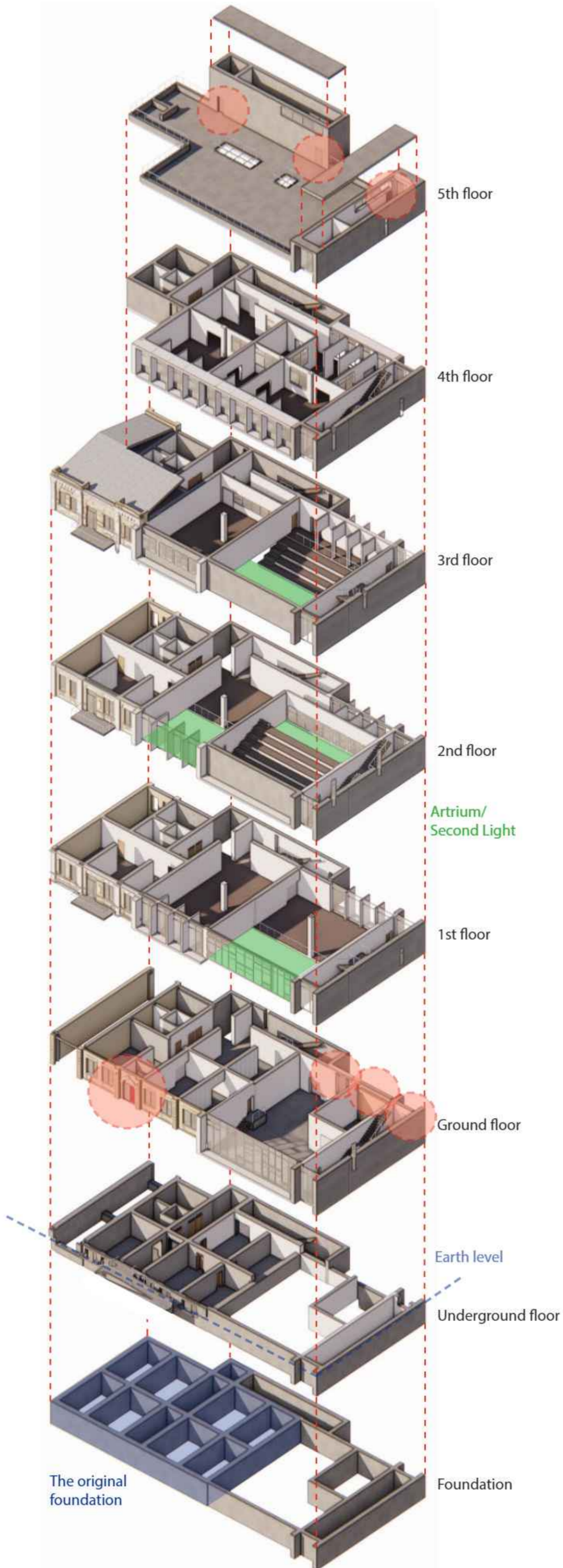
Iso exploded system of functions



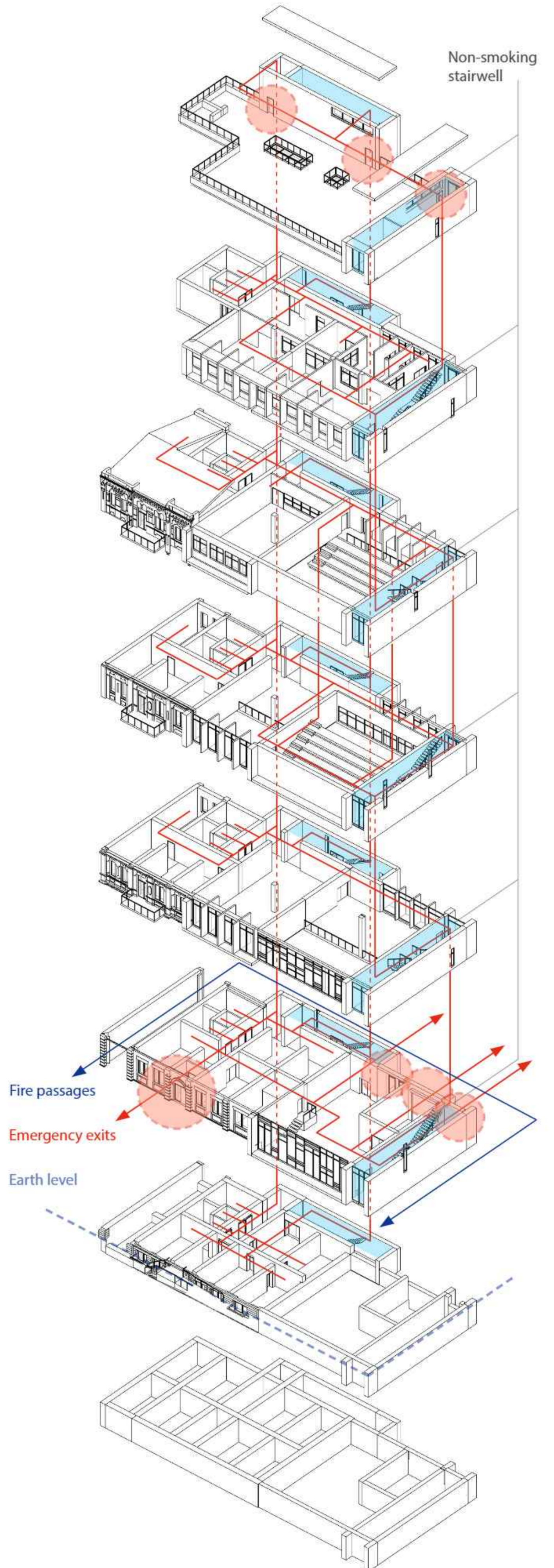
Analysis of the heights of the surrounding buildings and proposal of the shape of the building



Exploded systems of the building

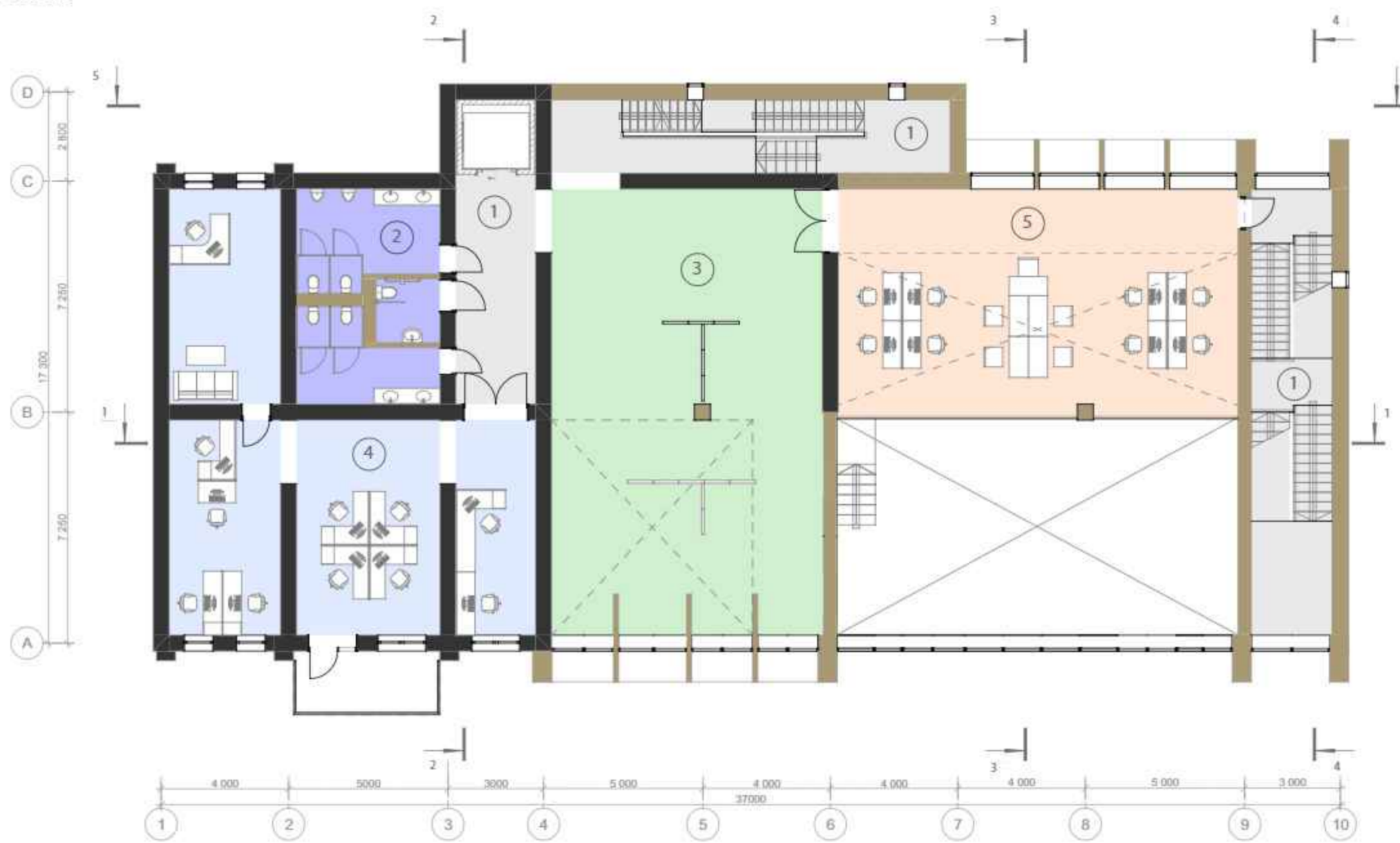


Exploded view of the building by floor



Routes of circulation of people in the building

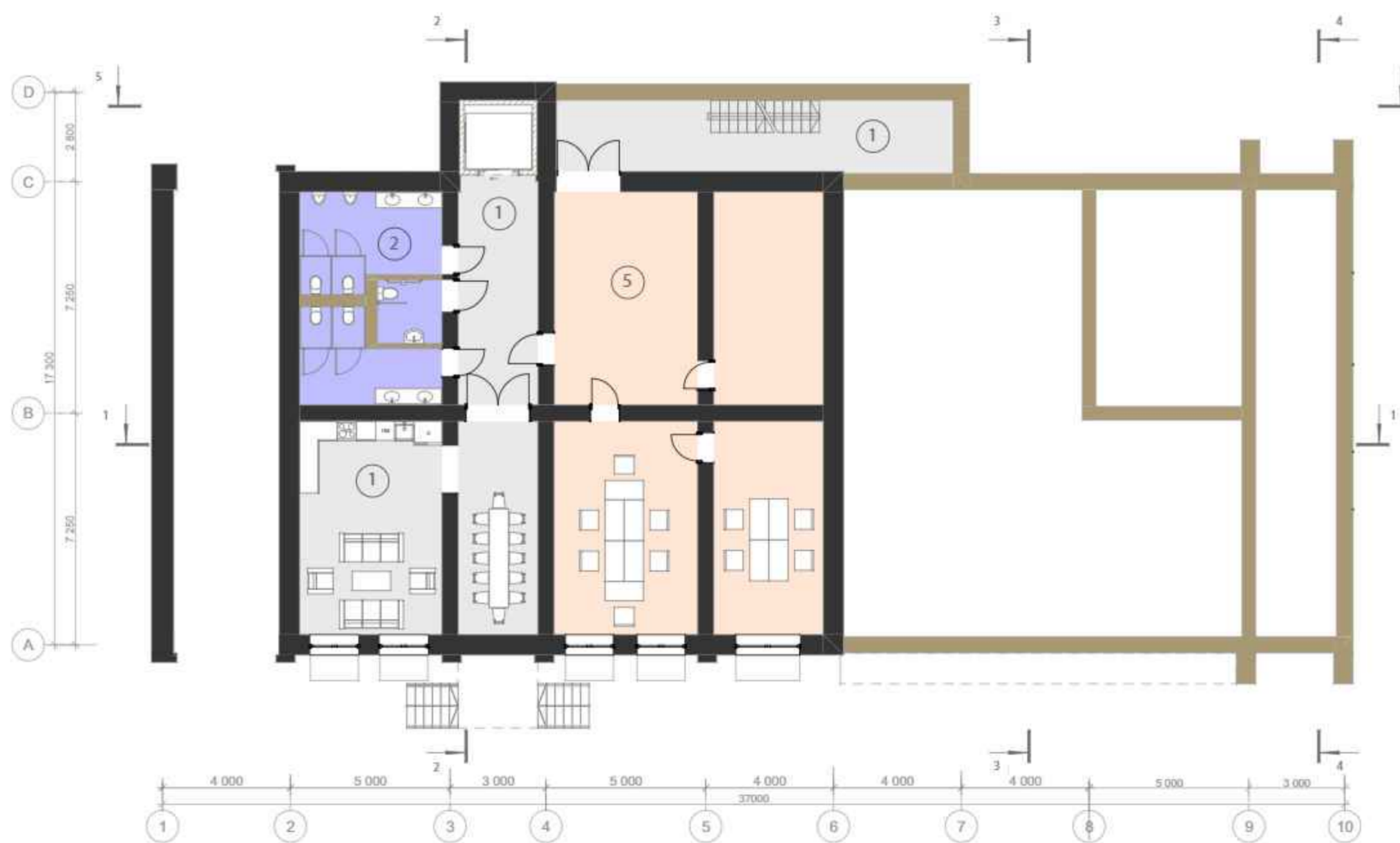
Plans



1st floor

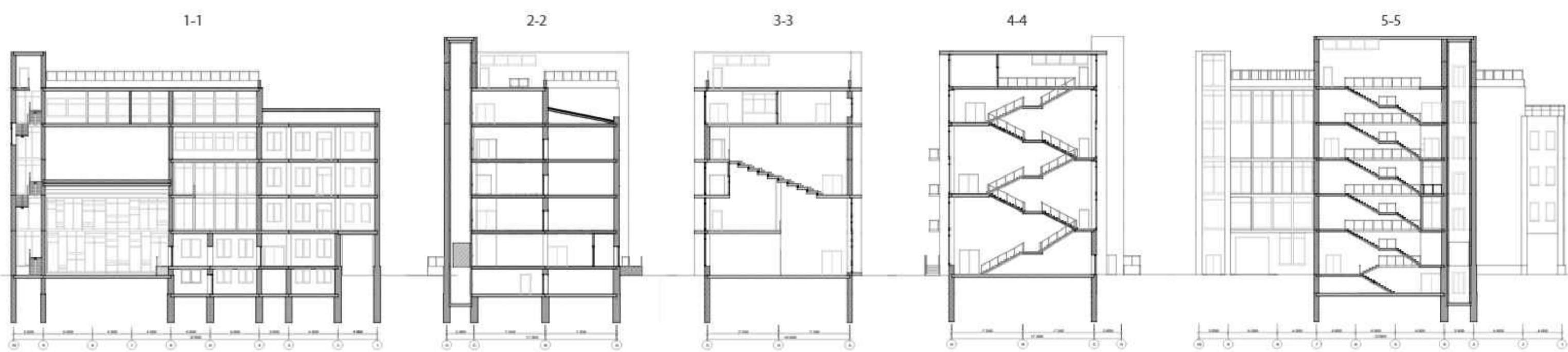
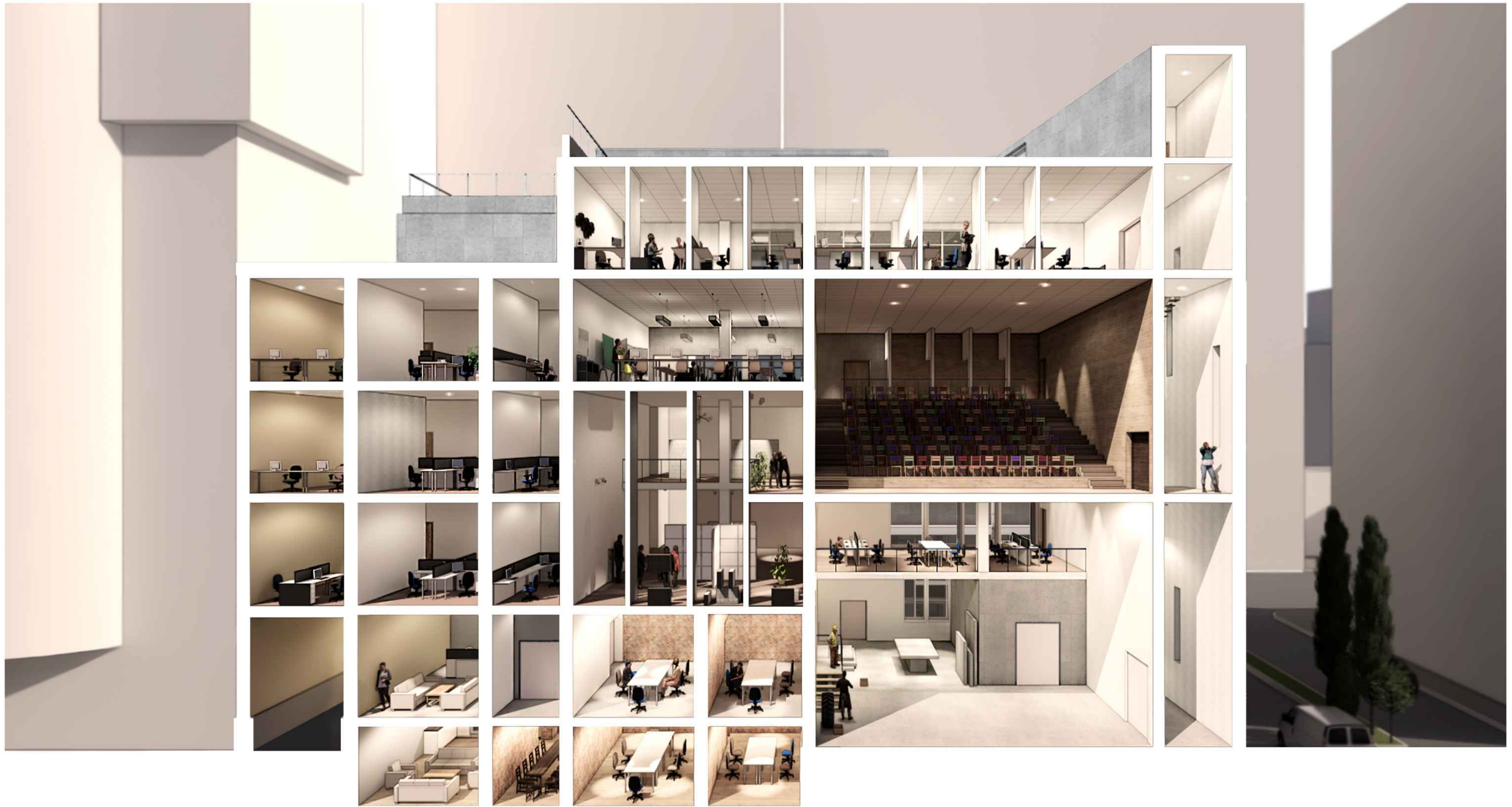


Ground floor



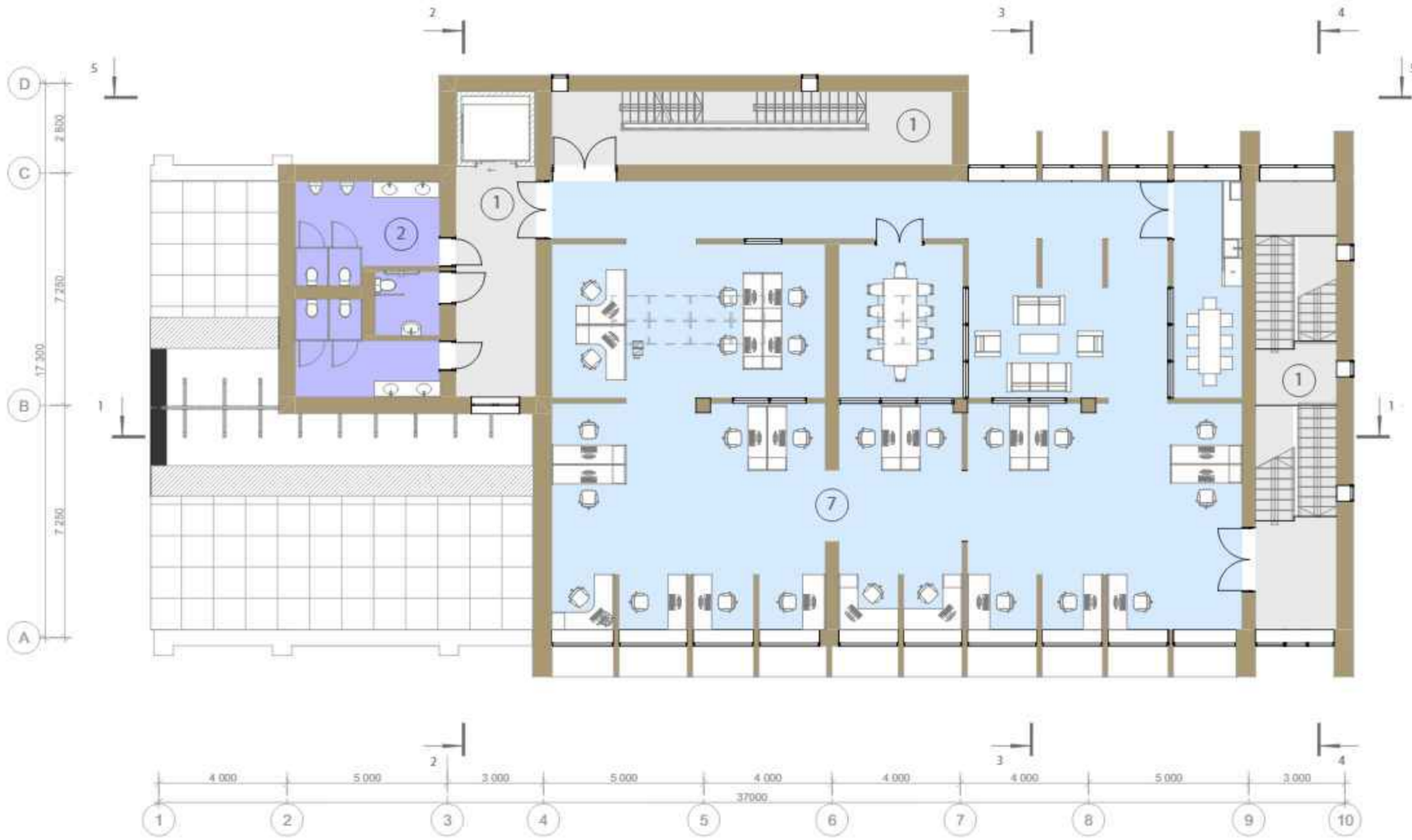
Underground floor

- ① Vertical and horizontal communications, communal premises
- ② Toilets
- ③ Exhibition hall
- ④ Offices (bureaucratic apparatus)
- ⑤ Workshop

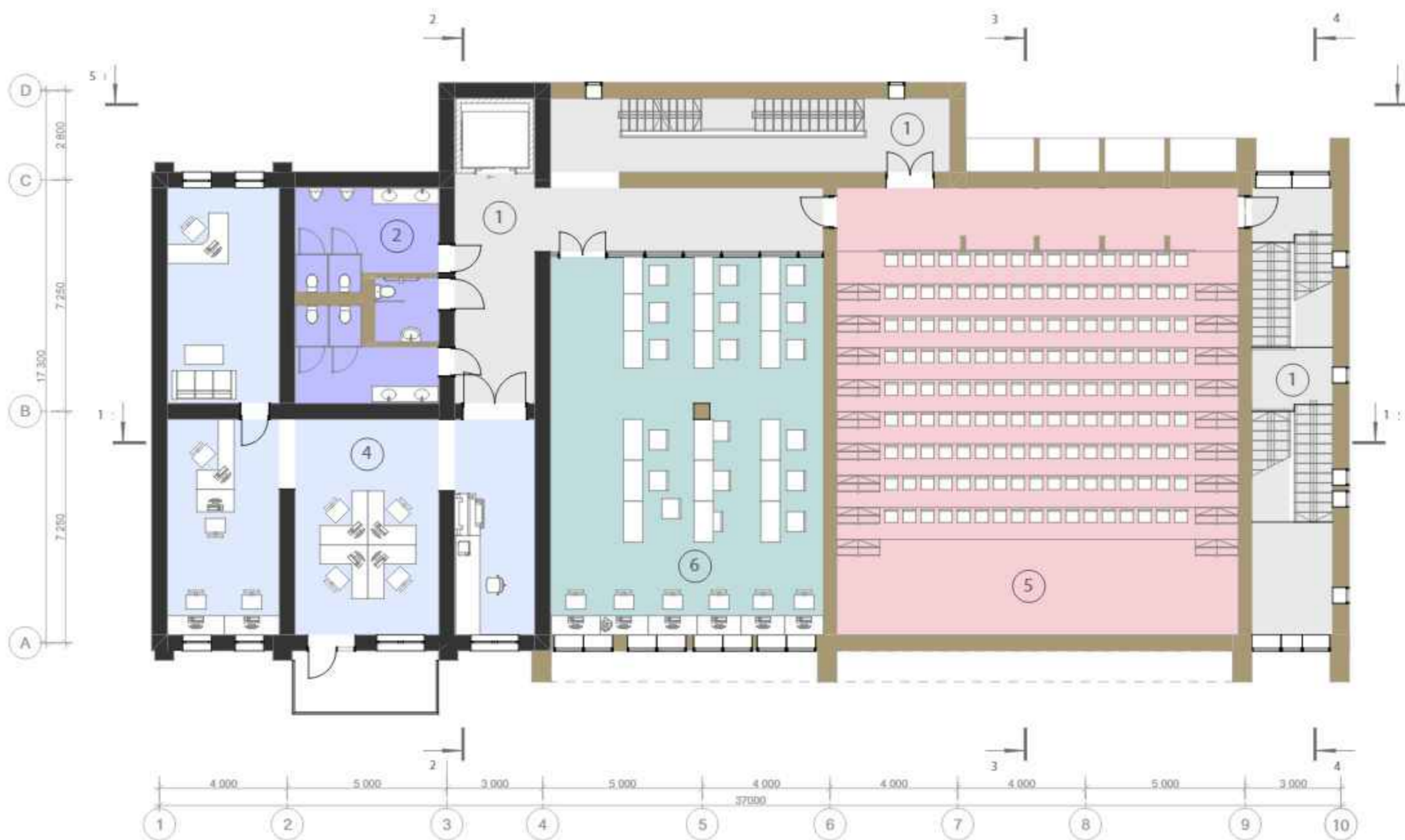


Sections @1:500

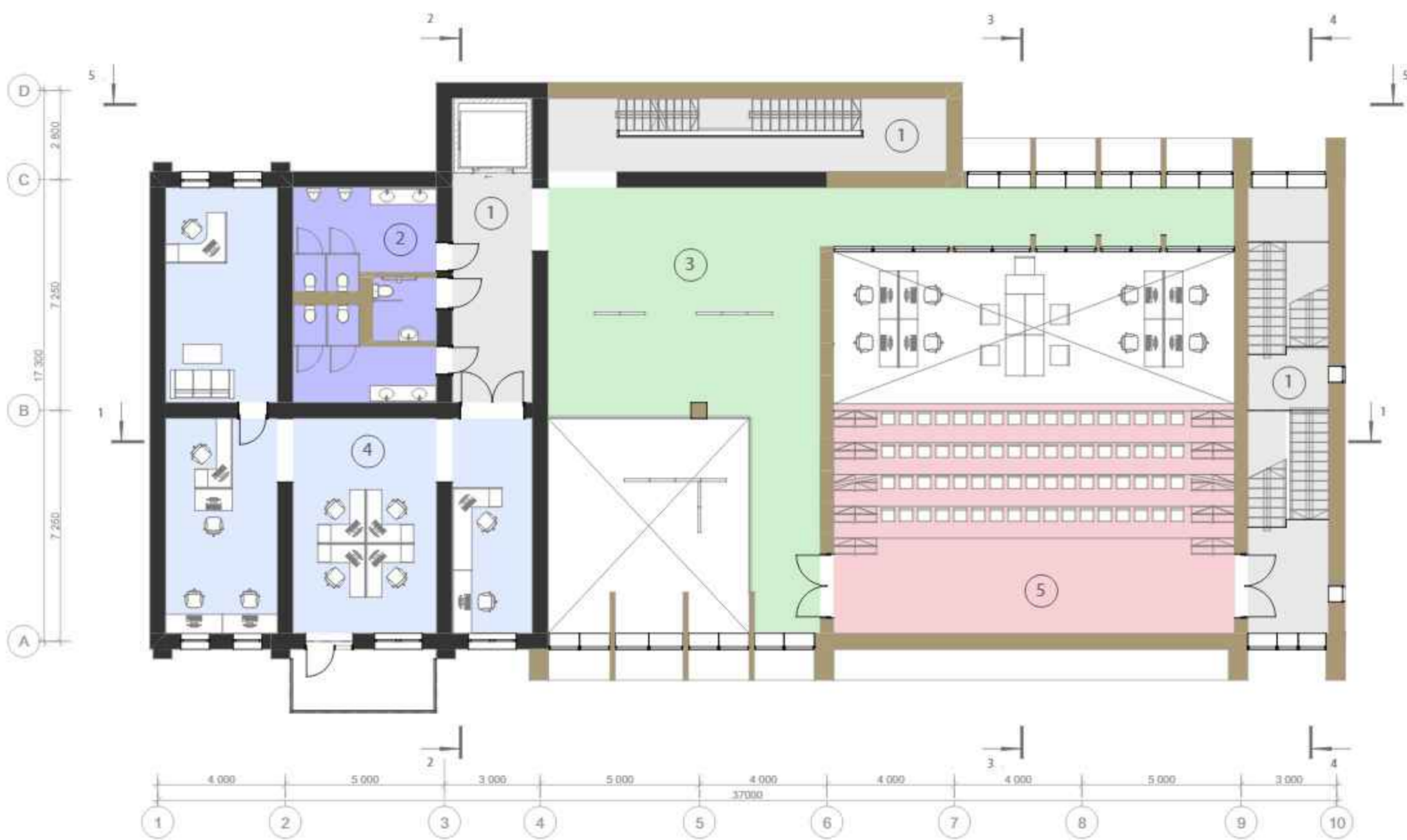
Plans



4th floor



3rd floor



2nd floor

- ① Vertical and horizontal communications, communal premises
- ② Toilets
- ③ Exhibition hall
- ④ Offices (bureaucratic apparatus)
- ⑤ Theater
- ⑥ Study rooms
- ⑦ Office of researchers



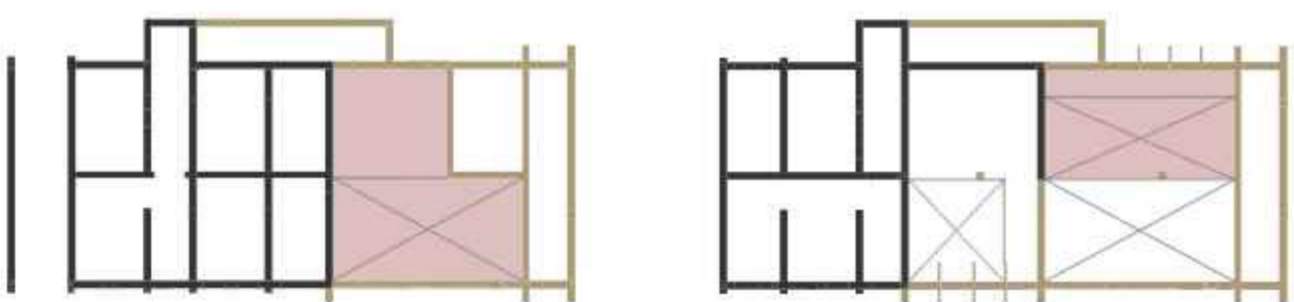
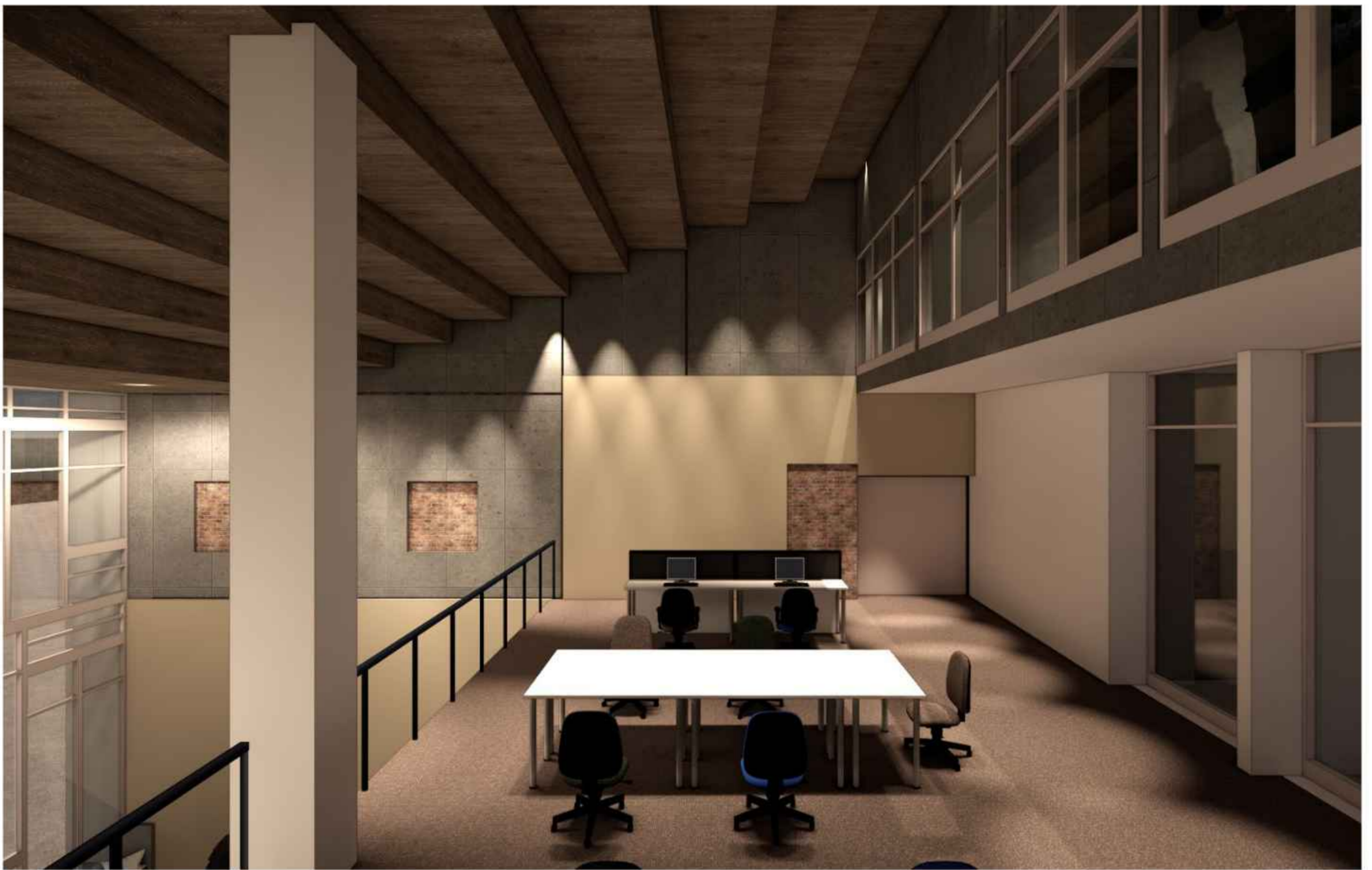
Street elevation



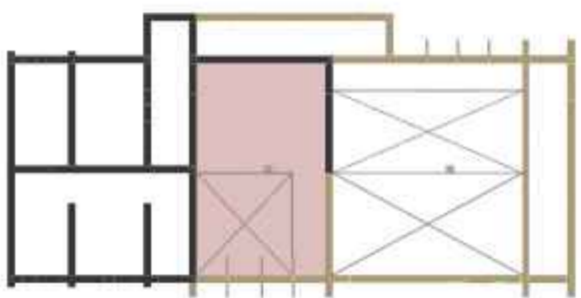
Courtyard elevation



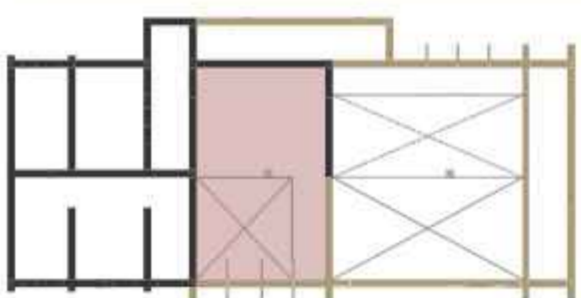
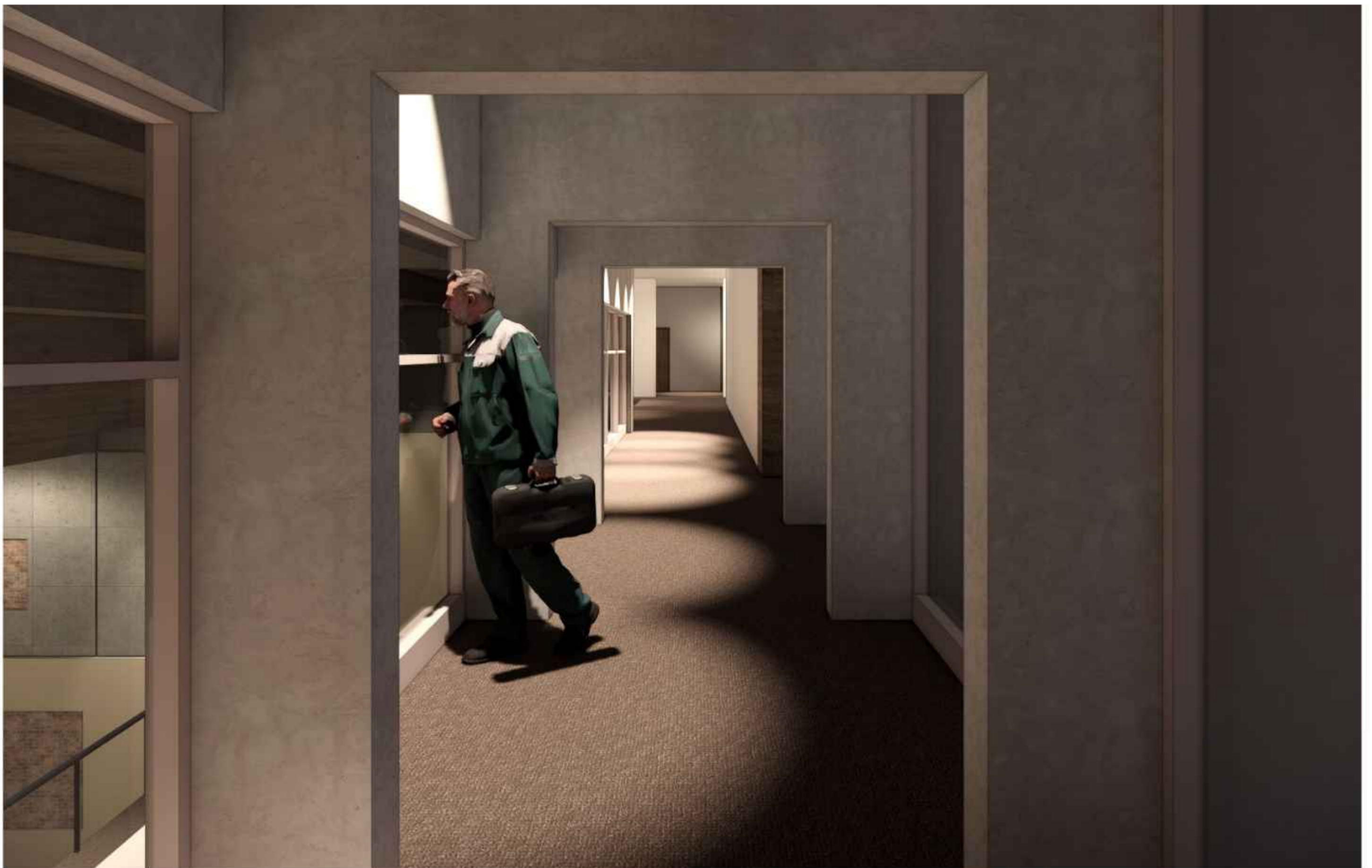
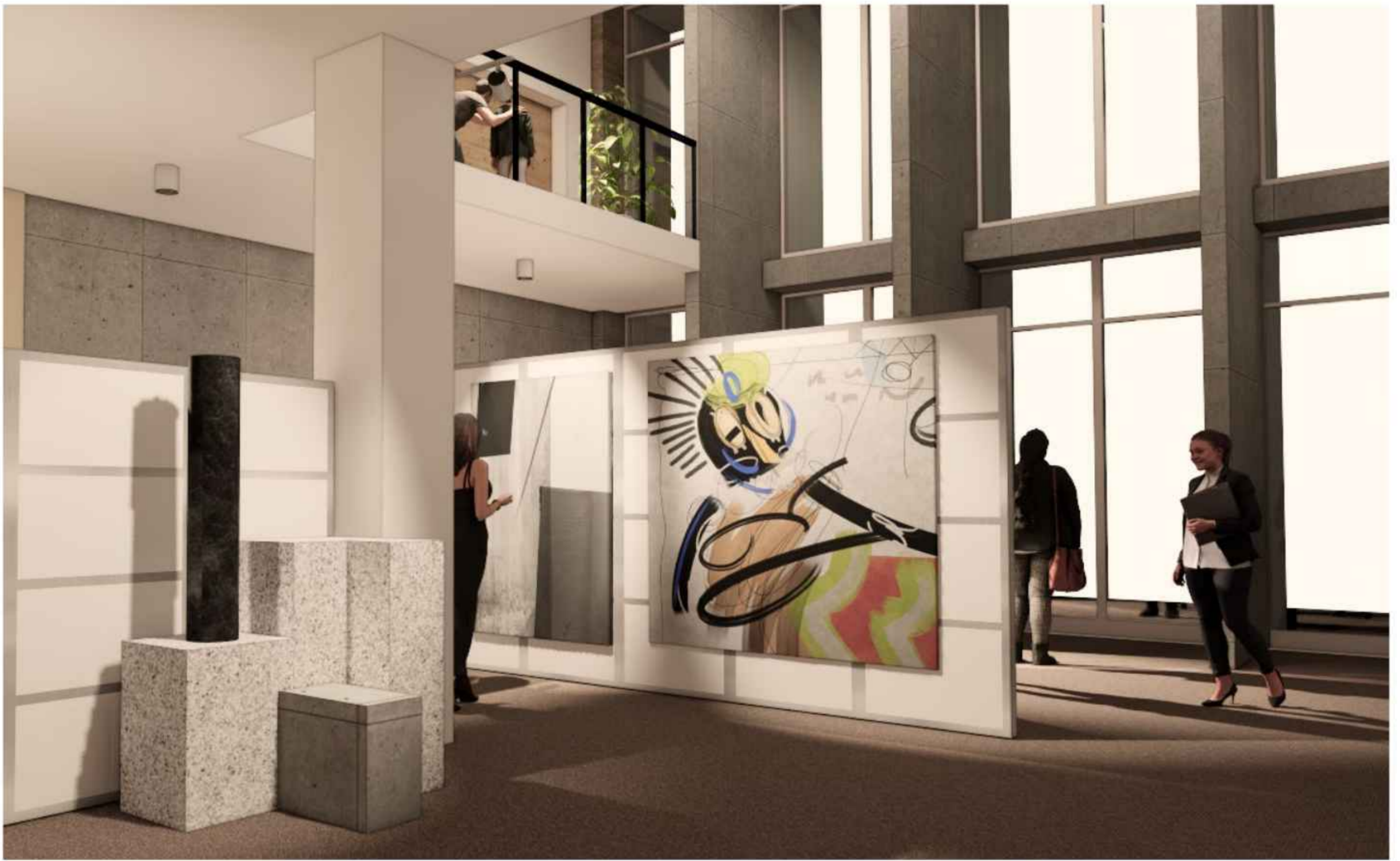
Side elevation



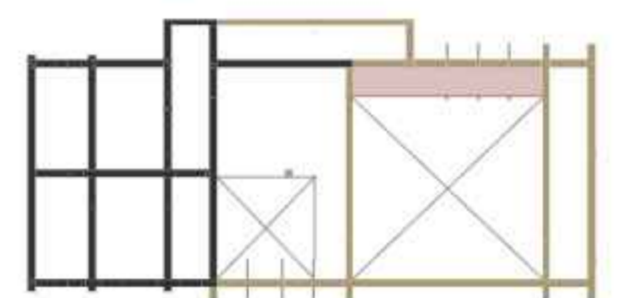
Workshop (Ground, 1st floor)



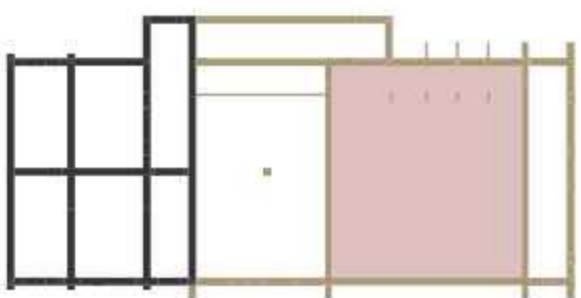
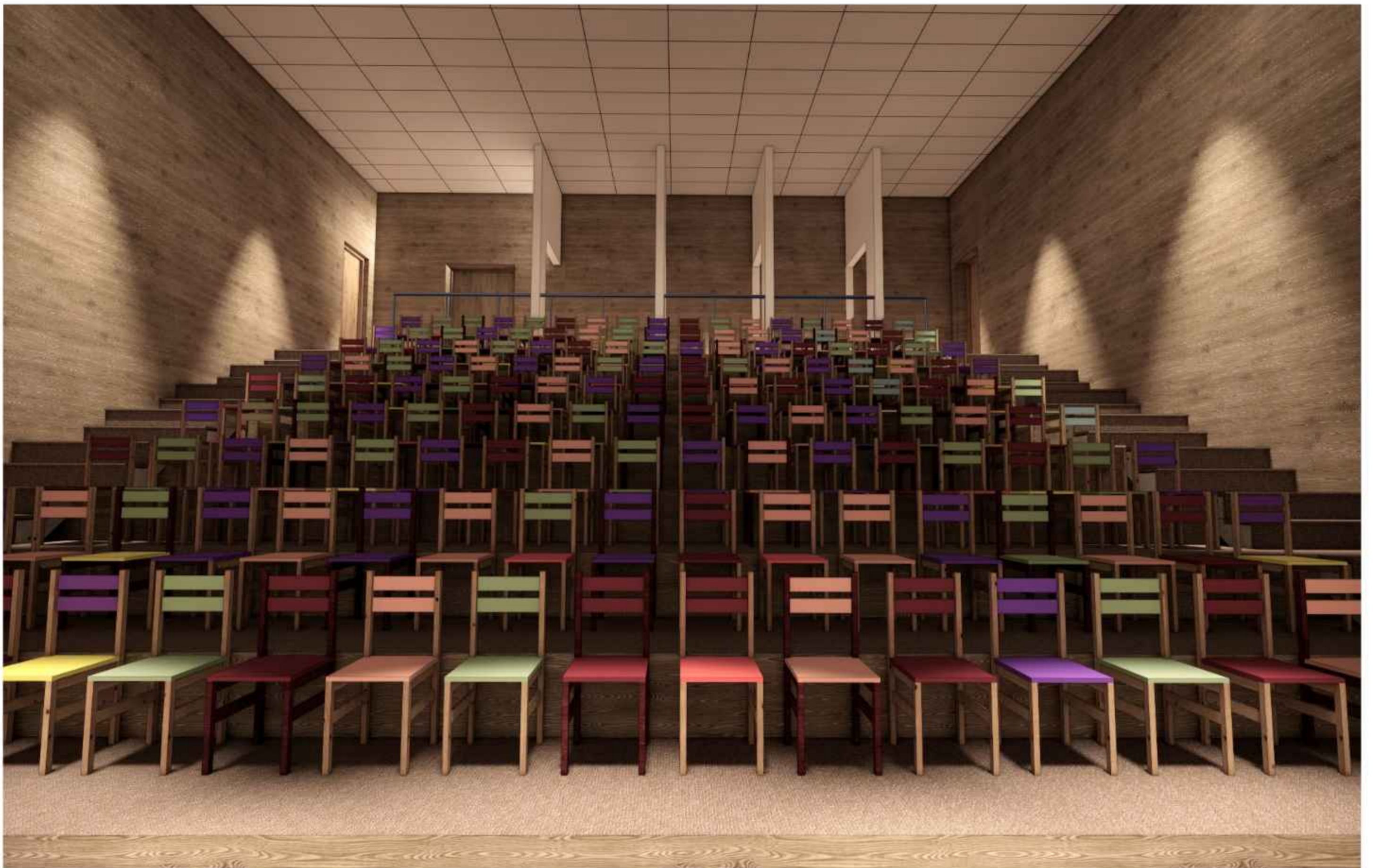
Visualization of the gallery (1st, 2nd floor)



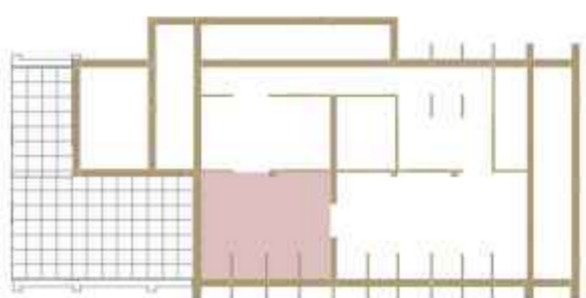
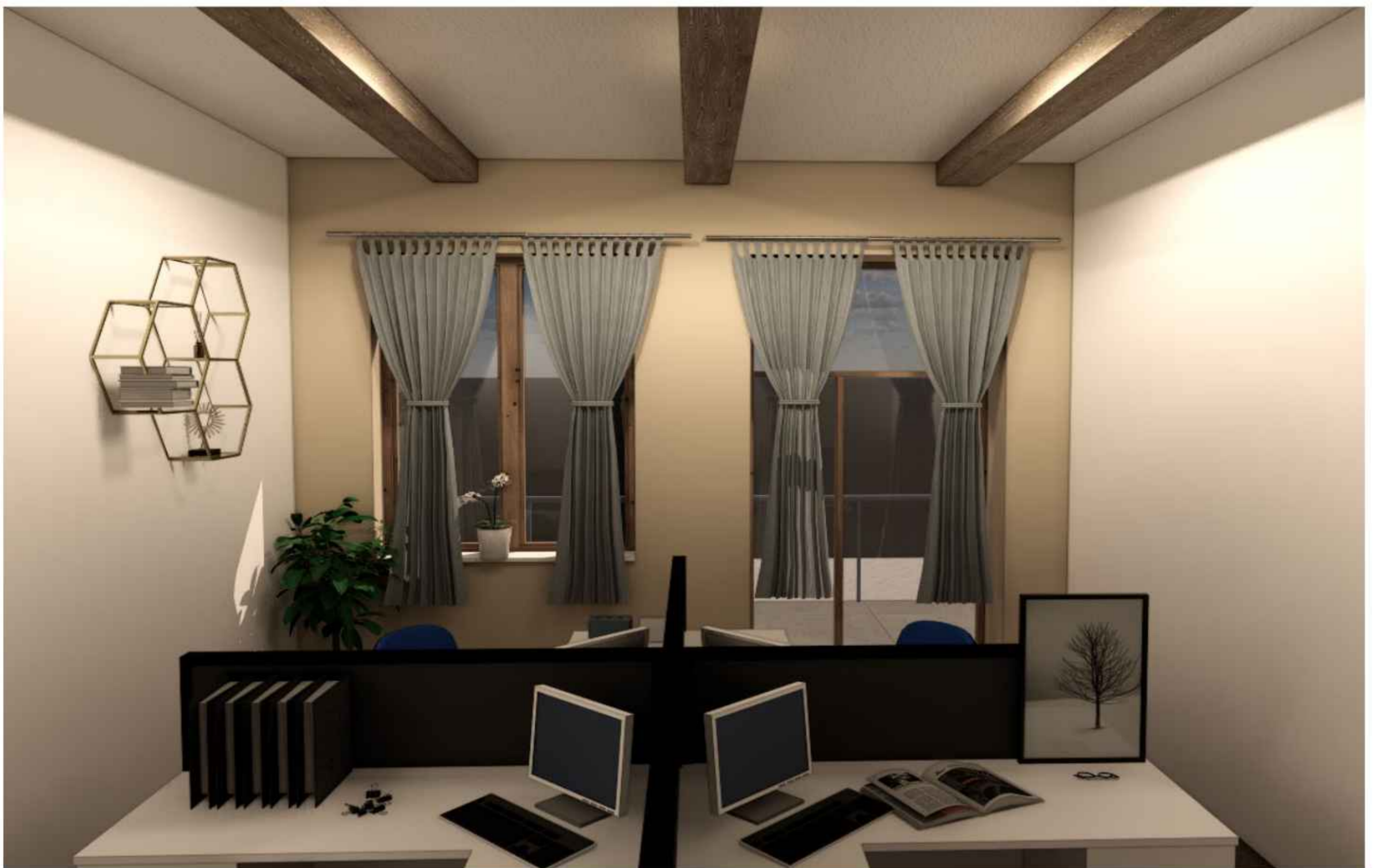
Visualization of the gallery (1st, 2nd floor)



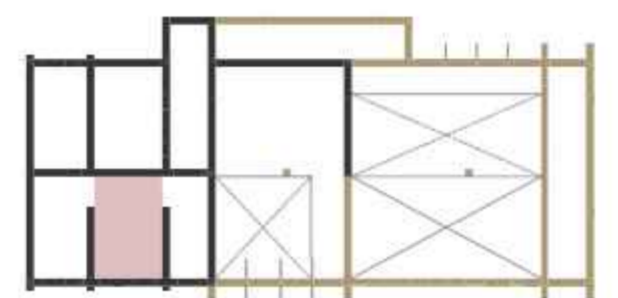
Glazed gallery-corridor (2nd floor)



Lecture hall (2nd, 3rd floor)



Visualization of the office of researchers
(4th floor)



Offices, bureaucratic apparatus
(3rd floor)



