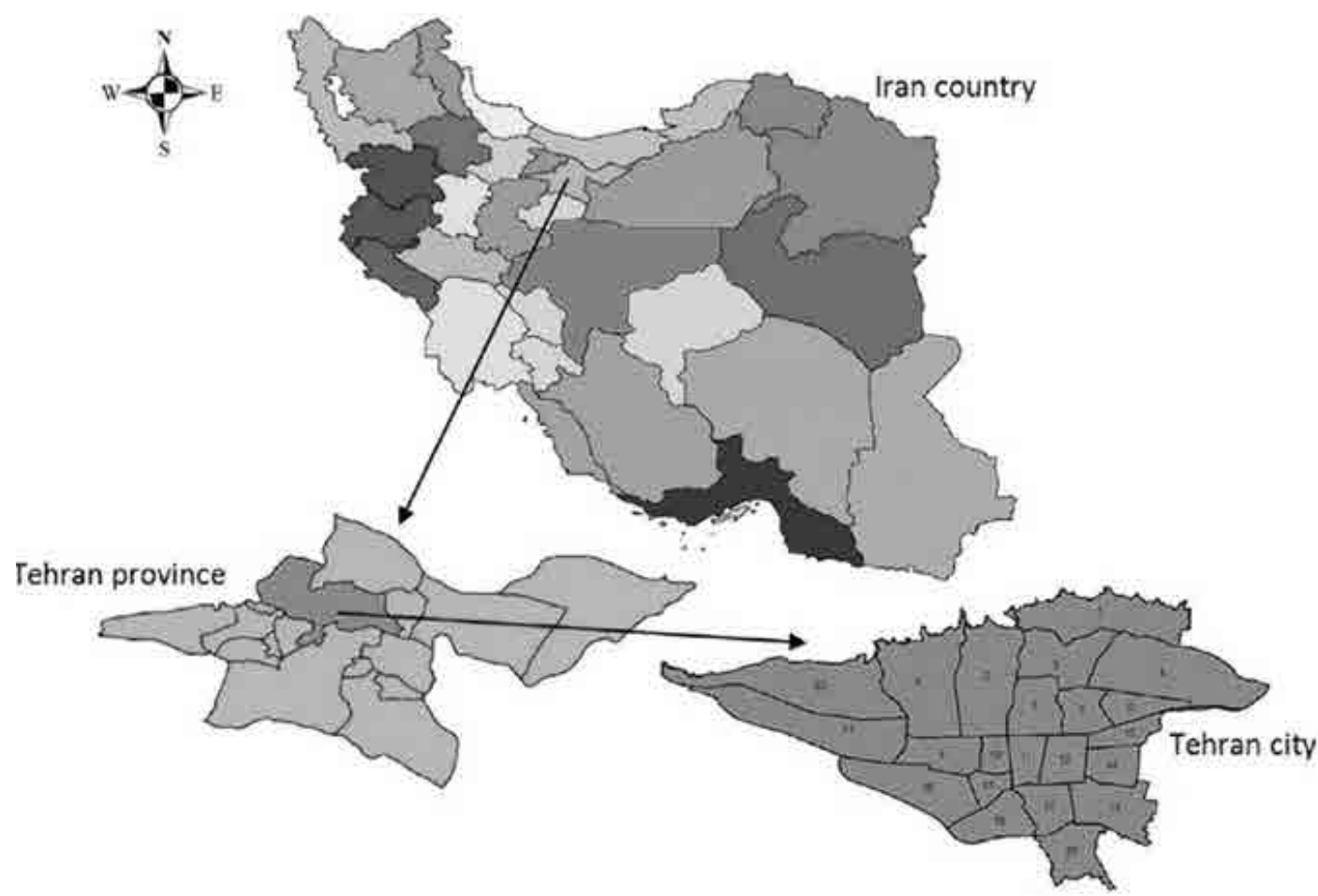


Geographic location of Tehran

As we look around from the center of Tehran, the Alborz Mountains in the north and the Alborz Heights in the east. The current range of Tehran has extended from about 900 to 1800 meters above sea level. The north of the city is about 1300 meters in Tajrish Square and is 1100 meters in the south of the Rah-Ahan Square. That is, there is 3.5 meters per kilometer.



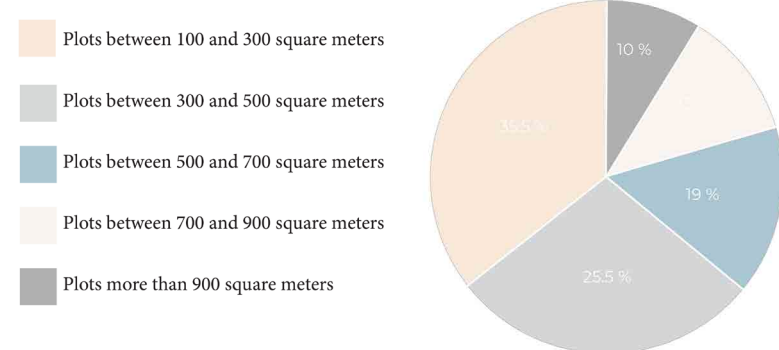
Body system

As can be seen, the elongation and orientation of the blocks are completely consistent with the topographic and longitudinal lines. Also, the width of the blocks varies according to factors such as land with different slope percentages. The type of blocking in this site is introverted and does not provide different options for pedestrian movement and practically creates impenetra-



Dimensions and grading of part

About 87 percent of residential lots have an area of more than 300 square meters. In this way, we are facing a coarse texture in this site.



4.2 WHAT is the novelty in Tehran

4.2.1 What should improve in Tehran

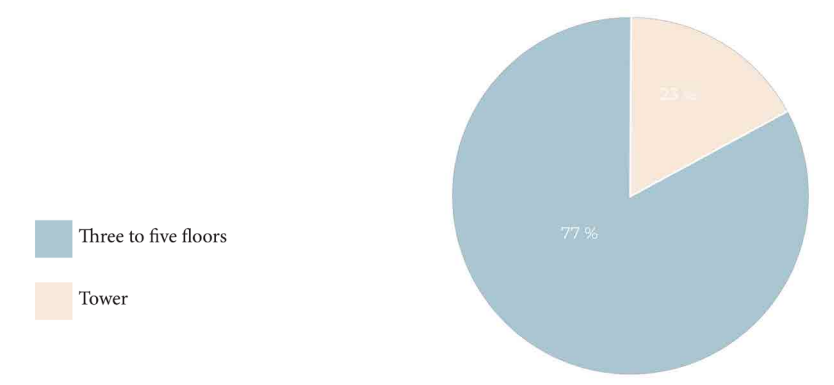
As I mentioned earlier, Tehran faces with population increase these days, because of migrating people from the nearest cities and villages for some reasons, like, more job opportunities, better facilities, and good infrastructure. So, the first and the most important thing that should be focused there is finding a solution to build houses fastly. Having more greenery is another important point because that area was a green village in the past it changed from a green spot to a concrete and metal spot full of buildings. As a result, it is necessary to bring back greenery in this part of the city. And also, due to new trends in the world, a lot of countries forget their culture and their roots not only in routine lifestyle but also in design. Tehran as a capital city in Iran has a strong culture which is important to illustrate in new buildings.

4.2.2 What is very successful in Tehran

The traditional Persian house is a representative of the culture, way of life, and beliefs of the Persian people during the golden era of Persian civilization in 17th to early 20th centuries. If you see and follow old architectural houses in Iran, the courtyard is one of the strong elements in most of the housing. In Old houses was the center and heart of the building. Central courtyard with porch on each side was the features that were seen in past Iranian architecture. Also the courtyard was a space for various ceremonies such as religious rituals, weddings and family gatherings.

The system of heights and floors

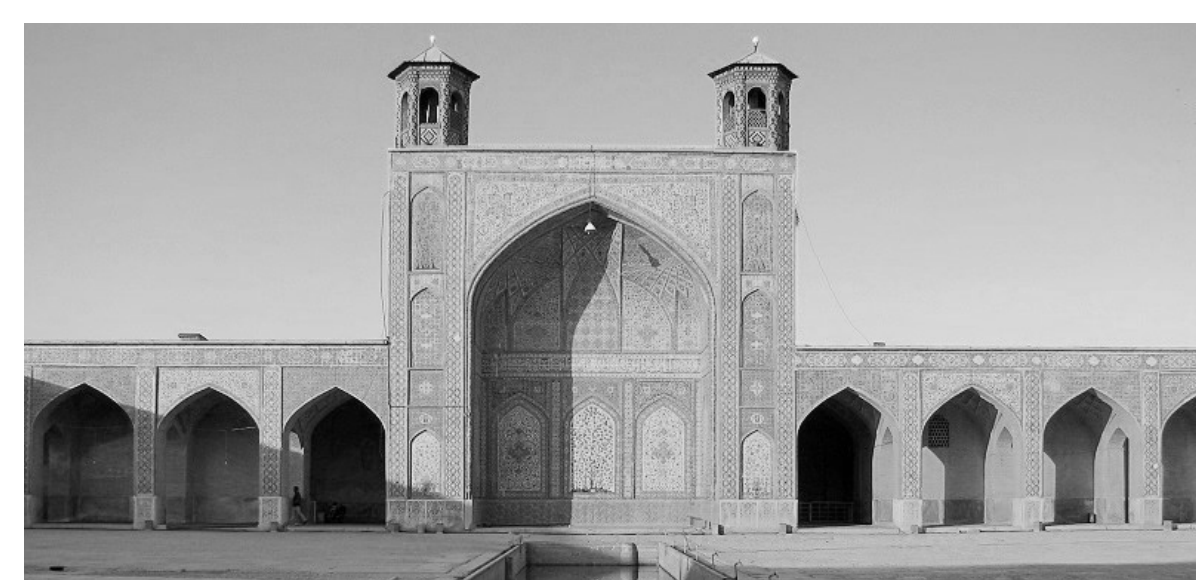
According to the observations made, there are short-rise buildings on the north and east sides, and high-rise buildings and towers on the south and west sides. This can be justified according to the topography of the land.



4.3 Symmetry in Persian architecture

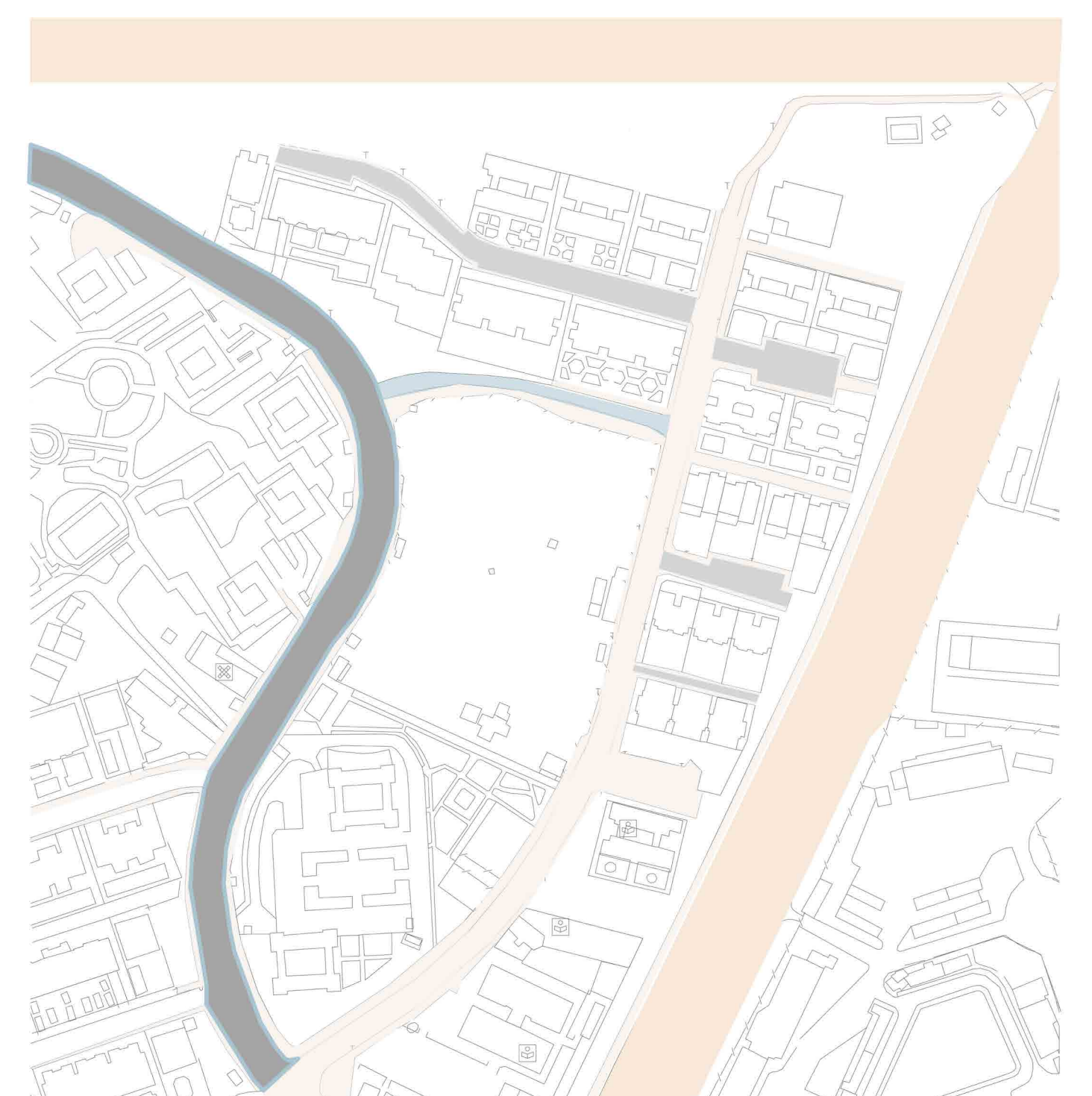
Architectural past periods of Iran were always inspired by the use of geometry and rich and detailed drawing practices. So far, knowledge of the mathematics rules and drawing and the use of specific types was the duty of every architect and beyond it, the engineering knowledge and knowledge of geometric means and the distinction between architects and their competition with each other has been based on the same axis. That is why you can see, a variety of geometric relations, details and decorations have been respected. One of these relations is symmetry, according to Antonio Palladio, the need for symmetry to coordinate has no place for the question and is considered as one of the aesthetic principles, although it is essential to say that symmetry argument cannot be proposed apart from the balance. The purpose of this design is to show how can we have symmetry in new design, and how we can avoid of repetitive shapes. So in first step we can have one block with around 33 units, not to mention 60 m² 90 m², 120 m² and 150 m², and keep it as one block and mirror it to have symmetry. Then we can put these 2 blocks next to each other in siteplan.

with this concept we have step by step modularities. First module is a square with 1.8 m * 1.8 m that it calls small module. Next module, known as medium module, is made by our units, 60 m² unit is based that it is made by 9 module of 1.8 m * 1.8 m. 90 m² unit is made by 3 modules and ect. Then we put them next to each other to make a block, so this block can be our large module.



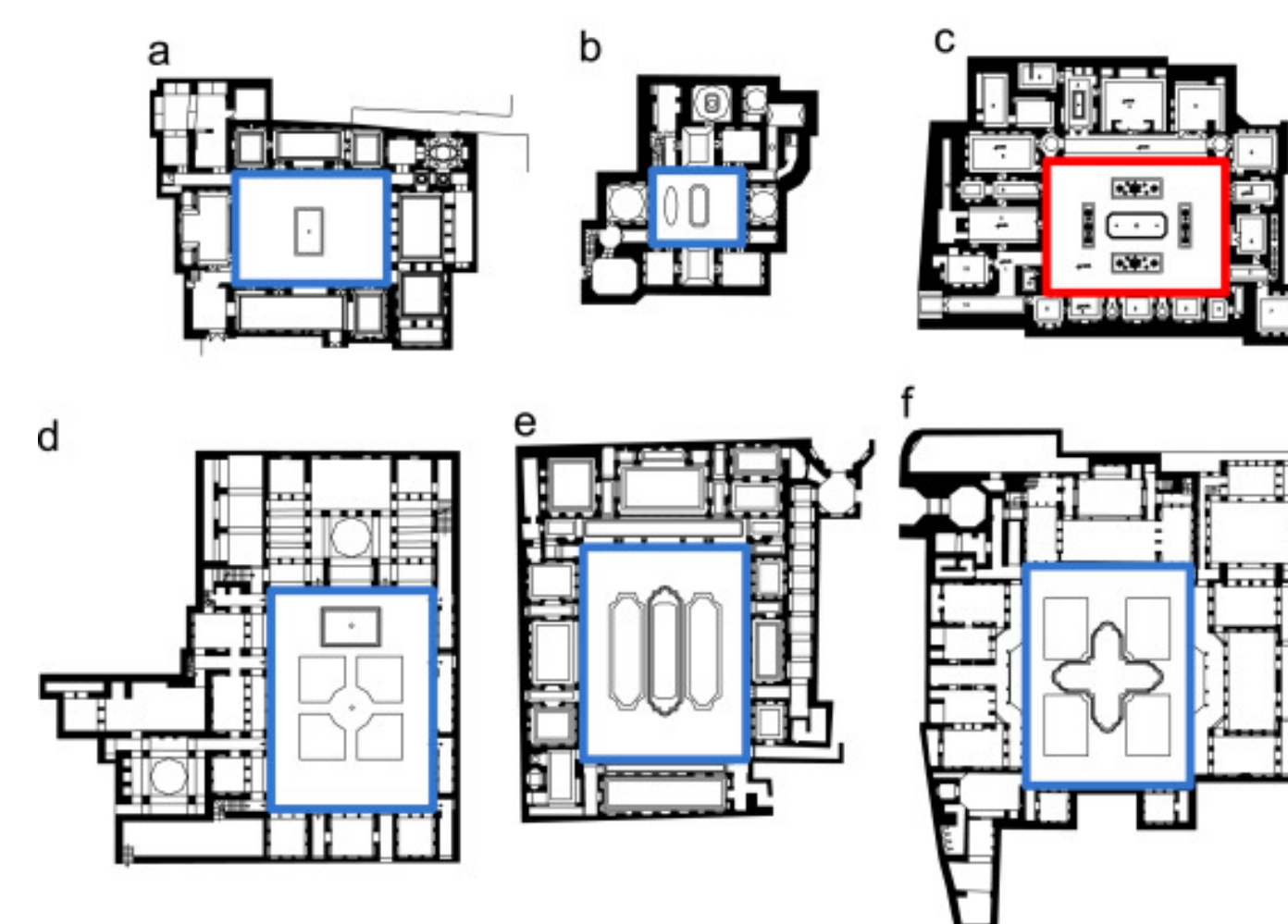
Horrmzan neighborhood has a gentle slope and is suitable for settlement. Horrmzan Street has the highest density for the location of the uses required by the neighborhood with a suitable and comprehensive slope for pedestrians and vehicles, and considering the radius of influence, it provided a suitable pedestrian access for all the residents. Also, Pirozan Street can be considered a quiet and suitable space for riding and walking.

- Residential use
- Educational use
- Religious use
- Gardens
- Services
- Office use



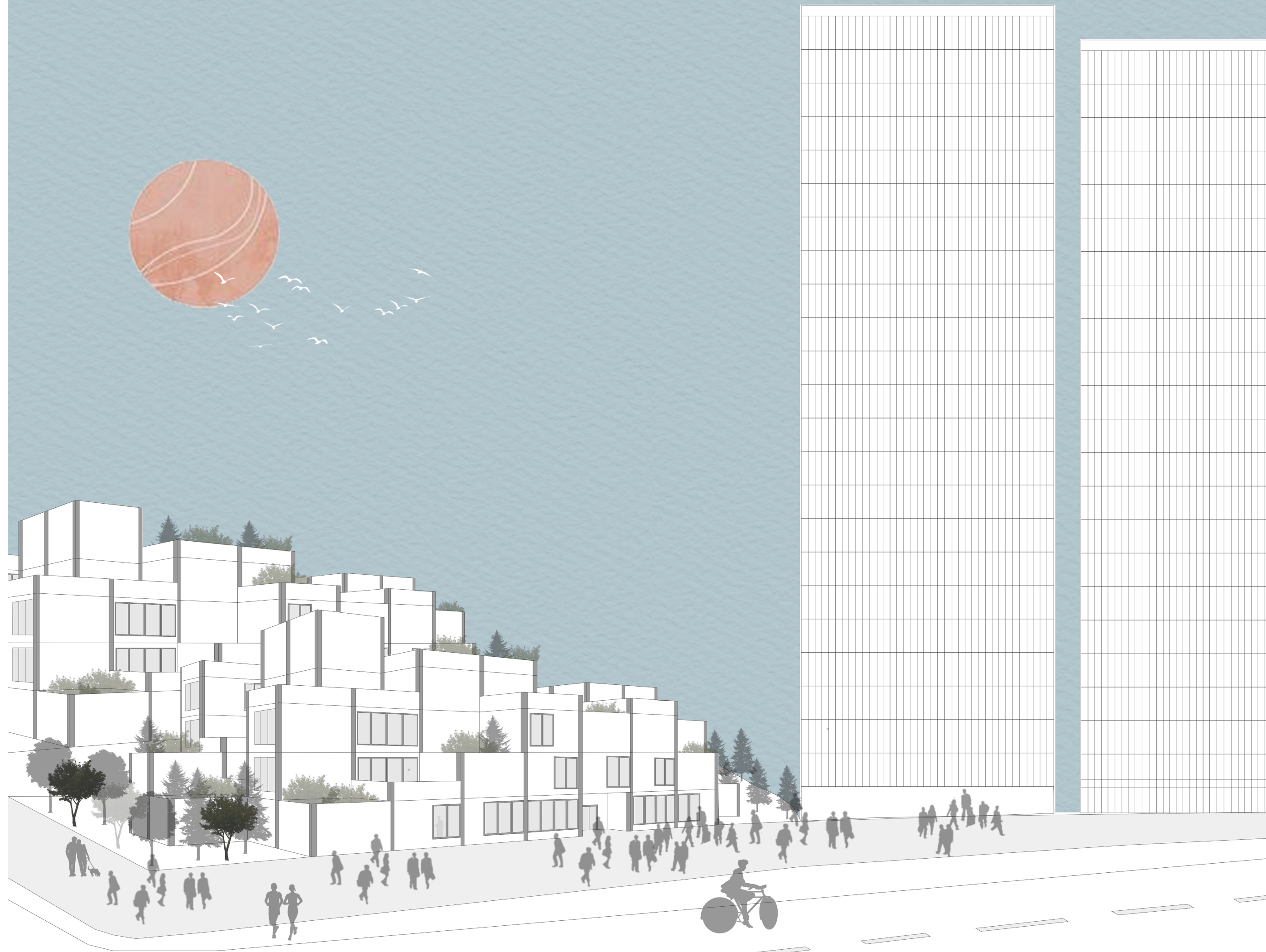
In this site, due to the distance between the public transportation stations and the site in question, it has caused residents to travel outside the area with private cars. Also, part of the parking requirement is provided by newly built residential units, and part of it is in the form of marginal parking along the roads, which causes the interference of pedestrian and pedestrian movement and threatens the safety of pedestrians in some places, and the lack of separation between the pedestrian and The rider also fuels this issue.

- Highway
- Local distributory artery
- Main access road
- Secondary access road
- Deadlock access
- Walking path



Courtyard is usually rectangular. Its dimensions normally were determined by the number and type of surrounding spaces. Usually, there were a pool and a garden in every courtyard that their geometry was different depending on local conditions such as climate and cultural factors. Also, one of the most beautiful habits in the past was families lived in a neighborhood for a long time like a colony, even if one of the children got married they just moved to another house in that neighborhood or they split the big house into small hoses for children. It could be nice to use this feature in the design process.

MODULARISM IN TEHRAN



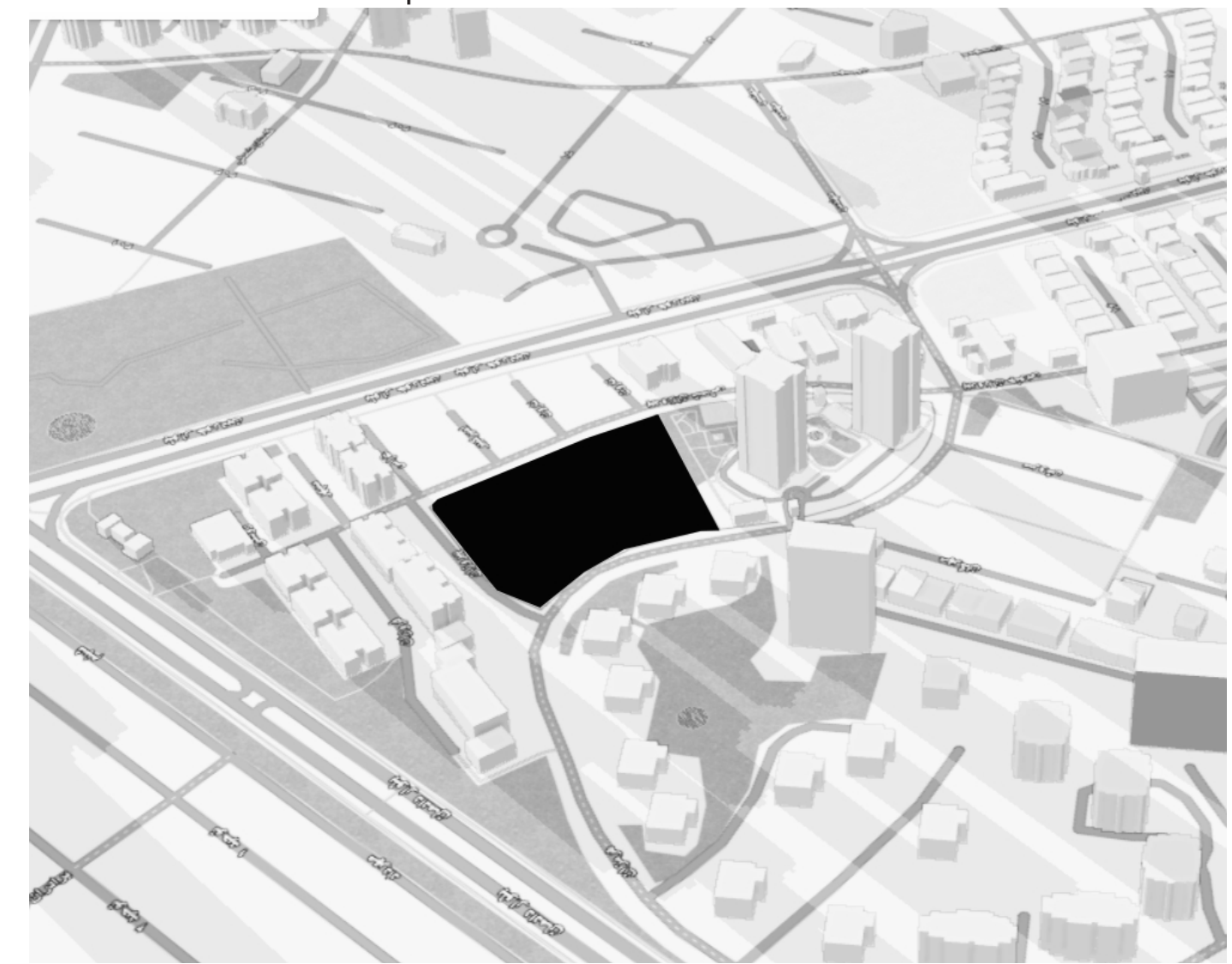
View of Hormozan street

One of the most important reasons for choosing the topic is the importance of housing. Residential environments play the role of a platform for human societies. It means that it lives, grows and works in a residential environment. Therefore, it is in constant interaction and influence with this man-made environment. In order to achieve physical concepts about housing and residential complexes, several examples have been evaluated. Another reason is the creation of a modular residential settlement for a certain stratum in the city of Tehran, Iran in the area of Shahrak-e Gharb. Due to the growth of the population and the need for housing, based on a housing development plan, I decided to achieve a fast and flexible supply between the fast and growing demand by using the module in housing design. There are variety of choices to achieve this goals and one of them is prefabricated system.

As I mentioned before the site of this project is located in Shahrak-e Gharb, Tehran Iran. In terms of the urban area in Tehran, this site is located in urban area 2. Considering that this site is located in zone R (residential) with a density of 160% (up to four floors). Our project site is located in Tehran city, District 2 on Hormzan Street. This land is located in the vicinity of the Twin Towers of Tehran and the corner of Hormzan and North Pirozan Streets.



Location of site-Top view



Location of site-3D view

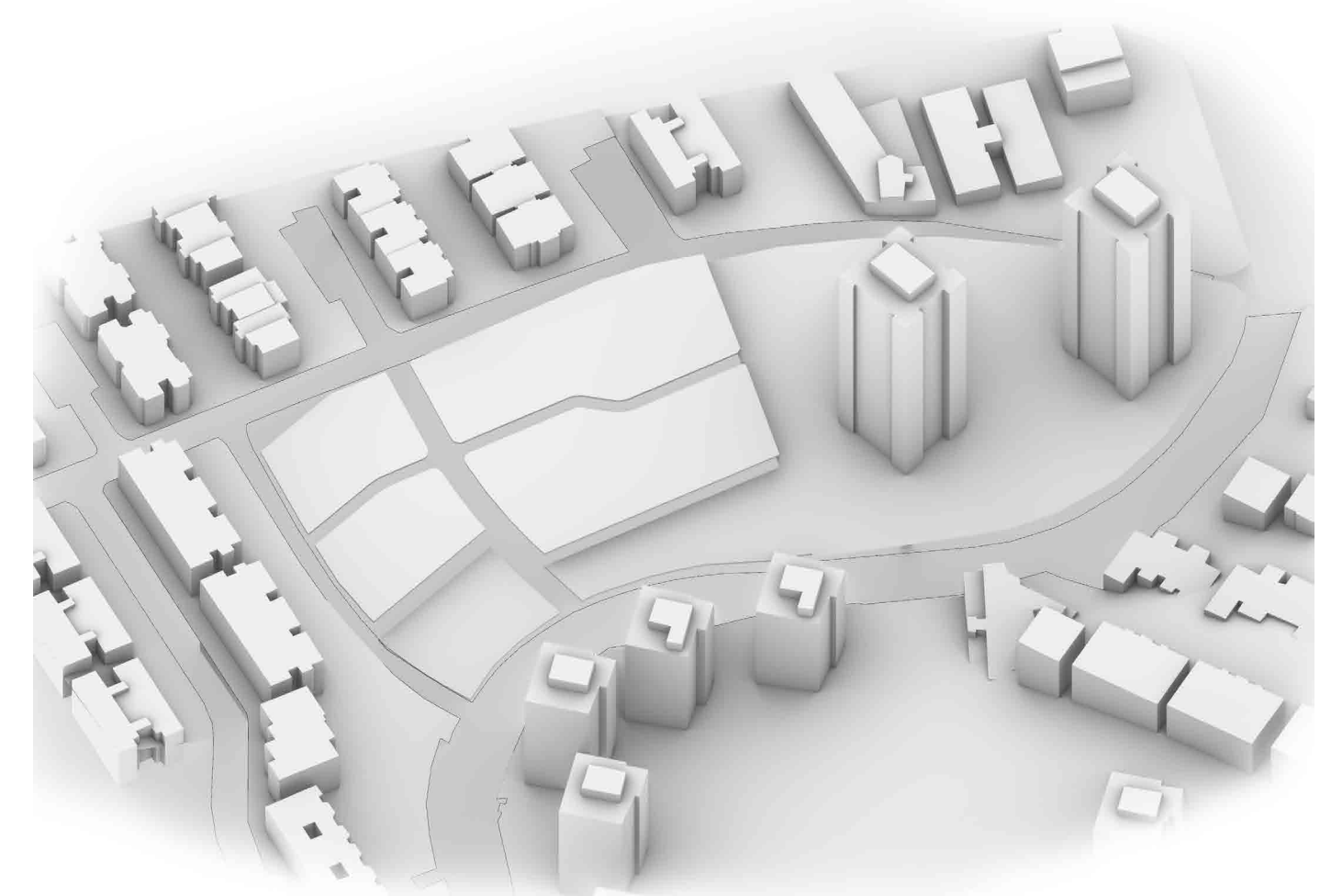
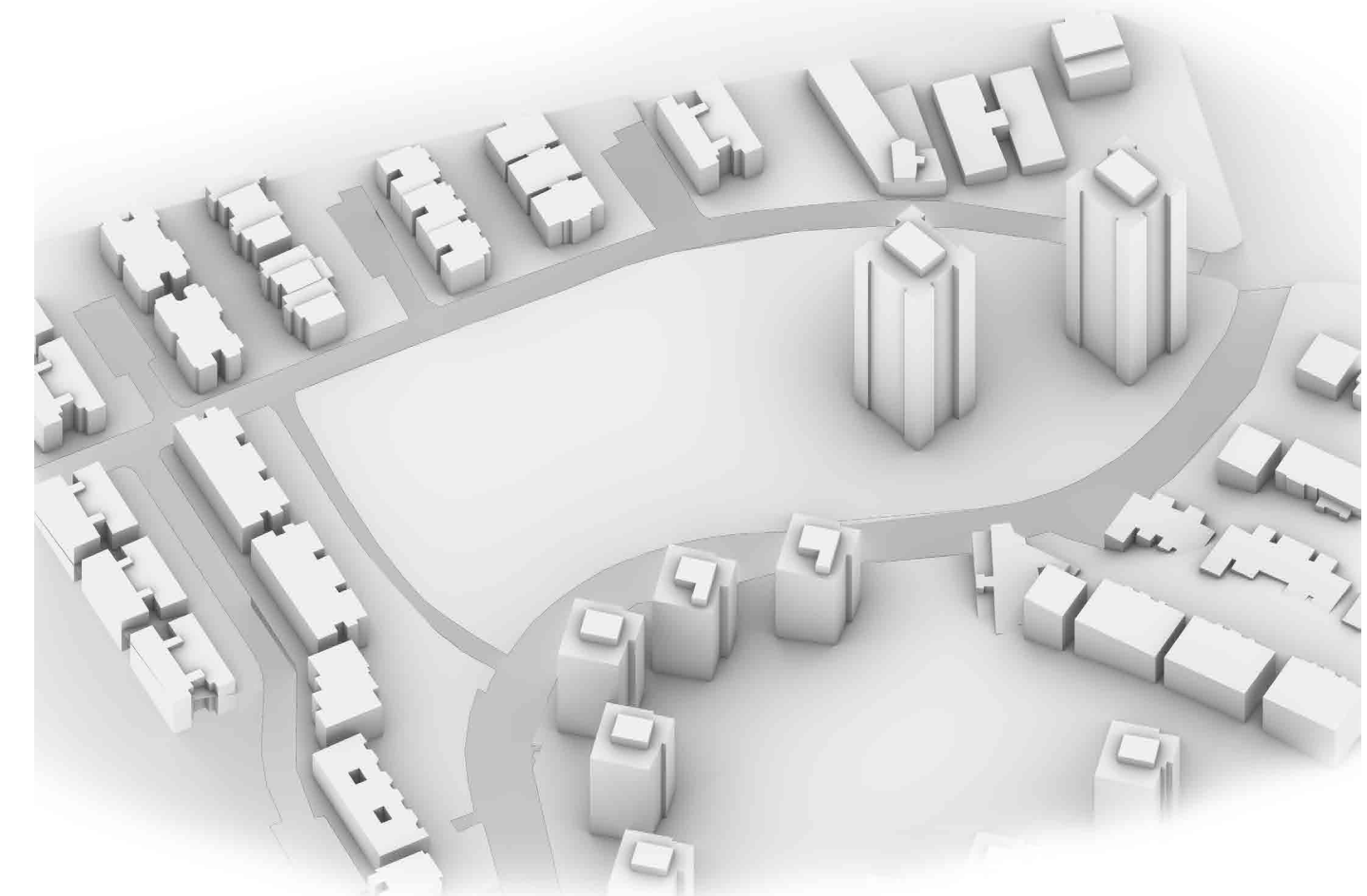
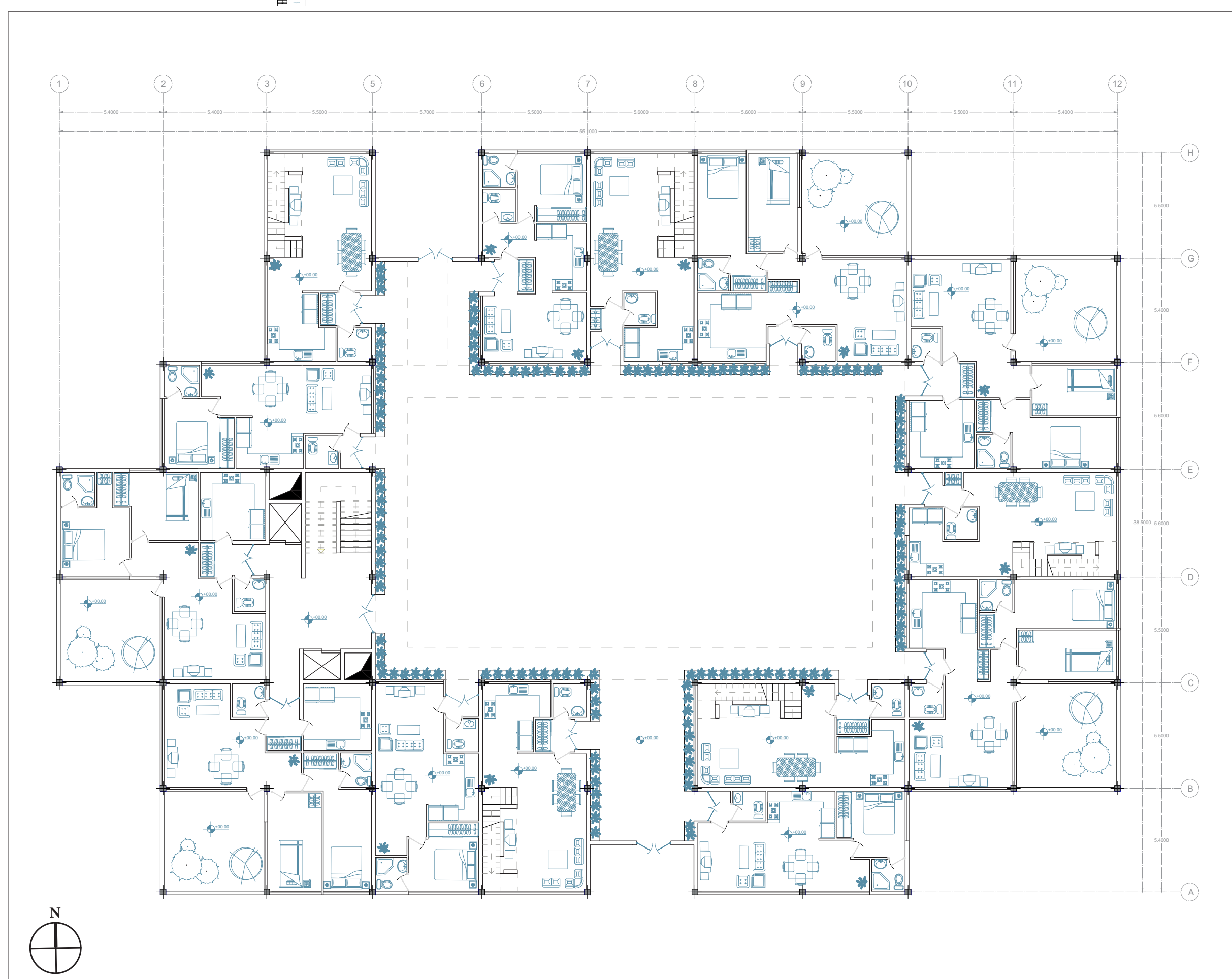
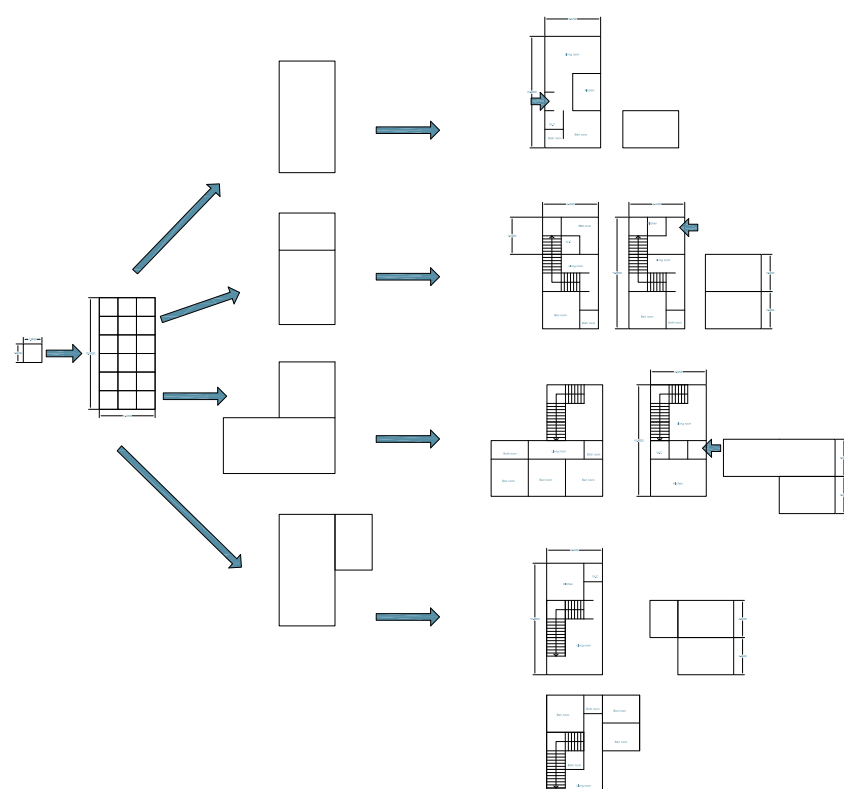


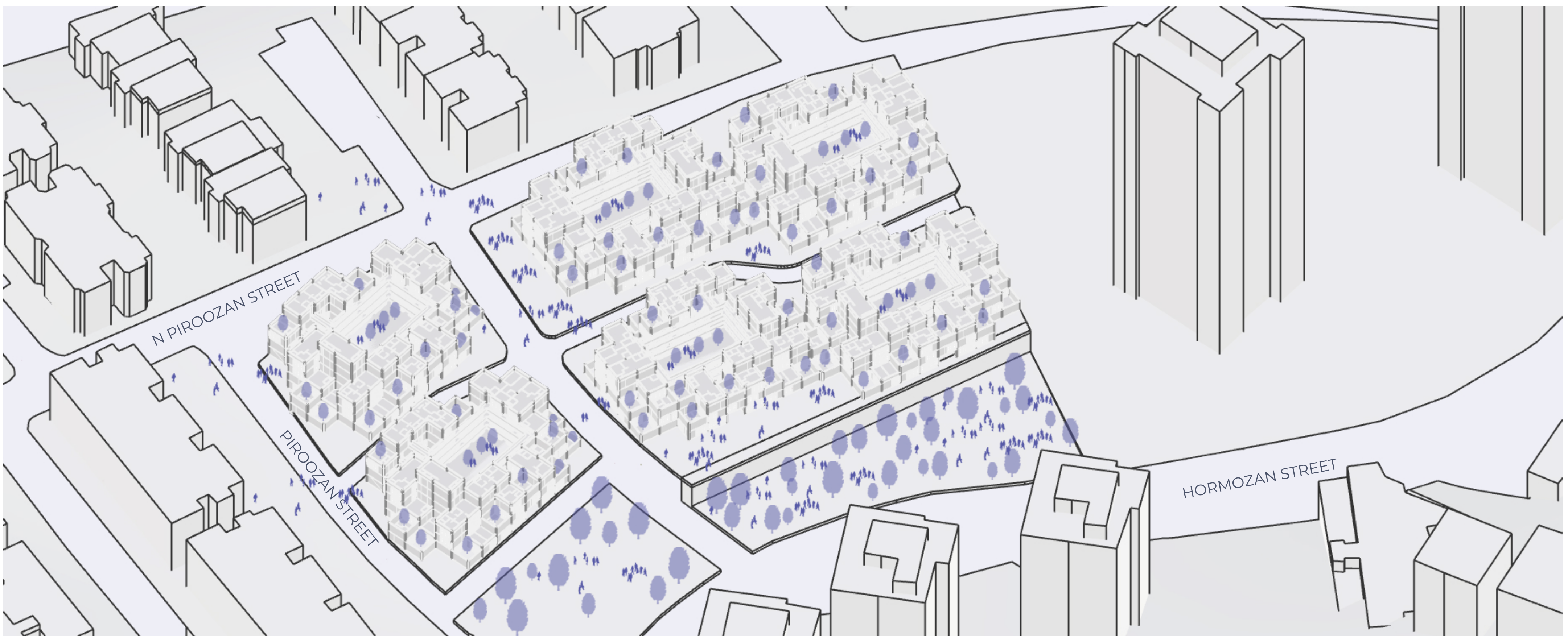
Diagram design process of siteplan

As we mentioned in second chapter, there are 9 meters height difference from north to south of the location. For making access from north to south, the site is divided into two pieces, then to solve the height difference, there are 6 different surfaces at different heights some of them include residential blocks and some of them are open to the public and green space. Finally, there are 6 blocks, all in all 210 units, all around the siteplan. All of them are in the north part to avoid the view of towers.

The green areas are public and accessible by all people, meanwhile, residence in this area have their own private green space, known as a courtyard.

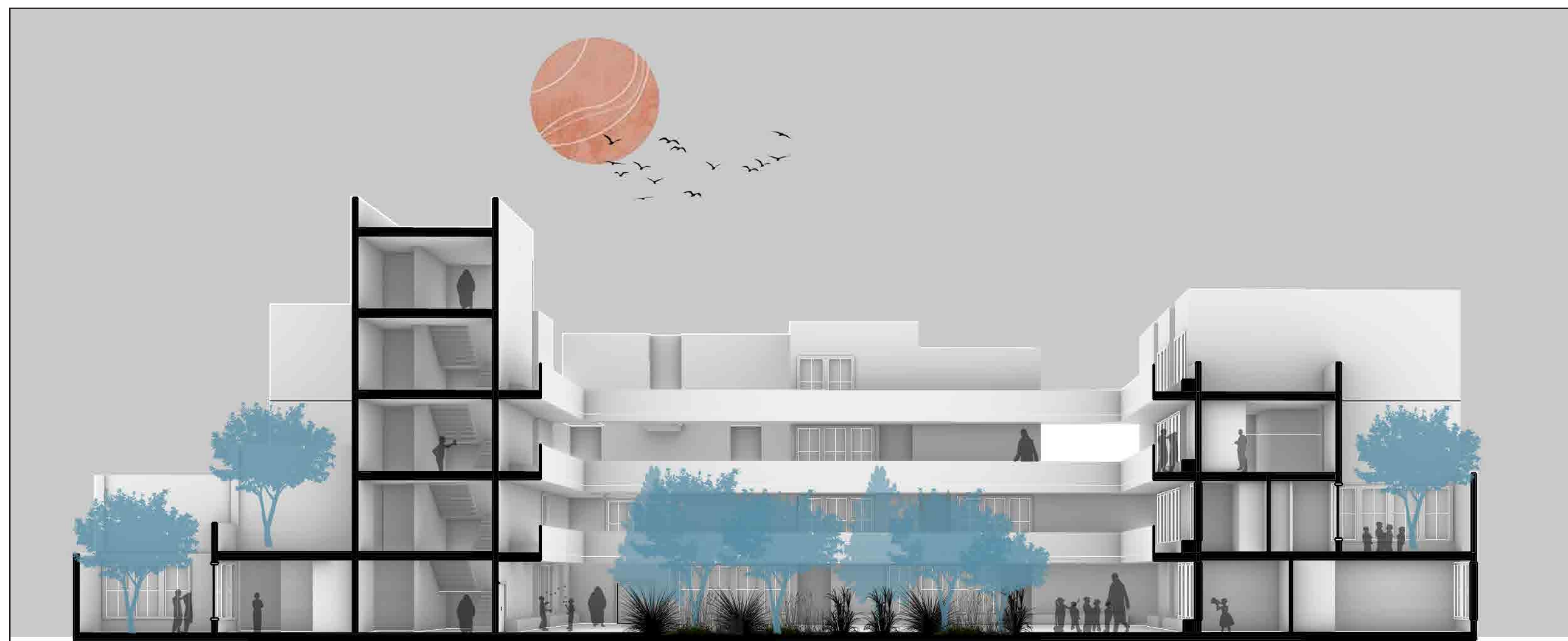


Ground Floor, SC 1.200

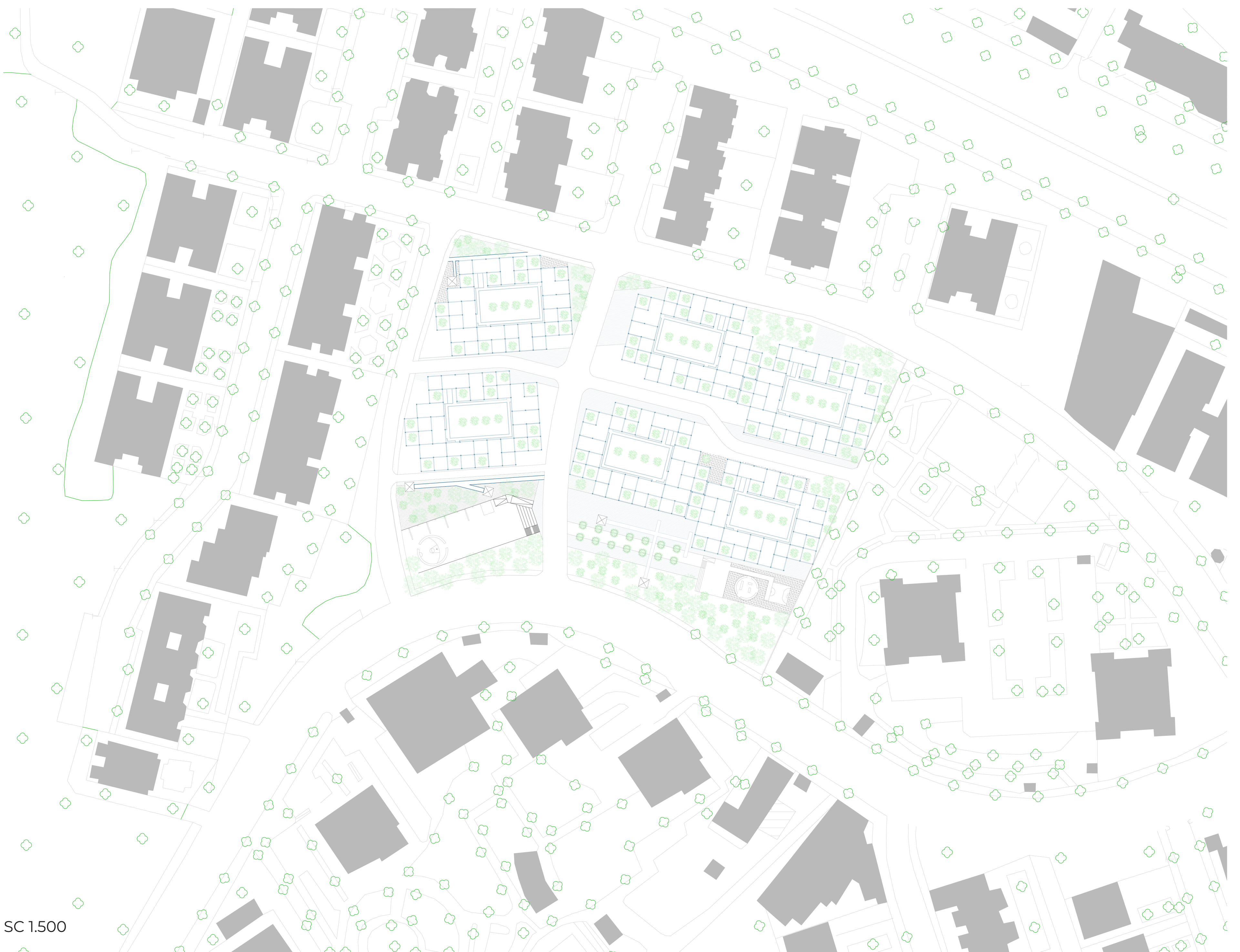
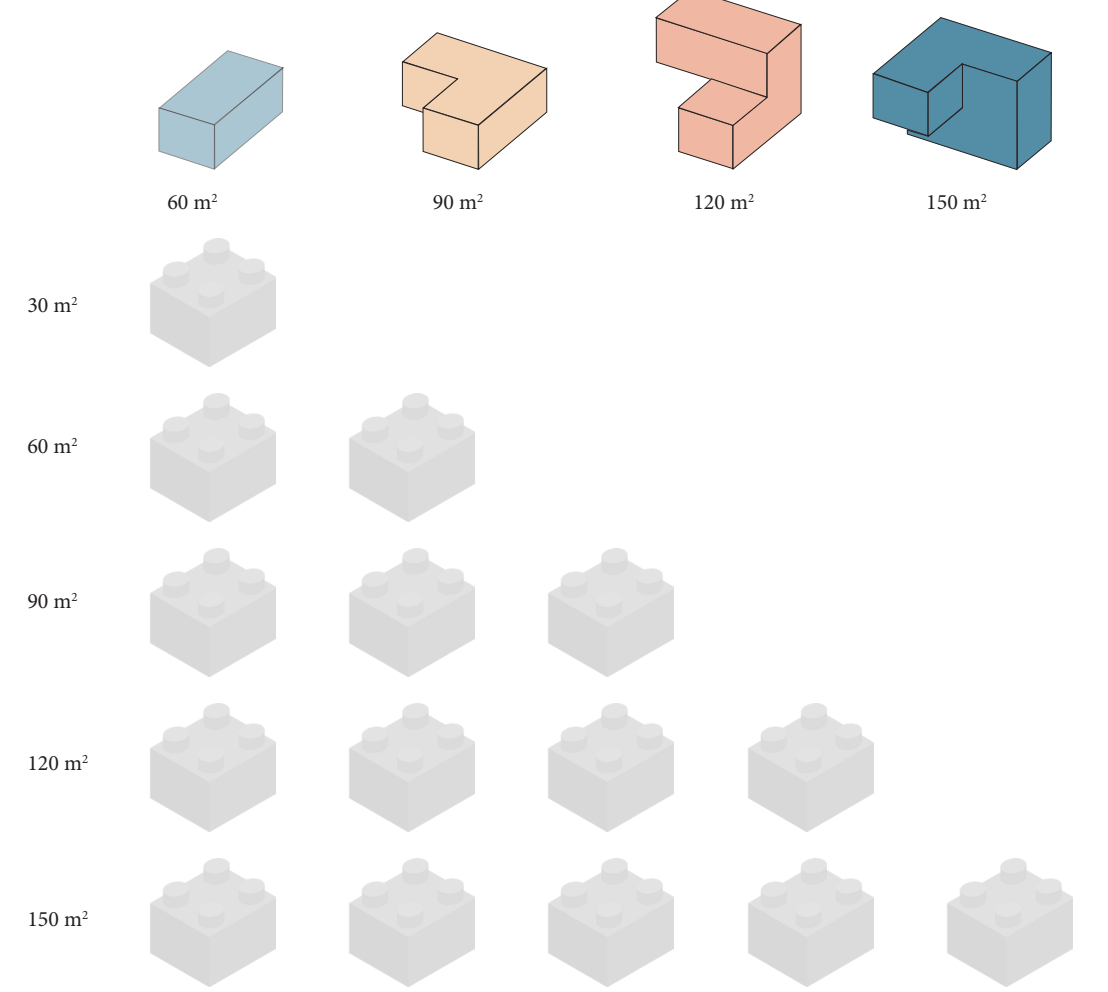


Birdeye view

According to the previous research and all case studies that are modular design, we have 3 different modules from the small scale to the large scale. In the first step as the smallest scale, one module is a square with 1.8 m x 1.8 m it is the base of all plans. The second module is our units, there are 4 different units, 60m², which consists of 18 small modules, 90m², which consists of 24 small modules, 120m², consisting of 30 small modules, and 150 m², consisting of 36 small modules. In the next step, these units make a block with different variations of housing, this block is the largest module which has 35 units.

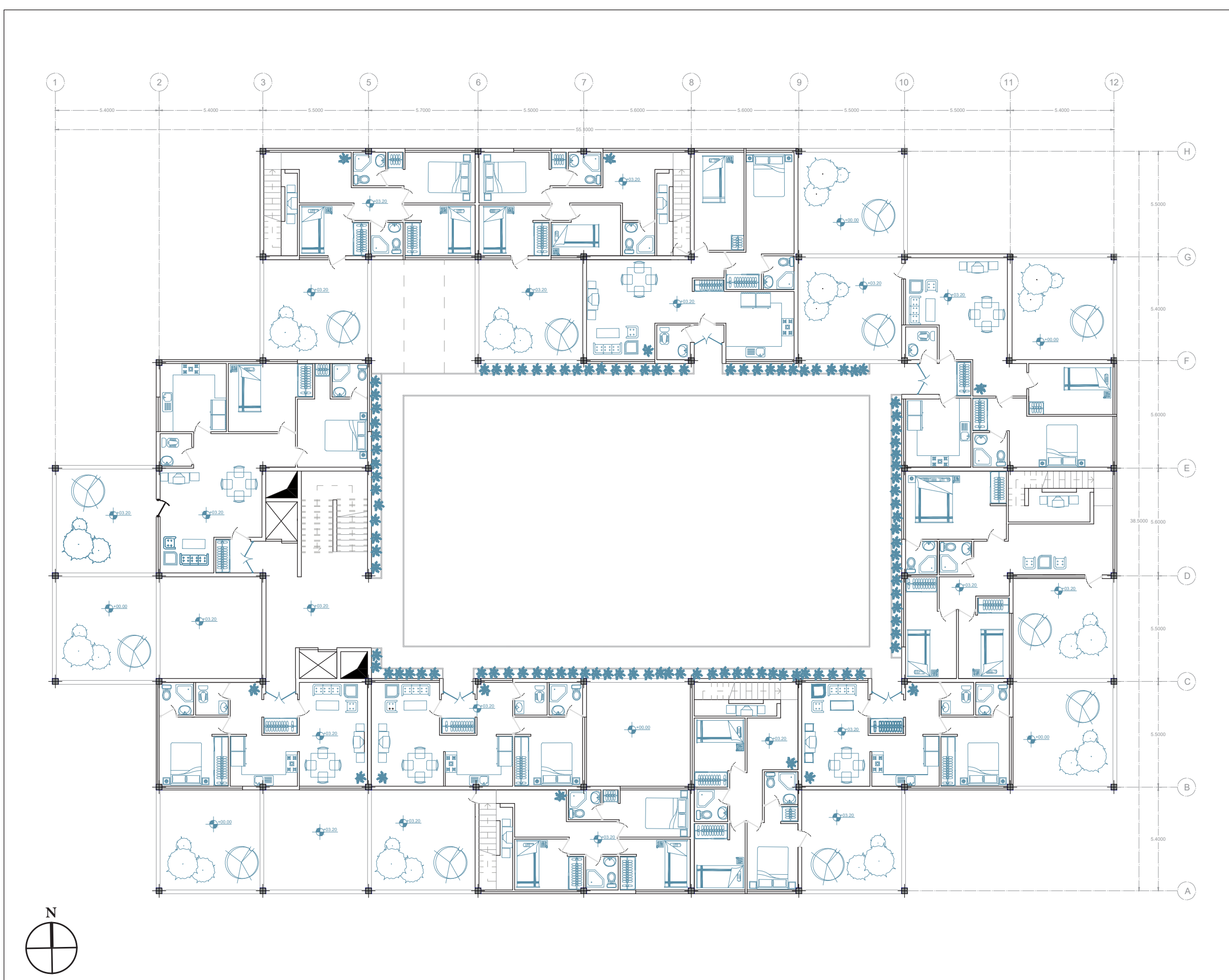


Section-3D of courtyard

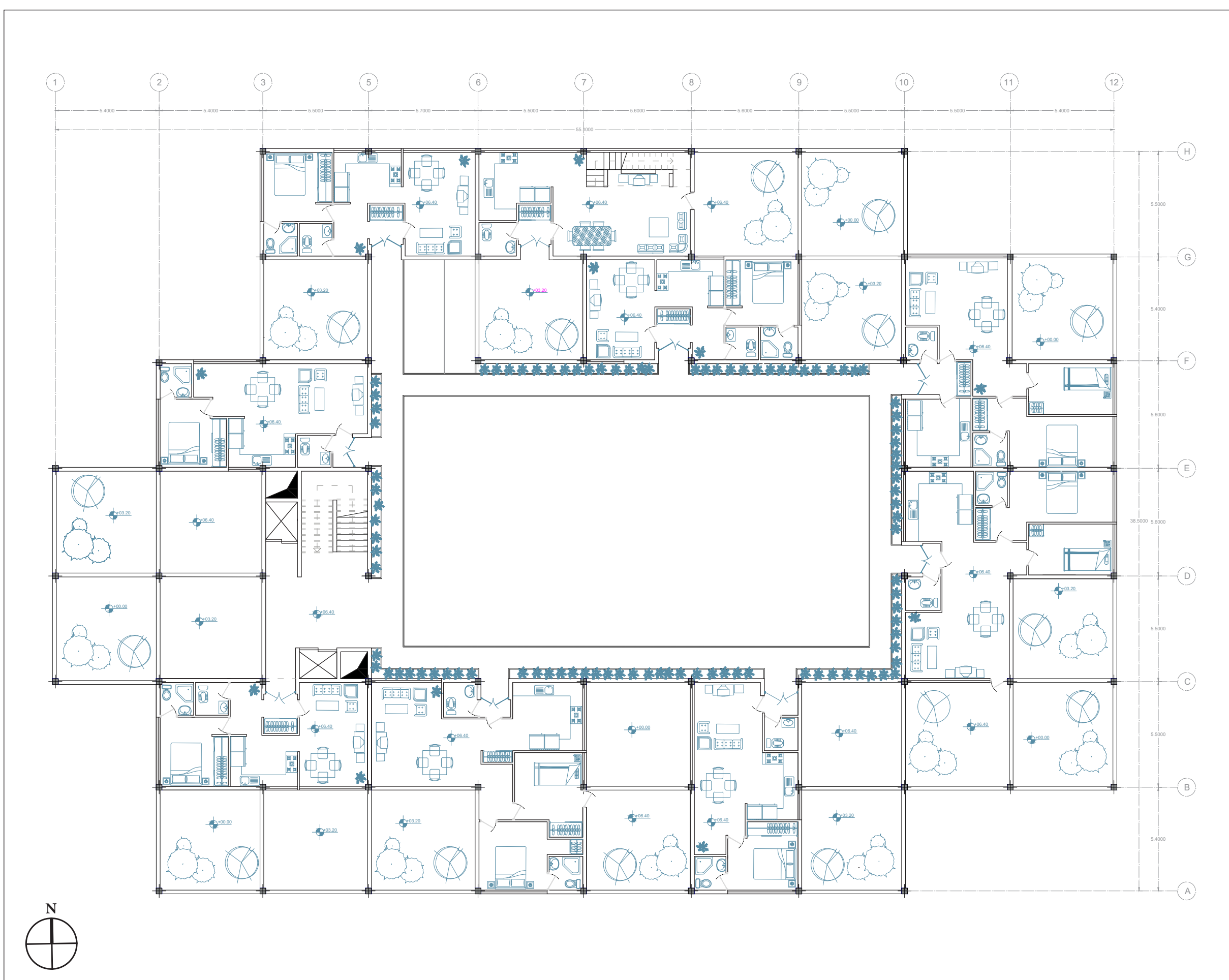


Masterplan, SC 1.500

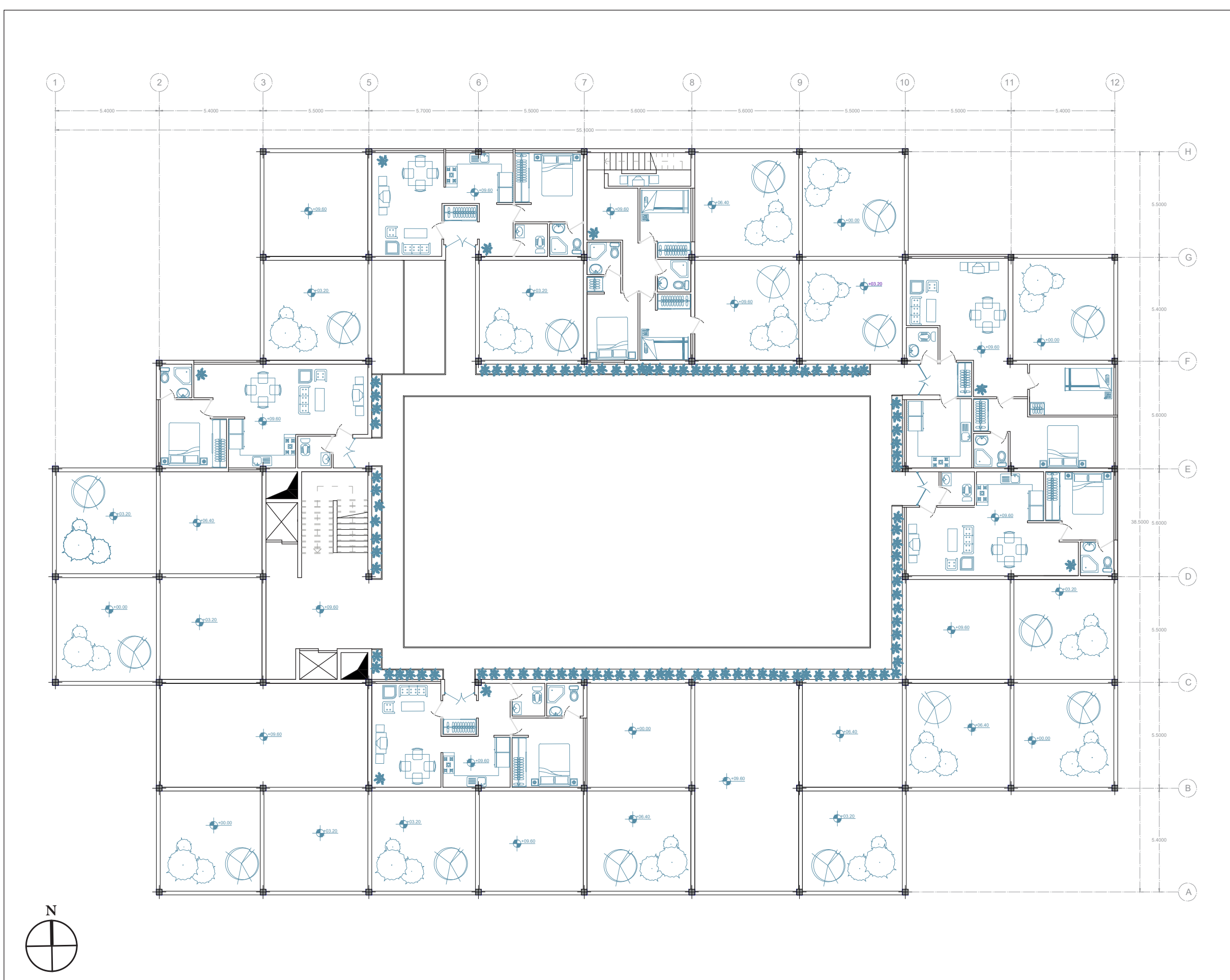




First Floor, SC 1.200



Second Floor, SC 1.200



Third Floor, SC 1.200

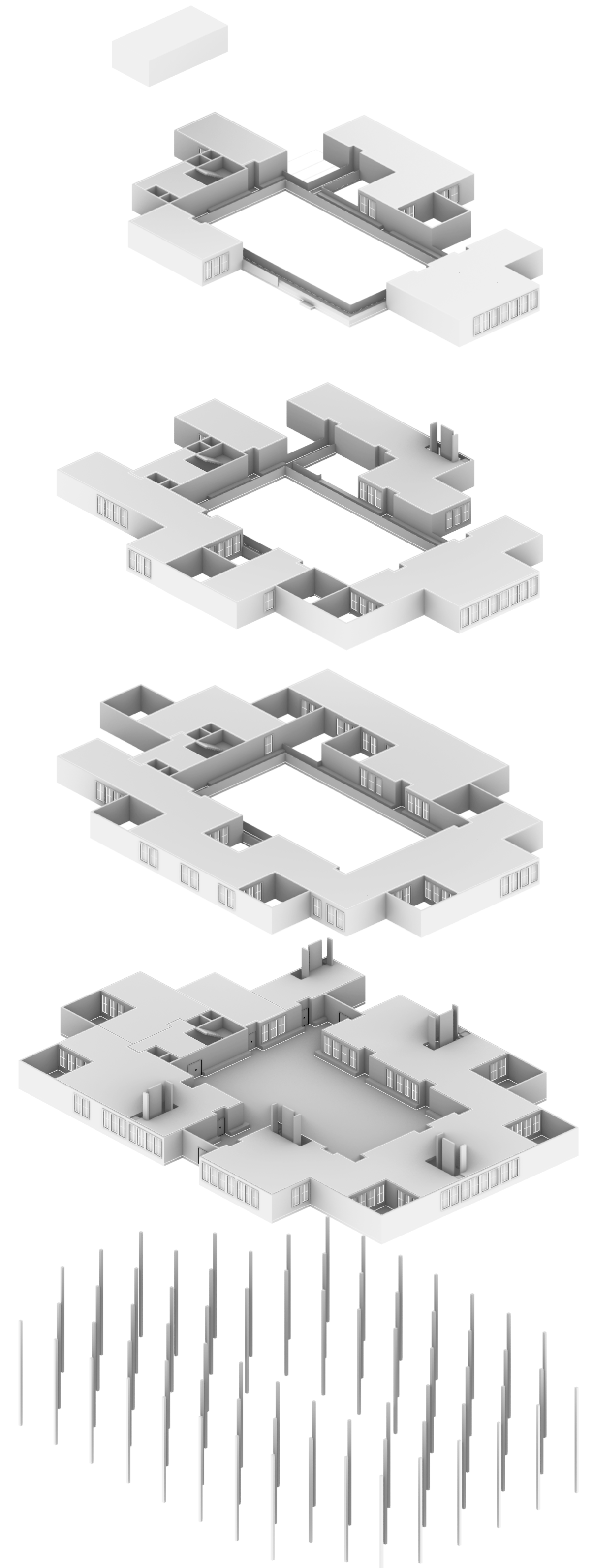


Diagram process of each block



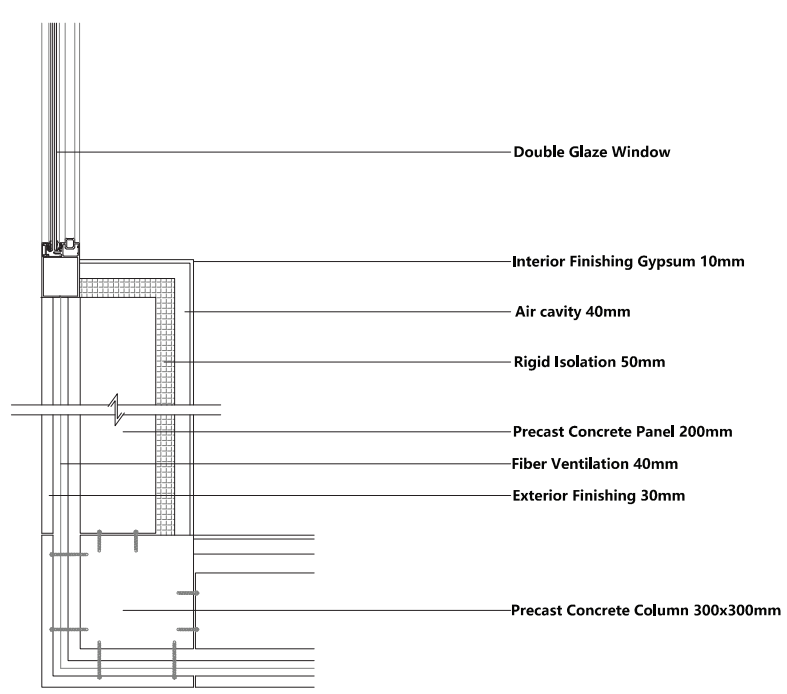
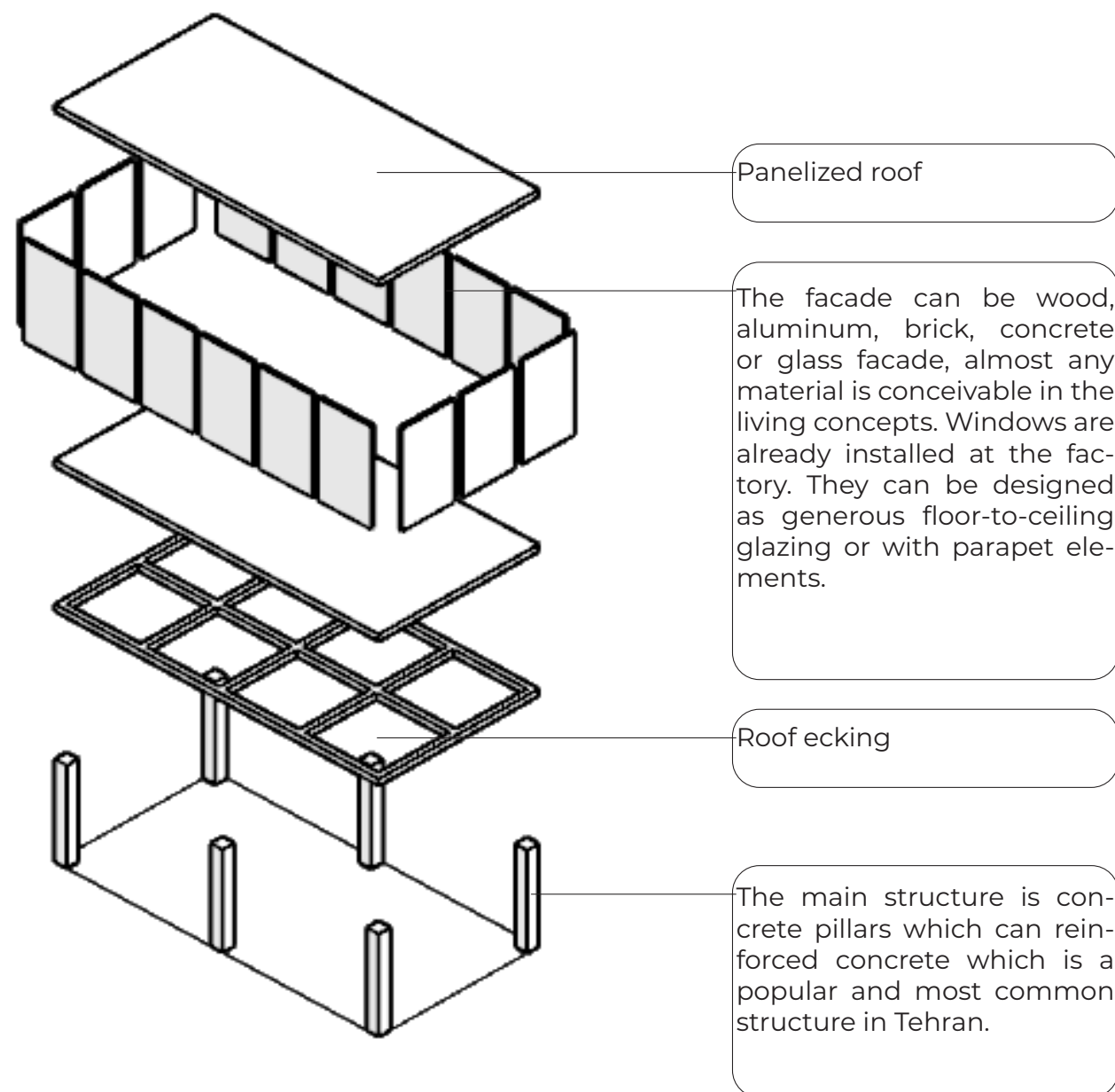
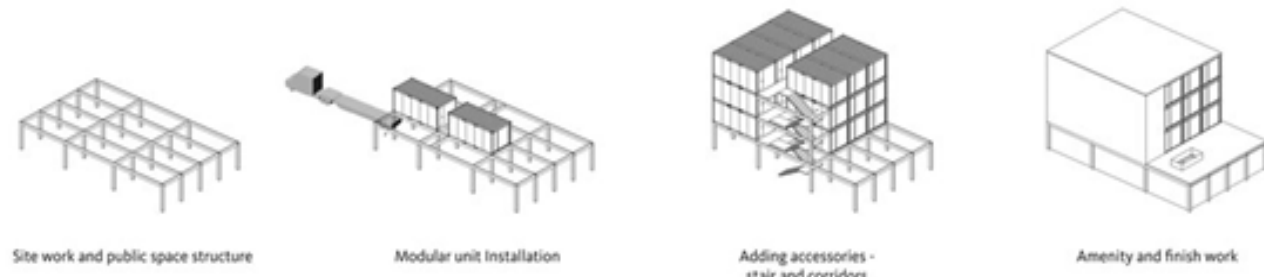
Collage view to the green cortyard



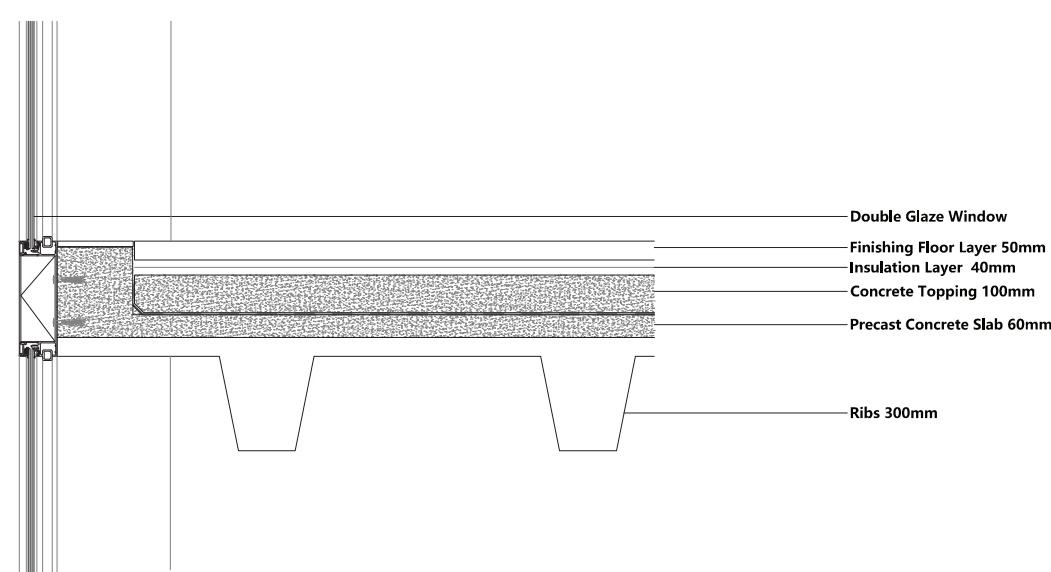
Combination of concrete structure and modular prefabricated units:
 As we know already concrete structure is really successful in Iran. We can have a concrete structure as a mesh in the site and add buildings as units in the site. With this system, we can have the possibility to extend add, or even remove units and have a variety of neighborhoods to achieve the cultural feature known as living in the colony.

4.4.1 Prefabricated units

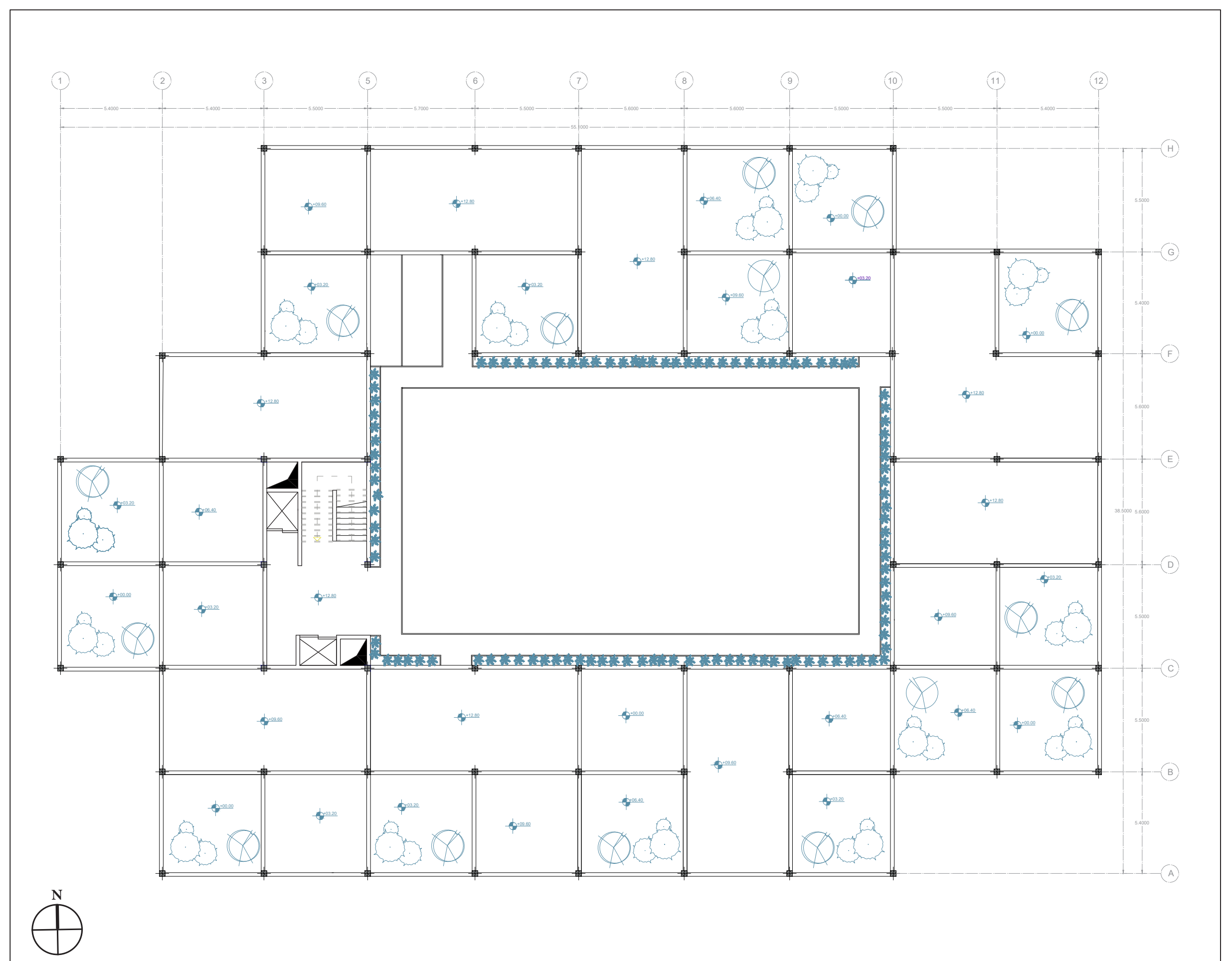
The high level of prefabrication reduces the duration of the construction site by up to 50 percent. There is also the effect of simultaneity. While the underground car park is being concreted on the construction site, the modules can already be manufactured in the factory. Shell construction and expansion take place at the same time.



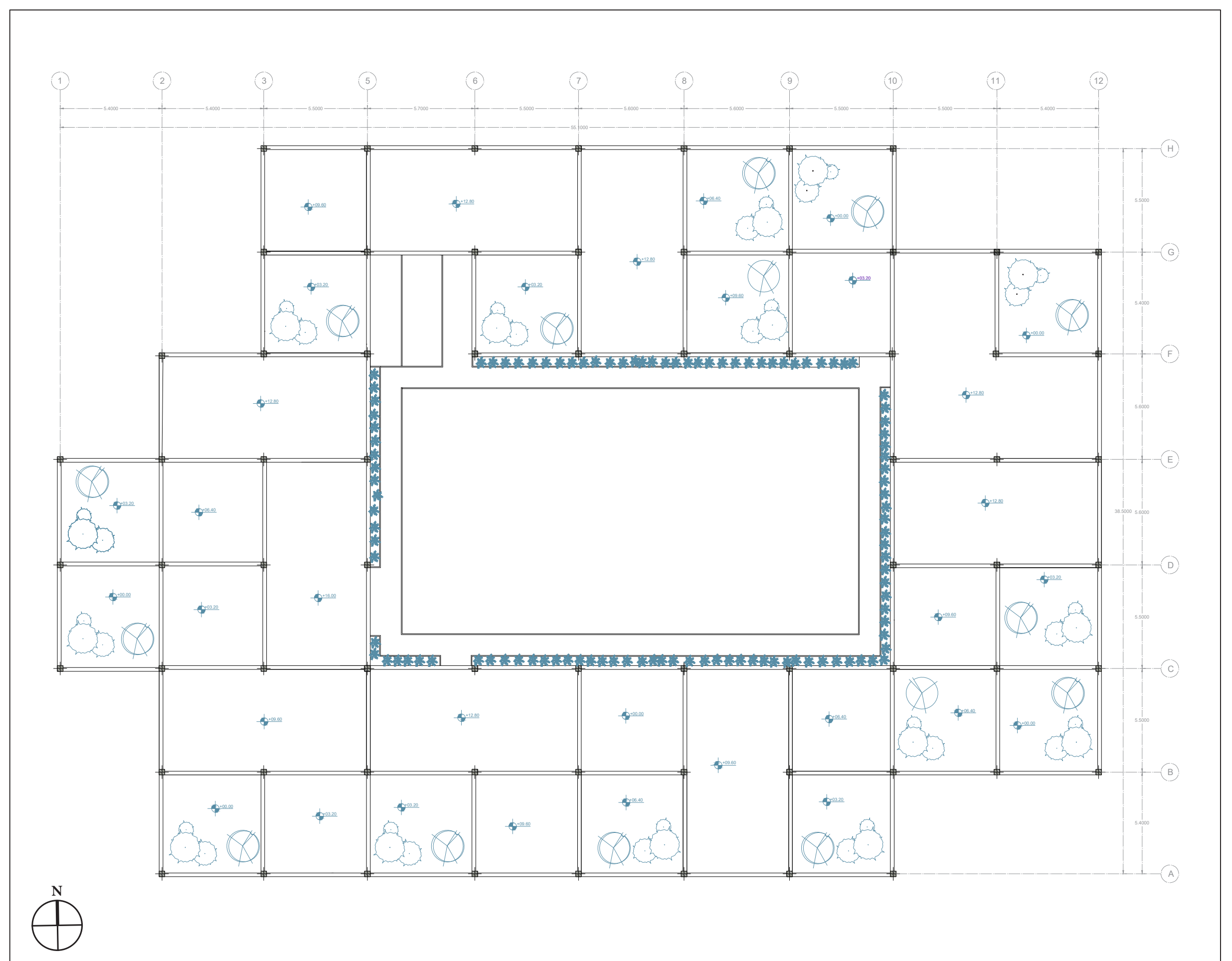
Technical plan, SC 1.20



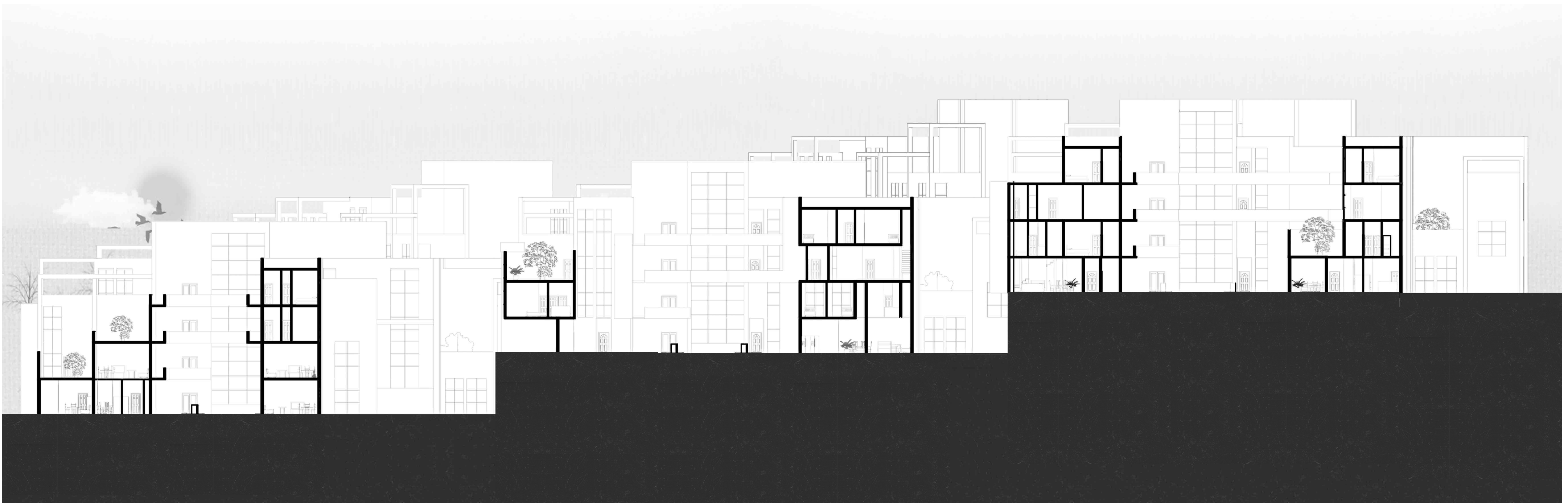
Technical section, SC 1.20



Fourth Floor, SC 1.20



Roof Floor, SC 1.20



Section, SC 1.20