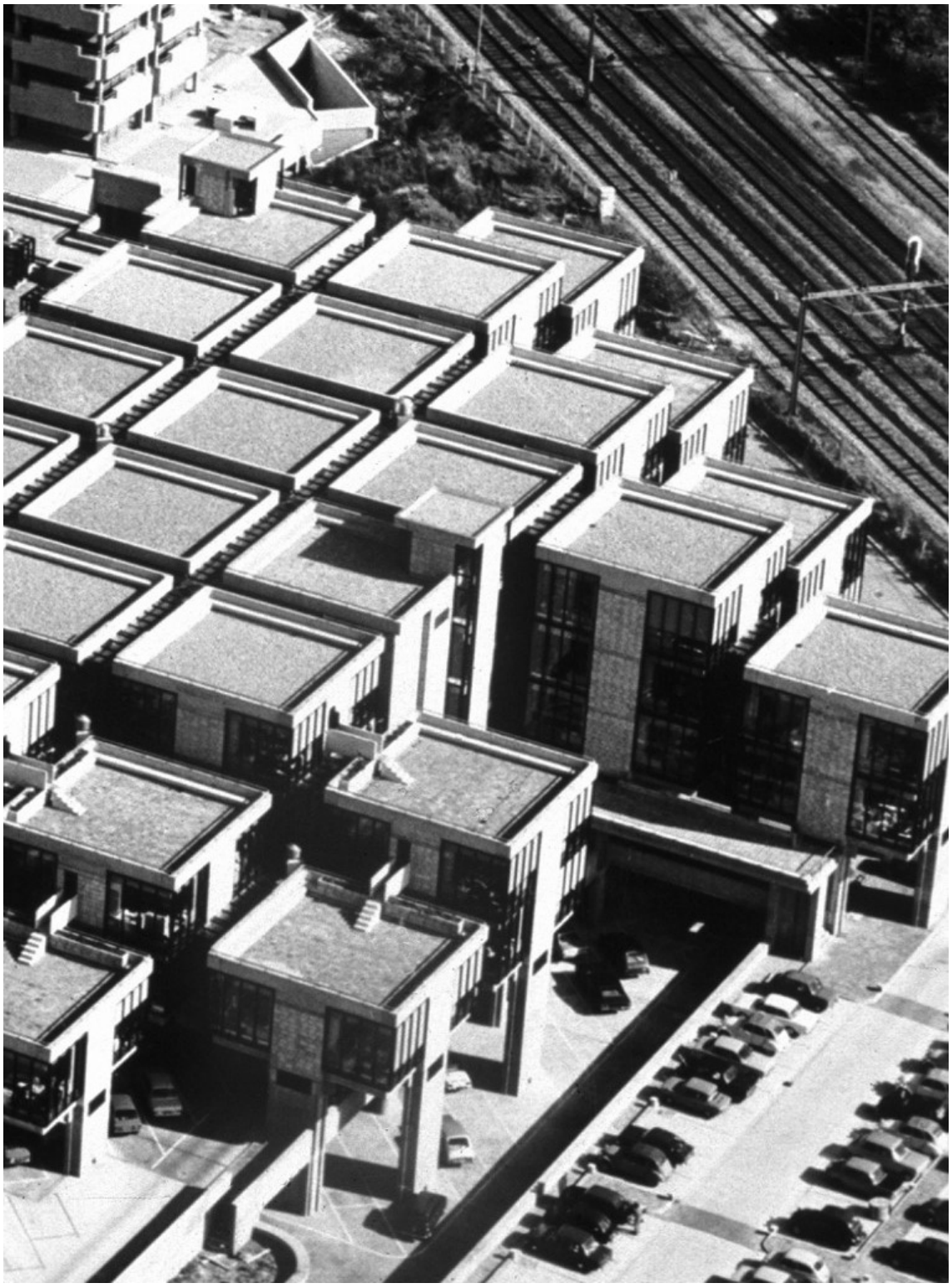
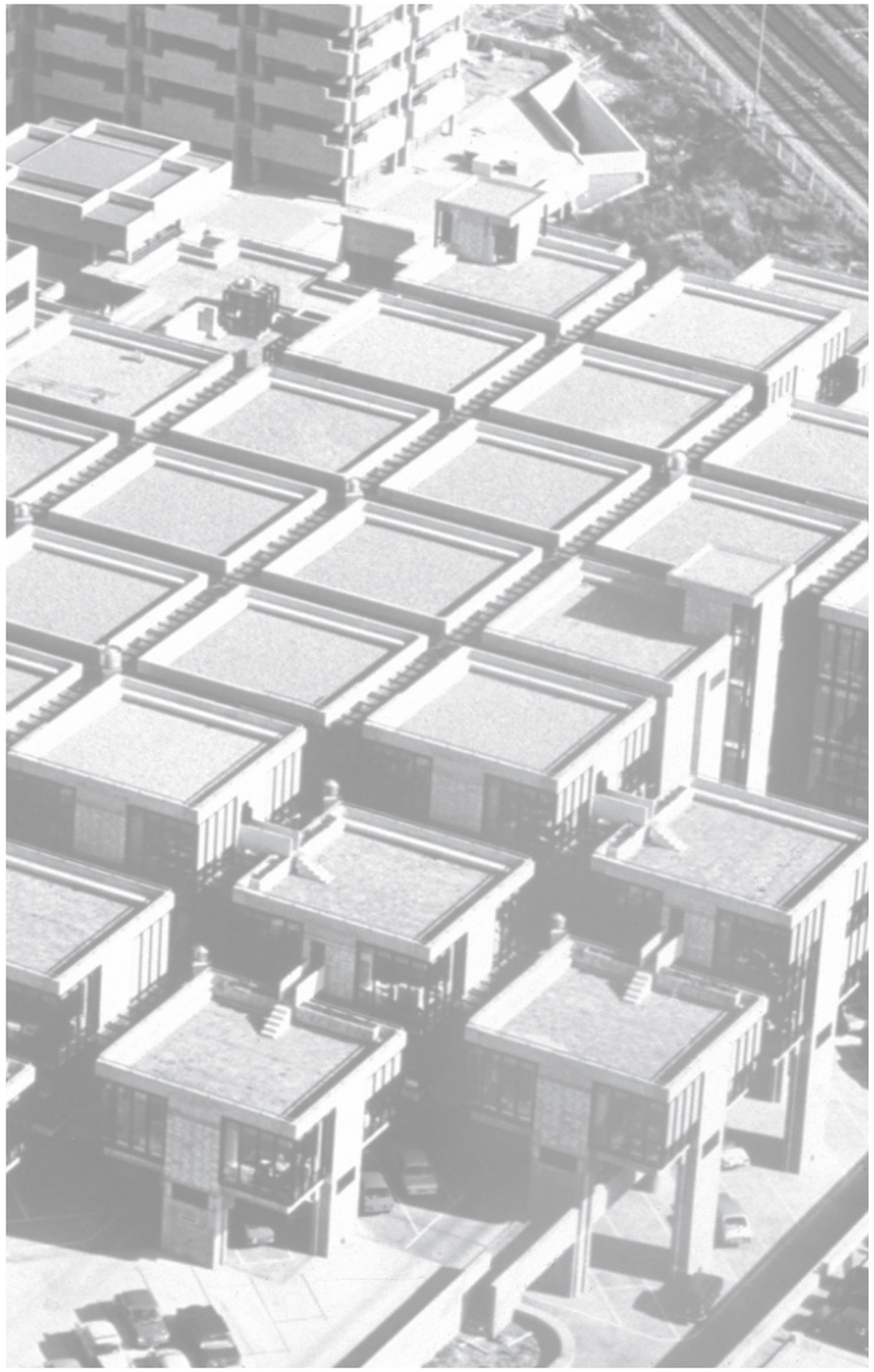
Revitalizing Centraal Beheer

Discovering the future potential of Structuralism, by redesigning Centraal Beheer and revitalize its inherent concepts



2. Re-design



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Discovering the future potential of Structuralism, by redesigning Centraal Beheer and revitalize its inherent concepts

MSc Architecture, Urbanism & Building Sciences
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Studio: Heritage & Architecture: The Future of Structuralism
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Content

1. Introduction 7
2. Transformation framework 9
3. Interventions 15
4. Optimized framework 33
5. Basic building block 51
6. Process 91
7. Configurations and programs 119
8. Impressions 173
9. Conclusion 183
10. Sources 191

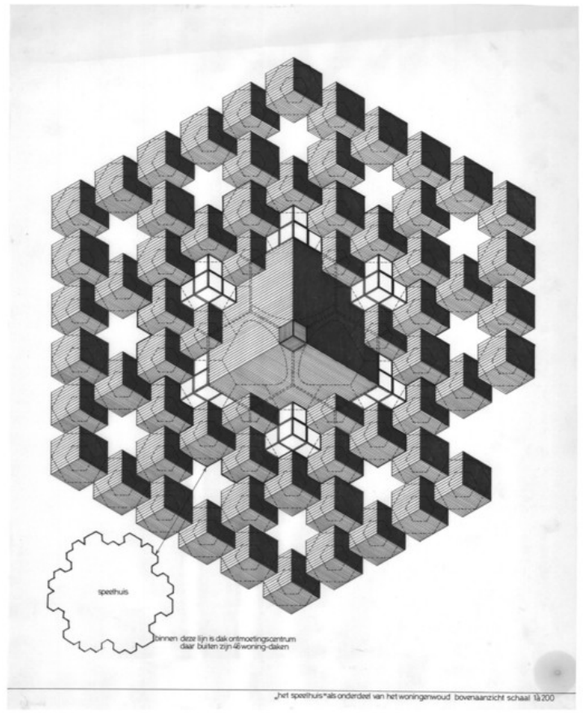


Fig 1. Piet Blom, the Speelhuis Theatre and Cube Houses, c. 1974.

1. Introduction

This booklet describes the beforehand research and redesign of the Centraal Beheer office building from 1972 by Herman Hertzberger in Apeldoorn. The building is design according the Structuralist paradigm which '*represents a human, social architecture that can interact, grow and adapt. Starting in 1959, Structuralism became a very influential movement in The Netherlands. But what happened ever since? Some of the Structuralist buildings became icons, but many are facing drastic transformation or demolition. Despite the design of open structures, flexible for the future by extrapolation or adaptation, the buildings show shortcomings in indoor climate, aesthetic appearance and programmatic possibilities*' (Heritage & Architecture Fall Semester, 2017). The studio, and therefore this project, aims on researching the future value of Structuralist buildings by making a redesign of an existing Structuralist building that functions as a case study.

This booklet departs where the 1. Research booklet ended, namely, by proposing a concept that stems from the transformation framework described in booklet 1. Research. From this concept, the re-design is being elaborated from the larger scale interventions, to the small scaled technical details.

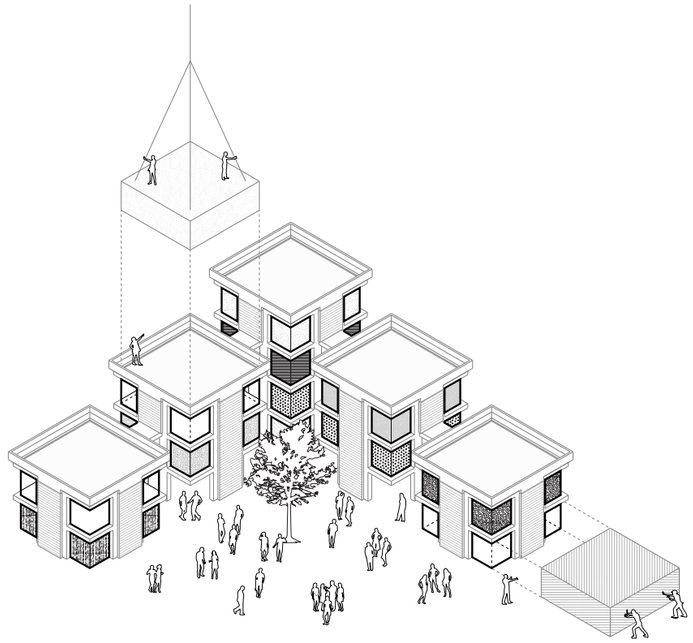


Fig. 2. Revitalizing core-aspect 1: Open for internal changes

2. Transformation framework

In order to respond to the studio's aim the most directly, which is trying to discover the future potential of Structuralist buildings, it is essential to give priority on the inherent characteristics that make the Centraal Beheer building a Structuralist building. Summarizing the information gathered from the analysis, Centraal Beheer can be seen as an open structure, consisting of neutral cells that are combined by an intelligent system. An open structure that is open to interaction with the outside world.

To convert the large amount of information into manageable parts, I depicted three core-characteristics or core-aspects of which I think capture the essence of the Structuralist paradigm in the Centraal Beheer building. Namely that Centraal Beheer can be seen as an open structure, that is *1. Open for internal changes*, 2. *Open for individual interpretation* and *3. Open for social interaction*. How these concepts are translated in the original design, is described in th first booklet 1. Research, chapter 5. Value Assessment.
The next step was juxtaposing the before mentioned 3 core-aspects to the contemporary, societal situation and see if these have to and can be manipulated in a way that they become relevant again, or if they need to be optimized or reinterpreted. This will result in the transformation framework, which is the guiding concept for the further re-design phase.

1. Open for internal changes

Nowadays, societal changes occur even more often and drastic than before. This leads me to the decision of reinterpreting this concept and expand it in a way that the building is able to accommodate any program, at any given time. The small interpretable 3x3m zone needs to be enlarged to a more feasable size, leading to the notion that each island of 9x9m will become the interpretable zone and creating the option of linking multiple islands together in the case a larger program is being added. This results in, again, an open structure in which *any* program can be added, removed, grow or shrink.

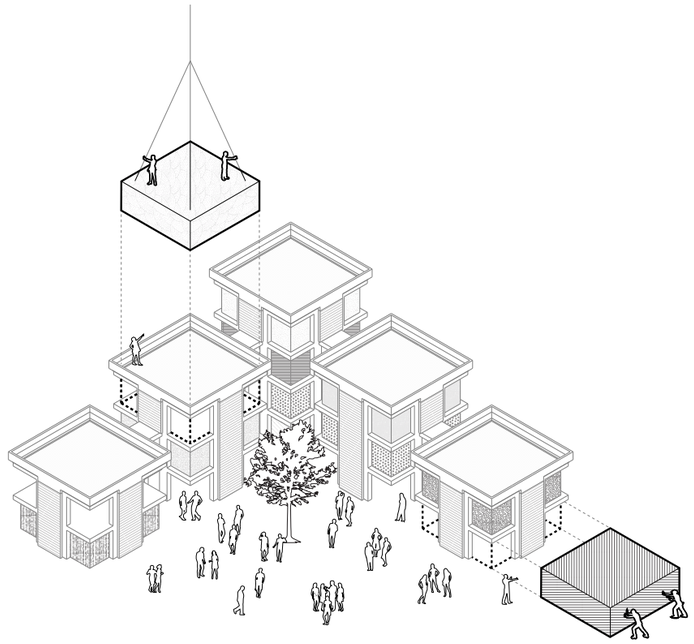


Fig. 3. Revitalizing core-aspect 2: Open for individual interpretation

2. Open for individual interpretation

Personal expression and freedom of choice have always been important values for mankind. In terms of the built environment, Modernism has proven its failure in its attempt to architecturally engineer society. The book ‘Spatial Agency: Other Ways of Doing Architecture’ (Awan, Schneider, Till, 2011) refers to an understanding of design that takes into account other spatial agencies than that of the architect and both define the architectural project beyond the articulation of a perfected image. Something that is acknowledged by Tom Avermaete in The Agency of Structuralism (Avermaete, v.d. Heuvel, 2013). He claims that that ‘people these days are more aware of their spatial agency than they were in the 70s’ 7. So the building is seen as a canvas, unfinished and open for individual interpretation which means users can come up with own initiatives, self design and built their programs.

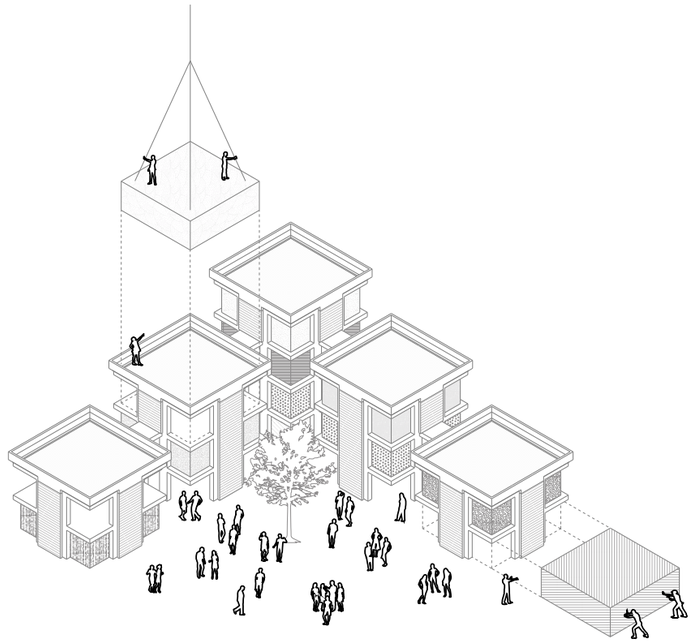


Fig. 4. Revitalizing core-aspect 3: Open for social interaction

3. Open for social interaction

With the pressure on public space due to urbanization and privatization, and the increasing influence of digital media on our social behaviour, the demand for spaces that stimulate direct social interaction is increasing. Due to unforeseen developments in the surrounding, urban context and the fact that the building was used by a single organisation which moved out, these concepts need to be respectively optimized and reinterpreted according its new intended use. Therefore, the urban contrasts will need to be restored. The 'building as a city' concept will be optimized, stimulating social interactions and the emergence of communities.

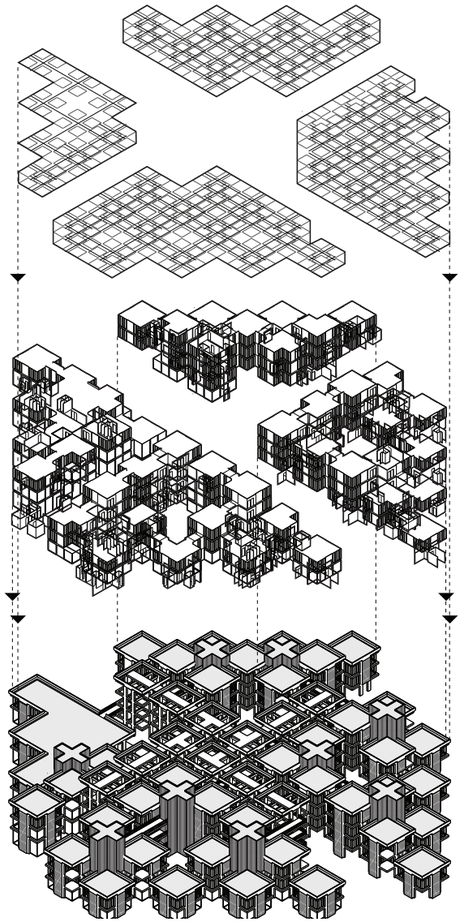


Fig. 5. Remove skin

3. Interventions

Here, the essential and tactical interventions on the building-scale are shown, that create the conditions for the three, before mentioned, core-aspects too be realized. In short they enable every island to operate independently, but can still be linked with its neighbouring islands. The interventions consist of either adding or removing elements.

Remove skin

The existing skin won't suffice to meet the desired concept for several reasons. Firstly, the existing skin is technically degrading, resulting in several leakages inside the building. Secondly, the skin is energy consuming since it is not insulated. And thirdly, degradation processes changed to color of the metal profiles to a pale pink color, resulting in a harsh contrast with all the other outdoor concrete materials. This combination is aesthetically unpleasing and will not extend the aesthetic life of the building.

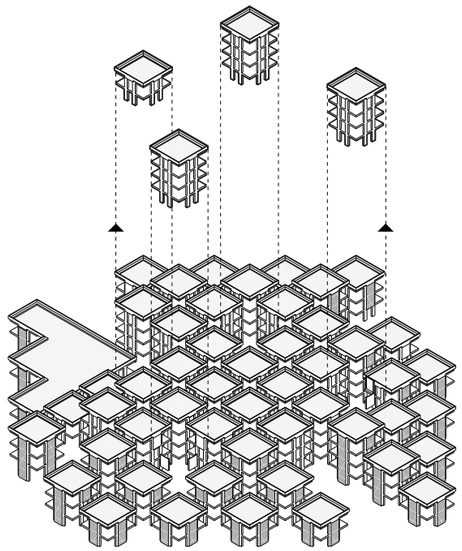


Fig. 6. Remove 4 towers

Remove 4 towers

The facade openings and the system of rooflights between the towers provided the building with natural daylight. Due to the proportions of the building its form, the inner core of this form does not recieve the amount of natural daylight a contemporary building should recieve. By removing 4 towers in such positions, the number of islands adjacent to the outdoor environment increases significantly, without completely disturbing the original building composition, which still remains readable.

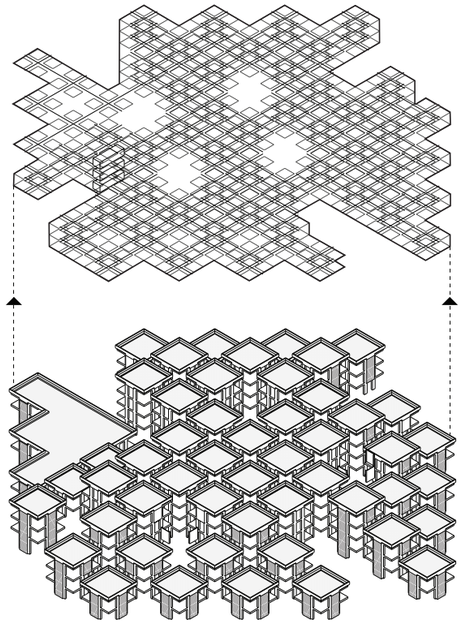


Fig. 7. Remove services

Remove services

The existing interconnected system of services is based on the fact that the building was used by a single user, who basically paid one energy bill. This will change completely, considering the building will be used by an undefined number of new users. Therefore a decentralized and seperated systems of services are necessary. Besides this, the existing services are unsustainable, making use of gas as heating medium.

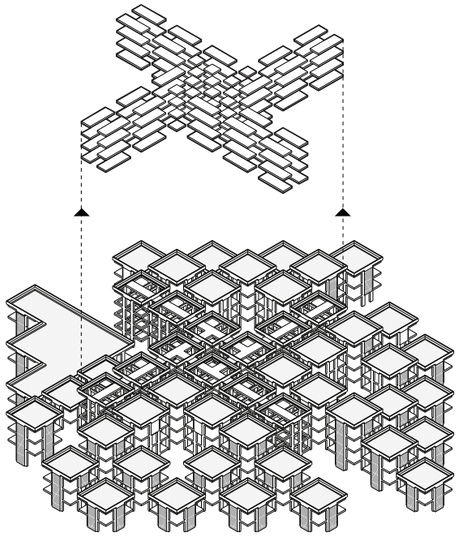


Fig. 8. Remove floor elements

Remove floor elements

The removal of the floor elements from the centre produces two positive effects. Again, to increase the amount of natural daylight and air inside the building. But also, it opens up the centre, allowing it to become an extension of the public domain and optimizes the original idea.

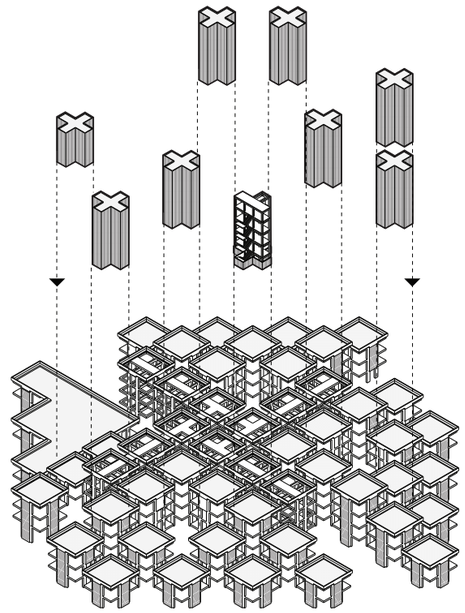


Fig. 9. Add infrastructural cores

Add infrastructural cores

By inserting several core's that contain the essential vertical infrastructure every surrounding island is provided with services and circulation. This enables almost every island to operate autonomously, compared with the other islands. Their location is chosen in such a way, so that the highest number of individual islands comes in contact with one infrastructural core. The intervention has none impact on the existing structure, since they are inserted in the existing voids. The shafts and staircases are overdimensioned so that they can both meet the demands of the program with 'heavier' regulations.

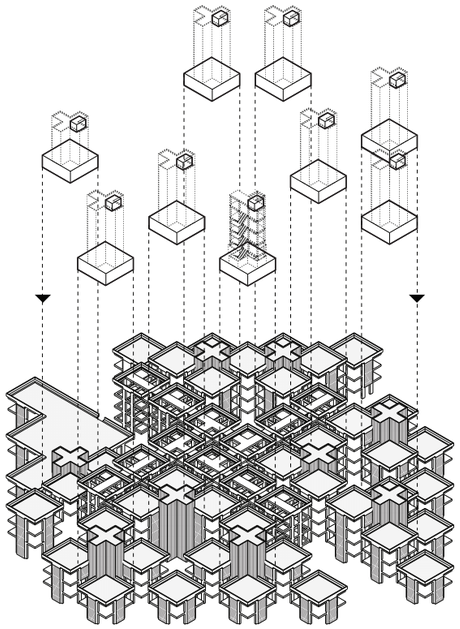


Fig. 10. Add services

Add services

In the bottom and the top of the infrastructural cores, spaces are reserved for the addition of new, sustainable climate installations. These spaces remain accessible and therefore the climate installations adjustable, being able to respond to the different requirements of each program. The building is heated and cooled by a heatpump, using outdoor air as it's source. Fresh air enters the building via the facades and is extracted from the spaces by a hybrid ventilation system. Rainwater is being collected and stored, which can later be used for the grey water circuit in the building.

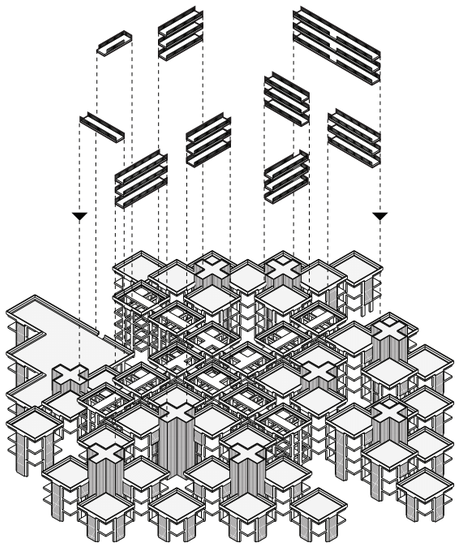


Fig. 11. Add bridges

Add bridges

The added bridges connect the infrastructal cores with the centre and with each other, forming one connected unity again. The centre, along with these added bridges, create a pattern for secondary circulation. This means circulation that can be used to go from one core to the other. It also connects a central elevator and elevating platform with the surrounding cores.

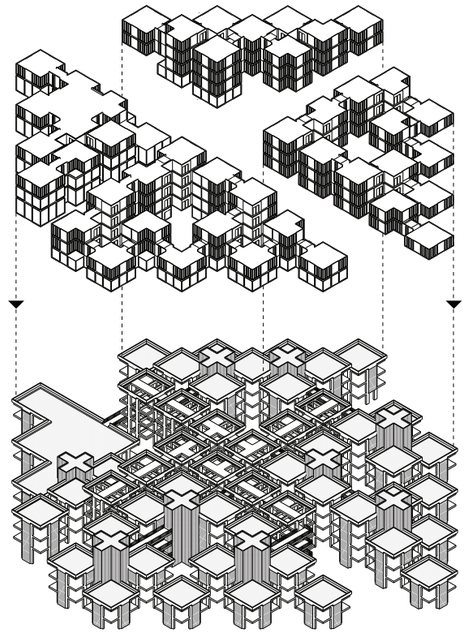


Fig. 12. Add skin

Add skin

A new layer of skin is added within the existing structure, resulting in a box-in-box principle. This ensures that each program has it's 'own skin', so that there is no leaking of sound, thermal heat, fire between different programs.

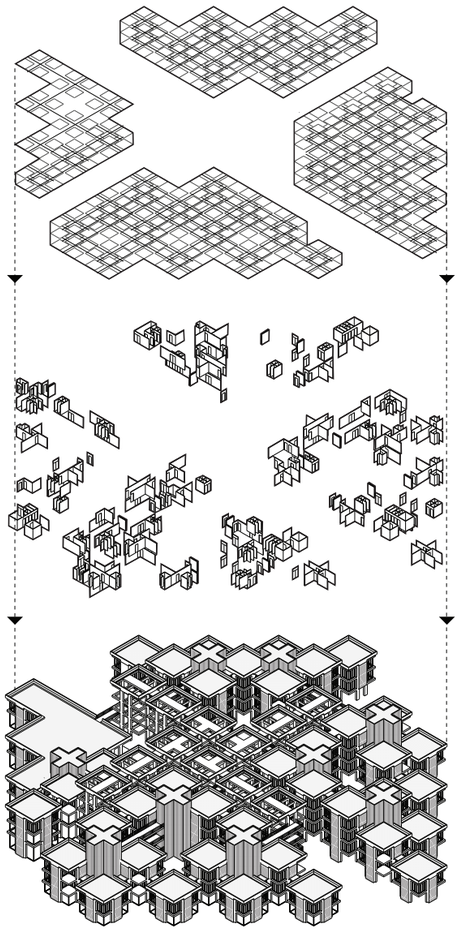


Fig. 13. Add services and space plan

Add services and space plan

Finally, the adaptable services and space plan are added, that makes use of the modularity of the project, meaning that they become circular building elements which are interchangable. They respond to the different technical and functional needs of any program. The user themself is responsible for adding and/or removing these.

Fig. 14. Urban plan (unscaled)

4. Optimized framework

The before described interventions result in an optimized framework, a open system that is waiting to be filled in by future users and is therefore yet unprogrammed.

Urban plan

On an urban level it shows how opening up the centre allows the building te become inviting, stimulating the public to walk trough the iconic building with in the centre the mere structure remaining. The building is anchored in its context, taking into account not the planned but the actual urban context. The centre becomes an extension of the public domain.

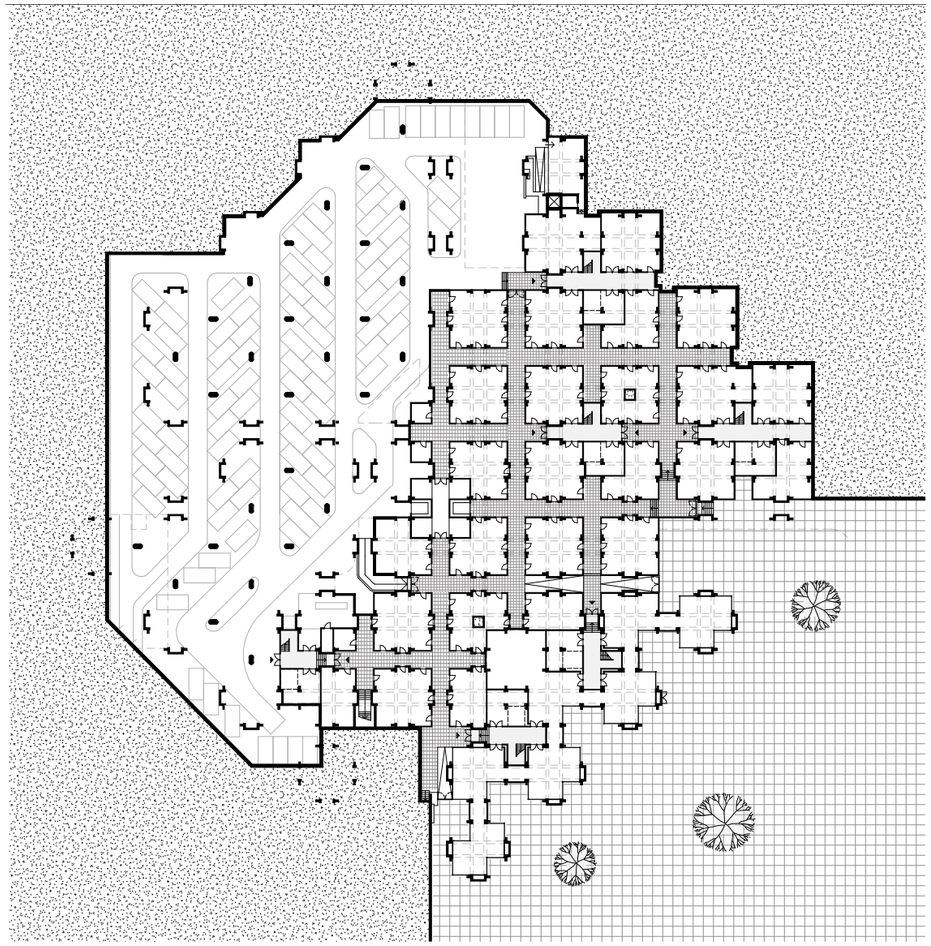


Fig. 15. Basement (unscaled)

Basement

The basement floor has not changed drastically. It consists out of 3 parts. One part is the existing parking garage, which will continue his function in the new building. The second part are storage and servant spaces, creating the possibility for users to store their domestic or business-related stuff. The modular space plan of these storages can be adjusted as well. The third is adjacent to the lowered otudoor square, which are treated similarly then all the other islands, and can contain any given program.

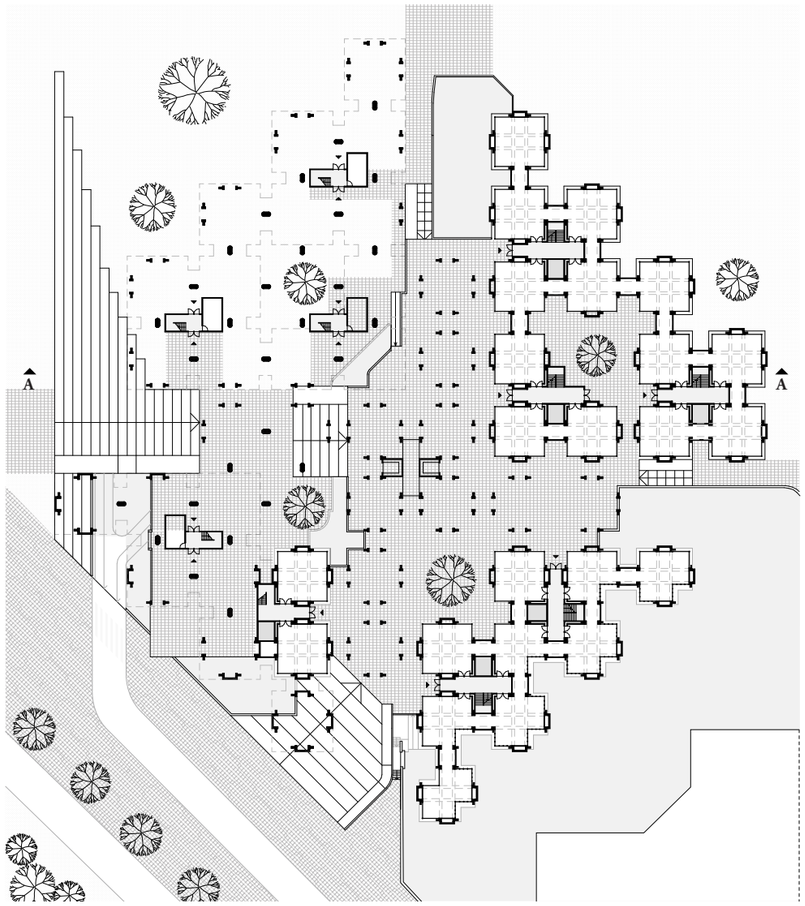


Fig. 16. Ground floor (unscaled)

Ground floor

On ground floor level, the building is being penetrated with (green) public space, opening up this iconic structure to the people. It's layout becomes a diverse mixture of urban elements such as streets, squares and parks all stimulating social interaction. The islands and also its programs on the groundfloor will therefore possess a more public character, compared to the islands higher up in the building, attracting diffrenent users. The inserted, infrastructural cores and central elevators are accessible from ground floor level, and leads residents and visitors to the program they are about to enter.

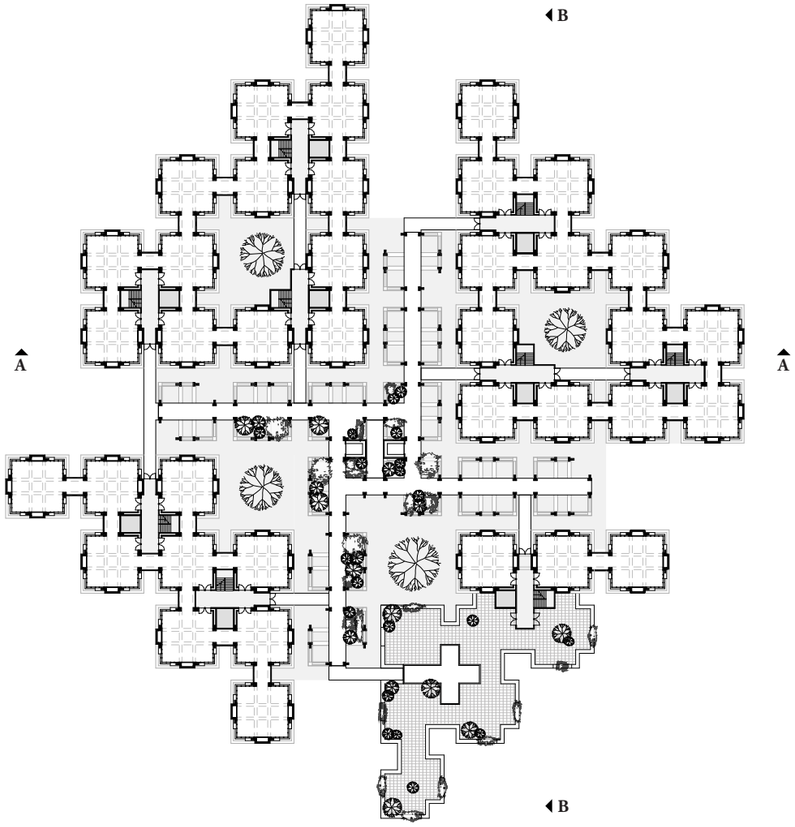


Fig. 17. First floor (unscaled)

First floor

The first floor shows the optimized framework the most purely. It consists of the four original quadrants, connected by the original but opened up centre. Each quadrant misses one tower, providing each island with natural daylight and air. The quadrants are now capable of accomodating multiple programs that can all ocur by different configurations. On top of the east-quadrant, there is a collective roofgarden, a place were the community can meet and enjoy the outdoor climate.

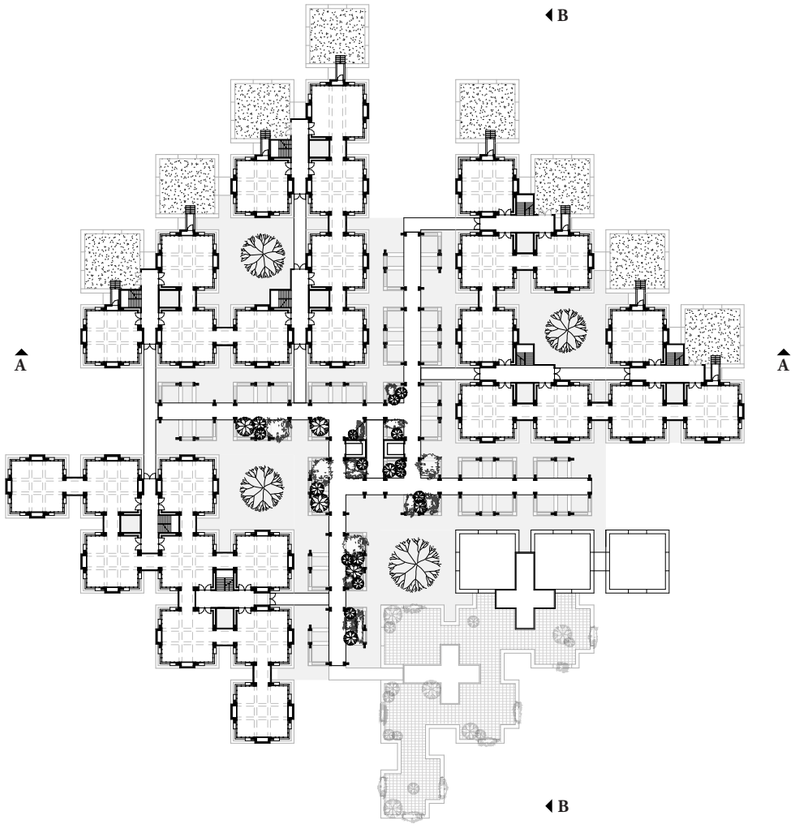


Fig. 18. Second floor (unscaled)

Second floor

The open system continous on the second floor, but it's external envelope decreases in peripheral size. This results in the appearance of roof terraces, that can either be combined with the adajacent island and therefore program, or they can be used for collective purposes since they can be entered from the inserted staircases as well.

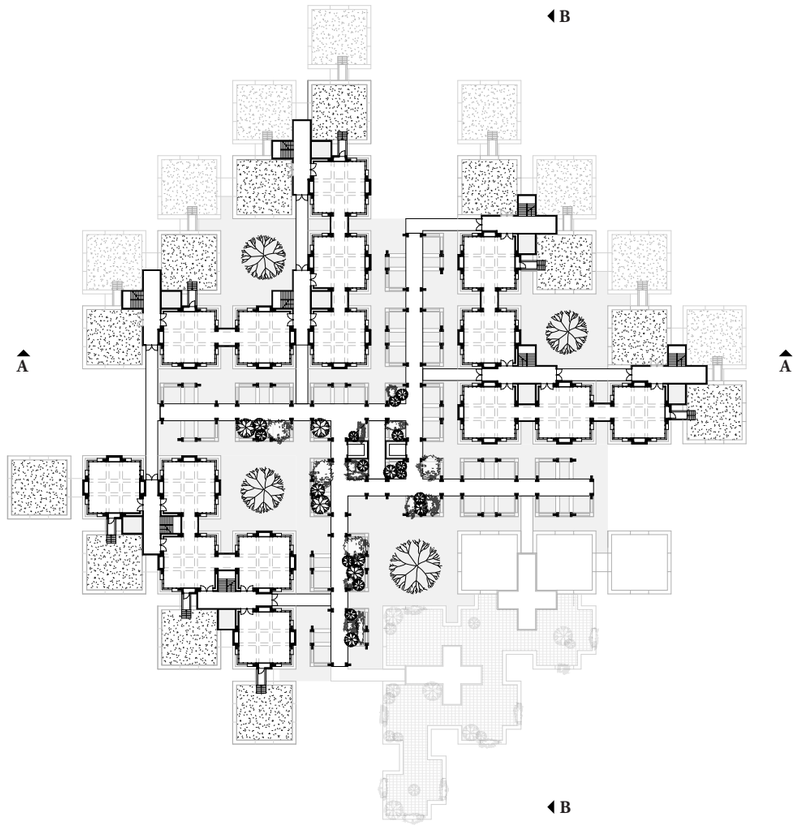


Fig. 19. Third floor (unscaled)

Third floor

Again, the system continous on the third floor and it's external envelope decreases in peripheral size with more roof terraces appearing. Because of this, the number of possible configurations decreases as well.

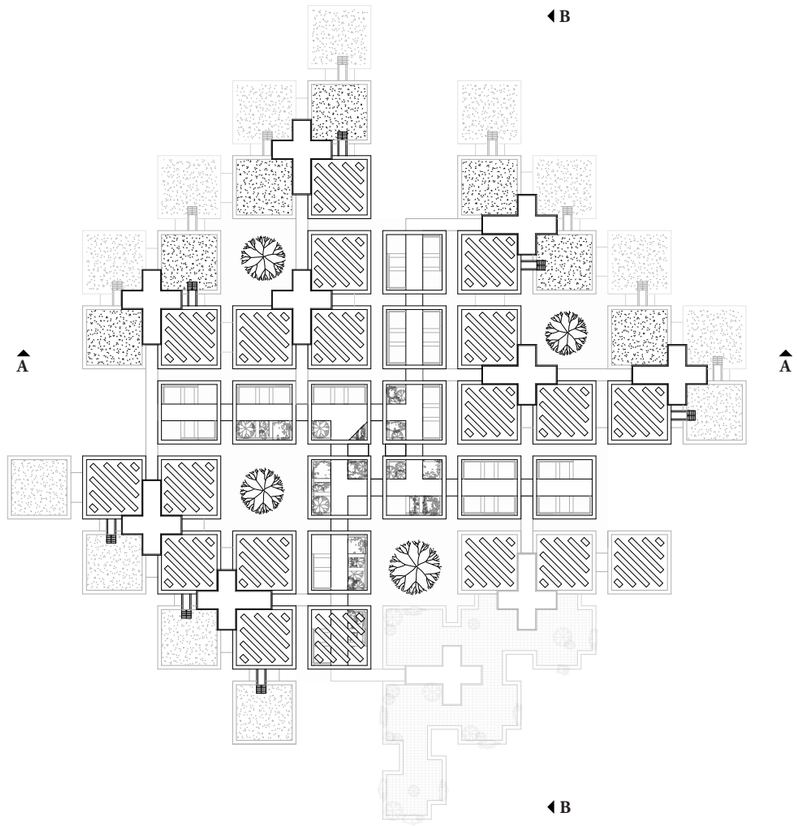


Fig. 20. Roof (unscaled)

Roof

And finally, the flat roofs from the islands on the third floor will be used for installing solar panels, directed at the south and due to the isolated position of the building in its urban context there is hardly obstruction, maximizing the effeciency on this sustainable way of producing electricity.

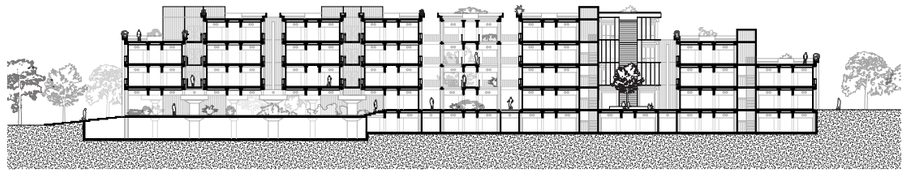


Fig. 21. Section AA (unscaled)

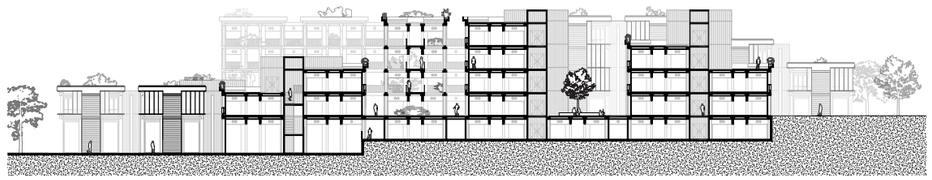


Fig. 22. Section BB (unscaled)

Sections

The sections clearly show all the before mentioned interventions on the existing building. Starting with the opened up centre, providing the building with natural daylight and air but still referes to the original composition and becomes a 3-dimensional garden, an actual outdoor space that is connected with the quadrants by bridges. Section AA clearly shows the public route penetrating the building. Also, both sections show the collective square, resulting from the removal of a tower. Several inserted infrastructural cores are shown, peeking out of the existing building, making them distinctive and clear that they have been added and are not part of the original building. And finally, the sections illustrate how each island became a seperate box, that is still capable of being linked with its neighbouring islands.

Fig. 23. North - West facade (unscaled)

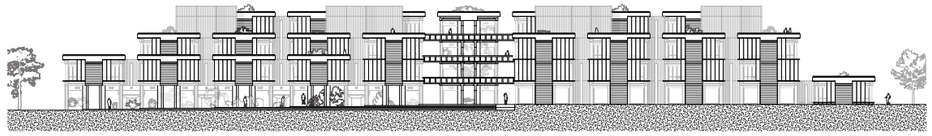


Fig. 24. South - West facade (unscaled)

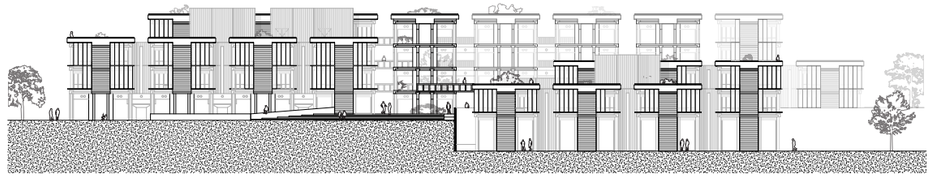


Fig. 25. South - East facade (unscaled)

Fig. 26. North - East facade (unscaled)

Facades

The existing and re-designed building does not have a front or back facade. The building is oriented four sided, treating every facade in a similar manner. By keeping this characteristic alive, the concept of the building as a city is maintained. The re-designed facade also refers to the original design, which will be elaborated later in this booklet.

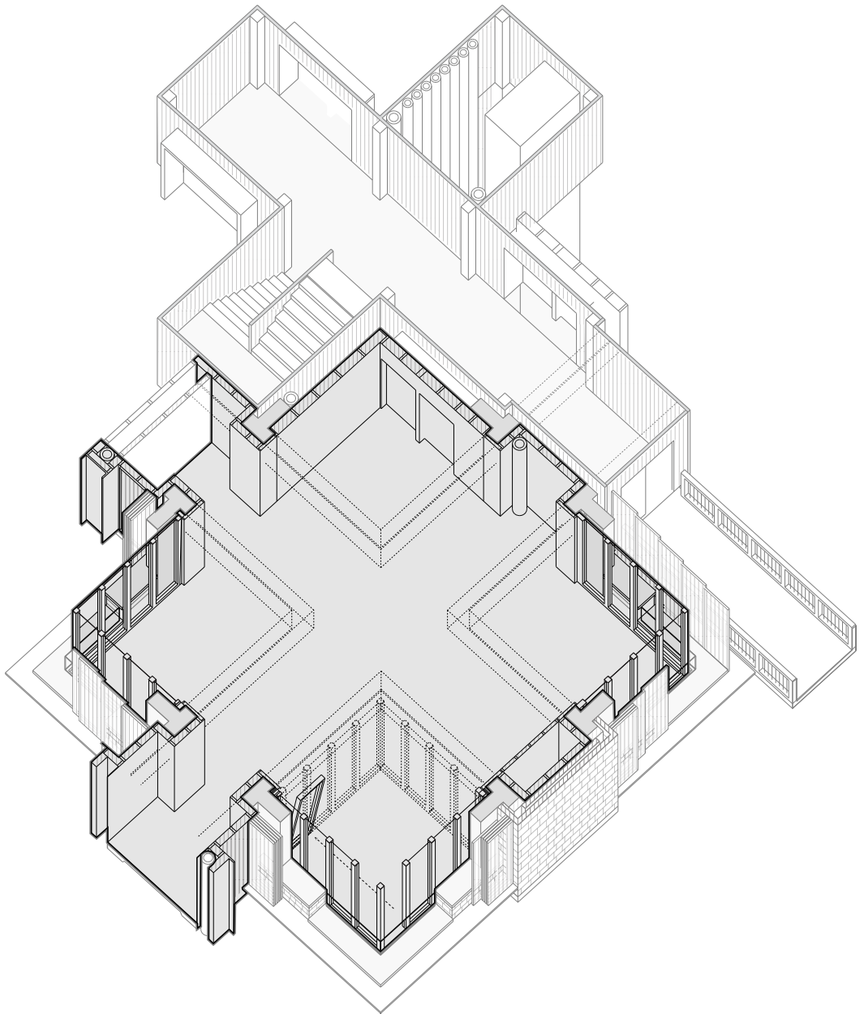


Fig. 27. Skin 1 adaptable

5. The basic building block

Now that the fixed framework is defined, which allows any program to be added, removed, grow or shrink, and contains optimized, quality public spaces stimulating social interaction, it is time to look at a single 9 x 9m island, that can be seen as the expanded, basic building stone of the project.

Skin 1 *fixed and partially adaptable*

Inside the existing structure, a layer of skin is added aaccording the box-in-box principle. This skin has the essential thermal and sound insulating capacity to ensure any program can be accommodated, whereby the regulations are equal for each possible program. The skin consists out of open and closed parts, respecting the original design and simultaneously offering the possibility to create spaces such as toilets and bathrooms. In the open part of the skin, windows can be opened for passive cooling and ventilation purposes. Also, ventilation grills that ensure a continuous supply of natural, fresh outdoor air. Before moving in to the plot, user can choose to either activite a outdoor loggia space or not. The facade elements are designed in such a way that they can fulfill both positions.

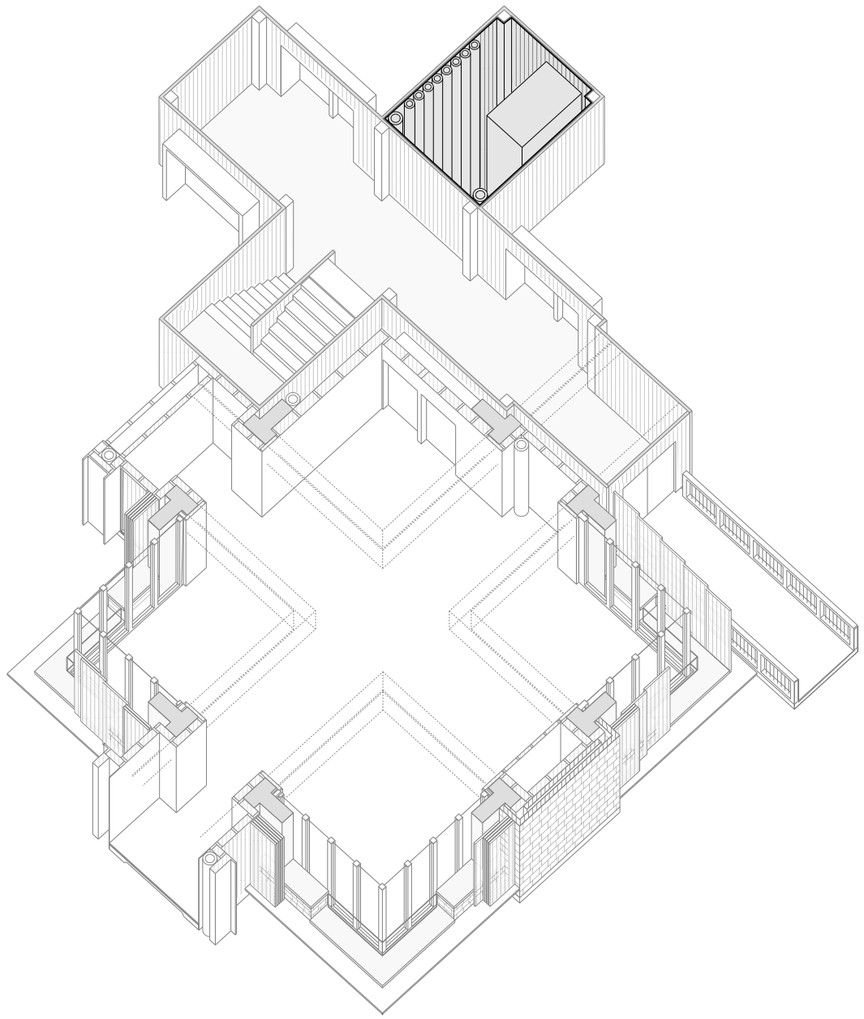


Fig. 28. Collective services fixed and adaptable

Collective services *fixed and adaptable*

The shaft, which is insside the inserted infrastructural core, is where the vertical distribution of collective services take place. The ventilation capacity is calculated on the required capacity an office would need, which is 6,5 dm3/s, p.p. Since these climate installations remain accessible and therefore adaptable, the capacity can be increased if for instance, a healthcare or educational program decides to move in the building. In terms of heating and cooling the spaces, the capacity is the same for each program, that can be adjusted internally.

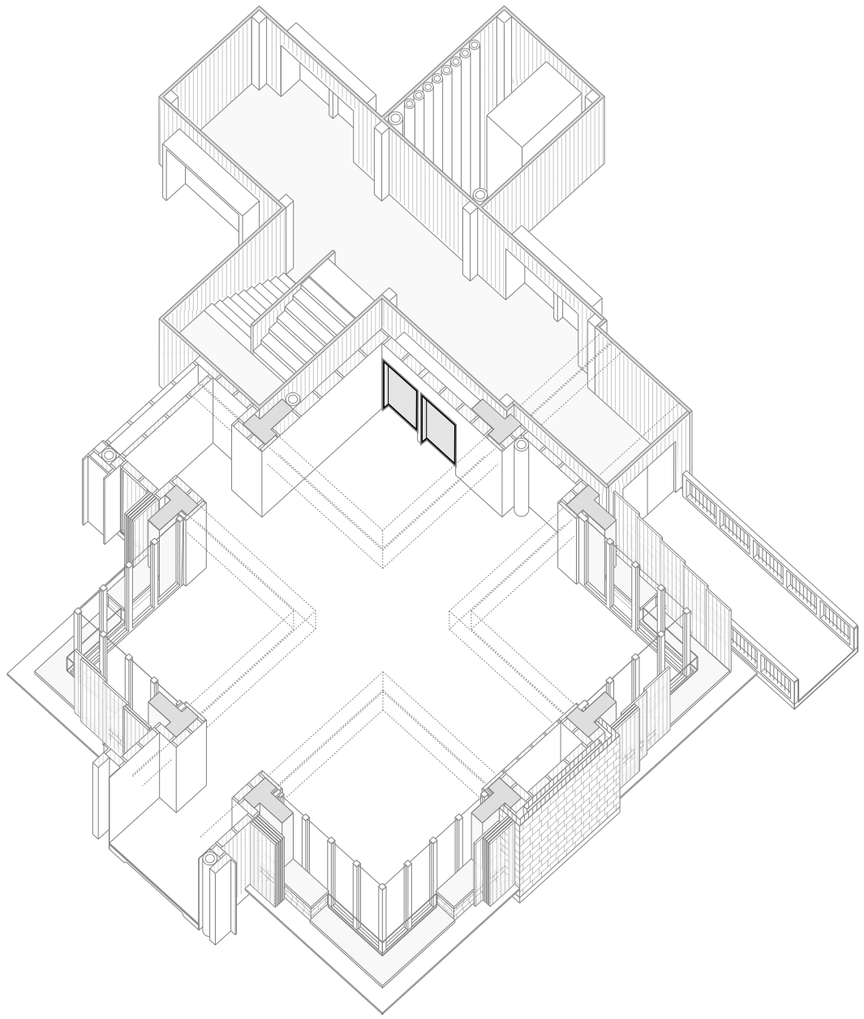


Fig. 29. Entrance adaptable

Entrance *adaptable*

Once a tenant has chosen his/her plot(s), the chosen entrance is being activated which can be entered from the infrastructural core. Depending on the program, the user can also choose to activate a single or double opening door.

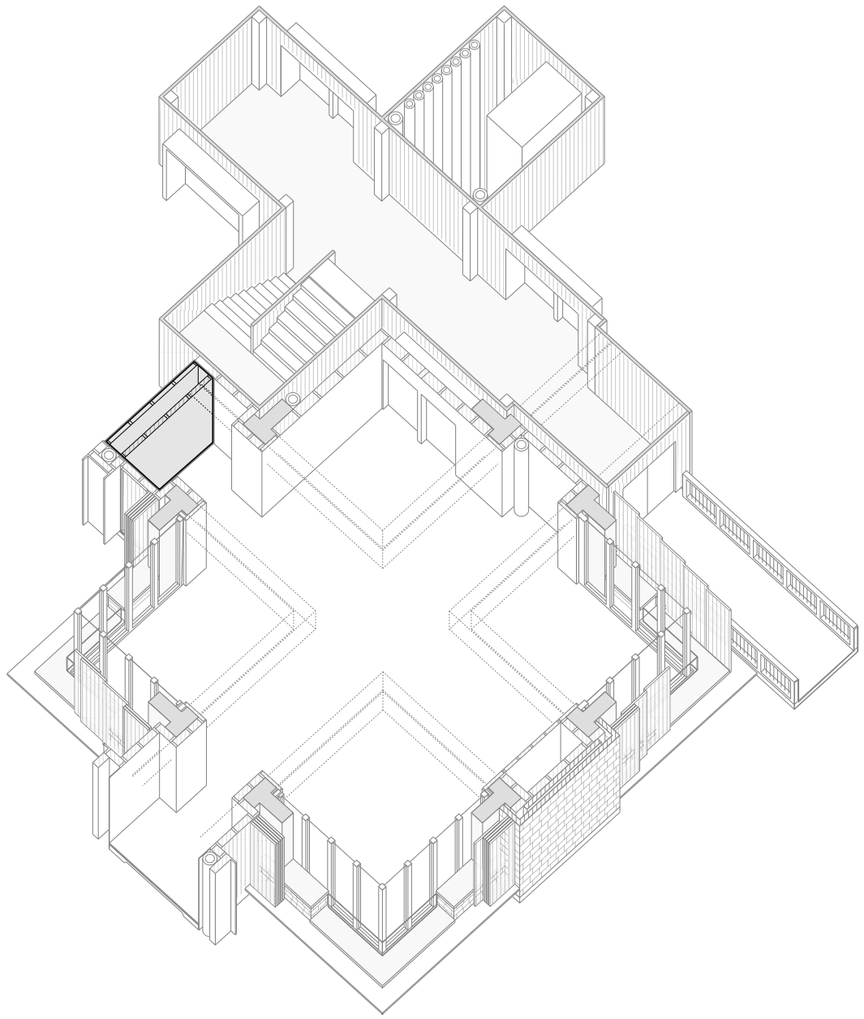


Fig. 30. Program division wall adaptable

Program division wall *adaptable*

A program division wall creates the border between two programs. This wall is relatively small which is favorable, so that the physical contact between the various programs remains limited. This wall is thus adaptable and ensures the prevention of thermal and noise leaks between the various programs. For this wall, the regulations are equal for each possible program.

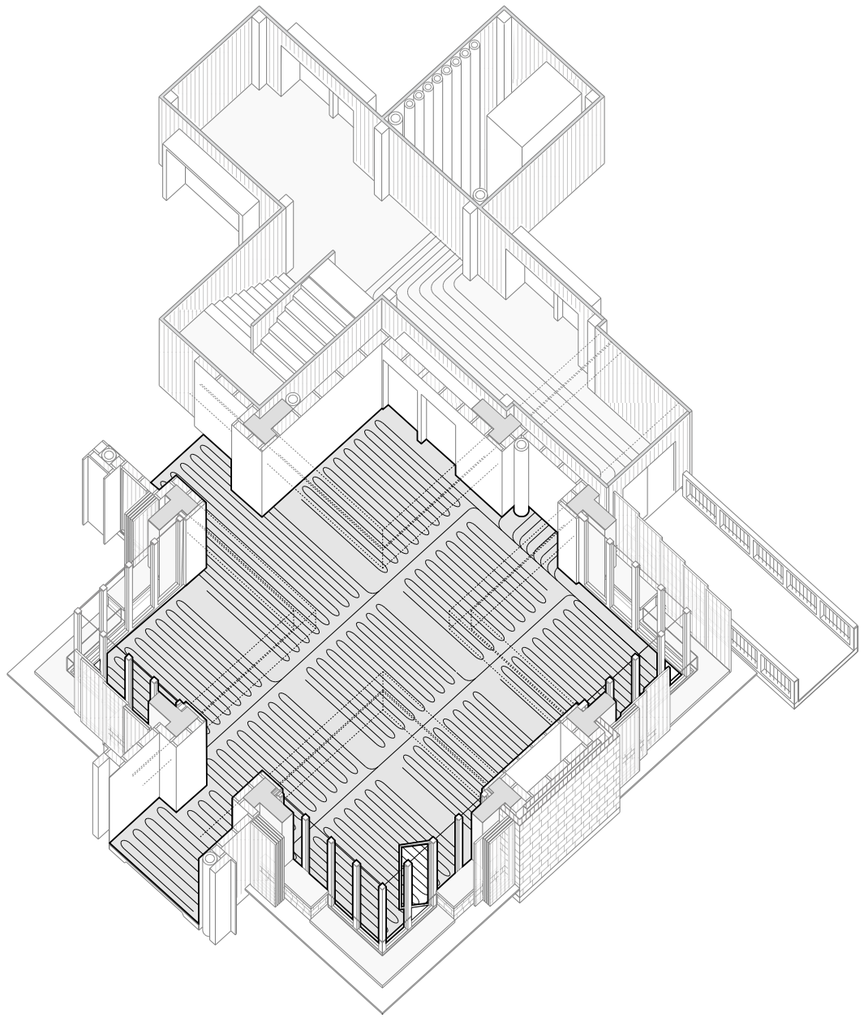


Fig. 31. Secondary services adaptable, heating and cooling

Secondary services *adaptable*

From the colllective services, each user can connect their adaptable services in order to climates their plot(s).

Heating and cooling

A low temperature heating and cooling system is fixed, integrated in a newly added top floor. This system consist out of different zones, that correspond with any potential programmatic layout. The system is adaptable in the way that the temperature can be adjusted depening on the outdoor climate and the internal heat production by for instance people.

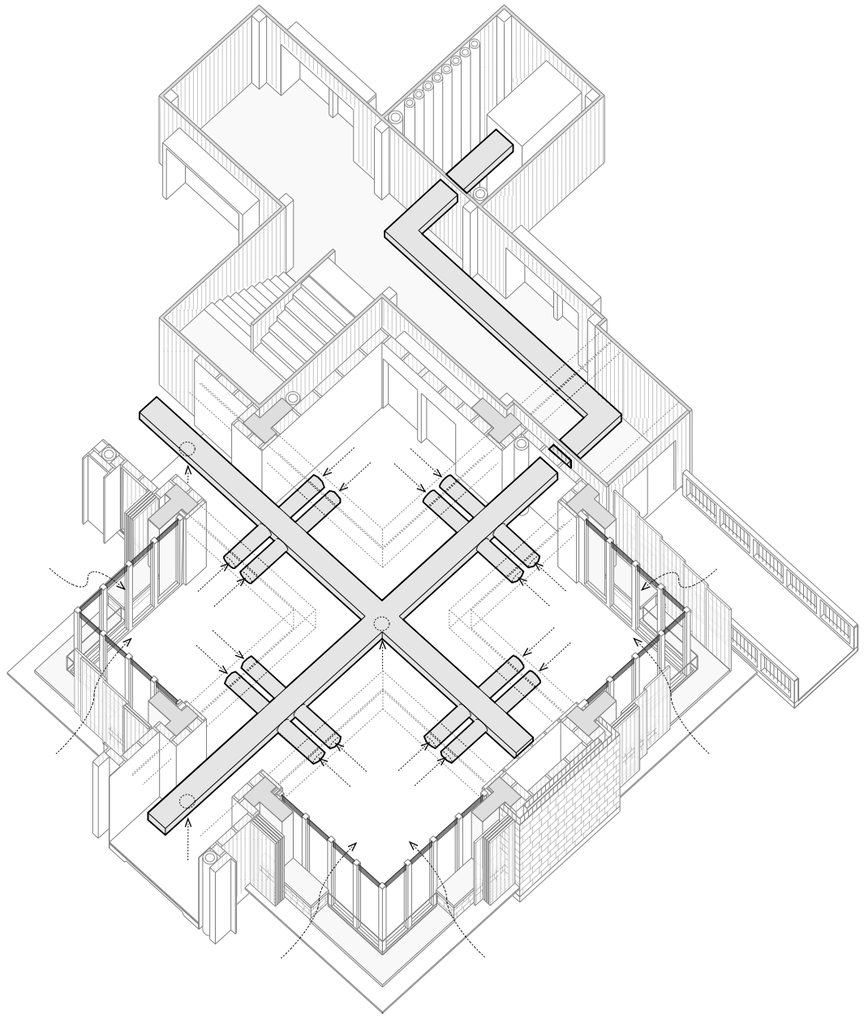


Fig. 32. Individual services adaptable, ventilation

Ventilation

Fresh air enters the island trough adjustable ventilation grills integrated in the facade elements, depending on the amount of fresh air required. Extraction takes place in the horizontal shaft between the two primary beams. From here on, ventilation ducts can extract the air from the adjacent 3 x 3 zones and the zone right below these two beams. CO2 detection meters determine how much ventilation air has to be extracted.

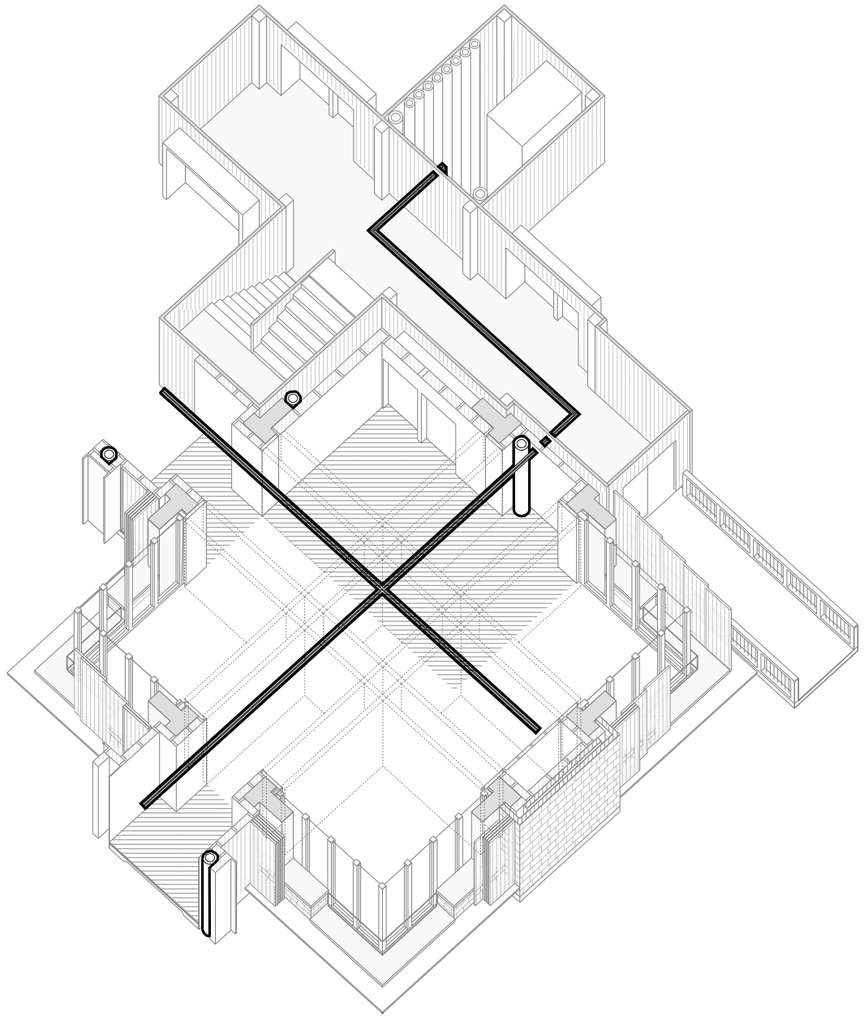


Fig. 33. Individual services adaptable, water

Water

Also in the horizontal shaft between the two primary beams, waterpipes can be added, that are also connected with the collective services within the shaft. From the horizontal shaft, water pipes will be integrated within the walls of the space plan, so that any location within the island can be provided with water. Drainage will take place at one or more of the added drainaige pipes. These also determine the potential locations of installing a toilet, bathroom or kitchen (marked as the striped zones).

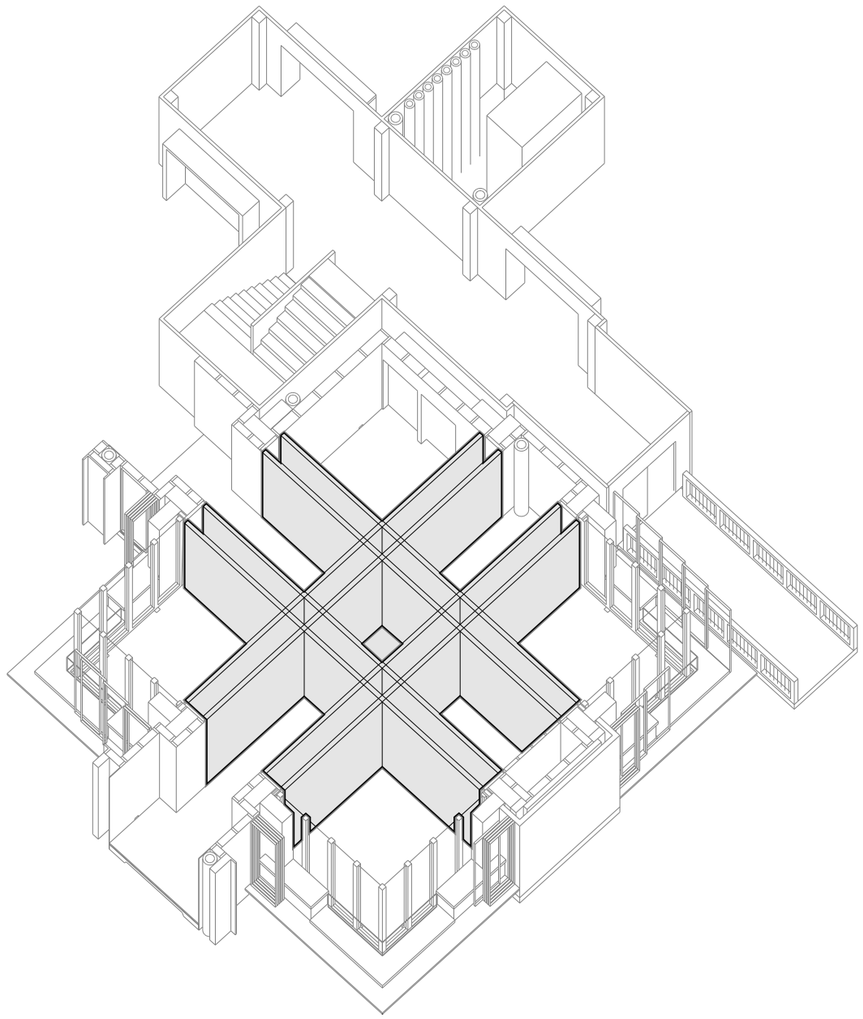


Fig. 34. Space plan adaptable

Space plan *adaptable*

Next step is installing the self designed space plan by the users themselves. Its possible locations correspond with the existing grid inside the 9 x 9 m island, which leads on both sides of the primary beams, indicated with the gridline. The space plan is modular and interchangeable, which makes it a circular building element that can be traded or sold innside the building and is sufficient for any programmatic scenario.

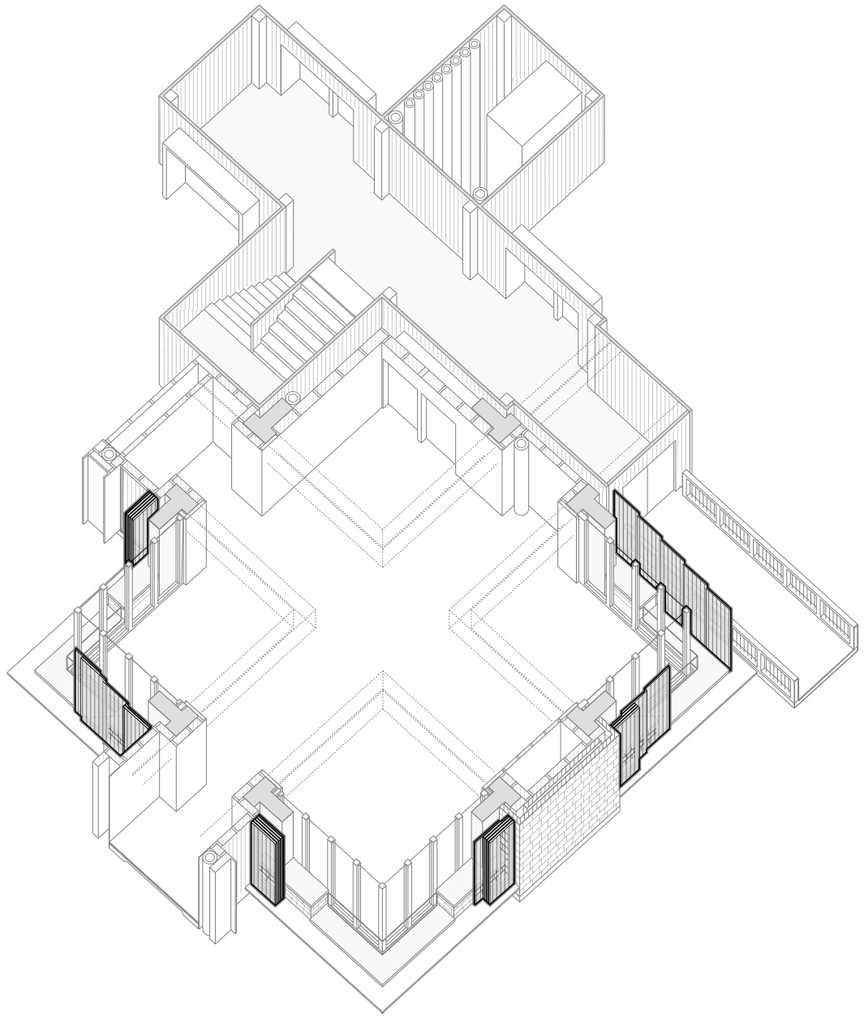


Fig. 35. Skin 2 adaptable

Skin 2 *adaptable*

Since each program has differing demans in terms of daylight, visibility, views and sunlight, a second layer of skin is added which consist out of moveable blinds, responding to those different demands. These blinds can be adjusted from the inside out, by first opening a window.

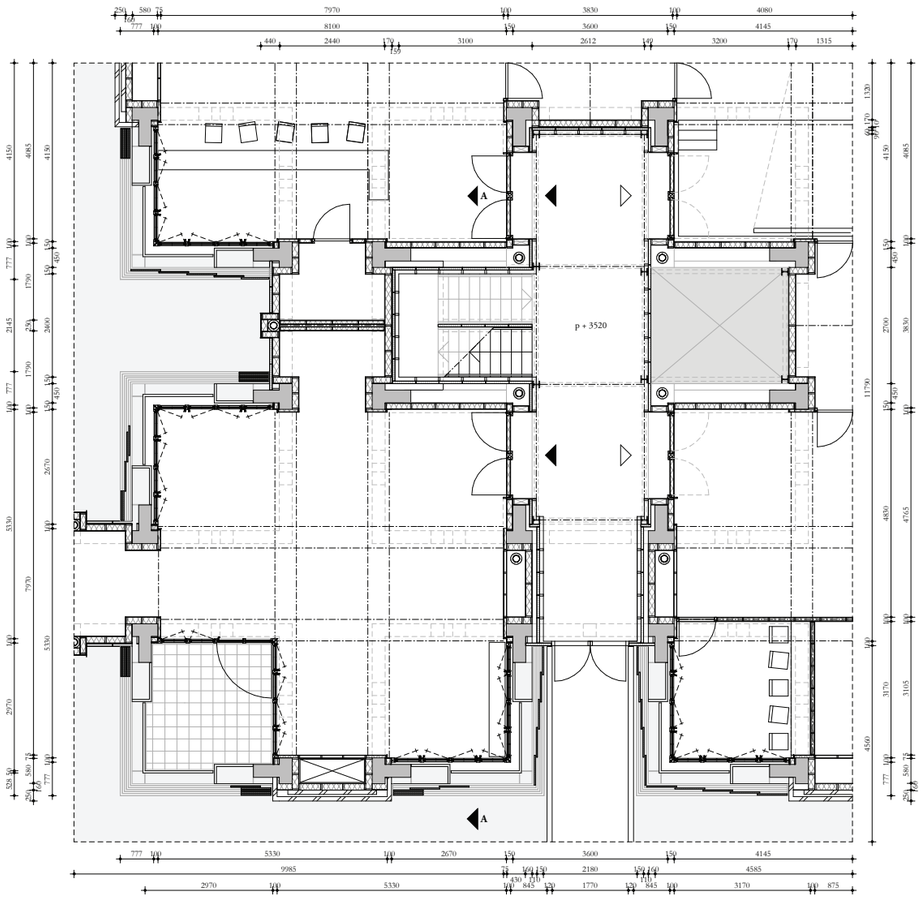


Fig. 36. Floor plan (unscaled)

Floor plan

Fig. 37. Possible spatial configuration

Fig. 38. Possible spatial configuration

Fig. 39. Possible spatial configuration

Fig. 40. Possible spatial configuration

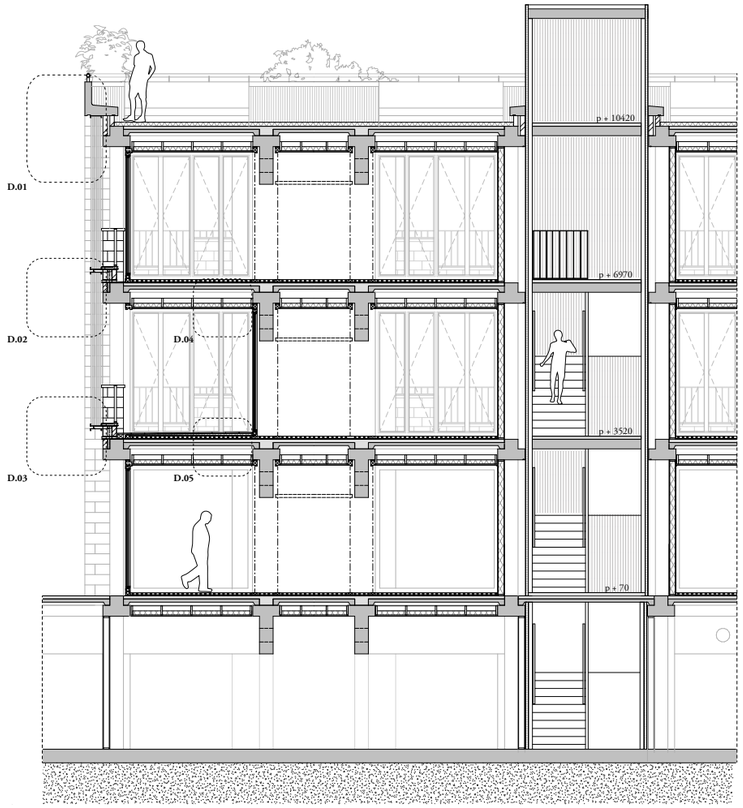


Fig. 41. Section AA (unscaled)

Section AA

Fig. 42. Facade

Facade

The new design of the facade can be seen as a blanco envelope, not representing any program, since the infill of the structure remains undefined. Therefore, the new design builds upon the composition of the original design, since this image has proved architectural and emotional value that people already can associate with.

The layering from the original design is brought back in the new one. Starting from the inside, are the adjustable, timber facade elements. The light weight material represents this adaptability and also creates a synergy with the existing concrete materials, making a nature related reference. If chosen to activate the outdoor loggia, the facade referts to the original balconies of the former office, that will be shown randomly in the total composition. The second layer consist of the concrete brick balustrades, whereby the timber part is replaced with a similar sized, durable steel balustrade. The third and final layer are the ajustable blinds, adding a certain lightness to the already massive structure. Besides, since their changeable in their positions, the overall design of the facade will show interesting vatiations of the same theme.

The ground floor facad differs from the upper ones, since these islands are surrounded by public and collective space, therefore attracting public programs.

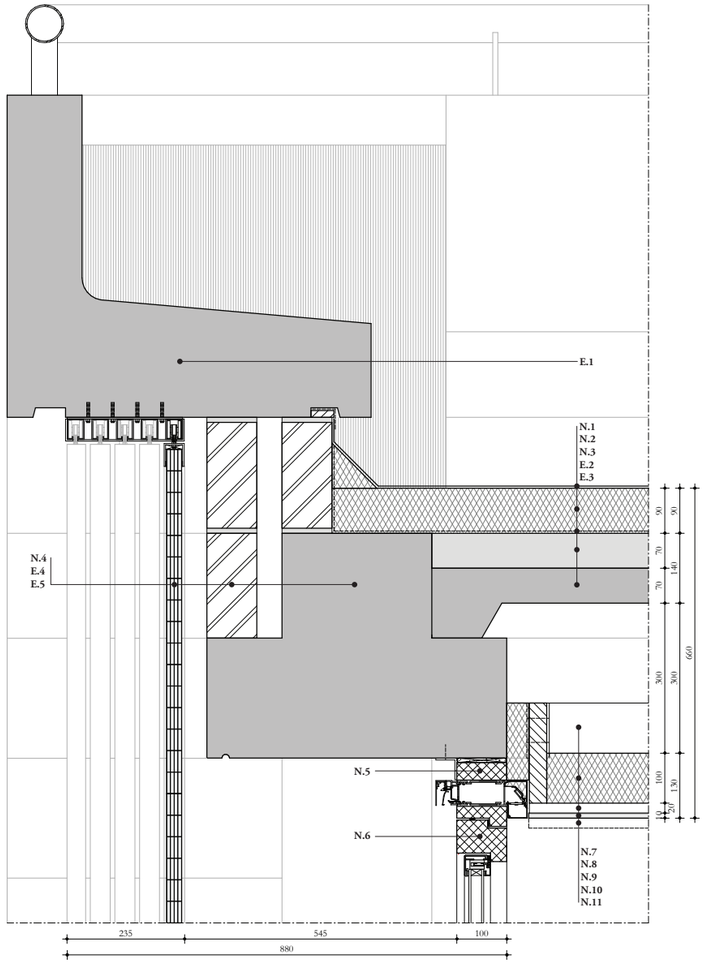


Fig. 43. Detail 1

Detail 1 Roof ending with blinds and box-in-box facade

Existing

E.1 Prefab concrete roof bench
E.2 Concrete top floor 70 mm
E.3 Prefab concrete floor element 70 mm
E.4 Concrete-brick masonry 100 mm
E.5 Prefab secondary beam 450 x 600 mm
E.6 Steel consoles
E.7 Prefab primary beam 600 x 1070 mm

New

N.1 Watertight roof covering
N.2 Sloping insulation
N.3 Roofing insulation 100mm Rc 6,0m2.K/W
N.4 Polycarbonate moveable blinds 40 mm
N.5 Timber profile with ventilation grille 100 mm
N.6 Timber facade element, aluminium windows 100 mm
N.7 Timber beams 40 x 200 mm
N.8 Insulation 100 mm 4,5m2.K/W
N.9 Timber slats 20 mm
N.10 OSB board 10 mm
N.11 Space for optional finishing
N.12 Steel balustrade height p+1000
N.13 Concrete watersill
N.14 Aluminium gutter
N.15 Cement floor topping with LT floor heating 50 mm
N.16 Insulation 20 mm
N.17 Terrace tiles
N.18 Timber frame 55 mm
N.19 Dampproof foil
N.20 Timber frame with insulation 4,5m2.K/W 150 mm
N.21 Watertight foil
N.22 Insulation filling
N.23 Timber profile for interior walls

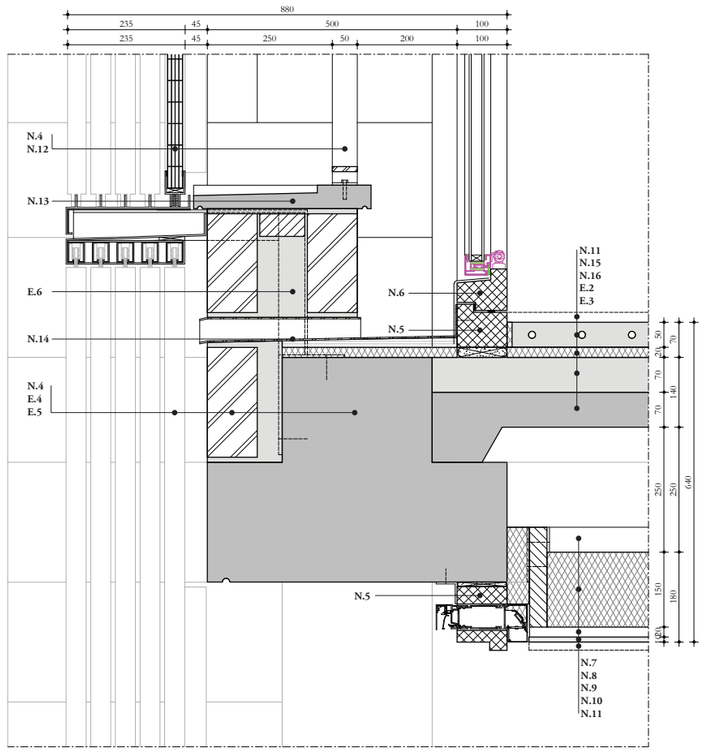


Fig. 44. Detail 2

Detail 2 Floor with (de)activated outdoor loggia

Existing

E.1 Prefab concrete roof bench
E.2 Concrete top floor 70 mm
E.3 Prefab concrete floor element 70 mm
E.4 Concrete-brick masonry 100 mm
E.5 Prefab secondary beam 450 x 600 mm
E.6 Steel consoles
E.7 Prefab primary beam 600 x 1070 mm

New

N.1 Watertight roof covering
N.2 Sloping insulation
N.3 Roofing insulation 100mm Rc 6,0m2.K/W
N.4 Polycarbonate moveable blinds 40 mm
N.5 Timber profile with ventilation grille 100 mm
N.6 Timber facade element, aluminium windows 100 mm
N.7 Timber beams 40 x 200 mm
N.8 Insulation 100 mm 4,5m2.K/W
N.9 Timber slats 20 mm
N.10 OSB board 10 mm
N.11 Space for optional finishing
N.12 Steel balustrade height p+1000
N.13 Concrete watersill
N.14 Aluminium gutter
N.15 Cement floor topping with LT floor heating 50 mm
N.16 Insulation 20 mm
N.17 Terrace tiles
N.18 Timber frame 55 mm
N.19 Dampproof foil
N.20 Timber frame with insulation 4,5m2.K/W 150 mm
N.21 Watertight foil
N.22 Insulation filling
N.23 Timber profile for interior walls

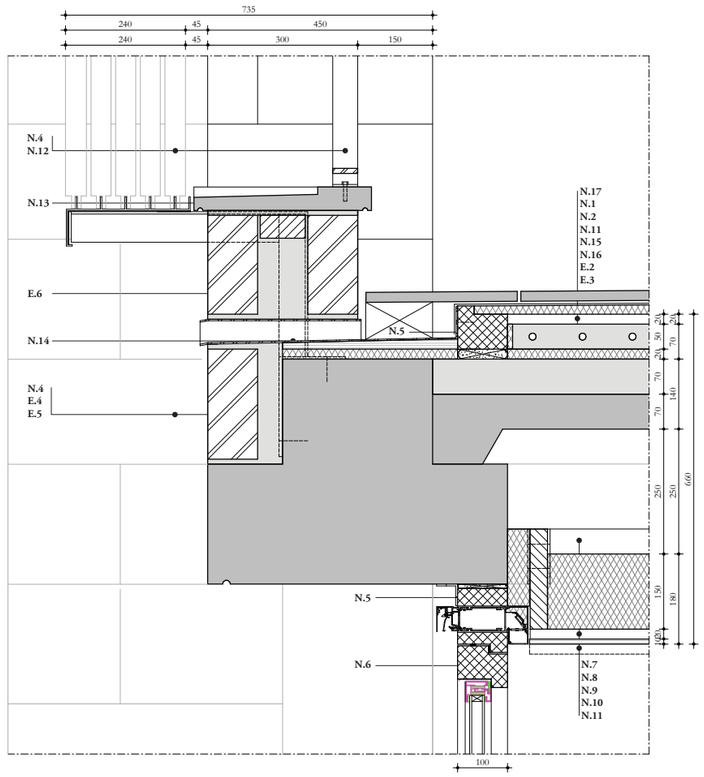


Fig. 45. Detail 3

Detail 3 Floor and (de)activated outdoor loggia

Existing

E.1 Prefab concrete roof bench
E.2 Concrete top floor 70 mm
E.3 Prefab concrete floor element 70 mm
E.4 Concrete-brick masonry 100 mm
E.5 Prefab secondary beam 450 x 600 mm
E.6 Steel consoles
E.7 Prefab primary beam 600 x 1070 mm

New

N.1 Watertight roof covering
N.2 Sloping insulation
N.3 Roofing insulation 100mm Rc 6,0m2.K/W
N.4 Polycarbonate moveable blinds 40 mm
N.5 Timber profile with ventilation grille 100 mm
N.6 Timber facade element, aluminium windows 100 mm
N.7 Timber beams 40 x 200 mm
N.8 Insulation 100 mm 4,5m2.K/W
N.9 Timber slats 20 mm
N.10 OSB board 10 mm
N.11 Space for optional finishing
N.12 Steel balustrade height p+1000
N.13 Concrete watersill
N.14 Aluminium gutter
N.15 Cement floor topping with LT floor heating 50 mm
N.16 Insulation 20 mm
N.17 Terrace tiles
N.18 Timber frame 55 mm
N.19 Dampproof foil
N.20 Timber frame with insulation 4,5m2.K/W 150 mm
N.21 Watertight foil
N.22 Insulation filling
N.23 Timber profile for interior walls

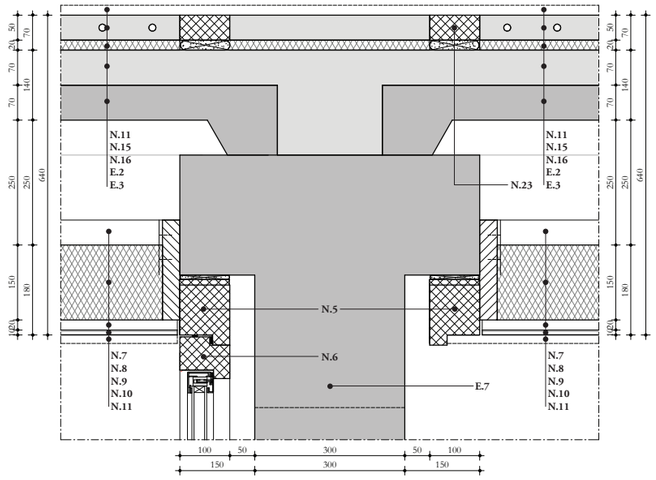


Fig. 46. Detail 4

Detail 4 Primary beam and (de)activated outdoor loggia

Existing

E.1 Prefab concrete roof bench
E.2 Concrete top floor 70 mm
E.3 Prefab concrete floor element 70 mm
E.4 Concrete-brick masonry 100 mm
E.5 Prefab secondary beam 450 x 600 mm
E.6 Steel consoles
E.7 Prefab primary beam 600 x 1070 mm

New

N.1 Watertight roof covering
N.2 Sloping insulation
N.3 Roofing insulation 100mm Rc 6,0m2.K/W
N.4 Polycarbonate moveable blinds 40 mm
N.5 Timber profile with ventilation grille 100 mm
N.6 Timber facade element, aluminium windows 100 mm
N.7 Timber beams 40 x 200 mm
N.8 Insulation 100 mm 4,5m2.K/W
N.9 Timber slats 20 mm
N.10 OSB board 10 mm
N.11 Space for optional finishing
N.12 Steel balustrade height p+1000
N.13 Concrete watersill
N.14 Aluminium gutter
N.15 Cement floor topping with LT floor heating 50 mm
N.16 Insulation 20 mm
N.17 Terrace tiles
N.18 Timber frame 55 mm
N.19 Dampproof foil
N.20 Timber frame with insulation 4,5m2.K/W 150 mm
N.21 Watertight foil
N.22 Insulation filling
N.23 Timber profile for interior walls

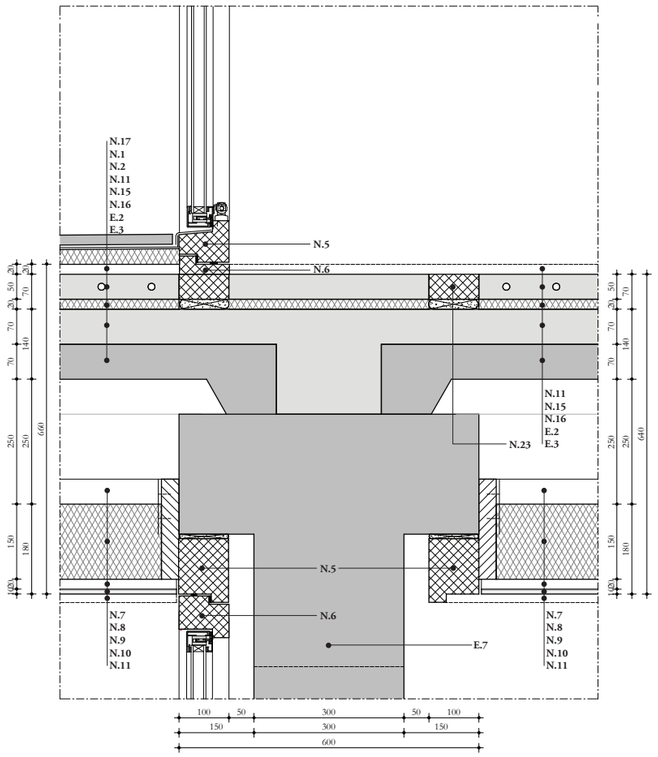


Fig. 47. Detail 5

Detail 5 Primary beam and (de)activated outdoor loggia

Existing

E.1 Prefab concrete roof bench
E.2 Concrete top floor 70 mm
E.3 Prefab concrete floor element 70 mm
E.4 Concrete-brick masonry 100 mm
E.5 Prefab secondary beam 450 x 600 mm
E.6 Steel consoles
E.7 Prefab primary beam 600 x 1070 mm

New

N.1 Watertight roof covering
N.2 Sloping insulation
N.3 Roofing insulation 100mm Rc 6,0m2.K/W
N.4 Polycarbonate moveable blinds 40 mm
N.5 Timber profile with ventilation grille 100 mm
N.6 Timber facade element, aluminium windows 100 mm
N.7 Timber beams 40 x 200 mm
N.8 Insulation 100 mm 4,5m2.K/W
N.9 Timber slats 20 mm
N.10 OSB board 10 mm
N.11 Space for optional finishing
N.12 Steel balustrade height p+1000
N.13 Concrete watersill
N.14 Aluminium gutter
N.15 Cement floor topping with LT floor heating 50 mm
N.16 Insulation 20 mm
N.17 Terrace tiles
N.18 Timber frame 55 mm
N.19 Dampproof foil
N.20 Timber frame with insulation 4,5m2.K/W 150 mm
N.21 Watertight foil
N.22 Insulation filling
N.23 Timber profile for interior walls

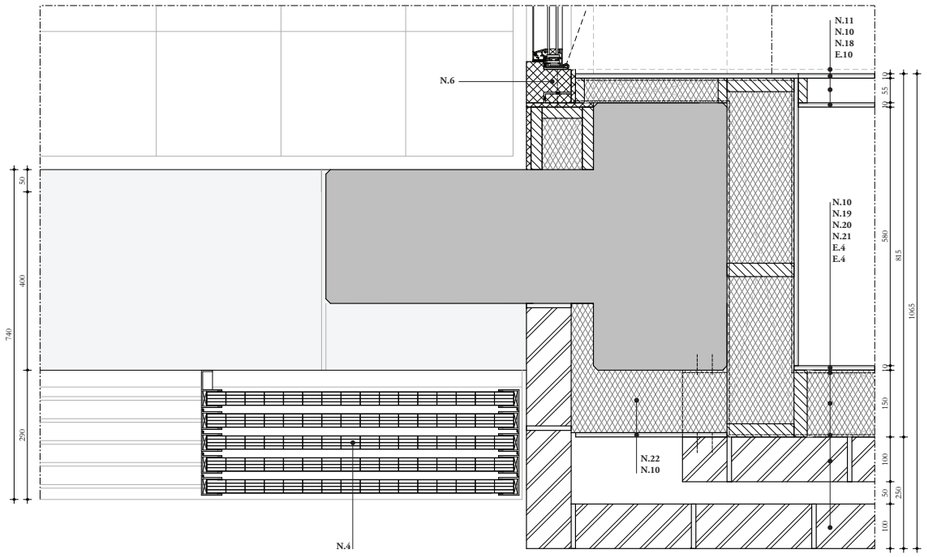


Fig. 48. Detail 6

Detail 6 Column and activated outdoor loggia

Existing
E.1 Prefab concrete roof bench
E.2 Concrete top floor 70 mm
E.3 Prefab concrete floor element 70 mm
E.4 Concrete-brick masonry 100 mm
E.5 Prefab secondary beam 450 x 600 mm
E.6 Steel consoles
E.7 Prefab primary beam 600 x 1070 mm

New
N.1 Watertight roof covering
N.2 Sloping insulation
N.3 Roofing insulation 100mm Rc 6,0m2.K/W
N.4 Polycarbonate moveable blinds 40 mm
N.5 Timber profile with ventilation grille 100 mm
N.6 Timber facade element, aluminium windows 100 mm
N.7 Timber beams 40 x 200 mm
N.8 Insulation 100 mm 4,5m2.K/W
N.9 Timber slats 20 mm
N.10 OSB board 10 mm
N.11 Space for optional finishing
N.12 Steel balustrade height p+1000
N.13 Concrete watersill
N.14 Aluminium gutter
N.15 Cement floor topping with LT floor heating 50 mm
N.16 Insulation 20 mm
N.17 Terrace tiles
N.18 Timber frame 55 mm
N.19 Dampproof foil
N.20 Timber frame with insulation 4,5m2.K/W 150 mm
N.21 Watertight foil
N.22 Insulation filling
N.23 Timber profile for interior walls

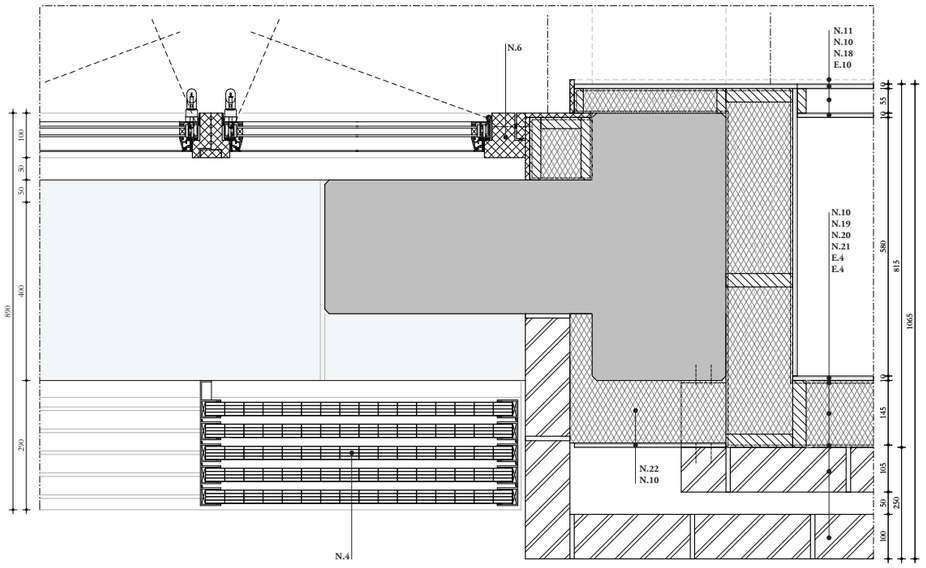


Fig. 49. Detail 7

Detail 7 Column and (de)activated outdoor loggia

Existing

E.1 Prefab concrete roof bench
E.2 Concrete top floor 70 mm
E.3 Prefab concrete floor element 70 mm
E.4 Concrete-brick masonry 100 mm
E.5 Prefab secondary beam 450 x 600 mm
E.6 Steel consoles
E.7 Prefab primary beam 600 x 1070 mm

New

N.1 Watertight roof covering
N.2 Sloping insulation
N.3 Roofing insulation 100mm Rc 6,0m2.K/W
N.4 Polycarbonate moveable blinds 40 mm
N.5 Timber profile with ventilation grille 100 mm
N.6 Timber facade element, aluminium windows 100 mm
N.7 Timber beams 40 x 200 mm
N.8 Insulation 100 mm 4,5m2.K/W
N.9 Timber slats 20 mm
N.10 OSB board 10 mm
N.11 Space for optional finishing
N.12 Steel balustrade height p+1000
N.13 Concrete watersill
N.14 Aluminium gutter
N.15 Cement floor topping with LT floor heating 50 mm
N.16 Insulation 20 mm
N.17 Terrace tiles
N.18 Timber frame 55 mm
N.19 Dampproof foil
N.20 Timber frame with insulation 4,5m2.K/W 150 mm
N.21 Watertight foil
N.22 Insulation filling
N.23 Timber profile for interior walls

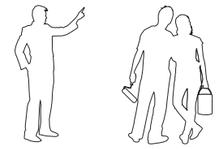
Fig. 50. Meetings

6. Process

The previous chapter described the functional, technical and architectural design of the single building block, which is a 9x9m island. This chapter focusses on the process a tenant, or user, has to walk trough for him/her to add a program to the building.

Meetings *Owner + users*

The process starts by organising meetings, which will be done by the owner of the complex, a corporation. The goal of these meetings is to attract a variety of users that show interest in adding their own program to the building. Hereby, a mixture of users and programs will lead to a diverse and vital building where the social contact will be intense and diverse as well. Bringing together people with different demographic backgrounds. This mixture is desired, but not the main goal. The building just responds to whatever societal need is emerging. During these meetings, potential users will be informed by the possibilities and limitations of the building.



Owner User

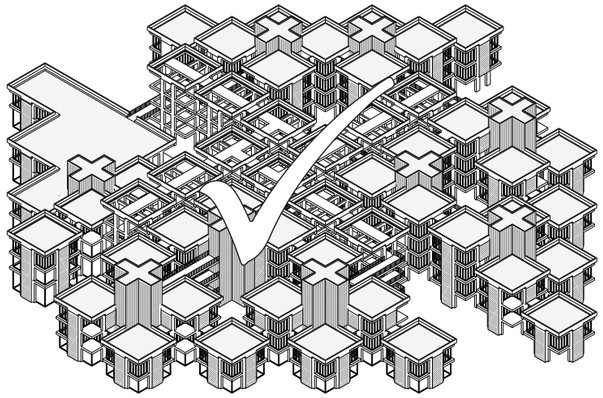


Fig. 51. Framework finished

Framework finished *Owner*

At the same time as the meetings, the optimized framework will be finished. This means the building is still unprogrammed and waiting for different infills, that will gradually be added by the users.

Owner

Fig. 52. Online auction

Online auction *User*

An online platform is of fundamental importance to this project. It functions as the regulating system that will guide users and programs troughout its entire, dynamic life span by making use of IT solutions and algorithms.

Users are able to renat an x number of islands. By choosing renting, instead of buying, the building becomes more accessible and attracts more diverse users and programs. Renting, will also make the infills of the building more dynamic and less static, as buying would do.

Before being the tenant of one or more plots, a online auction takes place right after the framework is optimized and every time an existing tenant decides to leave. This aution ensures that the rental price is maximized. For some plots, rental prices can be limited, so that they fall into the category of social housing.

User

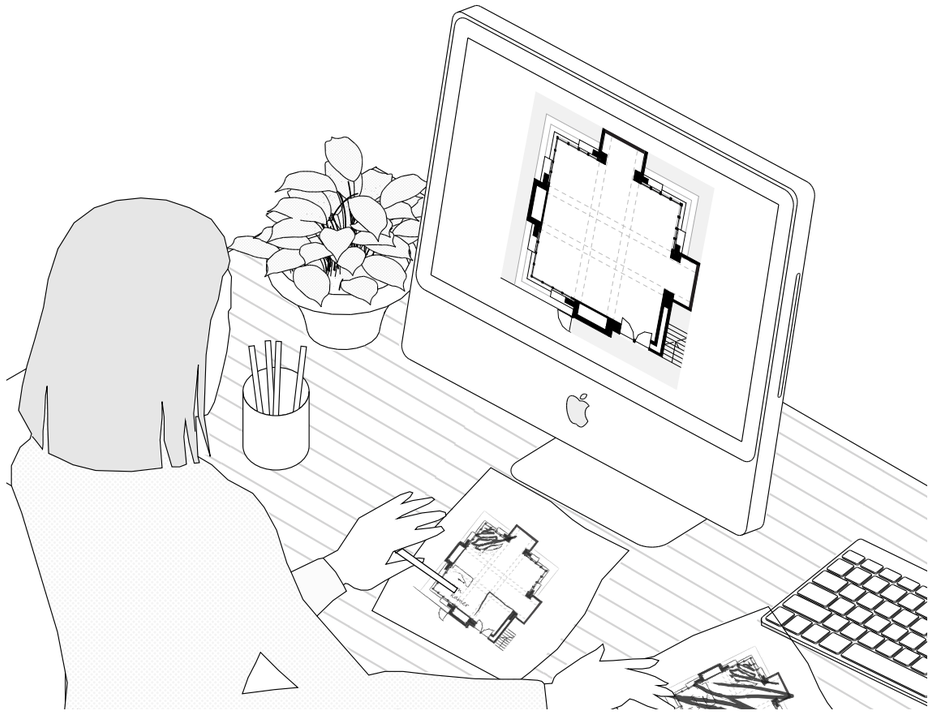


Fig. 53. Self design

Self design User

Tenants then have the option of self designing and ordering their infill, making use of the modularity of the builing. Both, the designs and the infill elements can be shared, traded or sold, making the building elements circular that are interhangable troughout the entire life span of the building. Here, the online platform functions as a. a database that stores all designs, b. a marketplace where people can share, trade and/or sell their designs and/or infill elements and c. as a way of coming in contact with other people using the building, stimulating social interaction along with the communal feeling.

Users buy their infill elements and become responsible for them. This ensures that once a user decides to leave, he/she is responsible for to delivering the island in its original state. They beccome attached to their infills, making these ellements interchangable commodities within the project.

User

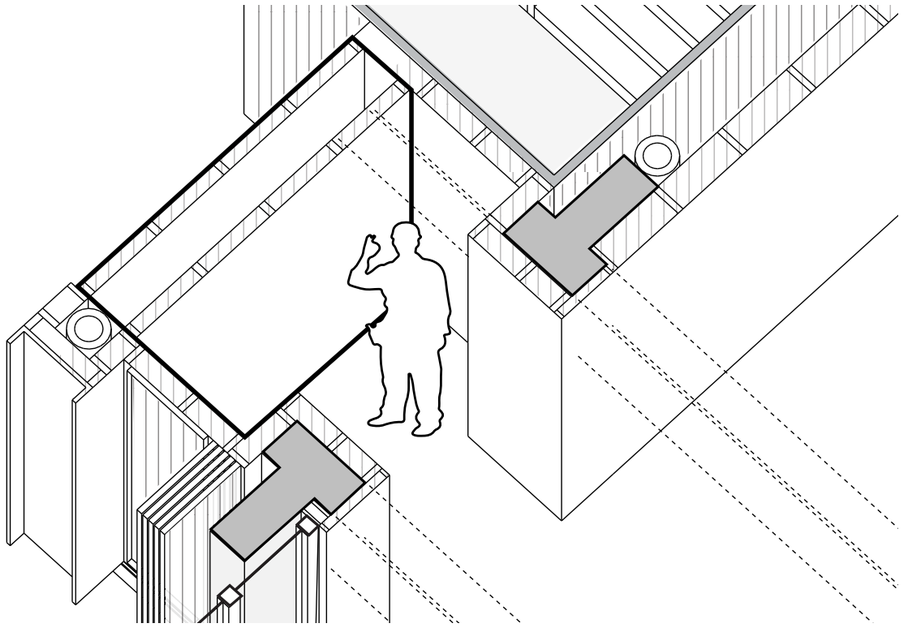


Fig. 54. Program division wall

Program division wall *Contractor*

A legitimate contracter that cooperates with the owner of the building, will do the first works of construction once a user has signed his/her contract regarding a x number of islands. This contractor will install the wall that seperates the island from its neighbouring island. In terms of sound and thermal insulation, this wall meets the technical requirements for each possible program, which are equal.

Contractor

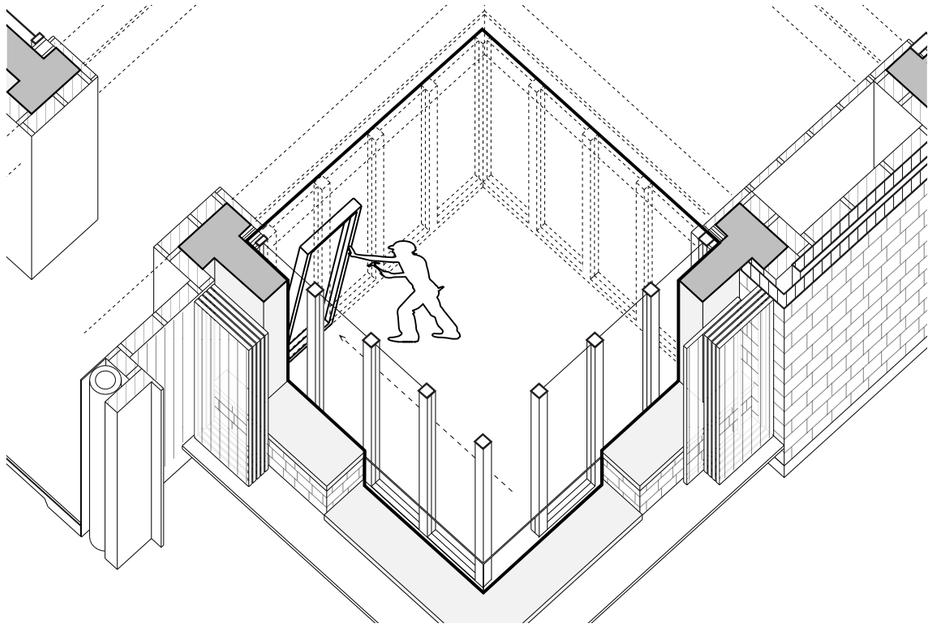


Fig. 55. Optional loggia

Optional loggia *Contractor*

If the user, while self designing his/her infill, indicated on the digital platform to activate the outdoor loggia, a contractor will beforehand replace the timber facade elements and add sloping insulation along with terrace tiles. This outdoor loggia will remain activated as long as the current user leaves and a new user indicates he/she no longer wants the loggia to be activated. The costs for (de)activating this outdoor loggia will always be for the user who is about to rent that specific island.

Contractor

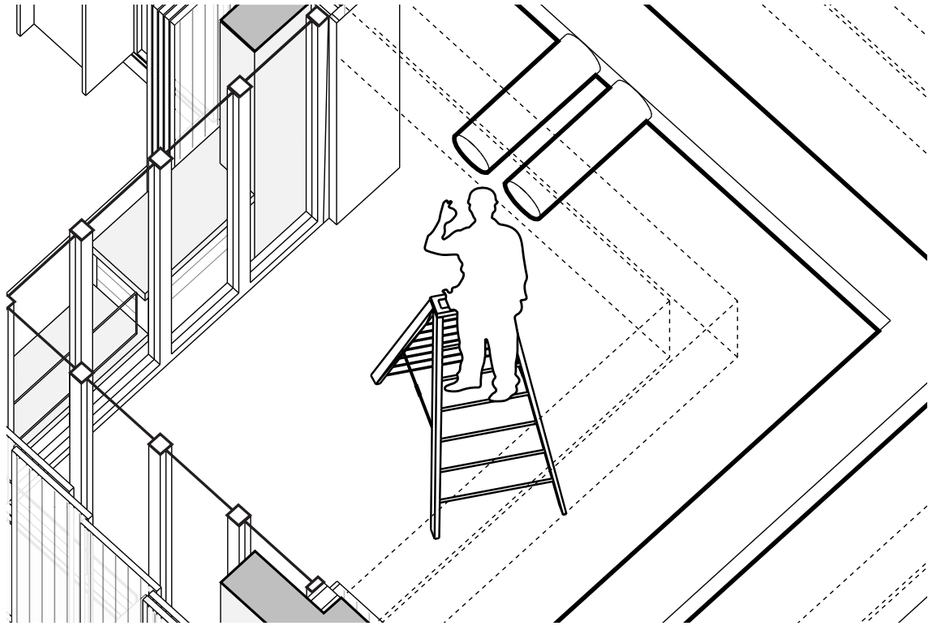


Fig. 56. Secondary services

Secondary services *Contractor*

The same contractor will connect the secondary services, that meet the demands of the program of that island, to the collective services. Services are in this case, ventilation, water and electricity.

Contractor

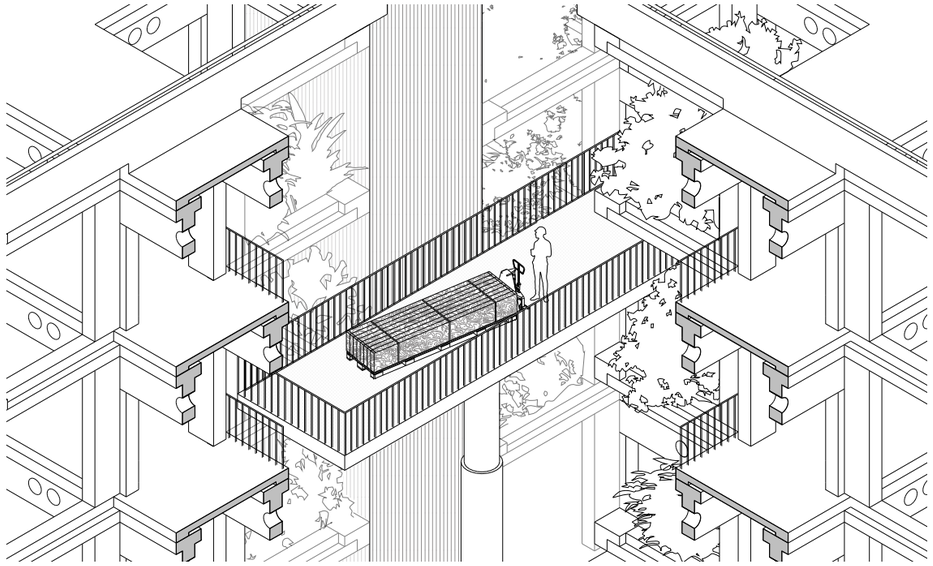


Fig. 57. Transport

Transport *User*

Once a tenant has finalized their infill design, the next step is transporting the self designed and ordered building elements from the basement storage, via the elevating platform in the heart of the building, to his/her plot.

User

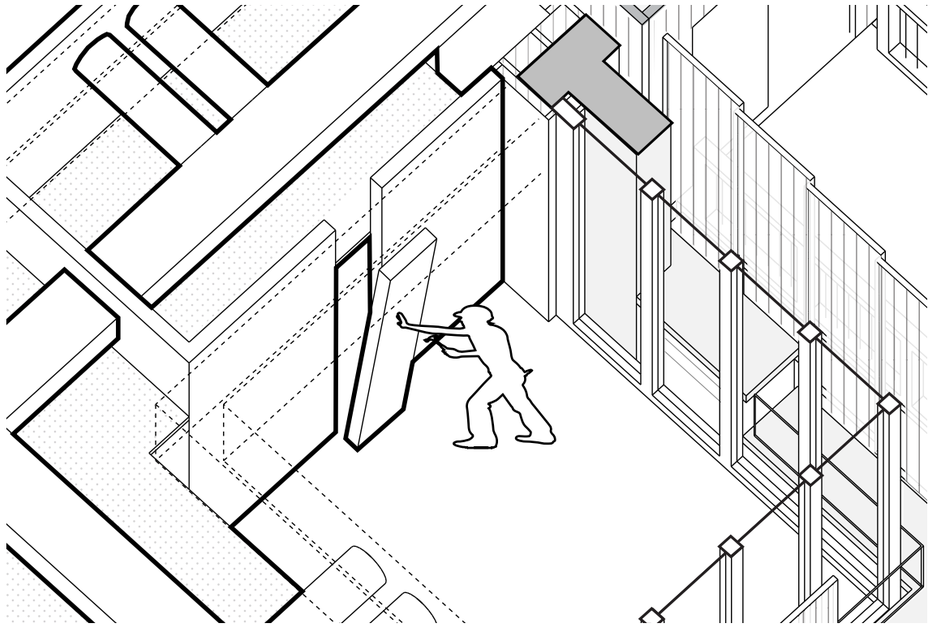


Fig. 58. Self build

Self build *User*

Due to leightweight panels and an easy to use system, users are able to install their self designed space plan.

User

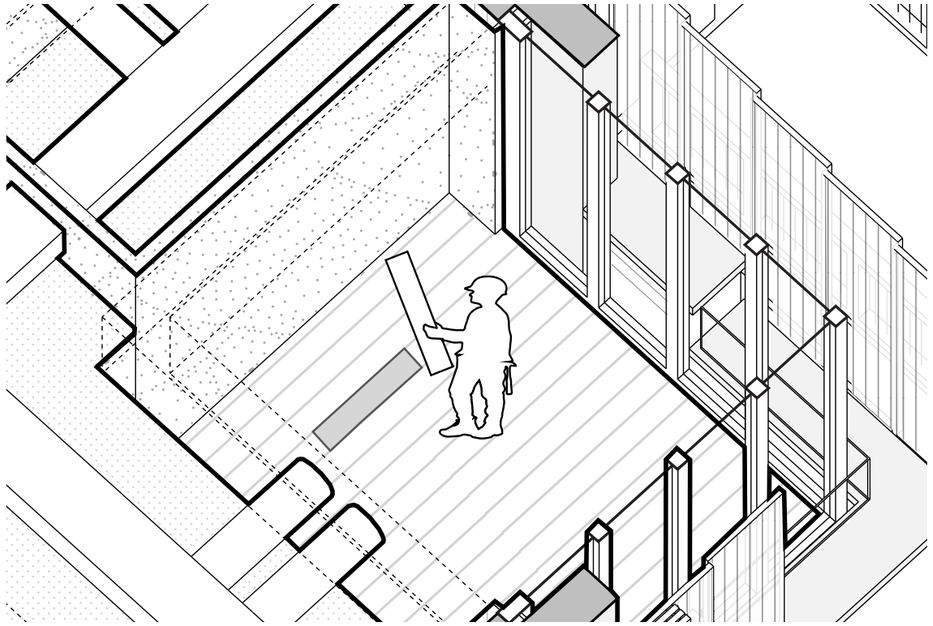


Fig. 59. Finishes

Finishes *User*

After installing the infill elements, users can now choose to finish these with any type of finishing, taking into account that they are self responsible for their infill elements, meaning that if they for instance finish these in an irreversible way, the tradability of their elements decreases.

User

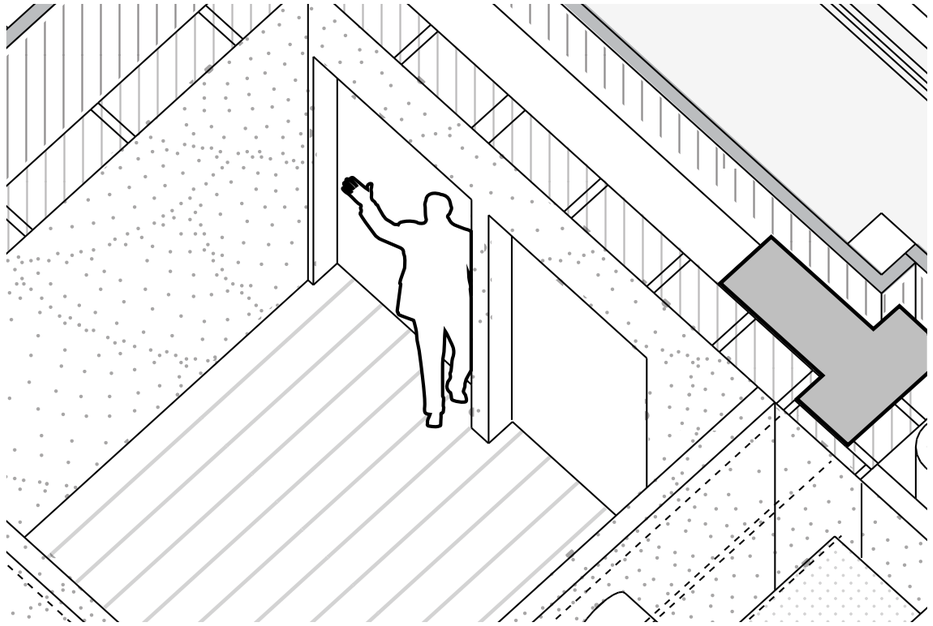


Fig. 60. Leavng

Leaving *User*

Eventually a user will leave the building.

User

Fig. 61. Online auction

Online auction *User*

This means that the island becomes available again on the online platform, waiting for a new tenant. This will again, like in the beginning of the proces, happen by an online auction, allowing the person with the highest bid, to become the new user of this island.

On the online platform, the infill of the previous user is automatically visible. Here, the new user will be informed about th option to buy, partially buy or ignore the previous infill.

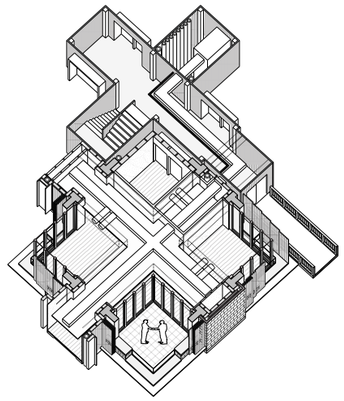
User

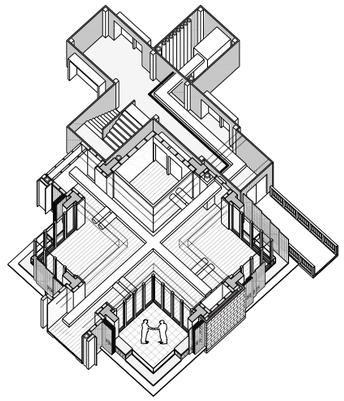
Fig. 62. New and old user

New and old user *User*

The new user can come in contact with the old user, again via the online platform. Allowing him/her to discuss with the old user and have a look at the island and its current infill

User





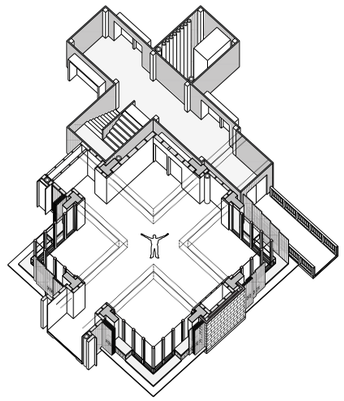


Fig. 63. F.t.t.b. Buy, partially buy or ignore

Buy, partially buy or ignore

The new user then gets to decide to buy, partially buy or ignore the previous infill. If one of the two latter options is chosen, the old user can then add these infill elements to the online market place, waiting for another user to buy of partially buy his/her infill elements

User

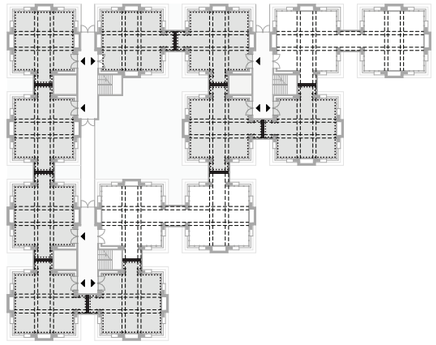


Fig. 64. Single islands

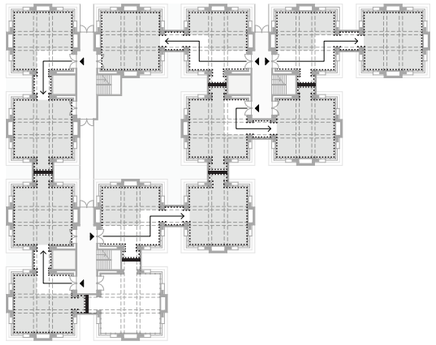


Fig. 65. 2 linked islands

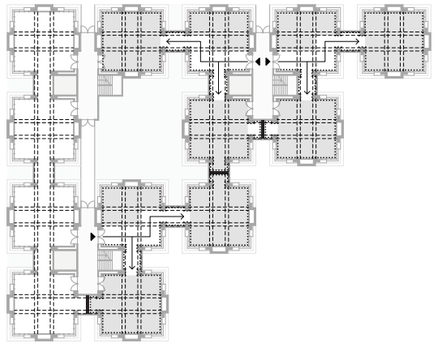


Fig. 66. 3 linked islands, central entrance

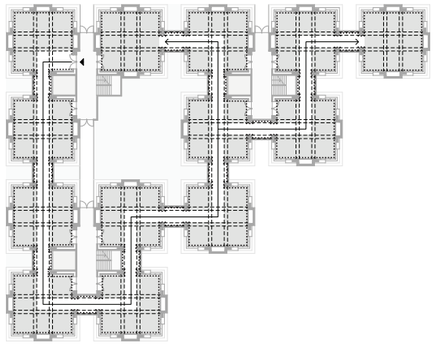


Fig. 67. 1 user on whole floor

7. Configurations and programs

Now that the basic building block is defined, the ‘building’ proces can begin. Starting from the optimized framework, the information of the basic building block can be added to create different programmatic configurations and scenarios.

Configurations

Zooming in to one quadrant, these figure show different types of configurations that can occur. With the exception of two linked islands, every plot can be used singularly. Islands can also be linked as duo’s, leaving one single plot individual. The same applies for linking islands as trio’s, where the entrance can either be at one of the ending islands, or in the middle island which a decrase of circulation space. Also, the option for one user occupying the whole floor remains possible. In reality, a mixture of these before mentioned types will occur.

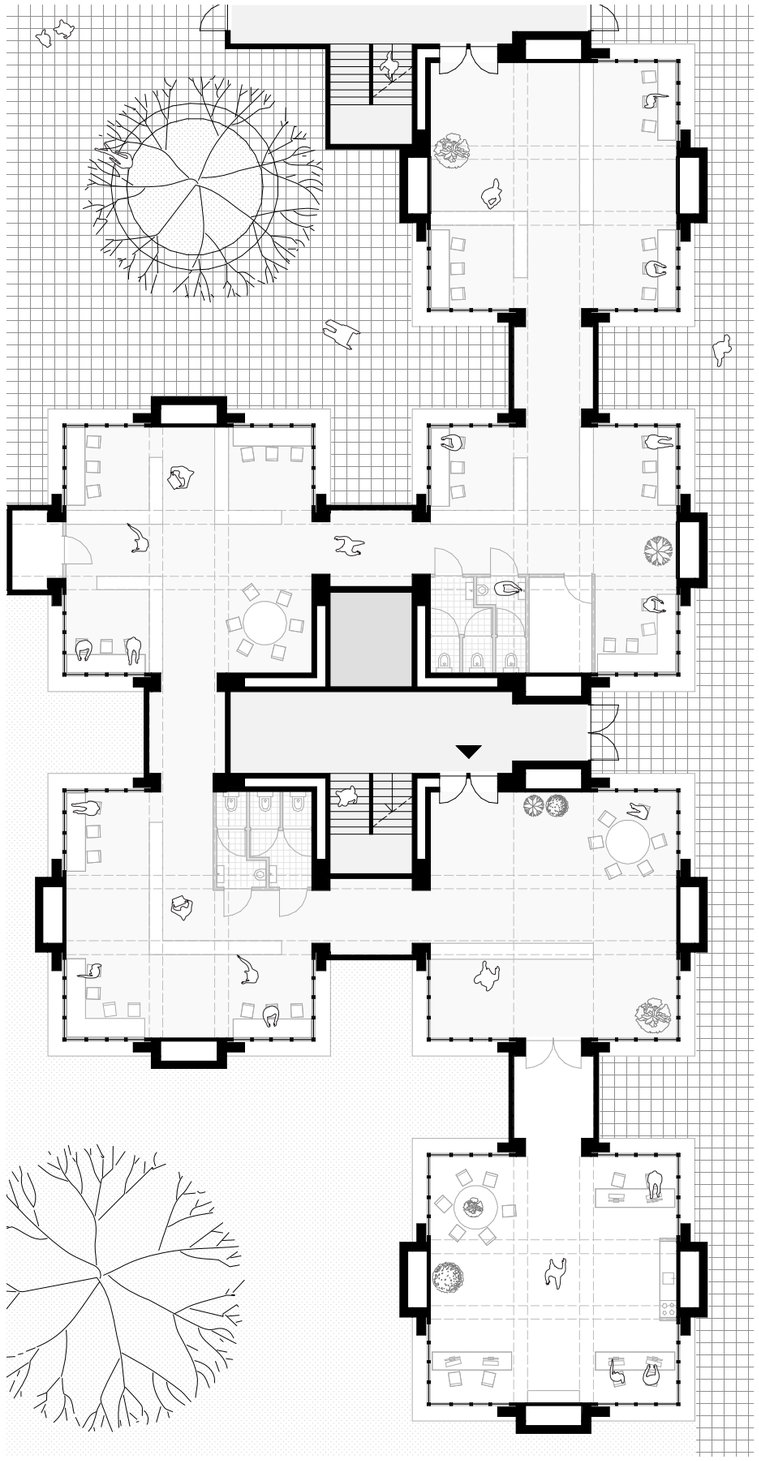


Fig. 68. Library

Programs

Now that all the information around the basic building block and the different types of configurations are defined, potential programs can be designed.

Library *434 m2*

Entrance
Library space
Study spaces
Toilets
Storage
Office

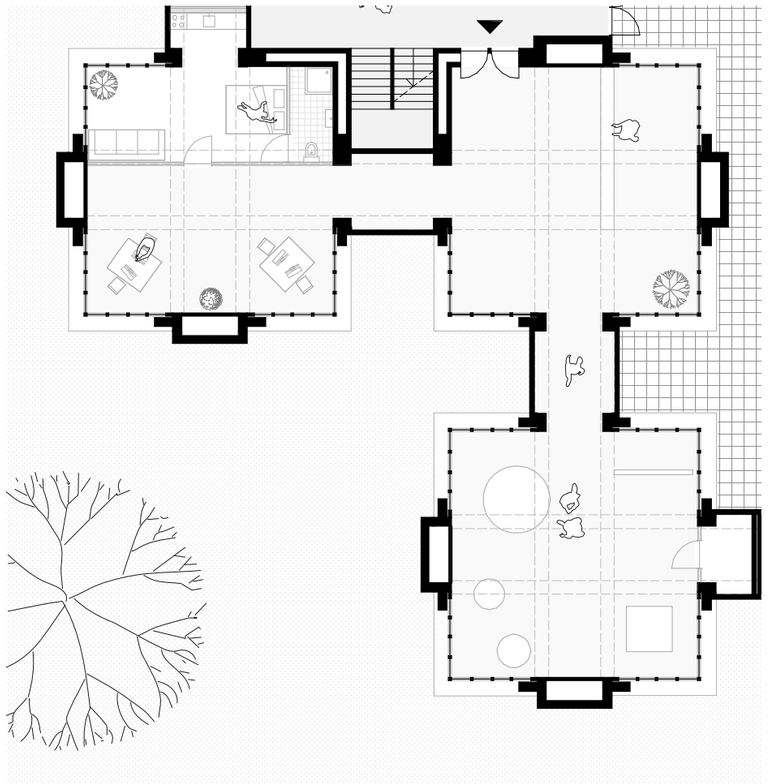


Fig. 69. Gallery

Gallery *211 m2*

Lobby
Exhibition space
Office
Living space
Toilet
Kitchen

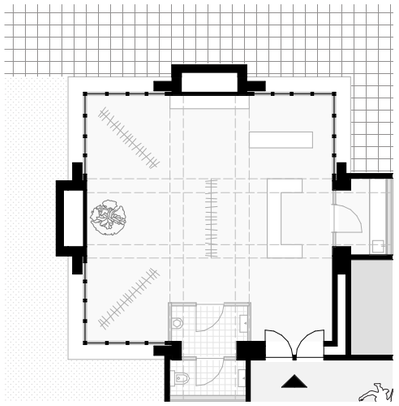


Fig. 70. Shop

Shop *73 m2*

Shop
Kitchen
Toilets
Storage

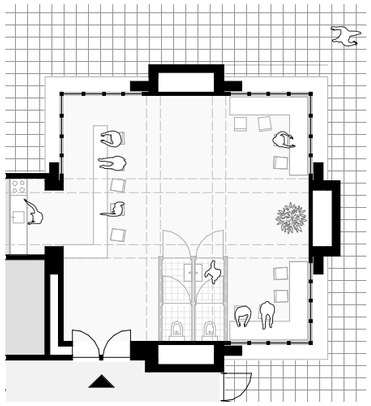


Fig. 71. Cafe

Cafe *69 m2*

Cafe
Kitchen
Toilets
Storage

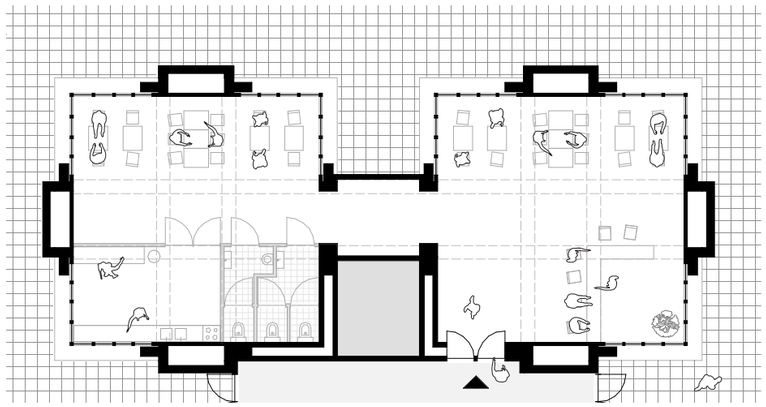


Fig. 72. Restaurant

Restaurant *138 m2*

Bar
Restaurant
Kitchen
Toilets
Storage

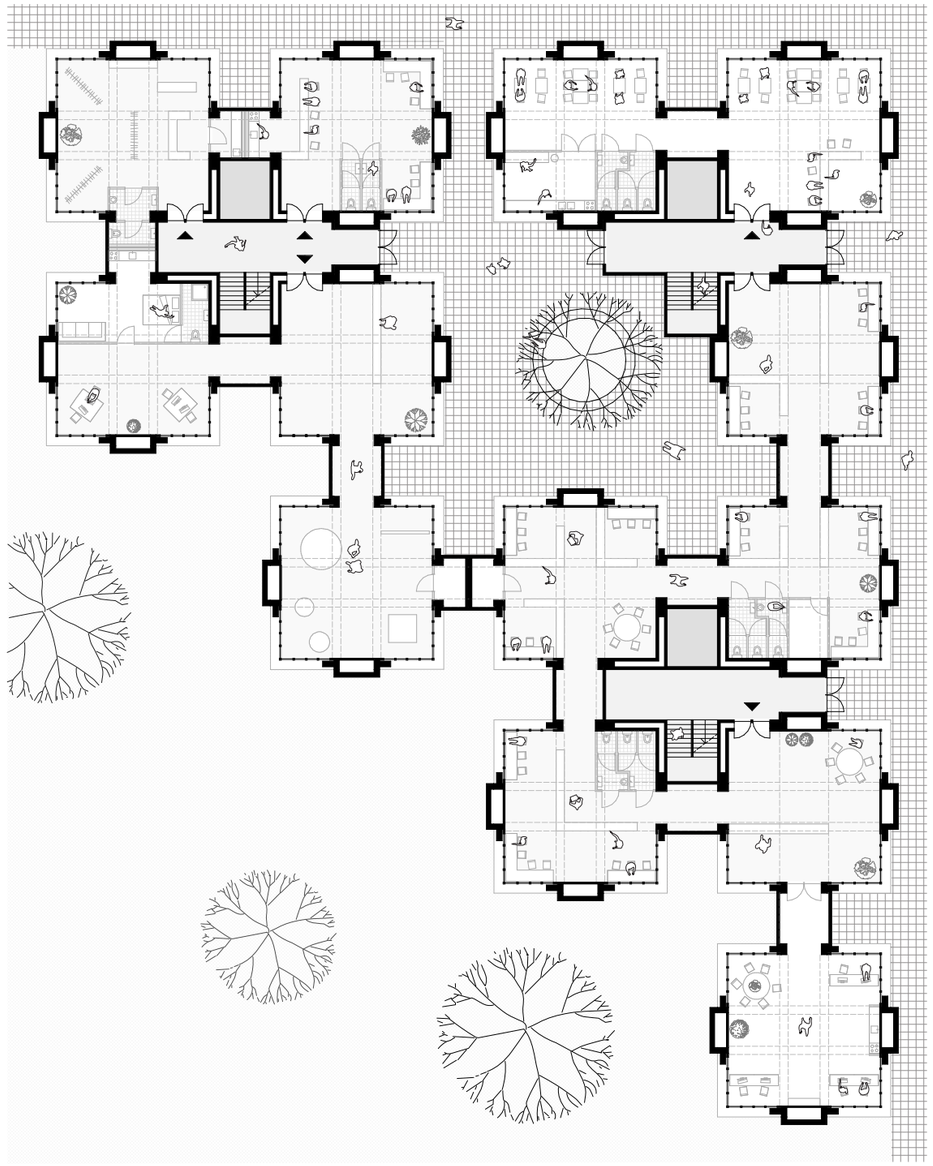


Fig. 73. North quadrant, ground floor

North quadrant, ground floor

Library *434 m2*
Gallery *211 m2*
Shop *73 m2*
Cafe *69 m2*
Restaurant *138 m2*

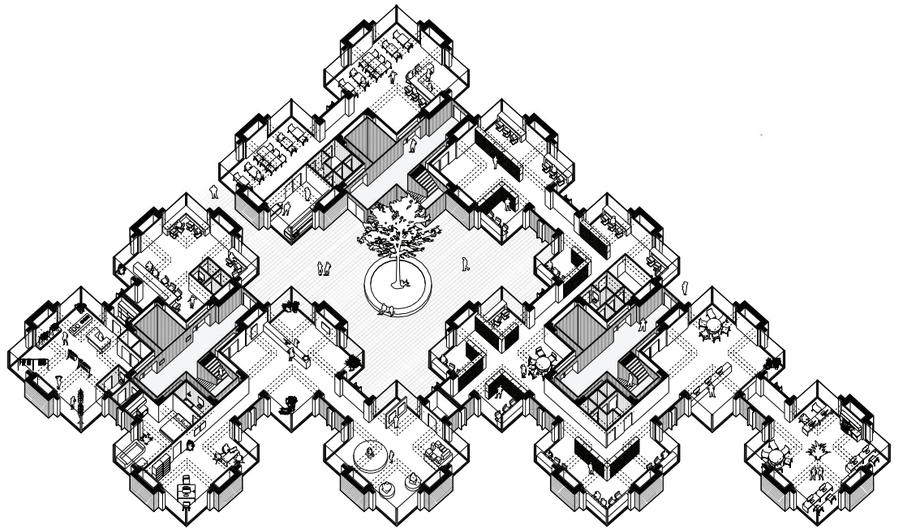


Fig. 74. North quadrant, third floor

Axonometric drawing

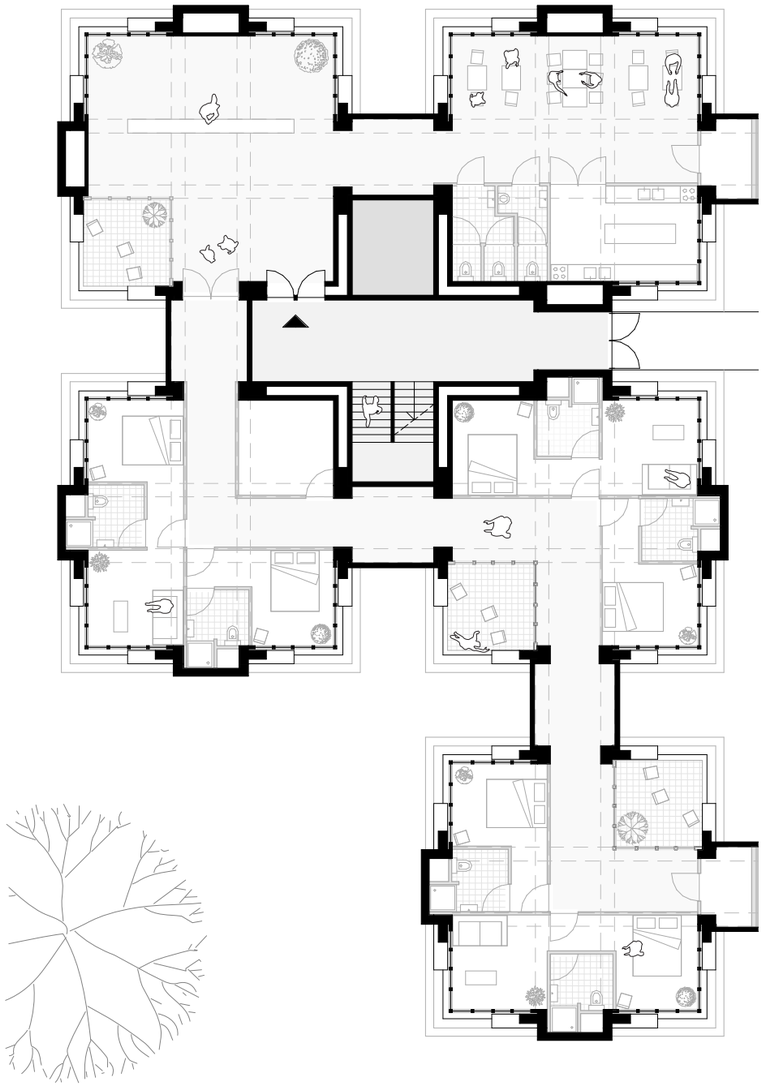


Fig. 75. Hotel

Hotel *357 m2*

Lobby
Loggia
Restaurant
Kitchen
Toilets
Storage
Hotel rooms

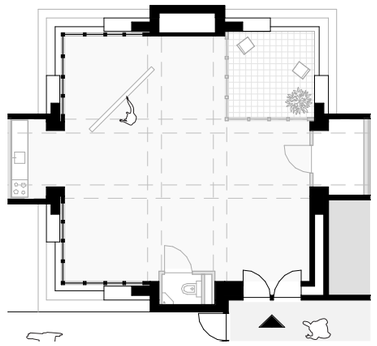


Fig. 76. Artist studio

Artist studio *73 m2*

Working space
Loggia
Kitchen
Toilet
Storage

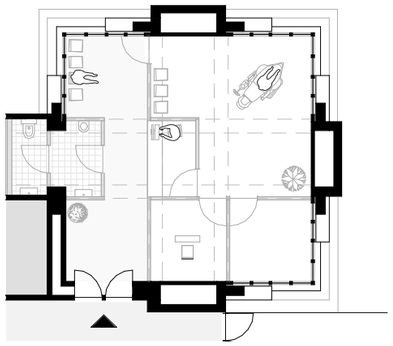
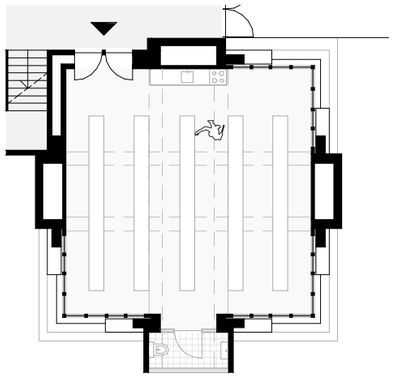


Fig. 77. Dental care

Dental care *69 m2*

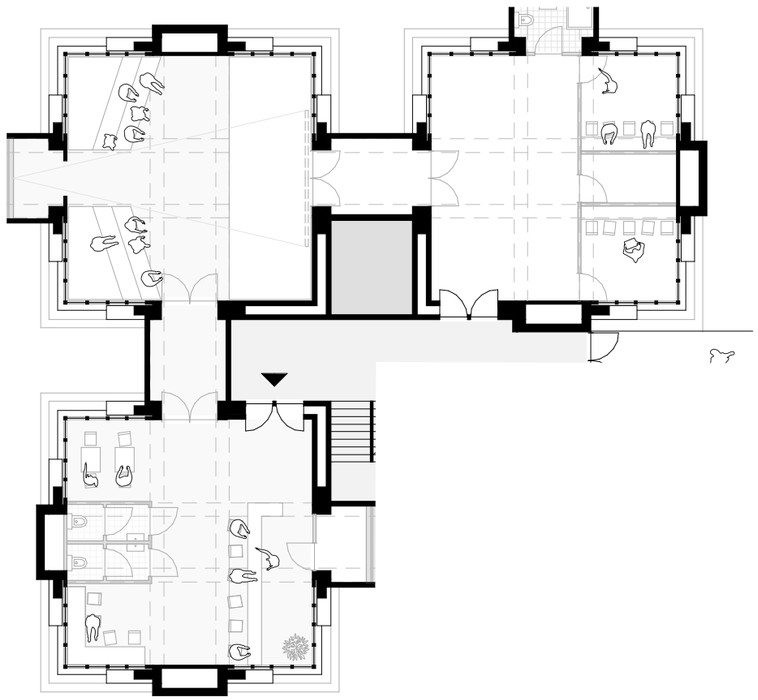
Waiting room
Toilet
Desk
Treatment room
X ray room
Storage



Archive *69 m2*

Storage
Kitchen
Toilet

Fig. 78. Archive



Art house cinema / theater *219 n2*

Foyer
Toilets
Storage
Cinema/theatre
Changing rooms
Storage

Fig. 79. Art house cinema / theater

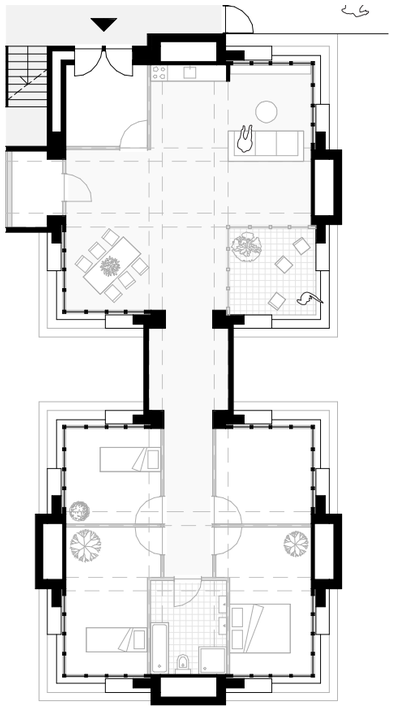


Fig. 80. Family dwelling

Family dwelling *142 m2*

Entrance
Living room
Kitchen
Loggia
3 Bedrooms
Storage
Bathroom

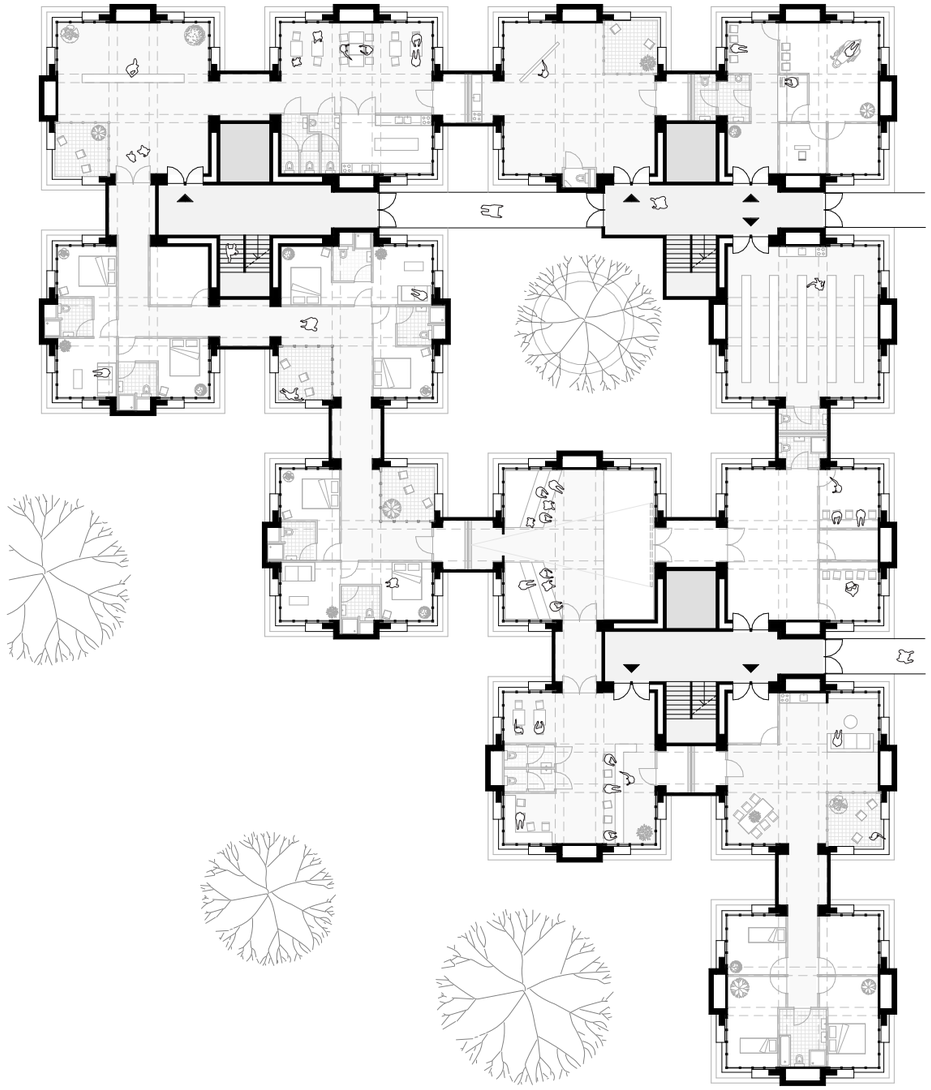


Fig. 81. North quadrant, second floor

North quadrant, second floor

Hotel *357 m2*
Artist studio *73 m2*
Dental care *69 m2*
Archive *69 m2*
Art house cinema / theater *219 n2*
Family dwelling *142 m2*

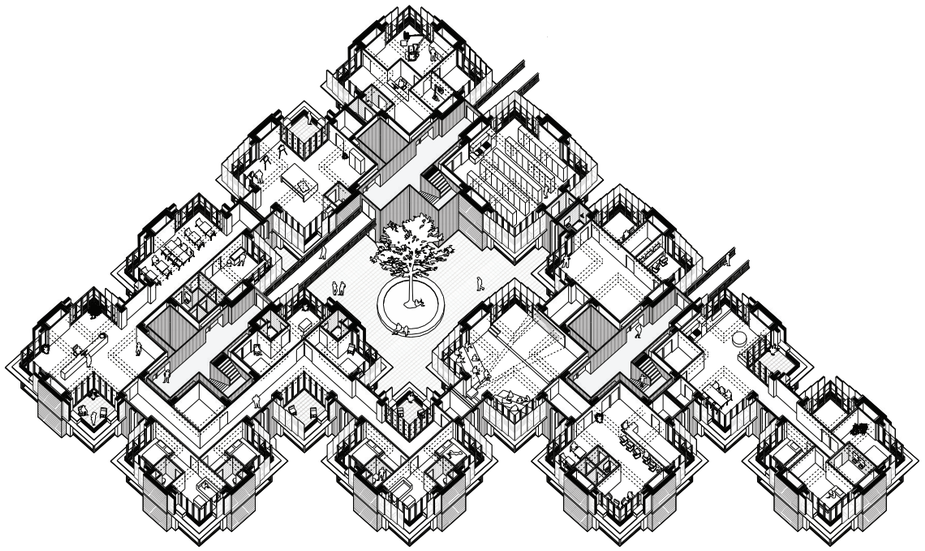


Fig. 82. North quadrant, third floor

Axonometric drawing

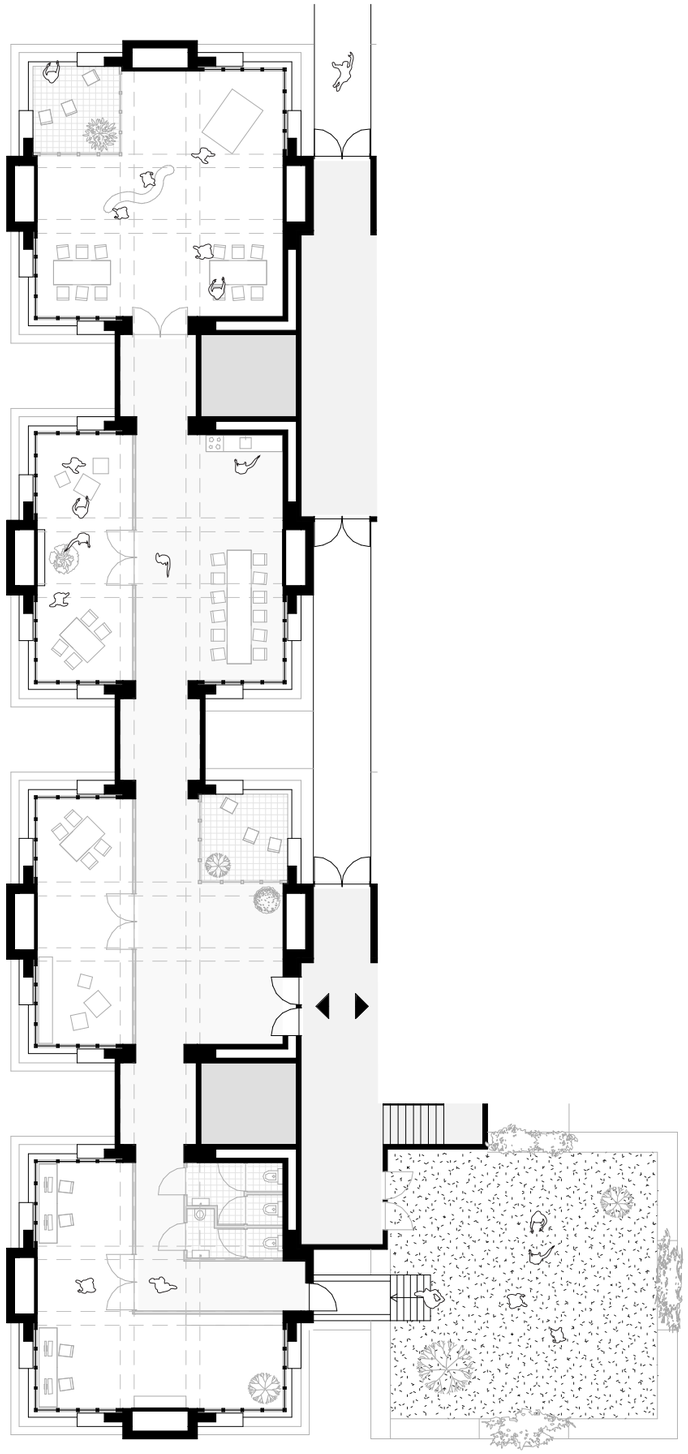


Fig. 83. Kindergarten

Kindergarten *357 m2*

Hallway
Loggia
Kitchen
Toilets
3 Rooms (age)
Office

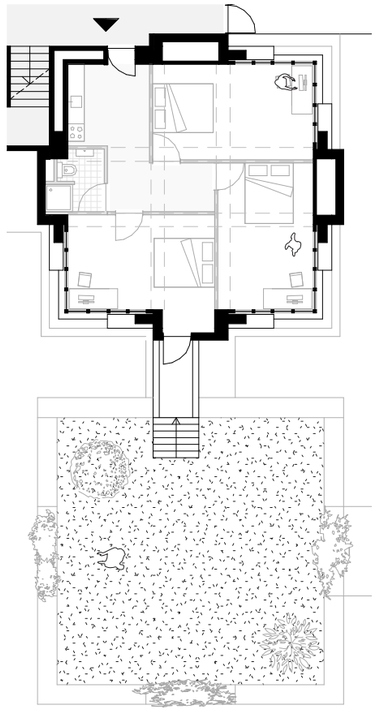


Fig. 84. Student housing

Student housing *135 m2*

Hallway
Bathroom
3 Living / working spaces
Terrace

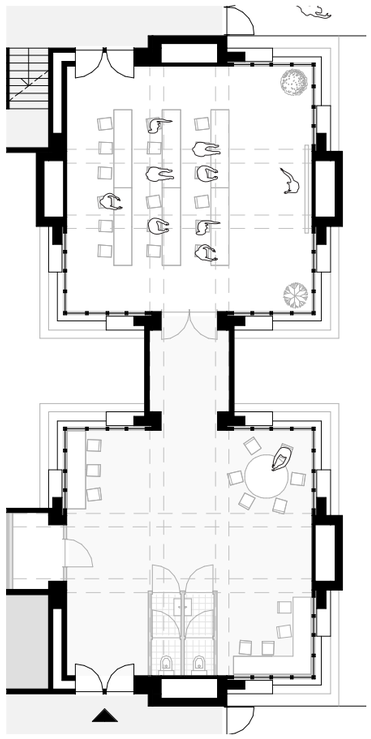


Fig. 85. Educational

Educational *138 m2*

Gathering space
Toilets
Storage
Classroom

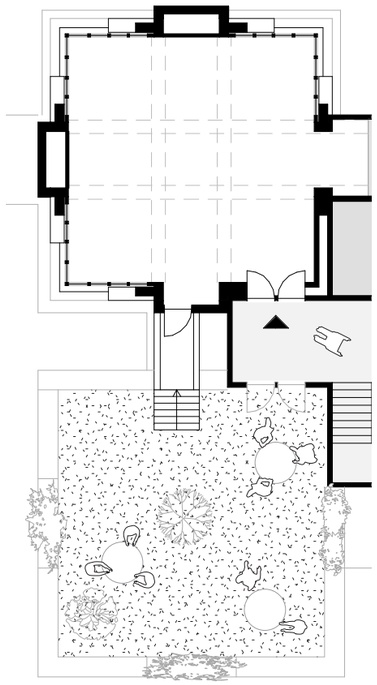
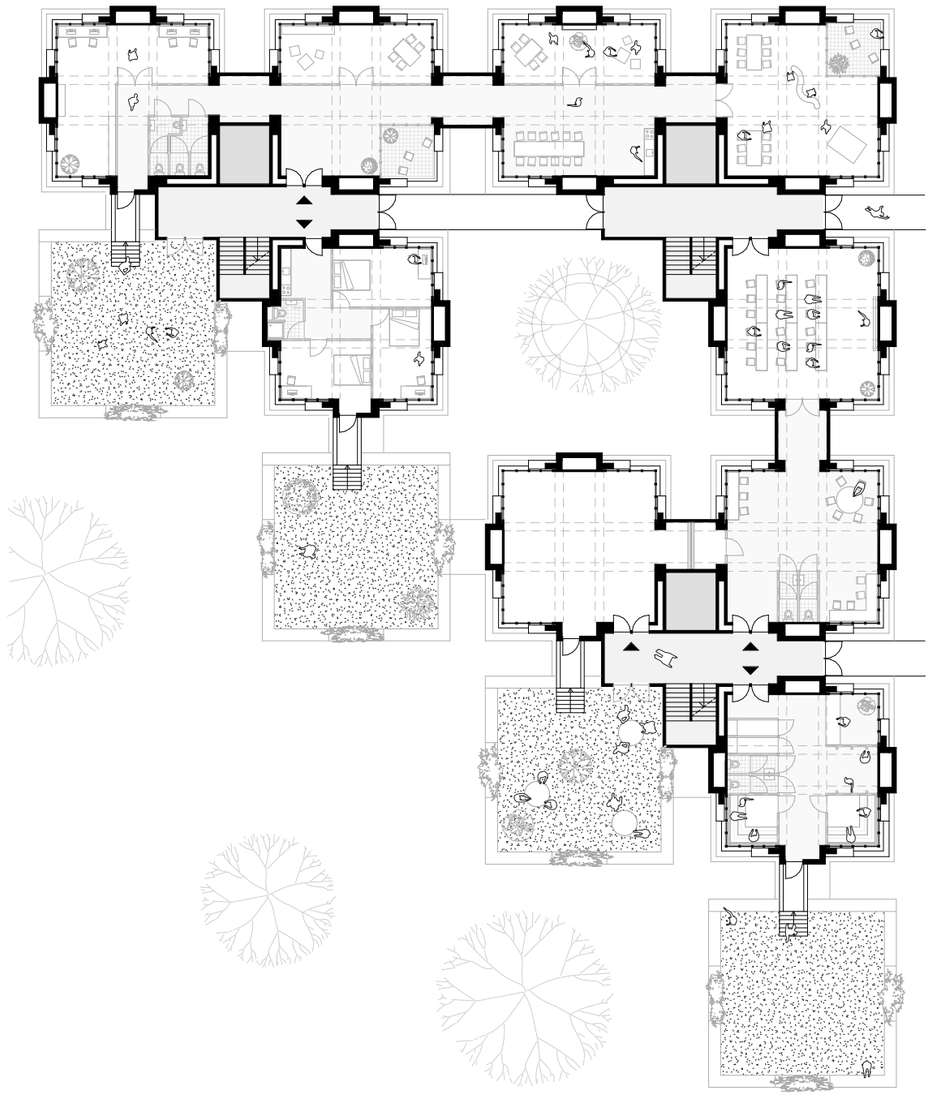


Fig. 86. Empty island

Empty island *135 m2*

Storage
Terrace



North quadrant, third floor

Kindergarten *357 m2*
Student housing *135 m2*
Educational *138 m2*
Empty island *135 m2*

Fig. 87. North quadrant, third floor

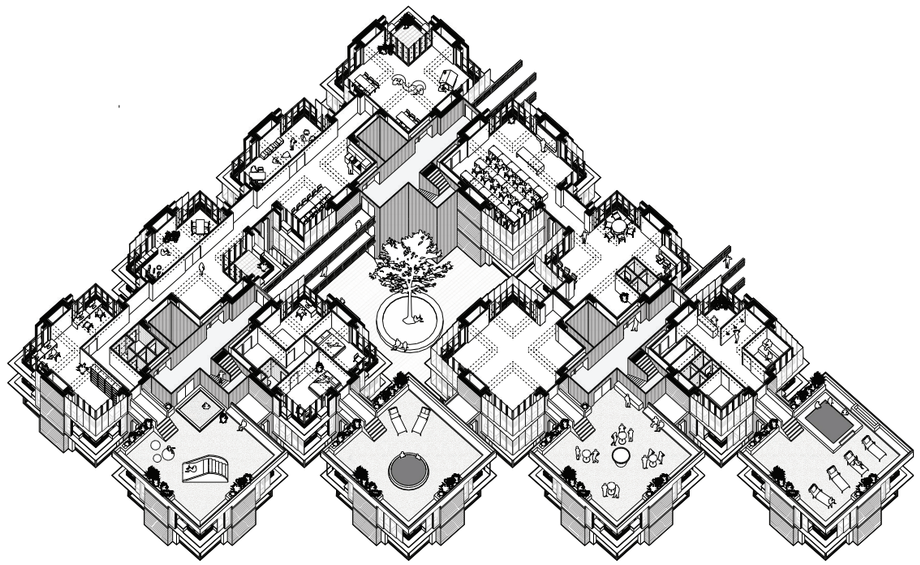
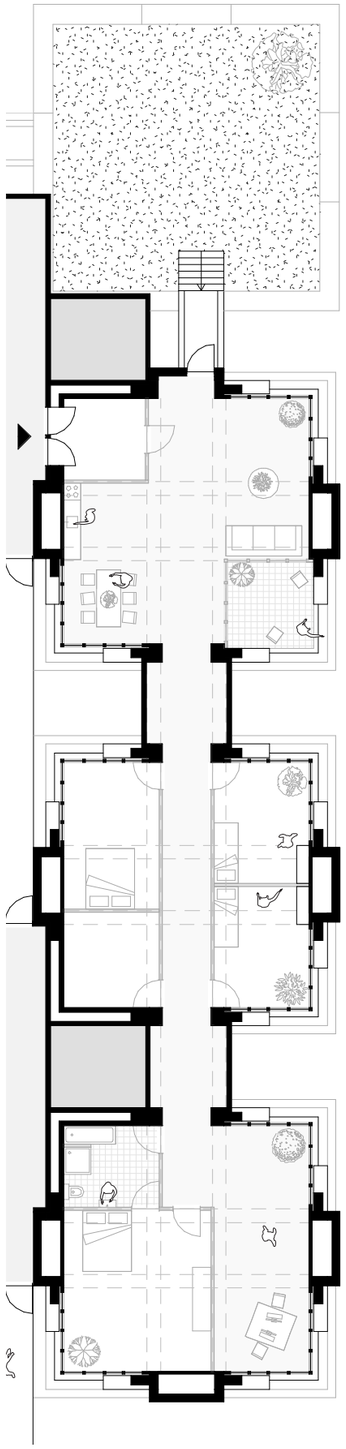


Fig. 88. North quadrant, third floor

Axonometric drawing



Family dwelling *281 m2*

Entrance
Living room
Kitchen
Loggia
Terrace
4 Bedrooms
Storage
Bathroom
Office

Fig. 89. Family dwelling

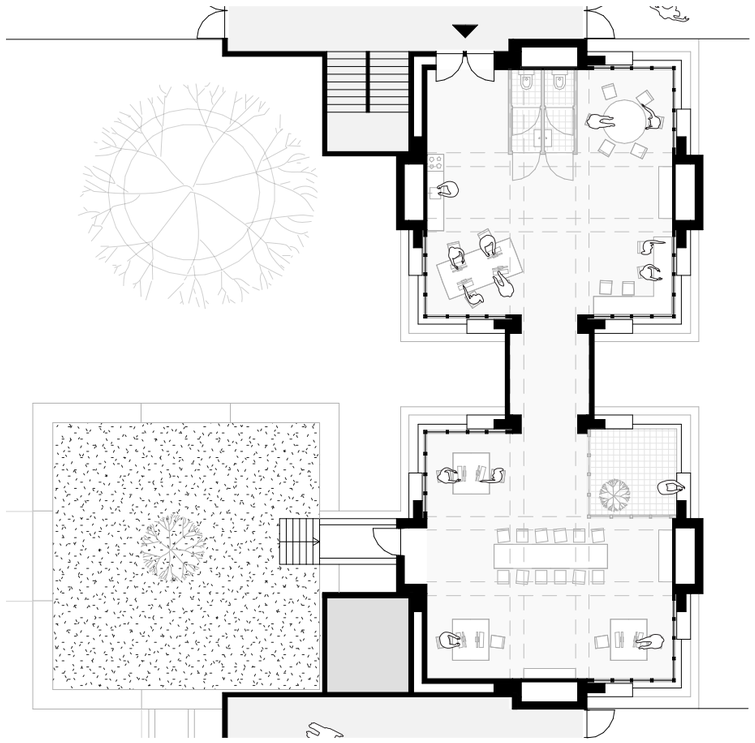


Fig. 90. Office

Office *208 m2*

Working space
Toilets
Storage
Kitchen

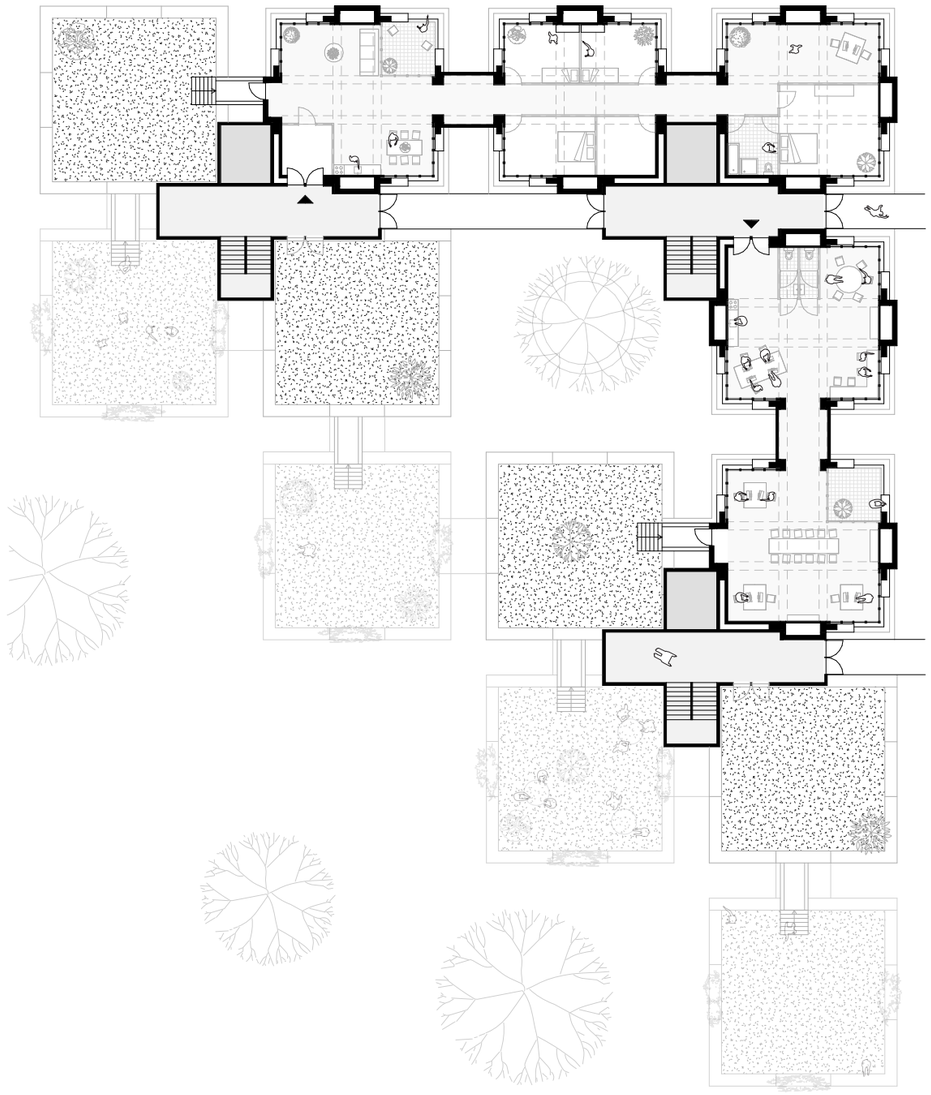


Fig. 91. North quadrant, fourth floor

North quadrant, fourth floor

Office *208 m2*
Family dwelling *281 m2*

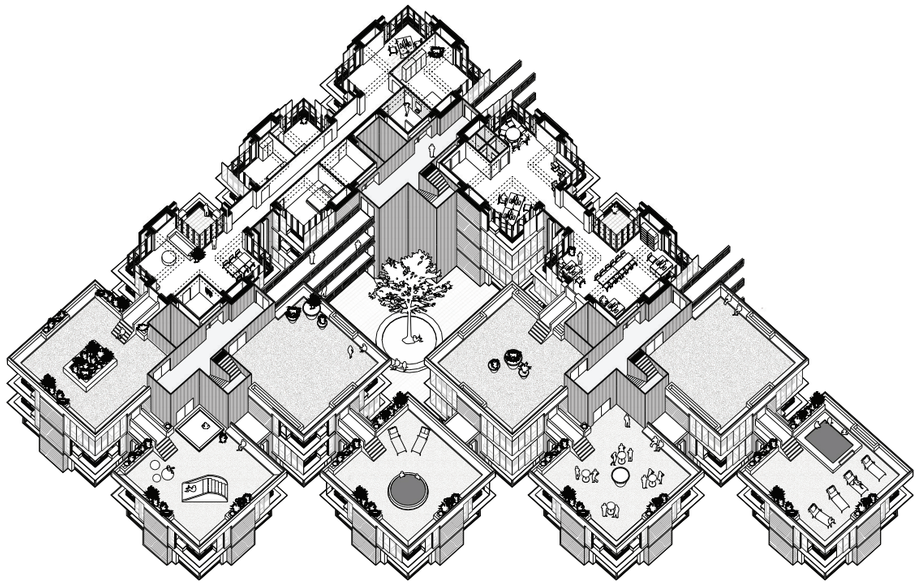


Fig. 92. North quadrant, fourth floor

Axonometric drawing

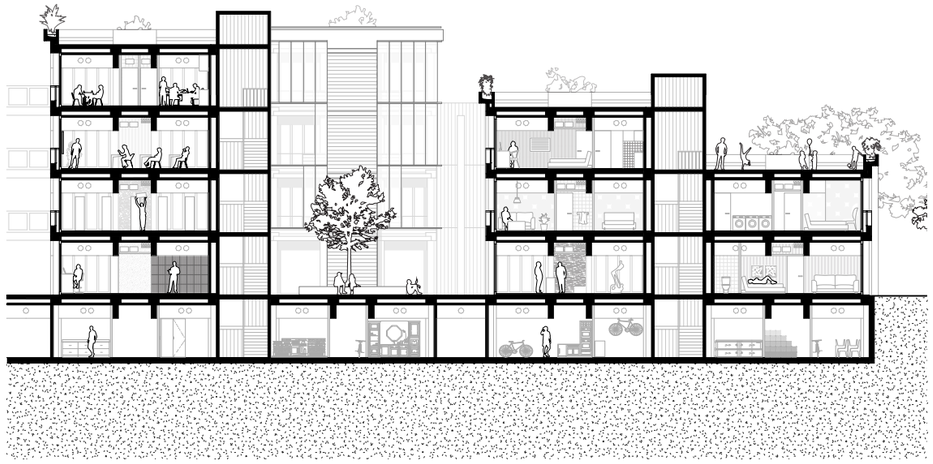


Fig. 93. Sction AA

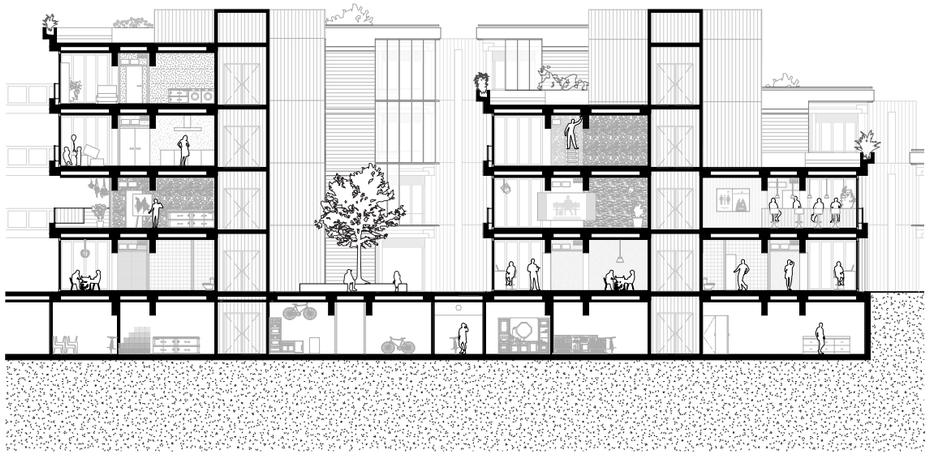


Fig. 94. Section BB

Fig. 95. Building viewed from park

8. Impressions

Fig. 96. One quadrant elevation

Fig. 97. Centre

Fig. 98. Removed tower

Fig. 99. Centre

9. Conclusion

The goal of this design studio was to discover the future potential of the architectural movement Structuralism. Or, in other words, what does this architectural movement and its buildings offer us for contemporary and future use? To be able to answer this question, the Centraal Beheer building functioned as a case-study whereby a re-design was unavoidable, due to several problems the building suffered from. These similar questions can be approached in two distinctive ways, a. by looking at the conceptual and Structuralist aspects that formed the basis for the design, and b. by looking at the physical and Structuralist characteristics of the building. My project emphasized the conceptual, Structuralist aspects.

It became clear that the concepts 1. open for internal changes, 2. open for individual interpretation and 3. open for social interaction can be considered as good ideas that reacted on then contemporary societal needs. Nowadays, there is again fascination on these concepts what makes it interesting to see if they have the inherent capacity to be relevant again. However, because society changed along with the urban context surrounding the project, these concepts inevitably asked for reinterpretation and/or optimization.

Then, the next step to assess is whether this reinterpretation and/or optimization of the Structuralist concepts should occur in a. a random existing building, b. in the existing Structuralist building, or c. in a new building?

a. In a random existing building

This option was not part of this project and has therefore not been researched. It has become evident that Structuralist buildings, in this case Centraal Beheer, possess over qualities that can make the realization of the concepts more feasible. These are mentioned below.

b. In the existing, Structuralist building

This option has been research, since the goal of this project was to discover the future potential of Structuralism, by redesigning Centraal Beheer and revitalize its inherent concepts. The project made clear that there are several reasons to reinterpret and/or optimize the Structuralist concepts in the existing, Structuralist building: (*DO)* and several reasons to not do it *(DON'T)*. These reasons are elaborated below.

DO: Existing building
By applying the concepts to a suitable, existing building, the pre-investment costs can be limited. This existing building already has a capital value, which will most likely increase after the revitalization.

DO: Structure
The existing structure of Centraal Beheer has several qualities that increase the feasibility of concept

1, being open for internal changes. The oversized structure already has enough load bearing capacity for the more 'heavier' programs to be accommodated. This will limit the costs of pre-investing in an oversized structure. Also, because the structure contains multiple voids, it makes it relatively easy to insert multiple, decentralized vertical infrastructures, which are essential for realizing concept 1, being open for internal changes.

DO: Façade

Concept 1. being open for internal changes requires a relatively large external envelope, so that each individual program can receive natural daylight and air. With exception of the interventions that were necessary for the core of the building to receive natural daylight and air, Centraal Beheer possesses of a large peripheral skin, strengthened by roof terraces.

Also, the design and composition of the original façade is one that is appropriate for realizing concept 1. being open for internal changes. By applying this concept, the façade becomes a mere blank envelope that does not represent the program behind it, since that remains undefined. The façade of Centraal Beheer can be seen as sober, but still strong due to the play of open and closed parts and also the vertical alignment giving the horizontal form of the building an opposite accent. Also, the façade is treated in a similar manner throughout the entire building. These two reasons enable the façade to transform easily into this blank envelope.

DO: Lay out

The concepts 1. Being open for internal changes and 3. Being open for social interaction strongly benefit from the layout of the existing building. The fact that the building is designed as a small city, will stimulate the social interaction and the formation of communities, compared to a building that is a simple slab for instance.

On a smaller scale, the autonomy of the islands, which are linked by bridges, enhances the possibility to be occupied by completely opposite programs. Due to the bridges, the interface between different programs is relatively small, which increases the level of autonomy making the building more flexible and minimize its rental risks.

DO: Modularity

The modular design of the single island and the repetitive design of the newly added façade, results in a project that knows a limited number of building elements, resulting in less fabrication costs and a faster construction time. This also applies for the infill elements, which become circular building elements that also limit the risk of users becoming stuck with them.

DO: Iconic value

The concepts are applied in an iconic piece of heritage that already possesses rich architectural and emotional values, not only for Apeldoorn, but even globally. This increases the likability of the project which will attract a high number of users, limiting the rental risks. The re-design also runs less risk because it builds upon the legacy of this icon, instead of coming up with a brand new identity.

DON'T: Rigid system
During the re-design, it became clear that the building is almost completely based upon the starting point of the original design, which is the 3x3m working zone. From here on, the space plan, the structure, the services and the skin have been designed. By moving away from this 3x3m zone and expand the notion of being open for internal changes to the 9x9m zone, the system of the original design is disturbed and only a multiple of the 9x9 zone is available for programming, noting in between. Although the accompanying conflicts can be solved, the system might function easier if the original zoning would be respected.

DON'T: Useable floor space
The necessary interventions that ensure the realization of concept 1. Being open for internal changes and 3. Being open for social interaction do have the downside that they decrease the amount of useable floor space, which decrease the rental incomes.

*DON'T: Larger programs, less design option*s
The programmatic study has shown that, due to the layout of islands that are connected by bridges, larger programs know less design options. This has to do with the essential circulation space running through an island, which divides the island into smaller bits.

c. In a new building

Also not part of this project and has therefore not been researched. But still, general and legit assumptions can be made regarding incorporating the 3 concepts to a new building, compared to an existing one.

DO: Freedom
Starting from scratch, the perfect conditions can be created for the 3. concepts to be realized. On a conceptual level there is complete freedom in designing these conditions.

DON'T: Costly
By designing a new building that incorporates the 3. concepts, the pre-investment costs will be significantly higher, since everything has to be designed and built from scratch.

DON'T: New identity
A new building, doesn't have an identity that people already can associate and feel familiar with. The position regarding the building's identity is carefully taken, but it remains uncertain whether it will prove itself over the years. Possible architectural and emotional values will established over the years.

DON'T: Existing building stock first
Instead of constantly adding more stuff to the world, the architect is now responsible to first critically assess the existing building stock.

Future value of Structuralism?

It is impossible to answer this question on the basis of a single project. What has become clear is that Structuralism was already dealing with a topicality that has become even more relevant to contemporary society. The Structuralist building can fucntion as a precedent in this sense. Considering the approach of this project, which focussed on the conceptual aspects of Structuralism, I believe it is important to not see these buildings as buildings, but as structures or let's say systems. Acknowledge and embrace their ambition of being open to influences and make use of this characteristic while redesigning them.

Follow-up

As mentioned before, the building is almost completely based upon the starting point of the original design, which is the 3x3m working zone. From here on, the space plan, the structure, the services and the skin have been designed. By moving away from this 3x3m zone and expand the notion of being open for internal changes to the 9x9m zone, the system of the original design is disturbed and only a multiple of the 9x9 zone is available for programming, noting in between. Although the accompanying conflicts can be solved, the system might function easier if the original zoning would be respected.

Therefore, I believe what might be an interesting follow up, also for discovering Structuralism's future potential, is to again take this 3x3m zone as the starting point, just like Herman Hertzberger did. And then see how this can relate to the reinterpreted and/or optimized 3. concepts. By doing so, the revitalization of its inherent concepts is in perfect harmony with the original, physical design of the building. From there on see what possibilities for future use this might offer.

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Figure 2 – 99. Self made figure