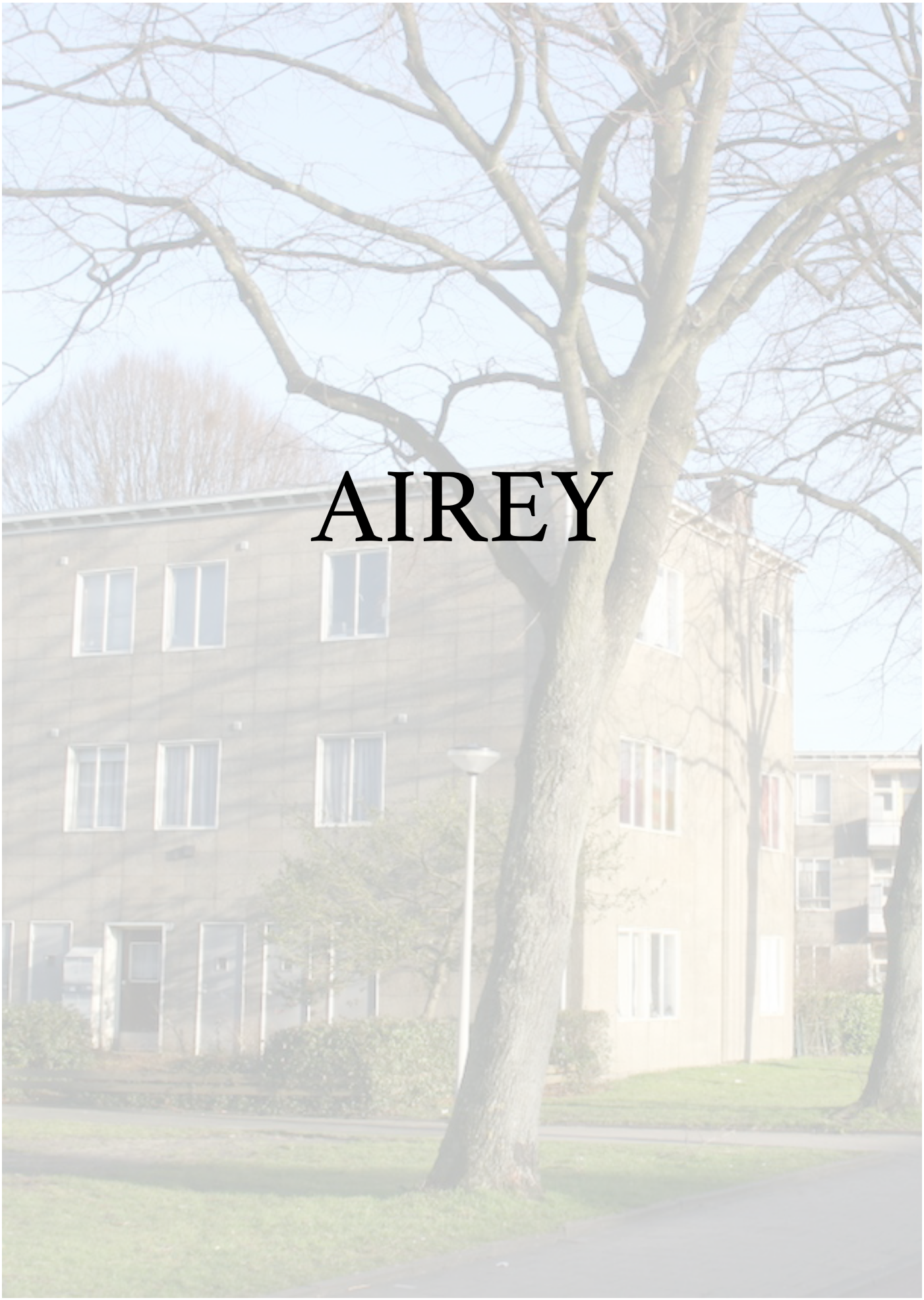


AIREY

Graduation Studio - Heritage & Architecture - Re-Housing
Analysis Group Airey - Yuan Chen - Ruben Kaipatty - HyungJu Seo

Preface

This report is the analytical output of the Dutch building system for the P1 presentation that is in the process of graduation at the faculty of architecture of TU Delft. The Re-housing studio in the chair of Heritage & Architecture deals with the housing system invented and developed under the post-war situation after the WWII. The purpose of this research is to strengthen the basics of the building system as a group and share the findings in the studio. The research conducted in a group of three students focused on how to reinterpret the housing heritage with the view of heritage triangle, Design, Cultural Value, and Building Technology. Cultural Value and Building Technology researched in depth both separately and simultaneously, and the outcomes interacted with every single chapter. In this book, the analysis of the building covers the A to Z of the Nemavo Airey system and the Airey strip located in the neighborhood of Geuzeveld-Slotermeer in Amsterdam. The only thing we did not elaborate is the shops attached to the building strips. Since the Airey strip is currently being renovated, the renovation plan and the stripped building under construction imparts a special richness to the report. The scope is comprehensive from the urban scale to detail. On top of that, various approaches studied to make the research be continued coming individual design process smoothly with a meaningful discourse.

To achieve the goal aforesaid, three staffs of the faculty from each corner of the heritage triangle, Ms. Lidwine Spoormans, Mr. Bas Gremmen, and Mr. Nicholas Clarke, stimulated student's interest and supported with their background knowledge. Moreover, the special guest Professor Anne Lacaton of the office Lacaton & Vassal in Paris enthusiastically showed us the way through her experience. Words of gratitude go from the bottom of the heart to the tutors.

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AIREY - SYSTEM

2.1. Site

Graduation Studio - Heritage & Architecture - Re-Housing
Analysis Group Airey - Yuan Chen - Ruben Kaipatty - HyungJu Seo

Site

2.1.1 Background

History of the AUP

The Airey blocks on the North side of Burgemeester de Vlugtlaan are located in the Slotermeer, one of the Western Garden Cities (Westelijke Tuinsteden), which is part of the General Extension Plan (AUP) of Amsterdam.

The AUP was designed by Cornelis van Eesteren (1897-1988) in 1939. In the course of the nineteenth century, Amsterdam already experienced an increasing amount of inhabitants and was facing a housing shortage, which necessitated the expansion. Although 'Plan Kalff' and 'Plan Zuid' were successively realized in 1877 and 1917, the city still faced a housing shortage. In 1928, the Department of Urban Development was installed to do research into the expected urban growth until the year 2000. This resulted in the design of the General Extension Plan in 1935 (image 1.1).

After WW2, the housing shortage became more severe due to that many houses had been damaged or destroyed and also a baby boom was coming up. A rapid and large scale housing production was necessary which also opened up new opportunities for urban-planning. The AUP changed slightly after the war. The network of roads was changed slightly and shopping malls became the center of some neighborhoods. The plan aimed to extend the edge of Amsterdam, without becoming separate satellite towns but to provide both housing and services within a green landscape setting.

Before WWII only small parts of the AUP had been realized in Bos en Lommer (1930s-1950s). After the war the AUP had to be carried out very rapidly due to the severe housing shortage. Slotermeer (1951-1954), was the first completed district, followed by Geuzenveld (1953-1958), Slotervaart (1954-1960), Osdorp (1956-1962) and Overtoomse Veld (1958-1963). In the seventies, the Garden Cities were completed.

The Quality of the AUP

The quality of the AUP lies within the relationship between the architecture, infrastructure and public space, which can be illustrated in following aspects:

Green Structure

The AUP distinguishes different types of green areas: forest, water and cycling paths, which not only serve as natural scenery and recreation, but also play an important role of framing the space. Between public green and private gardens, the semi-public courtyards are designed as smooth transition.

The Network of Roads

Also the network of roads frame the different districts, within a strong hierarchy. Primary roads run from the city center of Amsterdam towards the suburbs, whereas the secondary roads connect the different neighborhoods with each other. Finally there is also inner roads that reach into the center of the district itself.

Typology of Buildings Blocks

The typology of building blocks transformed from a closed structures towards an open structures, that is, building strips. This resulted in a more organic urban fabric that had a strong sense of interaction between housing blocks and public space.

Het Nieuwe Bouwen

'Nieuwe Bouwen' refers to the architectural innovations in Europe and the United States. The founders came from Germany (Adolf Behne) and Switzerland (Sigfried Giedion). The construction of the Weissenhof in Stuttgart was seen as the beginning of the movement. The village is designed by an international group of architects invited by Mies van der Rohe in 1927. The movement was not a concept of style, but aimed to create timeless and democratic architecture that would meet the needs of society at the time.

The architects aimed for a sober functionalism and promoted the use of new materials such as concrete, steel and glass. They also emphasized the importance of 'light, air and space' in buildings and in the city.

The General Extension Plan for Amsterdam is one of the examples of the 'Nieuwe Bouwen' movement. The architects were deeply involved in the AUP including Cornelis van Eesteren and Jo Mulder. The AUP resembled the ideals of 'het Nieuwe Bouwen' including: a functional cityscape which was characterized by open building blocks, in which different functions (living, working, recreation and traffic) were and separated. Public greenery had to represent nature and were as open as possible.

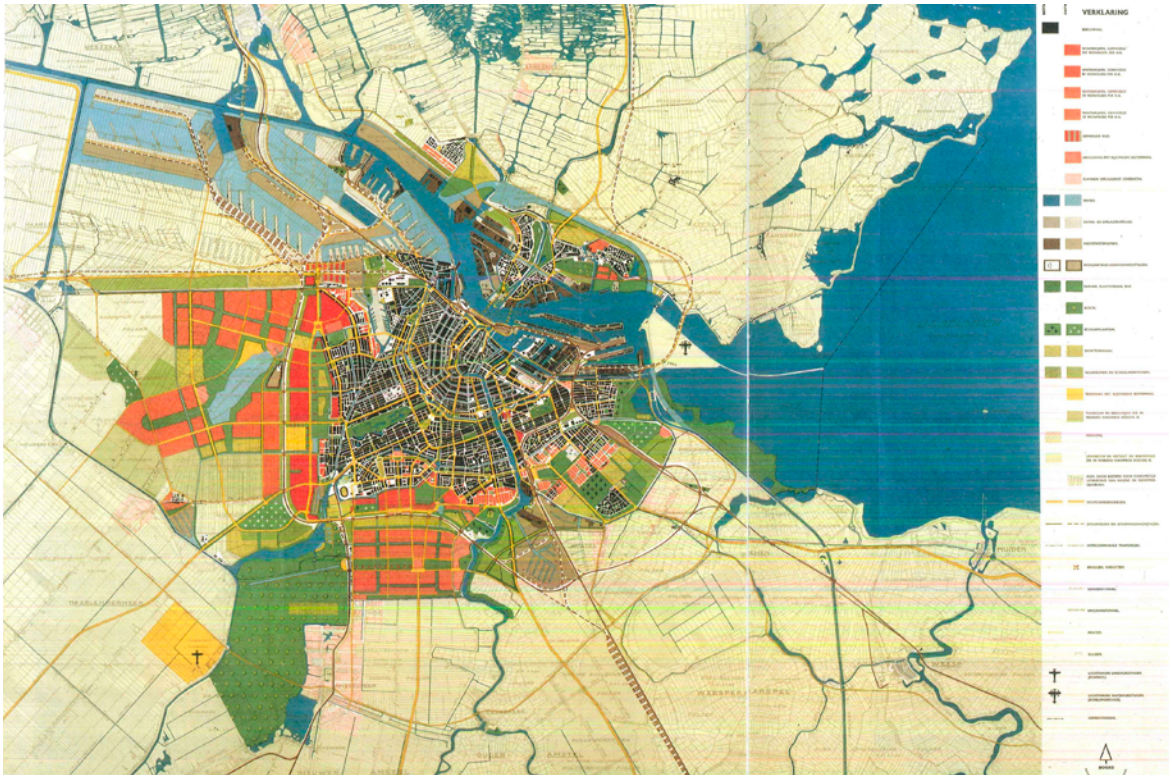


Image 1.1: The General Extension Plan for Amsterdam, 1935 (Source: The Functional City)

Source

1. Kees Somer, The Functional City: The CIAM and Cornelis Van Eesteren, 1928-1960
2. Gemeente Amsterdam. www.amsterdam.nl/kunst-cultuur/monumenten/monumenten/projecten-onderzoek/waarderingskaarten/
3. Algemeen Uitbreidingsplan https://nl.wikipedia.org/wiki/Algemeen_Uitbreidingsplan
4. Amsterdam – a short history http://www.arcam.nl/en/amsterdam-een-korte-geschiedenis/
5. Het Nieuwe Bouwen. www.vaneesterenmuseum.nl/cornelis-van-eesteren/visie/het-nieuwe-bouwen

Site

2.1.2 Location

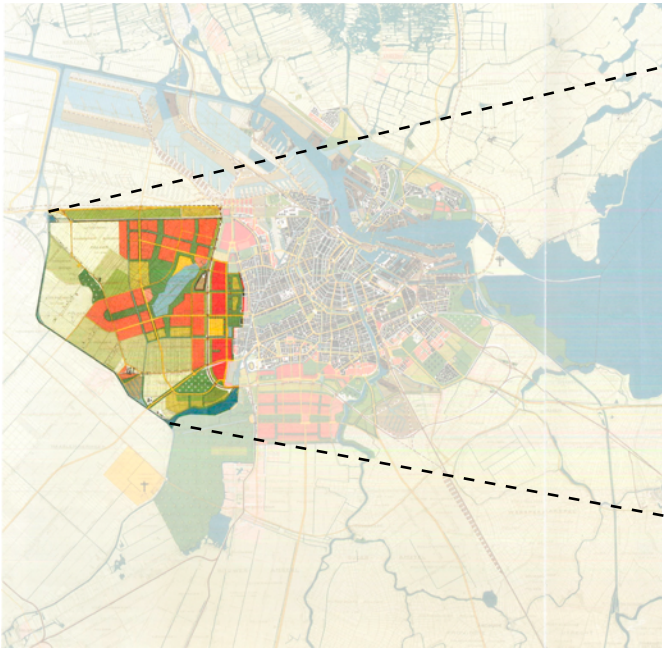


Image 1.2: The location of Nieuw-West in AUP

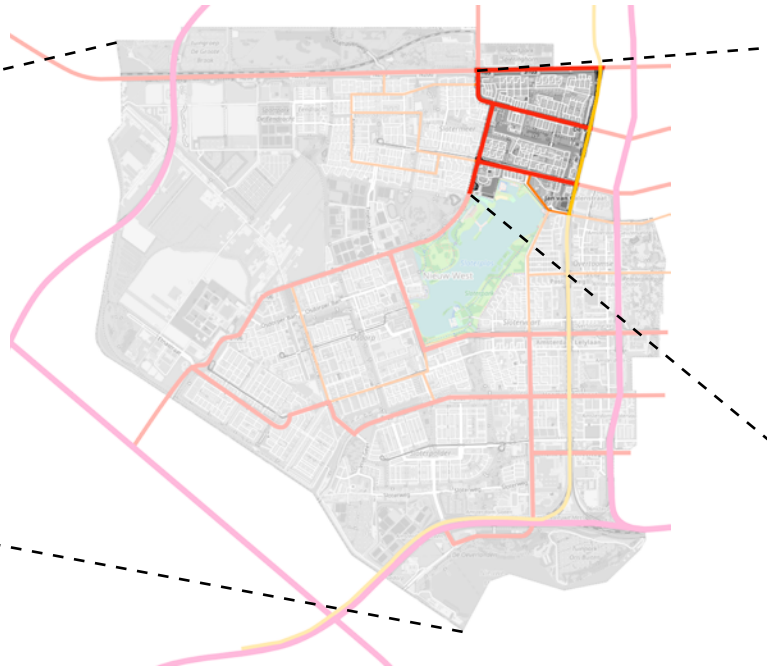


Image 1.3: The location of Slotermeer-Oost in Nieuw-West

The General Extension plan was more a structure plan that gave the outlines of the new suburbs than a urban design. In the plan, the Nieuw-West borough is a sprawling suburban residential area in the west of Amsterdam, which includes the Western Garden Cities.

Separated areas with different functions (living, working, recreation, commerce, etc.), greenery and roads, which belong to a larger scale and complex network together, compose the structure of the Nieuw-West.

Nieuw-West consists of six neighborhoods (Slotermeer, Geuzenveld, Slotervaart, Overtoomse Veld and Osdorp) that are known as the Western Garden Cities (Westelijke Tuinsteden). They are placed as such that they all surround the park (Sloterpark) and the lake (Sloterplas) in the heart of the borough.

Each neighborhood is connected to the city center of Amsterdam through primary roads, and to each other through secondary roads. There is a railway line across the eastern part of the Nieuw-West, which with highways contribute to the traffic network of the whole country.

Source

3. Amsterdam Nieuw-West https://en.wikipedia.org/wiki/Amsterdam_Nieuw-West



Image 1.4: The location of Airey blocks in Slotermeer Oost

Public Green Water

Image 1.5: Site of the Airey Blocks

Airey Blocks

The Airey strips are located in Slotermeer-Oost. The design of this neighborhood is based on the principles of the garden city: self-sufficient communities surrounded by greenbelts. Therefore, similar to the Nieuw-West, the middle park Gerbrandypark and the canal on the eastern side are the important structural elements of this area.

They thirteen Airey strips are located on the North side of the Burgemeester de Vlugtlaan. They are designed by J.F.Berghoef in 1951 and were built between 1952 and 1953.

The Airey strips consist of three-storey buildings of 6 to 7 apartments per floor with a flat roof. Also six separate stores are part of the plan.

The South side of the buildings, that is the rear, are provided with balconies and private gardens. The space in between the building strips is used as communal gardens (South) and parking lots (North).

Site

2.1.3 Historical Value of Site



Image 1.6: May of 'levend' open air museum (source: vaneesterenmuseum.nl)

The site of the Airey blocks stand out for its cultural historical value, of the AUP and the background of the 'Nieuwe Bouwen' movement. The site is preserved as an open-air museum that is known as the Van Eesteren Museum. Also the Airey blocks itself are valuable within the AUP, as they are labeled as monument worthy (monumentwaardig).

Van Eesteren Museum

The Airey blocks are located in the heart the open air museum of Van Eesteren Museum (image 1.6). With the extensive urban renewal at the beginning of this century, Amsterdam Nieuw-West became an important area due to its cultural historical value.

On July 1, 2003 the district council unanimously agreed to set Van Eesteren Museum to preserve this part of Amsterdam. On June 8, 2004 the district council, together with the Welstandsnota, established the Architectural and Urban Planning Evaluation Map (Architectonische en Stedenbouwkundige waarderingskaart) for Geuzenveld-Slotermeer, which set the base for the specific selection of the Van Eesteren Museum.

On January 2006, this area was officially designated as the outdoor Van Eesteren Museum. Then the concept of physical outdoor museum developed as the site became part of protected townscape of Amsterdam.

The housing corporations and residents did not see the benefits of a protected town scape at the beginning. While the housing corporations were mostly worried that their construction plans would be jeopardized, the residents did not believe that it would lead to a necessary renovations. It was not until the renewal plans were presented the spirit of a protected town scape started to settle. Residents realized the value of the site as they started to against renewal.

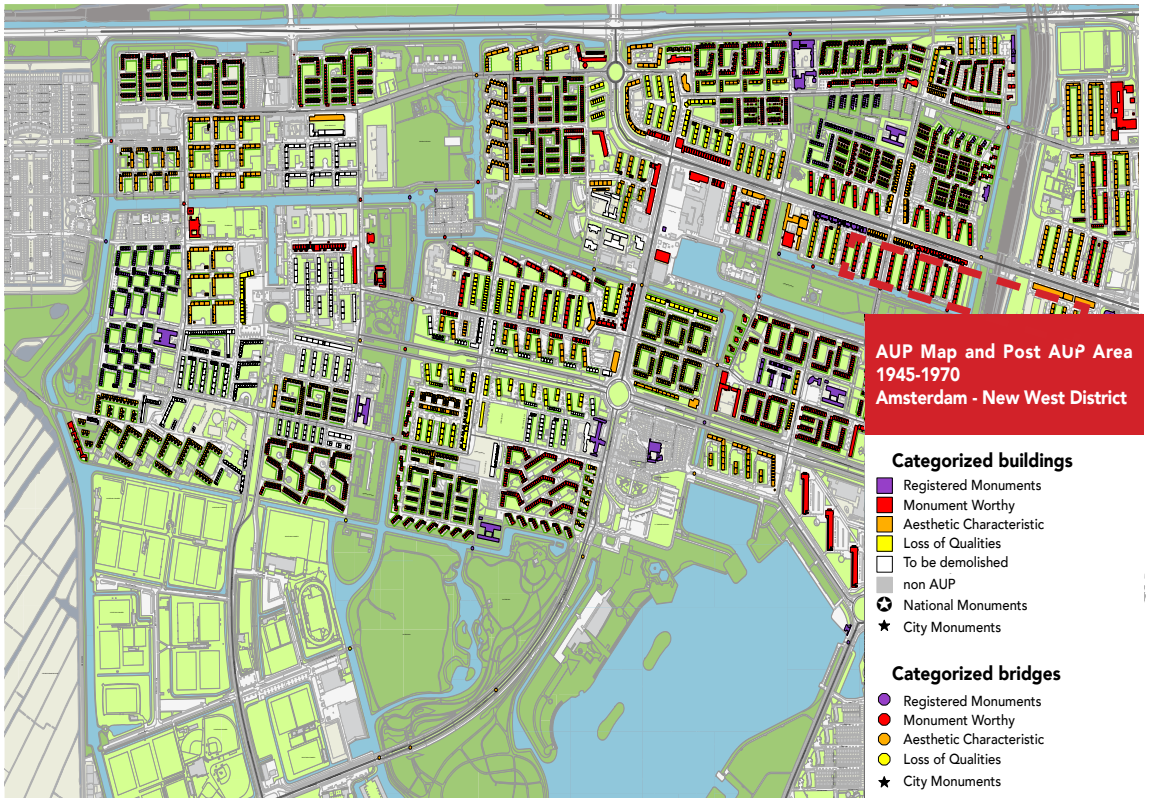


Image 1.6: Order May AUP Nieuw-West Geuzenveld-Slotermeer (source: Gemeente Amsterdam)

AUP Valuation of Airey Blocks

As of 2010, the Airey blocks were valued as monument worthy (monumentwaardig). This valuation included the following neighborhoods; Slotermeer, Geuzenveld, Slotervaart, Overtoomseveld, Osdorp, Buitenveldert, Tuindorp Frankendaal, Amsteldorp, Fizeaubuurt, Tuinstad Middenmeer, Bannebuiksloot, Nieuwendam Noord, Plan van Gool and Molenwijk.

All the buildings in these areas were valued from four aspects:

A. The typology of floor plans (villa, duplex, complex, gallery, etc.)
B. The architectural style.
C. The clustering of objects
D. The contribution of the objects to the public space.

The Airey Blocks score high on all four aspects, which is why it is registered as 'monument worthy'.

Sources

6. Buitenmuseum. http://vaneesterenmuseum.nl/het-museum/buitenmuseum/

7. Waarderingskaarten AUP gebieden, Gemeente Amsterdam https://www.amsterdam.nl/kunst-cultuur/monumenten/monumenten/projecten-onderzoek/waarderingskaarten/

Site

2.1.4 Green Network

The quality of the site, which roots in the AUP and the ideals of the 'Nieuwe Bouwen' movement, can be illustrated in the greenery, the network of roads, and the building typologies. The three aspects will be discussed in following chapters.

Water & Greenery

As it said before, the green network functions as the spatial structure in Amsterdam Nieuwe West. The water and the public green are structural elements that frame the area.
Around Airey blocks, there is a public green line facing the Burgemeester de Vlugtlaan and a green belt along Burgemeester Vening Meineszlaan, Burgemeester Eliasstraat and railway line. These greenery and Gerbrandypark are part of a larger scale network of the AUP.

The composition of water and greenery has hardly changed in the past 70 years. However the atmosphere and quality has been changed a lot in some of these green spaces.
In the initial landscape design the concept was to represent nature by implementing indigenous plant species into geometrical shapes. The image on the right (image 1.9) clearly shows the concept of the landscape design, that is, a variety of plants and an open view from the Cornelis de Rooijpad.
Nowadays, the diversity and transparency has disappeared (image 1.10).
Plants and trees have grown which may have lead to blocking the open view, but also due a lack of maintenance. The latter is probably due to the high costs that come with it.

Also, the inaccessibility of the large scale public greenery makes them more like barriers which isolate the dwelling from streets and the blocks from each other.

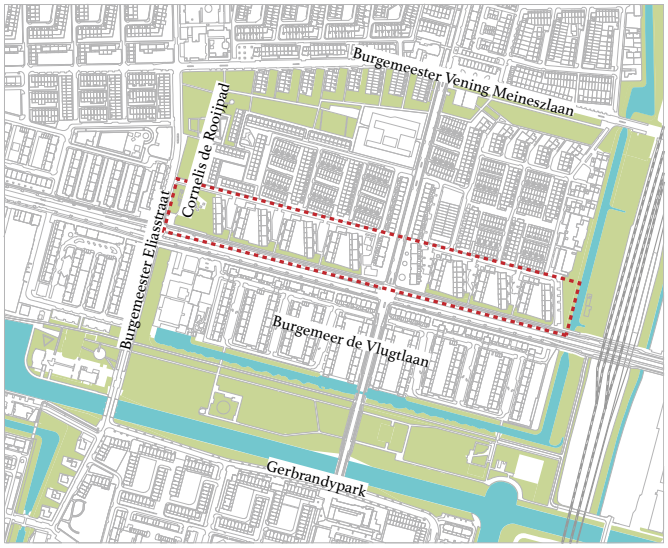


Image 1.8: Water and Greenery Water Public Greenery



Image 1.9: Cornelis de Rooijpad (Gemeente Amsterdam)



Image 1.10: Cornelis de Rooijpad, 2015 (Google street view)

The greenery in this area has a clear hierarchy between public, semi-public and private (image 1.11), each part has a distinct function.

The public greenery functions as a structural element while the semi-public greenery, that is the greenery between the public greenery and private gardens, plays an important role to smoothen the transitions. The smooth transitions play a crucial part in the design of the Western Garden Cities. The communal gardens, which are orientated towards the Burgemeester de Vlugtlaan, are the semi-public green for instance. They are intended as greenery to look at (*kijkgroen*) for the surrounding apartments rather than a place to relax. The communal gardens are not accessible for the public nor for the residents. On the one hand, the communal gardens provide a smooth transition between public and private greenery, because they separate the private gardens and the public greenery and pedestrian alongside the B. de Vlugtlaan. But on the other hand, they are not in some degrees amiable to people because of its inaccessibility and large-scale dimensions.

Note: the length of one communal garden is ca. 36 meters.

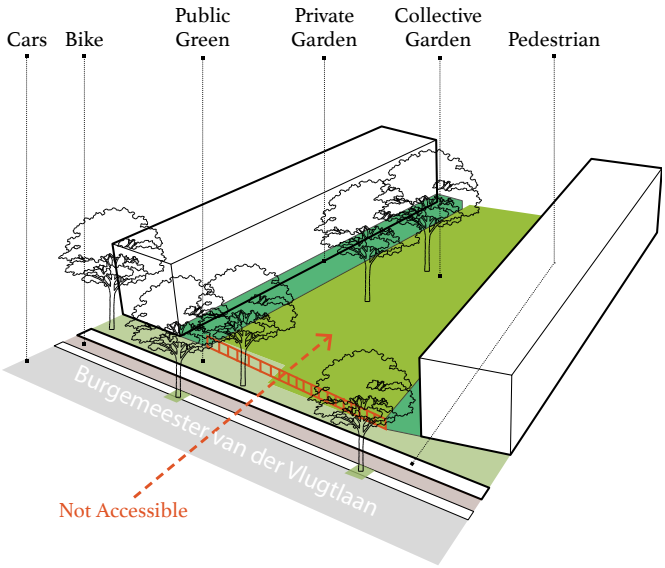


Image 1.11: Hierarchy of Greenery

Recreation

Besides public green spaces and parks, there is an abundance of playground providing the recreational space to inhabitants (Image 1.12). This is also an ideal of 'Nieuwe Bouwen' movement: the green network not only should provide enough fresh air but also should provide the opportunities for active outdoor recreation, both for young and elderly people.
Most of these playgrounds are next to the public green spaces or schools or community centers. They have remained in almost the original conditions.

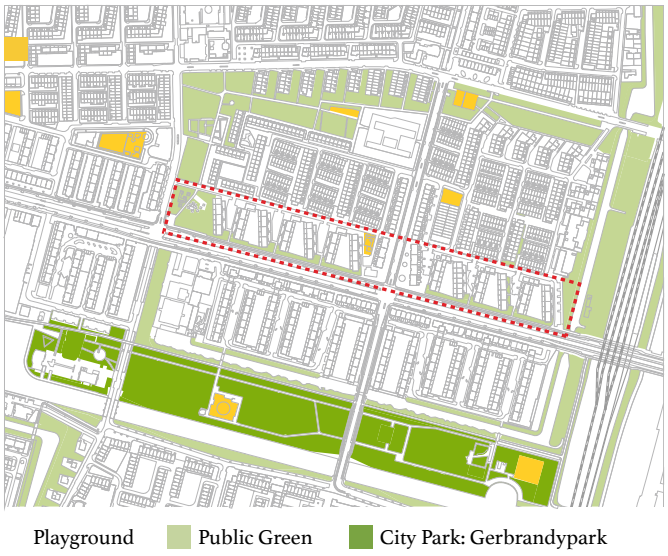


Image 1.12: The Recreation Space

Site

If we compare the historical pictures of playground in Jan Postmahof to nowadays (images 1.13 & 1.14), it shows that the environment has been remianed in a good condition. But the playground seemed more active in the past than today; there are more inhabitants and activities.

Conclusion

During our visit to the Airey strips, it shows that the green network and the ideal of light, air, space have been preserved well in this area. The public green spaces still function well as structural elements and the semi-public spaces still function well as smooth transitions. The abundant greenery provides enough fresh air. And the playgrounds provide the opportunities of outdoor recreations for inhabitants.

However one problem in these green spaces is lacking of maintenance in some public green spaces, which hampers the use of these spaces. Moreover, besides the playgrounds, the green space also should provide the outdoor recreation space, but most green space, both public and semi-public green spaces, is greenery to look at rather than a place to relax. It is opposite to the idea of 'light, air, space'. But it is also the opportunities to reuse and revive these potential public and semi-public green spaces.



Image 1.13: The Playground in Jan Postmahof (Gemeente Amsterdam)



Image 1.14: The Playground in Jan Postmahof, 2016



Image 1.15: The Potential Public Green Space

2.1.5 Road Network

Street Profile

The road network of Amsterdam Nieuwe West has been hardly changed during the past 60 years. As it mentioned before, the road network has a strong hierarchical structure of primary road, secondary road and inner road. In this area, there is only one primary road, that is the Burgemeester de Vlugtlaan, and several inner roads. There is no secondary road in this area (image 1.16).

The primary road Burgemeester de Vlugtlaan in front of Airey blocks is the most important road in this area. It connects this area to other neighborhoods and the city center. Compared the historical picture of B. de Vlugtlaan to nowadays, it shows that this road has been hardly changed even though the vehicles have been changed a lot (images 1.17 & 1.18).

Firstly, the width of the road has not been changed. In the beginning, the primary roads and secondary roads had temporary public green spaces, which can be transformed into new roads in the future. It showed that people already took future increasing traffic and tramline into account.

Therefore the composition of B. de Vlugtlaan has been not changed which includes the tramline, car lane, bike lane, greenery and pedestrian. It had on both sides lanes for bicycles and trees. The bike lanes were segregated from main road. Also, taken into account in the street profile were bus stops and parking lots. The bike lanes were segregated from the main roads (image 1.19).

The B. de Vlugtlaan also provide abundant shops in the complexes of dwellings and retail on south side while the north side only has dwellings.

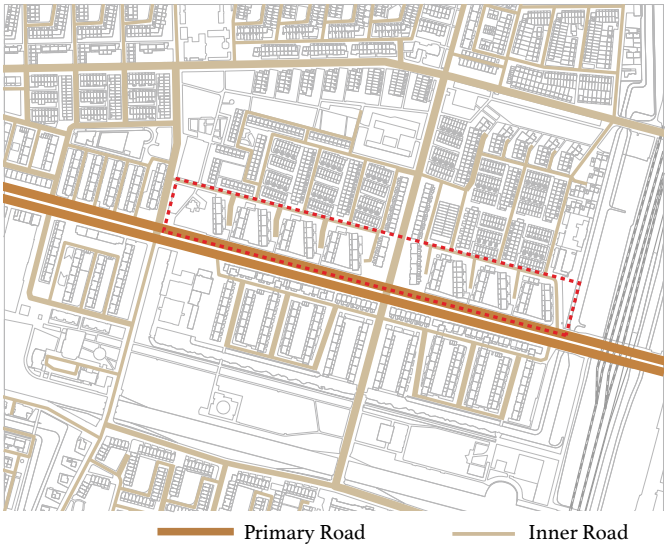


Image 1.16: The Street Profile (source: own image)



Image 1.17: B. de Vlugtlaan (Source: Gemeente Amsterdam)



Image 1.18: B. de Vlugtlaan (source: Google Street View)

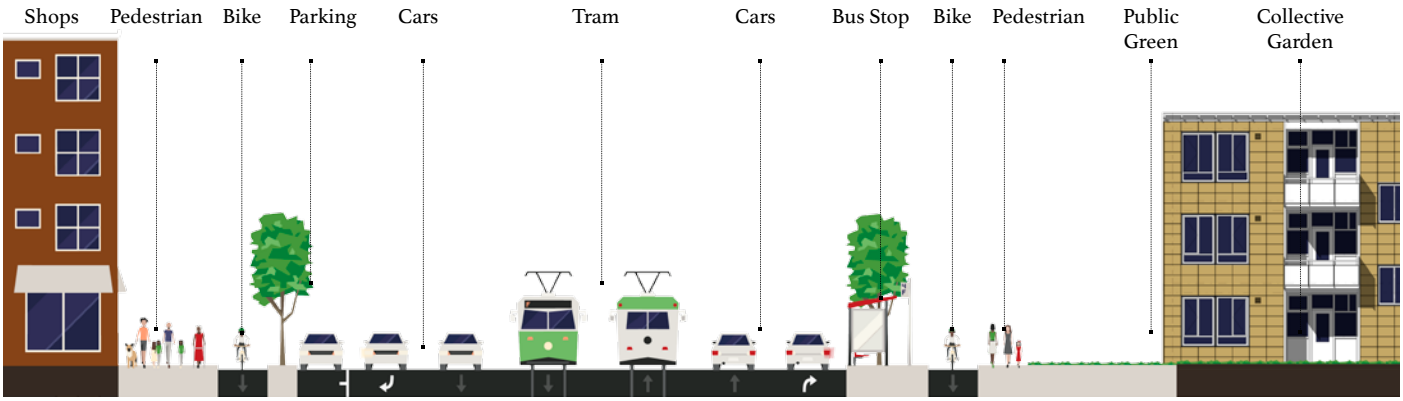


Image 1.19: The Section of B. de Vlugtlaan

Site

Parking

On the Northern side of the Airey blocks, at De Tourton Bruynstraat, are the parking lots located. Also the entrances of blocks are located at this side. The parking lots have been remained in the original conditions (image 1.24 & 1.25). The blocks have various numbers of parking spots (image 1.27). But the amount of parking space cannot meet the demands of residents. Along the De Tourton Bruynsstraat, extra parking lots are provided.

Compared to the entrance of the single-family house, the blocks also maintain the 'front gardens', which are the border green near the entrances. These natural elements help create an affable and comfortable atmosphere of the Airey blocks.

Street Names

The streets are named after the Dutch resistance heroes who were killed during WWII. The street signs also give a brief explanation of who these people were and what their role was within the resistance (image 1.26).



Image 1.24: Parking Lot (Gemeente Amsterdam)



Image 1.25: Parking Lot



Image 1.26: Commemorate Leo Frijda

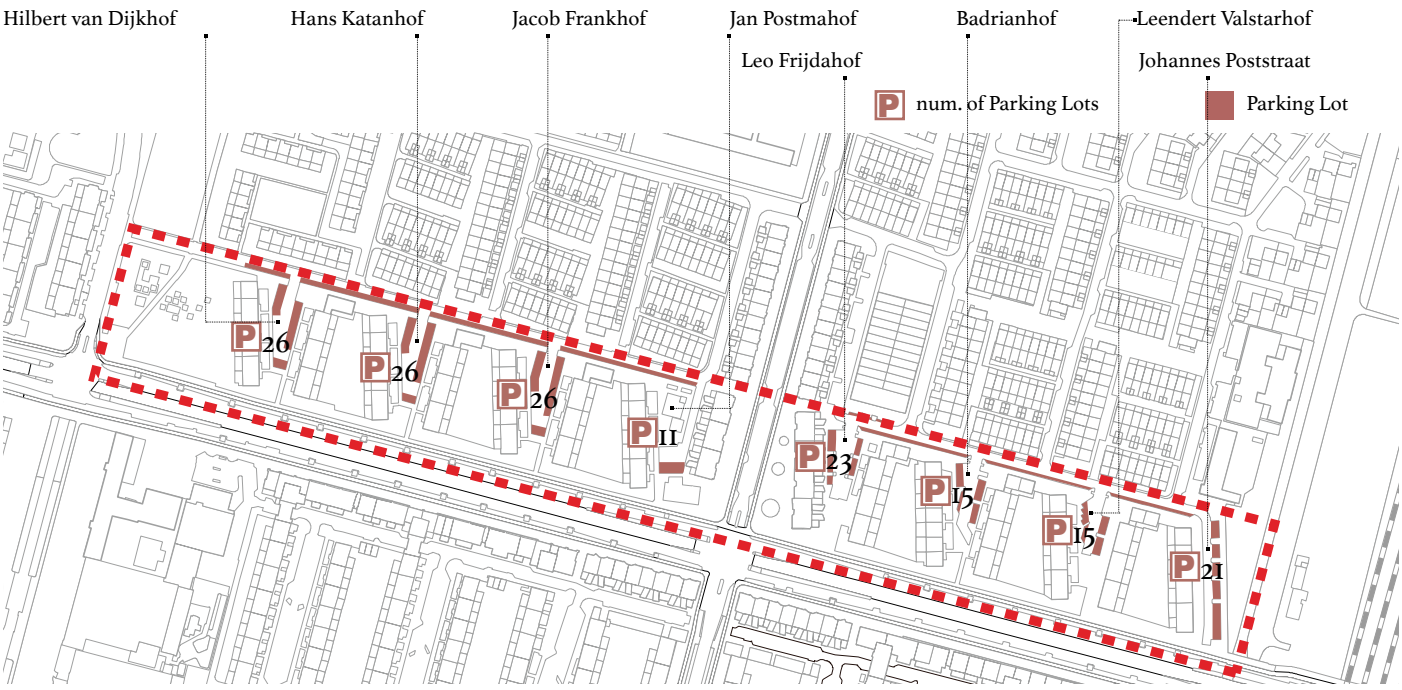


Image 1.27: Parking Lots and Street Names

Public Transport

The site has a good connection to the public transport, that is, metro (50), tram (7, 14, 20), bus (21, 80, 280, 752) and train (image 1.20). Sloterdijk station is only at a distance of 1.5km while most public transport is concentrated on Burgemeester de Vlugtlaan.

For cars, the Airey blocks can only be accessed from De Tourton Bruynsstraat where also the parking lots are located (image 1.21). Inhabitants can reach the Airey blocks from both Burgemeester de Vlugtlaan and De Tourton Bruynsstraat (image 1.22). By separating the footpaths and car lanes, an efficient and safe transport system is developed.

However, the design cycling lanes or to stall bikes, did not go that far because the car was considered to be the main vehicles at that time.

Conclusion

The network of roads was efficiently designed. The hierarchical structure provides the possibility to separate the busy roads from the residential area. For this area, this meant that only the Burgemeester de Vlugtlaan functions as primary road, while all others are inner roads, in which less cars pass by.

This is also one of the ideals of the 'Nieuwe Bouwen' movement. Moreover, public transport provides a good connection to other districts and the city center.

The street profile also has cultural value because of the naming of the streets. It commemorates the killed resistance heroes of WWII.

However the problem is that although the parking lot and bike lane were considered in the initial design but the number of the parking lots does not meet the demands today. And in some roads the bike lane is still lacking.



Image 1.20: Public Transportation

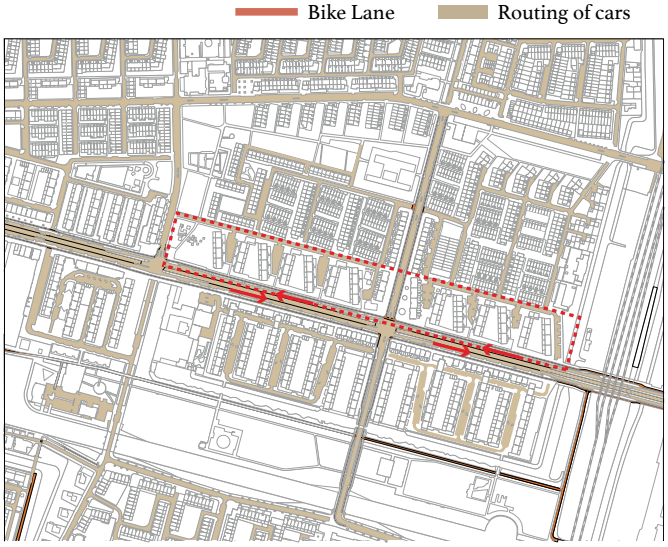


Image 1.21: The Routing of Cars and Bikes

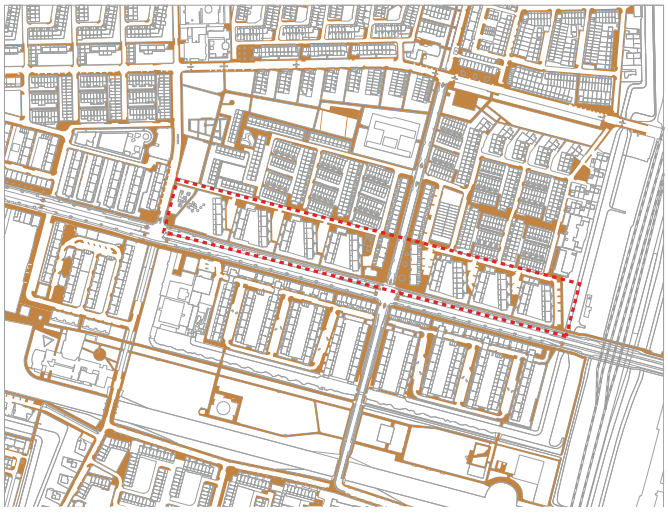


Image 1.22: The Routing of Pedestrians

Site

2.1.6 Typology

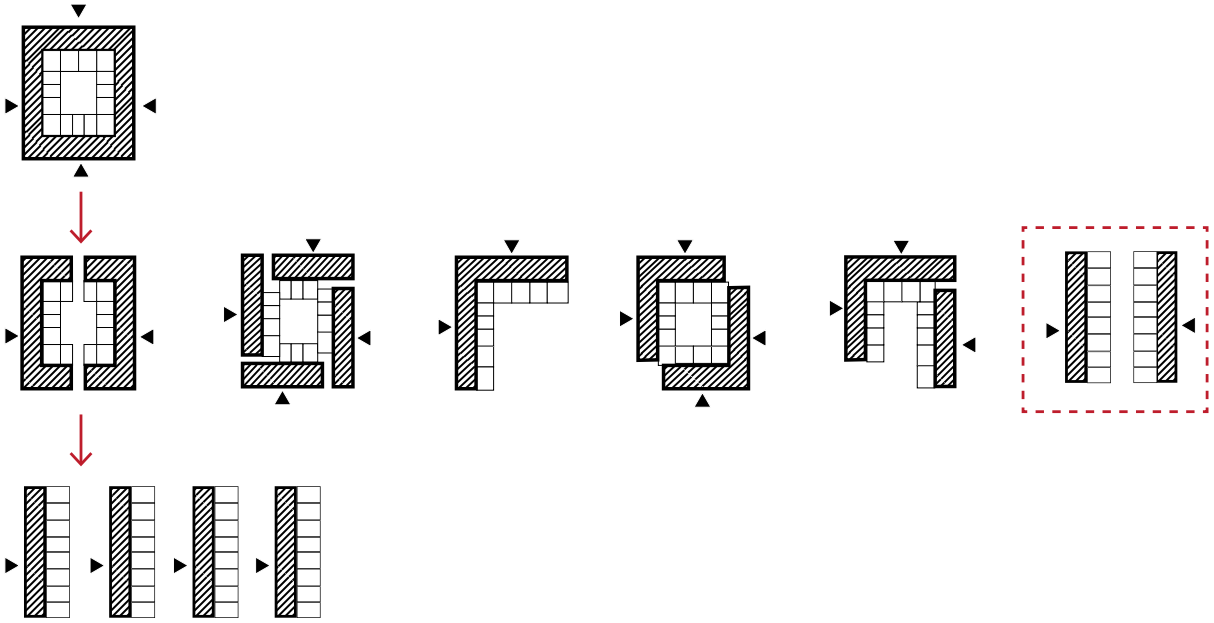


Image 1.28: From Close Block to Open Bloc

No Closed Building Blocks

The Airey blocks reflect the developments of the open building block that was popular within the 'Nieuwe Bouwen' movement. The building strips are segregated by greenery, water and roads.

Compared to the traditional closed building block, all buildings have the same (optimal) orientation towards the sun. There is no corner. Also, there is no real backside anymore which expresses the idea of transparency. The balconies and backyards are exposed to the public.

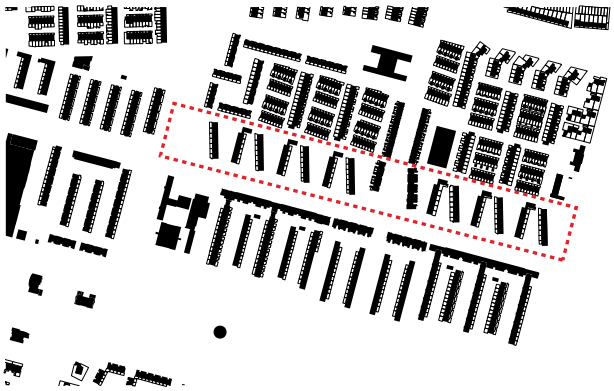


Image 1.29: Figure-ground of Airey Blocks

High-rise/Low-rise

Most surrounding buildings are med/low-rise. The low density of low-rise buildings is one of the striking characteristics of the neighborhood (image 1.30).

The strong differentiation between low/mid/ high rise of different buildings are one of the aims of 'Nieuwe Bouwen' movement. That high-rise buildings which would function as landmarks in a low-rise surroundings was considered to be the ideal cityscape for the 'Nieuwe Bouwen' movement.



Image 1.30: The Height of Building Blocks

Low-rise: 1-2 storey
Med-rise: 3-5storey
High-rise: 11 storey



Image 1.31: Function Map

Functions

Most building blocks are dwellings in Airey blocks and surroundings. To support them, there are a number of facilities, including the retail, church, school, etc. in this area (Image 1.31). The clear differentiation of different functional districts is one of the ideals of 'Nieuwe Bouwen'. Most of the However, are concentrated on the Burgemeester de Vlugtlaan and the Burgemeester Fockstraat. These shops include restaurants, groceries, supermarket, bike shops, etc. Schools are spread throughout the district and range from kindergartens, primary schools to religious and high schools. School was one of the required functions that had to be present in every district, to prevent children from crossing busy roads.

However, in the Airey blocks, there were shops located on the North side facing one inner road. They might be more attractive places than nowadays. It shows that the Airey blocks were designed as the combination of dwelling and shopping blocks. However, placing shops at the rear side seems not a successful option. The shops have decayed probably because they lack accessibility from the main road.

The Burgemeester de Vlugtlaan and the Burgemeester Fockstraat always have been active as commercial streets.

Site



Image 1.32 Shops on B. de Vlugtlaan (Gemeente Amsterdam)



Image 1.33 Shops on B. de Vlugtlaan 2016

Shops on Burgemeester de Vlugtlaan

Different commercial functions are situated along the B. de Vlugtlaan. Including; small groceries shops, large supermarket, bike shops and restaurants.

Since the population of the neighborhood has changed, due segregation, the shop owners did too. Nowadays, many Turkish and Maroccan entrepreneurs have their own restaurant or supermarket in the street.



Image 1.34 Shops of Airey Blocks (Gemeente Amsterdam)



Image 1.35 Shops of Airey Blocks 2016

Shops on Tourton Bruynsstraat

In the initial design of Airey blocks, the apartments were combined with shops in the north, which were convenient and active spaces for the inhabitants.

Since the population of the neighborhood has changed, due segregation, the shop owners did too. Nowadays, many Turkish and Maroccan entrepreneurs have their own restaurant or supermarket in the street.



Image 1.36 Mosque

Communal Functions

There is a mosque on De Tourton Bruynsstraat, which works as an important community center to the inhabitants.

Morphology

The Airey strip represents the open building block of the 'Nieuwe Bouwen' movement. To break the rigidity of the grid, Van Eesteren also placed half of the strips under an angle of 15 degrees. By doing so, he developed a stamp, which consists of a straight building strip versus a angled strip. This stamp has been repeated six times with an additional slanted building strip at the far West (image 1.37). This innovation is also one of the reasons to make Airey blocks unique and important in urban planning.

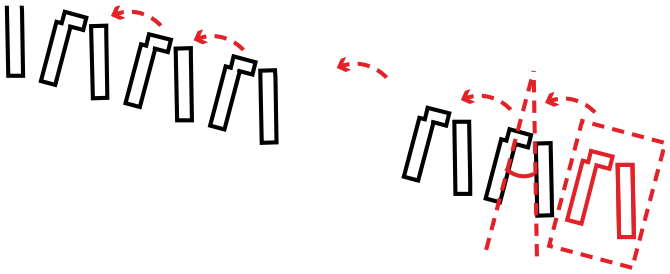


Image 1.37: Morphology and Stamps

Orientation

The placement of the building strips is probably not only done to break the rigidity of the urban plan, but also to open up the buildings towards the road. The perspective from the car is an important factor in this, considering that the car was became more and more important way of traveling. The private gardens and balconies are exposed to passing traffic, which expresses the idea of transparency. The Airey strips have nothing to hide and shows itself to the public in this way (image 1.38 & 1.39).

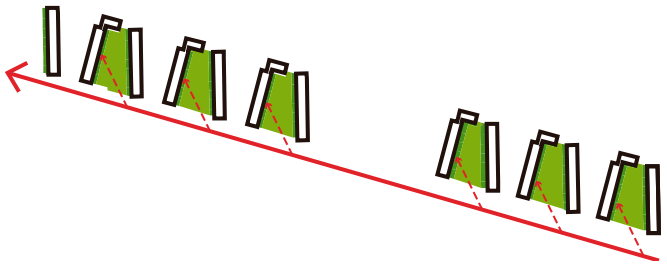


Image 1.38: View from B. de Vlugtlaan

Also are the rears of the building strips much longer exposed to the sun (image 1.40). It enhances the idea of an optimal orientation towards the sun.



Image 1.39: Street View from B. de Vlugtlaan (source: Google Street View)

Conclusion

The Airey blocks are situated in the middle of the development from the traditional closed building blocks to the modern building strips. The site has a strong differentiation of the height and the function of the buildings. Besides this the innovative morphology is also one reason why Airey blocks are so special in this area. The Orientation of the Airey blocks provide the enough sunlight to the interior and 'transparent' appearance to the outside. All these represent the ideal of 'Nieuwe Bouwen'.



Image 1.40: Orientation of Airey Blocks

Nowadays transparency can cause problems since people value privacy much more.

Site

2.1.7. Opportunities

As it mentioned before, the site itself has been selected as part of the protected townscape, therefore the profile of the street and the typology of the building blocks can hardly be changed. Besides the urban planning was based on the functionalism, every function in the site has been working efficiently. Therefore there is no obvious functional drawback.

However, there are still opportunities to improve the green space, which is not efficiently used now. It may be worthwhile to transform the public or semi-public green space into recreation space. The communal garden may also be worthwhile to open up and provide the connection between public street and Airey blocks.
It is also possible to extend the parking lots a bit to meet the current requirements of parking. Or, it can also be the potential places to provide the recreation spaces such as a playground, etc, which can be an outdoor communal space between Airey blocks.
Besides, the shopping blocks on the north side of Airey strips can be either opened up or transform into more attractive places.

AIREY
2.2 STRUCTURE

Structure
2.2.1 Development

The Airey system is an early post-war construction system, which was invented in a period the Netherlands, hastened to rebuild their housing stock and tried to catch up with the shortage of public housing. The demand for new housing was not only related to the damage caused by the war. It started much earlier with the industrialization process in the second half of the 19th century. The developments around this time of period were of great influence on the concept of social housing in general and to construct it, with for instance the Airey system.

Housing Act of 1901

The Dutch urbanization rate accelerated heavily due to the industrialization process. In Amsterdam, the population nearly tripled from 265,000 to 700,000 inhabitants in between 1865 and 1923. Social housing corporations as we know of today did not exist, leaving it up to private initiatives to deal with the urban growth. It resulted in that large parts of the urban population were housed through speculative housing developments, with little space and bad sanitary conditions (Oudenampsen, 2013).

At the same time, the housing shortage was still increasing, accompanied with an increasing amount of urban slums and the epidemics. The situation became untenable, which lead to the adoption of The Housing Act (Woningwet) in 1901. It meant the start of government regulation in the housing market, and so the concept of social housing was born. The Housing Act was there to aim for good quality housing. A healthy living environment became an important topic that also related to the concept of Light, Air and Space.

Post-War Period

The housing shortage became even more problematic after the war. More than a hundred thousand houses were destroyed, even more were heavily damaged and a baby-boom was coming up too. At the same time, did the industrial production start to get going again (meaning new labor), and so people started to settle around large cities centers. Especially here, the need for a high and fast pace building production was necessary.

Amsterdam made a plan to build 5000 homes per year in response. However, this proved to be too ambitious because of a lack of materials, finances and skilled construction worker. Schools who trained young men to become construction workers, who were known with traditional construction systems, had ceased to exist in times of war. The solution needed to be sought in new, faster and cheaper construction methods (Messchaert, 2004).

Research into new systems

In a quest to find new construction methods, 'Ratiobouw' was appointed by the Secretary of Housing, Ringers, to do research. The Dutch government started to subsidize industrial buildings methods, which resulted in a lot of submissions (sometimes rather suspicious) by contractors. In between 1947 and 1957 a staggering amount of 360 constructions were reported of which 60 were tested (Messchaert, 2004). Only a few made it through the cut, including the British Airey system. As funding was initially focused on systematized building methods on the basis of small elements (i.e. Airey), as of 1968 only large pouring concrete systems were publicly funded. Many plans for Amsterdam profited here from (Zijlstra, 2004).

N.E.M.A.V.O

Already in 1940, the Amsterdam city council established contact between '*H. van Saane*', a construction company who had a wide range experience in public housing, and secretary Ringers. The contact between both parties resulted into the Dutch Society for Public Housing (*Nederlandse Maatschappij voor Volkshuisvesting*) of which Ringers became president. As he also became director of Van Saane, the company, together by *Ratiobouw*, stumbled upon a systematized building method during a research-trip to England in 1946 (Messchaert, 2004). The so-called Airey system was invented by Sir Edwin Airey, composed small elements and was typically used to construct (military) sheds in England.



Image 2.1: Airey Building, UK (source: Gettyimages.com)

From Airey (UK) to Nemavo-Airey (NL)

It was an appealing system because it managed to save up to 40% of labor on site. The structure composed a load-bearing facade of lightweight concrete columns on which overlapping panels of 240 x 900mm were attached (image 2.1). The main concept was that a single man could carry all elements. Although the system showed a lot of qualities, it needed to be adapted to the Dutch standards (Messchaert, 2004).

H.T. Zwiers and J.F. Berghoef, both architect and professor at the TU Delft, were appointed to do so. According to Berghoef, the system could be improved in terms of prefabrication and in rationalizing certain details. The redevelopment of the Dutch version started in 1947 and was called *Nevamo Airey,* named after the abbreviation of '*Nederlandse Maatschappij voor Volkshuisvesting*' (Dutch Society for Public Housing). While improving, the system evolved over and over again. Initially it was only applicable for low-rise buildings, but eventually also for mid-rise (see 2.7.3 Sloterhof).

After a rich history in which more than 8,000 homes were realized (image 2.3), the production started to decline because of fast and large-scale constructions systems (i.e. VAM and ERA) were developed. The majority of realized Airey buildings is concentrated in and around Amsterdam. (Priemus, 1971).



Image 2.2: Structure of Nemavo-Airey, NL (source: Hooyschuur)

per	amount of finished houses	
	previous year	total
1 - 1 - 1957	...	5385
1 - 1 - 1958	332	5717
1 - 1 - 1959	973	6690
1 - 1 - 1960	154	6844
1 - 1 - 1961	264	7108
1 - 1 - 1962	0	7108
1 - 1 - 1963	0	7108
1 - 1 - 1964	162	7270
1 - 1 - 1965	234	7516
1 - 1 - 1966	339	7855
1 - 1 - 1967	163	8018
1 - 1 - 1968	86	8104
avg. in past 3 yrs.	196	

Image 2.3: Production trend (source: Priemus, 1971)

Structure

2.2.2 Construction Principle

The Airey-strip Along the Burgemeester de Vlugtlaan in Amsterdam is constructed with the Nemavo-Airey system (hereafter N.A. system). Composed by small and lightweight elements, each element could be carried by two men. Although the site consists six shops and thirteen apartment strips, this chapter only focuses on the latter.

Stability

The Airey blocks are constructed as 'table structures' in which the load-bearing facade is made of concrete columns (table legs) and the timber floors (table leaf) are supported by steel trusses. The load-bearing facade makes them have flexible floor plans with only one fixed steel column in the middle of the plan. These columns are part of a steel construction that provides stability and supports the steel trusses of the floor (image 2.4).

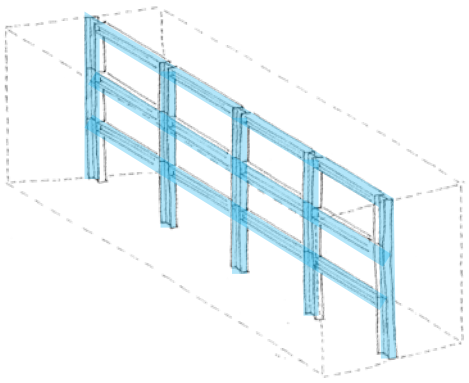


Image 2.4: Detail of floor joint

Facade & Walls

The facade forms the most important characteristic of the N.A. system as it sets an all-decisive grid for the other elements. The prefabricated concrete columns (62.5 x 125mm) run from floor-to-floor and are placed in the un-insulated cavity at a core-to-core distance of 625mm (image 2.5). The cavity is ventilated as fresh air flows from top to bottom. Throughout the full length of the columns runs a steel reinforcement pipe on which two bolts are welded at floor height. This is done to attach a steel edge beam of the floor suspension (image 2.7). The columns at ground floor are fixed on the foundation with dowel joints that fit into the steel pipes of the columns. The same principle is used to connect columns on top of each other (image 2.7). At the rear of the columns, two wooden strips (20 x 25mm) are casted to attach insulating panels of 20mm (image 2.6). To complete the inner leaf, a layer of gypsum blocks (60mm) is stacked. Columns right above and underneath the window frames are cut, which makes them loose their load-bearing capacity (image 2.5). The facade is clad with reinforced-concrete panels (625 x 375 x 40mm) that strengthen the image of the grid. In here, four bolts were casted to fix them on the columns (image 2.6). The sides are slightly beveled, resulting in wedge-shaped joints whereas the bottom and top are carried out with rabbets (image 2.6 & 2.7). The columns and panels are in good condition according to Hooyschuur. This is also why they will be kept in current renovation. The load-bearing walls of the staircases are made of hollow concrete B2-blocks (Priemus, 1971).

Floors & Roof

The blocks have three floors of either five or six apartments. The ground floor is together with the foundation beams (on wooden foundation piles) made of concrete. Hooyschuur assumes a thickness of 120mm and no insulation for the ground floor.

The first and second storey's are made of a timber floors which are supported by steel trusses (250mm, c.t.c. 625mm) bolted on [-shaped edge beams. The same principle is used for the roof, although a larger core-to-core distance is used since it has a smaller load to carry.

On top of the trusses, one finds wooden joists (30 x 30mm) with the wooden timber floor (22mm) on top. The ceilings are suspended on the wooden joists and consist of brican-ion (*steengaas*) on which stucco is applied. It results in a total floor thickness of 350mm and a floor height of 2650mm.

The lack of insulation in the floors has lead to a lot of noise complaints. This will be solved in current renovation by placing insulation in between the trusses (Hooyschuur, 2015).

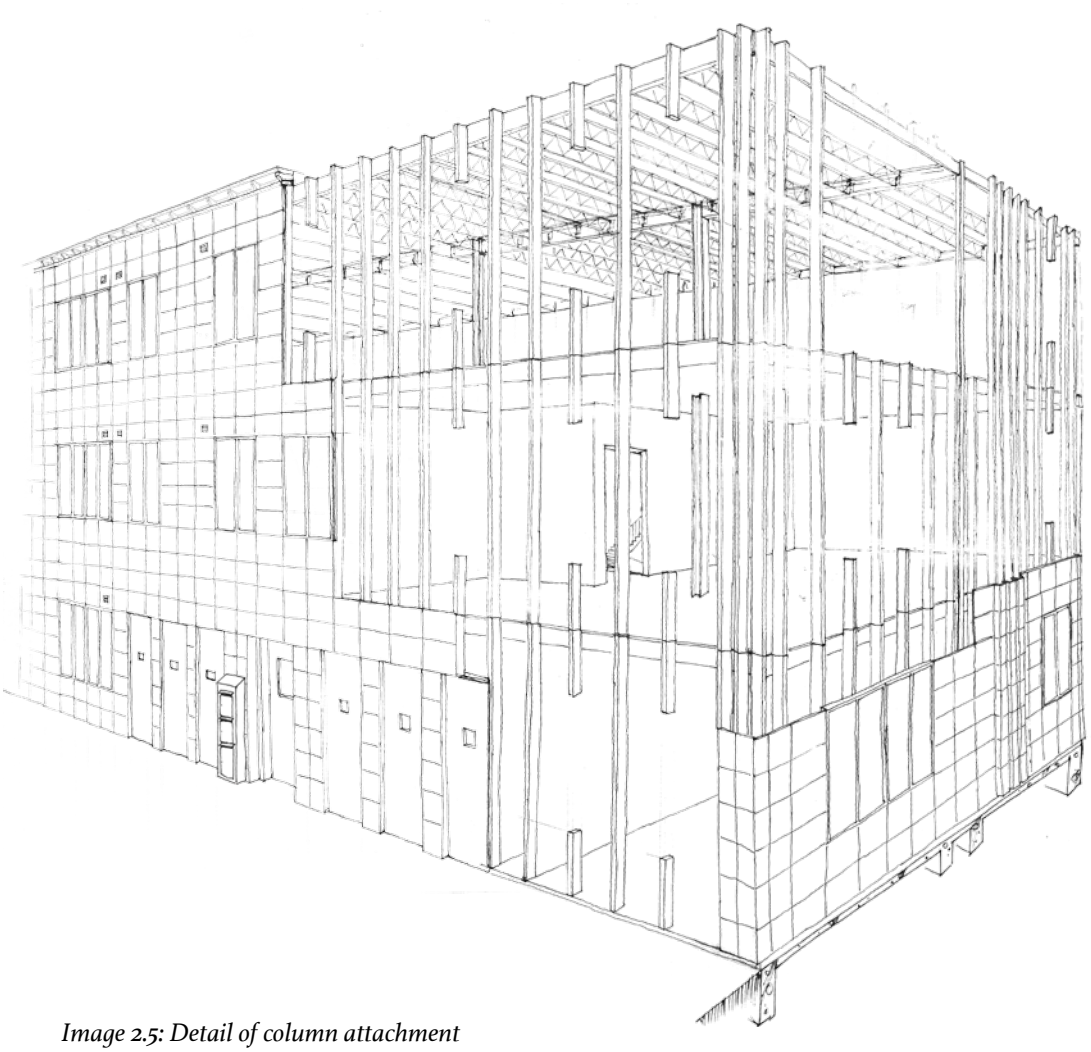


Image 2.5: Detail of column attachment

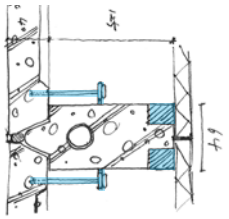


Image 2.6: Detail of floor joint

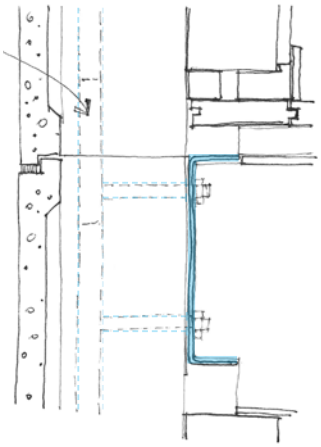


Image 2.7: Detail of floor suspension

Structure
2.2.3 Properties

The N.A. system was successful in that it lost a valuable amount of construction time. As mentioned earlier, the British Airey system managed to save up to 40% of the labor on site. After Zwiers and Berghoef enhanced it into the Nevamo Airey system, Priemus says that the construction of one bungalow (image 2.8) only took up to two to three months, that is, from prefabrication to constructing on site. In his well documented book on non-traditional systems, he is even more precise by saying that for the construction of 6 to 7 bungalows approximately 405 man-hours were needed in the factory and another 700 to 1200 on site (Priemus, 1971).

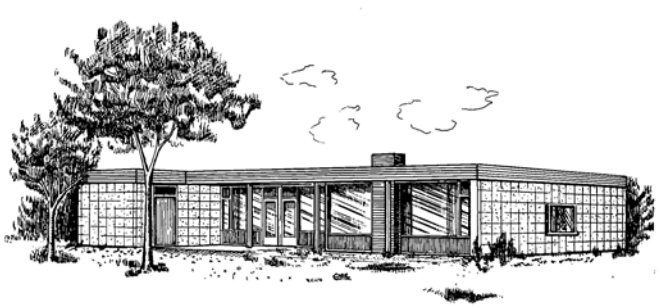


Image 2.8: Bungalow as described (source: Priemus, 1971)

Physical properties

The structural elements were designed with minimal dimensioning to save material and to make it possible to be carried by one man. Although Priemus says that the concrete columns were able to carry 7000 kg without leading damage (Priemus, 1971), the building could not carry much more. In light of current renovation, recent calculations confirmed this. The outcome show that with current renovation cannot carry much more load as originally was calculated. Especially the bathroom floor deserves attention because it is already critical in current situation (Strackee, 2015).
Also, tests were made to check the soundproofing. The results show that horizontal sound transmissions meet the current standards. Nevertheless, this is not the case in vertical direction as expected due a lack of insulation in the floors. In vertical direction, the apartments fall 10dB short, meaning 50% of the inhabitants experience noise (CHRI, 2015).

Thermal properties

According to CHRI, the following thermal properties and energy indexes can be assigned to the current construction. (CHRI, 2015)

Current Energy Indexes

apartment ground floor	2.31 / E
apartment 2nd floor	2.47 / F
apartment 3rd floor	3.43 / G
end apart. ground floor	2.74 / G
end apart. 2nd floor	2.88 / G
end apart. 3rd floor	3.65 / G

Image 2.9: Energy Indexes (source: CHRI, 2015)

Thermal Properties

not-insulated cavity wall	: Rc = 0,35 m2K/W
not-insulated concrete ground floor	Rc = 0,15 m2K/W
not-insulated roof	: Rc = 0,22 m2K/W
not-insulated door	: U = 3,4 W/m2K
Frames with single glass	: U-raam = 5,10 W/m2K ZTA = 80%

Image 2.10: Thermal properties (source: CHRI, 2015)

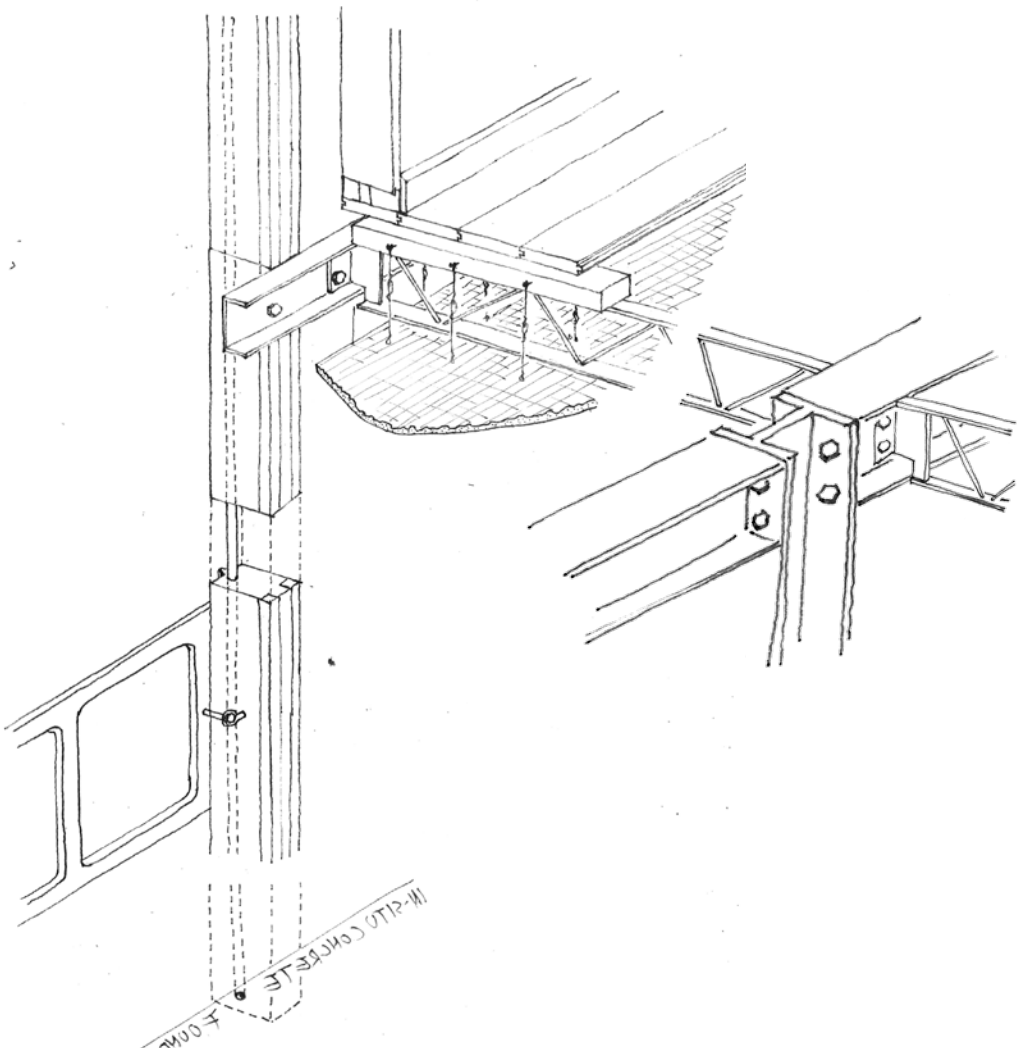
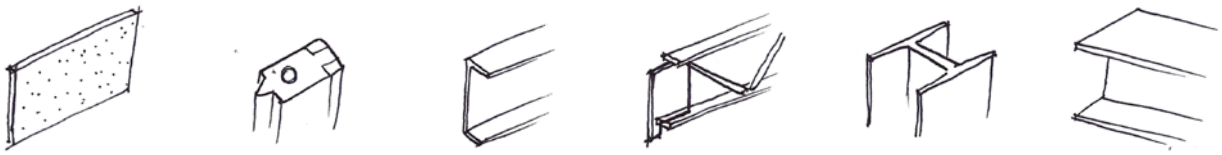


Image 2.11: Axo of Column / Floor joint



	concrete panel	concrete column	steel edge beam	steel truss	steel HEA 100	steel HEA 120
size (mm)	375 x 625 x 40	125 x 65 x 3000	45 x 200	4300 x 30 x 250	3000	4000
amount (A)	2674	1251	345m	234	13	36
(B)	3059	1433,25	393,73m	273	15	42

Image 2.12: Inventory of structural elements

Structure
2.2.4. Opportunities

As most connections are bolted (easy joints), issues of corrosion often arise when renovating Airey buildings and needs attention when doing so. In terms of adding or extending the building, the current structure is not able to carry more than calculated. It restraints the possibility of stacking new structures on top, or to entrust the facade with additional suspensions. Instead, in order to add space to the current building, this extension is possible when the new structure is constructed on its own. It provides opportunities to introduce new structural elements. When doing so, one might consider to follow the pattern of the grid (see 2.3.1 composition & ratio). New lightweight structures might add new value and revive the buildings.

The columns above and underneath the window frames are not load bearing, which makes it possible to enlarge these openings in the facade. Larger windows can be placed quite easily without deviating from the existing grid. On the other hand, these spot might also be interesting to introduce new structures to enlarge the space plan.

Finally, much needs to be achieved in terms of insulation. Since no insulation is placed in the facades and floors, the indoor climate drastically needs improved. The cavities of the facades and in between the floor trusses provide the possibility to fill it up with insulation. This is how current renovation and will improve indoor climate (from energy Index E/F/G to A) and solve the noise of the floors.

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AIREY

2.3 SKIN

Number of Tiles

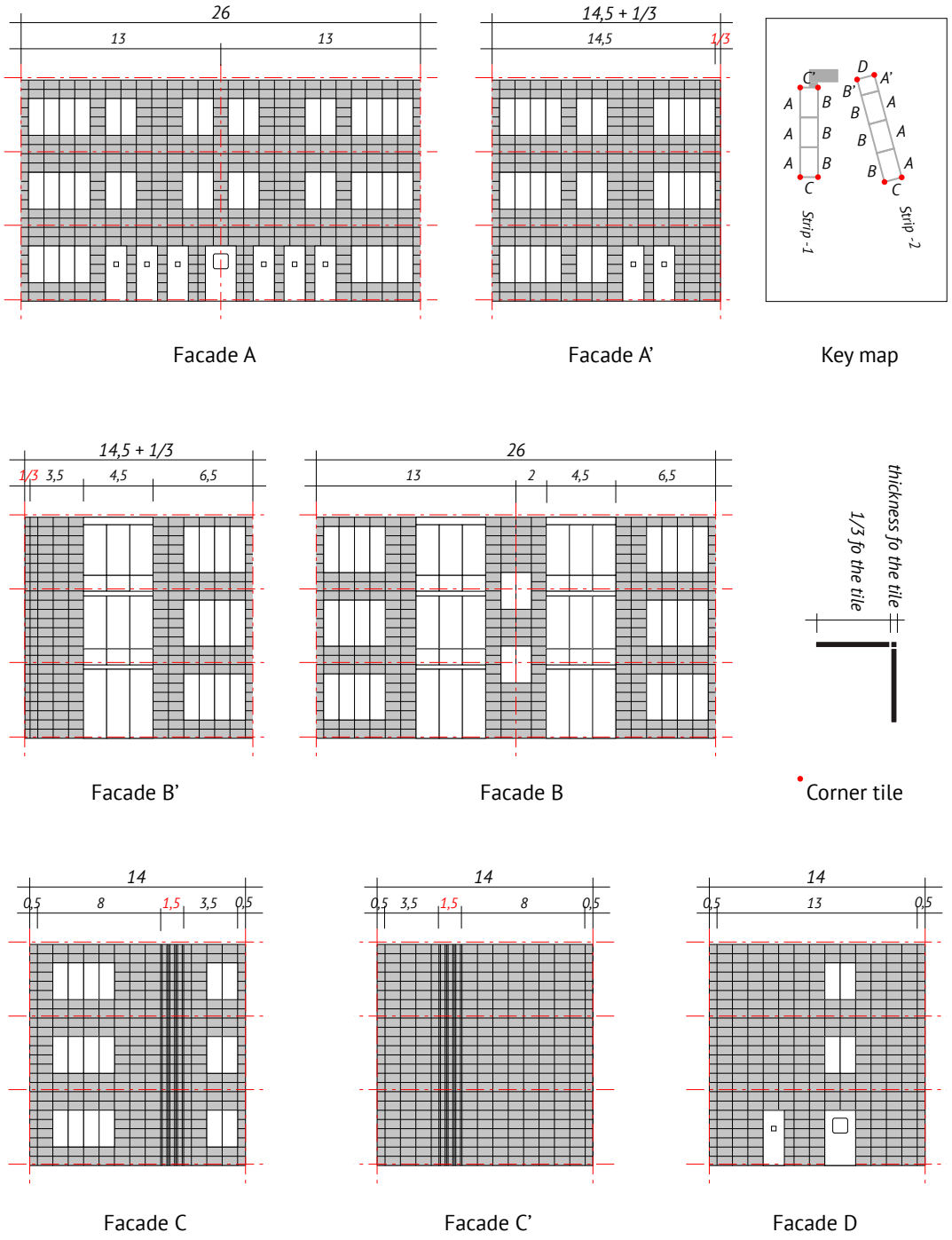


Image 3.1: Different Facades

	A	A'	B	B'	C	C'	D	Total strip-A	Total strip-B
Number of units	624	356	624	356	336	336	336	**4480**	**5192**
Number of tiles	398	234	272	188	264	336	299	**2674**	**3059**
Open ratio	36%	34%	56%	47%	21%	0%	11%	**40%**	**41%**

Skin

2.3.1 Composition & Ratio

As mentioned before, the British system was improved to meet the systematic standards the Dutch were aiming for. When comparing both envelopes, this can be confirmed. The envelope of the N.A. system clearly shows some rationalized details, resulting in a rather rigid grid and sturdy appearance. Whereas the British panels (900 x 240mm) were attached on three columns with an overlap, the Dutch panels had a much more rational look, i.e. it got rid of the overlap and were reshaped into smaller ones (625 x 375mm). Also, they were prefabricated with a rough mixture of gravel and cement, creating strong textures on the surface. It restrained the Airey-strips from having a flat concrete look, but instead, it created an aesthetic beauty and depth. According to Hooyschuur this feature gives a beautiful effect, especially when the sun hits the surface. Although many prefer the white painted facades (see 2.3.3 Renovations), current renovation will restore it to its original image of gray concrete. As Hooyschuur found beauty in the original appearance and composition, this chapter will try to do the same by elaborating onto; the grid, ratio, the elements and their composition.

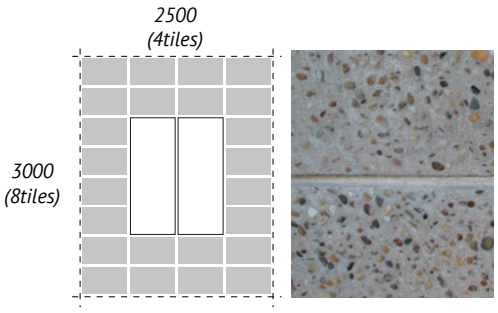


Image 3.2: Metric system

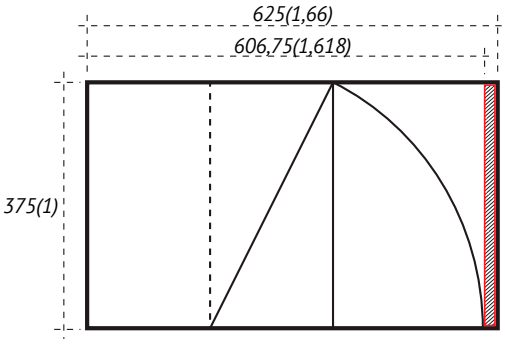


Image 3.3: Golden Ratio

Rigidity of the Grid

The grid is based on the measurements of a single panel, (625 x 375mm) and sets an all-decisive grid for the other elements. This includes the size of the window frames (image 3.2) and the core-to-core distance (625mm) of the concrete columns for instance. This logic contributed to a loss of valuable construction time since every element would fit right into place. While this method created a certain rigidity, it also created transparency in terms of how the buildings were constructed. The human scale and the logic of the grid make them easy to read.

Besides having fixed measurements, the image of the grid is emphasized by how the additional elements are shaped s (see 2.3.2. Elements). Most elements are designed with sharp corners that strengthen this image and makes them part of the large composition.

As some might argue that this rigidity has aesthetic beauty, it was an cost and material effective approach in essence. Berghoef made sure to waste as little as possible, since material was scarce, and related the logic of the grid to the metric system. As an example do some tiles deviate from its standard measurement i.e. the corner tiles or the ones next the storage. In here, 1/2 or 1/3 tiles are used so that the remaining parts would not be wasted but could be re-used.

Golden ratio

As shown in Image 3.3, we noticed that the measurements of the tiles come very close to the 'Golden ratio'. It contributes to the coherent whole and the human scale of the building. As we assume, Berghoef was interested in designing in with this rather aesthetic ratio, as he was a traditionally trained architect. Nevertheless, he needed to make a compromise by not using the exact golden ratio but to round it of, in order to make it applicable for prefabrication.



Amount : strip (A) 4 / strip (B) =5
Material : Concrete
Size : 937,5 x 420mm



Amount : strip (A) 12 / strip (B) 14
Material : Concrete (waffle floor)
Size : 2648 x 1244mm



Amount : strip (A) 192 / strip (B) 222
Material : Wood (roof gutter)
Size : N/A



Amount : strip (A) 21 / strip (B) 25
Material : Steel (doors)
Size : 1250 x 2250mm (entrance door)
900 x 2250mm (storage door)



Amount : strip (A) 111 / strip (B) 132
Material : Steel (original) / Aluminum (new)
Size : 1250 x 1500mm





Amount : strip (A) 60 / strip (B) 71
Material : Plastic (ventilation grill)
Size : ϕ100mm

Skin

2.3.2 Elements & Materials

Apart from the grid and its panels, there is a couple of elements which make the Airey-Strip stand out from other typical Airey buildings. These elements have certain aesthetics that do not directly relate to the systematic characteristic of the system, but reflect the trained background of Berghoef.

Chimney

Although the Nemavo-Airey system was an utterly functionalistic construction system, the design of the chimney clearly shows how the architect originally was trained. The chimney tiles along the facade as well as the chimney itself on the roof have aesthetically designed details. Both show strong linings and which is why they emphasize the prominence grid.

Roof Gutter

Like the design of the Chimney, also the roof gutter has aesthetic value as it shows the craftsmanship of the 50's. The roof gutter is designed as such that it also follows the grid of the system. It also preserves the box shaped building from looking monotonous like many other Airey buildings (See roof corner of 7.1 Tutti-Frutti Village for instance). The exposed drainpipe can be a point of improvement and provides possibilities to integrate it more into the design.

Window Frames

Another key characteristic are the slender window frames made of steel. Besides its slenderness, they have a small outwards offset which strongly emphasizes the slender shape of the window frames.

As seen in several renovations, some of the blocks have been renovated in order meet the current energy demands. Some of those have been replaced with new wooden windows, which do not have that slender appearance. In current renovation the original window frames will be replaced with aluminum frames. In this approach, Eigenhaard tried mimic its original characteristics by making the profiles as slender as possible and with a similar strong outer lining.

Balconies

The balcony (2648 x 1244mm) is constructed as a waffle slab floor, which is kept into place by a steel C-shaped framework. Besides that this type of floor saves material in that it is as strong as a regular concrete slab but with less concrete, the 'cassettes' underneath strongly emphasize the rigidity of the system and its grid.

The original balconies had steel fences that were painted forest green. Over the period of time, a lot of them have been modified with new types of fencing (i.e. wood) or have been painted. In the current renovation, larger balconies will be placed. In doing so, Eigenhaard aimed to use waffle slab floors also, but turned out to be too expensive.

Doors

The entrance doors of both the storage (left) and staircase (right) are made from steel and have been modified. Both doors have been painted (originally burgundy) and steel plate has been placed, probably to prevent rust caused by splashing dirt.

Although it can be argued there is little hierarchy between both, there are some differences. The entrance to the staircase follows the metric system, as it is as wide as two tiles, whereas the door of the storage is slightly off. The latter is been placed within a slender framework of steel, which shows the same features as the window frames. The architect tried to highlight the entrance of the staircase by giving it more depth and to frame it in a rather thick painted wooden framework. The postboxes were installed later and will be removed in current renovation.

Ventilation opening

Openings were made in the face to put ventilation grills in. These were not part of the original design and also not in use anymore. As these holes are not necessary and do not form part of the original design, they will be filled or be replaced by new panels in the current renovations.

Although many of the original elements will be removed in current renovation, almost all of them have had strong linings that accentuate the rigidity of the grid. This, together with their dimensioning which obey the measurements of the grid, makes them fit into the larger whole. The chimney and roof gutter both show the traditional background of Berghoef. These elements two make the Airey-strip stand out from most other realized Airey buildings.

Skin

2.3.3 Renovations



Image 3.4 - Different Renovations

Although the strip is currently under construction, only four are still in its original condition. Over the period of time, different housing corporations carried out several renovations. The Airey-strip consists of 13 building were build by four different housing corporations; Dr. Schaepman, Onze Woning, Eigen Haard and Rochdale.

The last two corporations have survived and have adopted the strips of the other two. Ever since, each of them carried out several renovations. The blocks have lost some of their original aesthetics in an attempt to improve the indoor climate conditions. We can divide the blocks into four types of renovation (see page 33).



Block 1 -4 [painted & new window frames]

property of Rochdale

Block 1 to 4 has been painted white in an earlier attempt to revive the buildings. Although the facade is been painted, the grid is still present in the facade, which means that the identity of the Airey-system is still visible. The steel windows frames are replaced by wooden ones, which has slightly improved the energy quality and solved the leaking windows.



Block 5-6 [new plinth & stucco]

property of Rochdale

Block 5 to 6 is most drastically renovated. The facade is plastered with new layer of insulating stucco, resulting in a radical energy improvement. On the other hand, it has lost of one of the characteristics of the grid. Also new wooden window frames are placed that contribute to the energy improvement. The original balconies are demolished and included into the apartment. Instead, a new steel structure with balconies is build against the rear of the building.



Block 7 - 10 [original, current renovation]

property of Eigenhaard

Blocks 7 to 10 are nearly original; the steel window frames and facade were not untouched. However, the blocks are currently under construction. The window frames will be replaced with aluminum frames, in which Eigenhaard tried to mimic its characteristics as good as possible. Nevertheless, the new window frames have thicker profiles and coated glass. Also the balconies will be replaced with larger ones, and not carried out in a waffle slab floor.



Block 11 - 13 [painted, current renovation]

property of Eigenhaard

Blocks 11 to 13 were originally property of Rochdale, but Eigenhaard has bought them and will be part of the newest phase of renovations. These blocks were also nearly original. They still had the original steel window frames; only the facade was painted white.

Skin
2.3.4 Opportunities

The Airey system is all about the envelope, as the buildings have free space plans and a load-bearing skin. The façade is divided into a grid based on the measurements of a concrete panel. These set an all-decisive grid which can hardly be deviated from. The grid shapes the identity of the system and needs to be threatened carefully. The strong lines it has, are emphasized by several elements including the balconies and window frames.
The first opportunities of enhancing the façade lie within adding insulation, as this is not applied in original situation. The cavity of the load-bearing façade provides opportunities , which will also be the approach of Hooyschuur in current renovation. Another possibility is adding insulation on the outside, which is also done at block 5 and 6 by Rochdale. Although this intervention did not respect the grid, it may be interesting to consider placing insulating panels within a the same or similar grid. This approach will not lead to loss of interior space and provides the chance to modernize to facade with new tiles for instance.
Also, the addition of new structures might provide interesting opportunities. The aim of this approach will be to add space. This can for instance be done with new balconies; change of composition, removal in order to add interior space or extension such as what Hooyschuur will do in current renovation.
Also, when renovating it might be considerable to increase the hierarchy between entrances. One might argue that the hierarchy is weak in current situation and could use some improvement.

AIREY
2.4 SERVICES

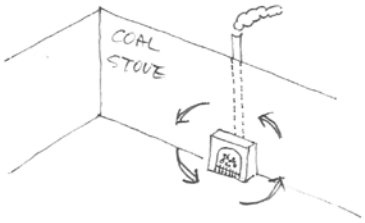
Services

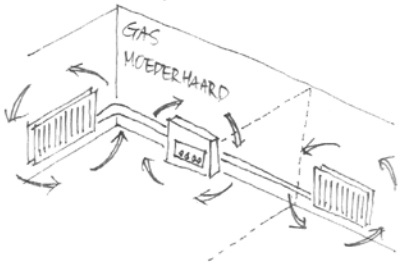
2.4.1 Heating

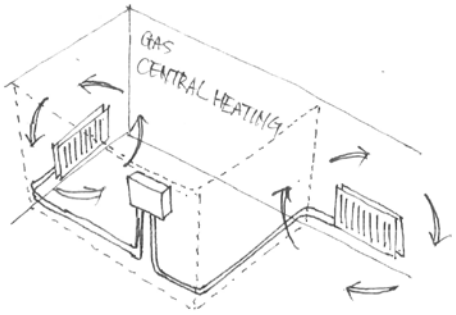












coal heating (from ca. 1952 - 1963)

moederhaard (from ca. 1963 - 1981)

*central heating (from ca. 1981 - **now**)*

Service includes all the facilities such as water and sewage, electricity, and lighting systems. While these services following a general idea rather, the heating and ventilation system have marked changes. Although the original system meets the standard of the time, the required performance of these two systems is getting higher. Therefore we are focusing on these two services in depth.

Original - Coal Heating

The first heating system made use of a coal stove in the living room. Traces of the system can still be found in the chimneys on top of the roof and the cavity in the facade. One can assume family members gathered together around the stove during the winter season.

Renovation #1 - Gas stove w/ central heating

After the gas discovery in Groningen (NL) in 1953, it was not until 1963 it was widely used to heat houses. For the Airey-strip (and lots of other houses) it meant that the coal stove was replaced with a '*moederhaard*' (gas stove). The system made use of a gas stove with an integrated central heating distributor. Gas was transferred to every radiator in the apartment resulting is a much more comfortable indoor climate.
We can assume that the gas stove was an important element for the unity of the family because people still have affection for the gas stove.

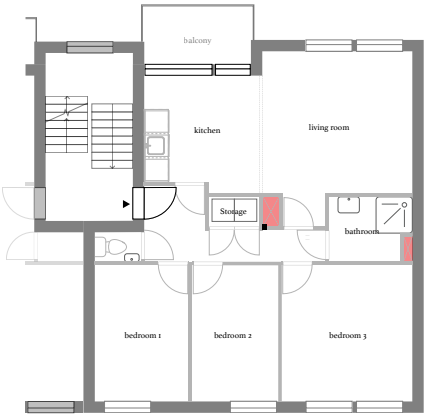
Renovation #2 - Central Heating (current)

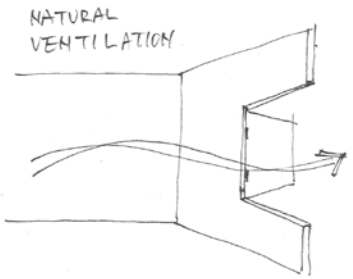
Central heating was first introduced in 1981 by Nefit in the Netherlands. Within this period, some houses have been equipped with a central heating system in the kitchen. Radiators were installed in every room which heated the space. The piping is exposed and attached along the corner of the wall. Also, the exhaust air pipes are collected at the staircase, and connected to the roof.

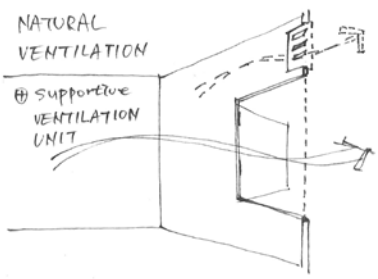
2.4.2 Ventilation

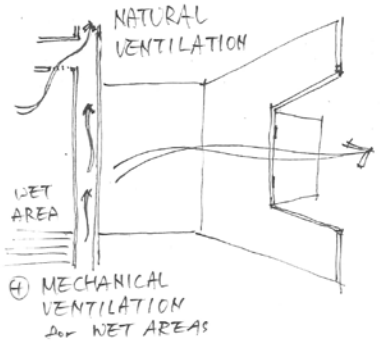












#1 natural vent. (from ca. 1952 - 1963) *#2 natural vent. (from ca. 1963 - 1981)* *mechanical vent. (**now**)*

Original - No mechanical ventilation

The original design was not equipped with mechanical ventilation but made use of *natural ventilation*. One had to open the windows to let fresh air into the apartment. The bathroom and kitchen were smartly placed along the facade and balcony. By doing so, the 'wet' air could easily be naturally ventilated by opening the door to the balcony or the tilted window above it.

Renovation #1 - Ventilation module(s)

Over the period of time, several renovations were carried out which made an attempt to solve problems of for instance leaking windows, mold, and moisture. Two types of interventions were made. The first intervention; A ventilation grill was made in the face so every room was exposed to additional ventilation device. The second intervention was integrated 'tricle vents' within the (new) wooden window frames. Both types make use of additional natural ventilation. Although they slightly changed the image of the facade, they improved the indoor air quality.

Renovation #2 - Mechanical ventilation (current)

In the current renovation plan, mechanical ventilation will be used for the kitchen and the bathroom. The extraction of the contaminated air occurs via the roof. The remaining spaces such as the living room and bedrooms will still make use natural ventilation.

Service

2.4.3 Opportunities

To meet the standard of energy efficiency, the heating system has been developing. Heating (as an active control system) could be regarded as a minor issue compared to the insulation performance of the skin. However, given the age of current central heating(more than three decades), the new and cutting edge system can be considered.

Also, the ventilation system has kept developing but in a somewhat passive way. This might be because the natural ventilation concept is still valid. Therefore, showing the respect to the original idea is important, although the intervention should be considered for the refurbishment to meet the requirement of the Dutch regulation.

AIREY

2.5 SPACE PLAN



Image 5.1: Interior according to 'Goed Wonen' principles (VanEesterenMuseum.nl)

Space Plan

2.5.1 Aim & Typology

The Airey-strip consists of 13 buildings strips of 3 floors, with each 6 or 7 apartments per floor. The apartments were considered to be huge at the time. The placement of the open buildings blocks was as such that each apartment had an optimal orientation towards the sun. In doing so, they were exposed to a plenty amount of daylight. The facade as load-bearing structure created a utterly flexible space plan, which had a spatial character that offered space for a whole family. The contrast between the old suburbs of the 1920's and the new modern ones of the 1950's was huge. As the modernist advocated for light and spacious interiors, society had to adapt to a new lifestyle too. This included new furniture for their interiors.

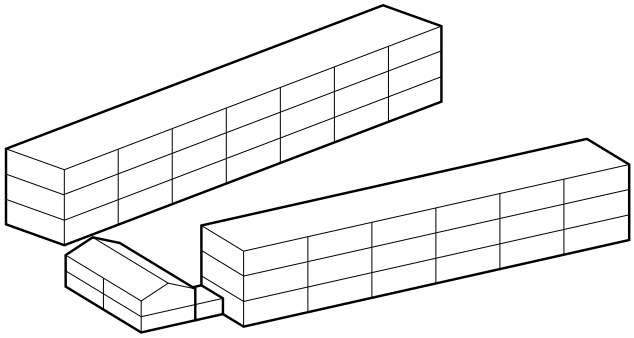


Image 5.2: side building versus building strips

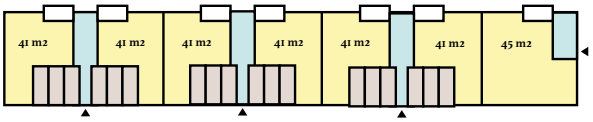


Image 5.3: ground floor organization

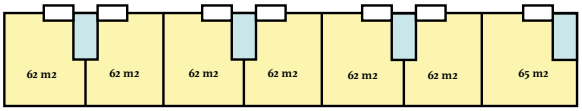


Image 5.4: top floors organization

Stichting Goed Wonen (Good Living)

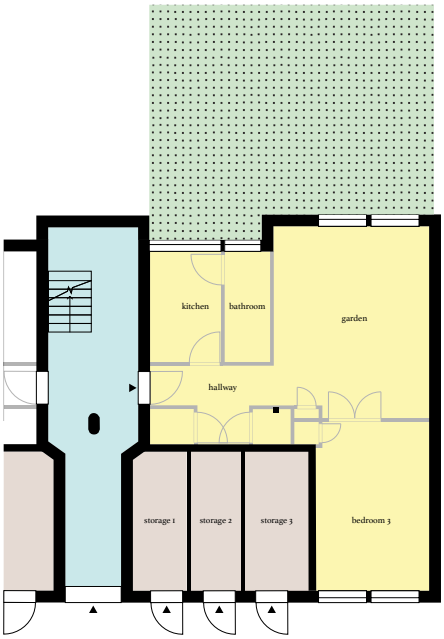
"Taste is a matter of education", that was the idea behind the foundation of Goed Wonen in 1946. With model homes and magazines, the foundation promoted modern interiors. With light furniture residents would get the most of their home and out of themselves. The architects strive for bright interiors after excluding the non-functional decoration (image 5.1). Just like the Modern Movement, the founders of Goed Wonen were very idealistic; better living contributes to a better society.

In several garden cities, the foundation installed model homes in which the visitors could experience how a 'good' interior should look like. In the same model homes, they were also confronted with how it should not be done (error), that were, heavy and dark furniture. The movement was dictated by the crisis; meaning material and space is scarce. To save space, furniture and other utensils often were assigned with multiple functions. However, for most people the modern furniture turned out to be too.

Flexibility

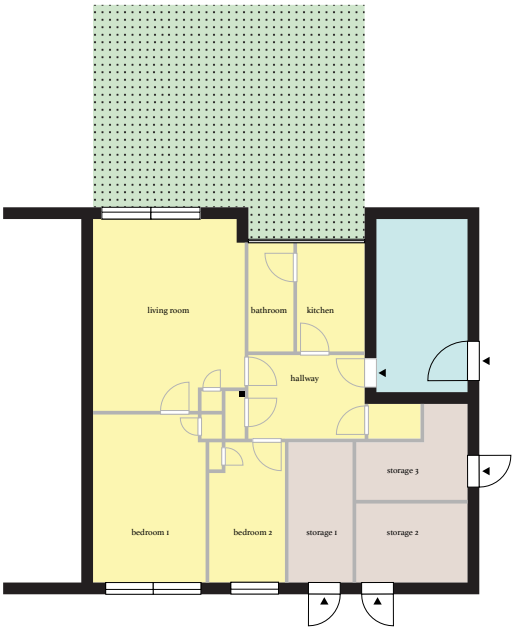
The original plan houses a total amount of 255 apartments. In here, four types of apartments exist which differ in size and configuration (image 5.5). The ground floor has six 2-bedroom apartments of 41 m^2 and a single 3-room apartment of 45 m^2 (image 5.3). The two floors above houses each six 4-room apartments of 62 m^2 and one three-room apartment of 65 m^2 (image 5.4). Since the blocks have load bearing outer walls and just a single column in the middle, there is a lot of flexibility in terms of organizing the space plan.

Besides the building strips, the plan includes five small building blocks which were also constructed in the N.A. sytem (image 5.2). These were initially build as shops but changed in function over the period of time. Nowadays they house different kinds of functions such as; a general practitioner and a communal space for activities. They will not be further discussed in this chapter as they are of less importance.



TYPE A01

Floor	: ground floor
Rooms	: 2
Size	: 41m²
Amount	: 78



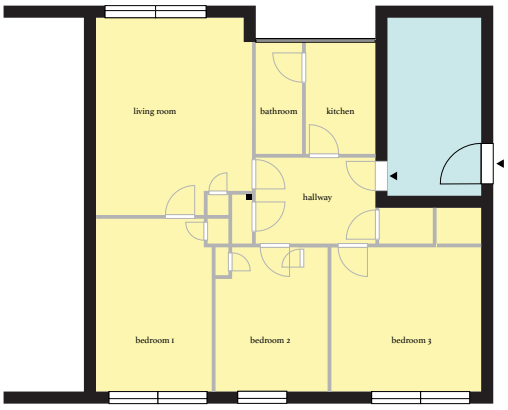
TYPE A02

Floor	: ground floor
Rooms	: 3
Size	: 45m²
Amount	: 7



TYPE B01

Floor	: top floors
Rooms	: 4
Size	: 62m²
Amount	: 156



TYPE B02

Floor	: top floors
Rooms	: 4
Size	: 65m²
Amount	: 14

Image 5.5: Types of Apartments

Space Plan
2.5.2 Circulation

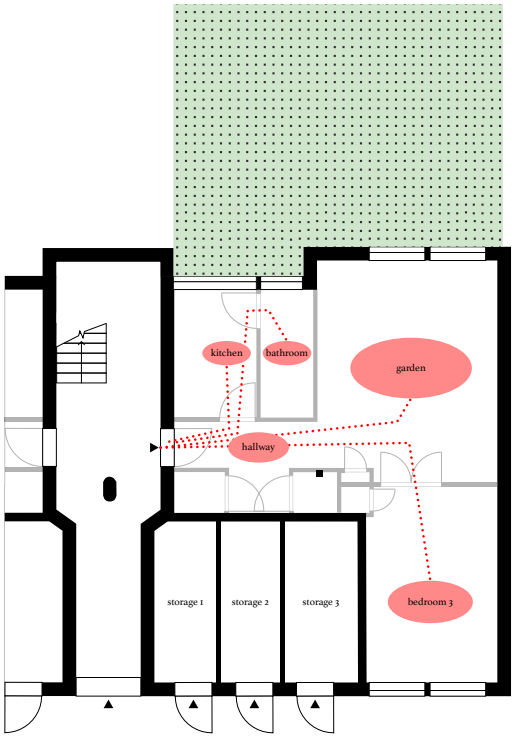


Image 5.6: circulation of ground floor

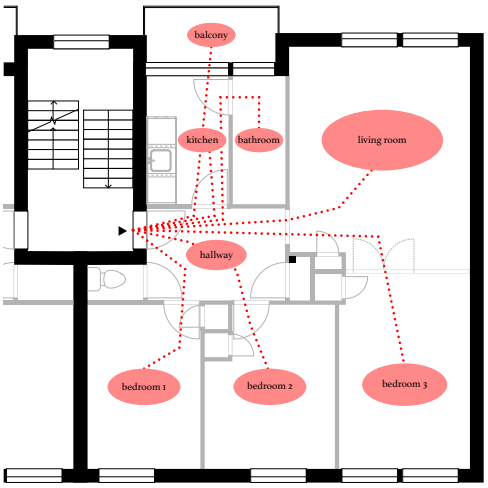


Image 5.7: circulation of 2nd and 3rd floor

Before entering the apartment, one needs to go through one of the shared staircases on which six apartments are connected. There are no elevators, which makes them less suitable for elder people. Although every landing has a window, the staircases feel rather dark and cold. Most residents tend to personalize their entrance because of this, but more about this in 2.6.1 Personalization.

When accessing the apartment, one enters the heart of the floor plan, the hallway. The apartments are divided into multiple box-like spaces, which surround the hallway. This method of configuring the spaces, result in a somewhat restrained circulation pattern with short lines.

The staircase as central node, not only functions as place of departure but also as wardrobe and to store daily attributes. As an example; many residents have placed a refrigerator in the hallway, as a clear sign of lack of space.

Space Plan
2.5.3 Garden & Views



Image 5.8: Private garden



Image 5.10: View towards communal garden



Image 5.9: View from balcony



Image 5.11: View towards parking lot/ entrances

Garden(s)
The apartments on the ground floor have a private gardens of ca. 8 x 5 m. For some it is the biggest plus of the apartment, although in most cases it is kept in a dilapidated condition. The greenery in between the building strips is property of Eigenhaard. Nowadays it is not accessible for the residents as it is enclosed by a steel fence. Therefore, it merely functions as an area which provides a nice view rather than a place where one can relax as it was intended.

View
From Apartment
The bedrooms are situated at the front and look over the parking lot whereas the living room and kitchen with adjoined balcony look over the greenery at the rear of the building. Each room has relatively large windows resulting in bright rooms. The residents who do have a private garden on the ground floor have no or a relatively bad view towards the communal garden since bushes and hedges block the view.

From Burgemeester de Vlugtlaan
The communal gardens face the Burgemeester de Vlugtlaan. From this main road one has a strong view towards the rear of the blocks which are placed as such that it stresses the idea of creating perspective. The rear of the building includes the living room and balcony which expresses the idea of transparency. It is this side where the daily lives of the residents unfold and where it displays itself to the main road (public). This expresses the post-war thinking of that society has nothing to hide anymore.

From T.Bruynsstraat / J.Posstraat
The entrances are situated on the other side, which again has a strong perspective view. This time its displays the parking lot which need to express the idea of the entrance and welcome any residents or visitors.

2.5.4 Living Room



Image 5.12: Living room with the view on communal garden



Image 5.13: Plants on the window sill



Image 5.14: 'Through living room'



Image 5.15: Covered window

Living Room

Size(s) : 16m² (A) / 16m² (B)
Orientation : garden

The living rooms are designed as '*doorzonwoningen*' (through living rooms), which becomes clear when opening the sliding door that divides the space in two. This separation divided the room into an area for sitting at the rear of the apartment and dining at the front. Although the partition could easily be removed, most families use the space as bedroom.

Combined with the relatively large windows, the concept aimed to create bright living rooms. When visiting the apartments, the space felt too small, since most single partitions were both used as sitting and dining corner. In doing so, too much (heavy) furniture was placed resulting in a loss of its bright character. This is strengthened by the fact that many residents covered their windows with curtains during daytime. Due to large windows crossing neighbors have a clear sight in each other's living room. As society started to value privacy much more, this explains why people cover their windows nowadays and why Hooyschuur will introduce dark coated windows in current renovation.

Space Plan
2.5.5 Bedroom



Image 5.16: bedroom with the view towards the greenery in parking lot



Image 5.17: personal bedroom

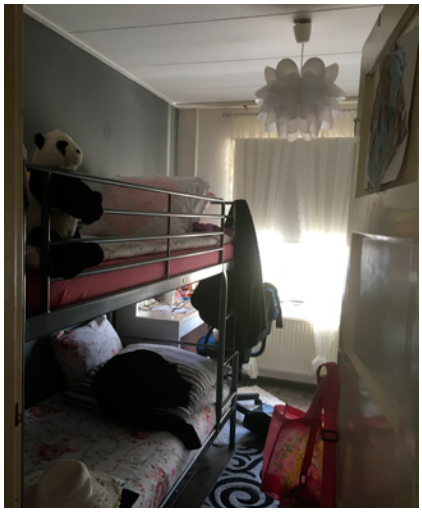


Image 5.18: shared bedroom

Bedrooms

Sizes (A): 8m² (1), 8m² (2), 10m² (3)
Sizes (B): 10m²

Dependent on whether one has a ground floor or 2nd/3rd floor apartment, the amount of bedrooms differs. Each bedroom has relatively large windows, which result in bright bedroom spaces. Their size seems right since most families strictly use them to place a bed and closet. They are dimensioned as such that both a single and double bed perfectly fits in.

However, when a family includes children, the children tend to create their own personal domain of their bedroom. It becomes a space were also a desk with computer and television is placed. In these cases, the amount of furniture has increased, resulting in less bright atmospheres in the bedroom.

In the original design, the rooms include small built-in closets of 0,5m wide. Although they are mostly too narrow to use it as wardrobe, it provides handful extra storage space. Children use it as space to store toys, whereas adults can often use it as bookshelves.

2.5.6 Kitchen + Balcony



Image 5.19: kitchen with simple equipments and the access to the balcony

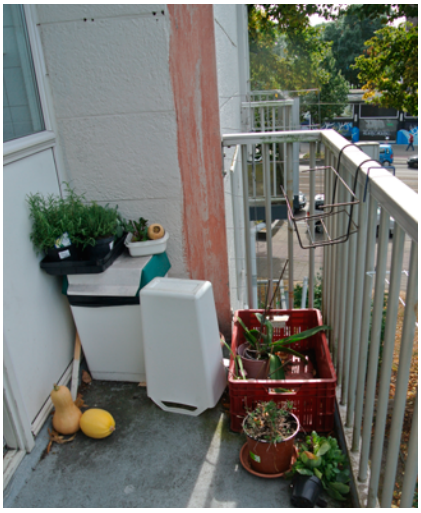


Image 5.20: balcony



Image 5.21: balcony used as storage

Kitchen + Balcony

Size(s) : 4m² (A), 4m² (B)
Orientation : garden

The narrow space of the kitchen provides access to the balcony and bathroom. Its a functional space in terms of that it consists of a single kitchen block and cabinets. There is no place to sit or dine in the kitchen, which is unfortunate considering the view on the communal garden.

Also in here, we often noticed the residents urge to blend their windows. The kitchen is also place of the central heating system that is covered by one of the cabinets.

The apartments on the 2nd and 3rd floor have a balconies with a view over the communal garden. Via a single door one enters the balcony of 2600 x 1250mm. The balconies are too small to sit on a chair and enjoy the view. On the contrary, its used as additional storage or space to put out laundry.

In current renovation Hooyschuur will extend the balconies to 2600 x 1600mm, making it suitable to place a set of chairs.

Space Plan
2.5.7 Bathroom



Image 5.22: Washing machine



Image 5.23: 'Terrazzo' floor



Image 5.24: Bathroom equipped with a shower and a basin

Bathroom

Size : 3m² (A), 3m² (B)
Orientation : garden

The bathroom can only be accessed from the kitchen, which is one of common downsides according to the residents. The bathroom is shaped into a narrow space and includes a sink and a shower at the end of the space. There is no toilet installed, but instead, the extra space it offers is being used to a washing machine (image 5.22).

The walls are cladded with ceramic tiles while the floor of the shower is equipped with a 'Terrazzo' floor (Image 22). Housing corporations commonly used terrazzo floors during that period of time. Its highly appreciated by the residents since it can easily be cleaned.

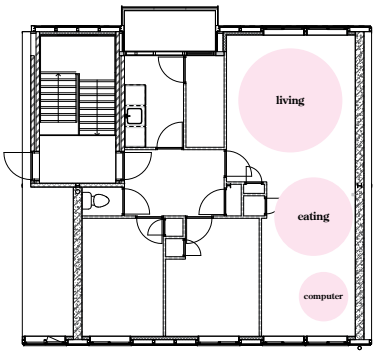
The bathroom has much potential to be improved. The size of the bathroom seems too small for the relatively large families who make use of them. Also the location is not ideal, as it situated on along the façade with the beautiful view on the garden. It might consider the option to combine the bathroom with the toilet, and place it in the middle of the floor plan.

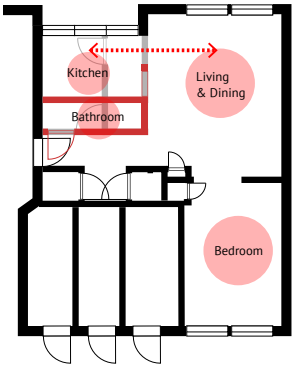
2.5.8 Modifications











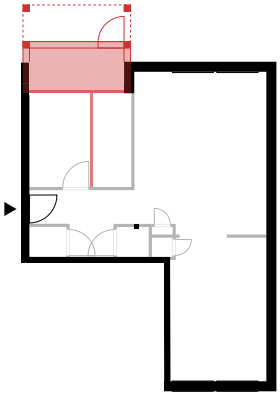


Image 5.25: Large Living room

Image 5.26: Open kitchen

Image 5.27: Additional steel structure

Modification #01

The first modification includes a demolition of the partition door (with sliding door) in living room. The resident did not need an extra bedroom as she lives in the apartment by herself. By doing so, she enlarged the living room and enhanced the concept of the 'through living room'. The living room was much brighter than the others, while she managed to keep a clear separation between sitting, dinning and hobby/computer area.

Modification #02

One of the residents on ground floor got rid of the partition wall between the living room and bathroom. The woman relocated the bathroom to the middle of the space plan and created an open connection between the kitchen and living room. It resulted in a open space plan, a larger kitchen and direct access to the garden from the living room.

Modification #03

Block 5 to 6 is most drastically renovated and includes new additional structures that extend the rear of the strips. After the original balconies were removed and added to the space plan, an additional steel structure was added to the kitchen with new balconies. The main aim of this intervention was to add space, although it also made a compromise by altering the original appearance.

Space Plan

2.5.9 Questionnaire & Interview

In a questionnaire conducted by the residents committee as well as an interview by ourself we got to know the major downsides are of the apartments but also what the residents value the most.

Important reason for the questionnaire conducted by the residents committee, were the emerging media reports saying that residents unanimously decided upon demolition as part of the urban renewal of Slotermeer. Demolition seemed inevitable due to a drastic change in the population demographics. The financial crisis saved the Airey blocks however from demolition as the housing shortage was expected to grow. When the residents were confronted with the renewal plans, most started to create an awareness of value of the site and buildings. As a result, resistance of large-scale demolition started to grow more and more.

Questionnaire by Committee

In general, the report shows a clear dissatisfaction of the technical quality. This includes the windows (-frames), doors, plumbing, ventilation and heating. Also, moisture, mold, pests, leaks, odors are common complaints. On the other hand, are the residents (often very) satisfied with their neighborhood (67%).

When asked about whether the residents prefer demolition or renovation, renovations (29) wins it over demolition (16). There were 86 reasons given for renovation, compared to 24 reasons for demolition. This clearly shows that many residents value the site and/or buildings strips itself. This is strengthened by the outcome showing that nearly 50% is willing to pay an extra of €80 per month and another 40% even of €150 per month (Paalvast, 2012).

Interview

When conducting our own interview, we figured out that the residents pay a rent between €327 - €627 dependent on their (mutual) salary and received housing allowance. In general the residents are satisfied about the height of their rent, the location and size of their apartment. Also the facilities in the neighborhood are excellent according to many. The residents who live in the building strips which will be renovated, are being compensated with a discount on top of their rent. This because these have not been renovated yet, and do not meet the current standards. During the site visit and interviews the following topics stood out;

#1 Lack of (Storage) Space

Although the residents have a private storage on ground floor, this seems not to be enough. They make use of every square meter, thus placing personal belongings on places not meant for storage i.e. the staircases are used to store bikes and shoes and also the balcony is more often used as storage than as actual balcony. This changes the image of the blocks into a rather dilapidated image.

#2 Vigilant Atmosphere

The residents seemed vigilant. When ringing the doorbell, a lot of residents first stared first through the window to check whose at their door. Also a lot of them were not willing to participate, as they did not trust us.

In a report on the neighborhood analysis shows that the average rates of burglary and sense of insecurity score really high. Also the higher rates of youth crime underlines this feeling.

#3 (Too) Large Families

When looking into the development of the average housing occupancy, the average housing occupancy was 3.77 in 1931 and decreased to 2.18 in 1984. Although the population of the city was growing slower than expected at the time, each resident claimed more square meters for himself (VanEesteren-Museum.nl, z.j.).

During the our site visit we noticed that the neighborhood merely consists of Turkish and Moroccan families. This observation is underlined by a residents whose been living in the neighborhood for 17 years. The Turkish or Moroccan families generally have larger families than the Dutch average. During the visit we stumbled on a lot of families who live with 4 to 8 members in the apartments. For contemporary standards, a apartments of 60m2 designed for 3-4 family members, this is way too small. This often leads to stuffed and messy image of the facade (see #1 lack of space). Also it might contribute the noise disturbance, as there is relatively much controversy between neighbors because of this says Hooyschuur.

#5 Technical Dissatisfaction

The residents are generally happy about the geographical location. However, the biggest complains related to the technical shortcomings such as no insulation resulting in leaking windows and a lot of noise disturbance.

Space Plan
2.5.10 Opportunities

The space plan provides tons of opportunities in terms of changing the program and change or configuration of spaces. One can consider to transform the program from social housing to; student housing, elderly housing (care) or middle class houses. In all of these cases the space plan needs be adapted.
A lot of variations are possible since facade is load-bearing and have a free space plan. In doing so, the apartments can be merged horizontally or/and vertically. Also new independent structures can be added to extend the apartments. While Hooyschuur is currently renovating the apartments, they already did research in new variations;

The first variant includes a horizontal distribution of the ground floor dwellings of 40 m2, and are merged into 80 m2 apartments. For the floors above this results in apartments of 120m2 (image 5.28). The second variant has a more detailed breakdown on the floor in which three apartments are merged to two resulting into four apartments of 90 m2 (image 5.29).
The vertical approach includes merging the ground floor apartments with the second floor as shown in opportunity three. This version creates ground-floor maisonettes of approximately 105 m2 (image 5.30). The third floor apartments can be merged horizontally in this version. The same version can also be doubled of course (Rapportage Airey-woningen, 2012).

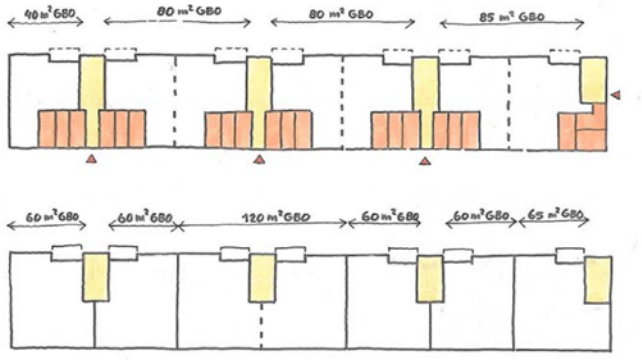


Image 5.28: Variant 1 of horizontal merging

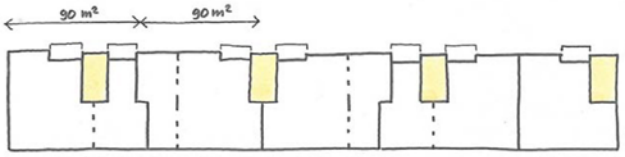


Image 5.29: Variant 2 of Horizontal merging, 3 to 2

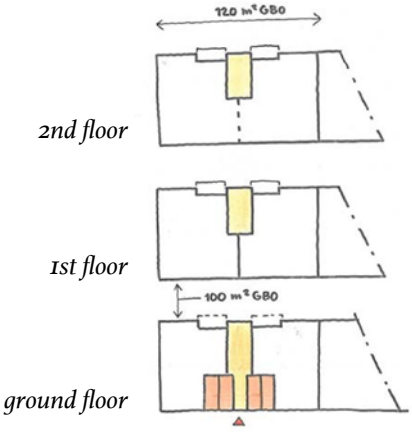


Image 5.30: Vertical merging

Sources

Paalvast, A. (2012). Bewoners over hun woning, hun buurt en de plannenvan Eigen Haard met de Aireystrook west.

Hooyschuur. (2012). Rapportage Airey-woningen.

AIREY

2.6 STUFF & STORY

Stuff & Story

2.6.1 Aim & Findings

Introduction

According to Brand, stuff changes continuously. Since all the things surround people changes in the short period, it gives the signs of people's behavior and its hidden meaning. During the visiting of the site, we found several interesting kinds of stuff and the story beyond it. These findings help us to understand more about the resident's needs.

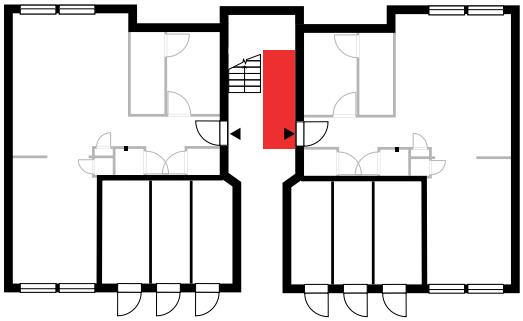
Decorating behavior

The Residents tend to mark their personal domain at their properties. For instance, most staircases are decorated with personal belongings. By placing these personal items they can relate to, residents mark their territory. This semi-private interior spaces shares the same quality of transition as the semi-public greenery. It provides a smooth transition between public to private.

2.6.2 Personalization

Door

Many of the inhabitants decorated their door. This action generally appears at the collective housing due to its uniformity. So, leaving this personal marks helps them to feel affection and makes it unique (image 6.1). This phenomenon implies that the resident's caring is an important factor for the pleasant living environment.



Ground floor entrances

territory



Image 6.1: Decoration of Entrance



Image 6.2: Occupation of the space underneath the staircase

Maximized using of space

The space underneath the staircase on the ground floor is often occupied by the inhabitants for personal utilization such as storage, parking bikes, etc. (image 6.2) As the apartments are relatively small for contemporary standards, the entrance space in front of their door is also used to store personal belongings such as shoe-boxes or bikes (image 6.4)

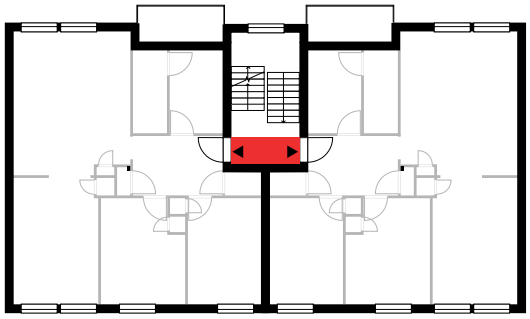
The space in front of the door in the staircase is also occupied by inhabitants for shoe case, storage, etc. (image 6.4) This sometimes causes a problem because of narrowing down another dweller's path.
Especially, the occupation happens more often, and the occupied area is larger on the second floor because it usually would not be reached by other inhabitants downstairs.

Decorated monotonous wall

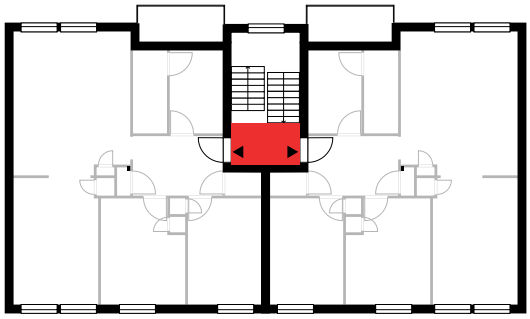
Like the entrances, the staircase is also well decorated in some of the Airey blocks; pictures decorate the monotonous wall of the staircase and the lacy curtain is installed over the window. A plant on the window sill enriches the view outside (image 6.3)

Welcoming

The decoration can be used as a device for the communication, which conveys the welcome message from the host (image 6.4)



1st floor entrances



2nd floor entrances



Image 6.3: Decoration in Staircase



Image 6.4: Occupation of the front door area

Stuff & Story

2.6.3 Small Interventions

Extended personal garden

In some blocks, inhabitants build their own personal gardens in the collective space in front of the entrance (image 6.5), which represents the people's attachment to their place. Although it is hard to figure out who installed and manage, one still could see the demands of a personal garden rather than bush.

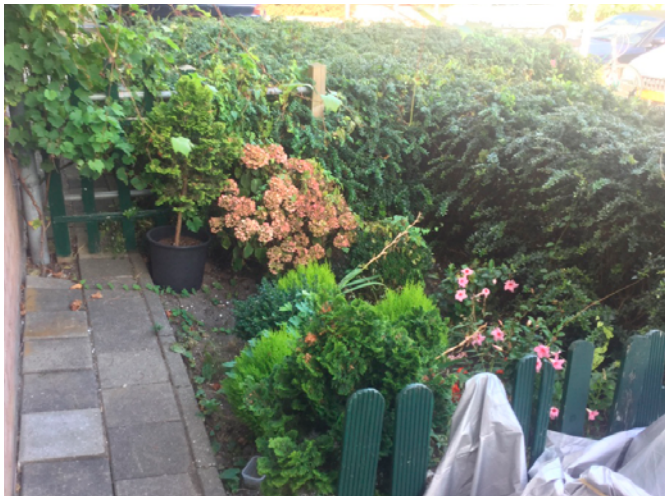


Image 6.5: Personal gardening

Small parking space

The bushes have been changed to small parking spaces for their motorbikes or strollers (image 6.6). This invention can be because of the shortage of space or the matter of convenience.



Image 6.6: Small parking space

Security Intervention

Side view mirror is attached to the window (image 6.7) so that the resident can watch who's at his front door. It might be an issue about the security or the user convenience. On the other hand, this could be a sign of the vigilant atmosphere in this area.



Image 6.7: Sideview mirror

Shade of balcony

In one case, the resident adds extra shade to the balcony (image 6.8). The possible reason might be that the shade provides the shelter for the hanging clothes in rainy days.



Image 6.8: Shade of balcony

Added door knob

An extra door knob was attached to the door frame (image 6.9), which probably aims at helping elder people. It also involves the desire for the barrier free design.



Image 6.9: Door knob

Ramp in front of the door

Like the added door knob, in another case, the slope is added in front of the door (image 6.10), which shows the needs for the elders or the disabled residents.



Image 6.10: Slope in front of the door

Stuff & Story

2.6.4 Nostalgia

In the beginning, the Airey block inhabitants used coal stoves in the living room for heating. When it changed to the gas stove (*moederhaard*) they had a place for family gathering. We could find a trace of the place for the gas stove since they use the central heating system nowadays (image 6.11).

Although the central heating system meets the energy requirements better, some dwellings installed a gas stove or even a fake one (image 6.12). This aspect can be considered as an nostalgia of the old days for some inhabitants.

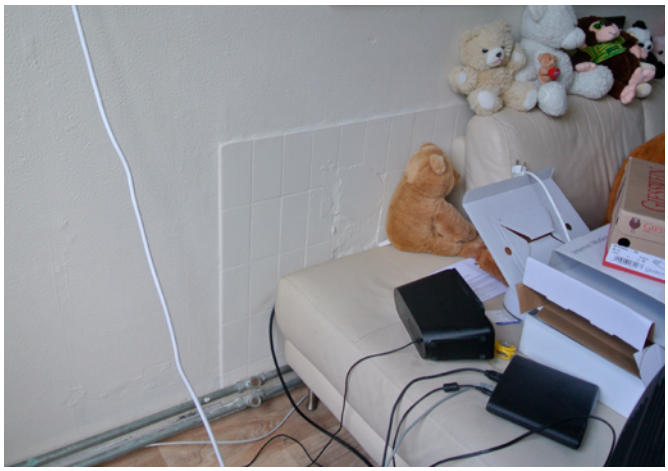


Image 6.11: The trace of the Gas stove



Image 6.12: Gas stove

2.6.5 Craftsmanship

The handrail of the staircase shows the aesthetics of the craftsmanship in the 50's (image 6.13).



Image 6.13: Handrail

2.6.6 Lack of Storage Space

The reason why people occupies the sharing space is be because of the shortage of the storage space. Although the type of the dwelling was efficiently designed at that time, the storage space is not enough to meet the current demands. Secondly, although the hallway (image 6.14) is an efficient traffic core for all rooms, the doors obstruct the use of this space. To secure the space to put the shoe case, the inhabitants occupy the staircase space instead.

2.6.7 Opportunities

In general, the residents' effort on decorating the spare space makes the semi-private space agreeable. The contributions of the residents not only improved the mood of the staircase (which is dark) but also take care of their communal space. This phenomenon implies a potential of using the core as a communal area for the people of six dwellings. Given the monotonous wall, one also need to take a close look at the relationship between the design and its use.

Several finding, that defined by small intervention, indicates the issues of security, barrier-free design, and the efficient use of space. The barrier free design as an example, one can take one of the options such as introducing the elevator or designate the elders as a target group for the ground floor.

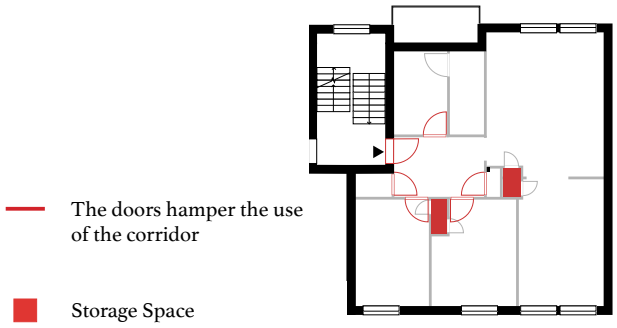




Image 6.14: Hallway

Stuff & Story
2.6.8 Demographics

To get a clear image of the neighborhoods population, we collected demographical data of the district. As the numbers of Geuzeveld and Slotermeer are merged into the documents, the percentages and graphs are not fully representative for Airey-strip. Therefore, we will compare our own findings with the data.

Population
When conducting the interviews, we chatted mostly with Turkish and Moroccan families. We noticed that very Dutch families are living in the neighborhood as also the names tags on the postboxes indicate. During the conversations we noticed that a lot of families were living with 4 to 8 members in one of the apartments. This is typical for non-Western families but not for the Dutch standard. Moreover, the data shows that 65% of Geuzeveld-Slotermeer has a non-Dutch background. According to our own findings, this is undoubtedly lower than the Airey-strip, as our estimate would be 80-90% for the site itself.

The documents show a lack of local involvement and signs communal tensions. It indicates that the area is a breeding place for polarizing communities. The tensions are underlined by the increased stress index (94 to 123). This increase shows an opposite trend because Amsterdam's started to feel safer between 2003 and 2013 on average. We can confirm this sense of insecurity, as some residents were not willing to talk with us because they did not trust us. Also small interventions such as mirrors on the facade reflect these signs of insecurity (image 6.7). In combination with that a third of the population are the lower income and educated, we conclude that there are clear signs of segregation.

Greenery
The greenery aimed to create a healthy environment. It succeeded in doing so, as its still being used as space to relax, meet and move around. According to Big Green Research, inhabitants started to use greenery more often in recent years. When reflecting on the Airey-strip, we also saw signs of this as small gardens were made in front of the building. Considering the appreciation the residents have for greenery, its even more sad that the communal garden is closed. On the other hand, it provides a lot of opportunities for improvement. This also includes the maintenance, as there are often signs of decay according to the inhabitants.

Dwellings
A vast majority of the districts housing stock is property of social housing corporations (71%). This also explains the signs of segregation. More than half of the housing stock (57%) includes housing smaller than 60m2 (including the Airey-strip). This results in relatively tight dwellings, meaning; as many or more people live in the house than rooms it offers. This is also happening to the Airey-strip, although this is party due large size of non-Dutch families. Furthermore, does the data show that the population is less satisfied with their dwelling than average (6.8 versus 7.6 in Amsterdam) as most houses are out-dated and show failures.
These failures also contribute to the high degree of nuisance between neighbors (30%) as also is the case within the Airey-strip due the noisy floors.

Sources
Gemeente Amsterdam. Stadsdelen in cijfers. (2015). Gemeente Amsterdam.

Gebiedsanalyse 2015 Geuzenveld/Slotermeer Stadsdeel Nieuw-West. (2015)

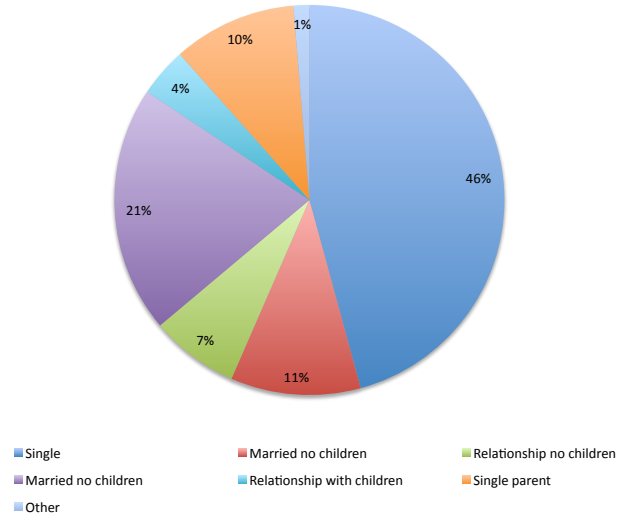


Image 6.15: The marital status of the residents

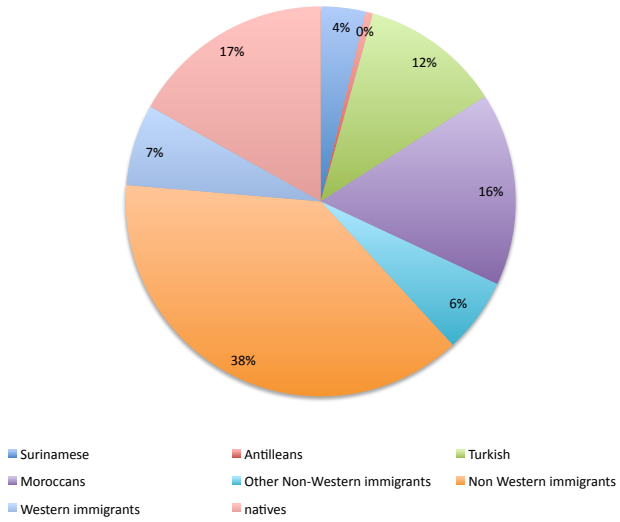


Image 6.16: The background of residents

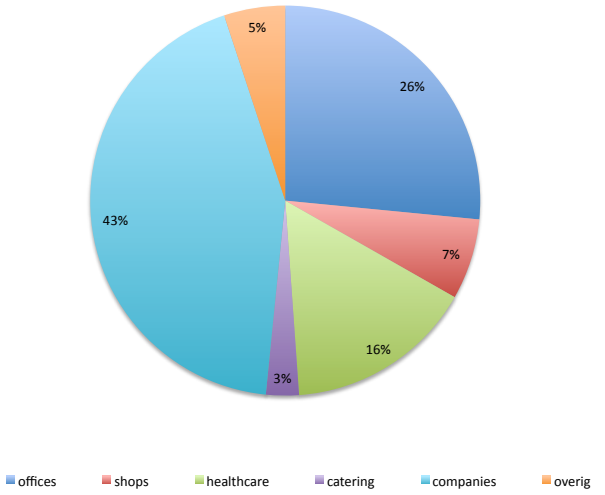


Image 6.17: The programs of the buildings

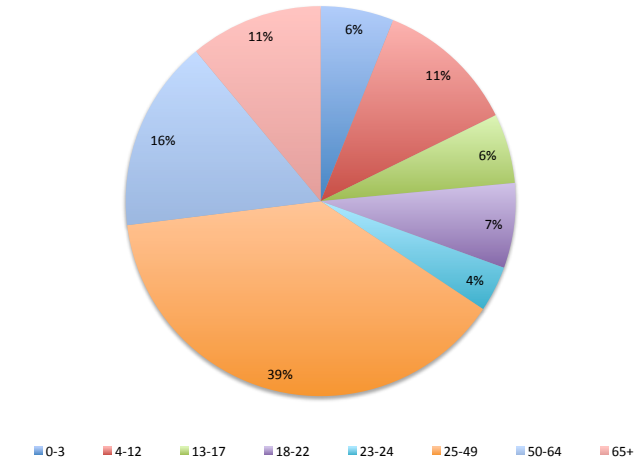


Image 6.18: The age of residents

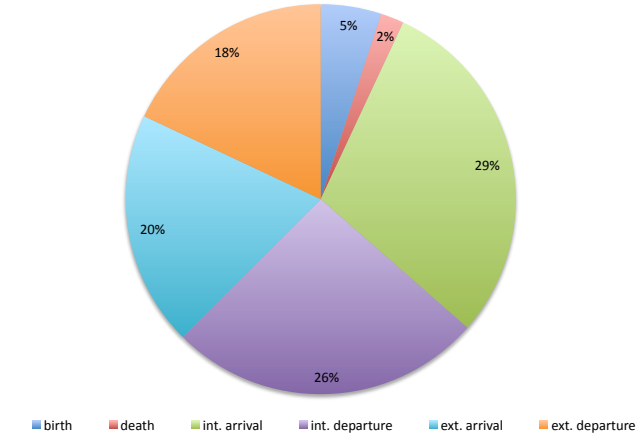


Image 19: The reason of the population changes

AIREY
2.7 OTHER PROJECTS

Other Projects

2.7.1 Tuttifrutti-dorp





Period : 1950
Architect : H.Zwiers
Site : Amsterdam

The extension plan of garden city Oostzaan-East (1950) or better known as the Tutti Frutti-village refers to the fruity street names. This district is shaped in a triangle and consists of three groups of buildings systems. One of those groups is designed in the bespoke Airey system by architect H.Zwiers. Among the other two is the similar Dotremont ten Bosch system and a final group which is built in a tradition system.

They Airey buildings by architect H.Zwiers included 199 'duplex' houses and 170 single-family houses. The dwellings were build with the typical characteristics of the Airey system such as the concrete panels and slender window frames. Besides these aesthetics, the houses had gently sloped gable roofs and a base plinth of brick. The entrances were slightly elevated and were accessible by a little stair. Also, a small garden was in front (see image).

The most Eastern part of the plan consists of East-West orientation orientated buildings which alternate in duplex houses and a building strip of single family houses with small sheds. On each end, one could find a small stroke of greenery. The central part of the plan, consisted of North-South orientated single family houses and East-West orientated duplex houses. The south side of the plan consisted of hook-shaped building strips which surrounded a public courtyard. Also here, the duplex house are projected in East-West direction.

Many of the residential blocks in the "Tutti Frutti Village" have been renovated and changed in appearance. The concrete facades are often fully or partly plastered or have been painted. The original doors and steel window frames have been replaced resulting in an incoherent whole. Architecture office Hooyschuur who is also responsible for renovating the Aireystrip along the Burgemeester de Vlugtlaan, have renovated some blocks Tutti Frutti Village too. They putted insulation on the outside changing the outer appearance of the houses very drastically as mentioned before.

Other Projects

2.7.2 Amstelhof





Period : 1952
Architect : J.F. Berghoef
Site : Amsterdam

The part of the expansion plan which includes the Southern part of the Rivierenlaan was set in 1951. After rejecting earlier plans for accommodating the staff of KLM (Dutch airline company), an approval was granted for the construction of the "Amstelhof" complex for Dutch Society for Housing and by J. F. Berghoef.

The plan includes the construction two long blocks of 175 and 125m along the President Kennedylaan. The East-West orientated buildings have four storey floors and houses 96 apartments in total. Because of its orientation the apartments have a floor plan which is stretches along the width of the building. The ground floor entrances have awnings and individual garages which was at that time an absolute novelty. The facades are cladded with typical concrete facade panels. The plinth on ground level is made of red bricks from Groningen, while the floors and ceilings are made out of reinforced concrete. There is a 10 meter wide green belt along the long south side of the blocks. The flats had four to five rooms and were equipped with central heating, hot water, a bath in the bathroom and well-equipped kitchens. Amstelhof was built for the middle class and for whom could afford to pay two-thousand gulden in advance. The apartments were private owned by the residents.

The plan also includes eight three-storey blocks with 192 apartment in total. The north-south oriented blocks are have spacious gardens and also have storage spaces on ground level. Furthermore there are 3 doctors houses, 18 single-family houses, 3 shop/houses, a gas station, 57 garage boxes and a boiler-house for the central heating.

After 50 years, the complex remains almost in its original condition because of the private ownership of the dwellings. The steel frames and detailing of the balcony fences are still present. Late 90's Amstelhof was facing demolition because it did not fit anymore in its surrounding and that it did not meet the current requirements. However, it was saved by the residents who protested against demolition. It shows how popular the buildings are today.

Other Projects
2.7.3 Sloterhof





Period : 1958
Architect : J.F. Berghoef
Site : Amsterdam

The expansion Slotervaart consisted of four parts of which Berghoef was also the architect. He designed the so-called Sloterhof complex in 1954, although it was not until 1957 when the construction started. It was the first time the Nevamo-Airey system was also used for high-rise buildings (seven and twelve floors).

Sloterhof consists of sixteen North-South oriented building strips which vary in height. Most prominent are the three maisonette buildings of seven storeys which are partly built above a canal. The buildings stand out because they are not cladded with the typical gray panels, but with a dark panels which have been spayed with asphalt. This gives it a new completely new look of the Airey system. The buildings have three floors with *duplex* apartments of five-rooms and another floor with two-room apartments for singles.

In between these blocks one finds four-storey building strokes, but now with the typical gray panels again. Characteristic for these building strips is are the galleries on ground level. The site is closed of by a high-rise flat of twelve stories. The facade is marked with white strokes of concrete and also here one finds the dark sprayed panels.

Sloterhof facilitated in 594 homes for families, 10 homes for single people, 48 homes for the elderly, four studio flats, 12 shops with apartments, 9 stores daycare 105 garages, two petrol stations, four workshops, four central boiler rooms, one bank branch and one café.

The houses were build with luxurious comfort such as central heating, hot water, luxurious kitchens, central garbage disposal and elevator.

Sloterhof is a keen example of the way of urban planning at the time. It shows a diversity by the rhythmic arrangement of building strips, high and low, dark and light, but also in the varied facilities it offers. Amstelhof has remained in almost its original condition.

Other Projects

2.7.4. Comparison

Compared with the Airey blocks located on the north side of the Burgemeester de Vlugtlaan, we can find that the Nevamo-Airey system was applied in a wide range. It can be applied in 'duplex' and single family house as in Tuttifrutti-dorp, or complex in Amstelhof or Sloterhof, it can also be applied in the apartment as in Airey strips. It can range from social housing as Airey strips to middle class housing as Amstelhof.

The typical Nevamo-Airey system was applied in low or middle rise buildings such as Tuttifrutti-dorp (2 storeys), Amstelhof (5 storeys), and Airey strips (3 storeys). But the evolved system can be applied in high rise buildings such as Sloterhof (13 storeys). The evolved system used the steel columns rather concrete columns, which composed the table structure. Then the table structure was stacked upon each other.

In Airey strips the facade is composed of the concrete panels and slender steel window frames, which is the typical character be found in Tuttifrutti-dorp and Amstelhof although both of them combined a base plinth of brick on ground level. The Sloterhof has a completely new look which are not cladded with the typical gray panels but dark panels spayed with asphalt.

Except Sloterhof, which were built with luxurious comfort and has remained in almost its original condition, other Airey houses were facing the demolition or has been experienced renovation because they did not meet the current requirements. For example, the Airey strip and Amstelhof were once facing demolition, but the Amstelhof was saved by the residents who protested against demolition. The Airey strip was saved by financial crisis. However unlike the Airey strip, which has been experienced several renovation phase, the Amstelhof remains almost in its original conditions nowadays. While the Tuttifrutti-dorp have been renovated and changed in appearance. The concrete facades are often fully or partly plastered or have been painted and the original doors and steel window frames have been replaced, which is similar to the current situation of the Airey strip.

AIREY

2.8 Cultural Value

Cultural Value

2.8.1 Statement

Airey strip has two noteworthy values;
The 'light, air & space' concept is still valid,
and the envelope represents the built environment in the 50's after the WWII.

Value of the Urban Plan

The Airey-strips is a keen example of a system which was developed as a result of the housing shortage caused by the WWII. The complex symbolizes the social and economic developments in the post-war period. Cornelis van Eesteren, who was member of the C.I.A.M, designed the plan. He was influenced by the fourth C.I.A.M. congress (1933) as they developed ideas of 'The Functional City'. Healthy living in which light, air and space were the key-pointsplayed an important role in the urban design of the AUP. Also the typology of the building blocks and how they are situated within the site, illustrate the ideals of the 'Nieuwe Bouwen' movement. The urban situation of the strips have a lot of value, since Van Eesteren tried to differentiate them from the typical building strips in the AUP. By placing half of the blocks in an angle of 15 degrees he not only differentiated, but also created an optimal sun exposure as well as to optimize the view from the Burgemeester de Vlugtlaan (car perspective, became more important) towards the buildings.

Value of the Structure

Also, when looking at the building strips itself the placement of the balconies and private gardens, which face the public garden and Burgemeester de Vlugtlaan, illustrate the ideals of the 'Nieuwe Bouwen' movement. The facade is organized in an extreme rigid grid, which is a key feature of the system. Its one of the strongest characteristics as almost every element obeys the dimensions of the grid. It decides their shape and placement within the larger whole, including; the window frames, doors and balconies. As the façade functions as a load-bearing envelope (table principle), the space plan is extremely flexible. Program functions related to our daily life activities, that is, the kitchen and living room were placed at the rear of the buildings in view of the public. Although the space plan should be improved to meet contemporary standards, the idea of transparency should be taken into account.

AIREY
3 TRANSFORMATION

Transformation

3.1 Introduction to Transformation



1 bowl €20

Standard Approach

Imagine, your single and you life in an apartment by yourself. Your a student, so your definitely not rich which means: use your money wisely!

Now, you want to buy a bowl to put for your delicious morning yogurts in. As you walk down the shop to buy one, you are confronted with two possibilities. The rst, you buy 1 bowl of 300ml, made out of gold, price €20.



2 bowls €20

PLUS: Lacaton's Approach

Or, you buy 2 bowls of 300ml, but this time they are made of silver. The price, also €20.

The second option symbolizes the Lacaton approach. It comes down to getting more for a same amount of money.

The bowl has the same function, but you invest in quantity (space) instead of expensive material.



Kintsugi: Palimpsest Approach

"Kintsugi is the 500 year old Japanese art and philosophy of repairing broken pottery with lacquer dusted or mixed with powdered gold, silver, or platinum.

It treats breakage and repair as part of the history of an object, rather than something to disguise. The understanding is that the piece is even more beautiful for having been broken."

Transformation
3.2 PLUS



AP2 halle



After renovation

FRAC Dunkerque

Location : Dunkerque / France
Design years : competition 2009 / completion 2013
Client : Communauté Urbaine de Dunkerque
Architect : Anne Lacaton & Jean Philippe Vassal
Program : artwork reserves, exhibitions, education
Size : 11 129 m2
(9,157 m2 new building; 1,972 m2 existing halle)
Cost : 12M €

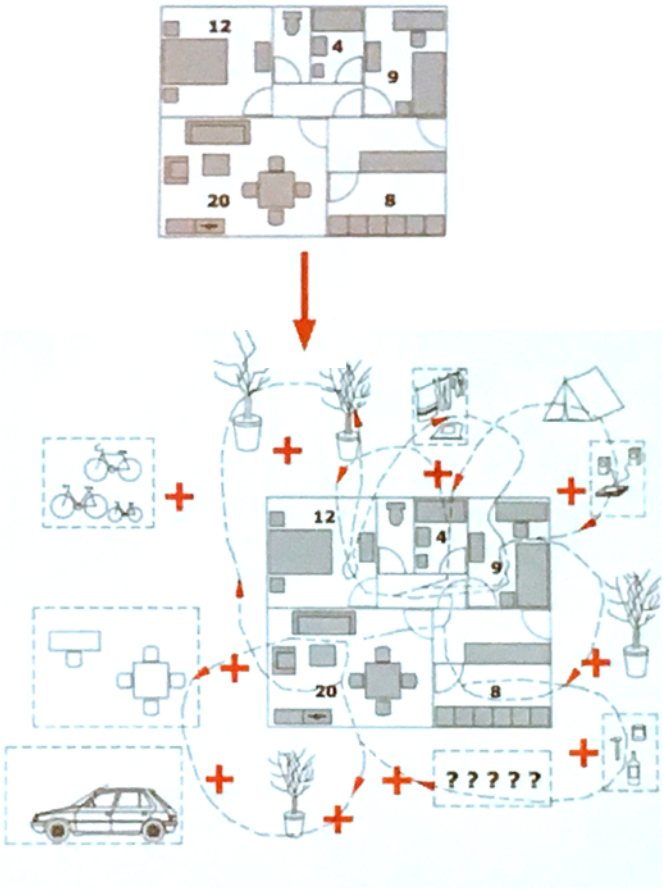
The AP2 is an old boat warehouse located in the port area of Dunkerque which was transformed to a new home for the archives and exhibition spaces of the Nord-Pas de Calais region. Instead of overhauling the existing workshop, the architects chose to conduct minor renovations and leave it empty so it can be used to host events, exhibitions and house large-scale artworks. In addition, they proposed constructing an extension of identical dimensions alongside it.

To keep the halle in its entirety becomes the basic idea of our project. The project creates a double of the halle, of the same dimension, attached to the existing building. The new building juxtaposes delicately without competing nor fading. The duplication is the attentive response to the identity of the halle.

The halle AP2 will remain a completely available space, which can work either with the FRAC (France's regional contemporary art fund), in extension of its activities, (exceptional temporary exhibitions, creation of large scale works, particular handling) or independently to welcome public events (concert, fairs, shows, circus, sport) and which enriches the possibilities of the area. The new structure extends from the side of the renovated warehouse and provides an additional 9,357 square meters of floor space which to meets the requirements of FRAC program.

The project so creates an ambitious public resource, of flexible capacity, which allows work at several scales from everyday exhibitions to large-scale artistic events, of regional but also European and international resonance, which consolidates the redevelopment of the port of Dunkerque.

Sources:
FRAC Nord-Pas de Calais, Dunkerque http://www.lacatonvassal.com/?idp=61#



Luxury

Same approach is also used in refurbishing existing housing stock.

'Dewllings must offer freedoms of usage, to generate possibilities for interpretation and appropriation, offer as much extra space as programmed space to promote relationships within spaces, to bring about pleasurable situations.'

'Every dwelling must have a private outside space, as balcony, a terrace, a winter-garden, to give the possibility of living outside, of having a garden, like in a single house. It means: building larger, twice more, building double, with the same cost as a standard dwelling, to be affordable for everyone.'

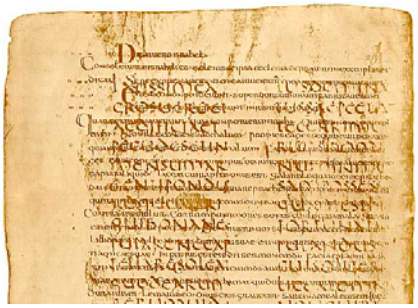
Transformation
3.3 Palimpsest

Palimpsest
[Origin]
Mid 17th century: via Latin from Greek palimpsēstos, from palin again + psēstos rubbed smooth.

[Definition]
Something reused or altered but still bearing visible traces of its earlier form.

[Aim of palimpsest in architecture]
Create greater meaning for existing structures.

[Method of palimpsest in architecture]
Embrace deterioration of the existing, and see it as a change to introduce new structures with complementary contrast.



Neues Museum
Location: Berlin/Germany
Years: 1997-2009
Client: Stiftung Preußischer Kulturbesitz represented by Bundesamt für Bauwesen und Raumordnung
User: Staatliche Museen zu Berlin
Architect: David Chipperfield Architects
Gross floor area: 20,500 m²

After the WWII, the building was left in ruins because of an extensive bombing. Chipperfield's approach to the new design included the exposure of deteriorations and putting the fragments back into the original composition. Also, the architectural language of the new additions reflect the classical architectural elements without copying it.





AIREY

4 Individual Approaches

Individual Approach

4.1 Quality of Living by Yuan

Introduction

It starts with the metaphor of pepper grinder. Anyone could get a well-functioned pepper grinder from a supermarket when buying pepper. However, many people still would like to buy a more expensive in some degrees luxury one for their kitchen. (im.4.1) It means people need a certain quality of the luxury grinder which is beyond its basic function.



im. 4.1 basic pepper grinder vs. luxury pepper grinder

As for living, the quality means to provide something beyond the basic function.

Observation in my room

From my observation of my room, this speculation of the quality of living can be revealed from the window (im.4.2), which is also the spatial element I valued most in my room.

The window has embodied a certain amount of quality such as it introducing the sunlight, fresh air, and the cityscape to my room. I feel connected through the window since I can hear and see my roommates in the backyard of the house and I am visually connected to the neighbor's balcony.



im. 4.2 the window in my room

But the quality of window has been added when I use the window sill (im.4.3) as the bar table or bookshelf, etc. The window sill provides the possibilities for reading, relaxing, etc, therefore provides the quality beyond its original basic function.

The basic means 'there should be a place for everything, and everything should be in its place.' However, 'things often work best when they are not being used for the purposes for which they were designed.'

It is the window sill that provides the possibility of misuse meanwhile provides the quality.



im. 4.3 the window sill

Resource: How to make a home

Architectural Aesthetics

From an architectural perspective, not only the window sill provides the quality, it also relates to the height of the window sill, the size of the wall, the depth of the window sill, the orientation of the window etc.

For example, in the design of BND house (im.4.4), the architects deliberately design the height and size of the window and make it suitable for sitting and an invitation to look at the nearby nature.



im. 4.4 BND House by OASI Architects *(Source: divisare.com)*

Potentials in Airey Blocks

The same kind of potential can be found in the Airey blocks.

In some staircases of the Airey blocks (im.4.5), the window is decorated with plants, which shape the atmosphere of the semi-public space and make it a smooth transition between public and private.



im. 4.5 The window in staircase in Airey block

In some apartments, the windowsill of the living room (im.4.6) is quite important. Since the size of the balcony is limited and it can be only accessed from the kitchen, the window sill replaces the balcony which provides the place for greenery.

However, on the other hand, the rigid structure of the Airey facade is also the limitation of openings which should be considered in the future renovation.



im. 4.6 The window in staircase in Airey block

Resource: O A S I ARCHITECTS, BND HOUSE https://divisare.com/projects/314807-o-a-s-i-architects-stefania-matteo-bnd-house

Analyzing the Possibilities of Window

Based on the dimension and the orientation of existing Airey house, I analyze several possibilities of the window:

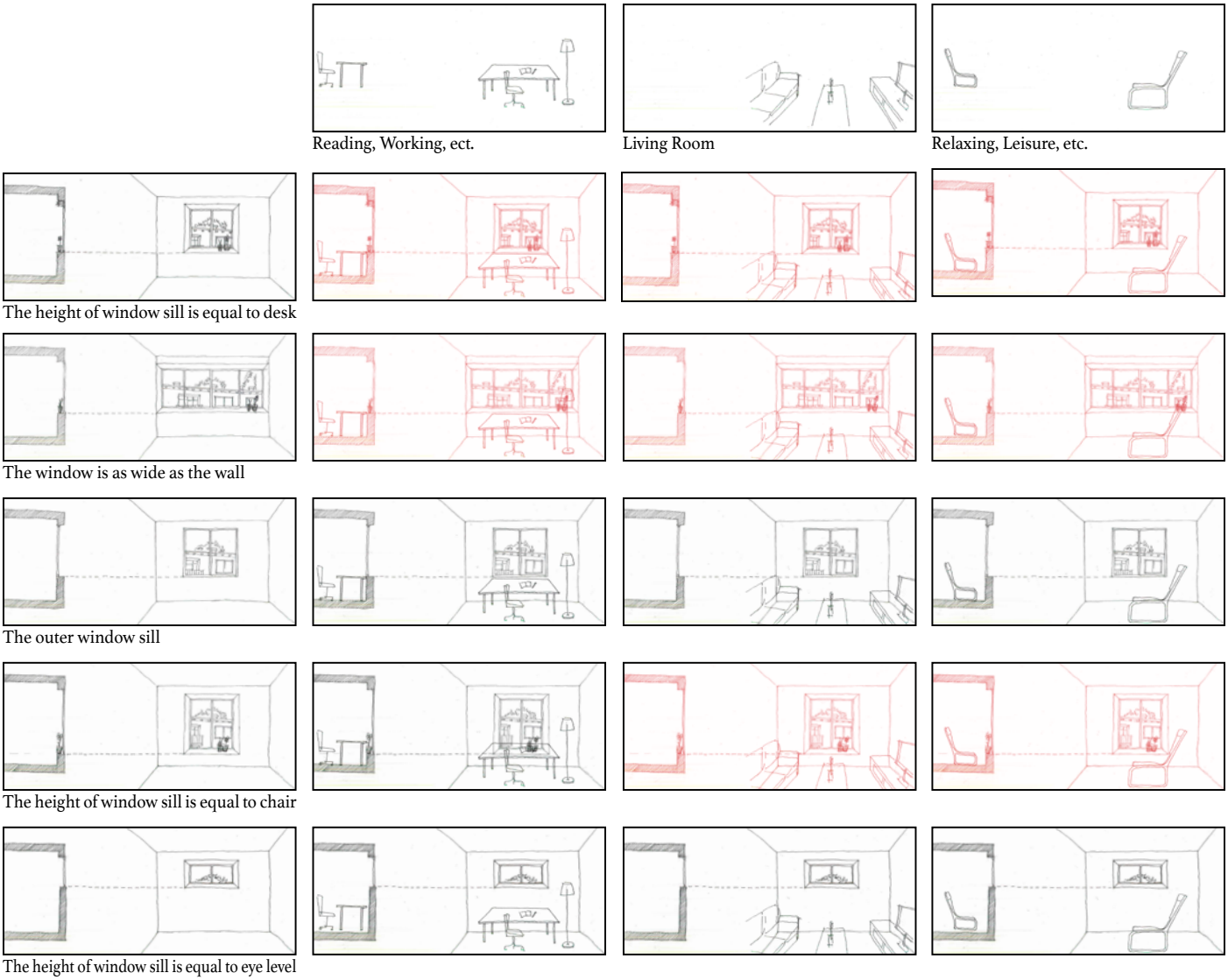
- When the height of the window sill is equal to the desk, space could be extended from the window to as far as possible.

- When the window is as wide as the wall, space is more open.

- The outer window sill reduces the depth of the window profile from the interior and also reduce the possibilities for plants, etc.

- When the height of the window sill is equal to a chair, it may not suitable to put some furniture such as a desk in front of it, however, it would be in a good relation to a chair, couch, etc.

- When the height of the window sill is equal to eye level, it provides more privacy.



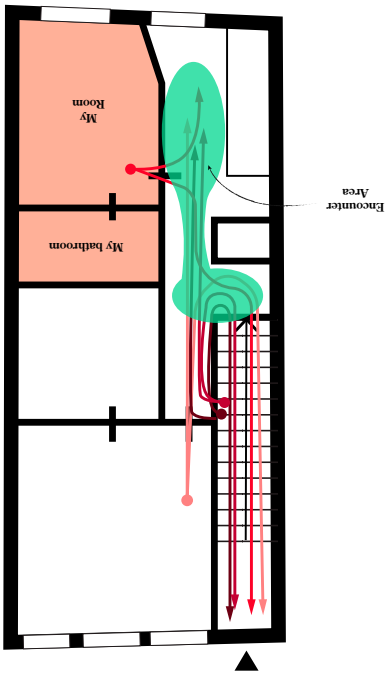
Individual Approach
4.2 Quality of Living by Ruben



large size desk is convenient for sketching. Also used to store frequently items such i.e. a coffee machine.



room is located along an active road. Nice for enjoying the view and observe moving crowd.





In an attempt to capture what I value as quality in my personal living environment, I started to capture my daily routine and to be aware of how I use the spaces I live in.
In a typical week I usually dwell two places, that is, my cozy student house in Delft and the house of my parents.

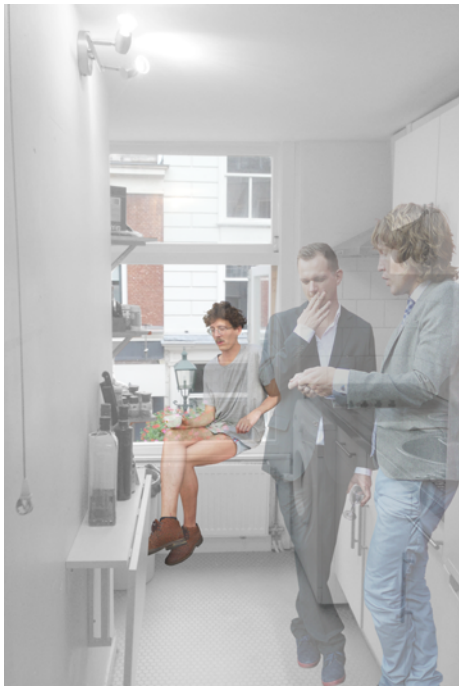
#01 Weekday - Student House, Delft (NL)

During the week I live in a student house with three other students. We all have our own rooms and bathrooms but we do share the kitchen. Because we all use it, its a place we frequently encounter each other and have a chat or drink. I value these encounters because we reflect on our day and provides a moment to relax.

My room itself is 12sqm and includes a bathroom. Since its quite small, I only use it to sleep and to work (at desk) rather than a place to hang out and invite friends over. Since I primarily use my room to work (and sleep) I value my view. I often find myself standing in front of the window, thinking about the work I'm currently working on and observe the activity which unfolds in front of the window.

#02 Weekend – Parents House, Assen (NL)

In the weekends I often visit my parents. Since I grew up, the kitchen was always an important place within the house. Cooking is an important part of my Indonesian background, where we cook a lot. Its also the place where we gather as a family and reflect on our week with a glass of wine.



kitchen is place where frequent encounters take place. Used also to catch up with roommates.

So, what is my quality of living?

[1]

A peaceful/recognizable environment which facilitates the need to charge yourself and hang out with family and friends (kitchen and couch in living room).

[2]

A shelter which protects you from weather conditions and facilitates our daily residential activities such as cooking & sleeping.

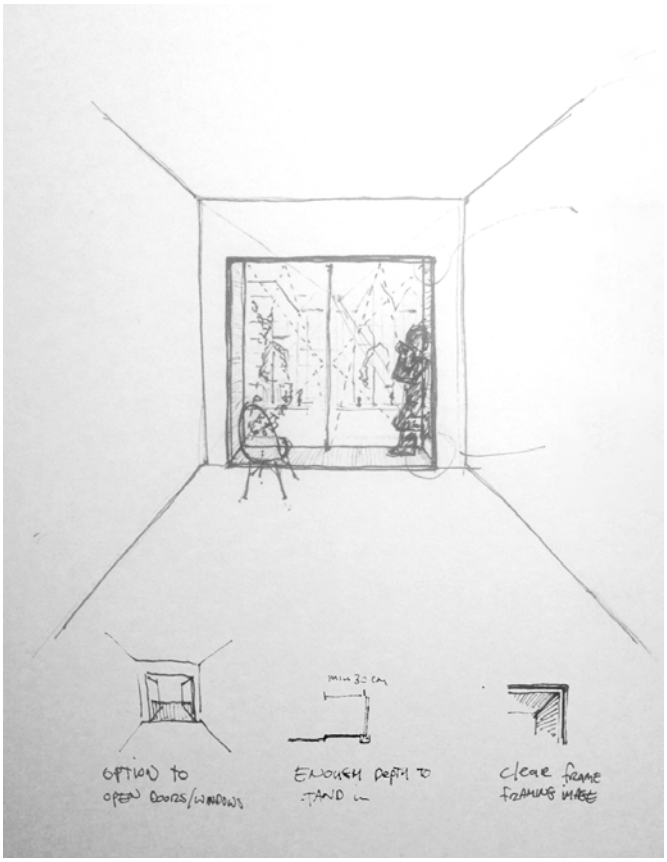












When looking at the my personal living environment I noticed that besides the encounters I have with my room-mates, I also value my window and the view that comes with it. To be more specific about what I exactly value about the window and/or the view I made an attempt to enhance the window. Or to put It differently, how to optimize the window frame?

To me, a window is a frame which *frames the scenery* outside. The idea of a frame should strongly be represented, so that is, it should strongly be marked with *depth* (min 30cm) and *material contrast*. The *sufficient depth* of the frame makes it also possible to stand within the frame, lean/sit against it while observing the scenery.

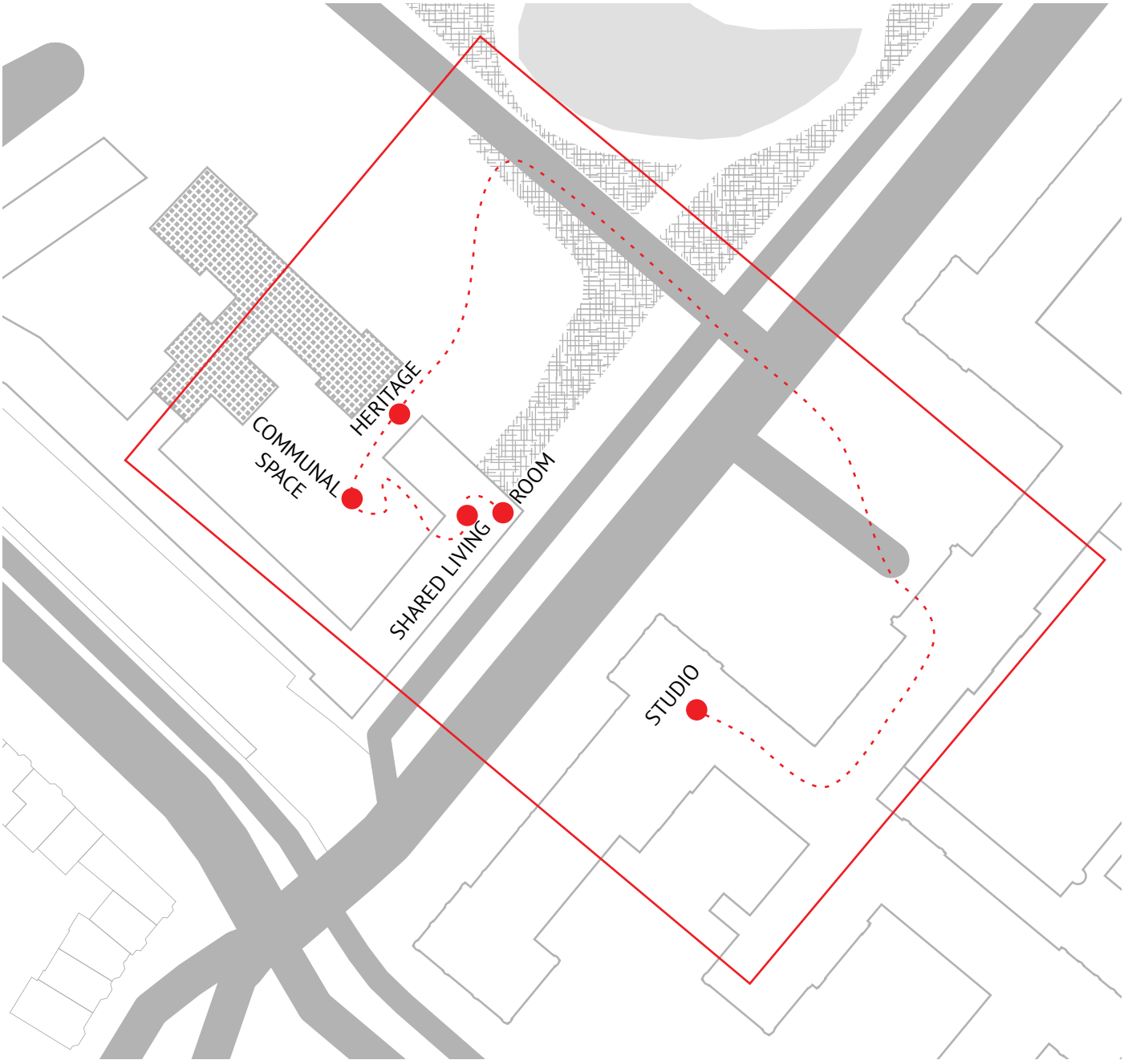
To create an optimal effect of awareness of the scenery the window starts from the floor. This can only be done when there is a enough distance to maintain the privacy of the interior.

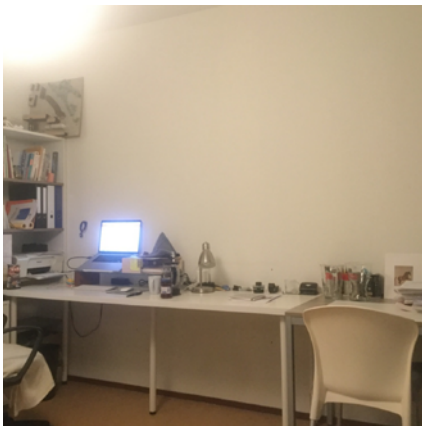
Individual Approach

4.3 Quality of Living by Hyungju

I explored the idea of 'Quality of Living' with the study of my living environment. During the journey, I valued both visible and invisible factors. Namely, I feel attachment not only because of the quality of courtyard, but also the Facebook group for the residents, which helps students to share the useful information.

Most of the time, the range of my movement is somewhat restricted because the house location is at right next to the faculty. From my repeated daily life, I figured out the transition from one space to another is quite significant. Also, the range of neighborhood for me is the inner part of the building block.





Long desk divided into three part according to the function I need; computer work, reading, and model making.



Although the room is only 16m², I furnished the space to use it as a small living space.



The sharing kitchen is the busiest space since two or three flatmates frequently encounter at the same time. We all thinking of purchase an extra cooking table.



Dining space is secured separately with its table. Flatmates are having dinner together from time to time.



The living room directly connected to the communal garden. We are often listening to music or talking on the couch.



In sunny days, people love to have BBQ outside. Also Sometimes the housing corporation host party for the residents.



I am proud of the heritage building next to the new building because it makes my home special.



The proximity of the faculty improves my life quality due to the short commuting time. On the other hand, living right next to the faculty is somewhat stressful, so I do not draw the curtain that much.W



Image 1. Kartoffel Raekkerne, Copenhagen



Image 2. Third Place, Singapore, National Awards: Jalan Bukit Ho Swee.
Image © Daniel Chia, 2014 Sony World Photography Awards

Communal realm, 'From the living room to the public square'

Daily life is a sequence of experiences between the private space and the public realm. I personally am satisfied with my place when I feel that I am well connected to the public area, which is from the shared living room to the square in the downtown.

First life, then spaces, then buildings
- the other way around never works.
_ Jan Gehl

As an architect, our role is quite limited to deal with people's life. However, we could take some architectural gestures that improve the life quality by attracting people to the communal realm. So, my personal approach is

'to form a coherent network between public and private by architectural gesture.'

This will help people to connect to the surroundings and provide a high quality of living. The more you connected, the more you will talk to others.

Possible interventions for better connection to the exterior.

A good dwelling that improves the community life is

- to have spacious outdoor space
(the private space directly facing the public area)

- to be connected to the ground floor
via agreeable and spacious staircase or gallery.

- to secure diverse size and kind of community space

- connected to the car-free environment

- to share the communal area that enclosed in a way

- to secure proper ratio of the target group with time and care
(family and elderly)

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Appendix