

The Sloterhof Complex in Amsterdam an Example of Exposed Concrete

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ABSTRACT

Sloterhof in Amsterdam is a neighbourhood in Amsterdam in the Slotermeer and Slotervaart section of the Algemene Uitbreidingsplan (General Expansion Plan) for Amsterdam of 1939, which was implemented under C. van Eesteren (1897-1988). In 1954 Architect J.F. Berghoef (1903-1994) started on the design for the area and completed it in 1960. Berghoef was used to traditional building methods. Sloterhof was one his first major commissions after the Second World War. During the war he joined a research group developing industrial housing. The modernist philosophy and the human approach were combined in an economical approach to architecture. The buildings looked modern and the building services had high specifications, including central heating and running hot water. Sloterhof has not yet been listed as a monument, however, it is on the top 100 list of potential listed monuments in Amsterdam. TNO (research institute) and TU Delft (University of Technology) investigated the qualities of the project and how to make this neighbourhood more sustainable. The main conclusions were that this complex is worth preserving. Fortunately it has not changed much during its lifetime. It belongs to our recent cultural heritage and it needs a durable protection instead of a zero CO2 approach. Sloterhof can be refurbished to make it more sustainable, while at the same time respecting its architecture.

KEYWORDS

post war, refurbishment, prefabrication, exposed concrete, monument, durability, ABCD[⊕] research method

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1 INTRODUCTION

Sloterhof was investigated using the ABCD[⊕] research method which was modified to suit this case and covered three levels of scale: town planning, architecture and construction engineering [Zijlstra 2009]. Technology provided me with the inspiration to develop a comprehensive research method to assess buildings: Analysing Buildings from Context to Detail in time: ABCD[⊕] research method. Providing information on practice is a key element in construction engineering, which is a learning process. We are not solely concerned with the end result. Changes are made during the life of a building, and they might be made differently if the history and technical aspects of the building were studied in greater detail. Both maintenance and changes require us to understand the building concerned.

2 THE ABCD[⊕] RESEARCH METHOD

The first part of the study concerns the context. It analyses the contextual aspects (brief, site, architect, typology, and design process), one after another, over all periods. The information provided by observation is sifted to obtain the contextual information which is or was relevant to the design, creation, existence and decay or future existence of the building. Where typology is concerned we should not only consider a functional or chronological order of buildings, based on building types. Instead, the buildings should be analysed primarily on the basis of a spatial typology, as the spatial conditions will remain, or may have to change when the function of the building is changed.

The second part of the study considers the building in greater detail and initially considers the following periods: creation, existence and decay/continued existence. The building is then analysed on the basis of the following aspects: space (interior and exterior); structure (load-bearing structure and elements which determine the structure); materials (the definition of space by materials, determined by: light, colour, texture, surface, sound, radiation, smell, dimensions and weight); building services (plant and installations to support climate control, comfort, maintenance and communications).

Analysing the four elements at the three levels (periods) leads to a matrix at the level of the whole building: the Analysing Building Construction in time matrix, or ABC[⊕] matrix. When this matrix is combined with the considerations based on the contextual factors it forms the regenerative conclusion of the ABCD[⊕] study of the building.

With Sloterhof the levels town planning, architecture and construction engineering were considered from two time perspectives: during the process of creating of the building (through to the handover) and how it expired after completed (from the handover to the present, and a look towards the future).

3 TOWN PLANNING - CREATION

This paper concerns the Sloterhof complex of dwellings, shops and commercial spaces in Amsterdam, on the Comeniusstraat in the Slotervaart district. Cornelis van Eesteren worked on the Amsterdam General Expansion Plan (AUP) from 1928 and the plan was approved in 1939 [Gemeente Amsterdam 1985]. It provided for Amsterdam a expansion from 4,608 to 12,052 hectares, around 120 km². The Garden City Committee appointed in 1923 had a major impact on these plans. The plan aimed to provide both housing and services with a series of buildings set within a green landscaped setting rather than designing separate satellite towns, the plan extended the edge of Amsterdam, with a fair degree of independence and open design [Van der Velde 1968]. The Slotervaart expansion plan was developed as part of the AUP, following these principles. In 1954, architect J.F. Berghoef was commissioned to design Sloterhof, part of the district of Slotervaart Fig. 1. When the design was completed in 1960, it included 668 dwellings, 21 shops, 2 service stations, lock up garages, a bank and a pub/restaurant. [Fischer 1968].

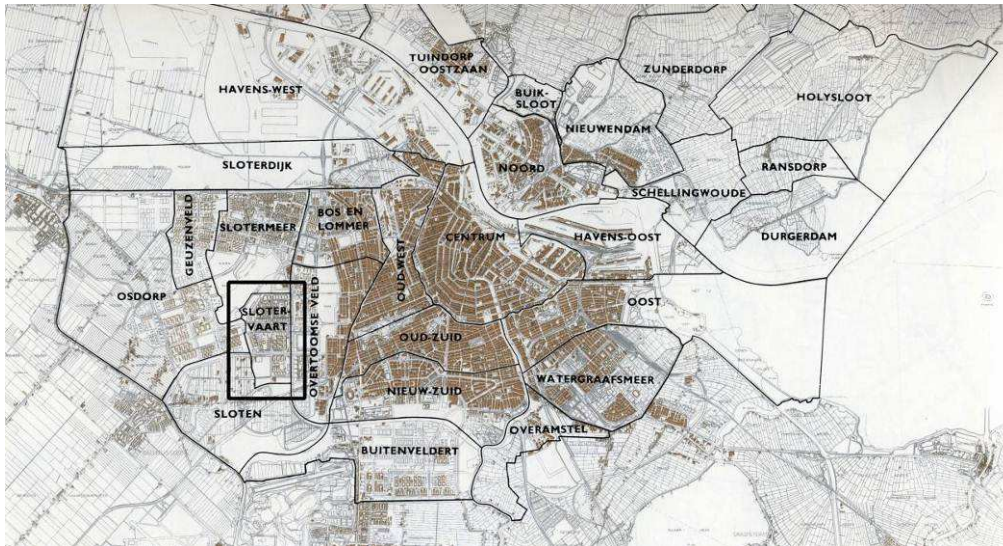


Figure 1. Sloterhof located in Sloterhof in the city of Amsterdam [Van der Velde 1968].

3 TOWN PLANNING - EXPIRED

In 2001 Sloterhof was assessed in particularly positive terms by Hereijgers and Van Velzen [2001]. In 2001 Sloterhof was described also as a "pearl" within the framework of Park City 2015 [Gemeente Amsterdam 2006]. It was also identified as a potential listed building in the study undertaken early in 2008 by Steenhuis & Urban Fabric. In May 2009 it was included among the Top 100 potential new monuments to be listed in Amsterdam [Bureau Monumentenzorg Amsterdam 2009]. The comments note that the objects are protected as "cherished rarities" and express surprise that Sloterhof, with its 900 dwellings, was not included among the national Top 100 of state listed monuments in the Netherlands [Van Santen 2007].

Current town planning concepts such as those outlined in Parkstad 2015 offer new opportunities to appreciate the original qualities of the Slotervaart district in Amsterdam. The aim is to provide a positive residential and work environment, with a diversity of residents and uses. The spaces for the provision of services could be used effectively again, and the public areas should be maintained and repaired to return them to their original condition, after which they might be further optimised. For example, the playgrounds designed by Aldo van Eijck are still there, but better use could be made of them. The potential redevelopment of Slotervaart should be guided by concepts such as the ranking of maximum house rents related to income, residents from different socioeconomic groups, affordability and the garden city concept.

4 ARCHITECTURE - CREATION

Sloterhof was built between 1958 and 1960 although the design work started in 1954. Working closely with H. van Saane, director of the Nederlandse Maatschappij van Volkshuisvesting (Nemavo), Berghoef applied the Airey-Nemavo system (NA system) in several projects like Populierenweg (1950, 300 dwellings) and Amstelhof (1952, 350 dwellings and general services). Although he had his doubts about prefabricated structures, he used them shortly after the Second World War. In his view, industrial production restricted architectural expression. Berghoef emphasised the importance of the urban context - public areas had to be incorporated in the design in order to offer a pleasant residential environment [Berghoef 1981]. His designs, which were realised using system construction, tempted to strike the right balance between tradition, new technology and public spaces. Based on those principles, his practice, which previously used traditional construction methods, started using system construction. He made a real effort to ensure that the human scale was still paramount in this

form of architecture. The mixed uses, carefully designed greenery, playing areas, covered playing galleries, craft rooms, lock up garages and small business units all underline his philosophy.

For Berghoef, the cohesion of the whole provided the basis of design for Slotershof. Along Lelylaan, there are seven blocks to the left, and nine to the right, grouped around Huizingalaan at their centre Fig. 2. The tall blocks(M) extend into the water, they mark the division and frame the development. During the development of the design the tall block envisaged on the Hemsterhuisstraat side was replaced by a square tower block (T) of twelve storeys, which broke the symmetry with a striking final chord. The recessed five-storey blocks (B) flank internal courtyards which are shielded from Comeniusstraat by blocks of lock-up garages (g) and shops at the ends. Huizingalaan forms the centre, with an urban variation of the low blocks (B) accessed by stairwells. Near Huizingalaan there are two blocks of shops (W) and two service stations (s). On the water side the internal courtyards have pergolas. The courtyards have playing areas for children. All shops have a dwelling for the shop owner. Near the tower there was space for four houses with artist's studios (A). An octagonal pavilion, for a bank, was built on the extensive paved area along Huizingalaan. The restaurant was accommodated in the block on the east side of Huizingalaan, near Lelylaan. Berghoef also designed the electricity substations, using the same precast concrete system. The prefabricated system imposed a pattern of concrete slabs with dimensions of 625 x 375 x 40 mm. Within this pattern variation was provided through the use of materials, detailing and colour. The lower blocks and shops had light grey as the dominant colour, while the taller blocks and the tower were black with prominent white concrete surrounds Fig. 3.

The garages, electricity substations and dwellings over the shops were striped, dark and light grey, while the houses with the studios were brick red. The two service stations stand out with their gull wing roofs. The dwellings were finished to a high standard for the time: central heating, hot water, fitted Bruynzeel kitchens, fitted wardrobes, central waste disposal and lifts in the taller buildings. The initial rents ranged from EUR 75 to EUR 84 per month, including maintenance and heating. This was rather expensive that time (1960).

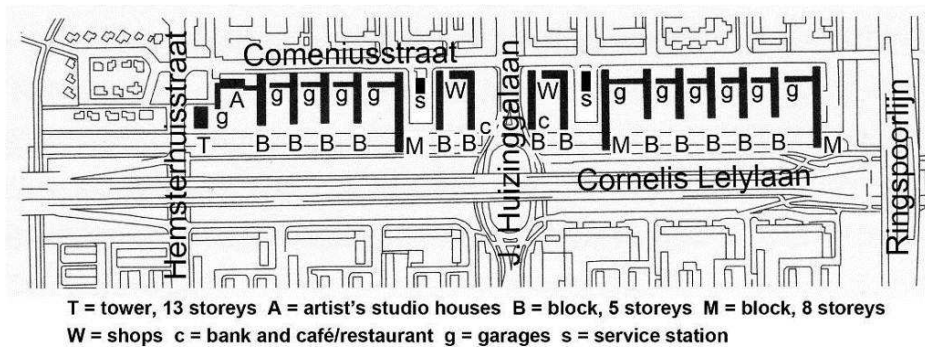


Figure 2. Slotershof and its realized program [Hereijgers & Van Velzen 2001].



Figure 3. The blocks on the Comeniusstraat [Messcheart 2004].

5 ARCHITECTURE – EXPIRED

Slotershof still has a plan based on the division of the plots into strips. The dwellings still have the original layouts and the local services are effective. Berghoef was fully aware of the duality of the brief. Hence he designed the dwellings so they face two directions. Berghoef [1951] commented as follows on the Airey-Nemavo system: *"Strictly speaking, once the width and depth have been chosen, based on the module of the wall slabs, you are free to design the layout. The windows were designed in series: the width and height of each window are a multiple of the wall slab dimensions. There was complete freedom in placing the apertures, as long as the window frames were aligned with the joints in the wall slabs. One of the difficulties is that the elevations are flat, and the building looks like a cardboard cut-out. The recesses at the front doors, a few balconies and the protruding chimneys at the end of the blocks help, but the plasticity is still limited. There are two options for dealing with this: changes, preferably clear ones, in the building line and the introduction of plastic elements in the street profile: posts, hedges, shrubs and trees. Trees, with their colour and irregular shapes, are particularly effective in combination with these light, unfussy houses. The porches associated with the storey levels are essential to create a plastic rhythm in the extended facades. It is clear that the street layout, building lines, division into plots and the greenery, i.e. all town planning aspects, are essential to the nature and character of the Nemavo-Airey complexes."* Berghoef used these elements effectively in the Slotershof development, and they govern its present quality.

6 CONSTRUCTION ENGINEERING - CREATION

In 1925 H. van Saane set up a construction company in Amsterdam. He specialised in designing and building social housing, rather like project developers these days. His plans for Amsterdam were inspired by residential construction projects in Germany and Austria after the First World War. Before the Second World War, he built Geuzenhof (1933) and Muzenhof (1939), both designed by Berghoef [Fischer 1968].

In 1946, the Dutch Reconstruction Committee asked him to study prefabricated housing systems in the UK and in 1947 Van Saane founded the Nederlandse Maatschappij voor Volkshuisvesting (Nemavo; Dutch Housing Company). The Dutch government subsidised prefabricated construction as there were shortages of materials and trained workers. Van Saane opted for the system developed by Sir Edward Airey in Leeds and decided to adapt it for the Dutch market. He asked architects Berghoef and H.T. Zwiers to work with De Vries Robbé in Gorinchem (steel structures and windows) and N.V. Betondak in Arkel (concrete roofs) to prepare the system "industrially and architecturally" for series production in the Netherlands, under the name Nemavo-Airey system. However, it never went into real series production and the money subsidised by the government was subject to inconsistent government policies. The municipality of Amsterdam decided to use the Nemavo-Airey system in Sloterveer and Watergraafsmeer.

The British Airey system was adapted for use in the Netherlands [Priemus & Van Elk 1970]. The Nemavo-Airey system was based on a table structure. The table top was formed by a wooden floor nailed to steel lattice girders which were rigidly connected to a steel ring beam. The legs of steel were secured to the corners to form a rigid and stable table. Centre beams with legs could be used to obtain a greater span. The advantages over the British system was that the columns could be placed anywhere relative to the horizontal members. There were no restrictions related to the floor joists and the columns could be installed anywhere to obtain reasonably large openings for doors and windows. For multi-storey buildings the tables were placed on top of each other and a steel frame was added inside the construction .

The exterior walls comprised a precast reinforced concrete load-bearing structure of columns connected by steel ring beams at each storey height. Precast concrete panels were used as the outer cladding and insulating boards were used for the inner cladding and could be finished with gypsum-

concrete units Fig. 4. Berghoef [1951] commented on the window openings: "At first, the steel window frames were incorporated in special concrete uprights and cills. However, these elements were difficult to produce and heavy and unwieldy during installation on site. After eighteen months we found a solution, by securing a special profile to standard steel window frames. This was an improvement in structural engineering terms. However, aesthetically it was a major disadvantage as the white surround between the grey wall and the steel window frame was lost. This presented the architects with a serious problem: the facades were already flat and now the last bit of plastic expression around the windows as well the added colour were lost. The only compensation was that they now had much more freedom than before in placing the windows." However, in Slotterhof we see that Berghoef continued to use an obvious white surround, now made of concrete, into which a steel window frame was fitted in the factory.

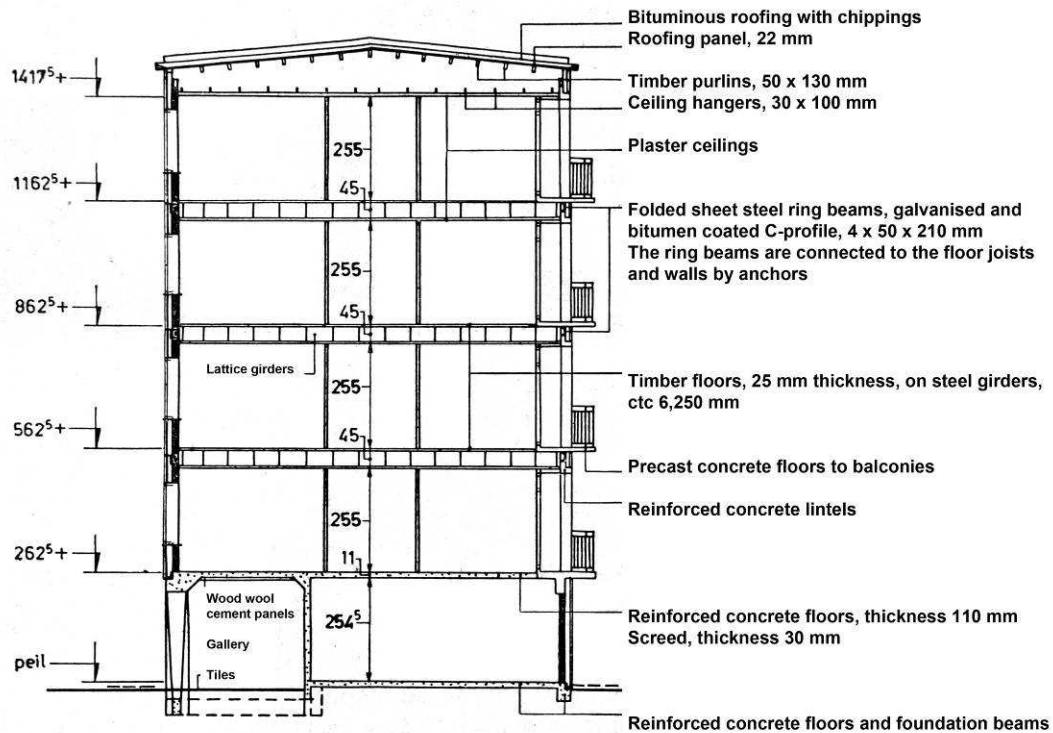


Figure 4. Construction of the Sloterhof B blocks [Polytechnisch tijdschrift 1959].

7 CONSTRUCTION ENGINEERING - EXPIRED

During Slotterhof's existence there have been few construction engineering changes. The surface colours of the smooth concrete elements such as the columns and surrounds of the balconies and window frames have changed several times. Concrete components affected by spalling have been repaired. In some areas the facade panels have been damaged, cracked or broken off. Furthermore, holes have been made in the panels for gratings, cables, and so on.

The recessed window frames of the balconies and porches are made of timber and are easily replaced where necessary. The flush window frames feature the concrete surrounds and have steel frames and steel opening lights. The same construction was used for the window and door frames in the end elevations of the B blocks. These frames have now been replaced by aluminium units fitted to the concrete surround. The original fenestration pattern was lost as a result. Replacement of the steel windows will be difficult, and is architecturally undesirable. They are integral with the concrete surrounds. The walls have 20 mm of insulation in the cavity and the air cavity is 120 mm. The design drawings for the tower block show that the architect considered the use of double glazing. This could

still be installed, in the existing frames. However, in that case the overall building physics balance of the wall will need to be considered.

8 CONCLUSIONS

The Slotershof complex, designed by Berghoef in the 1950s, is a surprisingly well preserved complex, in a favourable location relative to the centre of Amsterdam. Many of the building details have also been preserved Fig. 6. Elsewhere complexes of this type have been redeveloped architectural and technical unsuccessfully. The existing qualities of the complex of Slotershof can be strengthened and used to their best advantage. It should be redeveloped as a whole, rather than be split in different parts in order to conserve its integrity as a complex. There are many reasons, at different levels of scale (town planning, architecture and construction engineering) for treating the complex respectfully, from context through to detail. The quality and value of Slotershof is determined by its details, or the sum of its parts and shows us an example of durability with the use of traditional materials Fig. 5.

Hence, Slotershof deserves a comprehensive well considered refurbishment plan: first from small to large and then from large to small, as Berghoef intended. Hence, the future development of the complex should preserve the town planning, architectural and construction engineering qualities of the complex. In essence this means that the current appearance of the facades should be maintained and that the complex should continue to provide affordable rented housing, for which there is a high demand. This means that it should also be possible to improve the complex. Although some intervention is required, any structural and building physics measures should not detract from its appearance. The measures could add to the complex: restoring the original colour scheme, repairing facade panels and concrete surrounds, fitting internal insulation to exterior walls, installing thermal glazing, insulating the roof and basement and providing energy-efficient building services plant for the whole complex.



Figure 5. Present day details of exposed concrete and steel in Slotershof Amsterdam.



Figure 6. Present day environmental situation of Slotershof Amsterdam.

ACKNOWLEDGMENTS

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