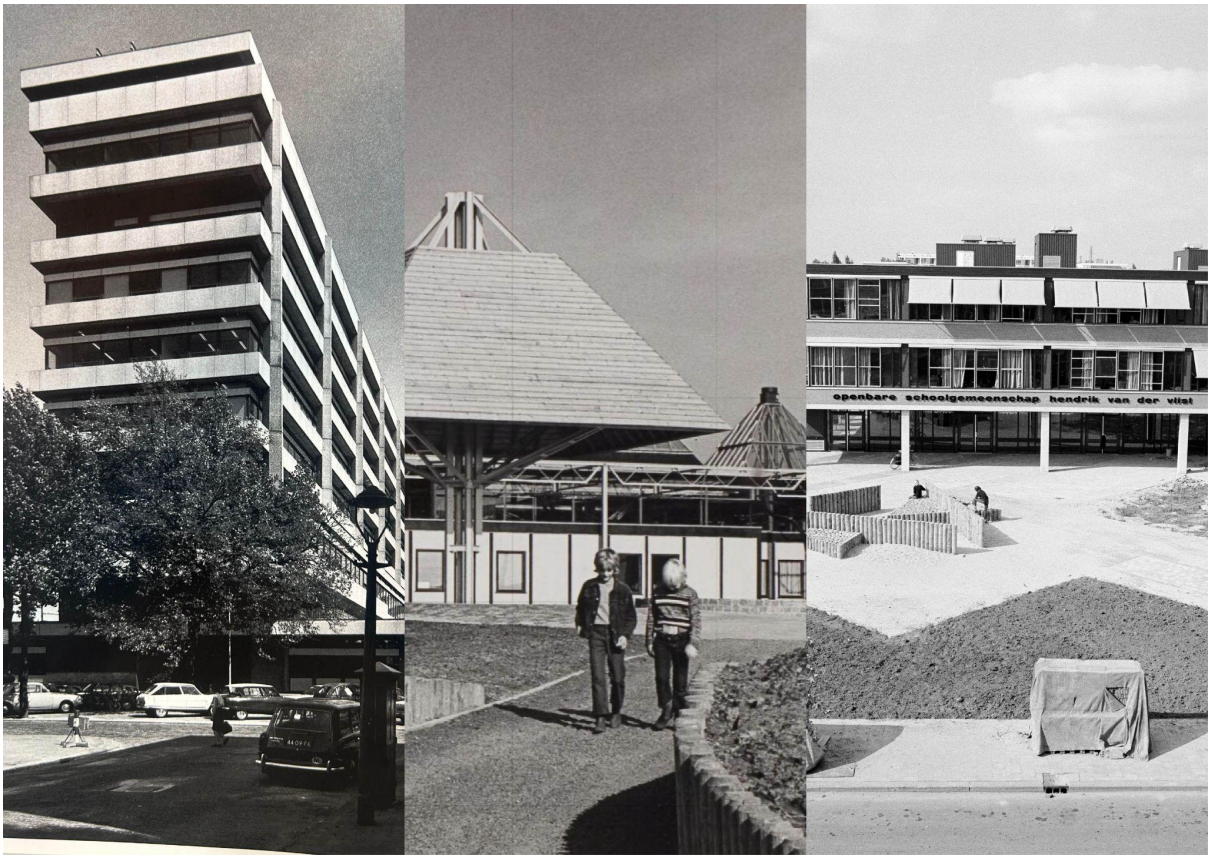
Meeting in Educational Architecture

Research into design principles on meeting in school buildings for secondary education in the Netherlands during the 1970s



Left: Technikon, middle: ‘t Karregat, right: Hendrik van der Vlist, (sources: Provoost & Versnel, 2003, p. 286, *rhce archive,* 68757*,* and *Het Utrechts Archief,* 856112).

AR2A011 Architectural History Thesis

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Abstract -

This history thesis contains the research question; *What are the design principles of the architects H.A. Maaskant, H. Dam and B.F.A. Dirkse, and Van Klingeren for secondary education buildings on the aspect of meeting in the Netherlands during the 1970s?* This question is answered via a literature review together with analyses of archival material. After the restructuring of the educational system in 1968, the existing inventory of educational architecture in the Netherlands experienced pressure for change and sparked a wave of new educational architecture in the 1970s. The first case study is from H.A. Maaskant, the Technikon complex in Rotterdam completed in 1970. The second case study is 't Karregat from Van Klingeren in Eindhoven, 1973. The final case study contains the Hendrik van der Vlist 'school cluster' by architect ir. Henk Dam and ir. B.F.A. Dirkse in Utrecht, built in 1973. The collective answer to the research questions is; *'The design principles of the architects H.A. Maaskant, H. Dam and B.F.A. Dirkse, and Van Klingeren for secondary education buildings on the aspect of meeting during the 1970s can be described as; connecting a multitude of separate entities together to enhance the collective, removing physical barriers to enhance interaction within a community, and creating a central space connecting different levels of education'*

Keywords - Meeting, interaction, design principles, educational architecture, 1970s, the Netherlands.

0. Introduction.

This history thesis focuses on the design principles of three different case studies on the subject of *meeting in educational buildings* in the Netherlands. Secondary education will be the focal point for the education type, as during the late 1960's a new law was introduced in the Netherlands on secondary education, the *'Mammoetwet',* known as the *'law for secondary education*' (Visser, 2022). The case studies from the three architects were built during the 1970s as indirectly a result of this new law. The first case study is from H.A. Maaskant, the Technikon complex in Rotterdam completed in 1970. It provides a perspective on the urban scale due to different educational buildings creating a public square as well as an interesting articulation on the building scale. For the second case study, a different perspective comes to light. 'T Karregat in Eindhoven, a controversial experiment by Van Klingeren in 1973, is a building that evokes meeting and interaction between people on many different levels. The final case study highlighted in this thesis is the Hendrik van der Vlist cluster by architect ir. Henk Dam and ir. B.F.A. Dirkse in Utrecht, built in 1973. The main meeting area within the building is a *'zitkuil'* or '*seating pit*', an architectural intervention that became more common in interior design in the Netherlands during the 1970s.

Theme.

By studying three different case studies by three different architects during the same time frame, this thesis investigates how the theme *meeting in educational buildings* was designed during this timeframe. The 1970s is chosen as the time frame for this thesis because of the introduction of the new education law during the late 1960s and the result of new types of educational building types, such as the *'scholengemeenschap'* or also known as *'school cluster'*. The research question answered in this thesis is; *What are the design principles of the architects H.A. Maaskant, H. Dam and B.F.A. Dirkse, and Van Klingeren for secondary education buildings on the aspect of meeting in the Netherlands during the 1970s?*

Literature & Archival material.

Analysing the literature and archival material used in this thesis, most of the research and documentation on the three different case studies focuses on the development of the building itself. Examples of existing literature used in this thesis are; *'Maaskant'* by M. Provoost, a book that illustrates and elaborates the work of architect H.A. Maaskant, *'Bouw'* by the Bureau for Documentation of the Construction Industry (BDB or '*Bureau Documentatie Bouwezen'*), magazines that documented the building industry in the Netherlands after the Second World War, and '*Onderwijs en Schoolgebouwen'* by C. van den Bosch, a collection of articles written between 1977 and 1978 about education and educational buildings. The archival material used in this thesis is varying between original sketches and drawings by the architect or architectural firm, illustrations, photographs, and literature from secondary sources collected over the years.

Via analysis and research of archival material and original drawings, this thesis tries to find ways of architectural interventions by the architect that affect the theme; *meeting in educational buildings* in different ways. This thesis will contain a new aspect of examining the respective case studies. Using this method of archival literature review, the buildings as well as the design principles for each architect on meeting in educational buildings will be analysed. Using the same method for each case study allows for a clear comparison between the different case studies and their respective design principles.

Structure.

The first chapter of this thesis will contain an introduction to the educational context in the Netherlands during the 20th century as well as the reasoning for the focus on secondary education. The following three chapters, chapters two, three, and four, will each include one case study with their respective architect and context. These chapters will be divided into the development of the building design and the development of the theme of this thesis; *meeting in educational buildings.* In the fifth chapter, the three case studies will be compared with each other on the design principles of their respective architects. Finalising this thesis the research question; *What are the design principles of the architects H.A. Maaskant, H. Dam and B.F.A. Dirkse, and Van Klingeren for secondary education buildings on the aspect of meeting in the Netherlands during the 1970s?* will be answered and a conclusion is drawn on the theme of this thesis.

1. Context; Secondary Education in the Netherlands during the 20th century.

This chapter contains an introduction to the educational context in the Netherlands during the 20th century. The theme of this thesis focuses on secondary education which also will be explained. Furthermore, a brief introduction to the three case studies and their respective architects will conclude this chapter.

Chronological timeline.

At the beginning of the 20th century, in 1901, the first step was made toward a revised educational system in the Netherlands. With the implementation of a new law, compulsory education was implemented for children between the ages of six and twelve years old. During different periods in the 20th century, this notion was further developed and extended from six to seven, eight, and eventually ten years of compulsory education in 1975. Moreover, the minimum age to start education got lowered from six to four years old (Nederlandse Overheid, 2023).

As well as the implementation of compulsory education, different perspectives on pedagogy developed during the beginning of the 20th century, which played a big part in the educational context in the Netherlands. The first type was pioneered by Maria Montessori, with the first school building dedicated to Montessori education opened in 1914. Her beliefs are based on the fact that each child has their own need and interest in education, and giving the child responsibility in what he or she wants to learn. The phrase '*let me learn it myself*' summarises this type of pedagogy (*De Montessori visie - Nederlandse Montessori Vereniging*, 2019). In the next few decades, more school buildings were realised with different pedagogical typologies. For example, the '*Vrije School*' or 'Free School' in 1923, with the pedagogic view that each child had the freedom to develop their personality (Vereniging van vrijescholen, z.d.). *'Dalton onderwijs'* or 'Dalton education' in 1930 with pedagogic views on five principles; cooperation, freedom and responsibility, efficiency, independence, and reflection (Anstadt, 2022). Moreover, *'Jenaplan'* or 'Jena Plan' in 1963, based on the idea that education should be more than maths, reading, and writing. Yet, values conversation, play, and creativity in their curriculum (Nederlandse Jenaplan Vereniging, z.d.).

One of the biggest changes in the educational context in the 20th century was a new law introduced in 1963 and implemented in 1968. The *'Mammoetwet'* or better known as the *'law for secondary education*' changed the educational structure in the Netherlands (Visser, 2022). Before the law, the three different levels of education possible were mulo, which abbreviated *'Meer Uitgebreid Lager Onderwijs'* or translated into '*More extensive lower education',* hbs which stands for '*Hogere Burgerschool'* or '*Higher civilian school*' and gymnasium, the highest level of education at the time (Visser, 2022). Over the years respectively mavo, '*Middelbaar Algemeen Voortgezet Onderwijs',* havo, '*Hoger Algemeen Voortgezet Onderwijs'* and vwo, '*Voortgezet Wetenschappelijk Onderwijs',* which each represented their levels of education. Besides, 'mms', known as education only for girls, was terminated. Due to the fact that mandatory education was extended at the time to nine years, the separation between primary education and secondary education became more predominant. To further develop the transition between primary and secondary education, the law also introduced the '*brugklas*', the first year of secondary education specifically designed for this transition period. It also allowed the student to choose their respective subjects as well as their respective level of education for

the rest of the remaining years**.** The law also gave students the possibility to change their level of education later on in the process, if certain requirements were met (Centraal Bureau voor de Statistiek, 2023). For example, a student could continue with the fifth year of vwo after they graduated from havo.

Transition in educational buildings.

This massive transition in the education context resulted in the fact that the current inventory of educational architecture at the time needed a transition as well. Soon after the implementation of the '*Mammoetwet'*, a new educational buildings typology was designed, called the *'scholengemeenschap'* or '*school cluster*'(Commissie Onderwijskundig Aspecten Scholenbouw, 1979, p. 10). This typology was the direct result of the changing educational structure in the Netherlands and was implemented throughout the country. A *'scholengemeenschap'* or *'school cluster'* is a collection of schools ranging over different levels of education. For example, the case study Hendrik van der Vlist cluster by Henk Dam in Utrecht is a collection of primary and secondary education, with multiple different levels of secondary education, such as havo, vwo, and gymnasium, all in the same building (Van den Bosch et al., 1980, p. 115).

Where the Hendrik van der Vlist cluster is a newly constructed building in the 1970s, the typology was first implemented in the already existing inventory of educational architecture. Multiple buildings were 'merged' together into one cluster, but in most instances spread out in different locations. Together with the rising demand for more space and the changing requirements of what an educational building needed, a lot of pressure was put on the existing inventory. For example classrooms needed to be more spacious, to allow more freedom in the interior of a classroom, specifically for secondary education. Furthermore, different typologies of the classroom came to light, such as rooms dedicated to creativity or physical education (*Onderwijsgeschiedenis - Onderwijs en opvoeding in de 20e eeuw*, 2022), which resulted in the transition of the way classrooms were set up. Certain subjects required certain equipment that was difficult to set up for each class. Before 1960, each group of students stayed in one classroom, with different subjects given in the same room (Commissie Onderwijskundig Aspecten Scholenbouw, 1979, p. 15). After the restructuring of the educational system in 1968, subjects got dedicated classrooms with interiors altered towards the subject, and the students were moving throughout the school. This change and pressure on the existing inventory sparked a wave of new educational architecture in the 1970s.

This interesting transition in educational architecture, which occurred specifically in secondary educational buildings, is the reason why the theme of this thesis focuses on secondary educational architecture.

Case studies.

The three case studies analysed and juxtaposed in this thesis are all built within five years after the implementation of the '*law for secondary education*' in 1968. The first case study completed in May 1970 is the Technikon complex in Rotterdam by H.A. Maaskant. This complex of educational architecture together with other public functions was one of the first large-scale projects that were completed after the new law. It also provides a larger-scale perspective on the theme of this thesis; *meeting in educational buildings.* The second case study analysed is 't Karregat in Eindhoven by Van

Klingeren, completed in 1973. The change in educational architecture also evoked the experimental side of the profession. Van Klingeren designed a building that was a frontrunner in the sense of meeting and interaction between different users with multiple different functions, from educational aspects to a retail area, all in one building without many walls. It was soon experienced as an experiment with controversial tendencies and strong opinions. The final case study is the Hendrik van der Vlist cluster in Utrecht, designed by ir. Henk Dam and ir. B.F.A. Dirkse in 1973. This educational building was a new type of school building known as a '*scholengemeenschap'*, with different types of education all in one place. As mentioned earlier in this chapter, different types and levels of education also allowed students to change between the levels later on in their educational careers. With the idea of better social interaction between the different students as well as an easier transition between the different levels or types (Van Der Werf, S. M. T., 1969)

In the next three chapters, each of these case studies will be further analysed and explained.

2. Case study I: Technikon by H.A. Maaskant, Rotterdam, 1970.

This chapter will be divided into two parts. The first part will discuss the *development of the design* by the architectural office Maaskant, and the second part will delve into the theme of this thesis; *meeting in Technikon.*

Development of the design, starting point.

H.A. Maaskant got an invitation from J. van der Vlerk back in 1955 to discuss a new educational complex at the Hofplein in Rotterdam, 15 years before the completion of the project in 1970. Van der Vlerk was part of the council of education and gave Maaskant the assignment of designing the new education complex that eventually would be called Technikon and Akragon (Provoost & Versnel, 2003, p. 272). During the conversation between Van der Vlerk and Maaskant, Van der Vlerk mentioned the initial idea about the urban context, which one of his urban designers suggested. In the design drawing from the urban designers (see figure 1 (Provoost & Versnel, 2003, p. 272), seven slabs were situated on top of a collective low-rise building, also sharing a round auditorium in the middle of the project.

Figure 1: The urban design presented by Van der Vlerk in 1955. (source: Provoost & Versnel, 2003, p. 272).

Maaskant was not impressed by this idea, and showed his first impression of the building, rotating the seven slabs and connecting them together. He asked Van der Vlerk; '*Is this also allowed?'* (Provoost & Versnel, 2003, p. 272). This first discussion about the urban context and the orientation of the buildings is what started the design process. Maaskant personally was convinced that Rotterdam needed a larger scale building, he called it a *'schoolverzamelgebouw'* or '*collection of educational buildings*', instead of a collection of small buildings that should be built in a rural area, not something for the city of Rotterdam ("Ik ben een rustig mens", 1971). The building had to house-hold eight

different educational ‘buildings’. This first development became crucial in the success of the design later on. As mentioned earlier in this thesis, in the late 1960s and early 1970s ‘*school clusters’* became popular in the world of educational architecture in the Netherlands.

The scale of the project became larger and larger over the years. During the development of the design, the assignment for Maaskant became more complex as well. With the boom of the Dutch population after the Second World War, the demand for educational buildings grew as well (Schuyt & Tavarne, 2000, p. 223). Especially in Rotterdam, which had been bombed heavily during the war. The stakes of the project rose when during the design process more and more stakeholders got involved and influenced the project (Provoost & Versnel, 2003, p. 272).

Urban explorations.

At the start of the design process in April 1956, Maaskant’s architectural office made five schematic plans to explore the urban magnitude of the project, (see figures 2-6, (*HNI archive*, MAAX3093.1). Because of its shape and magnitude, the urban design was crucial for the further development of the project.

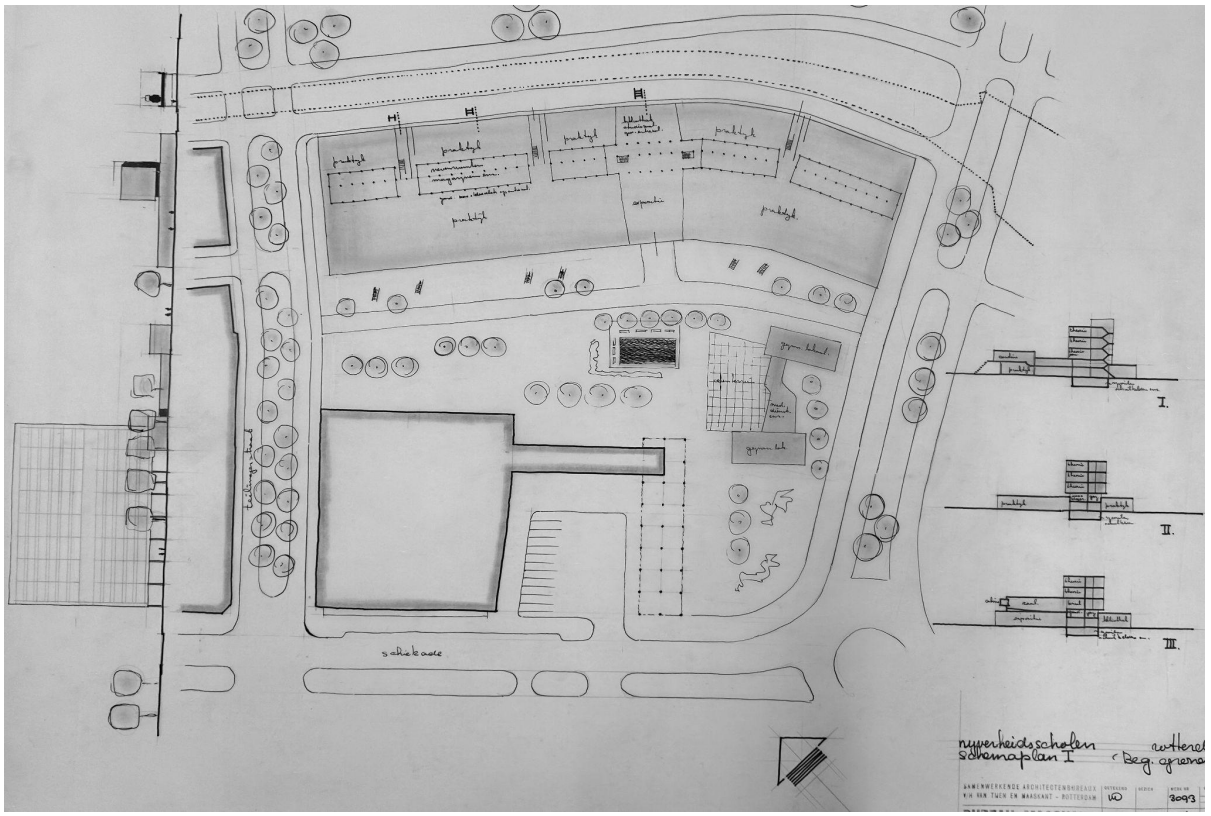

Figure 2: Schematic plan I for the urban context, by architectural office Maaskant, 1956. (source: *HNI archive*, MAAX3093.1).

In the first schematic plan by the architectural office Maastkant drawn in 1956, (see figure 2, (*HNI archive*, MAAX3093.1) the main building is developed from the seven separate buildings, as presented by Van der Vlerk and his urban designers in 1955, into one five-story high slab with a slight

curve. This resulted in the separation of the education complex from the northeast side of the urban context, creating an urban square typology on the southwestern side of the building. This square would be accessible from two directions, creating a passage where people could meet and interact with each other. The entrances towards the building are mainly located on the northeastern side of the building, with one exception with the main entrance, which is also accessible from the southwest, linking the building with the square and passageway. A separate building located on the south-eastern side of the complex contains the sporting facilities for the different schools, with a free-flowing shape also orientated towards the public square.

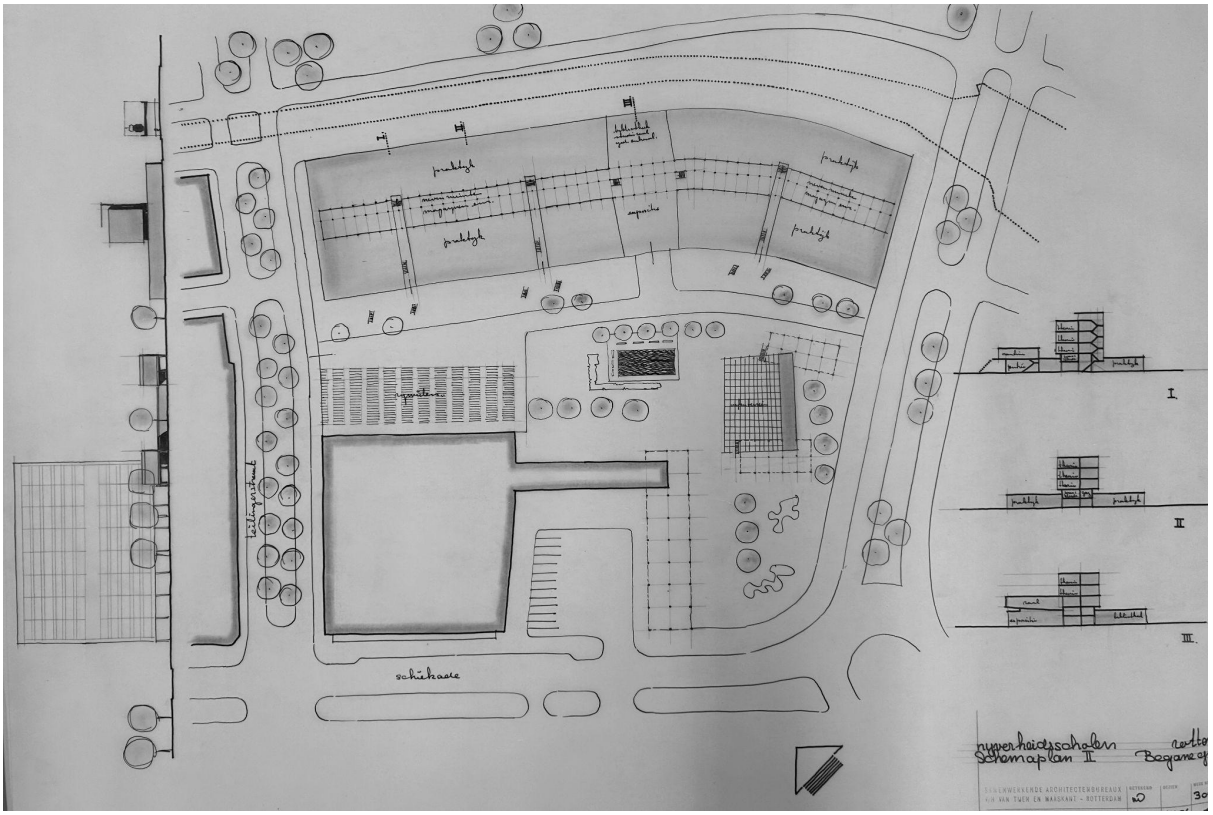

Figure 3: Schematic plan II for the urban context, by architectural office Maaskant, 1956. (source: *HNI archive*, MAAX3093.1).

The second variation of the schematic plan by the architectural office Maastkant drawn in 1956, (see figure 3, (*HNI archive*, MAAX3093.1) continues from the first schematic plan. One of the alterations is the locations of the entrances, which are now located on the southwestern facade, orientated towards the public passage and square, instead of the north-eastern facade displayed in the first plan. The functions of the building stay in the same place, but the separate building that contains the sporting facility changes from a free-flowing to a linear approach. The further development on the urban level articulates the addition of storage for bicycles.

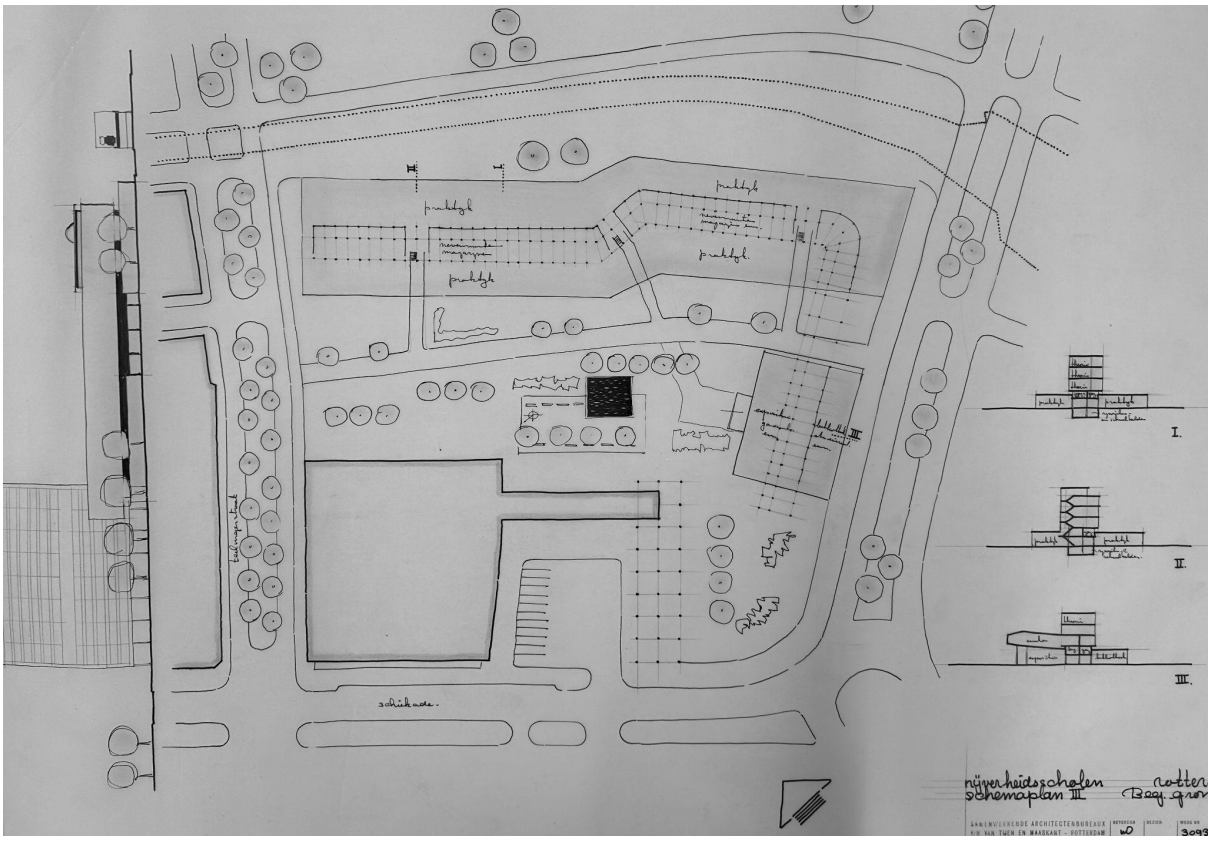

Figure 4: Schematic plan III for the urban context, by architectural office Maaskant, 1956. (source: *HNI archive*, MAAX3093.1).

For the third variation of the schematic urban design, Maaskant took a different approach (see figure 4, (*HNI archive*, MAAX3093.1). The contour of the building mass changes drastically, from a fluent curvature-like approach of the first two plans towards an angular approach. The formerly separated building on the southeastern side of the complex gets included in the main structure, with a central access system connecting the whole building. Functionally, this newly integrated part changes as well. The area was formerly dedicated to sporting facilities but is now transformed into a library, auditorium, and exhibition hall. As a result of this addition, to access the complex from the south-eastern side, people have to walk under the building which creates a different perspective from the outside. Where previously the public could flow fluently through the complex via the passageway and public square, the visible barrier changes this narrative into a more private one.

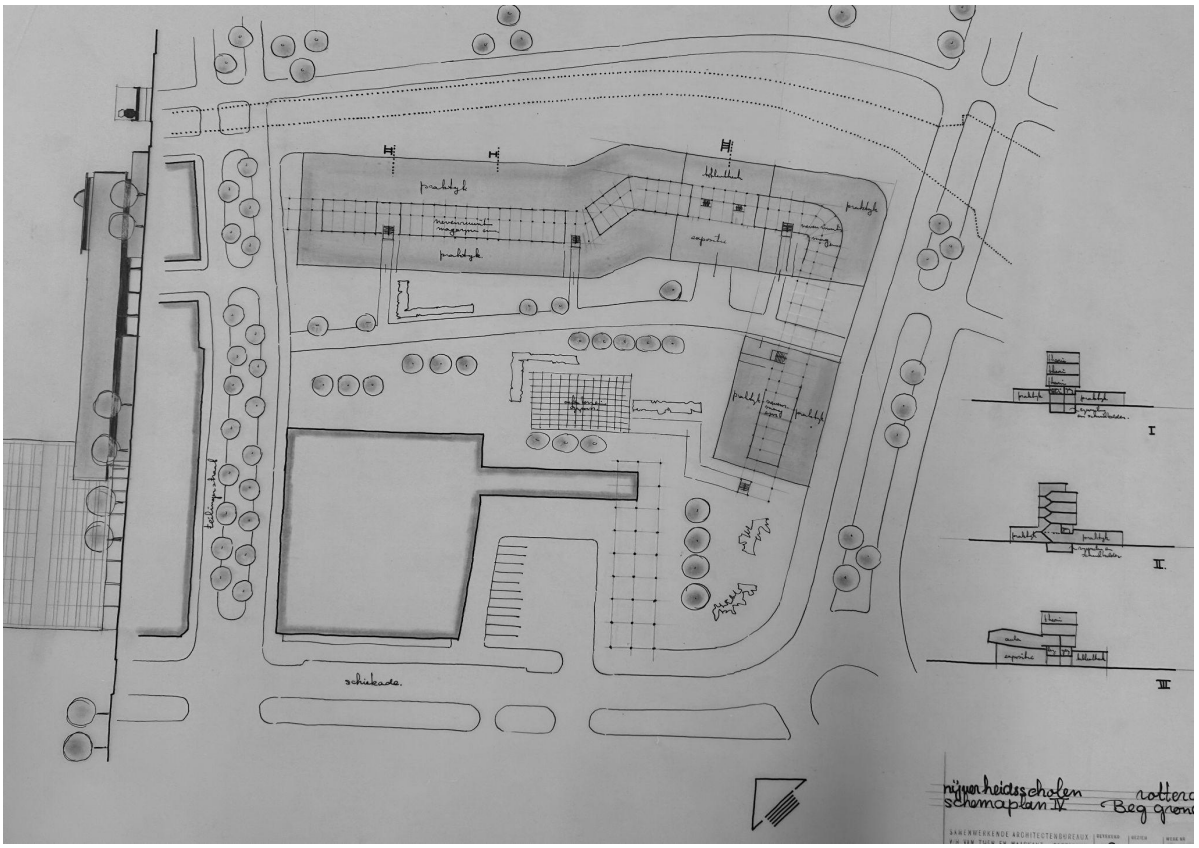

Figure 5: Schematic plan IV for the urban context, by architectural office Maaskant, 1956. (source: *HNI archive*, MAAX3093.1).

Architectural office Maaskant drew the fourth schematic urban exploration in 1956 which is a different variation of the angular approach of plan three (see figure 5, (*HNI archive*, MAAX3093.1). The overall shape of the building mass stays identical, but the corners and edges are more fluent. The curvature-like approach of the first two plans is applied to the current angular approach. Another interesting alteration is the placement of the library, auditorium, and exhibition hall. These functions changed location throughout the different schematic plans, with the current proposition similar to the first two variations facing the square.

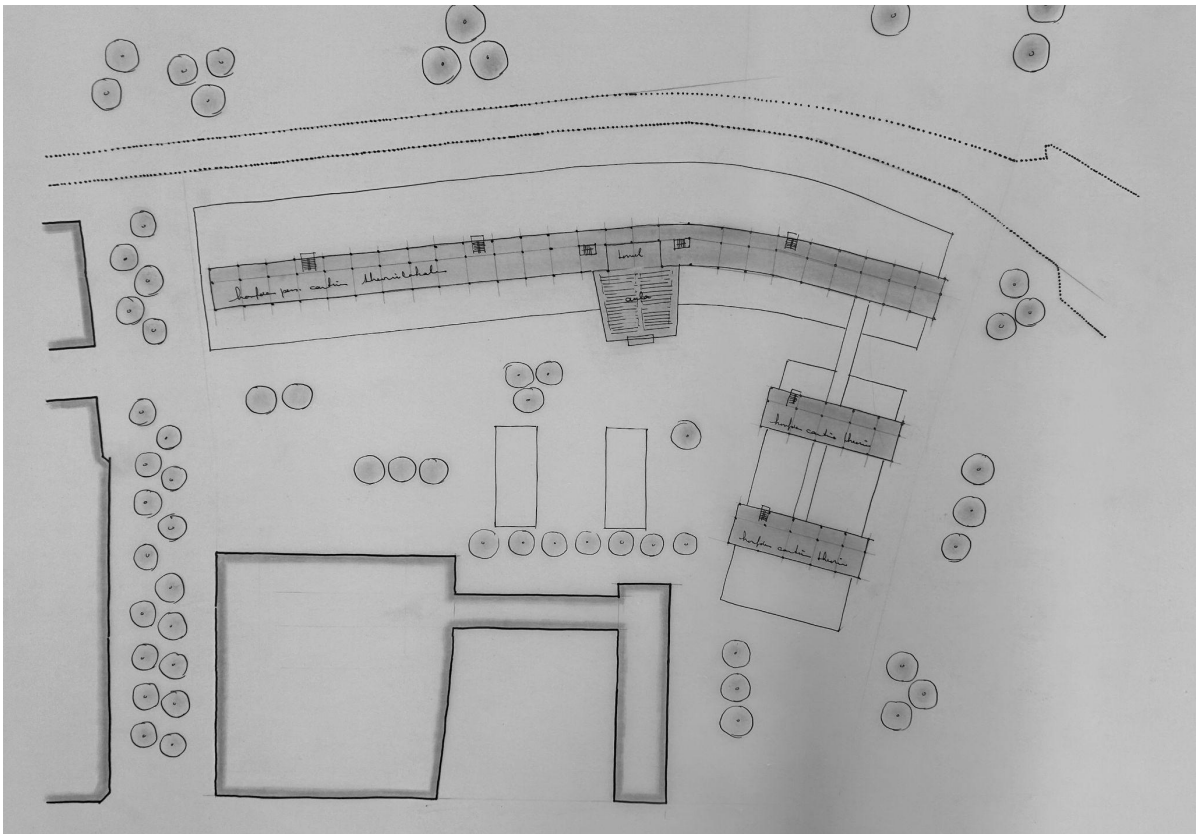

Figure 6: Schematic plan V for the urban context, by architectural office Maaskant, 1956. (source: *HNI archive*, MAAX3093.1).

The fifth and final schematic urban plan highlights the connection between the two different buildings via a bridge, arguably merging them into one (see figure 6, (*HNI archive*, MAAX3093.1). However, the building shape goes back towards the curvature approach, with the inclusion of the newly added building on the southeastern side of the complex. The auditorium, together with the library and exhibition hall on the ground floor, becomes the centre point of the building. Traces of the original urban plan made by the urban developers of Van der Vlerk and presented to Maaskant in 1955 are found in the added building in the southeastern part of the complex. The orientation of the building above the ground floor is parallel to the main structure, creating the different slabs Van der Vlerk talked about. This final variation of the urban schematic plan was the plan used for the further development of Technikon.

Further development.

After the five different schematic urban explorations, the requirements for the buildings got expanded. In November 1956, the number of square metres increased which resulted in the fact that the building went from the original five stories to seven. All non-educational functions had to be clustered in one place as well (Provoost & Versnel, 2003, p. 273). With this change, the characteristic mid-rise 200-metre-long slab was born.

During the building phase in early 1963, the different schools had grown heavily over the last few years, requiring further expansion. In the current situation, if the building was finished, it could only manage five of the eight different schools. To tackle this issue, the building on the eastern side of the complex had to be restructured and built at the same time as the main building. In the original plan, this building was part of an extension project, later down the line. Besides, the main building got restructured, which was possible due to one main design principle Maaskant implemented from the start, an open floor plan. He discovered this principle from factory buildings which allowed him to alter the floor plans at a later moment in the design- and building process (Provoost & Versnel, 2003, p. 274). He managed to do this by placing the constructive elements on the outside of the facade, which also characterised the expression of the architecture as a whole. At the end of 1963, the building costs exceeded the calculated amount, which resulted in a dull period of over a year without any progress on the physical building front. This intermission allowed Maaskant to further develop the project. Multiple alterations of the different classroom layouts were designed and discussed, with the changing demand of the eight different schools almost changing by the day. In 1964 the building phase continued, with the final modification to the auditorium in 1966. The municipality of Rotterdam asked Maaskant to redesign the auditorium to also simultaneously function as a public theatre (Provoost & Versnel, 2003, p. 274). In May 1970, Technikon was officially opened for use, 15 years after the first discussion.

Meeting in Technikon.

In this part of the chapter, the principle of meeting in Technikon will be discussed. To do this, a distinction is made between the main building and the urban context of the Technikon complex. For analyses of the inside of the building, two different aspects will be discussed. Firstly, the sequencing of classrooms by the use of the corridor typology. Second, the different functions within Technikon, such as the auditorium, library, and entrances.

Classrooms.

A characteristic feature of the Technikon building is the sequencing of classrooms (see figure 7, (*HNI archive*, MAAX3093.3). Due to the fact the building shape is long and narrow, each classroom was connected to the next, creating a chain of rooms. Another reason for the placement of classrooms came from the building regulation at that time. In 1955, classrooms needed to be able to get daylight from at least two different directions, as well as be able to be ventilated from two directions (Provoost & Versnel, 2003, p. 274). The only possibility for access in this typology was the use of a corridor system. The extra functions, such as toilets, stairs, and elevators were placed on this side as well. Because of this characteristic way of connecting classrooms, a lot of space is dedicated to the access system. Typically a corridor typology invites people to move from one space to another. However, Maaskant designed multiple places within the corridor where students can meet each other in between or after their classes, creating an interesting relationship between the inside and the outside of classrooms.

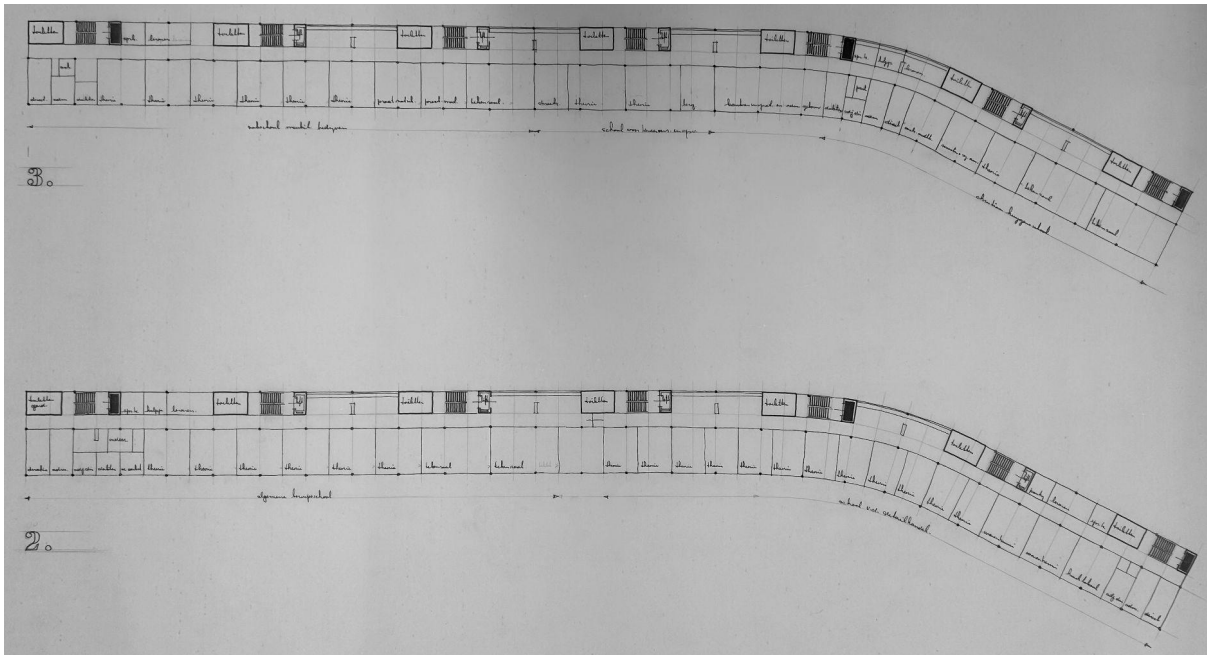

Figure 7: Sequencing of classrooms with corridor-typology, by architectural office Maaskant, 1956. (source: *HNI archive*, MAAX3093.3).

This almost endless line of classrooms got divided into the different ‘school buildings’ (see figure 8, (*HNI archive*, MAAX3093.3), with each school getting its own colour in the sketches by architectural office Maaskant to make a distinction between them. Moreover, each ‘building’ had its own entrance with a staircase and elevator, as well as access to its own sanitary facilities. The different schools could be indirectly accessed via a door to the neighbouring school, allowing students to roam within

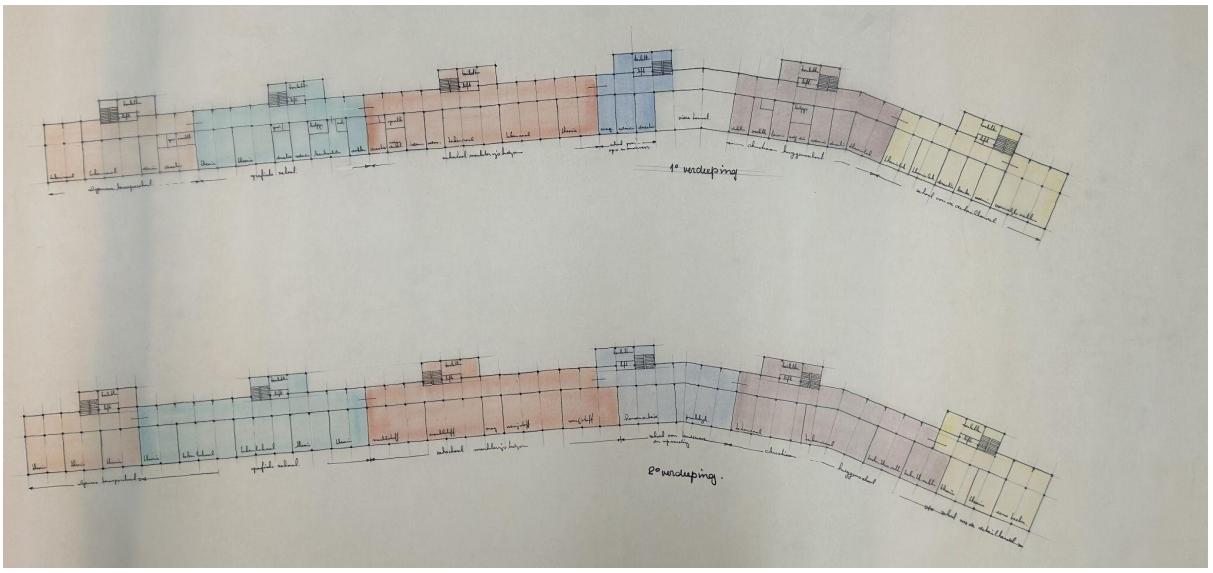

Figure 8: Different ‘school buildings’ articulated by colour, by architectural office Maaskant, 1956. (source: *HNI archive*, MAAX3093.3).

multiple schools. This feature allows further interaction between students and teachers from different schools, as well as a secondary exit in case of emergency. The initial idea for creating a *'schoolverzamelgebouw'* or '*collection of educational buildings*' can almost be identified as one massive school with different education typologies.

Auditorium or theatre.

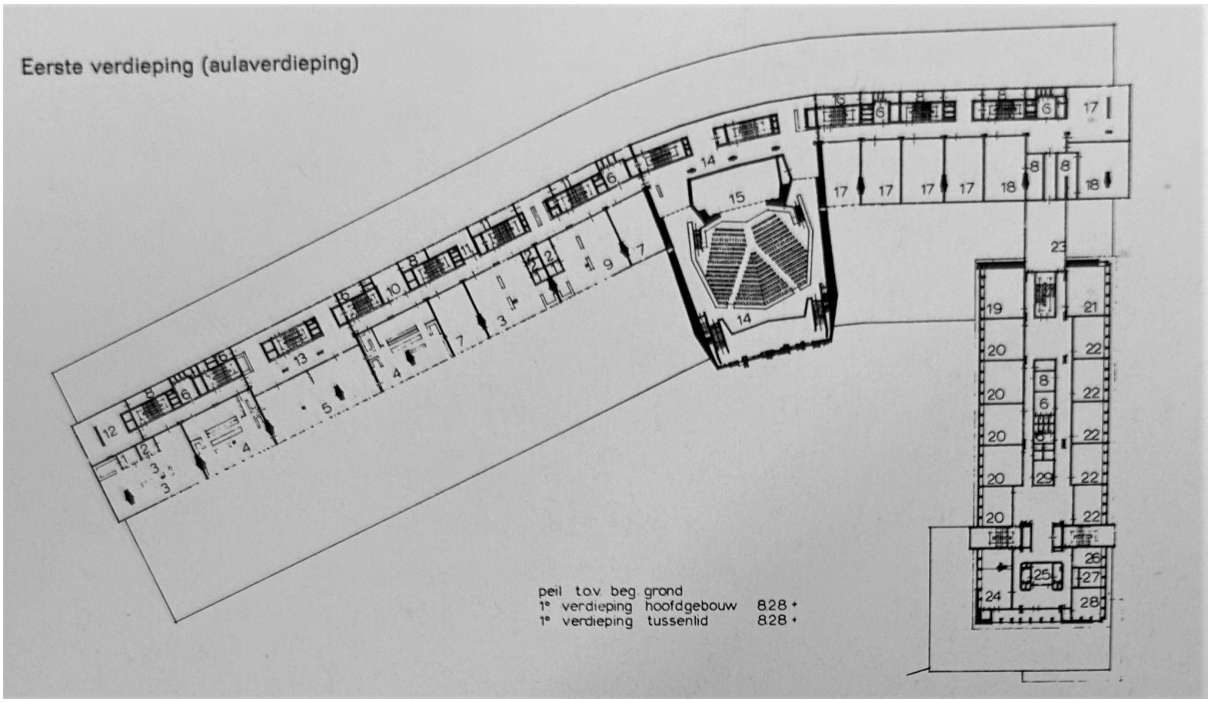

Figure 9: Floor plan of the first floor, with auditorium or theatre. Realised project 1970. (source: Provoost & Versnel, 2003, p. 284).

In the original list of requirements for the Technikon complex, an auditorium was one of the extra facilities the building had to offer (Provoost & Versnel, 2003, p. 273). Since more stakeholders got involved during the design phase, the scale of the project expanded. Where previously the auditorium would only function for its educational meeting purposes, it now had to function as a public theatre as well. This transition changes the narrative of this part of the building from the private to the public domain and affects the way people meet and interact with each other and who meets with who. Where in the original plan the space was oriented towards students and teachers, now the space is catered towards a larger diverse audience. The theatre is located on the first floor of the building (see figure 9, (Provoost & Versnel, 2003, p. 284), at the centre point of the building, and can be accessed via the elevator or stairs. The foyer of the theatre is located underneath the auditorium, which also functions as the exhibition hall and has entrances to two different 'school buildings'. During the day this space served an educational purpose for the schools, whereas at night the space served a cultural one.

Entrances.

Due to the urban explorations described earlier in this chapter, a central square was designed in the middle of the Technikon complex. Interestingly, only two of the eight schools did not have their entrance directly connected to this square, one on the north-western side of the complex and one on

the south-eastern side. The remaining six are spread out over the square, with two of them inside the exhibition hall or foyer (see figure 10, (Pietsch et al., 2018). Some schools did not have classrooms on the ground floor, creating an interesting way of entering the building. These corridors are narrow and serve only as access space, barely allowing any chance of interaction. In contrast, the schools that have educational spaces on the ground floor each have their own 'hall' or 'hallway'. These spaces connect the entrance to the classrooms and allow students to interact and meet with each other before and after classes.

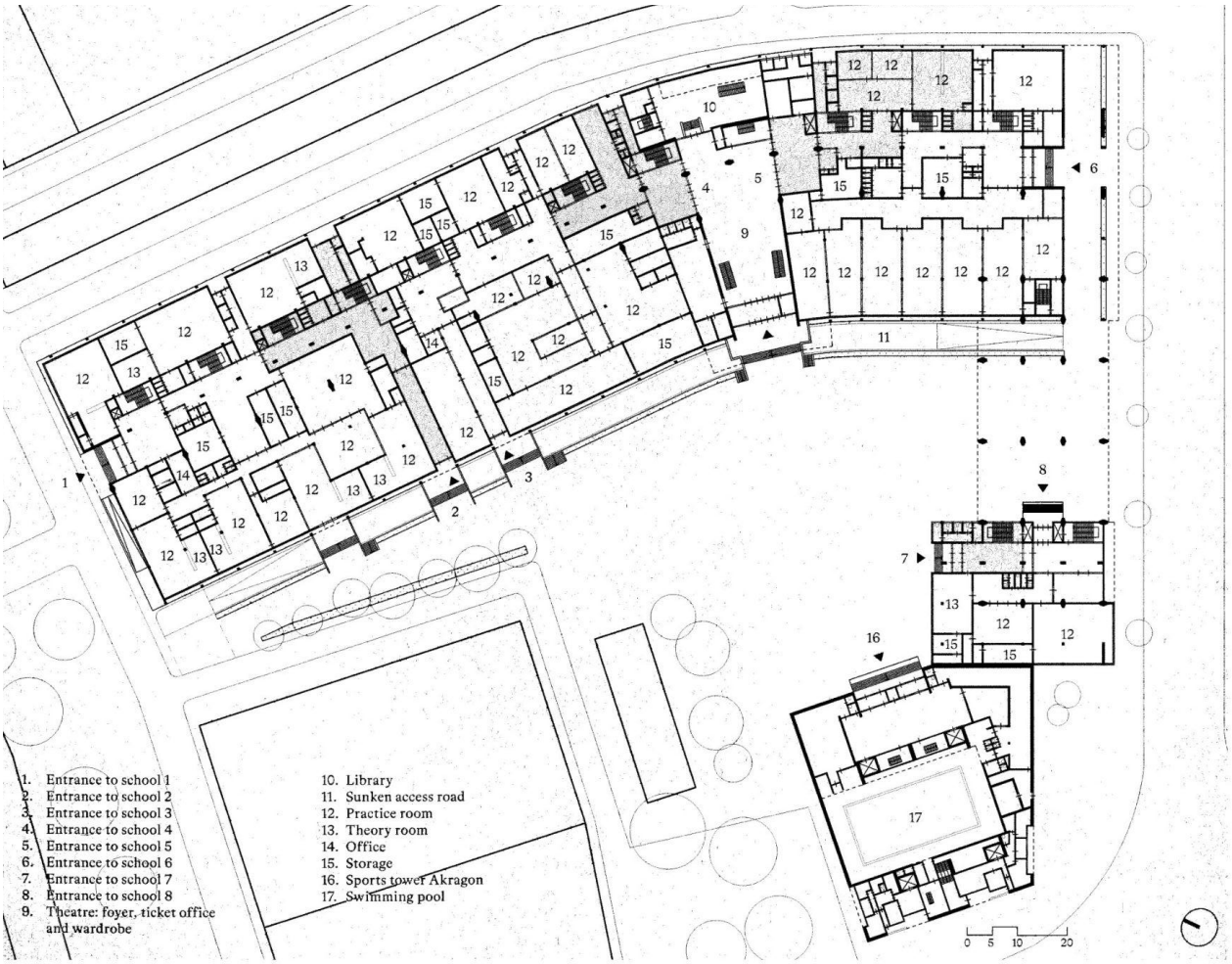

Figure 10: Ground floor plan Technikon complex, current situation. (source: (Pietsch et al., 2018).

Urban domain.

The urban square has a multifunctional use, as it served as the outdoor space for the eight different schools due to its location in the centre of Rotterdam. At the same time, the square served its public surroundings via the road underneath the Technikon and the passageway on the southeastern side of the complex (Pietsch et al., 2018). Because of the fact that eight different schools shared the same square, the interaction between students and teachers from the different schools became possible, which makes this square different from other schoolyards in the Netherlands.

3. Case study II: ‘t Karregat by Van Klingeren, Eindhoven, 1973.

This chapter will be divided into two parts. The first part will discuss the *architectural experiment* by the architectural office Van Klingeren, and the second part will delve into the theme of this thesis; *meeting in ‘t Karregat.*

Architectural experiment.

During the early ‘70s, the city of Eindhoven expanded with a new neighbourhood called ‘Herzenbroeken’. Located in the eastern part of the city, this newly built neighbourhood was a residential area where new ideas about living and social interaction were implemented (Van Zwet, 1973, p. 1581). As part of the neighbourhood, a multifunctional community centre would be constructed as its focal point (see figure 11, (Bureau Documentatie Bouwwezen, 1973, p. 1604). ‘T Karregat had to be in line with the rest of the neighbourhood and was constructed in the same timeframe as most of the circa 1700 dwellings. The municipality of Eindhoven and contractor Amro-Westland/Utrecht, the two main stakeholders in this project, contacted the architectural office Van Klingeren in 1969 about the project. During the discussion, the municipality mentioned to Van Klingeren that the community centre had to be multifunctional, which in their perspective would fit the new neighbourhood perfectly (Van Zwet, 1973, p. 1581). Multifunctional was an understatement because the community centre eventually contained a supermarket, five convenience stores, a café or restaurant, a health centre, a library, 18 classrooms for primary education, 9 classrooms for secondary education, a gymnastics room for the schools, communal areas and several different conference rooms (Van Zwet, 1973, p. 1588).

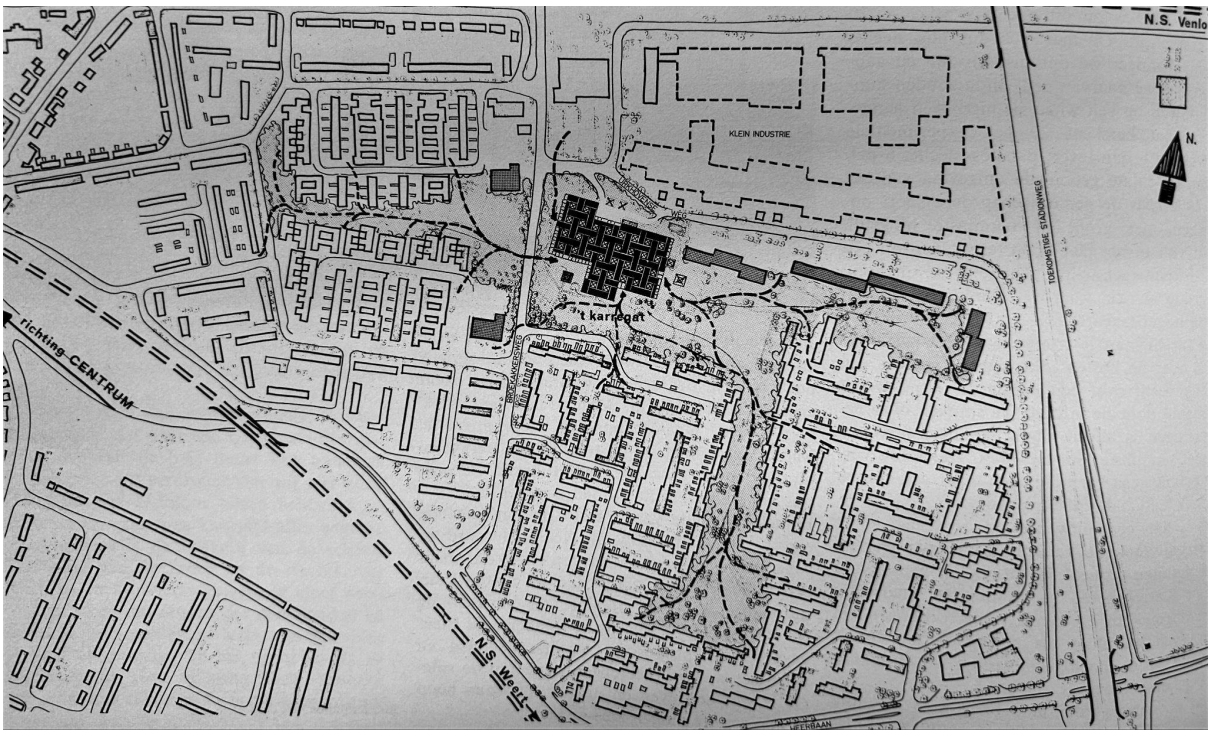

Figure 11: Situation drawing of ‘Herzenbroeken’, 1973. (source: Bureau Documentatie Bouwwezen, 1973, p. 1604).

During an interview after the opening of ‘t Karregat in 1973, Van Klingeren explained the design process with the first initial ideas about the project (Bureau Documentatie Bouwwezen, 1973, p. 1601). Originally, the contractors wanted a shopping centre with extra functions, such as a community centre and church. In the same timeframe as the first discussion about what ‘t Karregat exactly should be, Van Klingeren was inspired by American and Canadian colleagues about the notion of half-open schools. He explained in the interview that he did not know who mentioned the word ‘school’, but it changed the project drastically (Bureau Documentatie Bouwwezen, 1973, p. 1601). From that point onwards, ‘t Karregat was a building for culture, trade, and education, all under the same roof. When brainstorming with his colleagues of the architectural office, they agreed that the building had to have an open floor plan, where the individual pieces could be easily moved or changed in size depending on the circumstances. In their first sketches, this idea of an open floor plan further develops into the principle of ‘no walls’ (see figure 12, (*HNI archive*, KLINd12). He later referenced this design principle as an ancient city, where the streets are the connecting elements for interaction and meeting between the residents (Bontekoe, 1973, p. 1590).

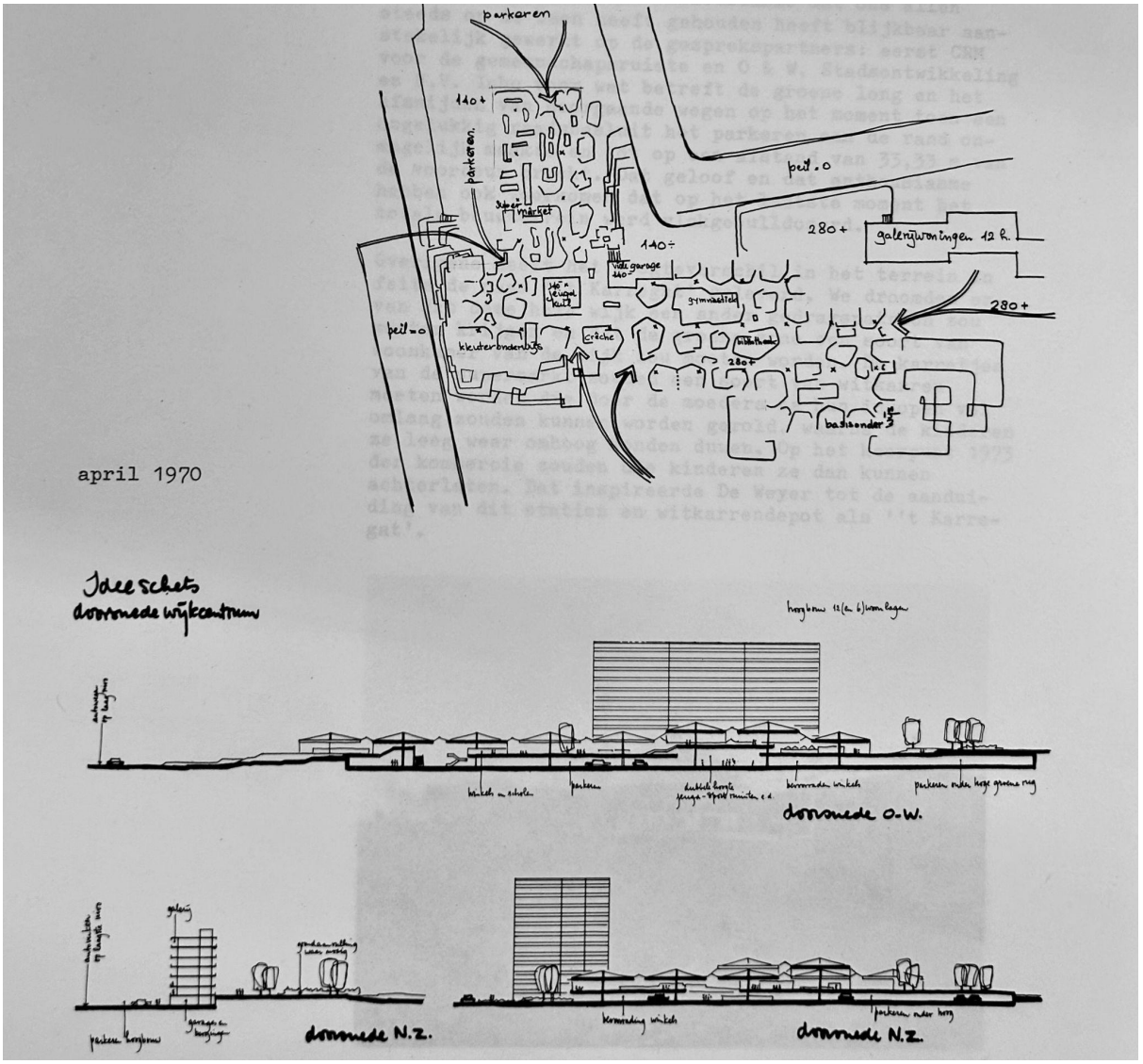

Figure 12: Initial idea sketches, by architectural office Van Klingern, 1970. (source: (*HNI archive*, KLINd12).

The sketches barely have any outside walls, with a multitude of objects of different shapes and sizes, scattered around the premises. The only clear division of spaces can be distinguished by the different levels, where the lower level is dedicated to parking. Moreover, the building had to be cheap, without ornaments, and be able to be built quickly with the expansion of the neighbourhood. Because of the fact that the building would possess local schools, the building started construction in September of 1972. With hosting the first classes in August of 1973, the construction process only took 11 months.

Educational facilities.

As for the educational facilities, the design principle of the open floor plan without many walls would heavily influence the notion of education. As mentioned earlier in this chapter, ‘t Karregat rested on the search for different perspectives. Both in an architectural sense and an educational one.

Van Klingeren had a different perspective on both. The architectural intervention of the open floor plan without walls would in his perspective create new possibilities for education (Bureau Documentatie Bouwwezen, 1973, p. 1602). Where normally a parent had to wait for the closed fence to pick up their child after school, with this new perspective, the parent could wander through the school during their grocery shopping. Besides, this stimulates the interaction between the parent and the teacher during classes, something that was never done before (see figure 13, (*HNI archive*, KLINd12). In Van Klingeren’s sense, he wishes that this type of education would invite the parents and local residents to help in the growth of the students (Van Zwet, 1973, p. 1582). For example, teaching maths, where students can meet the local supermarket owner and learn to add different groceries together. Or the interaction between sixth years and second-year students, where the sixth years would help teach the second years in certain subjects, allowing them to progress as well.

Figure 13: Mother watching over the students during class. 1973. (source: (*HNI archive*, KLINd12).

Renovation.

Even before the completion of the building, renovation plans were already discussed for several aspects (Zwinkels, 1981, p. 56). Because of the hurry to finish the building before the start of the new school year in September 1973, the acoustic regulations would take place after the opening. Sound-absorbing panels were placed on the roof to reduce the background noise throughout the building. However, this approach turned out to be disastrous. From the opening onwards, teachers did not know how to approach this kind of teaching environment. The continuous background noise without the possibility to create artificial silence led to several complaints by the teachers.

A major error was made in the regulations for education in ‘t Karregat. The Association for Educational Surveillance had given only temporary approval for the educational aspects of the building. However, the building process started anyway (Bontekoe, 1973, p. 1590). After the completion of the building, the association gave a one-year permit to ensure the opening of the schools in 1973. With the rising complaints by the teachers, the Association for Educational Surveillance refused to approve the building for educational purposes. This urged the need for transformation and resulted in a renovation process of the educational facilities only a year after opening, starting the renovation in 1978. Interestingly, it was never proven that the current system had any negative impact on the students (Zwinkels, 1981, p. 56).

The renovation of the educational facilities transformed this part of ‘t Karregat drastically. Where previously openness was the catalyst of the building, now the schools are ‘sheltered’ and hidden behind brick and foldable walls in the southeastern corner of the building (see figure 14, (Zwinkels, 1981, p. 57). The leading architect of the renovation, Tielemans, explained in a conversation between Zwinkels and himself that ‘*Men wanted to go back to the traditional style and structure’. However, there still had to be possibilities for openness, resulting in foldable walls’* (Zwinkels, 1981, p. 57).

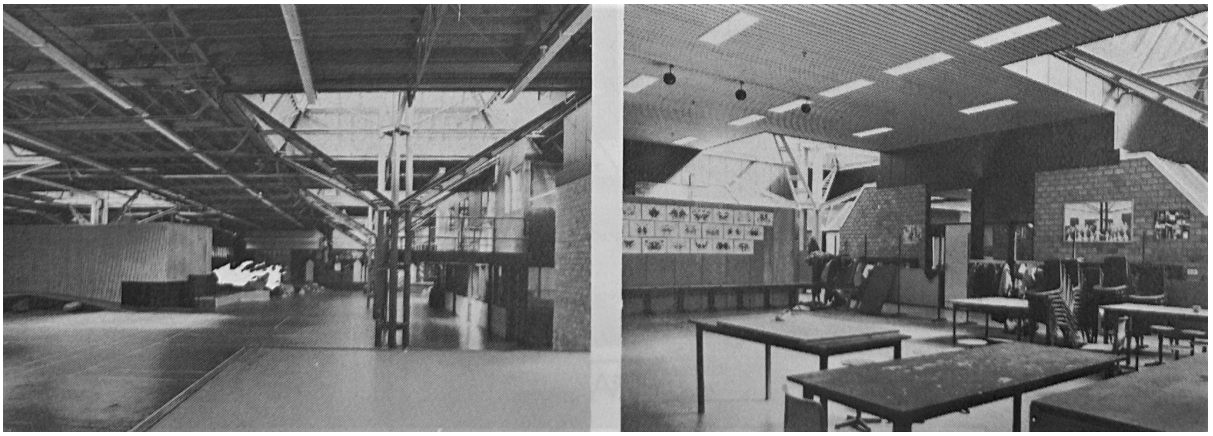

Figure 14: After the renovation of the educational facilities, 1981. (source: (Zwinkels, 1981, p. 57).

The commercial area of the building also experienced several issues throughout the first few years (Zwinkels, 1981, p. 57). One of these issues was the accumulation of dust. Because of the fact there were no walls and a high ceiling, the dust-inducing floor would leave traces throughout the building, making it difficult to clean. Another issue was the placement of sanitary facilities, within the realm of the supermarket. When it was closed, the visitors of the café had a difficult time accessing these

facilities. When in 1978 the educational part of the building started with its renovation, the contractor Amro-Westland/Utrecht responsible for the commercial part, decided to renovate their part as well. Architecture Group Noord took responsibility for the renovation, keeping the integrity of the original design by Van Klingeren but resolving the issues and altering the roof structure (Zwinkels, 1981, p. 59). With the renovations of both the educational and commercial areas matching the cost of the initial building process, in total 12 million guldens, ‘t Karregat got the nickname of ‘the most expensive living room’, overshadowing the project from this day onwards (Peters, 1981, p. 6).

Meeting in ‘t Karregat.

In this part of the chapter, the principle of meeting in ‘t Karregat will be discussed. To do this, a distinction is made between the educational- and the commercial areas. For the educational part, the open classrooms will be discussed, located in the southeastern part of the building. For the commercial part, the café, supermarkets, and library will be analysed, located in the north-western and middle parts of the building (see figure 15, (*HNI archive*, KLINd12).

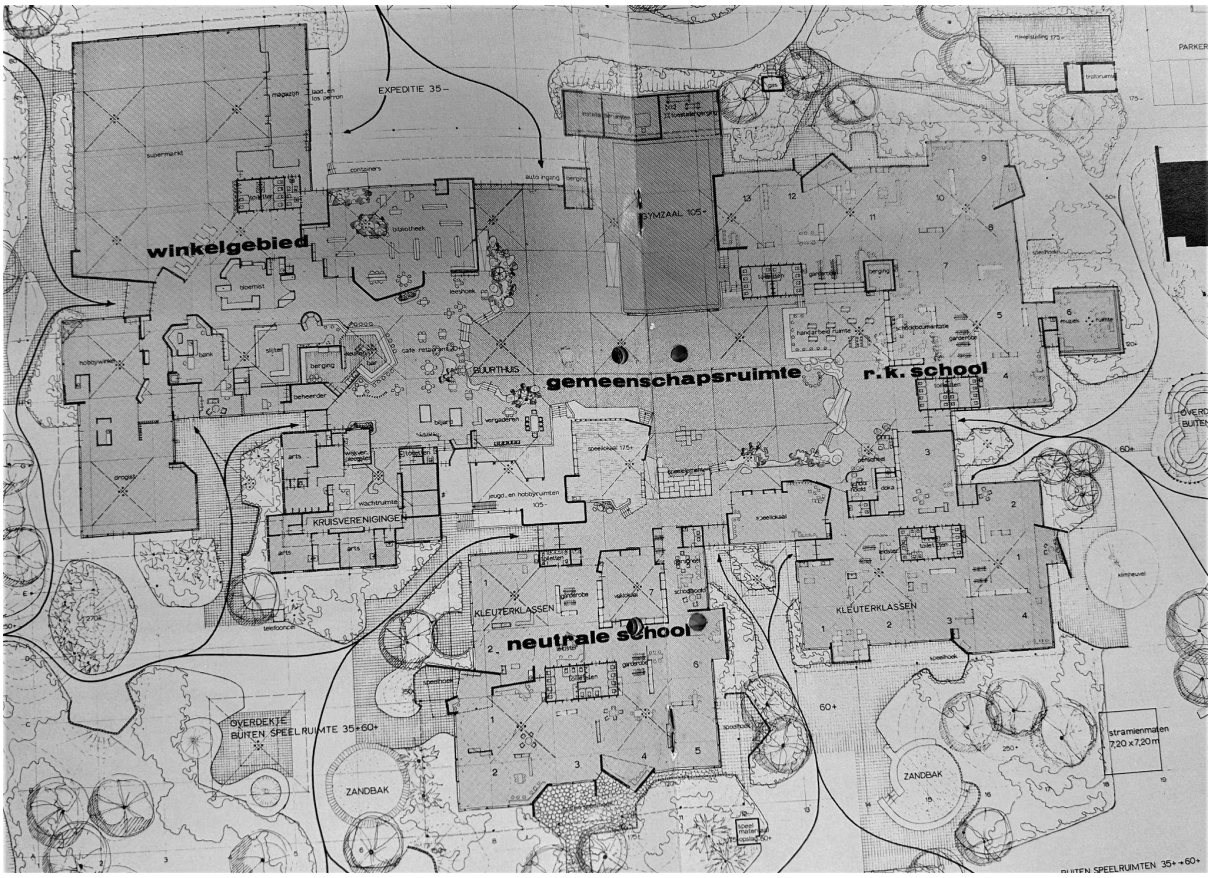

Figure 15: Floor plan of ‘t Karregat with different areas, 1973. (source: (*HNI archive*, KLINd12).

Open classrooms.

Several challenges emerged from the design principle of an open floor plan, containing no walls, regarding the aspects of classrooms. One could argue there are no ‘classrooms’, just one room divided into several spaces for each teacher or class. This feature allows interaction between different students, teachers, and even parents throughout the day, just like Van Klingeren envisioned (Van Zwet, 1973, p. 1582). To make sure sound would not be an issue, engineering office Van Dorsser was hired to calculate the acoustics of the whole building. For the educational area, a study was made, to visualise and calculate the effects of teachers talking to their students simultaneously in the same room. In the drawing (see figure 16, (*HNI archive*, KLINd12), the circle represents ‘the classroom’ with the arrow

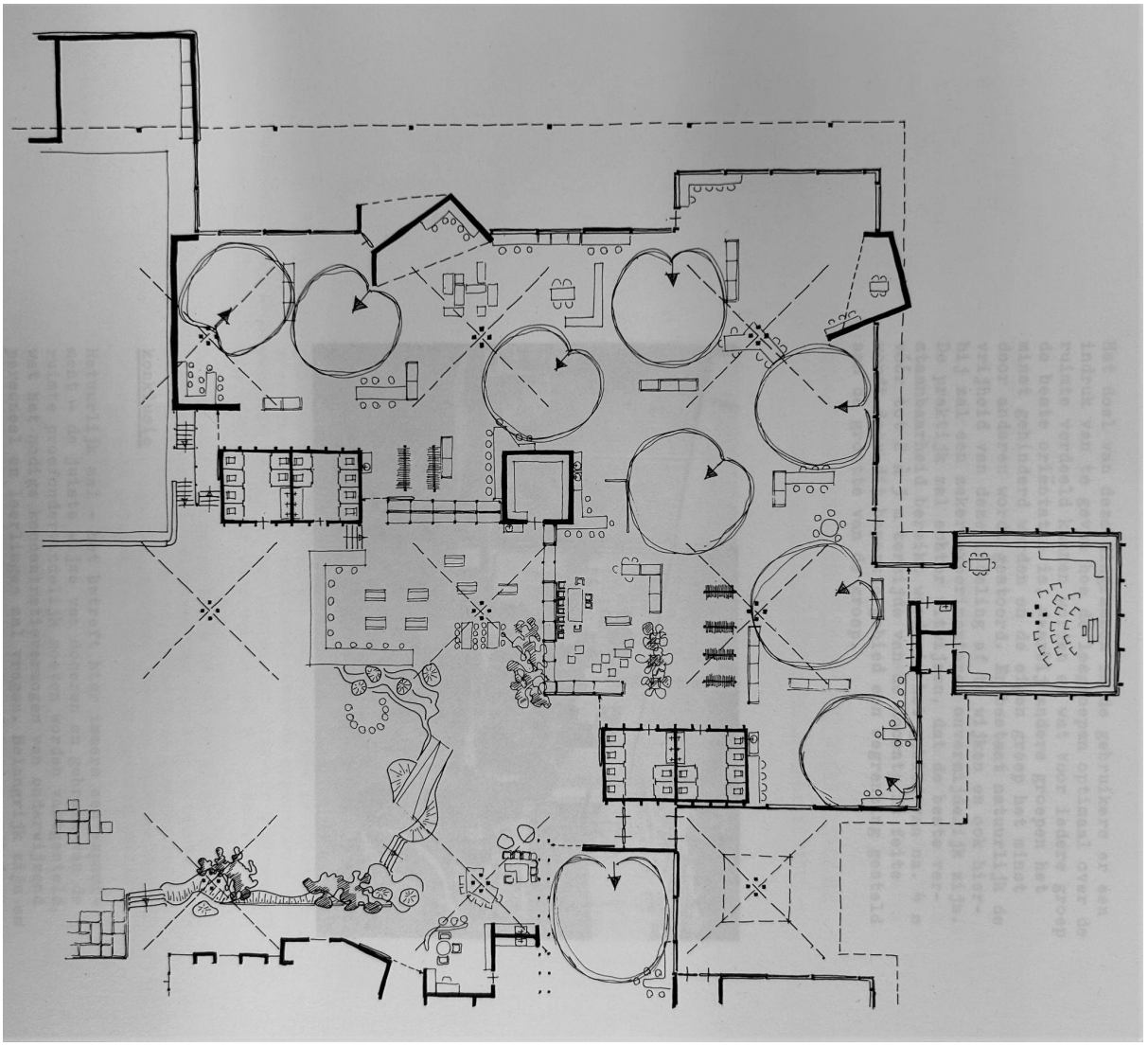

Figure 16: Floor plan of a school in ‘t Karregat, with analysis for acoustics, 1973. (source: (*HNI archive*, KLINd12).

illustrating the direction of the speaker. The total area was roughly 4 metres in depth, and 3 metres in width, representing the space needed for the sound to not interfere with the surrounding classes and only appear as ‘background noise’ (Zwinkels, 1981, p. 56).

As mentioned earlier in this chapter, this narrative did not work in the real world. Teachers did not know what to do with the background noise, unable to create artificial silence to enhance the interaction within the class. On top of that, the interaction between second-year students and sixth-year students did not work out the way Van Klingeren intended. However, a positive note contains the increase in interactions between parents and the classes. The parents felt more inclined to enter the school and watch the different classes, something that was not possible anywhere else in the Netherlands.

Commercial areas.

The commercial area contained the supermarket, bakery, pharmacy, medical centre, library, café, and convenience store, accessible from two entrances on the eastern side of the building. The centre point of the commercial area included the café and bar, where people sit and talk with each other, overlooking the open space (see figure 17, (*HNI archive*, KLINd12). Surprisingly, two functions that contradict each other in sense of interaction and sounds are placed next to each other, the café and library. Where the library evokes silence and is catered more to educational interactions, the café and bar do the opposite. The shops are placed close together, creating a ‘shopping area’ that becomes empty when closed. The placement of the medical facilities was experienced as unpleasant, with multiple complaints containing the fact that ill people had to wander through the shopping area and café to get to their location (Zwinkels, 1981, p. 58).

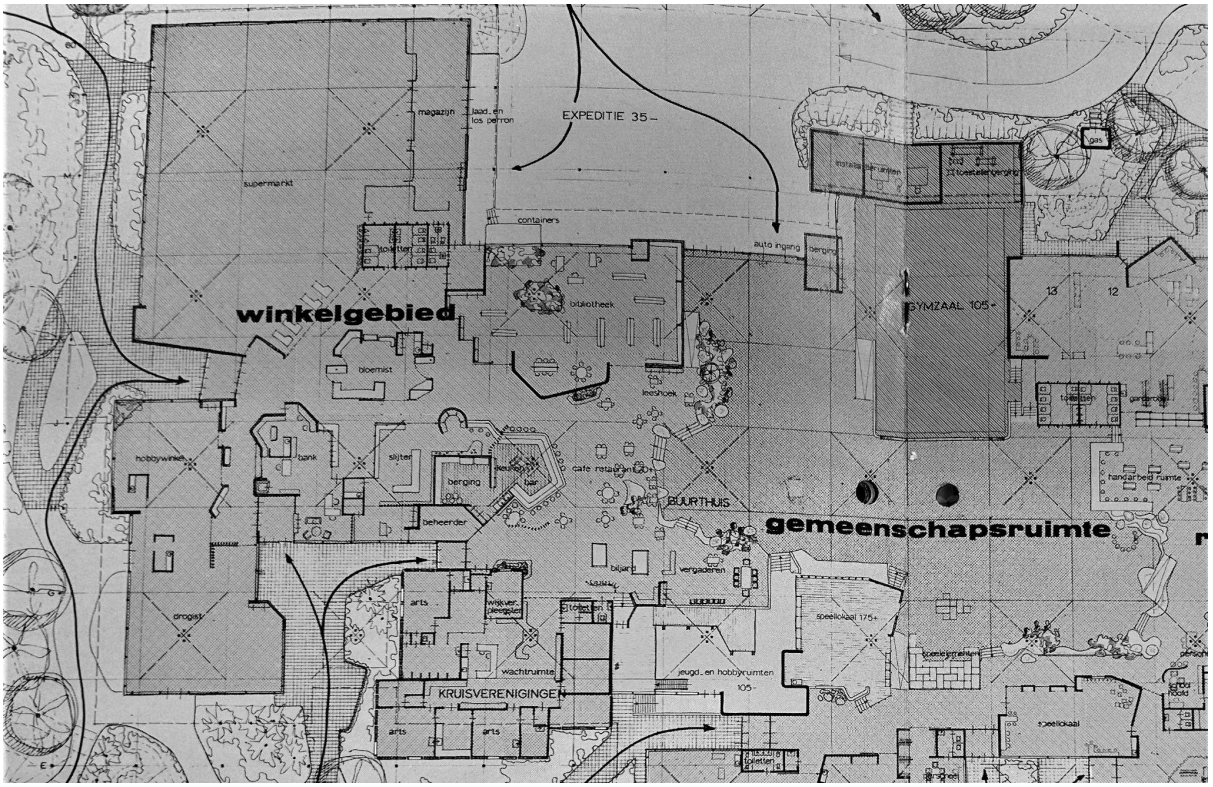

Figure 17: Floor plan of the commercial area in ‘t Karregat, 1973. (source: (*HNI archive*, KLINd12).

4. Case study III: Hendrik van der Vlist ‘school cluster’ by ir. Henk Dam and ir. B.F.A Dirkse, Utrecht, 1973.

This chapter will be divided into two parts. The first part will discuss the topic of *the collection of education* in the Hendrik van der Vlist ‘school cluster’ by architects ir. H. Dam and ir. B.F.A. Dirkse and the second part will delve into the theme of this thesis; *meeting in Hendrik van der Vlist ‘school cluster’.*

The **collection of education.**

The Hendrik van der Vlist was a newly designed educational cluster opened in 1973, dedicated to the collection of different levels of education. This building typology, called ‘s*cholengemeenschap*’ or '*school cluster*' was the result of the ‘*law for secondary education*’ in 1968. As explained in the first chapter of this thesis a *‘scholengemeenschap’* or *‘school cluster’* is a collection of schools ranging over different levels of education.

In 1963, ir. H. Dam and ir. B.F.A. Dirkse got the assignment from the municipality van Utrecht to create a new building, suitable for both traditional- and modern perspectives of education, usable for the neighbourhood, and with a capacity of circa 1800 students (Van den Bosch et al., 1980, p. 126). These students ranged from the age of four until eighteen years old, divided over a multitude of different levels of education, both in primary and secondary education. Since the building had to possess different levels of education, for example, lavo, mavo, havo, and vwo, the educational structure was crucial for the building to succeed. Two main typologies were discussed, one organised ‘vertically’ and one ‘horizontally’. The vertical structure contained the principle that each level of education, for example, all six years of vwo, got its dedicated section within the building. The horizontal structure is based on the principle of grades, where each year of education was placed together, regardless of the level of education, possibly stimulating the interaction and integration of the different levels of education (Van den Bosch et al., 1980, p. 116).

The notion of flexibility was another point of discussion. The municipality of Utrecht got the I.C.S involved, *‘Information Centre for School Buildings’*, because the Ministry of Education and Sciences had put out extra subsidisation for newly built case studies that would involve flexibility (Van den Bosch et al., 1980, p. 117). Reasoning for this implementation of flexibility was the idea that a flexible building would not need renovation or expansion when the educational programme of the school would change. The higher initial cost of the building would pay for itself through its value for the future (Van den Bosch et al., 1980, p. 123). As a result, ir. H. Dam and ir. B.F.A. Dirkse had to implement this notion in their design proposals, making the Hendrik van der Vlist ‘school cluster’ one of the first buildings that actively implemented flexibility in educational typology.

With this in mind, there are three design principles ir. H. Dam and ir. B.F.A. Dirkse used to design the building. Firstly, flexibility and adaptability. The building should be able to change and adapt if need be. Secondly, the clustering of subjects. Certain courses required certain facilities and should be placed near each other. The final design principle is the efficiency of space usage, reducing the amount of space needed for external usage, such as moving between classrooms (Van den Bosch et al, 1980, p. 122-123). Looking at the floor plans for the space dedicated to secondary education, (see

figure 18, (Van den Bosch et al., 1980, p. 119), ir. H. Dam and ir. B.F.A. Dirkse opted for the use of an open floor plan with columns as the main load-bearing structure. This allowed for flexibility and adaptivity while remaining their other two design principles. Both the first and second floors have the same layout, with the only alteration in the use of subjects, referring to the second design principle.

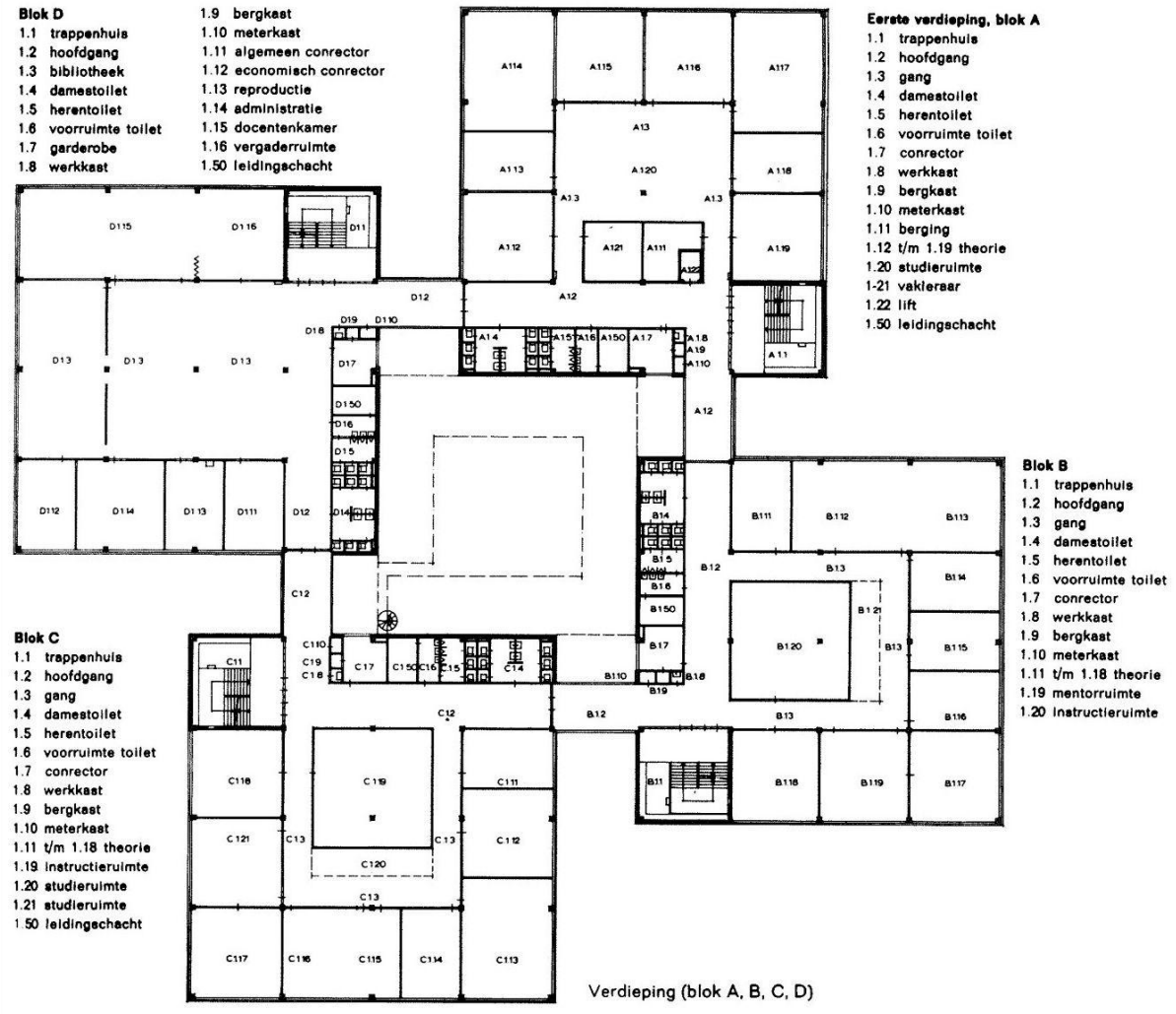

Figure 18: Floor plan of the first floor, 1973. (source: (Van den Bosch et al., 1980, p. 119).

Primary education is located in a different building, connected to the main building with a corridor. Just like the main building, the open floor plan principle is used, but the classrooms are irregular in size (see figure 19, (Van den Bosch et al., 1980, p. 119), catering to the use of the classroom. With the use of foldable- and removable walls, a high level of flexibility and adaptivity is integrated (Van den Bosch et al, 1980, p. 123). Interestingly, three entrances connect the inside with the outside. Each entrance articulates two grades, respectively first and second grade are clustered, third and fourth, and fifth and sixth. In addition, all classrooms have access to the central library and play areas, which can also be transformed into multifunctional usage. Together, the building articulates a '*houselike character*' and is adjusted towards the psychology of the child (Van den Bosch et al, 1980, p. 125).

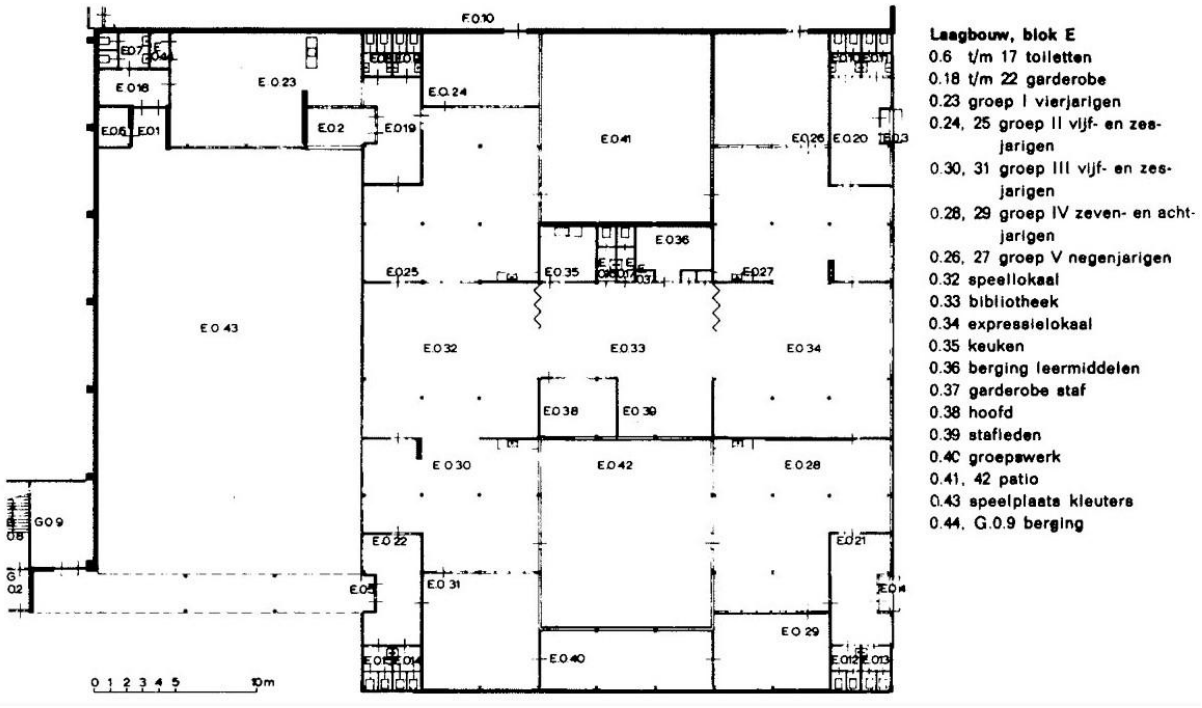

Figure 19: Floor plan building for primary education, 1973. (source: (Van den Bosch et al., 1980, p. 119).

Meeting in Hendrik van der Vlist 'school cluster'.

In this part of the chapter, the principle of meeting in the Hendrik van der Vlist 'school cluster' will be discussed. To do this, a distinction is made between the primary- and secondary educational areas. For primary education, the narrative about multifunctional communal areas will be analysed. For the secondary educational area, the analysis will be divided into two sections, one about the ground floor, and one about the first and second floors.

Multifunctional communal area in primary education.

As discussed in the previous part of this chapter, the primary educational area is located in a separate building. Because of the high level of flexibility and adaptivity within the building, through the implementation of foldable- and removable walls, possibilities to open up classrooms and other educational spaces, such as the library, arise to create a larger multifunctional communal area (see figure 19, (Van den Bosch et al., 1980, p. 119). This allows for the different age groups to interact and learn with each other, instead of separating them permanently. The playground next to the building is only accessible for students between four and twelve, resulting in a safe space for them to play and meet with each other, further enhancing the notion of '*houselike character*' described by C. van den Bosch (Van den Bosch et al., 1980, p. 125).

Where there are possibilities for meeting on a larger scale, there are also possibilities for meeting on a smaller scale. The different grades with their respective ages, grade one and two with the ages of five and six, grades three and four with the ages six and seven, continuing onwards, are clustered together into multiple smaller sections of the building. These sections contain a classroom dedicated to personal instructions and a larger classroom dedicated to group interactions and individual work (Bureau Documentatie Bouwwezen, 1971, p. 259).

Sitting together.

The ground floor features the main communal area for students and teachers of secondary education, the *'zitkuil'* or '*sitting pit'* (see figure 20, (*Het Utrechts Archief,* 802929). This square-like area is also referred to as the 'agora' or 'forum' of the building, where *'all residents of the building'* can meet and interact with each other (Van den Bosch et al, 1980, p. 125). The pit consists of six rings high enough to sit on, giving space to over 500 students (Bureau Documentatie Bouwwezen, 1971, p. 258). For entertaining purposes, the sitting area has also the possibility to transform into the theatre of the school, almost creating an amphitheatre-like experience.

Figure 20: *'Zitkuil'* or '*Sitting Pit*' on the ground floor, secondary education, 1973. (source: (*Het Utrechts Archief, 802929*).

When looking further into the floor plan of the ground floor, the canteen is considered too small for the scale of the building (see figure 21, top left D.012, (Van den Bosch et al., 1980, p. 121). Because of the near location of the '*sitting pit'*, it also features as the external sitting area for the canteen, making it a multifunctional meeting area. Because of this narrative of multifunctionality, the space has an informal and playful character (Van den Bosch et al, 1980, p. 125). Also connected to the centre square is the 'Art Block', with a multitude of classrooms ranging from subjects such as music, creating plays, drawing, and housekeeping. Just like the canteen, the centre square is used for practice during class or to perform for a small audience.

Communal study space.

From the centre seating area, four staircases ascend towards four different blocks of education, blocks A, B, C, and D. Each block contains two stories and has its specific subjects or functionalities. Within the centre of each block, a communal area is located, dedicated to group teaching and studying (see figure 18, (Van den Bosch et al., 1980, p. 119). Since this area is located in the middle of the block, there is no access to natural ventilation and daylight, making them vulnerable to its use. However, the design principle by ir. H. Dam and ir. B.F.A. Dirkse to increase the efficiency of space usage, leading to less space dedicated for transport or external functions, indirectly resulted in the success of these communal study spaces. Because these spaces were specifically designed to function as communal meeting areas, closely located to their classrooms, students would sit and work together after class (Van den Bosch et al., 1980, p. 122).

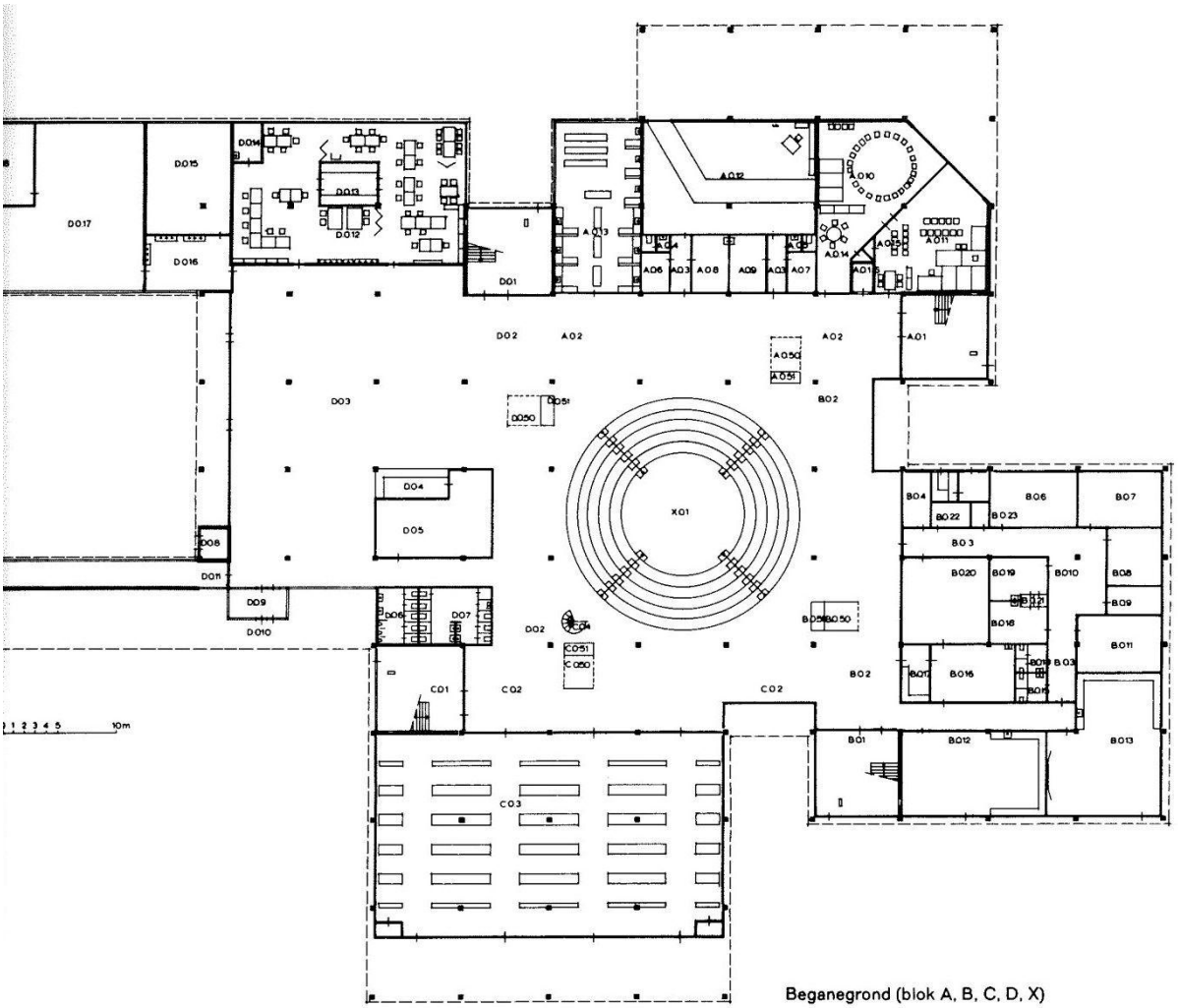

Figure 21: Floor plan of the ground floor, secondary education, 1973. (source: (Van den Bosch et al., 1980, p. 121).

5. Comparing and conclusion.

This chapter will be divided into two parts. The first part contains a juxtaposition of the three case studies explained in the last three chapters. Besides, the research question will be answered, and a conclusion on the theme of this thesis; *meeting in educational architecture* is given.

The juxtaposition of the case studies.

For the juxtaposition of the case studies, a comparison table is made with their respective design principles and meeting spaces (see figure 22, (T.Jansen, 2023).

Case Study:	Technikon, Rotterdam, 1970.	't Karregat, Eindhoven, 1973.	Hendrik van der Vlist 'school cluster', Utrecht, 1973.
Architect:	Architectural office Maaskant.	Architectural office Van Klingeren.	ir. Henk Dam and ir. B.F.A Dirkse.
Design principles:	Large scale project for Rotterdam. Connecting different school buildings. Creating a public meeting square.	Multifunctionality. Open floor plan. No walls.	Flexibility and Apadtivity. Clustering of subjects. Efficiency of space usage.
Meeting spaces:	Public square also functions as outside space for the educational facilities. Auditorium / Theatre. Corridor typology.	Open classrooms. Commercial area. Communal space.	Communal study space. 'Sitting pit'

Figure 22: Comparison table of the three case studies, by Author. (source: (T.Jansen, 2023).

For Technikon, the design had to function as a large-scale project, supporting the reconstruction process of the city of Rotterdam after the Second World War. Because of its scale, the architect H.A. Maaskant was convinced that the eight different educational facilities had to be connected, creating the shape of the building. Due to the shape of the building, a public square was realised that should function as one of the main meeting spaces within the project. 'T Karregat in contradiction to the Technikon would focus more on the principle of multifunctionality, implementing the open floor plan in a way that was never done before, a building without walls. The experiment with this typology was something that would make the project different from every other building or case study but also made the building vulnerable, requiring renovations throughout the project only five years after its completion. Comparing Technikon with the Hendrik van der Vlist 'school cluster', the notion of a collection of different typologies of education applies to both. However, where Technikon households eight different schools, each with their respective level of education, the Hendrik van der Vlist 'school cluster' is one school containing multiple different levels of education. When comparing the theme of this thesis between the two case studies, both contain a 'square' dedicated to interaction and meeting, but with contradicting ideas. One is outside, accessible to the public domain whereas the other one is specifically designed for its users located inside the building, in the shape of a '*sitting pit*'. Juxtaposing 't Karregat and the Hendrik van der Vlist 'school cluster', both contain the perspective of an open floor plan but apply this principle in a different manner. 'T Karregat implements this perspective as one of its design principles further developing it with the notion of 'no walls', creating

permanent open spaces. The Hendrik van der Vlist ‘school cluster’ grounds this perspective into its design principle of ‘flexibility and adaptivity’, allowing walls to be moved or removed depending on the situation, resulting in temporary open spaces.

Conclusion of the case studies.

In the introduction of this thesis, the research question is described; *What are the design principles of the architects H.A. Maaskant, H. Dam and B.F.A. Dirkse, and Van Klingeren for secondary education buildings on the aspect of meeting in the Netherlands during the 1970s?* The answer to this question will alter depending on the case study.

For Technikon by architectural office Maaskant, Rotterdam, 1970, the design principles for the aspect of meeting can be described as ‘*connecting a multitude of separate entities together to enhance the collective*’. Instead of keeping the eight different schools completely separated, the design integrates possibilities to allow interaction and meetings between the different educational facilities, while still retaining the separation of the entity on its own.

The design principles for the aspect of meeting in ‘t Karregat by architectural office Van Klingeren, Eindhoven, 1973, can be described as ‘*removing physical barriers to enhance interaction within a community’*. Where most multifunctional buildings have clear physical separations between them, the design experiments with its narrative on an extreme level, removing all walls and creating one open space dedicated to a community.

For the Hendrik van der Vlist ‘school cluster’ by architect ir. Henk Dam and ir. B.F.A. Dirkse in Utrecht, built in 1973, the design principles for the aspect of meeting can be described as; ‘*creating a central space connecting different levels of education’*. Although the building contains a large variety of students and teachers, one intervention connects them together and enhances the possibility to interact with one another.

The collective answer to the research questions is; *‘The design principles of the architects H.A. Maaskant, H. Dam and B.F.A. Dirkse, and Van Klingeren for secondary education buildings on the aspect of meeting during the 1970s can be described as; connecting a multitude of separate entities together to enhance the collective, removing physical barriers to enhance interaction within a community, and creating a central space connecting different levels of education’*.

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