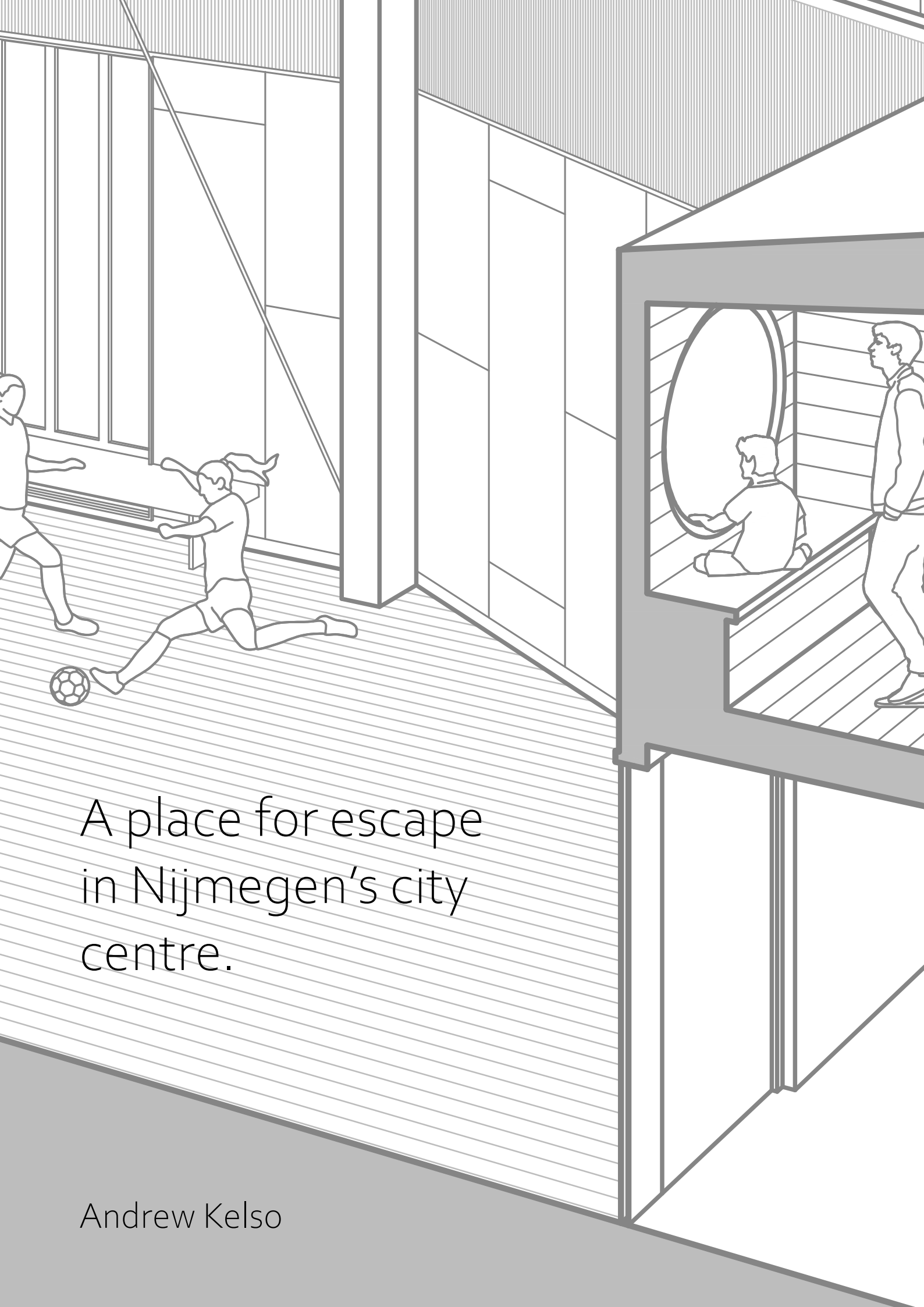

A place for escape in Nijmegen's city centre.

Andrew Kelso

Acknowledgments

Studio	Urban Architecture
Main Mentor	Paul Vermeulen
Research Mentor	Leeke Reinders
Building Technology Mentor	Jelke Fokkinga
Climate Mentor	Peter Mensinga

1.1 - Kindersepelen by Pieter Bruegel the Elder, Oil on wood.

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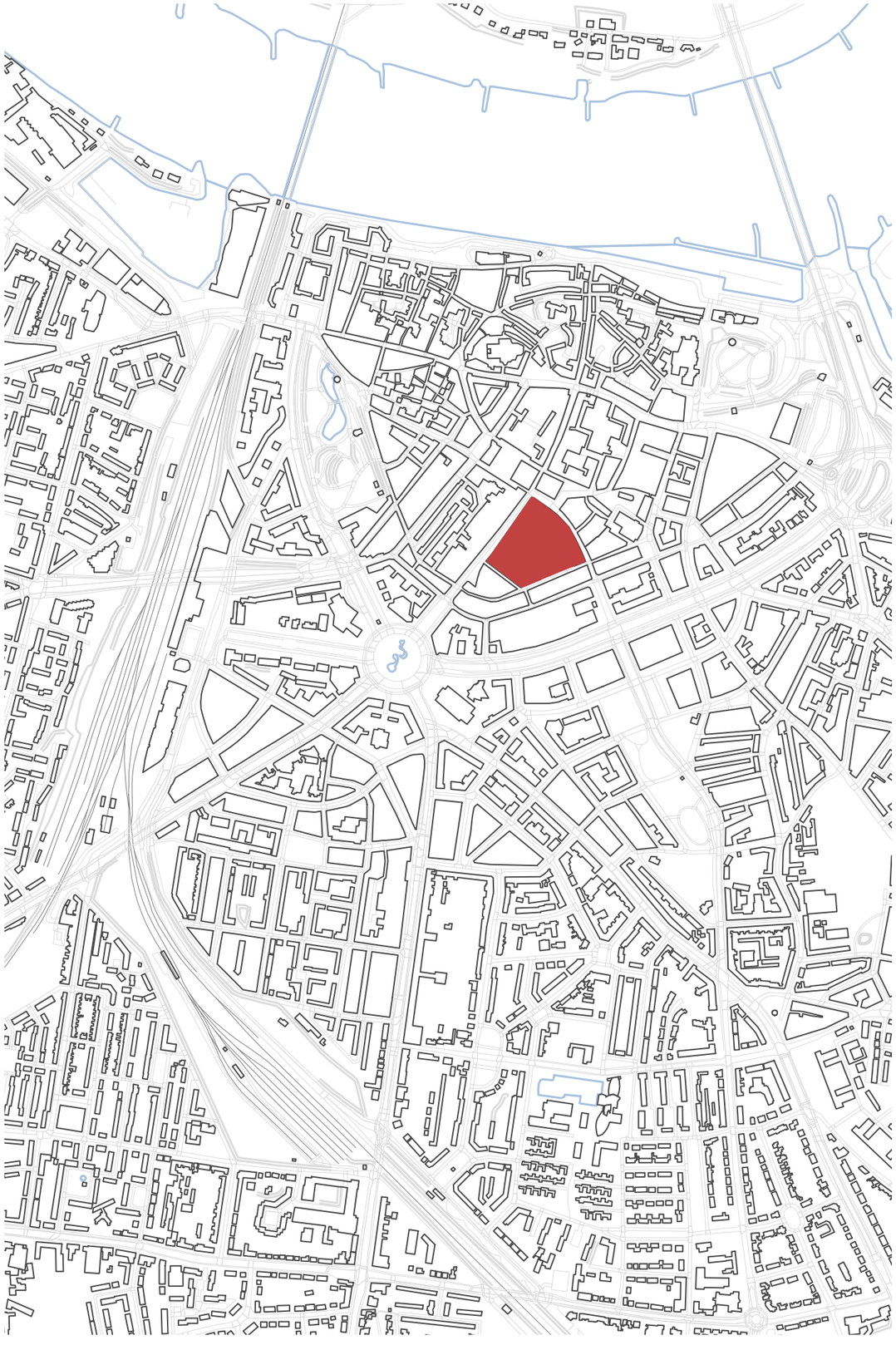

Introduction

This thesis aims to develop a new urban and architectural condition for the site of the existing Molenpoort shopping centre, within Nijmegen's city centre. The project aims to investigate how play can be considered as part of urban and architectural design in an attempt to make a healthier and more engaging city to live in.

Manifesto

A call to future planners, designers and builders to implement the ideas of bricolage in the search to create playful, joyful and engaging cities.

Space for the manifesto to be inserted in physical book. Attached within the following pages digitally

The importance of Bricolage in giving life to cities

by Andrew Kelso

Dear planners, designers and builders of future cities,

This manifesto argues for the implementation of the ideas of adhocism and bricolage in the design of cities as a means of introducing play and bringing life back to urban spaces. Cities today have become focused on effective physical organisation and the efficient movement of people and goods. While progress and efficiency are certainly needed in the world, architects and urban planners should take a step back by balancing efficiency with spaces for play and escape.

Many writers have written about how the machine age affected the creation of the built environment, and one key aspect of cities identified as having been affected is their layouts. Both Charles Jenks and Quentin Stevens identify that, during the 19th and 20th centuries, the organisation of cities became more determined by economic forces and less by social issues. These forces aimed to make the city function efficiently, optimising urban spaces for transportation and consumption (Jencks & Silver, 2013, p. 33; Stevens, 2007, p. 7).The remaining spaces in the city that have been designed for people have also become more privatised and commodified, creating places where people become passive consumers rather than active participators (Franck & Stevens, 2006, p. 4).

This issue is also raised by the *Harvard Project on the City* which draws attention to the fact that movement through the city has become designed for shopping. Links made between pedestrian routes, road systems, car parks, public transport and shops become the priority. Train stations, museums, hospitals, universities, the internet, the military and churches all become shops. (Koolhaas, Boeri, Kwinter, Ulrich Obrist, & Tazi, 2000, p. 125,140) People within this system become cogs in the machine.

Mass production and standardisation is another way in which market forces have affected the built environment. In his book *Adhocism,* Jenks blames this increased standardisation on capitalism, pointing out that, in order to make profit companies are forced to reduce prices through standardisation and use advertising to convince people they need the product. When it comes to the built environment, mass production coupled with increasingly complex materials has led to a disconnect between both the context and programme of a building and the way that it is materialised. Complex systems and materials make it difficult for adaptation or improvisation, forcing the use of mass produced materials in standardized ways (Jencks & Silver, 2013, p. 19,59).

The Modernist movement within architecture embraced these characteristics of efficiency and mass production, as well as disregarding the past and the historic significance of buildings which were not built by these principles. In the past, buildings were constructed on and built within the existing built environment, however, today it has become cheaper to reconstruct whole buildings rather than adapt the existing structure. This adds to the creation of monotonous cities built in similar forms and material, regardless of typology or context. These qualities of modern-day cities are well visualised in the sketches of Leon Krier.

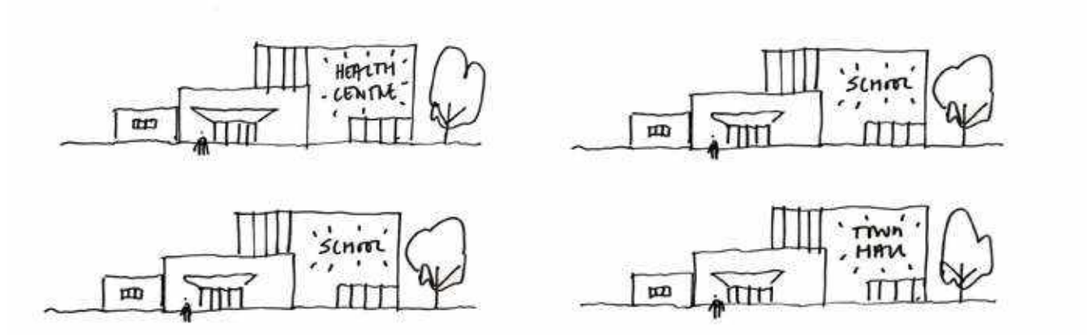

Fig 1 - Sketches by McGinlay Bell architects, 2017

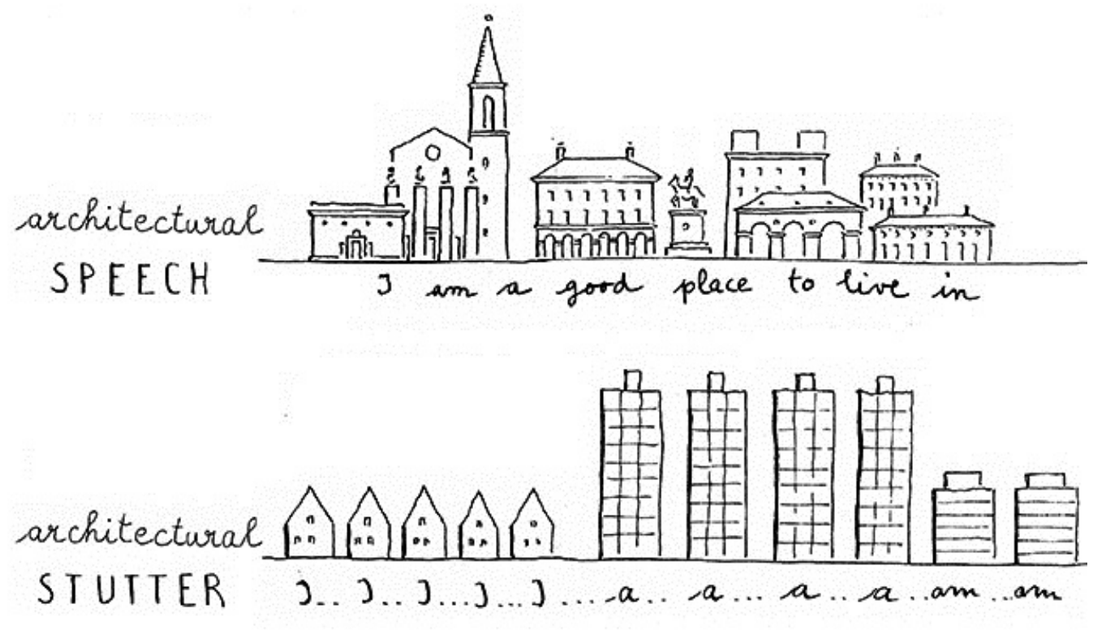

Fig 2 - A sketch by Leon Krier commenting on architectural speech, 2014

These characteristics of modern construction have led many to describe cities of today as blank, dull and monotonous, for instance Gordon Cullen uses the term "desert planning" to describe modern planning (Cullen, 1961; Gehl, 2011, p. 21; Jencks & Silver, 2013, p. 23). Another fierce opponent to modern architecture was Norman Miller who described cities as converted into monotony in a search for simplicity, adding that factories look like mental hospitals and that the outcome is a scaleless, "empty landscape of psychosis". He also adds that this form of construction fails to fill the human desire for shelter which is pleasurable and rich in character (Mailer & Scully, 1964).

This idea of creating spaces that are pleasurable and rich in character introduces the idea that architecture should be joyful and embrace and encourage moments that are inefficient and rich in potential. Through play people within urban spaces act in spontaneous ways, often making the most of urban spaces full of unforeseen opportunities. In this way, the study of urban play can be used as a tool to reconstruct spaces that enable people to escape from the serious and efficient world built around them. (Stevens, 2007, pp. 1–33).

Many writers have discussed the importance of play within the city. Stevens develops the argument that one of the fundamental functions of public space is as a setting for informal non-instrumental social interactions, or play. He argues that play is neglected as part of the urban experience within cities, which instead focus on creating efficient spatial patterns driven by economic forces (Stevens, 2007, p. 7). Henri Lefebvre also wrote about the importance of considering urban spaces as social ones. In arguing this point, he points to cities that existed pre-capitalism where a greater diversity of social functions occurred balanced with economic prosperity. He saw the city as a place for pleasure and enjoyment not solely focused on economic forces. This interaction between various groups of people through a variety of activities he saw as one of the key purposes of centralised urban forms (Lefebvre, 1996, pp. 65–85). More recently this argument has been made by Lain Lefaivre in *Ground Up City Play* and Stevens in *The Ludic City*. Both argue that a city's urban fabric should create opportunities for play. Play enables connections between people and diverse communities to form, preventing communities from becoming a collection of strangers. In this sense, the playful function of cities becomes just as significant to architecture and planning as rationality and productivity (Lefaivre & Döll, 2007, p. 56; Stevens, 2007, p. 5,11).

Johan Huizinga, in *Homo Ludens*, defines play as a wide-ranging concept that provides a step out of real life into a temporary sphere of activity with a disposition of its own. He sees the act of playing as something that is fundamental to being human. He addresses the fact that play can sometimes be seen as opposite to serious life, however, he goes on to argue that play can be both serious and non-serious. Child's play can operate at a level below the serious, however in other forms, play can move above it to the realm of the sacred (Huizinga, 1949, pp. 4–19). Both of these forms are similar in that they allow the player to escape everyday realities (Stevens, 2007, p. 29). Play can be seen as "a voluntary departure from the mundane world of involuntary routinization".(Lyman & Scott, 1975, p. 147) Stevens argues a similar point by acknowledging the importance of child's play, but emphasising that adult play, often overlooked, is a serious topic in its own right that can be used to stimulate and reconstruct space allowing for escape from surrounding social rules. (Stevens, 2007, pp. 1–28) This need to take play more seriously in the design of cities is echoed by Lefaivre in *Ground Up City Play* (Lefaivre & Döll, 2007, p. 71).

Play can be categorised into two forms: "paidia" and "ludus". *Paidia* is a freer play that refuses to accept limits and is instead a willing transgression of them. This form of play escapes societal constructs and explores new social connections. Ludus on the other hand is a more institutionalised and controlled play that presents itself as a game. These games follow rules and routines that are universally accepted by the players (Stevens, 2007, p. 33).

This idea of *ludus* is aligned with Stevens' definition of leisure within *The Ludic City.* He sees leisure as a more specific and controlled form of play, associated with a social construct that presents play within the confinement of particular practices - normally demarcated in certain spaces and times. The term "leisure" also has connotations with passive activities and attention to private life, self and family (Rojek, 1995, p. 16; Stevens, 2007, p. 28). This idea of leisure includes recuperation from work and the dissipation of accumulated recourses. In this sense, the term "leisure" has been partly occupied by capitalist ideas of time for workers to rest and spend their earned money through more passive forms of leisure which focus on consumption, including cinema and amusement parks. Stevens argues that this idea of leisure lacks the diversity and complexity that the city needs and that a freer play - or *paidia* - is capable of highlighting the urban experience (Stevens, 2007, pp. 28–33).

Fig 3 - Middle ages businessmen in suits - a toy maker and a potential buyers - showing the business behind play.

The idea of leisure as a more controlled sense of play may provide a way to build on an improved adult play which has become more controlled within society compared with child's play (Dargan & Zeitlin, 1990, p. 31). Adult play is seen as more acceptable if it occurs as a more controlled version of child's play. In the book *City Play*, Amanda Dragan and Steven Zeitlin identify that adults have taken games developed on the streets such as double dutch, street art and breakdancing, and have standardised rules and increased control. Children's response to increased control from adults can be to break the rules or to think of creative ways to misuse play equipment (Dargan & Zeitlin, 1990, p. 162). Even if adult play is more controlled and defined in comparison to child's play, Stevens argues that it occupies a broader range of behaviour and has a greater capacity to affect the urban environment. This is because adults have more knowledge, freedom and resources available to them than children (Stevens, 2007, p. 27).

A number of writers have also discussed the types of urban space that enable play. For instance, loose space is defined by Stevens as urban space that facilitates a rich variety of activities that the space was not designed for. Activities that generate loose space are not carried out for functional purposes. He defines them as being carried out for "leisure, entertainment, self-expression, political expression, reflection, and social interaction". (Franck & Stevens, 2006, p. 3) Loose spaces within the city can therefore be seen as spaces that allow enough freedom of use to be ideal places for play. The link between loose space and the category of *paidia* within play mentioned above are made clear when Stevens states that "looseness may serve as a 'time out' from everyday routines, as is apparent in spontaneous and optional activities, which are typically irregular in timing, duration and structure" (Franck & Stevens, 2006, p. 15). Alison and Peter Smithson (1953) add to this by describing how social groupings and interactions between people cannot be predicted and are instead a result of loose spatial organisation. They suggest that architects should aim to create spaces that allow for unexpected and spontaneous interactions between people.

This concept of loose space is investigated further by Stanford Anderson in *On Streets*, where he discusses the idea of latent space in architecture. He argues that the potential environment seen throughout the city is experienced by the city occupants as individual influential environments unique to individual interpretation. The gap between the potential environment and the influential environment then creates the unutilised latent environment. Anderson argues that spaces that have less defined uses provide more latent space and therefore allow more individual interpretation on how the space is used. (Anderson, 1978, pp. 7–11) This individual interpretation creates loose space and enables play to occur. Loose space provides people with the possibility to escape from everyday life.

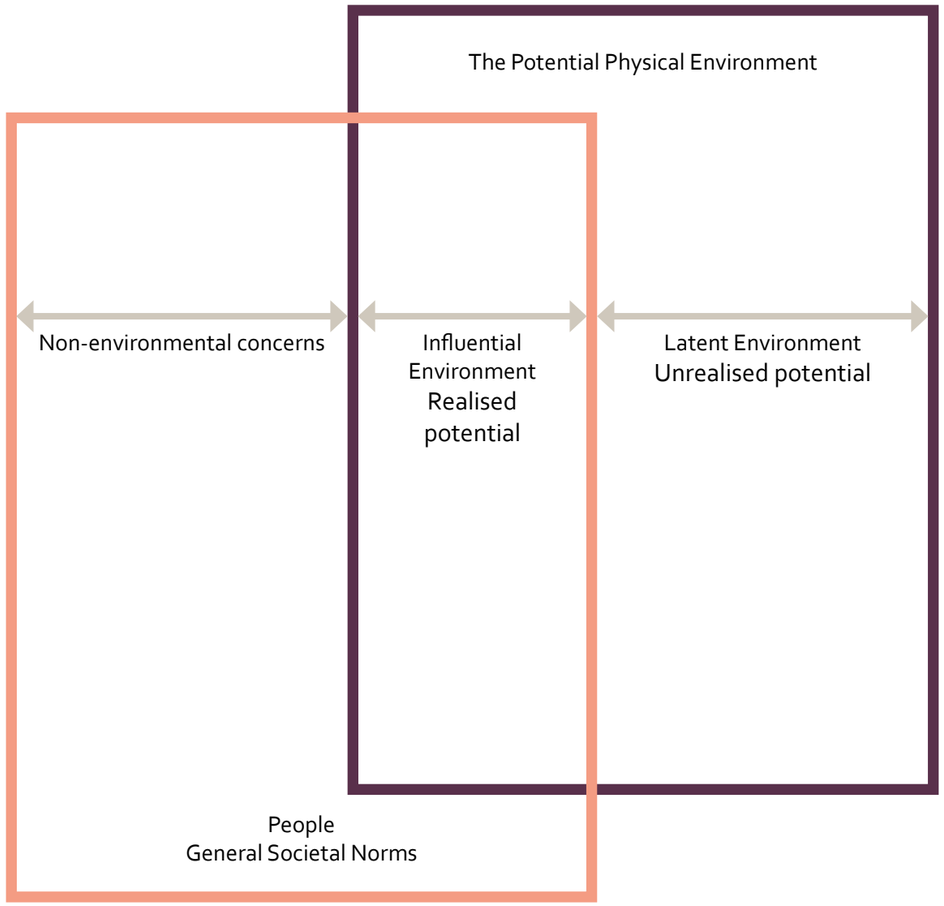

Fig 4 - Anderson's description of Social and physical environments yield influential and latent environments. Drawing by author after Anderson, 1978

Manifesto Insert

In considering loose and latent space as ways to provide space for play within cities, we are confronted with how such spaces could be created or designed. The ideas of adhocism and bricolage can be looked to for ways of overcoming the standardisation of modern construction and in turn providing spaces in the city that are suitable for play. This is clear in Jenks' description of the aim of adhocism as "to personalise what was becoming globally homogenous" and "provide an environment which can be as visually rich and varied as actual urban life" (Jencks & Silver, 2013, p. viii,73). Both practices focus on using the materials and systems at hand instead of creating specific materials for a construction (Jencks & Silver, 2013, p. vii; Lévi-strauss, 1966, p. 17).

Bricolage is presented by Lévi-Straus in the book *The Savage Mind* as an instinctive way to discover and create. He cites the origin of the word from: "Bricoler - applied to billiards, to hunting, shooting and riding. It was however always used with reference to some extraneous movement: a ball rebounding, a dog straying or a horse swerving from its direct course to avoid an obstacle."(Lévi-strauss, 1966, p. 16) This description gives a sense of the intuitive nature of bricolage that can be contrasted with the highly reasoned world of science.

Lévi-Straus uses the instinctive nature of "the savage" to argue that bricolage is a fundamental human quality (Lévi-strauss, 1966). Using the same comparison Huizinga also sees "the savage" (along with the child and the poet) as occupying the world of play. He uses the rituals of the savages to form his argument that rituals are also a form of play - a set of rules that create an escape from reality (Huizinga, 1949, p. 26). These associations with the savage are used to demonstrate the fundamental nature of both play and bricolage within humans.

The role that the engineer and science has played in architecture is discussed by Colin Rowe and Koetter in *Collage City*. They argue that total design has begun for some time to appear as a rather dubious and fruitless enterprise. In contrast, they suggest a more intuitive approach influenced by a multiplicity of stimuli, aligning with the ideas of the role of the bricoleur (Rowe & Koetter, 1983, p. 51,53). Jan Gehl in *Life Between Buildings,* argues that the city structures of medieval times - which grew slowly on top of what came before - create more opportunity for life than the planned city that was introduced during the renaissance (Gehl, 2011, p. 41).

Bricolage proposes, instead of a top down total design approach, that the remains and debris of events in culture should be used to produce structure (Lévi-strauss, 1966, p. 22). This can be seen as a need to move away from the top down design of effective physical order and efficiency in the city and consider balancing this with more loose and latent space inspired by what is already found in local culture. Robert Venturi and Denise Scott-Brown demonstrate this approach of observation and learning from our surroundings in *Learning from Las Vegas*. They propose enhancing what already exists in our environment instead of the modernist approach of changing environments (Venturi, Izenour, & Brown, 1977, p. 3).

In the same light as the bricoleur versus the engineer, Jenks describes Adhocism as a loose approach to a problem rather than a tight and systematic one. It is due to this loose way of combining parts that are not specifically designed for the job, that ad hoc creations are characterised by not being purely efficient and containing an element of redundancy or unused potential. Jenks argues that because of this, ad hoc creations are more open, suggestive and rich in possibilities compared to engineered solutions. These characteristic qualities of ad hoc products mean that they align with the ideas of latent space discussed by Anderson, enabling individual interpretation of how to engage with redundant characteristics. The extraneous material allows the user to imagine possible additional uses when compared with a perfectly engineered construction that only fulfil one purpose. (Jencks & Silver, 2013, pp. 15–37).

In addition, the process of creating in an ad hoc manner can also be considered as a form of play, as well as producing parts of the built environment that are rich in qualities that enable play. Jenks argues that creativity in finding new uses for items is an important characteristic of adhocism (Jencks & Silver, 2013, p. vii; Stevens, 2007, p. 218). This is something that adhocism shares with play, as argued by Dragan and Zeitlin in the chapter *Transformation* of the book *City Play*. In the introduction to the chapter, they state that "Transformation is the process of taking the rules, boundaries, images and characters of the real world and recasting them within the boundaries of play. At the heart of play is this process of taking a given space or object and devising a new use for it" (Dargan & Zeitlin, 1990, p. 106). The difference between bricolage, adhocism and play is therefore that play is not limited to the manipulation of just the physical environment but also social rules. Bricolage and adhocism also enable the creation of space for efficient purposes that are not playful, but with enough surplus space and material that play is possible.

Fig 5 - Go-cart made from a police barricade, Lower Manhattan, 1978 (photo by Martha Cooper)

Throughout the rest of the chapter *Transformation,* images of children engaging in bricolage are presented. It is noted that in poorer areas of the city, creating toys and play spaces from what can be found was more common than in wealthier areas. The improvement in wealth and availability of new technologies such as TV and computer games has clearly had an impact on how people play in urban spaces (Dargan & Zeitlin, 1990, p. 5). However, the availability of spaces for play in the urban setting is also a factor in how streets have changed from those seen in photographic studies of play and streetscapes.

Through modernisation, both the importance of re-use in construction of the built environment as well as in play has been lost. This is illustrated by a quote from Henry Callejo interviewed for the book city play:
"Henry Callejo of Astoria, Queens, saw his grandson discarding some used kitchen matches. He asked him to bring over the matches and explained to him what something as simple as a match might mean to a small child in Italy half a century ago; Callejo made a miniature house of match-sticks to demonstrate the importance of conservation" (Dargan & Zeitlin, 1990, p. 115).
Modernisation and standardization have certainly brought a better quality of life to a great number of people, helping to improve living conditions. However, at the same time this has reduced the need for people to harness the ideas of bricolage and to use what is at hand. A return to the world before the machine age is not wanted but there are certainly lessons to be learnt from the ways society functioned in the past.

The ideas of bricolage and adhocism raise the question: what is the architect's role in the design of the built environment? In *Adhocism*, Jenks argues that hierarchy in society, which architects are a part of, can have a negative force on allowing individuals to have full control of the built environment around them, adding that "the architect, bricklayer and occupant should be the same person"(Jencks & Silver, 2013, pp. 19, 65). This idea leaves less room for the architect and perhaps means that your role as a designer is to provide support and encourage others to create the spaces around them. Your role perhaps becomes largest in public projects that have the potential impact to inspire society and require someone to moderate and balance the many considerations involved.

Jenks also suggests that industrial items used in their intended context stifle individual development, but implementing new uses for such items can become refreshing through the contrast created (Jencks & Silver, 2013, p. 27). Perhaps in this way the architect's role is to implement bricolage and adhocism in their own work to create environments that stimulate people's creativity and show them that their own ideas are possible, breaking up systematic notions of use and opening society up to the endless possibilities available. The implementation of the ideas of bricolage and adhocism will create cities that provide greater looseness and opportunity for play, in turn allowing people to test their creativity and build social connections.

Fig 6 - Boy with a toy gun, Williamsburg, Brooklyn, 1986 (photo by Martha Cooper)

Manifesto Insert

Image References

Figure 1 - Sketches by McGinlay Bell architects. From New Typologies, by McGinlay Bell, 2017. Retrieved 27 January 2021, from https://mcginlaybell.com/work/new-typologies/

Figure 2 – A sketch by Leon Krier commenting on architectural speech. From Leon Krier on sustainable urbanism and the legible city. In *Architectural Review,* by Krier, L., 2014. Retrieved 23 May 2021, from Architectural Review website: https://www.architectural-review.com/essays/leon-krier-on-sustainable-urbanism-and-the-legible-city

Figure 3 - Middle ages businessmen in suits - a toy maker and a potential buyers - showing the business behind play. From Play the system. *Architectural Review* (p.8), by Smith, M. , 2021

Figure 4 - Anderson's description of Social and physical environments yield influential and latent environments. Drawing by author after Anderson, from People in the Physical Environment: The Urban Ecology of Streets. In *On streets, by* Anderson, S., 1978, Mass: MIT Press.

Figure 5 - Go-cart made from a police barricade, Lower Manhattan, 1978 (photo by Martha Cooper). From *City Play* (p.159), by Dargan, A., & Zeitlin, S. J. , 1990, New Brunswick: Rutgers University Press.

Fig 6 - Boy with a toy gun, Williamsburg, Brooklyn, 1986 (photo by Martha Cooper). From *City Play* (p.112), by Dargan, A., & Zeitlin, S. J. , 1990, New Brunswick: Rutgers University Press.

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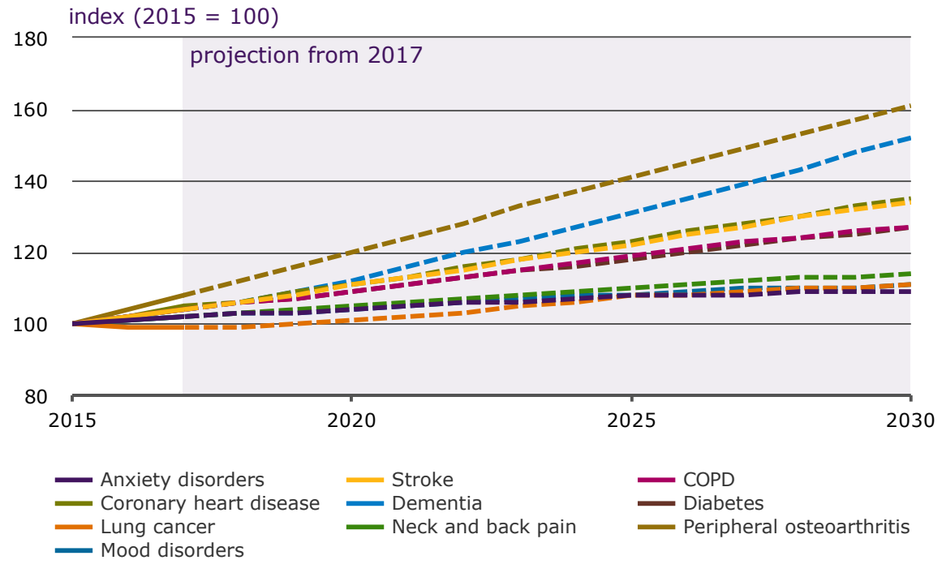
Problem statement

The most immediate issue seen on the site is the gradual decline of the Molenpoort, made evident by empty units. This issue reaches far beyond the site as similar issues are seen in malls and shopping centres around the world as society sees a move from brick and mortar shops towards online shopping. The *Harvard Project on the City* identifies the fact that shopping is vulnerable to decline due to its very nature. Shopping thrives on creating consumerist cycles, demanding people buy the newest version and forcing them to through planned obsolescence. In this way, shopping centres need to appear new to attract the attention of consumers and can fall into decline if they become to look dated, old and out of fashion (Koolhaas, Boeri, Kwinter, Ulrich Obrist, & Tazi, 2000, pp. 174–177). This situation raises the question of how shopping centres should be re-developed and if they provide society with an opportunity to reconsider its values.

The importance of economy and shopping tends to be the primary focus when planning urban redevelopments. Issues of how our lifestyle impacts our health tend to be overlooked in favour of economic profit. A number of papers have discussed the adverse effect that consumerism has on well-being, as it thrives on building a materialistic mindset. (Bauer, Wilkie, Kim, & Bodenhausen, 2012; Eckersley, 2006; Sweeting, Hunt, & Bhaskar, 2012) This thesis chooses to address the issue of wellbeing and focuses on how the redevelopment of shopping centres provides society with the opportunity to create spaces within the centre of cities that benefit the health of the inhabitants.

Modern life is having an adverse effect on health. Developed countries across the world including the Netherlands are seeing an increase in chronic illness, mental illness, and the proportion of the population who are overweight. These increases in lifestyle-related diseases have led to calls from TNO for more to be done to prevent illness (Central Bureau of Statistics, 2018; GGD Gelderland-Zuid, Radboudumc, & Gemeente Nijmegen, 2019; TNO, 2020).



1.2 - Trend in prevalence of health problems in Nijmegen

One solution which became the focus of my research is play and loose space within cities. There is a large collection of literature on the benefits of play on health[1]. In the case of child's play, it is seen as an important part of development providing physical, emotional and mental challenges.(Lucas, 2020; Whitebread, 2017) Play is where children learn how to build communities though testing social skills and societal rules (Dargan & Zeitlin, 1990, p. 170). The benefits do not stop at childhood: play allows adults to escape the busy modern world around them, providing much needed stress relief. In addition to physical benefits, play in adults is also important for creativity, imagination and emotional well-being.(Magnuson & Barnett, 2013) Maria Smith, within the Architectural Review's issue on play calls for a world were play is taken more seriously within everyday life. She argues the point that healthcare today has become focused on fixing the problem and sending people back to work, instead of a genuine concern for well-being and happiness (Smith, 2021). The diagram below shows the key areas that contribute to lifestyle related illness and highlights the areas to which play can contribute.

1.3 - Key areas that contribute to lifestyle related illness

[1] (Baptiste, 1995; Leeuwen & Westwood, 2008; Lucas, 2020; Proyer, 2017; Proyer & Jehle, 2013; Van Vleet, Helgeson, & Berg, 2019; Versluys, 2017)

This thesis aims to question the role that the built environment has in creating spaces that enable play, and promote positive lifestyles within the urban population. This aim poses the question:

What is the role of architecture and urban design in the creation of spaces that enrich human well-being through play?

What time is this place? - Collective

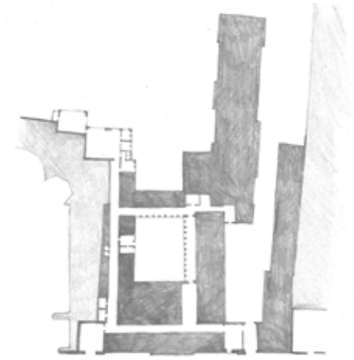
The themes of play and escape emerged as a response to the theme of structured time discovered through group work carried out for P1. The group aimed to answer the question "what time is this place?". The wide scope of this question and the multiple angles that an investigation of this kind could offer quickly became clear.

The investigation focused on three buildings that surrounded the site (the Church, the Farmhouse and the Guesthouse) and the different stories that each building could tell relating to its position in society through time. Anthropomorphism and the theme of talking buildings was used as the tool to achieve this, which we presented through the medium of film. This choice of technique allowed the site to be explored from a different perspective compared with traditional architectural tools. The formation of characters helped frame the historical research, and decide on the important moments in each character's development. Anthropomorphizing the buildings made it easier to identify with the buildings' stories on a more emotional level, giving a greater insight into the site's past.

The three characters aimed to represent three different concepts of time. In answering the question "what time is this place?", the investigation not only identified the changes that occurred to the site through time, but also the different ways that time was and is experienced on the site. The Church was used to demonstrate how its fragmented architectural elements act as an archive of historic moments and encapsulate a collective memory. The Farmhouse represented a time in history where there was no mechanical time but instead society functioned on the natural rhythms of life. Finally, the Guesthouse was used to explore the change in society towards mechanical time that it used to enforce house rules. Together, the relationships and conflicts between these three characters told the story of how the plot changed from a countryside community to a more fragmented collection of buildings as the site became part of the city.

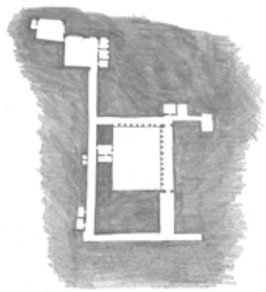
1.4 - Model of the church separated into its many fragments of time.

1.5 - Model of the city during the period of the farm house when time was dictated by rhythms of nature.



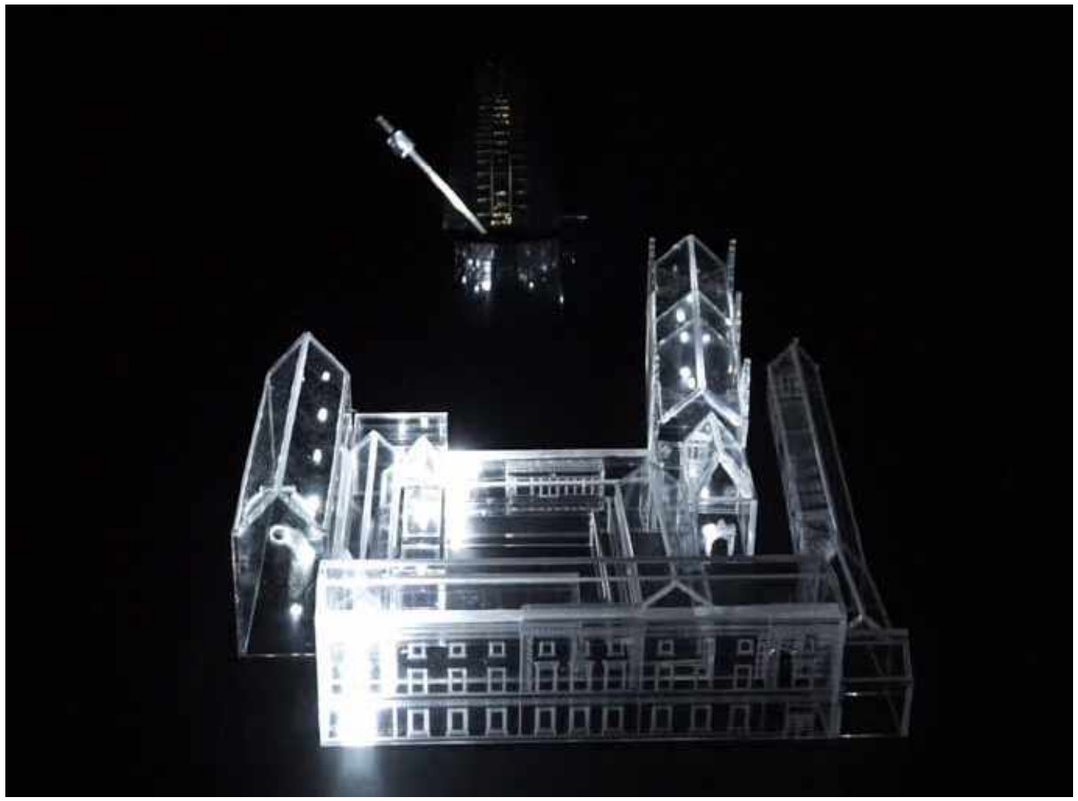
Female day
No men are allowed in the women's room or dining room, nor women in the mens room or dining room

Female dining
Men and women will be bound to come to the table when the bell rings (at noon all year, 7 o'clock in the summer and 6 o'clock in the winter)



Female night
After dinner the gasthuis will remain closed.

1.6 - Diagrams showing the functional distribution of people within the guest-house throughout the day.



1.7 - Model of the guesthouse fitted with rhythmic lights, governed by a metronome, demonstrating the daily routines of its occupants.

Investigating the site by giving life to the characters' stories through anthropomorphism gave a more personal perspective of the site compared with more analytical and measured approaches. This method emphasised the idea that different actors use the built environment in different ways and through adapting the method of investigation new perspectives can be achieved. This is discussed by John Habraken in *The Structure of the Ordinary* where he identifies that different actors see the built environment in different ways: the builder as a collection of materials, the poet as a collection of memories, and the occupant as spaces full of meanings.(Habraken & Teicher, 2000, p. 17)

The story of standardised time compared with experienced time became a focus of the research. The church on the site along with the guesthouse that previously stood in the place of the Molenpoort shopping centre were initially developed together as a monastery. Monasteries held one of the most significant developments in the standardisation of time through the creation of the Benedictine order and their periodic bells. The mechanical clock, first used by the monasteries, helped to stabilise society, regulating the sensations and temporal patterns of the human body. The clock then turned from punctuating the days of the monks to standardising time for surrounding communities when the church began to ring its bell to signal the hours of the day (Kwinter, 2002, pp. 16–17). This standardisation of time has continued until today, where clocks govern our daily schedule. Perhaps in today's world more consideration should be given to experienced time and the escape from constructed time. The theme of escape is revisited throughout the project through 3 main topics: the urban plan, the building programme and the architectural and detailed design.

1.8 - People walk past the church fixated on their phones. The church's clock and bell are no longer a necessity.

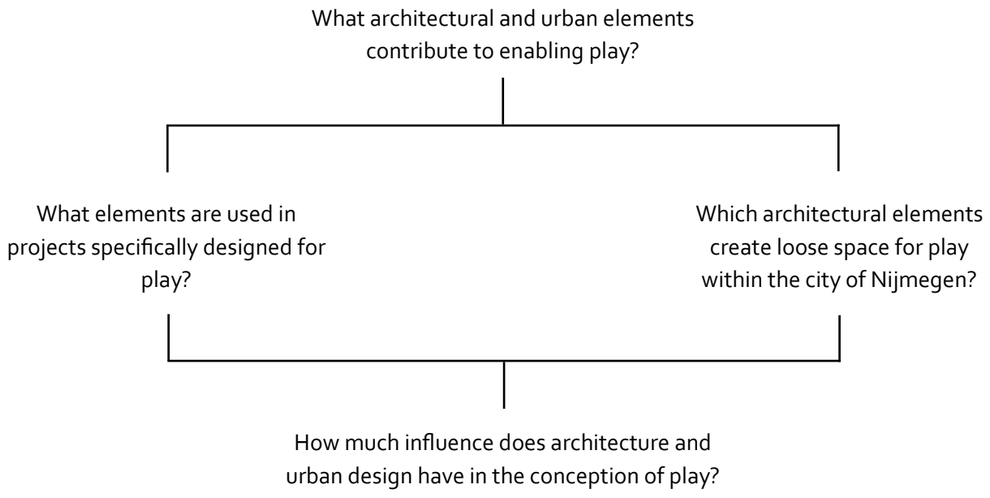
Play in Nijmegen and elsewhere - Individual

The following catalogue aims to capture moments of play within the loose spaces of Nijmegen. The catalogue takes inspiration from earlier studies and aims to relate to and reference them. One example is the book *The Ludic City,* which focuses on "uses of public spaces which are not practical and other than what the spaces were designed for" (Stevens, 2007, p. 26). Here this idea is continued by cataloguing the use (or re-use) of urban elements along with the intended use. It is intended that the primary research paired with references to previous studies will create site specific but also generally applicable observations and theories into how space accommodates urban play.

Methodology

What is the role of architecture and urban design in the creation of spaces that enrich human well-being through play?

Sub questions:



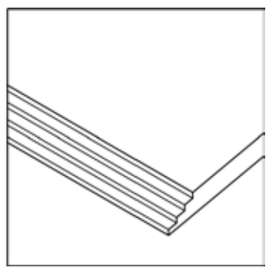
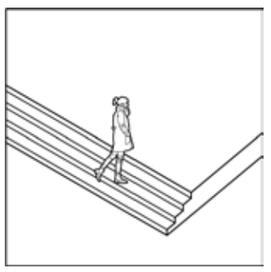
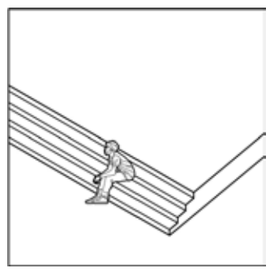
The studio's theme, bricolage, can offer guidance on the choice and implementation of methods. Lévi-Straus describes the process as the creation of a treasury which the bricoleur will then interrogate in the creation of a new structure or project. The creation of the treasury is done through collecting elements and knowledge that might come in useful: turning back to existing sets of tools and materials to consider their use, engaging these elements in a dialogue between themselves, before applying the found answers to a problem. Possibilities remain limited by the history of each element and any constraints.(Lévi-strauss, 1966, pp. 18–19) With consideration for this process, the methodology aims to create a treasury of relevant information that can then be used to inform the design of the project.

The focus of the following research is an investigation into the design of architectural and urban elements that create meaningful spaces for play. This will be achieved in two ways.

Firstly, through observation of behaviours in the city, loose space within Nijmegen that provides opportunity for play will be documented. The aim in doing this is to gain a greater understanding of the city and context in which the proposed building will sit, as well as building a collection of examples of real-world architectural elements that create space for play. This will be done by cataloguing architectural and urban elements in the city that are being used for something other than their primary function and are therefore successful in creating loose space. For each element the intended use and the observed use will be recorded. The observed element or phenomenon will then be related to other theories on loose space and play to gain a deeper understanding of the urban elements which successfully provoke play and why.

Secondly, architectural projects that have been deliberately designed to facilitate play will be analysed and reviewed. The Fun Palace by Cedric Price and New Babylon by Constant Nieuwenhuys will be the initial focus of this approach. The theoretical approach behind each project will be analysed through literature review and architectural elements and characteristics that enable play will be identified. These elements will then form part of my treasury of architectural elements that facilitate play.

This treasury of elements along with all of the other information collected will form the tools used for the materialization of the design of a Health and Wellness Centre for the city of Nijmegen.

Element	Intended use	Observed use
		
Steps	Circulation	Seat

Boundaries

Stevens identifies that boundaries and thresholds create spaces where different sets of social rules and expectations meet and transform enabling them to become blurred and inviting people to behave in creative and playful ways (Stevens, 2006, pp. 73–74). These liminal conditions also exist in time and moments within life. For example, children, teenagers and the elderly can use boundaries within periods of life to behave in looser ways. This is also true of collective moments of the day like smoke breaks, or in the year such as public holidays, celebrations and festivals.(Stevens, 2006, p. 74)

Boundaries are also used as elements within games, demarcating zones where different roles and rules apply (Stevens, 2007, p. 114). For example, two sections of the pitch within field games, the stage and the audience within performances, or within free play any line or separation can be used in conjunction with any created rule to form a unique and spontaneous game.

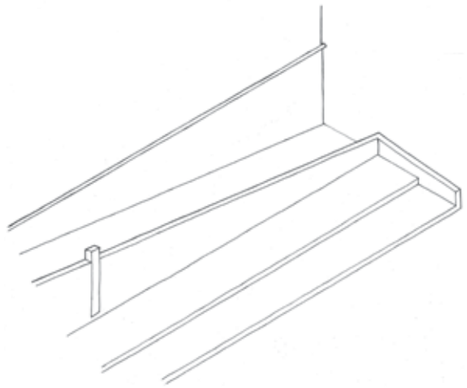
People within boundaries can gain a sense of togetherness, for instance a football team or crowd at a concert (Stevens, 2007, p. 115).

2.1 - King of the hill, Brooklyn, 1950 (Photo by Arther Leipzig)

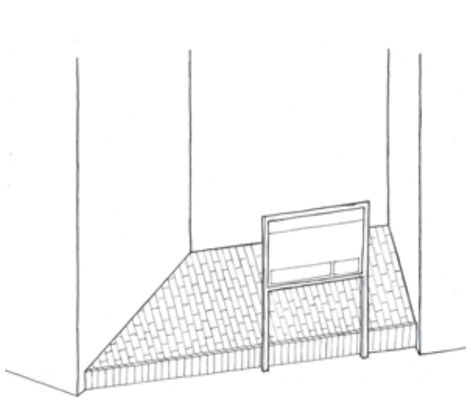
Performance

Stevens also identifies how boundaries can form a backdrop for performance.(Stevens, 2007, p. 120)

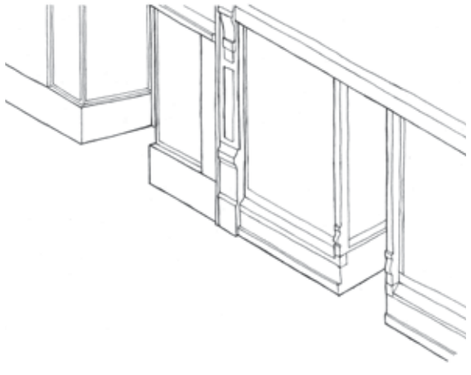
In the example observed to the right a guitarist stands in front of a façade in the lesser used space between two entrances.



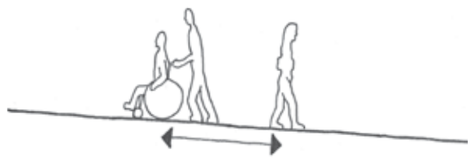
Museum ramp



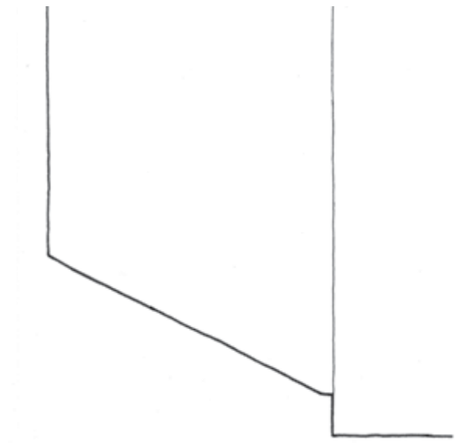
Sloped ledge



Street facade



Ramp access to museum



Architectural detail (possibly to prevent rough sleeping)

Blank space between entrances

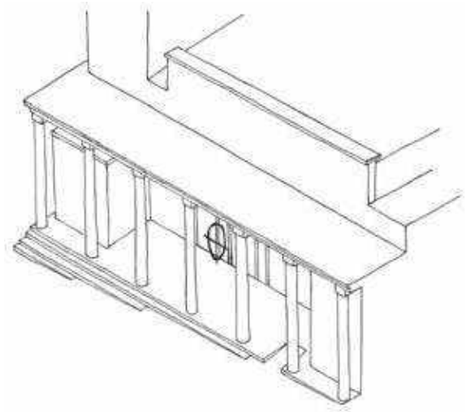
A bar table to eat at

Skating ramp

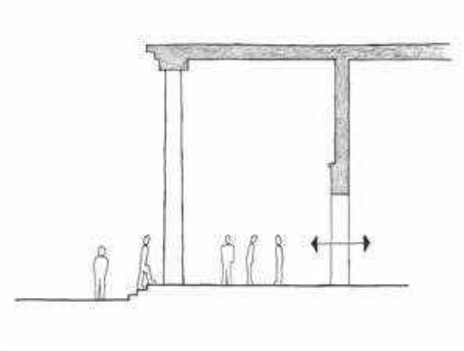
Performance backdrop

Boundary and time

In *Loose Space,* Stevens identifies how a space's boundary can also change with time. He gives the example of skaters using the stairs in front of an office once the office has closed for the day (2006, p. 82). The church on Molenstraat is a good example of this. Before and after worships the portico is used as a place to gather and chat. Throughout the rest of the week it becomes a place for passers-by to sit. A food truck also occupies a space in front of the church on most afternoons and the church steps offer a place to sit and eat the food. Food delivery drivers coming and going from central restaurants also use the space as a covered area to take a break and wait for the next order.



Church portico

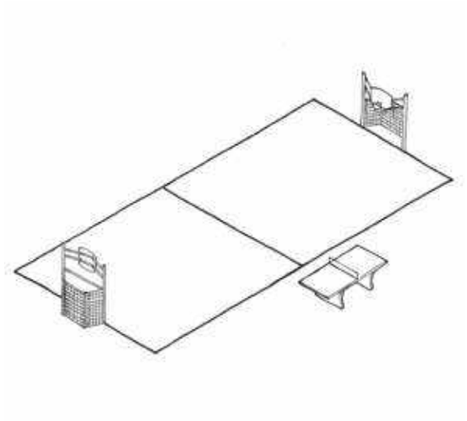


A transition space for churchgoers

A place to sit and take a break

Territory

Boundaries are then used to form territories. The book *City Play* identifies the importance of creating territories and controlling space as part of the New York playscape. Areas of the city can be divided into territories - some safe, some dangerous, and some designated as leisure areas (Dargan & Zeitlin, 1990, p. 23,136,142). Stevens (2007, p. 114) notes that these areas designated for play within the city can create spaces that allow people to behave differently. However Rodrigo Perez de Arce (2016) describes this kind of zoning as functionalist, and an example of the planner aiming to control the functional city.



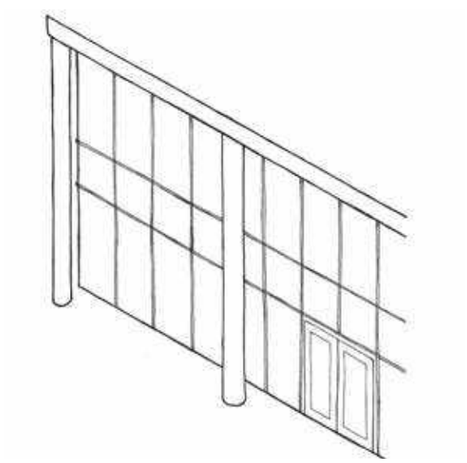
Sports court

Ball games

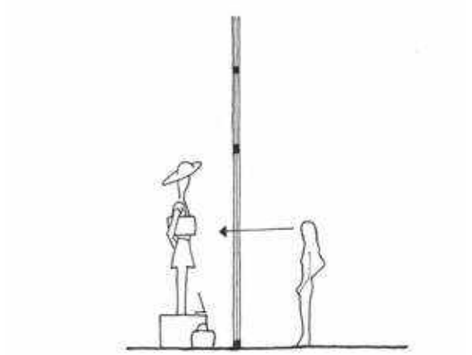
Events (retrieved from google street view)

Physical properties

The physical properties of boundaries can also inform how they are used for play. Solid edges can be pushed or played against and inclined edges can be climbed (Stevens, 2007, p. 114). In the case shown here the reflective quality of the glass offers a mirrored surface for play.



Shop window



Displaying clothes

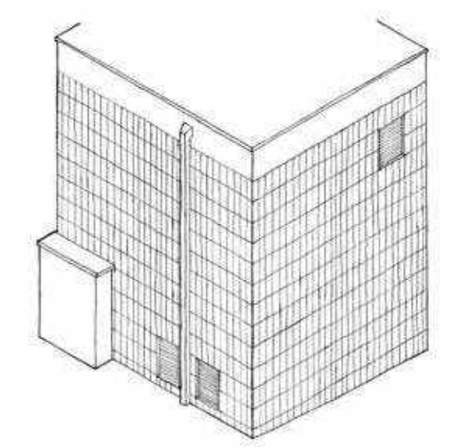
Using the window as a mirror to dance

Walls

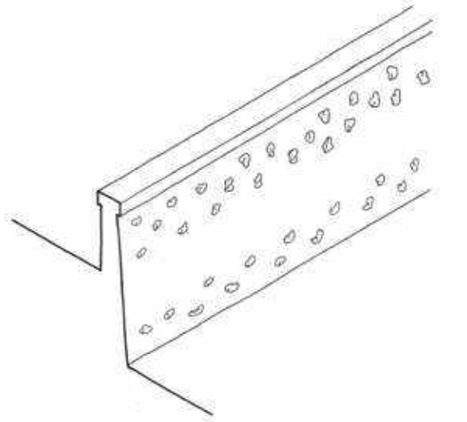
Walls are an example of play against hard boundaries. Amanda Dargan and Steven Zeitlin give examples of bouncing balls against walls or tying skipping ropes to protrusions (1990, p. 42). Stevens also gives examples of sitting, climbing, skating and hanging banners on walls(Franck & Stevens, 2006, p. 9). Habraken also comments on the role buildings can play in these moments of play by describing the facades of buildings as the walls of the street (Habraken & Teicher, 2000, p. 164).

2.2 - Photo of London's east end , 1949-1953, Nigel Henderson

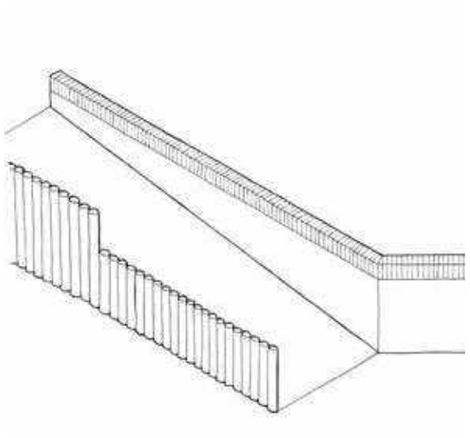
2.3 - Parkour within Nijmegen



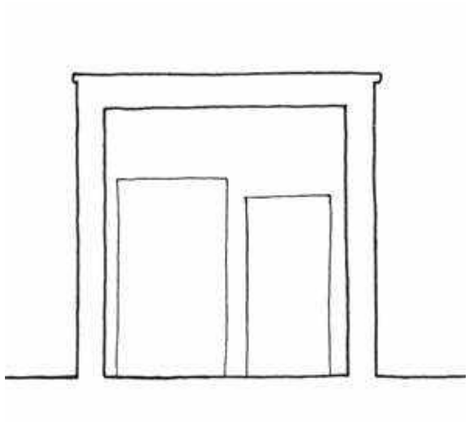
Wall



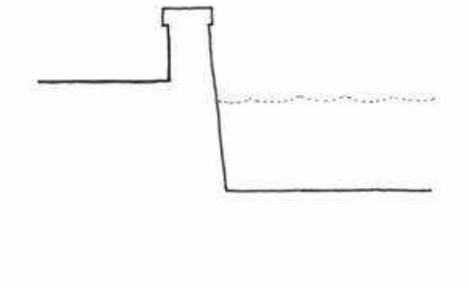
Wall



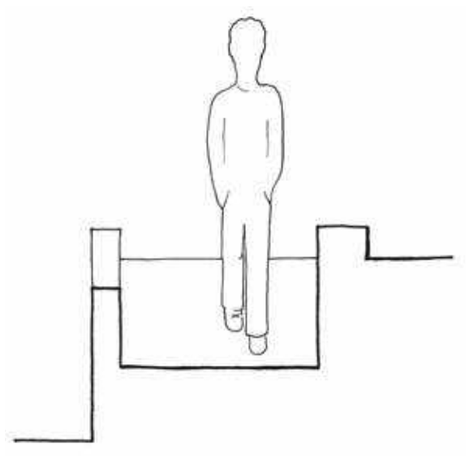
Wall



Contains functional equipment



The wall serves as a flood defence



Separation (of levels)

Football against a wall

Climbing

Parkour

The edge effect

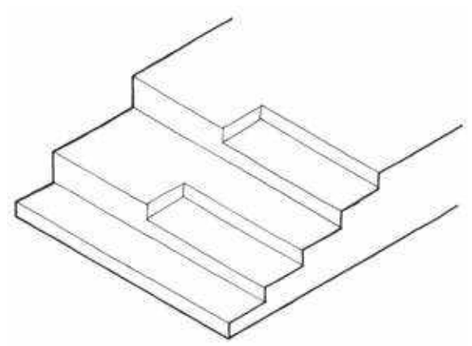
Coined by Derk de Jonge the edge effect describes the phenomenon where people prefer to stop, stand and sit at the edges of a space before then moving towards the centre (Jonge, 1967). In *A Pattern Language* it is argued that "if the edge fails then the space never becomes lively" (Alexander, 1977, p. 600). This is because the edge condition allows people to regulate their involvement with activity of the centre by allowing them to watch over the whole space and engage if they want to (Stevens, 2007, p. 115).
Both Alexander and Jan Gehl argue for the creation of building edges that engage with users inviting them to stop, helping to promote activity within public spaces next to the building. These "soft edges" also create a smooth connection between inside and outside. (Alexander, 1977, p. 752; Gehl, 2011, pp. 191–197).

Sitting

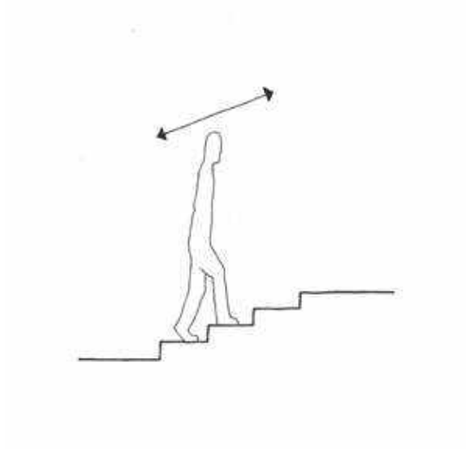
Creating spaces for sitting within cities is important: it is the basis for more complex forms of social interaction and play. Benches that face paths are favoured because people enjoy sitting where there is a view of other people. The shape of benches is also discussed by Jan Gehl: L shaped arrangements enable easy communication between people and tables provide opportunity for food and drink (Gehl, 2011, p. 27,155-170).
Gehl also argues that the use of secondary seating on fountains, steps, and facades means that if there are not many people at certain times it does not seem like the space is abandoned (Gehl, 2011, pp. 161–162).

Steps

Stevens identifies steps as being able to create stages or seats, balancing a connection between audience and actor (Franck & Stevens, 2006, p. 86). Within Nijmegen the use of steps as a seat, something to skate against, something to slide on and a stage for performances were all observed.



Steps



Circulation

Seat and Stage

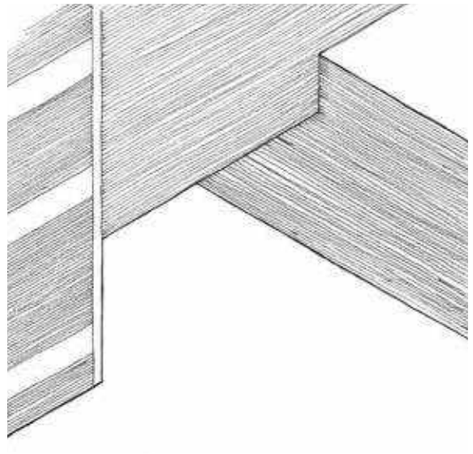
Niches

Niches can be found within cities as spaces that are particularly enclosed or secluded. Stevens identifies them as places where people can linger and feel less watched. The spaces could be used for forbidden activities such as drug use, sexual encounters or trading stolen goods, which Stevens also identifies as creating loose space (Franck & Stevens, 2006, pp. 9–12). Dargan and Zeitlin (1990, pp. 138–139) also observed this behaviour in children in New York who created clubhouses - special spaces where normal activities such as reading a comic became more sacred. It is then suggested that this urge to create childhood clubhouses is manifested as clubs for leisure activities in adults.

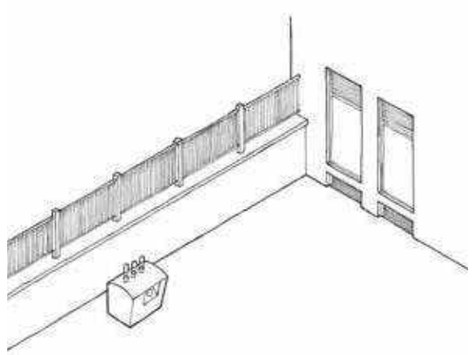
2.4 - Clubhouse, Lower East Side, manhatten, 1978 (Photo by Martha Cooper)

Standing

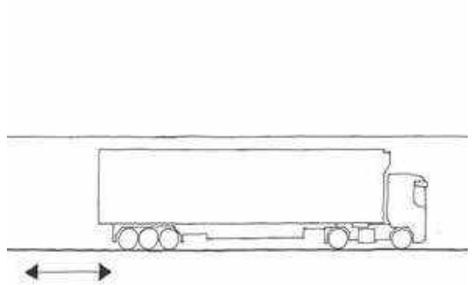
People standing in public areas can also make use of pockets of passive spaces that aren't used by people walking, avoiding getting in people's way and where they themselves are not a focus of attention (Stevens, 2007, p. 118).



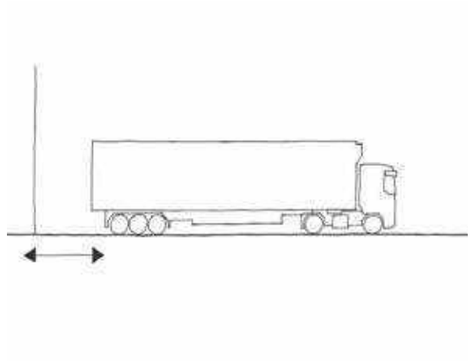
Covered alleyway



Area at rear of Molenpoort



Space for deliveries to shops



Space for deliveries to Molenpoort

A space used to hang out

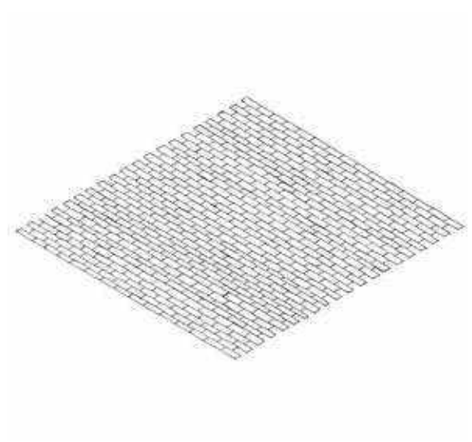
A place to take a smoke break

Hard surfaces

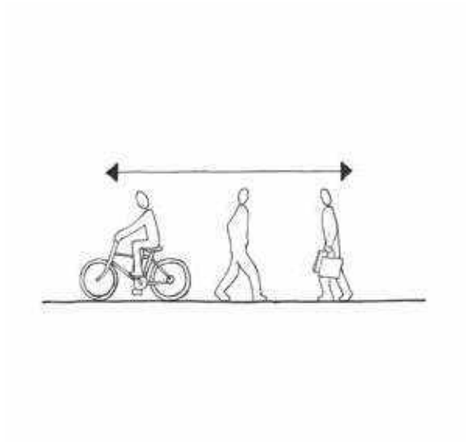
In *Loose Space,* hard surfaces are identified as places for protest and skating. Skating can be seen as an activity that creates loose space, with players actively seeking out loose and latent moments in the cityscape (Franck & Stevens, 2006, pp. 9–14).
Hard surfaces are used by roller skates and skateboarders throughout Nijmegen. One observation saw protesters writing "Zwarte Piet is racisme" all over the central streets of Nijmegen in chalk. As the morning progressed street cleaners and shop owners removed all traces of the message.

2.5 - Using the curb, Brooklyn, 1950 (photo by Arther Leipzig)

2.6 - Drawing on the road (photo by Arthur Leipzig)



Paved ground



Easy movement of vehicles and people

Graffiti

Graffiti removal

Soft surfaces

In contrast to hard surfaces, soft surfaces also enable play of other kinds. In *City Play* it is identified that, as the streets of New York were paved, it meant games such as marbles were pushed off the streets to any patches of dirt that remained (Dargan & Zeitlin, 1990, pp. 77–81).
As observed, grass allows people to sit on the ground comfortably and play games where players might fall.

Nature

Nature within the city offers moments of escape from constructed space, from small plants growing in gaps in pavements, to trees, to large parks. These moments provide escape from the urban environment inviting play (Dargan & Zeitlin, 1990, pp. 100–102).

Reasons for being in public space

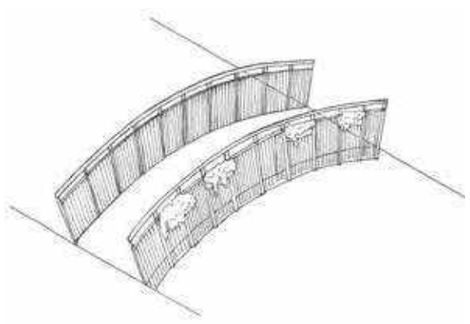
In a study of public space carried out in Denmark through photo documentation Gehl identifies the variety of ways and reasons that people occupy public space, identifying that people do not require functional reasons for venturing out and that, for example, hungry birds can be the reason to stay in a space (Gehl & Svarre, 2013, p. 90).
This same meeting of nature and people was observed in Nijmegen as a group of men gathered next to the fishmonger stall to feed the ducks.

2.7 - Game of marbles, 1914 (photo from the Chicago Daily News)

Paths

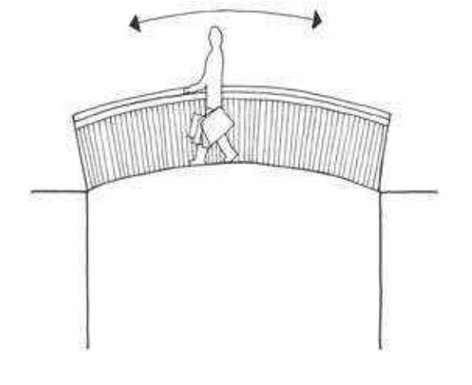
The Ludic City identifies paths as places within the city that play occurs. Paths guide people through the city and can bring them into encounters with others. Stevens notes that creating pathways that are free from vehicular traffic helps to promote spaces for play (Stevens, 2007, pp. 67–69).

Fishmonger next to park



Bridge

Eating fried fish in the park



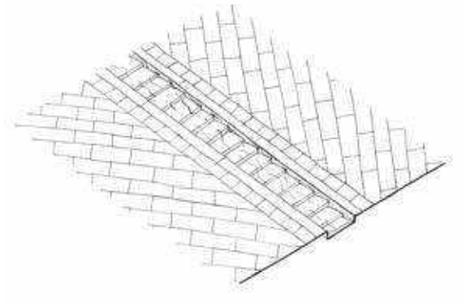
Allowing shoppers to cross between raised shopping streets

Feeding the ducks

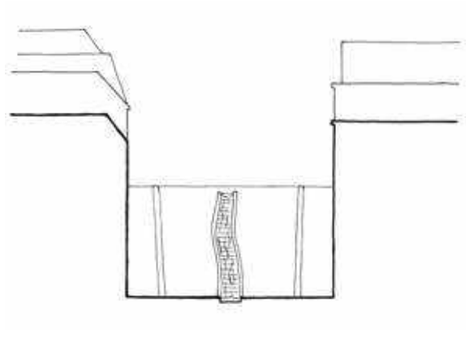
Child enjoying running across

Water

Water is identified as an element that influences play in a number of texts. In *City Play,* water is described as "a basic element of play and recreation" giving examples of beaches, pools and rivers (Dargan & Zeitlin, 1990, p. 91). Stevens also describes how river settings within cities create a sense of freedom because of the spatial separation created when compared with other parts of the city. He also describes how artificial elements such as fountains can become the focus of play, both as something to physically engage with or as something to watch (Stevens, 2007, p. 142,187). The book *City of Play* also gives reference to the historic annual flooding of Piazza Navona, in Rome, for recreation. The fire hydrant is also recognised as an urban element which became iconic in its ability to be repurposed for play. On a smaller scale water taps and hoses are used as elements of play within private gardens (Dargan & Zeitlin, 1990, p. 55; Pérez de Arce, 2018, p. 85,97).

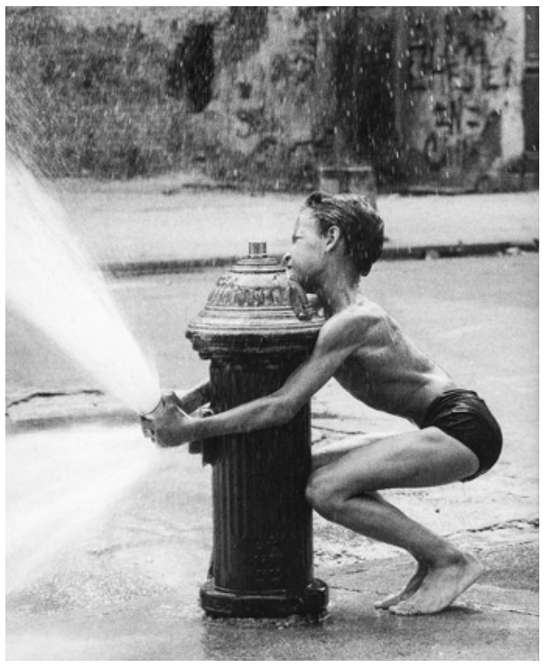


Water feature



Urban prop - water feature

Interacting with water

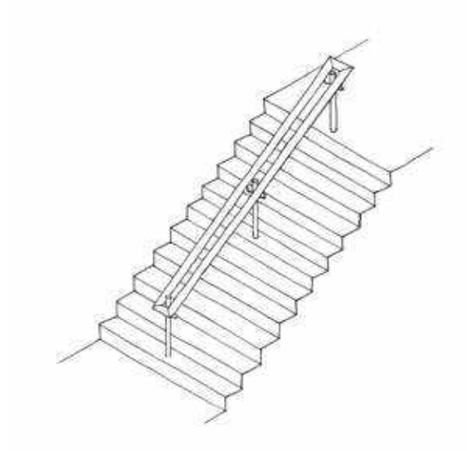


2.8 - Directing spray, Lower East Side, Manhatten, 1978 (photo Martha Cooper)

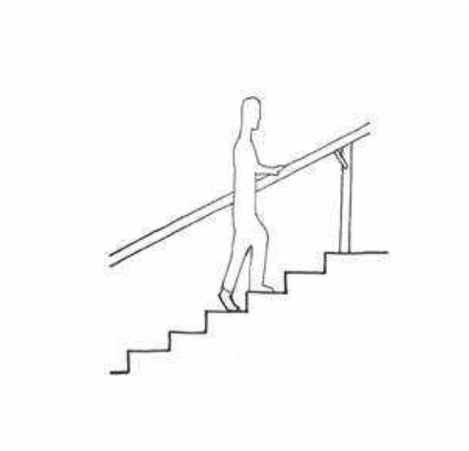
Opposite, bottom left 2.9 - Playing in the fountain on Ziekerstraat (photo Alma Bouwens)

Level changes

In *City Play,* Dragan and Zeitlin (1990, p. 14) identify how geological features caused New York to be formed in a particular way that then informs how people play within the city. This is also clear in Nijmegen where its natural topography creates level changes throughout the city that can be capitalised on by people as opportunities for play. Level changes appear as a recurring theme in the case studies examined in the following section as an opportunity for play.

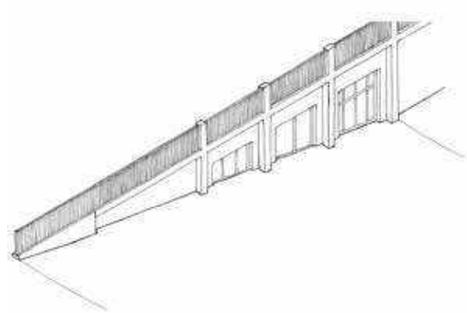


Handrail



Provide assistance when climbing steps

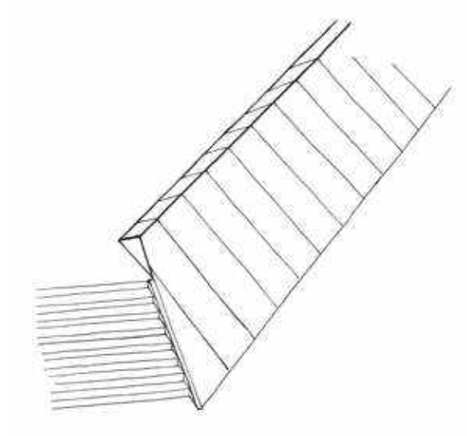
A slide



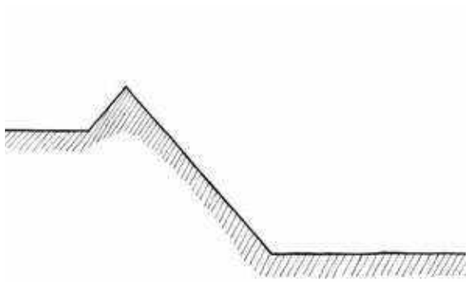
Ramp

Slope allowing movement of shoppers

Children scootering



Sloping stone form



Mediate level change

Sliding and climbing

Ice and Snow

Snow's plastic properties mean that it becomes the malleable surface of the city, enabling the building of creative structures or the use of slopes for sledging. It is also temporary, fleeting and disruptive of everyday routines, sharing qualities with celebrations and festivals. Ponds that bring water into cities also freeze over and offer new opportunities for interaction (Dargan & Zeitlin, 1990, p. 95; Pérez de Arce, 2018, p. 83).

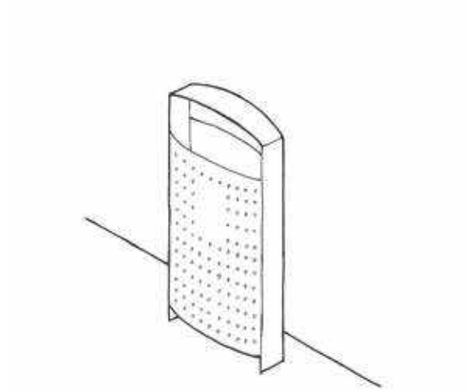
2.10 - Skating in Kronenburgerpark (photo by Geert Geenen)

2.11 - Sledging at Mariënburg (photo by Tom Hessels)

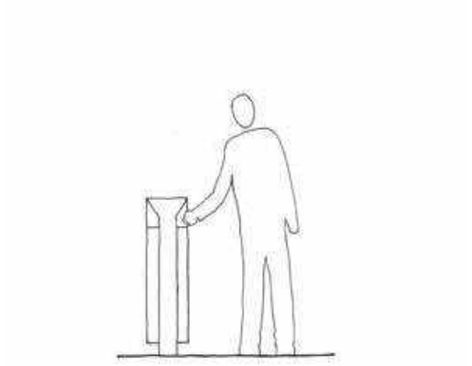
2.12 - Sledging at Kronenburgerpark (photo by Paul Rapp)

Bolards and columns

Gehl identifies trees, columns and bollards as creating good places for people to stop and stand for longer periods of time within the city. These elements act as something to lean against as well as creating space that is not in the path of others. In addition, bollards can allow other forms of play such as leap frog (Gehl, 2011, p. 147,151; Stevens, 2007, p. 193).



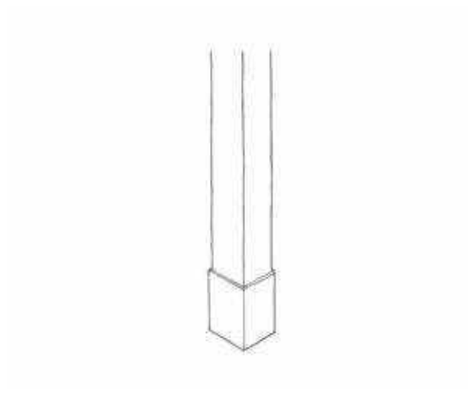
Bin



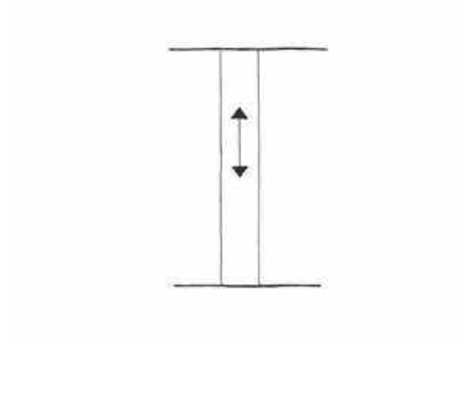
Throwing away waste

Something to lean on

2.13 - Something to lean on or place things near. Piazza del Campo, Siena, Italy



Column



Carrying structural load

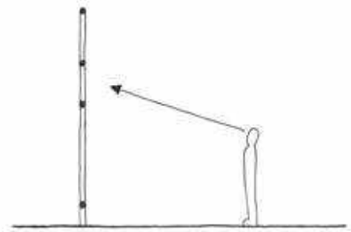
A place to sit

Props

In *The Ludic City,* Stevens identifies props as elements within the urban environment that facilitate play. This category includes fixed objects within the urban environment such as public art, street furniture and play equipment. The urban environment allows people to get close to and engage physically with designed elements, some of which intentionally provoke play and others unintentionally (Stevens, 2007, p. 178,191). Public artwork can allow people to both engage with the work physically, watch others play, or contemplate the art from a distance. The context of such elements also influences play, for instance open space allows players to gain speed or move around an object at the centre of an invented game (Stevens, 2007, pp. 181–184).

2.14 - Architectural Fragment, outside the State Library, Melbourne.

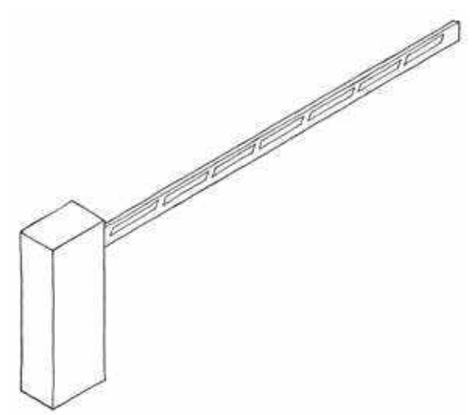
Sculpture



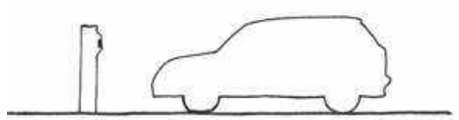
A piece of artwork

2.15 Climbing (see image references)

Division of space



Traffic barrier

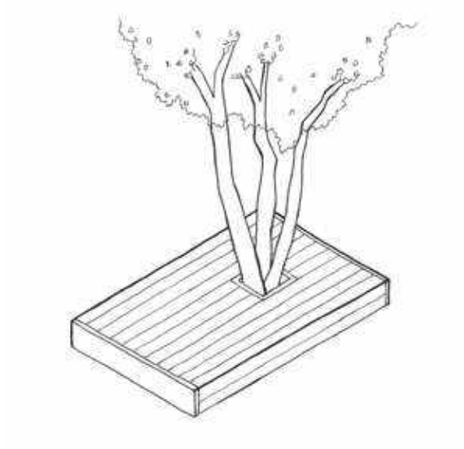


Control of cars into parking

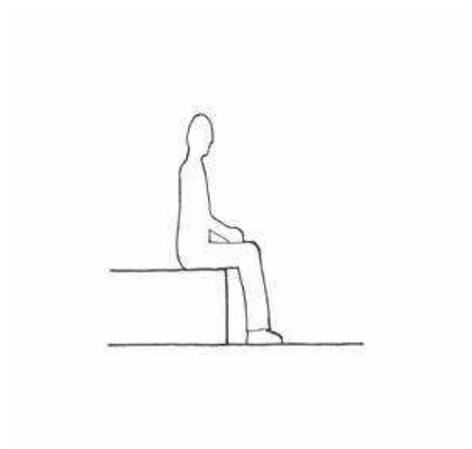
Tennis net

Street furniture

Stevens recognises that street furniture is often not designed for play and instead focuses on efficiently meeting a particular function, however, people that play in urban environments often test these elements and use them in creative and unintended ways (Stevens, 2007, p. 191).



Bench

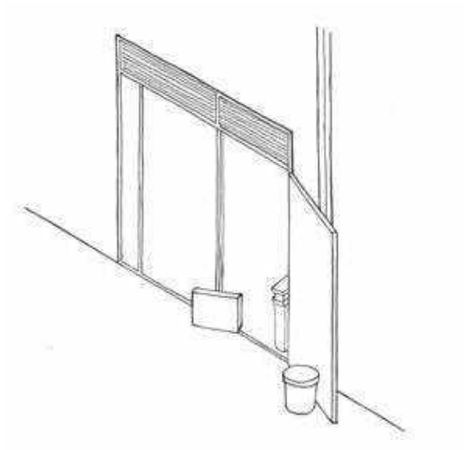


Seating

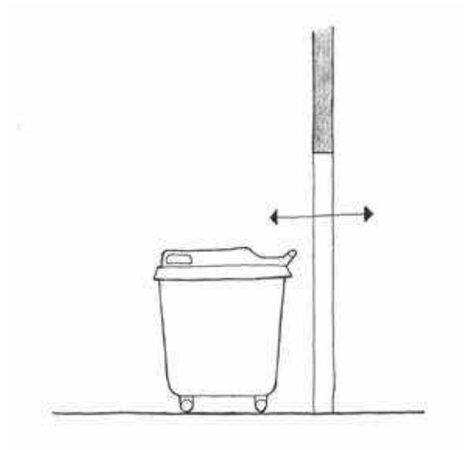
Skating

Doorways

Gehl identifies the entrance as a good location for a bench, allowing for time outside with views of the city streets. "If an inviting and convenient place to sit is waiting just here [the entrance], experience shows that it will be used a great deal" (Gehl, 2011, p. 187). Observations within Nijmegen showed how steps and seat next to doors were often used as a place to take a break.

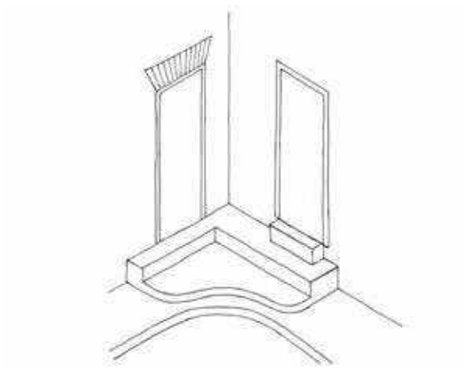


Rear door to alleyway

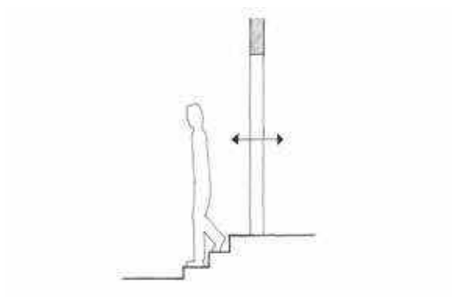


Functional exit providing service access

A space to have a seat and take a break



Door step



Entrance and exit

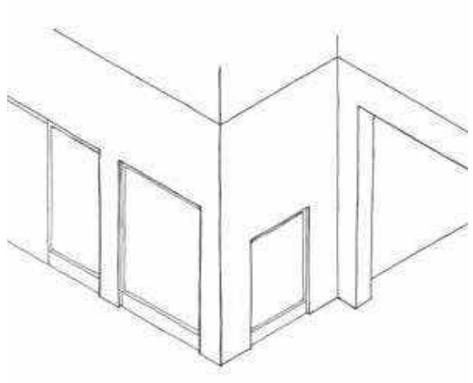
Seat

Busking

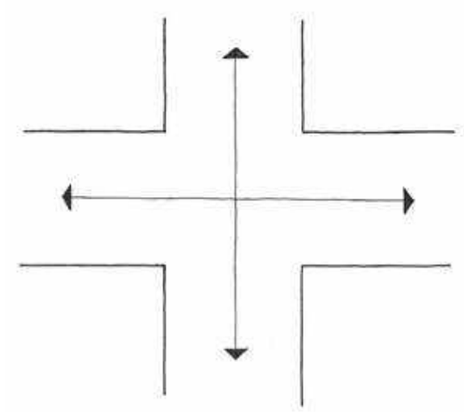
Busking can trigger members of the audience to spark unprompted conversations with each other. Whyte calls this phenomenon triangulation and it is something that can occur in other forms of play that gather spectators. The conversations are unplanned, playful and spontaneous in nature (Whyte, 2012). Informal seating with views over spaces where play occurs can help to promote this effect (Stevens, 2007, p. 117).

Intersections

Stevens identifies intersections as locations that help promote play. People are forced to slow down and become aware of things that are not directly in their direction of travel. This opens up the opportunities for distractions, making them good locations for performances or displays (Stevens, 2007, pp. 99–106).



Street corner



Intersection of roads

Creating of space suitable for busking

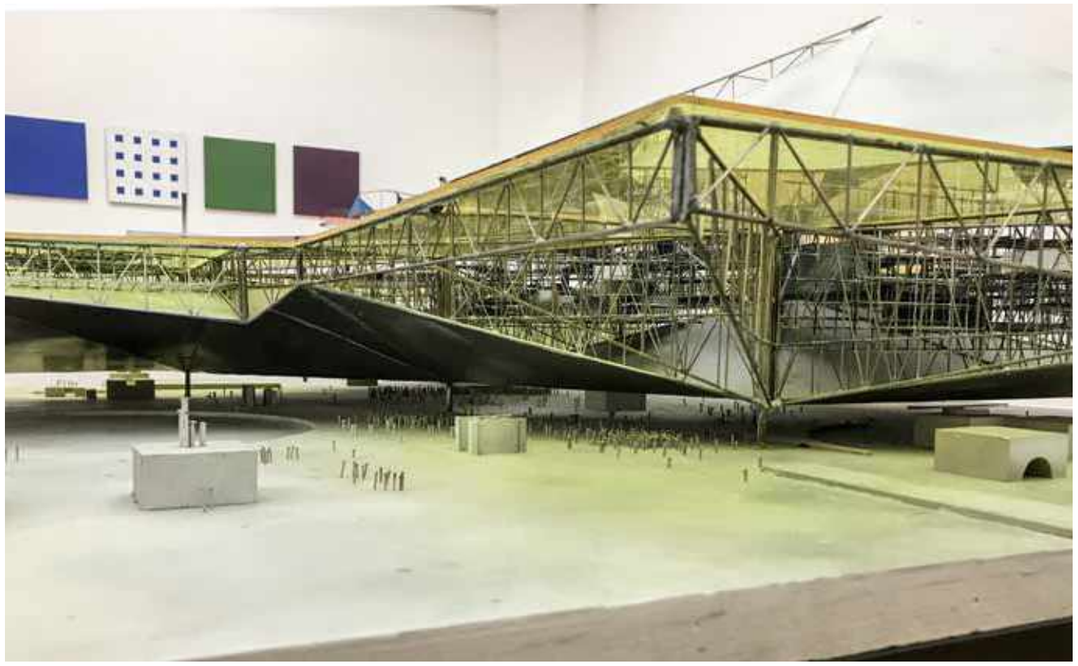
New Babylon, Constant Nieuwenhuys and The Fun Palace Cedric Price

Both New Babylon by Constant Nieuwenhuys and The Fun Place by Cedric Price were studied because of their aim to create more ludic spaces within cities, in an attempt to understand the methods used.

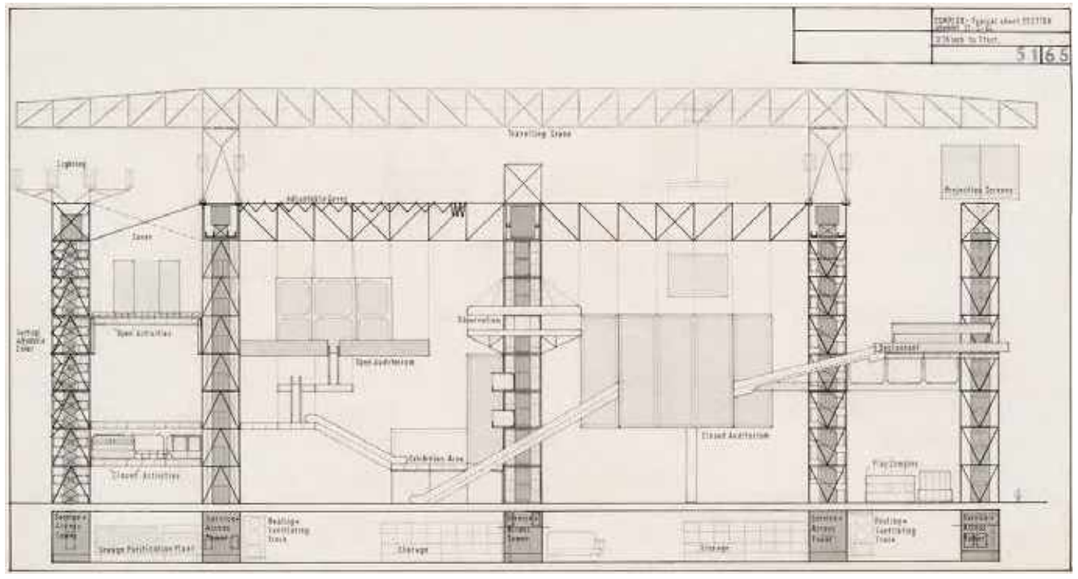
Both projects were a response to what Price and Nieuwenhuys saw as an overly functionalist and controlled city. Price saw the modern city as limited by the built environment of the past and the labels and functions associated with historic constructions. When describing urban environments, he said "redundant buildings and the resultant use patterns act as a straightjacket to total use and enjoyment." (Price, 2016, p. 21) He argued for a freer form of building that was less constrained to particular functions (Price, 2016, pp. 38–39). Nieuwenhuys shared a similar opinion, arguing that cities have become unsuited for the human need to play, described by Huizinga in *Homo Ludens,* and that they have become too functional to the point where human lives become a utility (Huizinga, 1949; Nieuwenhuys & Schrofer, 1966).

Both projects take a similar approach in seeking to resolve this issue of the functional and ordered city: they aim to create spaces that are flexible and change to the needs and requirements of the users.
Price describes the Fun Palace as a framework capable of hosting all manners of facilities ranging from theatres and cinemas to restaurants and workshops. He aimed to create a space for experimental activities that are then defined and chosen by the users, the architecture itself simply providing the conditions needed and the ability to change (Price, 2016, p. 4,28,39,372). These ideas are seen again in New Babylon where Nieuwenhuys describes "the environment of the homo ludens has to be flexible, changeable, assuring any movement, any change of need, any mode of behaviour" (Nieuwenhuys & Schrofer, 1966).

New Babylon took a particular focus on creating a city of play inspired by the book *Homo Ludens*.
Nieuwenhuys also worked as part of The Lettrist International and Situationist International which aimed to study the accidental playful qualities of existing urban structures and use them to create new architectural principles and ways of life. Building on the ideas discussed in these groups, Nieuwenhuys saw New Babylon as an artistic provocation of ideas for a future ludic city (Wigley & Constant, 1998, pp. 12-16,30,58,111).



2.16 - Large Yellow Sector model by Nieuwenhuys, 1958

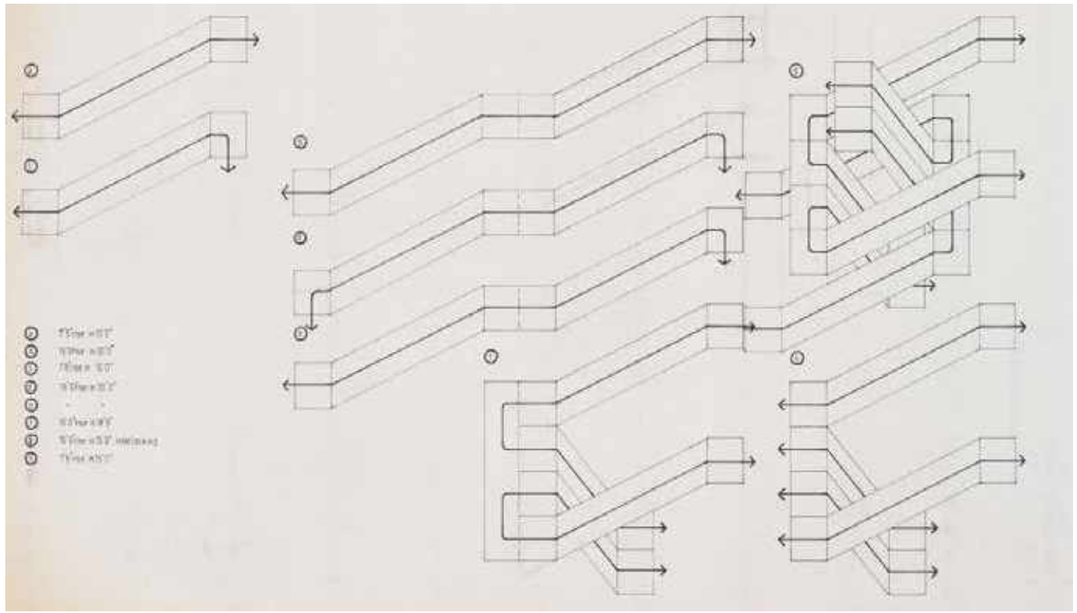


2.17 - Section of the Fun Palace by Price, 1964

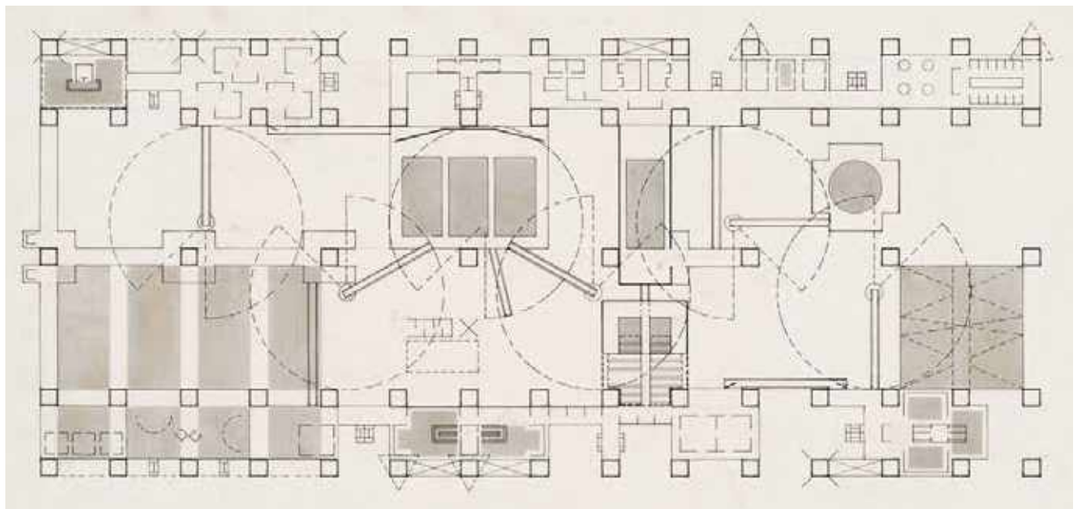
Movable building elements

New Babylon aims to create a "chaotic arrangement" of spaces which can be taken apart and rearranged through the use of standardised walls, floors, ramps, bridges and stairs. These movable elements enable the city's residents to control and construct their own desired environments (Nieuwenhuys & Schrofer, 1966; Wigley & Constant, 1998, p. 13).

The Fun Palace also aims to create adaptable space with moveable elements. Movable circulation is a theme with visitors to the building moving around on walkways, escalators and ramps that can move and change orientation. Furthermore, Price drew ideas of modular systems that could be used to create the walls of enclosures for functions (Price, 2016, p. 95).



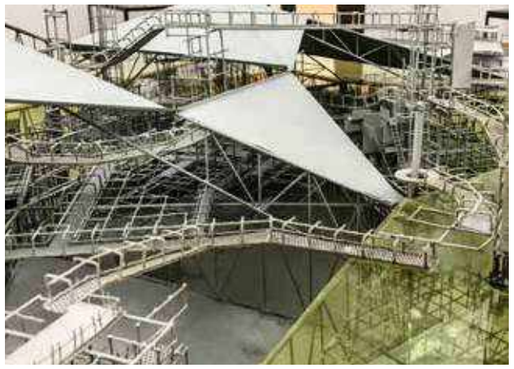
2.18 - Diagrammatic drawing of possible configurations of the modular stair unit designed by Price for the Fun Palace, 1964

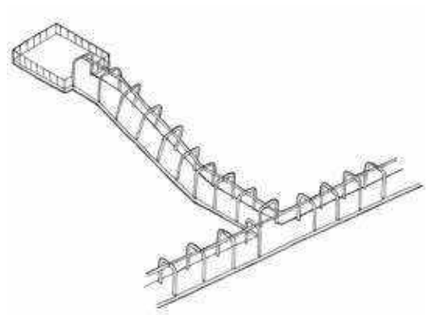


2.19 - Typical plan for Fun Palace showing the rotating escalators, 1964

Creating a labyrinth

Nieuwenhuys proposed the "chaotic arrangement" of spaces in an aim to create a labyrinthine structure as an opposition to the modern city's utilitarian organisation of space (Nieuwenhuys & Schrofer, 1966). Where modern cities focus on effective orientation to allow efficient transport of goods, New Babylon proposes a maze of endless intersections, increasing social interaction. The sense of disorientation created aims to capture the spirit of those who wander cities without a purpose, welcoming the unexpected spectacles of the urban environment (Wigley & Constant, 1998, p. 14,225,226).

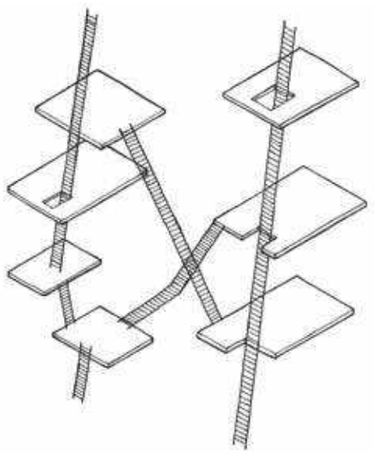




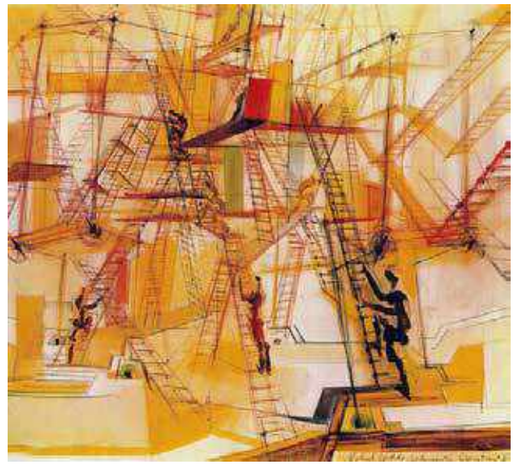
Raised gangways traversing in every direction

Levels

Levels play an important role in both schemes. New Babylon is constructed at a new level above the existing city while also containing meandering paths and different levels within it. The Fun Palace also creates an arrangement of different spaces at different levels, suspended within the supporting structure (Price, 2016, p. 93).



Changing levels and ladders



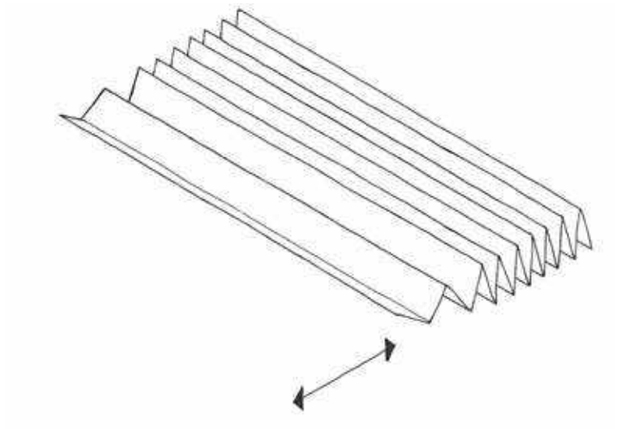
(Left top) 2.20 - Large Yellow Sector model by Nieuwenhuys, 1958
(Right top) 2.21 - Mobile ladder labyrinth model by Nieuwenhuys, 1967
(Right bottom) 2.22 - Mobile ladder labyrinth drawing by Nieuwenhuys, 1967

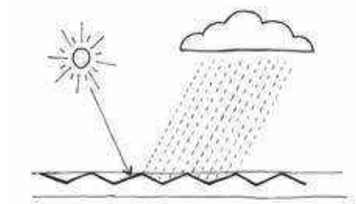
Blurring inside and outside

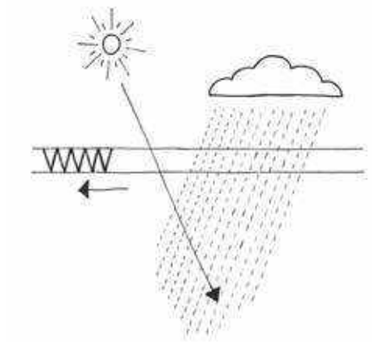
Price describes how the Fun Palace's absence of doors means that people are able to choose how involved they are with the different activities found within each space (Price, 2016, p. 95). The diagrams on this page also show the roof designed for the Fun Palace that allowed the space to adapt and open up.

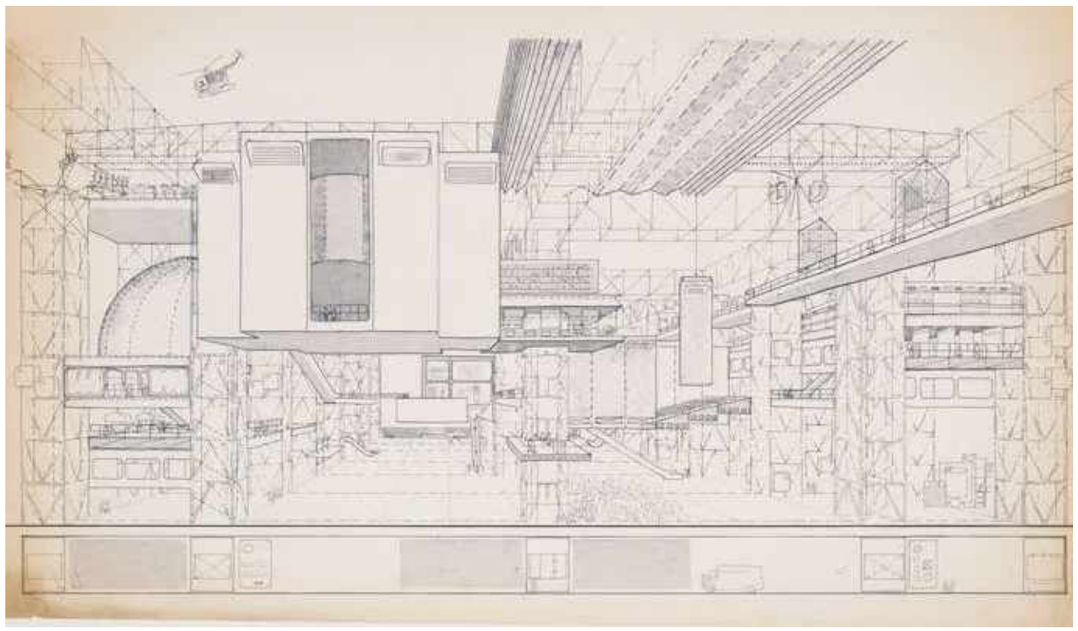
Nieuwenhuys describes the construction of inner division as senseless. New Babylon is instead proposed as fields of space which the inhabitants then roam between (Nieuwenhuys & Schrofer, 1966; Wigley & Constant, 1998, p. 13).

These ideas are related to the ideas of soft edges and thresholds discussed previously in the observations of Nijmegen.





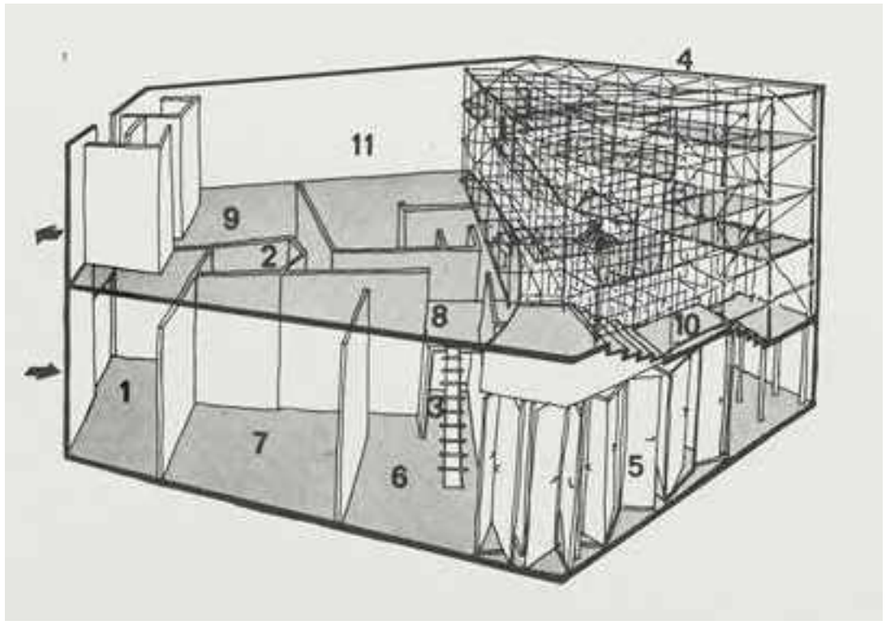




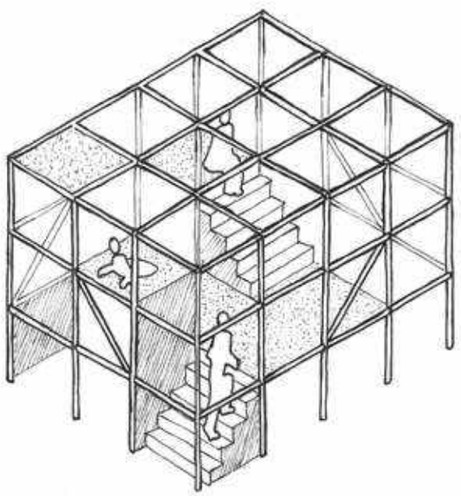
2.23 - Interior perspective of the Fun Palace by Cedric Price, 1960-5

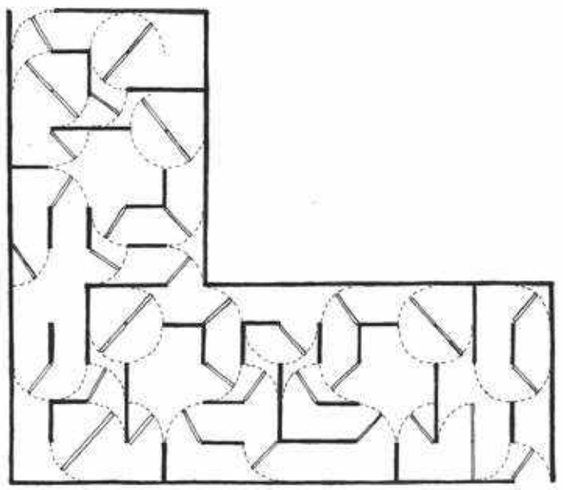
Experimental Studio Rotterdam

An example of a built project by Nieuwenhuys that incorporates ideas from New Babylon is the Experimental Studio Rotterdam exhibit. The labyrinthine spaces involved smells and sounds and required the visitors to climb and crawl though small spaces (Nieuwenhuys & Schrofer, 1966, p. 49).



2.24 - Experiment Studio Rotterdam, 1966





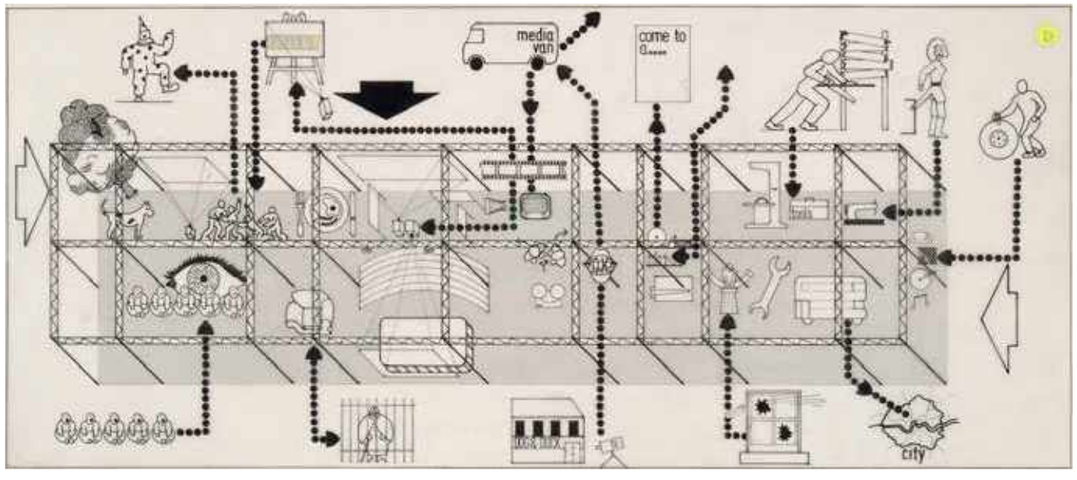
Ludic Stairs

Another project that implements some of the characteristics of New Babylon, in a built scheme, is Nieuwenhuys' "Ludic Stairs". Built for an exhibition in the Amsterdam Museum in 1969, the stairs continue the themes discussed by challenging how things can be used and proposing new creative and playful solutions to the everyday (Stichting Constant, 2014). In this case the form and use of stairs is questioned and a new solution is proposed promoting the building user to question accepted norms.

2.24 - 2.26 - Constant Nieuwenhuijs – Ludic Stairs displayed at the Amsterdam Historical Museum in 1969

Inter-action

Inter-action is an example of a project built by Cedric Price that aims to incorporate the ideas of the Fun Palace. A flexible exterior structure supports interchangeable enclosures aiming to create a project that enables a flexible change of programme. Within the scheme there is a layering of permanency with the external structure lasting 20 years, the enclosures rearranging as needed and the contents of the enclosures altering even faster (Price, 2016, p. 327).

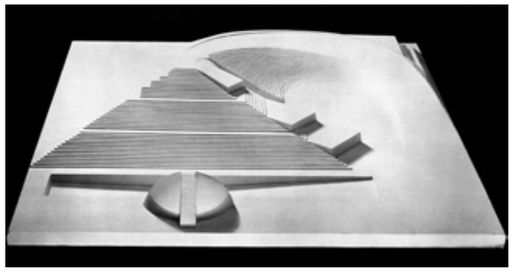


(top left) 2.27 - Aerial view of Inter-Action Centre, 1970-81. (top right) 2.28 - View of a fair held at the Centre between the 1st and 2nd phases of construction, 1974-1977. (bottom) 2.29 - Diagram mapping programme and community for Inter-Action Centre, 1977

Sculpture and play - Isamu Noguchi

Isamu Noguchi, best known for his sculptural work, was interested in the relationship between people and the surrounding landscape (Lefaivre & Döll, 2007, p. 49). One way in which he investigated this is the design of sculptural landscapes and play equipment. Play sculptures and forms had the benefit that though their use people would not only look at the object but interact with it. A key characteristic of his play forms is that their use is not always evident, enabling interpretation by the user and encouraging exploration (Hunter, 1979, p. 58; Noguchi & Fuller, 2015, p. 168). He argued a similar point to Stanford Anderson (1978) in acknowledging the idea of a latent space or a gap between the "cubic feet of space and the additional space that imagination supplies" (Noguchi & Fuller, 2015, p. 160). He saw children as having an upper hand in seeing the possibilities the world had to offer because everything is a new experience, not yet confined to rules or expectations (Noguchi & Fuller, 2015, p. 168).

Perhaps one of the most ambitious ideas was his design for "Play Mountain" - a communal play park proposed for a whole city block within Manhattan. The scheme proposed a large pyramid-like structure that could be climbed on containing a gymnasium, swimming pool, and skating facilities (Hunter, 1979, p. 56). Externally, water would run down the slope into a shallow pool. The slope could be used as a place to sit and watch performances at the bandstand during summer and a place to sledge in the winter. Similar themes were seen in subsequent work for similar landscaped playgrounds throughout his career (Noguchi & Fuller, 2015, pp. 176–177).



(top) 2.30 - Playscapes, Piedmont Park, 1976. (middle) 2.31 - Slide Mantra, 1986. (bottom right) 2.32 - Play sculpture at Moerenuma Park in Sapporo, Hokkaido, Japan. (bottom left) 2.32 - Play Mountain idea for playground, 1933.

Architecture of Joy - Arakawa and Gins

Shusaku Arakawa and Madeline Gins also investigated the relationship between the human body and architecture. Their work focused on creating architecture of joy that promotes life or the act of non-dying. They aimed to challenge people instead of providing spaces that were overly comfortable (Lambert, 2014, pp. 7–15; Yamaoka, 2010) Jenks in *Adhocism* argues a similar point that repeated standardized forms of the modernist movement create spaces where bodies become too comfortable and unengaged with the environment around them (Jencks & Silver, 2013, p. 56). In contrast, Arakawa and Gins created spaces where playing becomes living and the body is constantly challenged in how to occupy a space or what function spaces should be used for (Lambert, 2014, p. 41,60).

(top) 2.33 - Inside the Bioscleave House, 2008. (middle) 2.34- A round-bottomed study in one of the Reversable Destiny Lofts, 2005. (bottom) 2.35 - Ubiquitous Site, Nagi's Ryoanji, 1994.

Amsterdam orphanage and playgrounds - Aldo van Eyck

A number of themes already discussed can be seen in the work of Aldo van Eyck. Van Eyck believed part of the architectural problem was that elements were not just purely functional but also had a symbolic and social impact (Grafe et al., 2018, p. 15). This can be seen throughout his work where he carefully composes moments that allow interpretation and play. Van Eyck was interested in the informal way that life operated within the city and its urban fabric (Wigley & Constant, 1998, p. 28).

Props

Within the Amsterdam playgrounds van Eyck created frames and stepped forms that invite interpretation from the children.
In the Orphanage building, he creates fixed pieces of furniture that also invite interpretation and engagement.

2.36 - (top) photos of Aldo Van Eyck's Amsterdam Playgrounds, (bottom and opposiste) photos of his orphanage project.

Water

Carefully created forms are planned externally that collect rain water creating a small pool with a reflective surface.

Boundaries

Boundaries, mainly formed from circles, can be seen repeated throughout different elements.

Thresholds

The threshold between indoor and outdoor space are carefully composed, emphasizing their connecting function.

Soft edges

Throughout the orphanage there is a connection between the inside and outside: external doors connect the internal spaces with the external courtyards, windows frame moments in the courtyards and large windows open spaces out to the greenery. In addition, similar elements were used externally to reinforce this link.
For instance the reflective pool of water creates similar moments to reflective polished metal internally. Van Eyck believed that spaces inside buildings were never fully interior but also carried qualities of exterior spaces (Grafe et al., 2018, p. 15,47).

Conclusions

The studies into how play takes place within the city shows peoples' imagination and creativity in repurposing urban elements. It is also clear from observing the people of Nijmegen and analysing the case studies that steps, benches, ledges, paving, corners, nooks, doorways and other urban elements have far greater importance than simply their functional purpose. These ordinary elements have the potential to offer spaces in the city for play, testing limits, and socialising.

It also becomes clear what is meant by Karen Frank and Stevens when they describe loose space in cities as created through creative use by people (Franck & Stevens, 2006, p. 11). This creative mindset can be difficult to achieve and requires thought beyond the categories of use assigned to objects. The more sculptural precedent studies such as the work of Noguchi create architectural elements or props that the user has not encountered in the past, meaning that there is a no "intended use" aspect of the to the element. This intentional manipulation of space encourages people to approach the built environment with fewer social constraints and to make the most of what the space has to offer. In contrast, the work of van Eyck creates known elements such as steps and seats in new forms that can empower users to become more spatially aware of the element and its possible uses.

In *Life Between Buildings*, Gehl describes three categories of urban activities: necessary activities, optional activities and social activities. He argues that necessary activities will always occur but that optional and social activities only occur in spaces that offer favourable conditions (Gehl, 2011, pp. 9–12). Good design of urban spaces can then be seen as learning from the elements documented within this catalogue in an attempt to create more spaces in the city where play and social interaction can occur.

The catalogue of research creates a treasury of elements that were then used in the design of the project, as described in the following sections.

Development from research into design

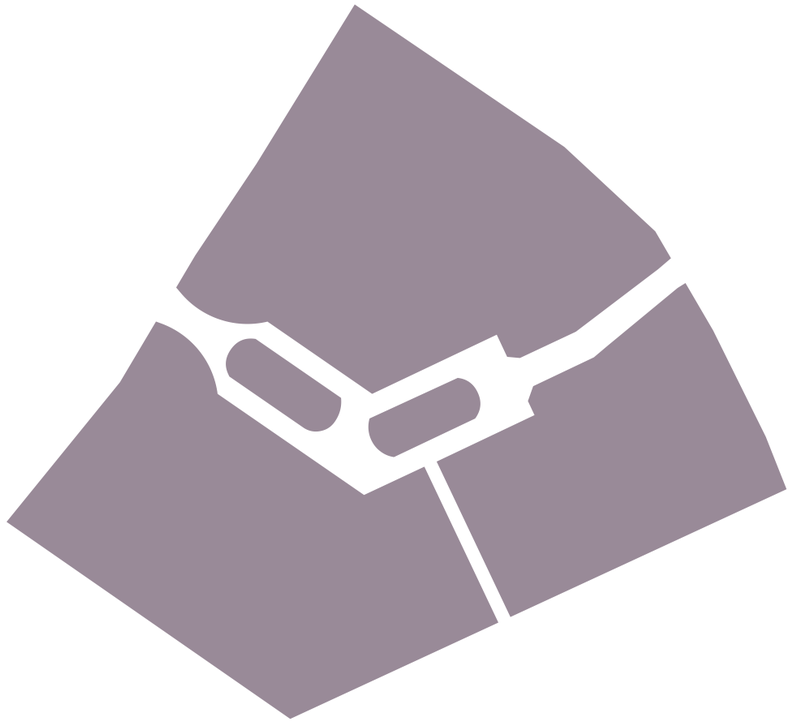
The following section outlines the transition from research into design of the urban plan, building programme and architectural design. These three areas of the design all aim to respond to the theme of escape which emerged during the group work in the previous section, “What time is this place?”

The following section will outline the:

Urban proposal – The creation of an oasis in the city centre, an escape from the dominant consumerism of the area.

Building programme - The proposal for a Health and Wellness centre that aims to provide an escape from the consumerist values present on the site and replace them with ones of community and mental and physical wellbeing.

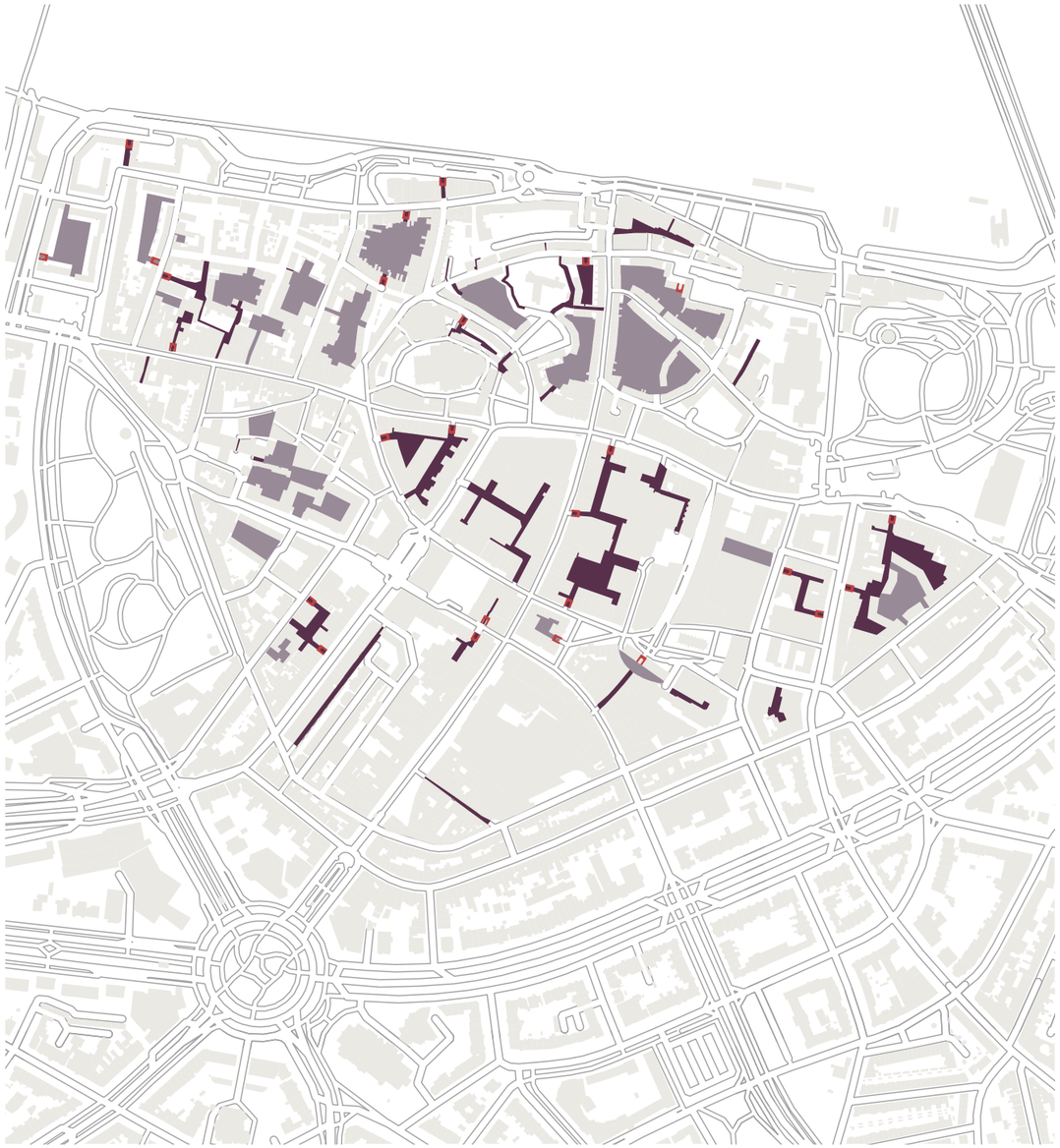
Architectural and detailed design – Implementing the previously outlined research into play, as a form of escape, within the architectural and detail design of the building.



The creation of an oasis in the city centre, an escape from the dominant consumerism of the area.

Nijmegen's courtyards

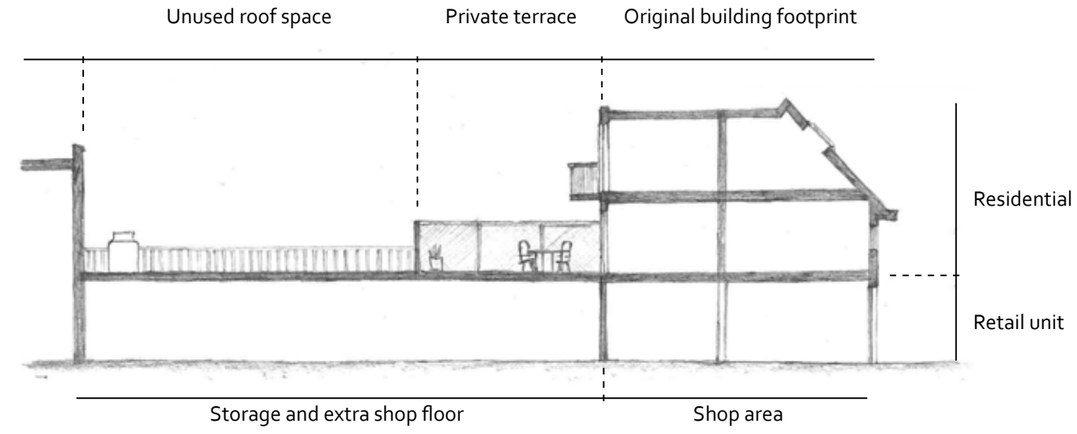
When walking the city, it became clear that the typology of an inner courtyard within urban blocks was common. These inner spaces range from back alleys to larger courtyards that contain amenities such as playgrounds. Passages are also seen as a common way of breaking the facades and allowing access into these inner spaces. These passages also have a historic significance for the site of the Molenpoort which takes its name from a nearby passage that passed through the old city wall.



Typical section of adjacent building

Through investigating the urban context of the area, it became evident that the site was surrounded by a specific situation. Most of the surrounding buildings are used as shops, cafes or bars on the ground floor, and consequently the buildings have been extended to the property boundary on the ground floor to provide more shop or storage space.

The original building then has a residential function on the upper floors. This creates a large roof space that the first floor opens out onto. Some of the residential flats have made use of some of this space for terraces but a lot of it is unused as seen in the images below.



Adjacent programmes

This study helps to illustrate the way that the site is surrounded by shops and cafes on the ground floor that have been built up to their boundaries, and that the level above is predominantly used for housing. The diagram also highlights the large parking garage in the block to the north of the site, raising the question of how much parking the area needs. The currently unused roof space is also highlighted in light grey.

Urban plan ground floor level

Parking

Proposed Housing

Proposed facilities

Proposed retail units

The scheme aims to create a place separated from the surrounding shops that is focused on wellbeing and health. The outer edge of the block is used to create retail units for those entrepreneurs from the Molenpoort that wish to remain on the site. As well as this on Tweede Walstraat, opposite what is already social housing, more housing with parking on the lower levels is proposed.

The central oasis is occupied by community buildings. These buildings include the health and wellness centre, an arts centre, a community kitchen with allotment and childcare facilities. At the centre of the scheme is a winter garden that can be used informally for covered park activities and also rented for events.

Scale 1:1000

Urban plan upper level

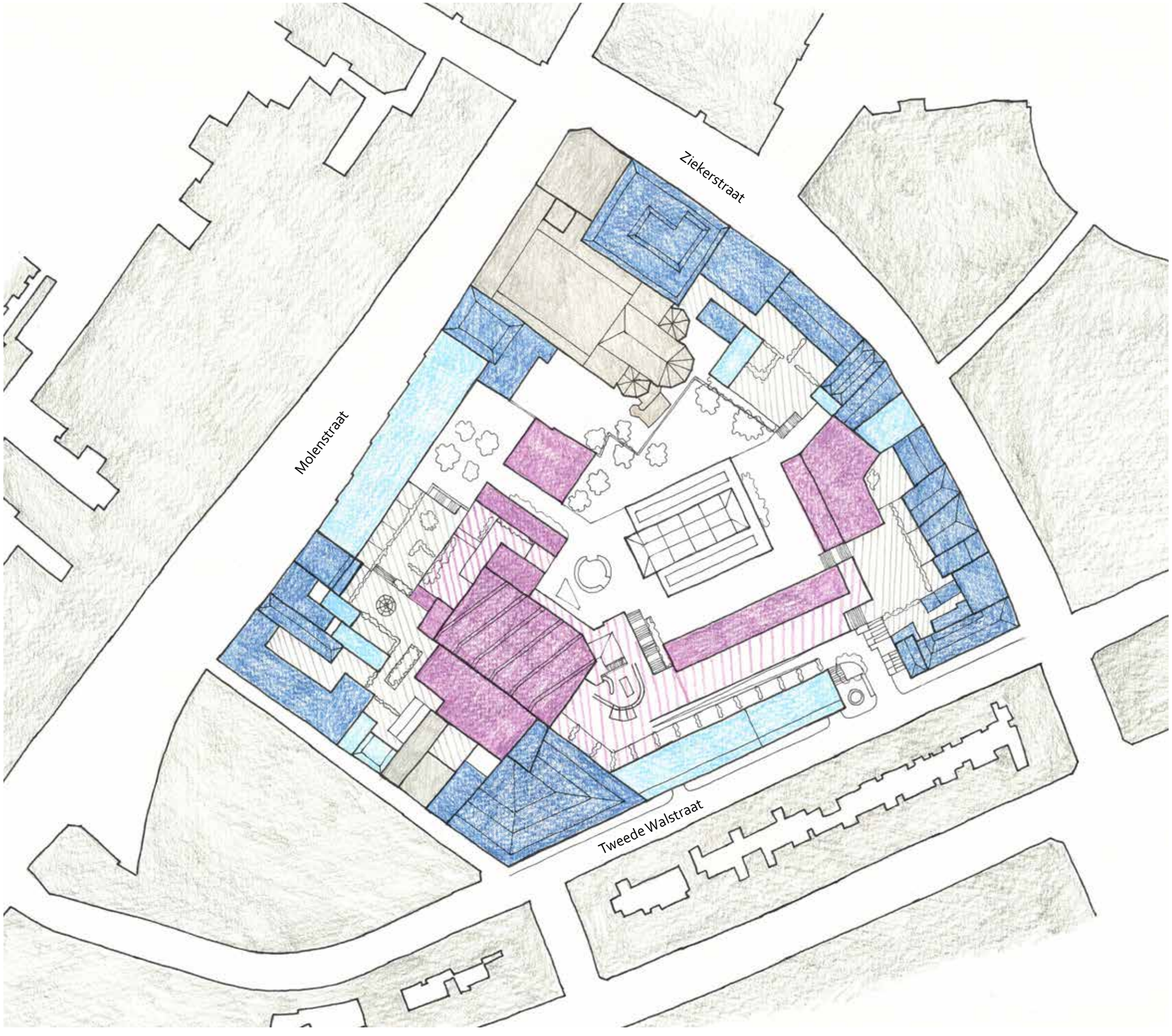
Existing housing

Proposed Housing

Proposed facilities

Roof terrace

Roof terrace (above proposed facilities)



The upper level is characterised by a ring of housing which opens up onto first floor roof space (hatched area), separating the housing from the inner community buildings.

Scale 1:1000

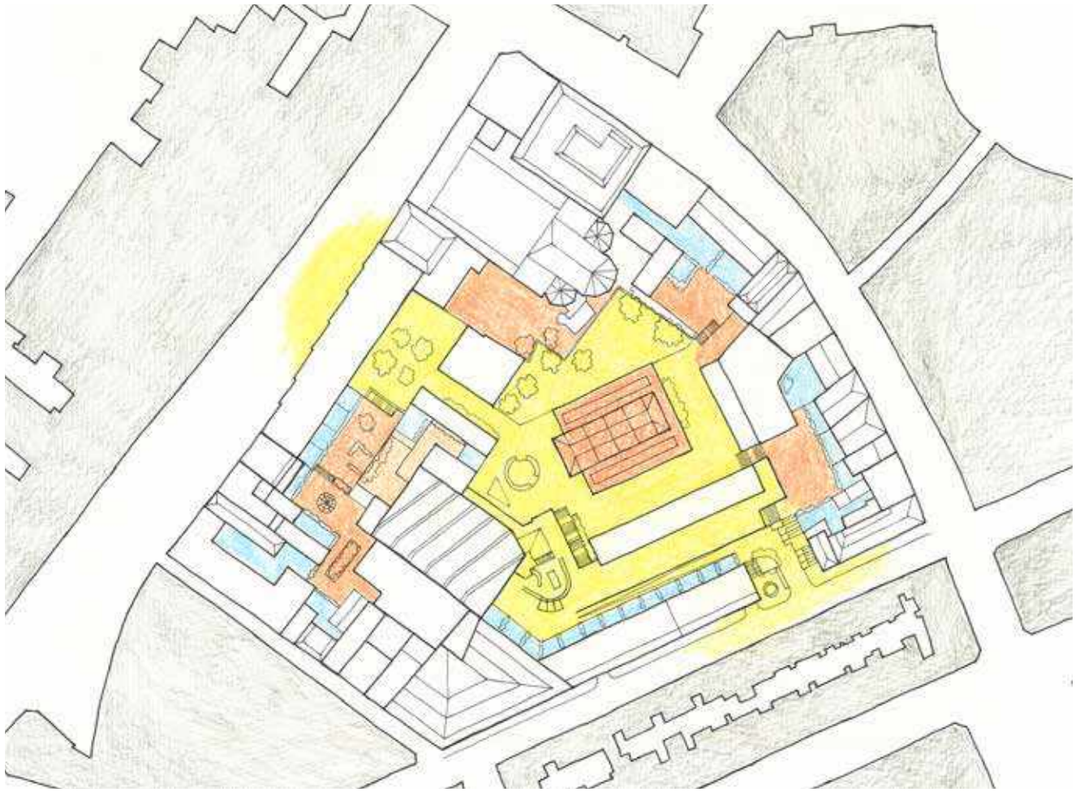
Public, semi-public, and private

Public

Semi-public

Private terrace

The proposed scheme creates a transition between fully public space on the ground level to more semi-public space and then private gardens on the first floor roof space.



Demolition plan

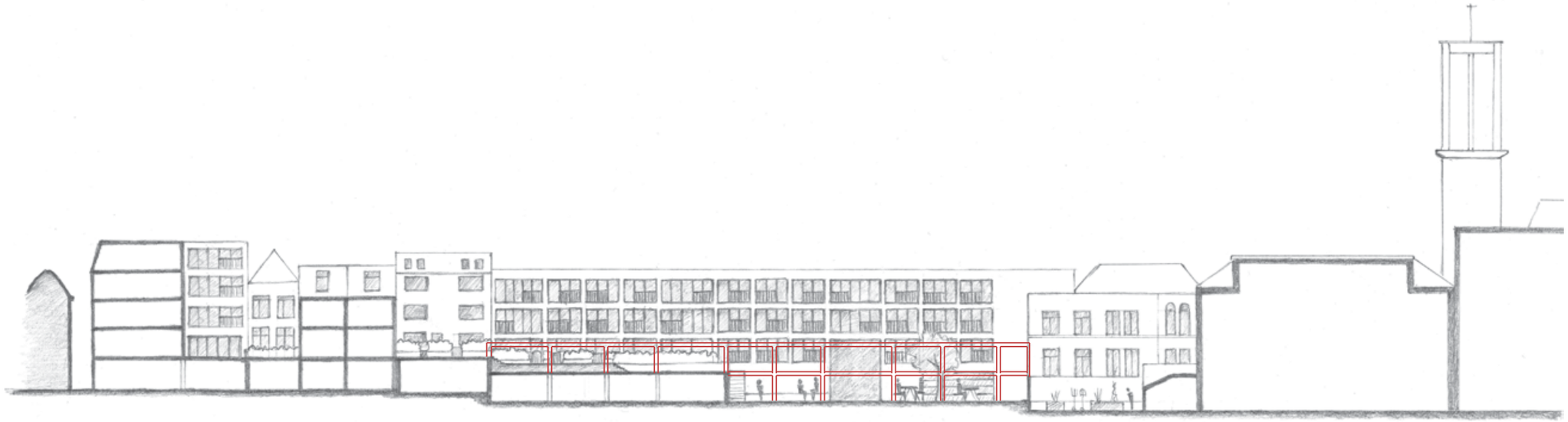
Demolished structure

Reused structure

Proposed building envelope

The scheme is designed within the boundaries of the grid enabling for the existing structure to be reused.

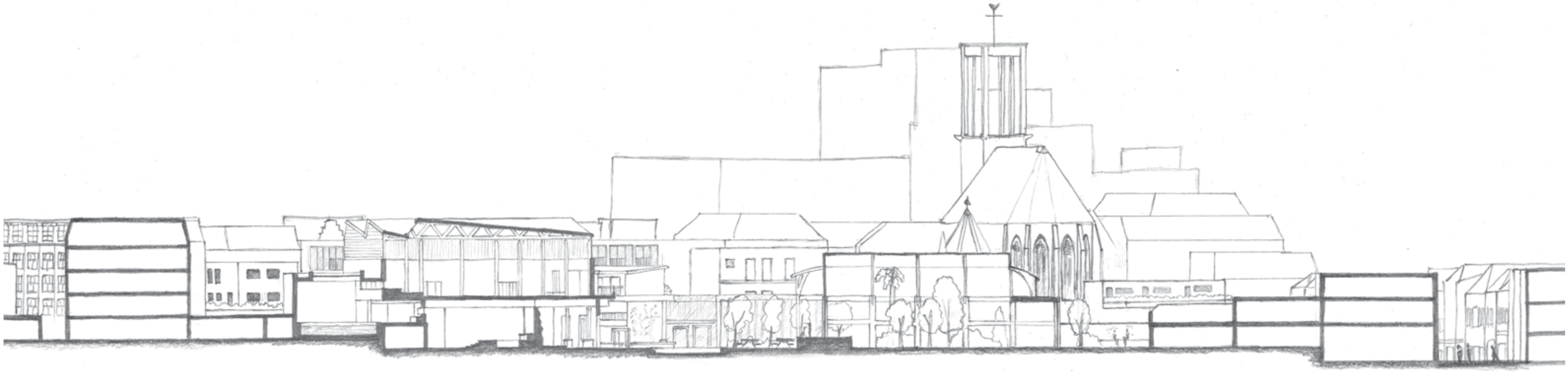
Urban section



Here red lines indicate the proposed demolition of the shopping centre. In some places the full structure is demolished to create the public spaces and in other parts only one level is demolished to create a connection with the adjacent roof spaces.

Scale 1:500

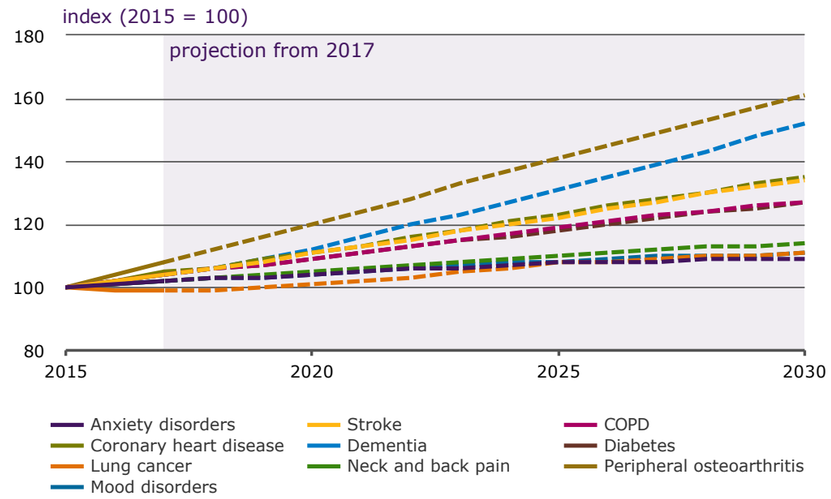
Urban section



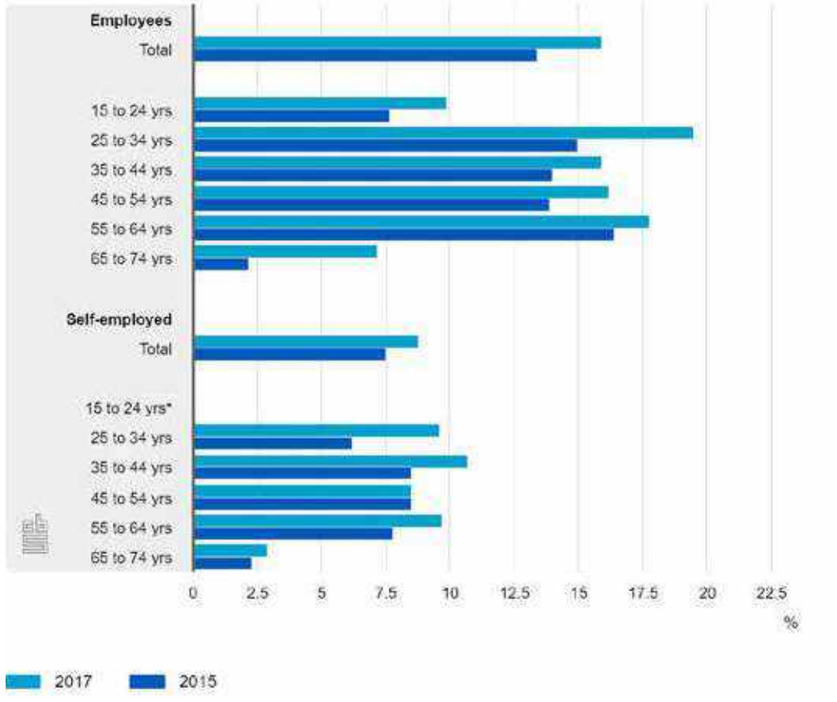
Shops with housing above | Roof terrace | Health and Wellness Centre | Central square | Winter garden event space | | Child care | Shops with housing above

Scale 1:500

The proposal for a Health and Wellness centre that aims to provide an escape from the consumerist values present on the site and replace them with ones of community and mental and physical wellbeing.



3.1 - Trend in prevalence of health problems in Nijmegen



3.2 - Trends in work related mental fatigue

Problem statement recap

As outlined in the problem statement at the start of the book, the modern way of living has seen an increase in lifestyle related illness. This increase has caused for a fresh look at what good health is and requires.
For this to be a success we need to let go of our current understanding of what healthcare is. In the spirit of bricolage and adhocism, the programme aims to achieve this through combining aspects of existing typologies, in particular health centres and leisure facilities.

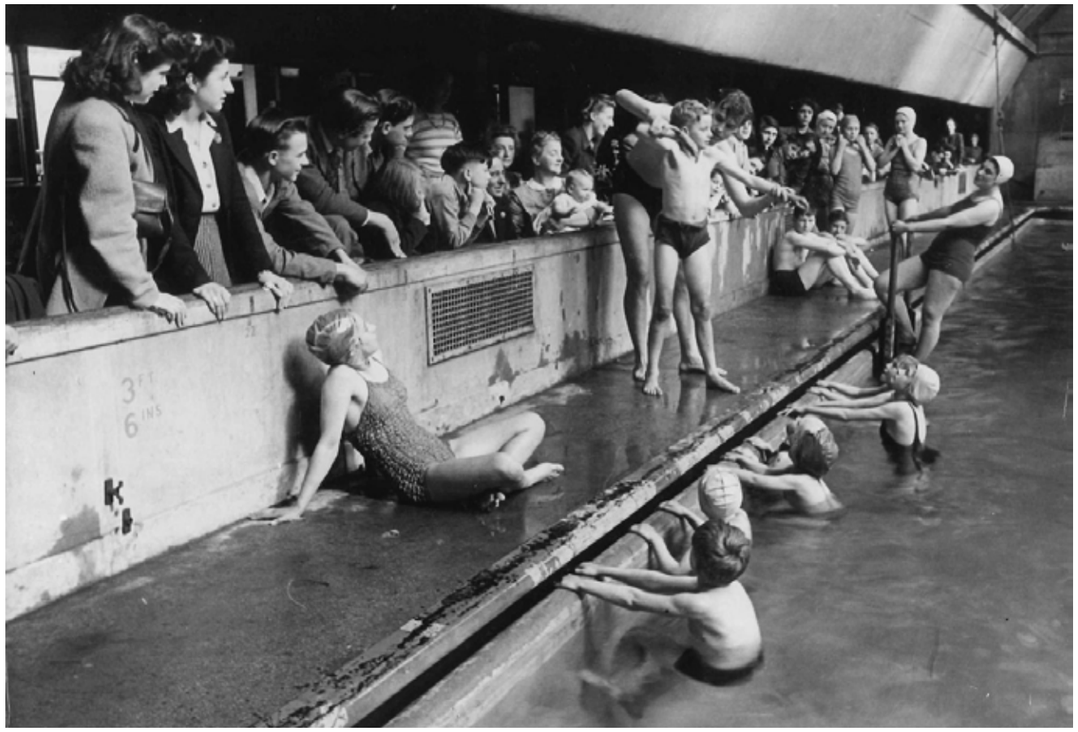
The proposed programme aims to speculate a future typology that could provide a place for escape from consumption and constructed time, a place for self-reflection, health and well-being.

"The continuing rise of lifestyle-related diseases and chronic disorders means that we need to take a fresh look at health and healthcare, and must combine prevention and treatment." - TNO

Precedence for a new typology in preventative health

Perhaps best described by Pattern 47, "Health Center", of *A Pattern Language*, where Christopher Alexander calls for the creation of a new system of care, preventative health centres emphasise an active approach in keeping people healthy and not just the treatment of sickness. This system was tested during The Peckham Experiment, which provided leisure and social facilities for the surrounding community as well as active participation from doctors providing knowledge on healthy living and regular consultations. The founders of the Peckham Experiment accused existing "health centres" of actually being polyclinics focused on the treatment of the sick. The Peckham Experiment was found to be successful in treating issues of early sickness leading to better health later in life, as well as providing the necessary social and physical activities for healthy living.(Alexander, 1977, pp. 252–255; Pearse, 1947, p. 48,79,113,290)

Other examples of projects which question the future of healthy living included OMA's "Hospital of the future" and McGinlay Bell's project "New Typologies". Both of these examples question the current ideas of only treating sickness and propose instead a more holistic approach that includes prevention.



3.3 - The swimming area at the Peckham Experiment, 1926 - 1950

(top) 3.4 - OMA's Hospital of the Future project. (bottom) 3.5 - A model for McGinlay Bell's New Typologies project.

Proposed Building Program

The building's programme is inspired by the 3 forms of prevention: primary prevention through education, reduction of stress and healthy diet; secondary prevention, which is early detection of conditions; and tertiary prevention, reduction of exasperation after diagnosis (Lombarts, 2013).

The proposed building programme then combines therapies that can be used both as part of primary prevention and tertiary prevention with healthy lifestyle activities. Health check rooms provide the opportunity for custom plans to be created for people to help them achieve their healthiest lifestyle. During the Peckham Experiment it was found that only 9% of participants were completely healthy and that the general population benefited from health advice (Pearse, 1947, p. 13).

The pairing of physio and psychological therapies with lifestyle related activities also helps to normalise these services and make them part of everyday life. Flexible studio spaces then also provide space for classes such as yoga, pilates, dance and exercise. All of these activities help to bring people together building relationships and helping with mental well-being.

The health benefits of play described in the problem statement (on page 10) mean that encouraging play within the architectural design of the building will also help to promote healthy lifestyles.

Consultation and therapies		
Health check rooms	2	50 m²
Physiotherapist	2	50 m²
Large physio room	1	60 m²
Psychologist	6	85 m²
Group therapy/ Seminar rooms	2	75 m²
Acupuncture/ Massage	4	75 m²
Lifestyle		
Swimming pool	1	620 m²
Sauna and steam rooms	4	20 m²
Hydrotherapy baths	1	230 m²
Changing	4	240 m²
Sports hall	1	720 m²
Squash courts	1	650 m²
Ping pong	1	130 m²
Spectators	2	180 m²
Flexible studios (Yoga, Pilates, Dance, Boxing, Amateur drama, exercise classes)	2	250 m²
Active corridor (Including bouldering, climbing wall, parkour equipment and social club)	1	460 m²
Administration		90 m²
Services (toilets, plant, storage)		520 m²
Circulation		370 m²
Total		4350 m²

Nijmegen Prevention Agreement

The need for prevention within the Netherlands has been recognised by national health initiatives as well as regional municipalities (Ministerie van Volksgezondheid, 2018). Nijmegen for instance, has published a local prevention agreement aimed at creating healthier lifestyles. As part of improving mental health and social well-being, the report outlines aims to create more space for greenery, relaxation, social interaction, sports and play (GGD Gelderland-Zuid et al., 2019). This outlines the interest within governing bodies for improving preventative healthcare as well as providing possible funding for the scheme so that the facilities are not limited to those who are able to pay for them.

As part of the prevention agreement the municipality has created circuits that encourage exercise around green spaces. However, none of the circuits are currently within the city centre. The proposed scheme aims to build on these good initiatives by exploring how the built environment itself can play a role in encouraging people to take a break, exercise and play.

3.5 - Cover of Nijmegen's prevention agreement

Aims:

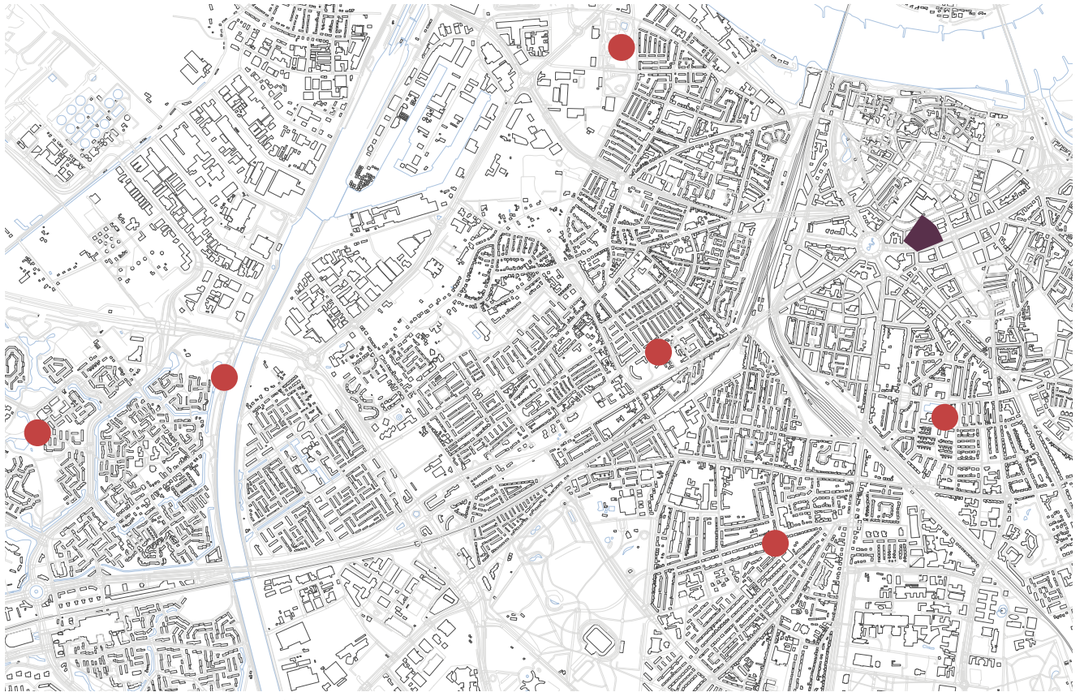
- Reduction in those who smoke

- Decrease in overweight population

- Decrease in excess consumption of alcohol

- Improved mental health and social well-being

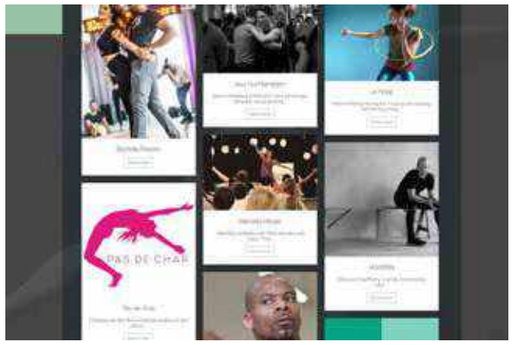
- Creation of a healthy environment



3.6 - Exercise circuits created by Nijmegen's municipality.

The Honig Complex

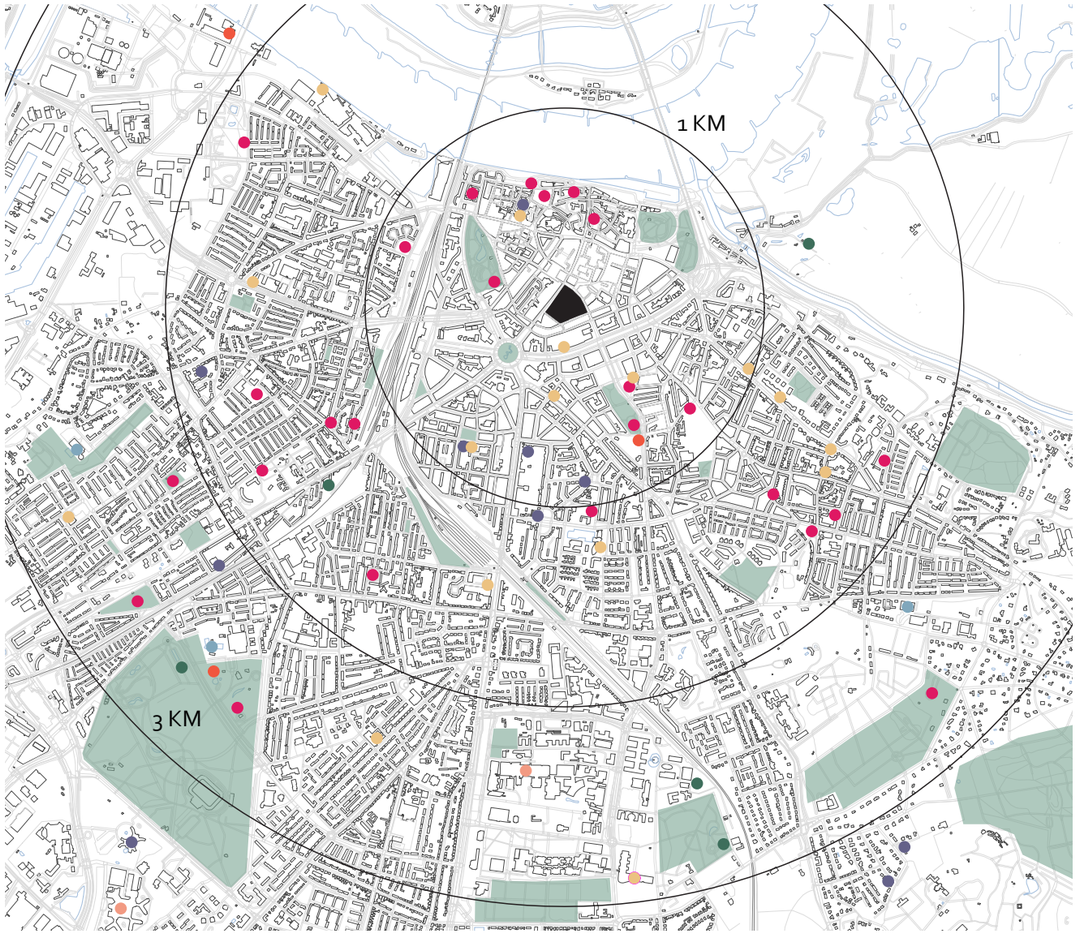
Similar programmes to those which are proposed can be found at the Honing Complex which is set to close in a years' time. Volleyball, dance, boxing, amateur theatre and physio facilities are examples of the types of businesses that aim to be accommodated by the flexible studio spaces and sports hall of the proposed scheme.



Large scale programme study

This programme study carried out on a larger scale showing programmes that are similar to the programmes suggested by the urban scheme. This process helped to give a better understanding of the context that such a scheme would sit in. It is clear that Nijmegen already has some wellness facilities such as parks, swimming pools and playgrounds, however what is interesting to observe is that these facilities are spread out over the wider area of Nijmegen. The very centre of the city, near the site is dominated by shops and cafes, therefore strengthening the idea that this is a suitable place to test how such programs could be incorporated into an urban site with the refurbishment of a disused shopping centre.

- Skate Parks
- Play Parks
- Meditation
- Gardens
- Swimming Pools
- Hospital
- General Practitioner



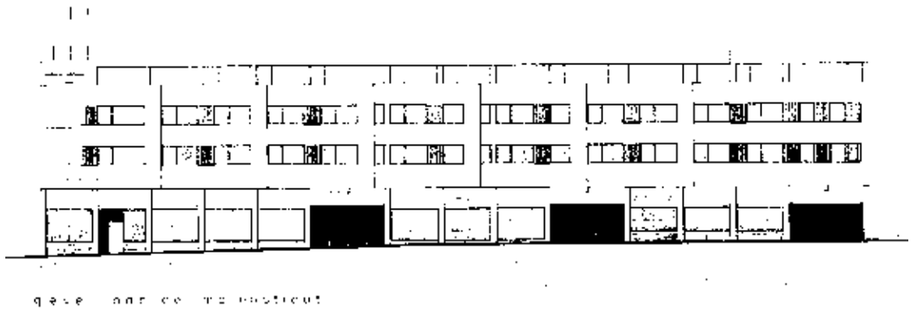
Architectural and detailed design

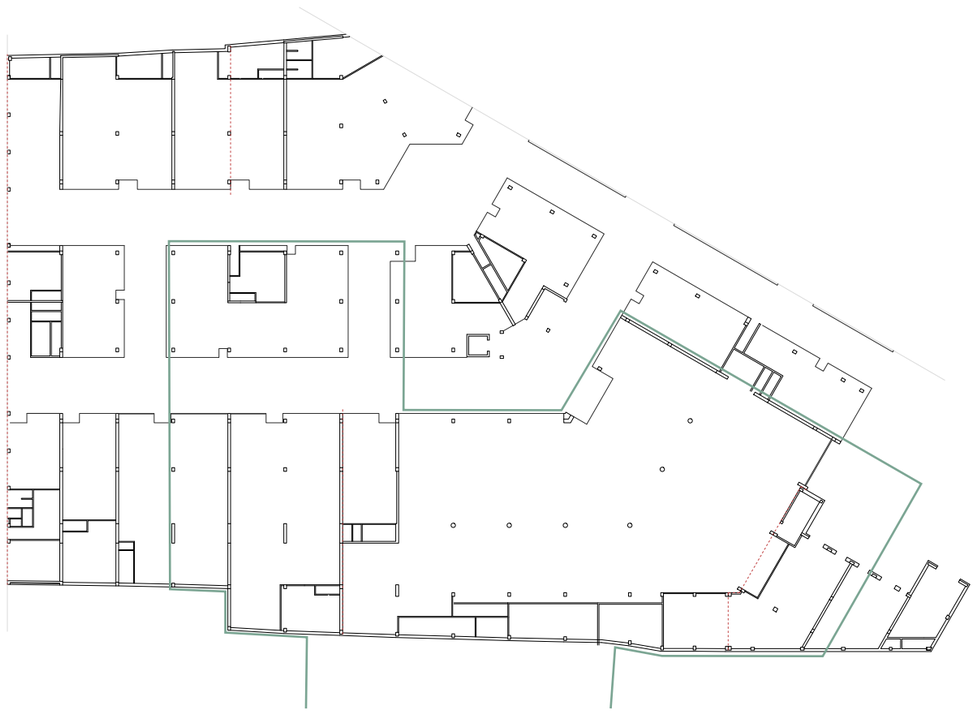
Implementing the previously outlined research into play, as a form of escape, within the architectural and detail design of the building.

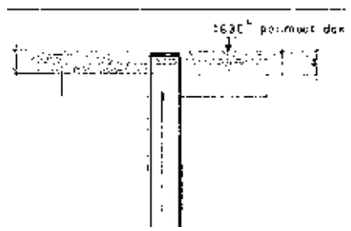
Understanding the Site

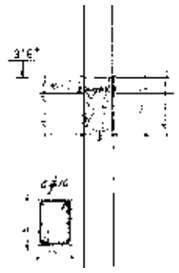
A detailed study of a fragment of the Molenpoort included in and surrounding the proposed building envelope was carried out. This was done to gain a detailed understanding of the existing structure, its nuances and the changes it went through during the three redevelopments of the shopping centre. In the following diagrams, red identifies the elements demolished during the period of redevelopment, blue indicates steel added to the construction and light green indicates the proposed building envelope.

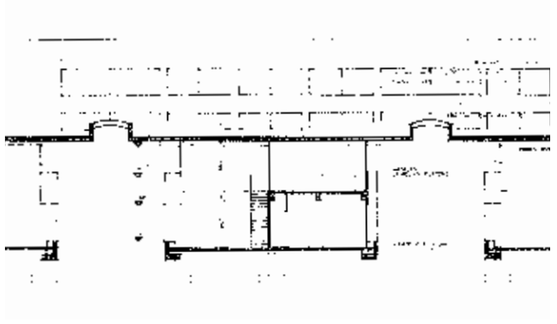
1971 - original construction

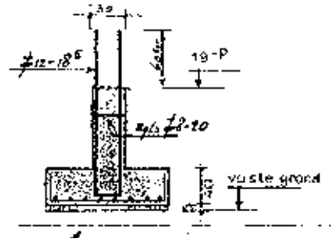








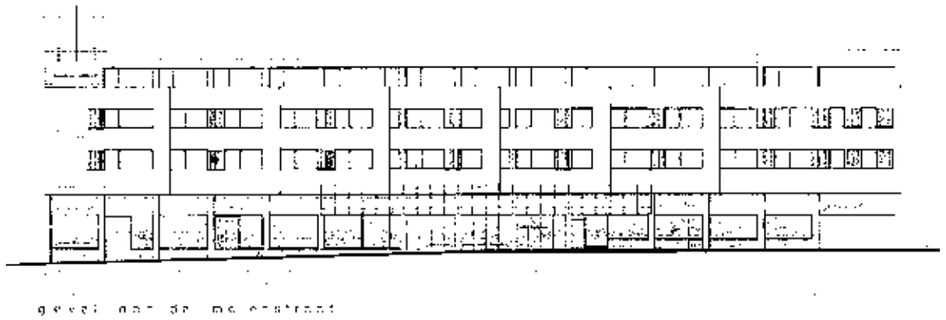


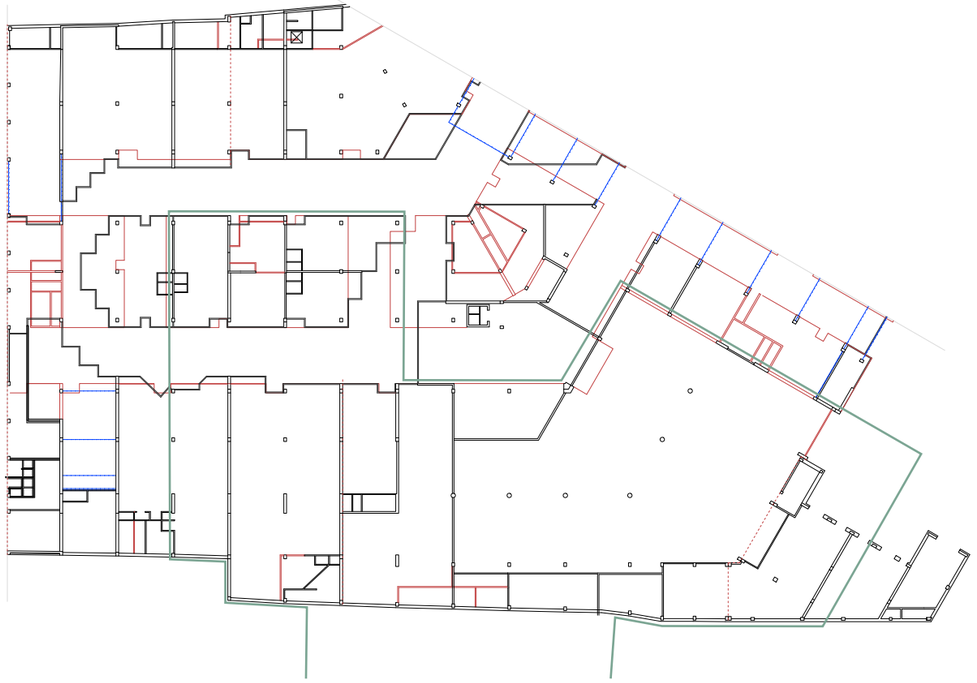


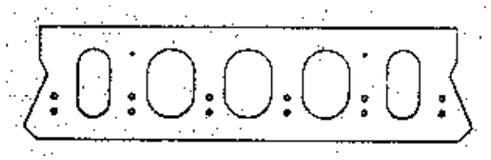
The original construction is a monolithic concrete structure poured in situ.

3.7 - Archival drawings retrieved from Digitaal Gebouwen Dossier.
3.8 - Archive photo retrieved from Nijmegen archive, 1967 (F84756).

1984 - refurbishment





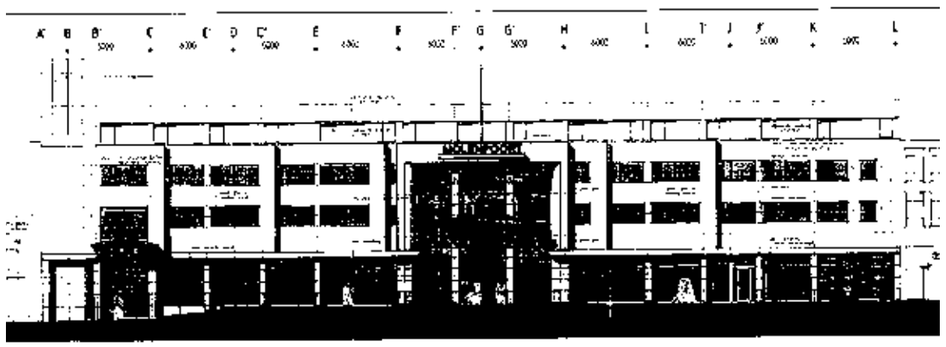


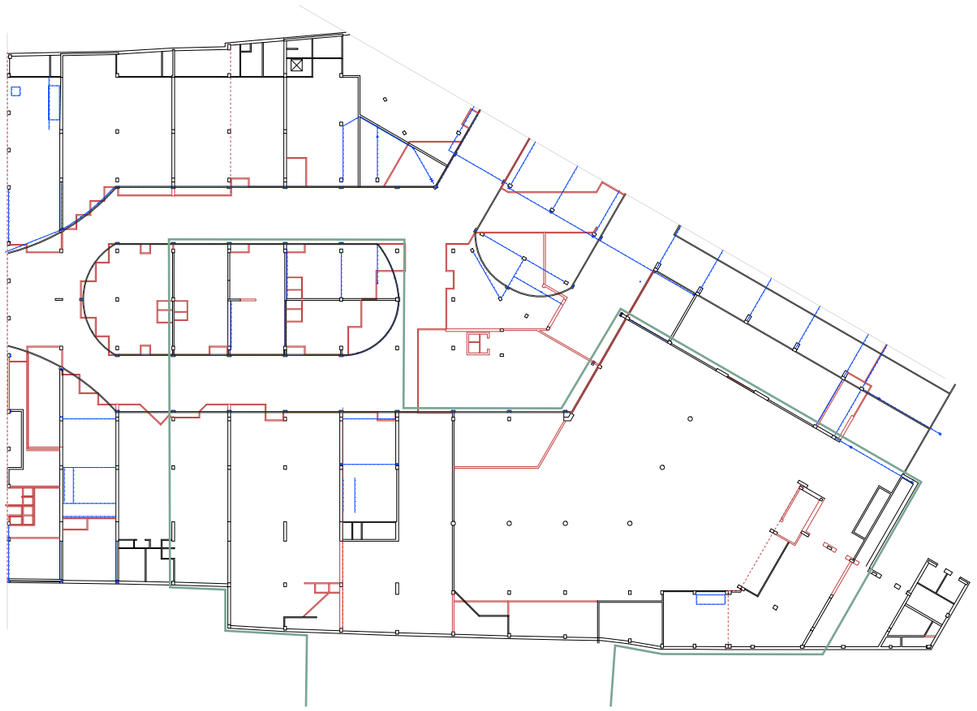
Pre-fabricated concret slabs are used to construct new floors.

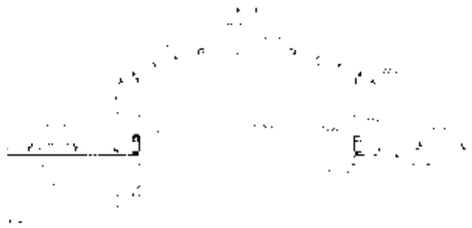
Steel is added the monolithic concrete construction to support to alterations.

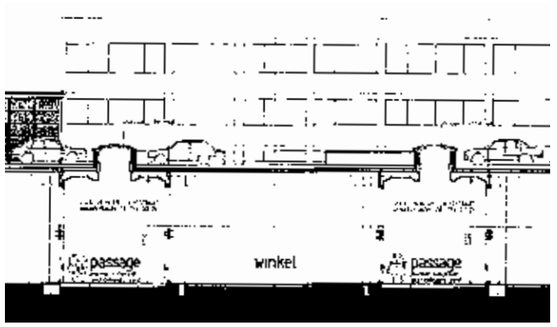
3.7 - Archival drawings retrieved from Digitaal Gebouwen Dossier.
3.9 - Archive photo retrieved from Nijmegen archive, 1988 (F18277).

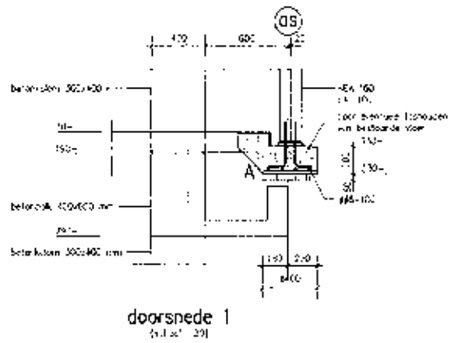
1998 - refurbisment











New steel columns are added throughout the building in the construction of new shopping windows, large atrium, and new car ramp.

3.7 - Archival drawings retrieved from Digitaal Gebouwen Dossier.

Reusable building elements

The main re-use strategy for the project is to work within the existing structure as much as possible. This made the investigations on the previous pages important in understanding the details and intricacies of the existing building. In addition to this, a number of building elements, - catalogued on this page - have been identified for reuse.

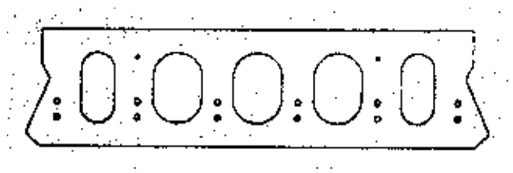
Tiles

Building details and investigations on site indicated that the floor tiles can be removed. It is proposed to reuse them in the pool and baths of the proposed building.

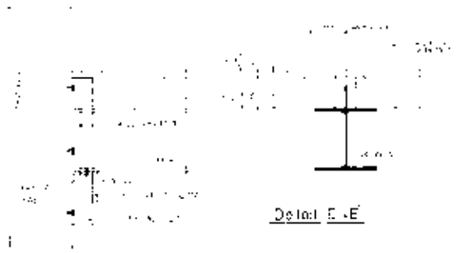
Stairs

The proposed building re-uses both of the existing public stairs.

Prefabricated concrete

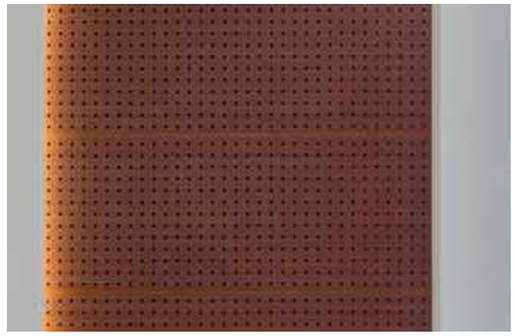


Steel sections



It is proposed to re-use the prefabricated concrete slabs and steel sections that are present in areas of the building which will be demolished as part of the urban proposal. They were added during the refurbishments of the building and are dimensioned to fit the 6x6 structural grid. This makes them ideal for re-use in the new building where structural steel or new floor slabs are required, following any required safety check by engineers.

Acoustic ceiling panels



The re-use of acoustic ceiling panels is proposed in the corridor and hot baths.

Internal windows

Shop windows are reused for internal glazing throughout the proposed building.

Railings

The re-use of handrails is proposed internally in spaces such as the baths and pool area where a balustrade is required.

Mechanical equipment

Mechanical equipment can be re-used as part of the air handling system to cool air in the summer.

Interaction with adjacent buildings

Proposed building envelope

Molenpoort shopping centre

Basic fit gym building

3.10 - Photo of Tweede Walstraat 80

Adjacent storage building

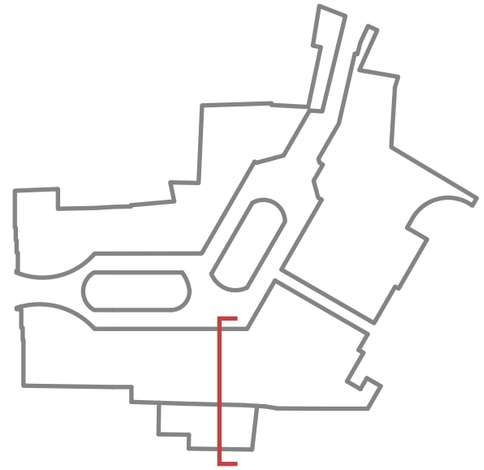
3.11 - Photo of Vlaamsegas 12

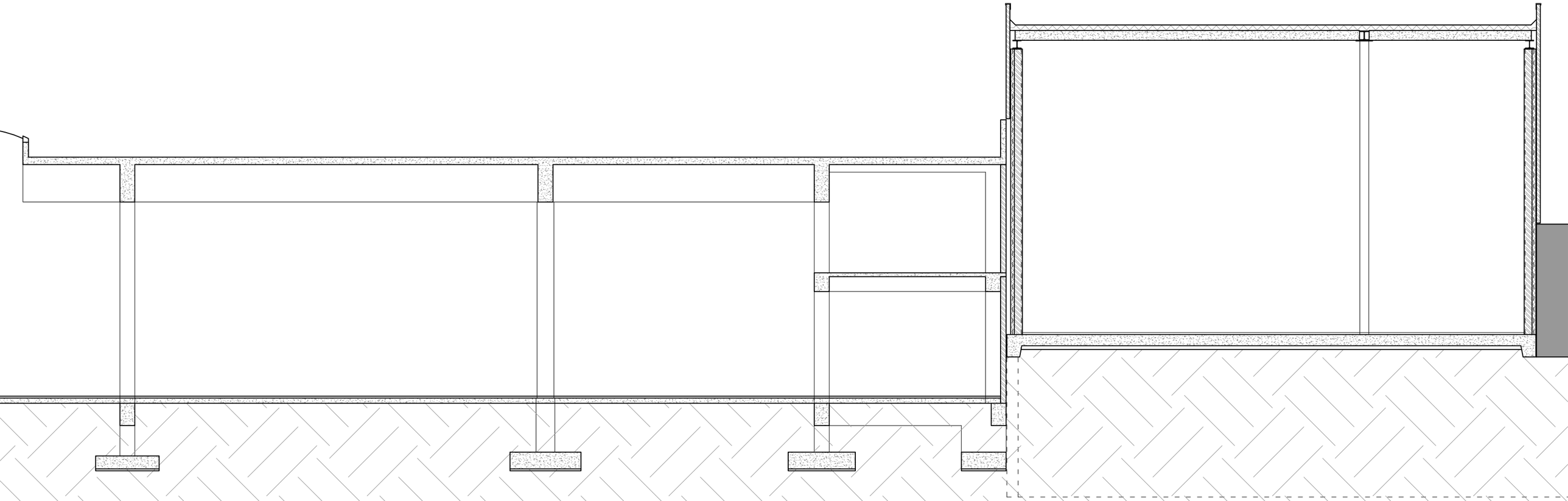
The plan above shows the proposed building envelope and how it interacts with the surrounding buildings. The adjacent storage building is incorporated into the envelope and proposed as the location for the scheme's swimming pool. A number of characteristics make the building suitable for a pool. The building offers a wider structural span of 9.4m compared with the typical 6m spans of the Molenpoort. In addition, it has a ceiling height of 7.8m and a basement which can be used to create a deeper pool and house pool plant equipment.

The scheme then also proposes to create a connection with the neighbouring gym building through the party wall so that the two buildings can share facilities.

Existing section

A section of the existing situation was also drawn using information from the archive drawings to gain a greater understanding of the structure. Drawing the section identified the way that the Molenpoort and adjacent storage building interact and the different level changes between the buildings.



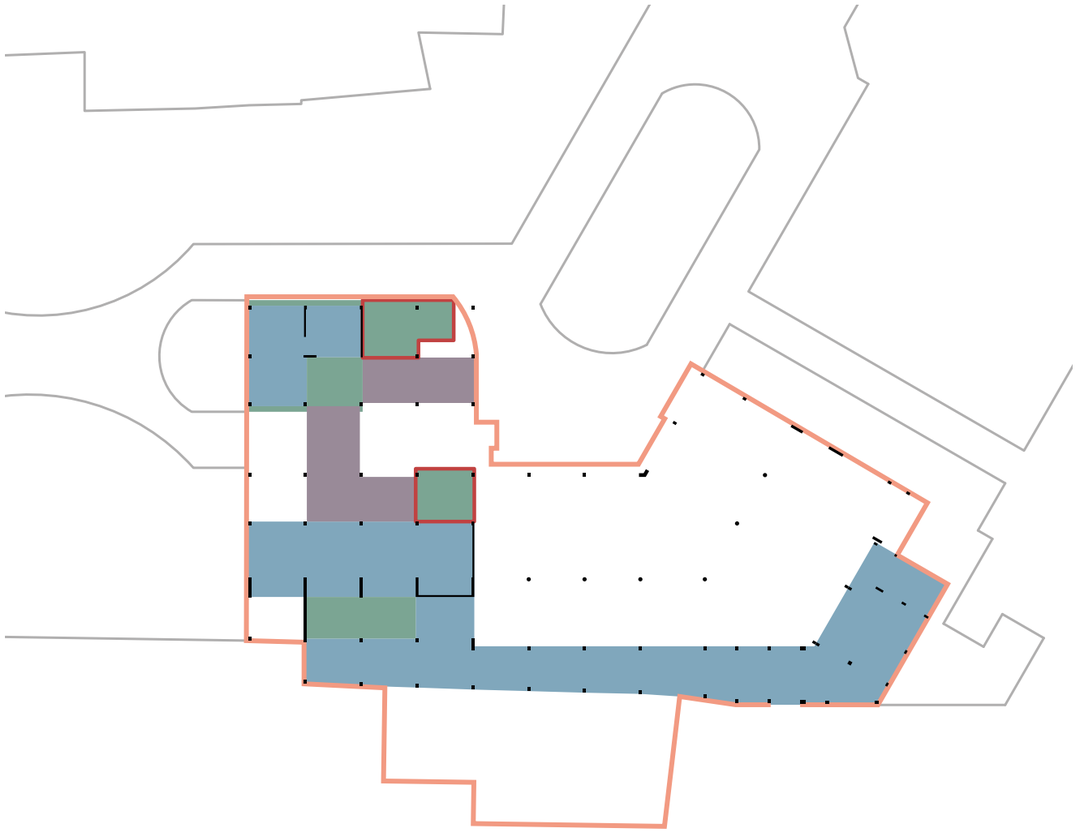


Scale 1:100 @ A3 (or 1:50 @ A1)

Response to analysis of structure

Existing first floor level structure

Proposed intervention



Original 1971 first floor structure

First floor structure added in 1998

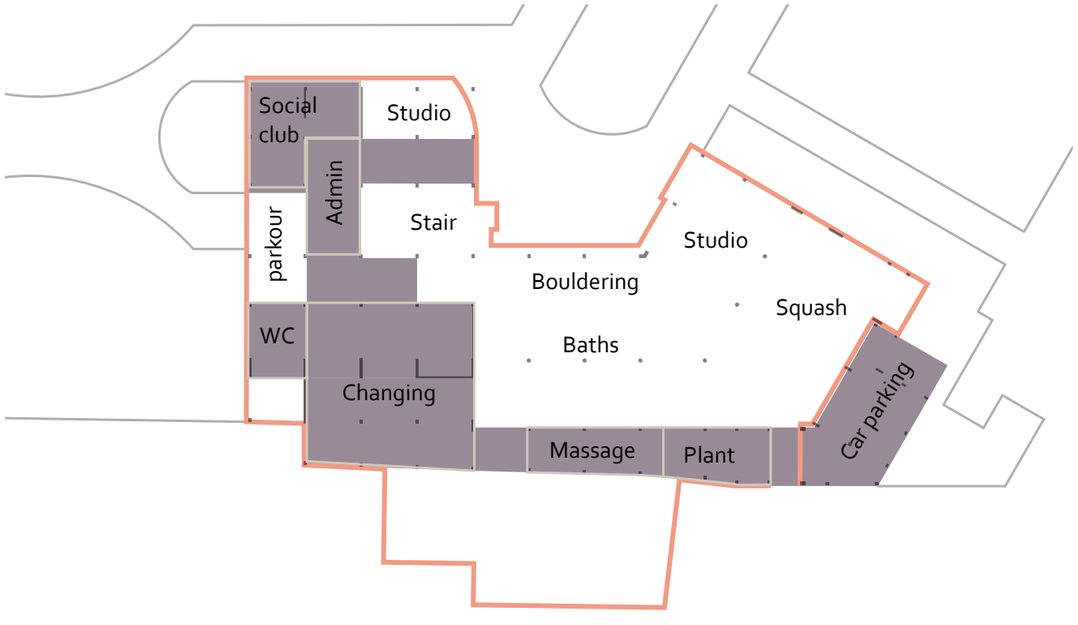
Proposed building envelope (non coloured areas are double height)

Proposed first floor slabs to be removed

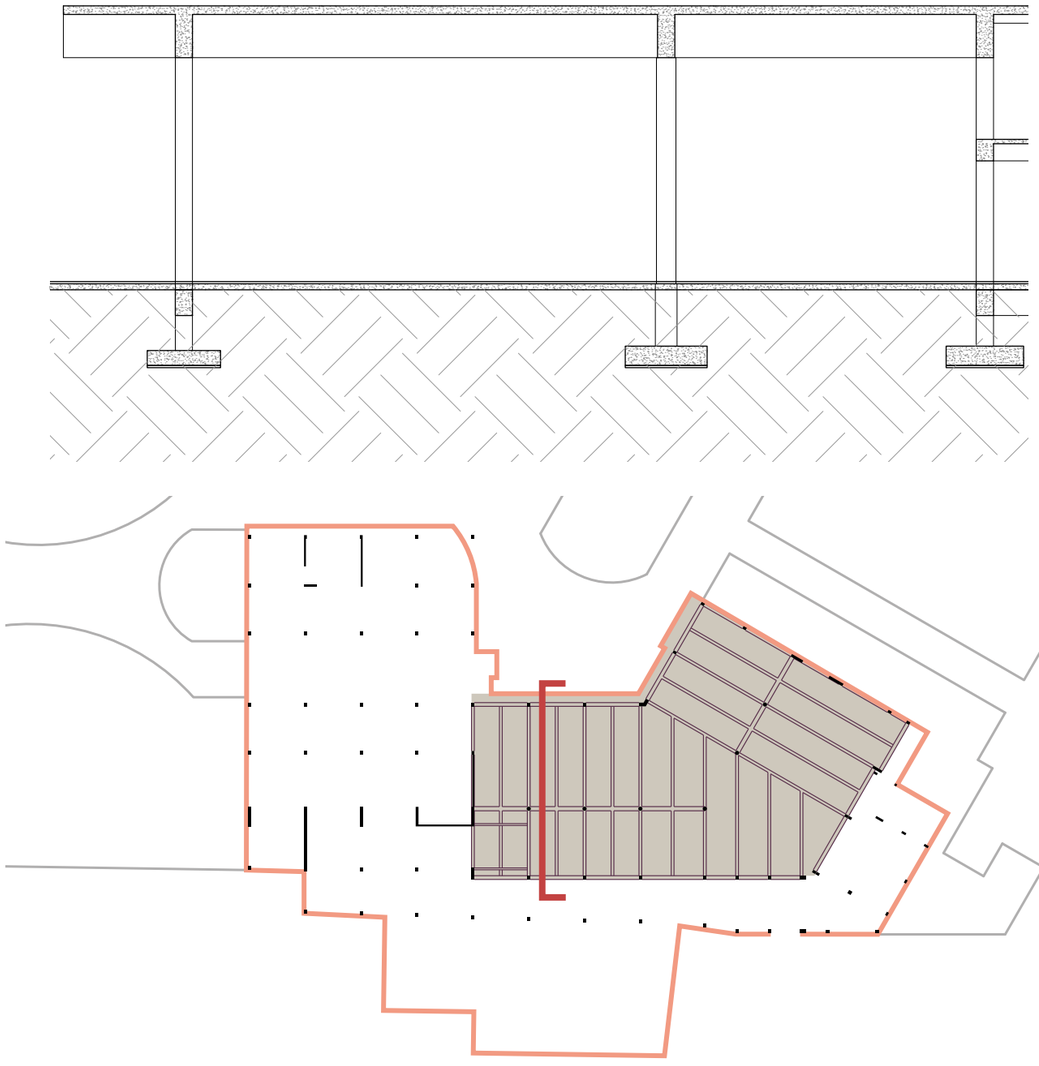
Proposed new first floor level structure

The diagram above shows the areas of the existing structure that have a floor slab at the first floor level. The areas left white are double height. The diagrams to the right show how these lower spaces are occupied on the ground floor within the proposed scheme. Areas such as the social club, administration, toilets, changing rooms, massage room and mechanical facilities have been placed within the single height spaces.

The remaining double height spaces are then used for activity spaces such as bouldering, fitness studios, squash courts, parkour equipment, and the hot baths.

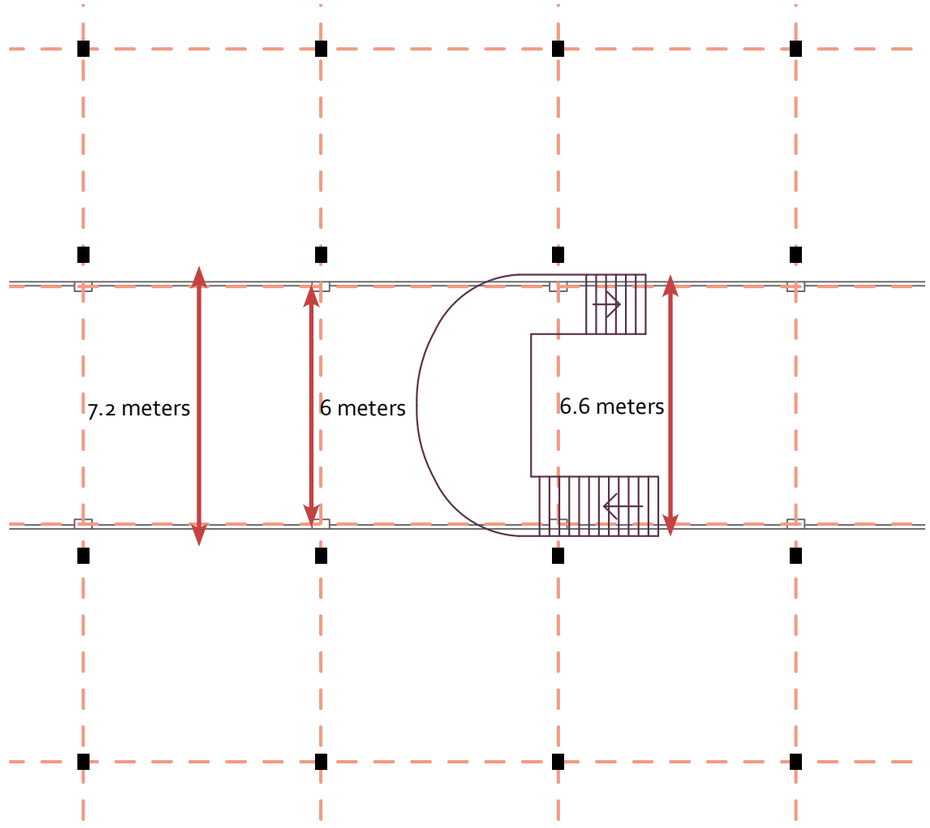


Area of large spans and 1m deep beams



The area highlighted above is the current location of the large co-op super market. It has larger 10 metre spans and as a result a different structural system is used for the roof. Instead of the 200mm concrete deck spanning between mushroom columns used elsewhere in the building, it spans between 1 metre deep concrete beams. This gives a ceiling height to the underside of the beams of 5.2 metres meaning that the space cannot be split into two levels under the beams and must be used as a double height space. The building proposes to use this space for bouldering walls, squash courts, a flexible studio space and the hot baths.

Re locating the existing staircase



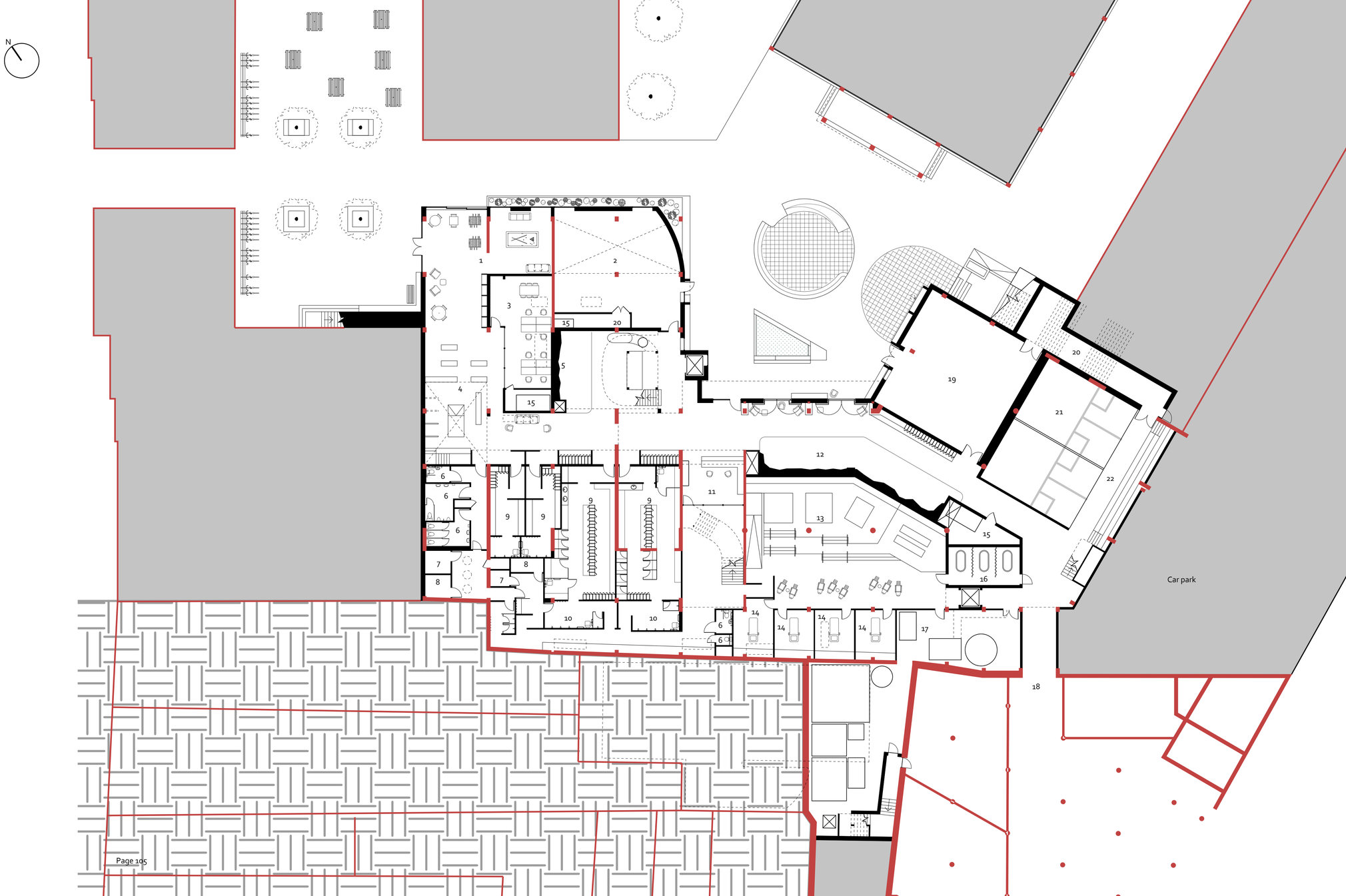
The existing stair of the Molenpoort shopping centre is 5.5 meters deep and 6.6 meters wide making it difficult to accommodate within the standard 6x6 meter grid of the Molenpoort. The solution used in the proposed building is to accommodate the stair in what is currently the shopping passage, where the columns have been offset from the grid to create a 7.2 metre span.

Ground floor plan

Scale 1:200 @ A2 (or 1:100 @ A0)

Existing construction is coloured in red

1 Social club
2 Studio
3 Admin
4 Parkour area
5 Climbing wall
6 Toilet
7 Sauna
8 Steam room
9 Changing
10 Showers
11 Front desk
12 Bouldering wall
13 Baths
14 Massage rooms
15 Plant
16 Private baths
17 Pool plant
18 Existing gym building
19 Studio
20 Store
21 Squash courts
22 Spectating



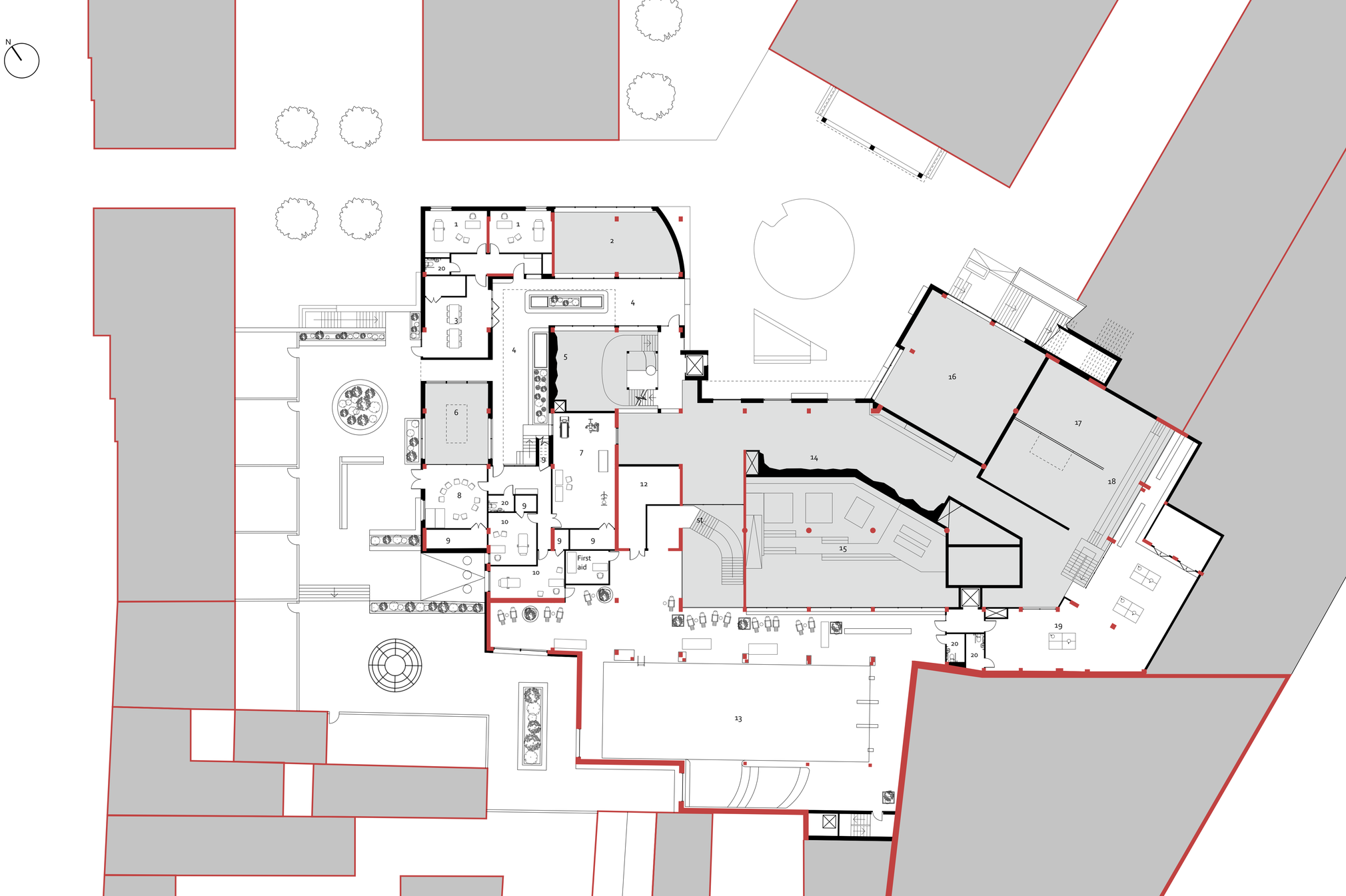
First floor plan

Scale 1:200 @ A2 (or 1:100 @ A0)

Existing construction is coloured in red

Void

1 Health check
2 Void studio below
3 Group therapy
4 External roof terrace
5 Climbing wall
6 Void parkour below
7 Large physiotherapy area
8 Group therapy
9 Store
10 Physiotherapy
11 First aid
12 Pool store
13 Pool
14 Void bouldering below
15 Void baths below
16 Void studio below
17 Void squash below
18 Spectating
19 Ping pong
20 Toilet



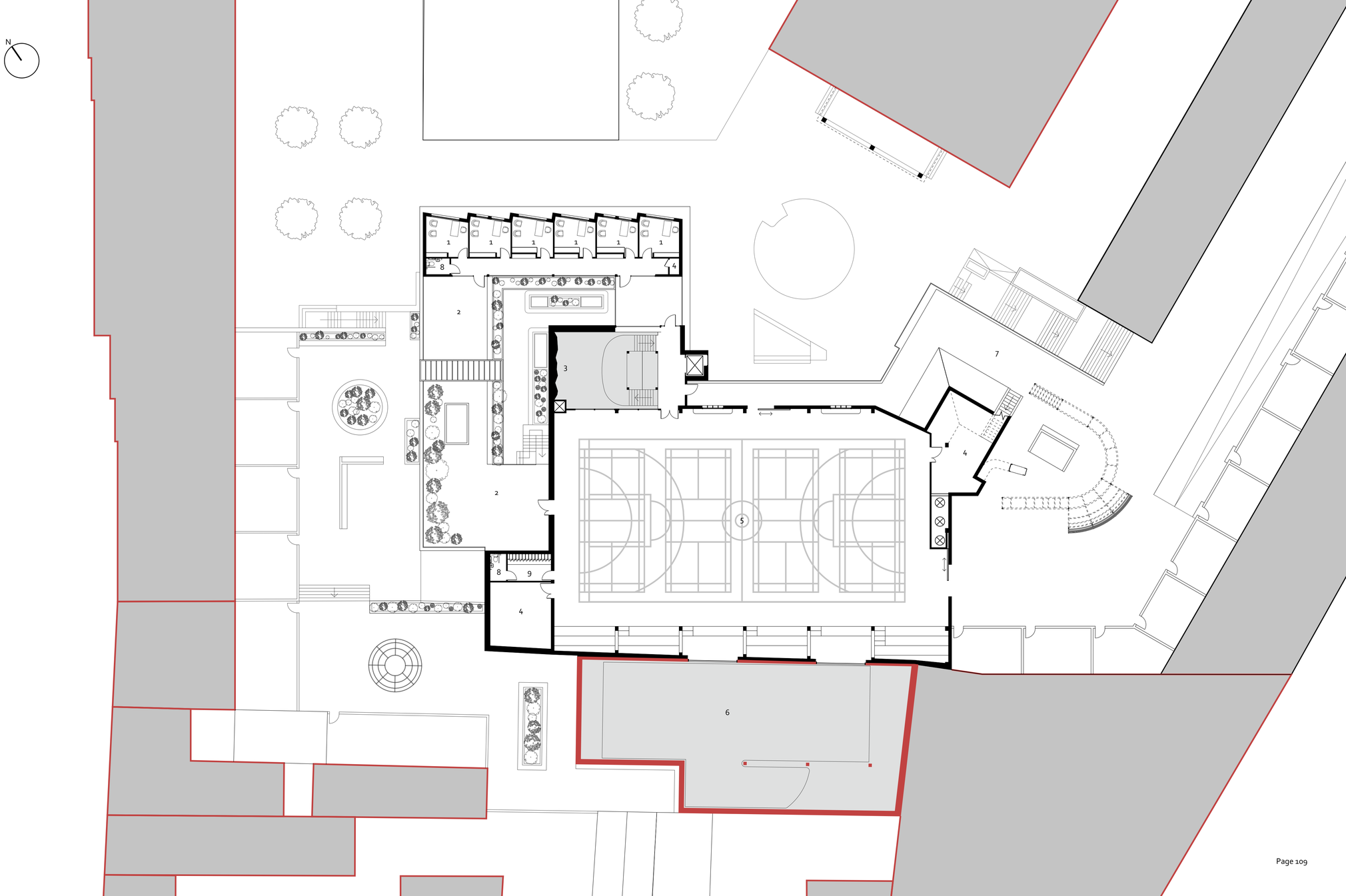
Second floor plan

Scale 1:200 @ A2 (or 1:100 @ A0)

Existing construction is coloured in red

Void

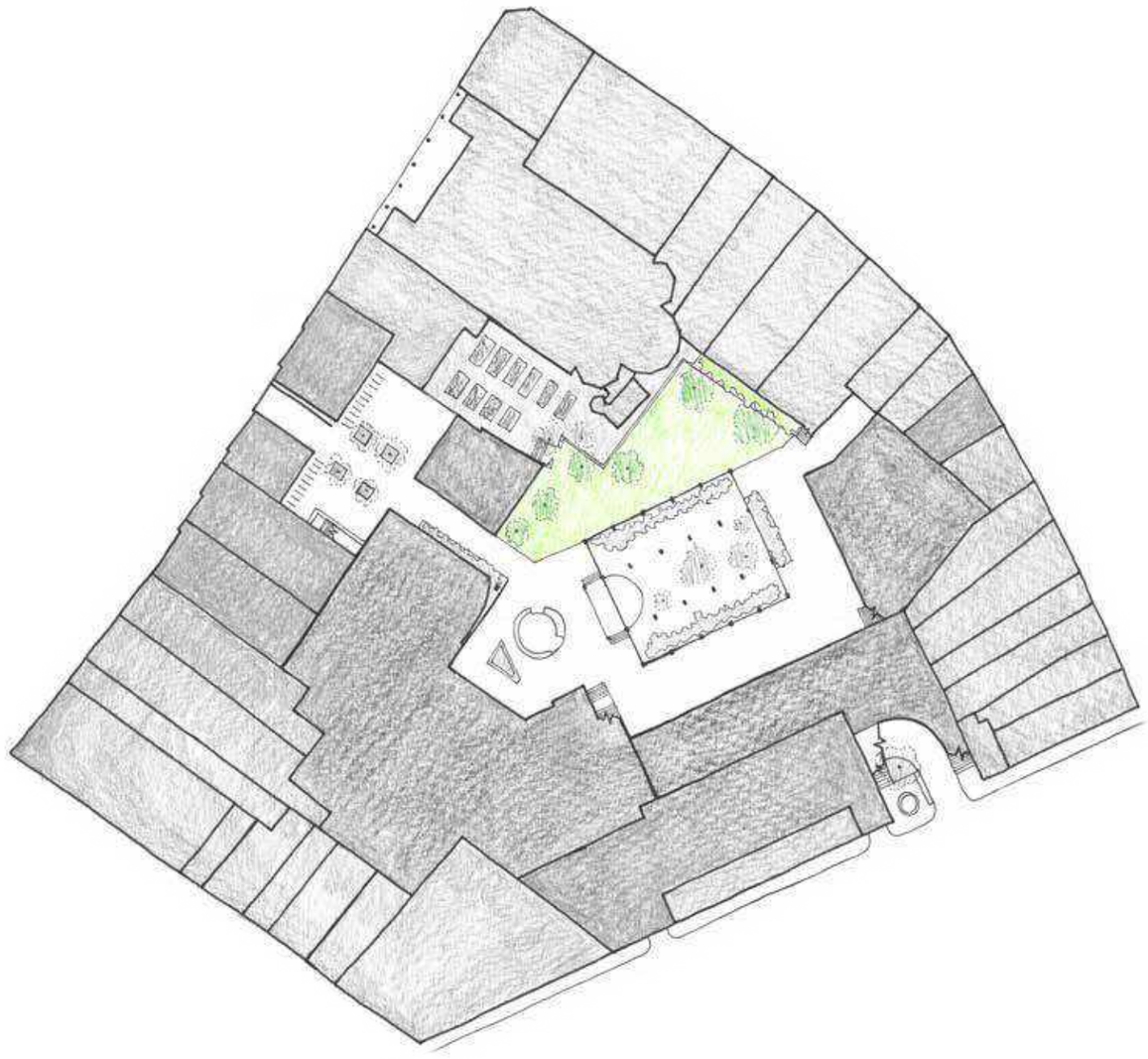
1 Psychotherapy consultation rooms
2 External roof terrace
3 Climbing wall
4 Store
5 Sports hall
6 Void pool below
7 Rooftop playground
8 Toilet
9 Additional locker area



Response to Play in Nijmegen and elsewhere

Hard and soft surfaces

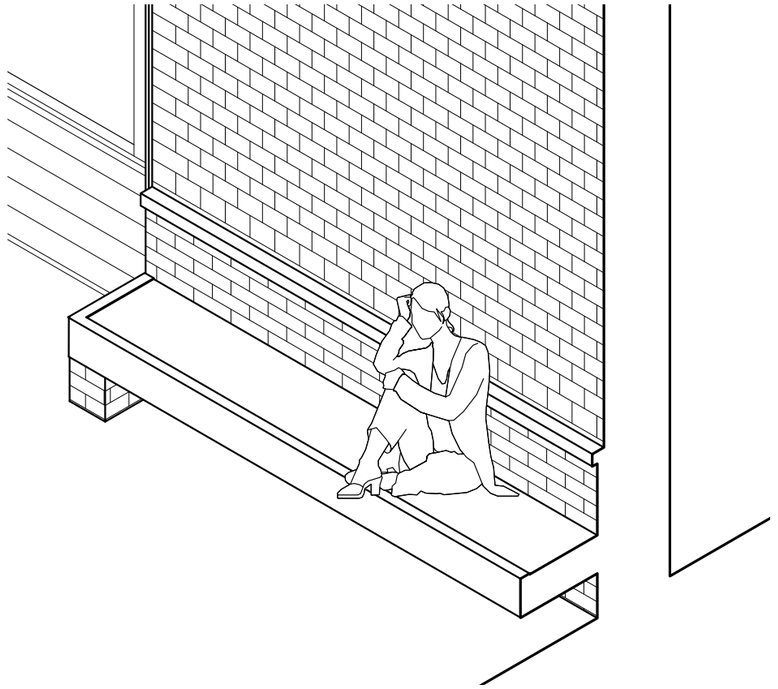
As identified in the research both hard and soft surfaces offer opportunity for different play. The scheme has reacted to this by offering both hard and soft space within the urban plan. The areas near the building offer a more urban play experience and the green space to the north offers a more traditional park atmosphere.

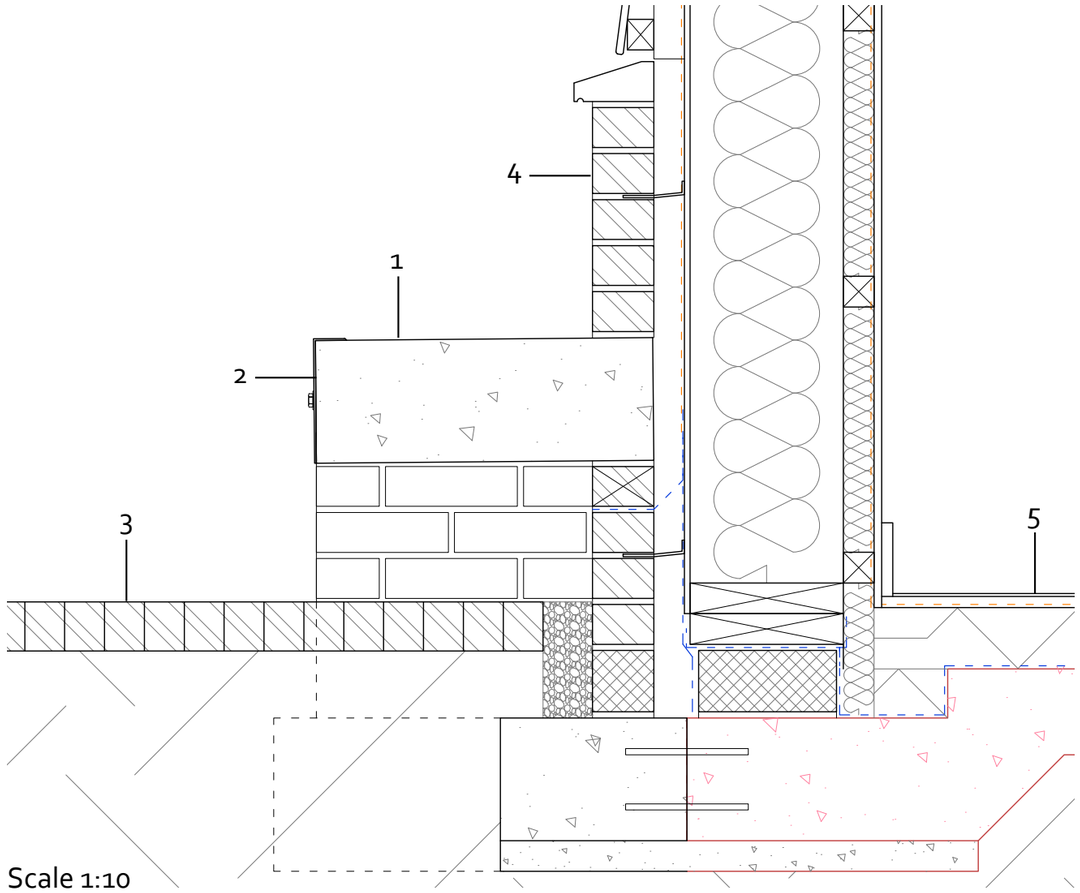


The edge effect and sitting

A prominent feature of the proposed facade is a built-in bench. This responds to the research categories of "edge effect" and "sitting". The benches are found on the facade that borders the edge of the courtyard in front of the building. The provision of space to sit at the edge of the public space allows people to start to fill and occupy the edges before filling the centre.
Incorporating the bench into the facade also enables the building users to directly interact with the building.
The bench surface itself is made from 200mm concrete recovered from the demolished parts of the shopping centre.

1 200mm thick concrete slab cut from recovered concrete of the demolished sections of the shopping centre.
2 Painted steel edging bolted to the concrete to protect its edge and the exposed rebar.
3 Brick paving laid on sand
4 Re-used masonry brick plinth tied to timber construction behind
50mm cavity
Breather membrane
12mm plywood sheathing board
250mm timber frame with insulation infill
50mm counter battens with insulation infill
Vapour control layer
12mm plywood internal finish
5 Reclaimed carpet tile
18mm OSB sub-flooring
Vapour control layer
100mm rigid insulation
Damp proof membrane
Existing construction below





Scale 1:10

Blurring inside and outside and creating soft edges

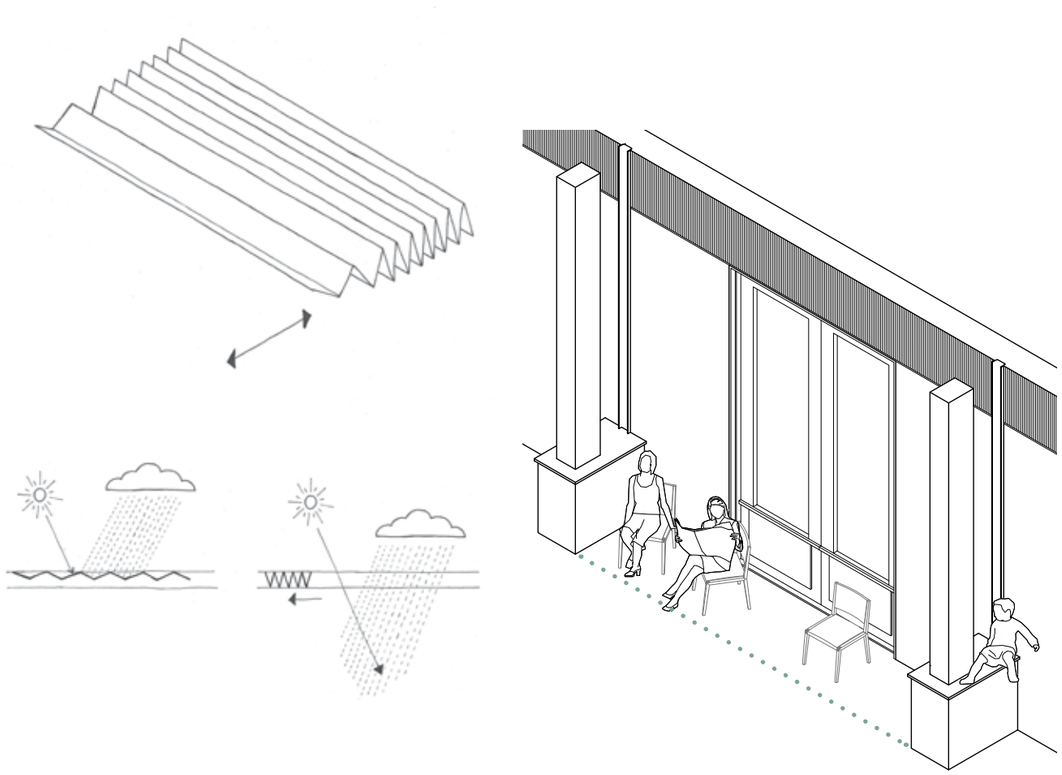
3.12- Photo of doorway threshold from Aldo van Eyck's orphanage project.

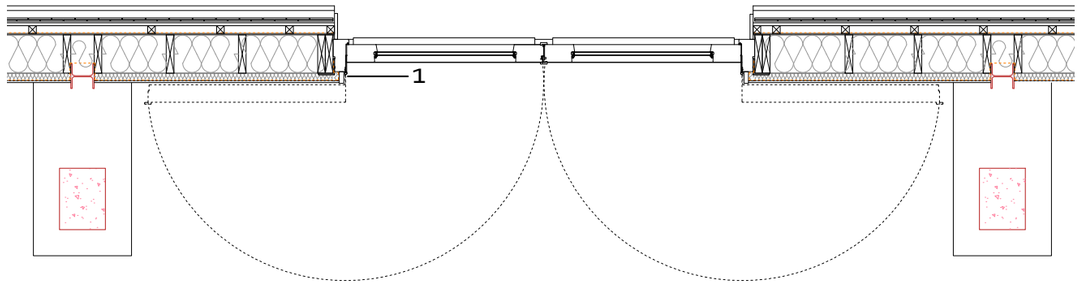
Large doors are used on the main facade facing the central square on both the ground and second level, the idea being that these doors are opened permanently during summer days. This responds to the ideas of blurring inside and outside as seen in the case studies as well as the idea of creating soft edges.

Permeable edges encourage interaction between the urban outdoor space and the internal space.

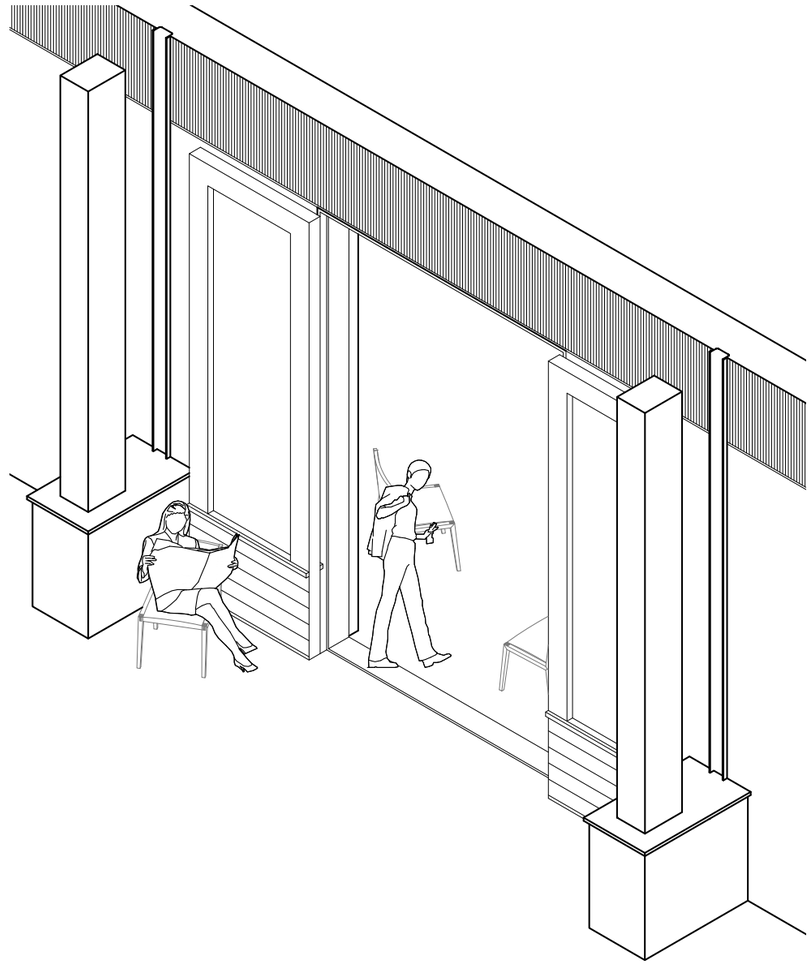
1 Wide throw hinges allow the doors to be opened 180 degrees.

As seen in the diagram below, when the doors are closed it creates a setback in the edge of the room forming a boundary - another theme that was identified in the research.





Scale 1:40 as printed (or 1:20 on spread printed at A2)



View from central square through to pool

The large glazed doors and internally reused shop windows provide a view from the courtyard through to the pool area.

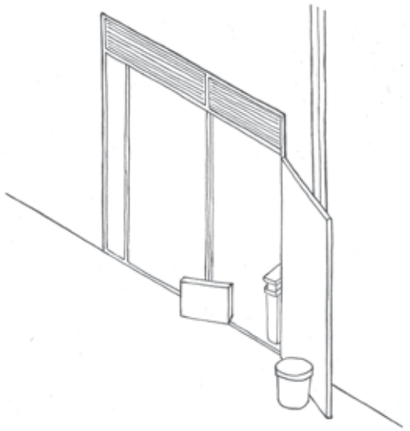
Responding to the themes of doorways and thresholds

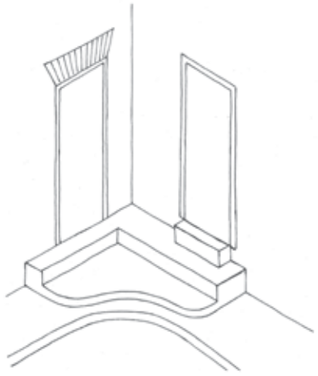
3.13- Photo of doorway threshold from Aldo van Eyck's orphanage project.

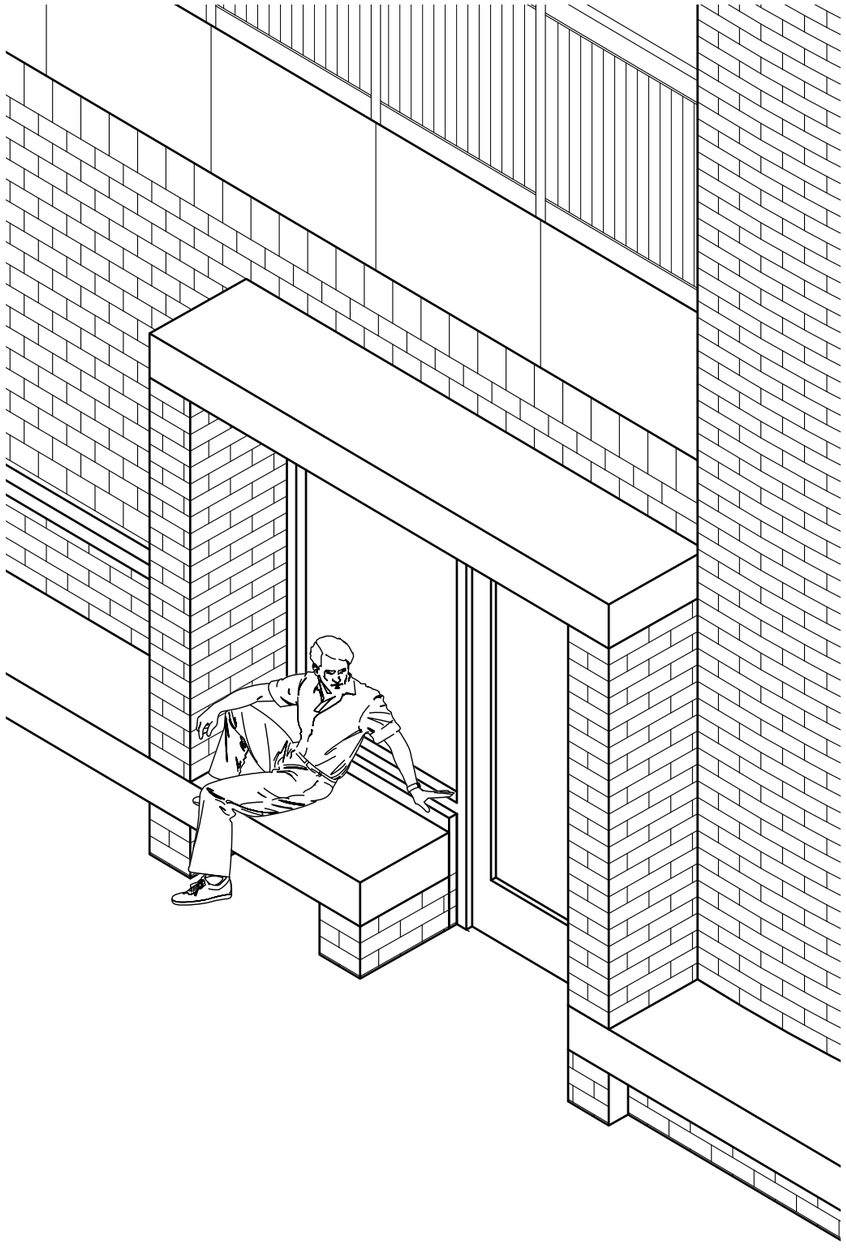
Thresholds are a theme that recurred throughout the research - for instance in the writings of Stevens and in the Orphanage by van Eyck.

As seen to the right, the external doors to the flexible studio spaces that open to the central courtyard are articulated and protected by a protrusion in the facade.

This moment in the design creates a level of privacy for the internal space and also provides a covered place to stand or sit when the door is not in use.





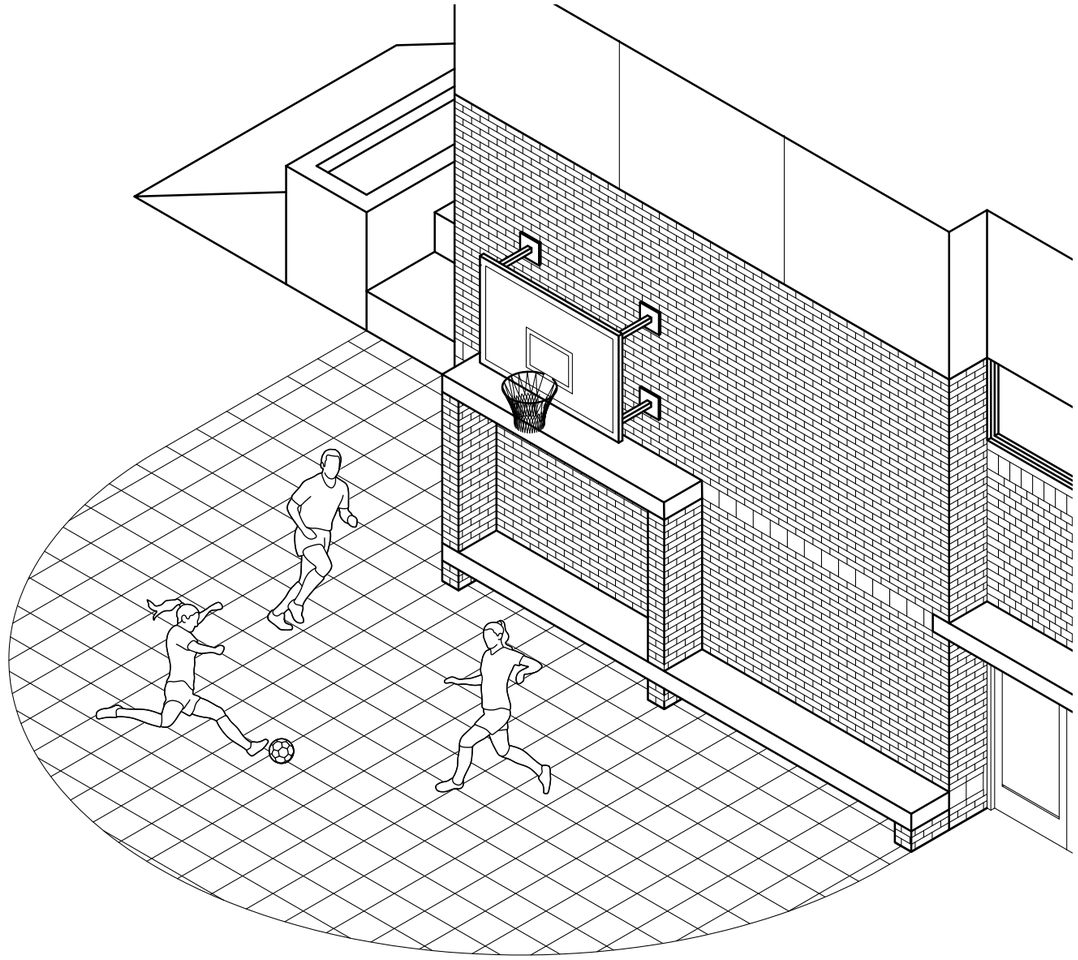


Responding to the themes of walls and boundaries

In response to the research illustrating the play opportunities offered by blind walls, one section of the proposed façade is made completely of brick to enable ball games to be played. This is further encouraged by adding a basketball net to the wall and creating a covered bench that protrudes from the wall that can double as a football goal.

A boundary is then demarcated by a change of material further adding to the playful opportunities created.

(top left two) 3.14- Photos from Aldo van Eyck's orphanage project. (bottom left) 3.15 - Photo of London's east end , 1949-1953, Nigel Henderson

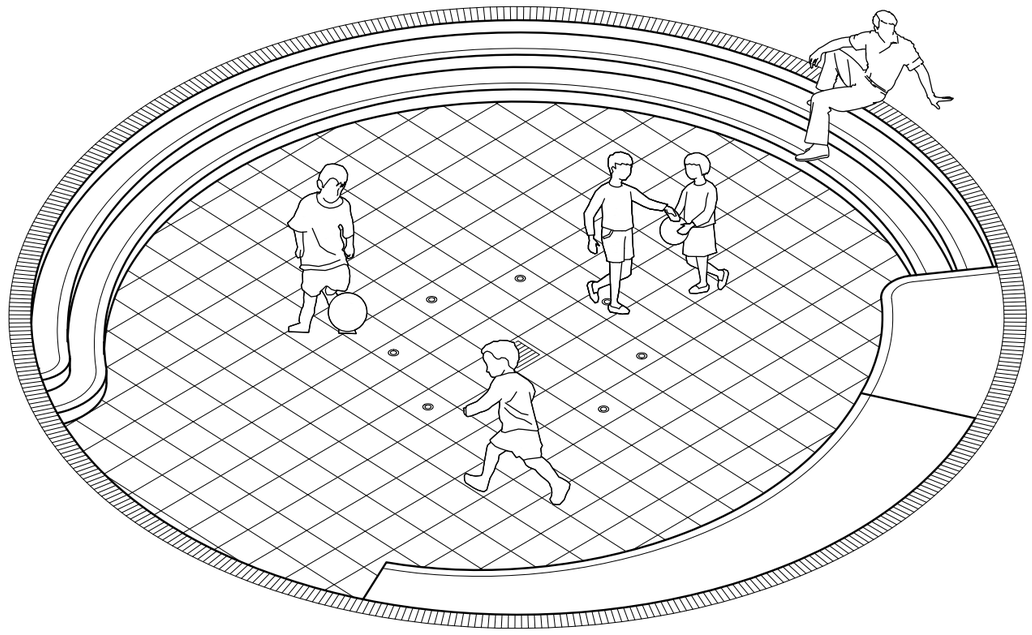


Responding to the theme of water

As a response to the theme of water as a key element of play in the research and a continuation of the water elements documented within Nijmegen the scheme proposes a paddling pool at the centre of the central square. The paddling pool can be left empty in the winter offering steps as a place to sit and filled with water in the warmer summer months.

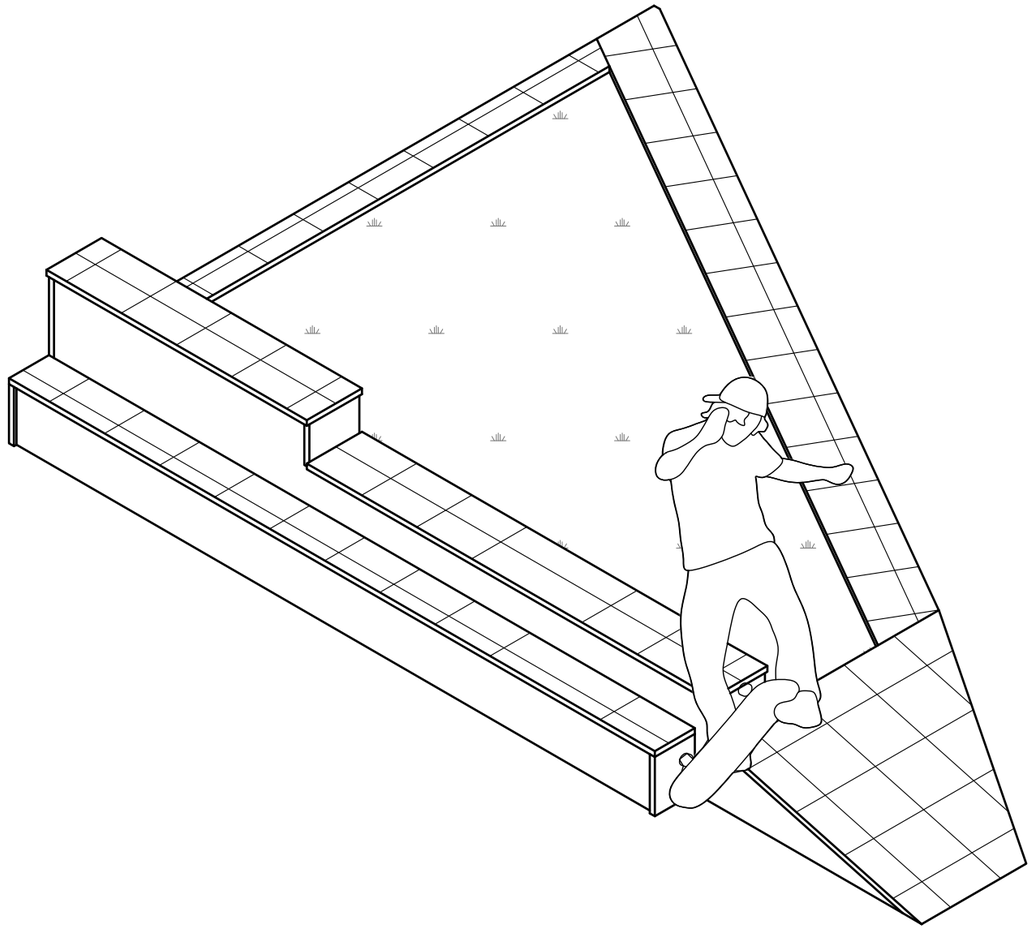
The proposal of a paddling pool also responds to van Eycks connection of the inside and outside through repeating similar ideas and architectural elements. The scheme relates to this by using the addition of the paddling pool within the urban plan as a gesture to the larger pool found within the building.

(left) 3.16 - Playing in the fountain on Ziekerstraat
(below) 3.17 - Photos from Aldo van Eyck's orphanage project.



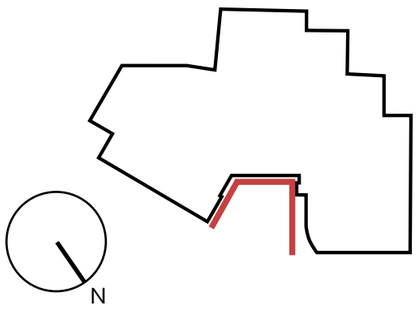
Responding to the theme of props

As discussed in the research props within the city provide objects and forms that allow people to engage with the built environment, such as public art and street furniture. In response to this within the courtyard in-front of the building a form has been created with parts of the demolished concrete of the shopping centre. Containing grass, this form provides sitting space, a space to lie down and different levels to climb on. Sloped edges also provide opportunities for skate boarders.



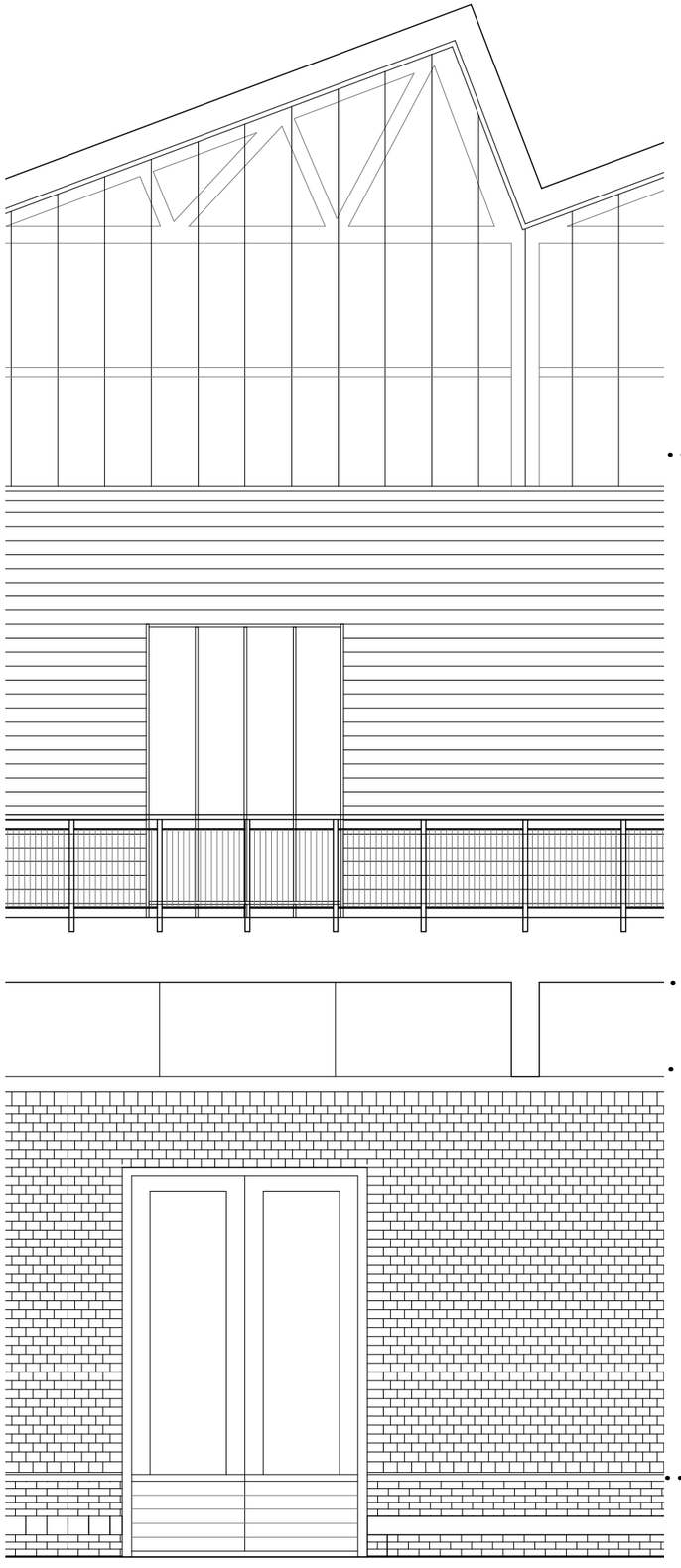
(Left top) 3.18 - Photo of one of Aldo van Eyck's Amsterdam playgrounds. (Left) 3.19 - Play sculpture at Moerenuma Park in Sapporo, Hokkaido, Japan. (Below) 3.20 - Architectural Fragment, outside the State Library, Melbourne.

Elevations that look onto central square



Scale 1:100 @ A2

Elevation and materials



Polycarbonate

Polycarbonate is chosen for its lightweight properties which are of importance in the construction of the sports hall on top of the existing structure. In addition its translucent quality provides diffuse light for the sports hall.

Horizontal timber cladding

Pine modified using the Accoya system is used for its light weight properties. The Accoya system is used to reduce maintenance on the public building.

Concrete tiles

Concrete tiles are used to gesture to the concrete slabs of the load bearing structure behind.

Reclaimed clay tiles

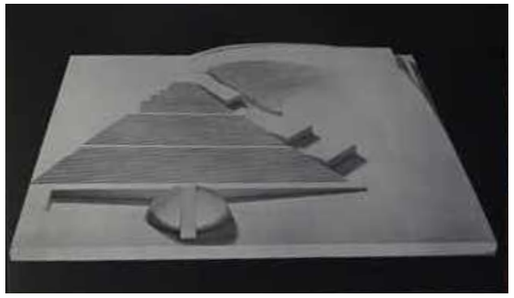
Clay tiles are used as cladding for the timber frame used to construct the facade. They are chosen as they are honest in acknowledging that the facade is just a skin and not load bearing. The monolithic load bearing concrete is then expressed on the inside of the building. In addition they are easily demountable.

Reclaimed brick

Reclaimed brick is used as a 900mm tall plinth around the perimeter of the building. In some places as discussed the brick becomes the full height of the facade.

Courtyard perspective

Responding to the theme of props and playgrounds



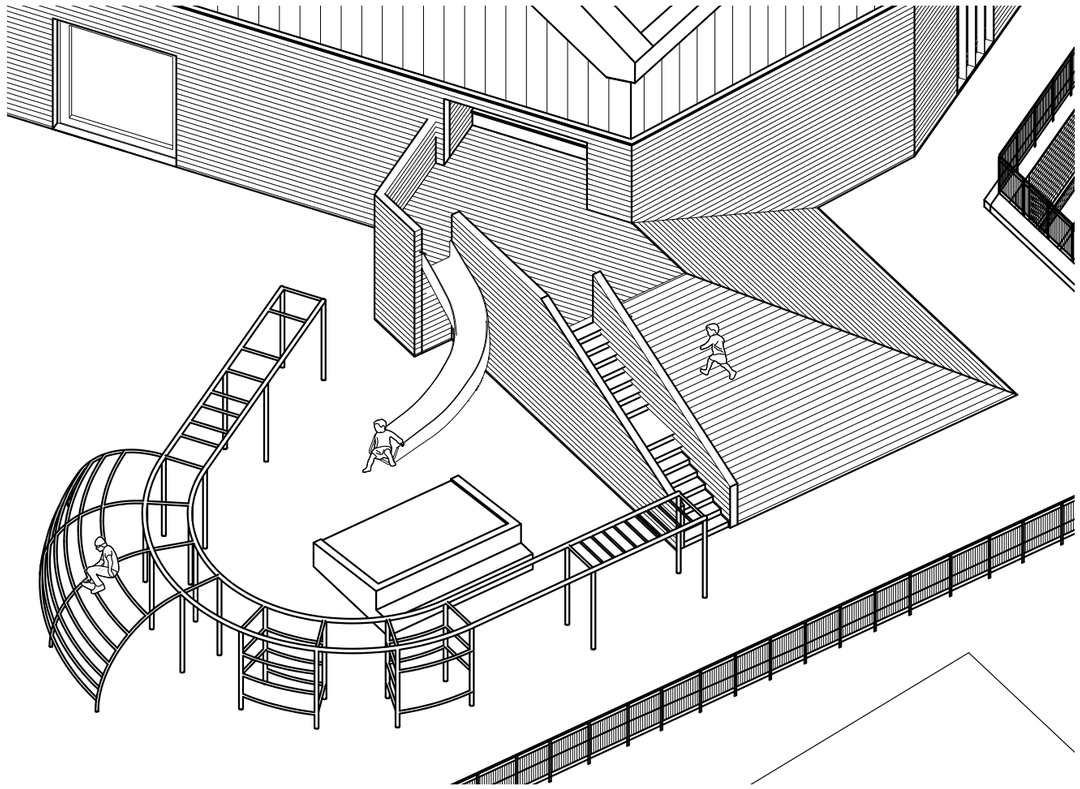
3.21 - Play Mountain idea for playground, 1933.

The research into the work of Noguchi's play sculptures and Arakawa and Gins' "architecture of joy" has been used as inspiration in creating the playground area on the roof of the building.
The framed play equipment of Aldo van Eyck was also seen as suitable inspiration for additions on the roof because of its lightweight characteristics .

3.22 - Inside the Bioscleave House, 2008.

3.23 - Belleville Playground designed by BASE.

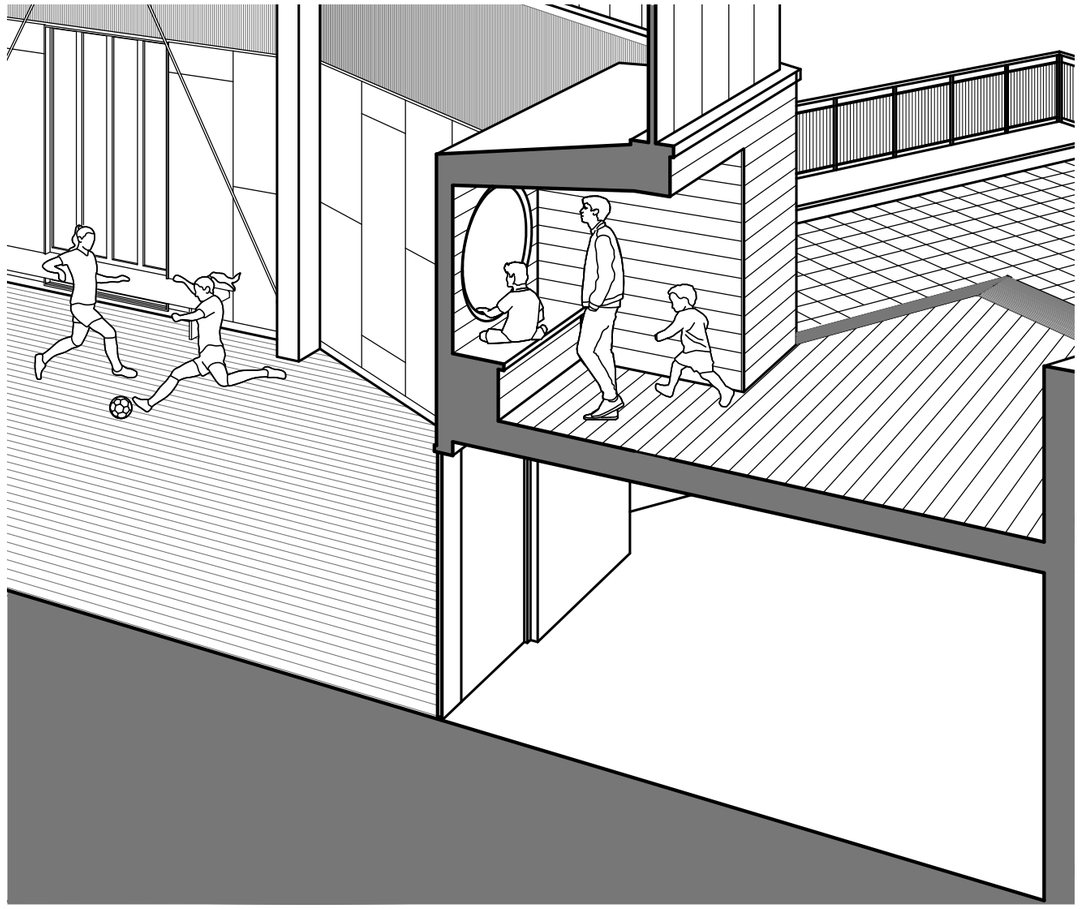
3.24 - Amsterdam playgrounds designed by Aldo van Eyck



Responding to the theme of creating niches

3.25 - Clubhouse, Lower East Side, manhatten, 1978 (Photo by Martha Cooper)

As a response to the secluded environments created by niches within the cityscape the project adds a small recess in the sports hall above the store room. This creates a covered space removed from the main urban area. The niche also includes a window allowing people to peer into the activities of the sports hall.

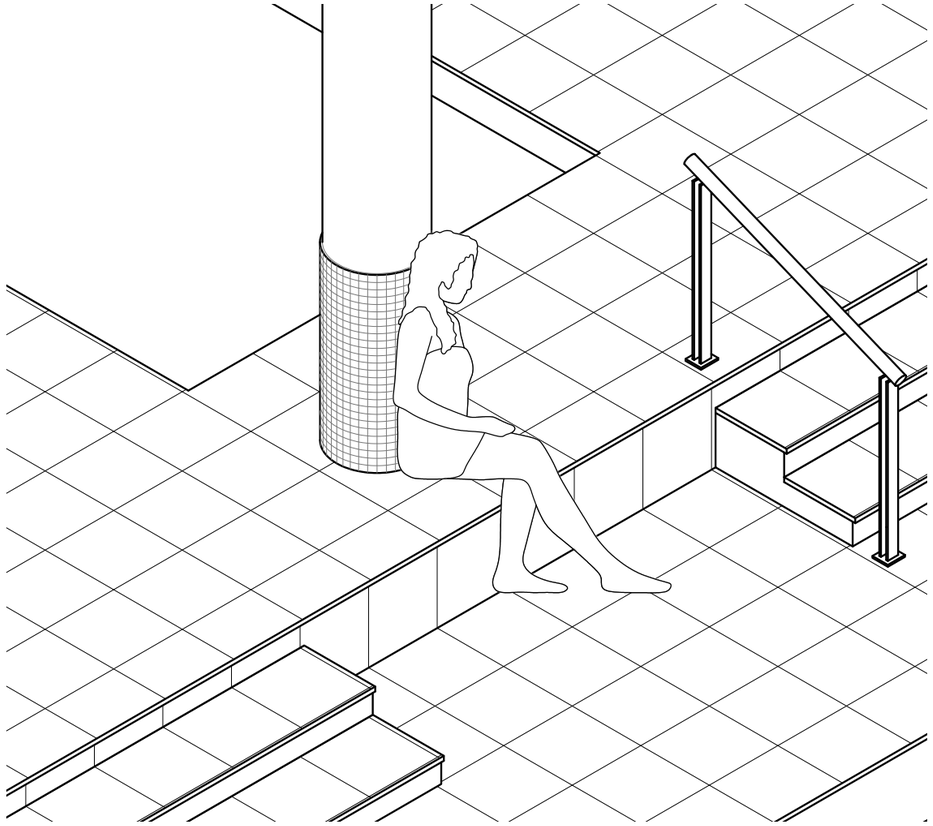


View from roof

The raised play area offers views across the internal oasis and to the city beyond.

Responding to the theme of bollards and columns

Bollards and columns are identified in the research as places that can provide an area to rest. This was also observed in the Molenpoort. These findings and observations were used as inspiration to engage with the column within the baths area as a seat.

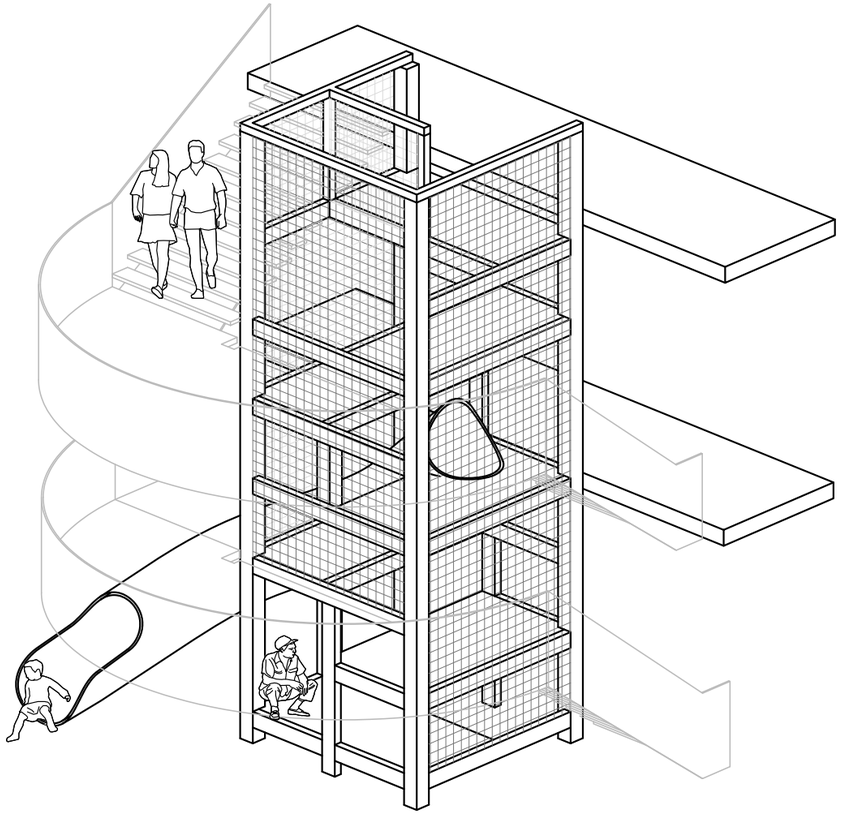


Responding to the theme of levels and circulation

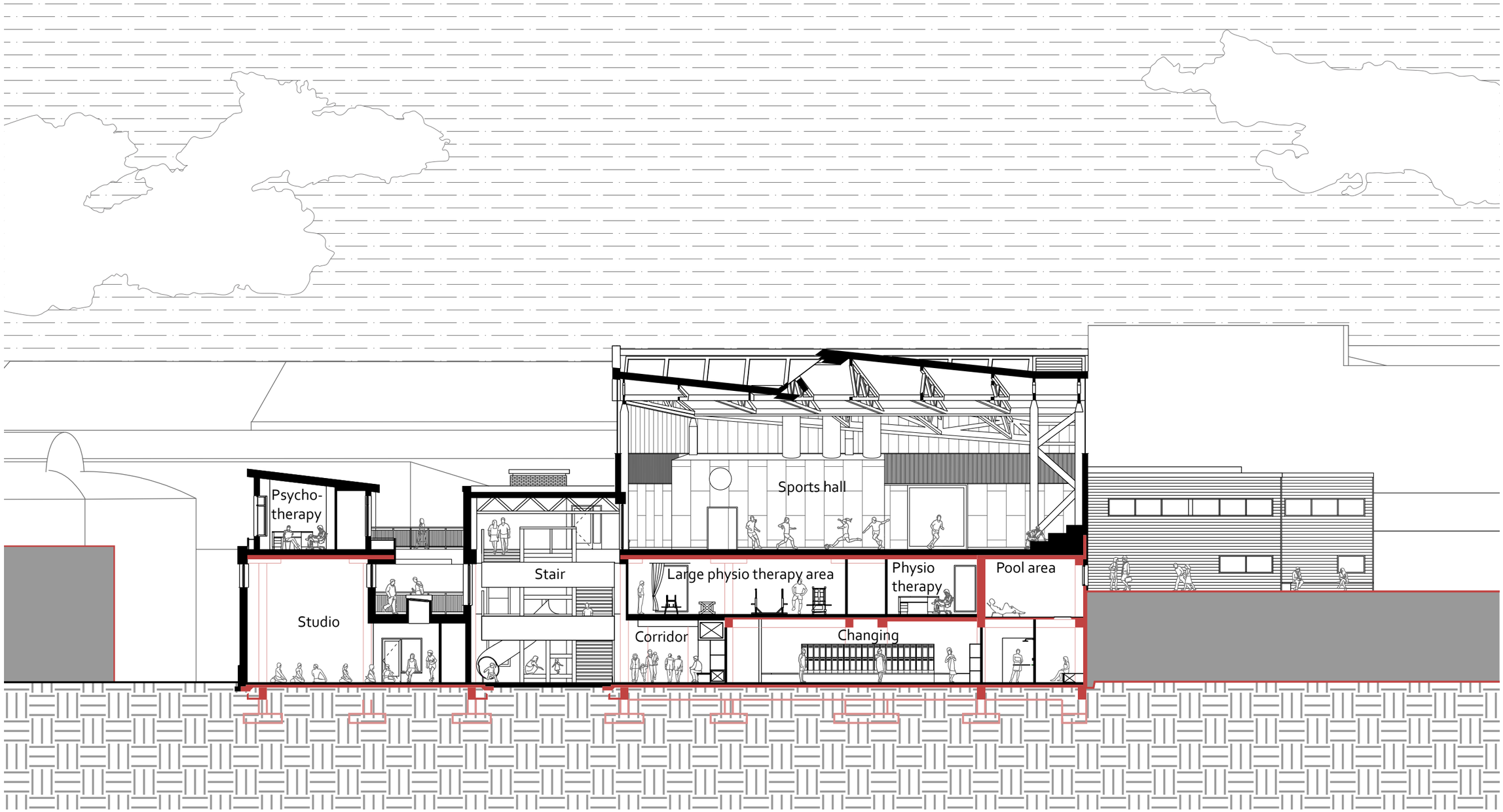
Inspired by the focus on circulation seen in New Babylon, Fun palace, Experimental Studio Rotterdam and Nieuwenhuys' "Ludic Stairs" a climbing structure has been added to the central void of the existing stair. This addition allows people to engage with the building in new ways and questions accepted norms of circulation.

3.26 - Ludic Stairs displayed at the Amsterdam Historical Museum in 1969

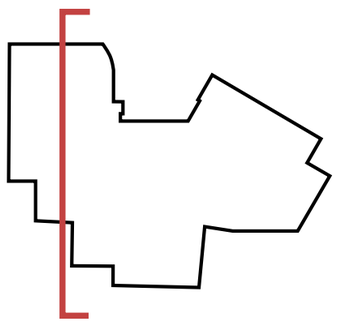
3.27 - Mobile ladder labyrinth model by Nieuwenhuys, 1967



Long section

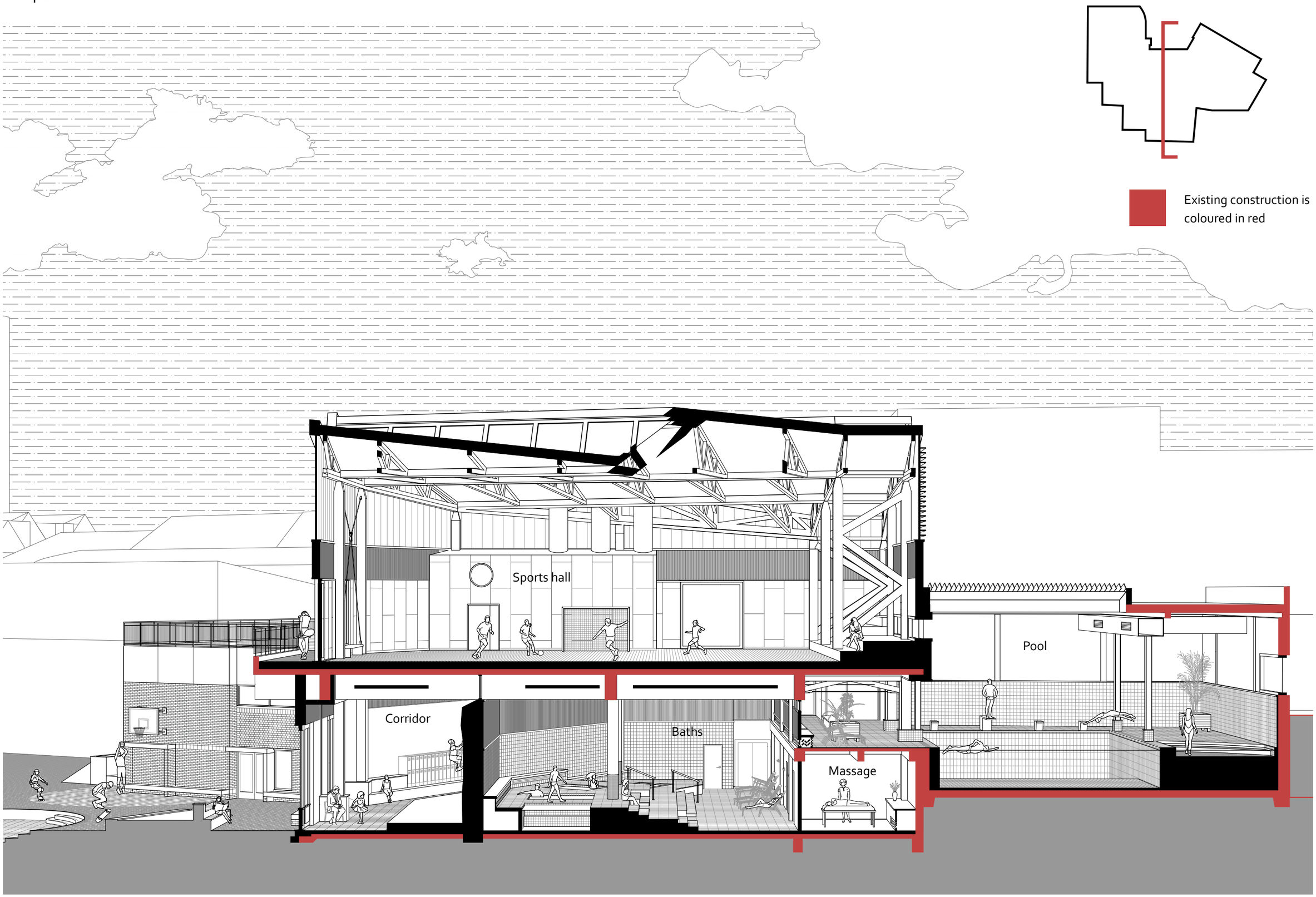


Existing construction is coloured in red



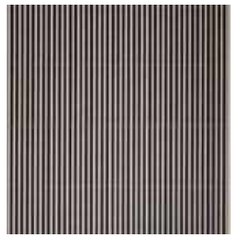
Scale 1:200 (1:100 @A1)

Perspective section



Internal view of active corridor

Exposed original concrete



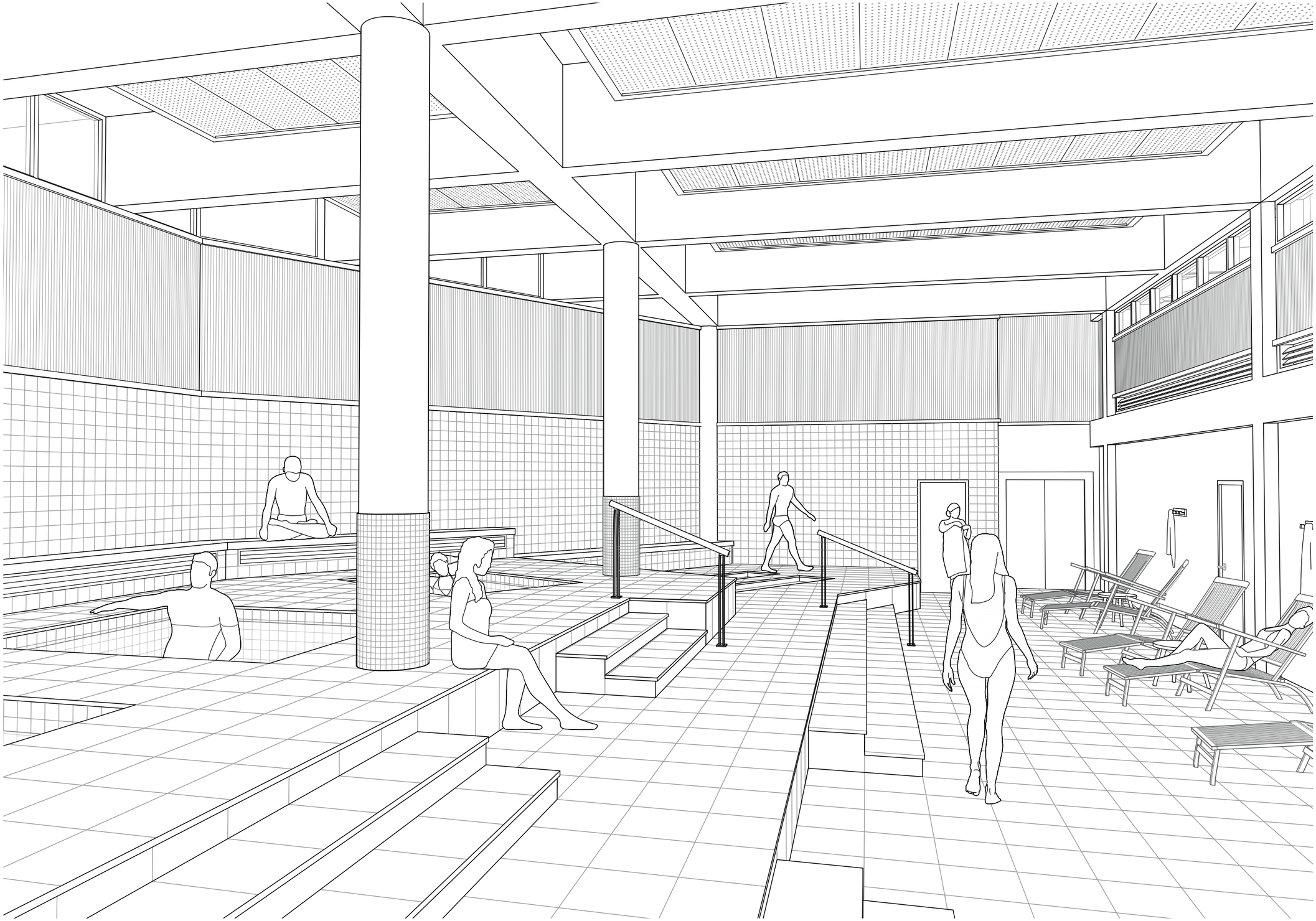
Timber batten acoustic panels

Birch plywood wall finish

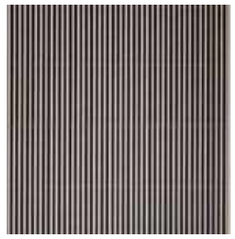
Painted original blockwork

Re-used carpet tiles

Internal view of baths area



Exposed original concrete



Timber batten acoustic panels

Birch plywood wall finish

Reclaimed wall tiles

Re-used floor tiles

Internal view of pool area

Exposed original concrete

Timber batten acoustic panels

Painted original blockwork

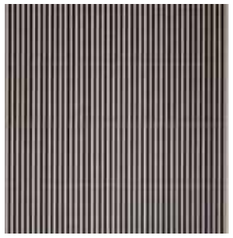
Reclaimed wall tiles

Re-used floor tiles

Pool tiles

View out of sports hall

Polycarbonate



Timber batten acoustic panels

Birch plywood wall finish

Engineered timber sports floor

Large North East facing windows aim to connect the activities of the building to the city by providing views out over the oasis and Nijmegen beyond.

Technical details

Existing construction is coloured in red

1 150mm sandwich panel from Triple Solar with integrated solar collector (solar energy is collected and stored in hot water tank and used to heat swimming pools and underfloor systems)
175x50 mm rafters (spanning 3.4 m) in-filled with insulation
Vapour control layer
12mm plywood internal finish

2 40mm thick polycarbonate panels

3 Double glazed timber window

4 Automated dampers control level of natural ventilation

5 Radiator under bench heats incoming air

6 40mm concrete tiles resting on supporting feet
Single ply water proof membrane
150mm rigid insulation
Existing concrete slab

7 22mm Sports flooring boards resting on
27x27mm flex-beam battens
10mm absorbing cradle
250mm timber floor joists resting on existing concrete slab in-fliilled with: 30mm rigid insulation with underfloor heating piping resting on 9mm plywood and insulation.

8 150x 20mm Accoya treated Radiata Pine
42x42mm vertical battens
Breather membrane
12mm plywood sheathing board
250mm timber frame with insulation infill
50x50mm counter battens with insulation infill
Vapour control layer
12mm plywood internal finish

9 Reclaimed ceramic tiles hung on
25x50mm horizontal counter battens
50x50mm vertical battens
Breather membrane
12mm plywood sheathing board
250mm timber frame with insulation infill
50x50mm counter battens with insulation infill
Vapour control layer
12mm plywood internal finish

10 Internal acoustic panels
Prefabricated panels of 20x40 mm battens
35x45 counter battens with 20mm acoustic insulation between them

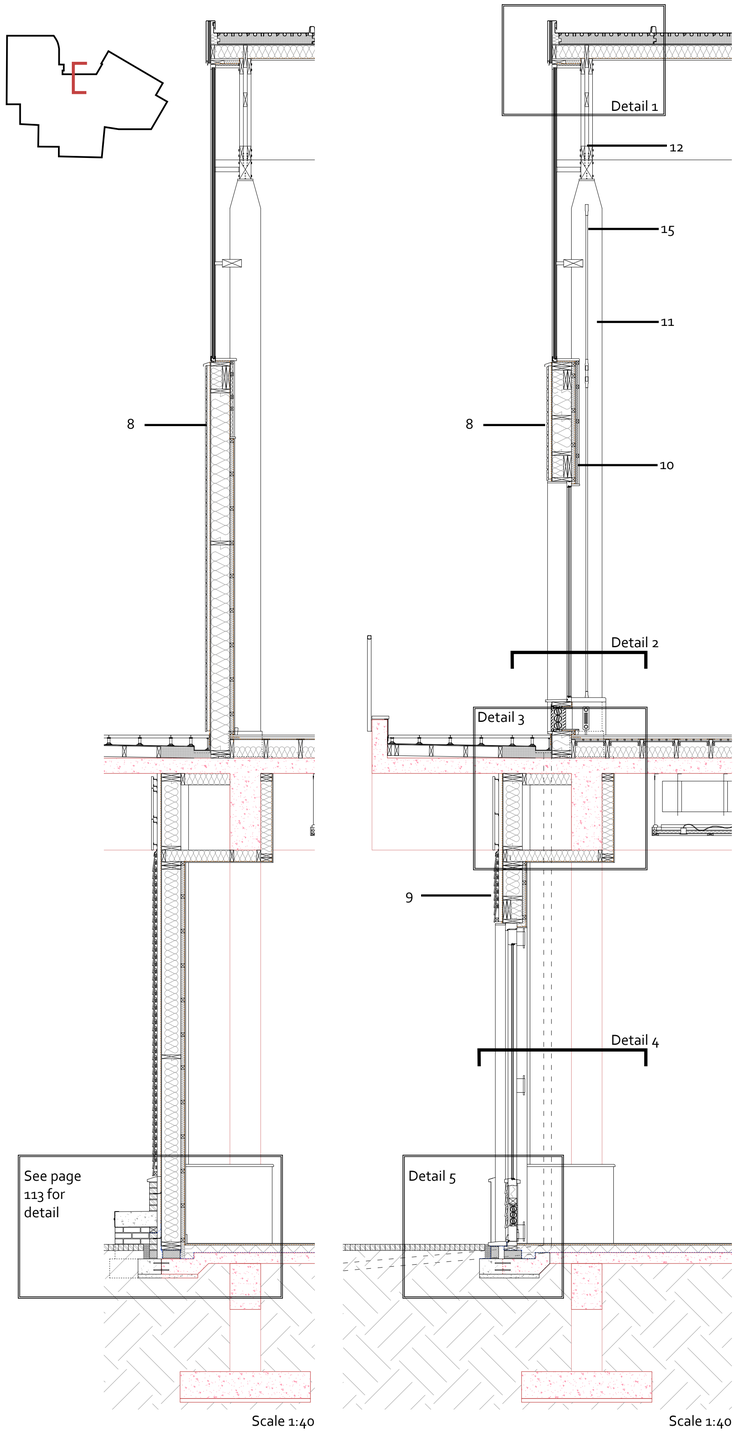
11 400x300mm glulam column

12 Timber truss made from 180x50 sold timber members bolted together as shown in detail 6

13 Large scale sliding door

14 Internal sliding screen (timber frame with rope net infill) to prevent balls escaping when the door is open.

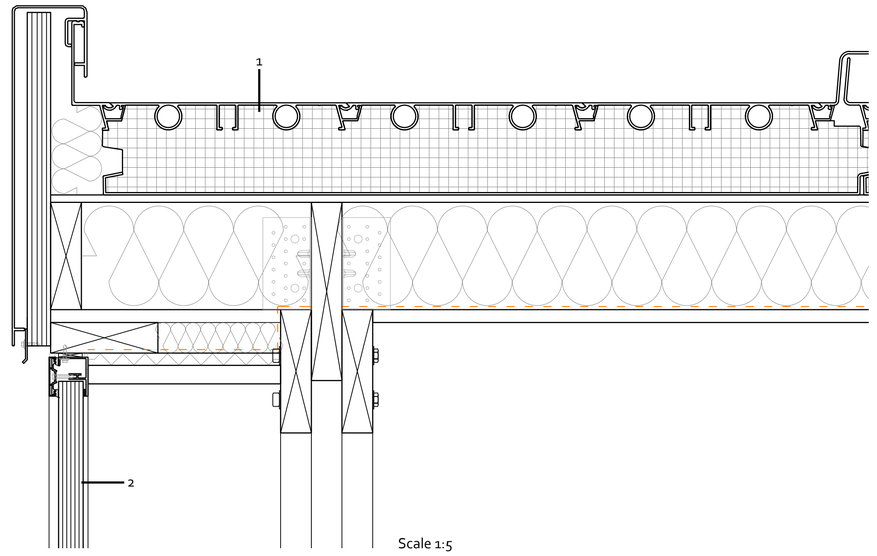
15 Steel cross bracing



Scale 1:40

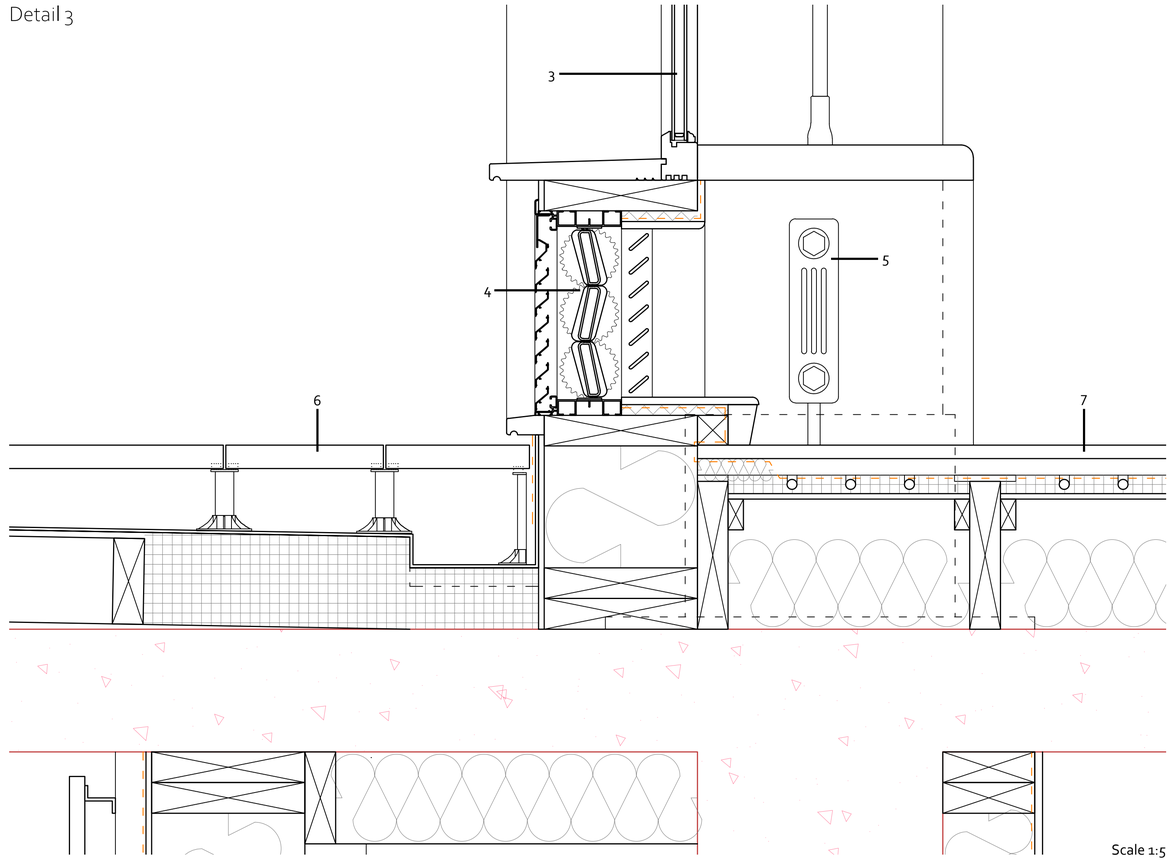
Scale 1:40

Detail 1



Scale 1:5

Detail 3



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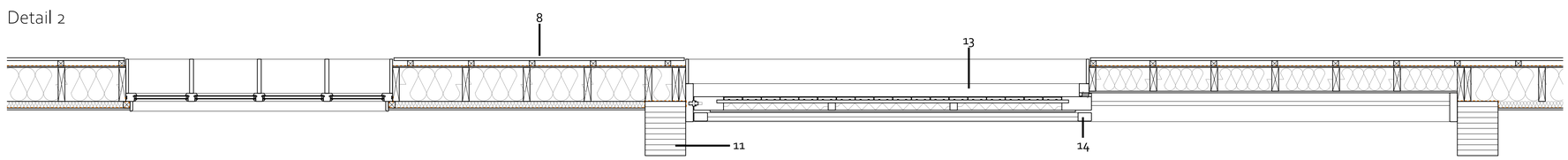
Detail 2



Scale 1:20

Existing construction is coloured in red

1 Large scale door with integrated ventilation dampers to allow for natural ventilation when the door is not left open.

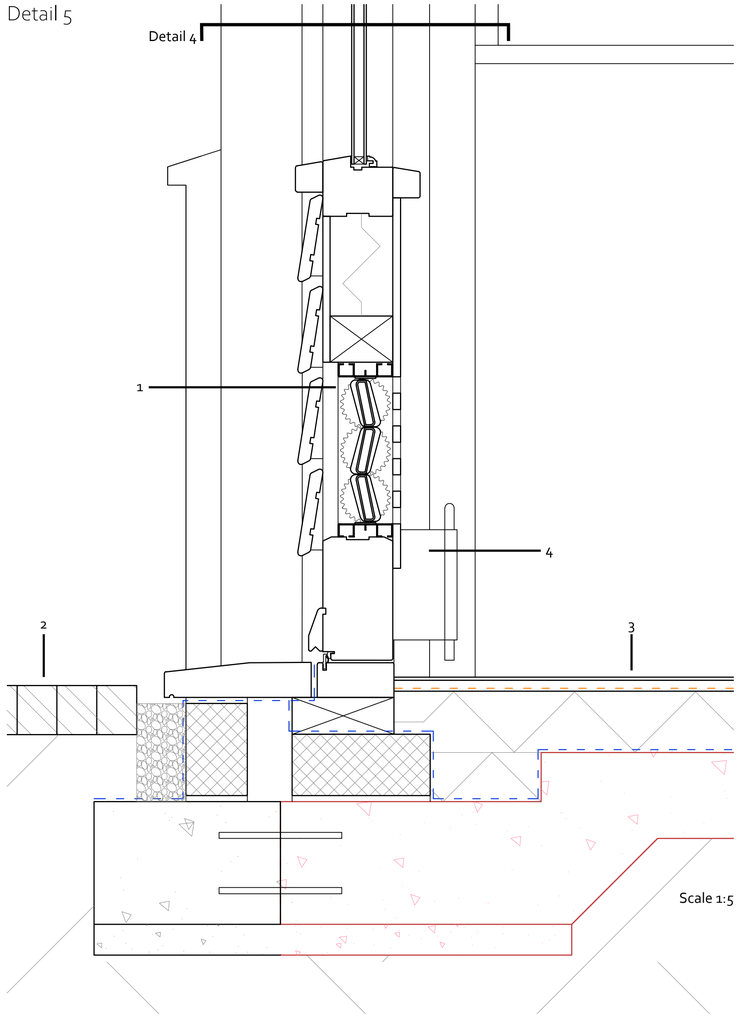
2 Brick paving laid on sand

3 Reclaimed carpet tile
18mm OSB sub-flooring
Vapour control layer
100mm rigid insulation
Damp proof membrane
Existing construction below

4 Wide throw hinges allow the doors to be opened 180 degrees.

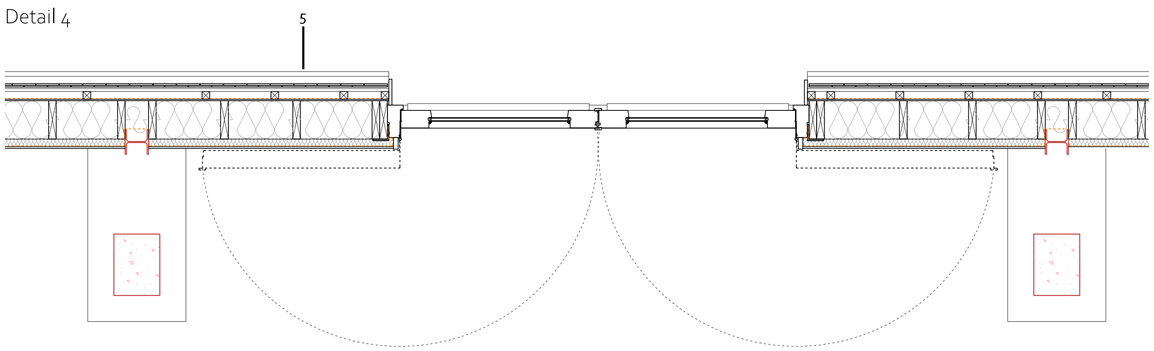
5 Reclaimed ceramic tiles hung on
25x50mm horizontal counter battens
50x50mm vertical battens
Breather membrane
12mm plywood sheathing board
250mm timber frame with insulation infill
50x50mm counter battens with insulation infill
Vapour control layer
12mm plywood internal finish

Detail 5



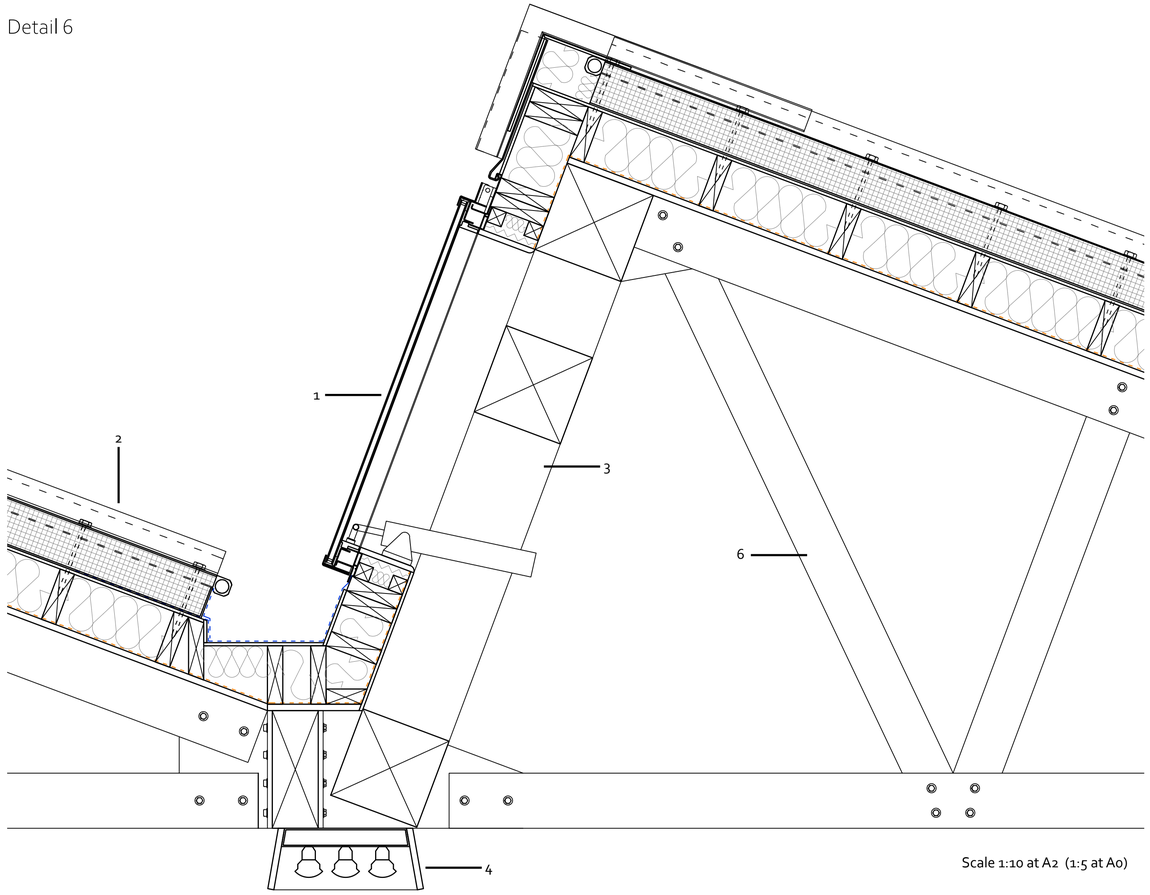
Scale 1:5

Detail 4



Scale 1:20

Detail 6



Scale 1:10 at A2 (1:5 at A0)

Existing construction is coloured in red

1 Automated open-able roof light

2 150mm sandwich panel from Triple Solar with integrated solar collector (solar energy is collected and stored in hot water tank and used to heat swimming pools and underfloor systems)
175x50 mm rafters (spanning 3.4 m) in-filled with insulation
Vapour control layer
12mm plywood internal finish

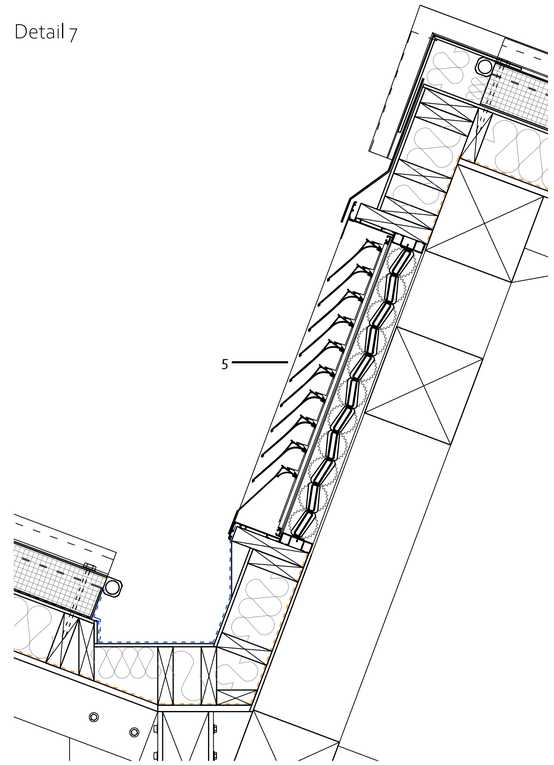
3 2.2 m deep timber truss made from 300x300mm glulam members and bolted steel plate connections spanning 21 m

4 LED down-lights run along the lower edge of the truss to provide lighting for the sports hall

5 Ventilation grill and automated dampers control the natural ventilation of the sports hall

6 Timber truss made from 180x50 sold timber members bolted together as shown

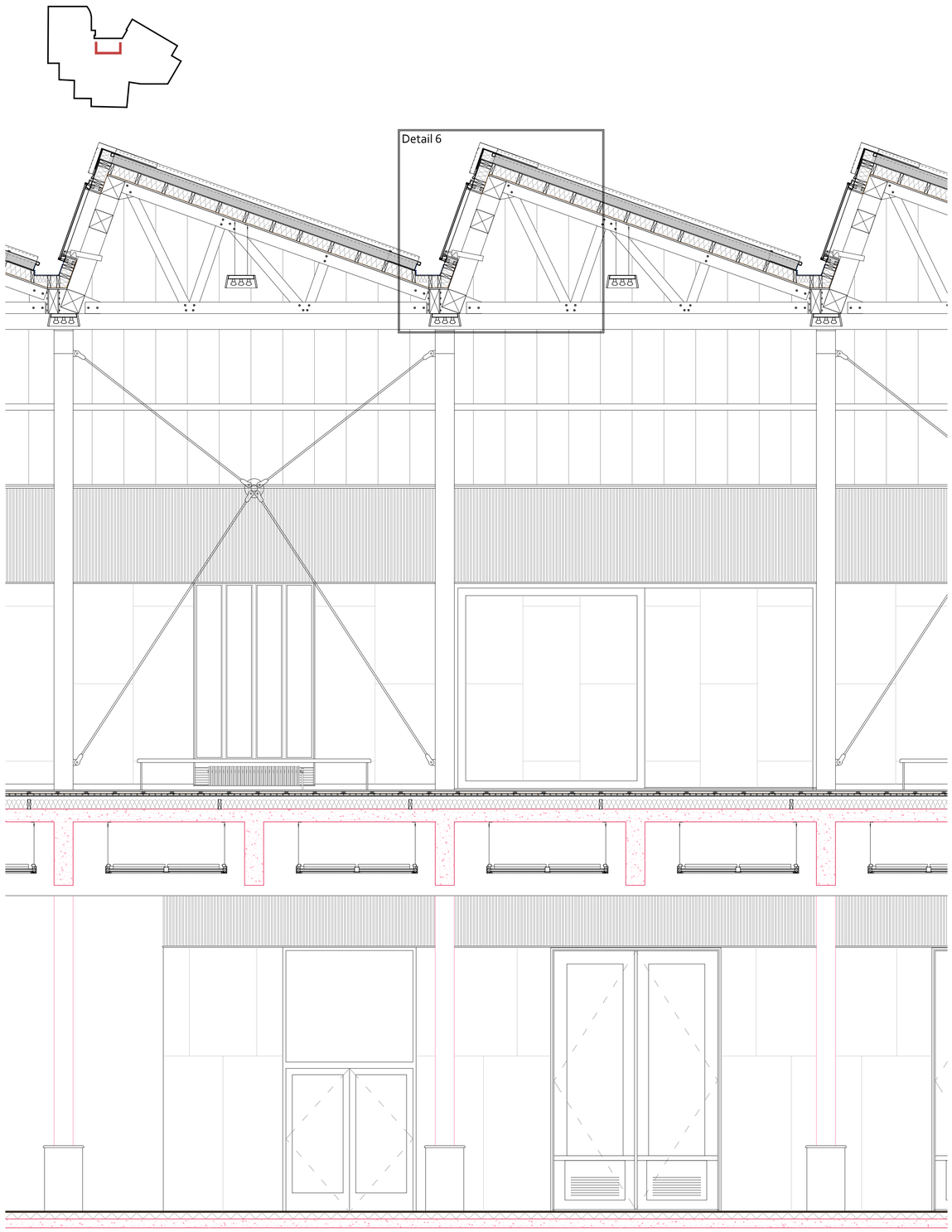
Detail 7



External elevation

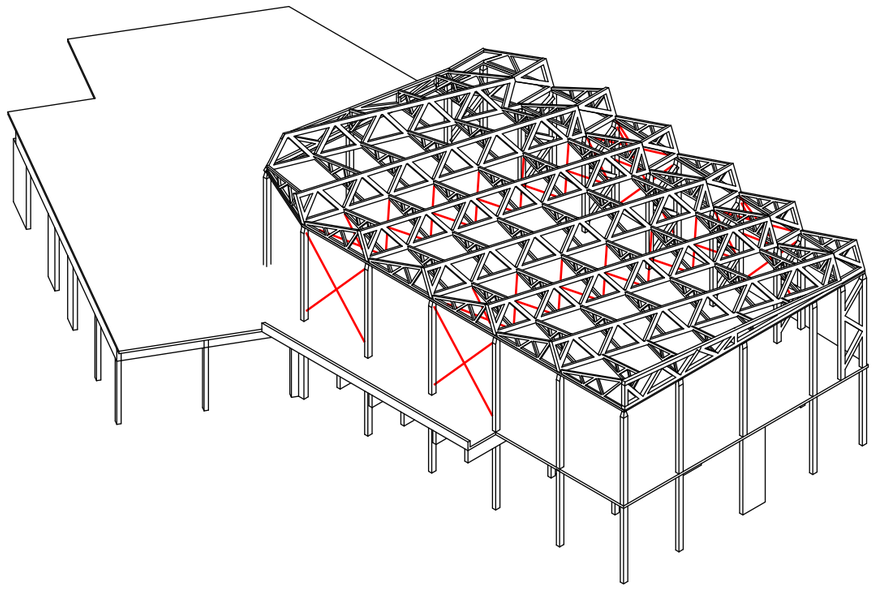
Scale 1:40 at A2 (or 1:20 at A0)

Internal elevation

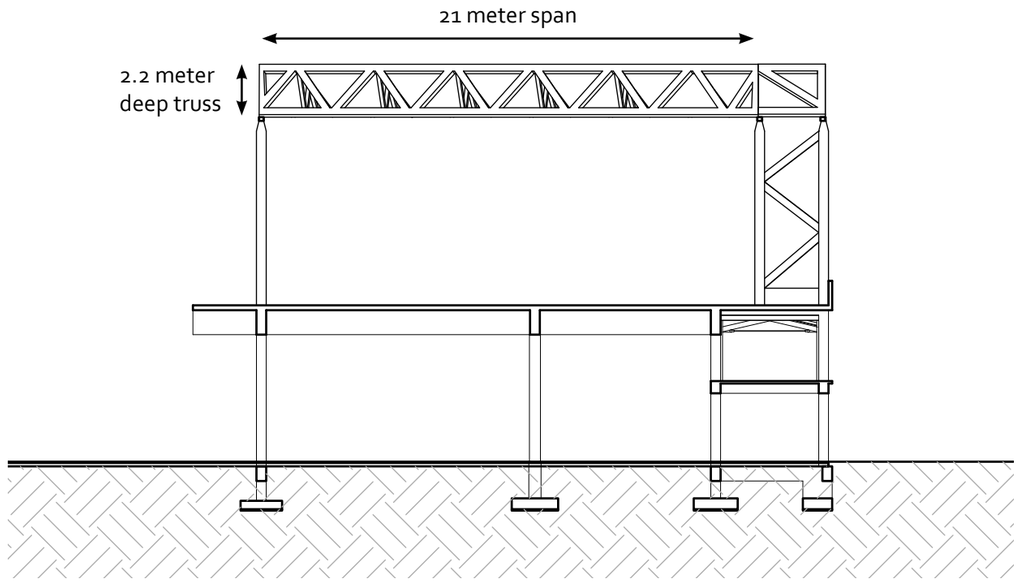


Scale 1:40 at A2 (or 1:20 at A0)

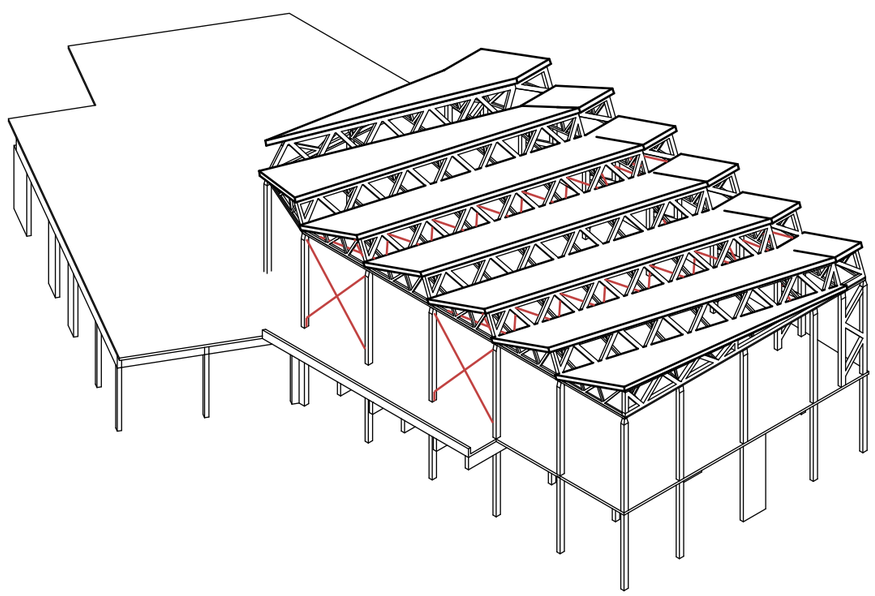
Structural design



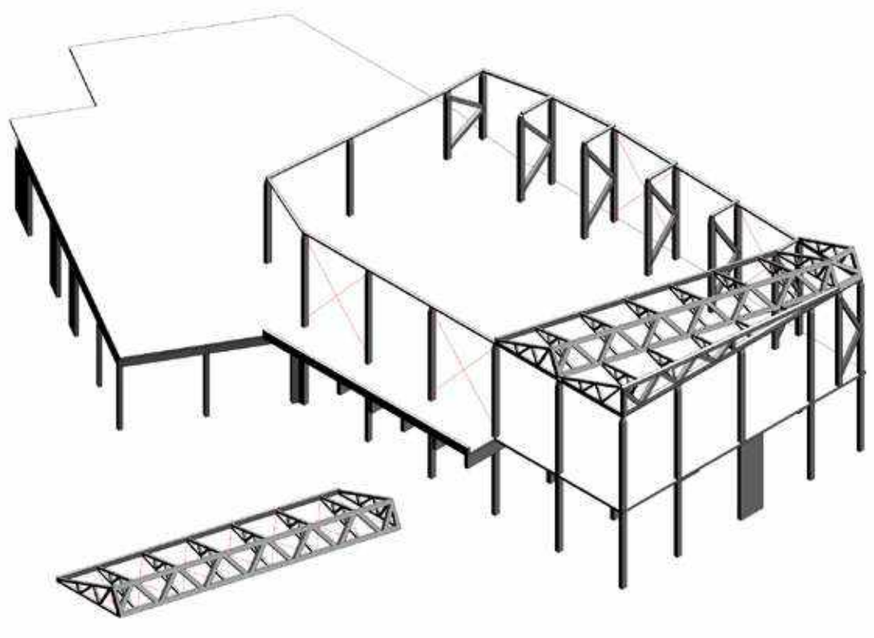
Cable cross bracing is present between the columns on the south and the north as shown, as well as within the roof structure that spans between them.



A vertical truss along the southern wall provides lateral support for the structure.



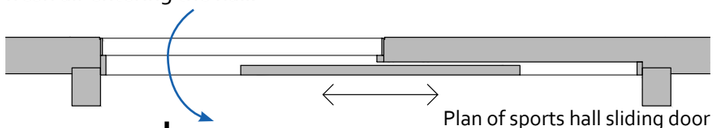
The timber plywood boards in the roof construction helps to provide further lateral stability once installed.



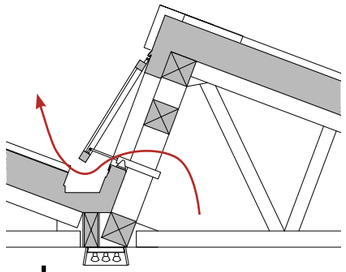
The trusses can be pre-assembled and then craned on to the columns. Additional beams below the trusses are present between the columns enabling this construction sequence.

Climate section summer

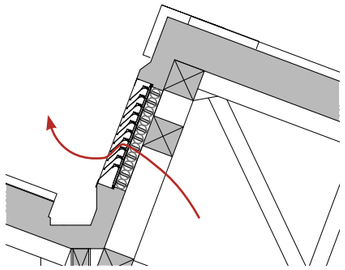
In the summer or periods of high occupancy, when increased ventilation is required, the roof windows to the right (also seen in detail 6) are opened to increase the amount of air exhausted and the large sliding doors below (also seen in detail 2) are opened to increase the amount of fresh air entering the hall.

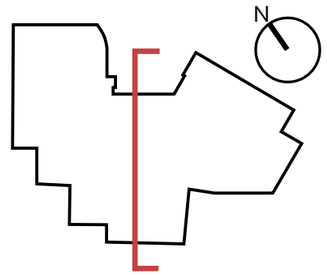


Plan of sports hall sliding door



Ventilation louvres on the roof seen to the right (also seen in detail 7) are opened to naturally exhaust air from the sports hall.

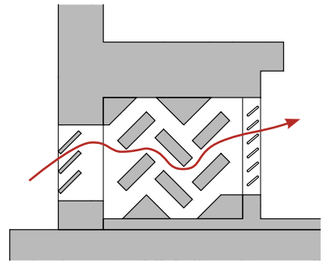


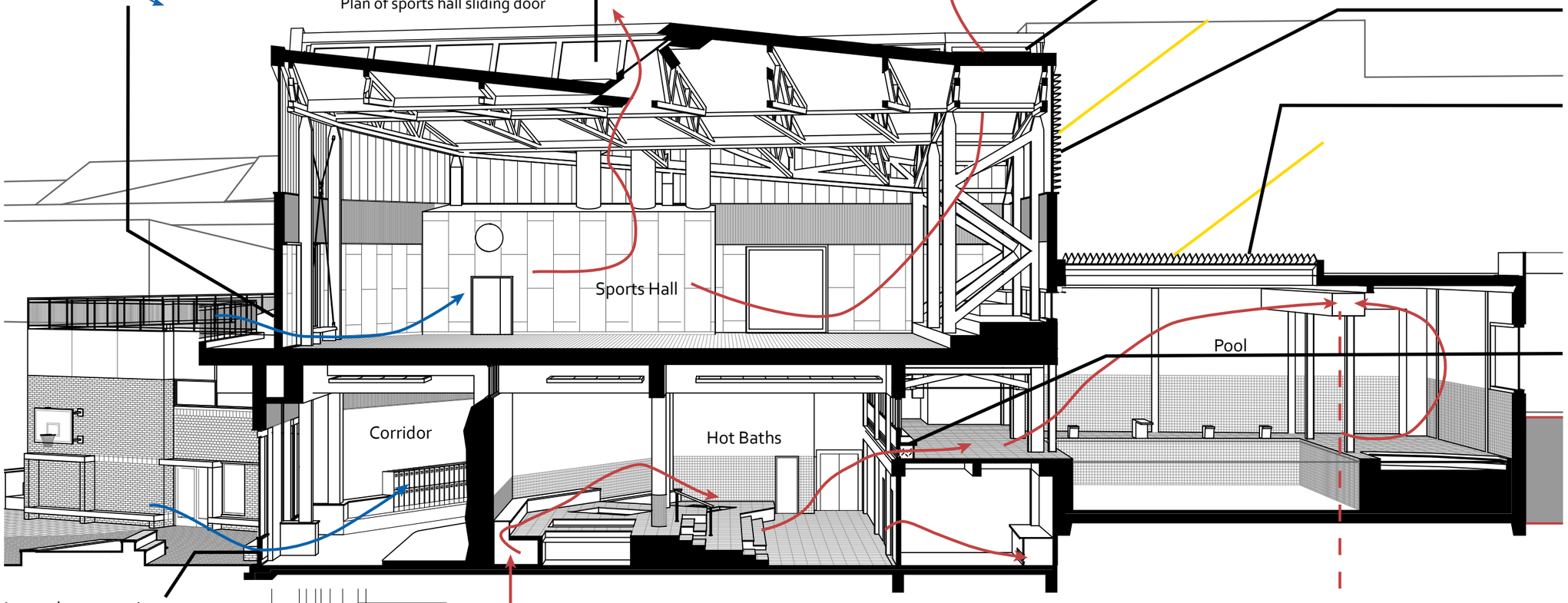


Horizontal shading on the south facade prevents solar gains in the summer.

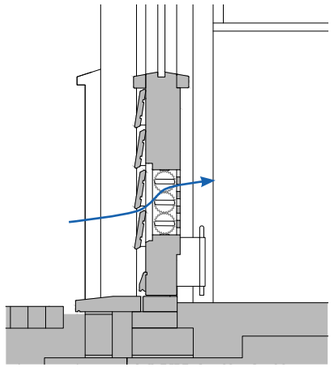
Mechanical louvres on the pool roof rotate to prevent solar gains in the summer.

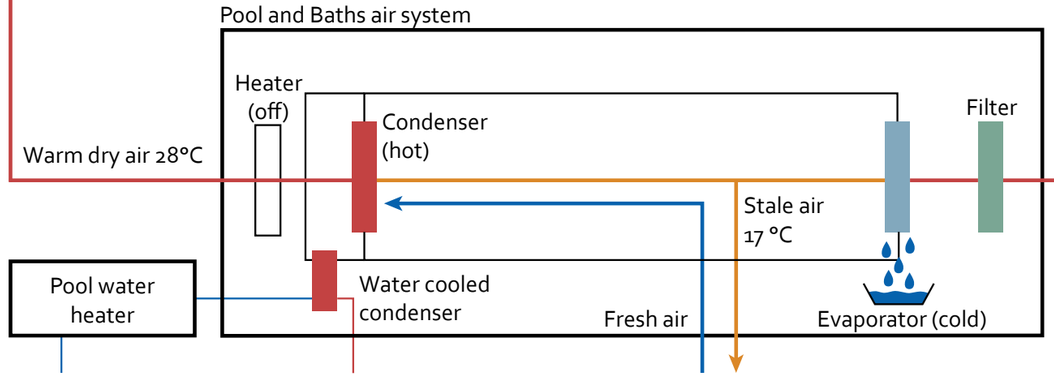
Acoustic louvers below a bench allows air to cascade from the hot baths into the pool area.





Large doors seen in detail 4 are opened in the summer to allow increased natural ventilation. When the doors are closed natural ventilation can be achieved with the louvers seen to the right (also seen in detail 5).





Evaporator

The evaporator cools the air below its dew point, condensing water vapour in the air into water. The heat gained from this process is transferred to a refrigerant solution within the evaporator which stores the gained heat by evaporating. The hot refrigerant gas is transferred to the condenser.

Condenser

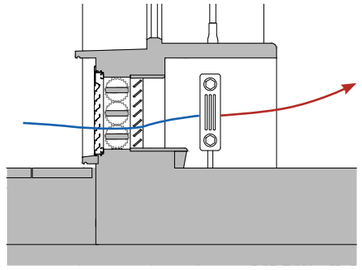
The condenser uses the hot refrigerant gas created by the evaporator to heat the cooled air. Through this process the hot refrigerant gas condenses back into a cool liquid. The cool refrigerant solution is then transferred to the evaporator and the cycle repeats.

During the summer, when the pool air needs to be cooled, heat removed from the pool air by the evaporator is used to aid the heating of the pool water. This is done by a second water cooled condenser. If too much heat remains in the system an air source heat pump can be used to transfer heat to the external air.

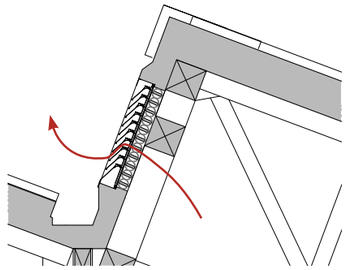
30% of the air is exhausted and replaced with fresh air, 70% is recirculated.

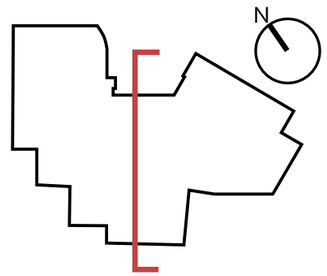
Climate section winter

During the winter the ventilation louvres seen to the right (also seen in detail 3) allow air to enter the sports hall. A small heater heats the incoming air making the bench comfortable to sit on. This is coupled with underfloor heating to efficiently heat the space to 15 °C with energy captured by the solar collectors within the roof (see detail 1).



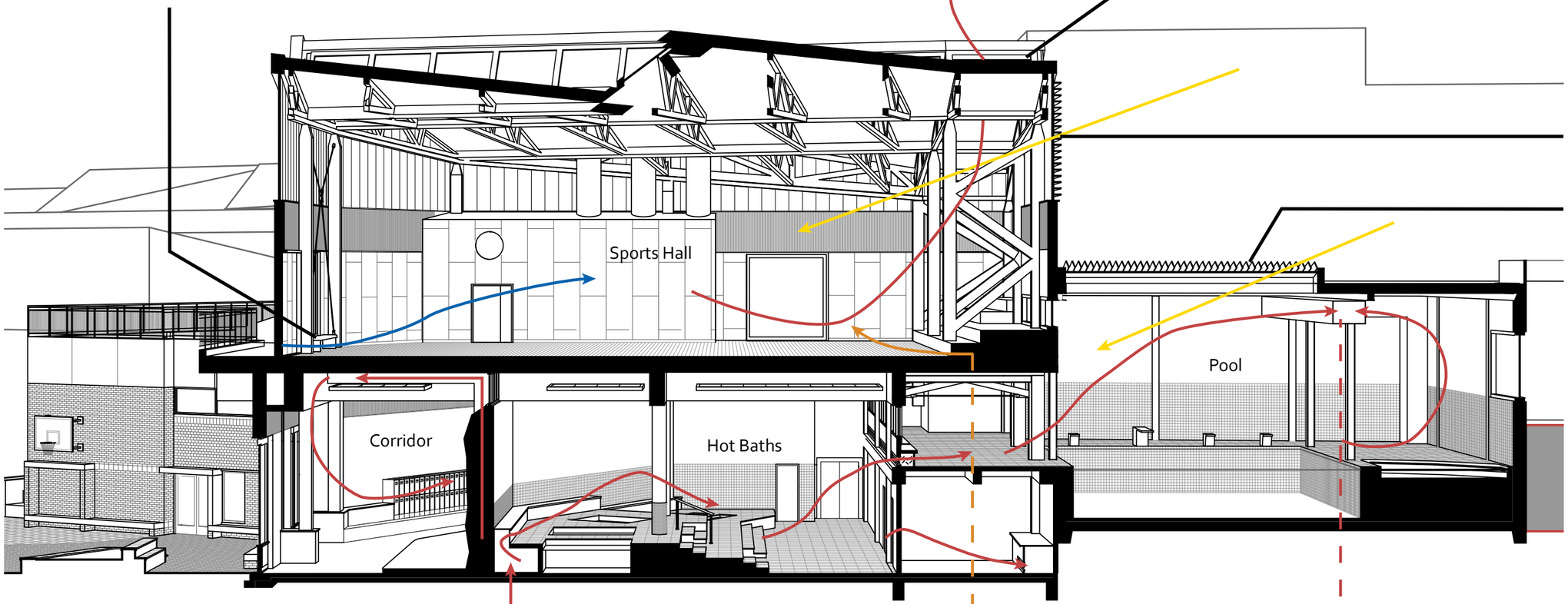
Ventilation louvres on the roof seen to the right (also seen in detail 7) are opened to naturally exhaust air from the sports hall.





Horizontal shading louvers on the south facade allow the low winter light to enter and heat the sports hall providing passive solar gains that help to heat the space.

Mechanical louvres can rotate to allow the sun to passively heat the pool area if extra heat is required.

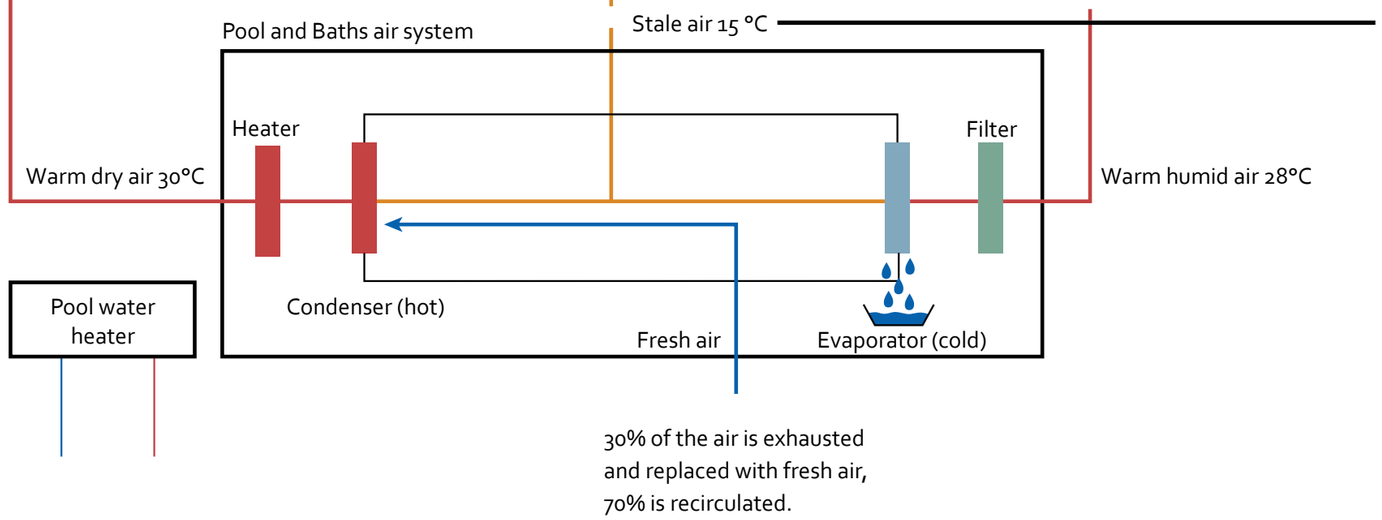


During the winter stale air that has been cooled by the evaporator is exhausted into the sports hall from under the spectator seating. This air helps to reduce the heating demand of the sports hall in the winter. In addition, even after water is removed from the air by the evaporator it still remains fairly humid, because of its low temperature, helping to humidify the dry air within the sports hall created by heating the cold external air. The addition of this air can be reduced if the humidity of the sorts hall becomes too high.

The pool water heater uses heat collected by the solar collector (see detail 1) on the roof of the sports hall as well as an electric water heater to heat the pool water to 27 °C. The hot baths are heated to 35 °C on a separate system that follows the same principals.

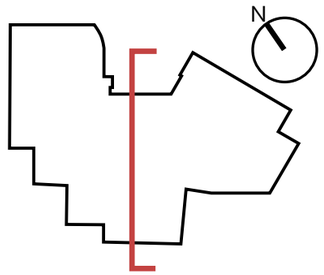
Condenser & Evaporator

See the previous page for an explanation of how the condenser and evaporator work to dehumidify the air within this system.

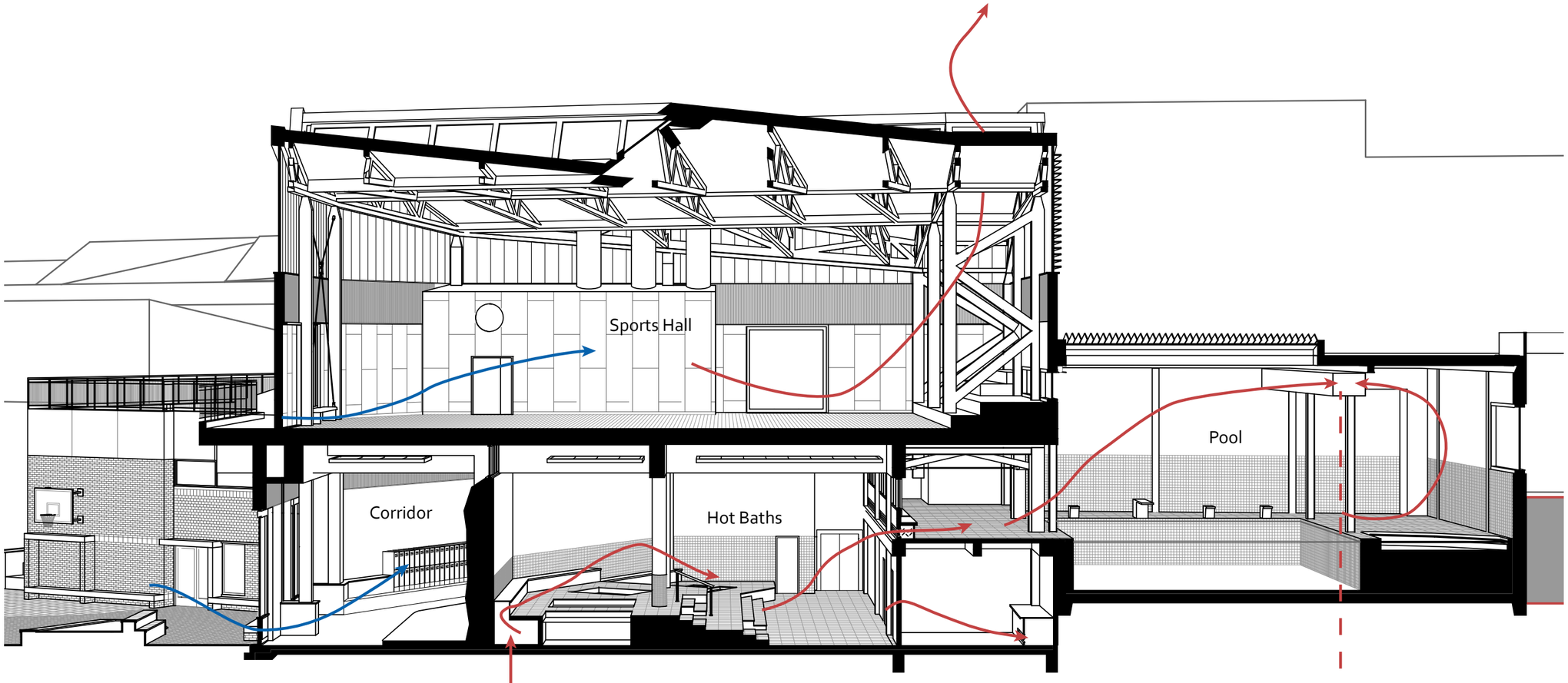


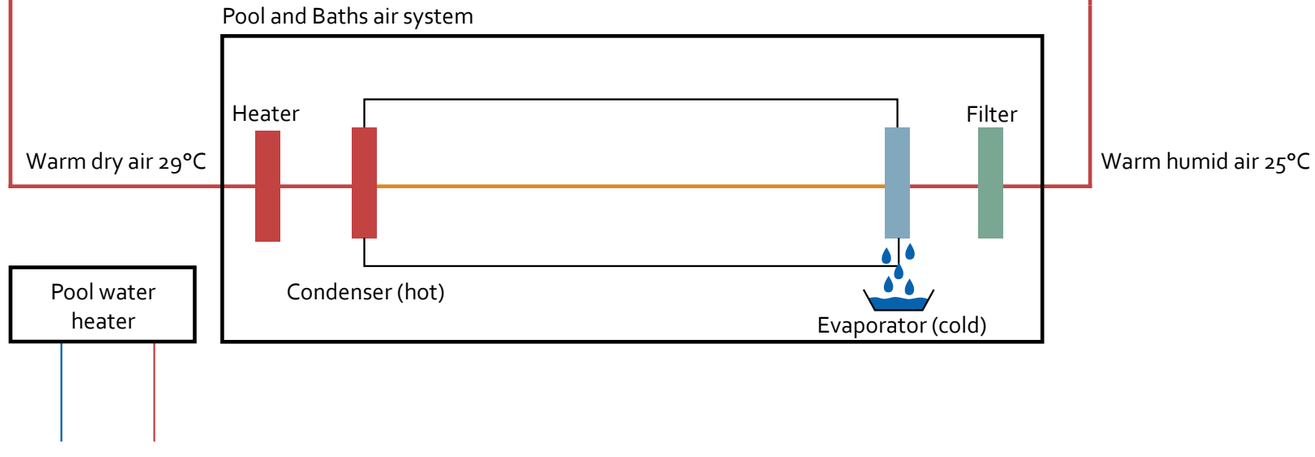
30% of the air is exhausted and replaced with fresh air, 70% is recirculated.

Climate section night



At night air is fully recycled through the pool system and no external air enters. The natural ventilation system of the sports hall can be used in hot months to cool the space during the night.





Additional schematic diagram for the rest of the building plan - summer

Fresh cool air

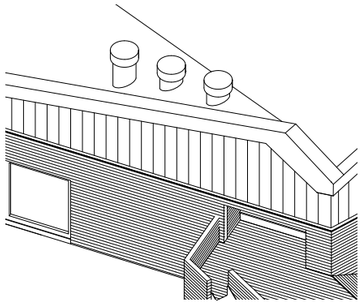
Stale warm air

Mechanical equipment

Ducting

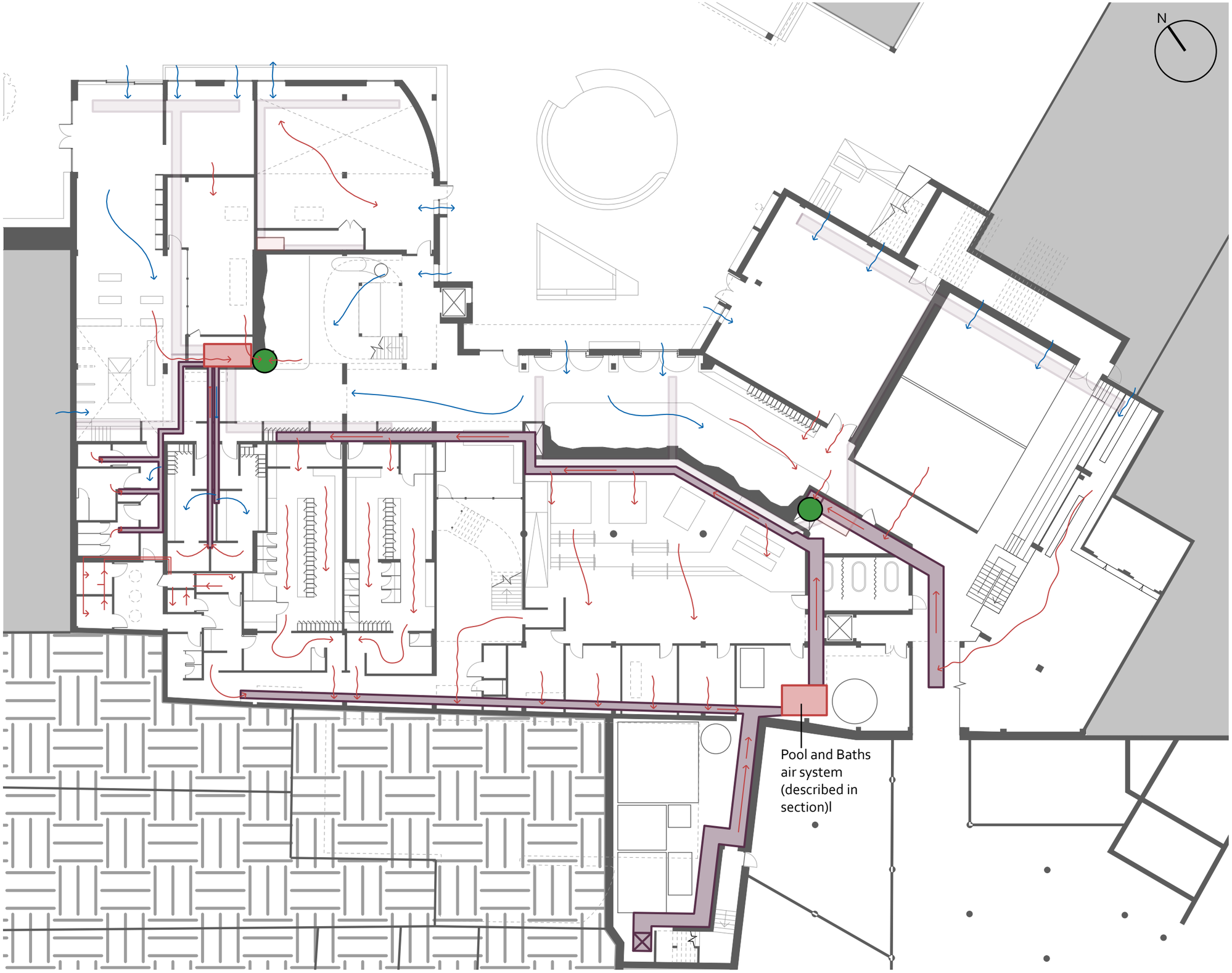
Turbine chimney exhausts

Example product photo



Turbine chimneys on sports hall roof (3 per extract marked on plan)

During the summer the pool, baths, changing rooms and toilets are mechanically ventilated as described in the section.
The remaining ground floor areas are naturally ventilated using turbine chimneys to extract air from the centre of the plan (areas marked with green circles). Fresh air then comes in through windows and openings around the edge of the building.
The turbine chimneys are able to be powered purely by the wind or when there is little wind an integrated motor powered by electricity can spin the turbines.



Additional schematic diagram for the rest of the building plan - winter

Fresh warm air

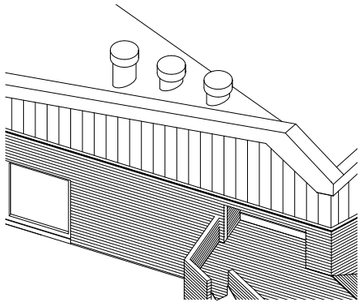
Stale cold air

Mechanical equipment

Ducting

Turbine chimney exhausts

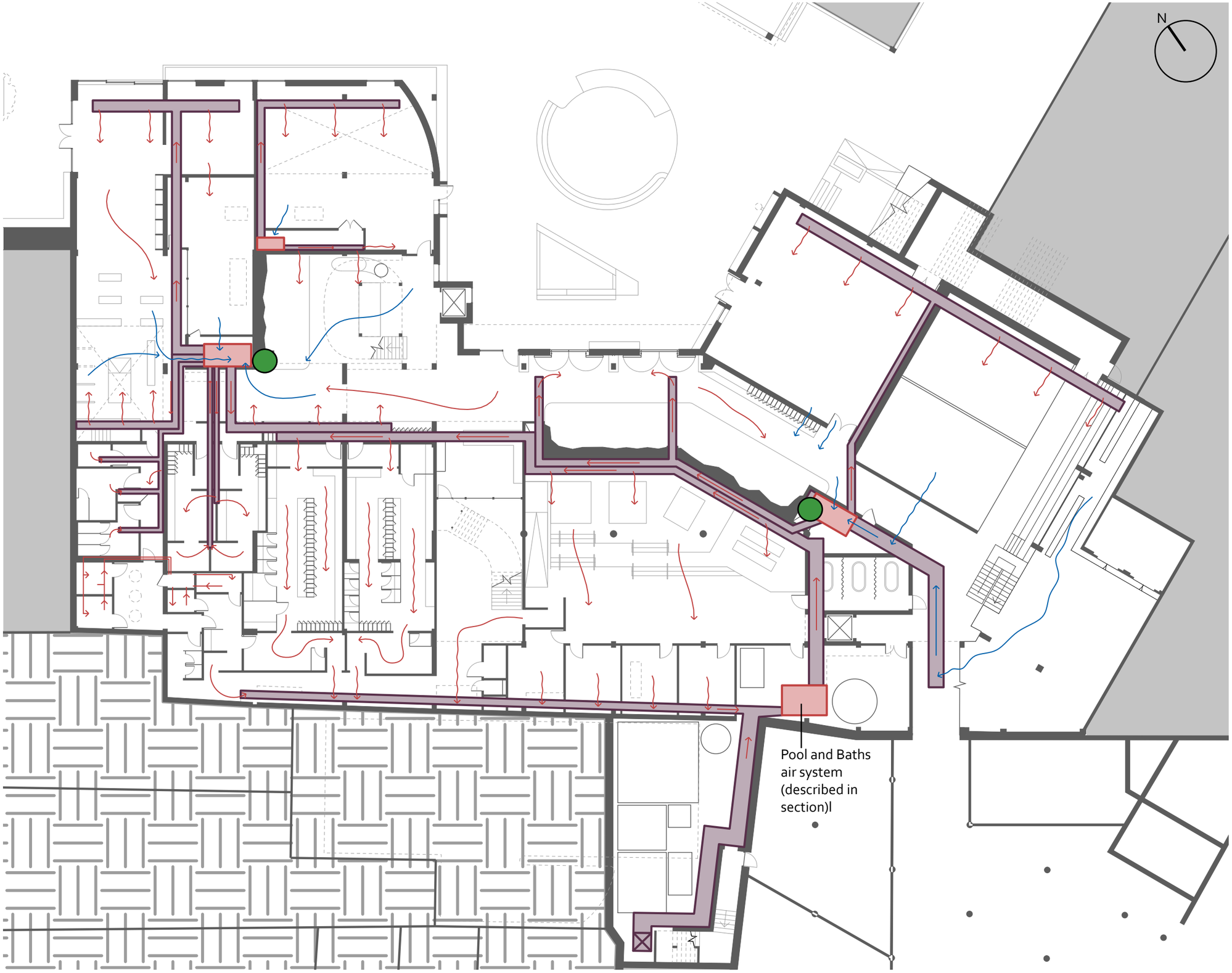
Example product photo



Turbine chimneys on sports hall roof (3 per extract marked on plan)

During the winter instead of bringing air into the scheme through windows, ducts are used to deliver warm air to the edges of the building. The air is then extracted from the same location as in the summer, passed through decentralised heat exchangers within the plant rooms and exhausted through the turbine chimneys.

In the summer if needed the mechanical system can be used to cool the spaces.



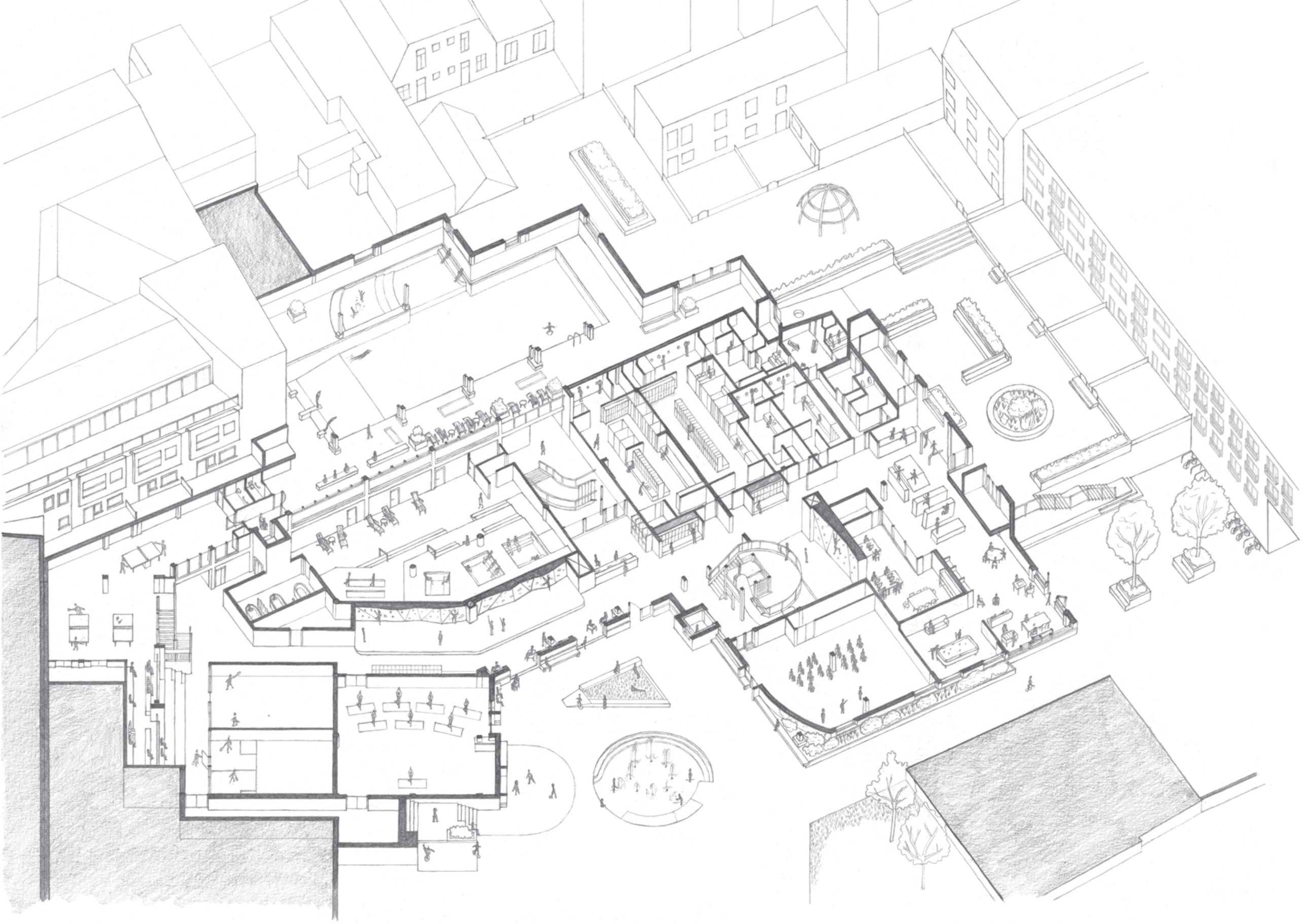


Image References

Introduction

1.1 - Pieter Bruegel the Elder, “Kinderspelen”, Oil on wood, 1560

1.2 - Trend in prevalence of health problems in Nijmegen. From *Volksgezondheid Toekomst Verkenning*, by RIVM, 2018, Retrieved 4 January 2021, from https://www.regiobeeld.nl/gezondheid-leefstijl?gemeente=Nijmegen

1.3 - Key areas that contribute to lifestyle related illness. Created by author, Data from *What is Lifestyle Medicine*, by American Collage of Lifestyle Medicine, 2019, Retrieved 27 June 2021, from https://lifestylemedicine.org/What-is-Lifestyle-Medicine

1.4 - Model of the church separated into its many fragments of time. Created as group work with Alma Bouwens, Alex Comanceanu, Alejandra Ferrera, Elisabeth Ihrig, Andrew Kelso, Julie Moraca, Laura Piccinin, and Roséane Singotani.

1.5 - Model of the city during the period of the farm house when time was dictated by rhythms of nature. Created as group work with Alma Bouwens, Alex Comanceanu, Alejandra Ferrera, Elisabeth Ihrig, Andrew Kelso, Julie Moraca, Laura Piccinin, and Roséane Singotani.

1.6 - Diagrams showing the functional distribution of people within the guest-house throughout the day. Created by author.

1.7 - Model of the guesthouse fitted with rhythmic lights, governed by a metronome, demonstrating the daily routines of its occupants. Created as group work with Alma Bouwens, Alex Comanceanu, Alejandra Ferrera, Elisabeth Ihrig, Andrew Kelso, Julie Moraca, Laura Piccinin, and Roséane Singotani.

1.8 - People walk past the church fixated on their phones. The church’s clock and bell are no longer a necessity. Created as group work with Alma Bouwens, Alex Comanceanu, Alejandra Ferrera, Elisabeth Ihrig, Andrew Kelso, Julie Moraca, Laura Piccinin, and Roséane Singotani.

Play in Nijmegen and elsewhere.

2.1 - King of the hill, Brooklyn, 1950 (Photo by Arther Leipzig). From *City Play* (p.137), by Dargan, A., & Zeitlin, S. J. , 1990, New Brunswick: Rutgers University Press.

2.2 - Photo of London’s east end , 1949-1953, Nigel Henderson. From *Streets: Nigel Henderson’s photographs of London’s East End 1949-53* (p.74), by Henderson, N., 2017, London: Tate Publishing.

2.3 - Parkour within Nijmegen. Captured from video *Freerunning—Nijmgen (Shootlab),* by 2Doc, 2012. Retrieved from https://www.youtube.com/watch?v=GhB0BD12Dbs&t=7s&ab_channel=2Doc

2.4 - Clubhouse, Lower East Side, manhatten, 1978 (Photo by Martha Cooper). From *City Play* (p.138), by Dargan, A., & Zeitlin, S. J. , 1990, New Brunswick: Rutgers University Press.

2.5 - Using the curb, Brooklyn, 1950 (photo by Arther Leipzig). From *City Play* (p.41), by Dargan, A., & Zeitlin, S. J. , 1990, New Brunswick: Rutgers University Press.

2.6 - Drawing on the road (photo by Arthur Leipzig).). From *City Play* (endpapers), by Dargan, A., & Zeitlin, S. J. , 1990, New Brunswick: Rutgers University Press.

2.7 - Game of marbles, 1914 (photo from the Chicago Daily News). From *City Play* (p.80), by Dargan, A., & Zeitlin, S. J. , 1990, New Brunswick: Rutgers University Press.

2.8 - Directing spray, Lower East Side, Manhatten, 1978 (photo Martha Cooper). From *City Play* (p.58), by Dargan, A., & Zeitlin, S. J. , 1990, New Brunswick: Rutgers University Press.

2.9 - Playing in the fountain on Ziekerstraat. Photo captured by fellow student Alma Bouwens

2.10 - Skating in Kronenburgerpark (photo by Geert Geenen). From *Twitter*, by Geert Geenen, February 2021 (https://twitter.com/TomBeuningen/)

2.11 - Sledging at Mariënburg (photo by Tom Hessels). From *Twitter*, by Tom Hessels, February 2021 (https://twitter.com/geertgeenen)

2.12 - Sledging at Kronenburgerpark (photo by Paul Rapp). From *Politie stuurt 600 mensen weg uit Kronenburgerpark,* by De Gelderlander, February 2021, Retrieved February 2021, from https://www.gelderlander.nl/nijmegen/politie-stuurt-600-mensen-weg-uit-kronenburgerpark~a8ba7071/?referrer=https%3A%2F%2Fwww.google.com%2F

2.13 - Something to lean on or place things near. Piazza del Campo, Siena, Italy. From *Life Between Buildings* (p.151), by Jan Gehl, 2011, London: Island Press.

2.14 - Architectural Fragment, outside the State Library, Melbourne. From *The Ludic City* (p.185), by Stevens, Q., 2007, New York: Routledge.

2.15 – Child climbing on sculpture. From *Het wordt tijd: wie verzint een naam voor het blauwe kunstwerk op Kelfkensbos?,* by in de buurt, 2018, Retrieved January 2021, from https://indebuurt.nl/nijmegen/gemeente/het-wordt-tijd-wie-verzint-een-naam-voor-het-blauwe-kunstwerk-op-kelfkensbos~16856/

2.16 - Large Yellow Sector model by Nieuwenhuys, 1958. Photo created by author at Kunstmuseum, Den Haag.

2.17 - Section of the Fun Palace by Price, 1964. Retrieved from the Canadian Centre for Architecture online archive (DR1995:0188:197), Retrieved February 2021, from https://www.cca.qc.ca/en/search/details/collection/object/309793

2.18 - Diagrammatic drawing of possible configurations of the modular stair unit designed by Price for the Fun Palace, 1964. Retrieved from the Canadian Centre for Architecture online archive (DR1995:0188:342), Retrieved February 2021, from https://www.cca.qc.ca/en/search/details/collection/object/309954

2.19 - Typical plan for Fun Palace showing the rotating escalators, 1964. Retrieved from the Canadian Centre for Architecture online archive (DR1995:0188:235), Retrieved February 2021, from https://www.cca.qc.ca/en/search/details/collection/object/309835

2.20 - Large Yellow Sector model by Nieuwenhuys, 1958. Photo created by author at Kunstmuseum, Den Haag.

2.21 - Mobile ladder labyrinth model by Nieuwenhuys, 1967. Photo created by author at Kunstmuseum, Den Haag.

2.22 - Constant Nieuwenhuys, “Mobile ladder labyrinth”, paper pencil watercolor, 1967, Kunstmuseum, Den Haag

2.23 - Interior perspective of the Fun Palace by Cedric Price, 1960-5. Retrieved from the Canadian Centre for Architecture online archive (DR1995:0188:123), Retrieved February 2021, from https://www.cca.qc.ca/en/search/details/collection/object/309710

2.24 - Experiment Studio Rotterdam, 1966. From *Constant. New Babylon. To Us Liberty* (p.186), by Nieuwenhuys, C., Gielen, P., Stokvis, W., Wigley, M., van der Horst, T., & Laura., 2016, Ostfildern: Hatje Cantz Verlag.

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2.30 - Isamu Noguchi, Playscapes, Piedmont Park, 1976. From *Isamu Noguchi* (p.51), by Hunter, S. , 1979, London: Thames and Hudson.

2.31 - Isamu Noguchi, Slide Mantra, Marble, 1986. Retrieved February 2021, from https://archive.noguchi.org/Detail/artwork/8822

2.32 - Isamu Noguchi, Play sculpture at Moerenuma Park in Sapporo, Hokkaido, Japan. Retrieved February 2021, from https://www.wpr.org/new-milwaukee-art-museum-exhibit-encourages-visitors-take-time-play

2.32 - Isamu Noguchi, Play Mountain idea for playground, 1933. From *Isamu Noguchi* (p.49), by Hunter, S. , 1979, London: Thames and Hudson.

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2.34- A round-bottomed study in one of the Reversable Destiny Lofts, 2005. From *Could Architecture Help You Live Forever?,* by The New Your Times Style Magazine, 2019. Retrieved May 2021, from https://www.nytimes.com/2019/08/20/t-magazine/reversible-destiny-arakawa-madeline-gins.html

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2.36 - (top) photos of Aldo Van Eyck's Amsterdam Playgrounds, (bottom) photos of his orphanage project. From *Orphanage Amsterdam: building and playgrounds* (pp.32, 33, 74, 113, 57, 65, 53, 58), by Grafe, C., Herfst, W., Fischer, S., Álvarez Santana, J., Otto, L., Martens, J., & Eyck, A. van., 2018, Amsterdam: Architectura & Natura.

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3.3 - The swimming area at the Peckham Experiment, 1926 – 1950. *From The Peckham experiment: A study in the living structure of society,* by Pearse, Innes H., & Crocker, L. H., 1947, New Haven: Yale University Press.

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3.9 - Archive photo retrieved from Nijmegen archive, 1967 (F84756). Retrieved September 2020, from https://studiezaal.nijmegen.nl/detail.php?nav_id=1-1&id=2186049633

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3.10 - Photo of Tweede Walstraat 80. Photo captured by fellow student Ziou Gao.

3.11 - Photo of Vlaamsegas 12. Photo captured by fellow student Robert Bichi.

3.12- Photo of doorway threshold from Aldo van Eyck's orphanage project. From Orphanage Amsterdam: building and playgrounds (p.53), by Grafe, C., Herfst, W., Fischer, S., Álvarez Santana, J., Otto, L., Martens, J., & Eyck, A. van., 2018, Amsterdam: Architectura & Natura.

3.13- Photo of doorway threshold from Aldo van Eyck's orphanage project. From Orphanage Amsterdam: building and playgrounds (p.58), by Grafe, C., Herfst, W., Fischer, S., Álvarez Santana, J., Otto, L., Martens, J., & Eyck, A. van., 2018, Amsterdam: Architectura & Natura.

3.14- Photos from Aldo van Eyck's orphanage project. From Orphanage Amsterdam: building and playgrounds (pp. 65+113), by Grafe, C., Herfst, W., Fischer, S., Álvarez Santana, J., Otto, L., Martens, J., & Eyck, A. van., 2018, Amsterdam: Architectura & Natura.

3.15 – See image reference 2.2

3.16 – See image reference 2.9 - Playing in the fountain on Ziekerstraat. Photo captured by fellow student Alma Bouwens

3.17 - Photos from Aldo van Eyck's orphanage project. From Orphanage Amsterdam: building and playgrounds (pp. 56+57), by Grafe, C., Herfst, W., Fischer, S., Álvarez Santana, J., Otto, L., Martens, J., & Eyck, A. van., 2018, Amsterdam: Architectura & Natura.

3.18 - Photo of one of Aldo van Eyck's Amsterdam playgrounds. From Orphanage Amsterdam: building and playgrounds (p. 32), by Grafe, C., Herfst, W., Fischer, S., Álvarez Santana, J., Otto, L., Martens, J., & Eyck, A. van., 2018, Amsterdam: Architectura & Natura.

3.19 - See image reference 2.32

3.20 – See image reference 2.14

3.21 – See image reference 2.32

3.22 – See image reference 2.33

3.23 - Belleville Playground designed by BASE. From *Belleville Playground / BASE,* by ArchDaily, 2010.

3.24 - Amsterdam playgrounds designed by Aldo van Eyck. From Orphanage Amsterdam: building and playgrounds (p. 32), by Grafe, C., Herfst, W., Fischer, S., Álvarez Santana, J., Otto, L., Martens, J., & Eyck, A. van., 2018, Amsterdam: Architectura & Natura.

3.25 – See image reference 2.4

3.26 – See image reference 2.26

3.27 – See image reference 2.21

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