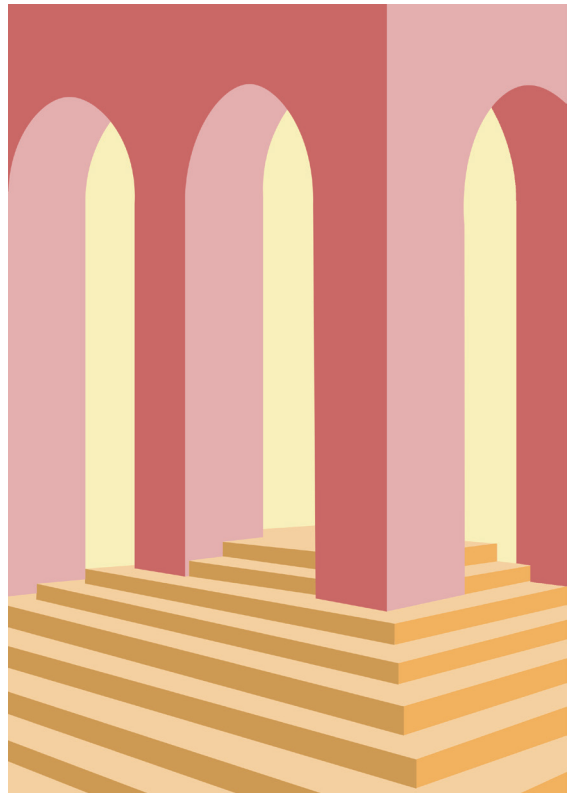
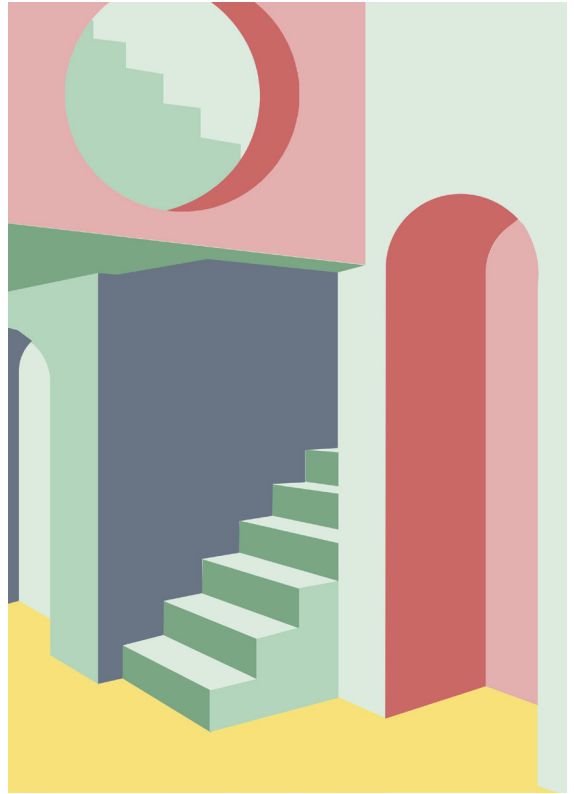
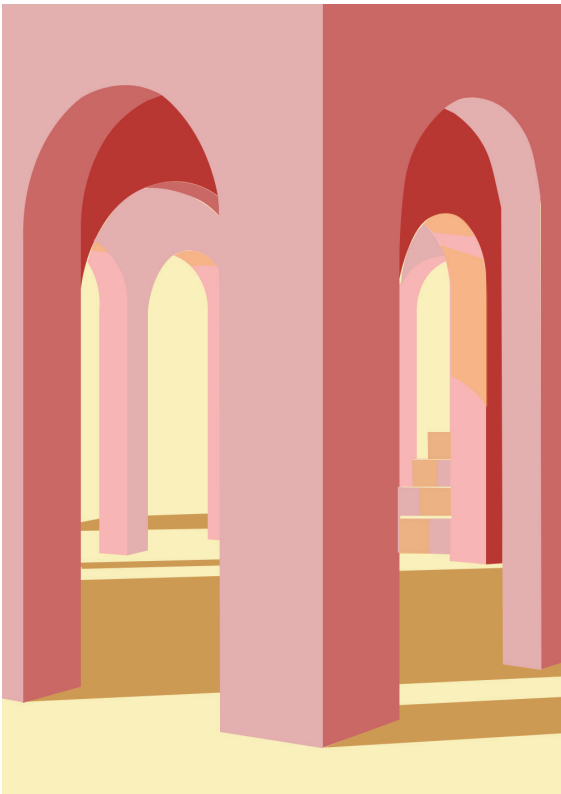
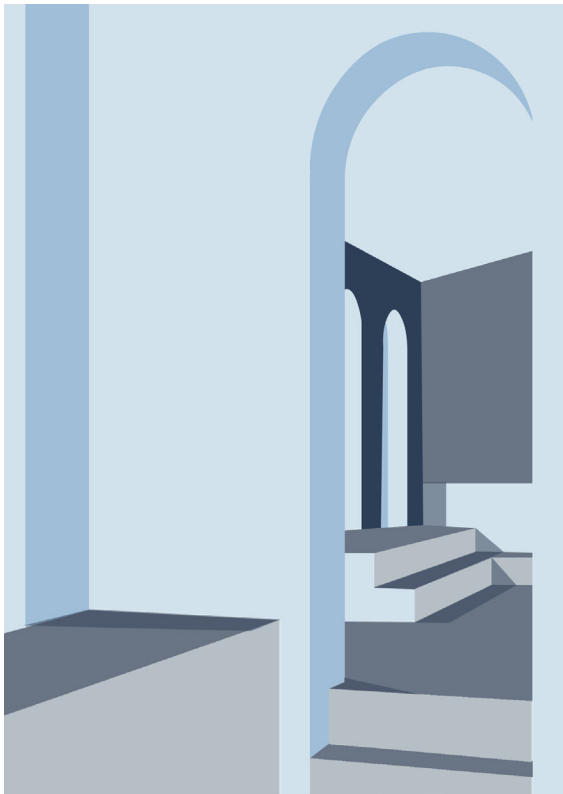


ROTTERDAM URBAN SCHOOL

01





Introduction

Cities are expanding and populations growing, the phenomenon of global urbanization causes cities to change. Considerations such as limited ground space, separated clusters and poor public amenities are becoming all the more pressing. Looking at the Dutch setting, Rotterdam is the most progressive vertical urban city. It is the second biggest city in The Netherlands with 644.000 inhabitants from whom 51,5% has a migration background. In its growth Rotterdam has been building ever since the Word War II bombing in 1940. Starting from the 1990's Rotterdam's high-rise strategy caused the city to densify its city centre to maximize the use of space. The vertical expansion is set to grow even more as 50.000 new homes are expected to be built in Rotterdam. Aiming for people and most importantly families to live in the city instead of in the suburbs. It is becoming apparent that the future of urban areas is becoming more dense, global migration and urbanization are urgent topics. The result of going vertical leaves the urgent challenge to make cities liveable and vibrant.

Rotterdam is becoming a city for people. The high-rise strategy is bringing living functions back into the city centre. The Unfinished City group vision enforces this approach with the infrastructure and diversification of functions, both social and functional, to support the densification of Rotterdam and respond to global trends, ensuring it becomes, and remains, a liveable and productive city. One of these important missing functions in the Rotterdam city centre is education. The intellectual and social development that a child receives during their time in education plays a major role in shaping the future of society. And therefore of great value to society.

Brief

The conventional Dutch school typology is low with a playground next to the school. This typology is no longer applicable to the dense urban city. This results in the school typology of the urban school which has not yet been explored in the Dutch setting. In line with the focus of the Hotel

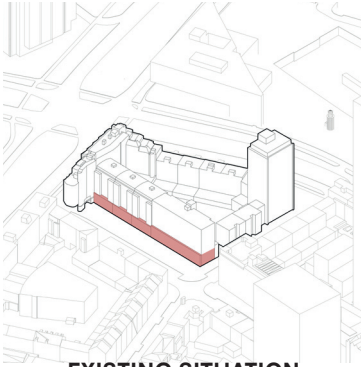
New York studio topic of migration, the non-physical migration of ideas and concepts is used as exploration and inspiration for the urban school. The urban school typology can be found in larger urban areas across the globe. Migrating this idea and exploring its challenges and complexities is the focus point of this research and design assignment.

The design assignment that results from this is an urban school that reacts to the increasing densification and the strategy of Rotterdam to become a liveable and vibrant city. The ambition of the Urban School which will serve as an educational function to children from 2.5 to 18 years old to provide a continuous and optimal learning environment for the development of a child while responding to need for new 21st century learning environments and concepts that will enforce new approaches to learning.

Concept

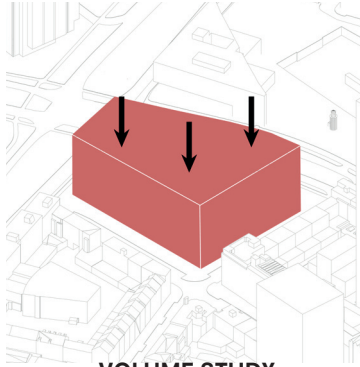
Looking at the future developments we can see that they cluster around specific areas. The cluster around Beurs will be strengthened by the Secondary Node by Lotte Souren, The Performing Arts school by Gabriele Piazzo, The Bank of Maas by Danica mijonic, The Rotterdam Athletic Club by Casper Bovy and the Urban School by myself. Together these projects will reactivate the historical north-south axis in this area, and transform it into a pedestrian friendly public space while acting as a connection between the different urban centers.

The chosen site next to Beurs is chosen due to its good connectivity, mix of functions and most importantly the high added density to this areas in coming years. The plot size was chosen bigger than as would have been expected when building in a dense city. Stacking program in a vertical approach on a smaller plot would be a logical solution. However this approach has its challenges: poor circulation, limited and very high outdoor space and dead ends. The Rotterdam Urban School proposes an approach that works at a mid-high rise level of vertical building on a bigger plot, stacking program and terracing.



EXISTING SITUATION

The location at the Churchill square in the Rotterdam City Center has potential to become more. The existing building is deprecated, only the restaurants on the west side have a real added value to the site.



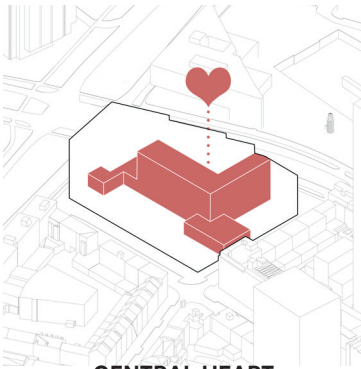
VOLUME STUDY

The volume of the building was formed through the urban rules of the site. The shape of the building follows the urban fabric and its height is determined by the Rotterdamse Layer and the desire to not make a vertical school but instead a mid-rise school.



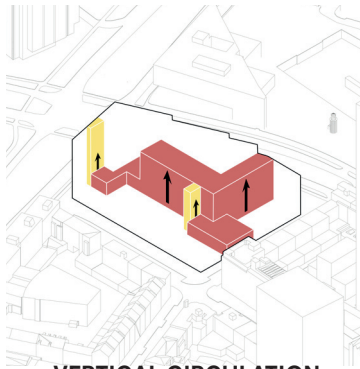
BUILDING VOLUME

The buildings volume is shaped down to create multiple terraces to be easily accessible from each level. In the center of the volume an atrium forms the heart of the school, this central hall will be the entrance point for all circulation and amenities.



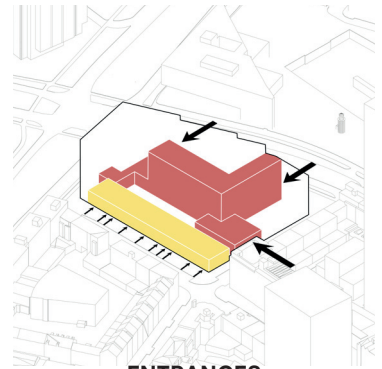
CENTRAL HEART

Everything surrounds the central hall of the school. Acting as a connector between the primary and secondary school. The shared hall connects all programs together and ensures enough natural light throughout the building being an atrium.



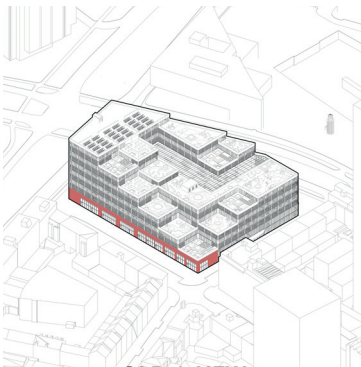
VERTICAL CIRCULATION

All vertical circulation is located within the central hall. From the crossplay of various staircases to the two cores which contain the elevators for each school.



ENTRANCES

To ensure the engagement with the rest of the city entrances are located on each side of the building. While also being located on separate sides to ensure an efficient student flow.



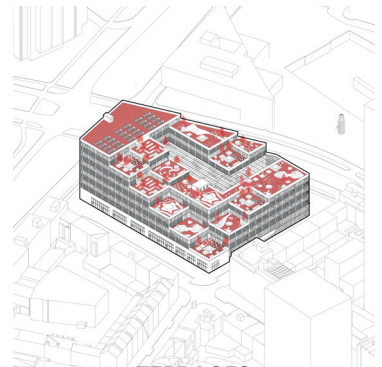
OLD & NEW

From the old situation the Restaurants have been incorporated in the design for a continuous stream of activity day and night. Their facade is redesigned to show a clear difference between school restaurant.



ACCESSIBILITY

The central location of the building means that from each side transportation is accessible. Entrances and engagement on each side of the building control the big student bodies that inhabit the building, in this way congestion problems are avoided.



TERRACES

The most important feature of the building are the terraces, ensuring the accessibility from each level to outdoor space. Differentiations between the spaces is created through the a variation in designs. The highest roof space is used for creating sustainable energy and building support units.

The volume follows the urban rules of Rotterdam by engaging with the urban fabric in its plint all-round the building. The existing restaurants located on the Schiedamse Vest will remain as they have an important function for leisure in the city throughout the day. The Rotterdamse layer is important in following the urban fabric and connection with the city.

In designing this building it is important to acknowledge that the school actually contains three different schools: Kindergarten, Primary School and Secondary School. Meaning that children from different age classes will use the building, each in a different way. The amount of children from different age classes means that large student flows and bodies are to be arranged throughout the building in an efficient way while still remaining a coherent whole. To achieve this and solve other complexities that come with this typology the design of the Rotterdam Urban School follows certain concepts with dynamic solutions

1. The Central Hall - will form the heart of the school from which all amenities will be available and while also acting as the center point for vertical circulation. In order to gain enough light throughout the building this hall will be an atrium to give ensure enough light in every space.

2. Entrances - each school has its own entrance designed towards the needs and expression of the user. This will help avoid big student flows and ensure safety between the age classes.

3. Vertical circulation - is divided from each other so the option to move between levels is always close by. Centralized in the central hall to give vibrancy to the school and a visual connection between the different schools.

4. Terraces – the building is designed in a terraced way to ensure outdoor space being available from each level of the building. The outdoor spaces are differentiated from each other in design and use.

5. 21st century learning - The shift to 21st century requires a change from the teacher led curriculum to a more open and free student teacher co-created curriculum. We as designers can turn these educational concepts into the spatial requirements and these 21st learning concepts require. The result from this is a learning environment which is open and closed divided in zones that differentiate from each other.

Design

The exterior design of the building is a terraced volume. In this way it is ensured that on each level of the building there is easy access to outdoor space. Which became one of the most important features of the building. In larger cities the possibility to quickly go to a safe outdoor space where children can play and relax is scarce. Therefore the topic became a key focus point for the design. Each outdoor spaces differs from one another, the primary school outdoor spaces are focused on play and color. On the 8th floor the big outdoor space can be reached for when larger breaks are taken. These terraces can be seen a lifted playgrounds.

The program supports sharing space by having the amenities on the lower levels and schools on the higher levels. In the program concept the Central Hall forms the heart of the building, it connects all of the functions together. The division of school programs avoids big student flows and problems in circulation. Each school has its own vertical circulation centred in the central hall. The design is terraced on the outside, this will ensure an abundant amount of outdoor spaces that can be differentiated from each other and easily accessible from each level.

The internal design of the primary and secondary school will not resemble the 20th century standard educational design with a teacher led curriculum that is emphasised on compliance and conformity over creativity. The three R's (the three basic skills taught in schools: reading, [w]riting and 'rithmetic) alone are no longer enough. A 21st century education is about giving students the skills



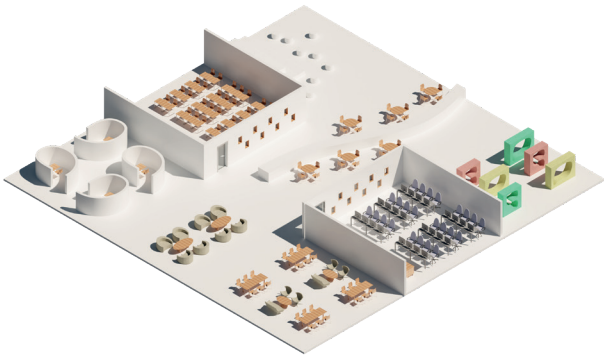
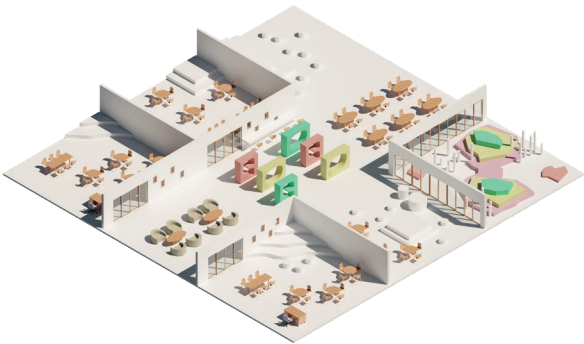
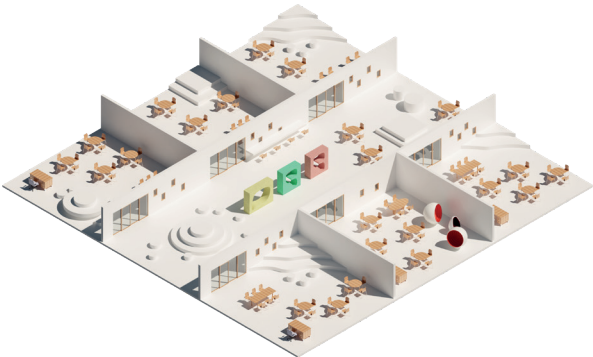
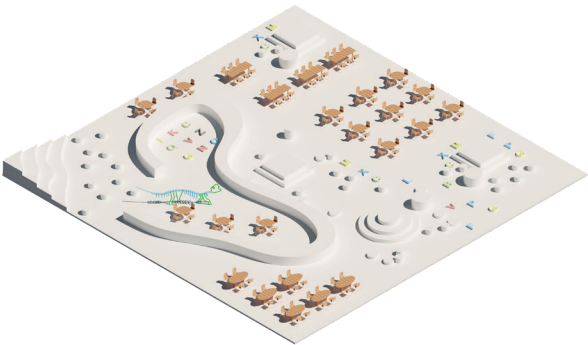
they need to succeed in this new world, and helping them grow the confidence to practice those skills. With so much information readily available to them, 21st century skills focus more on making sense of that information, sharing and using it in smart ways. The term “21st-century skills” is generally used to refer to certain core competencies such as collaboration, digital literacy, critical thinking, and problem-solving that advocates believe schools need to teach to help students thrive in today’s world. In a broader sense, however, the idea of what learning in the 21st century should look like is open to interpretation—and controversy. The identified four Skills for Today are: Creativity, Critical thinking, Communication and Collaboration. These four themes are not to be understood as units or even subjects, but as themes that should be overlaid across all curriculum mapping and strategic planning. They should be part of every lesson in the same way as literacy and numeracy. Creativity is about thinking through information in new ways, making new connections and coming up with innovative solutions to problems. Critical thinking is about analysing information and critiquing claims. Communication is understanding things well enough to share them clearly with other people. Collaboration is about teamwork and the collective genius of a group that is more than the sum of its parts. These four themes are not to be understood as units or even subjects, but as themes that should be overlaid across all curriculum mapping and strategic planning. They should be part of every lesson in the same way as literacy and numeracy. Creativity is about thinking through information in new ways, making new connections and coming up with innovative solutions to problems. Critical thinking is about analysing information and critiquing claims. Communication is understanding things well enough to share them clearly with other people. Collaboration is about teamwork and the collective genius of a group that is more than the sum of its parts.

The shift to 21st century requires a change from the teacher led curriculum to a more open and free student teacher co-created

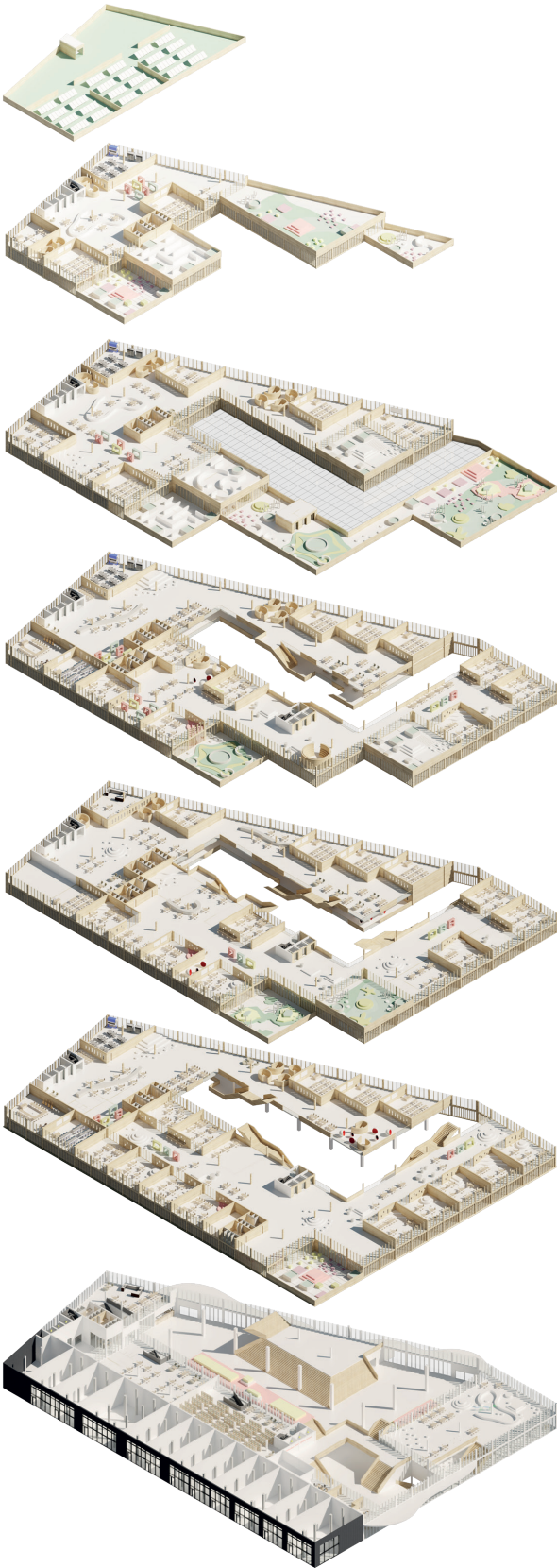
curriculum. We as designers can turn these educational concepts into the spatial requirements and these 21st learning concepts require. The result from this is a learning environment which is open and closed divided in zones that differentiate from each other. Meaning that one space is specifically for individual learning, the other for group or specific to a task or course.

As mentioned before the Rotterdam Urban School contains all levels of education for children. Starting with the Kindergarten, which is designed as an open and light space. The intention for this is to give the teacher an easy overview over the children. Playing, learning and eating are arranged throughout the space to alternate each other. Divided over two levels the children from ages 2.5 to 4 years old can start their early education in the Rotterdam Urban School.

Its entrance is located on the neighbourhood side of the building for safety reasons. The same goes for the Primary School, its entrance located next to the Kindergarten. In front the bicycle garage entrance leads the children who come to school by bicycle to minus one. From which they can go up to the entrance of the Primary School. The entrance is designed to a human scale to not intimidate the children. Simultaneously giving a glimpse to the central hall, the stairs lead them up to the levels of the Primary School. When necessary the elevators can also be taken to reach the higher levels or big playground on the roof of the building. The stairs split up in two ways so that it becomes easy to reach each classroom efficiently. The lower levels contain the youngest children. Classes 1 to 4 are designed with the idea the classroom is still the most valuable. Its dimensions are larger to intend various spaces within the classroom so several tasks can be done at the same time. The sliding doors can be opened towards the ‘hallway’, which give the option to extend the classroom and mix activities with other classes. The amount of freedom to do tasks is limited due to the age of the children. In the classes 4 to 8 this freedom is extended more, the children are encouraged to do tasks themselves. The teacher is an







aid to the children in helping them learning instead of being a sort of taskmaster. In this way children are encouraged to develop their own initiative, persistence and collaboration with other students to solve problems in a creative and critical way. Developing core skills for everyday tasks while also approaching complex challenges to enhance competencies in this age of vastly changing environments.

The Primary School introduces these topics in the later stages of primary education. The Secondary School of the Rotterdam Urban School fully embraces these topics. By changing the curriculum from a teacher-led curriculum to a student-teacher-led curriculum. The spaces becomes fully about learning and collaboration between students and teachers. Where student are given more freedom to learn how they want and when they want. Helping and discussing with each other is encouraged, teachers should be guiding students to do it themselves. The classroom is only used when necessary but not forgotten as in some subjects or topics the classroom is still the most effective tool for learning. The same accounts for the course specific subjects that have special requirements such as music or chemistry classrooms. For efficiency all of these rooms are located on top of each other as chemistry rooms require higher ventilation.

Climate & Structural design

The building works on Low-temperature Systems. All HVAC systems are low-temperature for high efficiency and comfort. With decentral ventilation the building is divided into different zones. Localized AHU's with low pressure and maximum use of natural ventilation are used to keep energy use as low as possible. A geothermal heat source is used in combination with a heat pump - Heat (18 - 20 0C) - and cold (6 - 8 0C) storage (ATES). Besides the geothermal heat source solar panels and solar collectors are used to convert sunlight into electricity to be used to power the building. Collectors will heat the water that is used for radiant heating in the building.

All collected rainwater from the used is stored underground and reused for lavatories and other greywater use. Through gutters in the terraces the water slopes down through covert rainpipes that are hidden in the pillars of the facade.

To reduce the Heat Island Effect and to provide more green space for the children in the concrete city. Contribute significantly to improving the indoor climate of the buildings. They increase the humidity, purify the air and provide a beneficial environment.

The structural design of the building is rather simple as a strict grid structure of columns and slaps. Hollow core slap floors and lowered ceilings ensure the possibility to hide wiring and ventilation pipes. The existing restaurants are extra heavily supported to make it possible to build the school on top of them. The facade of the restaurant is renewed in a deep dark grey brick to differentiate from the Rotterdam Urban School. Which is built up from a grid of Accoya wood windows. Accoya wood is modified to enhance performance, durability and stability. It is sustainably produced with a low CO² footprint while also actively contributing to a circular and biobased economy. For the interior a beech wood is used as it is cost efficient and works well for furniture. The flooring of the building is finished with an epoxy coating. Generally used for industrial uses as it is extremely durable. It protects against all kinds of impact, meaning that big student bodies won't damage the flooring of the building.









