

## DIPLOMARBEIT

### THE SCHOOL OF HEART, VIENNA

ausgeführt zum Zwecke der Erlangung des akademischen Grades  
eines Diplom-Ingenieurs / Diplom-Ingenieurin  
unter der Leitung

**Dörte Kuhlmann**

Ao.Univ.Prof. Dipl.-Ing. Dr.-Ing.

251

Institut für Kunstgeschichte, Bauforschung und Denkmalpflege

eingereicht an der Technisches Universität Wien  
Fakultät für Architektur und Raumplanung

von

**Predrag Stanković**

00928682

Wien, am 07.11.2018.

---





## 0. Abstract

This Thesis will discuss the problem of education today through building a school that encourages the understanding of humans as a part of the ecosystem, as well as fostering the idea of sustainability not only the ways of production of physical objects but rather as the way we think and plan for the future.

The Heart School will address crucial meta-themes that are connected to the way we act as a part of social construct, starting from family level up to a civilization. Based on observation and examination of different educational programs, such as the Montessori and Waldorf as well as the old industrial systems, thoughts and ideas will be refined and brought to a psychological level where the influence of built environment and overall site atmosphere on our feelings will be addressed. This and other socio-cultural aspects explored further in order to point toward an idea of a shape of the new school.

The site for the school is in 23rd Viennese district on the street of Erlaaer Schleife number 2. There already exists an elementary school on this site, bearing the same name as the street on which it is located. The northern side of the school was recently extended. This thesis will discuss the new task to extend the school even further to the southern part of the site with at least 20 additional classrooms, a physical education hall, a library and all the necessary spaces for teachers, administration and lavatories. The new extension of the school is to be built for the children of the ages 6 to 10 and to be of an all-day concept of school. The only required physical connection with the existing school is a pathway on the first floor of the eastern classroom wing.

The approach taken is the concept of dispersing classrooms into smaller units to avoid the corridors, instead grouping the classrooms as a form of a small village with many families that reside and share the space. It has been proven that this kind of setting is the most beneficial for the children of the ages six to ten. In addition, the hall has been generously sized and offers a lot of volume therefore it has been placed underground so that the ground level can facilitate a lively and green social life.



## 0.1 Kurzfassung

Diese Arbeit wird die Probleme der heutigen Ausbildung durch die Errichtung einer Schule diskutieren. Diese Schule betont die Wichtigkeit der Tatsache, dass die Menschen ein Teil des Ökosystems sind und als solche die ganze Erde beeinflussen. Gefördert wird auch die Idee von Nachhaltigkeit, die die Grenzen der physikalischen Sphäre überwindet und beschäftigt sich mit unserem Verhalten und Denken in der Zukunft.

Die Herz-Schule wird sich mit wichtigen Meta-Themen beschäftigen, die mit der Weise wie wir uns als ein Teil von dem sozialen Konstrukt verhalten. Der Maßstab dieses Konstrukts geht von einer Familie aus und steigt auf das Niveau einer Zivilisation. Basierend auf den Observationen und Analysen unterschiedlicher Ausbildungsprogramme, wie zum Beispiel Montessori und Waldorf, die Gedanken und Ideen werden verfeinert und auf ein psychologisches Niveau gebracht. Auf diese Art kann man sich mit dem Einfluss der gebauten Umwelt und der allgemeinen Grundstükatmosphäre auf menschliche Gefühle befassen. Das Alles und weitere sozio-kulturologische Aspekte werden untersucht, um auf eine Idee für die Form neuer Schule zu weisen.

Das Grundstück für die neue Schule befindet sich im Erlaaer Schleife 2, 23. Bezirk in Wien. Hier gibt es eine bestehende Hauptschule, die den gleichen Namen wie die Straße trägt. Auf der Nordseite wurde vor kurze Zeit schon eine Erweiterung fertiggemacht. Diese Arbeit wird sich mit der Aufgabe der zusätzlichen Erweiterung im Südteil beschäftigen. Die erforderlichen Räumlichkeiten der neuen Schulgebäude sind mindestens 20 Klassenräume, Turnhalle, Bibliothek und sämtliche Räume für die LehrerInnen, Administration und die Waschräume.

Das Konzept ist die Verteilung von Klassenräumen in kleine Gruppen um die langen Korridore zu vermeiden. Auf diese Weise die Klassengebäude formen eine Art des Dorfs, wo mehrere Familien wohnen und den Raum gemeinsam benutzen. Es wurde bewiesen, dass diese Konzeption am besten für die Kinder der Volksschulalter geeignet ist. Die Größe der Turnhalle wurde großzügig bestimmt und sie bietet sehr viel Raum an, deshalb wurde sie unterirdisch gesetzt, damit die Erdebene ein ungestörtes lebendiges und grünes soziales Leben ermöglicht.

## Gratitude

Reaching this point in my education was only possible through unconditional support of my parents and family. I am deeply thankful to them for having the patience with me and my slow progress. I would also like to thank my close friend Milica and other friends and colleagues for supporting me on this journey. Finally I would like to thank my Professor Dörte Kuhlmann who advised me in the best way I've ever been advised.

## **INHALT**

<b>0. Abstract</b>	<b>1</b>
<b>1. Introduction</b>	<b>7</b>
<b>2. The Social</b>	<b>9</b>
<b>3. The Concept</b>	<b>13</b>
<b>4. Nature and Landscape</b>	<b>21</b>
<b>5. The double ECO</b>	<b>25</b>
<b>6. Site Photos</b>	<b>27</b>
<b>7. Technical drawings</b>	<b>31</b>
<b>8. Renders</b>	<b>45</b>
<b>9. Resources</b>	<b>61</b>
<b>10. Illustrations</b>	<b>63</b>



## 1. Introduction

The train of thought that lead me to an idea of the subject for this thesis has a lot to do with my interest in human nature, psychology, human behavior conditioned by family, society and human interactions on a local and a global scale. The influence we exert onto one another is immense, but it is not any lesser on animals, on plants, or onto our environment and planet. Moved by the current crisis in the world we created on all sides, a small contribution of my own to alleviate some of the problems seemed like a good thing to do. How can you even address global problem as an individual? The answer is to firstly change you, yourself. Once this is done, one has the basis to change environment and other people around them. This can be either a very subtle or fundamental core shift in our mentality and reasoning, but every shift away from the state we are currently in is beneficial. So the change of psychology is the answer. But since changing of adults is a very demanding task which must be done nevertheless, the upbringing of next generations is as equally important because everything will be the same unless the education and school issue gets addressed.

The change is a constant human condition – be it a physical or a mental change. In this process, seeking for an optimal state in every aspect of our life is ever-present. But the important fact is that any process of change is not limited to the changes happening in individuals. Even though this is the first direct change we sense, the impact of the changes in oneself will echo deeply across the whole society one is a part of. One of the most active stages of our lives when most changes occur is the childhood. It is also the ground-laying stage, and in it the physical changes as well as psychical changes are equally significant. Therefore childhood is the time when the influence on individuals, no matter how small, can make the greatest impact on the future development of personality.

This is important to note because architects are the ones who shape the space for the young forming minds to live in. The message of architecture has a subtle yet deep influence on the subconsciousness of every individual, teaching them how to act and what to expect or anticipate from their environment. It shows them what spatial compositions are best used for which specific activities. It lets them realize in which space they feel at ease, where do they like to express themselves, and where do they like to learn. These spaces are not only different from one individual to another, but also different in different life stages, especially with young individuals. Therefore the architecture must offer them different possibilities in order to address these requests adequately.

The important question is what sort of graduate do I want to leave from school? This pulls in an array of other questions, such as: What do I want to teach the children in my school? What sort of activities do I want to support in school? What sort of ambience do I want to create? And those are just some of the questions relating to the developing of single individual. There is a whole set of correlations that arise when you put your architectural volume in context that relates to the environment. What do I want to be seen from across the street? What materials do I want to present? Do I want anything to be seen at all? Still, the most significant question is the impact of architecture on children. Will architecture aid their physical and mental development, or will it aid only children with certain type of interests? If architecture is to cater to a wider range of different personalities, it must be considered carefully. In its own silent, steady way, the architecture will greatly influence the sort of person that will eventually leave the school.

The school typology that has been practiced since the industrialization is no longer suitable for upbringing of generations today, since the problems adults face today are different than they were back then. That is why there has been a shift in school architecture, which is gradually leaning towards something new. This proposal for extension of an existing school in Alterlaa for children of first half of elementary education will try to cater to the problems of today's environment and reality. New island-like floor plan will offer a flowing space through the site and the gentle volumes of the houses will provide children with optimal balance between seclusion and sense of belonging. Different elevation of terrain and buildings will further induce the natural curiosity in children while the classrooms serve as nests with a view into the surrounding world. A school that inspires.

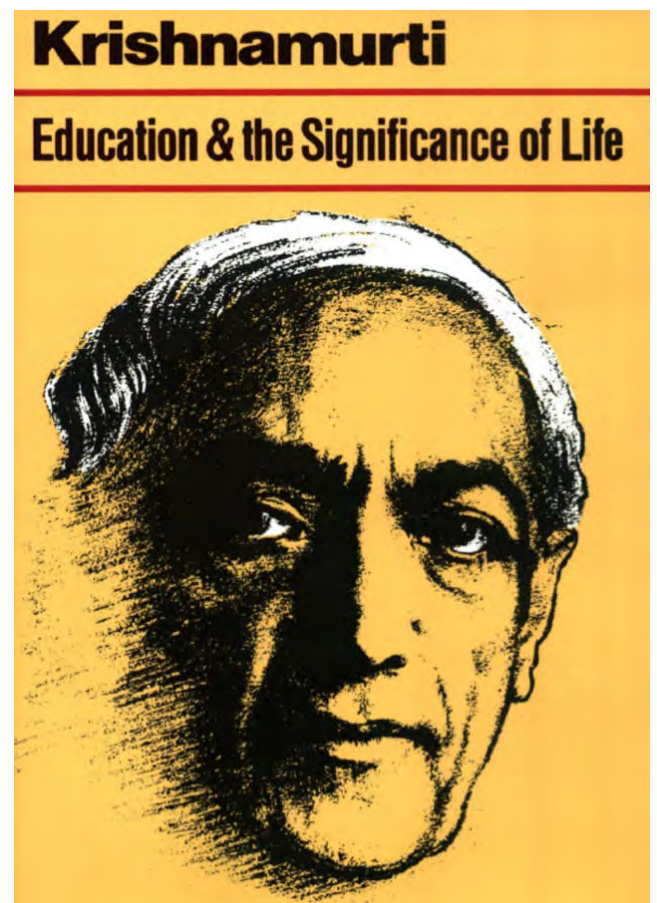


## 2. The Social

The Society of today has distanced itself from many essential values every human being should treasure and consider as a guideline as it develops, internally and outwardly, to the environment. The separation of individuals from these values has caused much imbalance in the today's civilization; therefore one of the ways to counter it is to reintroduce them to the developing human – a child. In this way the human society which is made of individuals, can start to recover itself, to get back to the path of compassion and understanding for ourselves and others with whom we share this environment and also, a compassion and understanding for the environment itself.

In order to steer us in the direction of awareness about ourselves and our environment without false instructors, the schools we send our children to must be reinvented, disconnected from the past which passes on too much negativity onto the children of the early elementary school age – from six to nine years old. A new school needs to provide the children with a healthy, non-invasive environment that allows children to come to terms with the information they gather from their surroundings in a way that is most beneficial to them as individuals – in a way that is most understandable to them. This sort of school needs to provide children with a sense of openness, warmth, eagerness to think, to explore and to learn. A mind that is forced to fit in a “society determined mold” will not be able to provide most individuals with needed abilities to face the adult world with their full potential and their full strength.

Instead of factory workers and rule followers, schools need to bring up generations of aware people who know what their qualities and goals are. Otherwise, the unstable environment we have created up until now will not support those who can't adapt to changes. However, then the question arises: “what is right education? Do you educate the students to conform, to adjust, to fit into the system or do you educate him to comprehend, to see very clearly the whole significance of all that and, at the same time, help him to read and write?”<sup>1</sup>



Ill. 1. Jiddu Krishnamurti Book Cover  
<https://www.slideshare.net/tskumar1/education-and-the-significance-of-life-j-krishnamurti>

<sup>1</sup> Jiddu Krishnamurti, (1974). Krishnamurti on Teachers. Chapter 1 “On right education”. Download am 10.10.2018 von: <http://jiddu-krishnamurti.net/en/krishnamurti-on-education/1974-00-00-jiddu-krishnamurti-krishnamurti-on-education-chapter-1>

Education should naturally be supported and helped by adults who are aware of these issues, similarly to the way Maria Montessori defined her teachers. “She won’t be presenting information for rote learning. Rather, she’ll be demonstrating specially designed learning materials that serve as a springboard for investigation and discovery. At the heart of the Montessori Method is the concept that mastery is best achieved through exploration, imitation, repetition, and trial and error.”<sup>2</sup> Even though the majority of learning and intelligence developing happens in the mind after the intake of information, there is still need for a present adult for more than just one reason. The adult should be there as helpers, clarifiers, libraries for questions of the children. The teachers should act as guides for students to help them not get lost and confused by the quantity of information, as well as lay down the facts when it comes to socializing with other individuals. The teacher’s job should be to help kids not only with processing the study material, but also teach them how to be a healthy individual, socially and individually and to help them realize what their own strengths and weaknesses are. Dr. Maria Montessori defined the main three traits a teacher in her school should possess: Skilled Observer, Creative Facilitator and Character Builder. She then continues to elaborate on what each of these skills mean, saying that as a silent observer, the teacher will learn what personalities each of her students have and then present them with learning technique or study material that is best suitable for them, meaning: which motivates them the most. And then when the material is mastered, she proceeds with additional new tasks.

As a creative facilitator, the teacher is student’s resource, she motivates them, encourages them when they face problems, celebrates their triumphs and steers them to better understanding. She also adjusts children’s working environment to best facilitate their needs during education. - As a character builder, the teachers’ task is to guide them to becoming adults, citizens and dwellers of earth. Empathy, kindness, and acceptance of individual differences are being promoted which then results in a healthy social aspect, team work and relation to other people and planet.<sup>3</sup>



Ill. 2. Maria Montessori with children

<https://www.carmelmontessoriacademy.com/maria-montessori/>

<sup>2</sup> American Montessori Society, (2018). Montessori Teachers. am 10.10.2018 von <https://amshq.org/Montessori-Education/Introduction-to-Montessori/Montessori-Teachers>

<sup>3</sup> American Montessori Society, (2018). Montessori Teachers. am 10.10.2018 von <https://amshq.org/Montessori-Education/Introduction-to-Montessori/Montessori-Teachers>

School is built with an image of a graduate that should come out of it. However, it sometimes seems unclear if this is really how it functions. It makes you wonder if schools are actually built like that or are we just ignorantly sending our kids to schools that should have been closed down long ago. Either way, the best investment in the future is the investment into those who will make decisions when the future becomes present. As such, it is rather irresponsible to stick to a certain rectangular ground floor pattern from a hundred years ago. Schools should be shaped and planned with the future on mind. So how should one approach the task of planning a school? And even with the whole array of alternative teaching methods, such as Montessori and Waldorf methods which address the problems of the old methods of conveying knowledge, the problem of out-of-date educational architecture has not been dealt with as much as it could have.

Henry Sanoff, Professor of Architecture in the States has said a well: “Educational reform, however, has focused primarily on what is taught, and how it is taught. As a result, curricula have been strengthened, instructional strategies improved, and learning materials updated. However, what has received too little attention is the physical environment in which education occurs.”<sup>4</sup> Important to note here, is that in the process of making an enjoyable school does not lie solely on Architects, but also on teachers and students as well. The school does not have to be expensive and have an abundance of technology to be enjoyable, especially in the early stages such as in this school. What brings most to the pleasant atmosphere of any space are personal crafts and decorations made by the people who use it. “Participation is needed – a word that many people never heard in their own school days.”<sup>5</sup>



Ill. 3. A classroom with organisation according to Montessori standard  
<https://www.leportschools.com/why-leport/beautiful-environments/>

<sup>4</sup> Sanoff H. (2015). Schools for the Future. Foreword. Pg.0

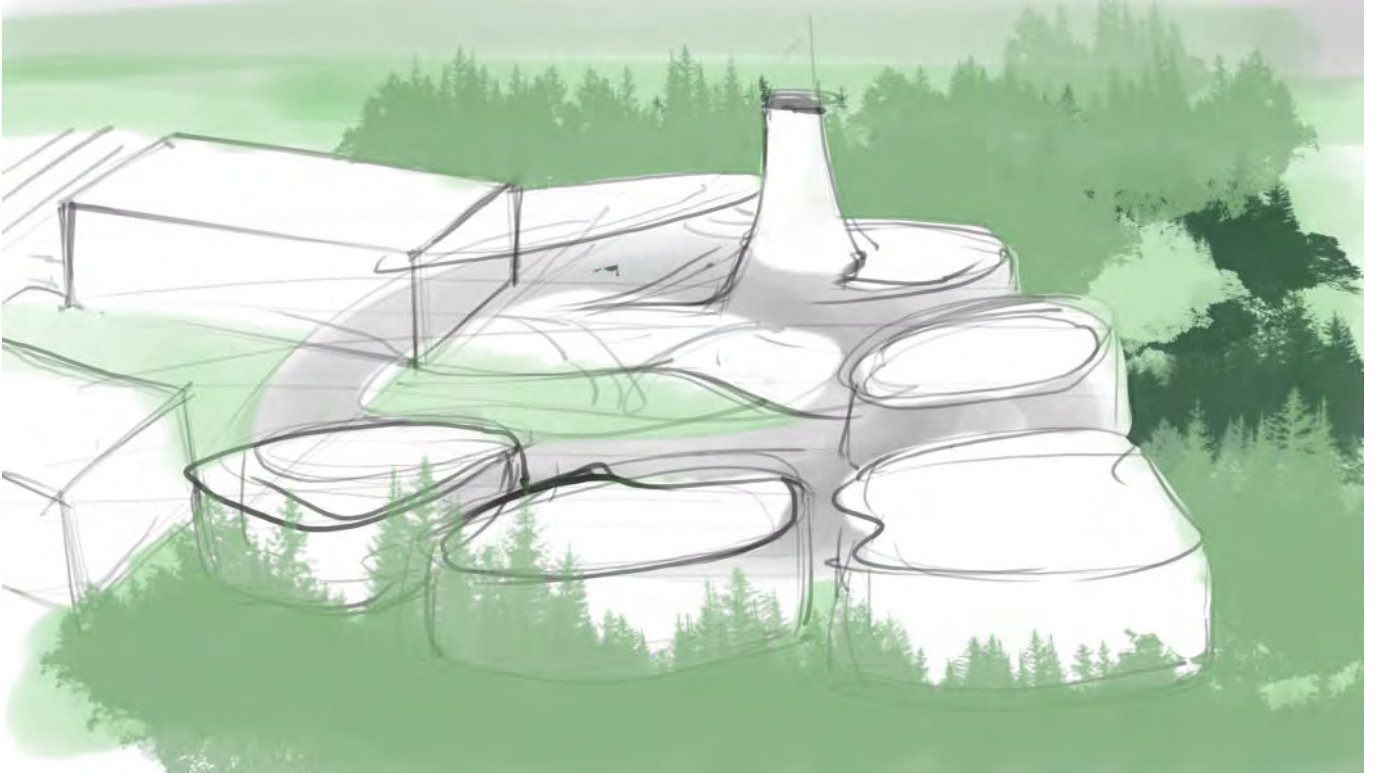
<sup>5</sup> Walden R. (2015) ). Schools for the Future. Schools claiming to be “Schools of the Future”. Pg.18



However, the school planning of 21st century has changed since the beginning of 20th century a lot. Today schools that stimulate the senses are built as well as those who follow cold concrete style, and the coming up with the right style often is done in consultation with the users, or at least there has to be certain decorative freedom to the built architecture so that the users can embellish their living/working space with the things that please them the most. Simone Schalz continues to say that the children should not be seen as temporary users, but as actual temporary owners and residents. After all these spaces will be their homes and workplaces. "The architect's goal must be to achieve wellbeing, comfort, and acceptance of the building by the children. This will result in joyful learning, willingness to achieve, and successful learning processes."<sup>6</sup> Combining this information about school life with understanding how can architecture influence every individual, the likelihood of getting positive results and reactions on a building inside and out can increase.

<sup>6</sup>Schalz S. (2015). Schools of the Future. The historical development of school buildings in Germany. Pg.69

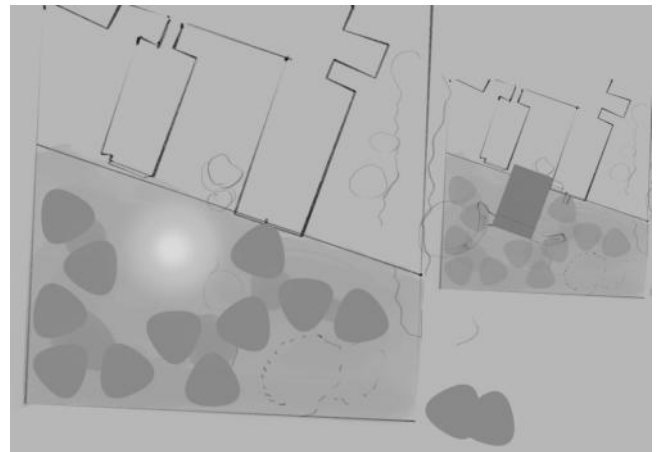
### 3. The Concept



Ill. 4. Concept drawing  
Personal illustration by the autor

The setting for discussion in this paper is an existing Elementary school in Vienna, Alterlaa. The school needs to be extended by addition of twenty classrooms for children of age six to nine. Since this project does not draw on a brand new school setting, a certain way of approach must be adopted around the existing school buildings that will not impair their function in any way. On the contrary, the new school building should provide an example and a welcomed addition to the existing one in esthetic as well as functional and spatial way. No huge block building should be built, instead a delicate and yet strong idea needs to run through the addition, based on no other element but the most beneficial for everyone - Nature.

The new school will bring completely fresh and new elements into the dry boxy shape of the existing buildings. After all, as Simone Schalz elaborated, cost and functionality should not be the prime concerns while designing buildings in which thousands of hours will be spent. Rather than those, esthetics should be pushed forward because those are more likely to lead towards well-being.<sup>7</sup>

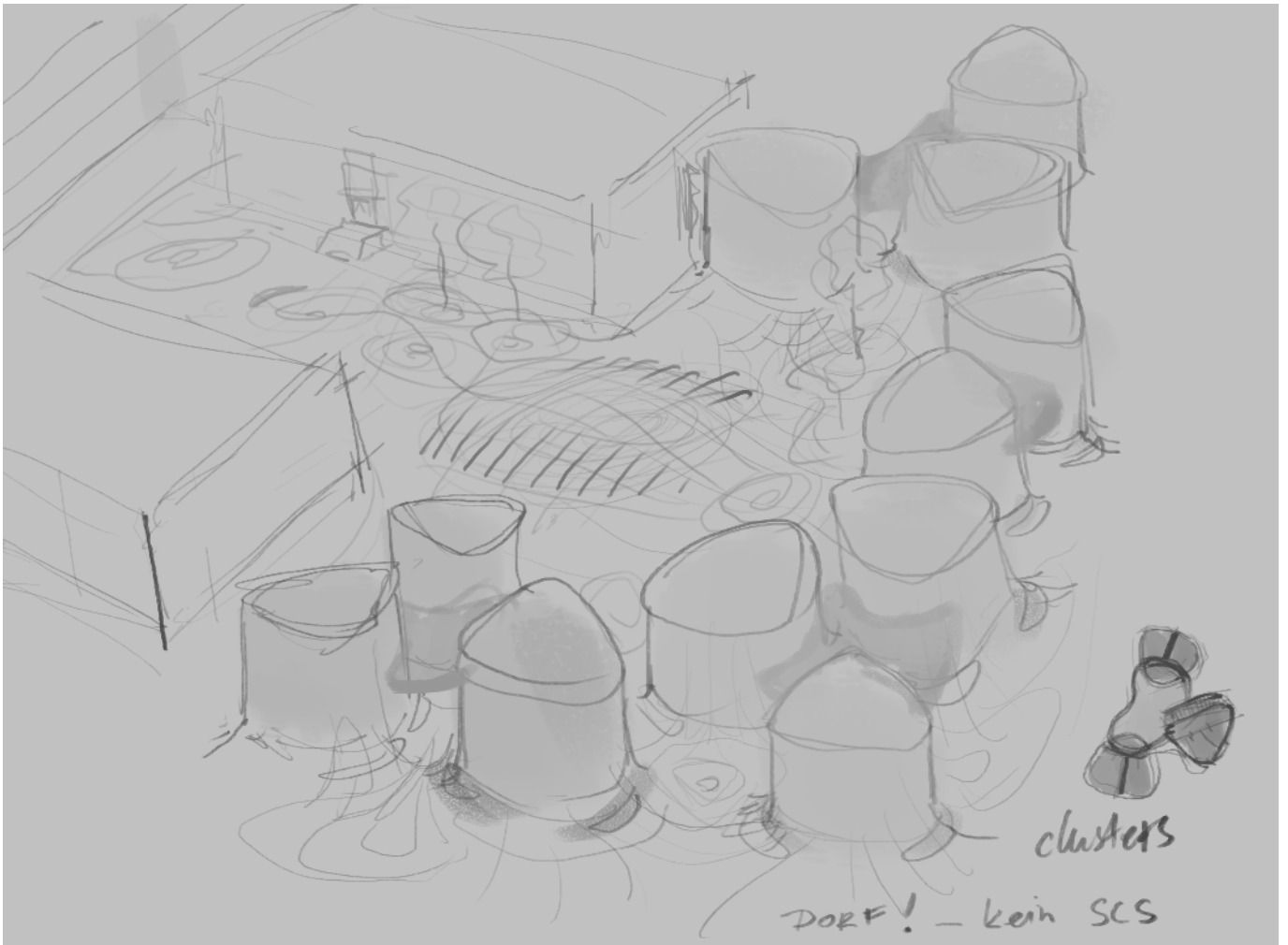


Ill. 5. Floor Plan with cluster formation  
Personal illustration by the autor

<sup>7</sup> Schalz S. (2015). Schools of the Future. The historical development of school buildings in Germany. Pg.69

Let us start from the basic: the way we act about the space which is given to us. Much like in the eastern architectural philosophy, where space is observed as eternal whilst a room is just its division, a similar approach is used here where space is observed as flowing and the buildings are just the reference points in it. They are gently shaped with soft natural curves that do not create dark niches and alleys of stale boring situations. Instead, individual buildings are positioned as islands, and rather than limiting space, they do not let you reach a dead end whilst moving through the site. They just gently direct you from one point to the other. This helps immensely when it comes to feeling as a part of your environment and a part of the world where kids do not just confide themselves to one box, but have subconscious feeling of belonging to a bigger world. Furthermore, such arrangement of architectural bodies helps avoid separation and creation of secluded areas, which would create spaces strongly isolated from sound and sight. This helps to eliminate bullying among children and instead encourages living together and feeling of belonging, contrary to the idea of fitting in to this or that specific playfield.

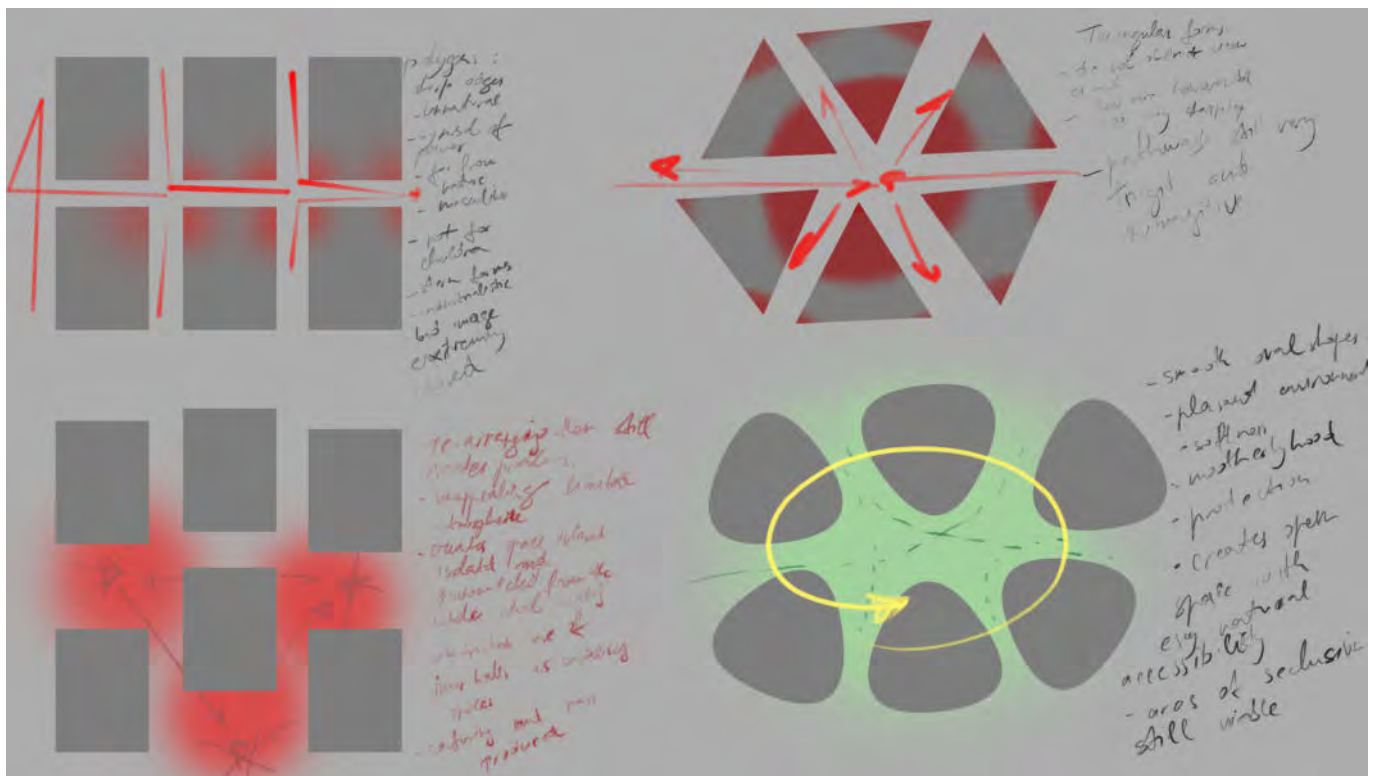
Keeping in mind the idea of Architecture which is made with Nature as model, an element of terrain has been added. The buildings are not only set in a flowing array on ground plan, but they are also elevated individually with subtle difference among one another. This creates a beautiful landscape between the volumes which gives to the space between them a lot of character and personality. If some children are generalists, they might appreciate the array and breeziness of the whole site; others, who are specialists and focus more on isolated problems, might find individual characteristic of the site more interesting, like hills or valleys formed by the differences in elevation and maybe choose a sheltered spot as a favorite. This height disparity will provide a picture of nature which is beautiful in its variety, and will create valleys and hills which can accommodate different elements, such as flora compositions, diverse areas for resting, playing and learning while keeping visible the idea of belonging to a bigger world.



Ill. 6. Sketch that shows clusters and the landscape diversity  
Personal illustration by the autor

This element of landscape doesn't end just here on the ground floor. Since the architectural volumes are standing in an array which opens the possibility of using the roofs as additional educational area, the top floor also presents itself as a world of its own, where children can climb "up from the forest and into the sky". The element of high ground is also very essential to a developing child. To be above the world is one of a kind of feeling, and if you can connect such a remarkable impression with your own school, then it too is more likely to be perceived as a good place to be.

And even if that doesn't work, then the sole variety of different learning and inspirational environments is extremely important. To gather inspiration for learning is equally important as the actual act of learning. So, while the ground floor will offer a protected sense of belonging somewhere, the open top floor can be used for expressing emotion or gathering energy and motivation. Once again the difference in terrain height will mirror itself on this level as well, and instead of getting bland even islands, the school forms beautiful hills with different setup and view. This area can also be enriched with different flora and seating elements to cater to different personalities of many kids.

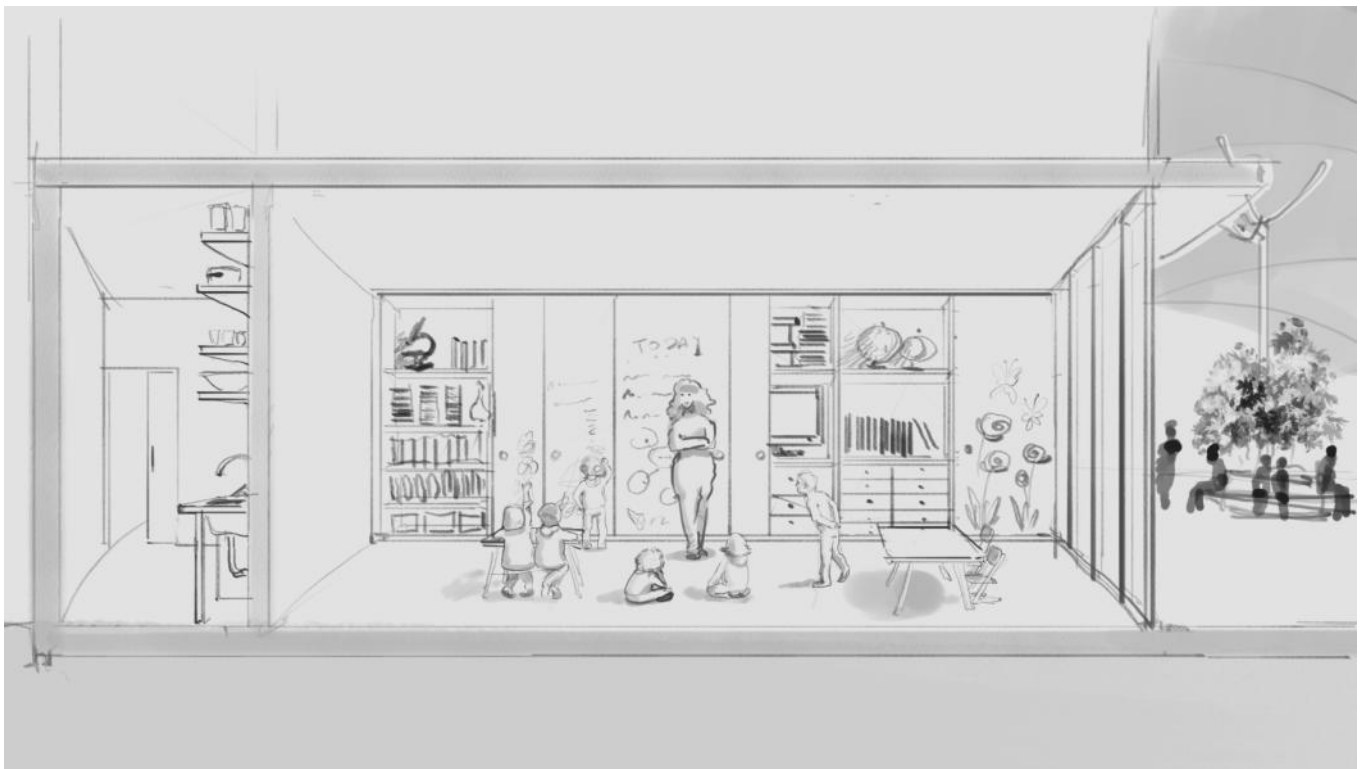


III. 7. Sketch following the reasoning behind building shape  
Personal illustration by the autor



And then we come to the building volumes themselves. As mentioned before they are formed of gentle curved volumes. A triangle is used as a starting point for a particular reason: the square has too strong masculine determination and separation of space while the circle is too indifferent and is in itself a very neutral and basic geometrical form: a point. Therefore, a triangle is used as a starting point for a ground plan, but then it has been softened and enriched with the neutrality of circle to form a beautiful gentle shape which allows creating meaningful yet noninvasive spaces. The inside volumes are organized with certain functions they need to serve while using the benefits of the form. There are three types of inside spatial organization: the classroom, the utility and the parent house.

In each classroom house there are only four classrooms. Each floor has two classrooms and one small common area. The classrooms are arranged in petal position as if they stem from the small common area which also serves as an entrance. The individual classrooms use most of the flowing glass surfaces as a reminder that the inside of the classroom is the same as the world outside. On the practical side, these big window surfaces can also be shaded with folding wooden façade which has different panels: pure natural wood efficient for sheltering classrooms during all seasons and green living garden which is positioned towards the center of the site. Between the two petal classes runs a supporting wall which helps not just to carry the building but also serves as a learning storage. It can be filled with different work material for the students and their individual interests. Again the importance of environment (windows) and individual (wall) is visible and both are equally treasured.



Ill. 8. A classroom organisation with multi functional central wall  
Personal illustration by the autor

Here, the rejection of classical rectangular room has made space open to the more imaginative and stimulating environment. The mid-point between rectangle and circle, much like with the exterior, has been reached. “Circular living provides a balance of looking inward and outward, looking out at the natural environment and surroundings but then coming in again to the self and the hearth.”<sup>8</sup> The two solid inner walls form an angle which gives children a sense of protection and retreat. Opposite to that, there is a single curved wall which instills into residents the impression of openness and belonging to a wider world. In this way, the curvature offers panoramic view into the surrounding from a safe spot. This is not the only benefit of rejecting rectangular floor plan - there is also the aspect of movement through rooms, which has much better flowing nature than when you have perpendicular four walls.

These are not the only benefits of rejecting the corners in a building. There are also ecological benefits to it. The first one is the saving of materials as the same floor surface can be covered with less material if it has circular shape (up to 30%). And since you need less material and you have shorter walls, not only there is less initial cost of 1m<sup>2</sup> of built space but there is also less surface in touch with the weather elements, meaning the energy loss is lower. Then we have the less notable benefit for Austrian conditions, which is the one connected with statics and greater stability of rounded floor plans compared to rectangular, which would become apparent during earthquakes and hurricane weather. And to conclude it there are acoustic benefits: “Sounds are softer inside the house making it ideal for rest and reflection, but also for socializing and playing music.

The shape also resists noise penetrating from the outside. Sound waves dissipate as they wrap around the building, shielding the interior from loud noise outside.”<sup>10</sup>

The school “village” has two utility houses. Each one is positioned in a way that on the upper level it connects with the classroom houses and forms a sort of a cluster. Several reasons stand behind this arrangement. One is the avoiding of the straight industrialist halls and classrooms stapled on its sides. With the irregular cluster formation and curved forms, the personality of the architectural situation has been accented and leaned towards the natural style which is the main motive of the school. Then there is the intent of avoiding massive slabs and making space for more air flow and sunshine by keeping the upper floor compact. These connecting ways have also been kept as outside area so that the huge expensive glass halls which could encapsulate whole school have been avoided. The decision was made that the outside will remain as the outside for the sake of being aware of the nature and its rites, and also for the sake of avoiding suffocating and echoing halls when dozens of children rush out and start playing. And since the utility houses have a good placement in the site, meaning they are positioned in the inner area and are closely surrounded by classroom houses, makes them a great place to position the lavatories. The girls and boys bathrooms are positioned each on the outer sides of the “petal” floor plan, and the ones on the outside are hidden behind rich and pleasant façade of greenery. In this way, the usual unattractive empty wall which often indicated the lavatory part of the building or the utility part, has been turned around and made into an advantage, because otherwise you’d want to open up the walls to let the light come into the inside of the living spaces, or classrooms.

<sup>8</sup> Schalz S. (2015). *Schools of the Future. The historical development of school buildings in Germany.* Pg.69

<sup>9</sup> Rotunda, (2018). Rotunda. All round better buildings. Am 11.10.2018 von <http://rotunda.co.uk/what-are-the-advantages-of-round-buildings/>

<sup>10</sup> Lockhart M. (2018). The benefits of round houses. am 11.10.2018 von <https://econation.co.nz/blog/the-benefits-of-round-houses/>

The staircases which run along the open façade opposite to the lavatories are designed to remind more of the inviting verandas rather than concrete towers as they usually are in urban schools. The problem of the emergency exit safety has been dealt with also by simple placement of the escape routes into the outside. In this way even the farthest escape route to the safety is no longer than 35m. In the inner part of the utility house, between the two lavatories, there is technical room as well as elevator.

The parent house is the tallest building. It also connects the new areal with the existing one through a passage on first upper floor. In this tower, the ground level contains the canteen and the kitchen. It has been shown as the best option because on the ground floor is usually the busiest and therefore it is most practical for the kids to access. However, it does not take the central position and is on the eastern side which is good since the central position on the site is for the gardens and playground and classrooms which is the main focus of activities. On the 1st floor there is a connection to the old building, which is why I've placed the library and the multipurpose room on this level. These rooms can be useful to the students from the old part of the school as well as from the new one. The second upper floor contains the rooms for teachers and administration. This part will relatively rarely be visited by any student so it does not matter if it's not positioned on a more approachable level. Here there are offices on the west side and on the eastern side there are rooms for the teachers' lounge with a kitchen, and the round table room for meetings and management.

As mentioned before, the physical education hall is set underground because of the big volume requirements and the way it would destroy the overall idea and the flow/functioning of the whole site.

Because it is underground that does not mean it feels like a vault. On the contrary, many sport halls have high walls simply because of the ball sports requirements and how they behave with glass surfaces (affecting the structural integrity/cost and maintaining costs). In this case windows are pushed up high towards the ceiling, which in itself creates a nice atmosphere of light and well lit ceiling. The Heart school hall has the ceiling windows because the most of the walls are either underground or run next to the neighboring buildings so not much light can be gained via that source. Instead, discreet ceiling openings have been made to satisfy the need for natural light. With the Heart school, the motive of terrain and nature has been followed again; the hall though submerged underground, has a ceiling that forms a hill. So with low volume investment the inside of the hall has been immeasurably upgraded from a rectangular basement into an architectural statement. Any form that's out of the box in an environment will make the whole area around this element seem special and distinct, which is what we want in schools: the space which motivates and invites. There is also another benefit of the curved hall instead of a boxy one, and that is usage of the roof as a fun, interesting meeting place. A role model has been found in the Gammel Hellerup Gymnasium and the new multi-purpose hall which was projected by BIG architects. In the BIG project description stands following: "The characteristic soft curved roof wood construction will act externally as an informal meeting place that can host numerous activities from group work to larger gatherings.", and then they continue to write: "Opposed to placing the hall outside the school's building – thus spreading the social life even more – the new hall creates a social focal point and connection between the existing facilities of the high school."<sup>11</sup>

<sup>11</sup> Frearson A. (2013). Gammel Hellerup Sports Hall by BIG. Am 13.10.2018 von <https://www.dezeen.com/2013/06/28/gammel-hellerup-gymnasium-sports-hall-by-big/>



Ill. 9. Gammel Hellerup Gymnasium hall roof  
<https://www.archdaily.com/412908/gammel-hellerup-gymnasium-big>

There are three possibilities to access the underground hall. One is from the utility house, closest to the center of the site, and the second one is from the extended staircase from the existing classroom wing in the eastern part of the site. The third entrance is an emergency entrance/exit placed on the north side of the hall. The utility house is the southern entrance, and same as in its upper levels, the underground level also contains the lavatories. It then leads to a short passage way which has the entrances for the girls and boys locker rooms before opening into the big open hall. The eastern entrance is simply an extension of existing staircase one floor lower exactly to the hall level.

This area has also been extended with gym equipment storeroom. The sports hall measures over 870m<sup>2</sup> and has 5m height on the lowest point and 7,4m at the highest point. The most prominent aspect of the hall is the ceiling construction, made out of wooden layered beams which enabled the oval form. A hall of these aspects can serve many purposes besides the athletics. It can also serve as a multipurpose hall for events, other school non-related clubs, anniversaries and other special school occasions.



## 4. Nature and Landscape

Before the elaboration of the concept for the organization of the school courtyards, let me point out the most common problems that can happen, as listed in a book “Schulhofgestaltung an Ganztagschulen” written by a group of German architects. Number one: The younger kids will be pushed out of the attractive spaces by older kids. Number two: Older kids do not want to share the break room with smaller kids. Number three: Girls have different interests from boys. Number four: The teachers will complain about constant friction during the supervision. Number five: Some colleagues will avoid the supervision. Number six: The house handyman will report constant vandalizing and littering. Number seven: Parents will write complaints with questions about why their kids couldn't take part in the courtyard break. This might make you think that the biggest problems are those of a social nature. But isn't it true that they stem from lacks of other types, such as poor equipment or courtyard planning? Let's take as an example the problem where younger kids are pushed out of the attractive zones of the courtyard by older students. This problem in particular might suggest that there is simply not enough attention given to the whole courtyard, so naturally some parts of it will be more inviting than the others. To overcome this, the proposal should consider even distribution of “attractions”. There also needs to be generosity when it comes to quantity of the same. So this can imply that the courtyard can solve or at least help solving social problems if properly organized.

So, now that the importance of proper designing of school yards has been shown, all possible functions should be listed as well, and those are:

- Physical activity ( sports, climbing balancing, strength )
- Playing ( free from classroom norms, open for creativity and ideas )
- Peace and relaxation ( eating, lounging, fresh air )
- Social ( meeting, contact with other classrooms, chatting )
- Nature exploration ( learning the responsible behavior around plants and animals, feeling the seasons )
- Study ( learning through drawing, measuring, painting, observing, building, studying on fresh air )<sup>13</sup>

The landscape of the area where the new buildings are has been slightly changed to resemble a natural landscape of hills and valleys. The school houses have therefore been elevated or lowered to mimic the element of a small, heartwarming village. This has not only created a character rich situation on the ground level, but also a possibly rich situation on the roof floor. It is one of the goals of the project, to enrich the school experience for children as much as possible, and to offer as many learning opportunities as possible, even if the learning is achieved through alternative ways the motivation plays one of the crucial roles.

<sup>12</sup> Dietrich K., Hass R., Marek R., Porschke C., Winkler K. (2005). Schulhofgestaltung an Ganztagschulen. Klärungsphase. S.14

<sup>13</sup> Dietrich K., Hass R., Marek R., Porschke C., Winkler K. (2005). Et al. S.18

The ground floor offers a good base for many different social situations. The Pathways for example will acquire a certain charm - instead of just being flat, straight and boring, they will go up and down and curve around buildings. To make the open space more attractive, certain equipment and installments shall be implemented, also to address the most common problems listed at the beginning of this chapter. The green-patches mainly consist of plants and shrubs or short trees. Some of them are maintained by the school staff, others however, which are mostly placed on the outskirts of the school site, offer an opportunity for the children to care for their own soil beds. These can be used for planting and caring experiences of kids with seasonal flower or vegetable beds. The Play areas have different playground equipment for children. They are positioned across the whole site to avoid having quarrels between kids of different ages and to better disperse the social areas and hotspots, so that a possibility of conflict “who gets the most attractive spot” can be avoided.

To make the atmosphere in this area even nicer, not only the horizontal, but also the vertical plain has been attended to through the building concept by utilizing different façade panels. This gives a further enrichment of the whole ambience. Even though the buildings can get as close to each other as four meters apart, the balance between the passageway and wider courts create many interesting and curious situations for the children with a lot to explore and more importantly to cater to different needs that come with different personalities. Added to it, we have the rounded buildings covered with plant life and wood, which further benefit the site not only in the ambience aspect, but also when it comes to acoustics and esthetics. Rounded forms with diffuse wooden rib façade is perfect for lowering the noise levels on the site, which is very important considering that this is a school for 24 classrooms.

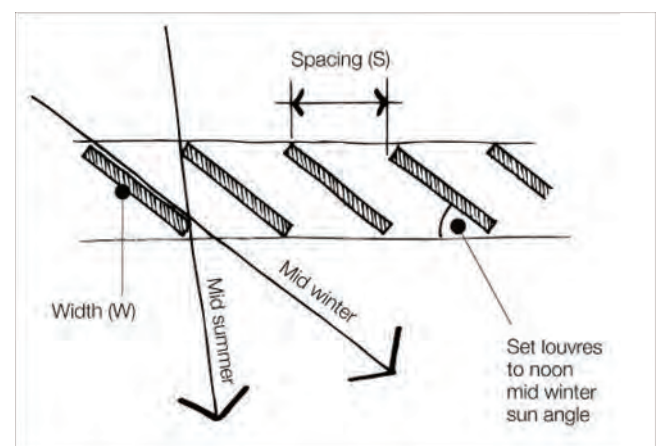


Ill. 10. Atmospheric sketch of the outdoor situation  
Personal illustration by the autor

The central area between the existing school buildings is occupied by the new underground physical education hall. Its curved roof creates a prominent hill which can be used as an attractive spot for the older students because of its openness and elevated position. The roof is covered with grass to make up for the natural feeling. On its perimeter, where the slope is minimal, a pathway is planned for easier movability in bad weather. Additionally next to this pathway in the roof of the hall, windows have been positioned in order to introduce the natural light into the underground level, considering that the hall is completely sunk and surrounded by buildings for the most part, so the placement of side and upswept windows is not optimal.

The eastern part of the site is sheltered by many old tall trees and is very quiet considering that next to it is exclusive pedestrian path. A bit further away there is a kindergarten which might compromise the quietness. However, considering the layers of vegetation between these two institutions in form of thick shrub lanes and many old trees, which form noise isolation, some harmony can be achieved. In the southern part of this eastern section of site a running track has been placed. In the north part a pleasant green part for older students, gently retouched to offer some content through seating and laying opportunities. In this way, students are encouraged to go out and spend some time in the open, especially since before, this part of the site was only accessible if they entered into an inner courtyard, then walked all around the school to get to this place. A door has been opened on the northern part where the main entrance of the school is to improve the accessibility, and the students find themselves in the park, onto which they only used to look at from their classrooms. Only now it has a reason for them to stay there and not sit cooped in four walls of the old building.

The landscape aspect of the site doesn't end here. The rooftops of the new buildings have full access to them via the utility houses and are included into the whole usable floor area of the school. This decision has been made in the spirit of offering children a variety of different environments to spend time at and to choose the best ones for their own progress and growth. Especially since the rather sheltered situation on the ground floor can nicely be contrasted by the openness of the roof floors. One of the first things to be noticed is the difference in the height of the roofs. Since this is a site composed out of nine houses, and each of them has different height, this is also reflected on the roof level. All of these platforms have been connected with bridges and act as a sort of an exploration road. The surface of the roofs itself varies from one to other platform in its arrangement. Some roofs are set up as green roofs and have bushes and plant life emerging from the soil under feet. There is also an option to keep plants in plant bedding which can be moved around following the seasons. The parts of the roof-scape where the staircases are, are covered with pergolas to offer protection not only for the activities that take place on the roof, but also to lessen the impact of bad weather on the staircases below.



Ill. 11. Static sun shades in different seasons  
Personal illustration by the autor



This is achieved because these constructions are two-layered, one is the rib construction that controls the sun and the other one is glass which controls the rainfall. The whole construction is kept light and simple to avoid casting too much additional shadow on the lower floors, which is also managed by not covering the roof in its entirety but leaving the outer frame as well as one “corner” open. The ribs on sun protective construction are placed under such an angle that, even though static, they can provide shade in summer when the sun is high, as well as let the sunrays through during winter season when the sunlight is desired. Four of the nine rooftops have these protective pergolas, and they are evenly distributed between the two utility buildings so that there are equal opportunities everywhere.



Ill. 12. A sketch showing the new school center  
Personal illustration by the autor



## 5. The double ECO

Two final leading goals for this project are very tightly interconnected, especially when observed in a longer time period from today. These goals are the ecology and the economy. We are living in a time of drastic environmental change in both ecological and the social aspects. To be able to adapt to these changes and predict or at least try to soften the impact of them could be proven to be crucial in building planning of today. Simply because architectural facilities are a big investment not just in the financial way, but more importantly it is a huge investment of natural resources for the initial execution of the project, and also of the resources that will be needed in the future to maintain the full functionality of the building. The School of Heart is addressing these problems in its planning.

The structure of the school has been executed through utilizing the renewable and decomposable material: the wood. Here we are talking about frame construction. The outer wall is composed of pillars with dimensions of approximately 22x30cm on a distance of 1,5m along the whole length of it. Inner more massive core has been planned with very few wall openings. Although also planned as wooden frame construction, it forms a shape of a cross which braces one another giving a very stable structure. Additionally, when the building is observed as a whole structure system, it is clear that when looked in the floor plan, the shape of the building is very smooth and circular. This is very beneficial for the structure, since it is very obvious that a bent wall can stand upright while the straight wall of the same length will fall down unless it is supported with additional beams and more material. In this way complex and expensive corner isolations of outer walls and constructions which utilize more material than circular ones for the same surface coverage have been avoided.

The slabs are also constructed of wood, laminated wood beams to be exact. Their dimensions are approximately 22x40cm and the biggest span they need to reach is 7,5m. This construction sits on a reinforced concrete plate. Because of the nature of the environment the wood had to be avoided due to complications when it came to planning the walls and floor of the underground volumes. When it comes to the hall as the main volume, steel reinforced concrete has been utilized, but the roof with its curvature has been accomplished through heavy duty wooden laminated beams with custom curvatures. The dimensions of these beams are 40x120cm so they can be sufficiently strong to carry the weight of roof and activities on it without any problems.

Next important aspect is the behavior of the site in case of emergencies, such as fire and excess water. Fire emergencies have been approached by securing three safe approaches for fire trucks from eastern, southern and western sides compared to only one before. The new school is also broken into smaller separate units, so that in case of fire, the spreading of it can be more easily controlled. Furthermore, long corridors and huge closed volumes have been avoided, so smoke development has been hindered since it can almost immediately exit the building. The only critical point is the underground hall which is dealing with smoke development in following ways: breaking off the corridors into sections through secure doors; planning ceiling openings so that smoke can escape the building. The evacuation routes have been planned in a way that not more than 40 meters needs to be crossed before reaching a safe evacuation route. The Hall has three exits on northern, eastern and southern parts. The new school complex is, as mentioned before, consisted of separate houses with common open air staircase. From no point either on roof or in classroom does a person need to cross more than 35m until they reach the stairs.

As safe spot for gathering outside in case of major danger several areas can be used: The western parking lot by the Erilaweg; the southern open plain of Hedy-Wunsch Park; or the school park by the eastern classroom wing. Because of the architecture with a lot of space between the buildings to move through, it is not hard for a fire truck to navigate into the center of the site.

The opposite danger of heavy raining and flooding has been coped with by planning underground rainwater tanks. There are six of 10.000 liter tanks scattered across the site and they are utilized in two ways. First one is as mentioned the case of emergency when excess water is being accumulated in these tanks safely without overbearing the infrastructure system. Second way is connected with ecology. Since the School of heart is enriched with greenery and plant facades, the stored rainwater will be kept for the summer season when watering needs to take place daily. The new part of the school has approximately 500m<sup>2</sup> of green facades; 210m<sup>2</sup> of plant facades have been utilized on the refreshing the existing school; about 120m<sup>2</sup> of gardens and not to mention the grass areas around the whole site. This all implies that investment into water tanks can be very beneficial even if years with lower humidity come.

To further mark the importance of self-sustainability of the site, the question of energy consumption has been confronted as well. Since it is said before that the majority of the outer wall is consisted of glazing, energy consumption and thermodynamics might be very bad. To address that issue but still keep the idea of “open-view” classroom the outer façade not only has movable wooden panels which can protect the inside of too much exposure to the elements, but there are also plant panels which absorb the heat and keep the inside fresh.

The energy consumption has also been improved by solar panels which can be installed on now empty roofs of existing school which have perfect unhindered orientation towards the southern sun. The total area of just the eastern and western classroom wings amounts to about 1200m<sup>2</sup> which is not negligible at all and can bring good savings to the school.

In the end, it all comes down to educating the next generations about the significance of properly functioning ecosystems and us as an influencer and a part of them. And what better way to do it in an urban area than to present the school to the kids as a living and breathing organism: with a sturdy body, cooling mechanics, energy to consume, water to drink and them as the heart of sustainable environment.

## 6. Site photos



Ill. 13. West classroom wing and inner courtyard; Hans Lechner ZT GmbH; Neubau GTVS inkl. Vorschule, Wien 23., Erlaaer Schleife 2; Teil C.1 - Fotodokumentation (18.01.'18.)



Ill. 14. Inner courtyard main entrance; Hans Lechner ZT GmbH; Neubau GTVS inkl. Vorschule, Wien 23., Erlaaer Schleife 2; Teil C.1 - Fotodokumentation (18.01.'18.)



Ill. 15. Main School Entrance; Hans Lechner ZT GmbH; Neubau GTVS inkl. Vorschule, Wien 23., Erlaaer Schleife 2; Teil C.1 - Fotodokumentation (18.01.'18.)





Ill. 16. View on the south site border  
Hans Lechner ZT GmbH; Neubau GTVS inkl. Vorschule, Wien 23., Erlaaer Schleife 2;  
Teil C.1 - Fotodokumentation (18.01.'18.)



Ill. 17. The eastern site border  
Hans Lechner ZT GmbH; Neubau GTVS inkl. Vorschule, Wien 23., Erlaaer Schleife 2; Teil C.1 - Fotodokumentation (18.01.'18.)



Ill. 18. Panoramic View of the site  
Hans Lechner ZT GmbH; Neubau GTVS inkl. Vorschule, Wien 23., Erlaaer Schleife 2; Teil C.1 - Fotodokumentation (18.01.'18.)



Ill. 19. East classroom wing from inner courtyard  
Hans Lechner ZT GmbH; Neubau GTVS inkl. Vorschule, Wien 23., Erlaaer Schleife 2;  
Teil C.1 - Fotodokumentation (18.01.'18.)



Ill. 20. Southeastern corner of the site  
Hans Lechner ZT GmbH; Neubau GTVS inkl. Vorschule, Wien 23.,  
Erlaaer Schleife 2; Teil C.1 - Fotodoku-  
mentation (18.01.'18.)



Ill. 21. View on the west classroom wing from southeastern corner of the site  
Hans Lechner ZT GmbH; Neubau GTVS inkl. Vorschule, Wien 23., Erlaaer Schleife 2;  
Teil C.1 - Fotodokumentation (18.01.'18.)





Ill. 22. East classroom wing  
Hans Lechner ZT GmbH; Neubau GTVS inkl. Vorschule, Wien 23., Erlaaer Schleife 2;  
Teil C.1 - Fotodokumentation (18.01.'18.)



Ill. 23. Inner courtyard  
Hans Lechner ZT GmbH; Neubau GTVS inkl. Vorschule, Wien 23., Erlaaer Schleife 2;  
Teil C.1 - Fotodokumentation (18.01.'18.)

## **7. Technical drawings**

- **Situation**
- **Floor plans**
- **Sections**
- **Elevations**
- **Movement plans**
- **Details**
- **Construction**

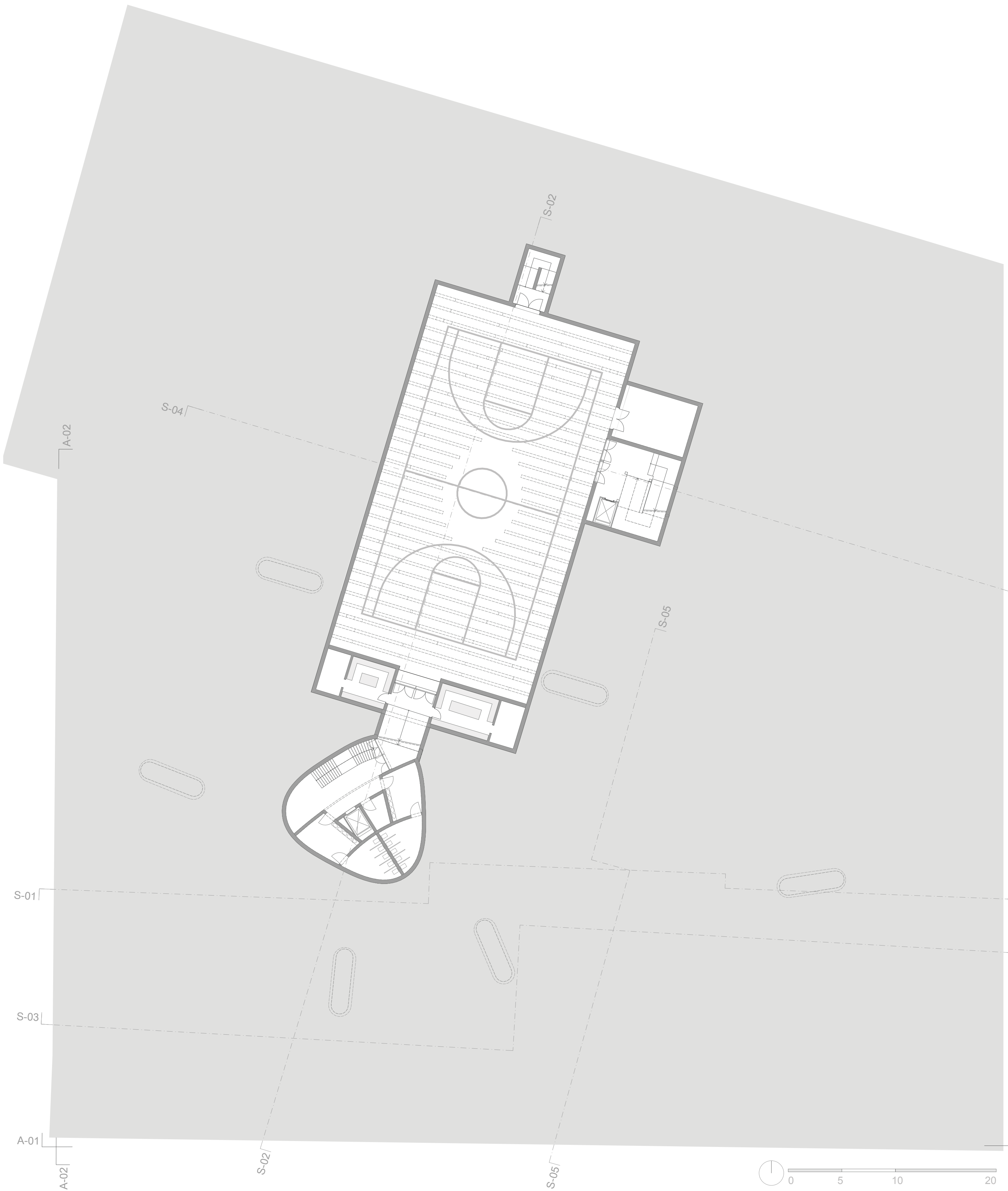




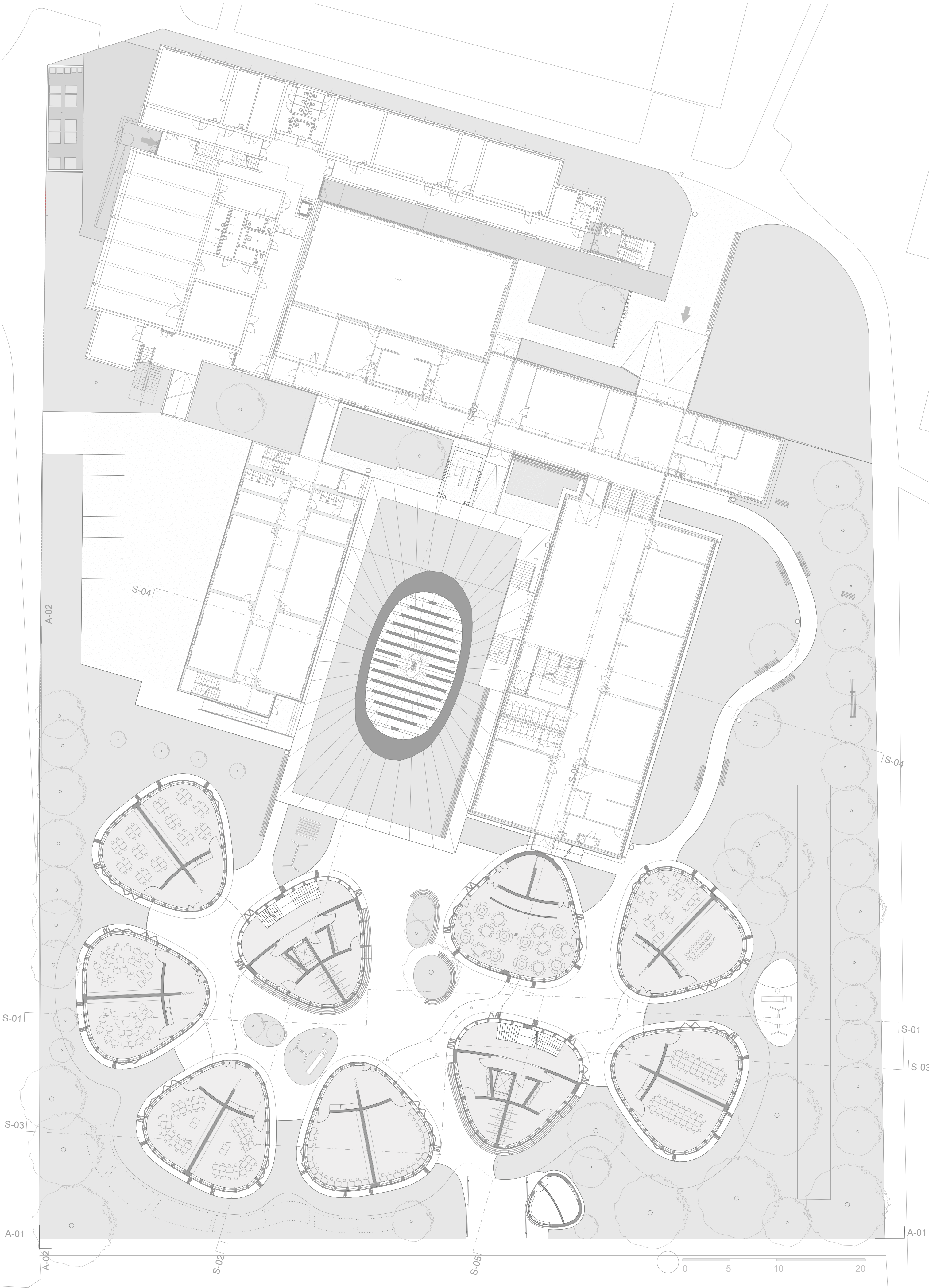


Situation

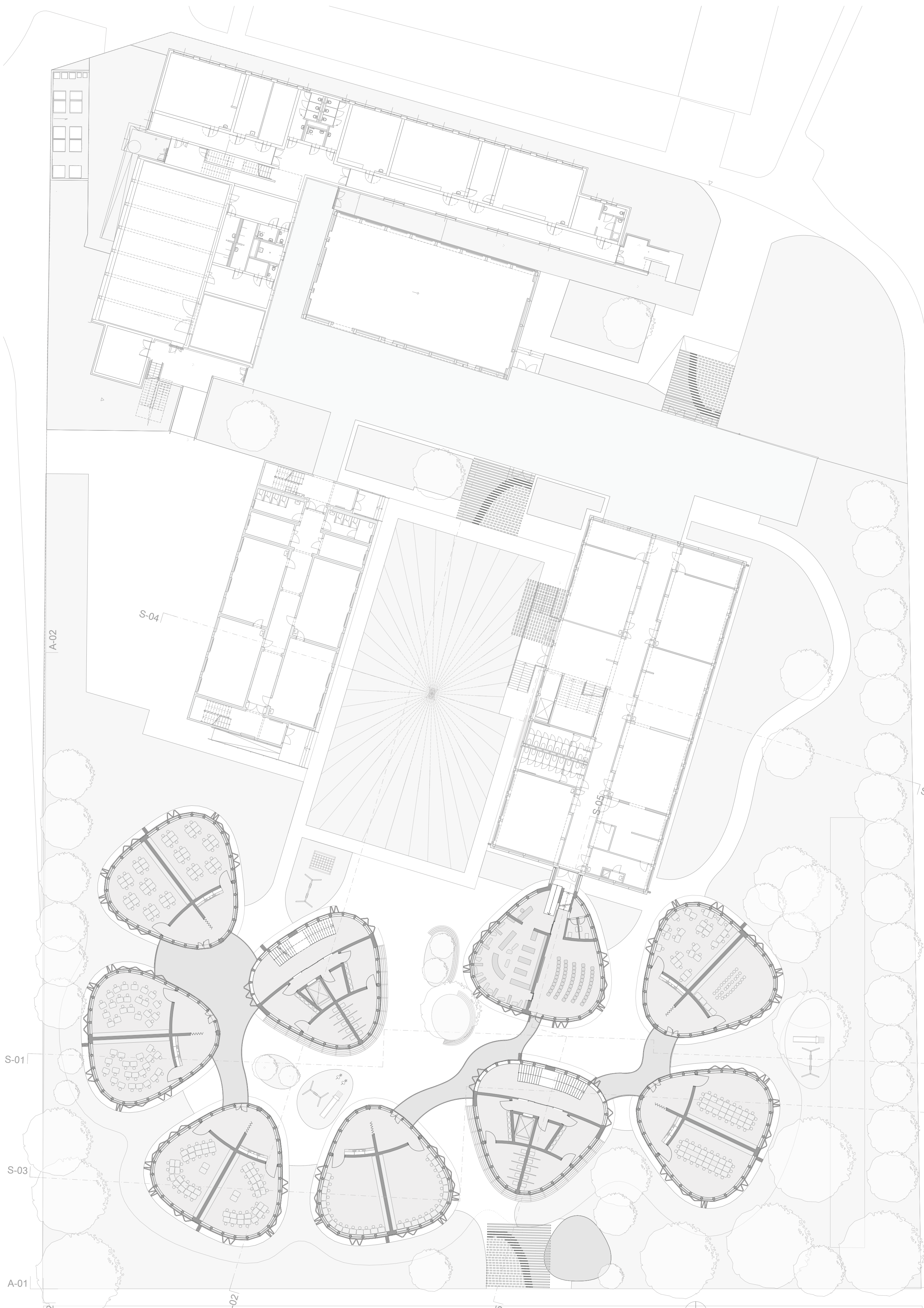
M 1:1000







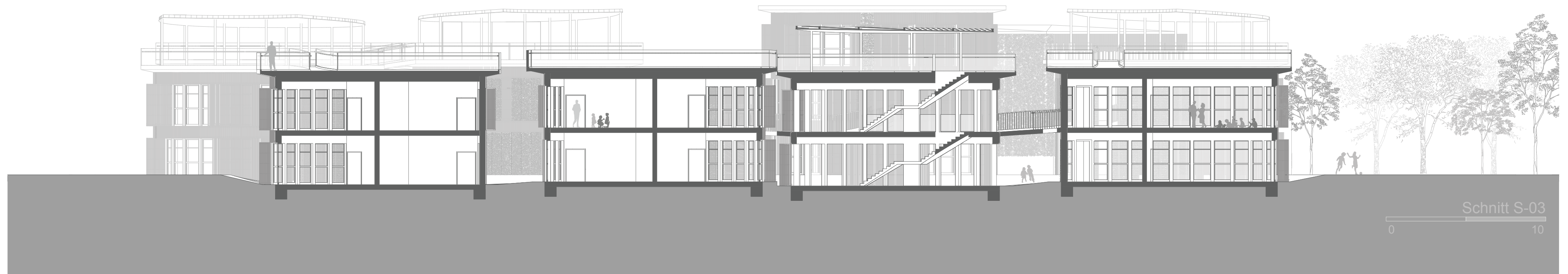
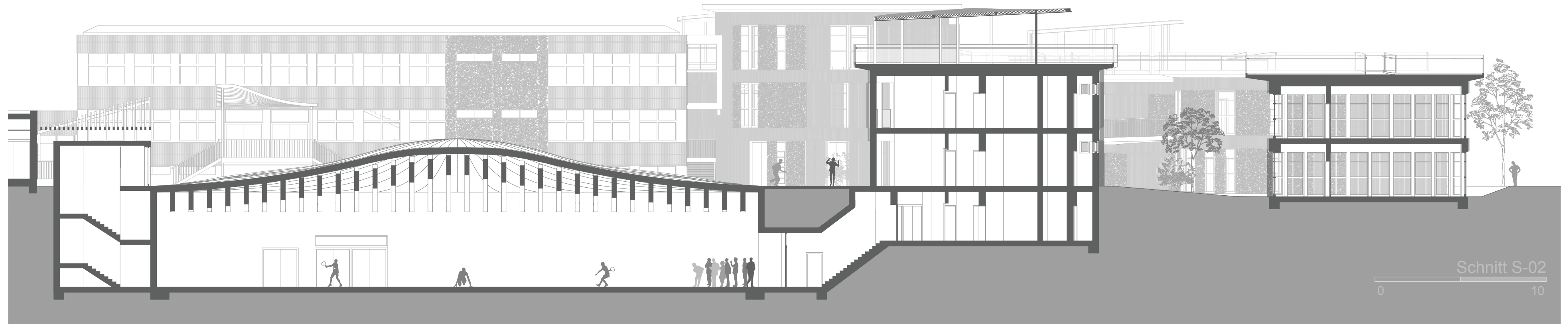






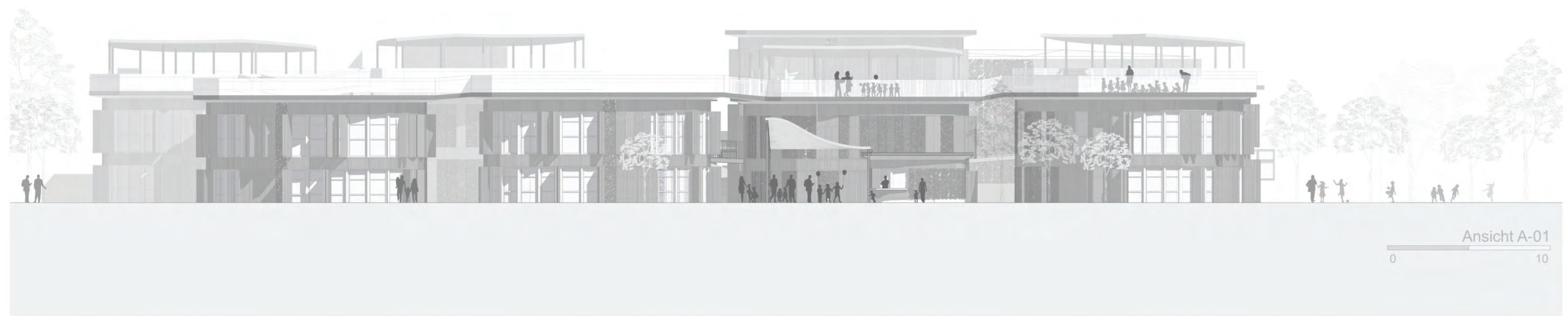






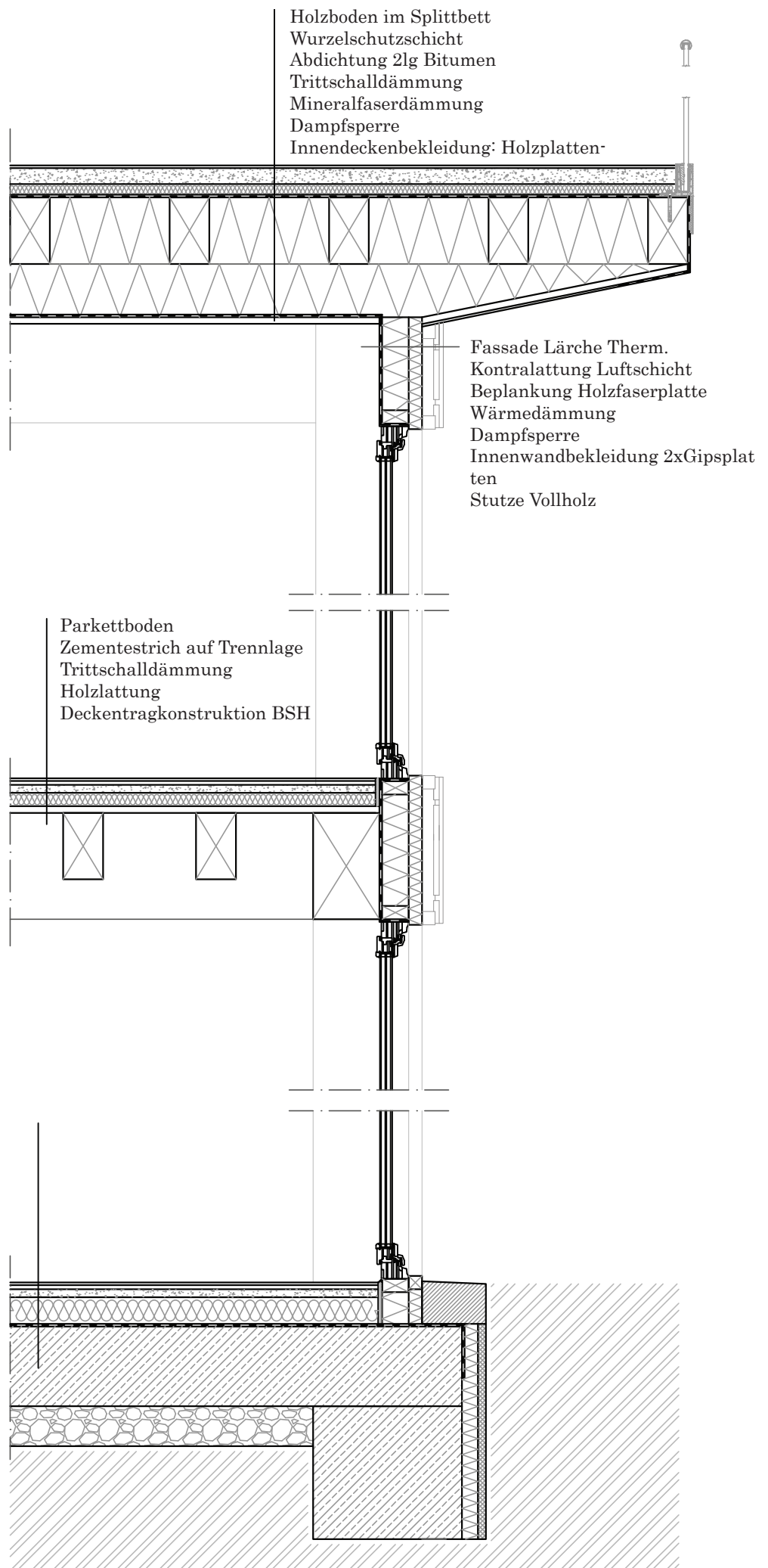








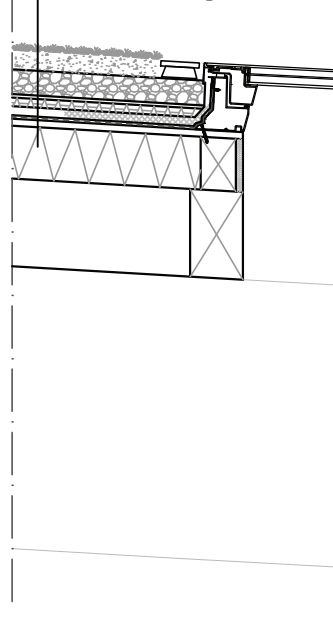




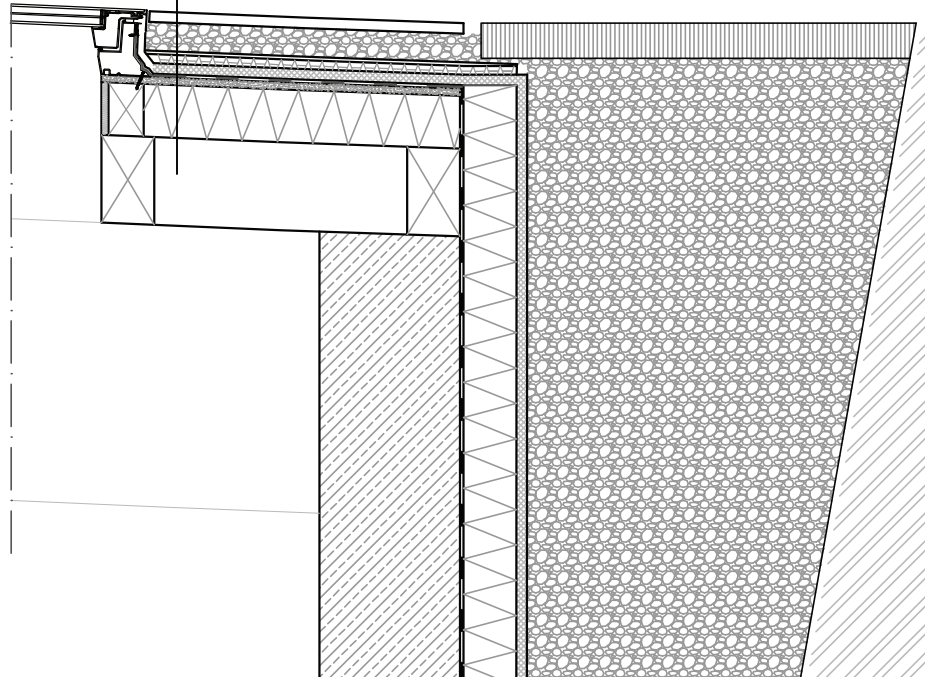




Extensivsubstrat  
 Filtervlies  
 Dränagematte  
 Schutzlage  
 Wurzelschutzschicht  
 Abdichtung 2lg Bitumen  
 Mineralfaserdämmung  
 Dampfsperre  
 Innendeckenbekleidung:  
 Holzplattenlattung

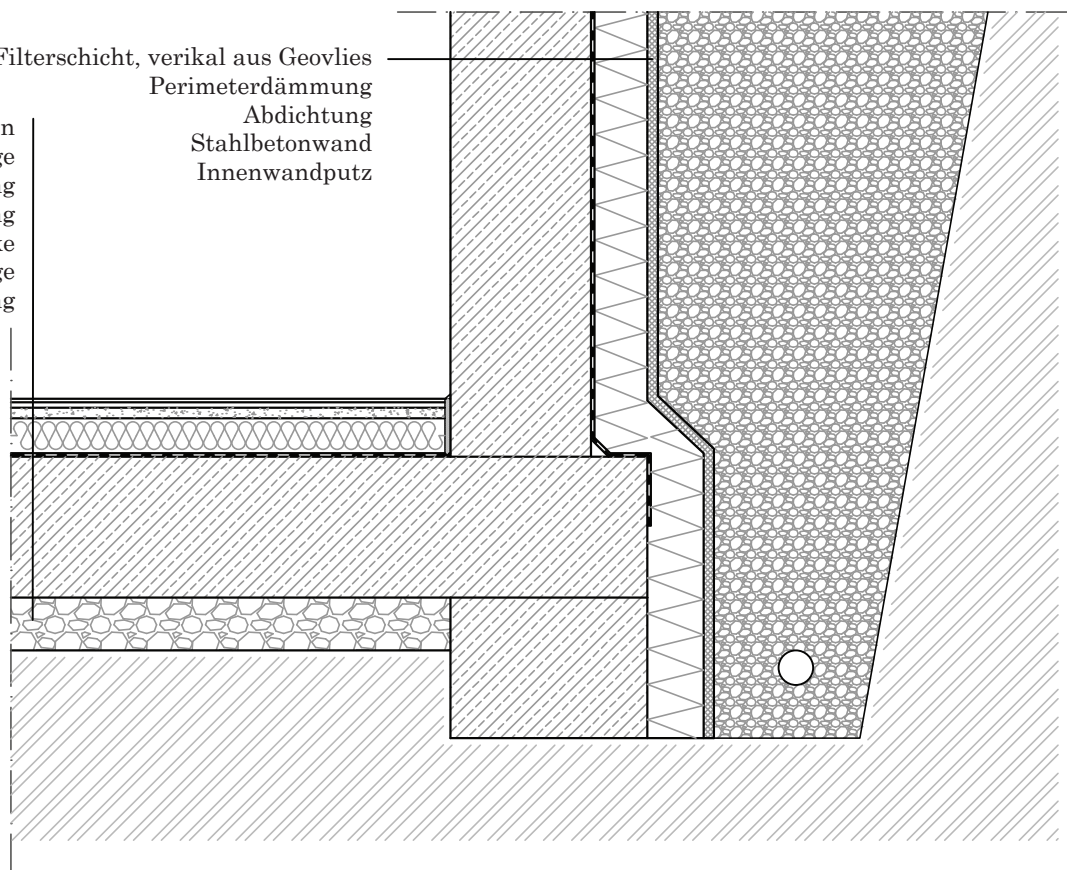


Holzboden im Splittbett  
 Wurzelschutzschicht  
 Dränagematte  
 Abdichtung 2lg Bitumen  
 Mineralfaserdämmung  
 Dampfsperre  
 Innendeckenbekleidung: Holzplattenlattung

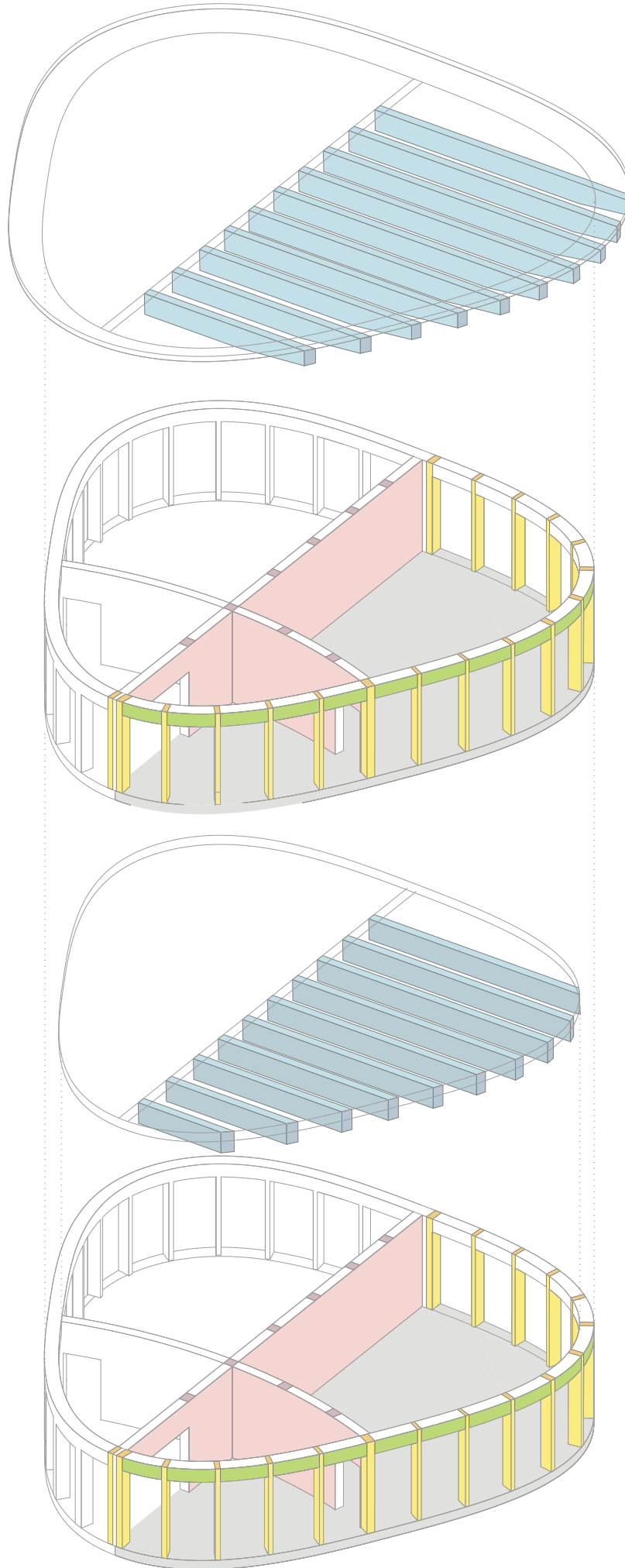


Parkettboden  
 Zementestrich auf Trennlage  
 Trittschalldämmung  
 Abdichtung  
 Stahlbeton Decke  
 Trennlage  
 Sauberkeitsschicht Rollierung

Filterschicht, verikal aus Geovlies  
 Perimeterdämmung  
 Abdichtung  
 Stahlbetonwand  
 Innenwandputz











## 8. Renders











































## 9. Resources:

1. Jiddu Krishnamurti, (1974). Krishnamurti on Teachers. Chapter 1 “On right education”. Download am 10.10.2018 von: <http://jiddu-krishnamurti.net/en/krishnamurti-on-education/1974-00-00-jiddu-krishnamurti-krishnamurti-on-education-chapter-14>
2. Jiddu Krishnamurti, (1953). Education and the significance of life
3. American Montessori Society, (2018). Montessori Teachers. am 10.10.2018 von <https://amshq.org/Montessori-Education/>
4. Rotraut Walden, (2015). Schools for the future design proposals from architectural psychology Rotraut Walden (ed.). With a foreword by Henry Sanoff and comments by Peter Hübner & Friedensreich Hundertwasser
5. Raitt D, (2018). The benefits of round houses. am 11.10.2018 von <https://eonation.co.nz/blog/the-benefits-of-round-houses/>
6. Rotunda, (2018). Rotunda. All round better buildings. Am 11.10.2018 von <http://rotunda.co.uk/what-are-the-advantages-of-round-buildings/>
7. Lockhart M. (2018). The benefits of round houses. am 11.10.2018 von <https://eonation.co.nz/blog/the-benefits-of-round-houses/>
8. Frearson A. (2013). Gammel Hellerup Sports Hall by BIG. Am 13.10.2018 von <https://www.dezeen.com/2013/06/28/gammel-hellerup-gymnasium-sports-hall-by-big/>
9. Dietrich Knut, (2005). Schulhofgestaltung an Ganztagschulen ein Leitfaden Knut Dietrich ...
10. Bruno Peter, Mainz, (2014). Prototyp mit positiver Energiebilanz+Energiehaus, Farschweiler. Am 06.10.2018 von [http://www.dbz.de/artikel/dbz\\_Nachhaltigkeit\\_Architektur\\_Energiehaus\\_Farschweiler\\_2025355.html](http://www.dbz.de/artikel/dbz_Nachhaltigkeit_Architektur_Energiehaus_Farschweiler_2025355.html)
11. Ernst Kürsten, (2016). Keilgezinktes Vollholz, Brettschichtholz und Balkenschichtholz. Am 14.09.2018 von <http://www.holzfragen.de/seiten/kvh.html>
12. Bernard Bühler, (2017). Architectural material & detail structure wood Bernard Bühler
13. Rudolf Lückmann, (2018). Baudetail-Atlas Hochbau praxiserprobt - normgerecht - herstellerunabhängig Rudolf Lückmann
14. Pamela Woolner, (2015). School Design together ed. By Pamela Woolner
15. Leo Care, (2015). Building schools = key issues for contemporary design Prue Chiles (ed.). Leo Care ...
16. Rotraut Walden, (2006). Schulen der Zukunft Gestaltungsvorschläge der Architekturpsychologie Rotraut Walden ; Simone Borrelbach ...

17. Thomas Hoffmann-Kuhnt, (2010). Schulen und Kindertagesstätten red. Bearb.: Thomas Hoffmann-Kuhnt ...
18. Sonja Hnilica, (2002). Disziplinierte Körper die Schulbank als Erziehungsapparat von Sonja Hnilica
19. Tim Waterman, (2010). Landschaftsarchitektur das Wichtigste in Kürze Tim Waterman
20. Chris van Uffelen, (2011). FaçadeGreenery contemporary landscaping Chris van Uffelen
21. Amjad Almusaed, (2011). Biophilic and bioclimatic architecture analytical therapy for the next generation of passive sustainable architecture Amjad Almusaed
22. wettbewerbe aktuell Verlagsgesellschaft mbH, (2015). Schulen und Kindertagesstätten [Redaktion wettbewerbe aktuell Barbara Jonas (V.i.S.d.P.), Judith Jaeger]
23. Nikolaus Hellmayr, (2003). Wien, Schulbau der Stand der Dinge = Vienna, schools : the state of the art hrsg. vom Magistrat der Stadt Wien, Geschäftsgruppe Stadtentwicklung & Verkehr ...
24. Wikipedia. Bildungssystem in Österreich. Am 13.03.2018 von [https://de.wikipedia.org/wiki/Bildungssystem\\_in\\_%C3%96sterreich#Schultypen](https://de.wikipedia.org/wiki/Bildungssystem_in_%C3%96sterreich#Schultypen)
25. Baier GmbH, (2016). Köln am Zehnpfennigshof. Am 06.06.2018 von <http://www.baier-gmbh.de/de/referenzprojekte/schiebefaltladen/Zehnpfenningshof.php>
26. Wikipedia. Montessori education. Am 20.03.2018 von [https://en.wikipedia.org/wiki/Montessori\\_education](https://en.wikipedia.org/wiki/Montessori_education)
27. Wikipedia. Waldorf education. Am 08.09.2018 von [https://en.wikipedia.org/wiki/Waldorf\\_education](https://en.wikipedia.org/wiki/Waldorf_education)
28. Armin Kanuthe, (2015). Die pädagogische Bedeutung von Architektur im Kindergarten
29. Karl Hruza, Angelika Lütkenhorst, Frank Rothe, (2010). Lehrplan der österreichischen Freien Waldorfschulen bzw. Rudolf Steiner Schulen im Waldorfbund Österreich
30. Multi Augustinum . Marchtaler Plan. Am 08.09.2018 von <http://www.multiaugustinum.com/unterricht/marchtal/>
31. Emmanuel M. Rohinton, (2014). Sustainable buildings 4 Building sustainability assessment ed. by Rohinton Emmanuel
32. Philip Jodidio, (2013). Green Architecture Now!
33. Walter Kolb, (2016). Dachbegrünung Planung, Ausführung, Pflege



## 10. Illustrations:

1. Jiddu Krishnamurti Book Cover, Source: <https://www.slideshare.net/tskumar1/education-and-the-significance-of-life-j-krishnamurti>. (04.11.2018)
2. Maria Montessori with children, Source: <https://www.carmelmontessoriacademy.com/maria-montessori/>. (04.11.2018)
3. A classroom with organisation according to Montessori standard, Source: <https://www.leportschools.com/why-leport/beautiful-environments/>. (04.11.2018)
4. Concept drawing, Personal illustration by the autor. (March 2018)
5. Sketch that shows clusters and the landscape diversity, Personal illustration by the autor. (April 2018)
6. Sketch following the reasoning behind building shape, Personal illustration by the autor. (March 2018)
7. A classroom organisation with multi functional central wall, Personal illustration by the autor. (April 2018)
8. Gammel Hellerup Gymnasium hall roof, Source: <https://www.archdaily.com/412908/gammel-hellerup-gymnasium-big> (04.11.2018)
9. Atmospheric sketch of the outdoor situation, Personal illustration by the autor . (April 2018)
10. Static sun shades in different seasons, Source: <http://carwiringdiagram.today/lou-ver-sunlight-diagrams.html>. (04.11.2018)
11. A sketch showing the new school center, Personal illustration by the autor. (April 2018)
12. Photograph: West classroom wing and inner courtyard, Source: Hans Lechner ZT GmbH; Neubau GTVS inkl. Vorschule, Wien 23., Erlaaer Schleife 2; Teil C.1 - Fotodokumentation (18.01.'18.)
13. Photograph: Inner courtyard main entrance, Source: Hans Lechner ZT GmbH; Neubau GTVS inkl. Vorschule, Wien 23., Erlaaer Schleife 2; Teil C.1 - Fotodokumentation (18.01.'18.)
14. Photograph: School Main Entrance, Source: Hans Lechner ZT GmbH; Neubau GTVS inkl. Vorschule, Wien 23., Erlaaer Schleife 2; Teil C.1 - Fotodokumentation (18.01.'18.)
15. Photograph: View on the south site border, Source: Hans Lechner ZT GmbH; Neubau GTVS inkl. Vorschule, Wien 23., Erlaaer Schleife 2; Teil C.1 - Fotodokumentation (18.01.'18.)
16. Photograph: The eastern site border, Source: Hans Lechner ZT GmbH; Neubau GTVS inkl. Vorschule, Wien 23., Erlaaer Schleife 2; Teil C.1 - Fotodokumentation (18.01.'18.)
17. Photograph: The eastern site border, Source: Hans Lechner ZT GmbH; Neubau GTVS inkl. Vorschule, Wien 23., Erlaaer Schleife 2; Teil C.1 - Fotodokumentation (18.01.'18.)

18. Photograph: Panoramic view of the site, Source: Hans Lechner ZT GmbH; Neubau GTVS inkl. Vorschule, Wien 23., Erlaaer Schleife 2; Teil C.1 - Fotodokumentation (18.01.'18.)

19. Photograph: East classroom wing from the inner courtyard, Source: Hans Lechner ZT GmbH; Neubau GTVS inkl. Vorschule, Wien 23., Erlaaer Schleife 2; Teil C.1 - Fotodokumentation (18.01.'18.)

20. Photograph: Southeast corner of the site, Source: Hans Lechner ZT GmbH; Neubau GTVS inkl. Vorschule, Wien 23., Erlaaer Schleife 2; Teil C.1 - Fotodokumentation (18.01.'18.)

21. Photograph: View on the east wing from the southeast site corner, Source: Hans Lechner ZT GmbH; Neubau GTVS inkl. Vorschule, Wien 23., Erlaaer Schleife 2; Teil C.1 - Fotodokumentation (18.01.'18.)

22. Photograph: East classroom wing, Source: Hans Lechner ZT GmbH; Neubau GTVS inkl. Vorschule, Wien 23., Erlaaer Schleife 2; Teil C.1 - Fotodokumentation (18.01.'18.)

23. Photograph: Inner courtyard, Source: Hans Lechner ZT GmbH; Neubau GTVS inkl. Vorschule, Wien 23., Erlaaer Schleife 2; Teil C.1 - Fotodokumentation (18.01.'18.)

