TECHNISCHE UNIVERSITÄT WIEN
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Diplomarbeit

The third teacher

Kindergarten Mühling

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

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The third teacher - Kindergarten Mühling

Abstract

Child education is a constantly recurring and also controversially discussed topic in today's society. Especially the question, if one wants to face that task with increased individual initiative or if one decides to take the child into a kindergarten or toddler group already in early years splits the people.

Current tendencies show particularly in urban regions, that the latter point is becoming more and more the standard and thus calls for more care centres. This – from the architectural point of view – means, that new, high-quality space, which is adapted to the needs of the children, has to be created.

The same counts for the district of Mühling in the Lower Austrian municipality of Wieselburg Land. The existing kindergarten already shows a couple of structural deficiencies, and in default of green space doesn't offer the opportunity to extend. That's why a new building, that meets the needs of current pedagogical concept, should be designed.

Therefore the new kindergarten shouldn't just function as building to prevent the kids and teachers from cold and rain, but should also encourage them to be curious and learn for life through their environment – and should become "The third teacher" Mühling.

Kindererziehung ist ein immer wiederkehrendes und kontroversiell diskutiertes Thema in unserer heutigen Gesellschaft. Vor allem die Frage, ob man sich dieser Aufgabe mit gesteigerter Eigeninitiative annimmt, oder man sich für den Weg entscheidet, das Kind bereits im frühen Alter in die Krabbelstube bzw. den Kindergarten schicken, lässt die Meinungen auseinander gehen.

Aktuelle Tendenzen zeigen vor allem in den Ballungsräumen, dass sich zweiterer Ansatz immer mehr durchsetzt und dadurch auch die Nachfrage nach Betreuungsplätzen stetig zunimmt. Aus architektonischer Sicht bedeutet das, dass neuer, qualitativ hochwertiger und an die Anforderungen des Kindes angepasster Raum geschaffen werden muss.

So auch im Ortsteil Mühling der niederösterreichischen Gemeinde Wieselburg Land. Der bestehende, zweigruppige Kindergarten weist mittlerweile etliche bauliche Mängel auf und bietet auch in Ermangelung ausreichender Freiräume keine Möglichkeit zur Erweiterung, weshalb unweit davon ein Neubau erreichtet werden soll, der neuen pädagogischen Ansprüchen gerecht wird.

Dieser sollte nicht bloß als reiner Nutzbau konzipiert sein, sondern die Kinder ermutigen, neugierig zu sein und durch die direkte, gebaute Umgebung auch zu lernen – und der „Dritte Pädagoge“ Mühling werden.

Danksagung

Besonderer Dank gilt meinen Eltern, die mir meine Ausbildung vom Kindergarten bis hin zum Studium der Architektur ermöglicht haben, mich stets in jederlei Hinsicht unterstützt und in meinen Entscheidungen bestärkt haben.

Weiters möchte ich mich bei Professor Will Alsop bedanken, der mir durch seinen Zugang zur Architektur vor dem Abschluss meines Studiums nochmals vor eine neue Herausforderung gestellt und mir neue Blickwinkel auf die Architektur aufgezeigt hat.

Schlussendlich gebührt all jenen Dank, die sowohl Hürden, Stress, Nachtschichten als auch bereichernde Diskussionen, Freuden und Feiern im Laufe des Studiums mit mir erlebt/geteilt haben. Allen voran jenen, die mir in den letzten Zügen der Arbeit ihre Unterstützung angeboten haben: meinem Bruder Dominik für die Modellbau-Hilfe und dem Team der tafkaoo architects - in erster Linie Alex - für den letzen Schliff in der Planung.

Nicht vergessen möchte auch ich auf Karin und ihre Mutter Rosemarie Wögerer, auf deren Bestreben diese Arbeit ins Rollen gekommen und enstanden ist.

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Mühling

municipality, climate, existing kindergarten


Kindergarten
Wieselburg
Kindergarten
Weinzierl
Kindergarten
Wieselburg
2 km
3 km
4 km
0
250
1000

Wieselburg Land - Mühling

The municipality of Wieselburg-Land has been founded in the year 1967 through a consolidation of the existing small communities of Gumprechtsfelden, Mühling, Marbach, Wechling and Weinzierl. Togehter with the township of Wieselburg it forms the northern border of the district of Scheibbs.

In Wieselburg Land a number of 3.715 people live on an area of 33,94 km². The characteristic settlement structure is rural with around 800 houses, mainly single-family homes.
In the local centres of Mühling, Neumühl and Weinzierl one can find fairly dense settlements, whereas in the local centres of Grossa, Gumprechtsfelden, Köchling, Krügling, Marbach, Schadendorf, Ströblitz and Wechling housing and agricultural buildings exist parallel. The centres of Berging, Brunning and Plaika consist entirely of farmhouses.
While there is no consistent form of single-family houses in the municipality, the form of the farmhouses is mainly the traditional „Vierkanthof“ - a rather big farmhouse with a square yard in the middle.
Even though the municipality is quite a young one, it‘s origin can be traced back to the Neolithic Age (2000 BC).

The fact, that Wieselburg-Land is inseparably connected to the city of Wieselburg is mainly because of the shared parish church (with the foundation dating back to 976 AD), of other historic connections and of course the proximity of some districts to the city center. [01]

[01] http://www.wieselburg-land.at/...; 08.12.2015

ill. 001: map of Austria

ill. 002: figure ground plan Wieselburg & Wieselburg Land 1:25000


SCHEIBBS < RAILWAY > PÖCHLARN
B25
RIVER ERLAUF
0
50
200

Mühling - the plot

The local district of Mühling extends along three characteristical elements:

Firstly it is the river of Erlauf in the very eastern part of the settlement.

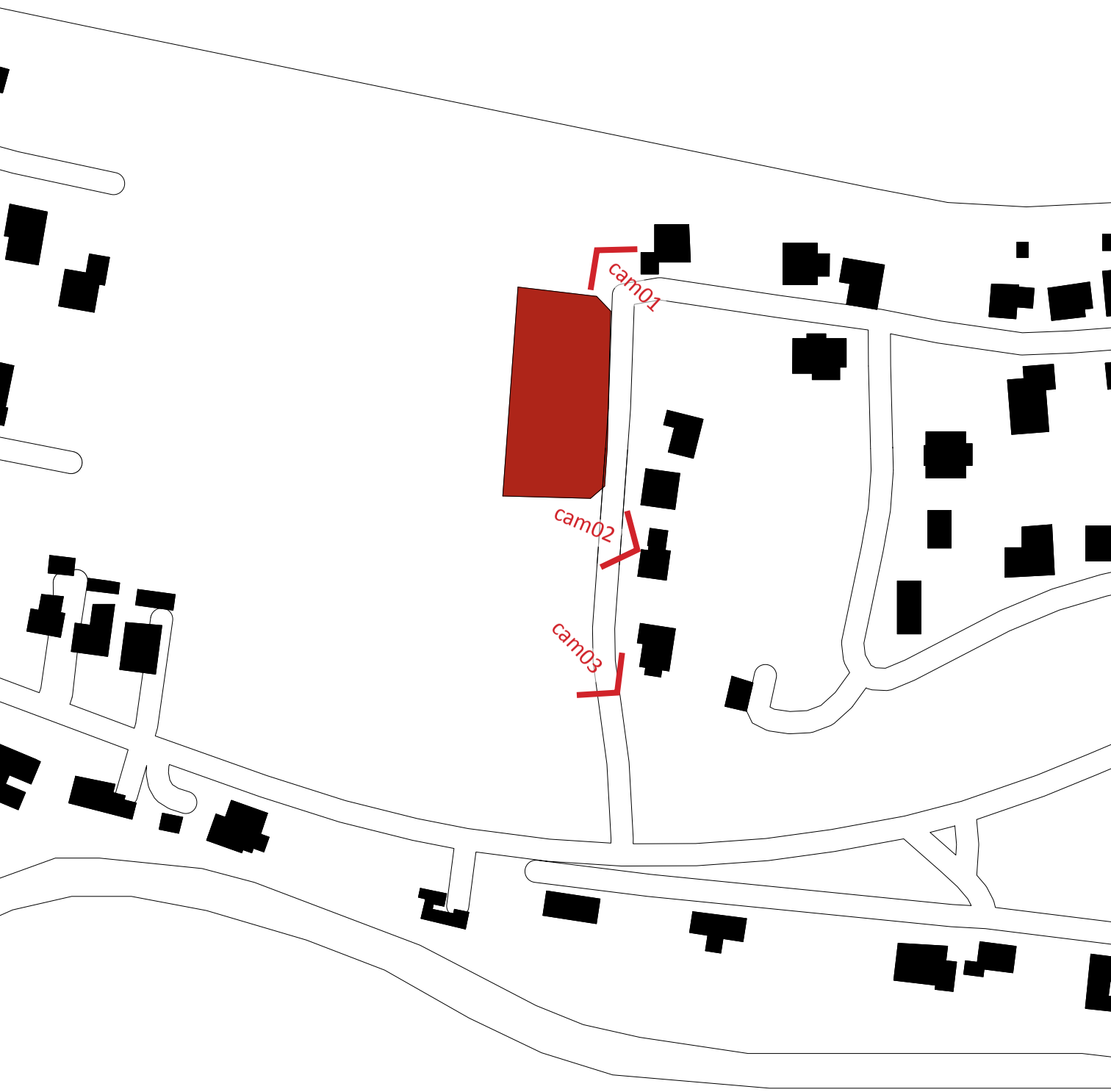
Secondly there is the Erlauftal-Bundesstraße, which runs parallel to the river, only divided from it by a row of houses.

And finally in the western part there‘s the local railway connecting the two local centres of Pöchlarn in the north and Scheibbs in the south.

Another 40km south of Scheibbs (60km from Mühling) one can find the Lower Austrian limestone alps. The Ötscher is a solitary positioned peak of the limestone alps and with a height of 1.893m well visible from Wieselburg. A view from your home to the Ötscher is worth a lot for the people in the area around Wieselburg.

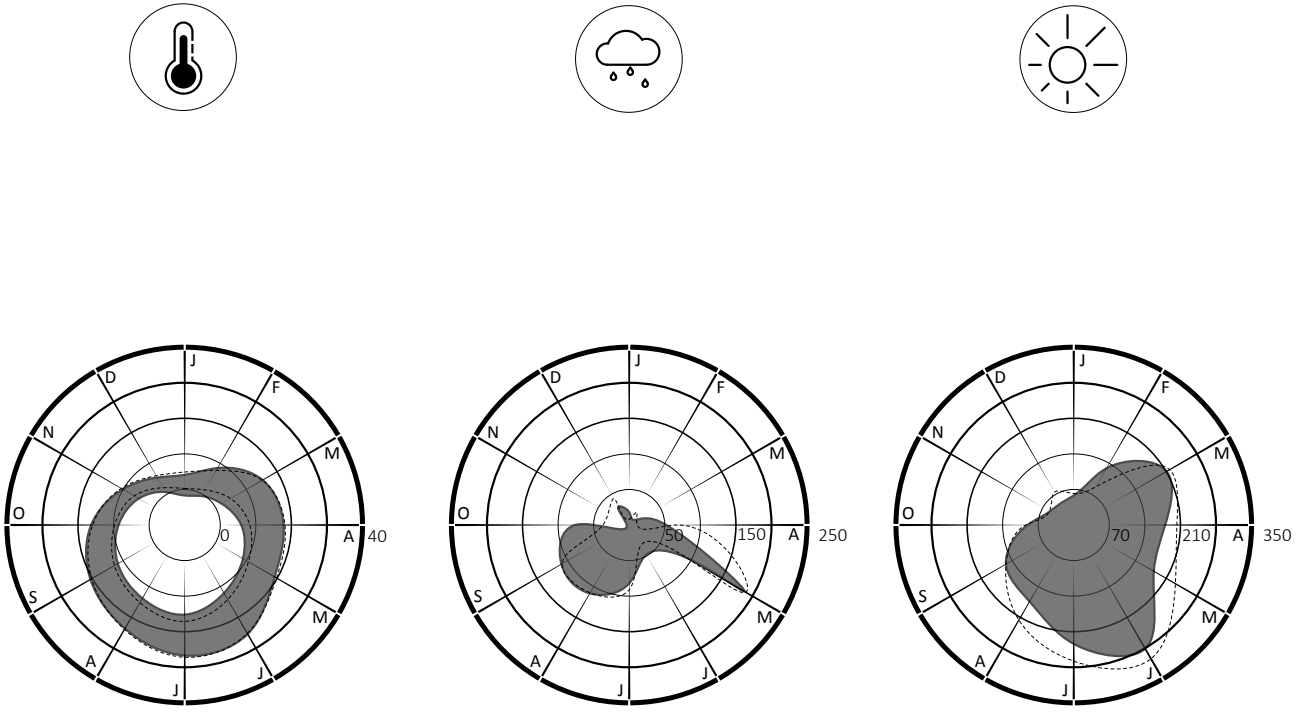
Taking a closer look at the structure of Mühling, it turns out, that the roots of the settlement are located in the north-east. From there the settlement mainly spreads southwards along the three already mentioned elements railway, river and road.

ill. 003: figure ground plan Mühling 1:5000


cam01
cam02
cam03

ill. 004: figure ground plan Mühling plot 1:2000

ill. 005-007: panoramas plot cam01 - cam03 (top to bottom)



ill.008 : climate comparison:
Mühling - Vienna

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ZAMG **2014** **Monatsauswertung**

Wieselburg

Lufttemperatur													
Parameter / Monat	Jänner	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember	Jahr
Mittelwert der Lufttemperatur um 07 MEZ (°C)	-0.2	0.7	3.7	8.2	11.9	15.8	18.1	15.7	12.8	9.9	6	2	8.7
Mittelwert der Lufttemperatur um 14 MEZ (°C)	3.2	7.6	13.7	16.2	17	22.9	25.1	21.7	19.5	15.2	9	4.5	14.6
Mittelwert der Lufttemperatur um 19 MEZ (°C)	0.9	3.3	9.2	12.2	14.5	21	22	18.8	15.5	11.7	6.7	3	11.6
Mittelwert der Lufttemperatur (°C)	0.8	3	7.6	11	13.6	18.6	20.5	18	15.2	11.6	6.9	2.8	10.8
mittleres Maximum der Lufttemperatur (°C)	4.1	8.5	15.3	17.8	19.2	25.4	26.7	23.6	20.6	16.3	10.1	5.4	16.1
mittleres Minimum der Lufttemperatur (°C)	-1.7	-0.6	2	5.9	8.9	12.1	15.2	13.8	11.7	8.6	4.9	0.7	6.8
absolutes Max. der Lufttemperatur (°C)	8.2	13.8	22.1	24	29.6	34.5	35.7	32.1	27.6	23	21.3	14	35.7
absolutes Min. der Lufttemperatur (°C)	-8.8	-4.5	-3	-1.4	2.4	7	10.2	7.5	2.3	0.5	0.5	-9.9	-9.9
Tag des absoluten Maximums der Lufttemperatur	10	21	21	3	22	10	20	2	8	12	12	19	-
Tag des absoluten Minimums der Lufttemperatur	30	4	9	18	5	4	4	25	24	29	27	29	-

Niederschlag													
Parameter / Monat	Jänner	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember	Jahr
Monatssumme des Niederschlags (mm)	18	9	17	52	186	48	82	111	110	76	5	30	744
maximale 24h-Niederschlagssumme (mm)	5	3	7	8	50	18	15	22	37	22	1	6	50
maximale Tagesschneehöhe (cm)	11	5	0	0	0	0	0	0	0	0	0	9	11
Tag der maximalen Niederschlagssumme	20	9	23	6	16	29	8	9	11	23	7	7	-

Sonnenscheindauer													
Parameter / Monat	Jänner	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember	Jahr
Monatssumme der Sonnenscheindauer (h)	58	129	211	180	182	281	234	174	154	91	54	50	1798
Summe der Sonnenscheindauer (% der maximal möglichen)	-	-	-	-	-	-	-	-	-	-	-	-	-

|= 0514_1224 =| 0520_1036 | 6 |A| 213.5 | 94 |B| 0 | 1 |C| 0 | 0 |<|

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ZAMG **2014** **Monatsauswertung**

Wien Hohe Warte

Lufttemperatur													
Parameter / Monat	Jänner	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember	Jahr
Mittelwert der Lufttemperatur um 07 MEZ (°C)	1.3	2.5	6	10.1	13.2	17.6	20.1	17.1	14.2	10.8	7	3.3	10.3
Mittelwert der Lufttemperatur um 14 MEZ (°C)	4.1	7	13.8	17	18.4	23.6	25.5	22.3	19.2	15.2	9.7	5.1	15.1
Mittelwert der Lufttemperatur um 19 MEZ (°C)	2.4	4.8	10.9	13.6	15.8	21.4	23.1	19.7	16.6	12.4	8.4	4.1	12.8
Mittelwert der Lufttemperatur (°C)	2.2	4.1	9.2	12.6	14.9	19.6	21.9	19	15.9	12.2	8.1	3.9	12
mittleres Maximum der Lufttemperatur (°C)	4.9	7.7	15.2	18.2	19.8	25.2	27.2	23.9	20.2	15.9	10.6	6.1	16.2
mittleres Minimum der Lufttemperatur (°C)	0.3	1.4	4.8	8.3	10.7	14.2	17.1	15.2	12.8	9.7	6.4	2.1	8.6
absolutes Max. der Lufttemperatur (°C)	12.9	13.1	22.2	24.7	28.6	33.2	33	31.2	25.8	22	19	15	33.2
absolutes Min. der Lufttemperatur (°C)	-9.8	-3.4	-0.1	2.9	4.7	10.5	12.5	10	5	0.6	1.1	-8.3	-9.8
Tag des absoluten Maximums der Lufttemperatur	19	20	21	8	23	10	20	9	9	9	5	19	-
Tag des absoluten Minimums der Lufttemperatur	26	1	11	18	5	27	1	25	24	29	28	31	-

Niederschlag													
Parameter / Monat	Jänner	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember	Jahr
Monatssumme des Niederschlags (mm)	8	21	12	66	189	33	91	110	109	37	34	43	753
maximale 24h-Niederschlagssumme (mm)	4	6	5	17	62	16	25	40	30	12	14	10	62
maximale Tagesschneehöhe (cm)	2	1	0	0	0	0	0	0	0	0	0	6	6
Tag der maximalen Niederschlagssumme	21	12	23	24	24	29	30	23	11	17	7	1	-

Sonnenscheindauer													
Parameter / Monat	Jänner	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember	Jahr
Monatssumme der Sonnenscheindauer (h)	62	87	218	203	231	304	268	216	154	95	55	75	1968
Summe der Sonnenscheindauer (% der maximal möglichen)	24	32	61	52	51	67	58	51	42	29	21	30	46

|= 0514_1224 =| 0520_1036 | 6 |A| 213.5 | 94 |B| 0 | 1 |C| 0 | 0 |<|

ill.009-010 : climate comparison:
Mühling - Vienna









meeting Mühling Nov. 09th 2015

head of kindergarten Müling, nurses, janitors,
mrs. Wögerer

group rooms have to be kept up
due to overview, acoustics,...

social meeting point for parents
1/3 of kids brought by parents
1/3 of kids come by bus
1/3 of kids come by foot

market place as conneting element in the
center of the design

the third teacher
architecture promotes self-initiatives
prepares them for real life
> e.g. traffic rules

meeting Mühling; 09.11.2015

ill. 011-019: Kindergarten Mühling

02

History of kindergarten

beginnins of paedagogics, Oberlin, Fröbel, Montessori, Steiner, Malaguzzi, kindergartens in Europe today

Beginnings of paedagogics

In today‘s world we accept it to be a fact, that childhood is a separate stage of a person‘s life. We know that children develop rapidly in their early years and change from one development stage to another. Still, summing up all those stages, it takes a couple of years for the kids to arrive in an especially psychosocial, cognitive and motoric stage, where they are able to join the learning society, that we are today.

“According to Philippe Ariès people in the Middle Ages lacked the sense of seeing children as such. They were, right after they learned to walk and to communicate, integrated into everyday life, into work as well as into leisure activities. They even wore the same clothes as the adults did, only smaller.” [02] The children were more or less forced “to live in the grown-ups society, who taught them the technical and social skills they needed in life.” [03]

“From the familial point of view, kids have until the 16th and 17th century been seen as a toy for the parents to play with. But things changed, when Michel de Montaigne‘s thoughts about the major influence of education in early childhood became known.” [04]

Montaigne‘s ideas were mainly based on a humanistic approach to life, especially on a non-violent education and the aim to form a human

[02] Aden-Grosmann 2002, p.17

[03] Ariès 1977, p.53

[04] Aden-Grosmann 2002, p.18

being, that longs for freedom an honor. [05]
Later on Jean-Jacques Rousseau wrote in 1762 in his book “Emile”, that the main purpose of bringing up children is to form them to persons, who are able take part in and to be part of the daily life of a democratic state. In that regard, he also mentions, that bringing up kids should be a public issue, so that equality and democratic aims are taught already in early years and to as many children as possible. [06]
In the end another crucial point in history has been a main factor, why kindergartens came into being: the industrial revolution and it impact into social life, especially into women‘s and also children‘s life. “They have gradually been integrated into work in industrial factories, which led to urbanisation, precarious living conditions and neglected children.” [07]

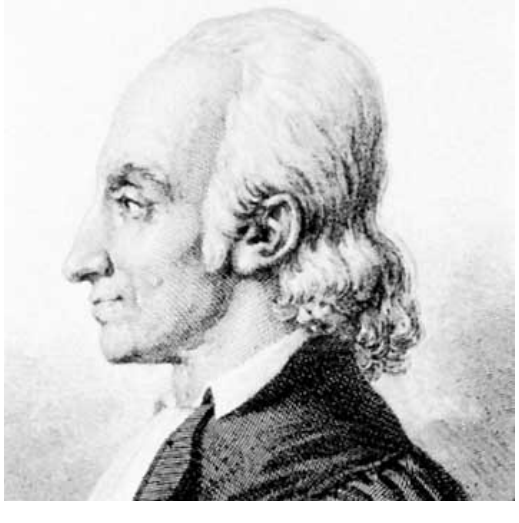
[05] Krecker 1971, p.30

[06] Aden-Grossmann 2002, p.19

[07] de.wikipedia.org/kindergarten; 01.12.2015

Jean-Frédéric Oberlin

1740 - 1826
France



ill. 020: Jean-Frédéric Oberlin

"Lernen muss man mit dem ganzen Körper." [08]

"You have to learn with your entire body." [08]

[08] http://www.oberlin-ulm.de/...; 06.12.2015

When in the last third of the 18th century Friedrich Johann Oberlin moved to the little village of Waldersbach (FR) to work there as a pastor, he came upon a society, that didn‘t comply with bringing up their children properly. The main reason was - as already mentioned in the chapter before - the integration of women and also children into (industrial) work.
Another major reason for the invention of a public education of children in France was the language. Around these times numerous dialects existed throughout the whole country. In the area of Waldersbach the people spoke Patois, which didn‘t correspond with the ideas of the ruling parties in Paris to strenghten the national state also by unifying the language.

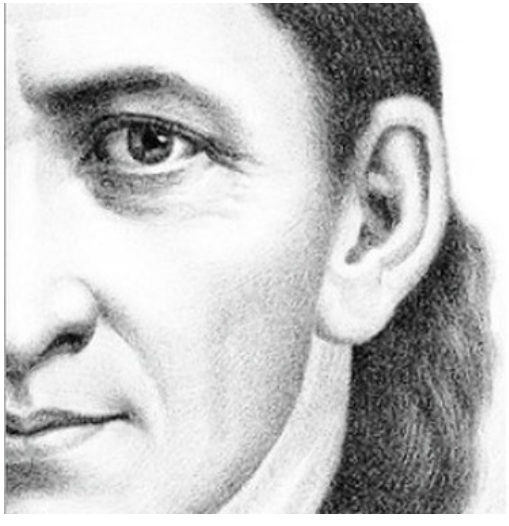
So together with the young villager Sara Banzet, who already started to take care of a little group of children, he founded the first institutions with an explicit pedagogical strategy – the so called “Strickstuben” - a space for knitting. [09] In this so called “Strickstuben” the children were taught the french language, to handle things in their surrounding environment, local history and knitting. Furthermore they have been physically educated.
So considering all these aspects, it‘s safe to say that Oberlin‘s “Strickstuben” weren‘t just Kleinkindbewahranstalten (bewahren=keep; Anstalt=public institution), but had an explicit educational interest, and were therefore definitely precursors of Fröbel‘s kindergartens, which emerged approximately 70 years later. [10]

[09] http://www.faz.net/...; 02.12.2015

[10] Aden-Grossmann 2002, p. 22

Friedrich Fröbel

1782 - 1852
Germany



ill. 021: Friedrich Fröbel

"Spiel ist nicht Spielerei, es hat hohen Ernst und tiefe Bedeutung." [11]

"Playing is not playing around, it's got a serious background and a deep meaning." [11]

[11] http://www.zeit.de/...; 03.12.2015

Friedrich Froebel was born in 1782 in Oberweißenbach, Germany. Less than a year after his birth, his mother died, so for the first years he‘s been brought up by their domestic servants. At the age of three his father got engaged again, but he wasn‘t able to forge a real relationship to his mother. This is why Fröbel became a rather clam boy, and he later on figured out, that experiences made in early childhood coin people more intensively than experiences made as a grown-up.[12]

As already mentioned in the last paragraph, these “Strickstuben” and “Kleinkindbewahranstalten” can be seen as precursos of the educational institution for three to six years old children called “Kindergarten”. One quite important difference between these two institutions is the religious implementation, which has always been part of Oberlin‘s ideas. Fröbel on the other hand opposed these religious ideas of the original sin, and assumed that something good is inherent in every human being.[13] Another major advancement was the addition of a yard (Garten) to the building for the kids. He called it from then on “Kindergarten”, which was already the basic form of how we know it today. The first of it‘s kind has been built in Rudolphstadt (Germany).
Fröbel‘s ideas of bringing up children mainly focussed on two aspects: the assumption of mental development in the early childhood on the one hand and his theory of playing on the other hand.[14]

Another invention made by Fröbel in order to enhance playing with the factor of learning are his Froebel Gifts. A set of his gifts consisted of six coloured balls, a sphere, a cylinder, a box and a construction kit.

Unlike Johann Heinrich Pestalozzi‘s (he once was Fröbels teacher) these gifts were not just one-dimensional sticks, but gave the children already a basic idea about geometry. From a solid footing they achieve with a box to a possible one-dimensional movement with cylinders to a totally free movement with spheres the kids could experience some of the most simple basic rules of geometry.

ill. 022: Fröbel gifts

[12] Fröbel 1826, p.22

[13] Aden-Grossmann 2002, p. 32

[14] Aden-Grossmann 2002, p. 31

Maria Montessori

1870-1952
Italy

“Hilf mir, es selbst zu tun.” [15]

“Help me to do it myself.” [15]

[15] Maria Montessori in http://montessoriguide.org/...; 06.12.2015

ill. 023: Maria Montessori

„Maria Montessori was the first woman to graduate from the University of Rome medical school and became interested in education through her work as a doctor, treating what today are known as children with special needs. When she went on to establish schools for the disadvantaged children of working parents in Rome - the Casa dei Bambini - she approached their education as a scientist, using the classroom as her laboratory for observing children and finding ways to help them to achieve their full potential.

It soon became apparent that Montessori had developed a highly effective method of teaching which could be used with great success with each and every child. She began to travel the world, establishing schools, lecturing about her discoveries and writing many articles right up to her death in Holland in 1952 at the age of 82. She was a true pioneer of child-centred education. Her innovative classroom practices and ideas have had a profound influence on the education of young children all over the world.

Montessori saw that children learn best by doing and that happy self-motivated learners form positive images of themselves as confident, successful people. She created specially designed resources to foster independence and a love for learning from an early age.

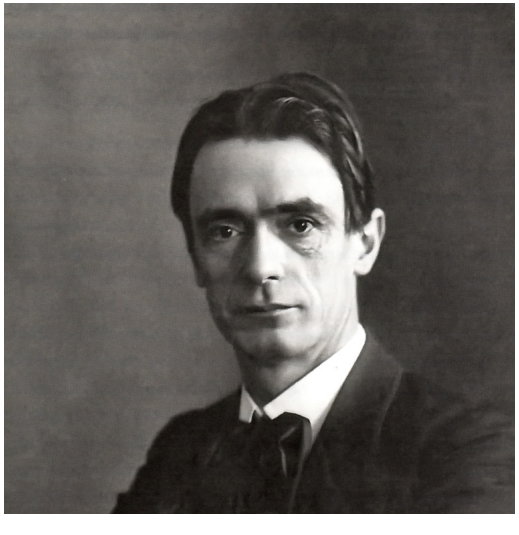
The Montessori approach is holistic and aims to develop the whole child. Fundamental to the approach is the belief that a child‘s early years from birth to six are the period when they have the greatest capacity to learn.“ [16]

ill. 024: casa dei bambini

[16] https://www.montessori.org.uk/...; 22.05.2017

Rudolf Steiner

1861-1925
Austria
Waldorf approach



"Receive the children in reverence; educate them in love; let them go forth in freedom." [17]

"Das Kind in Ehrfurcht empfangen, in Liebe erziehen und in Freiheit entlassen." [17]

[17] http://www.waldorfkindergarten.de/...; 22.05.2017

ill. 025: Rudolf Steiner

„The Waldorf educational system was created nearly a hundred years ago by Rudolf Steiner, an Austrian philosopher and scientist. Steiner was familiar with a philosophy known as anthroposophy, the idea that children who consciously cultivate independent thinking will be more ready to handle the important natural and spiritual questions with which philosophers and scientists are concerned. The Waldorf education was devised to be responsive to the needs of childhood, including allowing children to set their own pace and use their imagination and creativity.

The Waldorf method encourages a broad curriculum. Teachers are encouraged to explore new topics and allow themselves to be guided by the exploration of the students. This type of teaching encourages learning for the sake of learning, instead of for the sake of passing an exam or scoring well on grading rubrics. There are no grades given in a Waldorf elementary school.

There are several other differences between the Waldorf method and other traditional teaching methodologies. First, academic education is de-emphasized. In fact, the types of education which are routinely cut from public school budgets are often the crux of a Waldorf education. These include education in art, music, and foreign languages. Children are encouraged to learn to play musical instruments, knit, crochet, and draw. Additionally, the Waldorf Method uses no textbooks until the sixth grade. Instead, elementary school children keep a journal where they record their experiences and what they have learned.“ [18]

From the architectural point of view Rudolf Steiner is still known as the designer of the first and second Goetheanum located in Dornach near Basel, Switzerland. The second, still existing one has been completed in 1928 after the first one has been destroyed by arson on New Year‘s Eve in 1923.
Today it „is the world center for the anthroposophical movement. It includes two performance halls (1500 seats), gallery and lecture spaces, a library, a bookstore, and administrative spaces for the Anthroposophical Society; neighboring buildings house the Society‘s research and educational facilities.“ [19]
The second Goetheanum is known for it‘s „liberation from traditional, architectural forms“ [19], thus his sculptural appearance and the waiver of right angles. Furthermore it‘s famous for the use of concrete that allowed to design sculptures in an architectural scale.
The Goetheanum still has an influence on anthroposophical buildings, especially also todays Waldorf schools.

ill. 026: Goetheanum Dornach

ill. 027: Goetheanum Dornach at night

[18] http://www.teach-nology.com/...; 08.12.2015

[19] https://en.wikipedia.org/...; 10.12.2015

Loris Malaguzzi

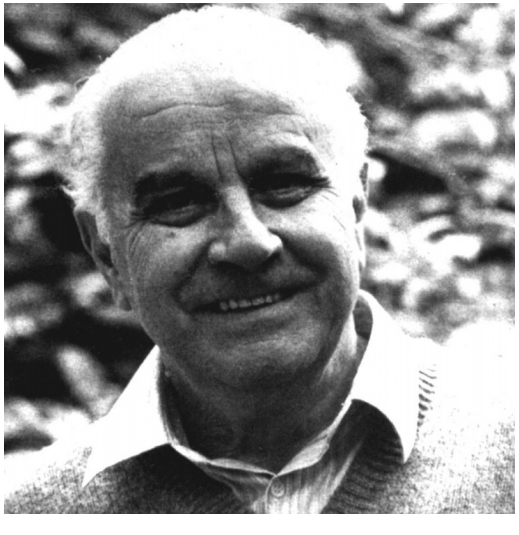
1920-1994

Italy

Reggio Emilia

„Raum ist (nach Erwachsenen und Mitschülern) der dritte Pädagoge.“ [20]

“There are three teachers of children: adults, other children, and their physical environment.” [20]



[20] thethirdteacherplus.com/...; 07.12.2015

ill. 028: Loris Malaguzzi

„The Reggio Emilia approach was developed after World War II by a teacher, Loris Malaguzzi, and parents in the villages around Reggio Emilia in Italy. Following the war, people believed that children were in need of a new way of learning. The assumption of Malaguzzi and the parents was that people form their own personality during early years of development and that children are endowed with „a hundred languages" through which they can express their ideas. The aim of this approach is teaching how to use these symbolic languages (eg., painting, sculpting, drama) in everyday life. The program is based on the principles of respect, responsibility, and community through exploration and discovery in a supportive and enriching environment based on the interests of the children through a self-guided curriculum." [21]

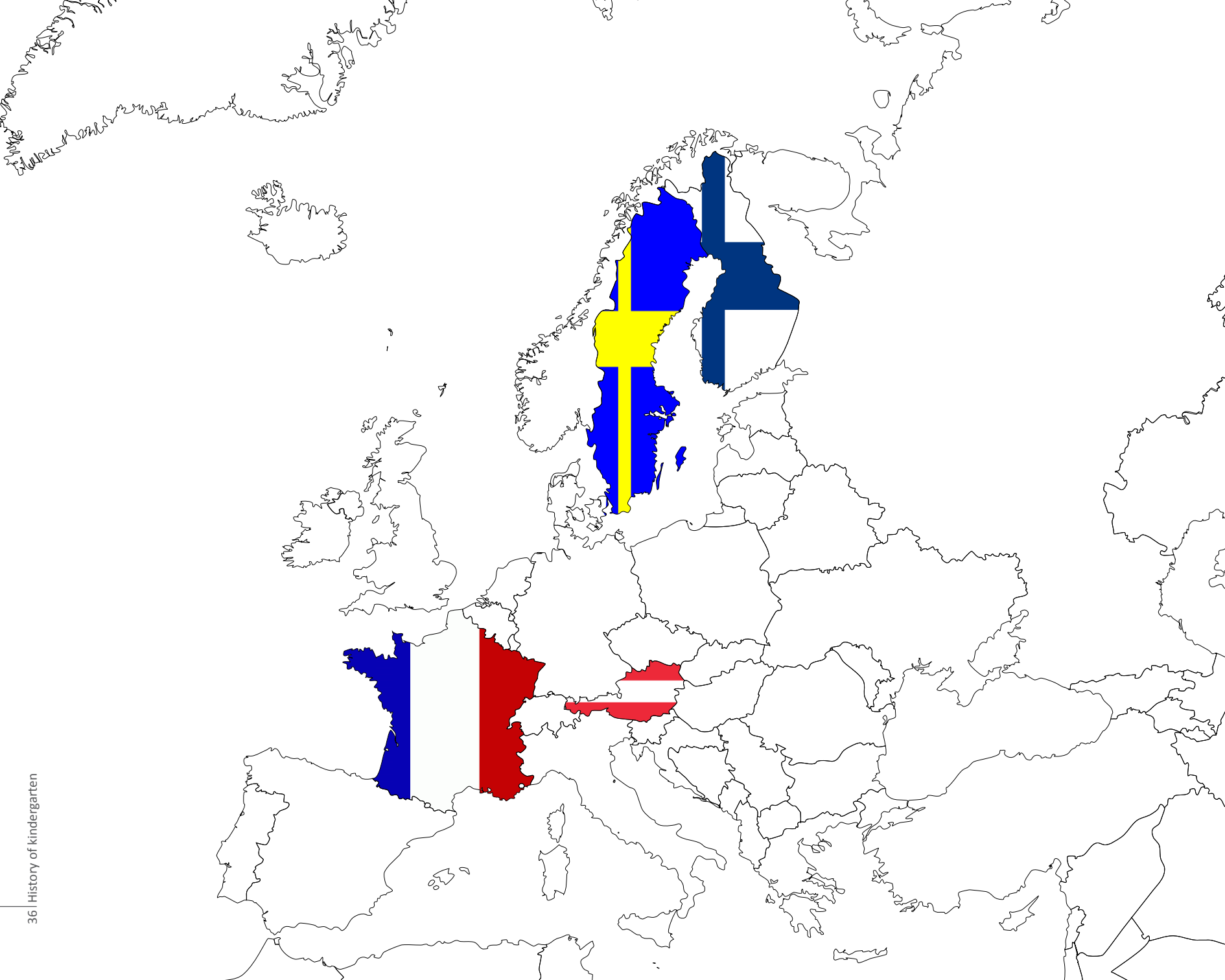
„Reggio Emilia schools seek to replicate the home and communal spaces in their environment. Classrooms have huge glass window panels that open out onto a central piazza and with a large, centrally located atelier and a smaller mini-atelier — clearly designated studio spaces for large-and small-group activities. There is an effort to create opportunities for children to interact in the piazza and classrooms; classrooms are connected with phones, passageways or windows; and lunchrooms and bathrooms are designed to encourage playful encounters." [22]

„Parents are an essential component of the program - a competent and active part of their children's learning experience. They are not considered consumers but co-responsible partners. Their right to participation is expected and supported; it takes many forms and can help ensure the welfare of all children in the program." [23]

[21] https://en.wikipedia.org/wiki/Reggio_Emilia_approach; 07.12.2015

[22] https://educationinjapan.wordpress.com/...; 07.12.2015

[23] http://www.learningmaterials-work.com/...; 07.12.2015



kindergartens in Europe today

In the elementary education - just like in education in general - there are huge differences between european countries. International studies show, that not only the systems, but also the quality of education differ from one another.
According to a UNICEF-survey in 2008 the scandinavian countries like Sweden and Finland, but also France lead the ranking of quality in education in Europe. In the scandinavian countries kindergartens are seen as educational institutions, where for example teaching of their mother tongue and also foreign languages is an important part of their daily routine.

In order to be prepared for teaching foreign languages and also to carry out simple scientific experiments, the finnish and swedish teachers mostly have an academic degree. In addition to that, the number of teachers compared to the number of children is higher than in Austria.[24]

ill. 029: map of Europe

[24] http://www.kindergarten.de/kindergaerten-im-europaeischen-vergleich.html

03

Analysis kindergarten

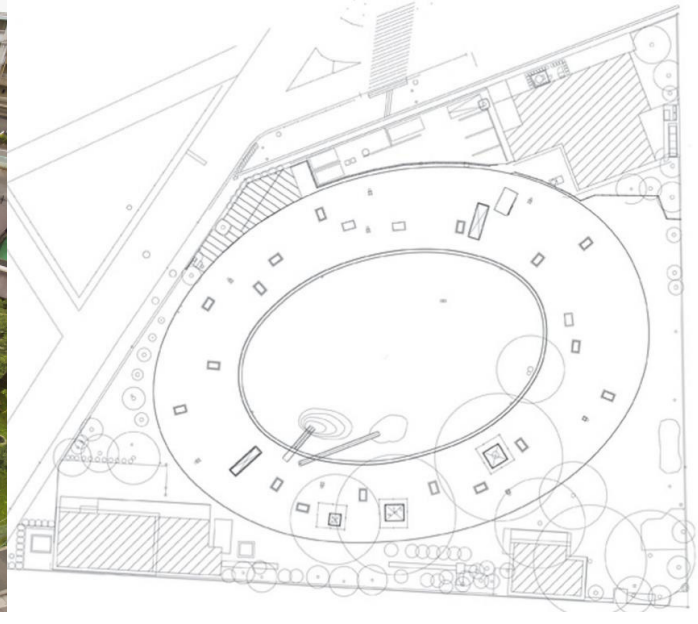
best practice international / national; kindergarten law Lower Austria

ill. 030:
Fuji Kindergarten

ill. 031:
Fuji Kindergarten ground plan

Kindergarten Fuji

Tezuka architects



Located in Tachikawa - a district of the japanese city of Tokio - the idea and the shape of the kindergarten can best be described as loop-shaped roof.

The shape of the building is oval with the outer facade using as much space of the plot as possible. In the middle there's a courtyard forming the one-storey building to a ring with slightly varying depths. The whole roof can be used as playground and especially as infinite running track. There are no group rooms in the building and the barrier from the inside to the courtyard is fluently designed with glass sliding elements.

„When you put many children in a quiet box, some of them get really nervous. In this kindergarten, there is no reason for them to get nervous. There is no boundary." [25]
The whole building is organized as one big open space, not forming any groups and only shaping the space with atriums for the trees, furniture and functional cores such as staircases and restrooms. Whenever the weather allows it, the inner facade to the atrium is opened, so that the building is no longer an „indoor-ring", but an „outdoor-arena" with a weather-proof roof all around it.

As the border to the courtyard is designed fluently, the whole kindergarten becomes one big playground. At ground level the courtyard provides water pumps to play with water, a slightly moulded landscape and a slide from the roof of the building.

The roof of the building can be seen as the most central element in the design of the building. It functions as already mentioned as a running track and as a second layer to get a different view of the kindergarten through one of the numerous skylights. Furthermore the children have access to the trees, that are growing through the building. The atriums that the trees grow through are only protected by fabric nets, that the kids can walk on and and therefrom climb the trees.

„Don't control them. Don't protect them too much. They need to tumble sometimes. They need to get injured. That makes them learn how to live in this world." [25]
That was - according to Montessori's approach „Help me to do it myself" - a main credo for the whole design process of the kindergarten. Give the children the chance to move freely, to discover things on their own and also to let them learn through trial and error.

Finally the architects also managed it to make the railing of the roof towards the courtyard usable. They figured out, that the size of the gap between the bars would still be big enough for the kids to get their feet, but not to fall through. So the whole railing of the ring also functions as an auditorium space for them to observe and study the happenings in their surrounding.

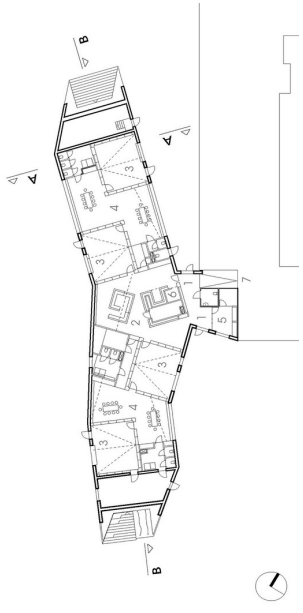
[25] http://www.archdaily.com/office/tezuka-architects; 21.12.2015

ill. 032: Råå daycare center ground plan

ill. 033-034: Råå daycare center

Råå Day Care Center

Dorte Mandrup Arkitekter



Råå is a small district with approximately 3000 inhabitants in the very southern part of the swedish city of Helsingborg.
It‘s characterized by the surrounding landscape at the beach with the mouth of the river Råån into the Öresund and the traditional local fisherman‘s houses. These are again characterized by their small scale, their gabled roofs and their (often also red coloured and narrow) wooden boards.

Both of these characteristics have been implemented into the design of the kindergarten, that is connected to the existing school in the eastern part.
According to the number of groups in the kindergarten the architects started the process with placing four „fisherman‘s houses“ into the landscape. In the following step these houses have been added a flowing landscape to connect them and set them into a common context.

As already mentioned, every group has got it‘s own house with a gabled roof, each of them with one of the two inclined planes totally glazed. According to the nordic education principles - Norway, Denmark, Sweden and Finland are known for their very good educational system - the number of children is planned not to exceed a figure of ten. This gives the nurses the time and possibilities to spend more time with each child and thus put more focus on individual strenght and weaknesses of every single one.

All of the groups are connected by the common spaces, that flow through the whole building. The barrier between groups and common room is not an opaque one, but executed as bookshelves with a transparent glass back panel.
„They create a fluent spatial experience and consistency and transparency through the entire institution.“ [26]

The facade and roof of the building are executed in the typical traditional untreated, natural boards from swedish robinia forming precise geometrical shapes.
The system of vertical boards is interrupted by one rectangular window in each group as well as triangular windows from the common rooms to the outside, which makes the difference between these two components visible on the outside.
Finally the „landscape“ - the roof - of the building is due to safety issues only usable at both ends of the building.

Surrounding the building there‘s a designed landscape with sandpits and mainly autochtonous plants.

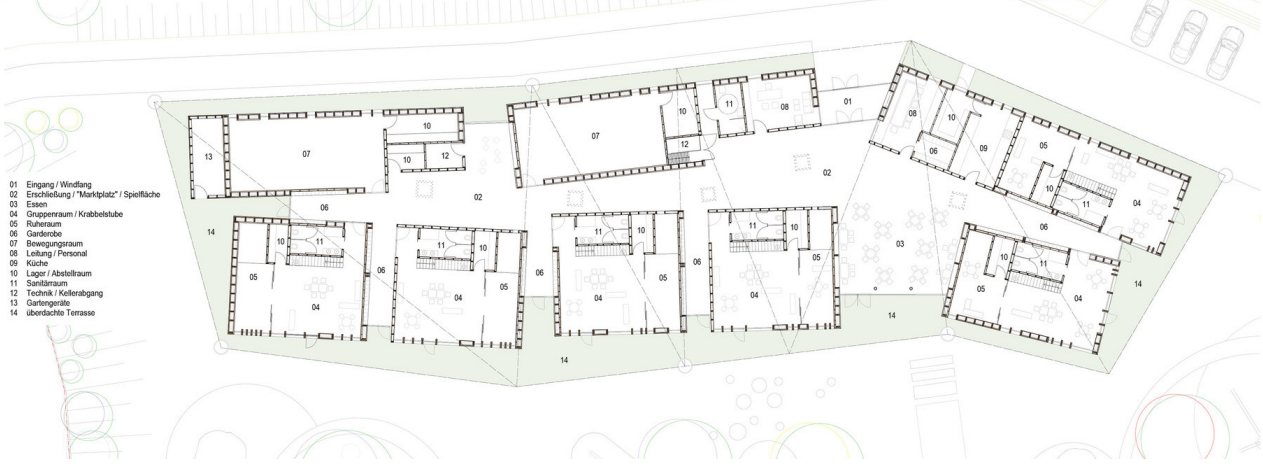
[26] http://www.dezeen.com/2014/...; 22.05.2017

ill. 035: Solar city Linz kindergarten
ground plan

ill. 036: Solar city Linz kindergarten

Kindergarten Solar City Linz

X Architekten



The solar city is a district of Linz planned around 1990 giving approximately 4000 people a home and also workplace. The main focus in the ciruclar small-town is on the energy optimized planning and execution of the buildings with sustainable materials.

A huge, extensively greened and folded roof, that connects the parts of the building to a unity is the distinctive feature of the kindergarten. It prevents the building in summer from overheating and provides weather-proof outdoor playgrounds.

Funtionally the kindergarten is organized in two layers. The first one faces north, accompanies the narrow road through which one can access the building. It accomodates the funtions entrance, gym, kitchen, staff and storage.

The second layer faces south and is entirely reserved for the four kindergarten groups and one toddler group, one more toddler group is oriented to the east. Apart from the facade all the four kindergarten groups are similar, the same counts for the two toddler groups. Between all of the six groups, there are different kinds of exits to the green space in the south, very narrow ones each between a pair of groups, wider ones between the others and a very wide right opposite the entrance to provide a view from there into the garden.

Each kindergarten group consist of a big multifunctional room, a recreation room, a storage room and a restroom. Addtionally there‘s space on top of the restroom and storage to provide a cavernous refuge appropriate for children. This space has got a visual link to the common room in the northern part of the groups.

The common space is planned as a market place in the entrance area in order to accomodate the dining room as well as the hallway. In the rear area the hallway is designed wide enough to make it usable as a playground, opening little gaps to the facade to ensure natural lighting and to create little corners for playing as well as for wardrobe uses.

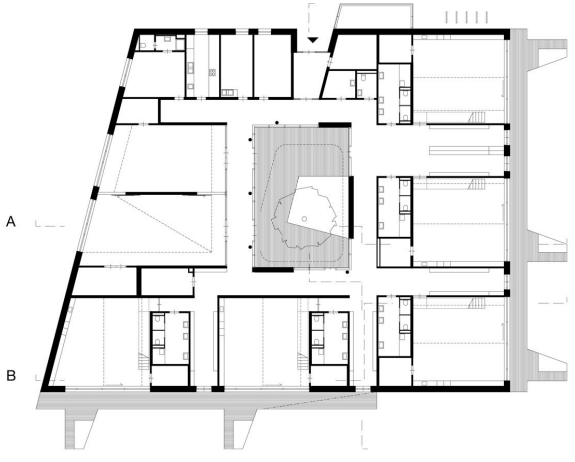
As already mentioned, especially in the southern part the big common roof functions as a shading element and the place underneath again as playground linking all the spaces in front of the building together.
From there one can access the south-western garden with swings and sandboxes to play with and trees and hills to explore the surrounding nature.

ill. 037: Ternitz kindergarten

ill. 038: Ternitz kindergarten
ground plan

Kindergarten Ternitz

AWG - Alles wird gut Architekten



The kindergarten in Ternitz - Lower Austria - is organized around a central courtyard, thus providing with the garden around it two different types of green outdoor spaces. The building - positioned in the north-western part of the plot furthermore divides the L-shaped plot into two different outdoor playgrounds - one in the eastern part of the building along the street and one in the southern part - more or less a backyard.

All the functionally necessary units - group rooms, gym, staff room and kitchen - are organized around the outer facade. Only narrow gaps between them open the hallway to the garden. Instead of, the hallway in the middle is directly linked to the courtyard, with most of its facade glazed - open and transparent.

The hallway itself is designed wide enough to be used as a multifunctional space - mainly as a bobby car-track. As far as the weather conditions allow it, the facade is of course open to extend the hallway spaces and to blur the boundaries between indoor and outdoor. The overhanging roof - as seen on the picture on the left page - prevents some of the outdoor parts from rain.

For special events the whole gym can also be connected to the hallway. In addition with the courtyard it provides enough space especially for parties in summer. Though beeing outdoor, there is no need to worry too much about children, since there is a closed building all around the central courtyard.

Kindergarten law Lower Austria

Abschnitt II Kindergartenbau

§ 10 Gebäude, Liegenschaften und Raumbedarf

(1) Der Standort eines Kindergartens muss für jede Kindergartengruppe eine Grundfläche von mindestens 800m² aufweisen. Davon dürfen höchstens 40 v.H. verbaut werden. Für jede Kindergartengruppe ist eine Fläche von mindestens 480m² zum Spielen im Freien vorzusehen.

(2) Für jede Kindergartengruppe ist ein Gruppenraum (mindestens 60m²), diesem zugeordnet ein Abstellraum, eine Garderobe und eine Sanitäranlage für Kinder vorzusehen.

(3)Für jeden Kindergarten sind ein Bewegungsraum (mindestens 60m²) samt zugeordnetem Abstellraum, eine Leiterinnenkanzlei (Leiterkanzlei), eine Teeküche, ein Abstellraum für Reinigungsgeräte, ein Abstellraum für Gartengeräte, eine Personalgarderobe sowie ein WC für Erwachsene samt Dusche einzurichten.

(4) In Ausnahmefällen kann von Abs. 1 abgegangen werden, sofern dennoch die Aufgaben des § 3 erreicht werden.

§ 11 Bauliche Gestaltung

(1) Kindergartengebäude sind in allen ihren Teilen nach dem jeweiligen Stand der Technik und nach den pädagogischen und sicherheitstechnischen Erfordernissen zu errichten.

(2) Das selbständige Verlassen des Gebäudes mit Ausnahme des Fluchtweges in die Freifläche seitens der Kinder ist mittels geeigneter Vorkehrungen zu verhindern. Ebenso ist das selbständige Verlassen der Liegenschaft zu verhindern.

(3) Zur Beaufsichtigung der Kinder ist vom Gruppenraum zur Garderobe eine Glasdurchsicht (mindestens ESG) vorzusehen, dessen Unterkante 1,10m und deren Oberkante 1,80m über Fußboden zu liegen hat.

(4) Zumindest die Hälfte der Fenster im Gruppenraum darf eine Parapethöhe von 0,50m üper Fußbodenoberkante nicht überschreiten.

[27] https://www.ris.bka.gv.at/...; 22.05.2017

NÖ Kindergartengesetz 2006, LGBl 5060

NÖ Bauordnung 1996, LGBl 8200-1

NÖ Bautechnikverordnung 1997, LGBl 8200-7

NÖ Bediensteten-Schutzgesetz 1998, LGBl 2015

NÖ Bediensteten-Schutzverordnung 2003
LGBl 2015/1-2

ÖNORM B1600
Barrierefreies Bauen

ÖNORM A1640
Möbel für Kinder in Kindergärten

ÖNORM B5371
Geländer, Brüstungen

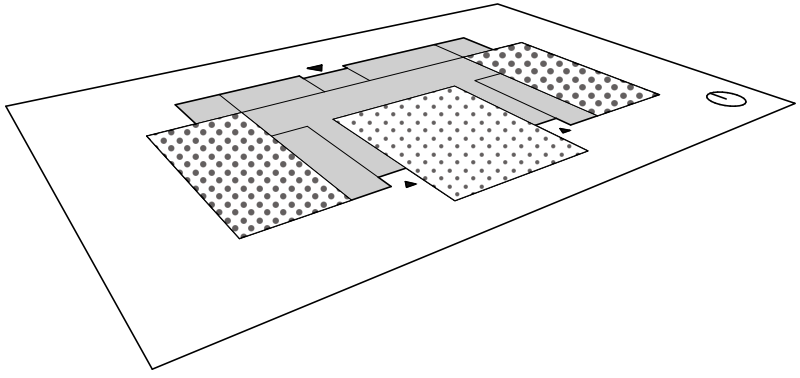
ÖNORM B2607
Spielplätze - Planungsrichtlinien

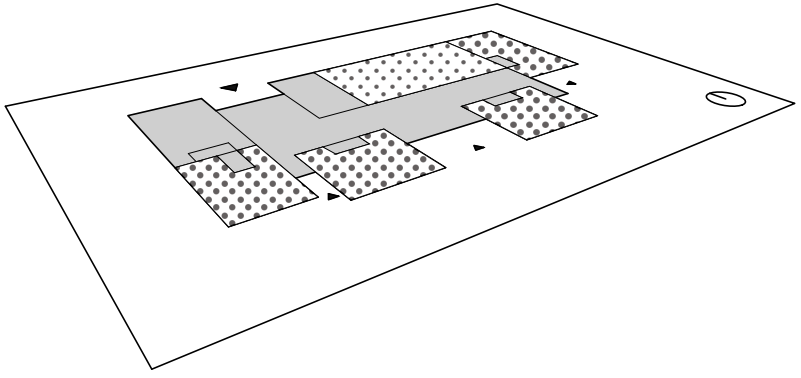
ÖNORM EN1176/1-7
Spielplatzgeräte

04

Design

inspirations, concept, ground plans, sections, elevations, interior visualisations





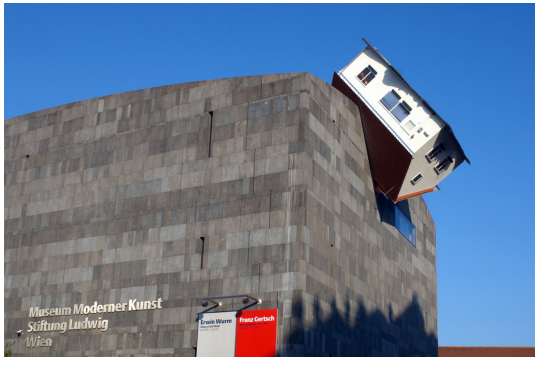
ill. 040: room schedule comparison existing - new kinder-garten

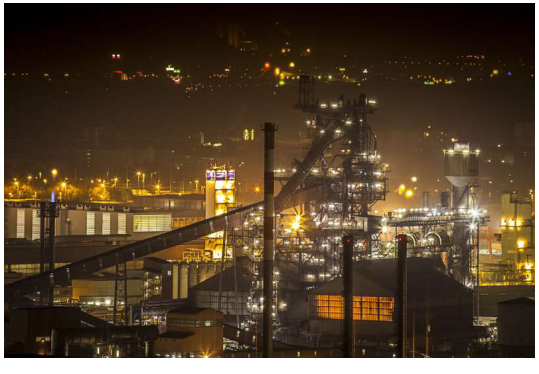
Raumprogramm

room schedule

es ist bereits ein Klimabündniskindergarten, sollte 4 gruppig und ebenerdig sein	4 groups, should be at ground level
da auch kleine Kinder unbedingt Wickelgelegenheit	toddler‘s group -> baby change unit, little bath tub
Personal- bzw. Sozialraum mit Garderobe für Mitarbeiter	staff room with wardrobe for employees
Küche für Essenzubereitung Jause und Mittag	kitchen for snacks and maybe lunch
Gruppenräume mit ca. 60 m² und jeweils ein Aufbewahrungsraum für Bastel- und Spielgeräte	group room 60m² with storage space
je Gruppe eine Garderobe	a wardrobe for each group
WC und Duschgelegenheit für draußen bei Schönwetter	outdoor toilet and shower (fair weather)
Ausspeisungsraum	dining room
Turnsaal mit 80 m² und Materialraum	gym 80m² and storage
Eingangsbereich mit Bibliothek und Ruhezone	entry with library and rehabilitation area

[28] Kindergarten Mühling; 09.11.2015


Museum Moderner Kunst
Stiftung Ludwig
Wien



It is the unconventional/unusual/abnormal things that you keep in good memory. Be it the shape, the colour, the scale or the (hidden) detail: all of them have the potential to leave their marks.

To me the Zeche Zollverein and the Voest Linz are perfect examples for buildings, that impress with their scale and their detail. Thinking back to the days when I was a boy, I would have spent hours, days and weeks exploring the area.

The Vitra design Museum fits the topic of making rural building traditions subject of discussion, reinterpreting them and therefrom generating someting new.

Concerning shape and geometry the Guggenheim museum in Bilbao and the house for Essex show a number of interesting aspects. While the museum mainly plays with deforming simple bodies, the house for essex can be seen as a smorgasbord of elements following typical elements appearing in children‘s books and programmes.

Finally one personal memory, that is still present in my head, is the comparison between the two different universities, that i have studied at. This is firstly of course the TU Vienna with its roots dating back to 1816 and secondly the faculty for architecture at the CVUT in Prague, finished in 2011.

Thinking of the first days at university in Vienna, it strikes me how often i had to check the site plan before going to classes. It took me quite a while/challenged me to understand the spatial relations within the building.

When in autumn 2012 I went to Prague to do an ERASMUS-Semester I was quite amazed about the simple and clear structure of the building. However, after a week the building appeared just like a boring uninspired block to me, neither challenging me to find any specialties/differences, neither to find my way to classes.

After returning to Vienna I was really relieved about having back this historically grown structure, that offers so many different spaces with different qualities.

ill. 040: Zeche Zollverein

ill. 041: A house for Essex

ill. 042: Vitra Design Museum

ill. 043: Kindergarten Guastalla

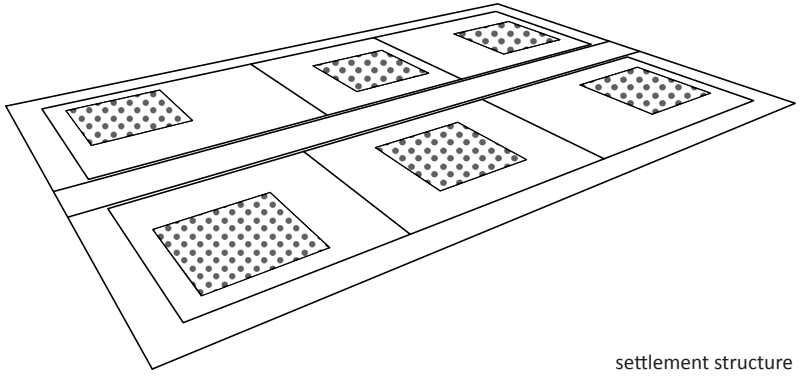
ill. 044: Mumok House

ill. 045: Guggenheim Bilbao

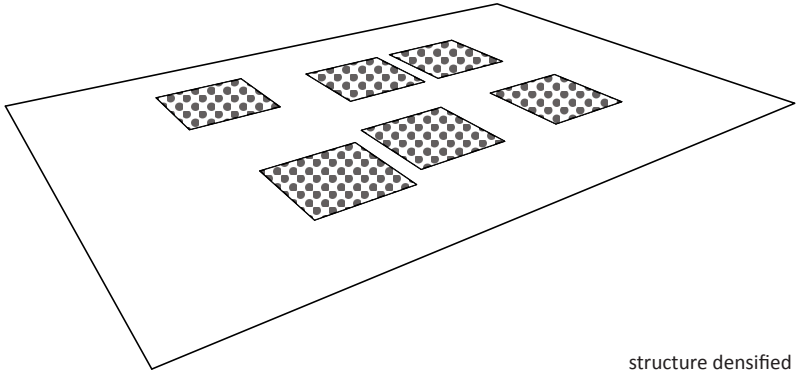
ill. 046: Voest Alpine Linz

ill. 047: CVUT Prague

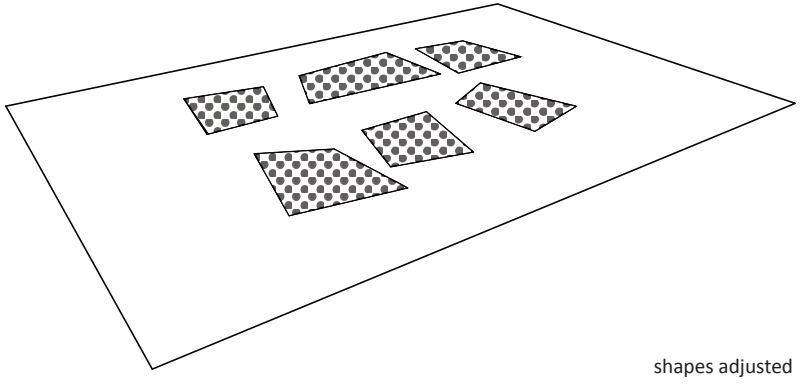
ill. 048: Kuppelsaal TU Vienna



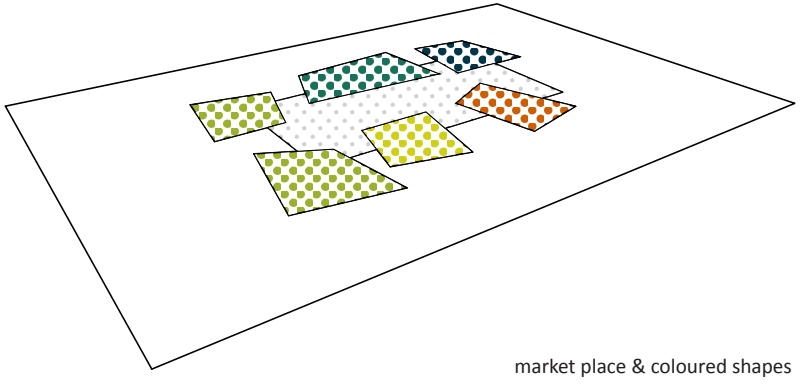
settlement structure



structure densified



shapes adjusted



market place & coloured shapes

„The most important aim of your project must be to delight and inspire the children with your building. Whenever they pass by it, they have to be curious about the day they will be able to join the kindergarten-community.“ [29]

According to the number of aspects listed on the prior page, the project tries to deal with a couple of them to achieve that goal.

First of all I decided to implement the structure of the surrounding buildings into my design, thus keeping single elements visible also on the outside of the building. Further on I densified this conglomeration and connceted them with another layer, which formally stays very much in the background - the entrance hall/market place.

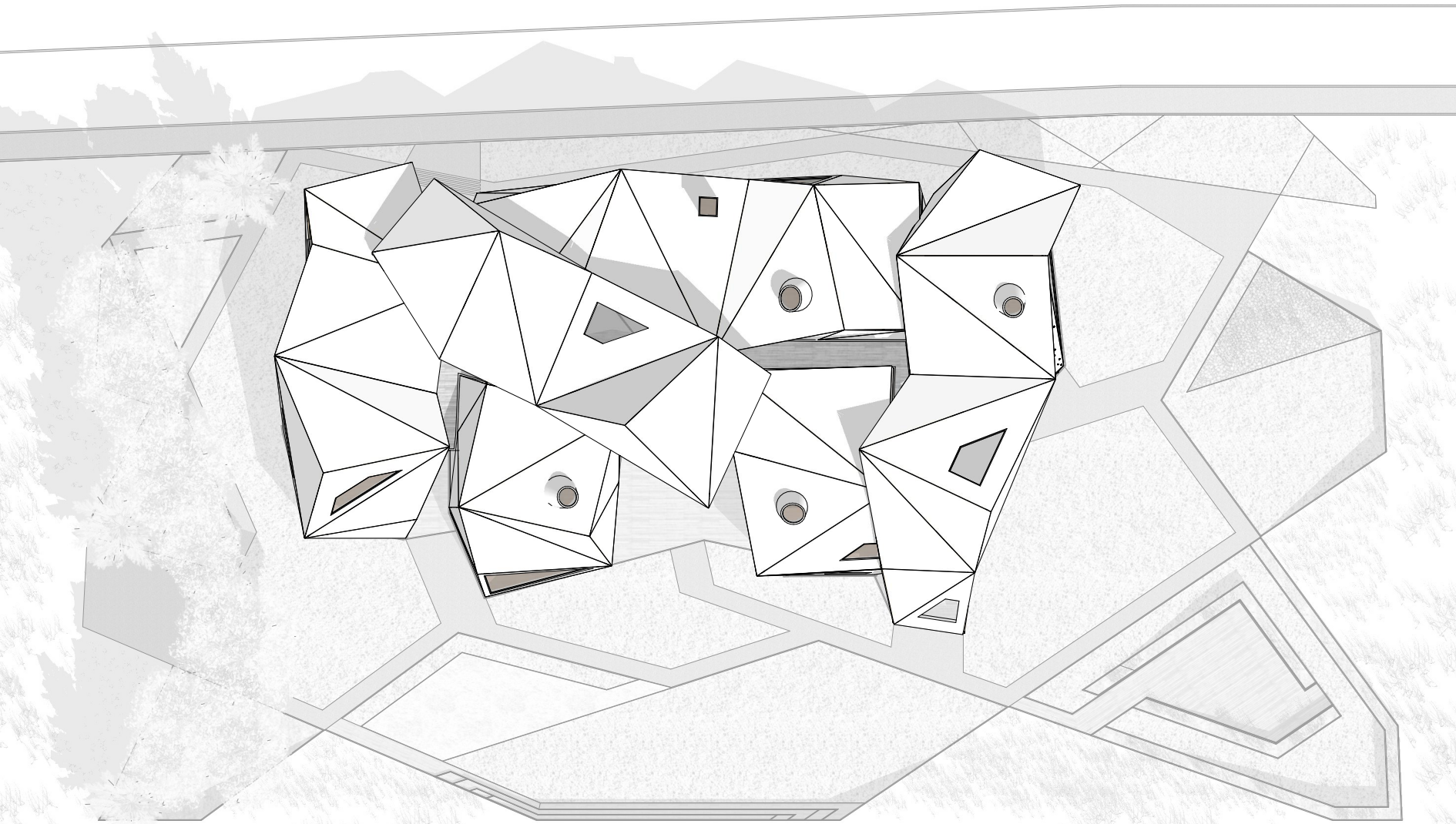
Concerning shape and geometry, there is a contrast between the rectangular box on the ground floor and the studios entirely made from triangular faces. The load bearing structure of the triangular elements can also be seen on the indside to make the static principle visible.

In order to transport the inner structure also to the outside, every studio is covered in a different colour. Only the entrance hall is painted in simple white and dark grey.

Finally the load bearing structure also has a major influence on the level of detail of the interior. It is not only the exterior walls, that follow the shape, but also a filter layer between market place and the studios.

[29] consultation Will Alsop; 26.01.2016

ill. 049: conceptual approach


0
5
10

03 staff

05 studio maker

06 studio painting

07 studio construction

08 studio music

09 gym

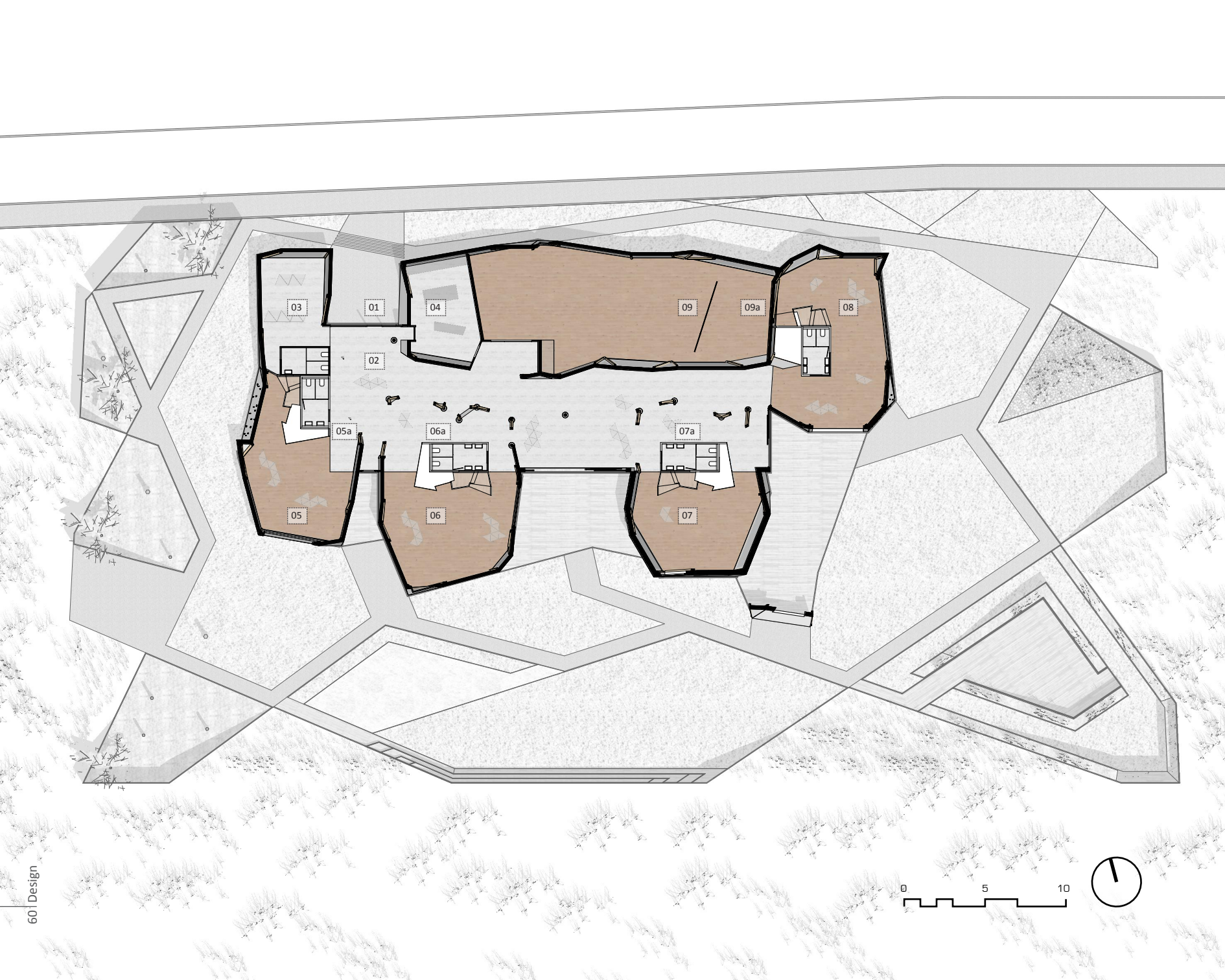
11 roof

The site plan shows a conglomeration of five solitary buildings with partly double heights (up to seven meters) and one component entirely used as a roof.

This roof covers the two main entrances to the building, one in the north, which functions as entrance from the street and one to the south, which is used as entrance to the yard.

On the ground floor the solitary buildings are connected by the one-storey market place with a height of three meters. Each of the studios is interconnected with the market place, which means, that the ceiling of the market place is extended into the studio / the studios are shifted into the market place.

ill. 050: site plan 1:333


03
01
04
09
09a
08
02
05a
06a
07a
05
06
07
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5
10

01 entrance

02 entrance hall/market place

03 staff

04 kitchen

05 studio maker
- 05a filter layer with wardrobe, restroom

06 studio painting
- 06a filter layer with wardrobe, restroom

07 studio construction
- 07a filter layer with wardrobe, restroom

08 studio music

09 gym
- 09a gym storage

The kindergarten is entered through the entrance in the northern part between staff room and kitchen/gym. From there you can directly enter the staff room, the kitchen and the market place.

The multifunctional market place is the central element of the kindergarten, basically everything is accessed from there.

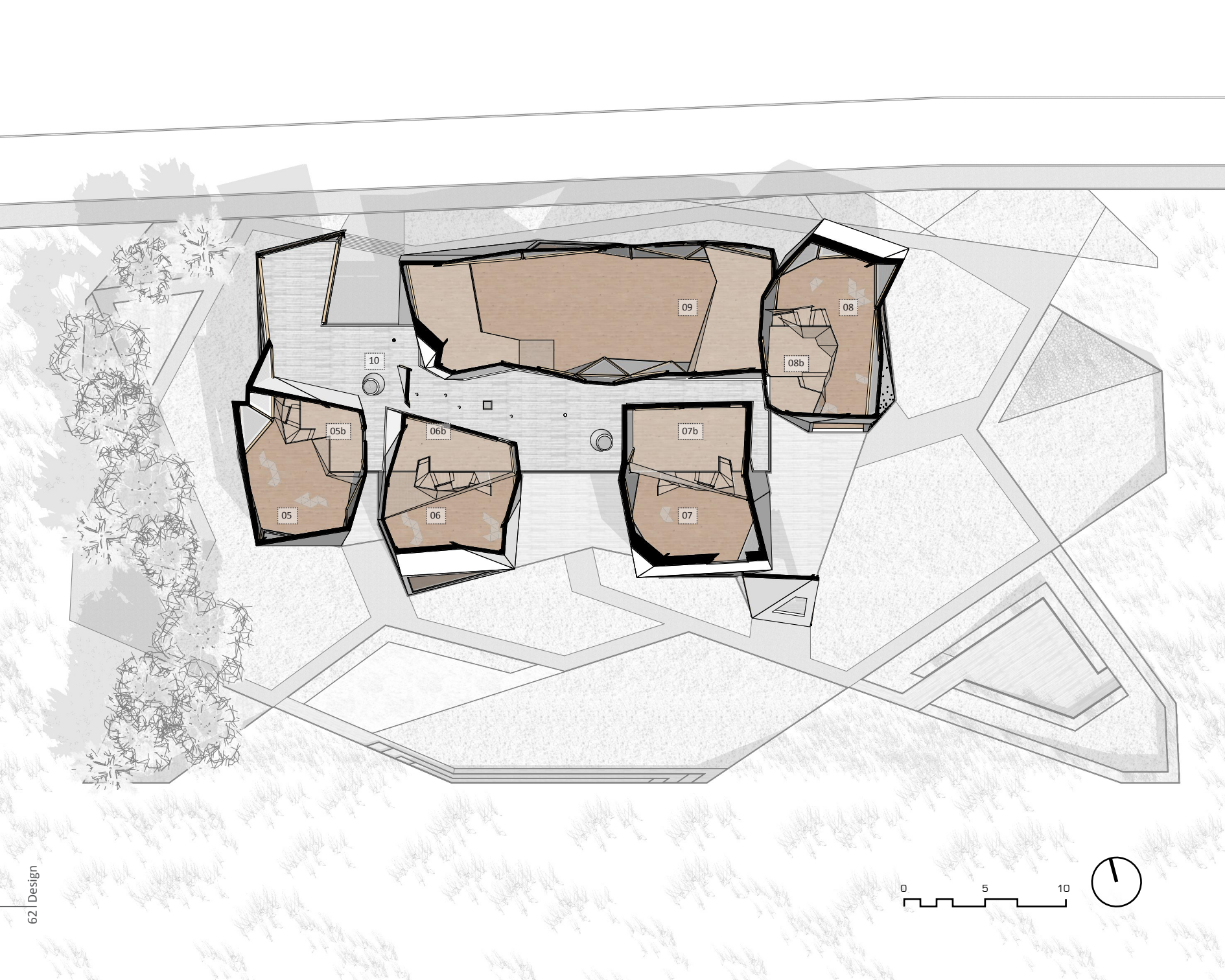
This is firstly the kitchen in the north, where another entrance makes it possible, that children can take part in the daily work in the kitchen.

Secondly it‘s the gym, that is also accessed via the market place and can be connected to it.

Thirdly it is the studios, which are divided from the market place by the sanitary boxes and a filter layer of columns used as wardrobes.

And finally it is the entrance to the yard between each of the studios.

ill. 051: ground plan +1,00 1:333


09
08
08b
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05b
06b
07b
05
06
07
0
5
10

05 studio maker
05b gallery studio maker

06 studio painting
06b gallery studio painting

07 studio construction
07b gallery studio construction

08 studio music
08b gallery studio music

09 gym

10 rooftop playground

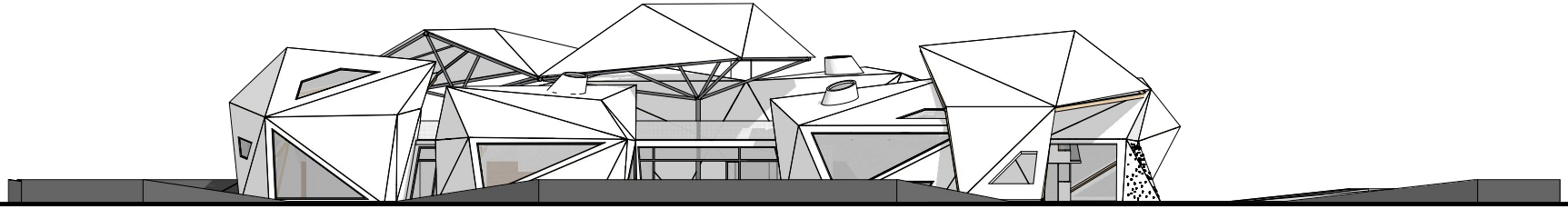
Another characteristic element of this kindergarten is the rooftop playground, which is only accessible through the galleries of the studios.

It is sheltered by the red roof, which is carried by a tree prop.

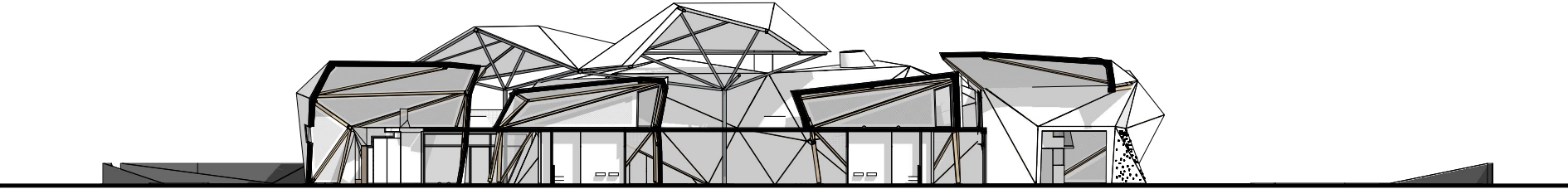
In addition to that, it provides openings to the market place to ensure a spatial relation between the inside and the outside.

Finally the openings between the studios assure connections between the rooftop playground and the yard and a visual axis to the Ötscher - the mountain that the community around Wieselburg identifies itself with.

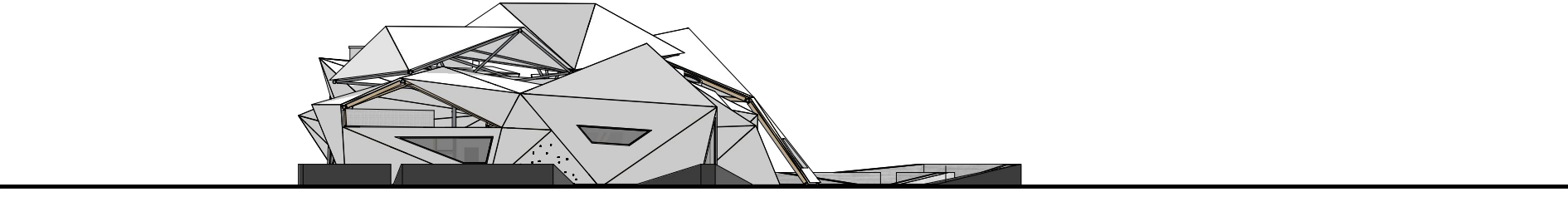
ill. 052: ground plan +4,00 1:333



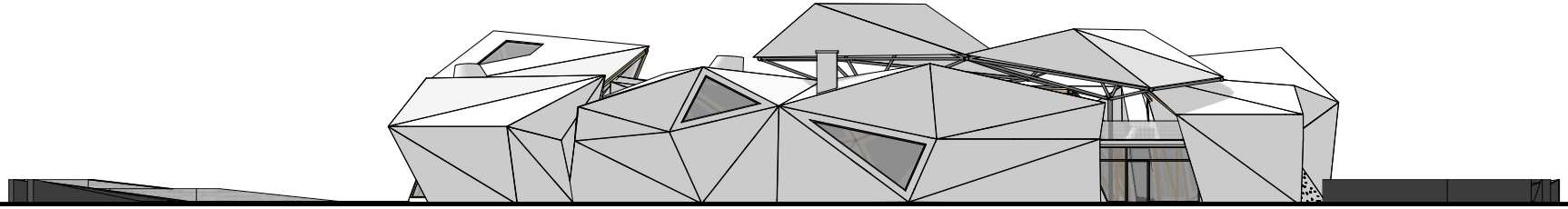
elevation south



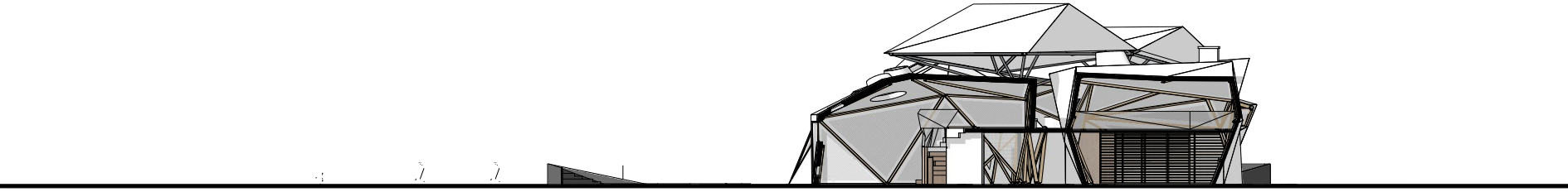
longitudinal section



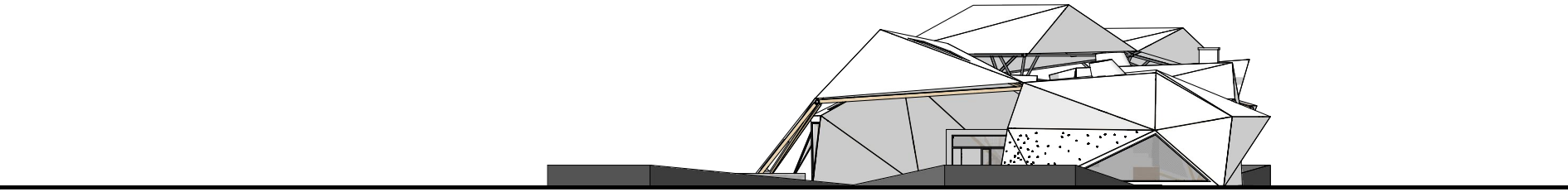
elevation west



elevation north

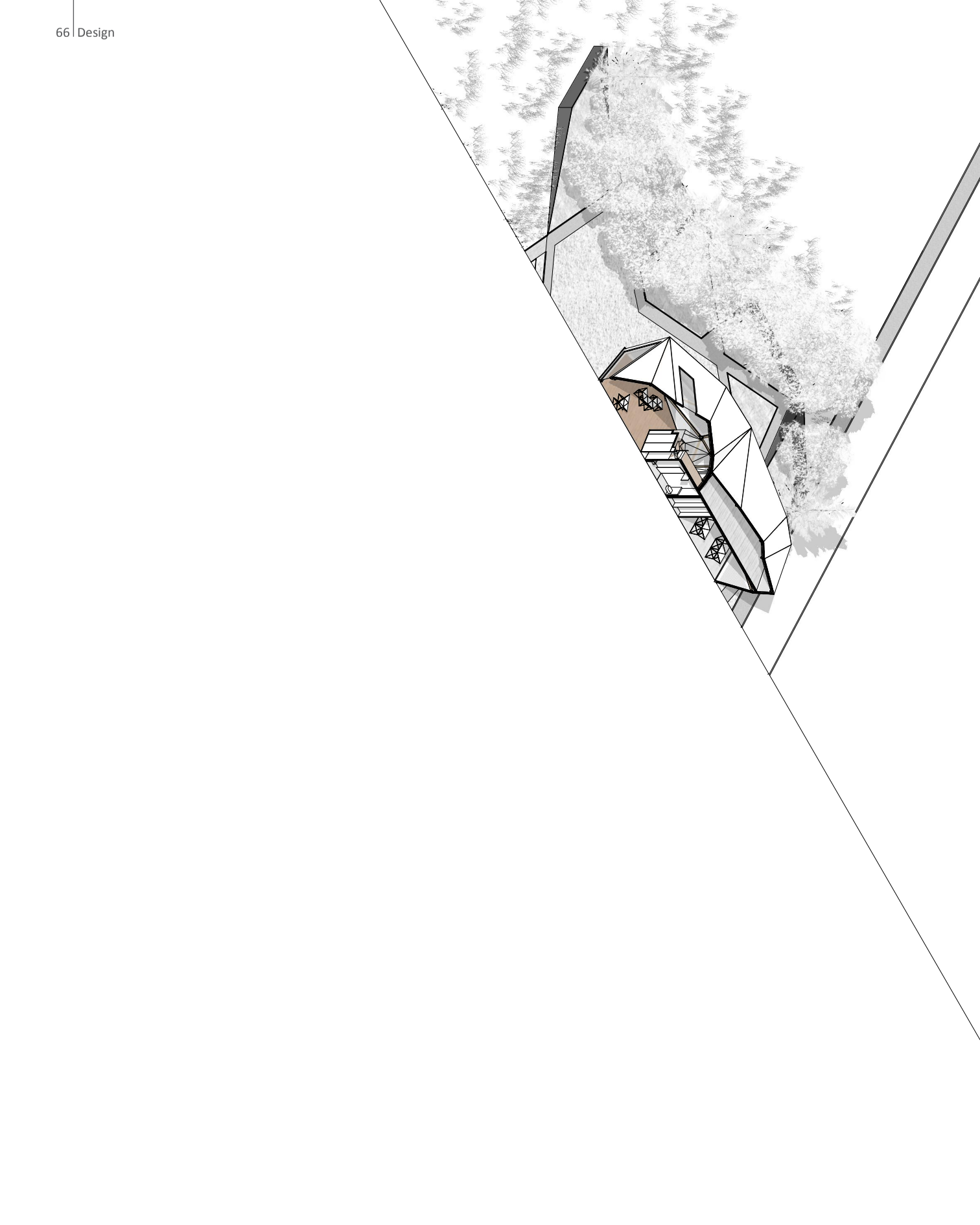


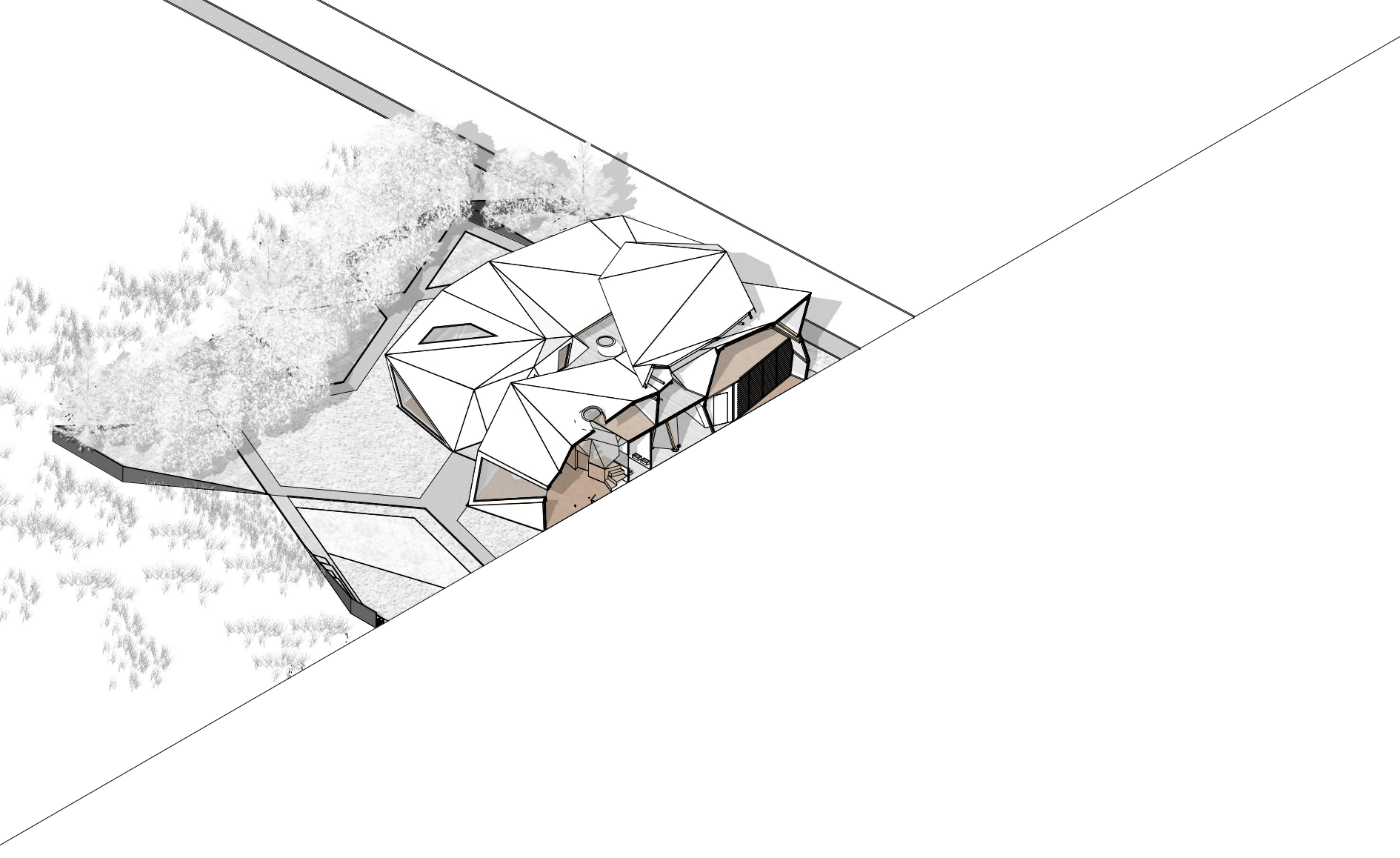
cross section



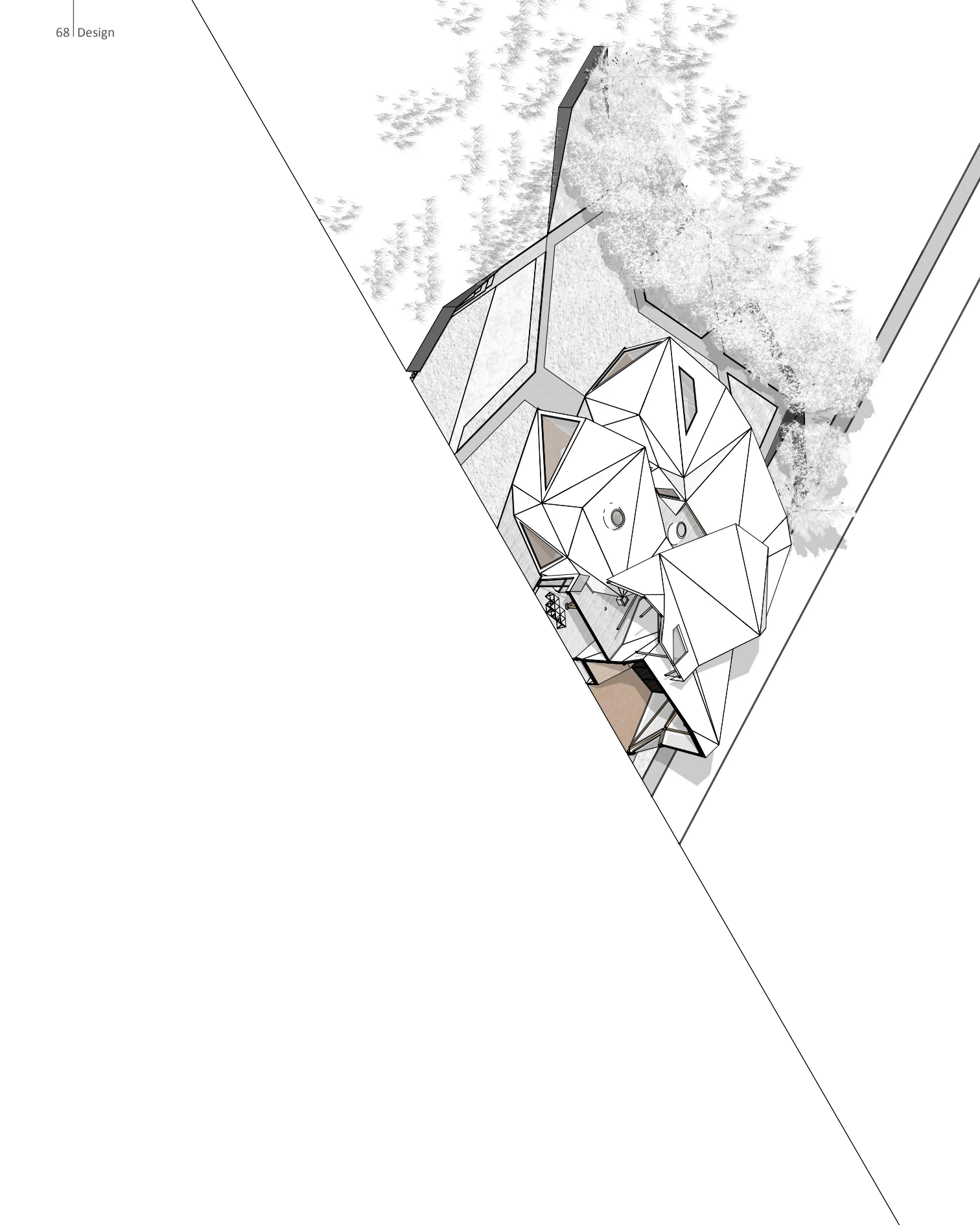
elevation east

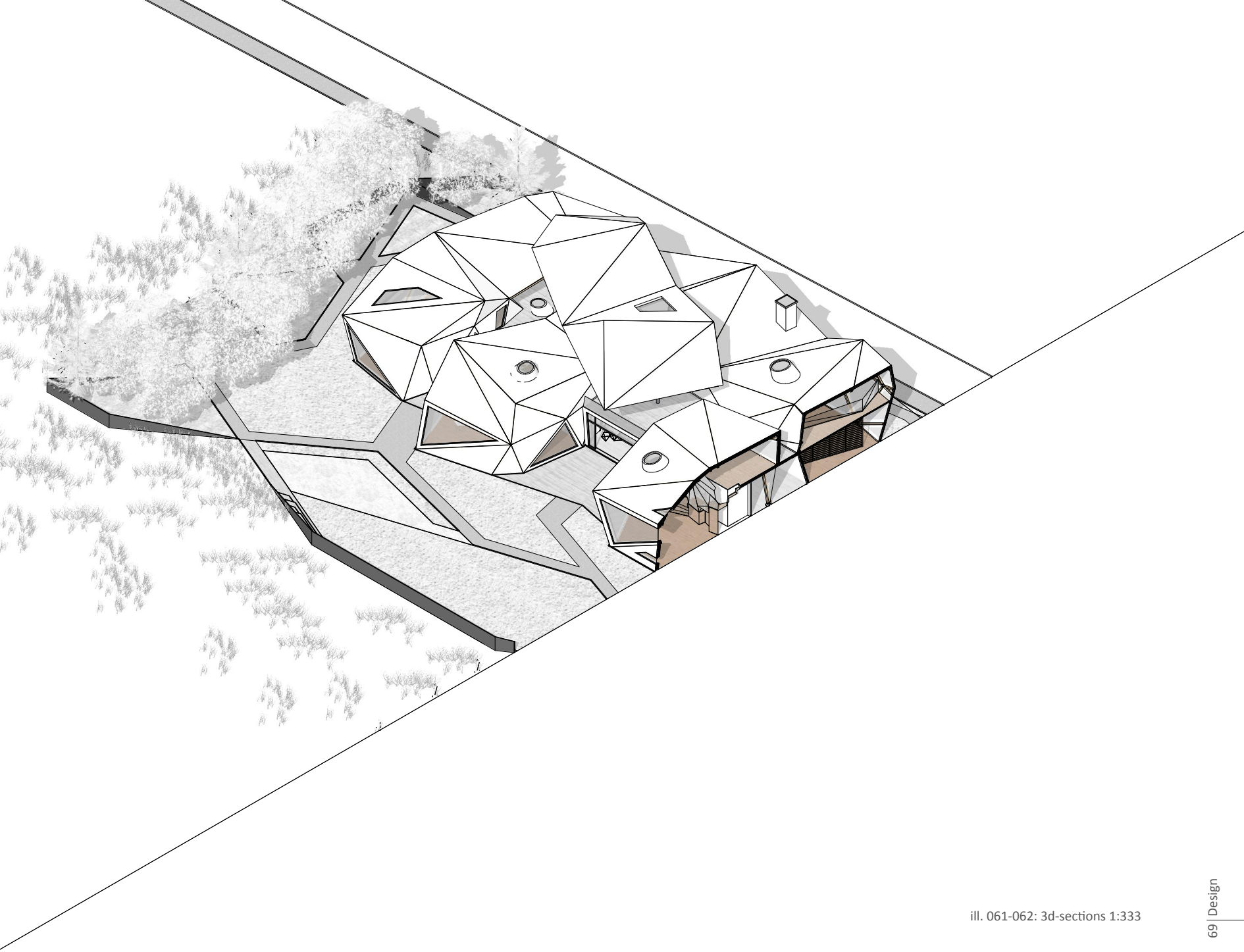
ill. 053-058: sections/elevations
1:333



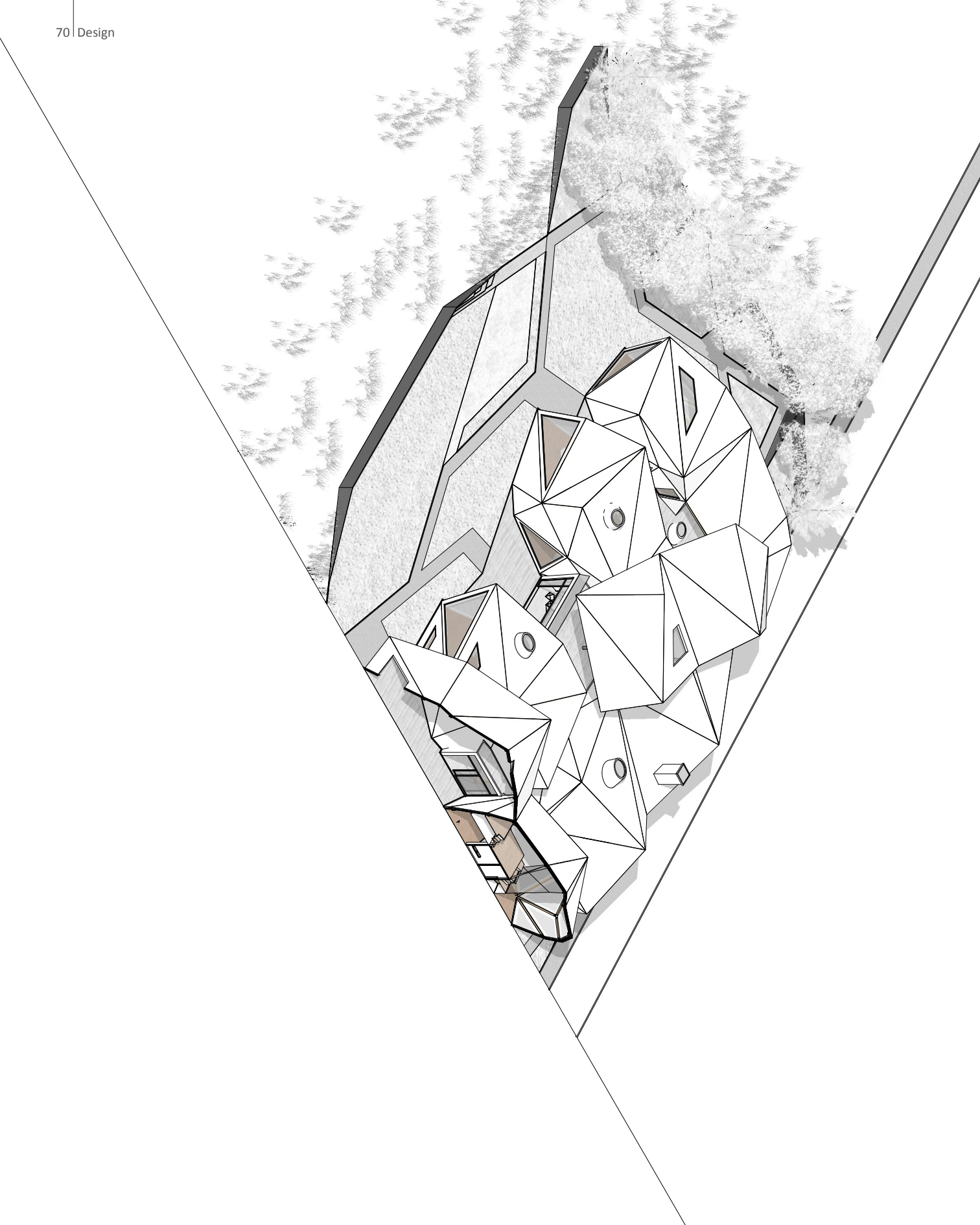


ill. 059-060: 3d-sections 1:333

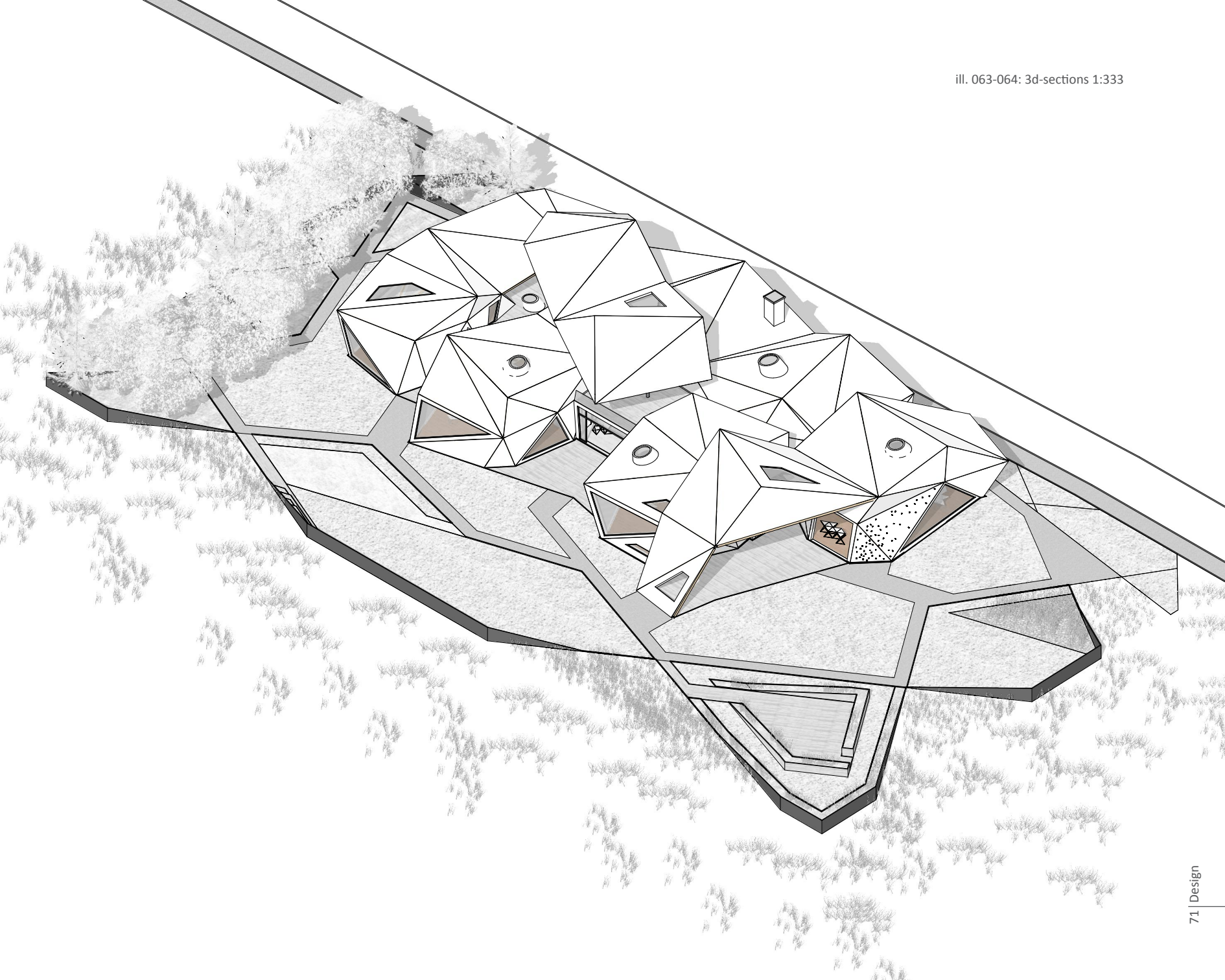


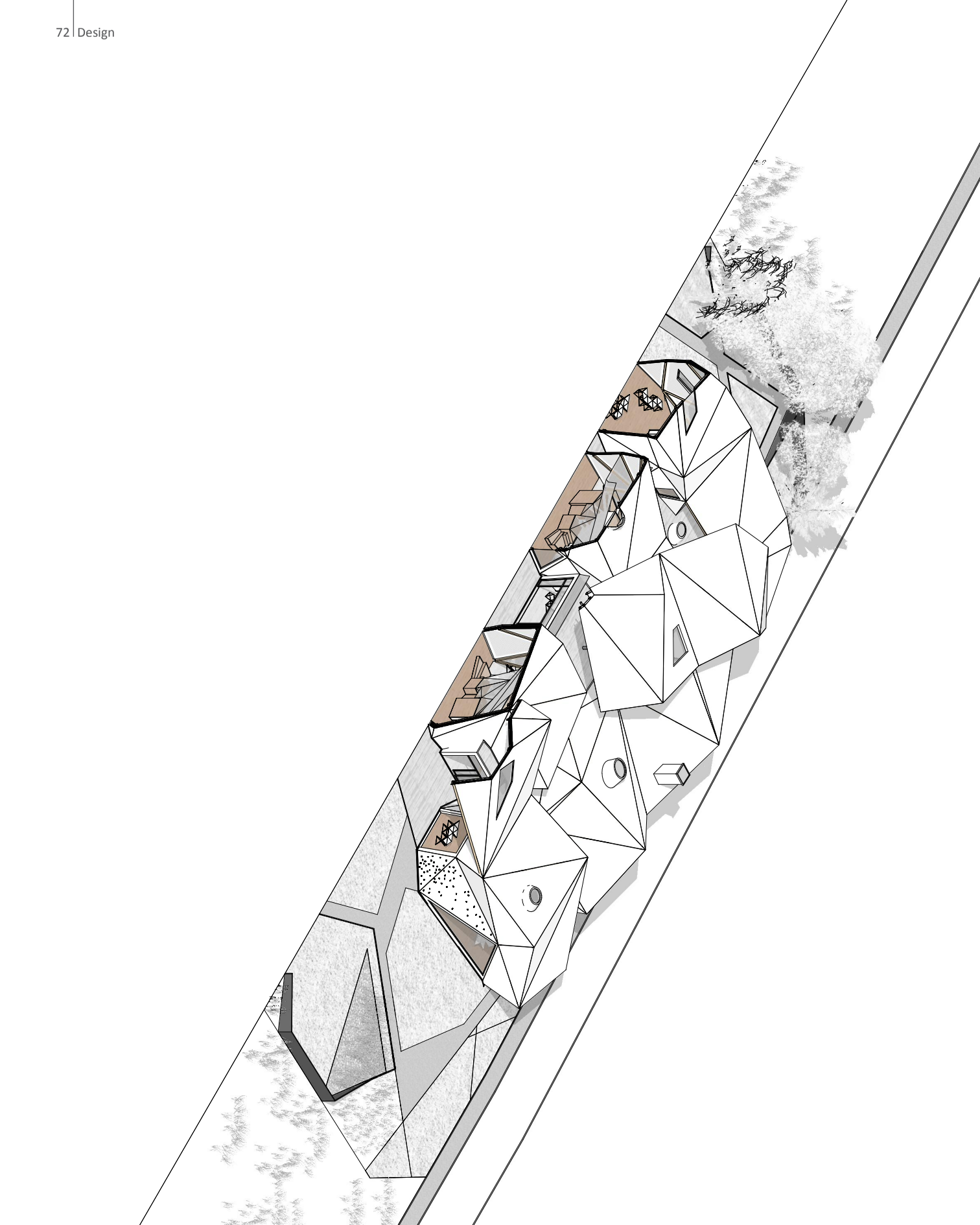


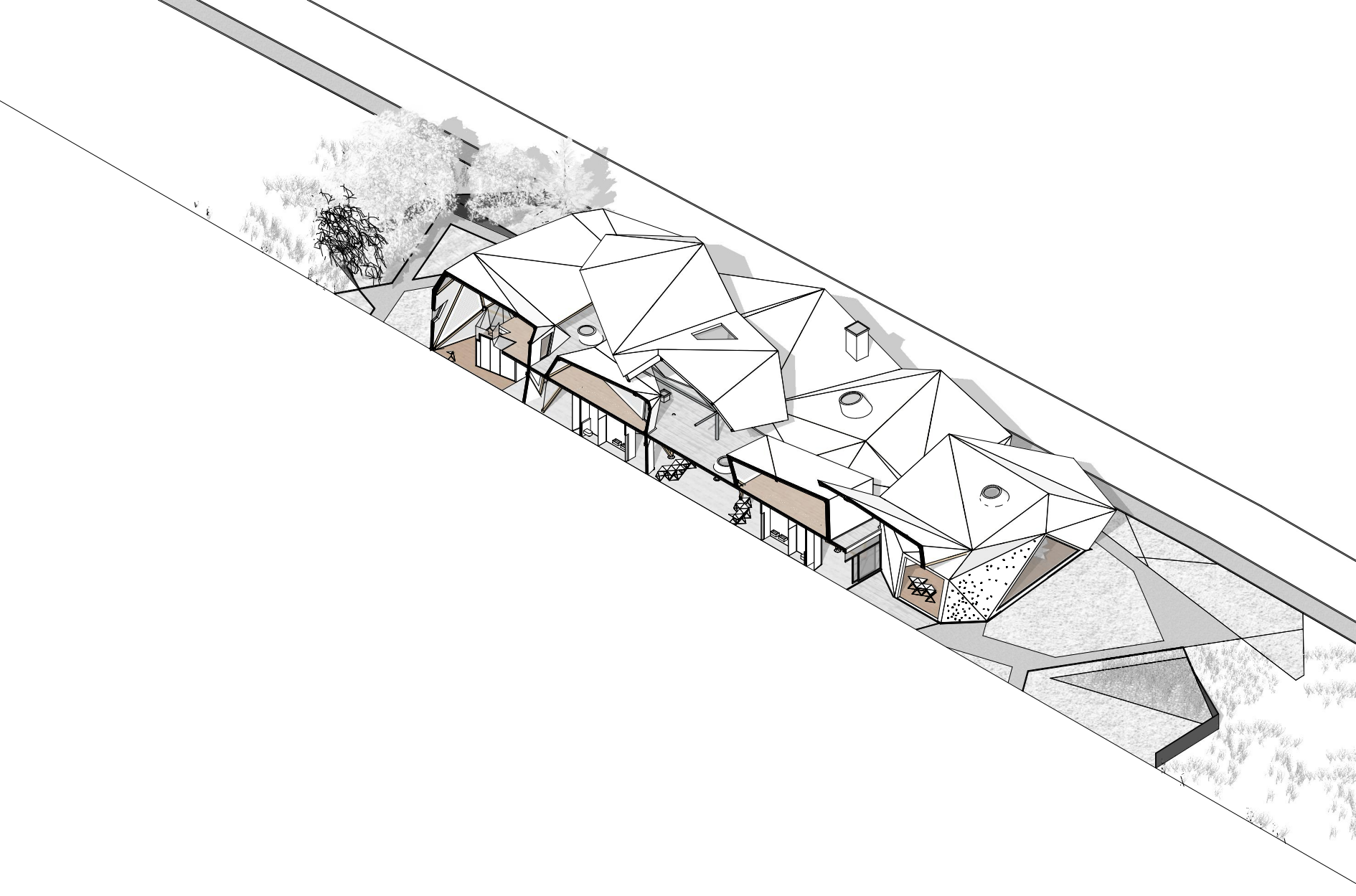
ill. 061-062: 3d-sections 1:333



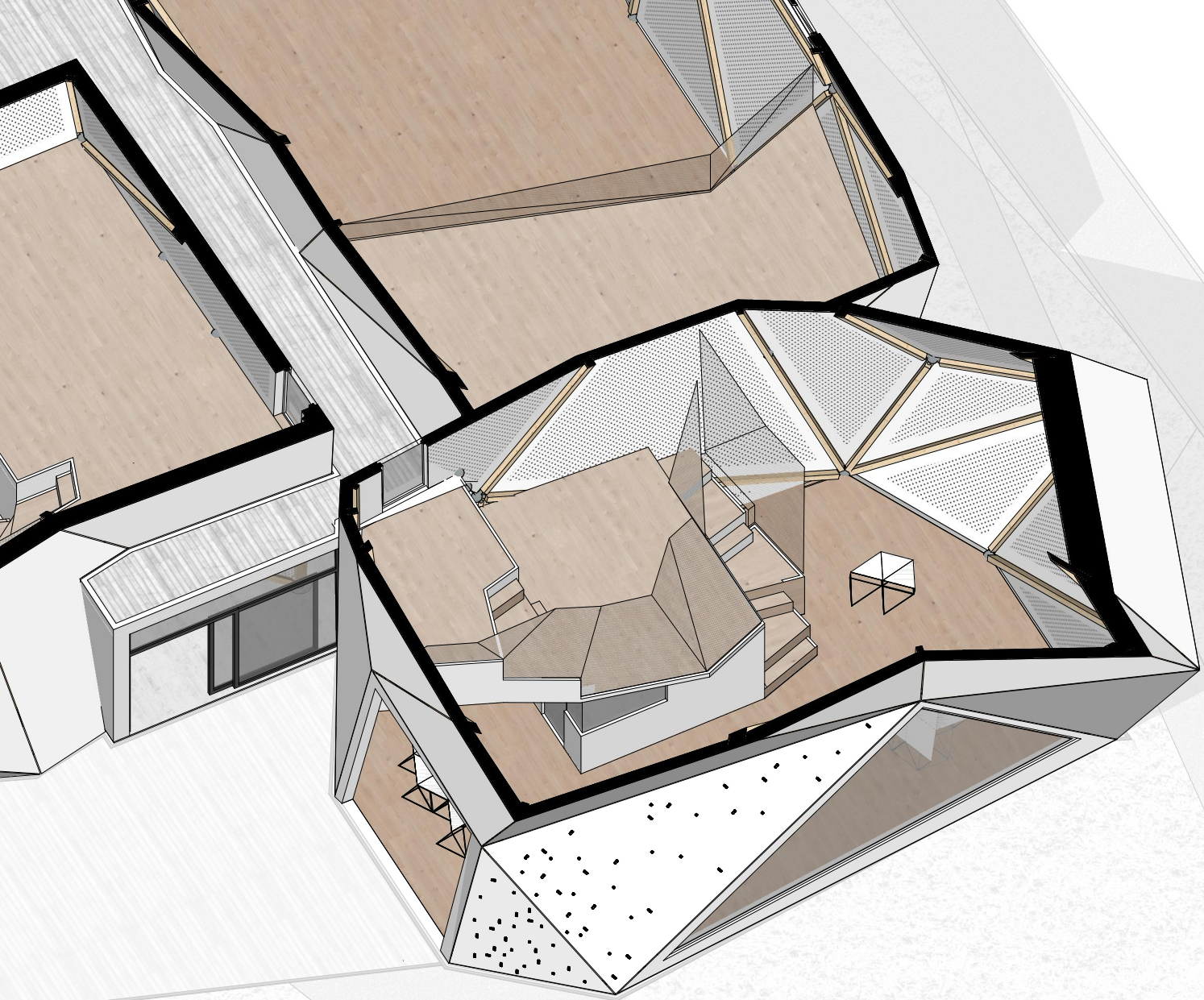
ill. 063-064: 3d-sections 1:333







ill. 065-066: 3d-sections 1:333



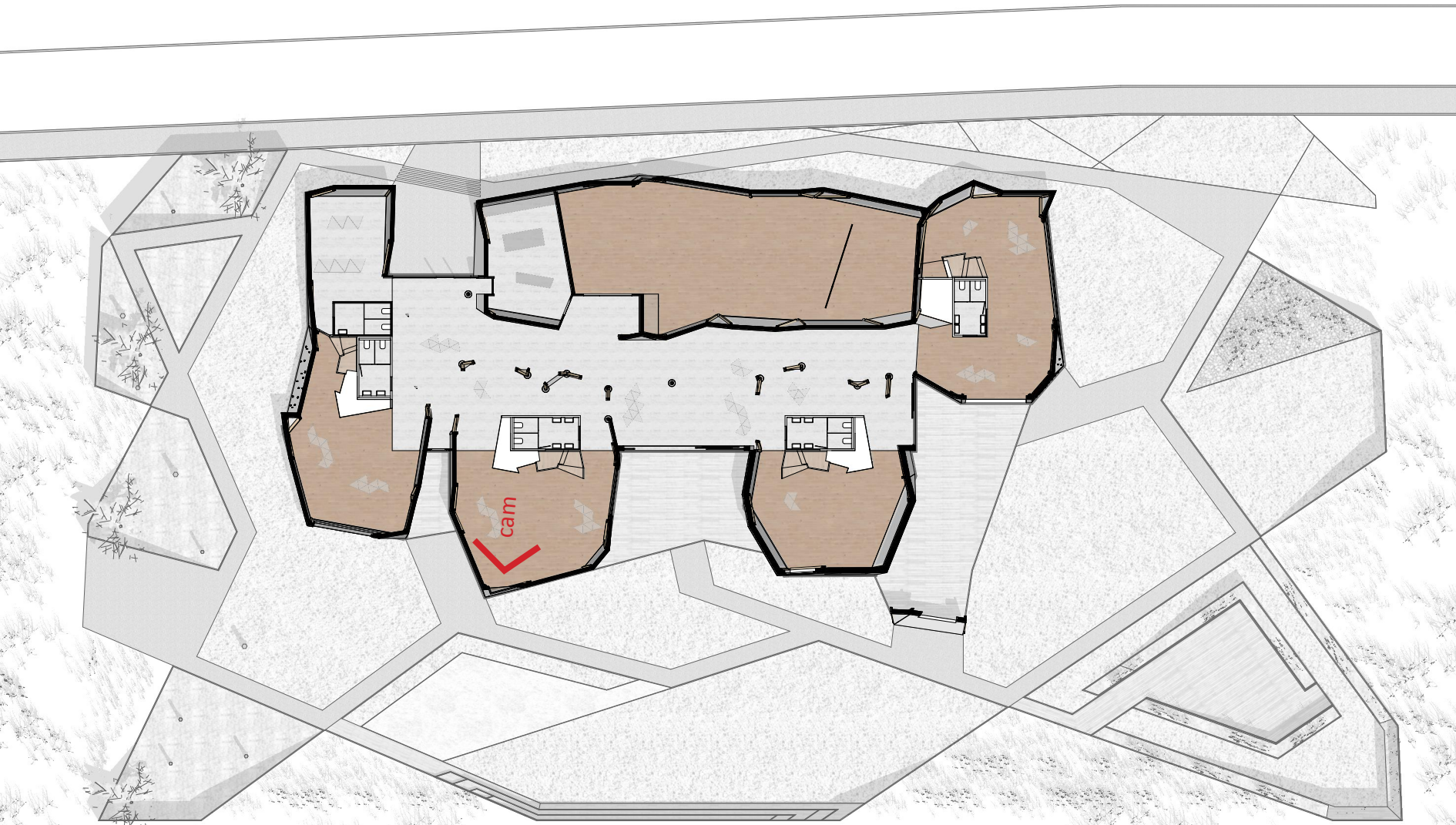
Every studio consist of a big space at ground floor, a sanitary box, storage space and a gallery with an entrance to the adjacent rooftop playground.

In front of each studio there‘s filter layer with access to the restrooms and space for wardrobes. The filters are formed by columns follwing the geometrical structure of the studios.

Modular funiture - also made from triangular elements - encourages the children to ajust it to their needs.

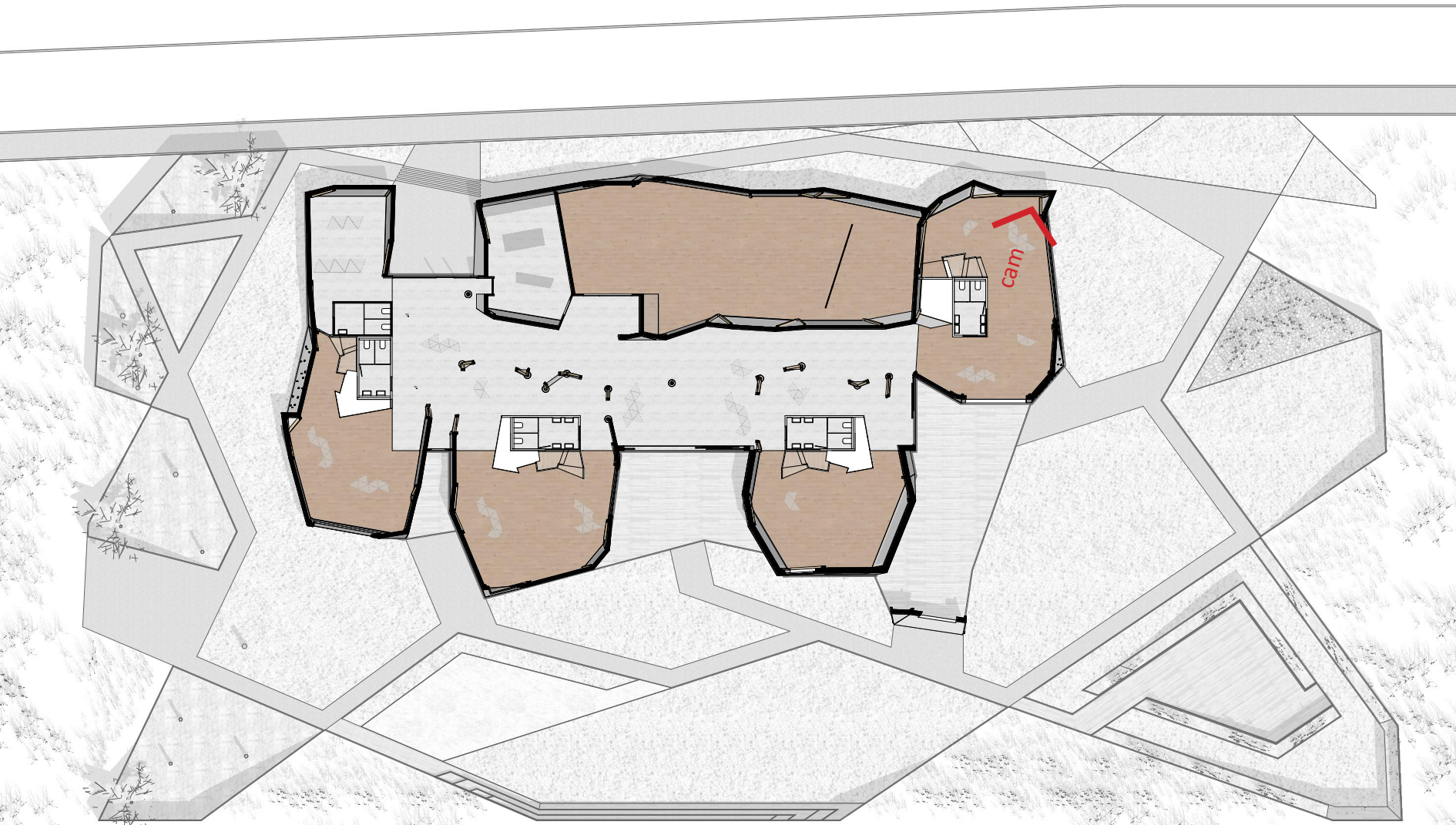
According to the tiling of the structural framework, parts of the interior cladding are adjusted to the needs of the studio, e.g. the painting studio is equipped with chalk boards.

ill. 066: 3d-sections studio music



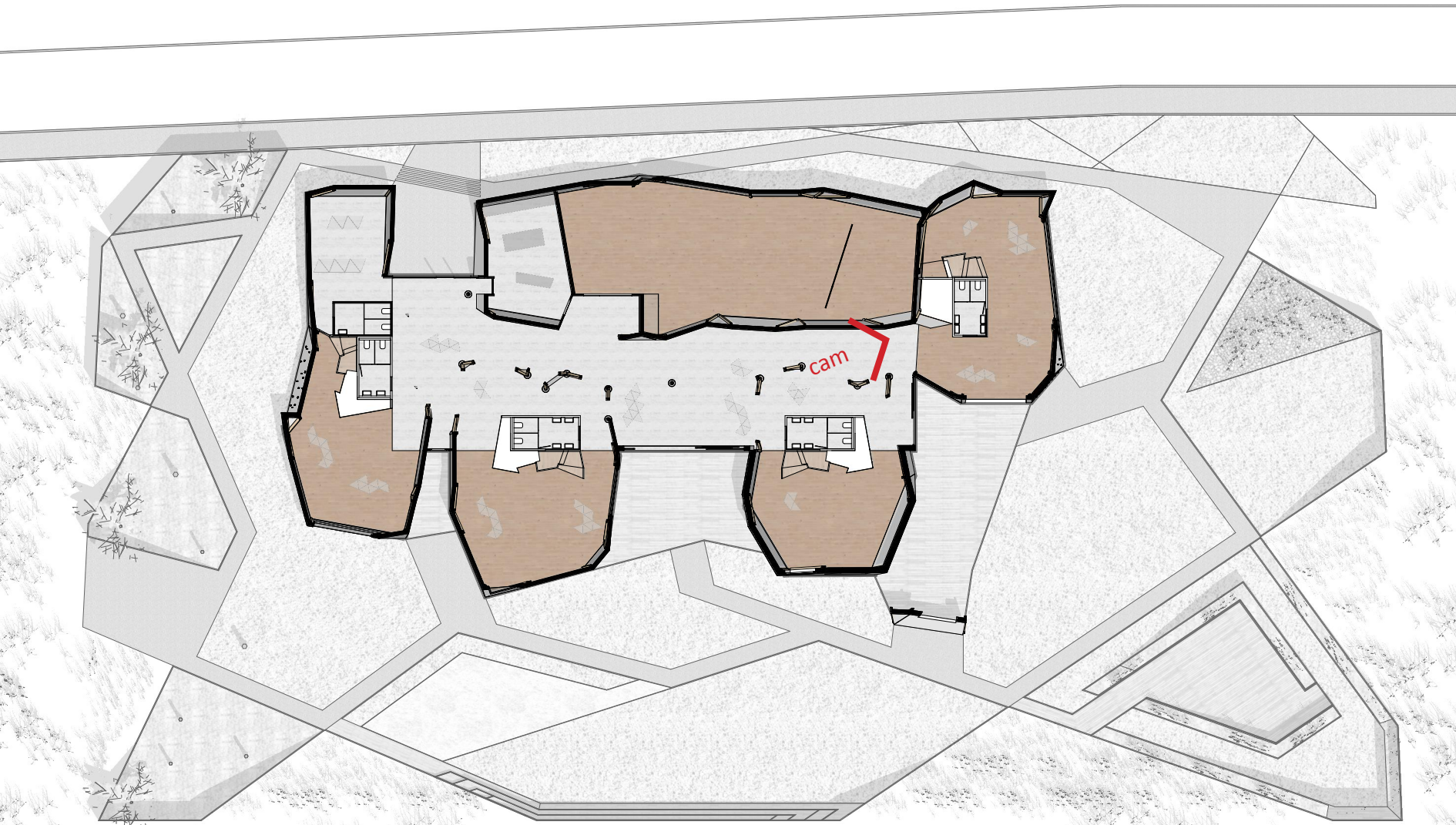
ill. 067: visualisation studio painting

ill. 068: position camera studio painting



ill. 069: visualisation studio music

ill. 070: position camera studio music



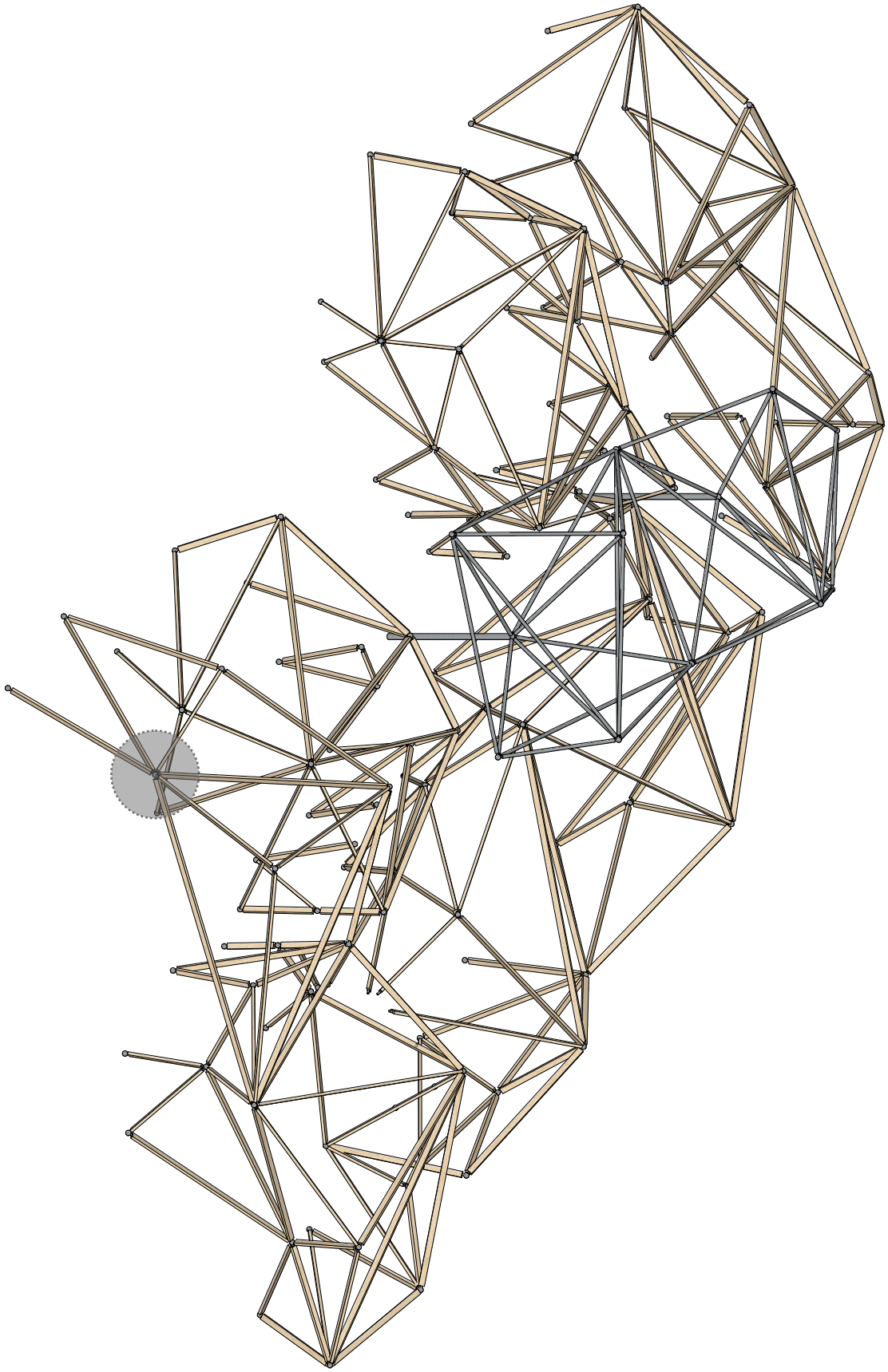
ill. 071: visualisation market place

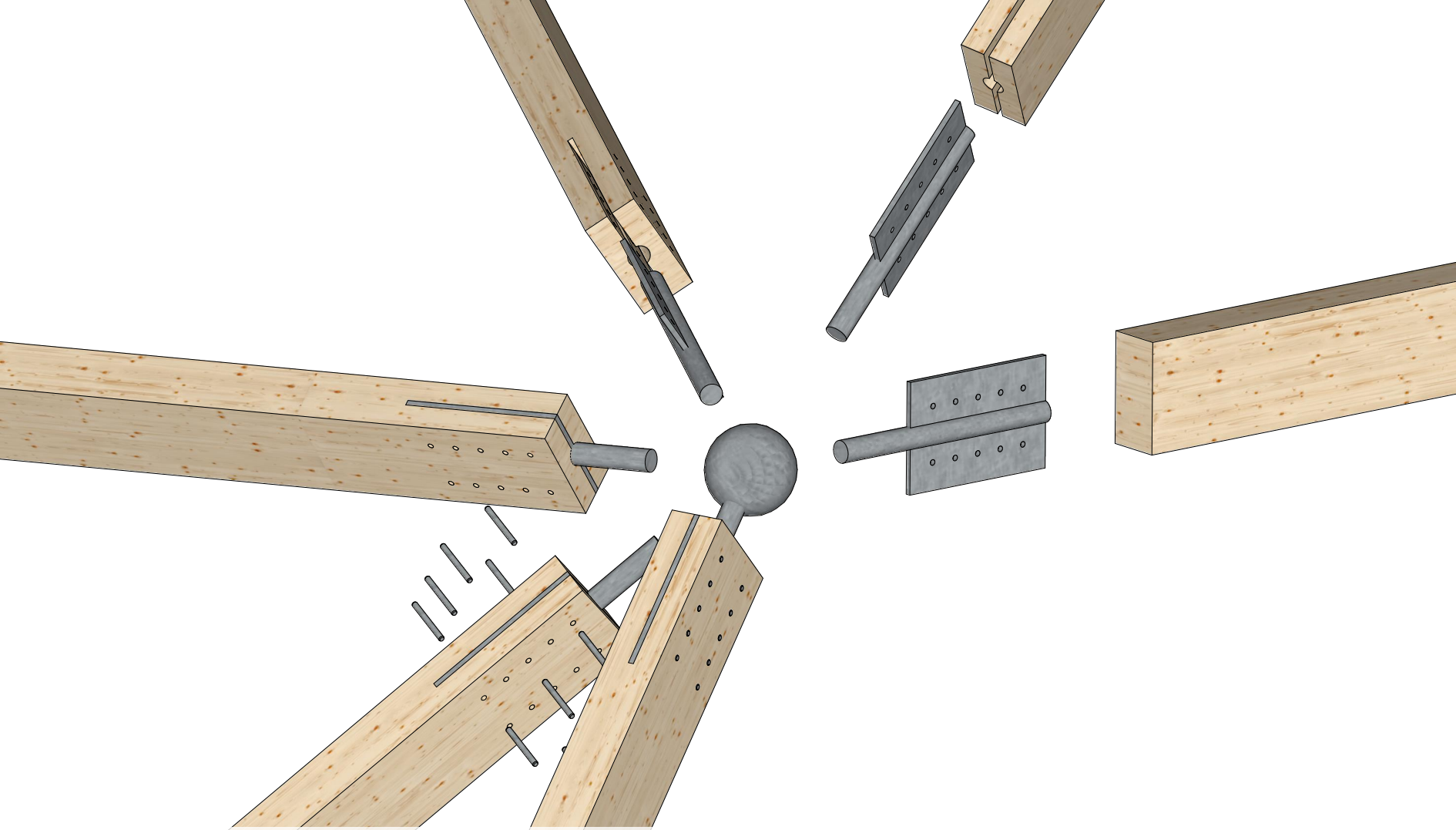
ill. 072: position camera market place

05

Construction

load-bearing structure, interior panelling, exterior panelling





The whole load-bearing structure is designed in linear , wooden beams starting and ending in a spherical metal junctions.

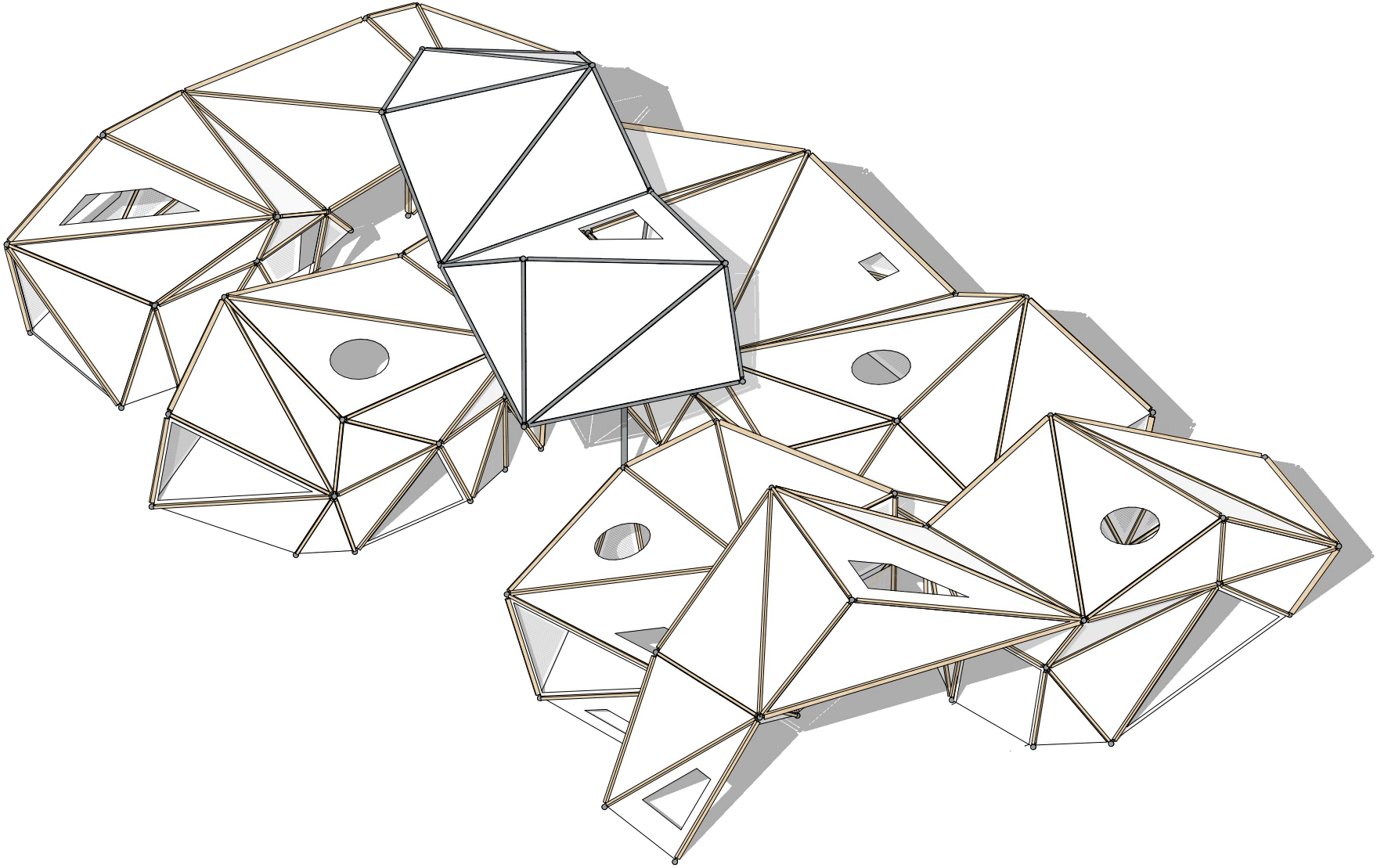
The transition from the spherical into the rectangular beam is done via a metal cylinder, which is welded on the knot and stuck into the beam.

The use of both sphere and cylinder makes it possible to join these elements in any angle.

In the last step the wooden beams are fixed onto the metal construction by a metal bar dowel.

ill. 073: load-bearing structure 3d

ill. 074: junction



The four studios are divided into four different topics:
- maker
- painting
- construction
- music.

According to the topic of the studio some of the interior panells of the triangularly divided walls are finished in different materials:

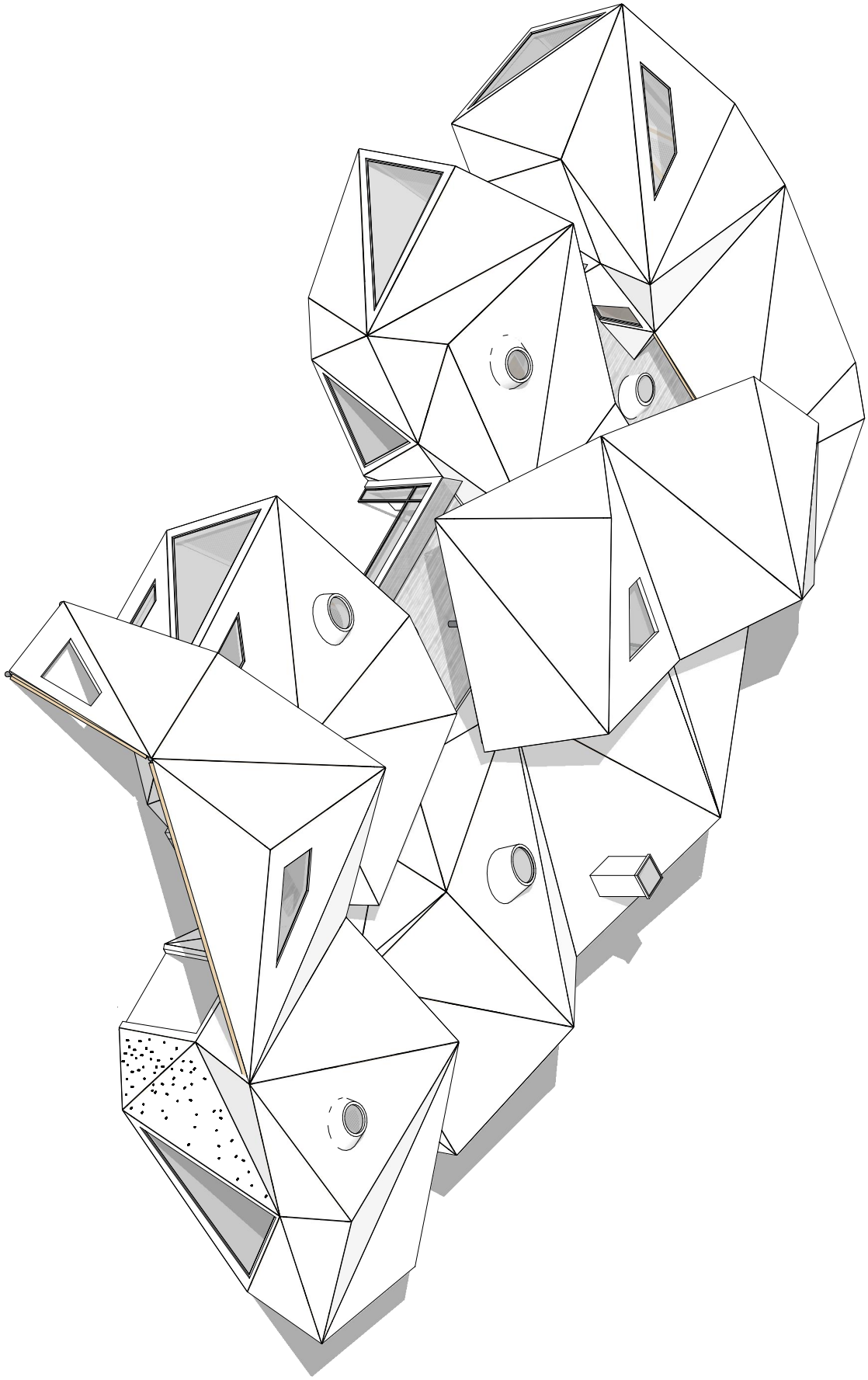
- the maker studio is equipped with an extra layer of wooden boards, where things can be fixed easi ly, cutting is allowed,...

- the painting studio‘s walls are equipped with chalk boards, which the children can draw and paint on and take a look at it or simply clear it and start from scratch.

- the construction studio‘s walls are equipped with bases of a push-fit-system analogue the system „LEGO“.

- the music studio‘s walls are equipped with acoustic boards (foam and plaster) to dampen the generated sound to the outside of the studio.

ill. 075: interior cladding 3d



The whole exterior cladding is made from Corian.

Corian is a compound material, existing by approx. 66% from gibbsite, 33% from polymethyl methacrylate (PMMA), catalysers and hardeners. It can be milled and cut, but most importantly it can be adjoined seamlessly and morphed in 3d by applying heat.[30]

In order to achieve a colourful, bright appearance each studio of the kindergarten is covered in a different colour with soffits and windowframes in contrasting colours. The same is true for all the chimneys on the roof.

colours / contrasts of studios according to CORIAN:

Studio maker/staff:
green - CORIAN grape green
orange - CORIAN citrus orange

Studio painting:
yellow - CORIAN imperial yellow
blue - CORIAN nightfall

Studio construction:
orange - CORIAN citrus orange
green - CORIAN grape green

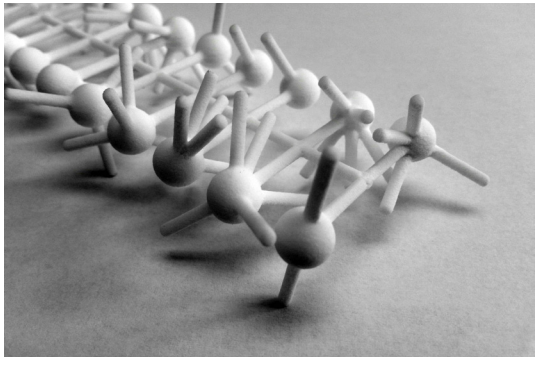
Studio music:
blue - CORIAN nightfall
yellow - CORIAN imperial yellow

Gym/kitchen:
turquoise - CORIAN mint ice
red - CORIAN hot

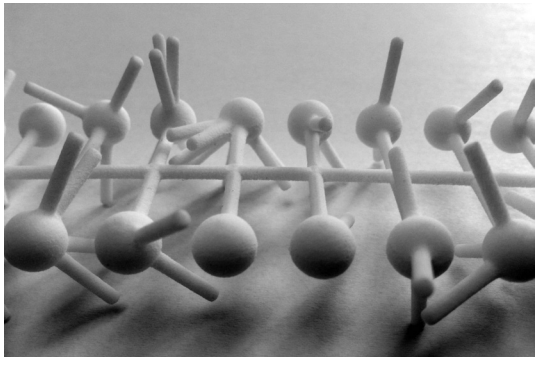
Roof:
red - CORIAN hot
turquoise - CORIAN mint ice

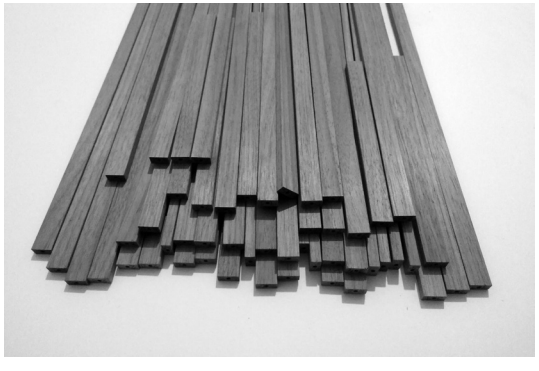
ill. 076: exterior cladding 3d

[30] https://de.wikipedia.org/wiki/Corian_(DuPont)

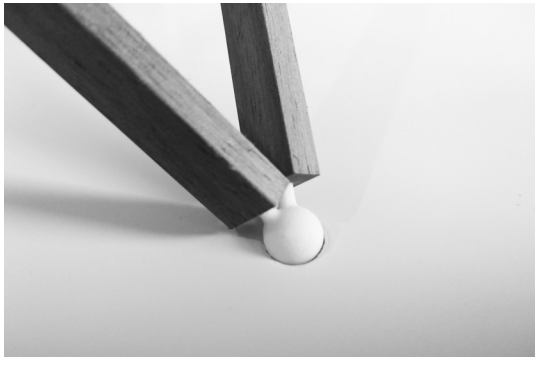


structural model:
metal junctions made from PA12
selective laser sinter





structural model:
wooden beams 5/10mm walnut



structural model:
beams fixed to junctions

The structural model consists of two different elements: the junctions made from PA12 (selective laser sintered) and wooden beams from walnut 5/10mm.

There is a number of 26 junctions with different numbers and angles of connectors. The number of connectors goes from one (junction on the ground) to up to nine in one junction.

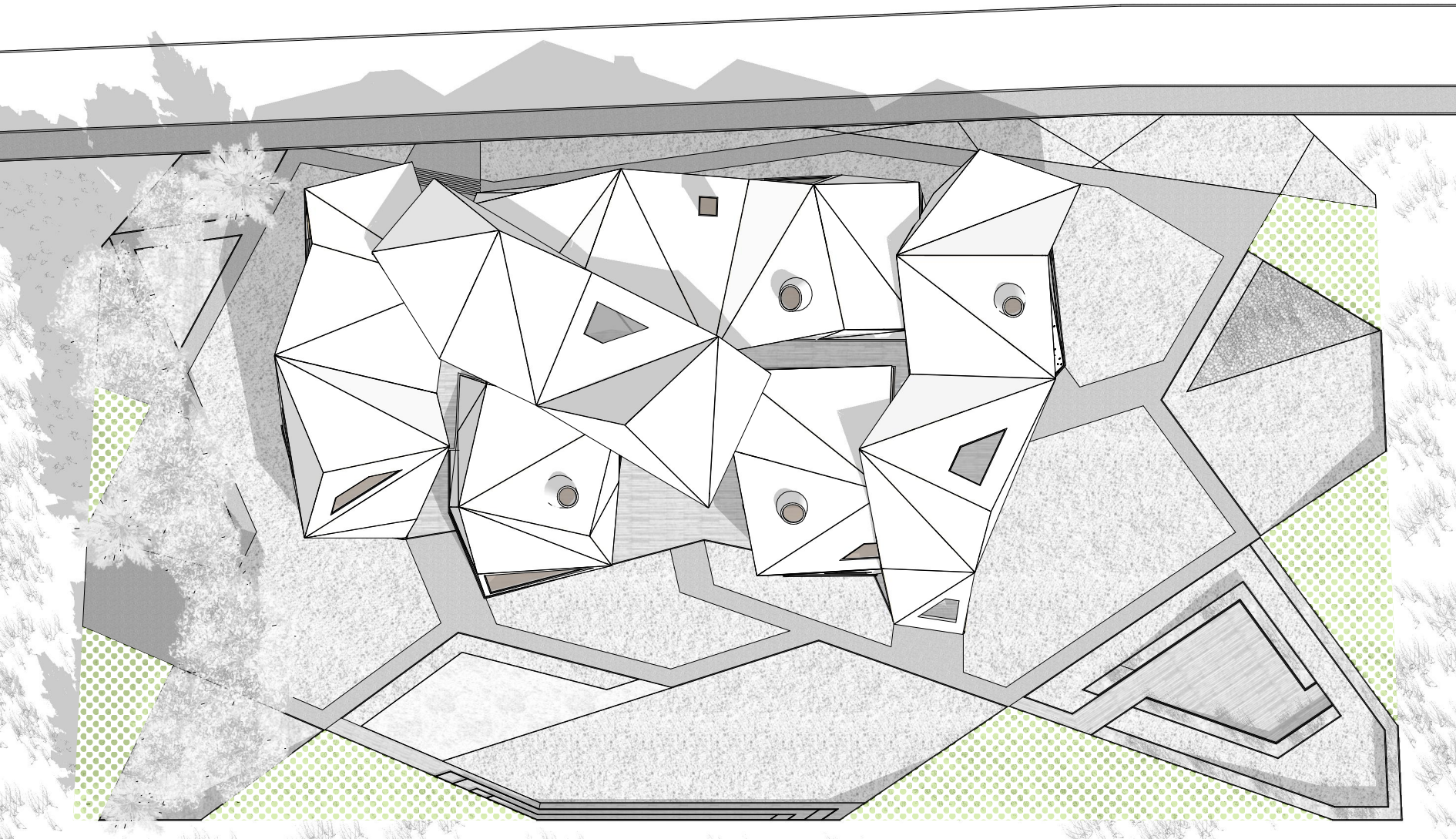
The same kind of individuality is true for the wooden beams: each of the 51 beams has a unique lenght and can therefore only be fixed in one defined position.

ill. 077-082: structural model

06

Landscape

surfaces, materials, plants



The general landscape design is based on the the idea of a polygonal shape surrounding the whole building. By extending the directions of these pathways to the border of the plot, the adjacent meadow is intermeshed with the plot itself.

The green belt, that directly surrounds the building is conceptualized as a simple lawn allowing multifunctional use.

In the very western part, the space outside the ring is under the topic „water“. A one meter deep excavation gets sealed at the ground, filled with gravel and water , then planted with reed to make evaporation possible on hot summer days.

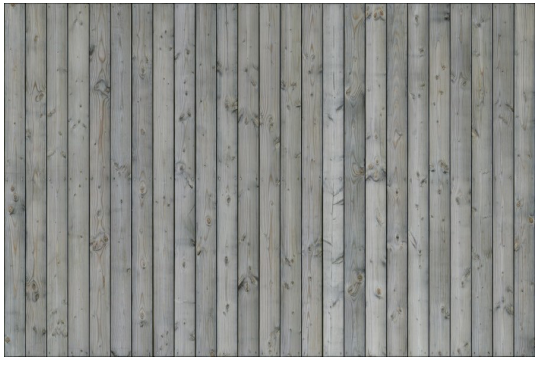
In order to make the children see, how vegetables and fruits grow, the south-western part is equipped with planting beds to sow regional products like lettuce, potatoes, tomatoes, cucumber, beetroot,...

Next to this - in the southern part - there‘s space for sportive activities. The bigger part is planted with lawn and designated as space for football, badminton and rugby. The smaller one is designated as sand pit for volleyball and beachtennis. It is also meant to be used as a long-jump pit with an inrun on the adjacent pathway. In addition this sports ground is equipped with a stand, that is also functioning as a fence to the neighbouring meadow.

Finally in the very western part of the plot one can find larger plants and trees like oaks, spruces, beeches and other regional plants. The positioning in the west prevents from shading the building during the day.

ill. 083: site plan 1:333

waterbound cover



wooden flooring

lawn

sand

tree bark

concrete

All of the surfaces used in the landscape are conceptualized to seal as little as possible of the plot.

The pathway surrounding the building is made from a waterbound cover to keep it unsealed for a certain degree and still to have it paved and useable the whole year long.

Terraces and the inlays of the sports are made from the regionally available spruce.

Finally the base frame of the sports ground stands are made from dark grey dyed concrete to illustrate the impact of solar radiation.

pathways:
waterbound cover

terraces:
decking boards spruce

playground:
lawn

playground:
sand

tree pits:
tree barks

sports ground stands:
dark grey dyed concrete

ill. 084: water-bound pathway

ill. 085: decking boards spruce

ill. 086: lawn

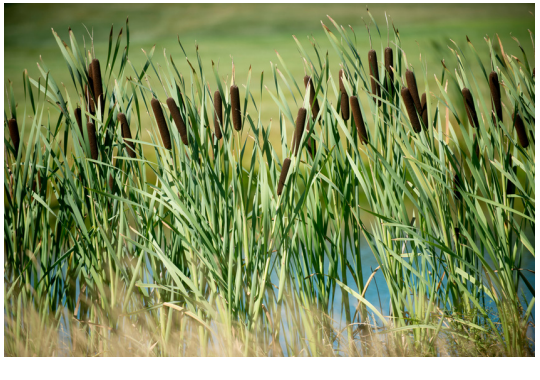
ill. 087: sand

ill. 088: tree bark

ill. 089: concrete coloured

local trees: oak (left), spruce (right), beech, birch,...

local vegetables: cucumber, lettuce, tomatoes,...



other local plants: potoatoes, reed,...

The children should get in touch with the local plants. Trees like oaks, spruces, beeches, birches and larches are traditional austrian trees, that every child should become aquainted with as early as possible.

The same counts for plants, that demonstrate, how e.g. some forms of climate work. Especially for hot summer days the water buffer in the eastern part with reed plants is used for cooling the surrounding by simply evaporating the buffered water in the ground. This shows how, low-tech elements can have similar effects as high-tech cooling systems.

Finally the children should also get in touch with the food they eat. By planting potoatoes, lettuce, cucumber, tomatoes and beetroot they can understand, how they look like, how they grow and also how they are harvested and used in the kitchen.

A basic understanding about our environment should thereby be delivered to the children and should have an influence on their approach to nature.

ill. 090: oak tree

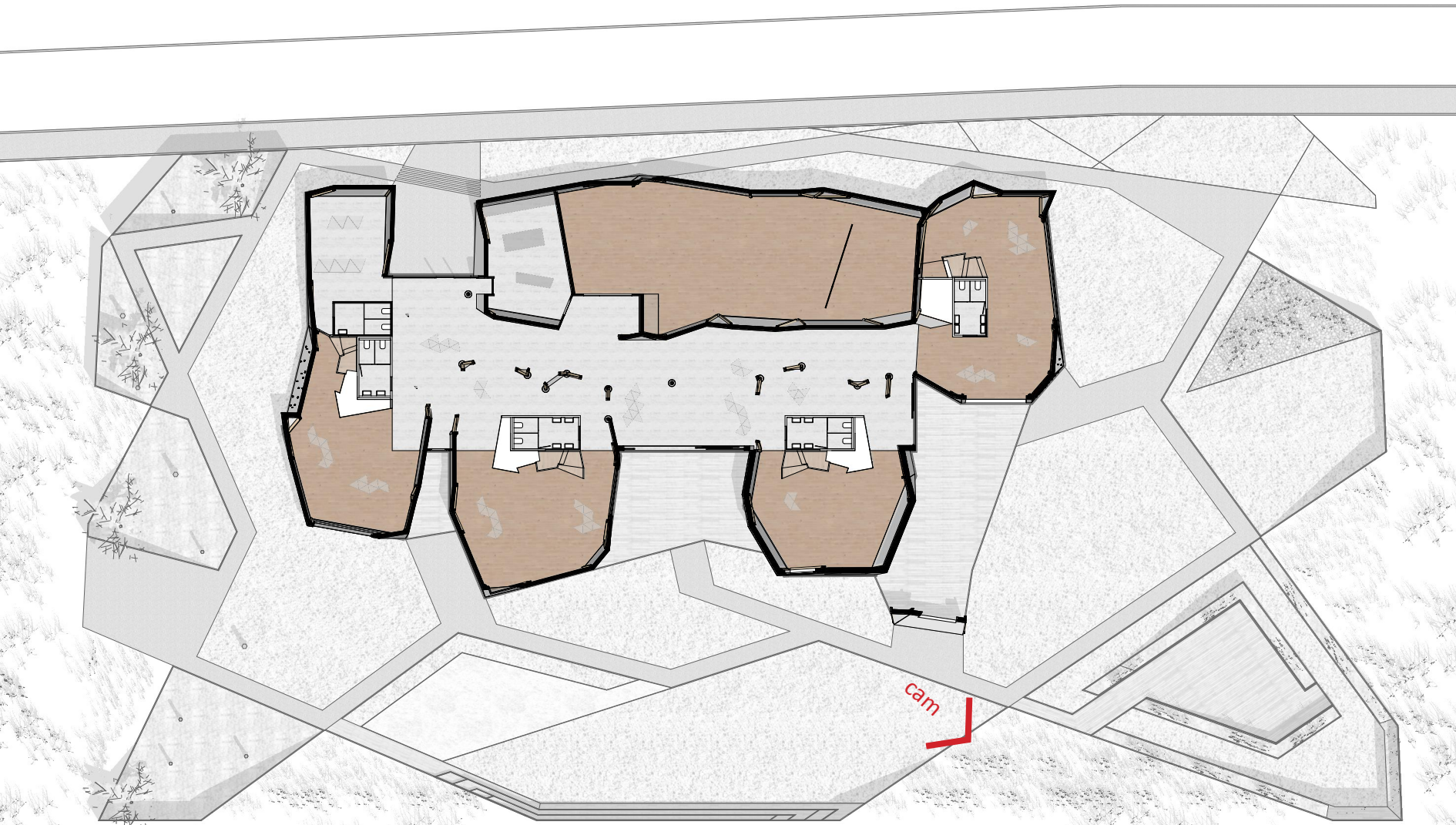
ill. 091: spruce

ill. 092: cucumber

ill. 093: lettuce

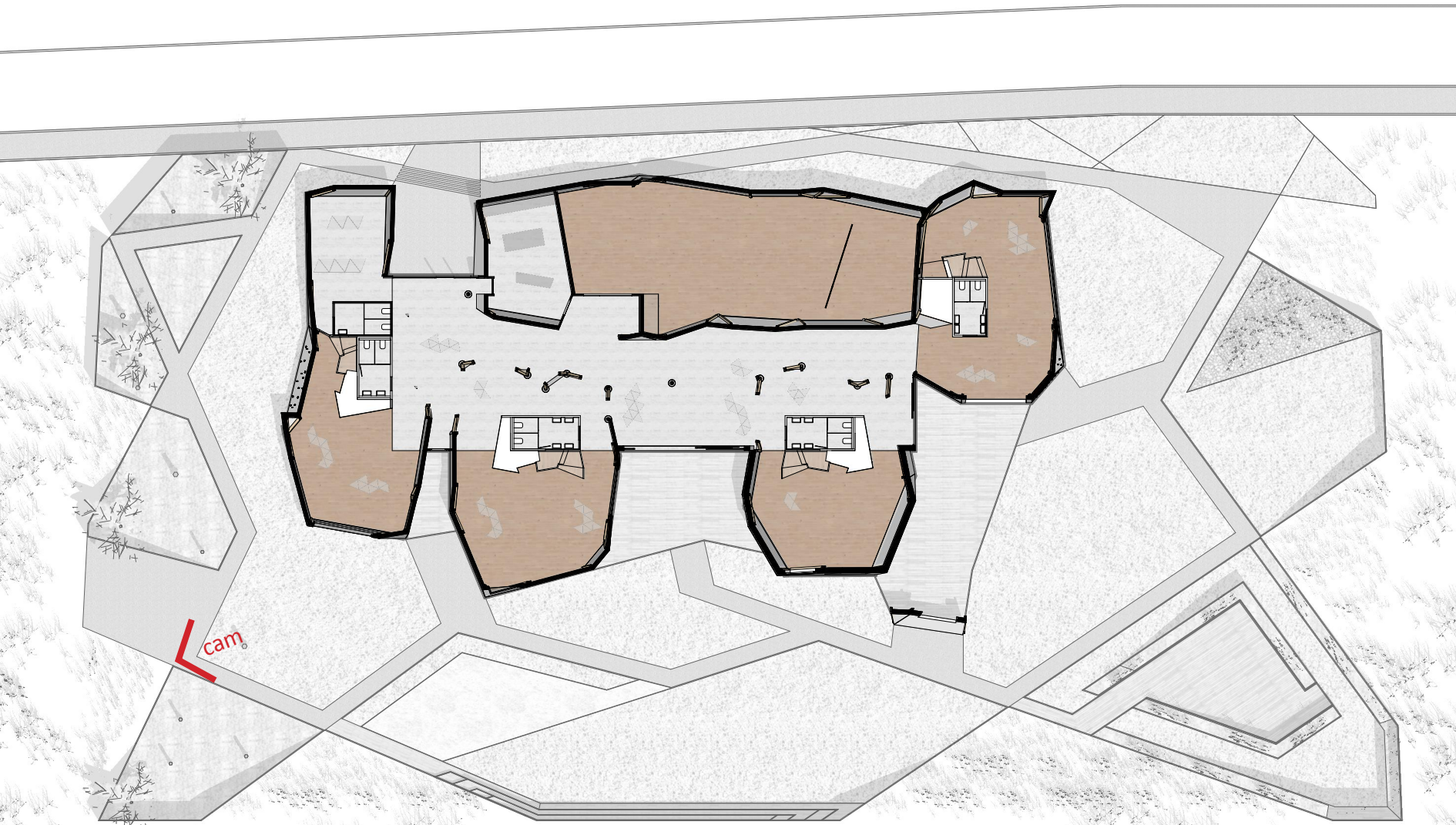
ill. 094: potatoes

ill. 095: reed



ill. 096: visualisation east to west

ill. 097: position camera east to west



ill. 098: visualisation west to east

ill. 099: position camera west to east

07

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