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MASTERARBEIT

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Pocket House - Regeneration Project for Tohoku Region in Japan

ausgeführt zum Zwecke der Erlangung des akademischen Grades einer
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unter der Leitung von
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Luna

Vienna, March 2014

A wooden modular system with multiple usage creating new identity and rethinking of the urban environment for earthquake suffered Yabuki town in Fukushima prefecture

ポケット・ハウス
Pocket House

Regeneration Project for Tohoku Region in Japan

Abstract

The Story of 'Pocket House'

Wouldn't it be helpful to have some kind of 'emergency kits' already spread all over the endangered city, if a natural catastrophe happens? They will pervade public purpose in everyday life and furthermore fulfil interpersonal functions, like improving social cohesion during the recovery period.

In disaster-affected regions, risk mitigation and security measures have always been a topic. Due to improvement of technological knowledge, nowadays it is possible to limit the level of destruction in a significant degree. Foremost, personal security is one aspect that has to be considered in first case. How can endangered areas prepare better for the next catastrophe? The keyword is 'self-help' in small steps instead of being depended on support from elsewhere. In case of a disaster people's basic needs, such as medical care, water/ food and especially temporary shelters should be provided instantly. Hence, in a country with high seismic activities like Japan, people can live in the certainty of being in a safe environment instead of living in anxiety.

The story of ‘Pocket House’ is multifaceted. The ‘Pocket House’ itself is simple. It is a small, wooden box that is placed in a certain amount in a disaster-endangered area as a prevention – in this story it is earthquake-suffered Yabuki town in Fukushima prefecture, Japan.

11th March 2011, the most devastating earthquake ever recorded in Japan’s history and a resulting tsunami hit the north-eastern coastline of the island. Learning from other regeneration projects by japanese architects, a new way of solving problems concerning common concepts of emergency shelters and post-disaster architecture could be achieved.

By placing the ‘Pocket Houses’ in a town with everyday-functions, the bound between the user and the object can grow up to the point when suddenly the catastrophe happens. They can be transformed into temporary housing units instantly – by anyone. The state of emergency is shorter, since the community can recover much quicker due to self-help and the tight connection among themselves. Parallel to this, the reconstruction can be initiated, as the two parts of the ‘Pocket House’ can be converted into a characteristic and permanent roofscape within the town. As a result not only a sustainable building is erected, but at the same time, the new structure marks the event of catastrophe like a reminder.

Kurzfassung

Die Geschichte von ‚Pocket House'

Wäre es nicht hilfreich im Fall einer Naturkatastrophe eine Art 'Erste-Hilfe-Ausrüstung' als Präventivmaßnahme in einer gefährdeten Stadt schon verteilt vorzufinden? Diese werden mit alltäglichen Funktionen bespielt und genutzt, und während der Regenerationsphase übernehmen sie eine unterstützende Rolle, wie die Stärkung des Zusammenhaltes innerhalb der Gemeinschaft.

In Regionen, die von zahlreichen Katastrophen heimgesucht werden, werden Strategien zur Risikominderung und Sicherheitsmaßnahmen großgeschrieben. Durch fortschrittliche technologische Kenntnisse ist es heutzutage möglich den Grad, der durch Naturkatastrophen entstehenden Schäden, minimal zu halten. Einer der wesentlichen Punkte stellt der Personenschutz dar, der besonders berücksichtigt werden muss. Wie können gefährdete Gebiete sich vor einer Katastrophe besser schützen? Das Stichwort heißt 'Selbsthilfe' anstatt nur auf Hilfe von außen angewiesen zu sein. Die Grundbedürfnisse der Katastrophenopfer, wie medizinische Versorgung, Nahrungsmittel und vor allen Dingen ein Dach über dem Kopf, sollten sofort zur Verfügung stehen. Besonders einem Land wie Japan mit hoher seismischer Aktivität wäre mit solch einer präventiven Maßnahme geholfen und das Sicherheitsgefühl würde unter den Einwohnern wieder gestärkt werden.

Die Geschichte von ‚Pocket House' ist vielseitig. Das 'Pocket House' selbst ist einfach. Es ist eine kleine Holzbox, die in gewissen Mengen in unsicherem Gebiet zur Prävention aufgestellt wird - in dieser Geschichte in der Stadt Yabuki in der Präfektur Fukushima/ Japan.

Am 11. März 2011 traf einer der verheerendsten Erdbeben in Japans Geschichte mit folgenschwerem Tsunami die Nordostküste der Insel schwer. Durch das Studieren einiger Wiederaufbauprojekte von japanischen Architekten, konnte eine neue Planungsstrategie für Notunterkünfte und allgemeine Wiederaufbauprojekte entwickelt werden.

Die ‚Pocket Houses' werden mit alltäglichen Funktionen ausgestattet und in der Stadt verstreut. Während dieser Phase können Nutzer und Objekt eng zusammenwachsen, bis plötzlich die Katastrophe passiert. Diese können sofort in temporäre Unterkünfte umgewandelt werden - von Jedermann. Durch die Selbsthilfemaßnahmen und starken Zusammenhalt, regeneriert sich die Gemeinschaft schneller. Parallel kann der Wiederaufbau begonnen werden, indem die flexiblen Teile des ‚Pocket Houses' als charakteristische und permanente Dachlandschaft ausformuliert werden. So entsteht nicht nur ein nachhaltiges Gebäude, sondern es wird auch ein Zeichen für die vergangene Katastrophe gesetzt.

Content

1 *TOPIC* Introduction

Img. 01: A resident of Natori after the Tsunami in March 2011

1 *1 Introduction*

On March 11th, 2011, when the Great East Japan Earthquake [in Japanese: 東日本大震災 (Higashinihon daishinsai), also known as Japan's '3/11'] occurred and a Tsunami rolled over the land, Japan involuntarily became venue of a catastrophe of unpredictable extent. The wave approached the Japanese coastlines nearly unnoticed. A silent tension was distinctly in the air right before the tsunami reached the shallow waters. Possibly it had been too calm – more than 40% of evacuated people took up too much time to be able to safe their lives. [III]

The sequences of the incident were in the focus on the media and were reported daily on newspapers and television; hence everyone of us was once again confronted with the destructive power of nature. However, this time the consequences were beyond everything happened before. The damages on the Power plants in Fukushima prefecture caught most of the attention. The whole world seemed to hold its breath and be standing still.

People in my environment, friends and acquaintances, were shocked about those tragic happenings, but seeing their reactions was the moment, when I could distinguish between two different emotional states: 'being touched' and 'being personally affected' by something. Being a half-Japanese and having relatives close to the stricken region, I felt a much deeper connection to the misery of those people, who had lost their homes, families and possessions, and their facial expressions left a big scar in my heart and my mind.

In Spring 2011 I started collecting possible ideas for my master's thesis topic. Torn between a couple of themes, I knew for sure that I wanted my thesis' content to have a focus on a contemporary, socially-critical problem concerning architecture especially in an industrialised country: It should deal with current and often discussed issues like 'building economy', 'functional flexibility', furthermore with 'efficient resource usage' and 'stainability'. After Japan's 3/11 the idea of creating a concept for post-disaster-architecture for the stricken areas in Japan became a more and more concrete subject, which was - and still is - a topic people should pay more attention to and care about, especially at that time.

Soon my decision was made and after I had fixed the proposal about the topic of my master's thesis, I applied for the scholarship for an exchange year for researching in Japan at the University of Tokyo, one of the most prestigious research universities. I had the opportunity to work together with university professors and acknowledged specialists, who particularly were involved in recovery projects and were acquainted with the current situation in the tsunami and earthquake-hit areas.

The catastrophe created an own dynamic movement amongst architects all over the world, who participated on certain projects and recovery organisations. At the LaBiennale 2012 next to the Japanese Pavilion, also other parts of the exhibition showed post-disaster matters and research results concerning future urban development. Amongst the wide range of presented projects, the focus was definitely on the tsunami-suffered areas, for which master plans for new structures of settlements had been proposed. The aim for my research was to deal with the circumstances in a much smaller area, a rural city/ town, which had been neglected compared to the bigger tsunami-suffered ones; a town, which hadn't attracted so much attention or publicity, nor had gotten instant support so far.

From October 2012 until August 2013 I was part of Professor Mikio Koshihara, my Japanese supervising professor's, laboratory, an architect and a structural designer specialised on timber. During that period of time, I developed a proposal for a simple wooden modular construction system with multifunctional, flexible usage especially for post-disaster regions.

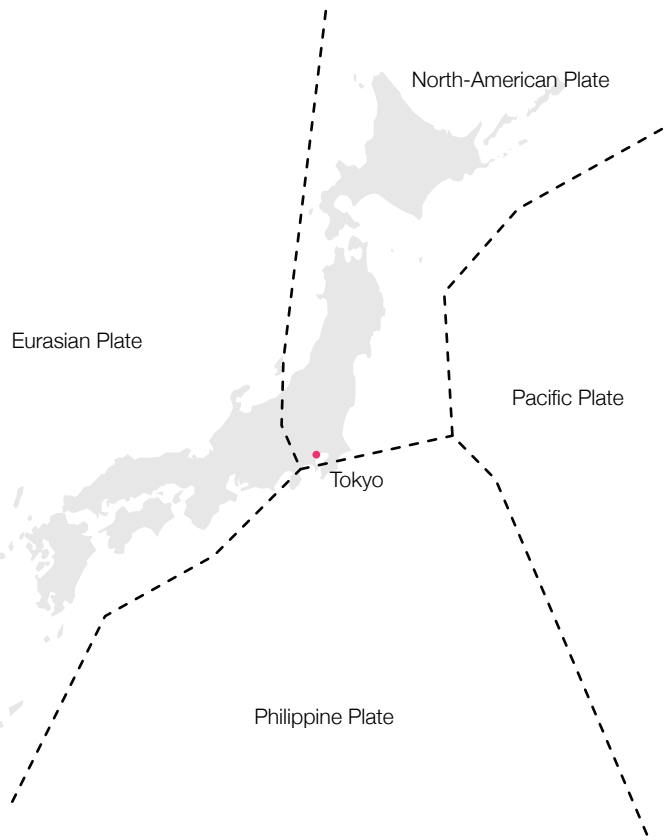


Fig. 01: Boarder lines of tectonic plates around Japan [10]

1 2 *Japan and natural disasters*

Japan has been stricken by frequent natural catastrophes. In average, the number of earthquakes in Japan comes up to approximately 70 per month. [VIII] The reason why the Japanese territory count such a high seismic activity, is because Japan is located in one of the most earthquake-prone areas in the world: In the highly active volcanic zone, the so-called 'Pacific Ring of Fire', and furthermore right at the intersection of four tectonic plates (Fig. 01). These plates mash and grind together generating subduction-zone earthquakes. The risk about earthquake incidents is the fact that they often trigger consequential catastrophes, such as tsunamis, landslides, fires, oil spills or the release of dangerous materials, which can not only cause temporary damage, but even have a long- term effect on people and the environment. [V]

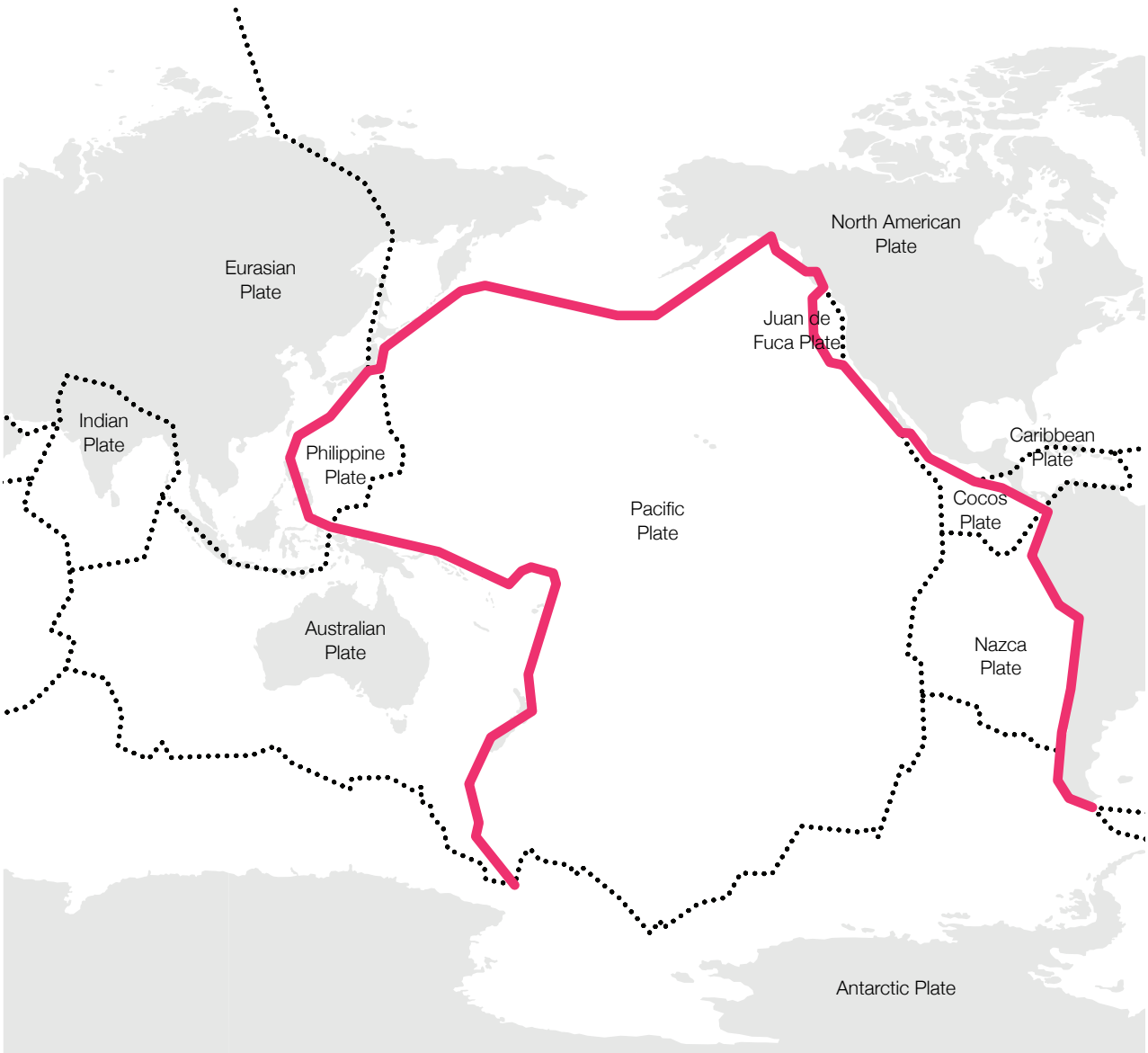


Fig. 02: The Pacific Ring of Fire [10]

Definition: Pacific Ring of Fire (Fig. 02)

Is a 40.000 km long belt in the basin of the Pacific Ocean where most of the active volcanoes are located. Together with a series of oceanic trenches, volcanic arcs, volcanic belts and/ or plate movements the Ring of Fire is formed. The intersection of tectonic plates can be discovered in that zone and their continual/ abrupt movements are the direct result for the high number of earthquakes and volcanic eruptions.

The horseshoe-shaped ring starts in South America at the Peru-Chile trench, further up the Middle America trench on the west coast, along the Aleutian trench on the southern coastline of Alaska. Over the Russian Kurile trench it continues down to Japan that is embraced by the Japanese, Izu Ogasawara and Ryuku trench, further to the hotspot including the Philippine, Marianas and the Java trench, and finally ends with the Tonga and Kermadec trench at New Zealand.

Approximately 90% of the world's earthquakes and 81% of the most destructive ones occur along the Ring of Fire. [02]

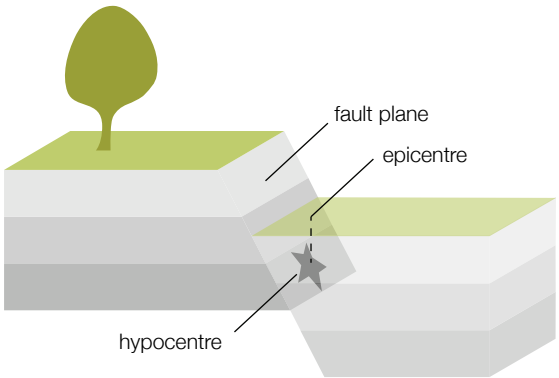


Fig. 03: Hypocentre/ epicentre

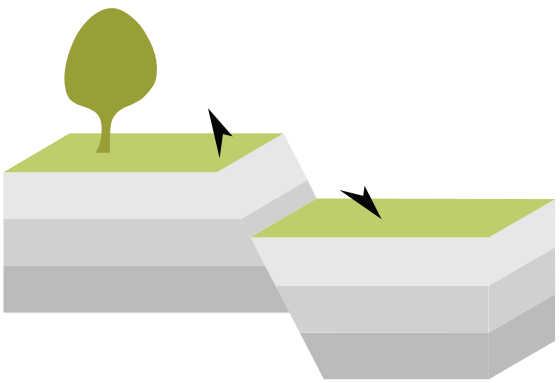


Fig. 04: Normal

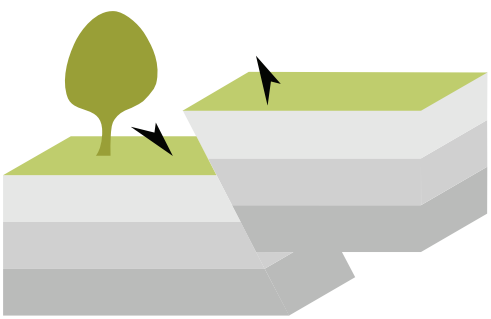


Fig. 05: Thrust

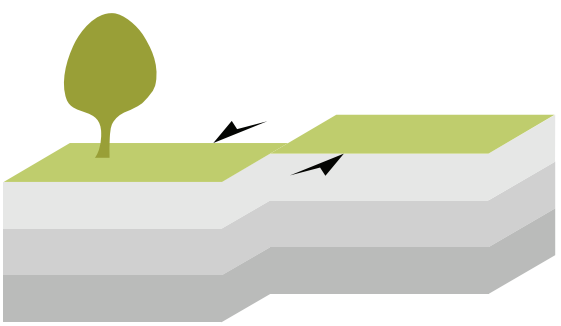


Fig. 06: Strike-slip

Definition: Earthquake

An earthquake is generated by an abrupt release of energy stored in the Earth's surface that creates seismic waves, which make the ground shake. It's a result of movements of loose tectonic plates that mash together along the fault planes' uneven surface. They are building up strain energy as the movement continues, which is released when coming loose from each other.

The three main types of earthquake faults are 'normal' (Fig. 04), 'strike-slip' (Fig. 06) and the most powerful 'reverse'/ 'thrust' (Fig. 05). The earthquake's actual location underneath the crust is called the 'hypocentre' and directly above it on the surface the 'epicentre'. (Fig. 03)

Earthquakes are recorded by seismographs that show the size as a certain magnitude on the so called Richter scale. Magnitudes lower than 3 are seen as being weak, and magnitudes higher than 7 are potentially dangerous, depending on the depth. The shallower the hypocentre is situated, the stronger is the earthquake. Since the start of taking records, the largest earthquakes had been slightly over magnitude 9. [10]

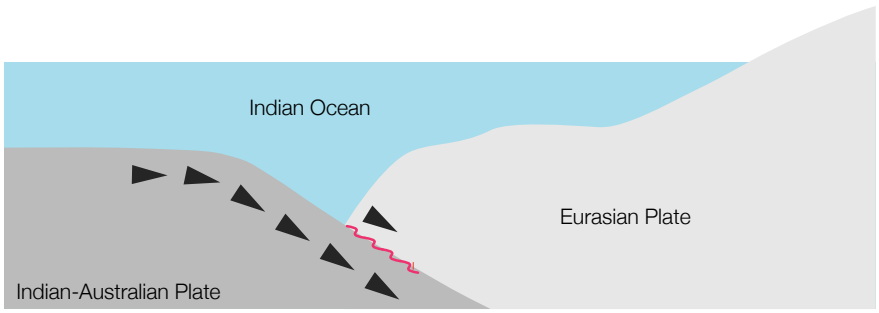


Fig. 07: Before the earthquake

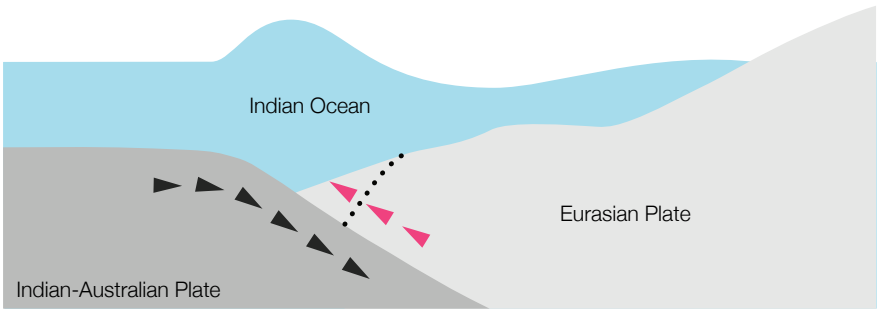


Fig. 08: During the earthquake

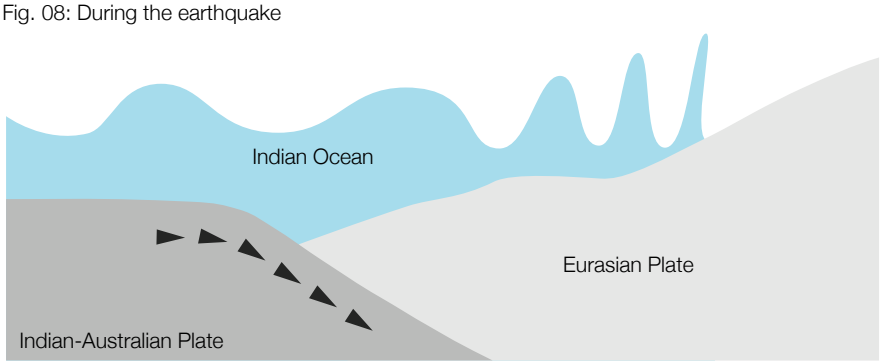


Fig. 09: After the earthquake

Definition: Tsunami

A tsunami [in Japanese characters: 津波, lit. harbour wave] describes a series of travelling waves in water caused by the abrupt shift of water, which is often the result of a drop of sea ground associated with submarine seismic activities. In the deep sea, these waves with high amplitude and long wavelength are hardly noticeable. Whereas, as they approach the sallow water, the speed drops, at the same time the amplitude grows to devastating heights and can therefore reach deep into land.

Development of a Tsunami:

The Indian-Australian plate moves slowly and with enormous powers underneath the Eurasian plate. They mash together and build up high pressure. (Fig. 07)

The plates become loose and due to the high pressure, the Eurasian Plate moves back to its original position and creates a rapid shift of the ground, which we feel as a quake. (Fig. 08)

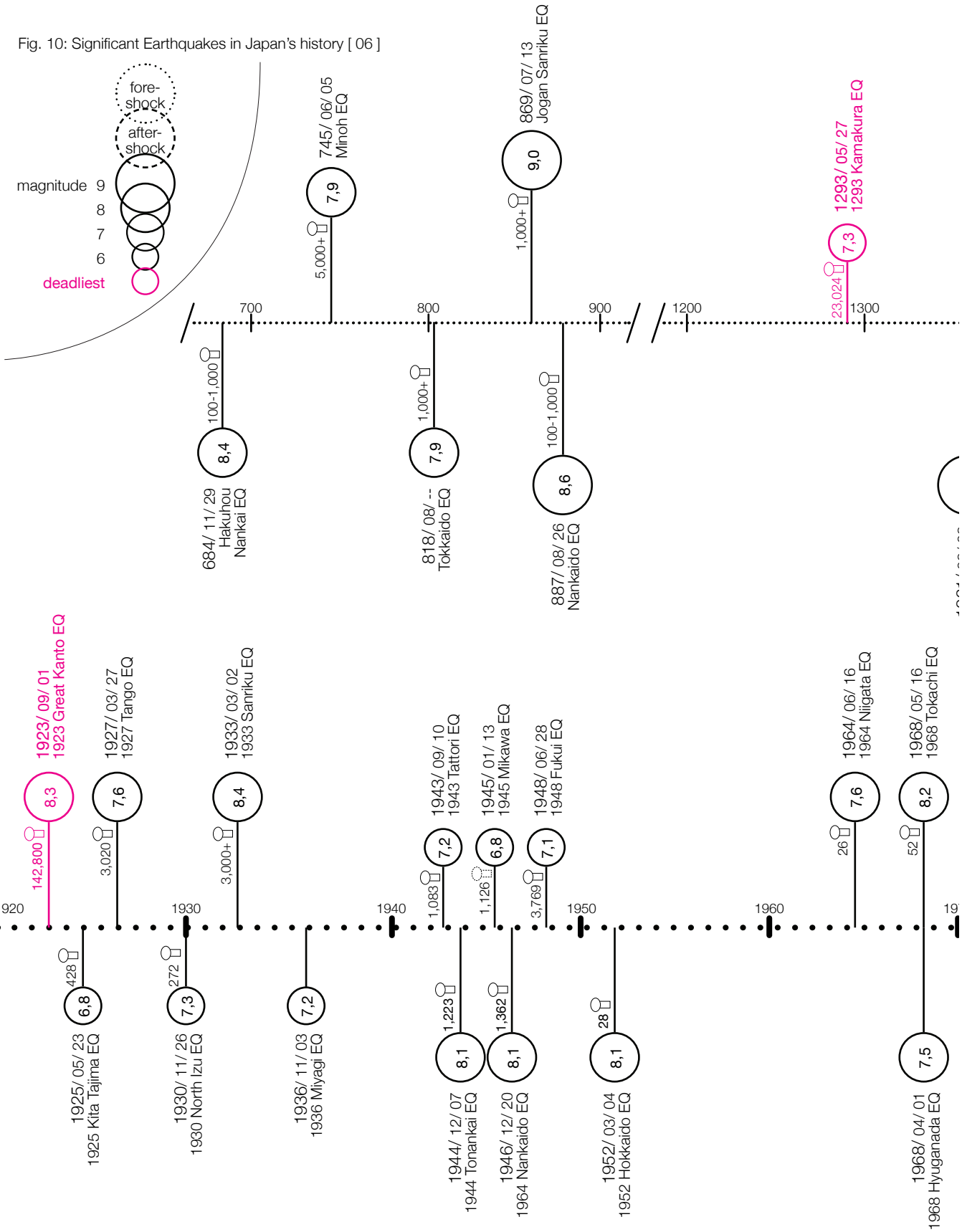
As the ground moves a couple of meters, the water is depressed for the moment, which creates the Tsunami. It propagates circularly in all directions. (Fig. 09) [05]

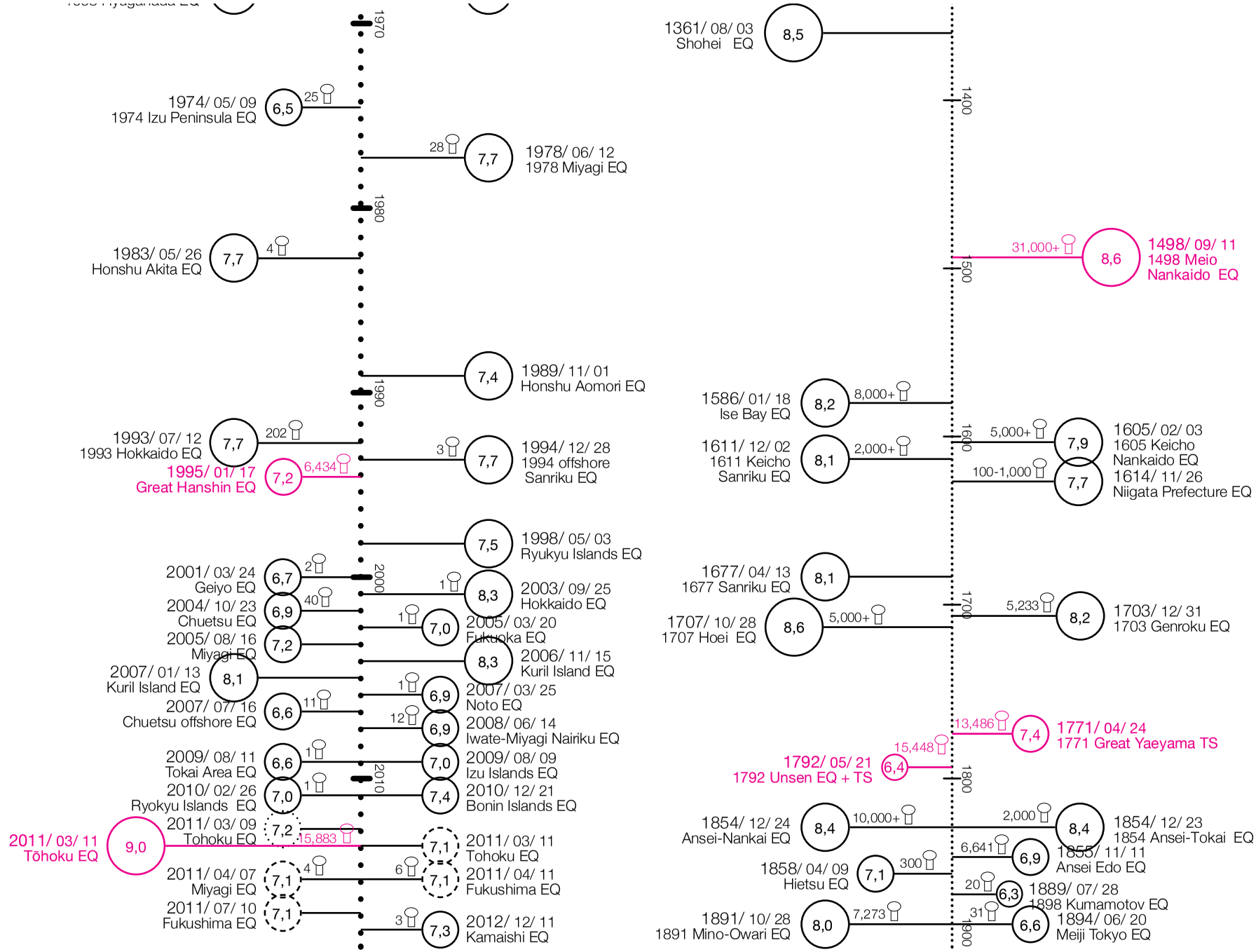
Img. 02: Desolation of Nihonbashi and Kanda, after the Great Kanto Earthquake in 1923

1 2 2 Historic earthquake records and consequences

Devastating earthquakes throughout the centuries mark Japan's history. The first reliably recorded quake took place in year 599. The Imperial Earthquake Investigation Committee was established in the late 19th century to create a systematic listing of the accessible historical data. [II] According to the documentation, the Kanto region - where high dense cities like Tokyo, Yokohama and Kyoto are located - had been stricken by earthquakes with magnitude of around 8 every 200 to 300 years and by several less intense ones in between. The Earthquake Research Institute replaced the Committee after the Great Kanto Earthquake in 1923 (Img. 02), which destroyed half of Tokyo and most of Yokohama due to an uncontrollable fire storm, followed by a Tsunami, which in total killed more than 100.000 people and made millions homeless. That tragic event did not only kick off a change towards the development of modern Japan, it also made the city/ council focus on improving the disaster prevention methods and information systems regarding reconstruction. However, another devastating catastrophe, the Great Hanshin-Awaji (Kobe) Earthquake in 1995, had to happen to initiate changes in every area of disaster risk management regulations, such as 'risk assessment, insurance, building code enforcement and rescue operations'.

Fig. 10: Significant Earthquakes in Japan's history [06]




1361/ 08/ 03
Shohei EQ
8,5
1400
1974/ 05/ 09
1974 Izu Peninsula EQ
6,5
25
28
7,7
1978/ 06/ 12
1978 Miyagi EQ
1970
1980
1983/ 05/ 26
Honshu Akita EQ
7,7
4
31,000+
8,6
1498/ 09/ 11
1498 Meio
Nankaido EQ
1500
7,4
1989/ 11/ 01
Honshu Aomori EQ
1990
1586/ 01/ 18
Ise Bay EQ
8,2
8,000+
1600
1611/ 12/ 02
1611 Keicho
Sanriku EQ
8,1
2,000+
5,000+
7,9
1605/ 02/ 03
1605 Keicho
Nankaido EQ
100-1,000
7,7
1614/ 11/ 26
Niigata Prefecture EQ
1993/ 07/ 12
1993 Hokkaido EQ
7,7
202
3
7,7
1994/ 12/ 28
1994 offshore
Sanriku EQ
1995/ 01/ 17
Great Hanshin EQ
7,2
6,434
7,5
1998/ 05/ 03
Ryukyu Islands EQ
2000
1677/ 04/ 13
1677 Sanriku EQ
8,1
1700
1707/ 10/ 28
1707 Hoei EQ
8,6
5,000+
5,233
8,2
1703/ 12/ 31
1703 Genroku EQ
2001/ 03/ 24
Geiyo EQ
6,7
2
1
8,3
2003/ 09/ 25
Hokkaido EQ
2004/ 10/ 23
Chuetsu EQ
6,9
40
1
7,0
2005/ 03/ 20
Fukuoka EQ
2005/ 08/ 16
Miyagi EQ
7,2
8,3
2006/ 11/ 15
Kuril Island EQ
2007/ 01/ 13
Kuril Island EQ
8,1
1
6,9
2007/ 03/ 25
Noto EQ
2007/ 07/ 16
Chuetsu offshore EQ
6,6
11
12
6,9
2008/ 06/ 14
Iwate-Miyagi Nairiku EQ
13,486
7,4
1771/ 04/ 24
1771 Great Yaeyama TS
15,448
1792/ 05/ 21
1792 Unsen EQ + TS
6,4
1800
2009/ 08/ 11
Tokai Area EQ
6,6
1
7,0
2009/ 08/ 09
Izu Islands EQ
2010/ 02/ 26
Ryokyu Islands EQ
7,0
1
2010
7,4
2010/ 12/ 21
Bonin Islands EQ
1854/ 12/ 24
Ansei-Nankai EQ
8,4
10,000+
2,000
8,4
1854/ 12/ 23
1854 Ansei-Tokai EQ
2011/ 03/ 09
Tohoku EQ
7,2
15,883
2011/ 03/ 11
Tōhoku EQ
9,0
7,1
2011/ 03/ 11
Tohoku EQ
6,641
6,9
1855/ 11/ 11
Ansei Edo EQ
1858/ 04/ 09
Hietsu EQ
7,1
300
2011/ 04/ 07
Miyagi EQ
7,1
4
6
7,1
2011/ 04/ 11
Fukushima EQ
20
6,3
1889/ 07/ 28
1898 Kumamotov EQ
2011/ 07/ 10
Fukushima EQ
7,1
1891/ 10/ 28
1891 Mino-Owari EQ
8,0
7,273
31
1900
6,6
1894/ 06/ 20
Meiji Tokyo EQ
3
7,3
2012/ 12/ 11
Kamaishi EQ

With new technological knowledge these disaster-preventing methods can be improved to decrease personal damage and provide better security concerning building technology and Japan is definitely one of the leading countries. Although the island is venue of frequent earthquakes and is densely inhabited, compared to other cases, there have not been so many claimed deaths. Nevertheless, the force of nature can cause unpredictably high destruction on environment and infrastructure, which make the costs of such catastrophes rise exorbitantly high. Next to these 'direct damages', there are the indirect consequences affecting not only the country's own economy, but as a further result also the world market. [V]

In March 2011, Japan was shaken by a 'triple disaster', which did not only have consequences for the country itself. It was the most powerful earthquake – with a magnitude of 9 on the Richter scale – in Japan's historic records. As a result, a devastating tsunami was triggered, which short time after hit the northeast coast and furthermore caused a nuclear catastrophe. Shortly after, the island had been suffering from heavy aftershocks, going through sensitive economic damage and political insecurity. Now, three years later, the situation in the Tohoku region seems to be stabilising again and the strong community spirit can be experienced intensively in those areas. Yet, deep concerns are still conspicuous, due to the fact only slow progress in reconstruction measures have been achieved so far. [IV]

Img. 03: Sendai city's beautiful beach and residential neighbourhood next to it, before the Tsunami in March 2011

Img. 04: After the Tsunami - the breakwaters could not protect the city from the giant waves

1.3 Natural catastrophes: *How to deal with them? How can architecture contribute to that problem?*

Not only Asia, but also nations all over the world had been confronted with the immense and unpredictable power of nature throughout thousands of years.

Statistics of recorded events show that the time gaps between them are shrinking. Consequently, the numbers of seismic activities, such as earthquakes with consequential tsunamis and volcanic eruptions, along with meteorological conditions like typhoons, hurricanes and heavy rainfalls, which can result in extensive floods, in parts of the United States of America and Europe, are increasing. Or has it always been so rough? Nevertheless, the regions and countries have been forced to adapt to its natural circumstances over centuries, which as a result had shaped the countries, the people, the culture, lifestyle and philosophy/religion.

Fact is that earthquakes occur approximately thousand times per year only in Japan, which also had an important influence on the historical development of its characteristic architecture. Nowadays, in some cases, the extent of damage can be kept to a minimum since the technological equipment and risk mitigation measures have improved. [IV]

Img. 05: The oldest wooden construction: the five story pagoda ‘Horyu-ji’

Img. 06: The biggest wooden construction: the ‘Todai-ji’ with its 23t Buddha

Img. 07: The ‘Ise Grand Shrine’

(A) In the city, where it’s said that Japanese tradition has its origin, Nara, the both UNESCO Would Heritage Site listed wooden temples, the oldest Horyu-ji [in Japanese: 法隆寺, lit. Temple oft the Flourishing Law] (Img. 05) and the largest Todai-ji [in Japanese: 東大寺, lit. Eastern Great Temple] (Img. 06) are still existing.

(B) Japanese Shinto Shrines, the most famous one being the Ise Grand Shrine [in Japanese: 伊勢神宮, Ise Jingu] (Img. 07) are symbolising these aesthetic points, since they are replaced by identical replica every 20 years, so that the buildings will be ‘forever new and forever ancient and original’. [VI]

1 3 1 Historic backgrounds

Being in an area with high seismic activities, Japan had gone through severe catastrophes and learning processes, and somehow had to adapt to those circumstances. Japan was isolated from the western world and influences until 150 years ago, consequently the skills of the traditional handcraft and constructing methods had been studied intensively and an own dynamic architecture language could be developed. Craftsmen and engineers had gained broad knowledge about which materials and techniques to use, so constructions would be able to resist strong earthquakes and keep the numbers of personal harm low.

Wood has been used as a building resource for thousands of years. Under loads it can be flexible, yet keeping strength when bent and being robust for vertical compression, while its little weight makes it easy to process. For a wood-rich country like Japan wood has been and is still one of the most important sustainable recourses.(A)

In case of a strong earthquake with consequential damages, old constructions and joints were made for possible reconstruction, so only destroyed pieces needed to be replaced. For average residential houses the one-story-high house typology dominated, which could resist shakings more easily and didn't do much harm to the occupants by fallen objects if not. 'Nothing last, nothing is finished, and nothing is perfect'– the Japanese culture, people's ambition and even the architecture are perfectly represented by the old Japanese 'Wabi-sabi' philosophy, which is based on the acknowledgment of 'transience and imperfection'.(B)

Img. 08: Historical town Sawara in Chiba

(C) In general Japan's geology is considered to be hilly. Nowadays, with new technology it's no problem any longer to construct on steep ground. But centuries ago, simple people, farmers and fisher men were forced to settle down on flat ground, which had been available most likely along the coastlines. (Img. 08)

Wooden buildings, being the most widespread ones all over Japan, had been a considered choice against natural disasters like earthquakes in former times. But on the other hand, considering that wood is easily inflammable, for more densely settled places, devastating consequences could still occur due to this fact. Furthermore, the constructions without any tight connections to the foundations would have been possible but with difficulties on hilly sides.(C) Apart from that, built up on flat land along the coastlines, those light wooden structures would not be able to resist tsunamis either. Thus people would settle down close to the sea over and over again, as it assured their daily supply of fish/ food.

The Japanese Zen Philosophy 'living in harmony with nature' being the major basement of its rich culture, the old tradition had always had high values. There have been and still is a way of thinking that catastrophes happens, because old Spirits of Nature are furious about us humans destroying natural habitat. In other words, those disasters should teach us lessons and are supposed to happen, so humans are forced to learn from nature. However, individuals refused to surrender, to move away from their ancestors' houses, rather would they live in danger than giving up their existence. The intense and depending relationship between human and nature, the degree of 'giving and taking', is rooted so deeply in the Japanese culture, which mentality is still very distributed nowadays – especially among the elder generations. [I]

Img. 09: Totally destructed shopping streets at Nagata, Kobe after the Great Hanshin Earthquake in 1995

1 3 2 *Risk mitigation*

Since ‘disaster risk management’ was introduced in the late 90’s in Japan after the Great Hanshin Earthquake in 1995 (Img. 09), the environmental and building/ construction policy especially in high dense cities had to be strengthened for the sake of public security. Significant fields on disaster mitigation, such as ‘earthquake and fire resistance’ or ‘early warning systems and tsunami barriers’, could be improved by the invention of new technologies. Additionally risk-preventing systems had been initiated to decrease the amount of collapsing buildings due to strong earthquakes and fires, as well the numbers of personal damage. With consistent investigations on historically documented disasters within Japan, new important knowledge could be gained and applied; as a result, certain events caused by the power of natural catastrophes can be forecasted, the possible extent be calculated and better controlled nowadays.

Img. 10: Eiko Araya, 58, a school principal, atop the inner sea wall in Taro: 'We felt protected, I believe. That's why our feeling of loss is even greater now.'

[D] The small coastal town Taro, in Iwate prefecture, is known for its 10m high and 1,5km long sea wall. It's a result of previous tsunami devastating the town. However, it offered an false sense of security, hence it couldn't safe Taro's residents from the Tsunami on March 2011. One of the tallest waves of 38m was recorded just close to Taro. (Img. 10) [12]

Often, earthquake hit areas in Japan show limited damage, since Japan is one of the leading countries concerning earthquake technologies. On the one hand, new buildings and constructions must comply with regulation standards, whereas measures for preserving old traditional temples and other structures, and preventing them from being damaged by strong earthquakes are more challenging. The mixture of 'new' and 'old', 'traditional' and 'modern', is one of Japan's cultural qualities, therefore preserving these buildings should be considered more. Apart from this, damage on infrastructure due to unavoidable subsidence is more unpredictable and more problematic. [12]

Considering a tsunami in high-populated coastal areas, around 40% of Japan's total coastline have been taken additionally to early warning systems, engineering measures, such as barriers, to minimise consequential damages.[D] Those enormous waves said to be activated approximately once in 150 to 200 years; may be too rare to consider about protection beyond that. At the same time, engineers have been questioning about the effectiveness of constructing greater barriers than the already existing ones along the endangered costal areas, as recent examples show that those can be overtopped easily and don't necessarily stop the amount of water from penetrating further into land.

1 3 3 *Architect(ure)'s contribution*

Our world, the planet we are living on was formed due to the permanent impact of the enormous powers of nature. In fact, we have to deal with these natural forces, whether we like or not. But is there a chance to protect us from severe damages and the even more persisting consequences? What role does architecture play in the battle of natural force? How can architecture contribute to the constantly existing problem 'natural disasters' in general?

Earthquakes, tsunami, typhoons, hurricanes, volcanic eruptions, natural catastrophes have a tight hold on our artificial world. Earthquake resistant constructions, as well as the stricter regulations in the building industry are already taken for granted in our lives. But will we be able to resist the force in the future better than nowadays? Considering tsunami-endangered areas, is it possible to provide more safety without serious interventions, like creating giant breakwaters in the natural habitat? Where do we have to draw the limit? What has to be changed not only in terms of constructive security measurements, but also in the way of thinking about peoples' security? Thinking of reconstruction methods, what do architects have to understand to be able to improve the situation?

Despite the fact that we will always face natural disasters, we are able to protect us up to a certain point, but if we believe that we are able to 'fight back' nature's power with our technologies, we are definitely wrong. We have to find new ways of thinking and preparing for it, dealing with that fact and probably, even learning from it.

The architect is no longer only the designer. He should be a clever economist, thoughtful sociologist, furthermore a critical intermediary of our community. The architect is able to place statements with his ideas, to create streaming and capable of shaping our future.

Parts of tsunami endangered coastlines are protected by concrete walls, which are nevertheless no barrier for greater waves like tsunami. A tsunami of an extraordinary range, like the one that hit Japans coats in March 2011, happens approximately once every 150 to 200 years, statistics show. We should be prepared for the next big wave, but the protection method should be done in a more decent manner. Starting to shape the topography of the landscape can help to provide a appropriate way of keeping personal harm low, as water can be lead away from residential areas.

Our society will always aim for the superlatives, no matter in which directions. Taking the current environmental situation into consideration, the trend leans towards self-sufficient buildings with renewable energy sources and natural materials usage. Architecture ecology is more important than ever, so the idea of alternative buildings with 'upcycled' materials are now becoming more relevant. So even untypical materials like cardboard and paper find their way into finalising architecture, with the Japanese architect Shigeru Ban being the pioneer on this field.

Talking about one of the recent most severe incidents, the Great East Japan Earthquake in March 2011, the Tsunami washed away entire towns along the coastlines of Fukushima and neighbouring prefectures. More than two years after the incident (during my stay in Japan), the situation and people have not recovered yet from their traumas and only small steps towards reconstruction have been made.

What does the area need? What are the things people are wishing fore? How can architec-

ture affect people and a disaster suffered area in a positive way? The knowledge of primeval needs and their development should be in focus as well as the security. Concerning the cultural value of a town/ area, after a disaster, how should the new architecture deal with these problems and important questions?

People have been suffering, their homes have been washed away or destructed, hopes and dreams have been given temporarily other values and meaning to them. Nevertheless, this doesn't mean that the cultural spirit, the residents community has been washed away. Are architects supposed to used those kinds of 'opportunities' to create a new town structure with new future development plans that replace the characteristics of the old town with pure modernism, modifying the town spirit by implanting new regulations due to security measures? What is the most important thing to consider for those people who have been living in harmony with nature for generations?

Security is important, but is it tolerable to ignore the lands memories, dismantling the relationships between people and the natural world, the heart-to-heart interpersonal connections that constitute the region's historical heritage? National government prefers to push plans heavily dependent on civil engineering technology.

'Architecture as an instrument of economy' – it is significant to show residents that a recovery or reconstruction project has to have more than the profit value for them, and the architect in first case as a human being, has to show what can be done in first case FOR the people and try to reexamine the essential meaning of architecture. We have the responsibility to do so. [III]

Fig. 11: World map

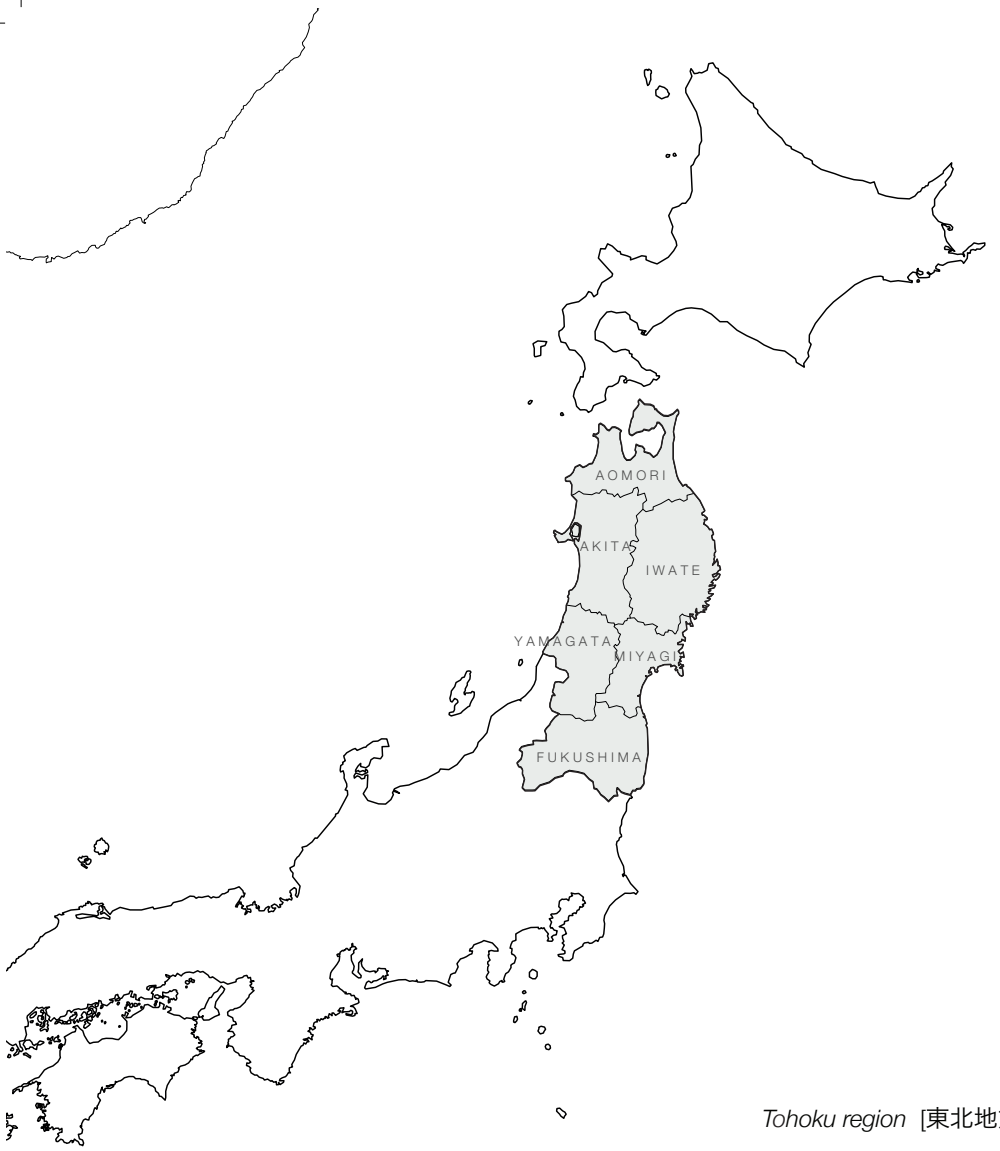
Fig. 12: Asia map with Japan

1 4 Project site: *Japan, Tohoku, Fukushima, Yabuki.*

Japan [in Japanese: 日本 (Nippon), lit. “Origin of the Sun”]

Japan (Fig. 12) is an island nation between the North Pacific Ocean and the Sea of Japan in East Asia. Four large islands Honshu, Hokkaido, Kyushu and Shikoku, and over 4000 smaller ones form the island chain. Japan’s population is the world’s 10th largest with over 126 million people living on an area almost the same size as Germany. The Greater Tokyo Area including the capital city Tokyo and the surrounding prefectures is the biggest metropolitan area in the world with approximately 30 million residents. Regarding the economy, exporter/importer status and the military budgets Japan is amongst the leading countries. Japan is one of the counties with the lowest homicide and infant mortality rates. Japanese women are said to have the second highest life expectancy, but on the other side the aging population in Japan has created an economic issue. [11]

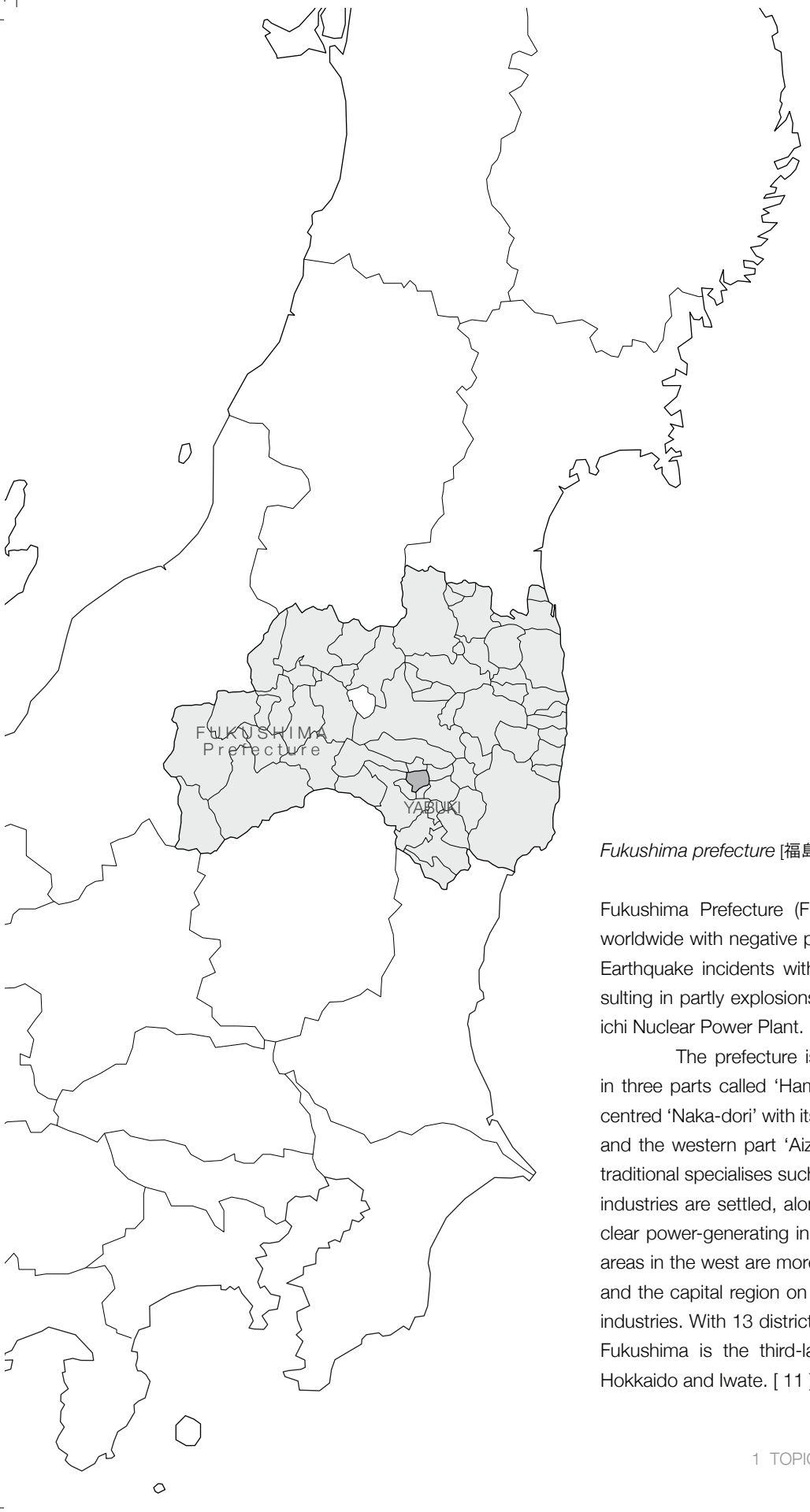
Fig.13: Japan map showing Tohoku region



Tohoku region [東北地方 (Tohoku-chiho)]

Tohoku (Fig. 13) is located in the north eastern part of Honshu, the main island of Japan, with an area of 67.000km2. It consists of six prefectures, which are Akita, Aomori, Fukushima, Iwate, Miyagi and Yamagata, and inhabits approximately 9.6 million people. Amongst them Sendai city in Miyagi prefecture, with roughly one million inhabitants, is the largest city in Tohoku region. Tohoku's Tourism is one of the major industries, which is well-known for its rich nature and tasty foods. Like forestry, the fishing industry used to be flourishing with the highest output within Japan. But neither big areas of forest nor the fishing equipment were safe from the tsunami occurred in March 2011 and it will approximately take some time until these industries can recover again. [11]

Fig. 14: Location of Yabuki town in Fukushima prefecture



Fukushima prefecture [福島県 (Fukushima-ken)]

Fukushima Prefecture (Fig. 14) got acquainted worldwide with negative publicity due to the 3/11 Earthquake incidents with following tsunami, resulting in partly explosions of the Fukushima Daiichi Nuclear Power Plant.

The prefecture is divided by mountains in three parts called 'Hama-dori' in the east, the centred 'Naka-dori' with its capital city Fukushima, and the western part 'Aizu'. At the costal region traditional specialises such as fishing and seafood industries are settled, along with electric and nuclear power-generating industry, while the upland areas in the west are more focused on agriculture and the capital region on software and electronic industries. With 13 districts and 59 municipalities, Fukushima is the third-largest prefectures after Hokkaido and Iwate. [11]

Fig. 15: Terrain and overview plan of Yabuki town

Yabuki town [矢吹町 (Yabuki-cho)]

Yabuki (Fig. 15) is located in the southern district called Nishi-Shirakawa, in the Naka-dori region of Fukushima prefecture. The town has an estimated population of approximately 18.000 on a total area of 60 km^2. Situated on the old North-South axis from the Edo era, which then was an important routes through the country, it's well integrated in the infrastructure, connecting Yabuki with the bigger surrounding cities. However, the accrued separation of Yabuki town in the older western part and the newer eastern part drives the community apart.

It has four elementary schools, one junior high and one high school, as well as The Farmers Training Educational Institute. A traditional Sake factory, run by the family Oki for generations, is still producing high quality Sake, which is traded all over Japan. Parts of the production hall collapsed after suffering damage from the 3/11 earthquakes, together with some traditional wooden storage houses spread over the old city core. Amongst them an old wooden house 'House of Taisho Roman'. Furthermore, half of the hospital buildings as well as a minor part of the infrastructure were destroyed.

The Yabuki Town Cultural Centre offers musical and theatrical entertainment. The Olke park (Big Pond Park) is Yabuki town's greenest spot that offers leisure activities and rich nature. [14]

Img. 11: The ‘House of Taisho Roman’ in its reconstruction phase.
The Blue Ribbon has become a sign of recovery for Yabuki town.

1 4 1 Why did I choose this place?

The 3/11 Earthquake and its aftermaths were unpredictably devastating. Especially, the tsunami suffered areas had been in focus due to the enormous extent of destruction, while 'only' earthquake struck smaller cities, like Yabuki and many others, hadn't got so much support or instantaneous help.

The University of Tokyo graduates and young architects' 'team RISO', who dedicated their attention to Yabuki's stricken community directly after the disaster for personal reasons, established the contact with the University of Tokyo. University professors, amongst them Professor Mikio Koshihara, and other cooperation of architects and students had formed a team named 'Omusubi' - which means 'connecting' or 'coming together' - to support the city's recovery process. Yabuki's community launched a big 'urban development' project, using the extent of damages caused by the disaster as a 'new beginning'. An old urban developing plan had existed, which outlines of the master plans should be still considered in the new project. Due to financial issues only small steps could have been realised so far.

Professor Koshihara, who is a specialist in timber construction, was asked to help with renovating the traditional wooden houses in Yabuki. Together with his architects' collaboration 'team Timberize', the western-style wooden building 'House of Taisho Roman' (Img. 11) – historical remains of America's influence - was renovated and partly reconstructed and it became Yabuki towns symbol of recovery.

Img. 13: One of many damaged wooden storehouses in Yabuki

Img. 12: Mascot of Yabuki: 'Yabukijikun', a pheasant (in front of Yabuki urban planning centre)

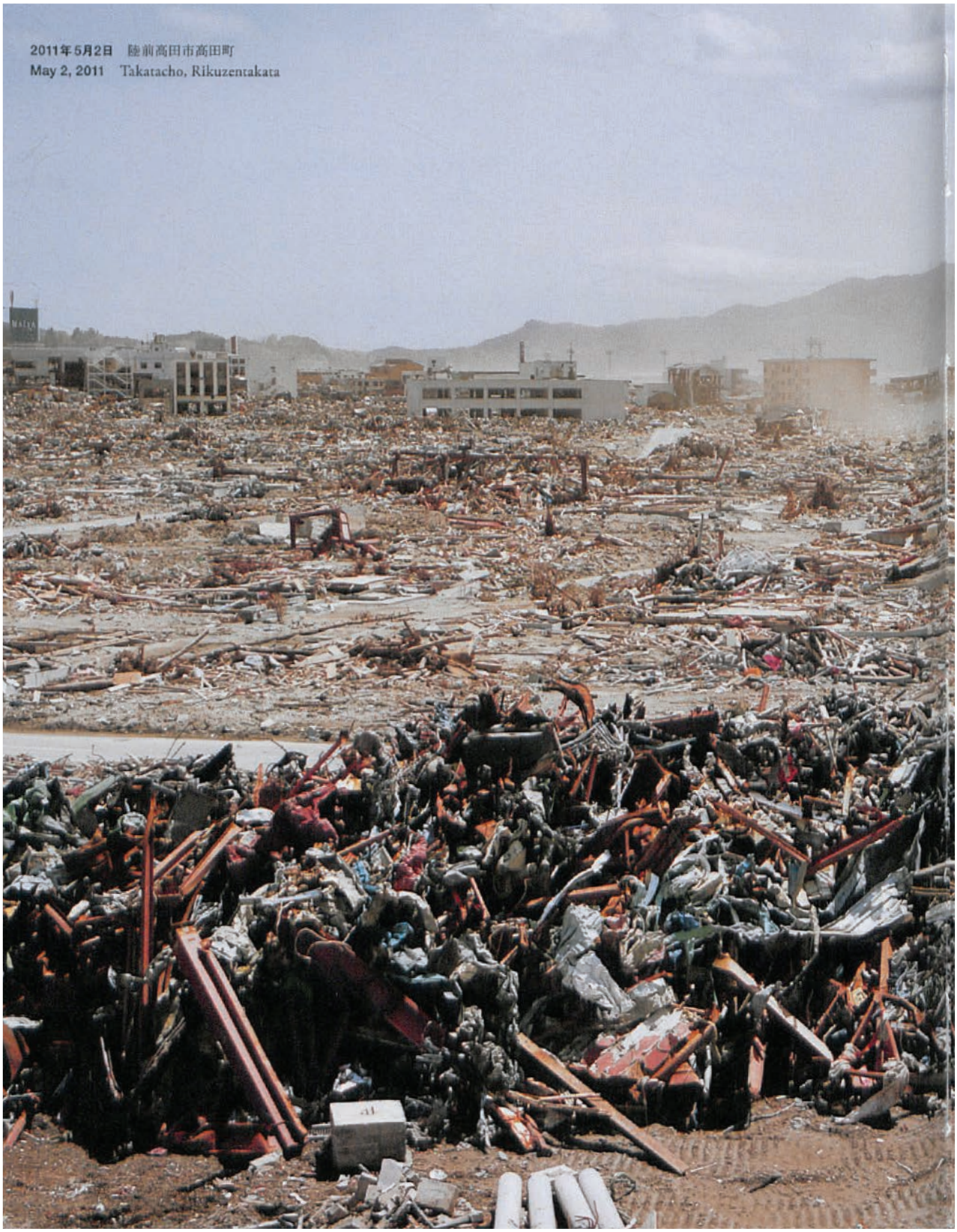
More than 1 1/2 years after the disaster, when I arrived in Tokyo, the worst seemed to be under control, yet the situation in the stricken area hadn't returned to normality, from what I had heard.

At my first meeting with Professor Koshihara, I presented him several suggestions about how I would like my thesis content to look like. At that time I didn't have either my project site or the exact outlines fixed, therefore I wanted to ask for his professional advice and whether he could help me finding the ideal location in the disaster area for my research project.

Professor Koshihara introduced me to one of his recent projects he was working on, the 'urban development' project for earthquake suffered Yabuki town in Fukushima prefecture. He and his team had been working on revitalising old collapsed timber buildings and additionally designed a multifunctional compact wooden box to support the regeneration phases. It was clear to me that I would not get any other better locations than Yabuki town. I suggested that I could use the given circumstances of the town for my master's thesis to develop my own regeneration and architecture design project.

My first visit to Yabuki was in early November 2012 (Img. 12). I accompanied Professor Koshihara and his team to a meeting with the municipal council, where they discussed about further steps concerning the recovery process. When I saw the first collapsed buildings (Img. 13), deserted market streets and only a few people moving through the centre, I was literally touched by the superficial 'melancholy' of the town's atmosphere. Even though it seems that everyday-life had been continued for most of the residents, hearing stories about daily life before the earthquake showed me that life can dramatically change within a couple of minutes, or even seconds. Every single fate, which came to my ears, was even more touching than the previous ones. Even though the visit was a trial for me to see whether I would be able to use those circumstances for my master's thesis, the decision was made right at the same moment.

2 *GREAT EAST JAPAN EARTHQUAKE* March 2011



Img. 14: Rikuzentakata after the tsunami, March 2011 [Ill]

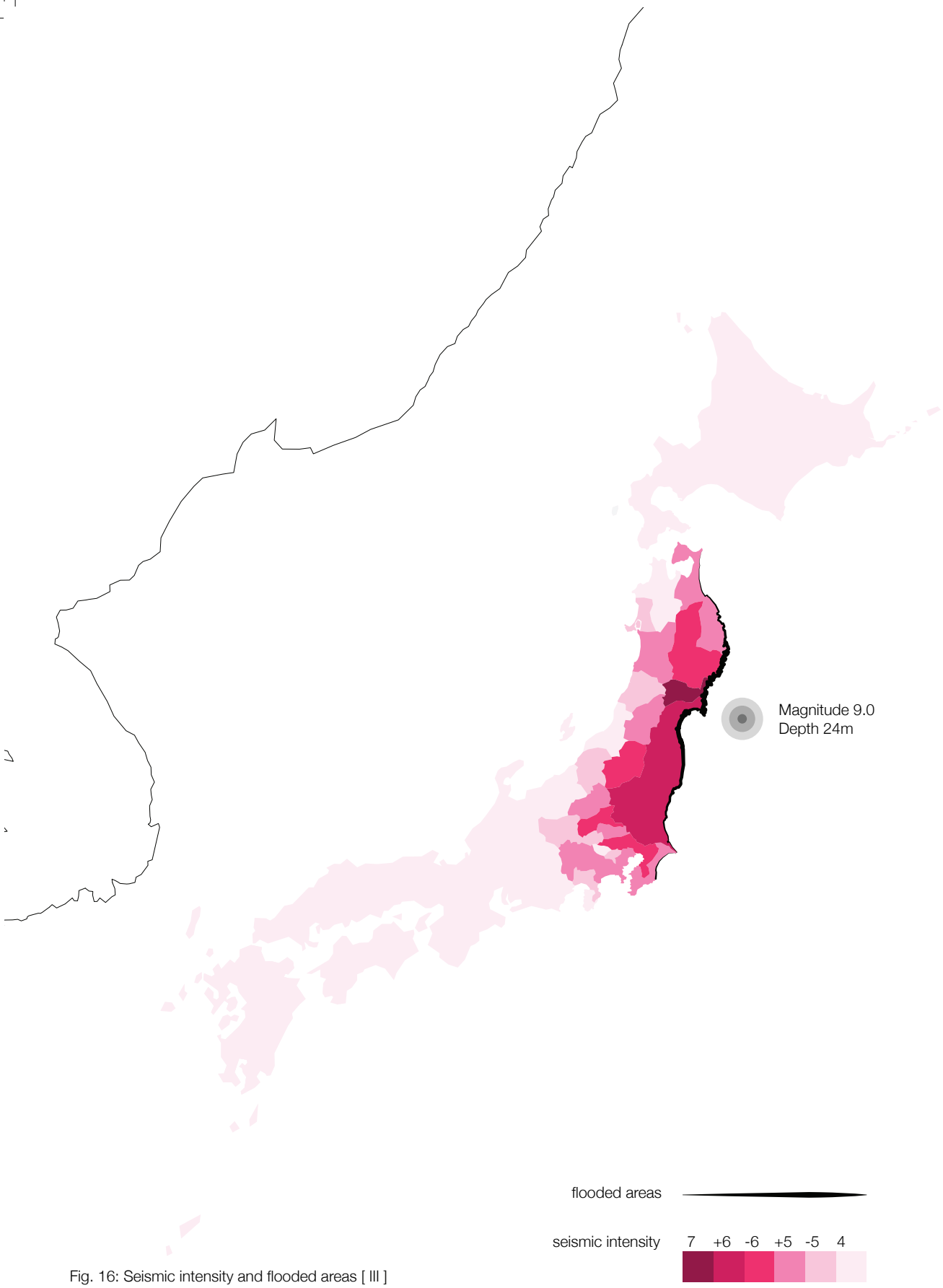


Fig. 16: Seismic intensity and flooded areas [III]

2 1 Research: *3/11 Earthquake - What happened?*

Facts (Fig. 16) [III]

- Date and time: March 11, 2011, 2:46 PM (local time)
- Epicentre: 38°6.2'N, 142°51.6E [Japan Meteorological Agency (JMA)]
- Depth of source: 24 km
- Magnitude: M 9.0
- Greatest tremor intensity: Level 7
- Aftershocks greater than Level 5.0: 713 times (through December 5, 2012)
- Approx. 535 km^2 in 62 cities/towns in 6 prefectures was inundated.
  Of this area, more than 40% of it was flooded to a depth of 2m or greater.
  [Ministry of Land, Infrastructure, Transport and Tourism]
- Maximum run-up height of tsunami: 40.1 m in Ohunato, Iwate
  (largest ever observed in Japan) [National Tsunami Joint Survey Group]
- 263 fishing ports in Iwate, Miyagi and Fukushima were almost completely destroyed.
  [Ministry of Agriculture, Forestry and Fisheries]

Destruction, casualties, damage to buildings

- Flooded above floor level: 20,587
- Flooded below floor level: 15,627
- Completely destroyed: 129,642
- Partially destroyed: 266,512
- Dead: 15,874 person
- Missing: 2,744 person
- Injured: 6,114 person
- Total households affected by power outages: approx. 4.86 million
- Evacuees: 325,000 person
- Losses resulting from damage: ¥ 16-25 trillion Yen

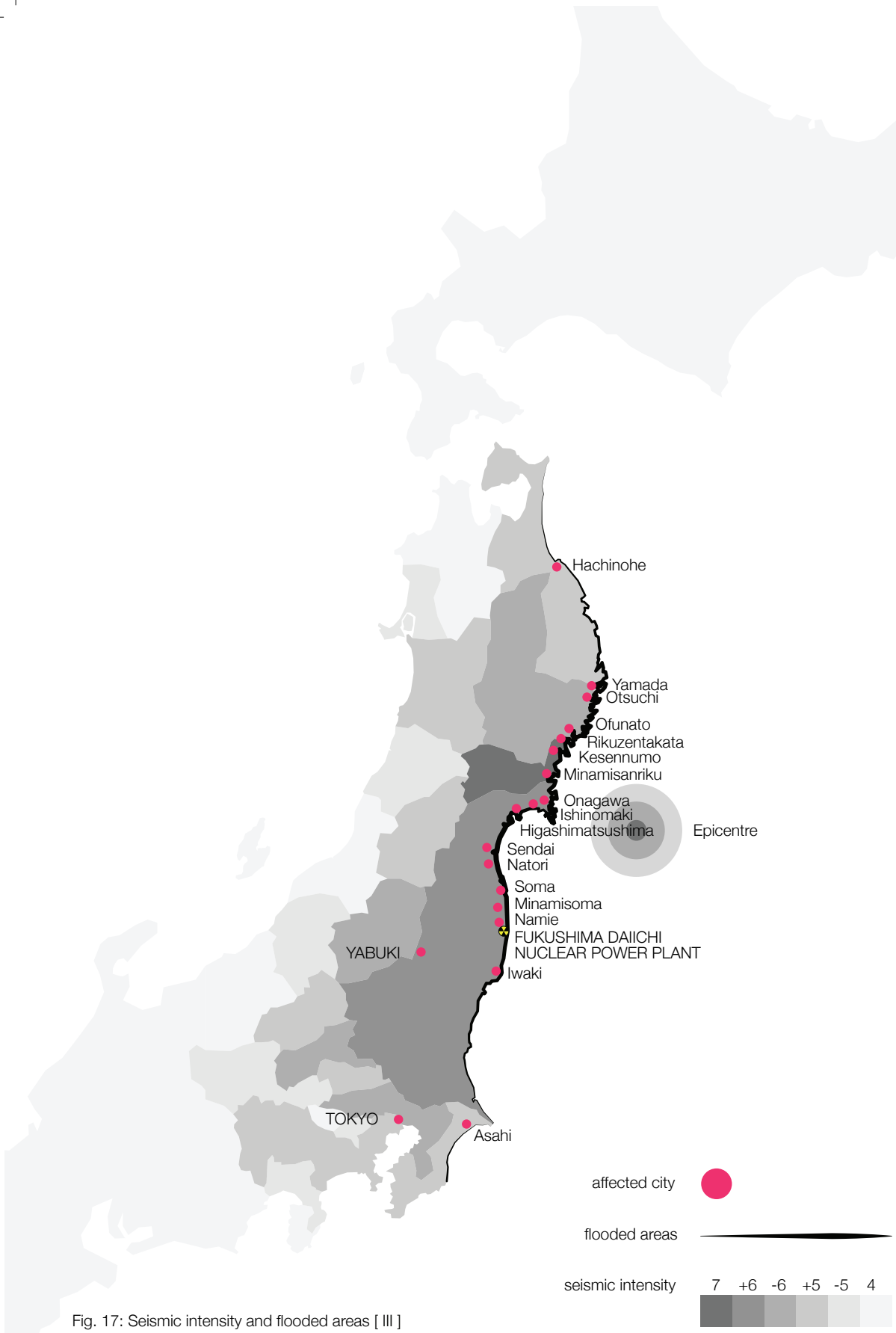


Fig. 17: Seismic intensity and flooded areas [III]

March 11, 2011 will go down in Japan's history as one of the most drastic disaster incidents that ever happened - so far - , and as the 'triple disaster', the first one that included an earthquake, a tsunami and a nuclear power plant accident. A magnitude 9.0 earthquake, the most powerful known ever to have hit Japan, struck in the Pacific Ocean off the coast of the north-eastern region of Japan's main Honshu island in the early afternoon. The shocks reached from Miyagi, over Chiba Prefecture to Tokyo – measured magnitude upper 5.0 – and lasted for several minutes. Half an hour later, a tsunami of unpredicted force and heights of up to 41 m hit 650 km of Tohoku coastline, demolishing sea walls and other protecting constructions, flooding over 500 km^2 of land, and washing away entire towns and villages (Fig. 17). Due to the earthquake the Honshu island was moved 2,4 m towards the east (Fig. 18), and furthermore the Earth was shifted on its axis. [04]

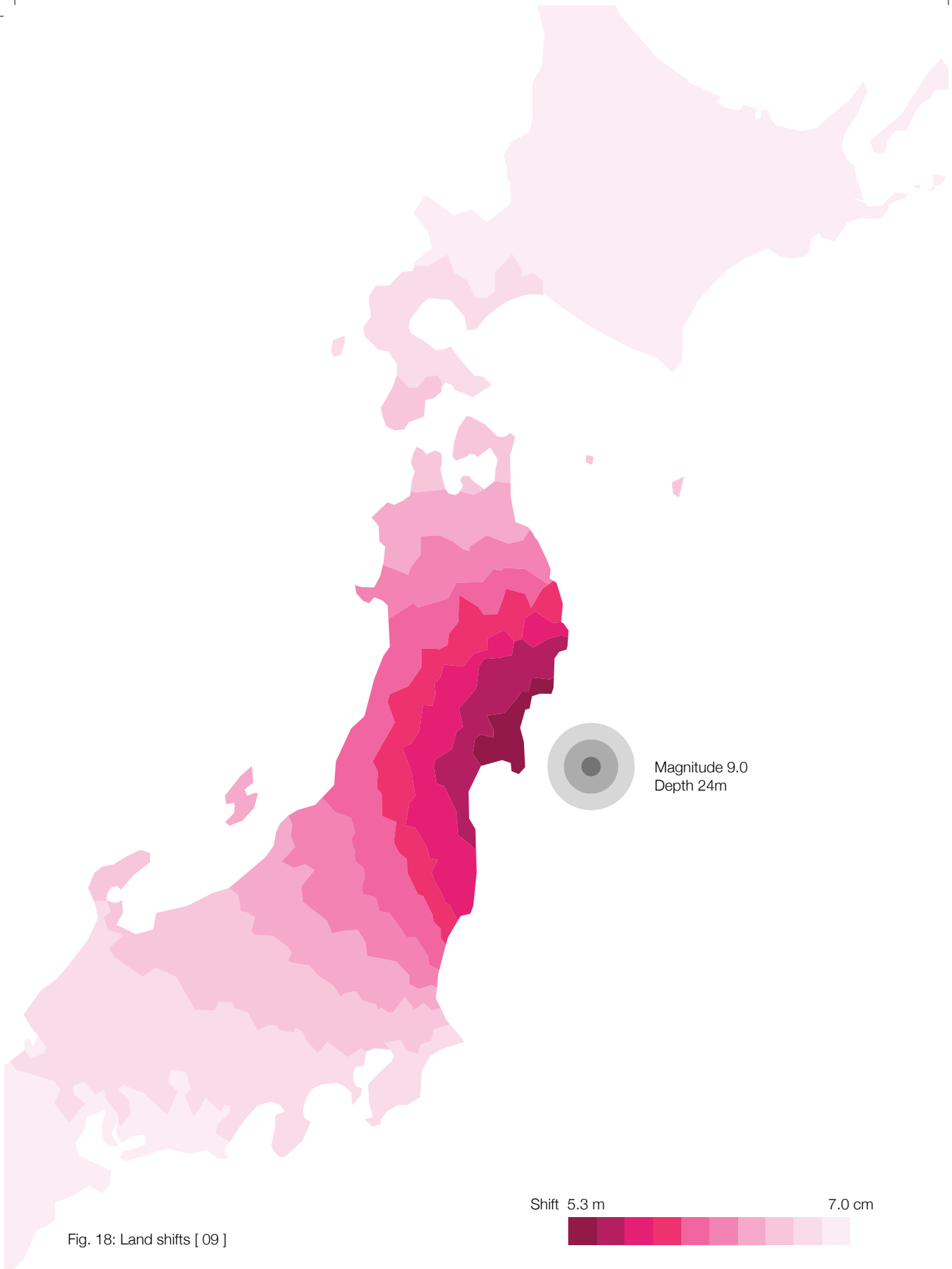


Fig. 18: Land shifts [09]

Japan, being a densely populated country, the extent of the destruction mostly caused by the tsunami was catastrophic, as the numbers of death toll and environmental damage show. Around 20,000 people were killed or listed to be missing after the devastation. The power of the tsunami washed away 130,000 houses and caused severe damage to 260,000 more. Around 300 railway lines and expressways stopped operations instantaneously, almost 700 national highways, prefectural and municipal roads were closed shortly after the disaster. 4.4 millions of households in the Tohoku area were left without electricity and further 1.5 million without water. The prefectures Iwate, Miyagi and Fukushima were stricken the worst, including consequential severe damage on nearby nuclear power plants. The tsunami caused nuclear meltdowns at three reactors in the 'Fukushima Daiichi Nuclear Power Plant' complex. Hundreds of thousands affected residents in the evacuation zones within a 20km radius were forced to leave their homes and escape to nearby safer regions. Since Japan is a highly developed country, with leading technologies, on the one hand the degree of damage by the earthquake could be lowered, but on the other extreme, due to the unforeseen tsunami's consequential damage the costs could rise as much as €152 billion Euro or ¥20 trillion Japanese Yen, making it both the costliest natural disaster in world's history and in Japan's history since WWII. [13] [IV]

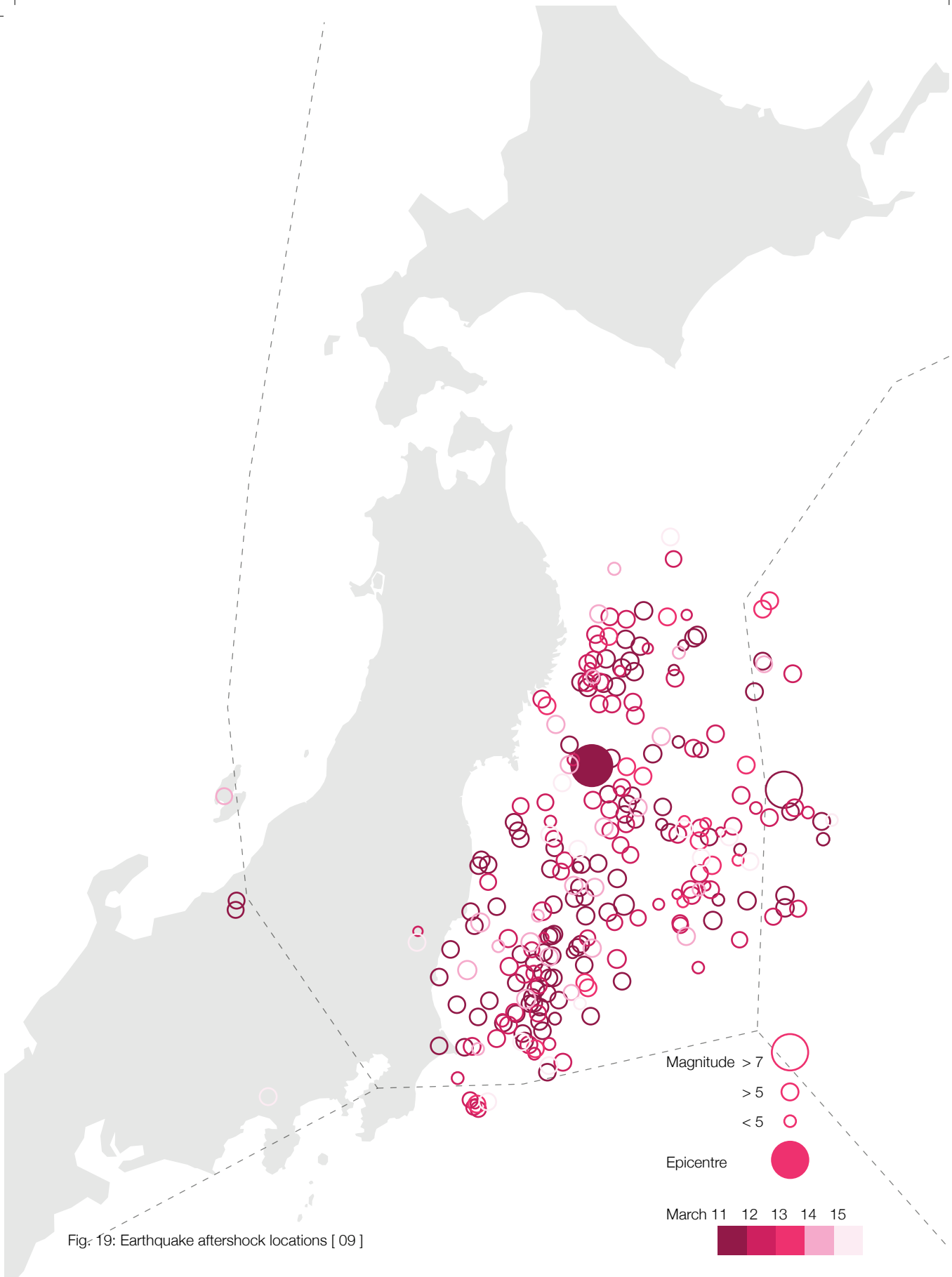


Fig. 19: Earthquake aftershock locations [09]

2 1 1 *Aftermaths*

The incidents of the 3/11 Earthquake resulted in a humanitarian crisis, massive economic impacts and the damage on the nuclear power plants, creating aftermaths in the long run.

The tsunami made over 300,000 residents of the Tohoku region to refugees, which resulted in shortages of food, water, shelter, medicine and fuel in certain areas. In response to the crisis, the Japanese government mobilised the Self-Defence Forces, 128 countries offered their assistance by sending search and rescue teams. Japan received support from 33 national and international aid organisations in form of donations, food, medical care and textiles.

Until temporary shelters could be built up, the sudden evacuees had to find accommodation in nearby school gymnasiums and other public buildings. Due to, primarily the partly destructed infrastructure, bad weather conditions and furthermore fuel shortage, it happened that the important supplies of food, water and medicine had been held up. The small numbers of already erected provisional housings had long waiting lists and lack of space and organisation in the disarranged areas was an additional problem for smooth and quick improvement of the situation. Many evacuees had to spread out to neighbouring towns and cities that provided enough space for evacuation shelters, splitting communities, even families apart. Those ‘emergency housings’ are mostly simple container constructions, without any isolating systems and comfort, often occupied longer than planned due to unpredicted problematic and slow recovery process. [12]

The economic impacts had short and long-term consequences. On the one hand the immediate problems, such as industrial production stagnation, which also affect the economy in the long run. On the other side long-term issues concerning agricultural contaminations, which in total had been estimated at € 152 billion Euro or ¥ 20 trillion Japanese Yen shortly after the disaster. Factories of well-known exporting companies were forced to stop their productions due to severe damages, resulting in serious aftereffects on the world market. The seawater soiled wide areas of flooded land including forestry and agriculture. Especially the contaminated extremely sensitive rice fields dropped Japan's rice production approximately up to 4%, with unpredictable consequences for possible rehabilitation for the early future. The fishing industry was almost completely destroyed by the tsunami, as 90% of all fishing boats in affected prefectures were unusable.

Nevertheless, at the same time, the disaster created a high demand in the building business and provided jobs in the Tohoku region. Domestic craftsmen and carpenters are an important figure in the rebuilding process. They can encourage a quick start by offering their handcraft for free. For the residents of the destroyed towns they can be a psychological support and give them hope by showing progress in their efforts.

Furthermore the serious damage to the Fukushima Daiichi Nuclear Power Plant complex activated a nuclear meltdown, also releasing amounts of radioactive cooling water into the sea. Meteorologists predicted that radioactive particles could be spread out by the winds and go down in form of rain in a certain surrounding, including neighbouring countries. The collapsing power plant and the consequences had drawn most of the attention and had led to increased worldwide protests. An international discussion based on concerns about the security of the atomic energy policy got launched, since an atomic catastrophe would have a severe global impact.

Whereas the Daiichi Nuclear Power Plant operating company TEPCO (Tokyo Electric Power Company Inc.) and Japan's government were endeavoured to keep the consequences of the actual extents low, the international media and specialists examined the whole situation. On the one hand, it was important to be cautious with spreading out alarming news to avoid mass panic and escape, but on the other side, the concerns about the Japanese media's authenticity grew and put the nation in anxiety. [12]

Img. 15: Photographies of Rikuzentakata before and after the tsunami March 2011 [III]

2 2 Call for help! *Architects's regeneration projects*

The aftermaths of natural disasters comprise more than extraordinary high material damages. The dimension of personal harm, loss of a stable environment and community with history and culture, and the need of looking towards the future briefly right after suffering such a shock, means a lot of physical and mental stress for the victims. An instantaneous preparation on taking the first steps in the direction of recovery plans of stricken areas are necessary as much as quick actions and first aid measures.

Amongst the architects, not only the Japanese, the 3/11 earthquake disaster and the following crisis generated global dynamic movements in all aspects, economical, ecological, social and political. Previous catastrophes of similar severe extent have always moved specialists and engineers to overthink and improve emergency strategies, security measurements concerning construction performance for the possible imminent natural impacts. The aim is to find the right balance between an immediate necessity of support in case of an emergency and implements of permanent plan changes for a more safe future. However, in any case the people are the victims, who are depending on support, and their hardest enemy is time.

Slowly but constantly, 1 ½ years after the disaster, the regeneration progress has been proceeding and leads to a new era of exemplary sustainable architecture with focus on social and interpersonal aspects.

The following three exemplary reference projects by Japanese architects and architects collaboration show different conceptual methods and ideas to contribute to the disaster in the Tohoku area.

Img. 16: ‘Home-for-All’ team: Kumiko Inui, Toyo It, Akihisa Hirata, Sou Fujimoto and photoprapher Naoya Hatakeyama [III]

2 2 1 *'Home-for-All' by Toyo Ito, Kumiko Inui, Sou Fujimoto, Akihisa Hirata*

A team of well-known Japanese architects - Toyo Ito as the commissioner, Kumiko Inui, Sou Fujimoto, Akihisa Hirata (Img. 16) –, contributed to the reconstruction as they originated the project called 'Home-For-All' for the tsunami stricken city of Rikuzentakata in Iwate prefecture.

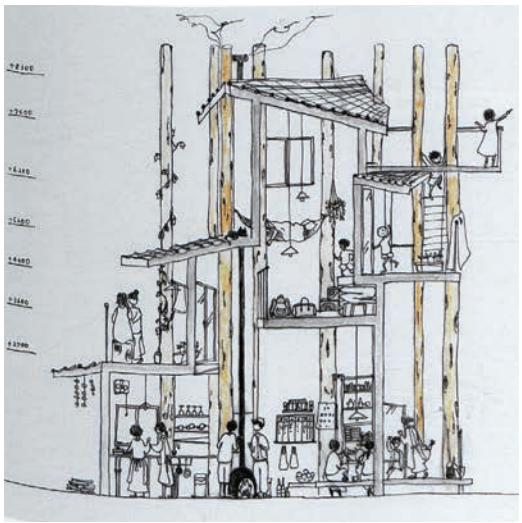
Project development and description

In the beginning, the task was not defined and the three unlike architects established their own ideas with their individualities. Important to understand what exactly was needed, was Mr Ito's concern: 'Architecture. Possible here? What can architecture achieve for a place, where everything is lost?' Mr Ito's opinion, architecture is only possible 'under such conditions and in such places' – in other words, it is necessary to not rebuild for the sake of reconstruction only, but to preserve the old memorable surroundings for the sake of the residents, but still in a safe environment. The idea of creating a small common house in the stricken area is supposed to allow those traumatised people to gather, interact with their helpers on an equal footing, which is an important foundation to be able to 'retrace architecture's primeval process of development' while talking about and listening to their needs, hopes and wishes for the future. It should carry the function as a common base point of operation for the future regeneration process of the town, creating a network of residents, which can implement their ideas to the local government. Due to that, the project is no longer just a building, it symbolise the critical top-down approach of reconstruction and at the same time it raises the emotional values of the created architecture.

In the first months after the catastrophe, hundred thousands refugees needed to be accommodated in school gymnasiums and other public facilities that had temporarily been converted to shelters. Amongst the victims a tight-knit community – often referred as 'disaster utopia' – had developed. When finally the temporary housing units were erected, those people were dispersed all over the areas, tearing them apart and the community was in danger of disintegration. Mikiko Sugawara, who also lived in those temporary shelters, initiated the idea of providing a place where the members of the community could continue to meet. Her positive spirit and thirst of action that resulted in an own small project called 'Genki House' (Energy/ Good Spirit House) and

Img. 17: ‘Home-for-All’ after completion [III]

Img. 18: 1:10 model of 'Home-for-All' [III]



Img. 19: Sectional sketch shows how spaces can be used by everyone from child to the elderly [III]

caught the attention of the architects. The problem of a 'disaster utopia' is the fact that is only last temporarily, as it is attached to a certain event and place only. 3/11 being a devastating event in Japan's history, the three architects and Ms Sugawara were searching for a solution for a building with a symbolic character, marking the happenings in a reminding way and honouring the victims.

The architect's first attempts of creating a building with multifunctional character, but still in a simple manner concerning the circumstances, were leading in different directions. After being introduced to visit the actual site and listening to Ms Sugawara's impression of her life in the temporary housing with the community, their blurry image started to get a concrete shape in their minds. The goal was more than just to achieve to build a house where people could meet, discuss and exchange ideas about the future or the town. More essential questions regarding interpersonal connections and the original meaning of architecture were more in the focus than the final design. Eventually, the design that had been shaped by collaboration between architects and residents was born.

Halfway in their constructing process, Toyo Ito and his team presented their 'Home-For-All' project at the 13th LaBiennale in Venice in summer 2012. The Japanese Pavilion showed the designing process together with touching interviews and photographies by Naoya Hatakeyama, a resident of Rikuzentakata, of the destroyed town. 'Home-For-All. Architecture. Possible here?' won the Golden Lion for the best presented project of that exhibition. The team received positive and encouraging feedbacks from the international Jury for a contribution in an exemplary manner.

The tower-like building (Img. 17) with its different spinning levels provides common spaces, where people can cook together, balconies and platforms as view points over the total coastal area of Rikuzentakata. The community had lived in close touch with nature for centuries and their common wish was to use the cedar trees that were washed away or died due to seawater-contaminated soil. Those 10m long tree logs were used as the characteristic construction of the building. [III]

Img. 20: Archi+Aid in the tsunami stricken area with Yoshiharu Tsukamoto

2 2 2 *'Itakura Core House' by Atelier Bow-Wow's Yoshiharu Tsukamoto supported by 'Archi+Aid'*

Archi+Aid - Relief and Recovery by Architects for Tohoku Earthquake and Tsunami

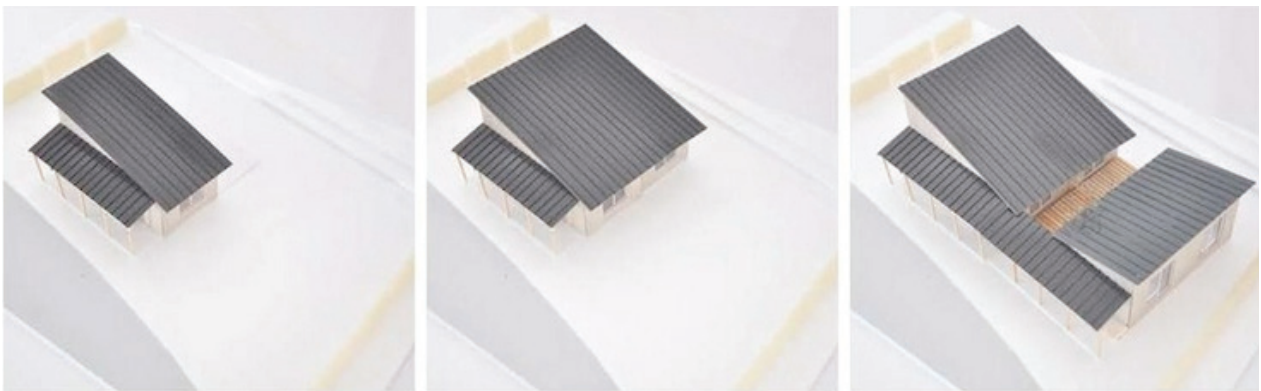
The reconstruction support network of architects and architecture students 'Archi+Aid' was introduced that proposes a cooperative effort towards recovery of the disaster stricken areas. Its aim is to create a platform that provides a joint between the locals and the professionals to be able to put quick actions on areas that need help. The cooperation between the Sendai Design League - centred on Tohoku University – and the non-profit design and building company Architecture for Humanity started the basis for such a platform. Architecture departments of national and international universities were linked together to large networks to offer a share-point of interdisciplinary know-how and support on various fields, as well as a wide pool of creative ideas can be collected and a fast processing can be achieved.

The goal is to develop a practical educational service concerning reconstruction, while motivating students and young people, who will sustain these regions in the future, for their support. [01]

In cooperation with the open platform PechaKucha 20x20[E] Archi+Aid could raise funds for the reconstruction project 'Itakura Core House' by Atelier Bow-Wow's architect Yoshiharu Tsukamoto (Img. 20)

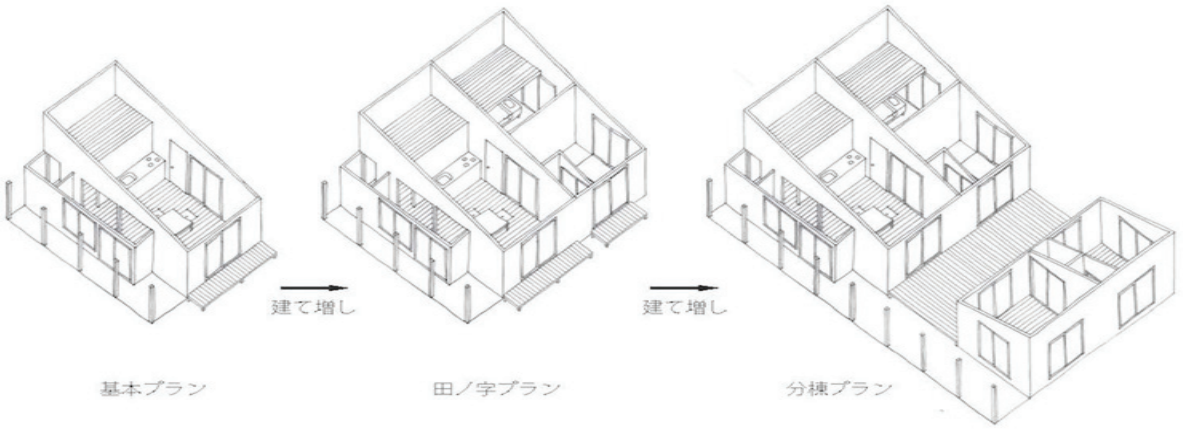
A special 'PechaKucha x Archi+Aid' event in Tokyo was held in late 2012, where well known architects' bureaus took part and presented their impressions about the actual state of the tsunami stricken areas of Tohoku and their ideas of possible projects with future. Next to Yoshiharu Tsukamoto, Japan's famous architects Kumiko Inui and architects' collaboration SANAA represented their contributions, followed by discussions. [08]

[E] PechaKucha 20x20 is an international open platform where architects and creative minds are able to present, share and discuss their ideas. The format 20x20 means 20 images are shown for 20 seconds each and switched to the next automatically while you talk along. The format was invented by Astrid Klein and Mark Dytham of Klein Dytham Architecture, a British office located in Toyko. The first PechaKucha Night took place in Tokyo 2003. Since then the trend has been spread out in over 700 cities worldwide.



Img. 21: Model of extension steps

Img. 23: Image of ‘Itakura Core House’



Img. 22: Plan of extension steps

Project development and description

Atelier Bow-Wow's Yoshiharu Tsukamoto proposed a minimum house for the revitalisation of tsunami destroyed fishermen's town in Oshika peninsula. The low range of jobs, small changes of a promising future and the catastrophe's consequences discouraged the younger generations to either stay in their hometown or move back. The project's first aim was to create a generation-mixed living community to give the young people an attractive reason to return. Due to the increasing numbers of elder residents, the persisting of the local fishing industry was endangered. Mr Tsukamoto's wanted to encourage planners to think about a house in its original meaning. How people used to live, in case of Oshika, at the beach, close to the sea.

The Core House is designed in the traditional wooden constructing method that consists of prefabricated pieces and can be built up in within a short time. It needs twice as much more wood than normal houses even though its minimal size. However, the forestry industry can be reactivated after the disaster by producing the pieces.

The name 'Core House' comes out of the smart organisation of the residence's small spaces. The minimal 'core' of 3.6x3.6m, consisting of kitchen and bathroom, are attached to a dining room, which is living and sleeping room at the same time. The shed roof creates a higher inner space on one side, which can be also used as an extra storage. Fishermen need to be able to hang their nets and clothes for drying – the high ceiling is ideal for it. An outer loggia on the street-side of the house is a place where people can meet and communicate, which support the community's strength. [08]

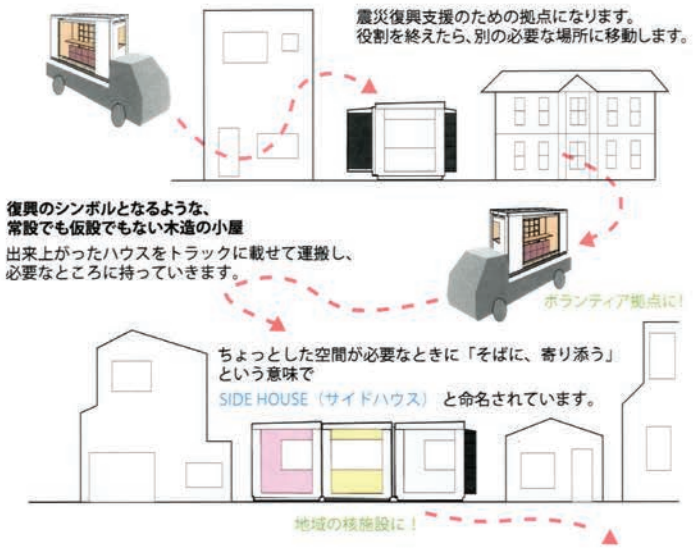
Img. 24: Team Timberize with Prof. Mikio Koshihara (4th from right)

Img. 25: ‘Omusubi’ members with Yabukis Mayor Nozaki Yoshiro (2012/03/14)

2 2 3 *‘Side-House’ by team Timberize, architect and structural designer Professor Mikio Koshihara*

Since the Great East Japan Earthquake in March 2011, Professor Mikio Koshihara and his team Timberize (Img. 24) are participating in the extensive reconstruction project of the Tohoku region. Other then the two previous references, their project is planed for one of the earthquake destructed areas in Fukushima prefecture, in a small town called Yabuki.

For team Timberize, not only the revitalisation of buildings, but also the social support is required in order to improve the stricken areas health and wealth. In tight collaboration with the local craftsmen, carpenters and residents, essential needs and common goals are tried to be visualized together. As a result, an own organisation called ‘Omusubi’ (literally translated: ‘coming/bringing together’) could be launched in cooperation with a different mix of architects (Img. 25) and architectural students. Such a regeneration process takes time and a long-term view of the city planning and urban development is necessary. Taking the advantage of the symbolic spirit of a repaired building, new hope can be put into the regeneration process. Other than the tsunami destroyed areas, the earthquake stricken ones are equally demanding, but in a different sense. Both cases need different kinds of supports in various ways. Whereas the tsunami swallowed whole towns leaving nothing behind, in the earthquake hit places the extent of destruction is often not revealed completely at the first sight. Those hidden damages on wooden constructions are tricky and hard to detect. The probability of those buildings collapsing after a certain time is not low. [07]



Img. 26: Transportation, use as minimal space, further to extended version of the ‘Side House’ [VII]

Img. 29: Side House during revitalising ‘House of Taisho Roman’

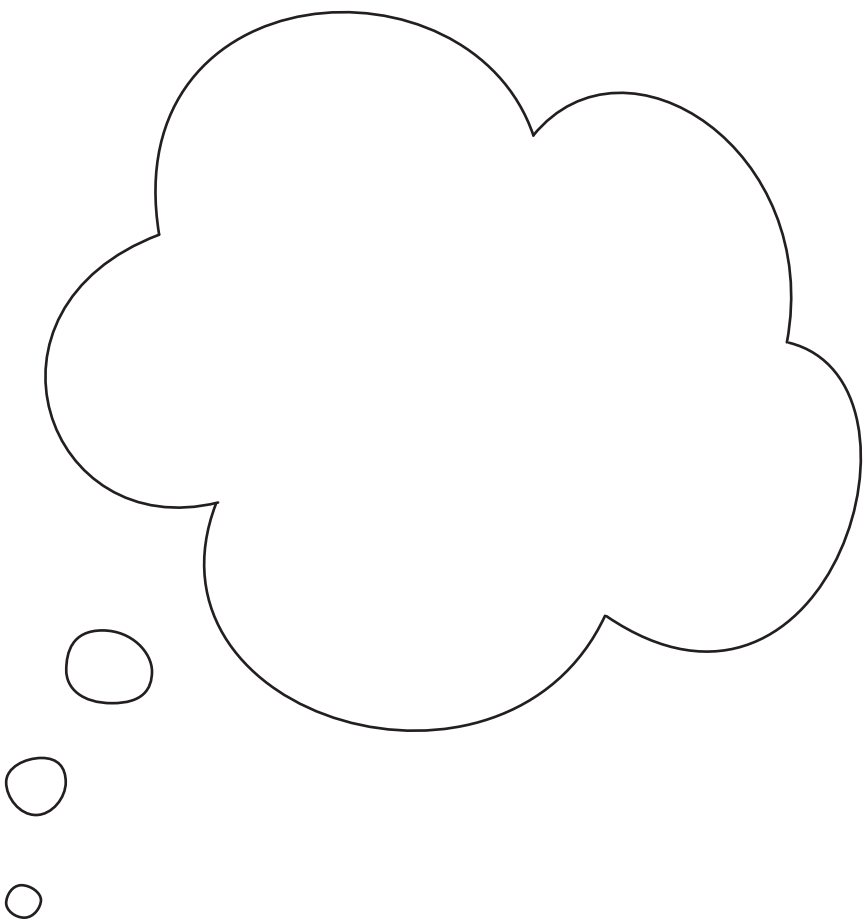
Img. 27: Single use of Side House [VII]

Img. 28: Extended Side House [VII]

Project development and description

Going further to constructing temporary or new housing, the use of local forest recourses maintains an effective and sustainable way of regeneration progress. At the same time, the building and forestry industry get activated again, which raises the countries stricken economy. To keep a clear vision about how the future can be established in people's mind is significant during the early phases.

Professor Koshihara and his team came up with the idea of creating a small wooden box (Img. 29), which is provided during revitalisation works in town and becomes automatically a part of it as time goes by. The 'Side-House' is put next to the actual reconstruction site like a piece of mobile furniture and furthermore it offers the participants a place to rest, meet and share their experience during the regeneration period. The 'Side House' is extendable on all four sides through a connecting element with another unit, allowing to adapt its size to the actual circumstances. It was already used during the time 'House of Taisho Roman' had been repaired. For festivals and events, the 'Side House' is turned into a portable unit with various functions. Until the next revitalisation starts and afterwards it should be moved again to any other location – where it is needed. [07]



2.3 Design question: *Analysis of architects' regeneration projects vs my vision of 'Pocket House'*

The three previous reconstruction projects in the disaster affected areas in Tohoku have three different approaches of relief strategy for each situations. Whereas two of the projects are found in the tsunami hit regions, the third one deals with an earthquake stricken town. The architects have been developing individual and specific concepts reflecting the circumstances and fates in each case of the supported town.

In all three exemplary projects, the social value was more in focus than the actual output or the design of the contribution. Moreover, the projects were not only planned and erected 'for' the victims, but 'together' with the affected residents using local materials and handcraft. By listening to their needs and concerns, sharing ideas and future visions, and creating the final outcome together, these architects are not longer only any constructor in a huge network of a disaster relief projects, but can be seen as sympathetic supporters on an equal footing.

Img. 30: Entrance of the Japanese Pavilion at the 13th LaBiennale (2012/09/16)

Img. 31: 'Home-for-All' exhibition at the 13th LaBiennale (2012/09/16)

2 3 1 *Analysis part and comments on the projects ...*

Analysis: 'Home-for-All'

That project had to resist a lot of critiques from the very beginning, even though prominent architects joined together. Or perhaps due to that reason that the cooperation was between well-known architects the interest was even higher. At the 13th LaBiennale in Venice 2012 (Img. 30 + Img. 31), Toyo Ito and his team presented their project, which was still waiting to be finished, and won the Golden Lion for being the best contribution. From then people started to have a closer look at the catastrophe relief project.

At the first glance, it was challenging to try to understand the project and its values. It was supposed to be placed in a tsunami destroyed area, where everything was lost. After the incidents of 3/11, a temporary housing district was set up with ordinary container-like structures for the victims. The whole world was following the architects' plans and assumingly a kind of an urban planning proposal for the following revitalising projects was expected. When the 'Home-for-All' went public, it was already seen as a pioneer project.
The victims knew that it would take time until their city will be back to normal. As long as there are forced to stay in the temporary shelters, which are spread all over the area, a space where the community members can continue to meet was desired more than a permanent housing plan. The design of a common house was developed during intense discussions among the architects themselves, but also together with the key persons of Rikuzentakata and their inputs, which first of all made that project possible. Finally, in a temporary housing project Toyo Ito and his team had created a permanent building with an exemplary unique character and a priceless value, as a symbol of regeneration for the whole Tohoku area.

< The concept of developing an individual common space due to the given conditions could be adapted in many ways and be recreated in different other places. But all in all, from the view of urban planning, the 'Home-for-All' project has a great influence on the future development of the city. It is not only a building with a public function, it also gives residents the change of integrating

Img. 32: Constructing Core House in Itakura method

Img. 33: Future image of Oshika peninsula

themselves in the recovery process of their own city. The fact that it is the first constructed building in that area, makes it to an important part of the new structure and will be perfectly integrated later on. I can imagine placing similar projects in affected regions to gain the same effect. >

Analysis: 'Itakura Core House'

The aim to achieve a recovery of the local forestry and fishery industries as soon as possible, made architect Yoshiharu Tsukamoto eager to propose a permanent revitalisation plan. A new structure consisting of small specific houses, which is adapted to the peoples' lifestyle – most of them were fishermen –, was developed. The tsunami stricken areas have to be reorganised before residents can permanently settle down again. The estimated date is set on five to six years from the actual time the incidents happened. A high percentage of the elder generation was affected, aged 60 to 65. Considering the passing time until those residents are able to return to their hometown, they will be already 65 and even older. To make it reasonable for them, Tsukamoto designed the house in a way, that the primarily minimal space can be extended whenever the residents have again more money to spend. Due to that method, the residents are easily encouraged to resettle there. The industries are reactivated, since the construction works will continue slowly, but constantly.

< Considering that the typology of the 'Core House' is conceived for a fishermen's lifestyle, nevertheless the open and clear design allows a universal usage, almost everywhere. The project was financed by donations through the organisation Archi+Aid and could construct a model house for the residents. If the regeneration plans for town Oshika can be developed like in Mr Tsukamoto's proposal, the whole town could afford to start a new chapter of their lives in a 'Core House's that brings back life in the devastated areas of Tohoku. >

Img. 34: ‘Side House’ while being used

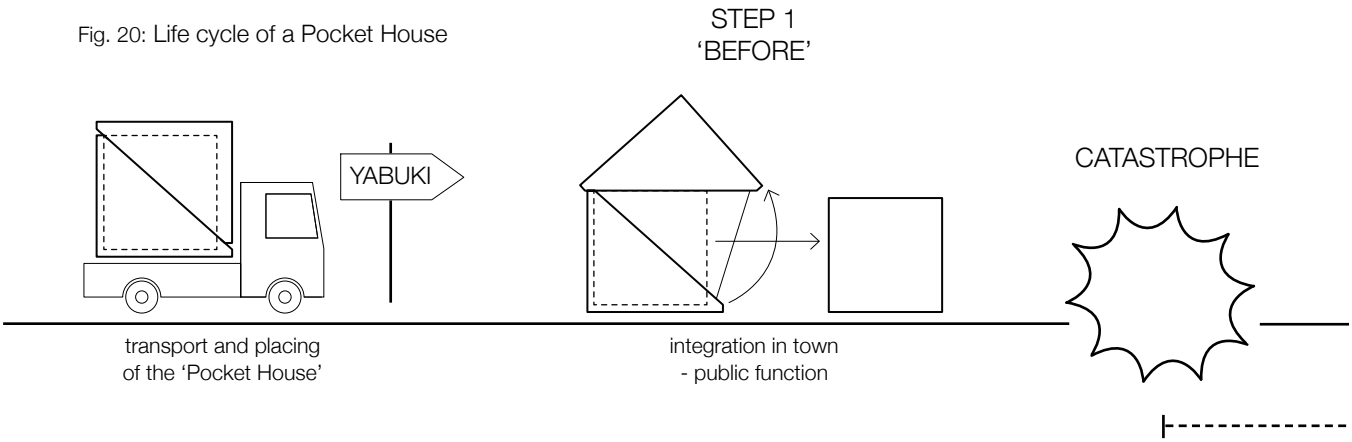
Img. 35: Interior of ‘Side House’

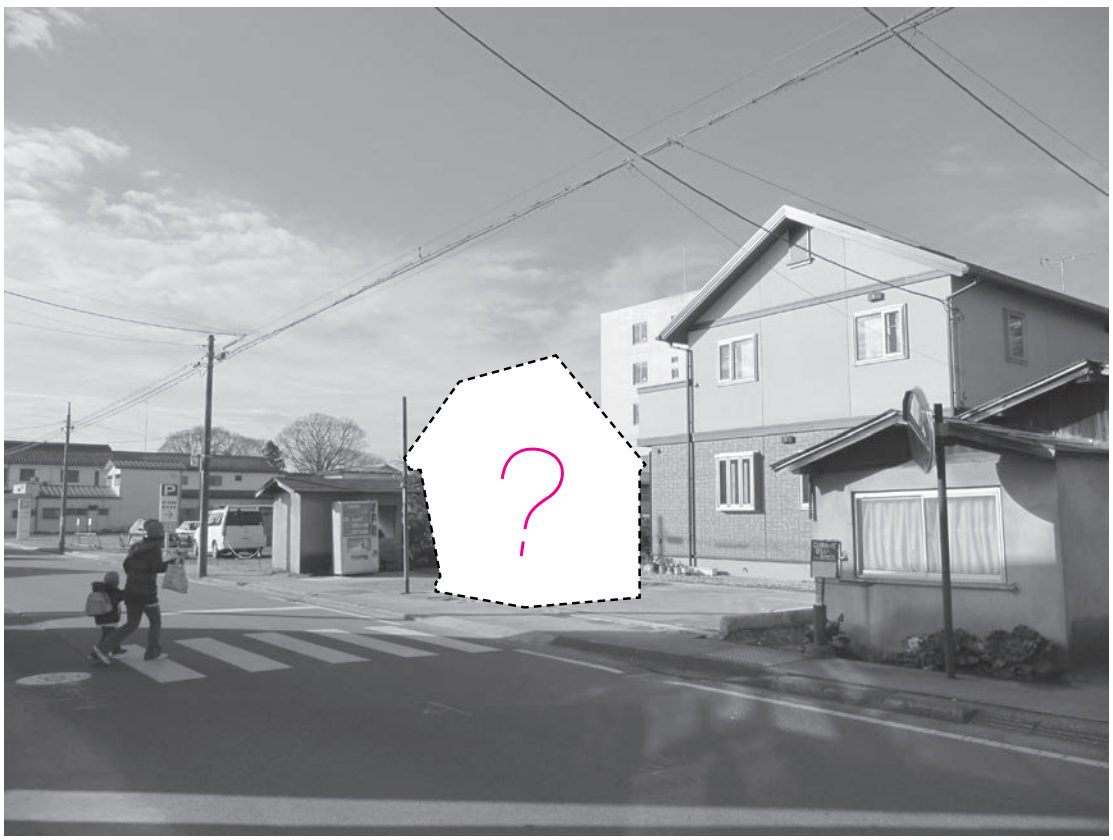
Analysis: ‘Side House’

The small wooden unit for earthquake stricken Yabuki town has more than the function of being a portable common space. Team Timberize knew from the beginning that the reconstruction phase would not be finished within a short period of time, but that it would last at least years. The Side House was provided as a meeting point and a place to rest for the workers during revitalisation works on ‘House of Taishou Roman’. The aim is to give the Side House the opportunity to continue accompanying the following rebuilding projects and to grow to a permanent component in town. At the same time, it is never permanent, since it is portable and can be moved wherever it is needed. The Side House is a ‘permanent temporary’ unit that can change in size and use.

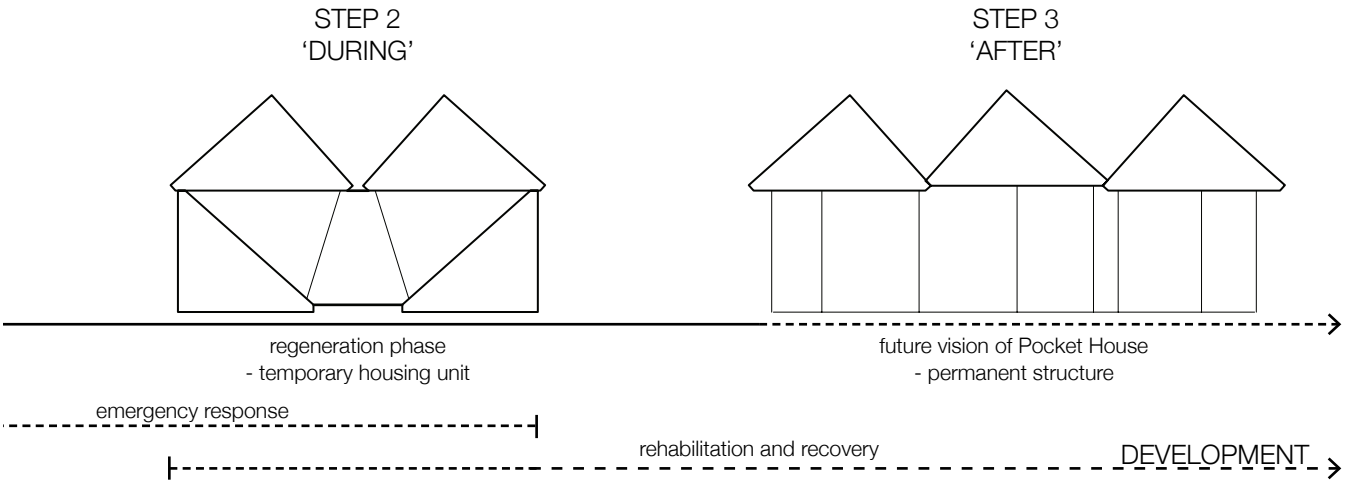
< Just by placing a small wooden unit, Yabuki can feel the progress towards normal life again. The strong community oriented function, as a shared space together with its story will keep on living in the residents hearts. As time passes and everyday life returns, still the people will always associate the positive and optimistic feelings during the regeneration phase by seeing the Side House. As it can be easily transported, the variety in usage and location is endless. For more promotion within the town, it should switch its spot once every month and also its function. The possibility of permanence is ensured, but does it only provide expanding in two directions. A change in shape and dimension would be desirable. >

Fig. 20: Life cycle of a Pocket House





Img. 36: One of the ‘Pocket-House’s positioned with a public function before the catastrophe occurs



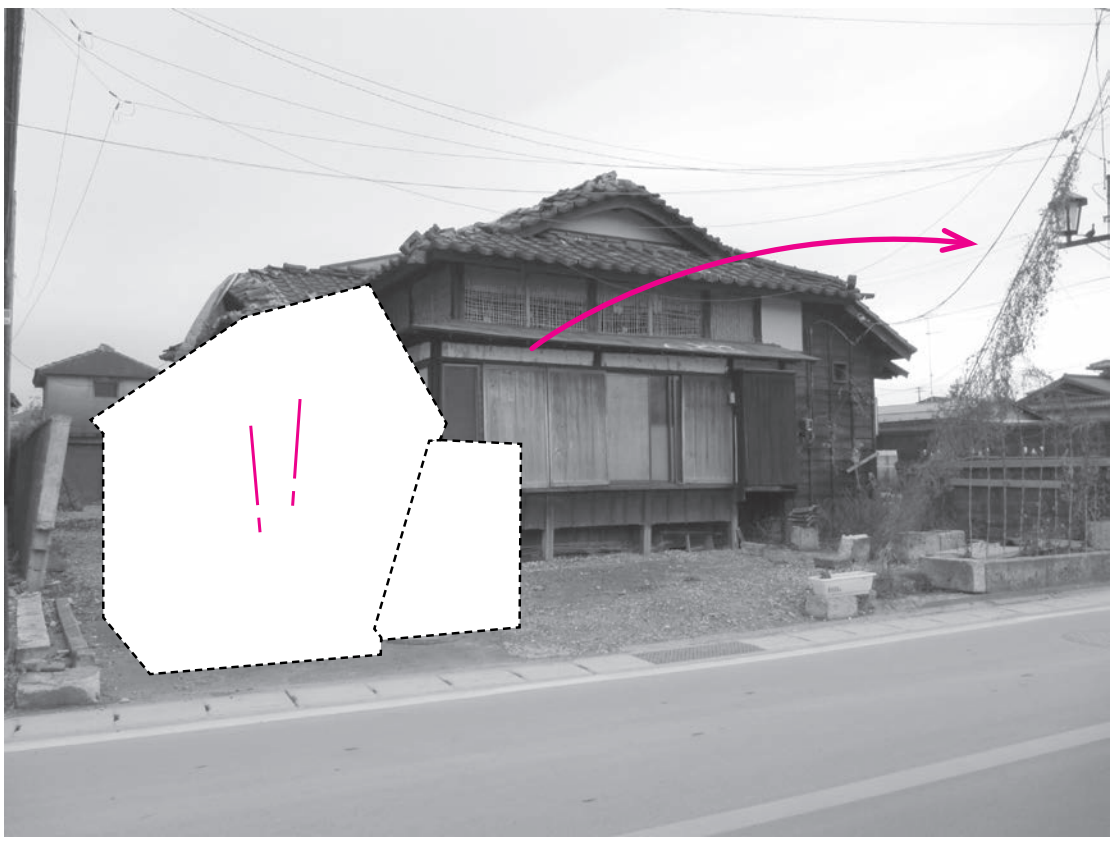
2 3 2 *... vs my vision of 'Pocket House'*

Whenever a natural disaster occurs, severe personal damage has to be assumed. Next to the fatal cases, the unsheltered, injured victims have to be helped as instantly as possible. The priority is to supply them with shelter, medical care and basics necessaries, like water and food. As such a catastrophe usually affect a large area. In case of the Great East Japan Earthquake in March 2011, approximately 650 km of coastline was hit by the following tsunami, which extended far into land. The catastrophic range of damage by the floods and the continuous aftershocks shaking the Tohoku region, complicate the circumstances for the helpers either to reach the affected areas by themselves or to get things transported there due to damaged infrastructure.

In case of the three previously discussed projects, the intention was to help as soon as possible, but logistically it was not manageable to avoid that people were accommodated in containers-like structures beforehand. But after an improvement of the situation and the containers are not required anymore, what happens to them? Are they brought back the way they had come to the disaster regions? And if it is so, do they even have a second life?

There is an incredibly big amount of shipping contains existing. Which are converted or even upcycled in accommodations. It is both an economical and ecological method of providing temporary shelters. But still, it's required to transport them from place A to place B where they are needed. This factor is the weak link within the logistic cycle, since the infrastructure could have collapsed totally, in worst case. Transportation only via air is unrealistic and raises the costs enormously. Therefore risky delays are caused, while people in catastrophe stricken areas are depended on support from outside.

Fig. 21: BEFORE - ‘Pocket House’s with public functions are spread all over Yabuki town



Img. 37: The preparation for moving to the ‘Home Station’ after the catastrophe.

Fig. 22: AFTER - ‘Pocket House’s are gathered in groups at the ‘Home’ (emergency) Stations

Wouldn’t it be helpful if ‘emergency kits’ were already place in certain endangered areas before hand? A small, portable and multifunctional box, which can be adapted to any situation and switch its purpose by configuring its features. People are familiar with the provided box from everyday life and know where they are located, so in case of emergency they can help themselves in the first place. The box can be moved easily by attaching external wheels, or if the given conditions after a catastrophe allow it, transported by a pick up truck. With a couple of steps the kit can be transformed smoothly into an emergency shelter – the ‘Pocket House’. Compiling them in a constellation, a temporary housing structure can be formed quickly.

These first months of tight social cohesion within the community helps the victims out of their misery and a faster regeneration progress is possible. The Pocket Houses, which had been used as temporary housing, can either be transformed back into their old public functions, be moved to another place where it is still required, or even convert totally into something different. Its temporary character grows into a permanent part of the town and remains the community as symbolic reminder of the crisis.

3 *DESIGN PROPOSAL* Concept

Img. 38: An early photography showing hunters with their dogs, even children.

Img. 39: The pheasant population in Yabuki was rich

Img. 40: Military Airbase on the flat grounds of Yabuki during the War

Img. 41: Dry conditions forced construction of the Hatori dam

3 *1* Project site: 矢吹町 *Yabuki-cho, Yabuki Town*

The name Yabuki 矢吹, literally means ‘arrow’ (矢印, yajirushi) and ‘blow’ (吹く, fuku). It’s said that in the 11th century a man called Hachiman Taro built up a Shrine, on which straw roof he shot an arrow after finishing. This is the origin of the town’s name.

Yabuki’s history

In the Meiji era, most of Yabuki (former Yabukigahara) was wilderness and it was used as hunting ground for the Imperial House. During the war a military airfield base was built. Afterwards, it was considered to be used for agriculture, but due to dry conditions it was not possible until the completion of the Toba dam.
Yabukigahara’s wilderness and rich population of wild animals, especially pheasants, attracted the Imperial House and it became their hunting ground, which was also popular amongst other wealthy individuals (Img. 38 + Img. 38).

In Edo era Yabukigahara was an important post town of Oshu Highway, the north-south axis, which still exists. In 1928 Yabukigahara got a lot of PR about an airplane landing on their wide fields. The flat geography offered the ideal conditions for an airfield and short time after plans for a provisory one was set up. Soon the military showed interests, started to expand the already existing airfield and in 1937 it was established to a military base (Img. 40). During the War, the Kumagai Army Flight School Yabuki was erected that was bombed by the US in 1945.

After the War ended, 3000 ha of land was gained back from the Imperial House by the Yabukigahara. The Ministry of Agriculture and Forestry planed to cultivate land. But due to poor watering, the use for agricultural purpose was only possible after the finalisation of the Hatori dam in 1955 (Img. 41). Since then agriculture is one of the most important industries in these region, not in Yabuki only. [14]

Img. 42: The deserted Shopping Street with the shutters down.

Img. 43: Once the Shopping Street was used to be a lively place. Now there are no pedestrians around.

Situation now

After 3/11 the situation in Yabuki City has not completely recovered yet. The area around the Yabuki train station as well as the old market street seem to be almost deserted, shops and the few restaurants are less visited, cars would pass only to stop at the convenient store.

Nevertheless, the streets occupy a lot of high-potential traditional houses, which need to be preserved. Albeit the town suffered from the 3/11 earthquake, everyday-life has returned and ever since people have been trying to bring back life to Yabuki's old town core. Several recovering plans for the upcoming years have been set up, as well as workshops with both planner/ architects and residents to discuss their needs and desires for Yabuki's future.

What has to be done?

More than 2 years later, some people, whose houses broke, still have to live in 'temporary' facilities until either their houses are restored or even rebuilt. Obviously, the majority is incapable of paying a new house, so they are forced to preserve in these facilities until the money is placed by the responsible insurance.

Nonetheless, planners are needed for both restoration of old buildings and construction of new ones. Several old houses partly collapsed or especially timber buildings slightly twisted and they need to be renovated.

Besides these small-scale problems, the major challenge is the urban planning for Yabuki town. It has been discussed about an extra expressway to be positioned through the main core to maintain an easier access to the train station and to the city ward. If this idea is about to be implemented, it means the core will be divided into two parts, which definitely has a destructive and unsatisfactory result. To bring life back into Yabuki town, the priority focus must be given to ensure a better urban planning suggestion, combined with a satisfactory solution for after disaster measures especially concerning quick and affordable housing structures.

Fig. 23: Accessibility and Train connection from Tokyo [03]

3 1 1 Regional analysis: Big to medium scale

Img. 44: Shinkansen is a popular commuting transportation from Tokyo suburbs to the metropolitan centre

Accessibility

The old north-south axis from the Edo period, starting in Tokyo towards Aomori, and the east-west axis connecting Tokyo and Kagoshima, are nowadays the fastest way to move across the country. Yabuki town being located on the north-south axis, its access is said to be convenient in many ways.

By taking the Tohoku Shinkansen (Fig. 23) via Tokyo towards Aomori, Yabuki can be reached within 130 minutes. The Shinkansen station Shin-Shirakawa is the closest one to Yabuki, where a local train leaves every 30 minutes.

A fast access by car is possible on the Tohoku Express Way (Fig. 24), along the same axes as the Tohoku line. Five prefectural streets leading in all directions are running through the old city core around the Yabuki station, making traveling and commuting from more convenient. [03]

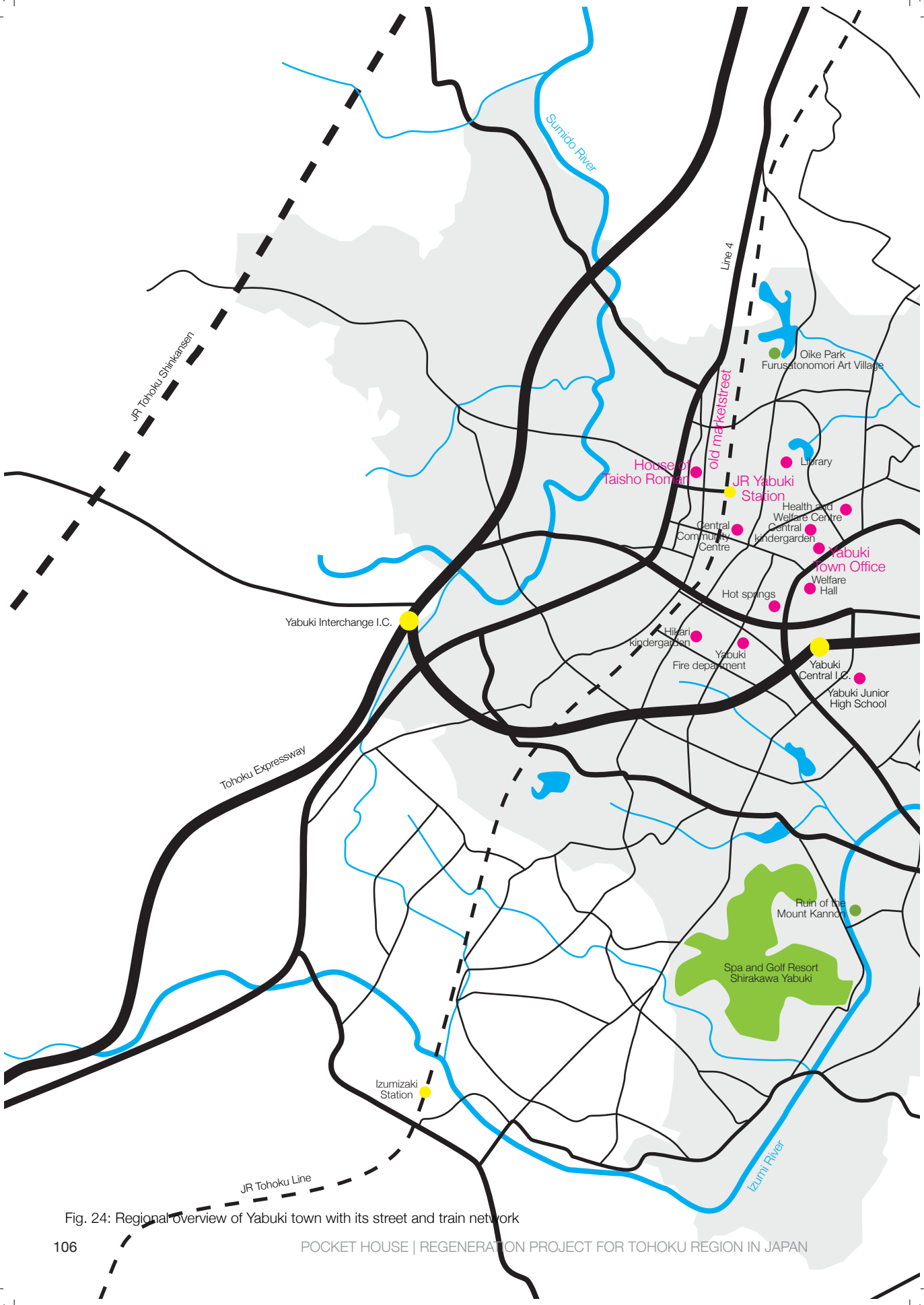


Fig. 24: Regional overview of Yabuki town with its street and train network

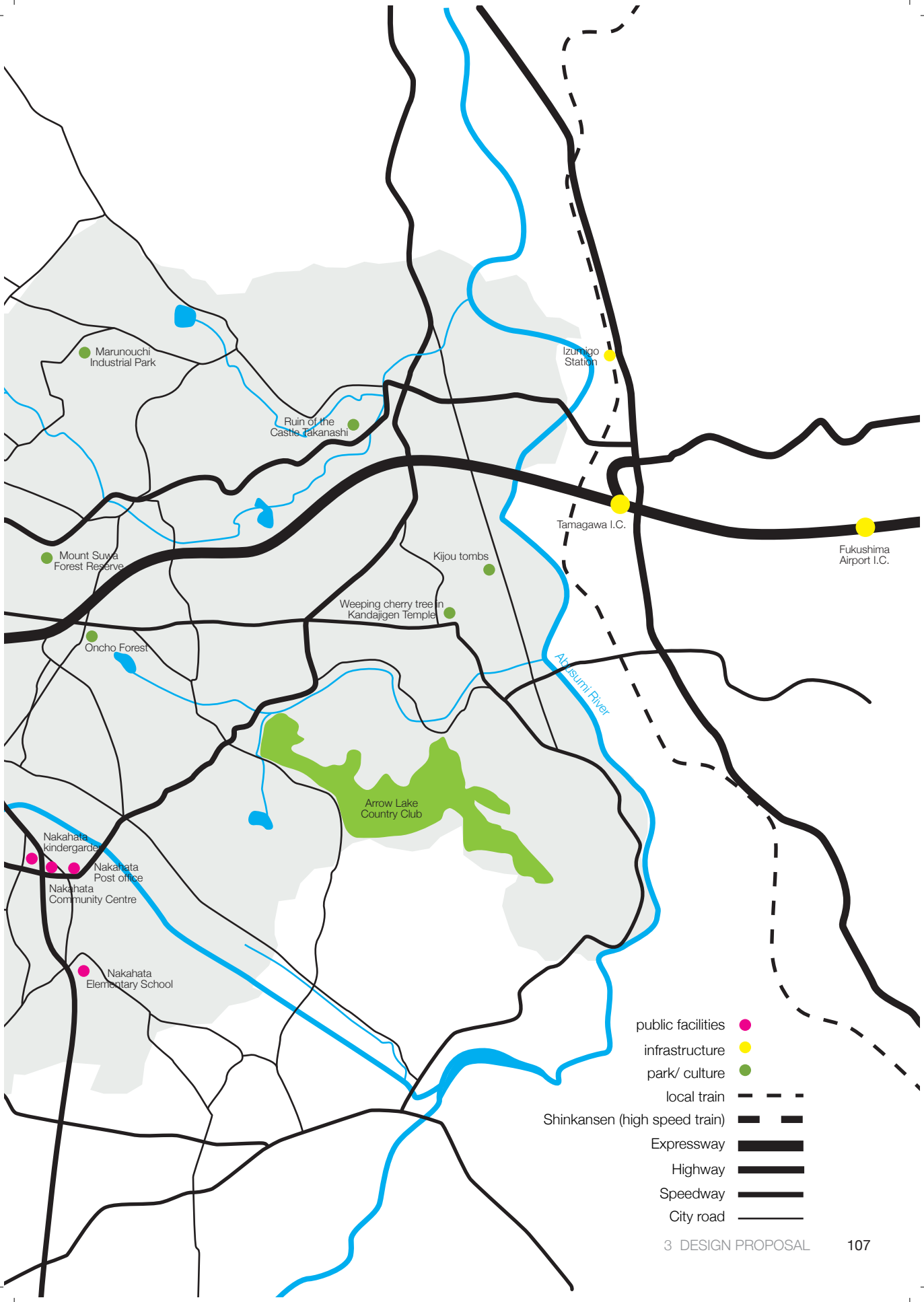

Marunouchi Industrial Park
Izumigo Station
Ruin of the Castle Takanashi
Tamagawa I.C.
Fukushima Airport I.C.
Mount Suwa Forest Reserve
Kijou tombs
Weeping cherry tree in Kandajigen Temple
Oncho Forest
Abukuma River
Arrow Lake Country Club
Nakahata kindergarden
Nakahata Post office
Nakahata Community Centre
Nakahata Elementary School
public facilities
infrastructure
park/ culture
local train
Shinkansen (high speed train)
Expressway
Highway
Speedway
City road

Fig. 25: Yabuki's terrain with focus on the old city core

3 1 2 *Urban analysis: Medium to small scale*

The Edo period north-south axis is still running through Yabuki town like it did centuries ago. Back then it was a busy main streets and market street at the same time. Nowadays, the market-like atmosphere is noticeable, due to the characteristic typology of the long residence houses with the trade business part in the front towards to street. Traditional handcraft shops, along with a Sake factory and a couple of small grocery shops are located there, creating the old charming city core close to the station.

Nevertheless, the shopping street has become more and more deserted, since big supermarkets and malls opened in the south-eastern part of Yabuki town. The incidents of 3/11 worsened the situation, after old houses collapsed and had been destructed for safety reasons.

Future Plans

Seeing these trends, the future plans for Yabuki town could mean the end of the historical street, which is needed to be preserved. Even though the road network within Yabuki is said to be good, some voices claim that the central shopping street should be reconverted into the main north-south route, regarding to its original function. [F] Currently, this street can be described as narrow and only allows low speed, and the sidewalks are not pedestrian friendly. In the past, it was widened already once. The streets' elevations show traditional houses with not quite matching, plain front sides – those were cut and shortened, so the necessary width could be achieved. If the government's plan goes up, the historical buildings along with the atmosphere are endangered to be lost.

[F] Yabuki's population is about 18.000. Due to the phenomenon 'urban sprawling', a four-membered-family owns on average at least two cars. The amount of parking spaces around the old residential areas is high, while the public facilities close to the station show too few parking possibilities. The high car population leads to support the government's infrastructure plans. However, introducing a local bus service can decrease this problem.

Fig. 26: Yabuki town actual situation and major spots

1 Yabuki Hospital

Abandoned wooden building with shut shop front 2

3 Example for shortened building with shop in the front

Ooki Sake Factory during renovation 4

5 Traditional handcraft shop

Ooki Sake Factory Shop also suffered damage 6

7 'House of Taisho Roman' during restoration works

Yabuki Station platform 8

Central Crossing

9

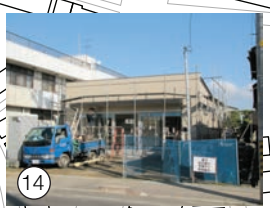
10

11

12 Z: Green areas ar

Yabuki Station

13 Destructed storage house



Shop during renovation 14

15 Ueda Toy Shop

Yabuki Community Centre with Yabukiji-kun, the mascot 16

17 Traditional abandoned house

New plot after building collapsed 18

19 Oike Park

20 Mega Hall shopping mall

s around the city core

Img. 45: After the successful workshop in Yabuki town with all participants

3 2 Problem description: *The Yabuki Workshop*

On the 17th of February 2013 the first workshop for the urban planning project in Yabuki town took place. Groups of architects from Tokyo, TODAI professors and students were organizing that event. (Img. 45)

The preparations for the workshop included not only designing a poster and a flyer for the announcement to collect participants within the community and the surrounding neighbourhoods, but also building a 1:1000 scaled model and making working gears for each groups. The people's ambition was very high, but in the end the ideas and proposals of the community, especially those of the children and the youth, exceed all expectations.

Set goals

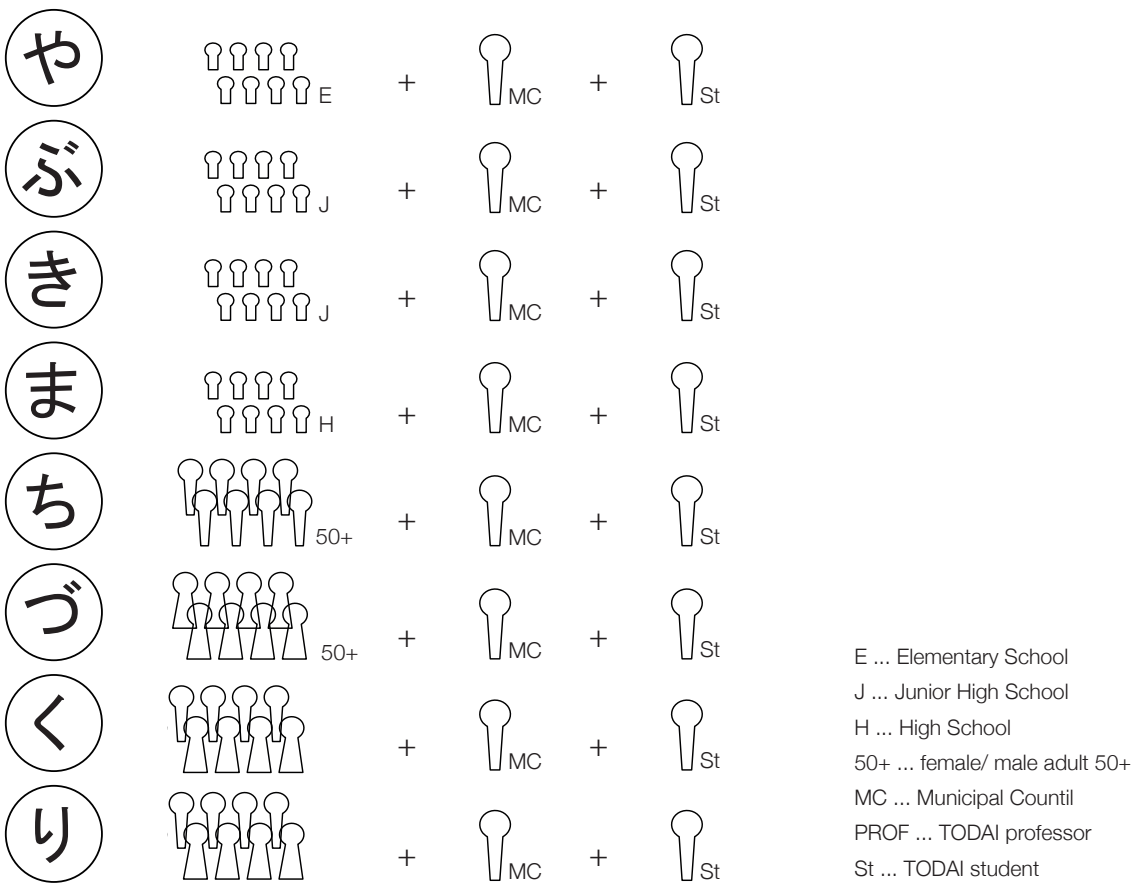
An ambitious team of architects, professors and students mixed with the residents have been working on innovative, but still down-to-earth goals for the city's 'dream future'. Without loosing the focus on the community's desires and the importance of its comfort, the teams created mind maps of ideas and future goals during the workshop.

The city still hasn't recovered from the aftermath of the 3/11 Earthquake completely, although in the meanwhile some small projects like the 'Side-House' and the renovation of the 'House of Taisho Roman' have been realised. The hope that Yabuki's carefree spirit would return has never weakened and the community is trying its best to achieve a much higher goal than just recovering: the Yabuki town regeneration plans as an exemplary project within the stricken Tohoku region.

From the view of the professionals, the whole city structure, including matters such as infrastructure, city density, convenience and benefit of certain facilities, should be reconsidered and discussed to bring back a lively and cheerful Yabuki. Both an extensive urban planning concept and a small scale improvement of the life quality within the city may be the main focus for this project.

Img. 46: The colourful 3D mind map created by all the participants

Fig. 27: 8 groups - different formations - various dreams



E ... Elementary School
J ... Junior High School
H ... High School
50+ ... female/ male adult 50+
MC ... Municipal Countil
PROF ... TODAI professor
St ... TODAI student

Achieved goals

During the workshop, the eight members of the 8 teams「や･ぶ･き･ま･ち･づ･く･り」(Fig. 27) wrote down their desires, thoughts and doubts on post-its and flags, and pinned them on the 1:1000 model (Img. 46), creating a colourful 3D mind map, where ideas, suggestions and dreams could be directly addressed.

The evaluation diagram shows (Fig. 28) that more than 50% of the flags' content were negative. Besides topics such as green/ sports/ leisure time, shopping street/ mall, events/ PR/ culture and life-quality, the most discussed topic was in general 'infrastructure' within the city, with a noticeable focus on the train station.

Splitting up the positive and negative comments it is clearly visible, which matter the community is concerned about most. Whereas some people compliment all kinds of Yabuki's events, for others the present situation about the poor variety in shops and purchasing offers along the historical shopping street are apparently not satisfying. Besides these facts, Yabuki still has rich nature and a charming laid-back character, which maintain a good life-quality. The infrastructure and the good connection to the surrounding areas are seen as one of Yabuki's greatest qualities, which is an important point for living in a rural area. But still the public transportations, both in micro and macro scales, need to be concerned for the sake of the cities car overpopulation.

Fig. 28: Diagram showing evaluated workshop outputs categorised in topics

Evaluation

Talking about each category in detail, the different problems within the city are made visible:

** green areas/ sports field/ place for spending leisure time:*

In Yabuki town, there are several parks, which provides rich nature and calm atmosphere for people all age. Yabuki in fact is framed by soft hills with woods and rivers, so it seems to be easy to find relaxed places.

On the east side, the Oike Park with the large pond and a variety in vegetations, is one of the most charming and greenest spots of Yabuki. But somehow, it is inconvenient to reach the park and people claim the fact that a car is needed. > A public transportation from the centre to the park should be offered or > an attractive sidewalk for making people strolling round should be considered.

On the western side of the rail tracks, in the old city core of Yabuki, no public park exists. The dense Bamboo forest around the temple and graveyard have high potential to become a spot for relaxing. To bring back life to this part of the devided city, > some green and open spaces to rest, spend leisure time, play around, drink and eat, study and meet friends should be introduced. Besides parks, also > sports fields and places to hang round are desired, mostly by the younger participants of the workshop.

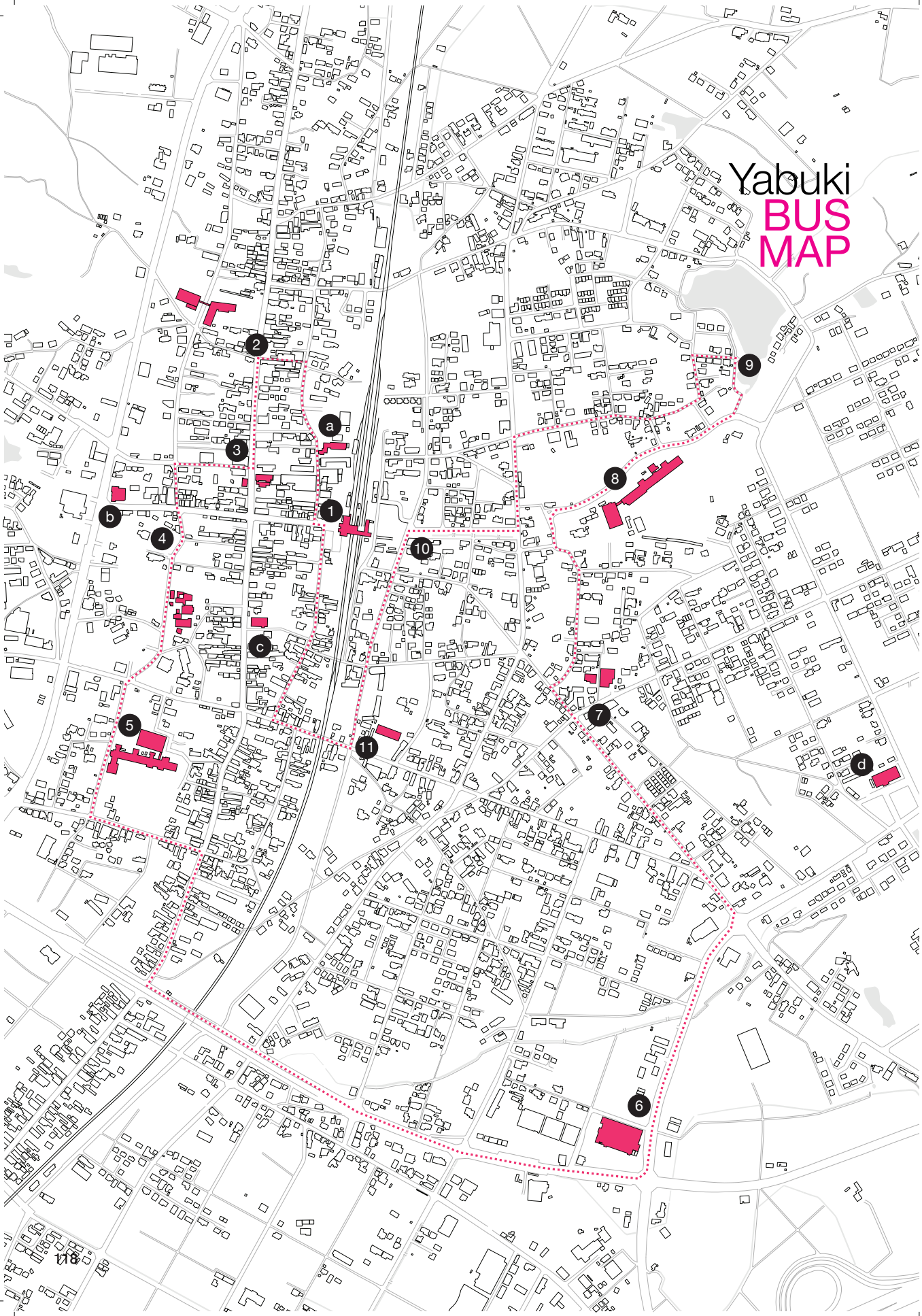
**infrastructure/ public transportation/ train station:*

Yabuki is said to have optimal connection with its surrounding areas. Thus, the town suffers from a lack of public transportation within it and infrequent train hours are not commuter-friendly. Most students claim that due to the rare number of trains stopping at Yabuki Station, long waiting hours are the result. The station‘s poor facility doesn‘t provide any spaces to spend the waiting period efficiently,

To improve this condition, > a more comfortable area for spending the waiting time and some kind of > café or convenient store should be considered. Not only the young workshop participants, but also the elder residents wish to have a > town bus, which spins through the city frequently. (Fig. 29) As a side-effect, the numbers of cars can be decreased as well.

** shopping/ shopping street/ mall/ variety:*

The main Shopping Street had been the


Yabuki
BUS
MAP
1
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3
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8
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11
a
b
c
d

Fig. 29: Yabuki town's new 'Bus Map' connecting the important spots:

1. Yabuki Train Station, Main Bus Stop
2. Yabuki Hospital
3. House of Taisho Roman/ Community Space
4. Temple and graveyard
5. Yabuki Elementary School
6. Maxi Hall Shopping Mall
7. Yabuki Town Library and Community Centre
8. Zengo Elementary School
9. Small Pond Park
10. Yabuki Train Station, backside
11. Yabuki Central Community Centre
a. Seiwa Kindergarten
b. Post Office
c. Yabuki Urban Planning Centre
d. Yabuki Town Hall

only possibility to make grocery shopping and buy certain utilities for a long period of time. But since Yabuki town had grown, a bigger shopping centre with more provided parking spaces was needed. Further apart from the city centre, on the east side of Yabuki Mega Hall shopping facilities were built. They are convenient and well visited, but also from the view of the residents this kind of facility is the reason for the city centre becoming more and more deserted. The wish that the Shopping Street can be filled with life is on people's mind. The once lively and cheerful shopping street needs more attention from both Yabuki's residents and the surrounding neighbourhoods. > Inventing special offers and events would increase the number of people shopping there again, and in combination with an efficient transportation system, the traditional shopping street could regain the atmosphere from former times. > It is also significant to have a certain variety of shops that attract both young and elder people.

** events/ PR/ culture:*

Yabuki is well known for its delicious food, especially for fresh fruits and vegetables, rice and sake. Some festivals attract not only the residents but also the people from the surrounding neighbourhoods. > But to gain more popularity, Yabuki town needs more PR concerning events and also a visual mark or symbol. 'House of Taisho Roman' is one of the pioneers and many others should follow. > Adding an individual touch for Yabuki by integrating the Pocket House into the city, which develops to an essential part of the town in the future. > The regeneration project can play an exemplary role for upcoming recovery projects. Yabuki could not only increase its attraction within Fukushima prefecture, but also within the whole Tohoku region.

** life quality:*

Yabuki town's good life quality was weakened after the 3/11 incidents. Thus, the hope of recovering has not faded away. 'The cheerfulness of a city is created by each individual. As long as the community is strong and joyful and willing to help each other, the quality of life within a city won't decrease.' These are words from a participant of the workshop, which can be seen as Yabuki town's philosophy. > The tight bound within the community promote positive energy for a faster regeneration, which is the main ideas of spreading the 'Pocket House's - to form a unity.

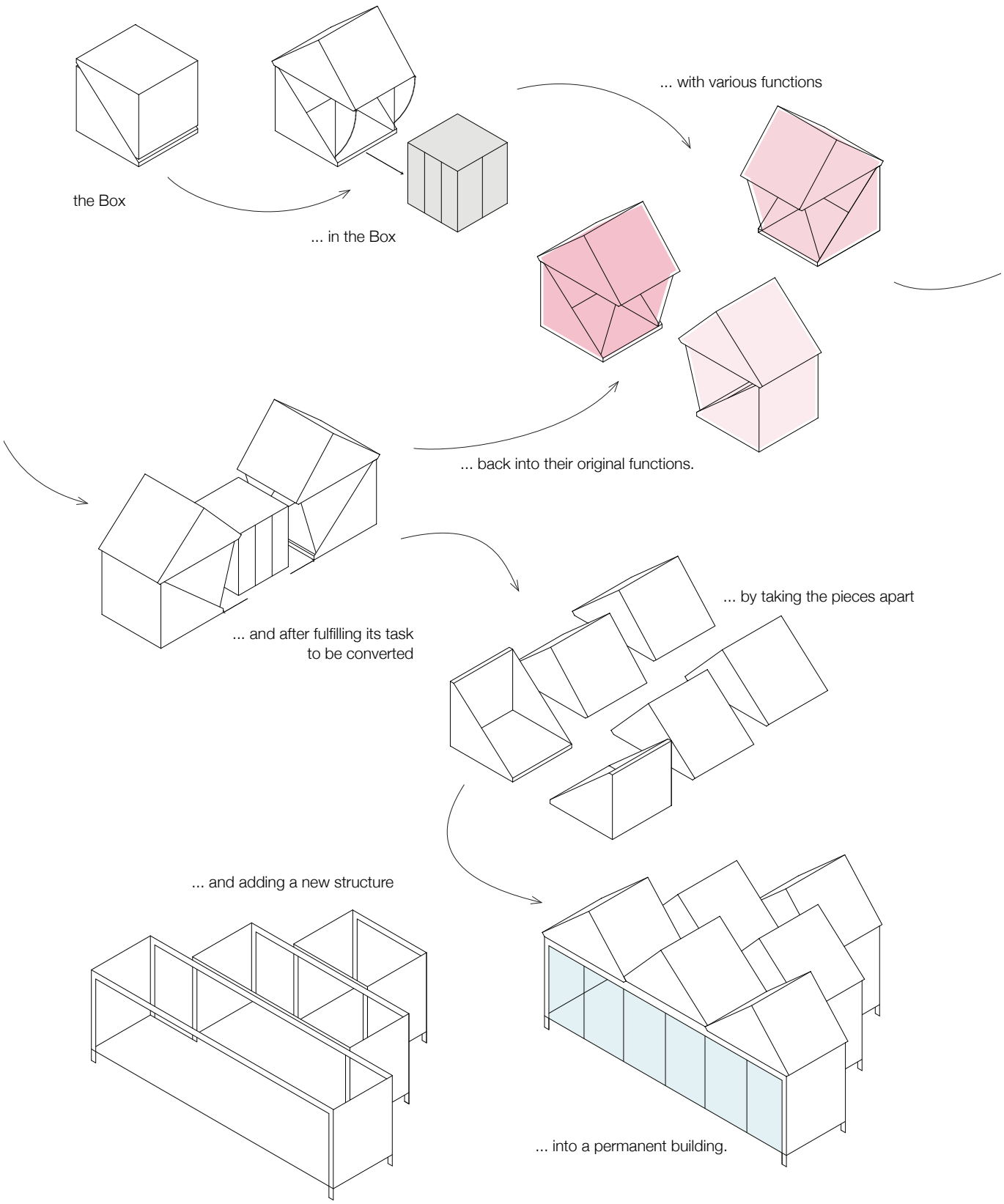
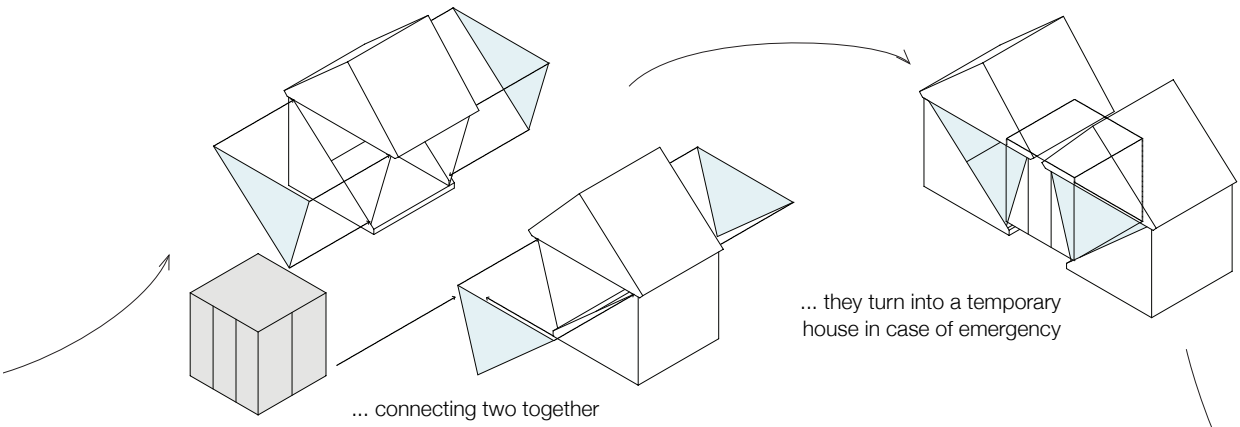


Fig. 30: Transformation graphic from the box over the temporary housing units to the permanent structure



3 Program/ concept: *'Pocket House' -*
3 A Box in a box - multiple functions - transformation

The concept of the 'Pocket House' is based on risk mitigation measures for regions with high disaster probability as well as on the idea of self-help preparations in case of a catastrophe. Social, ecological and economical aspects are the three fundamental columns on which both the idea and the design lie. It is a box that goes through three stages of development and is spread over a place. In the first step the 'Pocket House' providing public functions is used in everyday life and supports the residents to gain more confidence about their preparedness if a disaster occurs. The second step is the rapid transformation into a temporary housing unit by combining two with a Sanitary Box. If the regeneration is developing well and the temporary housing units are not needed any longer, they can either be converted back into their original functions, or are moved on to the next step to finally become a permanent part within the town.

Due to the simple but uncommon opening mechanism of the Pocket House, the form changes as soon as it is opened up. A box usually stays within its frame when all surfaces are folded open. In case of the Pocket House, the volume increases more than 50% of its original one. The floor space stays the same, while the additional height provides an extra storage or a sleeping space underneath the roof.

Since the design of the Pocket House is minimalist there is no limit in variety of functions. The white surface allows any individual add-ons for each purpose and each owner. By attaching the four external wheels on each corner, the Pocket House can be moved easily by any vehicle or even by human power.

Used as a temporary housing unit, the combination of two Pocket Houses and a sanitary box offers as much space as in a common shipping container. The openings on each side can be closed by adding translucent multi-skin-sheet panels, which let in the daylight but protect the residents from views from outside. Electricity and water are provided by the Home Stations where the Pocket Houses are plugged in. The entrance is in the centre of the connecting sanitary box.

After a successful recovery period, some of the temporary housing units can be recycled and be used a new roof structure. Mounting them on a simple wooden frame construction, the not symmetric roof elements create a playful but still simple building as a new landmark within the town.

Daily Life Stories with my 'Pocket House'

Shingo Fujita
age 9, elementary school kid

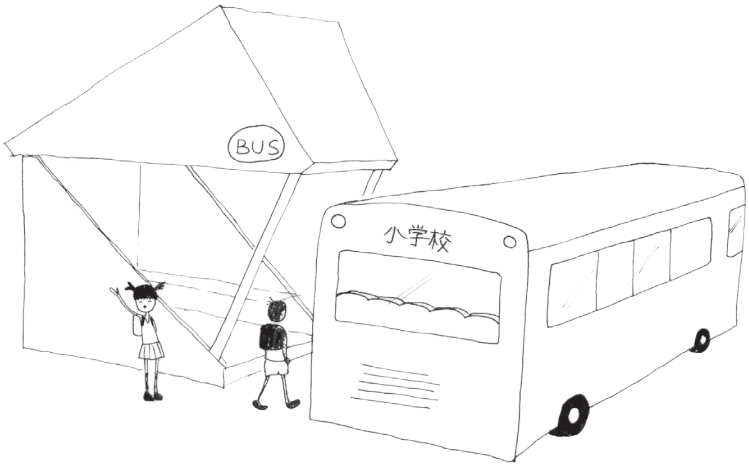
Shingo lives together with his parents and his younger sister in the east part of Yabuki town. His father is working at the municipal office and his mother works at the nearby kindergarten. Both are quite busy and have long working days. To the family's relief, the newly introduced town bus brings Shingo to the elementary school and back home safe. He loves playing football and in his leisure time Shingo and his friends take the town bus to the playground. Children use the 'Pocket House' bus stops as their regular meeting places.

Masaru Saitoh
Age 78, vegetables and fruits farmer

Mr Saitoh and his wife own a grocery shop close to the shopping street. Since it is a bit off the lively centre, customers used to pass his shop and to head to the market space instead. Luckily, he could afford to buy a 'Pocket House', which he uses as a portable market stand to bring the goods to the customers. Mr Saitoh and his fresh groceries are now well known in Yabuki, so his shop is frequently visited. With his flexible service of bringing orders directly home, he is also providing his vegetables to the schools in town.

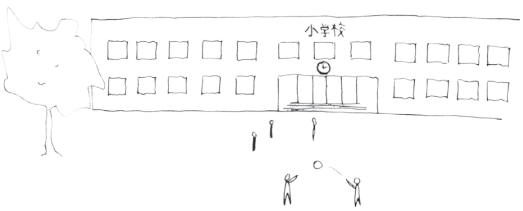
Yukiko Moto
Age 45, librarian at Yabuki Town Library

Ms Moto and her cats live in a small apartment in the same street as family Fujita. She loves books, history and children. She found her passion in books in early ages and worked at libraries in bigger cities, but moved back to her hometown, since she heard that the Yabuki Town Library's condition has become worse. Ms Moto puts all her heart into the 'Mobile Library' project to make children read more and provides schools with interesting books and magazines during the afternoon breaks.



8.15 am
Shingo on his way to school taking the Yabuki Town Bus.

2.30 pm
Mr Saitoh sells his fresh vegetables and fruits at the market space.



1 pm
Ms Moto's 'Mobile Library' is popular amongs the school children.

Friday, 2.46 pm:

An earthquake with a magnitude of 9.0 on the Richter scale occurs and hits the Tohoku region heavily. The cities along the coastlines are evacuated immediately to look for shelter in the higher located 'Safe Zone' to escape a possible tsunami. Residents of Yabuki town have to face a wide range of damage on buildings, infrastructure, as well as personal harm. Due to the self-help method, the whole town is mobilised and starting the emergency procedure until the first aid troops arrives the cut off town.

As Mr Fujita made sure his family and house are safe, he and his team collect as many 'Pocket Houses' as possible and gather them at the nearest 'Home Station'. The ones that are used as bus stops are easily accessible. The sanitary boxes are heaved into the 'Pocket Houses' and are transported together by vehicle or man power on the attached wheels. Within a short time the first temporary houses for those in need are available. Mrs Fujita takes care of Mr and Mrs Saitoh, after their house has collapsed. First aid equipment are stored in all public buildings for emergency cases. They are brought to a stationary 'Emergency Pocket', where help is provided for injured people.

Mr and Mrs Saitoh were not at home when the shakings started. They have been out for a walk with their dog. Even outside in the fields the earthquake feels strong and both of them hurry back.

As they return, the old house was destructed as the ground floor collapsed completely. Mr Saitoh have been living in this house all his life, he inherited it together with the shop from his parent. He and his wife continued the grocery shop successfully. Now all their existence is gone - only his 'Pocket House' and his small pick up truck are left. Mr Saitoh prepares to bring the 'Pocket House' to the 'Home Station', where they can stay until the recovery phase.

Ms Moto's apartment was safe. At the time of the incident she was in the Town Library. One part of the old building's roof came down, but luckily nobody was harmed.

The library members are worried about the building's condition. Even though it can be dangerous, Ms Moto starts packing the 'Pocket House' with books to bring them to another place to prevent them from suffering more damage. Then she has the idea of providing the 'Mobile Library' for the ones at the 'Home Station'. Ms Moto believes that books (the same Kanji as her name) are the origin of joy and bring people together.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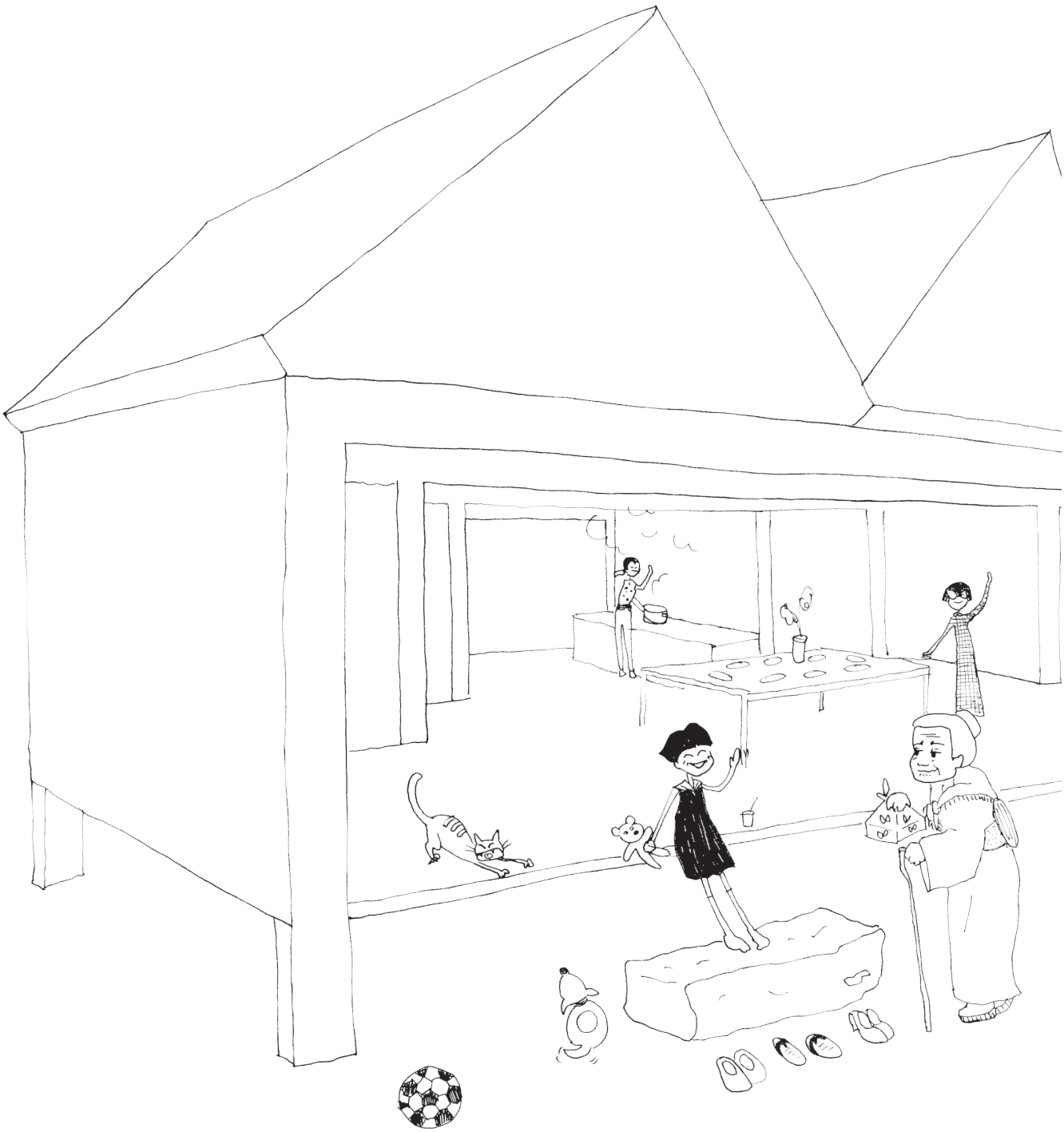


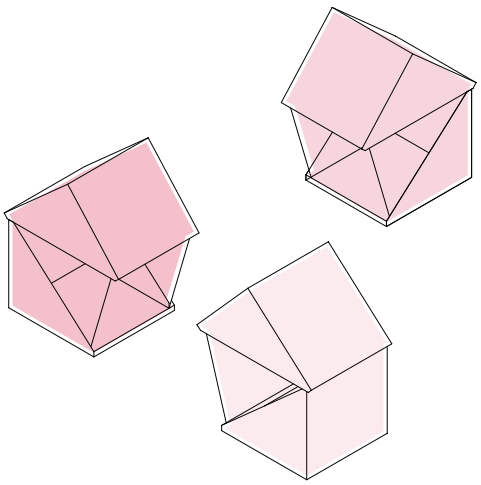
Some time later ...

Yabuki's small community is recovering well step by step. The temporary house Home Stations are crowded and filled with life. Everyone is helping each other - the tight bound between the individuals and the local emergency equipment indicate the fast regeneration and improve the positive spirit within the town.

The new 'Community House' as the centre of the Community Space brings back life during times of crisis and leads to a better future for Yabuki and its wonderful residents.

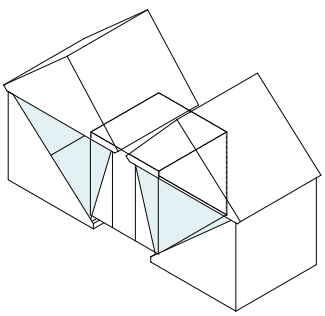
Step I

Pocket House with its
various public functions



Step II

Pocket House as a
temporary housing unit



Step III

Pocket House as a permanent building
with its roof as the new landmark

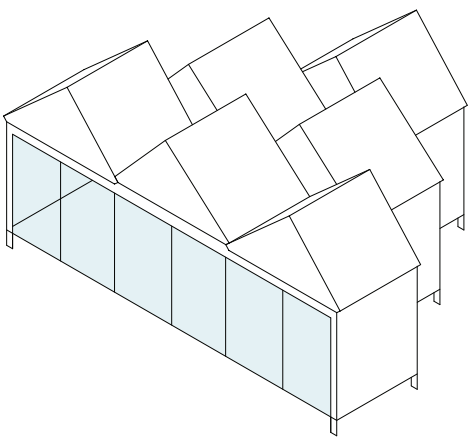


Fig. 31: The 3 steps of development of the Pocket House

3 3 1 *Adaptation and changes in usage over time*

In the Yabuki town, the main purpose of the Pocket House is the preserving of the old town structure by introducing a new infrastructure element to improve the current situation. Urban sprawling drives Yabuki's divided town more and more apart, which results in a high car population and a lack of parking spaces. At the same time, the old town's shopping street suffers from the declining number of customers, as more convenient supermarkets have opened their doors in the new town. The traditional shopping street needs a new concept to get back to what it was before – a lively market and food street with traditional shops and services.

* Step I: The Pocket Houses are used mainly as bus stops and are spread all over the town. The introduced Town Bus that spins around the town and reduces the number of cars within the old town. As a result the parking spaces can be converted into Community Spaces or parks to achieve a lively Shopping Street atmosphere with strolling potentials. A weekly market supports small shop owners and farmers to increase their popularity. The central location of the Yabuki Train Station fulfils the task of the new intersection between the east and west parts. By providing small kiosk or cafés and restaurants, a more commuter friendly atmosphere around the station can be achieved.

* Step II: The actual purpose of the Pocket House is the function as a temporary housing unit in case of an emergency. The quick transformation allows people without shelter after a catastrophe to move in instantly. Gathered at the Home Station around the Community Spaces, the Pocket Houses are provided with energy and tub water and offers space for four persons. Due to the self-help concept, the regeneration phase within the community doesn't take so long.

* Step III: By using the two pieces of the Pocket House as the roof, a new landmark can be put up after a successful recovery development. One the one hand the new roofscape marks a certain tragic event like a reminder, but on the other hand the new function as the Community House can help to improve the bound amongst the residents and helps Yabuki to create their own future with perspective and joy.

Fig. 32: Each step of constructing ‘Pocket House’ is shown

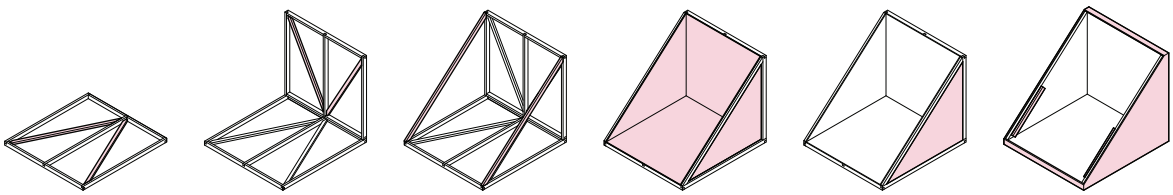
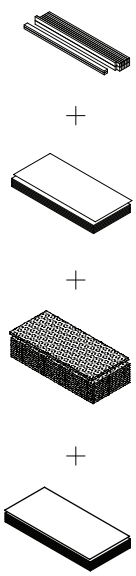
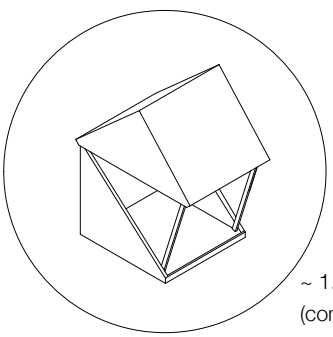


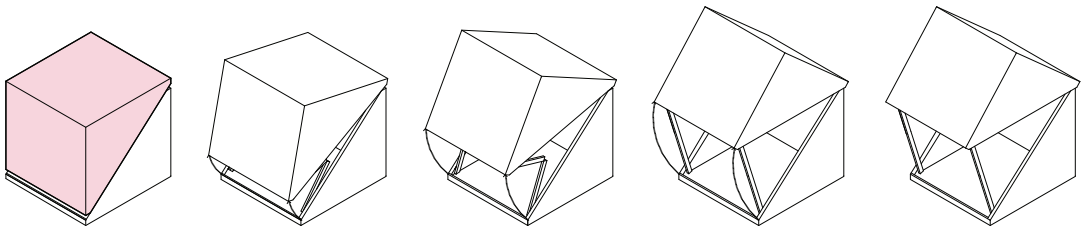
Fig. 33: The ‘Pocket House’ consists of ...



Materials	Quantity	Price ¥	Price €	Price ¥	Price €
Construction timber in pine 50x85 mm	90 m	¥ 1.400	€ 10,00	¥ 126.000	€ 990,00
Laminated wood panels moisture barrier 18 mm	~35 m²	¥ 2.380	€ 17,00	¥ 83.300	€ 595,00
Cork insulation 60 mm	~33 m²	¥ 2.800	€ 20,00	¥ 92.400	€ 660,00
Veneer laminated wood panels waterproof 22 mm	~37wm²	¥ 2.790	€ 20,00	¥ 103.230	€ 740,00
				~¥ 444.000	~€ 3.200,00
				incl. electric wires + assembly costs	
				~¥ 700.000	~€ 5.000,00



~ 1.100 kg weight
(comparable with a small car)



3 3 2 *Development of the Pocket House*

As a compact box with the outlines of 2.440/ 2.600/ 2.600 mm (W / H / L), the 'Pocket House' fulfils the international standard size of a shipping container 2.438/ 2.591/ X mm. The lengths of two 'Pocket House's match one common length container, which makes the transportation on tracks and streets possible.

The simple design is based on two wooden frame structures in pine with diagonal struts for the horizontal stability that are connected by two side bearers to support the vertical loads. To ensure the rare ventilation within one part, the size of the frame construction varies, so a gap between the cover panels and the insulating layer formed. On the top of the cork insulation the sealing layer prevents the moisture to penetrate into the construction. For the outer skin water resistant veneer laminated wood panels in white cover the structure. Laminated wood panels with transparent moisture-barrier coat are used for a natural atmosphere. Three swivel joints on the upper end of the boxes and two foldable wooden rests on each side connect the two elements together. The hydraulic cylinders assure the smooth opening mechanism, so a single person is able to open the 'Pocket House'. The upper element – the roof - rests in a complete horizontal position and the space underneath can be used as an extra storage or sleeping place.

The pure material cost is calculated for the production of a single 'Pocket House'. Including the assembly costs, the additional items like hydraulic cylinder and installations, the price is around € 5.000,00 Euro/ ¥ 700.000 Yen – comparable with a small car, even the weight of approximately 1.100 kg.

Img. 47:「がんはれ!ざぶき」'Gambare! Yabuki' ('Yabuki, be strong!') as a call for a better future.

3 4 Conclusion: *What do I want to achieve for Yabuki town?*

A natural catastrophe might be a quite rare phenomenon, but once it occurs it hits with an enormous impact. Even though all the best possible security measures are taken, in endangered regions the topic natural disasters will always be present. Other than finding new ways of improving the safety and minimising the aftermaths, it is more significant to ask oneself 'what can be done beyond that?' The power of nature is not controllable by either engineering or architecture. Nor does the situation afterwards find more relief in erecting fancy regeneration orientated buildings that are difficult to grow into the town. Hence, also with small steps, stricken areas can get back to normality.

During the 'Yabuki Workshops' residents who participated showed enormous energy and effort. Compared to their great eagerness, their future dreams were quite small. 'We want the happy and united Yabuki town back!' To achieve that modest goal, not much is needed. The society is responsible for the life quality within the town and each individual contributes to the whole social bound in first case.

The proposal for an improvement of the infrastructure and the revitalisation of the old 'Shopping Street' are two original key points in Yabuki's recovery plan. To support the fundamental changes in the urban planning, the 'Pocket House' can play the leading role for the community's reunion. The idea is dealing with the social critical aspects of a natural disaster and furthermore proposes a possible way of integrating security measures already in everyday life sequences. The 'Pocket House' does not only bring the people together, it carries new spirit and confidence amongst the residents.

By reorganising the streets' hierarchies and reducing the amount of cars around the Yabuki Station, the Interchange with its characteristic flair and traditional shops can be more enjoyed by the pedestrians. Former parking lots are transformed into 'Community Spaces', which are provided for events or weekend markets that again are attracting people.

Step by step, the currently deserted 'Shopping Street' turns into a lively spot, initiating the start of the dream future and creating a new identity for Yabuki town as a leading example.

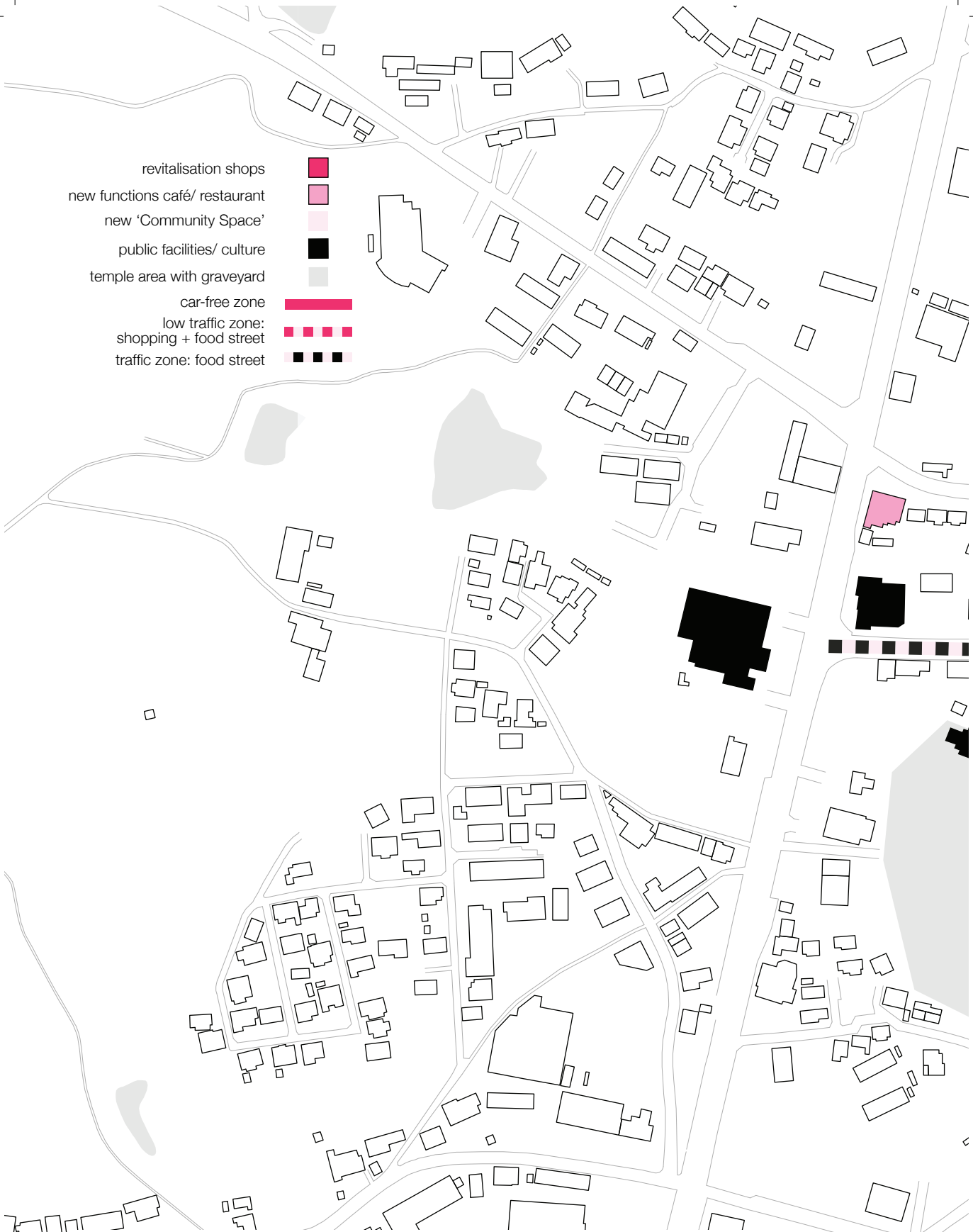
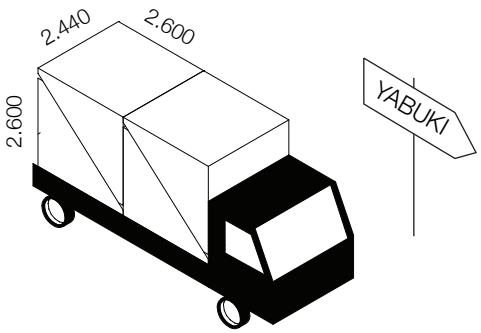


Fig. 34: Revitalisation plan for the traditional shopping street and the area around the Yabuki Train Station

4 DESIGN Plans/ Visualisations

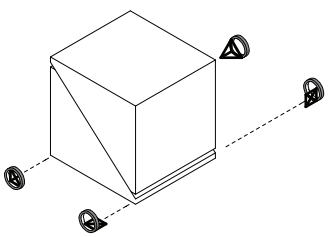
Img. 48: ‘Pocket House’ Transportation visualisation

4.1 The box in a box: *Transportation*

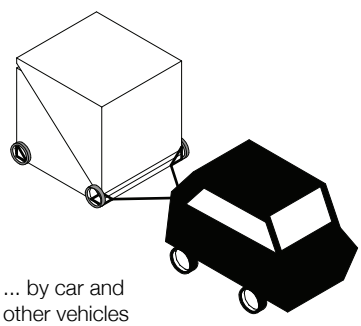


2.600 / 2.600 / 2.440 mm (H / L / W)

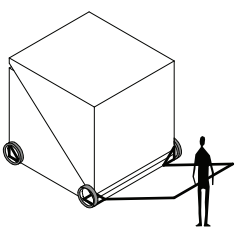
2 ‘Pocket Houses’
matches 1 usual shipping container



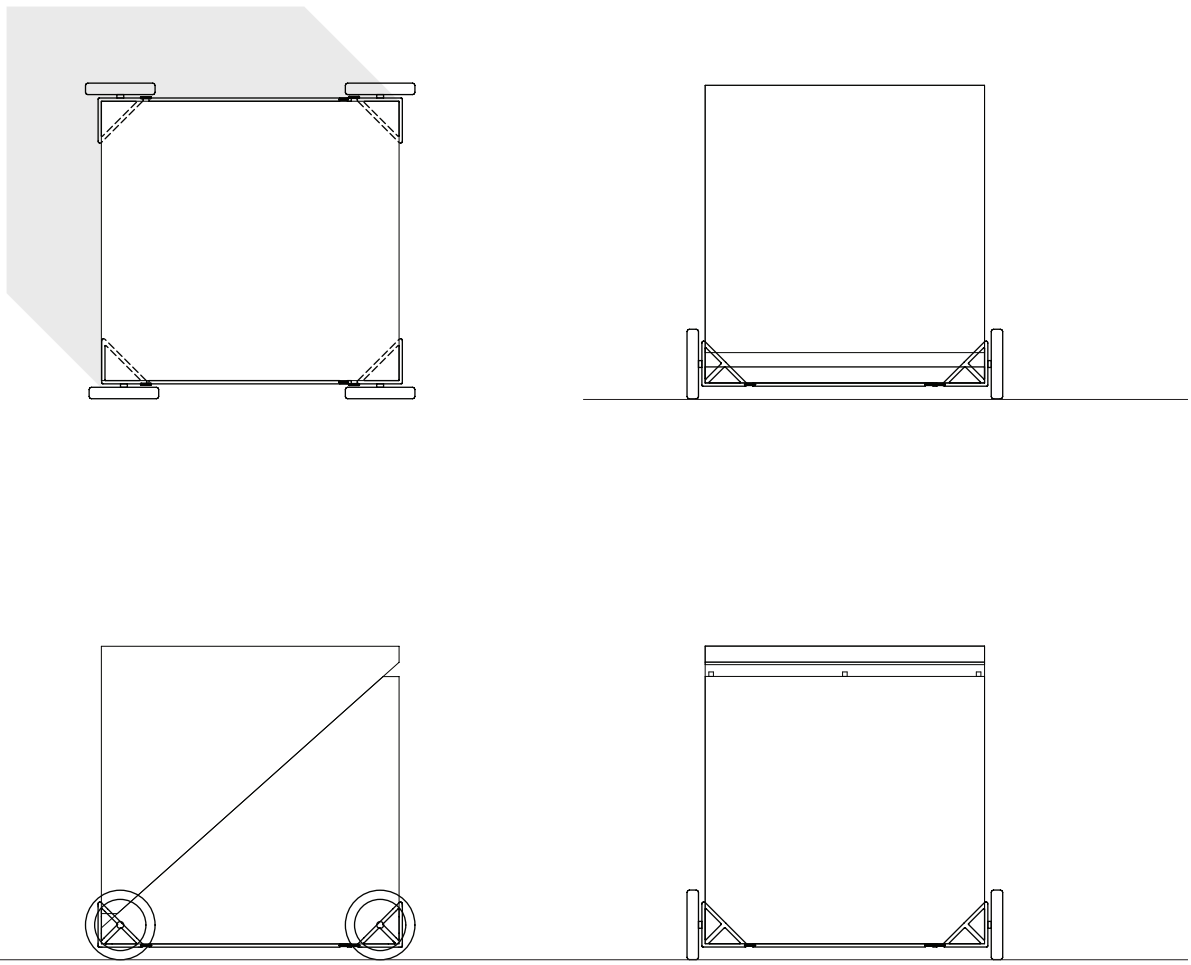
By attaching 4 external wheels the
‘Pocket House’ is transportable ...



... by car and
other vehicles



... or by human
strengths



elevations 1:66 ‘Pocket House with attached wheels’

1 Water-resistant veneer
Laminated wood panel 22 mm
Rear ventilation 40 mm
Sealing layer
Wooden frame construction
and struts in pine
for horizontal stability 50/85 mm
Cork insulation in between 60 mm
Laminated wood panels
coated with moisture barrier 18 mm

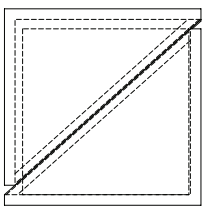
2 Side bearers for vertical
stability 50/85 mm

3 Swivel joint at 3 points
in wood

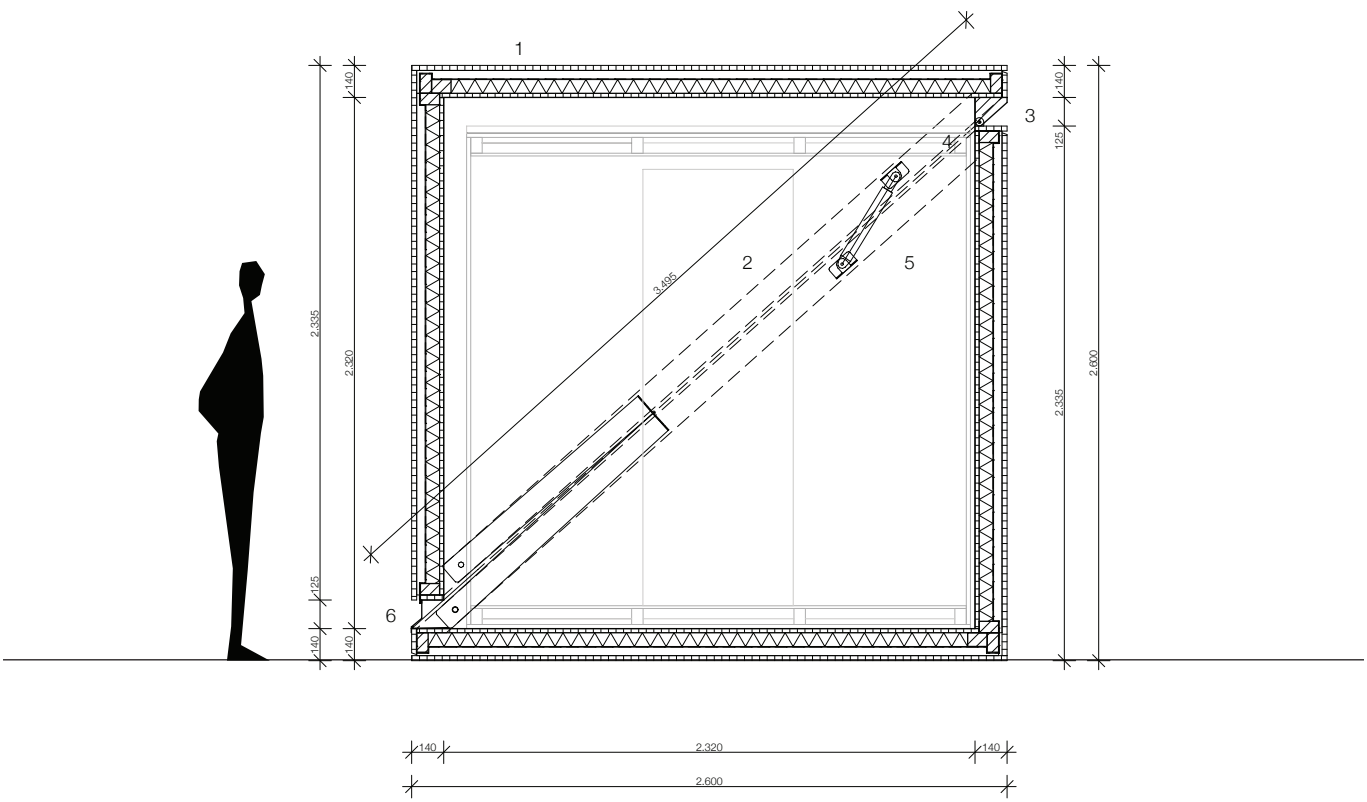
4 Sealing strip

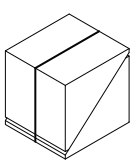
5 Hydraulic cylinder as support

6 Metal cover

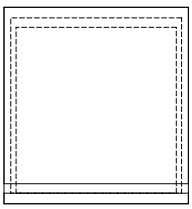


side 1:100

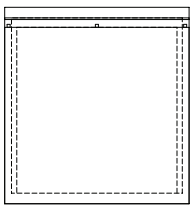




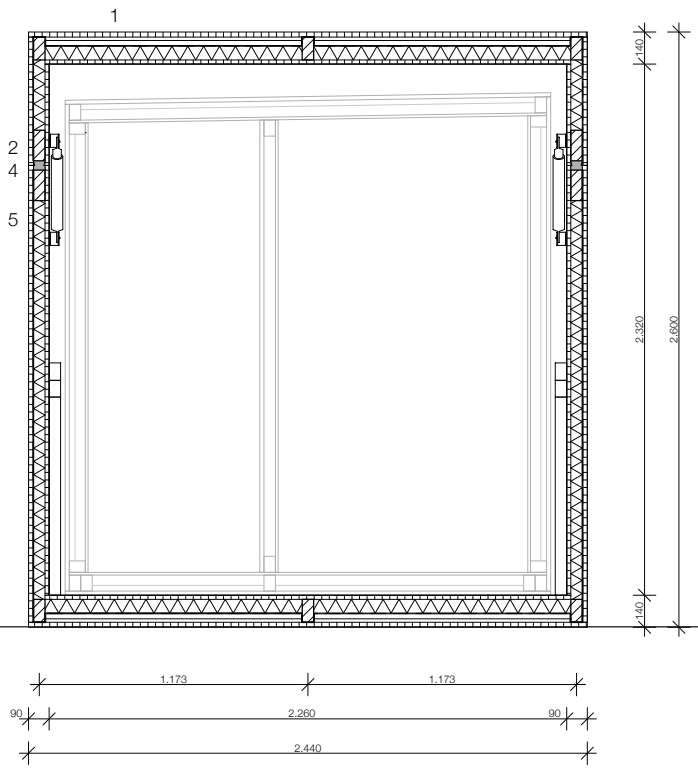
section 1:33

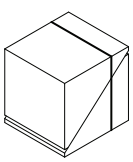


front 1:100

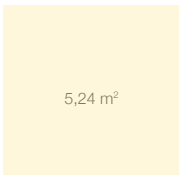


back 1:100

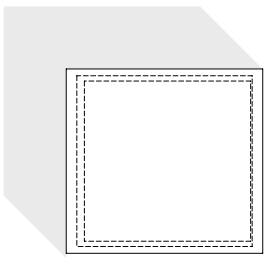




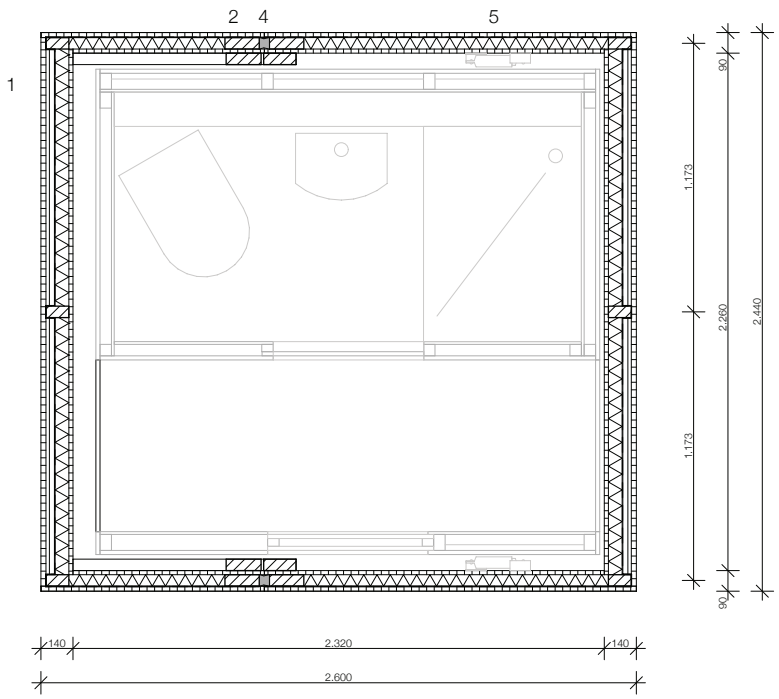
section 1:33

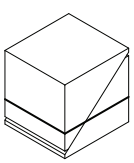


floor space



top 1:100

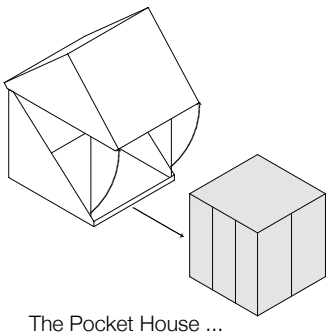




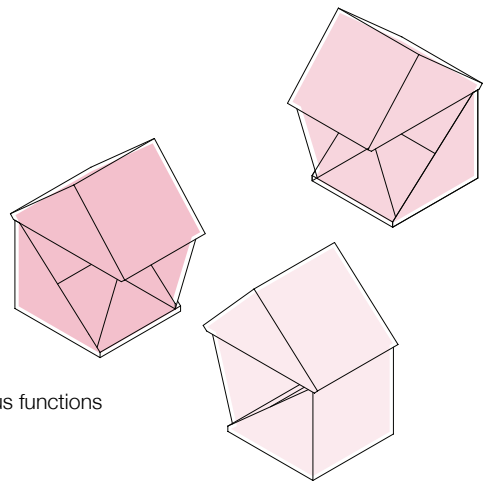
plot 1:33

Img. 49: ‘Pocket House’ Step I - public function, shop visualisation

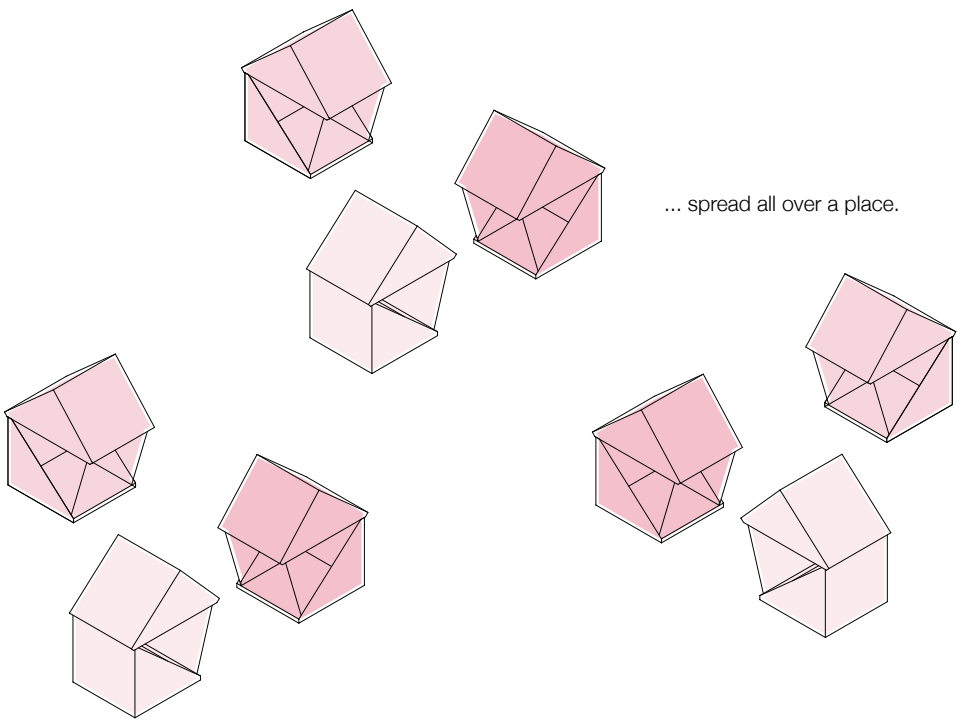
4 2 Step I: '*Pocket House*' with various public functions



The Pocket House ...



... with various functions



... spread all over a place.

1 Water-resistant veneer
Laminated wood panel 22 mm
Rear ventilation 40 mm
Sealing layer
Wooden frame construction
and struts in pine
for horizontal stability 50/85 mm
Cork insulation in between 60 mm
Laminated wood panels
coated with moisture barrier 18 mm

2 Side bearers for vertical
stability 50/85 mm

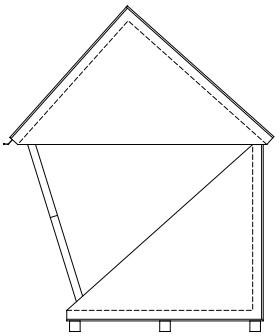
3 Swivel joint at 3 points
in wood

4 Sealing strip

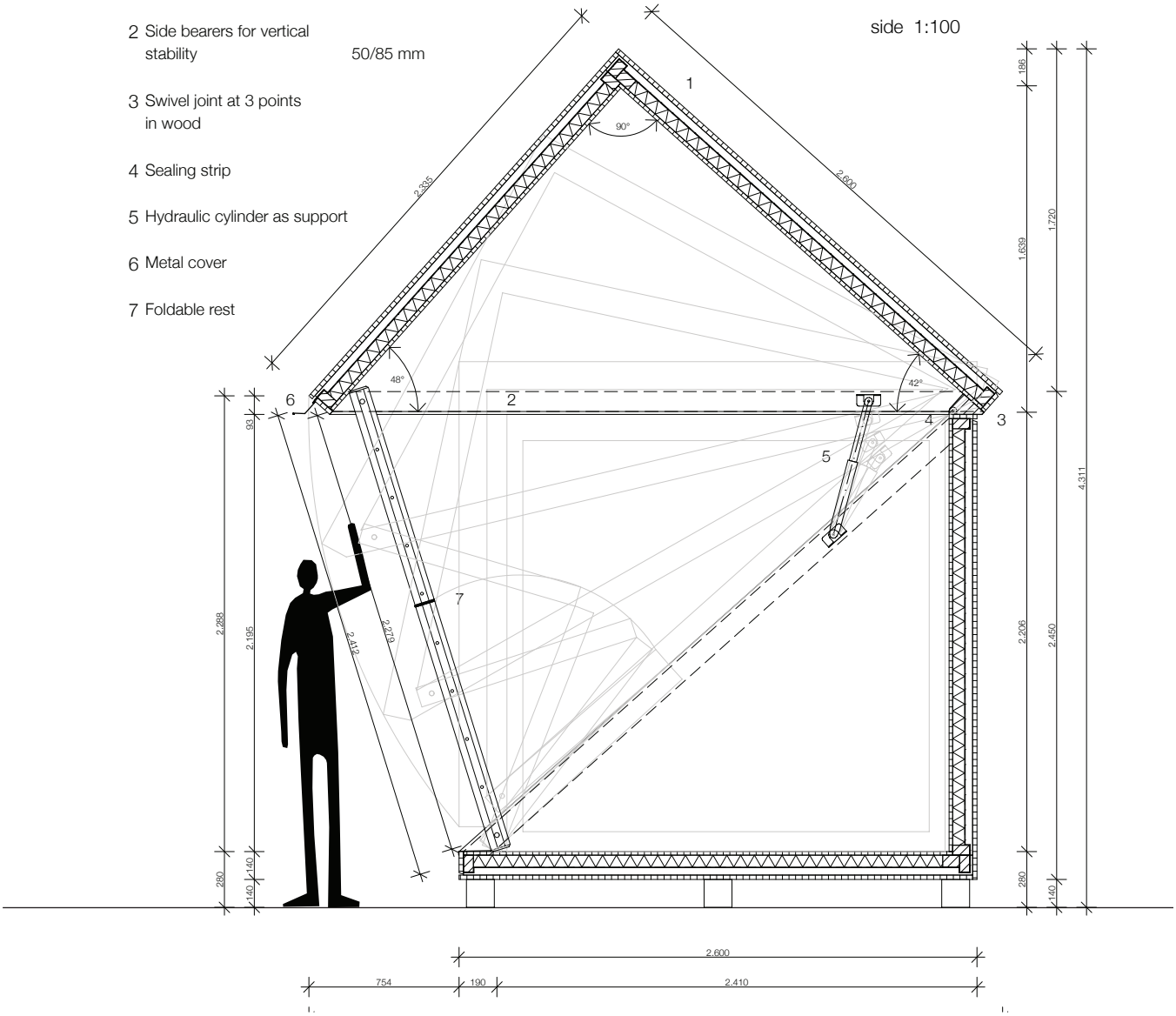
5 Hydraulic cylinder as support

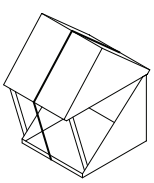
6 Metal cover

7 Foldable rest

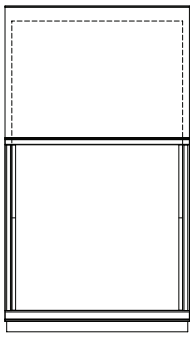


side 1:100

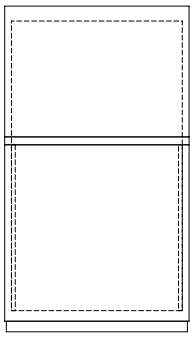




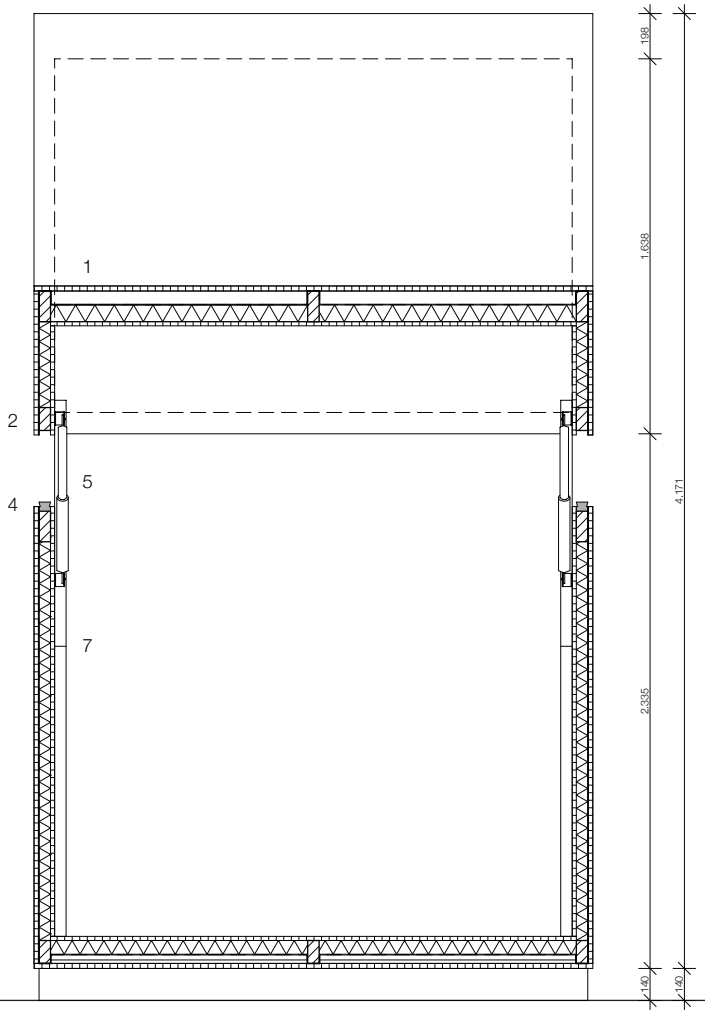
section 1:33

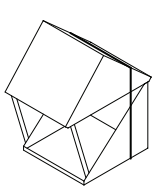


front 1:100



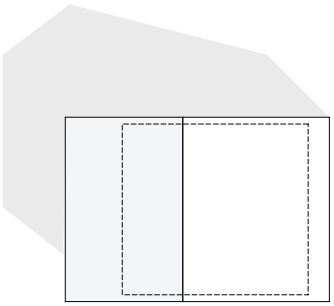
back 1:100



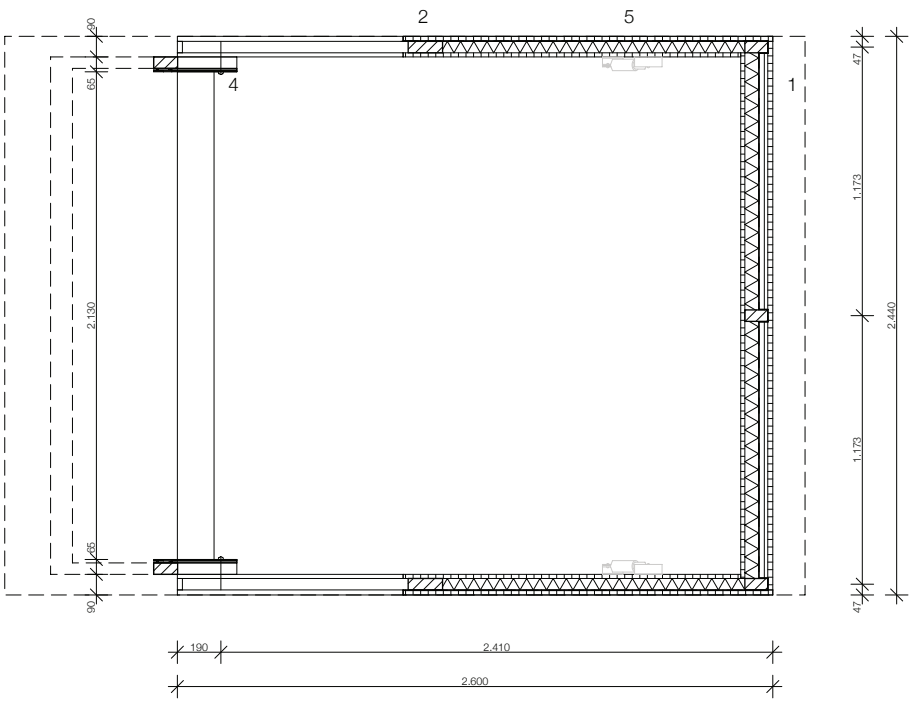


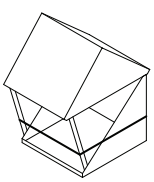
section 1:33

floor space



top 1:100



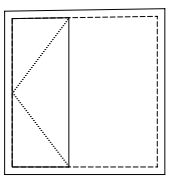


plot 1:33

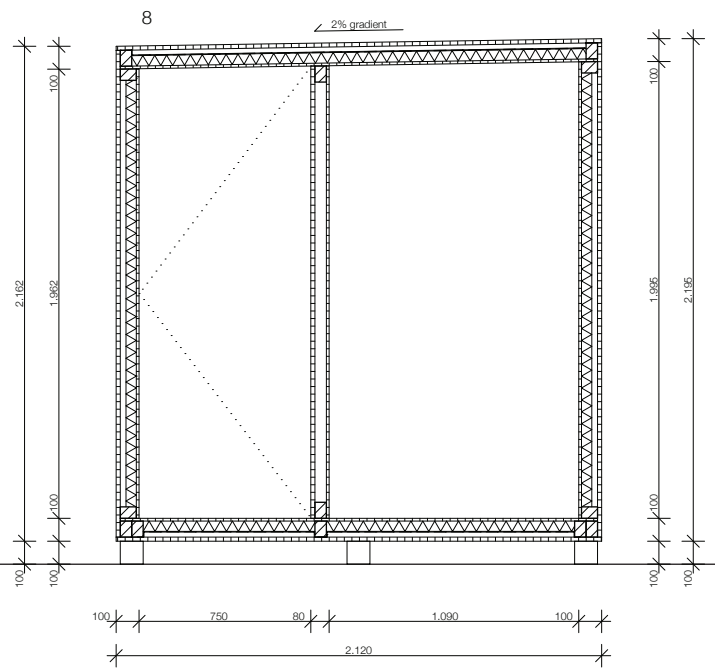
Sanitary Box

8 Water-resistant veneer
Laminated wood panel 18 mm
Rear ventilation 25 mm
Sealing layer
Wooden frame construction
and struts in pine
for horizontal stability 50/70 mm
Cork insulation in between 45 mm
Laminated wood panels
coated with moisture barrier 12 mm

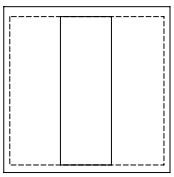
9 Sanitary cabin
chemical toilet, basin and
shower (water pipe con-
nection)



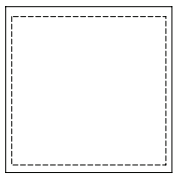
side 1:100



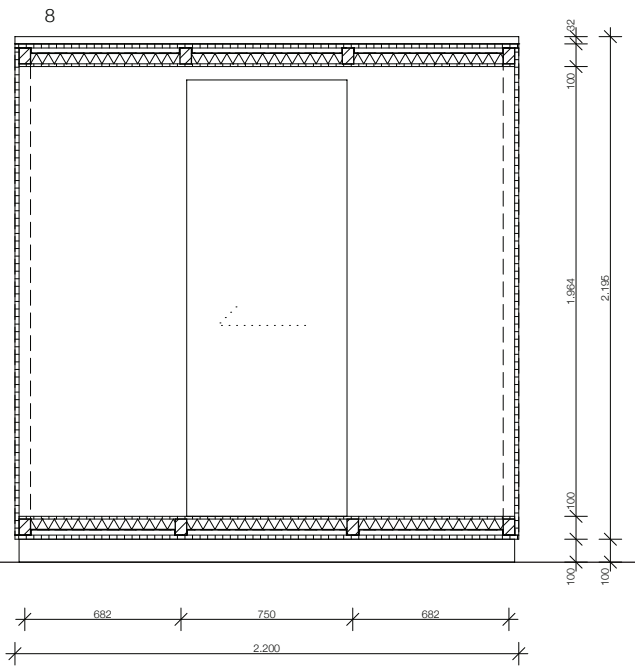
section 1:33



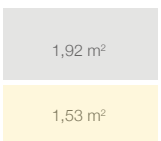
front 1:100



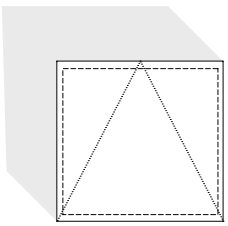
back 1:100



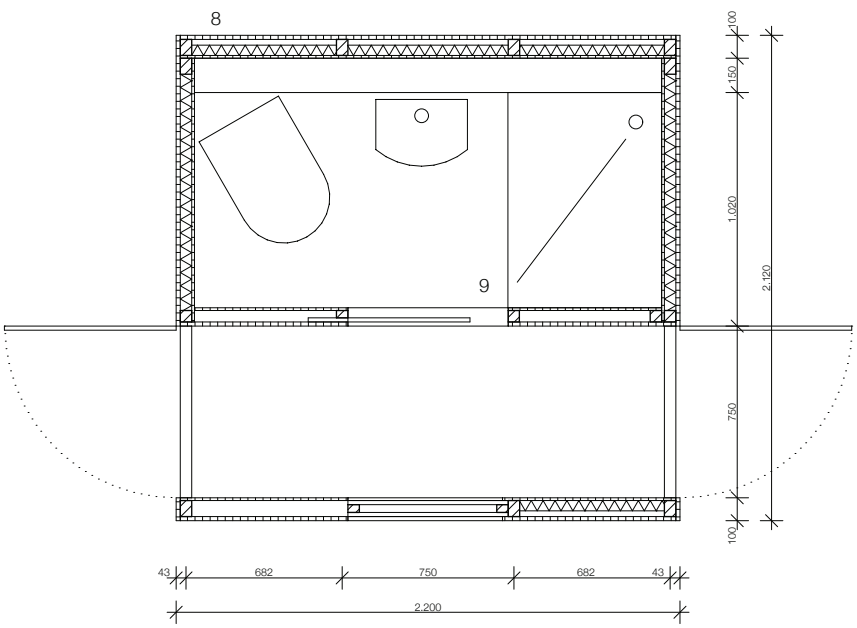
section 1:33



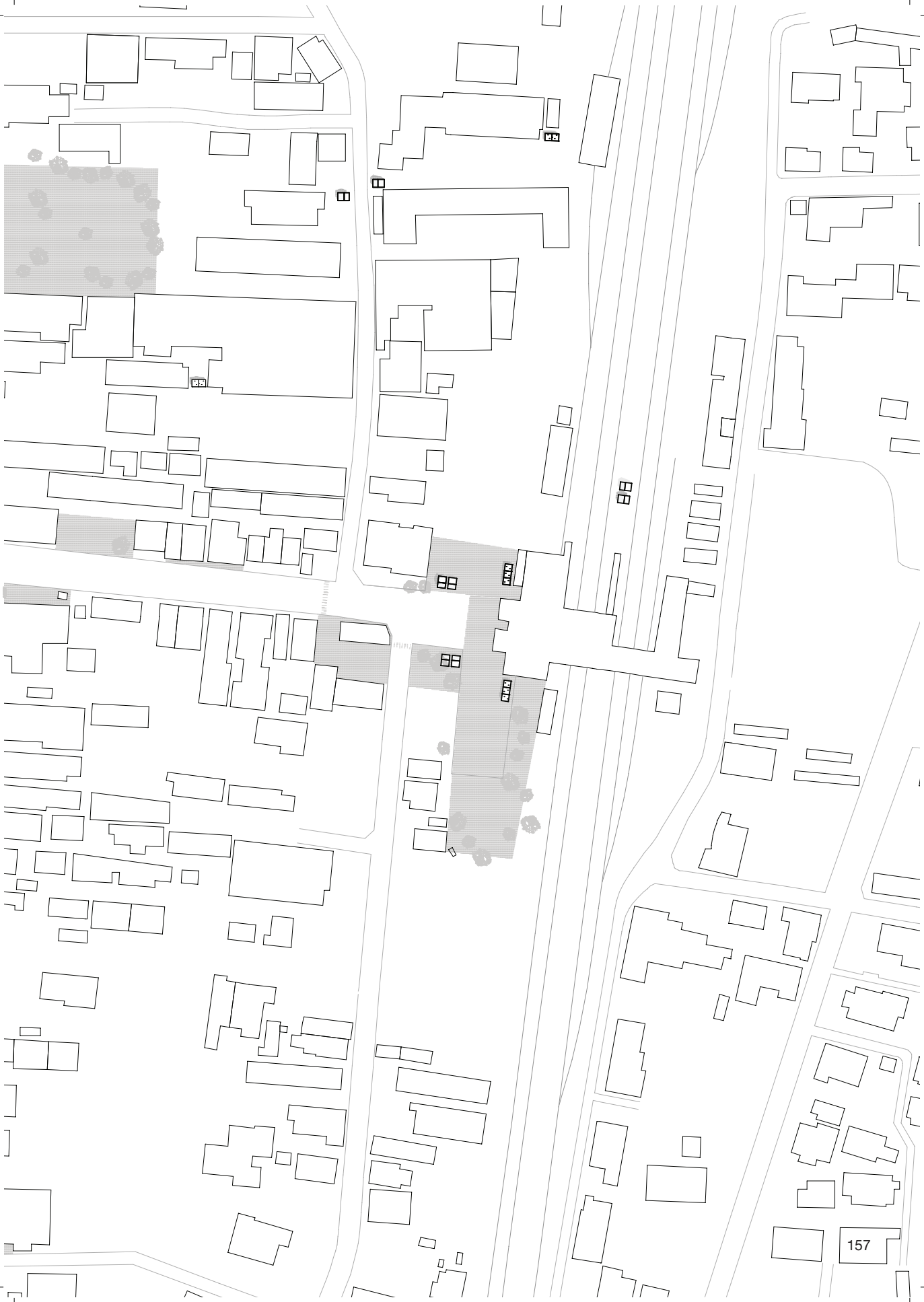
floor space



top 1:100



plot 1:33



Img. 50: ‘Pocket House’ Step II - temporary housing unit visualisation

4 3 Step II: '*Pocket House' as a temporary housing unit*

1 Water-resistant veneer
Laminated wood panel 22 mm
Rear ventilation 40 mm
Sealing layer
Wooden frame construction
and struts in pine
for horizontal stability 50/85 mm
Cork insulation in between 60 mm
Laminated wood panels
coated with moisture barrier 18 mm

2 Side bearers for vertical
stability 50/85 mm

3 Swivel joint at 3 points
in wood

4 Sealing strip

5 Hydraulic cylinder as support

6 Metal cover

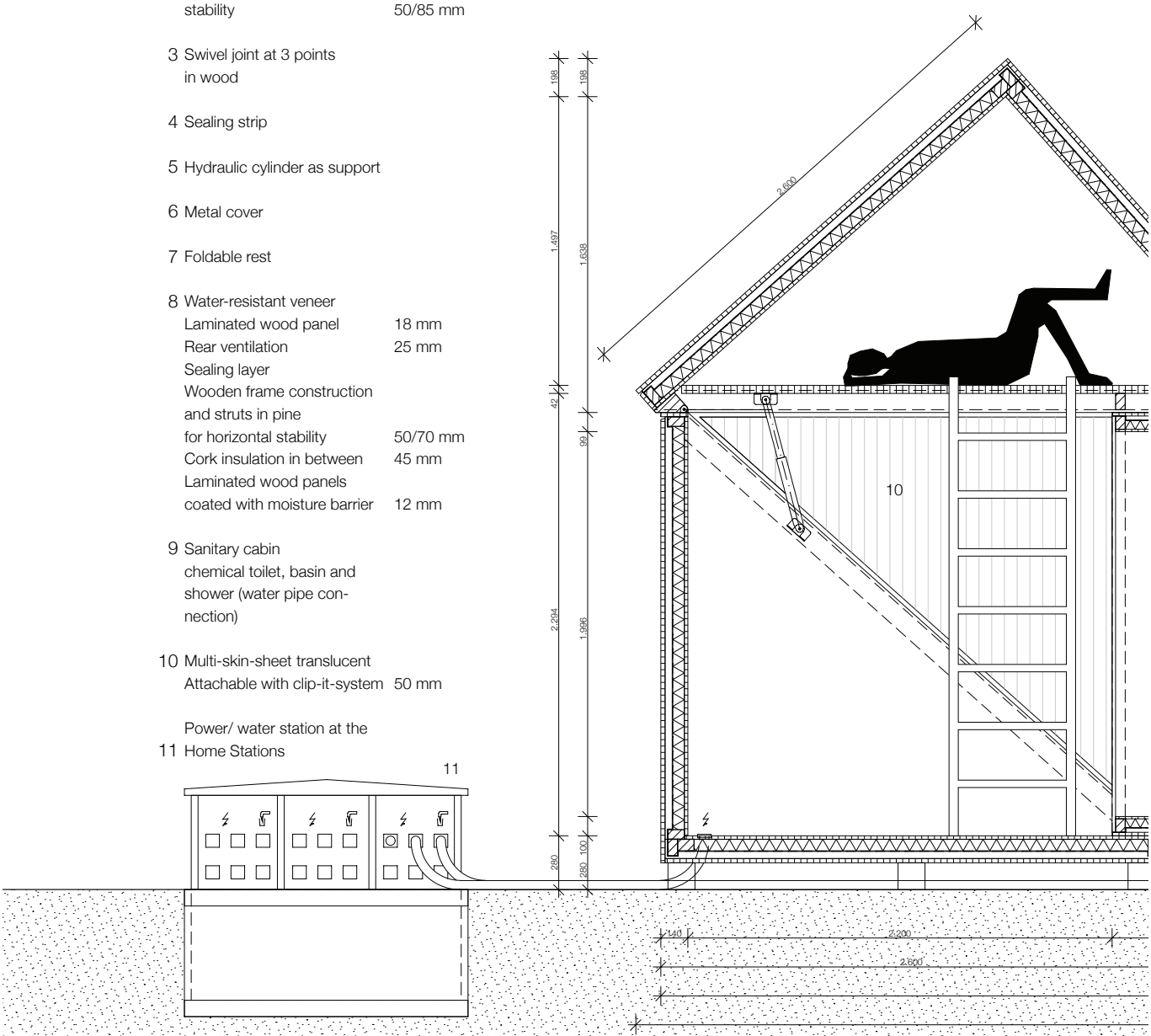
7 Foldable rest

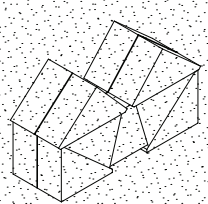
8 Water-resistant veneer
Laminated wood panel 18 mm
Rear ventilation 25 mm
Sealing layer
Wooden frame construction
and struts in pine
for horizontal stability 50/70 mm
Cork insulation in between 45 mm
Laminated wood panels
coated with moisture barrier 12 mm

9 Sanitary cabin
chemical toilet, basin and
shower (water pipe con-
nection)

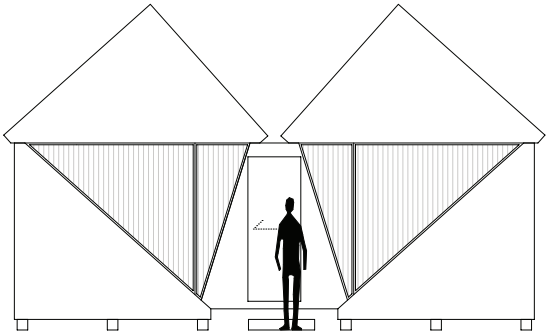
10 Multi-skin-sheet translucent
Attachable with clip-it-system 50 mm

Power/ water station at the
11 Home Stations

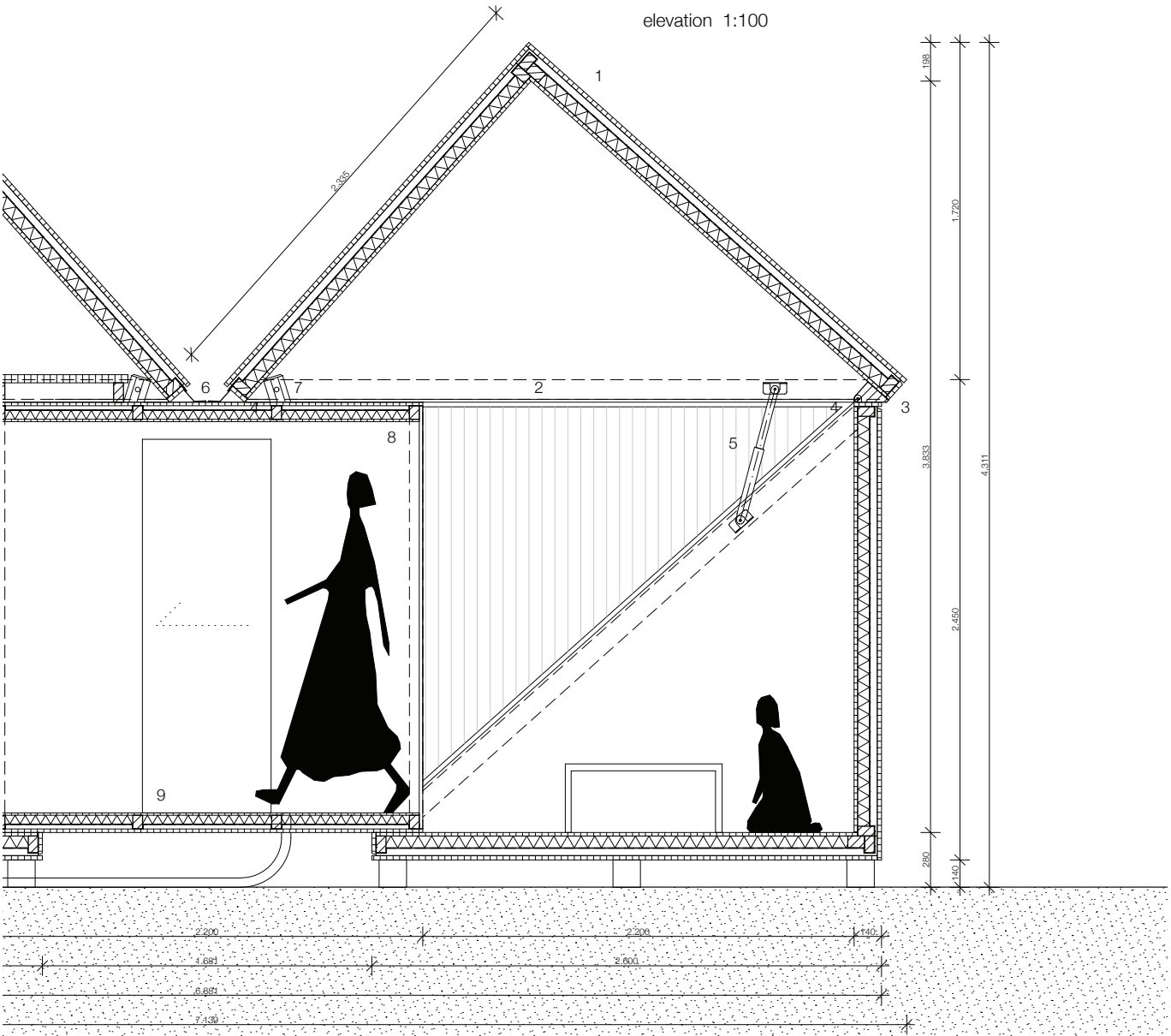


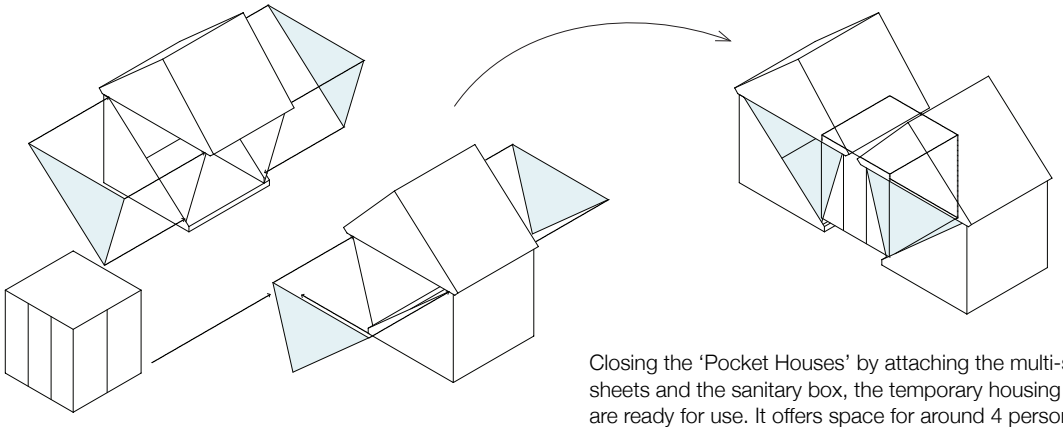


section 1:33

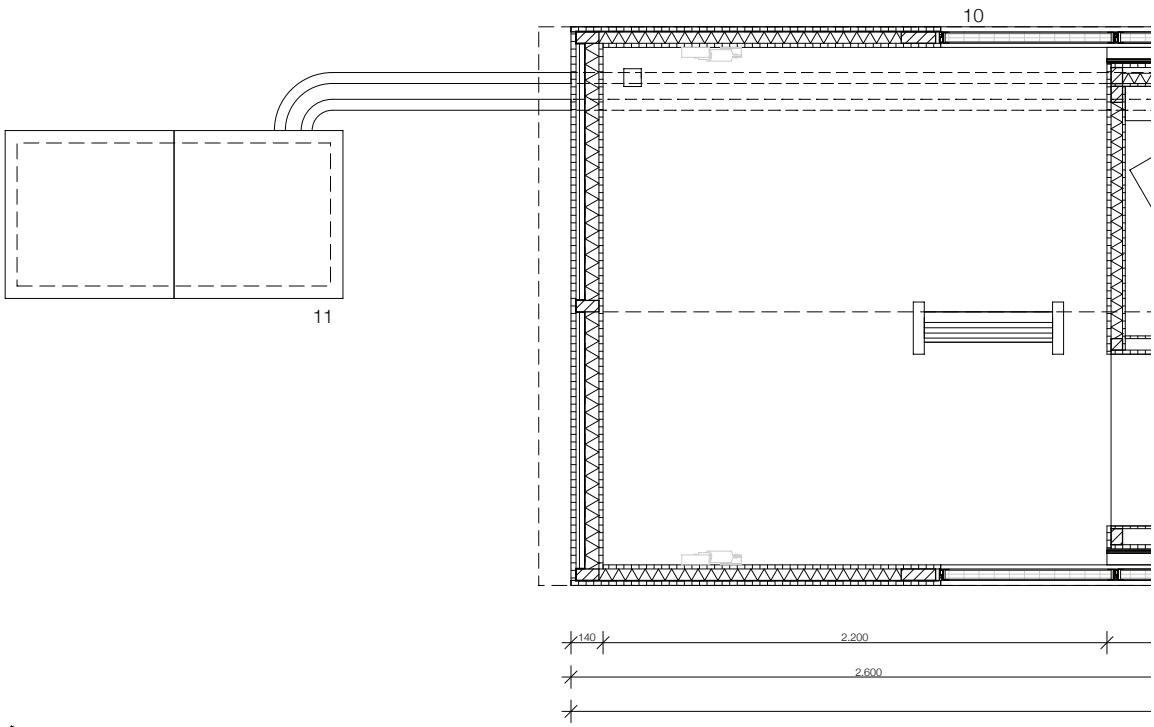


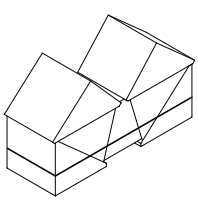
elevation 1:100



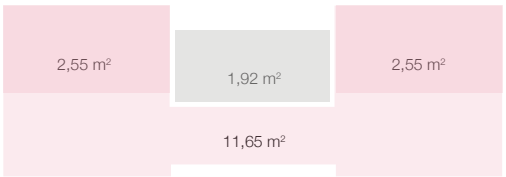


Closing the ‘Pocket Houses’ by attaching the multi-skin-sheets and the sanitary box, the temporary housing units are ready for use. It offers space for around 4 persons.

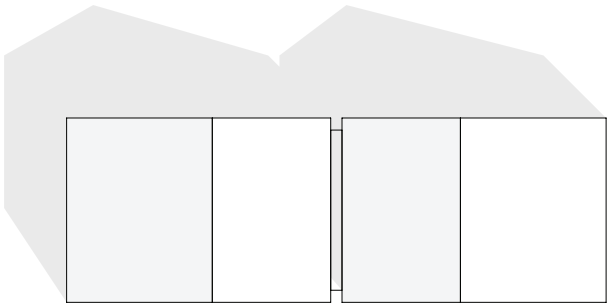




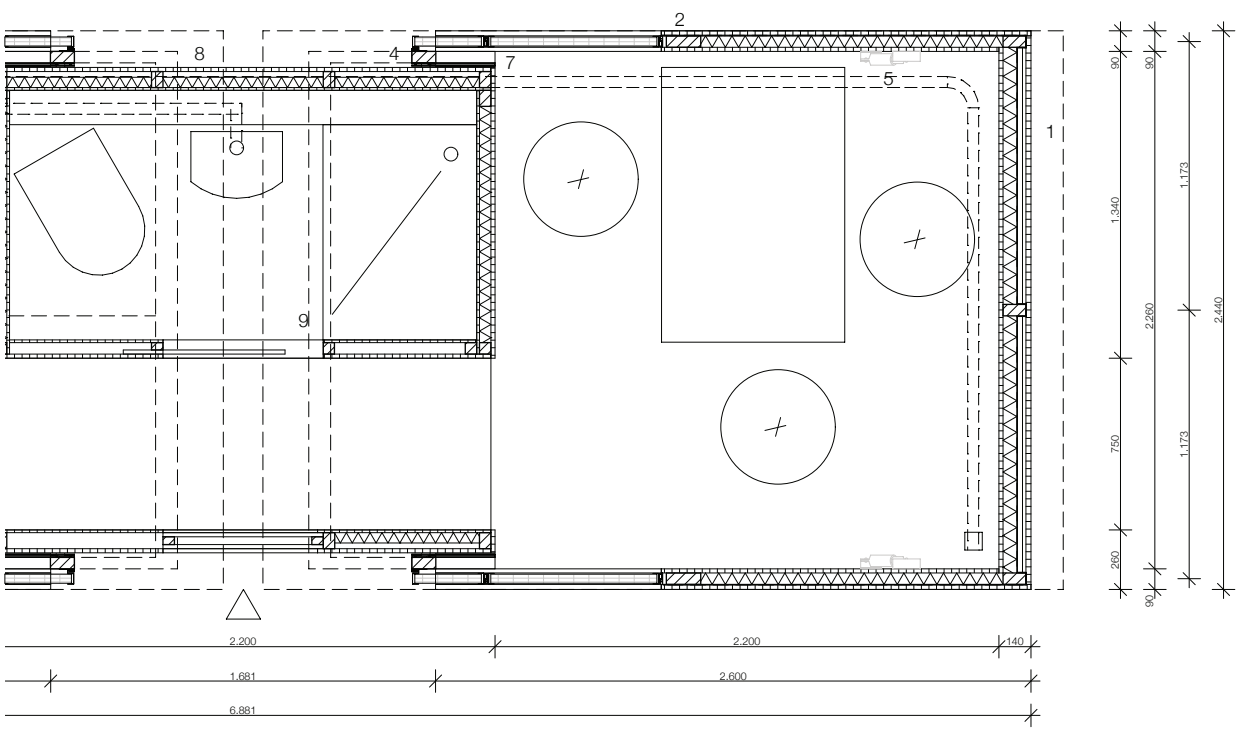
plot 1:33

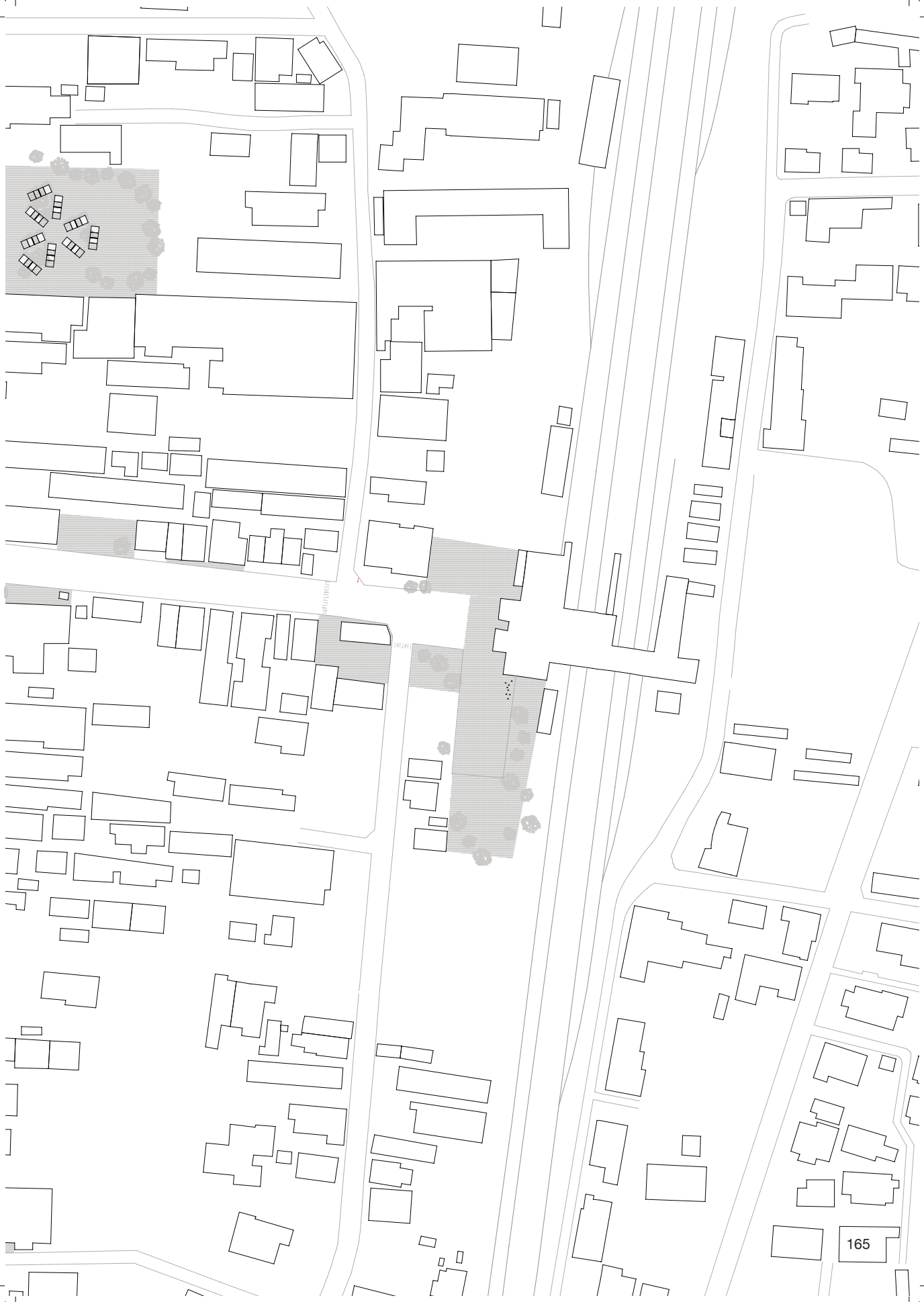


floor space incl the roof spaces



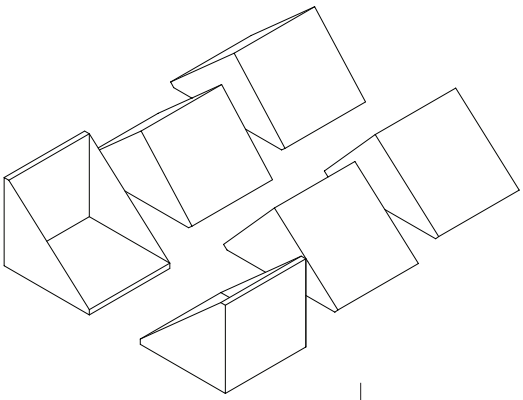
top 1:100



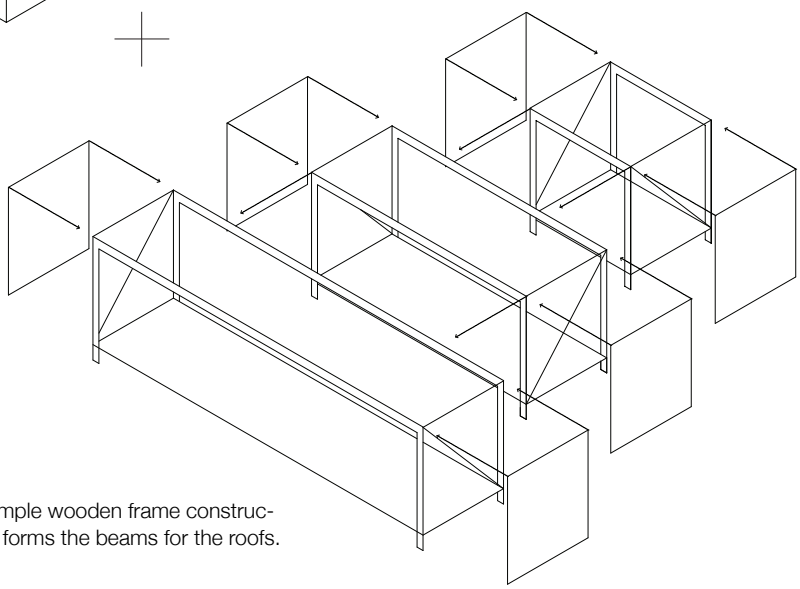


Img. 51: ‘Pocket House’ Step III - ‘Community House’ visualisation

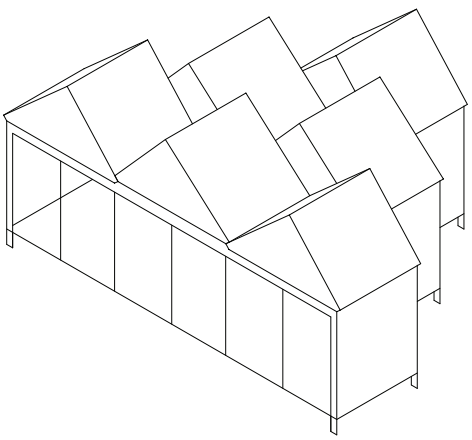
4 3 Step III: '*Pocket House's roofscape as the new landmark*'



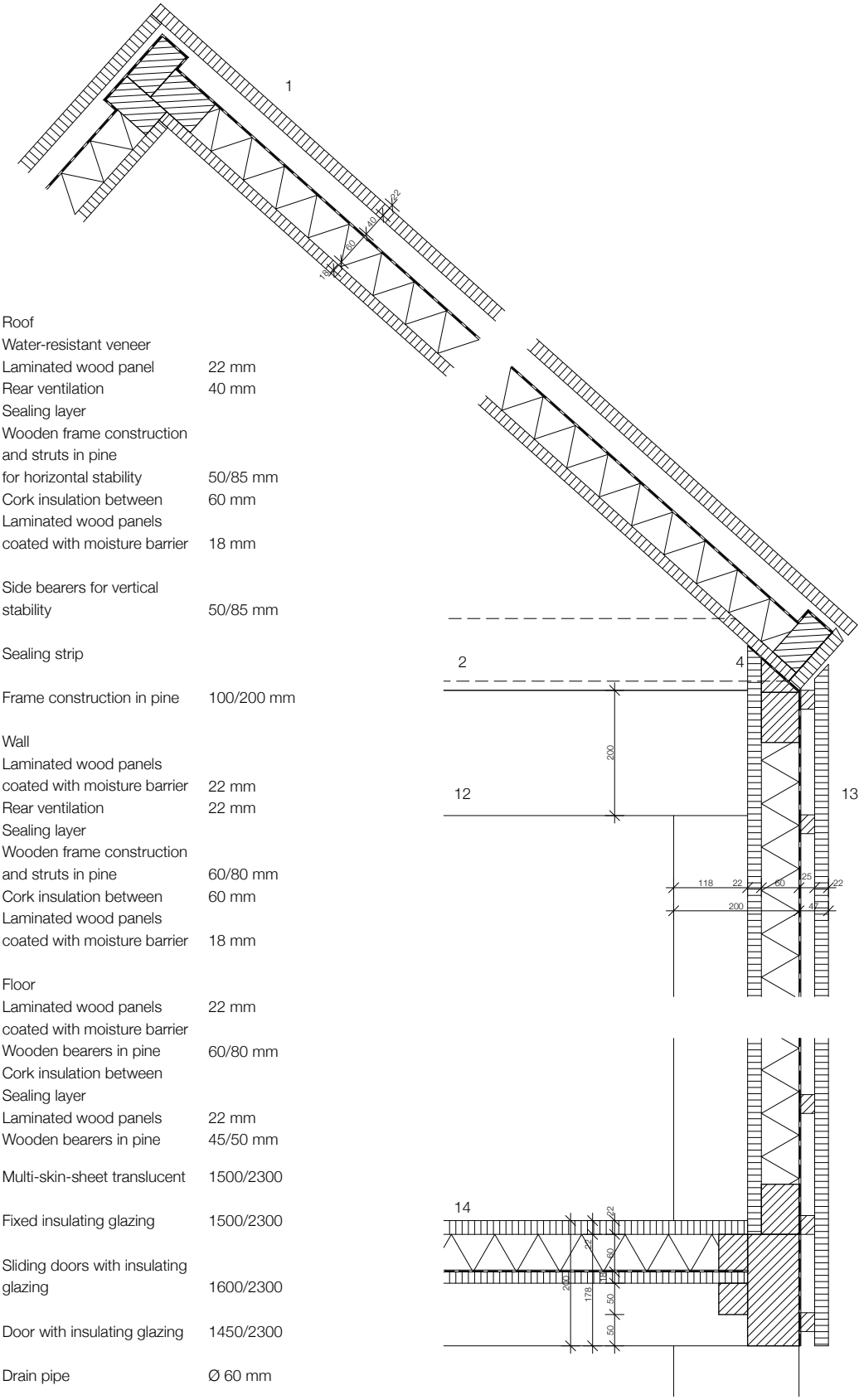
By taking the 2 pieces of the ‘Pocket House’ apart, they can be used as the new roof structure.



A simple wooden frame construction forms the beams for the roofs.



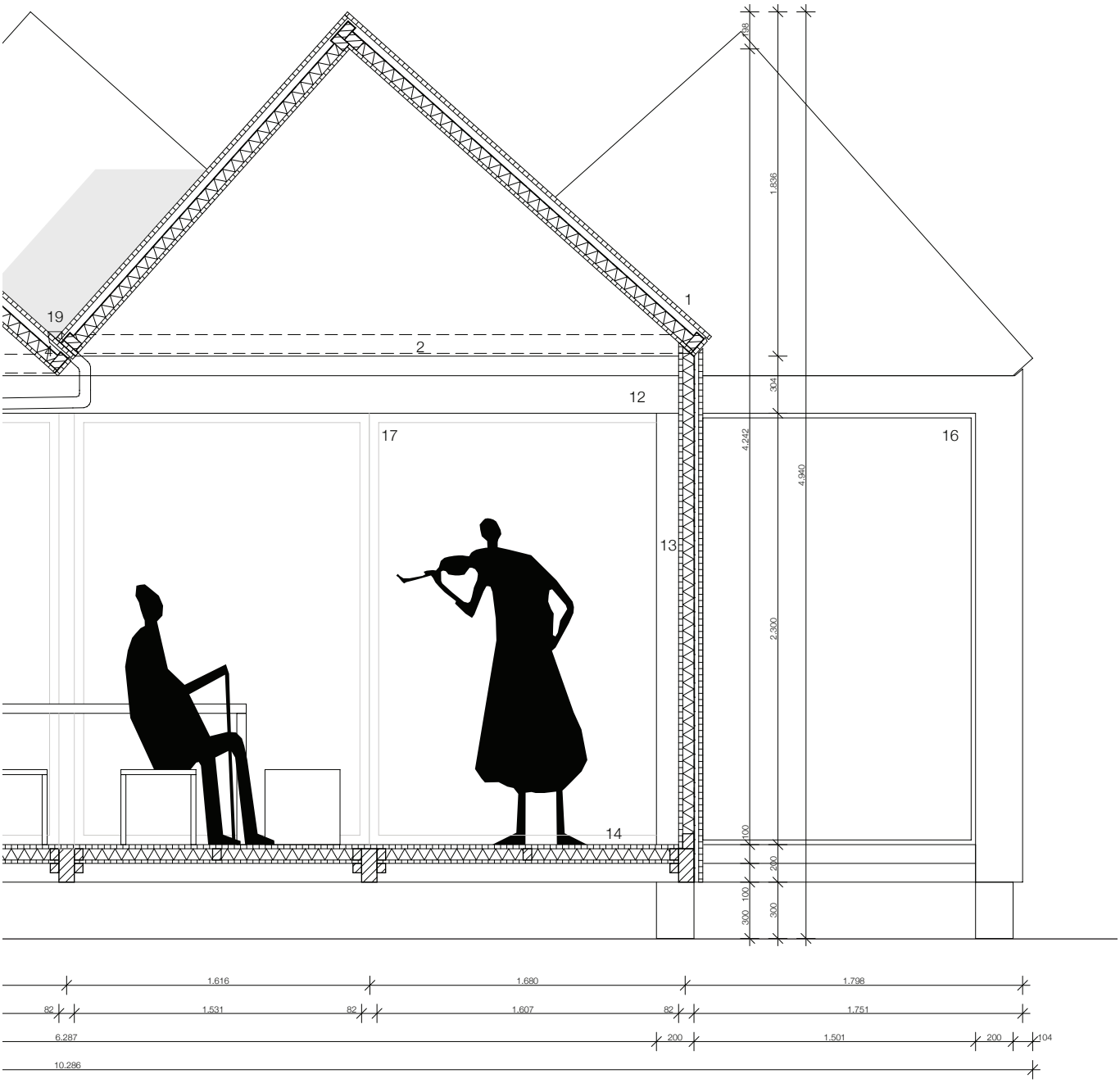
The open and light space provides enough space for various functions. The ‘Pocket House’ turns into a permanent building, the ‘Community House’.

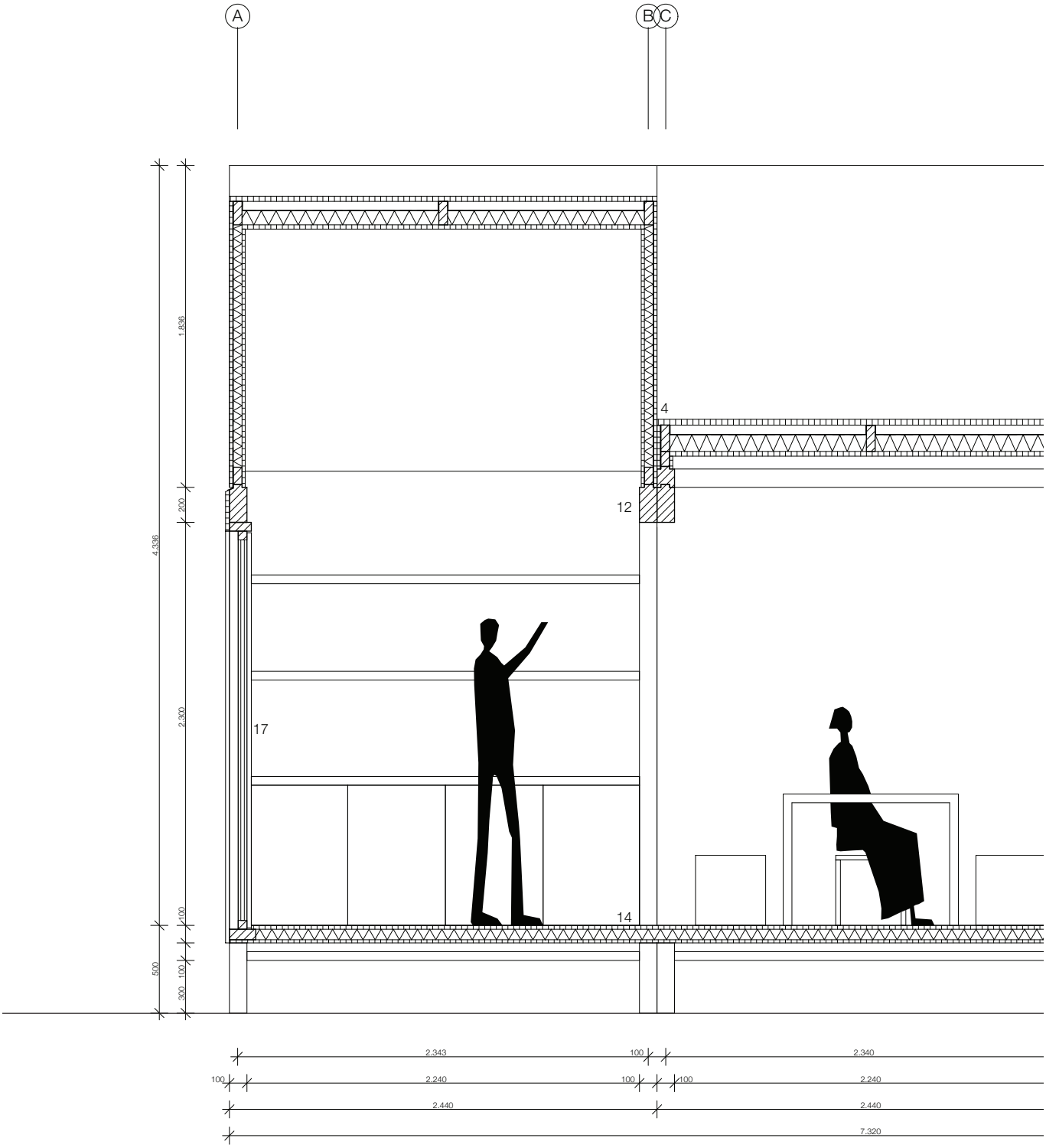


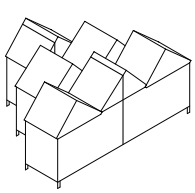
1	Roof	
	Water-resistant veneer	
	Laminated wood panel	22 mm
	Rear ventilation	40 mm
	Sealing layer	
	Wooden frame construction and struts in pine for horizontal stability	50/85 mm
	Cork insulation between	60 mm
	Laminated wood panels coated with moisture barrier	18 mm
2	Side bearers for vertical stability	50/85 mm
4	Sealing strip	
12	Frame construction in pine	100/200 mm
13	Wall	
	Laminated wood panels coated with moisture barrier	22 mm
	Rear ventilation	22 mm
	Sealing layer	
	Wooden frame construction and struts in pine	60/80 mm
	Cork insulation between	60 mm
	Laminated wood panels coated with moisture barrier	18 mm
14	Floor	
	Laminated wood panels coated with moisture barrier	22 mm
	Wooden bearers in pine	60/80 mm
	Cork insulation between	
	Sealing layer	
	Laminated wood panels	22 mm
	Wooden bearers in pine	45/50 mm
15	Multi-skin-sheet translucent	1500/2300
16	Fixed insulating glazing	1500/2300
17	Sliding doors with insulating glazing	1600/2300
18	Door with insulating glazing	1450/2300
19	Drain pipe	Ø 60 mm


16
1,620
1,819
96
200
4,819
4,150
2,422
2,300
100
200
200
400
300
300
1,792
1,695
1,607
1,751
82
1,619
82
1,520
93
200
1,501
200

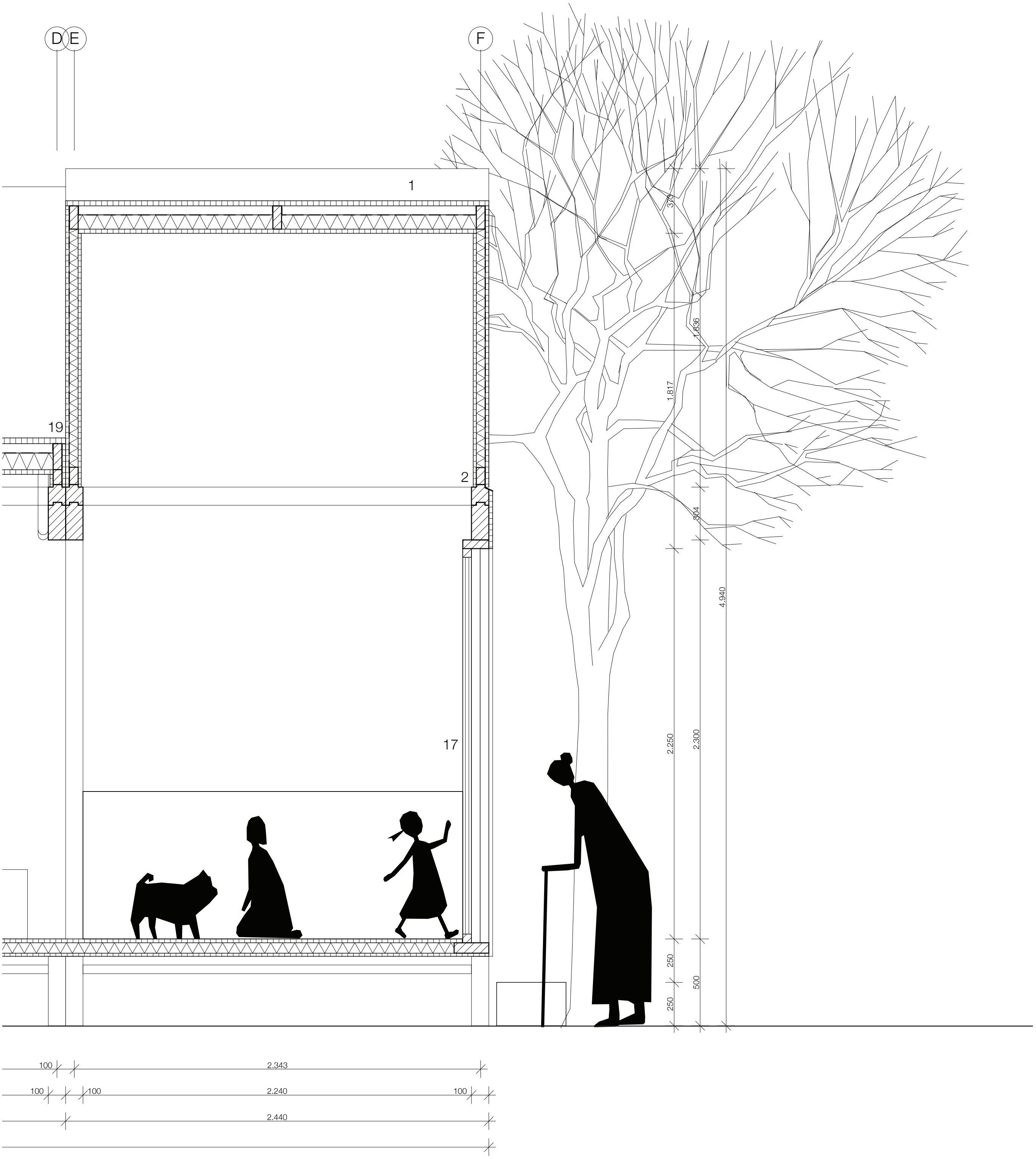
section 1:33

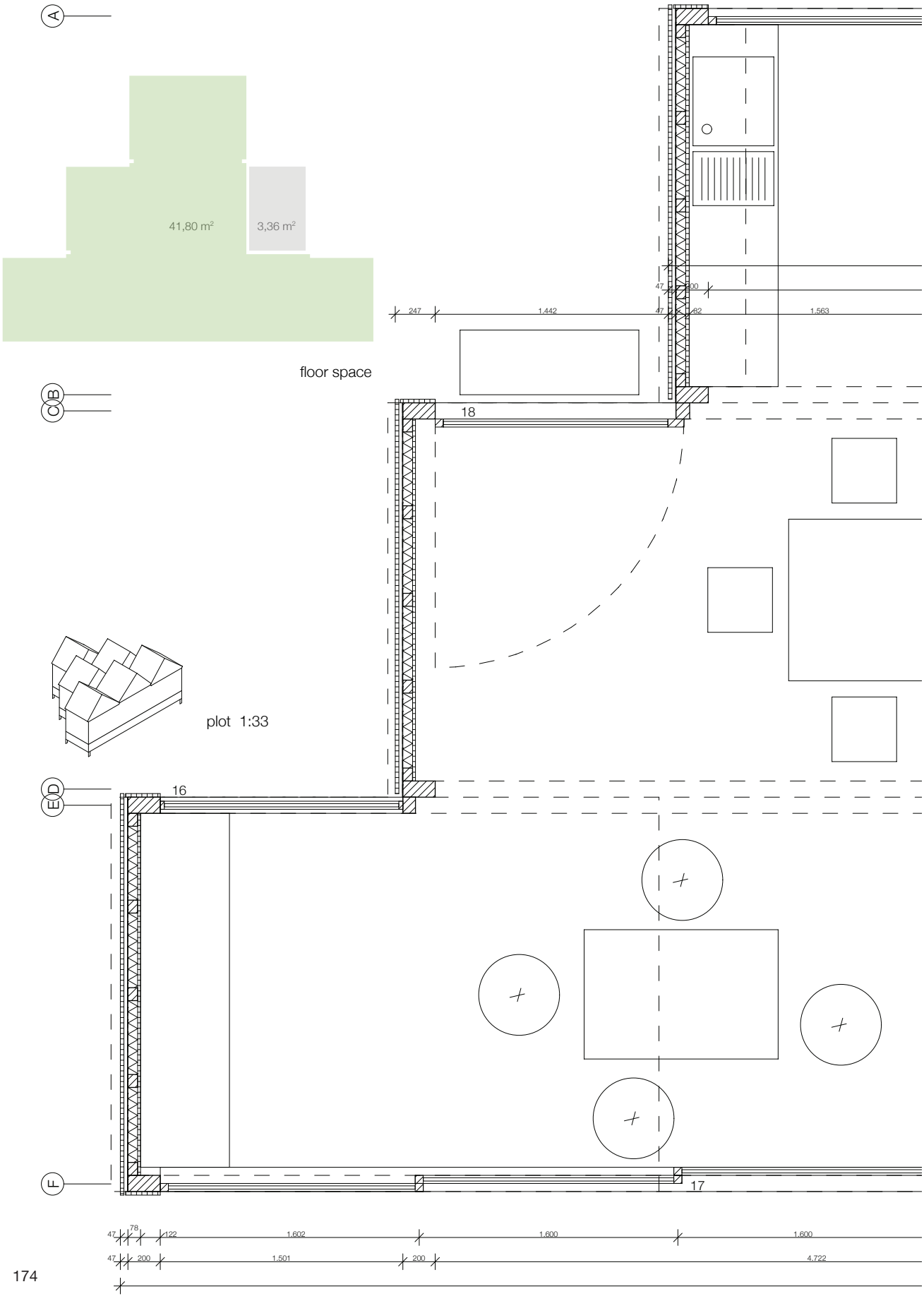

19
1
2
12
17
16
13
14
89
1.696
304
4.242
4.940
2.300
100
200
100
300
900
1.616
1.680
1.798
82
1.531
82
1.607
82
1.751
6.287
200
1.501
200
104
10.286

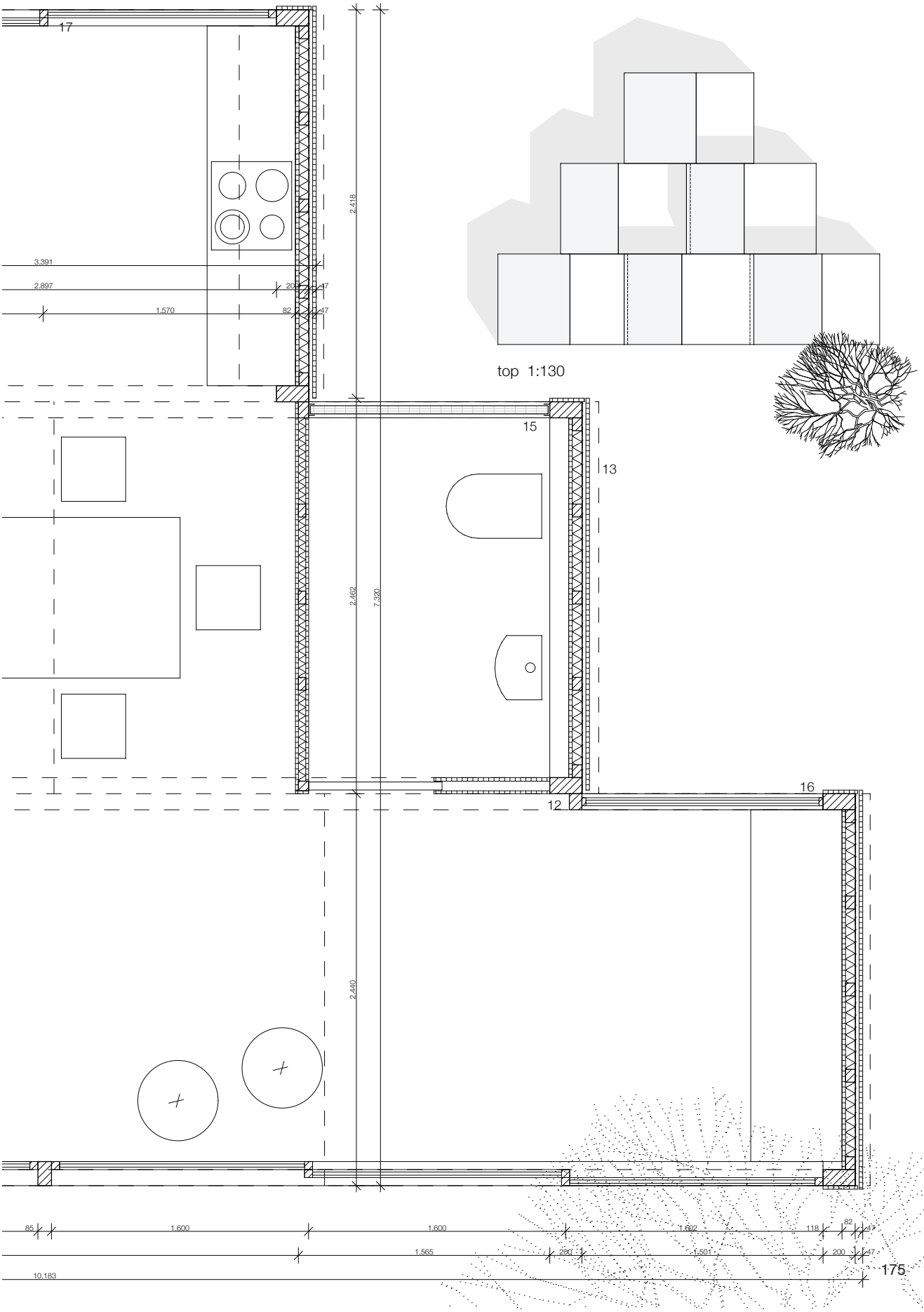

A
B
C
1.836
200
4.336
2.300
100
500
100
300
4
12
17
14
2.343
100
2.340
100
2.240
100
100
2.240
2.440
2.440
7.320

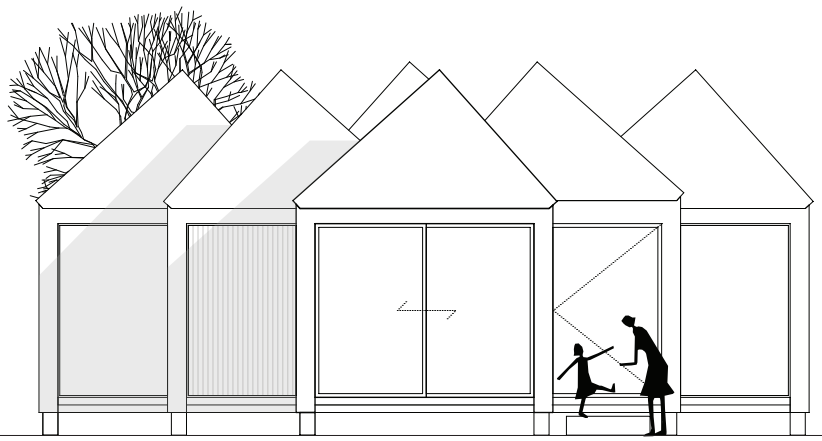


section 1:33

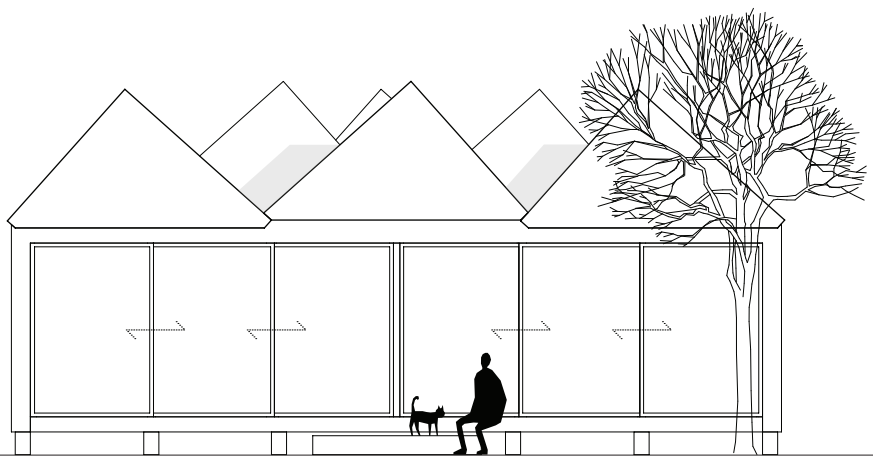

D
E
F
1
19
2
17
375
1.636
1.817
304
4.940
2.250
2.300
250
500
250
100
2.343
100
100
2.240
100
2.440


A
41,80 m²
3,36 m²
floor space
C/B
18
plot 1:33
E/D
16
F
17
247
1,442
47
200
62
1,563
78
122
1,602
1,600
1,600
200
1,501
200
4,722

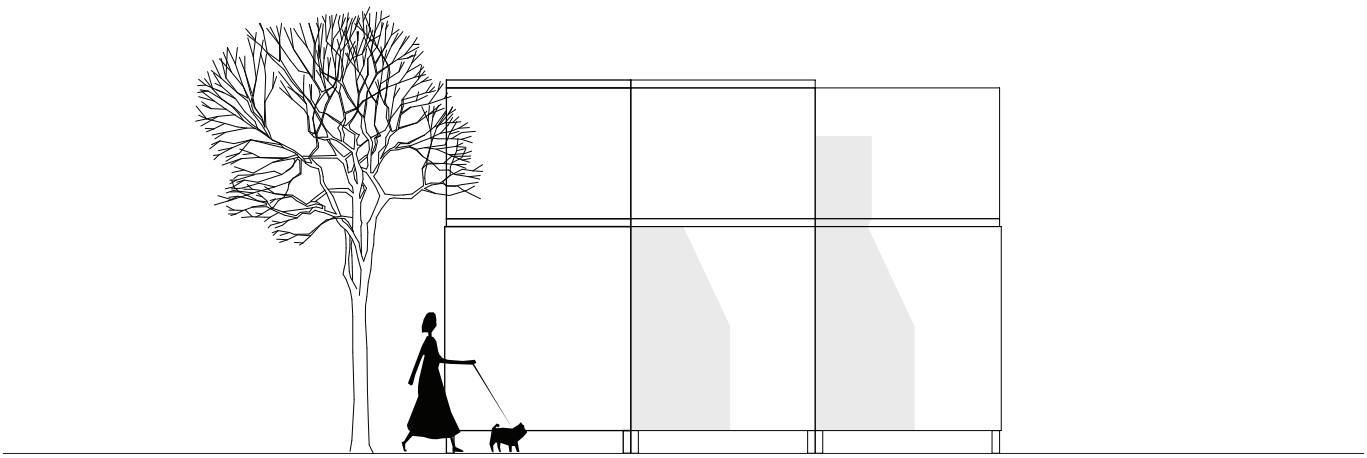

17
2.418
3.391
2.897
209
47
1.570
82
47
top 1:130
15
13
2.462
7.320
16
12
2.440
85
1.600
1.600
1.602
118
82
47
1.565
200
1.501
200
47
10.183



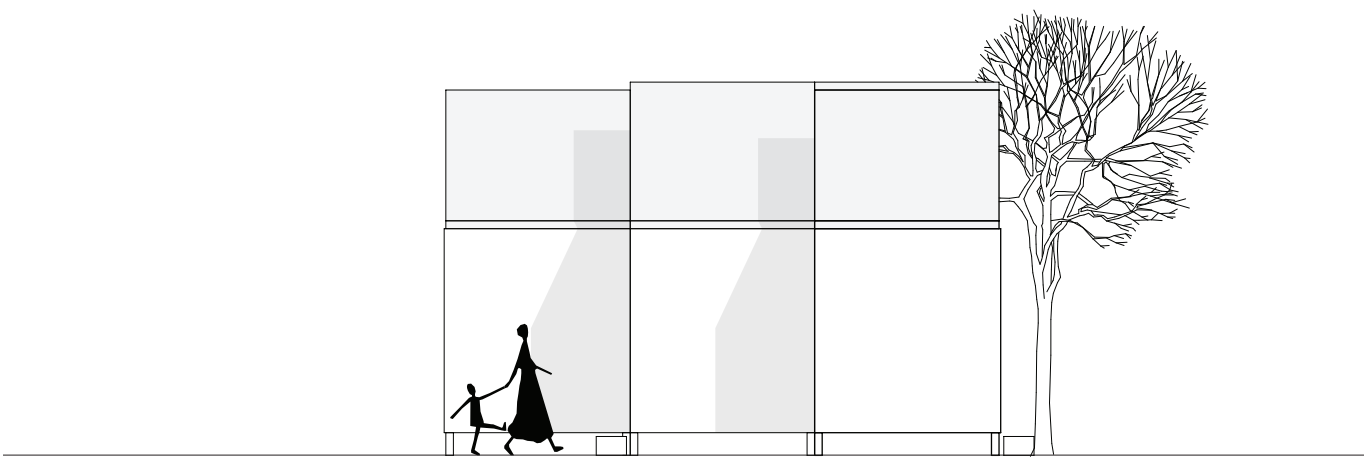
north side 1:100



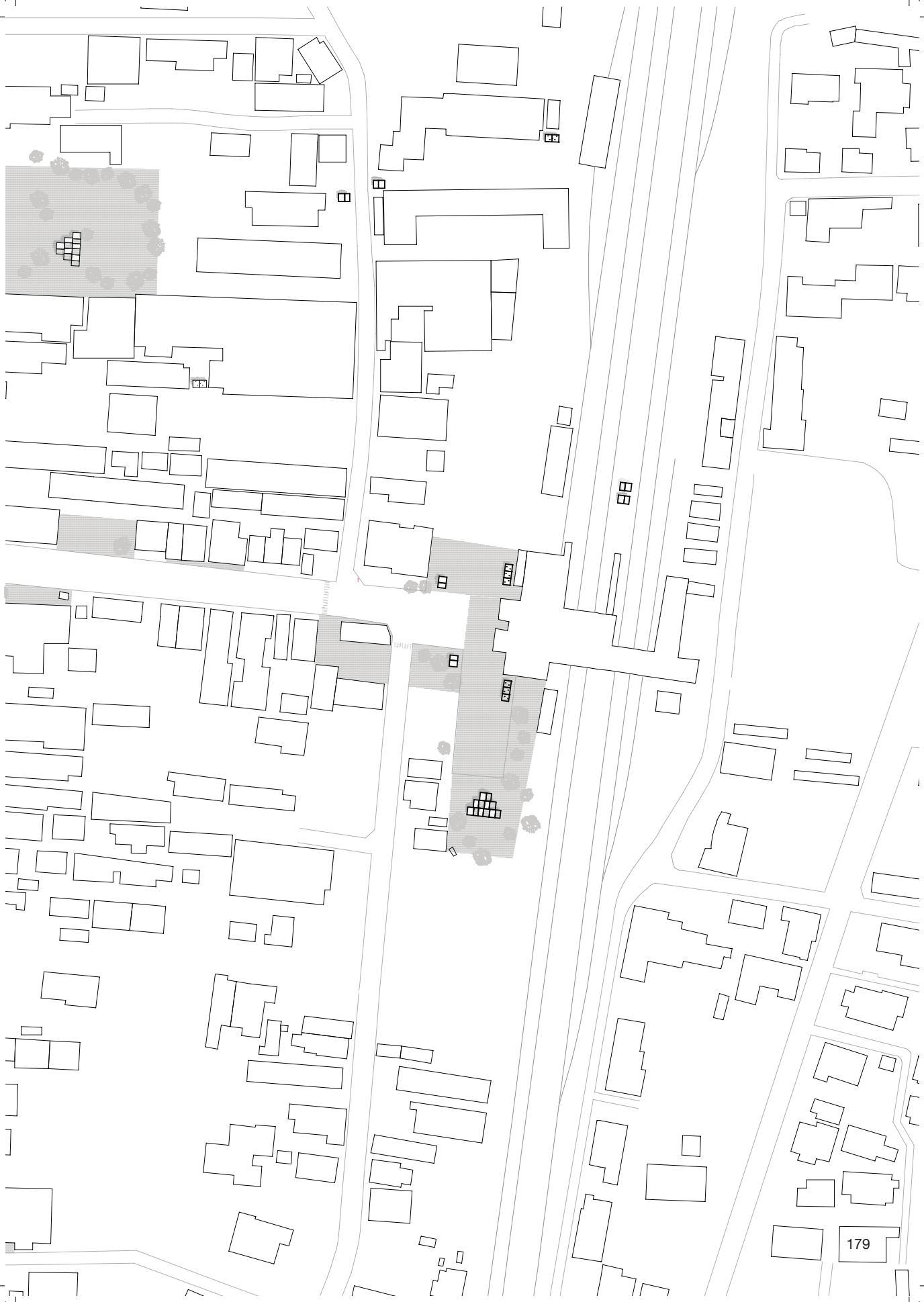
south side 1:100

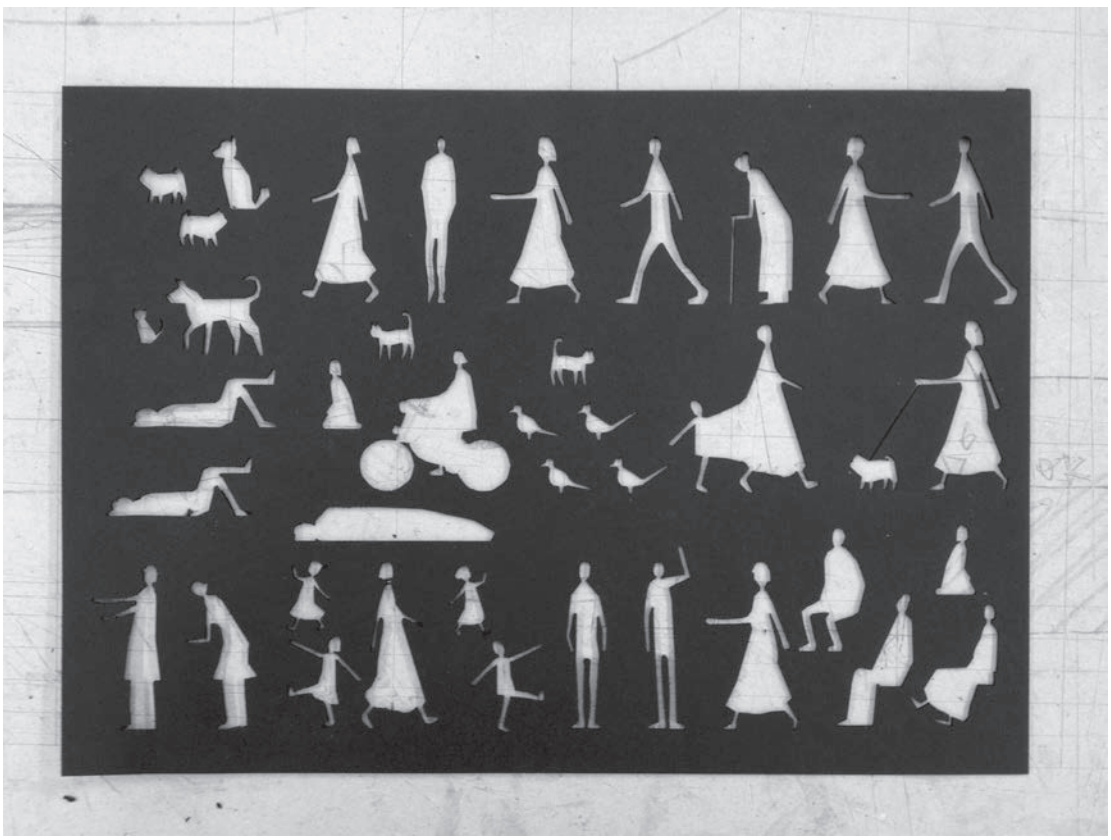


east side 1:100

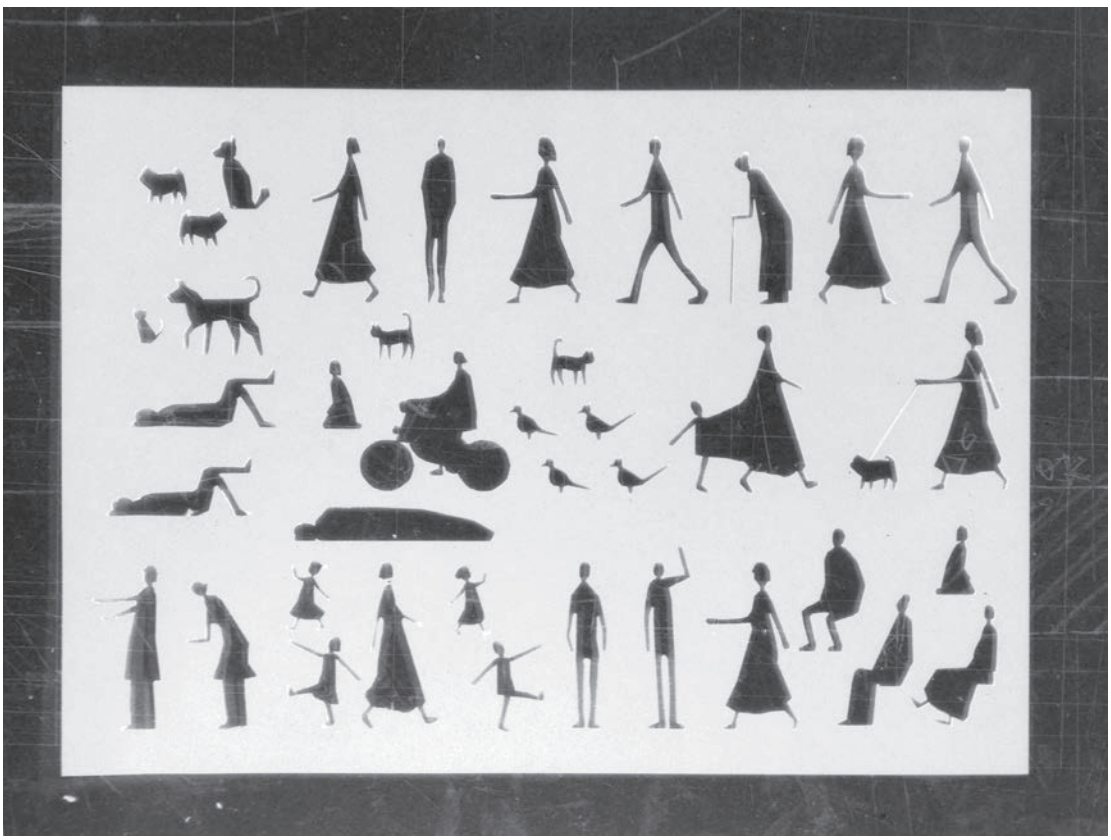


west side 1:100





4 5 Model photographs



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Img. 62: Pocket House Step III model, scale 1:33/ roof scape of the new structure

Img. 63: Pocket House Step III model, scale 1:33/ community centre

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2 Images

Img. 01
A resident of Natori after the Tsunami in March 2011

> http://www.telegraph.co.uk/news/picturegalleries/worldnews/9131914/Japan-earthquake-and-tsunami-anniversary-30-powerful-images-of-the-disaster.html?frame=2162803 (2013/10/17)

Img. 02
Desolation of Nihonbashi and Kanda, after the Great Kanto Earthquake in 1923

> original source: Osaka Mainichi newspaper. http://commons.wikimedia.org/wiki/File:Desolution_of_Nihonbashi_and_Kanda_after_Kanto_Earthquake.jpg (2013/08/29)

Img. 03
Sendai city's beautiful beach and resitential neighbourhood next to it, before the Tsunami in March 2011

Img. 04
After the Tsunami - the breakwaters could not protect the city from the giant waves

> http://www.nytimes.com/interactive/2011/03/13/world/asia/satellite-photos-japan-before-and-after-tsunami.html?_r=0 (2012/11/13)

Img. 07
The 'Ise Grand Shrine'

> http://www.jinjahoncho.or.jp/en/ise/ (2013/12/03)

Img. 09
Destroyed shopping streets at Nagata, Kobe after the Great Hanshin Earthquake in 1995

> by Matanao. http://en.wikipedia.org/wiki/File:Nagata001.JPG (2013/12/03)

Img. 10
Eiko Araya, 58, a school principal, atop the inner sea wall in Taro

> Ko Sasaki for The New York Times. http://www.nytimes.com/imagepages/2011/04/02/world/jp-02wall.html (2013/09/07)

Img. 20
Archi+Aid in the tsunami hit area with Yoshiharu Tsukamoto

Img. 21 + Img. 22
Model and plan of extension steps

Img. 23
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Img. 32
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Img. 33
Future image of Oshika peninsula

> http://www.pechakucha.org/channels/archiaid/blogs?category=humanity (2012/11/25)

Img. 24
team Timberize with Prof. Mikio Koshihara (4th from right)

Img. 29
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> http://www.timberize.com/index.html

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Side House while being used

Img. 35
Interior of Side House

> http://wood.iis.u-tokyo.ac.jp/tohoku311.html (2012/03/14)

Img. 38
An early photography showing hunters with their dogs, even children.

Img. 39
The pheasant population in Yabuki was rich

Img. 40
Military Airbase on the flat grounds of Yabuki during the War

Img. 41
Dry conditions forced construction of the Hatori dam

> http://www.town.yabuki.fukushima.jp/view.rbz?cd=936 (2012/03/14)

Img. 05
The oldest wooden construction: the five story pagoda ‘Horyu-ji’

Img. 06
The biggest wooden construction: The ‘Todai-ji’ with its 23t Buddha

Img. 08
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Img. 11
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Img. 13
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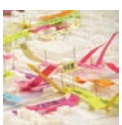
Img. 31: ‘Home-for-All’ exhibition at the 13th LaBiennale (2012/09/16)

Img. 42: The deserted Shopping Street with the shutters down.

Img. 43: Once the Shopping Street was used to be a lively place. Now there are no pedestrians around.

Img. 44: Shinkansen as a popular commuting transportation from Tokyo suburbs to the centre



Img. 46: The colourful 3D mind map created by all the participants

Fig. 01 - Fig. 34

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> by Luna Perschl

Img. 45
After the successful workshop in Yabuki town with all participants

Img. 47:「がんはれ！ざぶき」'Gambare! Yabuki' ('Yabuki, be strong!') as a call for a better future.

> by Photographer Satoshi Asakawa

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> by Christian Chladek