

Kellers Park's Residence

Ma4-Ark17
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Abstract

The Master thesis takes point of departure in 'Sustainability in the Preliminary Design'. Attention is on outside interests and client survey reflection in a design process, in this projekt concerning a residence for socially disadvantaged young people. Studies are based on local and national descriptions, and social psychology. The design expresses an educational sympathetic approach with close relation to the stimulus variations in the surrounding countryside.

Index

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Reading Guide

project report contains the process behind the design of the master's thesis. report is based on a fictional offering, which is the first part of the report. This part describes a supply project materials with the parties involved need, working conditions and daily routines. Project material contains a final and summary table of priorities. Afterwards comes the analysis part which is directly linked to and answering priorities. The responses are embodied in concepts with a follow-up process description from concept to design. as afrundig of the project presented the final design.

As a supplement contained an appendix at the back of the report. The literature is referred to at Harvard and the method is to obtain the previous appendix, as is the case for the list of illustration. Concluding a CD containing documents containing the digital files associated with the project.

Introduction

In the design of a public institution client's interests and governmental- & site advisory descriptions highly influence the process of creation. Matters of sustainability are presented and prioritized in a tender ad that in addition with functional municipal guiding's of how the citizens' wellbeing is obtained and a transparent and fair competition becomes project basis.

The master thesis takes point of departure in the municipality of Vejle's fictitious tender ad for Keller's Park Abode and the following conceptual design proposal. It focusses on the merging of architectural perception of materials and space with institutional practice of health, prevention, safety and environment in the selection of materials and final objective requirement specification of them.

Institutional circumstances demands levels of hygiene that effect the built environment not only in the surfaces but also construction. Hence institutions often become synonymous with clean, hard surface and a sterile environment that counter-effect the actual purpose of an opportunistic and creative atmosphere.

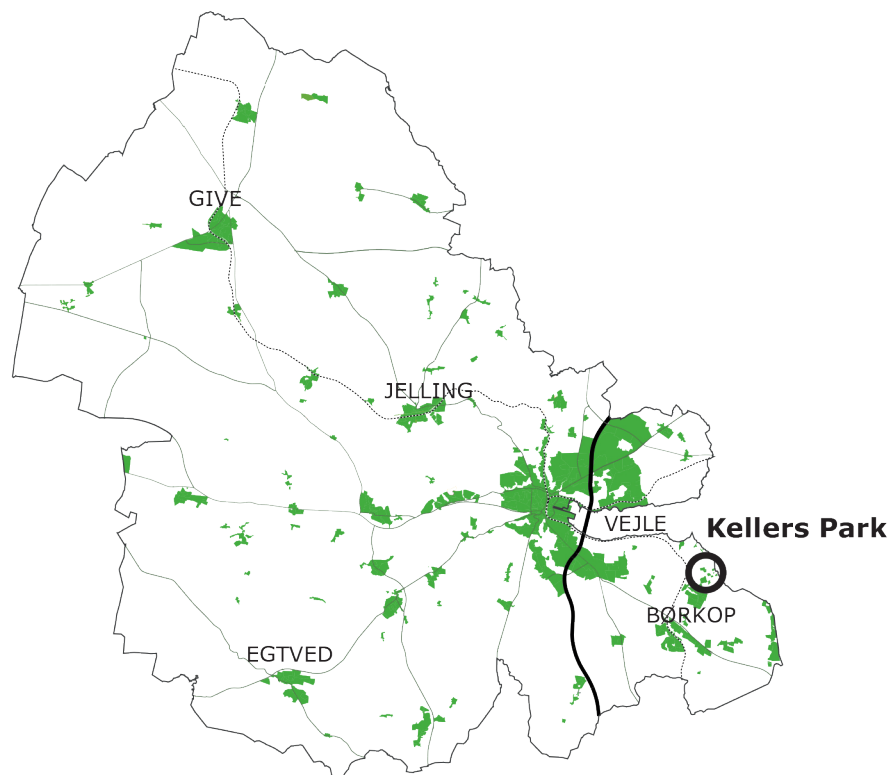
Sustainability-wise building regulation 2020 is integrated in the tender ad to force the use of passive techniques related to the characteristics of the site and promote active technologies.

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Tender Ad



III. 1

History - Kellers Park

Kellers Park, designed by Vilhelm Klein, was constructed late 19th century. As treatment center for retarded, Doc. Christian Keller considered the site to be part of the treatment with its beautiful surrounding nature, close access to water and hilly terrain. The distinct characteristics of the surrounding nature were emphasized and complimented by an Italian and French renaissance inspired design. Key in design was peace, harmony and regularity in symbiosis with nature. It was a small self-sufficient community with agriculture, orchards, workshops, knitting and laundry. Today it is a luxurious lifestyle area with wellness, hotel, art, golf, marina and housing. [1]



History - Workshops

The workshop area of the Kellerske Institutions contained workshops, laundry, and supply- and service buildings. Since the closure of the Kellerske Institutions it has lost its original purpose and most recently used as office, trade, public administration, art workshop and storage of kayaks among others. In connection with the provision of regional and municipal plans for Kellers Park it has been rated as not worth preserving. [2]

Buildings

The workshop area consists of 4 buildings whose walls are built in lightweight concrete (light brick stone, gas concrete) and brick (brick, limestone, cement rock). The roof consists of fiber cement and asbestos (wave or slate-cement) or tar paper. [3]

Purification

In connection with the workshop's previous function, 5p oil heating tanks were buried in the grounds. In 2005, suspected oil led to purification. There is no imminent risk of further contamination, but in the case of detection, alert the municipality and stop construction immediately. [4]



Mapping

Distinct from the flat and vast landscape of Denmark, the hilly terrain adjacent to the sea provide plenty of small spaces with a variety of experiences including forests, ponds, dunes and fields. Most are protected from the dominant south-west wind with an unobstructed view to the sea.

Access

Access is made from the main road of Vandvaerksvej at the east-end of the site. This road links to Chr. Kellersvej that is a direct connection to the town of Brejning and the rest of Kellers Park, but also to the coast with the marina. From the main road there are two entrances, forming a beginning and end of a road that incapsulates the site. A hierarchy exists between the entrances, as one primarily is used for bikes as it links with the natural paths of Fredskov and the other for cars. The topography enables only access to the collection of detached houses at the north and lowest part of the site; hence the access road by car is determined by this parameter. It forces space for turning on each single land register.

Neighborhood

The site is part of a small collection of detached houses that forms a small society partly isolated from the rest of Brejning due to the topography. Close by a scout boarding school resides in the old "women's home" of the Kellers Park Institution.

Transport

Apart from car and bike also public transportation is an option. In the intersection of the main road of Chr. Kellersvej and Vandvaerksvej busses 204, 350 and 351 can be reached. 350 and 351 have only local destinations in the area between Vejle and Fredericia, while 204 travels forth and back from Vejle and Fredericia.

The destinations of the local busses are Brejning Station, Boerkop Station, Center of Boerkop, School of Englyst, School of Gauerslund and School of Andkaer.

Activities

Concerning supply and inspiration of the materialistic part of a lifestyle Boerkop center is gathering point of shops and supermarkets that transforms into a small pedestrian zone (4,4km). A more complete variety of shops and supermarkets are to be found in Vejle or Fredericia.

Addressing sports associations in radius of 5km is Boerkop Badminton, Boerkop Billard BKK 79, Gauerlund IF (football), Gauerlund Gymnastics (Gymnastics & Volleyball), Boerkop Handball, Gauerlund Running, Shape Fitness & Motion, Orange Fitness, Boerkop Riding Club, Gauerlund Rifle Club, Tempo Swimming, Gauerlund Tennis, Brejning Boat Club and Comwell Kellers Park Golf Club. [5]



III. 4

Chr. Kellers Vej

Localplan

In response to a question regarding changing / adjusting the forest boundary on the basis of the existing built-up area, is produced material in addition to existing local plan. The material begins with motive for calling followed by appreciative adjustment.

Open space

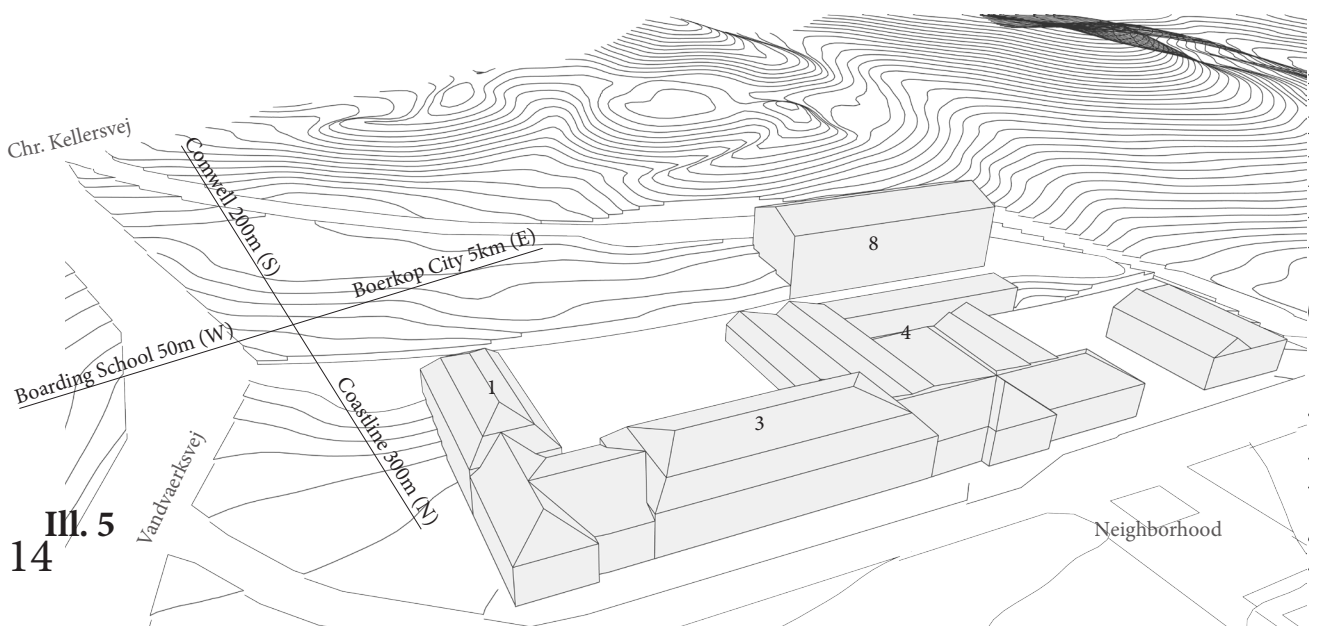
In the preparation of an outline proposal will be exposed more land for recreation area [6]. It will contribute to an open atmosphere in the neighborhood, allowing other residents in the area to reach the forest visually.

Forest boundary line

To adequately provide the experience of a cohesive open area where the new settlement does not create an exclusionary effect on the other, it is a desire that the building boundary line is changed to include the existing building conditions.

Reuse

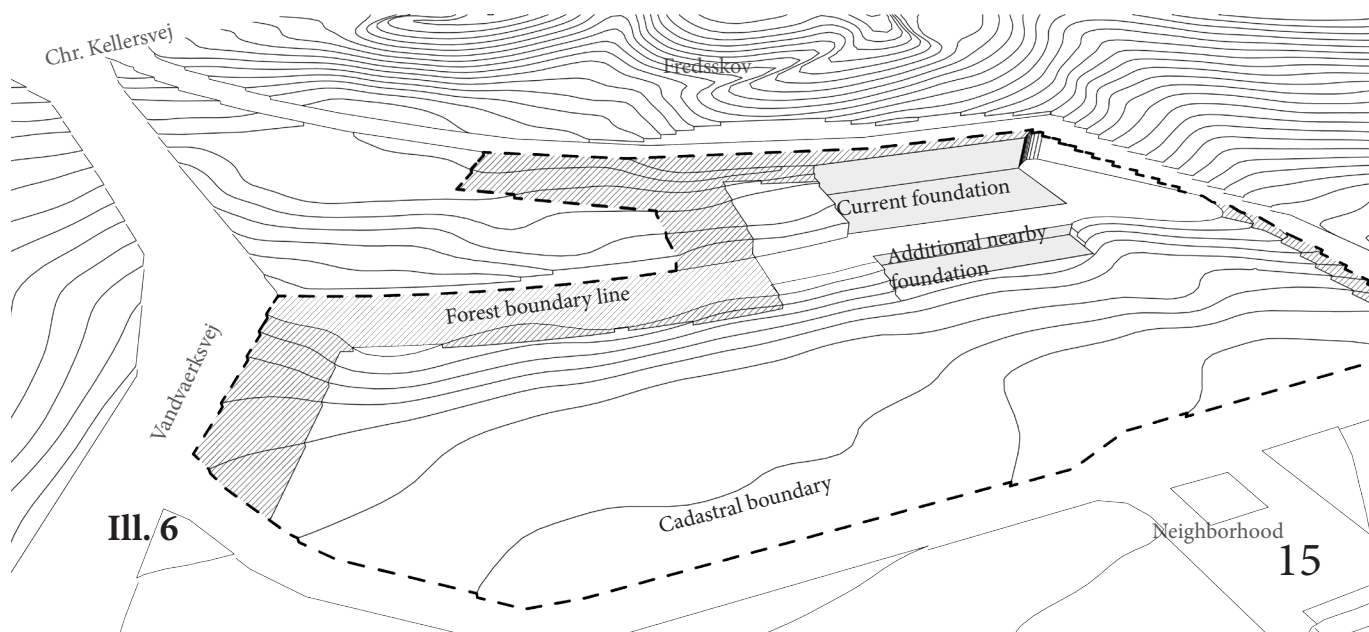
The current building, which was built before the protection of forest came under scrutiny, today occupies part the natural protected area. The use of the existing built-up area, with the assumption that the base ring boundary line are met, is not to be considered a violation of this law .



Intentions

Kellers Park's Residence request construction of a new building with social educational facilities and private quarters for 12 socially disabled young people aged 13-25 years and 6 staff members. It is to serve as an open institution that provides socially pedagogy treatment and residence. The target group is marginalized young people that have developed specific social problems that generally make it difficult for them to cope in social and interpersonal relationships, which could benefit from a commitment in a small community, thereby become relevant and acknowledged as part of a unit.

Being part of a unit includes frames and requirements each needs to perform in order for it to work. It supports the pedagogy of restoring the self-image that reconstruct a positive and trusting individual. They are characterized by struggling to complete educations and keeping committed. They are not to be associated with addicts, serious crimes or strong emotional damages. In referral of new young people it has high priority that it is a match to the existing unit. [7]



Room Schedule

Entrance - Wardrobe

The road into the institution should be designed to transport sand, dirt and soil into the day care center is minimized .

Wardrobe is most appropriate in close connection to the entrances so that undue passage through the living room and kitchen areas with outerwear and footwear are avoided.

Staff wardrobe should be separated from the crew compartment. Staff toilet with wash basin should be placed close to , or preferably with direct access to the cloakroom. [8]

Parking

Institution outdoor area should include covered bicycle sheds and the possibility of parking for staff and visitors' cars. [9]

Laundry

The laundry room should contain, for example washing machine , dryer and drying cabinet with extractor to the outside , as well as a sink and dirty clothes basket. [10]

Cleaning Room

Cleaning materials, detergents and other chemical agents shall be stored in a secure, locked cleaning rooms with a sink and good lighting that is well ventilated to the outside.

If the room is not lockable, there must be a secure, lockable cupboard in the room where cleaning products and chemicals and products etc.. may be stored. [11]

	m ²	Notes
ADMINISTRATIVE PREMISES		
Head Office	15-20	Is important to have physical and visual contact to the hub area. As residents rooms it shall be close to public roads, as it is not allowed to smoke at the premises.
Additional Office	15-20	
Meeting Room	20-25	
Conference Room	30-35	
2x Toilets	3	
2x Baths	3	
RECREATIONAL AMENITIES		
Fitness	-	Can not disturb the residents that are not part of it. Can be partly separated from the other quarters. Garage
Music Room / Recording Studio	50-60	
Woodwork and Machine Shop	150	
Outdoor All-Weather Track	-	

Room Program

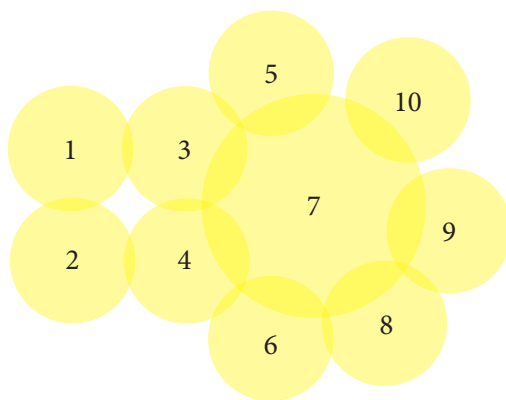
Workshop

There should be wall panels for storing tools, and possibly. dangerous tools must be stored in a locked cabinet. [12]

Materials such as boards and the like should not be placed directly on the floor , so it prevents cleaning.

Kitchen

In the kitchen there should be, a well ventilated room with sufficient shelf space for raw materials and delicatessen, with soil contaminated materials, as they should not be stored in the kitchen. [13]



Logistics Diagram

- 1) All-Weather Track
- 2) Fitness
- 3) Multiroom
- 4) Workshop
- 5) Recording Studio
- 6) Garage
- 7) Kitchen/Dinning Area
- 8) Storehouse
- 9) Sensory Room
- 10) Residence

Bodies Involved

Organization

Is made up of social workers in the ratio 0.5 / 1 - 0,8 / 1 with citizens, as well as external technical assistance dependent on citizens diagnostic / r. It is a residential institution that, on the basis of the abode's opportunity for offers, works with specific groups of impaired children / adults. Recently, the development of gathering several groups, have resulted in competition of economy, due to political considerations. [14]

Citizen

The definition of socially impaired children / adults is socially handicapped. Diagnoses under this category can be; minor neurological-related disorders, autism spectrum disorders, such as ADHD, Asperger's, OCD and autism, poorly gifted, social and emotional difficulties related disorder, neglect, with consequent impairment, lack of social skills and in some cases with outward reaction, undergone detoxification in need of support / treatment to be able to live socially in their own home / in the community, some who are unable to take care for themselves and who profit from pedagogy, judgment placed under Penal Code Chapter 9 § 74a juvenile or where the offender's probation partially / or constantly is subjected to supervision and needs to reside in a suitable institution. [15]



User Behaviour

Personnel Measures

The social worker operates under constant mental and physical pressure in shifts of 8-9 hours, in the case of on-call 24 hours. The staff are helping each other with discharging this built-up pressure. It takes place when the time is appropriate or in the last 15min of the guard, as there is no set breaks as it is traditionally understood. [16]

An Individuals Development

A new citizen is immediately presented to the environment at the institution without any preparation, except in necessary situations. In this case a field trip is arranged for the citizen to later gradually be presented for the environment at the institution. In addition to the social issues will also be cultural. The institution is the stage before psychiatric. [17]

In this context it is considered in some cultures as a "stamp" and the citizen becomes excluded in his society. Thus, there is a greater spread in the category socially handicapped. By age in the range 13-18 and 18-25 years citizens are split up. Further subdivision is done by gender. By composition of residents of multiple inappropriate categories, a second division is made.



Pedagogy Teaching

When working with socially disabled young people there are three mental stages. Marginalized refer to devaluation of the individual as redundant. Excluded refer to devaluation as not part of the society and normal values. Stigmatized refer to devaluation of the individuals own mind of fitting in the society. [18]

Zoning

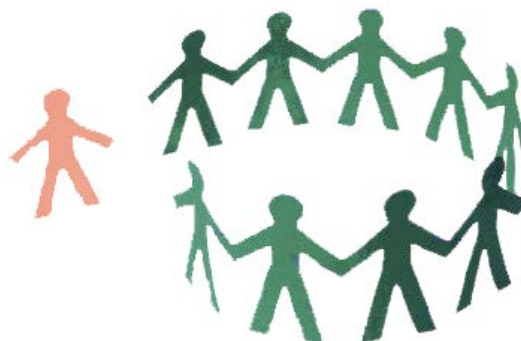
The physical environment is about more than just to accommodate physical disabilities but also psychological. In the matter of social anxiety, it acquires space; i.e. not to be compelled in confrontational situations. Social Psychology can be taken into account, when zoning, on the basis of the following categories [20]: privacy, ease of communication, control of space, disturbance.

“The Heart”

Activities create another social educational opportunity. Here work is done with “The Third” concept . At this stage, it is a free environment in which the activity of the citizen in educational cooperation creates a situation that motivate citizens to talk about themselves or that socially can bring respect, trust and identity for the socially handicapped. It is about creating positive experiences for individuals at elementary level, which can be the basis for the citizen to take care of themselves. The kitchen is considered to be essential in teaching methods. [21]

Inclusion

At Kellers Park Residence primarily marginalized is relevant, excluded secondary. Apart from traditional teaching, inclusion is about creating an environment and framework that bends the misconception of normal values. Not to be associated with integration that focuses on adapting the individual to a specific mindset of social rules and interaction. An example about a famous composer is used; he had trouble concentrating over a longer period of time during class, leading to disruption of the other pupils. Instead of giving him a punishment that would exclude him in the eyes of his classmates, the teacher allowed him to run off his energy and come back and finish. By doing so, the classmates included and widened the conception of normal values. [19]



III. 10

Focus

Flexibility in accommodation

Some diagnostics are commonly known of having predominance of boys, but it is never conclusive who needs the effort provided by the residence. Additionally the age ranging from 13-25 impose the quality of an adaptive environment. Not only needs it to consider gender and age, but also diagnostics. Each citizen is unique and usually has multiple diagnostics that interrelates.

Accommodation service fulltime

The citizens are sensible to transformation and needs stable and regular frames. It is essential that the rooms inherent qualities that fulfill the needs of the citizen throughout the entire stay, as interruptions of moving could cause a setback in their development. This includes the periods of process in the beginning where they are under strict observation with no authority and limitations of access until the end where they take care of themselves with only pedagogy assistance when asked for.

Example of Everyday Routine

Wakening	06:30
All citizens take shower before breakfast	
All citizens eat	07:30
Departure to School	08:15
Arrival from School	15:00
Silence	14:45 - 15:30
Gathering, gets handed their cell phones	15:30
Homework is done before handover (until)	16:00
Schedule of the day	
Preparing of dinner	17:00
All citizens eat	18:00
Gathering, schedule of the evening	19:00
Closure of the day, evaluation	21:00
Goodnight	22:30
Complete silence	23:00

III. 11

Award Criteria

40% Architectural Quality

To justify an outline proposal selection, emphasis is, for architectural quality, attention to the design and the interior supports user behavior through technical and organizational solutions. It should appear as a whole and contextually respect the distinctive nature of the site and the nearby settlement's modernist expression.

35% Social Synergies

Constructional, future standards and requirements, as a result of the development of society, could be regulated with limited financial and material terms of waste.

25% Environment

By demolition of the existing buildings, it is the intention to reconstruct biodiversity to create open recreational areas that motivate an active outdoor life.

References

Localplan 1043

As reference, the local plan provides knowledge of site analysis by describing the existing environment and its character, and property details with change of use, land location and the workshop's location within it.

Amendment NO. 05

In addition to the aforementioned the Annex is attached. This contains additional information of plot ratios and provisions for road, path and parking.

A Pre-Debate

This reinforces the story of why, over time, it has been forgotten due to lack of occupancy and thus lost identity and relevance.

Requirement Specifications

Demands

Building Regulations 2020

Thermal Comfort Classification 2 (Normal level of expectation for new buildings and renovations)

Indoor Air Quality Classification 2

Wishes

Environmental Product Declaration that follows ISO 21930/ISO 14025 about Construction Products

Cradle to Cradle Certified Products

ARCHITECTURAL QUALITY

Solution of Organized Space

Social Psychology

ASF

The diagnosis of autism spectrum disorder depends on three typical deviations known as “problems triad”; limited ability of mutual social interaction, limited ability of mutual communication, limitation of behavioral repertoire, play, imagination and interests. It is a pervasive developmental disorder that differs from mental retardation of being a deviant and uneven development rather than a slower and delayed development. [22]

Abilities of social interaction can be categorized in four groups [23]; the remote, the passive, the active but odd, the greatly formal and rigid. ASF is mostly represented by the third group. Characteristics of this group are a naïve, clumsy and odd approach in social interaction. They approve social contact but on their own distinct terms, that lack mutuality.

Additional problems related to / and inherent in ASF diagnostics can be perceptual disturbances. Often they do not react on general requests but can be highly sensitive towards other noises. Sensitivity of touch is frequently experienced as painful when light, and comfortable when powerful or more equally touched.

Strengths associated with ASF are photographic or significant strong memory, accuracy, punctuality, persistency, honesty and factual common knowledge in areas that interests them.

Asperger’s has better communicative abilities, although with a distinct way of thoughts. They are considered to be normally intelligent contrary to infantile autisms’ that are mildly mentally retarded. In terms of gender, guys are represented in ratios stretching from 1:2 to 1:10.

Infantil autism (ASF)	Tolerance
Privacy	1 2 (3) 4 5
Ease in communication	1 (2) 3 4 5
Control of space	1 2 (3) 4 5
Disturbance	(1) 2 3 4 5

Asperger (ASF)	Tolerance
Privacy	1 2 (3) 4 5
Ease in communication	1 2 3 (4) 5
Control of space	1 2 (3) 4 5
Disturbance	(1) 2 3 4 5

III. 12

Socio- Emotionelle Dificulties

Low self-esteem and great social difficulties are general descriptions of this category. It is not a comprehensive definition. Professor Jan Tønnesvang defines four general human basic components that need to be fulfilled in order to achieve a sense of identity; self-assertion and self-presentation, signification, cohesion, mastery and competence.

In the case of socio-emotional difficulties sensitivity of acceptance is significant. They become intolerant towards criticism and rejection and needs continuously stimuli. The reaction is a high level of energy and eager / or difficulty in concentrating that can lead to disruption of others and dominance. The need of cohesion obstructs the development of the three other general human basic components. Acceptance is inherent in cohesion and promotes a sense of belonging; shared thoughts of mind, mutual respect, stability and security.

Socio-emotionelle difficulties	Tolerance
Privacy	1 2 3 4 (5)
Ease in communication	1 2 3 4 (5)
Control of space	1 2 3 4 (5)
Disturbance	1 2 3 4 (5)

ADHD

Privacy	1 2 3 (4) 5
Ease in communication	1 2 3 4 (5)
Control of space	1 2 3 4 (5)
Disturbance	1 2 3 4 (5)

ADHD

With Attention Deficit Hyperactivity Disorder there is a distinction between children and adults. In the childhood it is the inattentiveness, learning and the ability to carry out an action that affects the given circumstances, which leads to either distraction by being overwhelmed of too many actions or restlessness, irritability and mental absence if too little. When adult it is about taking care of a home and fulfilling the tasks put forth by the role as a partner or parent [24]. Hyperactivity in the case of adults is reflected by internal discomfort and being unable to manage patience. Impulse disturbance is commonly known, although not always visible, and affects the power to stay calm in cases of just small annoyances. Research indicates that it might be a decreased ability to regulate feelings that is the key issue.

Diagnosticians of ADHD are often associated with creativity, inspiration, artistic and actors. Daily intensive exercise or hours in workshops that enables creativity is an important tool to make the remaining hours during the day more learning-minded.

III. 13

OCD

The obsessive compulsive disorder concerns mental images, impulses and rituals that are repeated to prevent a specific unwanted happening that is predicted to have negative consequences of pain to the patient or others. Subjects of OCD diagnostics is frequently contamination/chemicals, necessity of order/symmetry, cleaning and reassuring a given action by doing it over and over again. They are highly metacognitive, which means aware of their thoughts and behavior. [25]

As they conceive themselves “ill”, they force themselves to become preventive that is a matter of safety. One reaction is that thoughts are believed to be decisive of whom they are, resulting in a negative circle of thoughts “anxiety of anxiety”. It is a psychological disorder, not to be associated with mental illness, which ranges in a variety of degrees. Among diagnosticians there are no documentation on it affected one gender before the other.

OCD	Tolerance	Notes
Privacy	① 2 3 4 5	Difficulties in understanding others behaviour and intentions, as well as ordinary social contact. Most often they disapprove bodily contactA mild form of mentally retarded.
Ease in communication	1 ② 3 4 5	
Control of space	1 ② 3 4 5	
Disturbance	① 2 3 4 5	

Educational Support

Late developed young people and detoxified young needs educational support to overcome mental disorders such as e.g. anxiety and depression caused by childhood related or educational teachings that do not provide the necessary attention and focus that they require. Anxiety in company with others generally concerns social phobia. It is anxiety of making mistakes when surrounded by others. Often it is a combination of both anxiety and depression. Depression decreases the energy level, often followed by self-blame, guilt, psychical pain or nervousness.

Their behavioral level ranges from outward reacting to introvert. It acquires comfort and predictability for the young to establish an environment where they can feel safe in interacting and socialize with other people and they are highly dependent on an adult to supervise them in the elementary daily tasks.

Educational Support	Tolerance
Privacy	1 2 (3) 4 5
Ease in communication	1 2 (3) 4 5
Control of space	1 2 3 (4) 5
Disturbance	1 2 (3) 4 5

Judgement placed	
Privacy	1 (2) 3 4 5
Ease in communication	1 2 (3) 4 5
Control of space	1 2 (3) 4 5
Disturbance	1 (2) 3 4 5

Judgement Placed

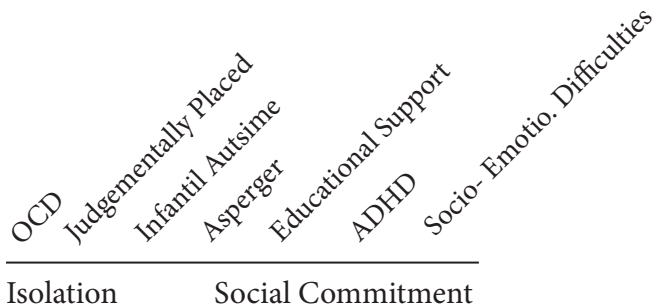
Top priority is to establish trust and confidence in the social worker. In the process there is a distinction between education and adaptation. When it is achieved motivation of social practice becomes easier. Those, which are included in this group, need to be reassured of their competencies through activities that explore practical and partly theoretical interests at the residence. The outward reacting behavior presents the need of isolation to some extent in the investigation phase.

Conclusion

Diagnostics seldom come alone and independent of other diagnostics. As in the case of ASF typically ADHD and / or OCD are related, which can lead to mental disorders as anxiety or depression. Identifying specific environments for each individual is not possible, as it depends on a multitude of diagnostics that vary from individual to individual.

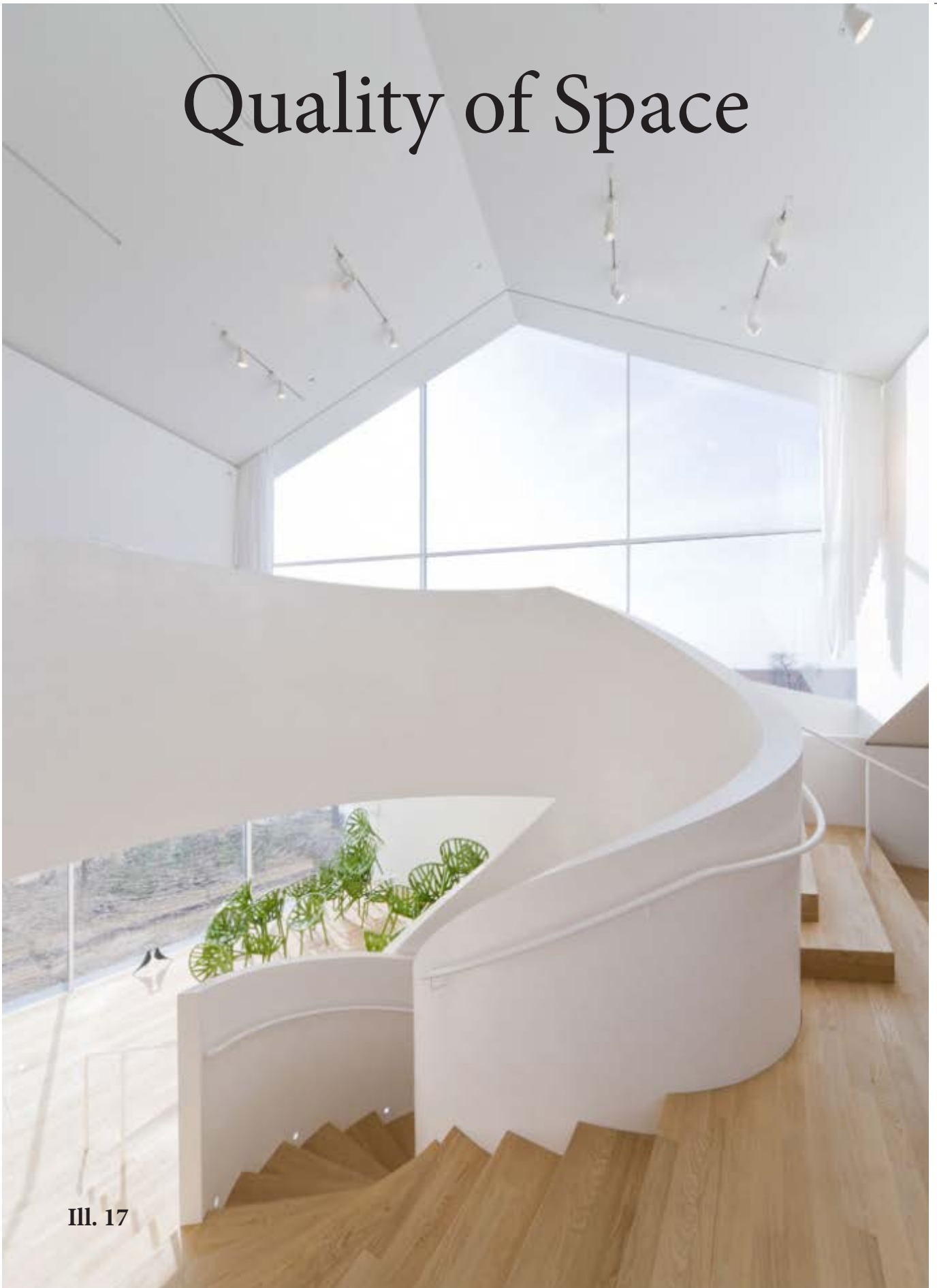
Although there are some basic needs that can be quantified such as clarity in the arrangement, stability of elementary needs regarding accommodation, and comfort in support and not being alone. Another aspect is the noise threshold that each group requires. Above shown diagram transforms the social psychology parameters into a graduate framework that expresses the need and ability for social practice. Based on these conditions, following design parameters are made:

- The residents' rooms shall poses qualities to accommodation related to all phases of the social practice period.
- At all times residents' must never visibility-wise feel alone.
- It must be possible to comprehend the organizational structure of the entire complex from all zones.
- Social relations of functions depend on above shown diagram.



Ill. 16

Quality of Space



Hub

It is a multisensory experience with acoustics of kitchen, TV room, pool table, outdoors and transit of users from one facility to another and scent of outdoors and cooking. It is a great open space that is always occupied and safe in terms of social workers presence.

Furnishing and arrangement are open, allowing communication throughout the entire space and control by the employees.

As heart of the built it needs overview of the spaces consisting. There needs to be a hierarchy for the citizens to identify areas of workshops, outdoors and private quarters. Citizens are highly reliable of symmetry and order in arrangement, not to be confused and disoriented. Colors are significant in emphasizing the flow of transit. Colors used are not intended to draw attention away from actions taking place.

The atmosphere of an open space shall be assisted construction-wise to merge the space with the outdoors, inevitably utilizing the color as contrast and link to the exterior space. The vast space will provide a setting opposite of the intimate common room. Still being a social space, it allows communication without getting close that often tends to be a concern in the first stages of the stay. The volume separates one with the feeling of dominance and becomes a space for everybody.

Common Room

It services as social space with limited supervision from social workers. Subdivided into genders, it enables for two distinct environments of play.

It is an interactive space that requires high wear resistance surfaces, and intimate scale to identify oneself with the action taking place. Furnishing is flexible in arrangement to accommodate the needed interplay.

It needs to be a welcoming environment encouraging social contact. Curiosity is to be achieved through a bufferzone, a space to observe the action taking place and sensing the environment without actually being a part of it. This bufferzone needs not to be a physical space, as it can be the merging of and interplay between the common room and another space.

Conclusion

Inspiration from the imaginary mental transition between walking area and space, described in common rooms, and the spatial design of a hub from which the entire building can be assessed motivate a different structure of the physical environment.

Ignoring the traditional concept of a walking area, inspiration is sought in how the rooms and corridors can be the negative volume of a fixed physical environment. Permanent physical spaces such as rooms, administrative units, larder, laundry room, utility, music, fitness, workshops and sensory room must design a space that can facilitate common rooms, hub and entrance with related wardrobe.

This design will also minimize conflicts related to social anxiety disorder that can occur in narrow aisles and passageways. Further blurring the definition of spaces and zones that create domains that can develop into users' dominance of certain areas.

Solution of Technical Space

Practical Issues - Construction

Building Materials

Inside construction materials should be robust to withstand children's and youth activities.

They should be able to maintain regularly and have intact surfaces of the predicted daily use, so there is no build up of harmful germs and dirt in cracks and scratches.

They should be able to be cleaned effectively without being damaged. [26]

Ceilings

The fibers of mineral wool slabs should be fixed so that contamination of indoor air is prevented.

Hanging ceilings are difficult to keep clean, and they are generally not robust enough for use in day-care centers for children and youth. They should therefore be avoided whenever possible. [27]

Walls

Surfaces should be so robust that they are suitable to withstand children's and young people's daily activities.

Wall surfaces should be washed to over-reach height, and should be vacuumed, so the accumulation of harmful germs and dirt in cracks and crevices avoided.

Unpainted hessian may lead to heavy accumulation of dust, while the painted hessian and glass fabric can be cleaned.

They must be effectively cleaned with wet cleaning methods.

When selecting a floor covering should the danger of slipping and of static electricity be sought avoided.

Instead of panels should floors if possible, be provided with coved lists or curved over the wall to facilitate cleaning . [28]

Floors

Flooring materials should not be able to deliver gases and vapors into the indoor air by (solar) heating .

There should only be used floor coverings of plastics, provided that it contains thermostable softeners.

Floor coverings should be seamless or welded joints garden . [29]

Doors

There should be no threshold in order to decrease risk and to make cleaning more efficient. [30]

Practical Issues - Inventory

Rugs

fungi and dust mites, and they may also give textile fibers in addition to chemicals from washing or cleaning of indoor air.

Practically all types of textile floor coverings can be greater or lesser extent lead to the generation of static electricity, most pronounced at low humidity. [31]

Inventory

Upholstered furniture and mattresses should be used only to a limited extent due regard to the dust emission and lack of cleaning. [32]

Kitchen

Furniture and equipment, including refrigerators and freezers should be installed to allow cleaning of the furniture as well as the surroundings are not compromised. [33]

Equipment that is not easily removable, (on wheels) or which can not be placed at least 20 cm from the floor and wall must be placed on a base with covered or sealed to the floor and wall. [34]

Bathrooms

Countertops must be of hard, smooth joint-free material, for example PVC, which is easy to keep clean effectively. [35]

Cleaning

The floors should be once secure and should not be cold, and they must have a clear case against the floor drain . They should end with groove or the like against walls.

A specific cleaning means a basic daily cleaning routine, drawing attention towards the main traffic junctions in the spread of infection ; doorknobs , faucets, sinks , railings, floors, walls in reach - height tables, mattresses, pillows and fabrics , " toy" , glassware, tableware and toilet bowls. [36]

Conclusion

Concerning the floors focus is on each zone. Common to all is the requirement of coves to facilitate cleaning . These regulations specify the choice of materials for bands / rolls or floors that can be cast out . The housing and common areas prefer cushioning and softer materials that correspond to the activity and the intimate nature. The hub which is also open kitchen is allowed a harder surface clinically . This surface should differ in terms of color from the other floors to mark a movement through the building , a hierarchy.

Textiles are not to be used to cover an entire room floor, but are allowed to be used in the form of decorative textiles in offices. Decorative in terms of meeting the general requirements for cleaning, so that it can be removed while the cleaning is done and the individual textile maintenance or changing are easy. In the sensory room attention is towards the experience. The floor is not part of the senses. The experience and atmosphere, light, in terms of color and activity in itself creates a contrast and hierarchy to the flow of material through the building . The floor needs strength associated with moving and changing room furniture .

The sound room is covered with a membrane absorbent floor / floating floor as needed. It should cause interruption between a bass and low frequencies, where the instrument is placed directly on the floor . Workshops require hard surfaces and association to work being done, to help bringing forth the spirit of the craft.

Organizational & Technical Regulatives

Restrictions

Smoking

At Kellers Park's Residence that also serves as a residence for the young, it can be decided that the young people are allowed to smoke outdoors on school premises.

It is not allowed for the employees and others to smoke at Kellers Park's Residence. Smoking ban to employees and others at these institutions apply to the entire premises, ie. also the areas in which it has been decided that smoking for young people to take place. [37]

Locking

On non-secure units in residential institutions for children and young people, including partially closed residential institutions, can, according to the Order § 4 pcs. 2, happen locking of departments at night and exceptionally short periods during the day. [38]

Privacy

Constitution § 72 protects letters and other papers, postal, telegraph and telephone privacy. Intervention in these secrets requires that there are specific powers here. Service Law § 123, paragraph 2 excludes children and young people staying at shelters and residential institutions. [39]

House Rules

This event may lawfully establish house rules, indicating that children and young people need to clean up their room and clean, help with practical tasks at the place, when children and young people must have visit and be home in the evening, and where and when they can use their cell phone.

House Rules cannot control who the child or young person is visited by whether the young to smoke or whether the child or young person must have his cell phone. [40]

Building Regulations

Acoustic

Building Regulations 9.4 Daycare: The living room in day care, there must be a reverberation whose average value in the frequency range 125-2000 Hz does not exceed 0.6 seconds. [41]

Terrain

Building Regulations 3.4.2 Workspace: The floor of the living room in day- and residential care and in normal classrooms in schools and the like must not be lower than the ground outside.

On special terrain conditions one may differ from this requirement if the floor is above ground level along with at least one window wall. [42]

WC

Building Regulations 3.4.1 General: If adapted lavatories intended to persons other than employees, at least one of these shall possible to be used by wheelchair users.

Adapted to public lavatories on several floors, must appear on each of these floors at least one toilet facility that can be used by wheelchair users. The requirement also applies to public lavatories in basements. [43]

U-Values

Exterior doors and hatches cannot have a U-value higher than $0.80 \text{ W / m}^2 \text{ K}$.

Exterior doors with glass shall have a U-value higher than $1.00 \text{ W / m}^2 \text{ K}$, or an energy boost through the door during the heating season in less than $0 \text{ kWh / m}^2 \text{ per . years}$.

Exterior walls cannot have a U-value higher than $0,09 \text{ W / m}^2 \text{ K}$.

Roof cannot have a U-value higher than $0,07 \text{ W / m}^2 \text{ K}$. [44]

Ventilation

Ventilation plants needs heat recovery with a dry temperature efficiency of at least 75 per cent .

Systems that supply one dwelling shall be provided with heat recovery with a dry efficiency of at least 85 per cent

Specific electricity consumption for ventilation must not exceed $1,500 \text{ J / m}$.

For facilities serving only one dwelling , the limit shall be 800 J / m^3 . [45]

Conclusion

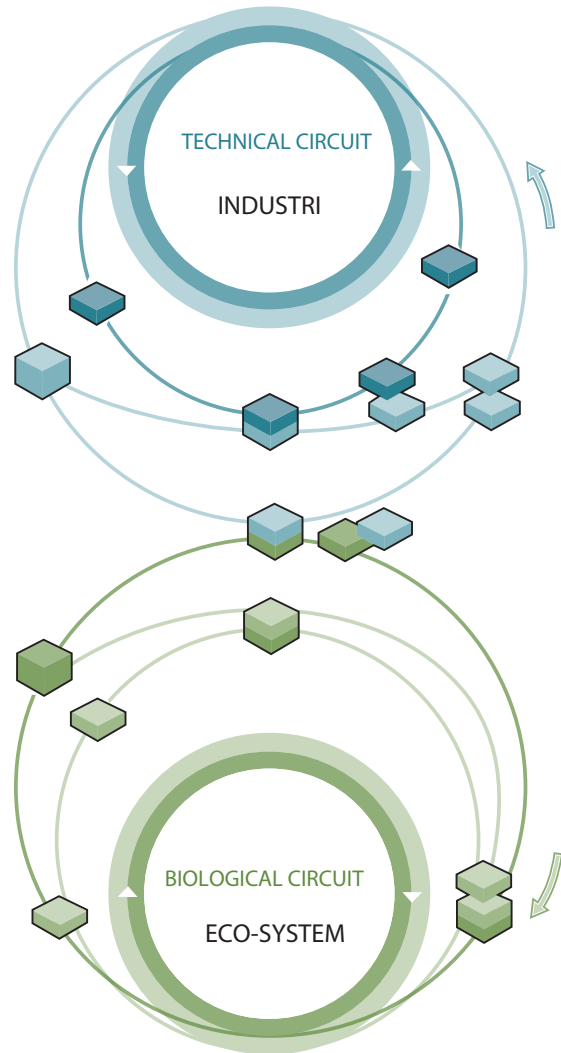
The design must take into account a ban for young people about smoking on the land register. The action must also be taken of the area as a residential area where several young people who openly stands and smoking can create a creepy atmosphere and cause a rift between the residents of the neighborhood. It is a neighborhood where children are part of everyday life and activities that can have a negative impact on their behaviour are to be kept away. As a design criterion, attention is drawn to the secondary road at the back of the land register, which is used as a bike path. By smoking on this path, young people will be out of sight. The design must also take into account the readily available access, traffic and distance for young people and social workers to this path.

SOCIAL SYNERGY

Design for Disassembly

In favor of flexibility of future needs in the built, an example of cradle to cradle's practice of healthy materials by design for disassembly is implemented. The essence of it is through a closed lifecycle of the material, either biologically or technically, to transform the constructed to be a materials bank for future generations. This approach will equally ease the process of renovation, alteration or extension to enable future needs of use and utilization.

Deconstruction, reuse and recycle becomes guiding of how to extend the lives of materials, save resources, and limit associated impacts of new material production after their useful life in a current application. Matters to be aware of is: specify recyclable materials, challenges of deconstruction, design for disassembly principles, components and materials for DFD, cost of using reclaimed materials. [46]



III. 18

Brick Masonry

Materials given on site in substantial quantities are brick masonry from the existing buildings 1, 3 and 4. Priority of use is considered in terms of structural integrity and properties. Other materials should support and / or cover the desires of construction not met by the brick masonry.

The intention of flexibility to ease renovation, alteration and extensions suggest brick masonry, deconstruction-wise more permanent and time consuming, to wrap around the inner flexible spatial configuration. Its weatherproof properties make it interesting as an outer leaf in building a facing wall. The mortar used in early 20th century was lime mortar, which is easier to dissolve and thereby the appropriate choice of mortar in future deconstruction.

Concrete Slab

Precast concrete elements are highly permanent, reducing the usability to slabs. Its powerful thermal mass has a positive impact on accumulation of heat and reduction of temperature variation between night and day. It would enable hidden installations not accessible to users, an even distribution of heat and reduction of step sounds. The assembly of it is by casting inevitably decreasing the use to basement slabs that are highly likely to be permanent throughout the buildings lifetime.

- Minimize environmental impacts from cement mortar
- Considerations when using salvaged brick
 - o Traces of mortar compromise the bond with new mortar
 - o Highly variable durability, strength and absorption characteristics
 - o Size and uniformity may be more variable
 - o Salvaged brick have more worn or rugged appearance

Concrete:

- As composite material only reusable in precast elements
- Use concrete efficiently by high performance concrete
- Reduce use of cement by substitution
- Need early-age compressive strength in formwork

Untreated Wood

For use untreated wood can be used indoor, where the dimensions permit. In larger spans glulam is recommended. As it is considered more likely that untreated wood is composted or used for energy production for more, than a laminated wood's component reuse complete, untreated wood is chosen. Besides each building's unique design, the assembly of the elements lead to impacts on its structural integrity. Glulam is also considered to be a material that fullfils some very specific design solutions.

Wood & wood products:

- Engineered wood is more efficiently used than traditional lumber
 - o Is a composite material

Steel

Steel is an excellent alternative to larger spans where glulam else was intended. Steels superior strength as compared to construction wood and glue-laminated timber makes it interesting in the choice of building construction , where freedom is needed in the internal spatial organization. Steel is a more costly alternative , but can be re-used like construction timber , in this case by melting and thus form part of a second member in the future with new specific dimensions.

Metals:

- o Embodied energy is substantially higher
- o They can be sized to specific structural needs
- Unnecessary waste can be created if not dimensioned with standards
- Wood scraps can be recycled or composted if not pressure treated or contain glues
- Untreated wood can't be reclaimed and reused whole
- Ranges of appearance and quality lumber are specified for appropriate application
- Prefer interior applications to avoid toxic protection techniques
- High energy consumption
- Pre- and post-consumer scrap can substantially reduce energy use

Conclusion

The characteristic strengths of the various materials create a hierarchy in the design construction . 1) The existing and additional foundation will be concrete with closed underfloor heating which ensure an even distribution . 2) Bricks from the site reused in the new construction as outer leaf in a skalmurs construction. This in order to reduce the load of producing new brick . Brick also provides a different rustic surface that aesthetic can maintain a reference to the Kellers Park as it was formerly a part of. 3) To allow a larger negative volume flow , referred to in the quality of the room , which used steel supporting structure. 4) Wood is used as floor slabs and interior cladding, which provide some warm colors , texture and experiential umålbare qualities of its interaction with the solar and softer nature . Material Use of priority is hereby generally and lifetimes (permanent , long- term , medium) , structural strength and resistance to weather.

For the future aspects provides a skalmur-skonstruktion opportunity in the future to optimize the outer wall properties for new standards without changing the interior spaciousness . The steel frame and wood floor tires allow flexibility for the redevelopment and siding can be replaced as needed if other materials are interesting .



ENVIRONMENT -Motivation of outdoor lifestyle

Domains of Movement

Access

Body movement plays an important role in the construction of real competence in action and identity development. The social and spatial structure in the child's life space is exercising its interaction, body and movement experiences. There is a short way from resorting to grasp things. Bodily experience is key for the acquisition of motor, social and intellectual skills. [47]

Gender

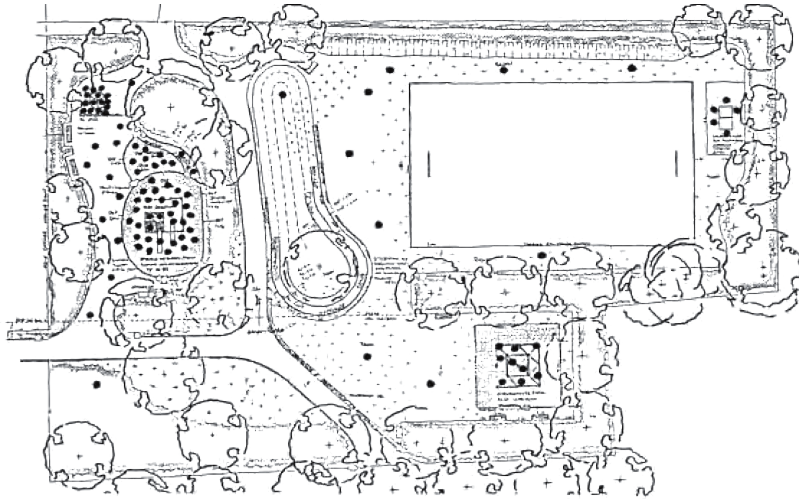
Through a study, results showed the way girls and boys experienced and explored their surroundings differently. The boys in their dominant outing was more expansive and competitive in their games while girls were more interested in interaction and thus considered their environment as a medium. The two different ways to experience space on was often the subject of conflict, where the girls were pushed aside by the more dominant boys unless supervision was present. Likewise, formed a picture of how and where genders selected to settle down. The girls often sought the more intimate space that was foreclosed and came rarely beyond there. Contrary, the boys were confident to experience all areas, but most took advantage at the open areas with the possibility of high intensity.

Kitchen Garden

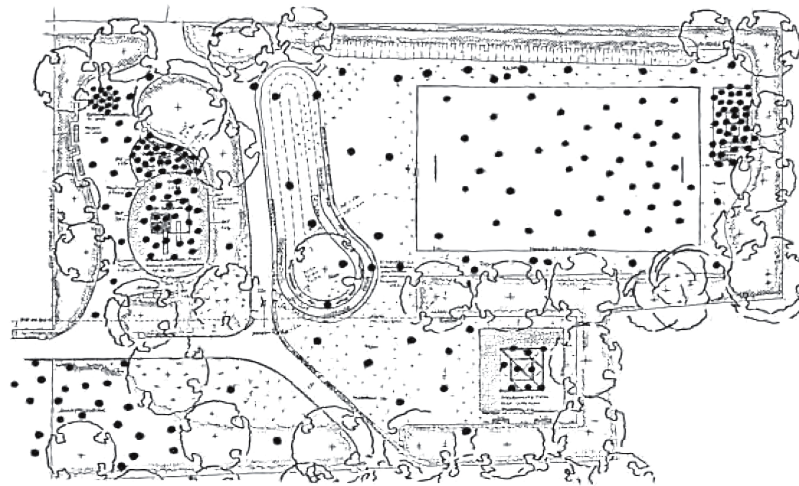
In addition to outdoor experiences and building residents' skills in cooking established a vegetable garden. The kitchen garden may also be part of the physical frame as the more intimate outdoor area. It combines several elements that give rise to greater attention to the maintenance of the garden when it is part of the residents' necessities of daily life. It can create a historical association with Keller Institution who in his time was even further.

Conclusion

To meet exploration results, outdoor areas in close contact with the administration must be performed with a more intimate character which comply with the requirements for interaction with nature as a framework.



III. 20



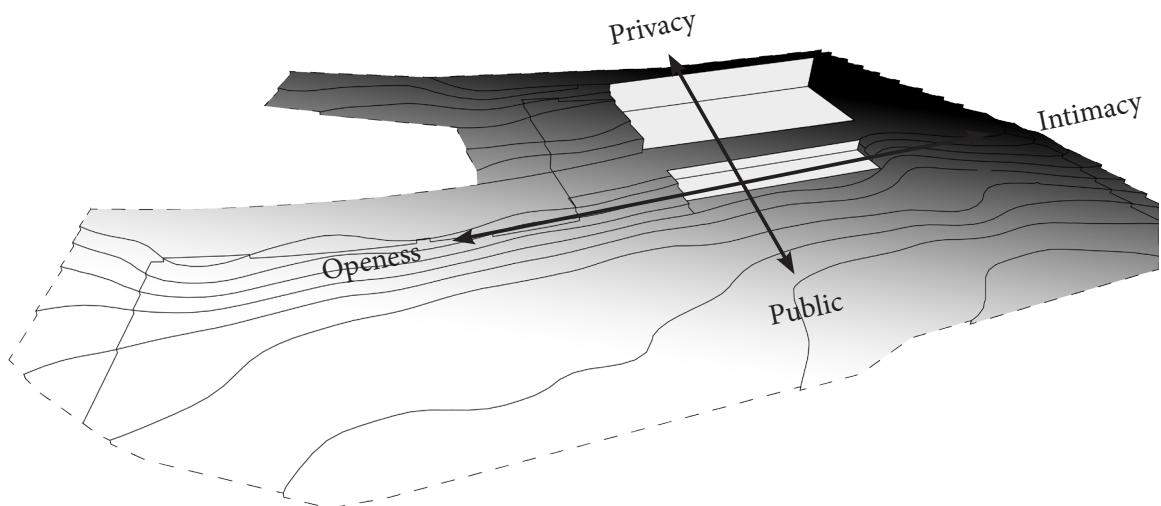
III. 21

CONCEPT

Urban Concept

The urban concept is inspired by the Kellers Park, now used as wellness, where the building upon arrival will be staged in the landscape. The design is back on the land register and leaves the air and nature. This space is essential for both the building and its surroundings. In building its volume is reduced in the interaction with the hilly terrain and the neighbors regarded the surrounding open space more welcoming, which can create the proper respect for privacy between the parties.

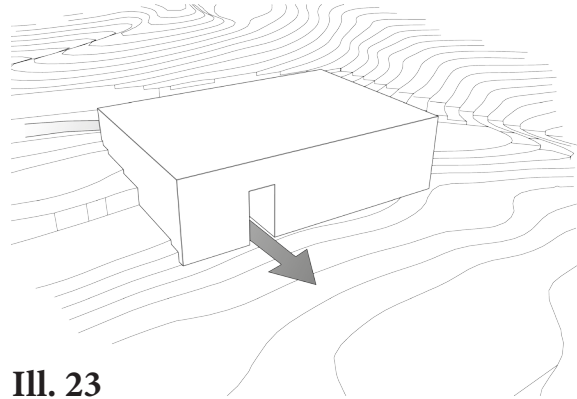
For residents, the large exposed area no limitations on activities and regarded less as an enclosed space for “special people”. Final surrounded the building at the western end of the room for more intimate scale. These spaces create a front yard of the building and attached to girls’ way to socialize themselves.



Building Concept

Access

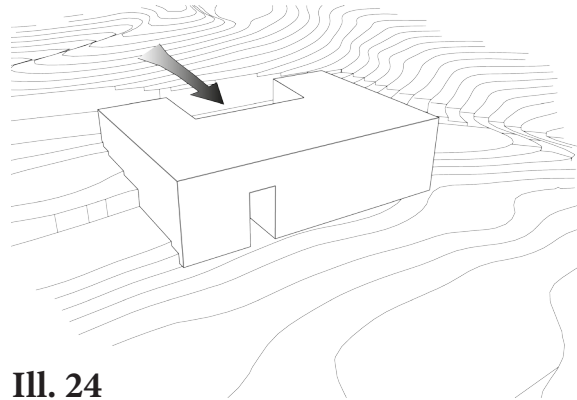
The hilly terrain is linked together by the building logistics. It is important to have access from multiple levels. It creates a relationship between the residents and the area. Further it creates hierarchy in the utilization of the building as each access has its own experience.



III. 23

Sun

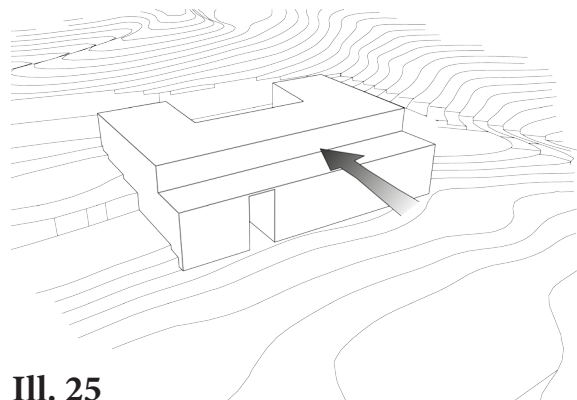
The surface to volume ratio is clearly in the north side's favor. To restore the balance it is opened up in the central core. Core of the building, the hub, is placed in this space.



III. 24

View

To the north there are views to the sea. The hilly terrain sloping down towards the sea creates a great visibility, with great pleasure that can be observed by the residents in a relaxing zone.



III. 25

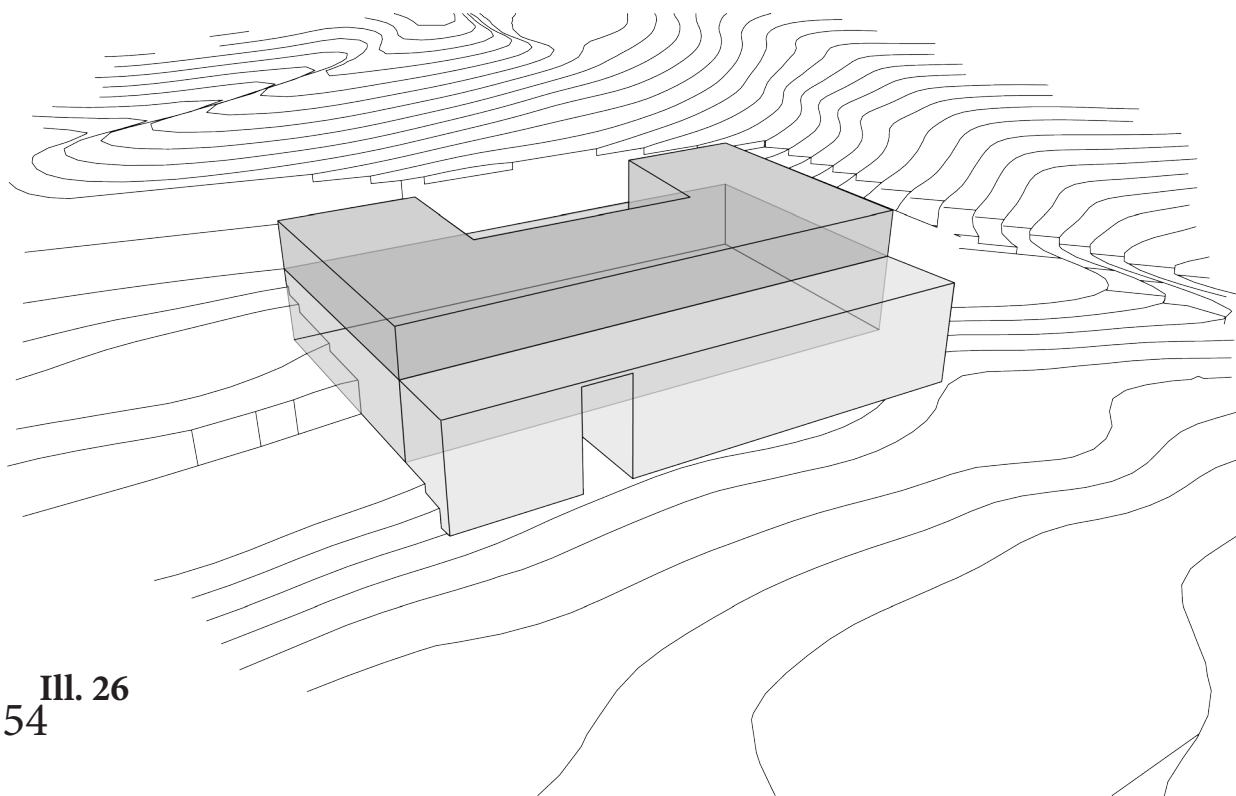
Building Complex

Vertical hierarchy

The hilly terrain, residents easy access to smoking in a distant area, public transport located in the same level and access to a large forest area is ideal for a private area reserved for residents. Since it is also an existing bike path it is an obvious choice. Residents are distanced vertically, creating privacy.

In the level below which the access point does not turn to the secondary cycle track or the highway, place one institution zone. Here, residents can engage with staff and residents in a safe environment.

level with the main road, which also serve as guest hall, educational facilities are located. It is a more public area that caters to the neighbors.

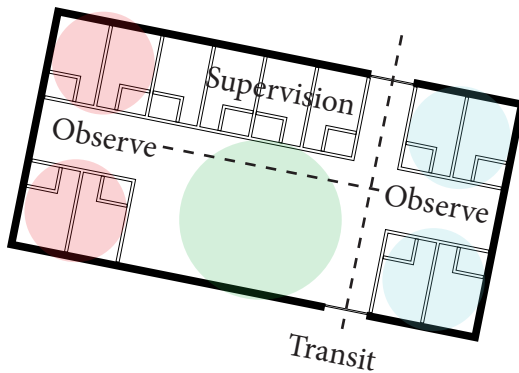


DESIGN PROCESS

Organization of Accommodation

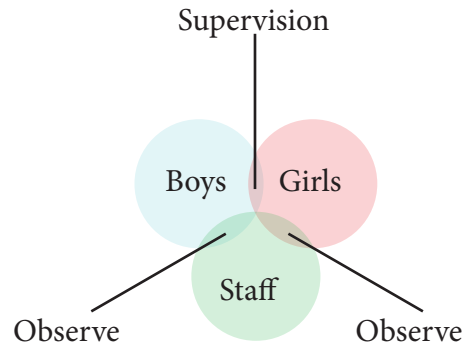
Through the study of social psychology diagrams was performed with different diagnoses of isolation and socially engaged. At the same time meeting the requirement in the arrangement of fulltime service through all phases so that movement was not a subject.

The distance between the flow and the room was a parameter for the formation of the rooms. The mere presence of the staff provided the feeling of security and privacy.



III. 27

Separated by transit in favor of girls are done as boys are more accommodating and extroverted in their activities. Personnel monitoring allows for flexibility in the housing of its citizens. At the same time it does not deprive residents of these rooms to participate in the common rooms as they are not physically isolated. Besides the social psychological aspect, these rooms are used by both sexes. This is made possible by giving each room its own shower and toilet.

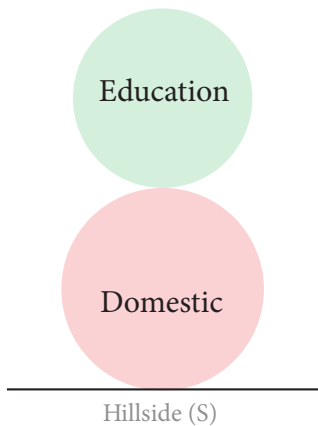


III. 28

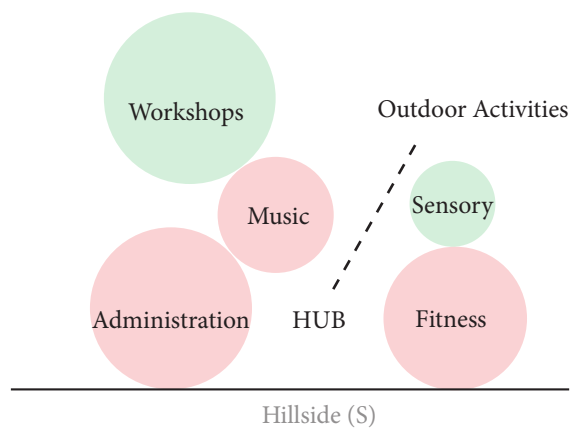
Organization of Heart

Hierarchy is made in the room program by differentiating between residential oriented facilities and educational. With reference to the section on quality of space, the hub is arranged as the gap between the residential premises at which the household / domestic atmosphere becomes more apparent.

The focus is on a clear logistic where access to outdoor activities are short and concentrated in a zone. This is also convenient to the hallway and recommendation of footwear and outerwear.



III. 29

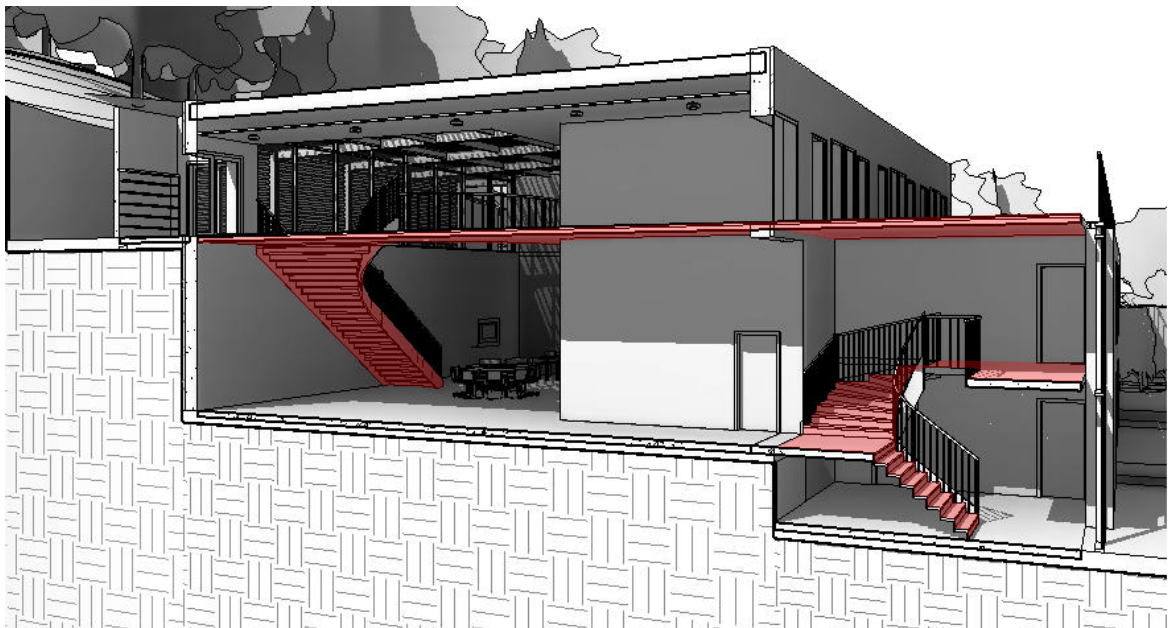


III. 30

Hierarchy, Flow & Axiality

The institution is snarre a private home than a public institution. This medium flow also influenced by. The split between the occupant's claim and staff / guest title. The residents' zone are angularly turned away from the guest hall. This creates a break in access and residents can move freely in the bedroom and one of the other residents in public spaces without visitors a greater role in the everyday.

Vertically distinguishes also between public zone and residential zone where the public zone has easy access to educational facilities.



Perspective Section - East

Quality of Light & Windows

Room (N) - August

24 hour average 23,4 °C

Temp. variation 2,1 °C

Max. temperature 24,4 °C

Hub - August

24 hour average 23,9 °C

Temp. variation 3,3 °C

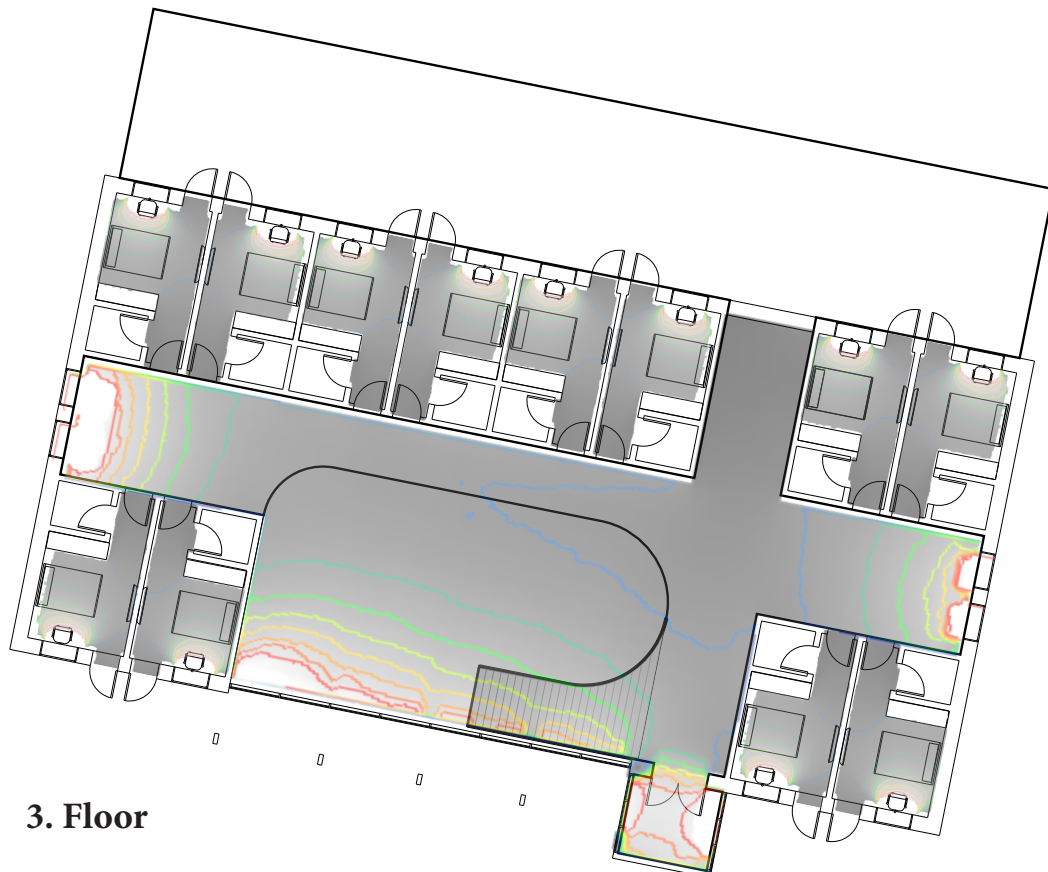
Max. temperature 25,6 °C

Room (S) - August

24 hour average 23,5 °C

Temp. variation 2,1 °C

Max. temperature 24,7 °C



3. Floor

Ill. 32

CONCLUSION

In the design of the atrium the amount of windows permitted played an important role. In order to utilize as much roof as possible, skylights with solar cells as shading by lamellas, the amount of windows towards north was limited. The optimization led to a total cover of needed solar cells as lamellas. Integration of renewable technologies was achieved. Simultaneously it became the structural choice of material for the entire internal built up.

The layout of the rooms was interesting. The restrictions of each room having at least 2 exits challenge the design of the terrace. In order not to have a separate structure as terrace the other volumes was creatively organized to support an integration of terrace as part of the existing volume. The rooms themselves with cavities as shelves and built in work station in the window also contributed to some variations of windows to the rooms during the design. It became an minimalist inspired design due to the safety regulatives.

The floor at the privat level with cork bands, treated with an oil based wax was key in avoiding a sterile environment. The task of accumulating enough heat during day force the atrium floor to become polished concrete. The acoustics made it necessary to cover the entire ceiling and walls with acoustical panels. The acoustical panels of white plasterboards with a surface capable of cleaning, in addition to the coved floor created an environment with little detailing. The contours and colors of the cork bands emphasized the concept of a easily interpreted logistic.

PRESENTATION

Arrival

Upon arrival at the Kellers Park Residence, the residents are greeted by a warm light that shines out through the solar cells, which act as lamellas in foreclosure of the atrium. The arrival expresses an open and welcoming lighting and by setting of the bike at the entrance, one enters and becomes part of the atrium. From here you have a full overview of who is present and what activities are going on. The building's full volume is not felt at this level. The building ranges in a single storey height and the meeting itself is very moderate.



Atrium - 1. Floor

The atrium is experienced as a different kind of open environment than what you experience from the outside. The large skylight with lamellas that forecloses gives the impression of a covered terrace. The large volume provides space for transit and communications. Down here, the environment is predominantly white, broken only by objects such as sofas and other furniture. In this way, the focus is on what activities that unfold. Toward the wall is an open kitchen.



Common Room - 4. Floor

From the common room, it is possible to keep up with today's time in the atrium. It is further to be considered a cozy corner rather than an actual room. The physical setting gives the impression of a loft or a volume carved into a solid. It provides a natural sense of safety to sit up in the zone, while you can hear activity in the kitchen when approaching dinnertime. At the same time if you were a part of the social unfolding down in the atrium and the common room. The fluid border between logistics and space make it a welcoming meeting and appeals to be curious about what is unfolding.



Arrival - Guests

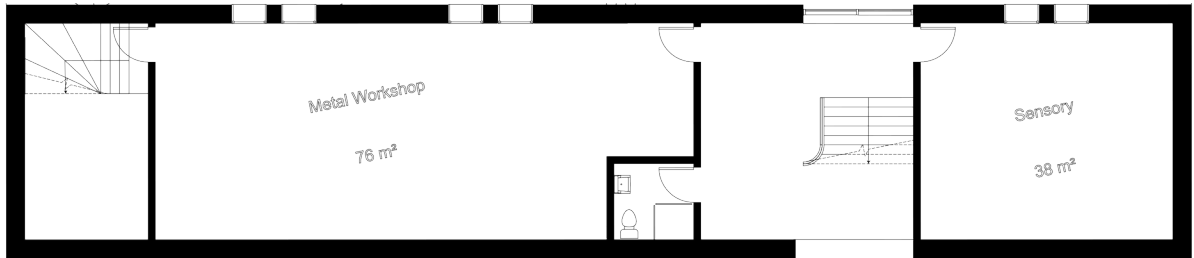
For outsiders the meeting with Kellers Park Residence appear calm. The shape itself does not attract attention and nuances of the water-washed facing wall with brick exterior gives it a soft impression. It seems easy to find your way into the building where you are met by a wider opening on two floors. Without actually having been inside one can see how the stairs inside continues on into a larger volume .

The building is set back on the land register , which makes it comfortable to consider the building's location in the countryside at a distance and follow how the terrain surrounds the building. The terraces on the side moves in the same slope as the terrain down to the parking lot. From the road you can feel the more intimate character among the planting and flower beds located on the periphery of the terrace. To the east of the building is a large grassy area with a multi-lane where young people can get rid of excess energy and be social .

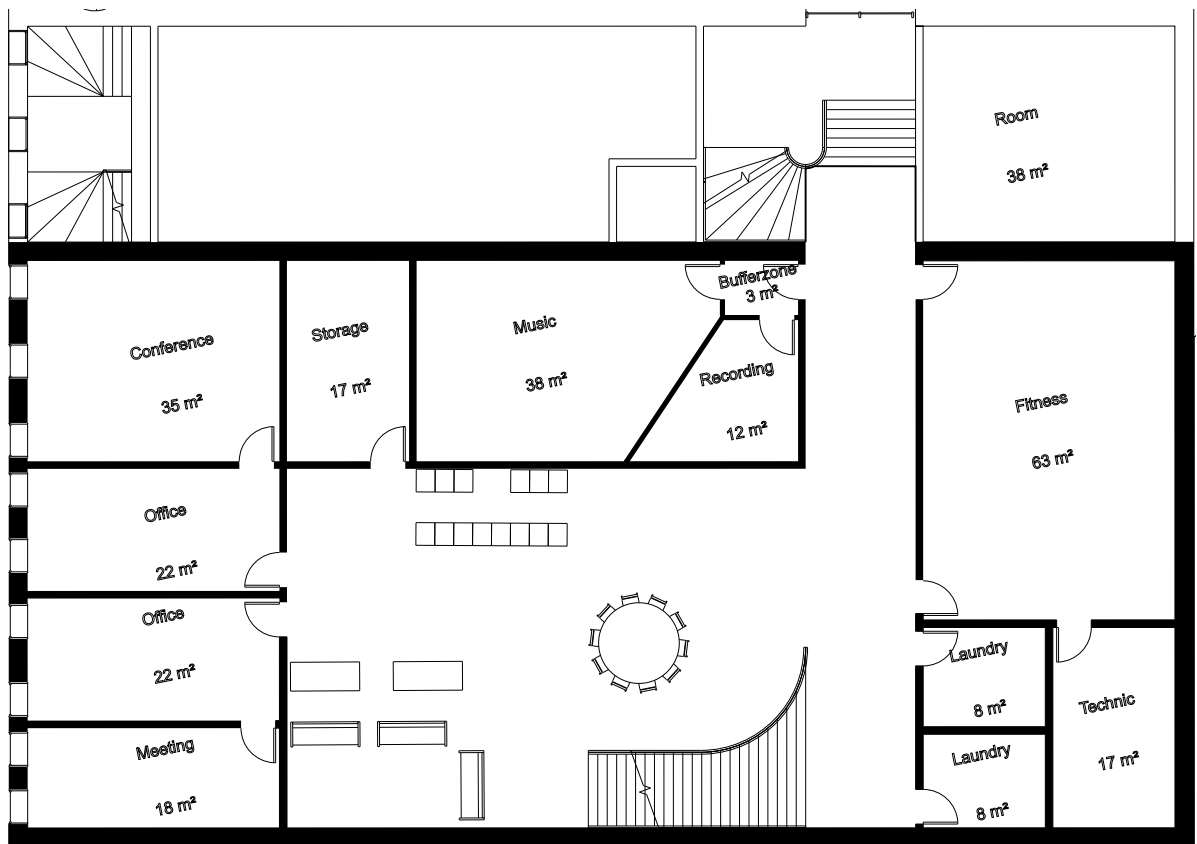
The only road between the outdoor areas in this level and building activity provides entrance , broken down into several rooms with activities . You sense how constant movement associated with the building and its surrounding stimulating challenges in the landscape.



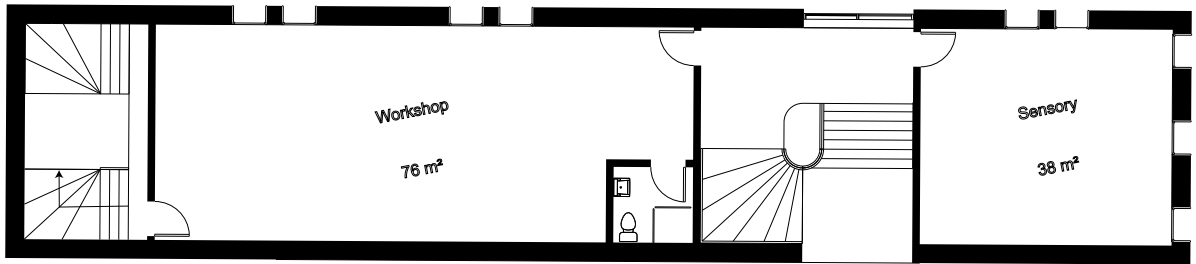
Ill. 36



III. 37 Ground Floor

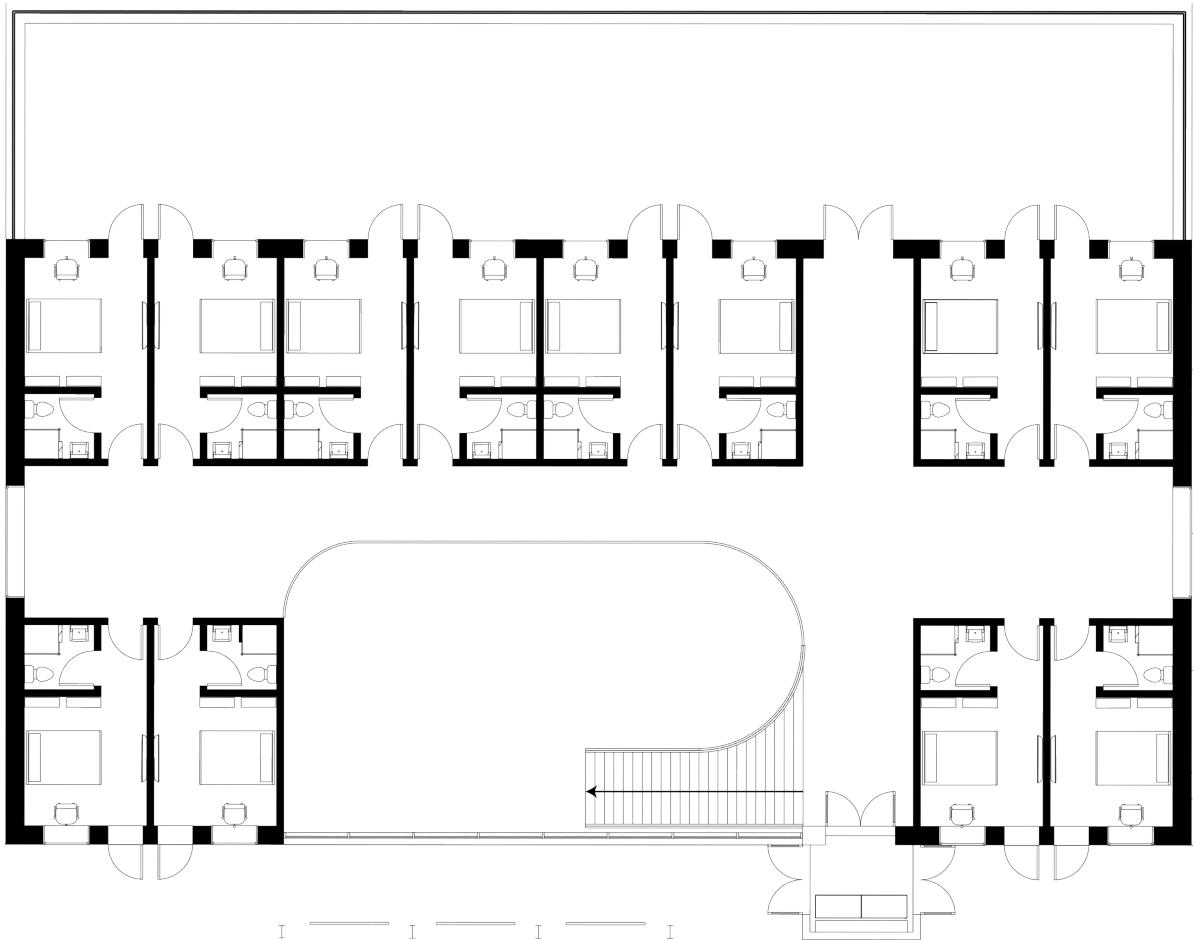


III. 38 1. Floor



Ill. 39

2. Floor



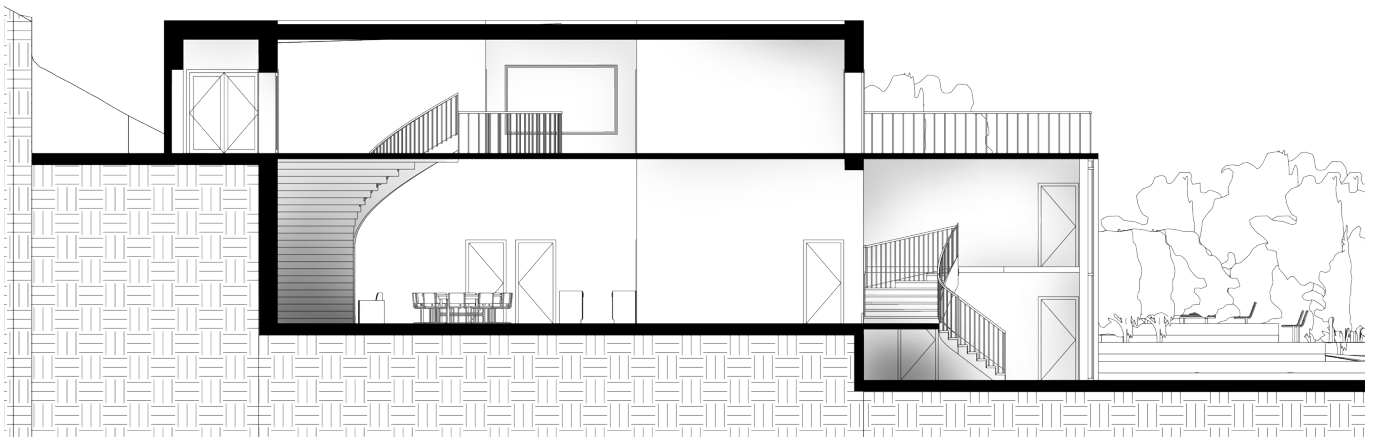
Ill. 40

3. Floor



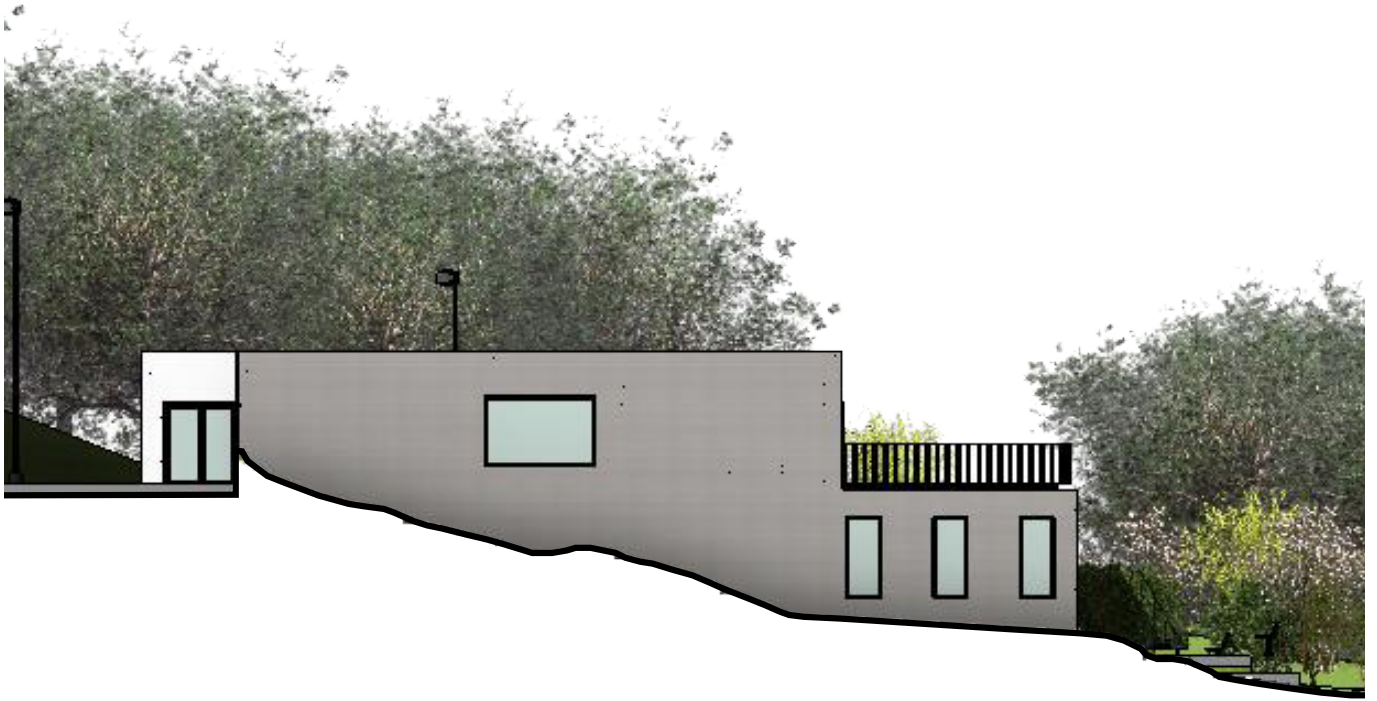
Ill. 41

Elevation - West



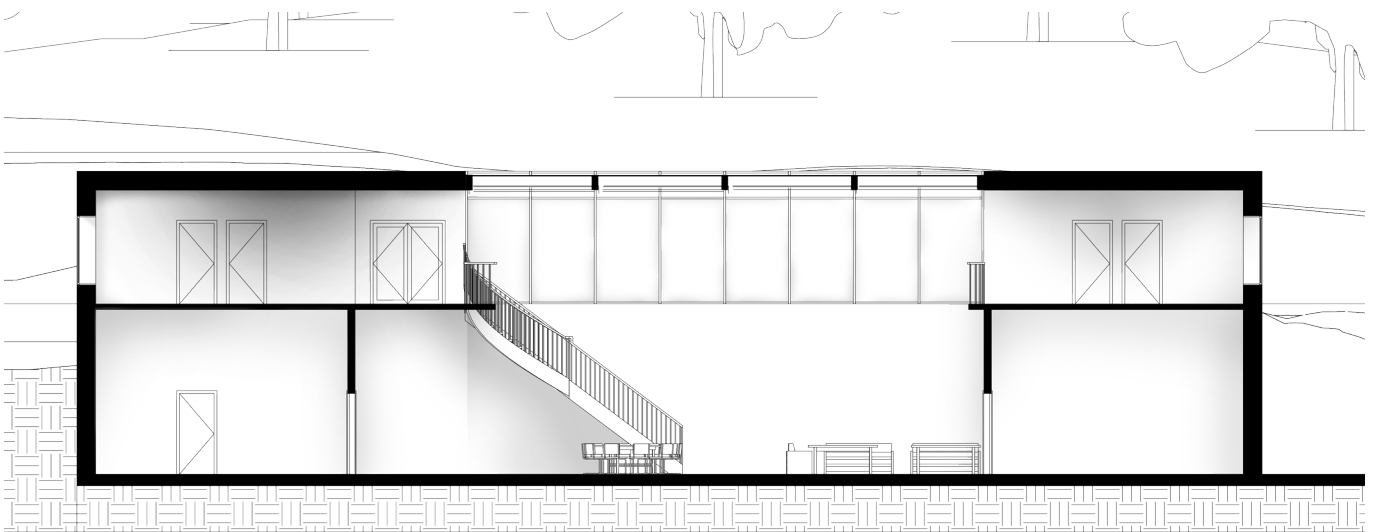
Ill. 42

Section - South-North - 1:200



Ill. 43

Elevation - East



Ill. 44

Section - East-West - 1:200



Ill. 45

Elevation - North



Elevation - South

Ill. 46

CONCLUSION

The design allows through a freedom of movement within and outside that residents can move and interact confidently knowing that it is constantly supervised. Monitoring is possible at distance because the of Hub, which is a key part of the educational environment, can grasp all zones of privacy, without physically presence of staff. The flexible organization of the rooms allows variation of the residents put together. Thus, designed for the future municipal demands on a more differentiated user-group. The area's nature is utilized as part of the logistics of the design. The private sector has a close relationship to nature on arrival and unobstructed view of the ocean from the rooms and the attached terrace.

Technically, additions and remodeling in the future are possible in order to meet the new standards or functions. Wall preserve the inner space. With a focus on materials have been used weatherproof materials as outermost element of the building envelope as the protection of the internal structure. There is a distinction between the materials' duration for replacement and assembling them. Joints without the use of welding, gluing or casting, with the exception of the foundation and ground slab.

REFLECTION

An understanding of the nature of the project has been predominantly regulative. Many descriptions have specific details of how an institution shall be operated. It has been a special experience with the many inputs from the course , which in spite of their professional background , has the same challenging approach to the subject. Parts of the project documentation was done on the basis of these discussions in the classroom , after which the literature has been difficult to follow up .

In addition, each municipality have their own distinct guidelines for the use of materials. The very specific situations have been challenging, but has been solved. Technically speaking, there has been a major influence on how it was possible to create an exciting environment that did not seem locked. The challenge has been faced with a parameter as the terrain, with a large north-facing facade that did not contribute to storage of heat, which then had to be included in other ways. The construction of the glass roof of the atrium has been challenging in terms of material selection. The end result is however fine, adding contrast to the pure white surfaces and directs attention upward , where one get an exciting experience through the small views of the forest above.

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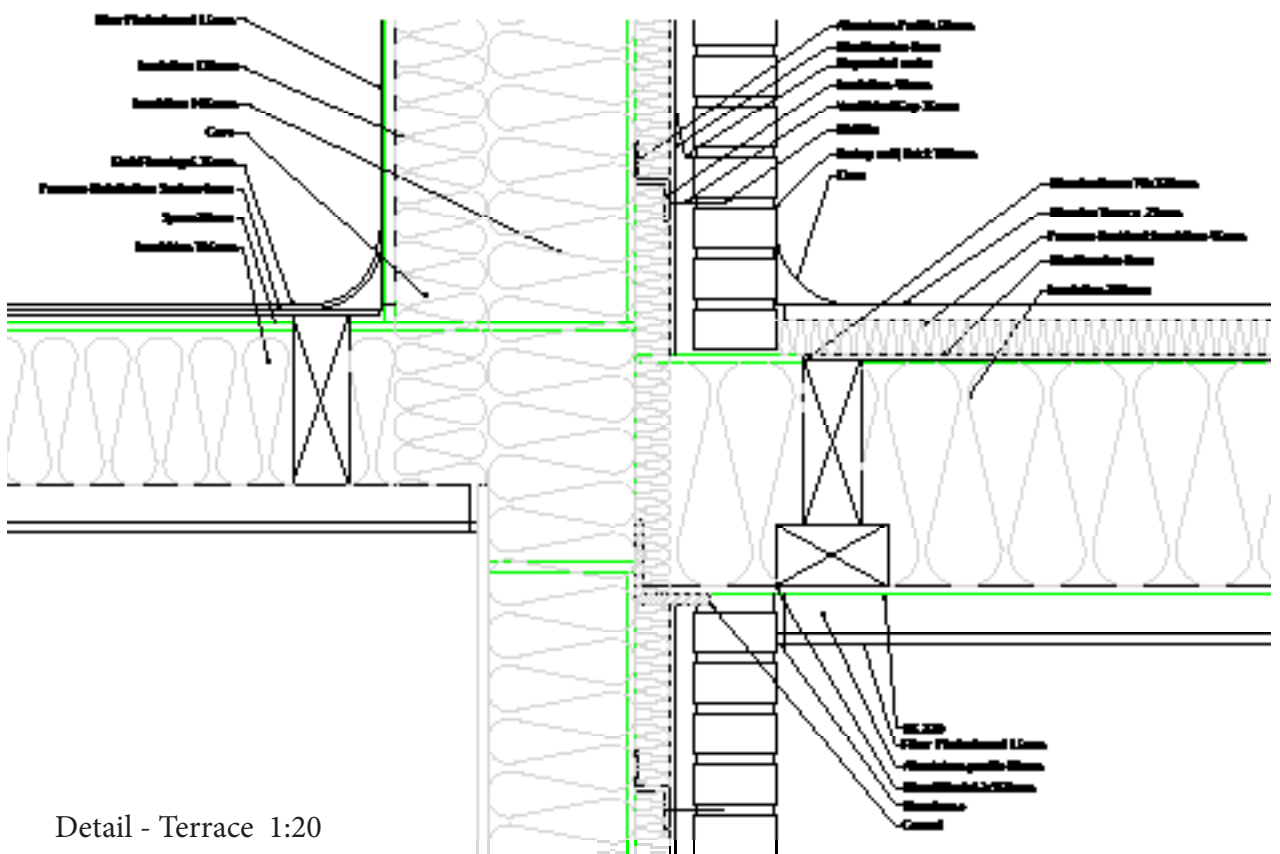
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Illustrations

- Ill. 1 -Vejle Kommune (2012) Lokalplan nr. 1043
- Ill. 2 -http://www.comwellkellerspark.dk/om_hotellet/bygningernes_historie/
- Ill. 3 -Own picture
- Ill. 4 -Vejle Kommune (2012) Lokalplan nr. 1043
- Ill. 5-8 -Own
- Ill. 9 -http://www.aktivweekend.dk/wp-content/uploads/aw_header_2.jpg
- Ill. 10 -<http://www.tonybates.ca/wp-content/uploads/social-inclusion.jpg>
- Ill. 11 -<http://www.opholdsstedet-sletten.dk/botraeningen/dagligdag>
- Ill. 12-16 -Own diagram
- Ill. 17 -http://www.yatzer.com/assets/Article/2139/images/VitraHaus-Architecture-Herzog-and-de-Meuron-2010-Photo-by-Iwan-Baan-yatzer_4.jpg
- Ill. 18 -Danish+Building+Manual.pdf
- Ill. 19 -<http://wallpapersus.com/wp-content/uploads/2012/11/Woods-Green-Grassland-Plant.jpg>
- Ill. 20-21 -Roessler, K.K.(2003) Arkitekturpsykologi
- Ill. 22-32 -Own diagrams
- Ill. 33-36 -Own renderings
- Ill. 37-46 -Own diagrams

APPENDIX

Construction Detail



Detail - Terrace 1:20

Be10 - BR2020

Nøgletal, kWh/m² år

Energiramme BR 2010

Uden tillæg	Tillæg for særlige betingelser	Samlet energiramme
54,3	0,0	54,3
Samlet energibehov		25,9

Energiramme Lavenergibyggeri 2015

Uden tillæg	Tillæg for særlige betingelser	Samlet energiramme
31,1	0,0	31,1
Samlet energibehov		23,3

Energiramme Byggeri 2020

Uden tillæg	Tillæg for særlige betingelser	Samlet energiramme
20,0	0,0	20,0
Samlet energibehov		17,1

Bidrag til energibehovet

Varme	12,8
El til bygningsdrift	5,2
Overtemp. i rum	0,0

Netto behov

Rumopvarmning	12,5
Varmt brugsvand	0,0
Køling	0,0

Udvalgte elbehov

Belysning	0,0
Opvarmning af rum	0,0
Opvarmning af vbv	0,0
Varmepumpe	0,0
Ventilatorer	5,2
Pumper	0,0
Køling	0,0
Totalt elforbrug	50,9

Varmetab fra installationer

Rumopvarmning	0,0
Varmt brugsvand	0,0

Ydelse fra særlige kilder

Solvarme	0,0
Varmepumpe	0,0
Solceller	0,0
Vindmøller	0,0

Be10 - Zero Energy

Nøgletal, kWh/m ² år			
Energiramme BR 2010			
Uden tillæg	Tillæg for særlige betingelser	Samlet energiramme	
54,3	0,0	54,3	
Samlet energibehov		-6,4	
Energiramme Lavenergibyggeri 2015			
Uden tillæg	Tillæg for særlige betingelser	Samlet energiramme	
31,1	0,0	31,1	
Samlet energibehov		-8,9	
Energiramme Byggeri 2020			
Uden tillæg	Tillæg for særlige betingelser	Samlet energiramme	
20,0	0,0	20,0	
Samlet energibehov		-6,1	
Bidrag til energibehovet		Netto behov	
Varme	12,8	Rumopvarmning	12,5
El til bygningsdrift	5,2	Varmt brugsvand	0,0
Overtemp. i rum	0,0	Køling	0,0
Udvalgte elbehov		Varmetab fra installationer	
Belysning	0,0	Rumopvarmning	0,0
Opvarmning af rum	0,0	Varmt brugsvand	0,0
Opvarmning af vbv	0,0	Ydelse fra særlige kilder	
Varmepumpe	0,0	Solvarme	0,0
Ventilatorer	5,2	Varmepumpe	0,0
Pumper	0,0	Solceller	12,9
Køling	0,0	Vindmøller	0,0
Totalt elforbrug	50,9		

Solar Cells

Total site:

	Size	Pers	Pieces	Be10 result
Kellers Park Residence	928	18	1	19,9

Type	Area [m2]	Efficienc	Sys factor	Angle (0 vandret 90 lodret)	Angle (0 syd -vest +øst)
Monokrystalline syd atrium	160	15	0,75	0	0

Total site square meters		3000	Density (h		31%
Total heated squaremeters	EI (use) - Own estimations	EI (use) [kWh el/(Year Apt)]	[kWh el/(Year electricity/yea Apt)]	19915	
928	9655	16848	10260	19915	
928				19915	kWh/year to be generated by solar cell
Peak	Angle(Lodret)	Angle(øst/Vest)	Solar radiance	Yearly gain	Yearly gain (pct)
24	30	0	1152	20736	104%
			Σ	20736	104%

Reverberation Time

Resource Consumption	Reyerberation Times	Acoustic Response
125Hz:	413.365	0.72
250Hz:	630.203	0.55
500Hz:	688.994	0.47
1kHz:	628.480	0.43
2kHz:	558.993	0.47
4kHz:	551.510	0.56
8kHz:	308.419	0.66
		0.52
		0.53
		0.68
		1.10
		0.56

Detailing of Beams

Loads

Wooden beams: C18 - 75x225

PERMANENT (g - own load)

Glass	2,5kg/1mm/m ² x 2m	= 0,4kN/m
Photovoltaic	11,85kg/m ² x 2m	= 0,24kN/m
Wood beam	8,4kg/m	= 0,084kN/m
Total		= 0,724kN/m

VARIABLE (q - snow load)

Snow	0,72*1,5 x2m	= 2,16kN/m
Total	g+q	= 2,884 kN/m

AG

Load combination 1.0 according to EC1

Uinst.g	= $(5 \cdot 0,724 \cdot 3430^4) / (384 \cdot 9000 \cdot (1/12) \cdot 75 \cdot 225)$	= 2,03mm
Uinst.q	= $(5 \cdot 2,16 \cdot 3430^4) / (384 \cdot 9000 \cdot (1/12) \cdot 75 \cdot 225)$	= 6,08mm
Umax.g	= 2,03 x (1+1,0 x 0,6)	= 2,44mm
Umax.g	= 6,08 x (1+0,3 x 0,6)	= 7,17mm
Umax.total		= 9,61mm
Maximum allowed deflection	3430mm/300	= 11,4mm OK

BG

Md (P)	$(1 \times 0,724 \text{kN/m} \times 3,43^2) / 8$	= 1,06 kNm
Md (V)	$(1 \times 2,16 \text{kN/m} \times 3,43^2) / 8$	= 3,18 kNm
Tens. (P)	$1,06 \times 10^6 / (1/6) \times 75 \times 225^2$	= 1,68MPa
Tens. (V)	$3,18 \times 10^6 / (1/6) \times 75 \times 225^2$	= 5,03MPa
Calculated strength (P)	18 x 0,667	= 12MPa OK
Calculated strength (V) 1	18 x 0,444	= 8MPa OK

Detailing of Beams

Loads

Steel beam: IPE 330

PERMANENTE (g - own load)

$$\text{Roof} \quad 0,724 \times 3,43\text{m} / 2\text{m} \quad = 1,24\text{kN/m}$$

$$\text{Steel beam - (T.S. tabel 6.6)} \quad = 0,49\text{kN/m}$$

$$\text{Total} \quad = 1,73\text{kN/m}$$

VARIABLE (q - snow load)

$$\text{Snow} \quad 2,16 \times 3,43\text{m} / 2\text{m} \quad = 3,7\text{kN/m}$$

$$\text{Total} \quad \text{g+q} \quad = 5,43 \text{ kN/m}$$

AG

Load combination 1.0 according to EC1

$$U_{\text{inst.g}} = (5 \times 1,73 \times 9500^4) / (384 \times 117,7 \times 10^6 \times 0,21 \times 10^6) = 7,42\text{mm}$$

$$U_{\text{inst.q}} = (5 \times 3,7 \times 9500^4) / (384 \times 117,7 \times 10^6 \times 0,21 \times 10^6) = 15,88\text{mm}$$

$$U_{\text{max.g}} = 10,00 \times (1 + 1,0 \times 0,6) \quad = 11,88\text{mm}$$

$$U_{\text{max.g}} = 13,05 \times (1 + 0,3 \times 0,6) \quad = 18,73\text{mm}$$

$$U_{\text{max.total}} \quad = 30,61\text{mm}$$

$$\text{Maximum allowed deflection } 9500\text{mm}/300 \quad = 31,67\text{mm OK}$$

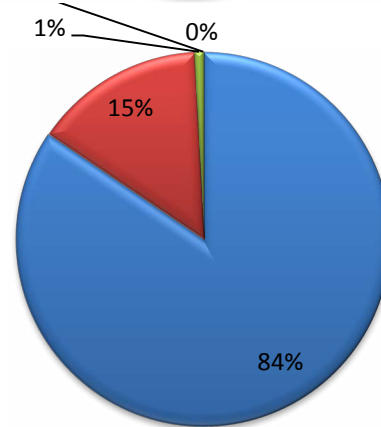
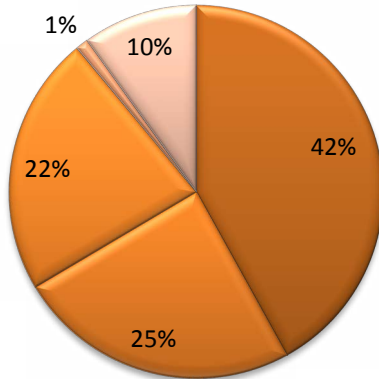
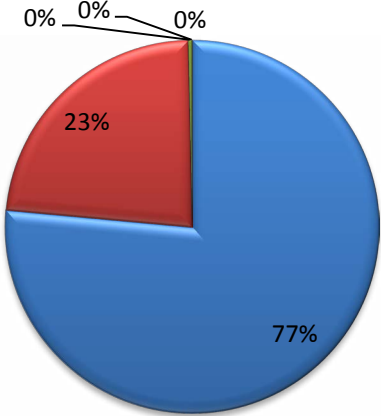
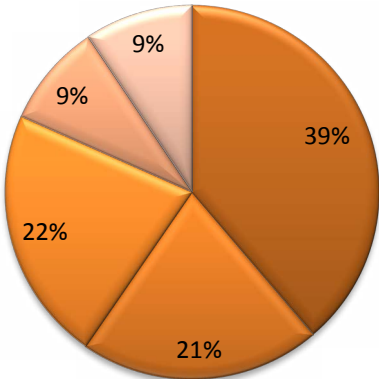
BG

$$M_d \quad (1 \times 5,43\text{kN/m} \times 9,5^2) / 8 \quad = 61,26 \text{ kNm}$$

$$\text{Tens.} \quad 61,26 \times 10^6 / 713\text{mm}^3 \times 10^3 \quad = 85,92\text{MPa}$$

$$\text{Calculated strength} \quad 235 / 1,1 \quad = 213,63\text{MPa OK}$$

Comfort Analysis



- KatA [23,5-25,5]
- KatB [23-23,5]&[25,5-26]
- KatC [22-23]&[26-27]
- Above KatC [27+]
- Under KatC [22-]

- KatA [21-23]
- KatB [20-21]&[23-24]
- KatC [19-20]&[24-25]
- Above KatC [25+]
- Under KatC [19-]

