



# EQUAL EQUINE

- A New Equestrian Center in Mölndal





**CHALMERS**

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## 01. Introduction

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# 01. introduction.

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## 01. *Introduction*

# abstract.

**“ Horses are wild animals  
and were never meant for captivity.  
Equestrian facilities are often designed from a  
human perspective and not the animal’s. ”**

The relationship between horses and humans has for thousands of years been one of the most significant bonds between a human and an animal. Ever since the domestication of the horse, it has played a major part in the development of our societies. As transport, for hunting, in war, in agriculture as well as in sport and leisure.

However, the relationship is not on equal terms. Horses are wild animals and were never meant for captivity. Stables and other equestrian facilities where horses are being kept, are often designed from a human perspective and less from what the animal needs. Captivity in cramped isolated spaces causes great stress in horses, which in the long run will lead to poor health and diseases. In order for horses to be mentally and physically healthy, it is crucial that they can exhibit the same behaviours as they would in the wild.

This master thesis takes a post humanistic stance to architecture and explore how we can design equestrian buildings and facilities to adapt to the natural behavioural patterns of horses while at the same time meeting the needs of the human users. It raises the questions of how humans and animals can live side by side without one being favoured over the other, creating a mutually beneficial relationship.

The design task is to design Askim Fältrittklubb's (AFRK) new riding school facilities in Balltorp in Mölndal. Threatened by heavy expansion of housing in the municipality of Göteborg, the riding school, which is located in the northern part of Askim today, has decided that it is time to move their school and also to expand, going from 20 big horses today to 60-80 horses of all sizes in the new facilities.

## 01. Introduction

# student background.

### Education

2018 - 2020  
Chalmers University of Technology  
Master's Program in Architecture

Studios:  
Architecture and Urban Space Design

Future visions for healthcare, housing  
and work 2: Housing inventions

Future visions for healthcare, housing  
and work 3: Healthcare architecture

2016 - 2017  
Tokyo Institute of Technology  
Exchange semester  
Lab: Koichi Yasuda

2013 - 2016  
Chalmers University of Technology  
Bachelor's Program in Architecture

### Work

2017 - 2018  
FOJAB, Malmö  
Supervisor: Mats Molén

Projects:  
Grand Hotel, Lund  
New Verandas and Ventilation Floor

Borelund Equestrian Center, Lund  
Private Center for Dressage Horses,  
New Stable, Renovated and Extended  
Arena and Refurbishment of the Old  
Stable to Housing

MCR Equestrian Center, Malmö  
New Riding School in Jägersro,  
Ordered by Malmö Stad for Malmö  
Civila Ryttarförening

2012 - 2016  
Zoom Arkitekter, Lund  
Summer Internships

## 01. Introduction

# background.

**“ A new type of horse-keeping is on its rise,  
the loose housing, where horses  
can move around freely,  
with access to food, water and shelter.”**

Equestrian sport is one of the biggest sports in Sweden with more than 500 000 practitioners. As it engages so many people, both as a workplace and as a hobby, equestrian facilities are of great importance. However, it is often a forgotten field of architecture. There are many both interesting and complicated challenges within equestrian architecture; the inefficient and conservative practices of working methods, the aging riding school facility stock, the usage of hippotherapy and the implications that have on the architecture, the riding school as a social arena and lastly, the area which interests me the most, horse welfare and the relationship between humans and animals within architecture. The horse-keeping today is based on human needs and has military roots. In recent years researchers and horse-

owners have become increasingly aware of the importance of animal welfare within equestrian sport and leisure. A new type of horse-keeping is on its rise, the loose housing. In this system horses can move around freely in a paddock, with access to food, water and shelter. It has been shown to improve both the physical and psychological health of horses. However, the loose housing system is not optimal for riding schools. Safety is one big issue, both for humans but also for horses, as well as manure management in the paddocks, which can be very time consuming if the paddocks are not designed properly. With this thesis I explore ways of which humans and horses can live together without one triumphing greatly over the other. I look at how human needs can meet the needs of horses and the hybrid which that creates.

## 01. Introduction

### aim.

The aim of this thesis is to design an equestrian center which balances the needs of the school and the needs of the horses, in a way where all parties can live side by side, mutually benefitting from each other's company. The idea is thereby to create a completely new type of flexible hybrid equestrian center. The aim is also to investigate what

horse welfare means in terms of spatial and architectural qualities as well as how architecture can help to spread knowledge about horses and inspire to a connection between humans, animals and nature. Lastly, this thesis aims to explore how the school can be optimized and more efficient for the staff and to improve their working conditions.

### method.

This thesis is divided into two main parts; one concerning the theoretical background of the topic, and one concerning the application of the theory into practise, resulting in a design proposal. The theoretical part is conducted through literature reviews, participation in seminars and lectures, contact with experts (researchers, architects,

riding school staff), study trips, case studies and personal reflections on the material. The practical part includes site visits and site analysis, volume studies, working with models to translate the needs of horses into spatial elements, discussion with the riding school and input from tutors and experts.

### delimitations.

This thesis does not seek out to question the norm of keeping animals locked up, but rather seek to improve the conditions of the animals we already have, and how humans can relate to them.

The main focus is on animal welfare in relationship to humans, which means that other aspects such as hippotherapy or the school as a social arena for young people, will not be discussed.

## research questions.

**How can an equestrian center, in a peri-urban Swedish context, be designed to enable horses to perform their natural behaviors while still meeting the needs of the users?**

*How can equestrian architecture be designed to maximize the health, safety and needs of both horses, staff, students and visitors?*

*How can the new center relate to the surrounding and the cultural landscape of the Swedish countryside and become an asset instead of a liability?*

01. *Introduction*

# askims fältrittklubb.

Askims Fältrittklubb, AFRK, was founded in 1962 and run their organisation together with Askims Ridhus in the northern parts of Askim, close to Göteborg. The school is a part of Svenska Ridsportsförbundet. Today the school has approximately 300

members between the ages of 13 and above, and owns 20 big horses and a few member horses. Every week the school gives 28 lessons to students of various levels and ages, resulting in about 350-400 rides in total per week.

## visions.

- To provide lessons and activities for members of all ages and all levels.
- To create awareness among the members to increase engagement in the works of the organisation.
- To work to maintain the possibilities to provide varied and stimulating experiences for the riders and the horses in the nearby nature, terrain and surroundings.

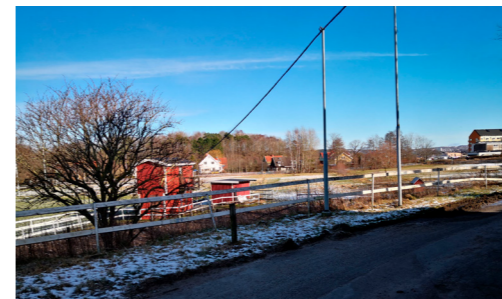
## facilities.

- Club house including café
- Riding track around the facilities
- Nature riding track
- Horse jumping track
- Terrain track
- Spectator stands
- Horse riding arena
- Outdoor riding arena
- Stables
- Paddocks

## current situation.

Due to the strong urbanisation in Sweden the pressure to develop new housing is high for urban municipalities. Gothenburg is no exception. One of the many areas which has seen many such projects pop up in recent years is Askim, where Askims Ridhus is located. Over the last few years the expansion has increased so much that the school has become more or less surrounded by new housing and thereby cut off from the forest and nature they once used to ride in. Another difficult thing for the school is a change in legislation which came into place year 2010. The new legislation states that horses are not permitted to stay

in tie-stalls for more than 16 hours per day. Moreover, the government is currently working on updating the legislation into a full on ban of tie-stalls. For a riding school, where the tie-stall has been the norm for smaller horses, this means that the tie-stalls needs to be replaced with the larger box-stalls, resulting in a need for expansion of the stable. Due to this change Askims Ridhus has not been able to provide pony riding for its members the last few years. These two are the main reasons why the riding school is looking across the border to Mölndal, to construct a new bigger and more sustainable school.



## 02. theory.

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**“In order to understand the horse,  
we dive into animal and  
horse welfare  
and horse ethology. ”**

The aim of the first part is to provide the theoretical background of the topic. In order to understand the horse, we dive into animal and horse welfare as well as horse ethology. The theory is based

of the free-ranging horse, knowledge which is important to understand in order to comprehend horse welfare and how the living environment can affect the wellbeing of horses.



02. Theory

# animal welfare.

**“ Animal welfare, or animal rights, focuses on the well-being and the moral and legal entitlements of nonhuman animals. ”**

The concept of animal welfare, or animal rights, focuses on the well-being and the moral and legal entitlements of nonhuman animals. This an old concept in western philosophy which have debated the place of animals in human ethics since the time of ancient Greece. Today the view on animal welfare can generally be divided into three broad objectives which have all given rise to different scientific approaches (Fraser, 2009).

The first view focus on the physical health and functioning of animals. Animal welfare in this case is defined by the absences of disease, injury, mortality and reproductive success as well as the access to food, water and shelter. In order to improve the welfare researchers would try to find the cause of the diseases or injuries and correct the environment. The drawback is that scientists could be inclined to keep the animals in sterile individual cages to isolate them from disease which instead lead to mental health problems (McGlone, 1993).

The second view focus on reducing undesirable affective states such as fear, pain and stress and enhancing positive affective states like pleasure. By measuring the animal’s response (for example the cortisol levels or how long a chicken remains in tonic immobility) one can assess the effectiveness of procedure. The third and last of the philosophical views on animal welfare is returning to the animals’ natural state to allow them to perform the same behaviours as they would in the wild. The environment should mimic the natural habitat of the species and the animal’s natural ways should be respected. (Fraser, o.a., 1997)

In many cases all three approaches lead to the same conclusions, it is just a matter of different philosophical views. However, focusing on just one of the three objectives might result in poor welfare. To truly attain good animal welfare, one must achieve a balance between the different perspectives.

# criteria for horse welfare.

**Good feeding**

1. Absence of prolonged hunger
2. Absence of prolonged thirst

**Good housing**

3. Comfort around resting
4. Thermal comfort
5. Ease of movement

(Viksten, 2016)

**Good health**

6. Absence of injuries
7. Absence of disease
8. Absence of discomfort caused by use

**Appropriate behaviour**

9. Expression of social behaviour
10. Expression of other behaviours
11. Good human-animal relationship
12. Positive emotional state

# animal - human relationship.

Horses and humans have a special bond. While it is hard to pinpoint exactly when the connection began, there are 15000 years old cave paintings, from France and Spain, showing evidence of the earliest use of horses by humans. The domestication process however is said to have not started until around 4600 BCE (Waran, 2007). Ever since then, the horse has served many important roles in our societies. First as a source of food and then later as mount and for transport, for hunting, for warfare and in agriculture. After the industrialization of the western world many of the earlier jobs of the horse were taken over by machines. This has led to horses today mainly being used for sport, recreation and as companions,

but also increasingly being used in healthcare and rehabilitation therapy (Busby & Rutland, 2019).

The human-animal bond is defined as a mutually positive and dynamic relationship between the two species, including emotional, physical and psychological interactions. The human-horse relationship is not different. Over time humans and horses have developed a way of communication which enables cross-species interactions that relies on non-verbal signals of physical and emotional connections (Scopa, o.a., 2019). Visual and tactile communication is especially important, and it has been suggested that human attitude affects horse behaviour. (Hama, Yogo, & Matsuyama, 1996)

02. Theory

# natural behaviours.

“ In the wild the horse is exhibiting a range of behaviours which have evolved through evolution over millions of years.”

In the wild the horse is exhibiting a range of behaviours which have evolved through evolution over millions of years. Despite the domestication of the horse about 15000 years ago and the physical changes that have taken place since then, the behavioural patterns of the horse have not changed much (Christensen, Zharkikh,

Ladewig, & Yasinetskaya, 2002). Most of these behaviours are related to survival and include feed seeking, resting, social behaviours, grooming, movement and explorative behaviours (Karlsson, 2017). An extensive list of horse behaviours are presented in *table 1* on page 18.

## resting behaviour.

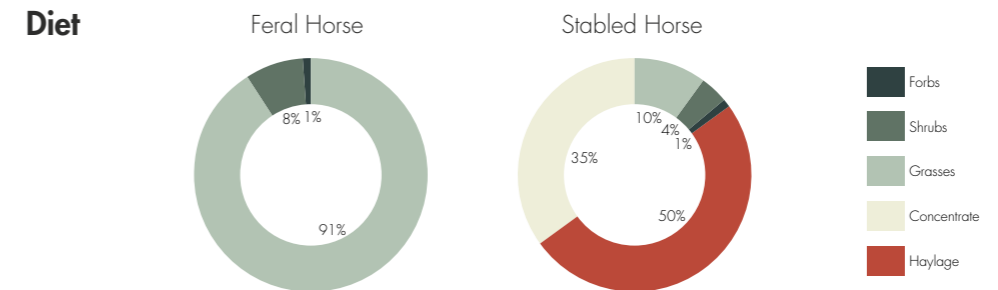
Sleeping and resting restore energy and is crucial to establish proper horse welfare (Fraser, 2010). Horses are crepuscular and polyphasic creatures, usually sleeping or drowsing between 3-5 hours for short periods of time during a day. (Busby & Rutland, 2019) The length can vary depending on the environment, the size of the resting area as well as the

position of the horse in the social hierarchy. (Zeitler-Feicht & Prantner, 2000). Horses sleep both standing up and lying down. For REM (Rapid Eye Movement) sleep to occur however, the horse needs to lie laterally recumbent. Sufficient sleep can only be achieved in familiar stress-free environments surrounded by familiar herd members. (Busby & Rutland, 2019).

## feeding behaviour.

Horses are herd animals and move around large areas while grazing continuously throughout the day. The digestive system of horses has evolved to be able to digest large quantities of fibres as well as being able to handle the liquids found in fresh vegetation (McDonald, o.a., 2011). A feral or pastured horse graze for approximately 16-17 hours per day which equals to about 70% of the time.

In stabled horses, where food is served in large quantities at specific times, the total time eating equals only around 10% which might cause digestive complications for the horse. (McGreevy, 2012). Movement is also a crucial part of horses' feeding behaviour and when the need for feeding or feed seeking is not fulfilled, the horse may exhibit increased abnormal and stereotypic behaviours (Karlsson, 2017).



## locomotive behaviour.

Horses live naturally in vast grasslands and must travel large distances in the search for food, water and shelter. The locomotive behaviours are therefore of great significance for the animal's survival (Busby & Rutland, 2019). The most common natural gaits of a horse are walk, trot, canter and gallop. The walk is the slowest and is for example used while grazing, and gallop is the fastest. (Harris, 1993) When horses are kept in restrictive space, such as in box-stalls or tie-stalls,

their natural need for movement is unable to be fulfilled. It is estimated that a horse need approximately six meters to roll over from one side to the other, an action which is impossible in a box of 3x3 meters (McGreevy, 2012). Confined horses without the ability to interact with conspecifics, have shown to increase their locomotion once released to pasture. Other factors that can increase movement is the size of the paddocks and the ability to run together with other members of the herd. (Karlsson, 2017)



## 02. Theory social behaviour.

Wild horses live in one of two types of groups; a bachelor band of young stallions or a harem (Feist & McCullough, 1976). The size of the groups depends on the available resources (Stevens, 1990), but are usually small and stable groups at around 3-12 members. When the resources are scarce, some overlapping between bands and territories might occur (Busby & Rutland, 2019).

The social behaviours of horses are intended for deepening the bonds within the herd, to establish dominance and hierarchy and to communicate potential dangers. Horses use an intricate system of signals of sounds, smells, vision, touch and body posture to communicate with each other. Researchers are still uncertain as to what exactly all the different signals mean. (Busby & Rutland, 2019)

The equine social behaviours can be divided into three sub-categories; affiliative behaviour, play behaviour and agnostic behaviour.

### *Affiliative Behaviour*

These types of behaviours are intended to encourage group unity and includes positive behaviours such as mutual grooming (Feist & McCullough, 1976). These behaviours are good indicators of emotional health and are used to assess animal welfare. (Boissy, o.a., 2007)

### *Play Behaviour*

Play helps the horse to strengthen muscles, practise social interactions and gain positive emotions (Byers & Walker, 1995). Play includes object play, sexual play, locomotor play and play fighting (McDonnell & Poulin, 2002).

### *Agnostic Behaviour*

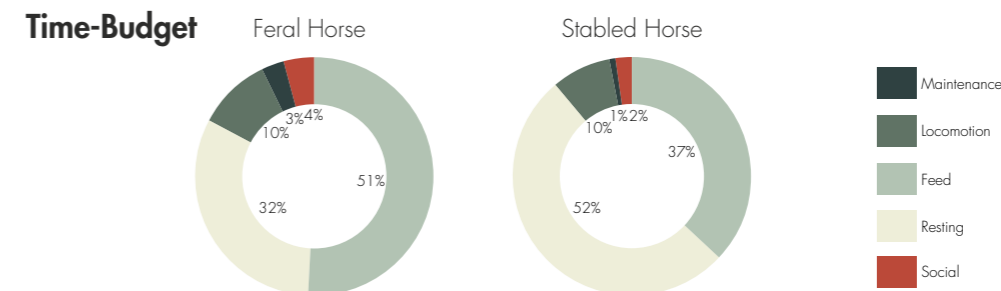
Agnostic behaviours include aggression, threats, appeasement and avoidance behaviour between horses (McDonnell & Haviland, 1995). It can for example be used to assert dominance and can lead to injuries. (Haupt, Law, & Martinisi, 1978)

## stereotypic behaviour.

If horses are exposed to prolonged stressful environments and situations it might develop atypical behaviours such as crib biting, box walking, apathy or aggression. These behaviours do not fulfil any specific function and are often repetitive. Such actions which do not appear in horses naturally are called stereotypic behaviours. (Mason, 1991) Stereotypies are typically a sign of

frustration and is generally developed early in life (Waters, Nicol, & French, 2002). Stereotypic behaviour seems to be directly linked to poor welfare and in order to avoid them, horses need to be able to perform their natural behavioural instincts, including socializing with other conspecifics, free movement and access to sufficient amounts of roughage (McGreevy, 2012).

## time budget.



The time budget of a horse represents how much of the day a horse dedicates to perform specific ethological behaviours. For a wild horse, the time budget depends on the season, the temperature and weather, the sun rise and sun set, the availability of food and water as well as predator activity. (Busby & Rutland, 2019) Most of the time budget of a wild horse consists of eating and resting, with locomotion only being a small part as it mostly occurs at a very low intensity

while grazing. The remaining 7 percent are spent on maintenance and social behaviours.

When comparing the time budget between that of a free ranging horse and a stabled horse, potential welfare and stabling problems may be revealed. (Keeling & Jensen, 2009) The time budget of horses in captivity should strive to be as close to their wild counterparts as possible, to promote the physical and mental health of the horses.





## horse ethology chart.

Ethological Behaviour	Behavioural Indicators
Responding to Threats and Safety	<ul style="list-style-type: none"> <li>- The possibility to position themselves towards potential threats to either run away or towards the threat at speed.</li> <li>- The ability to respond to threats as a group or by themselves by preserving individual and heard space.</li> <li>- To be free of pain.</li> </ul>
Ingestion	<ul style="list-style-type: none"> <li>- Access to fresh food and water daily and to be able to eat and graze on a forage-based diet for up to 16 hours per day.</li> </ul>
Body Care	<ul style="list-style-type: none"> <li>- The ability to roll on different types of surfaces to get rid of loose hairs, to itch or to coat themselves in mud for waterproofing.</li> <li>- The ability to swish their tails to get rid of flies.</li> <li>- To groom together with familiar herd members.</li> <li>- To be free from pain.</li> </ul>
Rest and Sleep	<ul style="list-style-type: none"> <li>- To be able to lie on the stomach to rest and sleep.</li> <li>- To be able to lie on the side to rest and sleep (the only way to achieve REM sleep).</li> <li>- To be able to achieve normal sleeping patterns, including sleeping while standing.</li> <li>- Familiar herd members and environments in order to achieve proper sleep.</li> <li>- Some herd members stand on guard while the rest of the herd sleeps.</li> <li>- To be free from pain.</li> </ul>
Locomotion and Physical Activity	<ul style="list-style-type: none"> <li>- To move around freely in their home area. For example for grazing, playing with other herd members and to react to threats.</li> <li>- Play only happens when the herd is stable and with familiar members.</li> <li>- Play patterns are innate and established while the horse is still young and continue throughout adulthood.</li> <li>- Playing with objects to reduce the fear and stress responses to new stimuli.</li> <li>- To strengthen the bonds within a herd through play.</li> <li>- To be free from pain.</li> </ul>
Exploration	<ul style="list-style-type: none"> <li>- To have access to the herd, water, shelter, vegetation and shade and to roam their surroundings.</li> </ul>
Herd Dynamics	<ul style="list-style-type: none"> <li>- To be able to create lifelong bonds with herd members and family.</li> <li>- Courting, mating and parenting and other reproductive behaviors.</li> <li>- To be free from pain</li> </ul>

Table 1 Busby & Rutland (2019)



## 03. riding schools.

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### 03. *Riding Schools*

## riding in sweden.

**“The students are predominantly females,  
at around 90%,  
and is one of few sports where  
women and men compete together.”**

Equestrian sport is the 6th biggest sport in Sweden and engages half a million people. The students are predominantly females, at around 90%, and it is one of few sports where women and men compete together. Riding is also highly beneficial as forms of therapy and engage many disabled. (Ridsportsförbundet, 2017)

To understand and to look deeper into the current situation of riding schools in Sweden, this segment introduces the typical configurations of a stable, the routines, the student's perspective as well as conducted study trips to schools in south western Sweden.

03. *Riding Schools*

# stabling types.

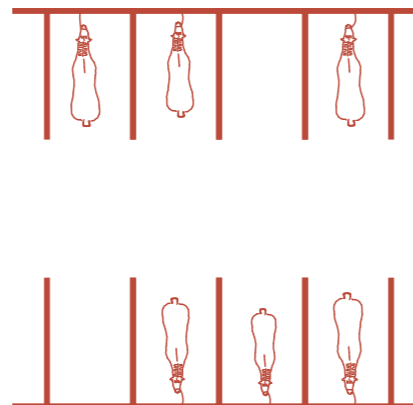
“ The choice of housing in a stable is based on the practicality, the available space and the wellbeing of the horses.

There are mainly two types of housing; individual housing and group housing. The most common stabling types in Sweden today are the individual housing types box-stall housing and the tie-stall housing, as well as the more recently

popular group housing type, loose housing. This page presents some of the types and figurations of a stable. The choice of housing in a stable is based on the practicality, the available space and the wellbeing of the horses.

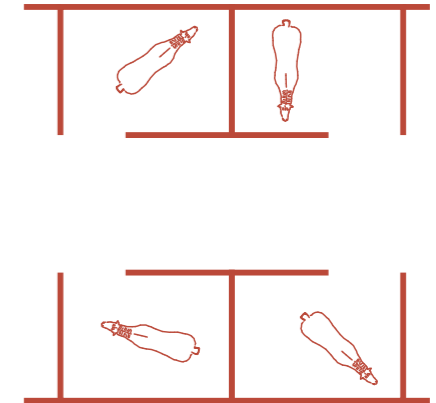
## tie-stall housing.

The tie stall is a housing type where the horses are tethered to the wall. The movement of the horse is heavily restricted. The tie stall was made illegal to build a few years ago which has made it less common. A good solution is a grooming stable with tie-stalls in combination with loose housing.



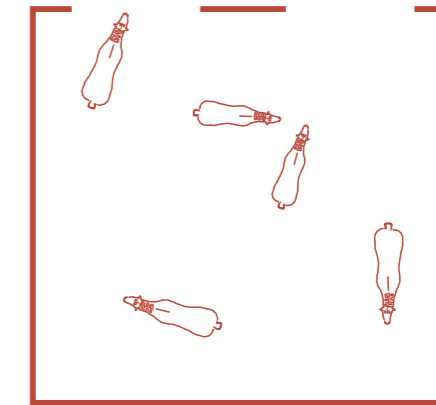
## box housing.

A box stall is a small space, around 10 - 12 sqm, in which the horse can move around freely. Horses in this type can typically see and sniff other horses, but with minimal interactions. Box housing is the most common stabling type in Sweden, especially after the tie stall was made illegal.



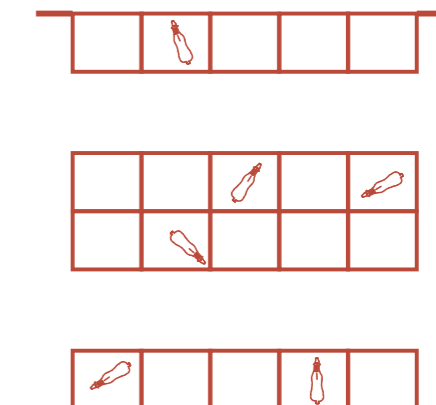
## loose housing.

In loose housing the horses are kept together in a flock, with free access to paddocks, shelter, feed and water. Loose housing usually results in better psychological and physical health of the horses. It could, however, pose a safety threat to the staff and problems regulating the amount horses feed.



## double corridor.

One common stable arrangement is the double corridor. This is efficient from an economic standpoint, as the building envelope is reduced, and from a management standpoint. The drawbacks are the lack of visual connection for the horses in the middle, increased noise and dark and stressful environment.



## 03. *Riding Schools* elements of a stable.



### 03. Riding Schools

# daily routine.

“ Most of the work is done by the staff, including feeding, cleaning and prepare the horses before the students arrive.”

The elements of a riding school consist of for example changing rooms, stalls, paddocks, arenas, tack rooms, wash stalls and laundry. The elements found of the previous page contains some of the most common spaces and tasks of a stable. These are used to explain the spatial qualities of the daily routine and the timeline of a riding lesson.

Most of the work in a riding school is done by the staff, including feeding three times

a day, cleaning the stables and the boxes and prepare the horses before the students arrive. These tasks are heavy work and often results in various types of injuries. The heaviest tasks include transports of for example manure and feed through manual means, which is time consuming and leads to strain injuries, and handling the horses, which can be difficult due to herd and rank problems, individual needs and for safety reasons.

### 03. Riding Schools

# box housing.



### 03. Riding Schools

## student perspective.

“ Students usually arrives around 30 minutes before the lesson start in order to prepare themselves and their horse.”

Students usually arrives around 30 minutes before the lesson start in order to prepare themselves and their horse. They start by changing their clothes and collecting their required equipment such as vests and helmets. Usually the schools provide personal lockers where students can store personal items such as boots and whips.

In the stable the student starts by collecting the equipment of the horse from the tack room. This is hanged on the door of the box while the student starts to groom the horse by brushing it and cleaning the hooves. Afterwards the horse is fitted with its equipment. This can be a quite tricky process depending on the horse, so it useful to provide grooming stalls where the horse can be tied or calm spaces outdoors.

Right before the class the students line up, and lead, under the teacher's supervision, their horses to the riding arena. A class usually contains between 4-10 students and last for about an hour.



## a lesson.

17.30

### Arrival at the school

The student arrives at the school by public transport or by car. Fellow students and teacher are greeted, and the student checks the list for which horse she/he is assigned.



17.35

### Changing and preparation

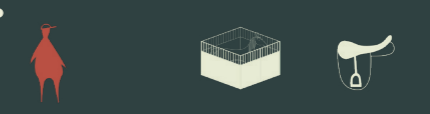
Personal items are collected from the lockers and the student changes in the changing room. Helmet and safety vest is picked out.



17.40

### Enter the stable

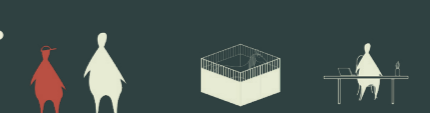
The student looks for the horse and then greets it. The student collect grooming tools, saddle and bridle (and other necessary items) from the tack room.



17.43

### Preparation of horses

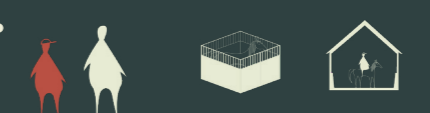
The horse is tied to the box (or tie-stall) and groomed and cleaned. The horse is fitted with saddle and bridle.



17.58

### Horses are led to the arena

The students lead their horses in a line to the arena.



18.00

### Lesson starts

The lesson is usually one hour long in groups of about 4-10 students.



19.00

### Lesson ends

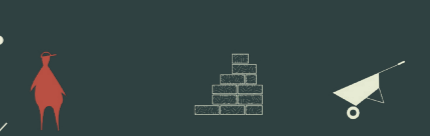
Horses are taken back to the stable and cleaned and equipment is removed. Afterwards the student change and go home.



19.20

### (Preparation of feed)

Students may have duties in the stable like preparing feed for the next day.





### 03. *Riding Schools* study trips.

- 01. Partille Ridklubb
- 02. Kungsbacka Ridklubb
- 03. Silvagården
- 04. Göteborgs Handikappridklubb
- 05. Göteborgs Fältrittklubb
- 06. MCR Equestrian Center
- 07. Klagshamns Equestrian Center
- 08. Billinge Equestrian Center

During the project I have conducted a series of study trips to different types of riding schools and equestrian centres around Sweden. These range from more traditional schools, such as Göteborgs Fältrittklubb, to schools with loose housing and rehabilitation profile, like

Silvagården, and to schools with a more modern approach and style, such as Klagshamn and MCR. During these trips I have collected good and interesting solutions that the schools have implemented. Some of these findings will be presented in this segment.

## partille ridklubb.

Location: **Partille**  
Tie stalls: **23**

Type: **Riding school**  
Box stalls: **4**

Horses: **27**  
Loose systems: **2**

Partille Ridklubb's Riding School is a medium sized school located in Furulund in Partille with good access to nature. The horses are divided into two active stable systems, one for ponies and one for large horses. Due to a lack of available land, both systems are relatively small at about 0,25 ha each.

The riding school were overall happy about the active stable system for the horses, which seemed calmer and more harmonious than before, but wished that they had the possibility to keep the horses indoor in boxes when needed.



preparation stable with lights from above



rubber floor in stable to protect hooves and facilitate cleaning



feeding system which forces the horse to move



loose housing with two separate sections



### 03. Riding Schools

## kungsbacka ridklubb.

Location: **Kungsbacka**  
Tie stalls: **8**

Type: **Riding school**  
Boxes: **31**

Horses: **29**  
Loose systems: **2**

Kungsbacka Riding school is a competitive school in Asslöv in Kungsbacka. The facilities are quite generous with three riding arenas, two stables with boxes or tie-stalls for every horse, two outdoor arenas, two loose housing systems and paddocks.

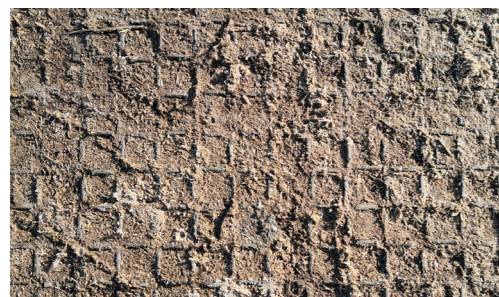
The loose housing system was implemented a few years ago for all horses. The results have been largely positive, despite problems with the feeding stations, and all the horses appear more relaxed and harmonious and the stereotypic behaviours have disappeared.



herding corridor, the horses run themselves to their box



open feed stations works better than complicated systems



ground preparation and raster to ensure stability and avoid mud



café with direct connection to the riding arena

## silvagården.

Location: **Kungälv**  
Pasture land: **20 ha**

Type: **Riding school, rehab profile**  
Box stalls: **9**

Horses: **21**  
Loose systems: **3**

The rehab and handicap-oriented riding school Silvagården is located in Rödbo in Kungälv. It is run by an enthusiastic elderly couple who do all the work by hand at the school. Despite the facilities being quite simple, Silvagården appear to provide an

environment closely resembling the natural environment of a horse. With only 21 horses on 20 hectares of land and a flexible system of pasture lands, which can be connected in a range of ways, the horses can freely graze almost the entire area.



loose housing with different parts



connection between stable and loose housing



using natural and outdoor elements to create horse preparation spaces



### 03. Riding Schools

## göteborgs handikappridklubb.

Location: Kungälv  
Pasture land: 13 ha

Type: Riding school, rehab profile  
Stalls: 7 boxes, 10 tie stalls

Horses: 25  
Loose systems: 2

Göteborgs Handikappridklubb is another medium sized school outside of Kungälv with abundant pasture lands. The school focus is on disabled children and adults and provides classes for mixed groups of disabled and non-disabled individuals.

The school has taken the idea of loose housing quite far and has planned their pasture so that the horse will get the maximum amount of movement. The school is satisfied with their system and have divided the horses based on the horse's level of overweightness.



smart placement of feed and drink stations to maximize locomotion



extended ramp for disabled riders with space for helpers



weather protected ramp with suspension system

### MCR Equestrian Center

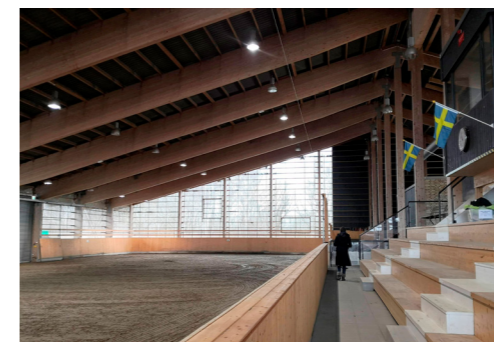


100 meters long arena with curved beams



light from above and light from the gable creates a soothing environment

### Klagshamn Equestrian Center



L-shaped arena with self-ventilating perforated metal facade



Flexible box walls which can be removed and cleaned out with a machine

### Bäringe Ridhus



curved, slightly indented, beams creating a pleasant and beautiful interior space



walls made of slidable elements which can be opened during the summer

## 04. concept.

---

### 04. *Concept*

## design for animals.

**“ The theories about horse welfare and ethology are translated into a catalogue of spatial elements which enable horses to exhibit their natural behaviours. ”**

In the fourth section, concept, the theoretical and practical research are transformed into design strategies. The theories about horse welfare and ethology are translated into a catalogue of spatial

elements which can be combined in the design to enable all horses to exhibit their natural behaviours. These strategies and elements functions as a starting point and guides the design proposal.

04. *Concept*

# ethology elements.

natural environment

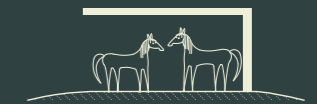
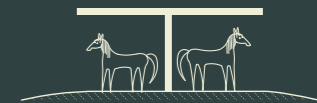
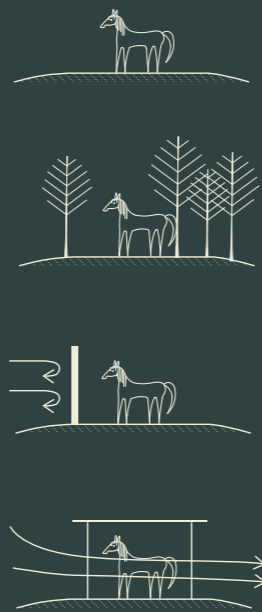
Locomotion

Resting

Drinking

Feeding

Social



unnatural environment

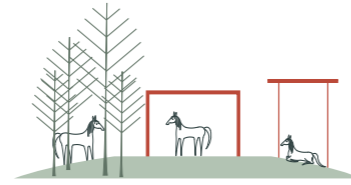


04. Concept

# design strategies.



incremental building



ability to choose



adapt to landscape



connect to nature



cultural heritage



efficient workplace



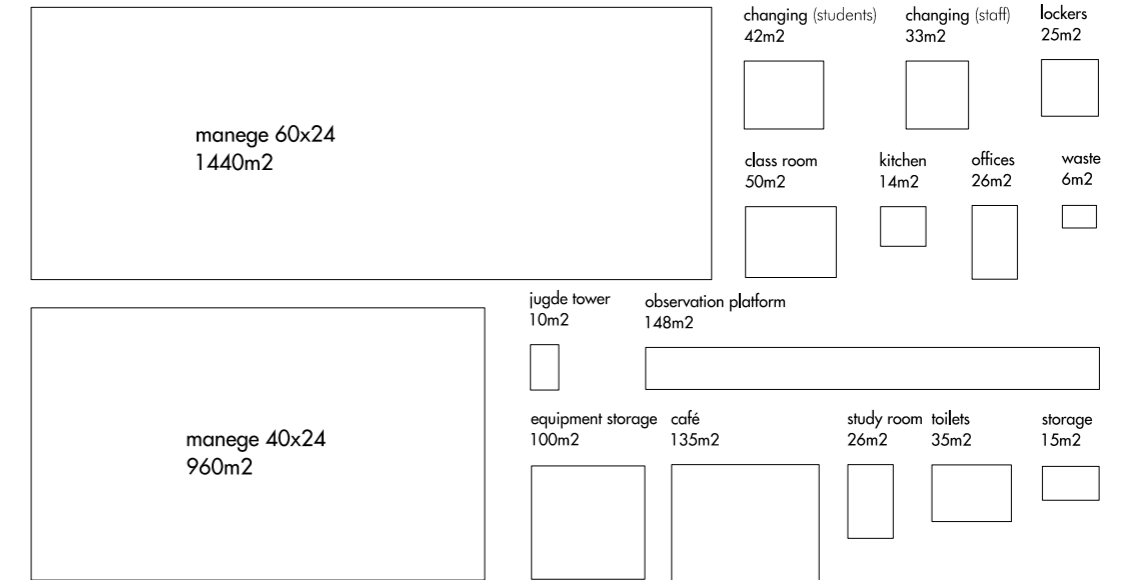
wood building



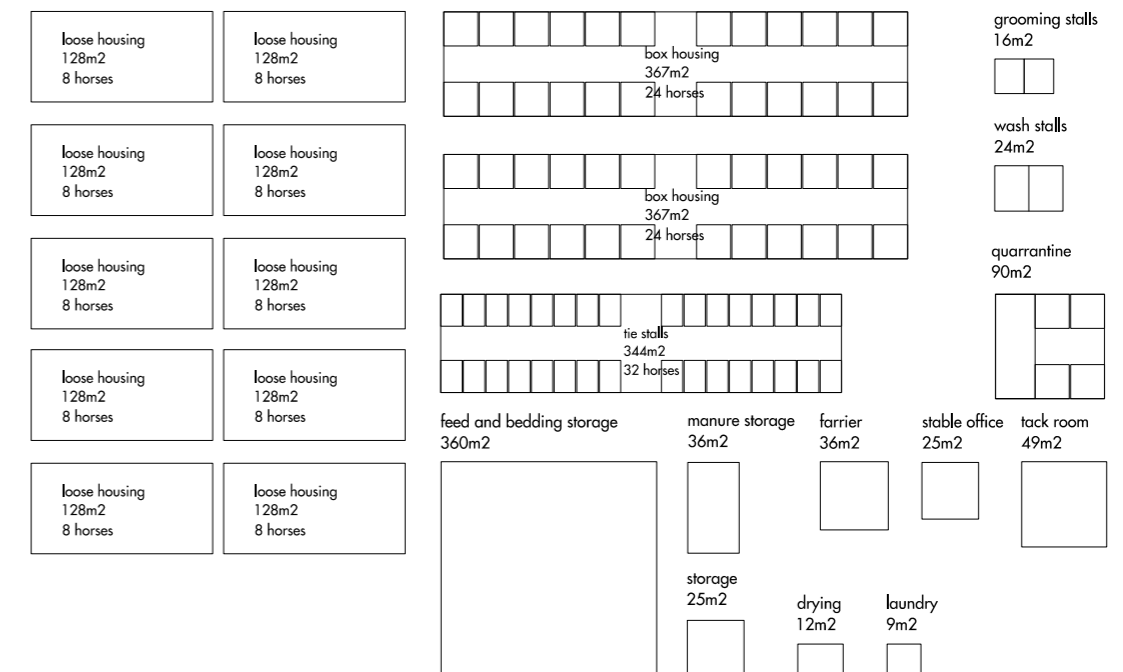
natural behaviours

# program.

## Riding Arena



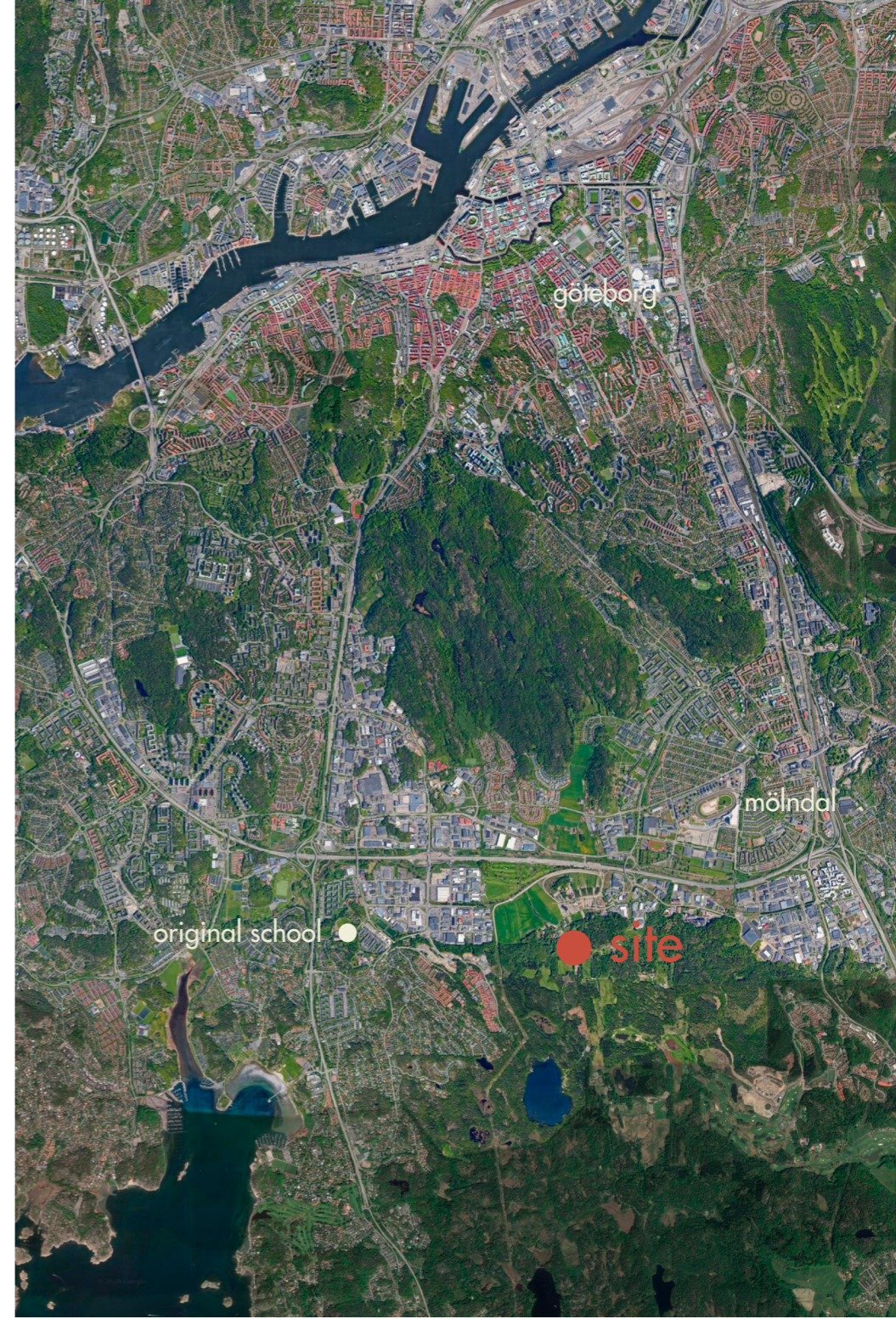
## Stable



# 05. site and analysis.

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## 05. *Site & Analysis*





05. *Site & Analysis*

# balltorp.

“ Balltorp is a largely undeveloped area with a lot of nature, smaller farms and summer houses.”

Balltorp is a neighbourhood in western Mölndal municipality, close to the border of Göteborg municipality. It is a largely undeveloped area with a lot of nature and smaller farms and summer houses. Two characteristic traits of the area is the vicinity to Sisjön, one of the most popular

natural areas for hiking and swimming, as well as the military areas in the south. To reach the neighbourhood one may go by foot, by public transport, and walk through Riskulla industrial area, or travel by car.





## 05. *Site & Analysis*

# existing conditions.

The site is located along the road to Sisjön and consists of open relatively flat fields surrounded by trees. On the southern side of the site you will find a small deforested mountain side. Along the northern side of the plot there is a small forest and a stream. The site is one of the lower parts of the area, making it quite wet during the rainier seasons.



# the landscape.





## 06. proposal.

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### 06. *Proposal*

## process.

**“ The segment presents the practical implementation of the research and the design concepts and strategies.”**

The following segment presents the practical implementation of the research and the design concepts and strategies. During the process, several designs, configurations and adaptations was investigated. This was done through

hand and digital sketching, model studies and volume studies. The final result is an amalgamation of these investigations. The chapter contains plans, sections, facades, perspective, diagrams and flow charts.



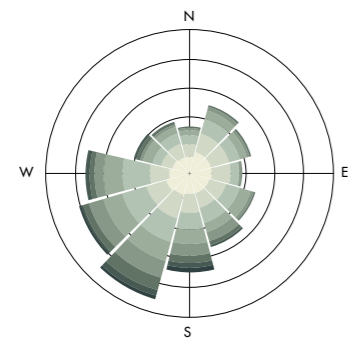
## 06. Proposal site plan.

“ The site and pastures are surrounded by small forests and lines of trees, hills as well as a small stream which runs through the site. ”

The riding school is placed on a relatively flat grass field on the southwestern side of the site with pastures divided into three parts; for ponies, horses and the horses of member riders. The site and pastures are surrounded by small forests and lines of

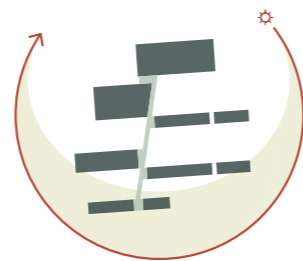
trees, hills as well as a small stream which runs through the site. The pasture and the paddocks are connected, forming three large loose housing systems, each with with sheds both in the paddock and the pasture.

Wind Study



0,5 m/s         >16,5 m/s

Sun Study





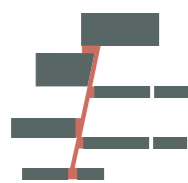




## 06. Proposal organisation.

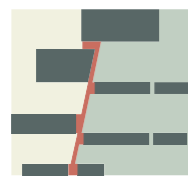
The program is separated into six separate units, all connected through an open passage running diagonally through the entire site, together forming courtyards between the units. A main intention of the project was to design a building that could be expanded or subtracted based on the needs and economic situation of the school. The units and program are therefore arranged and divided to allow them to function separately. The units include two riding arenas, connected to the main entrance and public functions, two outdoor arenas with seating, three stables, a quarantine with seating, three loose housing systems with paddocks and pasture. The paddocks are placed between the building units and can be separated from the rest of the loose housing system for safety or convenience. The equestrian centre is reached from the north and can be accessed by car or public transport. The machinery and manure management are centred around the southwestern courtyard and separated from the public flows.

stable and a functional unit with the feed storage, garage, workshop, farrier and animal hospital. All three stables have access to separate loose housing systems with paddocks and pasture. The paddocks are placed between the building units and can be separated from the rest of the loose housing system for safety or convenience. The equestrian centre is reached from the north and can be accessed by car or public transport. The machinery and manure management are centred around the southwestern courtyard and separated from the public flows.



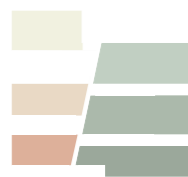
### Central passage

The buildings are connected through a central passage. It is a roofed colonnade with wood lattice walls. It serves as rain protection but lets the wind pass through, and functions as a soft barrier between humans and horses.



### Human and horse zones

The central passage divides the site into two zones, one for horses and one for human functions. This protects the horse from disturbances and serves as a reminder of the natural habitat horses.



### Courtyards

The space between the buildings forms courtyards which are used for different purposes, as paddocks for horses and as outdoor arenas, main entrance and machinery for humans.



### Phase 1

The school consists of the small riding arena, the tie stall stable (with enough space for the 20 horses the school currently have), the garage and the feed storage.



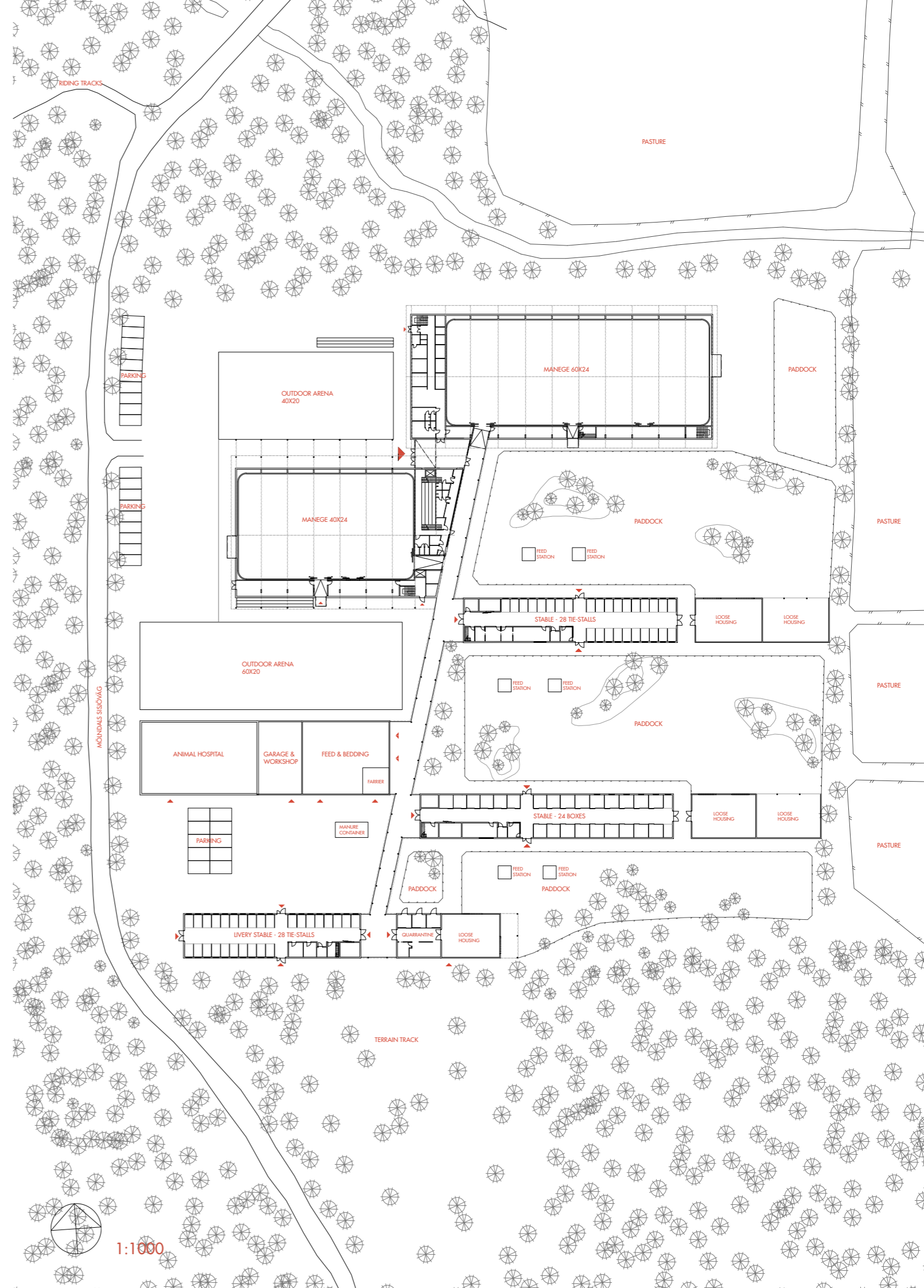
### Phase 2

The school is expanded with the horse stable and the large riding arena, including more staff spaces and educational spaces.



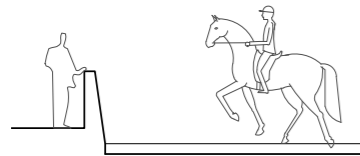
### Phase 3

Finally, the livery stable and animal hospital are added in the final step. Altogether the school now has 80 horses and three loose housing systems.

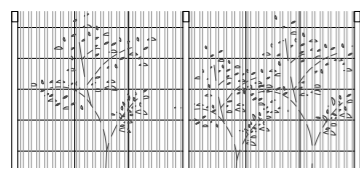


## 06. Proposal riding arenas.

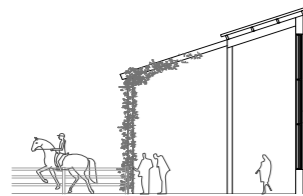
The riding arenas are where the riding lessons and competitions are held. It was therefore the ambition to create a bright and open space with a good climate for work and exercise. Most of the pony riding lessons will be held in the small arena and the larger arena will be for big horses and competitions. Dividing the arena into two improves the sound quality and reduce disturbances.



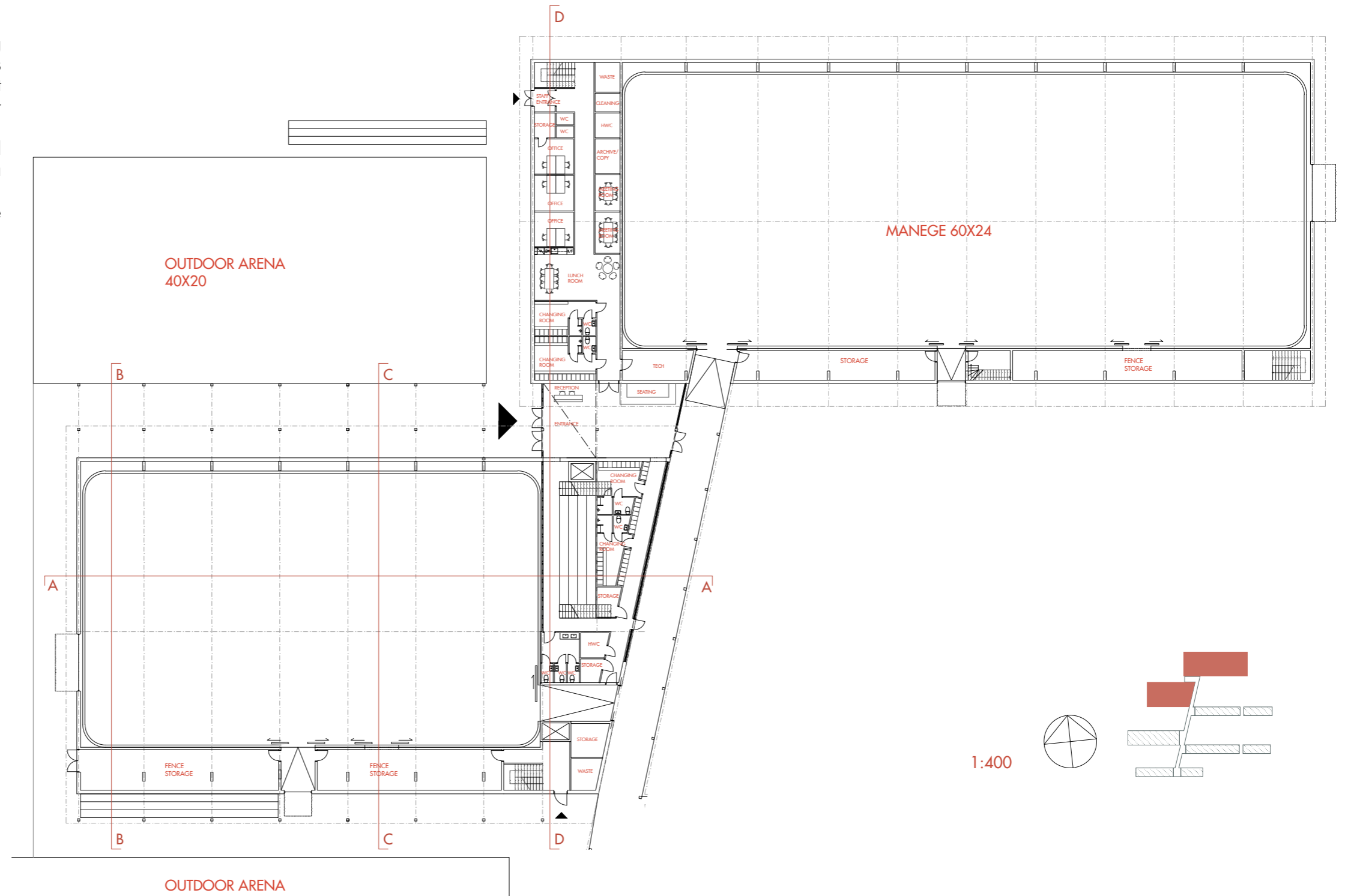
The manege is lowered to provide better views for the audience.



Wood lattices along the northern and eastern facades to soften light and provide views.



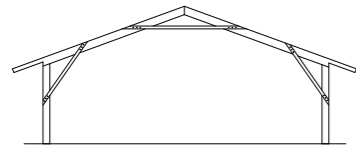
A pergola is extended from the roof to mark the entrance, provide greenery and to shelter from rain.



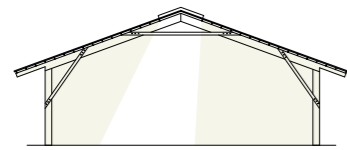
## 06. Proposal riding arenas.

On the second floor of the riding arenas you will find the bleachers, the café as well as common spaces for students and staff. These areas include classroom, lodging rooms and a library, all which

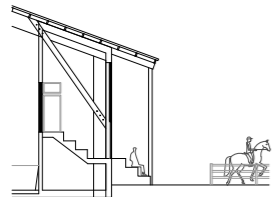
can be use during camp schools and other educational activities. In the lounge there are a couple of steps for people to read or to watch events happening on the small outdoor arena.



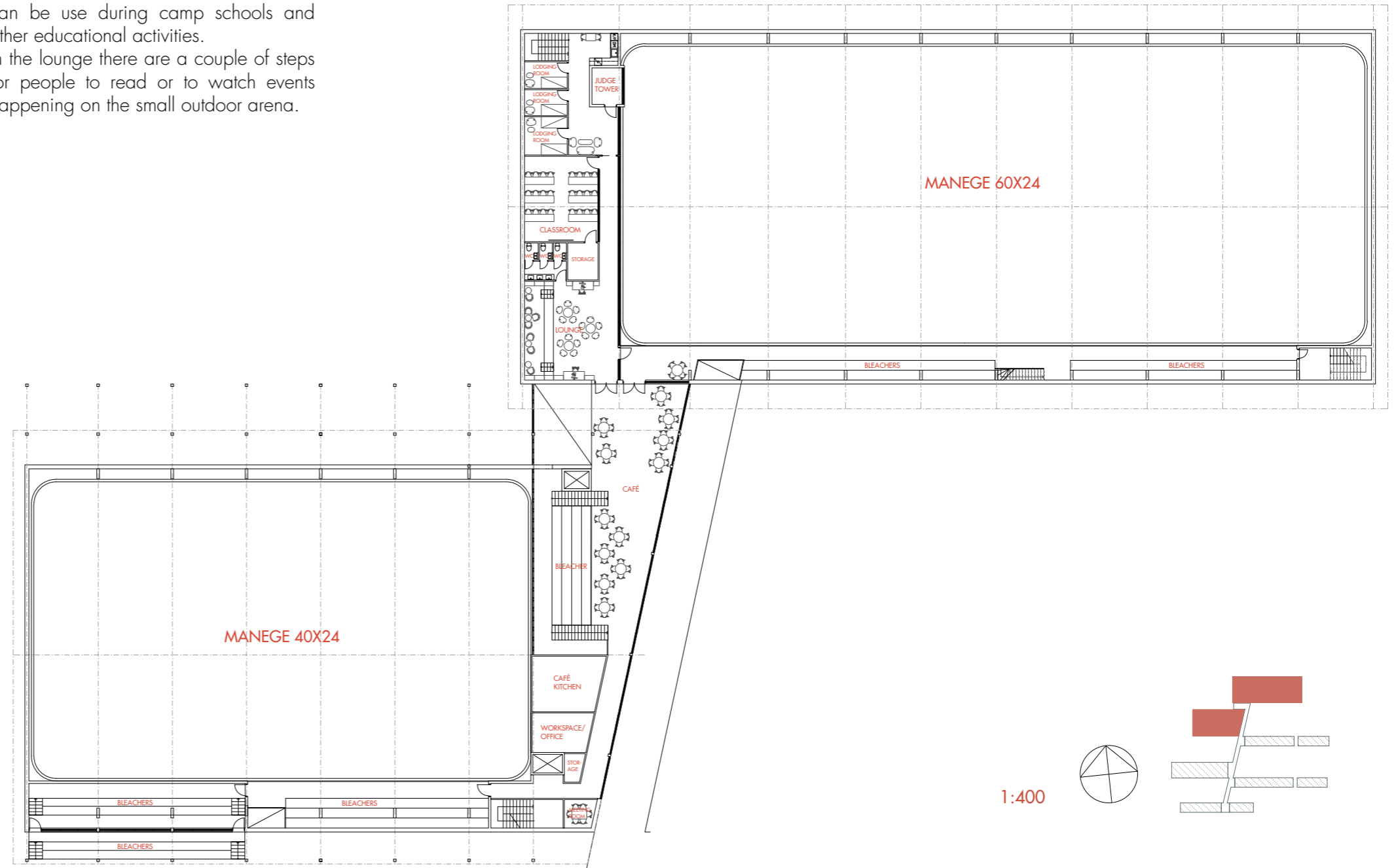
28m glulam structure with beams and posts function as a spatial element in the room.



Roof lights provides the spaces with light and atmosphere



The bleachers for the outdoor arena continue into the indoor arena, creating comfortable seating in bad



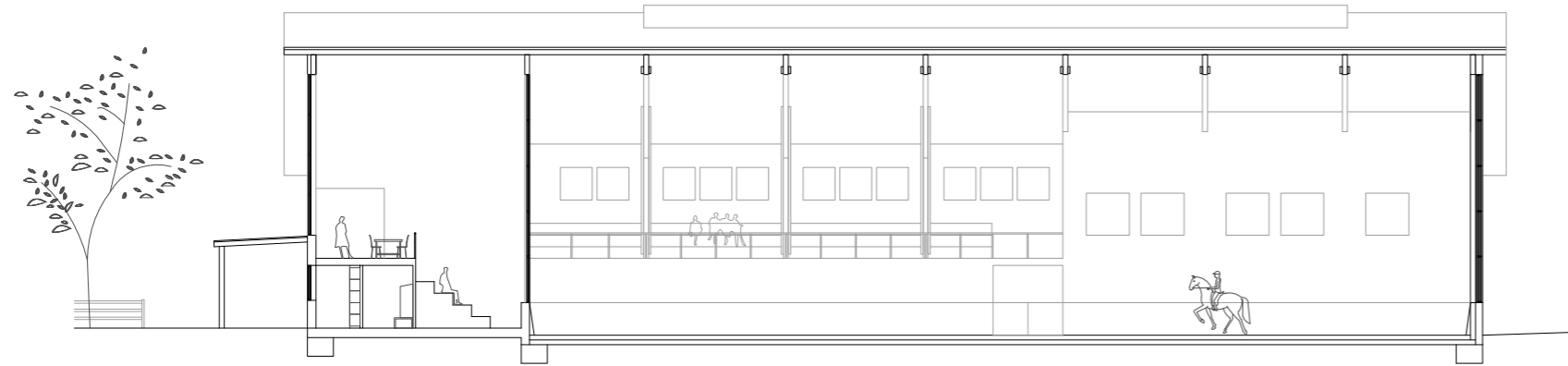




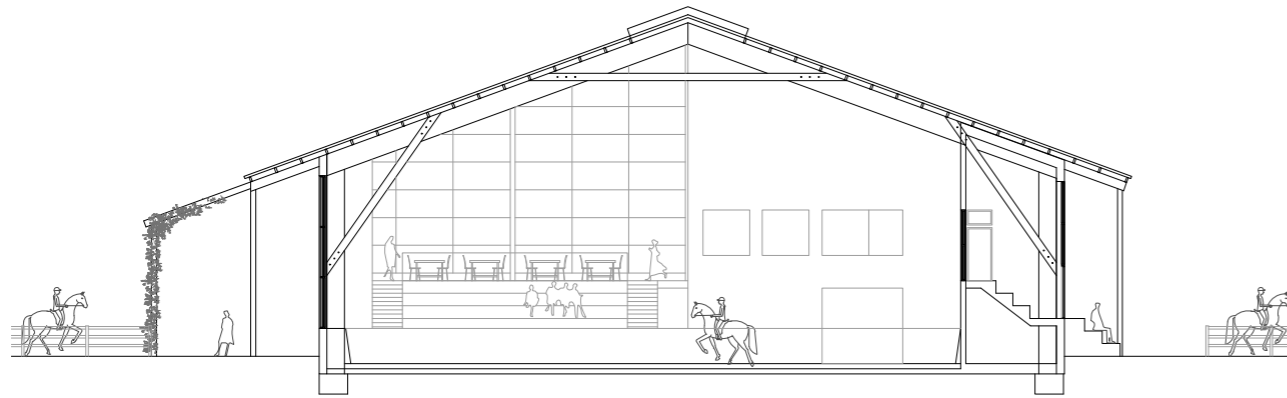


06. Proposal

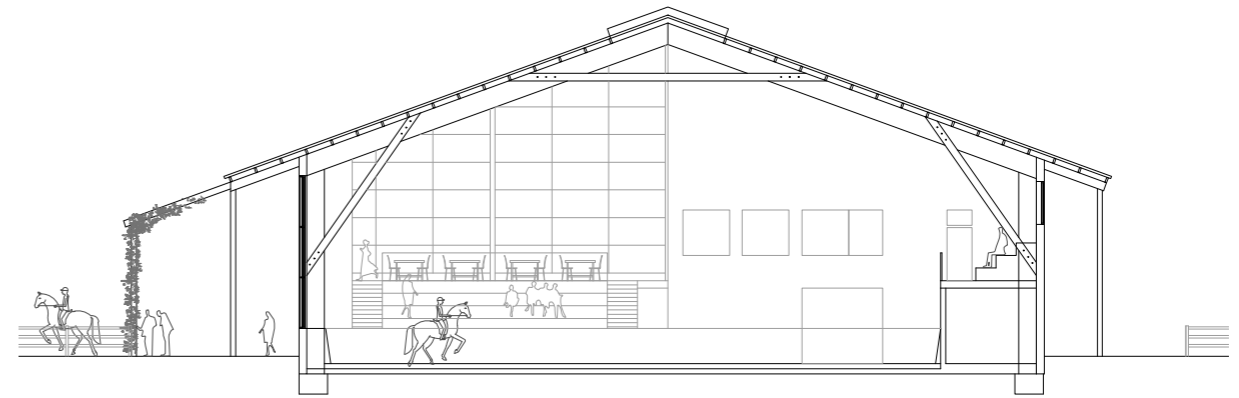
# sections riding arena.



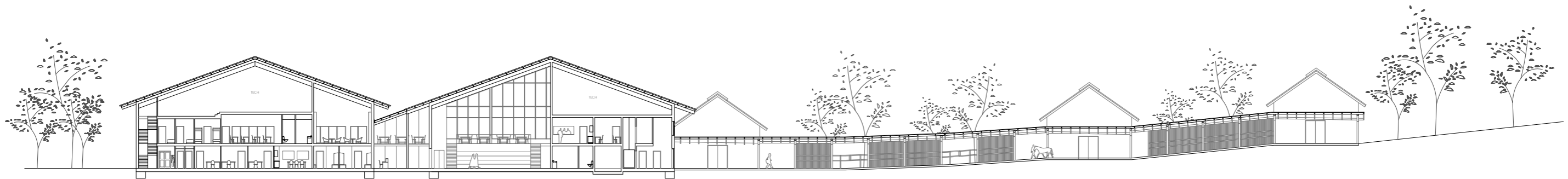
Section A 1:400



Section B 1:400



Section C 1:400



Section D 1:1000







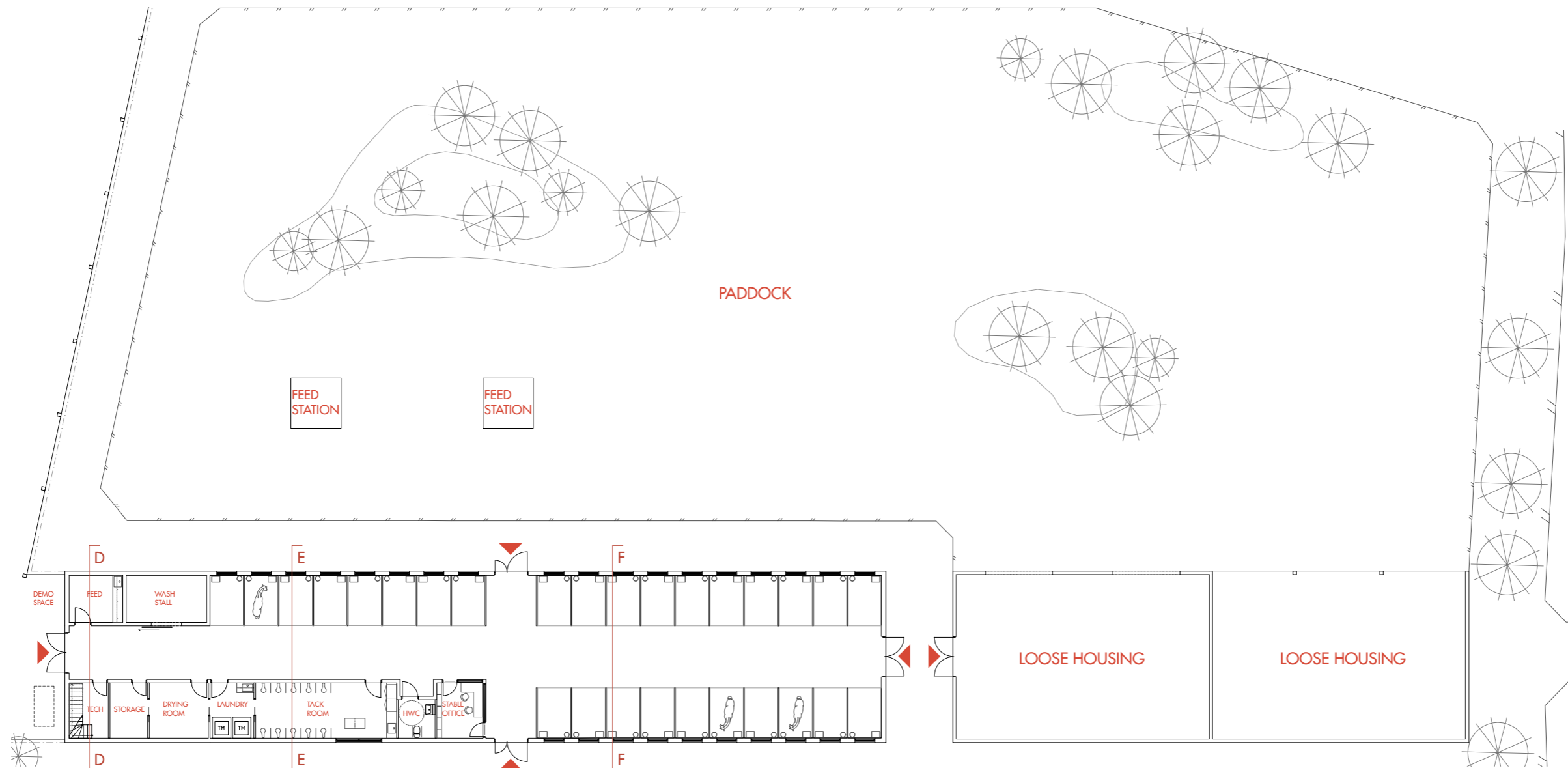
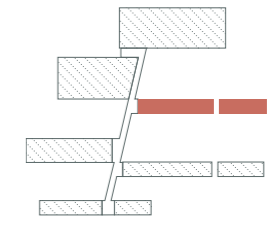
06. Proposal

# pony stable.

The pony stable is close to the riding arenas and contains 28 flexible tie stalls which can be converted into 14 box stalls if needed. The stable has all the necessary support functions to be able to function

as a separate unit. The stable works as a grooming stall first and foremost, with the ponies spending the majority of their time in the loose housing system. The shelter can be directly accessed from the stable.

Between the buildings there is a gravel paddock, with feed and drink stations, for nighttime use or in between lessons. The paddock can be opened up and connected to the rest of the pasture.

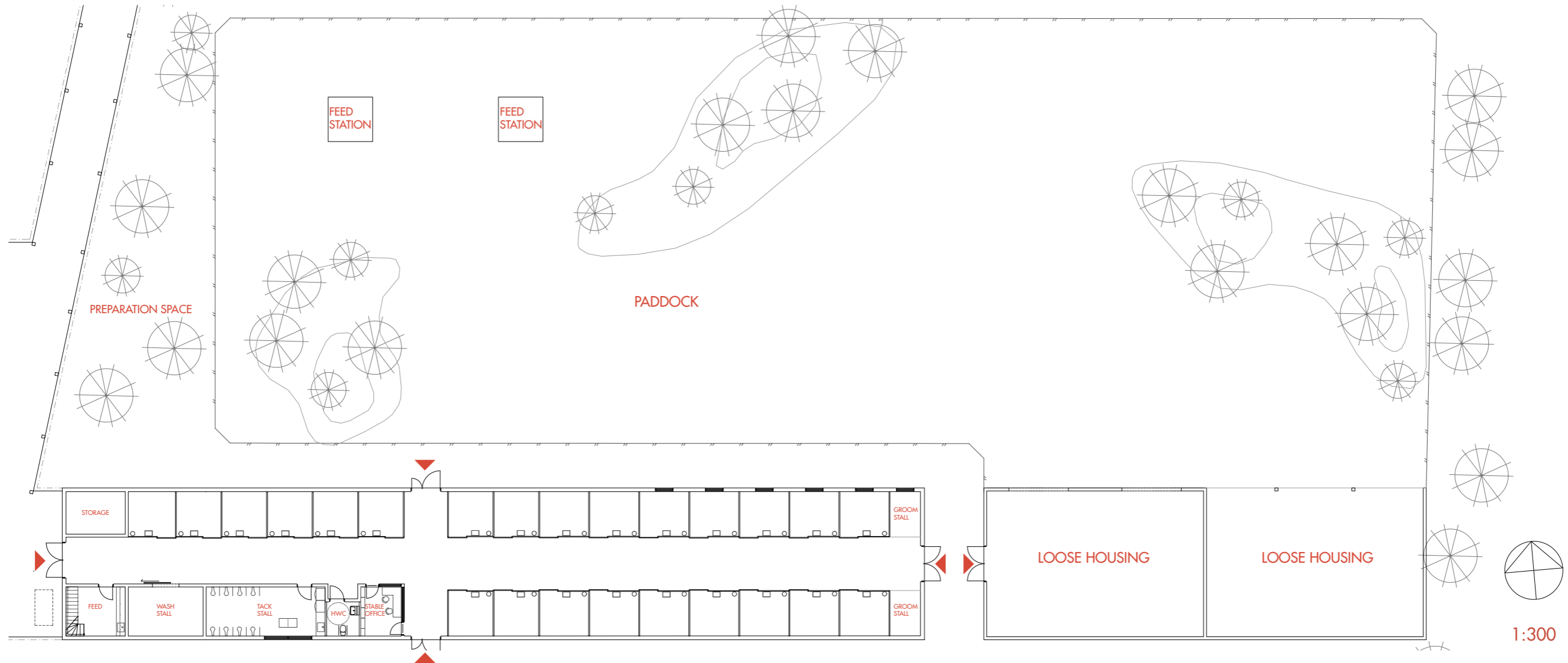
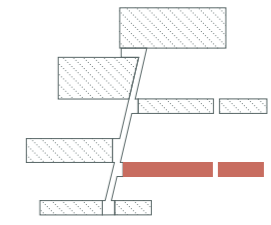


06. Proposal

# horse stable.

The horse stable is similar to the pony stable, but with box stalls. This stable is for larger horses and the box stalls are of two different sizes; 3x3 and 3x3,5. Thanks to the boxes, it is possible to keep the horses inside of needed.

The manure management is done via an underground system of scrapes. Each box stall or tie stall is fitted with a hole where the manure can be thrown down. It is then transported to the manure container.

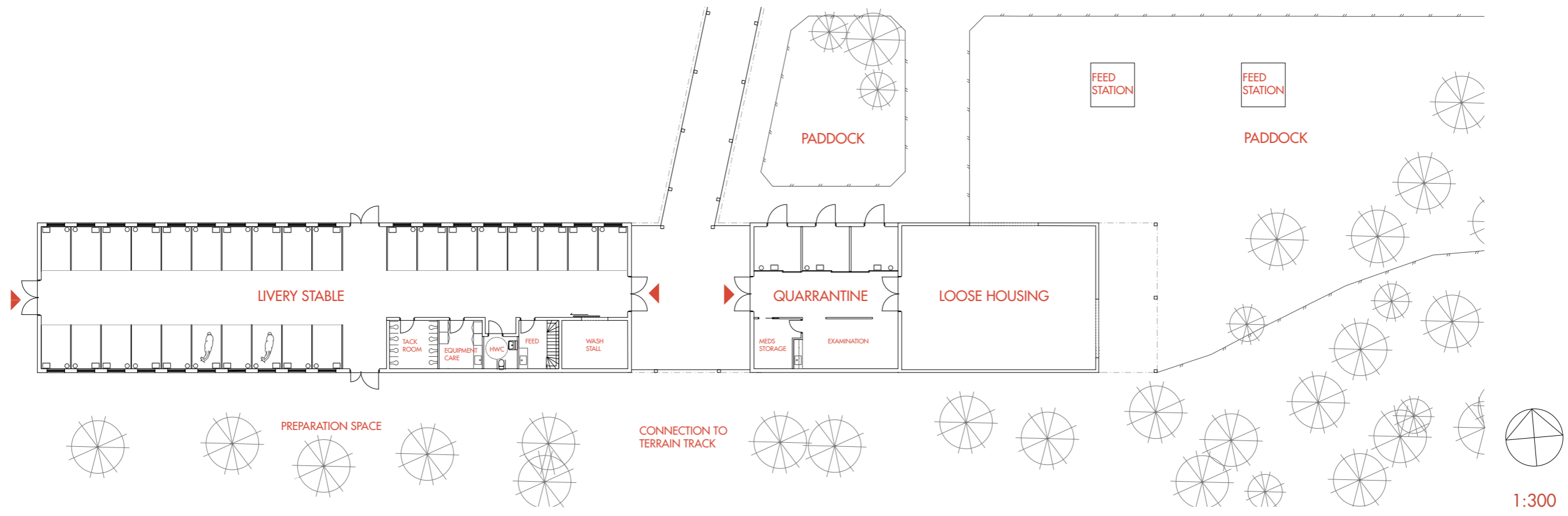
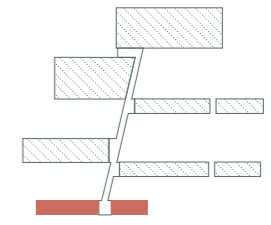


06. Proposal

# livery stable.

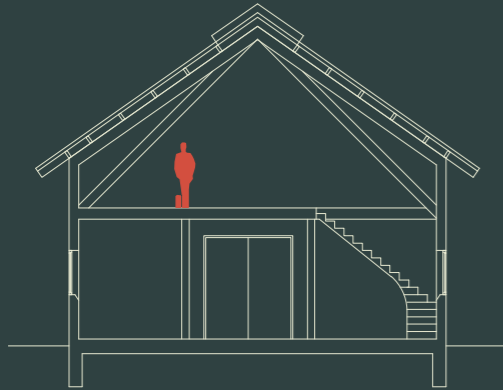
The livery stable is where the member riders keep their horses. Just like the pony stable, it contains tie-stalls. This is because the horses only stay in stable for grooming and preparation and the rest of their time in the loose housing. Loose housing for the livery horses is ideal

as it is highly flexible. The horses can take care of themselves while at the same time get social contact with the other horses. The livery stable does not contain laundry or drying rooms, as it can be done by the owners at home. It is also not connected to the underground manure system.

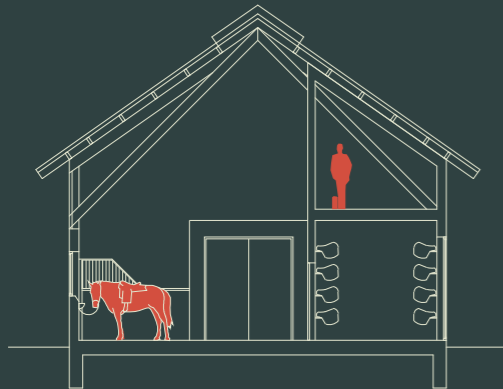




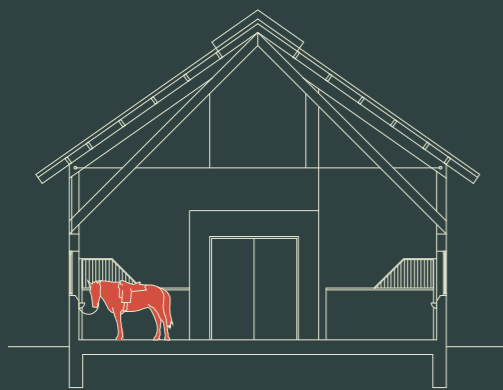
06. Proposal  
sections.



Section D 1:250



Section E 1:250

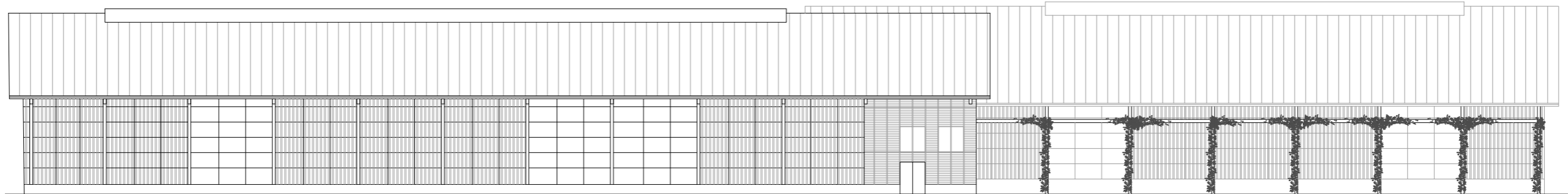


Section F 1:250

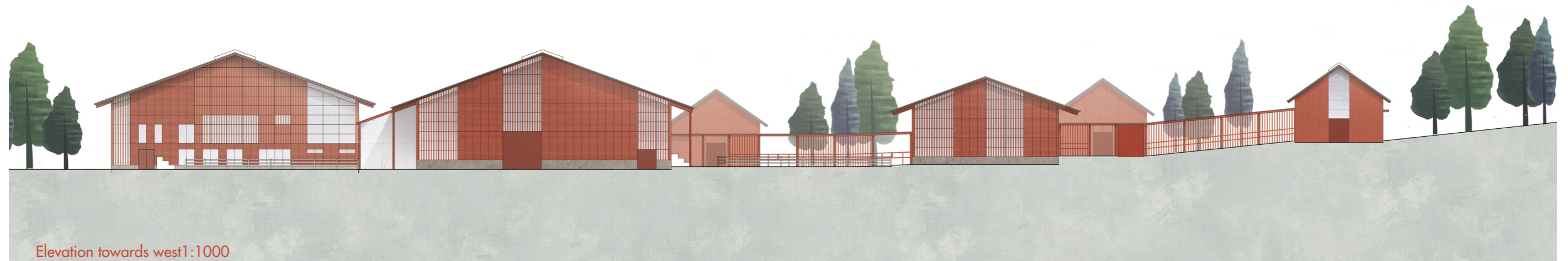




06. *Proposal*  
**elevations.**



Elevation towards north 1:300



Elevation towards west 1:1000



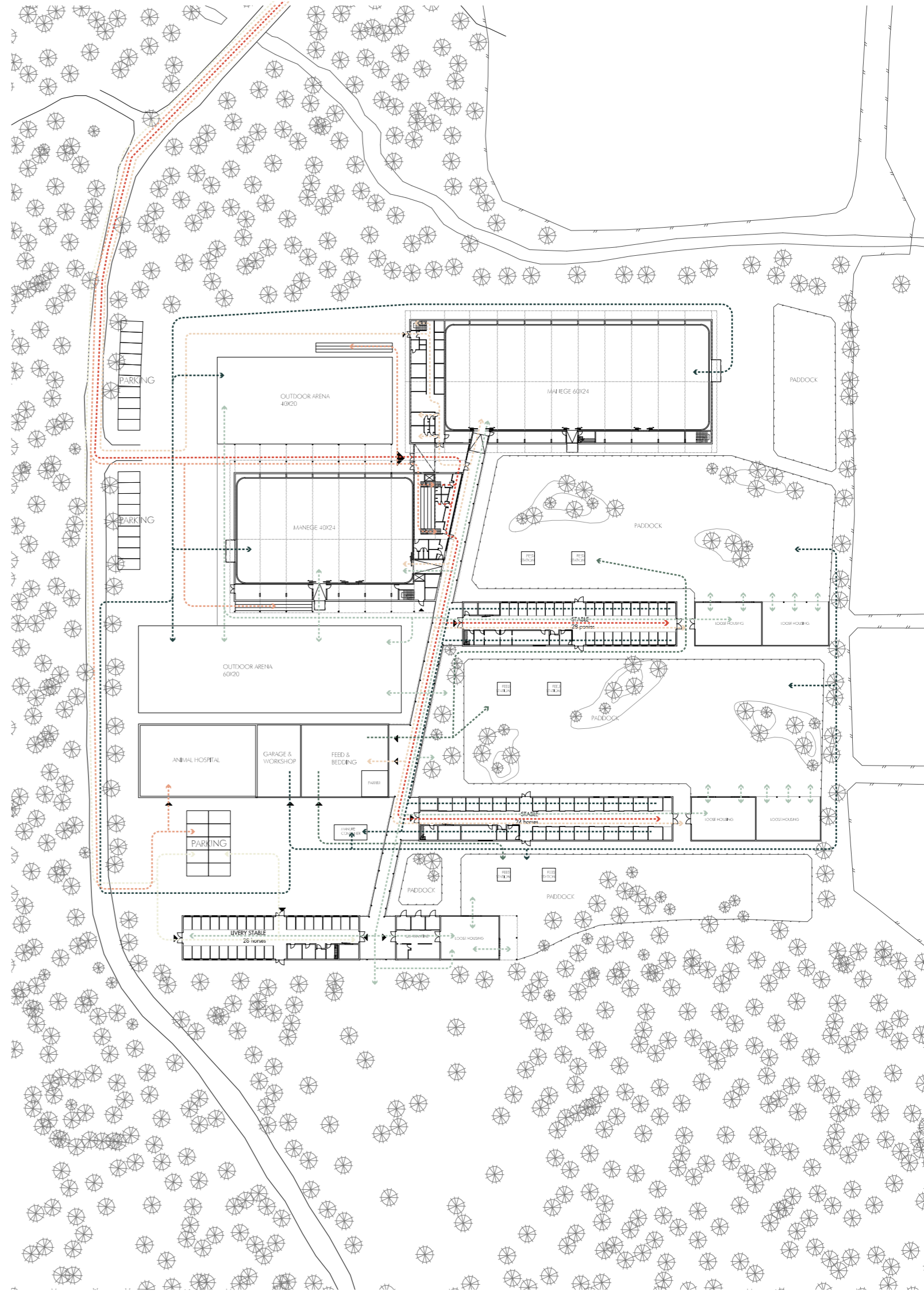
## 06. Proposal flows.

“ The main flow through the facility runs through the central corridor and connects to the important functions ”

The facility has a clear front and backside with one courtyard for the main entrance and the public flows and one for machinery and heavy-duty vehicles. The flow of people and horses have largely been separated along with a separation

of staff, student, member riders and visitors. The main flow through the facility runs through the central corridor and connects to the important functions of stables, riding arenas and feed and bedding storage.

- - - - - students
- - - - - visitors
- - - - - staff
- - - - - member riders
- - - - - horses
- - - - - feed management
- - - - - manure management & maintenance



## 07. reflections.

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**“ The aim was to design a new type of riding school where the needs of humans and horses are met equally.”**

The aim of this thesis was to discuss the role of animal welfare in architecture, and to design a new type of riding school where the needs of humans and horses are met equally. To investigate the topic, I formulated the main research question; How can an equestrian center, in a peri-urban Swedish context, be designed to enable horses to perform their natural behaviors while still meeting the needs of the users?

To be able to answer the question, I needed to study both scientific fields, such as ethology and zoology, as well as practical implementations of welfare and the usages of equestrian facilities. Therefore, I started by deriving knowledge

from articles and books on the biology and ethology of horses in combination with articles on horse welfare. This gave me a good theoretical framework which I could analyze further during my field trips to equestrian centers and schools.

I used the field trips to gather practical data and information from the staff and the users of the schools. I asked questions about what worked and what did not work at their school, both from their perspective and the perspective of the animals.

Combining theoretical and practical research helped me to understand the needs and practices of a riding school.



## 07. Reflections

*How can an equestrian center, in a peri-urban Swedish context, be designed to enable horses to perform their natural behaviors while still meeting the needs of the users?*

The loose housing concept is currently the best for horse welfare. For the staff, the system can result in some tasks being made easier, for example feeding, other tasks can be trickier to do, such as mucking. However, by implementing mechanical solutions many of these problems can be solved. In that way the loose housing system can prove to be beneficial for both the staff and the horses.

The more land the school can provide for pasture the easier it is to achieve good welfare, especially if the land in question is of a varied nature with both fields, forest and water elements. This can be difficult to provide in an urban location where free land is sparse and expensive. In such locations, like the site in Balltorp, it is therefore important to plan the pasture and the placement of feed stations, drink stations and sheds to maximize the movement of the horses, thereby making the area appear larger than it is.

Another important factor is the ground preparation. When many horses share the same space, the ground often turns to mud due to the many tramps of hooves. It is easy to simply turn the entire pastures into gravel paddocks to avoid this problem, but a mixed environment with grass is better for the horses. Instead, the especially sensitive areas are around the sheds, the feed and drink stations, should be made of a hard ground material.

Safety issues for horses during the night is another problem for riding schools close to the city with loose housing. In this case, the building volumes can be used as protection and to form a smaller paddock for nighttime use. This way the horses can remain outside during the night instead of having to spend the night in their boxes. When it comes to the students, it is important to create safe and calm stables with a good overview to reduce potential injuries. Providing space where the horses can be prepared outside of in a separate space is also valuable, as it can make the preparation of the horses easier to manage.

The riding school is also an important place for young people and functions as a place to foster good ethics, social skills and leadership. To enhance this, providing social and learning spaces is key.

To avoid injuries, the flows within the equestrian center needs to be separated between humans and horses. This is especially true for the visitor flow. The visitors are often not as experienced with horses which may lead to injuries if acting carelessly as well as creating additional stress for the horses. It is also a good idea to separate the flows for machinery and humans.

## reflections.

From the research I learnt the importance of avoiding stressful environments and to enable the horses to choose what type of space they need and when they need it. The materials gathered during the first phase was therefore used to develop design strategies and to turn the theory of horse ethology into spatial elements which could be used design a more versatile environment for horses. To study what type of environments horses prefer, I looked at the natural habitat of horses and how one, through architectural elements, can design corresponding spaces for their needs.

In the design proposal, these elements were implemented into the paddocks and loose housing, both as natural elements (trees, hills, water, etc.) and as architectural elements (sheds, feed stations etc.). Due to a lack of time, I was unable to develop this as far as I had intended to. I believe there is much potential in this way of working, which could be of help for others working with the development of equestrian spaces. The collection of spaces could be expanded with more

fully designed elements and turn into a catalogue of spaces from with the designer can choose spaces to include in the design.

The area that could be used for pasture was a bit too small. While a riding school of 80 horses could be placed on the 1.5ha available, I believe that it would be better at maybe 40 horses. That way it would improve the welfare and limit the damage to the ground, while still being able to have many students and rides. The different building phases of the design partly takes care of this problem.

One thing that I found difficult was the relationship between the "natural" design strategies for horses and the strict dimensions of the equestrian facilities such as the arenas. These large volumes had me stuck in a quite orthogonal mode, which limited the design. In a future project I would like to work in a less strict way and see if it is possible to create new typologies. Perhaps these types of typologies could also make horse welfare easier to achieve.

## 08.

# references.

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