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Department of Architecture

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Dedication

This research is dedicated to:

The sake of Allah, my Creator and my Master,

My great teacher and messenger, Mohammed (May Allah bless and grant him),
who taught us the purpose of life,

My homeland Palestine,

My teacher Dr. Eman Al-Amad,

My great parents, who never stop giving of themselves in countless ways,

To all my family, the symbol of love and giving,

My friends who encourage and support me,

All the people in my life who supported me,

And to me ,

Without whom this book would not have been possible

I dedicate this research.

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Chapter One

Abstract

Abstract

Equestrian sport is an important and respectful sport where the knight learns the power of personality, determination and respect. Omar ibn al-Khattab may Allah be pleased with him said (Teach your children swimming, archery and riding).

Equestrian for Arabs:

The art of horse riding, which is not limited to the skill of the knight in the stability on horseback, but include another aspect significantly. This aspect of equestrian spirit carries this concept of values and morality. Equestrian is a natural aspect of Arab life since its inception. As a result of natural, social and economic conditions, and of the challenge of others, Equestrian took a means to meet these challenges.

The lack of interest of Palestine in creating projects for horse racing starts from the fact that the last official field of horse racing is the Roman field in the city of Nablus. This obvious lack of interest has continued to the present and this has clearly affected the culture of new generations and led to ignorance about the issue of horses and sport races, even though there is some new centers that initiated the revival of this sport, but it seem to be marginalized and unknown to people and that's because of the lack of culture and direct attention to this sport.

And because the new centers do not really give this sport its right, or the possibilities in our country do not allow for the expansion of this sport and professionalism, there was a need for a project that revives this sector and seeks to raise people's awareness about it, a project that includes an equestrian school, a racing course which will be the first and biggest course in Palestine, in addition To all specialized services in this field. This is a large scale project that will be the first in Palestine.

Chapter two

Design standards

2.0 Equestrian center

2.1 Equestrian school :

2.1.1 Indoor dressage arena (riding hall) :

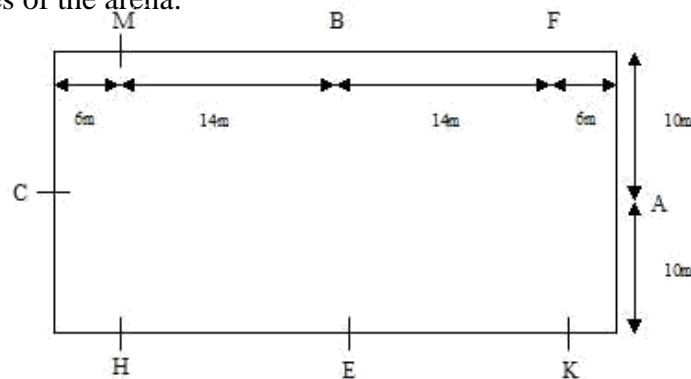
The arena is the playing field, for the sport of Dressage. There are two sizes of arenas: small and standard. Each has letters assigned to positions around the arena for dressage tests to specify where movements are to be performed. Cones with letters on them are positioned on the sidelines of the arena for reference as to where a movement is to be performed.



ch.2 figure1 :indoor dressage arena

Small Dressage Arena:

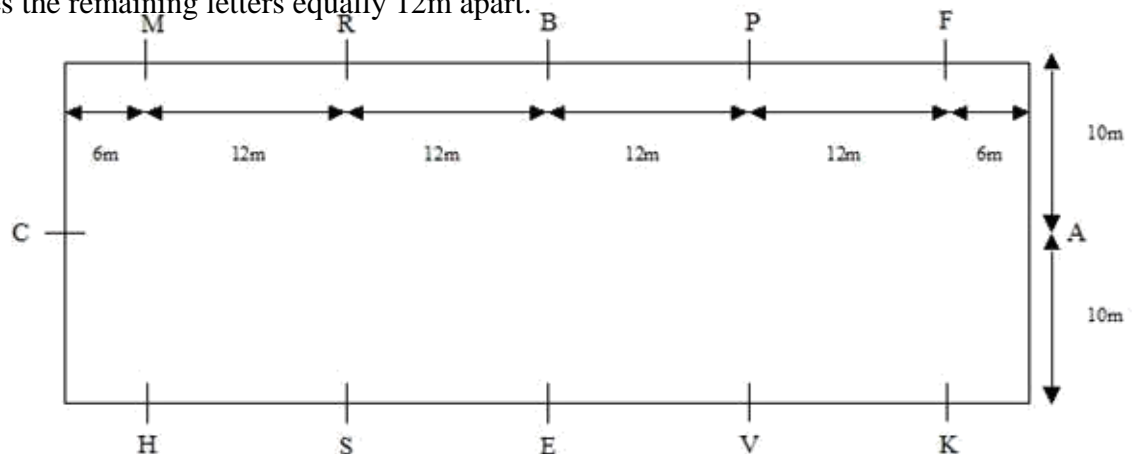
The short dressage arena measures 20m x 40m and is rarely used in the sport of dressage today. While the small arena is used for primarily for training purposes, it can also be used for Introductory level dressage tests. The short dressage arena layout is outlined in Figure 1 above. The letters used in the small dressage arena are placed as follows: F, K, M, and H are 6m from the ends of the arena, B and E are placed 14m apart from the remaining letters and A and C are placed 10m from the sides of the arena.



ch.2 figure2 :short dressage arena

Standard Dressage Arena:

The standard – or long – dressage arena measures 20m x 60m .This arena is used for all dressage testing above the Introductory level. In addition to the letters found in the short arena, the standard dressage arena adds the letters R, S, V and P as shown in Figure 2 above. The standard dressage arena maintains the 6m spacing from the ends of the arena to the first letter; however, it spaces the remaining letters equally 12m apart.



ch.2 figure3 :standard dressage arena

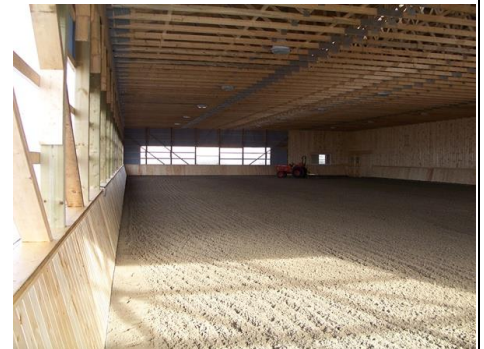
While the two main dressage arenas differ in size, they have many similarities. Both arenas have a centerline and the very center of the arena is “X”. A judge is placed at C with a second judge, when present, placed at E or B during the tests. In addition, each arena can be segmented by 20 meter circles, quarter lines, short diagonals and long diagonals. Letter placement is generally 1/2 a meter back from the perimeter of the arena. The variety of letters are used during a dressage test or riding lesson to instruct the rider where to perform different movements.

Design Considerations:

1-Structure Types:

Wood post frame :

Wood post frame buildings offer design flexibility. Windows and doors let in natural light, and the roof and walls can be insulated. Wood framed arenas are limited in the maximum width, which is approximately 28m(90 feet).



ch.2 figure4 :wood post frame structure

Steel frame:

Steel frame buildings can go to spans to 60 meter or more, and their open style cathedral-like ceilings are appealing. The roof and walls of can be insulated for more comfortable winter riding. The main advantage with steel frame buildings is that you can go to bigger spans, 30m to 60m (100 to 200 feet) wide, or bigger if desired.



ch.2 figure5 :steel frame structure

Fabric covered:

These buildings consist of a steel frame with a translucent fabric roof, most commonly made from polyethylene. One of the main advantages with these types of buildings is the amount of natural light they let in .



ch.2 figure6 :fabric covering structure

2-flooring material :

Unfortunately, there are no universal recommendations for the perfect riding surface or footing material. A “perfect” riding surface should be cushioned to minimize concussion on horse legs, firm enough to provide traction, not too slick, not too dusty, not overly abrasive to horse hooves, freeze-proof during cold weather, inexpensive to obtain, and easy to maintain. The intended use of the arena for jumping, reining, or driving, for example, also influences footing material attributes such as traction or depth of loose material. **COMMON FOOTING MATERIALS:** Sand , Stone dust , Wood Products , Rubber.

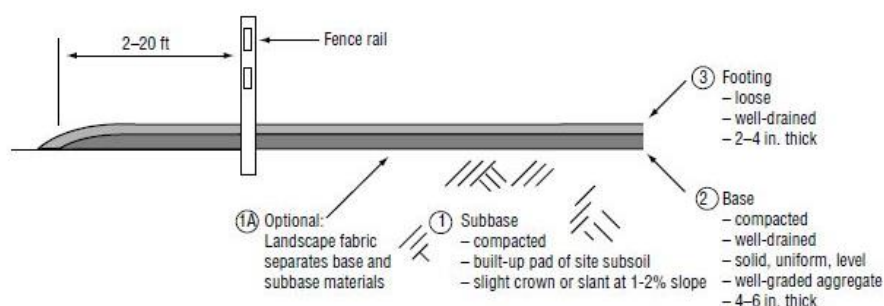


Figure 17.1. The footing material is only the top layer of riding arena construction and is dependent upon the support of a suitable base and subbase.

ch.2 figure7 :arena footing material

3-Building Location:

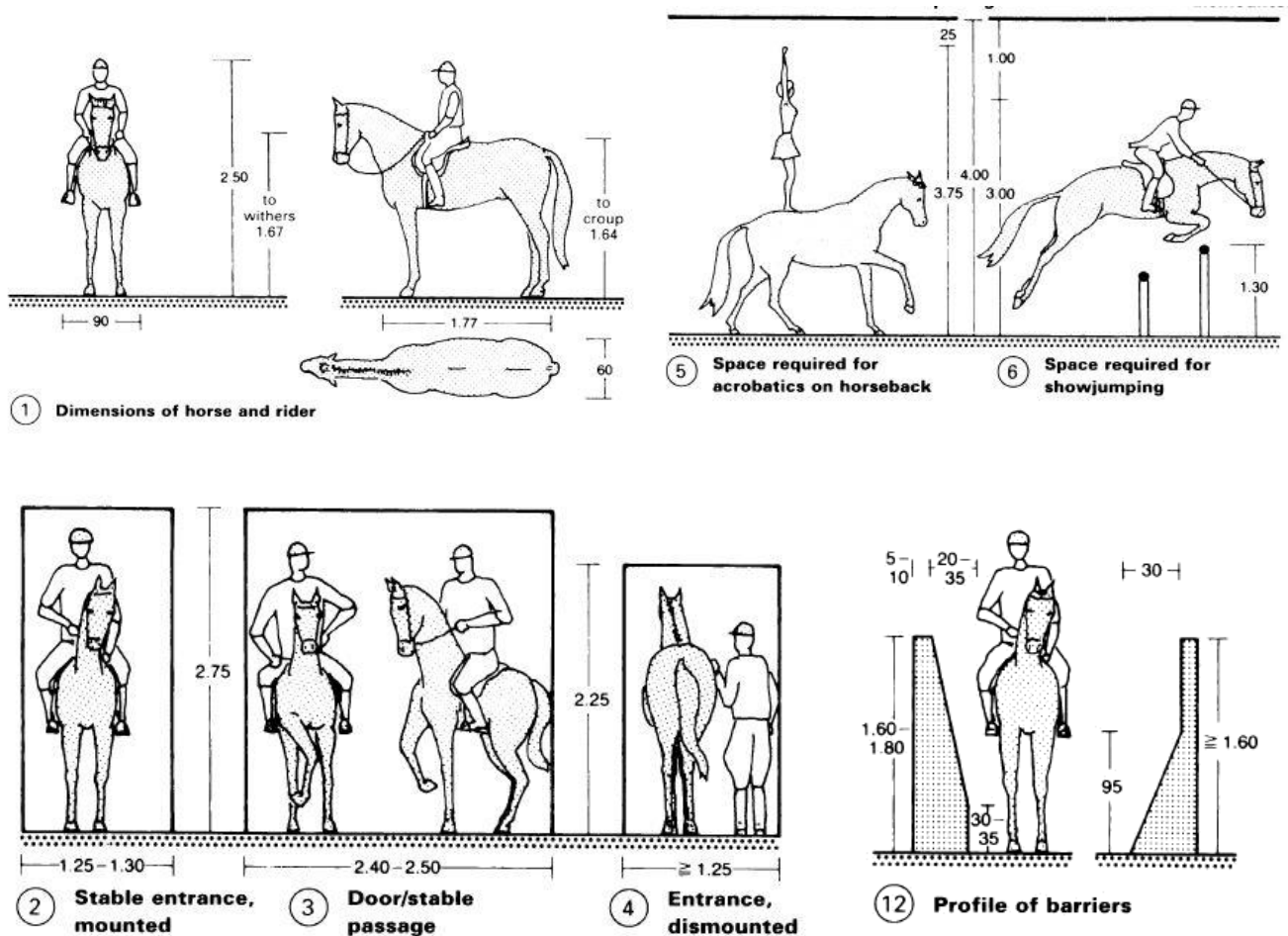
Many people prefer to have an arena attached to the stable, rather than in a separate location. This arena by we cover is attached to the stable on one side. When sitting the building on the property, the base of the arena should be kept higher than the surrounding ground to prevent water from damaging your arena base.



ch.2 figure8 :arena location

4-Hight of the arena and dimensional standards :

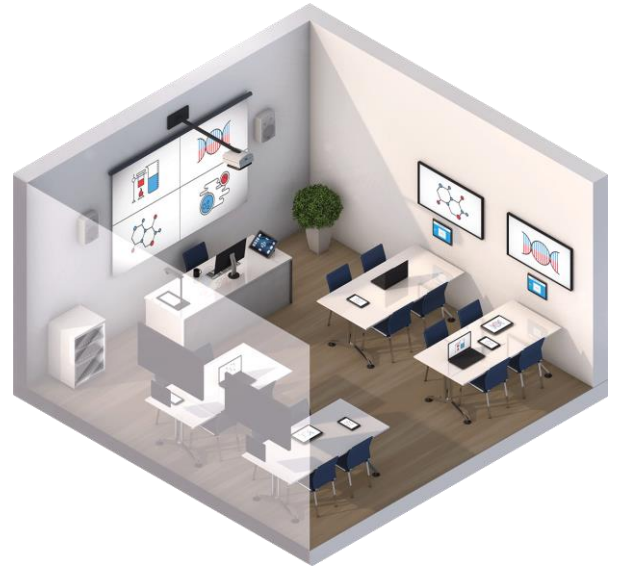
In riding arenas the minimum headroom is 4m.



ch.2 figure9 :dimensional standards

2.1.2 Teaching rooms :

lessons that don't take place on horseback occur in network wired interactive classrooms with views of the arena. Interactive learning sessions are held in the audio visual room which is well equipped with a LCD Projector and a large screen, a wide screen television, DVD players, a scanner, and CDs and DVDs on different subjects for different classes. With area of 35-40 m² per 15 students



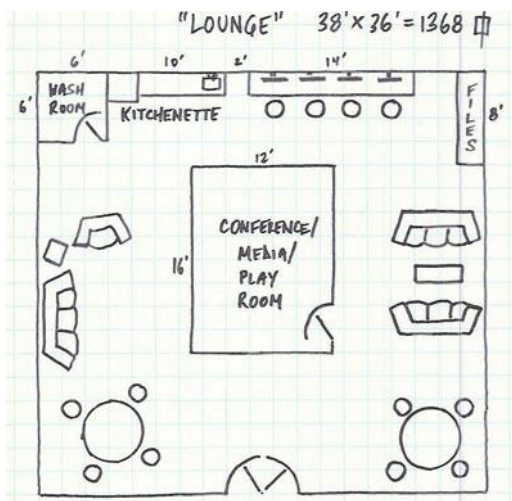
ch.2 figure10 :teaching room layout

2.1.3 Administration Area :

It's the organizational and instructional leadership and interactional area in any building with a minimum area as 25 m², and when having secretary maximum area as 50 m² and meeting room with a minimum area as 50 m². An extra staff offices with area as 50 m² per 5 people . With total area of 150 m². The office of the manager should be positioned to command good supervision over riders passing in and out of the yard must be allowed for.

2.1.4 riders lounge:

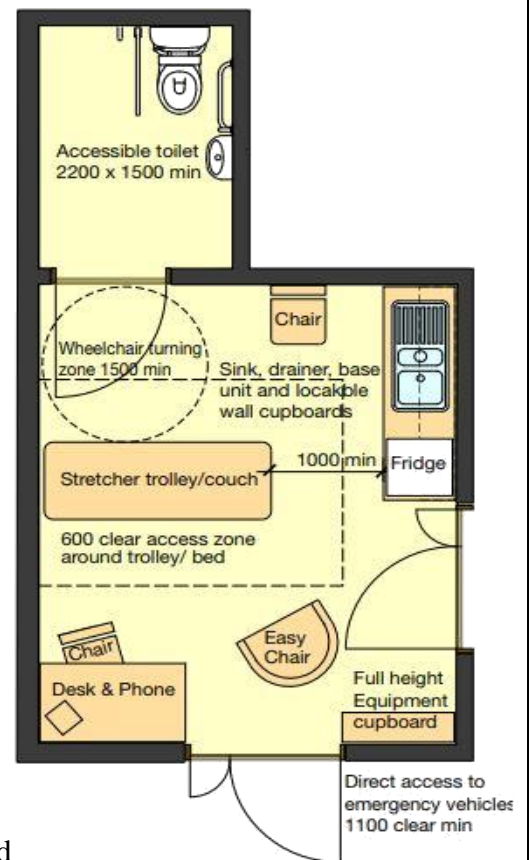
it's basically a resting area for the riders and a supervision area for the parents offering an overview to the arena. Air conditioned with comfortable seating, toilets, kitchenette , games and TV screens. With area of 70-100 m² .



ch.2 figure11 : riders lounge layout

2.1.5 First aid / physiotherapy room:

containing a sink , a secure first aid cabinet and access for a stretcher. A clear space of 2.0 x 1.6 m is recommended as a minimum. A supply of drinking water should be available and there should be an adjacent WC compartment with a hand basin.



ch.2 figure12 :first aid room layout

2.1.6 Services:

1-changing rooms :

The need to accommodate varying ratios of males/females with buffer or individual changing units is required. Changing areas need to be fully accessible for disabled users. Have entrances that screen off views from circulation areas. The design should allow a minimum of 1.6 m² per person with a 0.5 m bench run for an accessible open group changing area and shower areas.

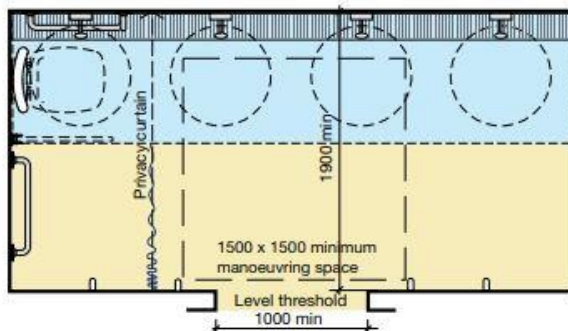
2-lockers :

The decision on the location of lockers is often dependant on the local situation and user profile. Lockers in the main corridor can be easily supervised by staff and might help to deter vandalism, whilst lockers in the changing room are more convenient for users. In many centers a mixture of both are provided.

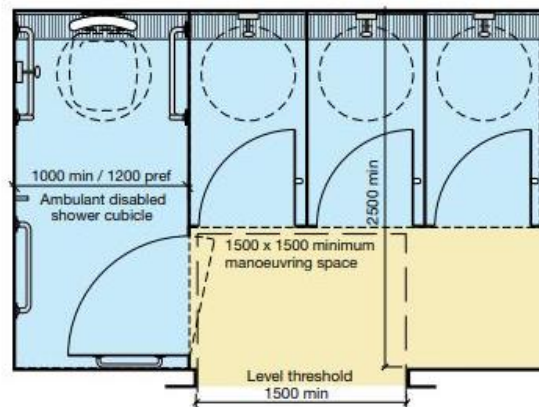
3-showers :

Allow one shower point to every six changing spaces. Provide a separate dry off area and include a proportion of cubicle showers.

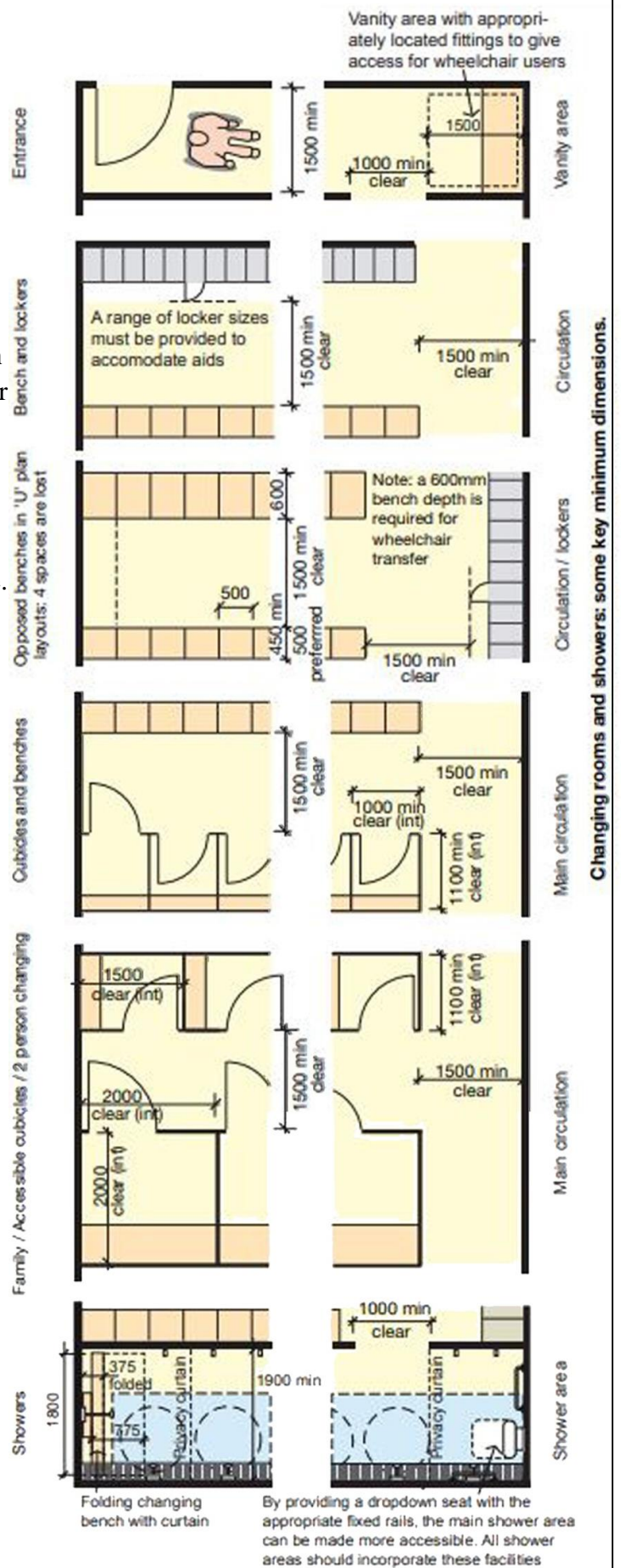
Two types: 1-open shower:



2-Cubicle shower:



ch.2 figure13 : showers layout

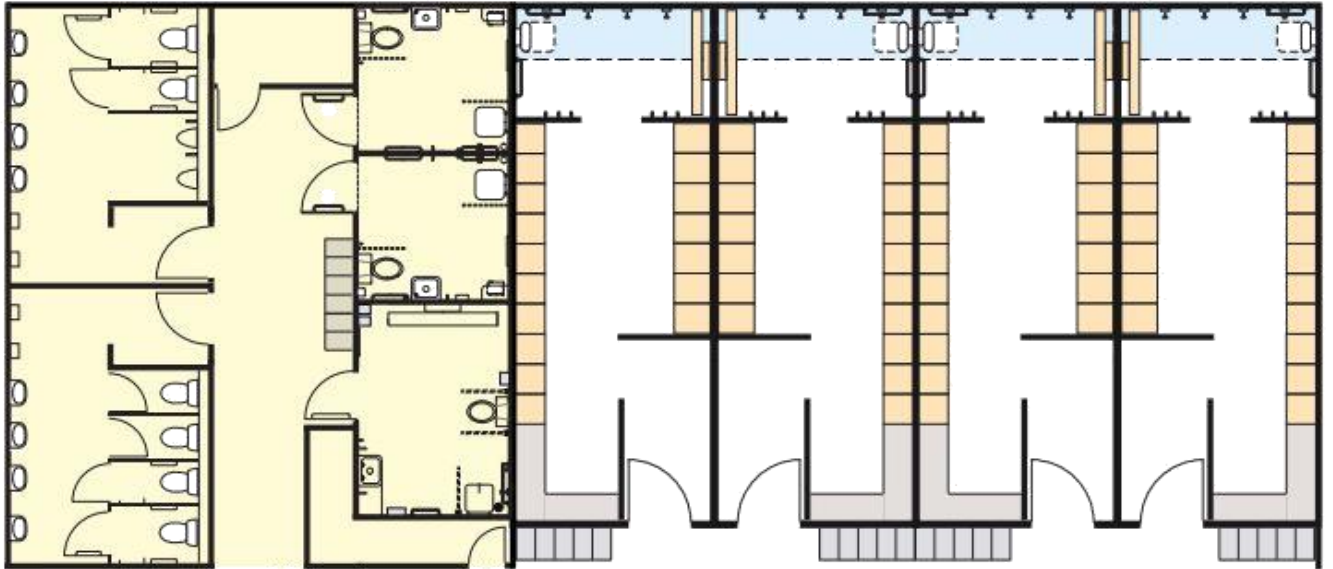


ch.2 figure14 :changing room - lockers layout

4-w.c :

W.c units need to be fully accessible for disabled users. And located near changing units.

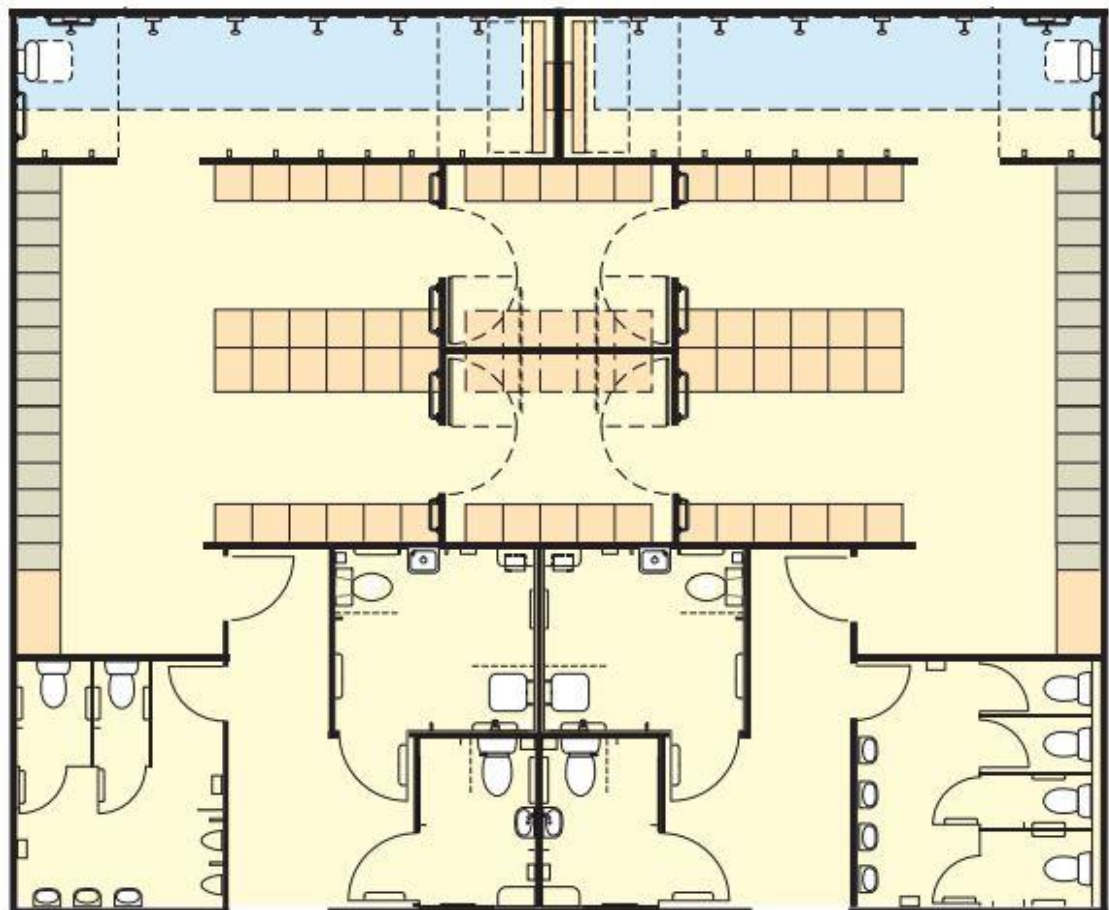
Individual units allocated as required to provide flexibility. Each unit can incorporate toilets if the centre's main facilities are not adjacent.



ch.2 figure15 : w.c layout and location 1

An arrangement of similar capacity incorporating lockable buffer rooms for flexibility.

Generally, this is the more economical approach in terms of overall floor area and is more easily supervised.



ch.2 figure16 : w.c layout and location 2

Table1 : horse stalls diminsions

	floor area (m ²)	box size (m)	box height (m)
riding horses	10.00 12.00	3.30 × 3.30 3.50 × 3.50	2.60-2.80
dam and stallion	12.00 16.00	3.50 × 3.50 4.00 × 4.00	2.60-2.80
small horse (W ≤ 1.30 m)	4.00 5.00	2.00 × 2.00 2.25 × 2.25	1.50
small horse (W > 1.30 m)	6.00 9.00	2.45 × 2.45 3.00 × 3.00	1.50-2.00

W = height of horse at the withers

2.2 Stable barn:

2.2.1 horse stalls:

1)Types of horse stalls :

tie (standing) stalls for farm horses the minimum measurements are 1,5 meters wide and 2,4 meters long.

box (loose) stalls for riding horses the minimum measurements of the stall should be at least 3×3 to 3,5×3,5 meters.

The stall should be wide enough so the horse can lie down comfortably.

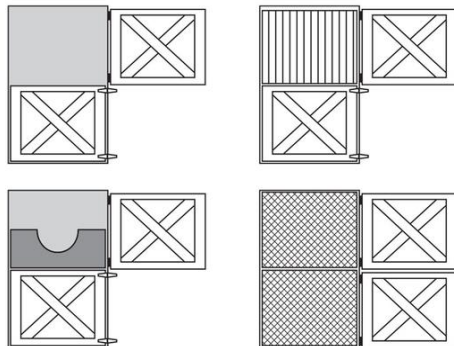
2) Width of aisles:

The aisles between stalls should be at least 2.5 meters wide to turn a horse safely.

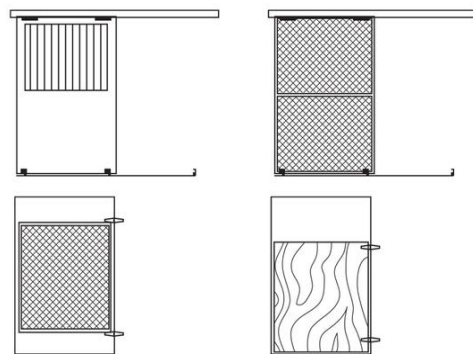
3) Doors of the stable:

for the horse stalls it can be either sliding or swinging doors . The criterions for the doors are that they should be at least 1.2 meters wide.

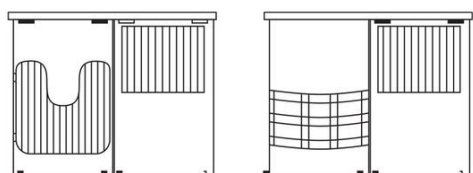
Exterior Stall Doors



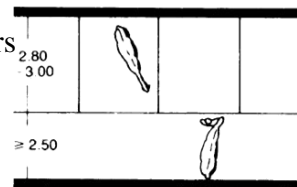
Interior Aisle Stall Doors



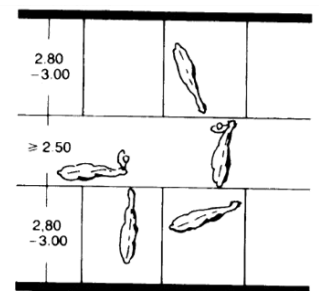
Interior Stall Doors with Safety Gate



⑪ Dimensions of horse boxes

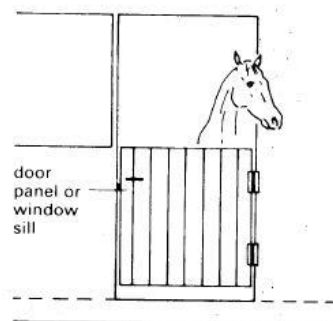


④ Single-row box stable

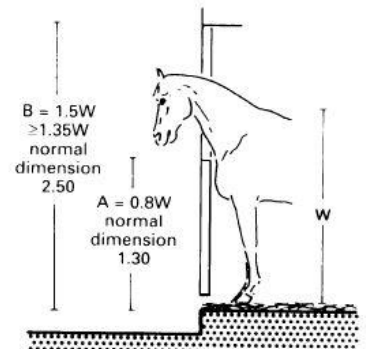


⑤ Twin-row box stable

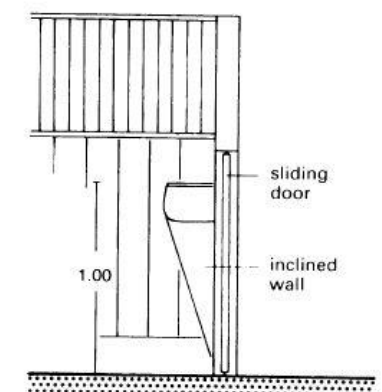
ch.2 figure17 : barn aisle width



⑥ Dimensions of stable doors



⑦ Drinking bowl

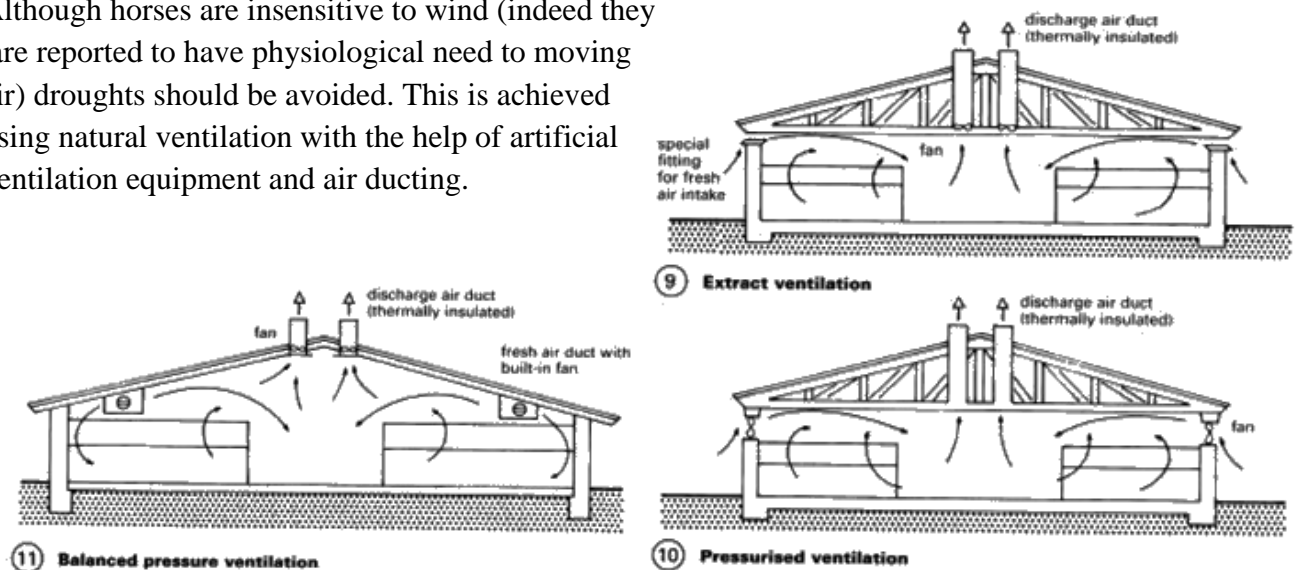


⑧ Trough height

ch.2 figure18 : stall dimensional standards

4) Ventilation:

Although horses are insensitive to wind (indeed they are reported to have physiological need to moving air) draughts should be avoided. This is achieved using natural ventilation with the help of artificial ventilation equipment and air ducting.



ch.2 figure20 :barn ventilation system

5) Wiring and lighting:

the lighting and wiring of horse stables should be made safe for the horses. Lighting should be placed so that there is a minimum of dark areas. Light bulbs and switches should be placed out of reach from the horses and the bulbs should also be surrounded with safety cages. All plug-ins should be moisture and rodent proof.

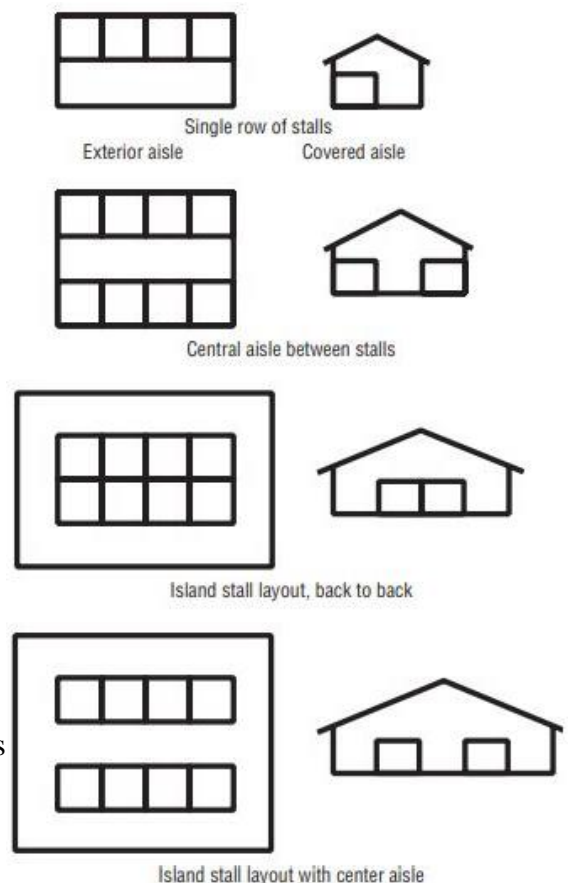
6) Stall layout options :

On the basis of stall and work aisle locations, horse stable floor plans are usually identified as single row, center aisle, or island design.

The single-row configuration is attractive and minimizes enclosed space compared with the other two options. Horses are closer to their natural environment, so each horse can have a desirable position within the stable. The handler has less protection from weather unless the aisle is partially enclosed.

The central aisle floor plan makes efficient use of interior space, with one work aisle serving two rows of stalls. It provides occupants protection from the outside elements. The central aisle configuration can also be designed to provide each stall with a door to the outside.

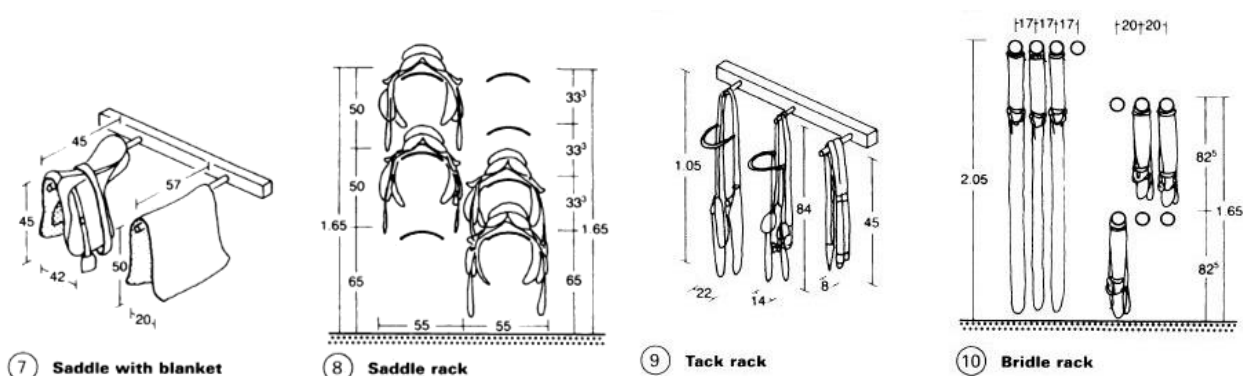
In the island floor plan, the aisle can be used to cool horses or, if the ceilings are high enough, to exercise animals.



ch.2 figure21 :stall layout options

2.2.2 Saddle room :

It's a room used to store saddles, tacks and bridles. The area of this room depends on the capacity of horses.



ch.2 figure22 :saddle room equipment storage dimensions

2.2.3 Grooming station :

"A grooming station is of similar dimension to a box stall outfitted with cross-ties for securing the horse. The horse typically faces the open side to the stable aisle. A strong rail can separate adjoining grooming stations. Grooming stations are located near the tack room for convenience because tack is not kept in the grooming station. Flooring may be of any material suitable for horse stalls, with an emphasis on being easily cleanable and durable. Concrete, asphalt, and rubber mats over packed stone dust are common grooming station floor materials. Provide electric convenience outlets on sidewall and posts supporting divider rails between grooming stations. Outlets near the front end of the horse are needed for clippers. When wet floors are anticipated because of light washing or the grooming station doubling as a wash stall, the electric outlets need ground-fault interruption (GFI) for safety against electrical shock. "

(Eileen Fabian Wheeler,2006,203)



ch.2 figure23 : grooming room

2.2.4 Washing room :

"A dedicated horse bathing area is included in many stables where show and competitive horses are kept. A dedicated wash stall is most common, but in smaller stables a simple area may be designated and outfitted with water and drainage to handle horse bathing. Cross-ties are used to keep the horse securely but safely centered in the wash area. A durable and no slippery floor is essential for safety. Any electrical outlets in the area need to be GFI (ground fault interrupted) outfitted to reduce the chance of electrical shock.

One wash stall per 20 horses expected to use it is a good starting point for a typical boarding stable. For training facilities with almost daily horse bathing, the number of wash stalls can be doubled. Sometimes, grooming stations and wash stalls are combined for more efficient use of space." (Eileen Fabian Wheeler,2006,204)



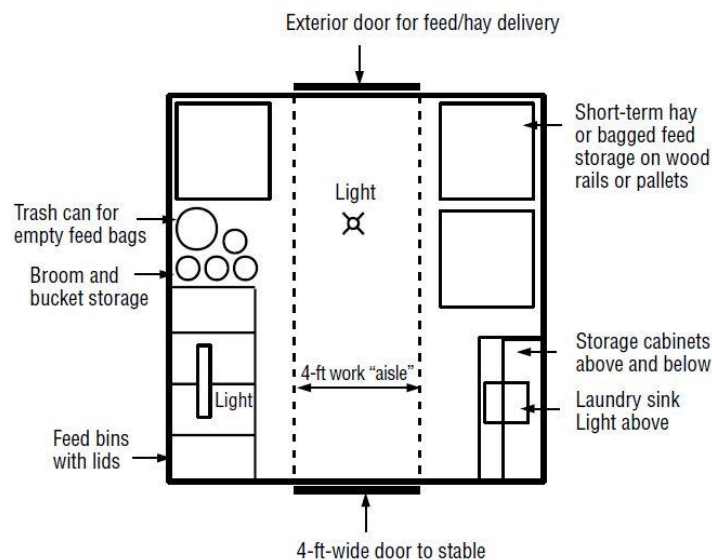
ch.2 figure24 : washing room

2.2.5 Feed room :

Feed room construction in many ways concentrates on exclusion. Exclusion of rodents and loose horses is essential. Features inside the feed room will make it easy to prepare and deliver feed to horses within the stable. In all but the largest stables, horse feed is handled in bags. Large stables employ exterior feed bins.

Size and Location

Typical size for the feed room in many moderate sized stables is the equivalent of one horse stall. The room may be used for short-term storage of hay in addition to feed. A 4-foot-(1.2 m) wide door offers room for a wheelbarrow carrying feed buckets to pass comfortably; a 5- to 6-(1.5-1.8 m) foot door is even better for handling hay bales comfortably or for delivery of a pallet of feed bags. A door in the middle of the feed room wall allows for storage space on both sides of a central working area in the feed room (Fig. 25). The room may be heated to maintain feed materials above freezing and for worker comfort with in floor radiant, overhead radiant, or space heating.



ch.2 figure25 : feed room layout

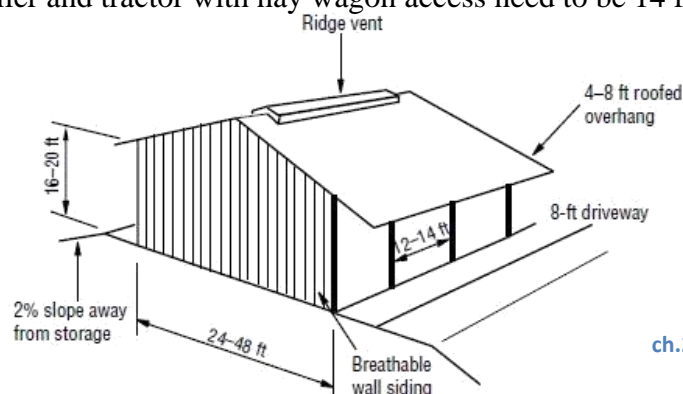
Figure 13.1. Features of centrally located feed room providing a central work aisle.

2.2.6 Feed storage:

1-Long-Term Storage

DIMENSIONS AND STORAGE SPACE

Provide the long-term hay and bedding storage building with a 16- to 20foot-(4.8-6 m) sidewall height and storage bays of 12- to 14-foot-(3.6-4.2 m) width between support posts . Building width typically varies from 24 to 48 feet-(7.3-14.6 m). Doors or overhangs that allow semi-truck-trailer and tractor with hay wagon access need to be 14 feet-(4.2m) high.



ch.2 figure26 : storage shed dimensions

LAYOUT

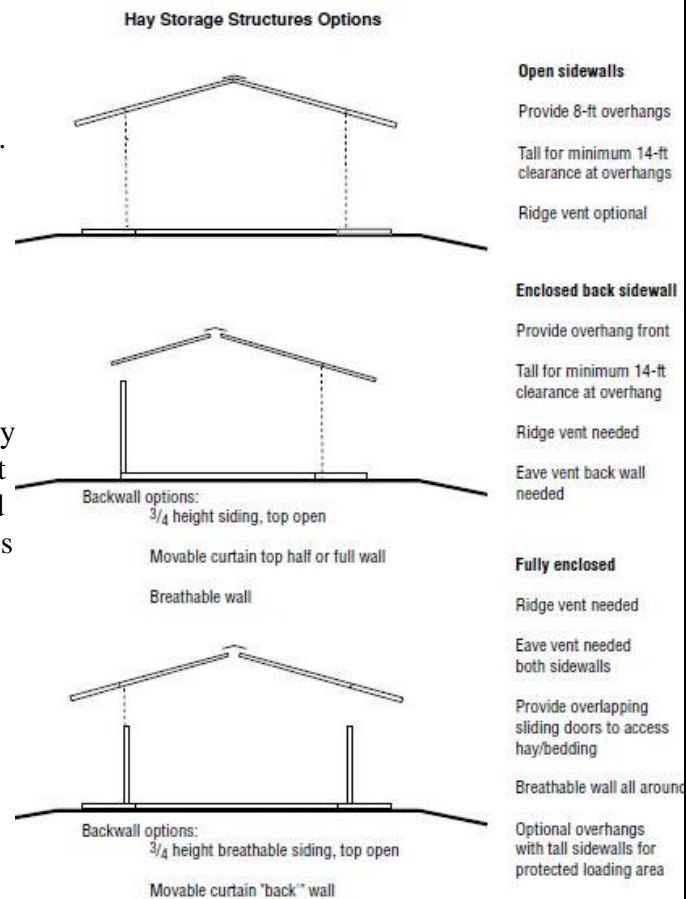
A hay and baled bedding storage building can be a simple roofed structure with or without solid walls. With no walls, ventilation is assured but at the risk of precipitation contacting the outer layers of stacked hay. A more common version of the open-sided storage is to enclose the end walls and keep sidewalls open. Figure 27 shows three storage layout options including: open sidewalls, three-sided with one open sidewall, and fully enclosed. Long eave overhangs are recommended particularly along any open sidewall to provide a buffer against rain and snow entry and to discharge rainwater and snowmelt away from the building. Long overhangs also provide a sheltered loading area to protect workers and hay being moved to the stable. The roofed structure without sidewalls is sufficient in arid climates and with proper design can work in temperate climates.

LOCATION

Make sure the base of the structure, where hay is stacked, is about 12 inches (30 cm) above surrounding grade. The structure will need at least one driveway with access for incoming loads of hay and daily or weekly removal for feed and bedding use. Large tractor trailers are best handled with a drive-through configuration that eliminates the need for backing. Provide a driveway capable of supporting their weight. Hay storage with ability to load and unload from either side needs a driveway on both sides. Locate the hay storage at least 75 (22 m) feet away from other buildings. This will minimize fire spread from sparks, allow access by fire trucks.

2-Short-Term Storage in Stable

"Provide short-term storage for up to a week's worth of hay in the stable when a long-term storage is used. Hay is easily stored in an open alcove area off the main work aisle (Fig. 28). Locate the storage for convenient delivery of hay coming from the long-term storage and convenient delivery to the stabled horses. Up to 100 square feet (9.5 m²) of space may be allocated to short-term storage in order to keep a convenient yet modest amount of flammable material in the stable. Short-term bedding storage may be added to the hay area. Locate tools nearby for handling hay and bedding. In large stables a centralized location is more convenient for daily feeding, with short trips back and forth between the farthest stalls and the hay supply. Short-term storage may be located in the feed room to combine grain and concentrate and forage feeding trips to horse stalls. Whether in the feed room or its own centralized area, provide wide access door (4 to 6 feet) (1.2-1.8 m) to the exterior to easily transfer hay from long- to short-term storage.



ch.2 figure27 : hay storage structures options



Figure 13.4. Short-term hay storage in the stable with easy access for weekly deliveries from long-term storage and feeding of stabled horses.

ch.2 figure28 : short-term hay storage

2.2.7 Sick Box:

"At least one sick box is essential in large establishments and it is obviously of great advantage to include one in the plans of even small stables . In the main it is intended for the accommodation of an animal suffering from an infectious disease and therefore requiring to be isolated from other horses . It may in fact be used by any horse needing quiet and possibly specialized treatment. The box should be placed well away from the stables but, as a sick animal requires to be visited more often than a healthy one, the position must be related to the convenience of those in charge of him. If possible, place it in such a position that although isolated the horse can see the other horses . Remember that horses are gregarious animals, so the patient will be happier and probably make a quicker recovery if he does not feel completely isolated from the world. The box should be bigger than the usual box by about 50 percent."(McGraw Hill, 1983,1256)

2.2.8 Tool and machinery storage :

Keep tools convenient to daily cleaning routines, with hanging storage for rakes, brooms, shovels, and forks. This keeps them tidy, in a set location, and up out of foot traffic and thus less prone to being knocked over (Fig. 30). A storage location near the stable's feed-tack working areas is typical. An additional set of tools and a manure collection bucket are often positioned near an indoor riding arena entrance to aid in picking up manure deposited on the arena footing. A small alcove of tool and small equipment storage off the main work aisle is useful (Fig. 30).

A separating wall with a 4- to 6-foot(1.2-1.8m)wide doorway is an option. Provide a 6- 8-foot(1.8-2.4m)wide nook with one wall of hanging tools, room for the wheelbarrow (or similar), and perhaps the all-terrain vehicle. Cabinets and shelves can be hung for storing smaller items. Mechanized equipment is often needed for material movement for stall cleaning and feeding activities. Providing covered storage will prolong the useful life for equipment, such as tractors, implements, and all-terrain vehicles, than leaving them exposed to the weather (Fig. 29). A simple three-sided shed is sufficient for the larger equipment. A 14-foot clearance will accommodate large-scale horse farm equipment; a 10- to 12-foot (3-3.6 m)clearance will suffice for small farm implements. Provide 12- 14 -feet (3.6-4.2 m)wide bays for each tractor or implement needing storage. This storage may be added as a large roof extension on an indoor arena construction or as a separate structure."(Eileen Fabian Wheeler,2006,201-203)



Figure 13.16. A building separate from the horse stable can serve a dual function on a small farm in storing hay and bedding and farm machinery when not in use.

ch.2 figure29 : machinery storage



Figure 13.14. Keep hand tools for stall cleaning hanging in a handy location, often in the work aisle of the stable near the centralized work area.



Figure 13.15. Tools and small equipment can be stored in an alcove off the main work aisle to keep the stable's main work aisle uncluttered with items used every day.

ch.2 figure30 : tools storage

2.2.9 Suitable exercise area:

Corrals and paddocks need safe, durable, and attractive fence material on sturdy posts (Fig. 31). Provide adequate space in paddocks and access lanes. An efficient traffic plan reduces labor for turning out and bringing in horses. Consider fencing the entire farmstead so loose horses cannot leave the property in conditions where loose horses are particularly undesirable.



Figure 2.11. A suitable area is needed for daily turnout or exercise of horses.

ch.2 figure31 :paddocks area

2.2.10 Office and staff Accommodation:

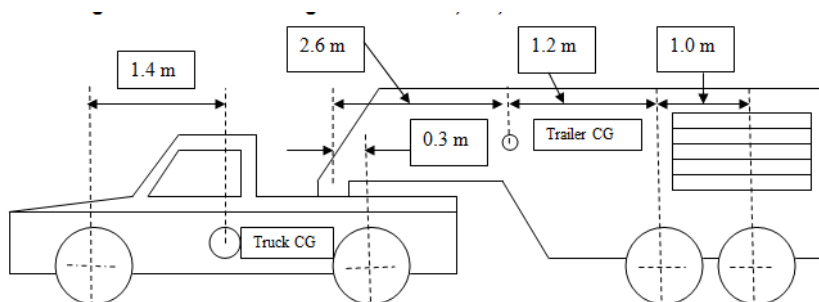
Large establishments will require an office for the manager. In most cases it will require to accommodate a desk, chairs, filing cabinets and stationery cupboard. A room of about 100 to 150 sq ft(9-14 m²) will be ample in most cases. The office should be positioned to command good supervision over the stable yard and over the delivery of goods. In riding schools supervision over riders passing in and out of the yard must be allowed for. In large establishments some permanent living-in staff are usually employed Lavatory accommodation will be required in most schemes. With minimum area of 40m².



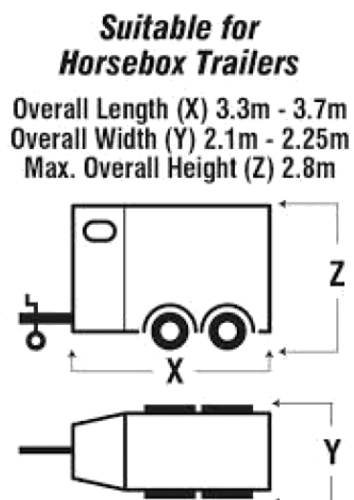
ch.2 figure32 : barn staff accommodation layout

2.2.11 Accommodation for Motor Boxes and Trailers:

Most small stables will require accommodation for one trailer and many will own their own motor box. Provision may be required for these vehicles, either by a completely enclosed building, or by an open sided shelter. Normal garage provision should be made, though large establishments with more than one motor box may require a workshop for a mechanic and an inspection pit. Often repairs will be carried out at the local garage. Ensure that there is adequate space for turning, for lowering ramps both side and rear, and for loading and unloading the horses. **a minimum width of 8 m**



ch.2 figure33 : horse trailer and truck dimensions



2.3 Sleeping areas - dorms :

In large establishments some permanent living-in staff are usually employed. Lavatory accommodation will be required in most schemes, and if the establishment is likely to be used by the public, provision should be made for both sexes. The larger riding schools may in addition require changing and shower rooms for use by their clients. Riding schools should have accommodation for both clients and staff convenient to the stables.

2.3.1 Sleeping rooms for riders (dormitory) :

Shared rooms or single rooms with grouped bathroom

General

- 1 . Room dimensions must accommodate :
 - a . Furniture sizes and design (wall mounted, freestanding)
 - b . Furniture use spaces
 - c . Combination of furniture items
- 2 . Room size (and shape) will affect two levels of possible room change :
 - a . Adaptability of furniture arrangements
 - b . Divisibility of spaces-physical or visual separation of activities

1-Room Areas

- 1 . Definition of terms used :
 - a . Minimum-access to furniture items overlap of items and use space some restriction in the use of furniture
 - b . Optimum-no overlap of items and use space
 - c . Generous-beginning of space divisibility

2 . Single Rooms

- a . Minimum recommended area-90 sq ft (**8.5 m²**)
- b . Optimum recommended area-110 sq ft (**10.5 m²**)
- c . Generous recommended area-120 sq ft (**11 m²**)

B Bed
D Desk
D₂ Desk 2'6" × 5'6"
W Wardrobe
SC Soft chair
BC Bookcase



Fig. 4 Diagrammatic arrangements rectangular rooms, single rooms.

ch.2 figure34 : single room layout

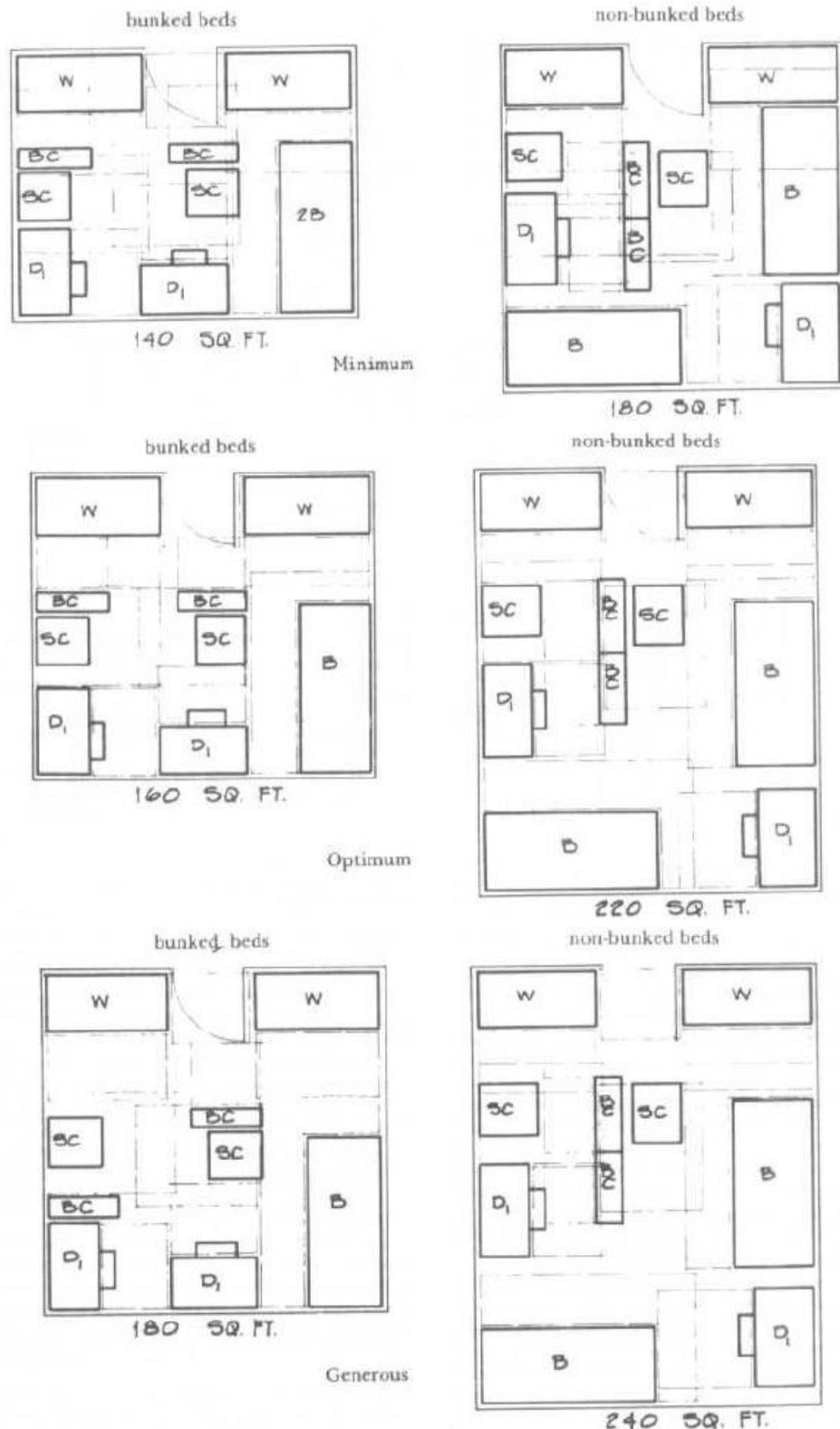
3 . Double rooms with bunked beds

- a . Minimum recommended area-140 sq ft (**13 m²**)
- b . Optimum recommended area-160 sq ft (**15 m²**)
- c . Generous recommended area-180 sq ft (**17m²**)

B	Bed
D	Desk
D ₂	Desk 2'6" × 5'6"
W	Wardrobe
SC	Soft chair
BC	Bookcase

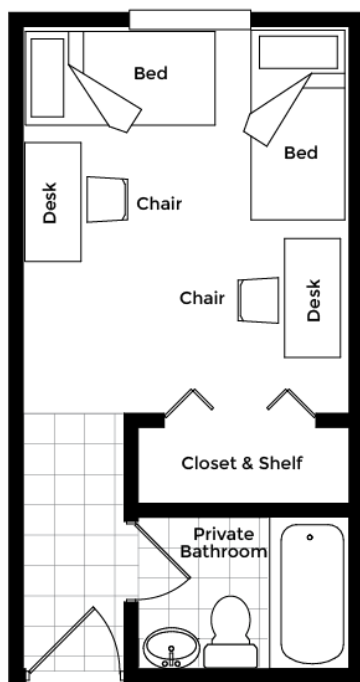
4 . Double rooms without bunked beds

- a . Minimum recommended area-180 sq ft (**17 m²**)
- b . Optimum recommended area-220 sq ft (**20.5 m²**)
- c . Generous recommended area-240 sq ft" (**22.5 m²**)

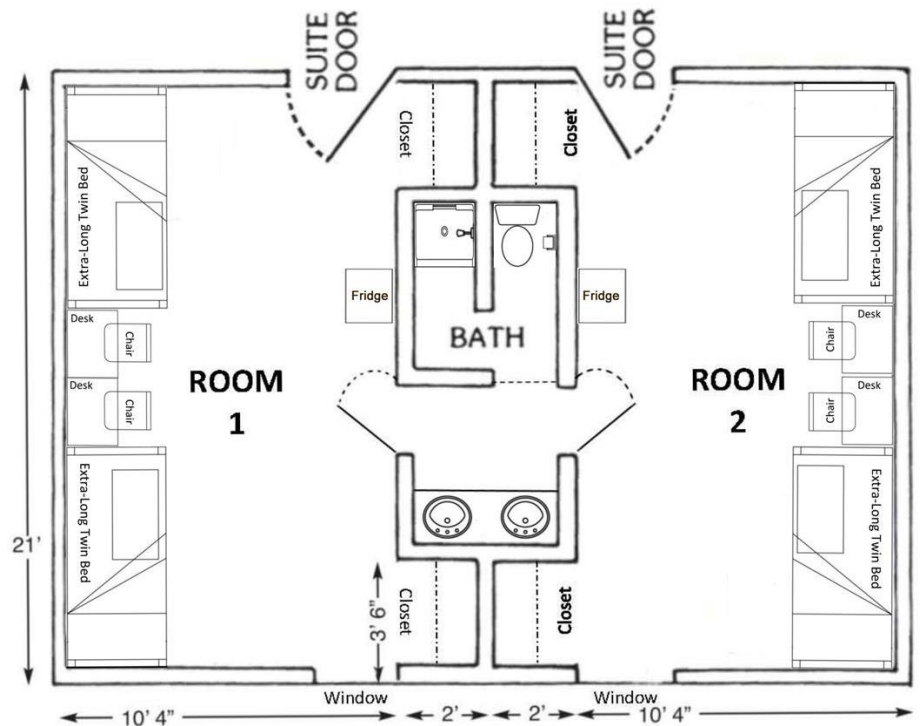


ch.2 figure35 : double room layout /with-out bunked beds

4 . rooms suite layout :



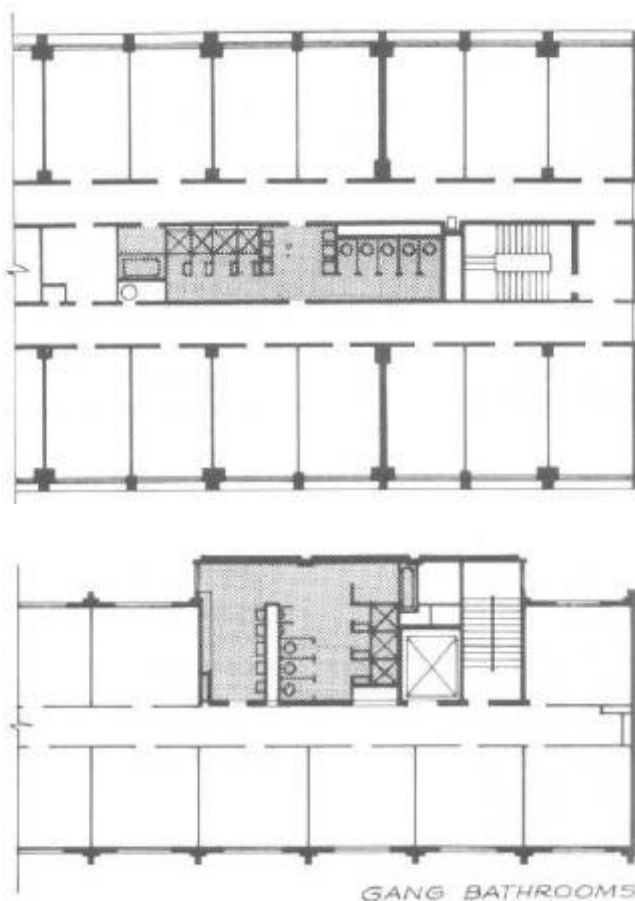
ch.2 figure37 : suite room



ch.2 figure36 : two suites one bathroom layout

2.3.2 Bathrooms :

The gang bath is one of the most persistent features of residence halls. Usually it's a compounded area of toilets and showers but can be separated in to two areas .



ch.2 figure38 : gang bathrooms location

Table2 : dorms minimum toilet requirements

TABLE 5 Schedule of Minimum Toilet Requirements

Boys' toilet				
No. of persons	W.C.	Urinals	Sinks	Showers
4	1	0	1	1
8	1	0	1	1
10	1	1	2	1
12	1	1	2	2
16	2	1	2	2
20	2	1	3	2
24	2	1	3	3
28	2	1	3	3
30	2	2	4	4
Girls' toilet				
No. of persons	W.C.	Urinals	Sinks	Showers
4	1		1	1
8	1		1	1
10	2		2	2
12	2		2	2
16	2		2	2
20	3		3	3
24	3		3	3
28	3		3	3
30	4		4	4

2.3.3 Common room:

The Common Room is a warm and welcoming place, a perfect blend of fun and function. It contains sitting areas TV, some games and maybe a vending machine as well.

Table3 : common room area

TABLE 1. Room area chart*

Number of people	Common room, min. sq ft	Dining and common room, min. sq ft
10	150	220
15	225	330
20	300	440
25	375	550
30	450	660
35	525	770
40	600	880

*These are minimum room sizes. More space is always desirable.



:common room39 ch.2 figure

2.3.4 Dining room:

Table4 : dining room area

TABLE 2 Dining room (only) room area chart*

Number of people	Area needed, min. sq ft	Window area, min. sq ft
8	100	8
10	120	10
12	144	12
16	192	16
20	240	20
24	288	23
28	336	27
30	360	29

*These are minimum room sizes. More space is always desirable.

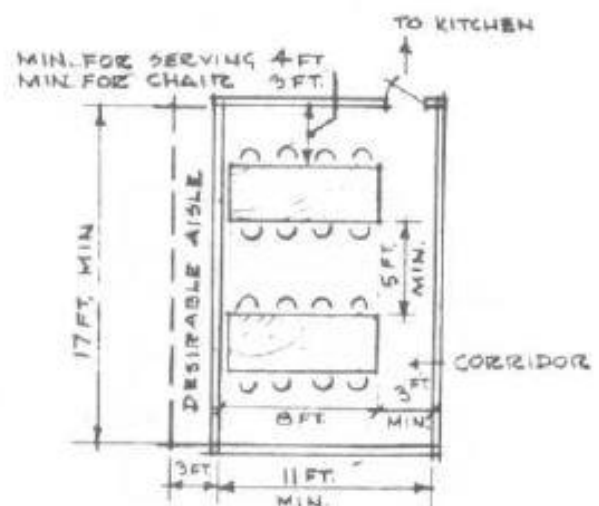


Fig. 4 Typical dining area for 16 people.

ch.2 figure40 : dining room layout

The common room and dining room may be combined in small hostels and provides a big, flexible space for recreation .

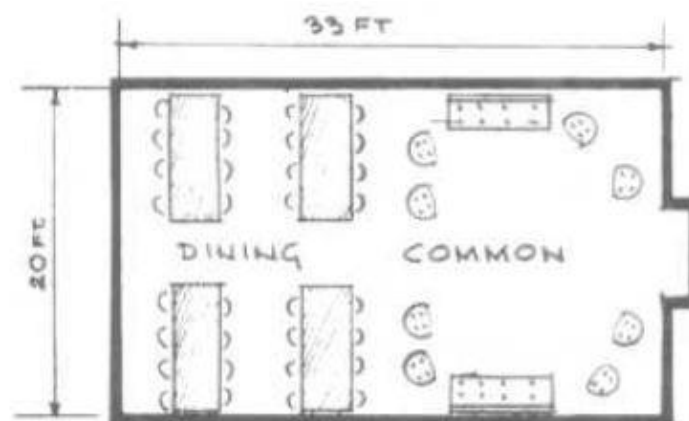


Fig. 3 Dining-common room. Typical layout for 30 people.

ch.2 figure41 : dining-common room

2.3.5 Kitchen:

the kitchen, located off the dining room. If possible, the kitchen should have direct outside access for ease of food and garbage transport.

Table5 : kitchen minimum fixture units

TABLE 3 Schedule of Kitchen Fixtures (Minimum)

Number of people	Sinks	Range burners	Retrig., 8 cu ft	Ovens
10	1	3	1	1
15	2	3	1	1
20	2	4	2	1
25	2	5	2	2
30	3	6	2	2
35	3	7	3	2
40	3	8	3	2

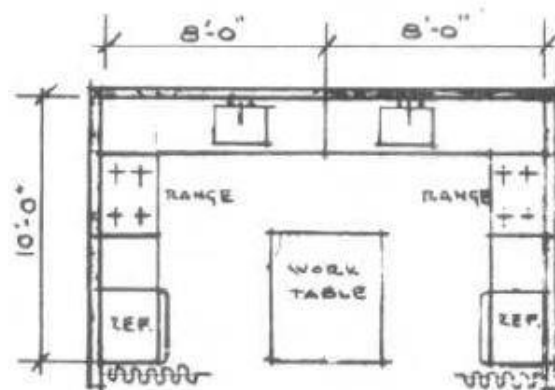


Fig. 7 Typical kitchen (feeds about 30 people).

ch.2 figure42 : kitchen layout

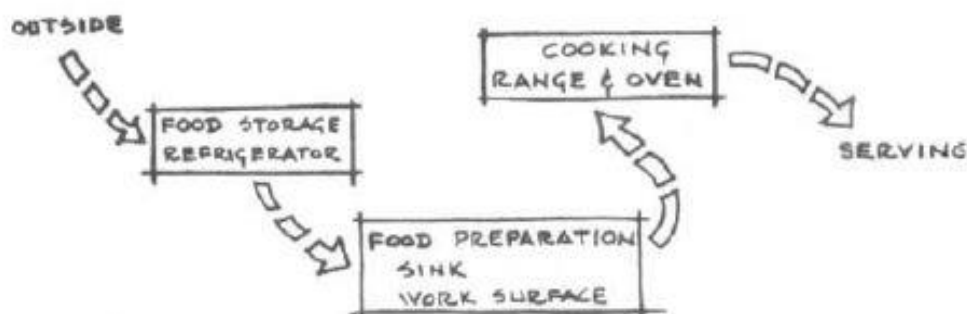
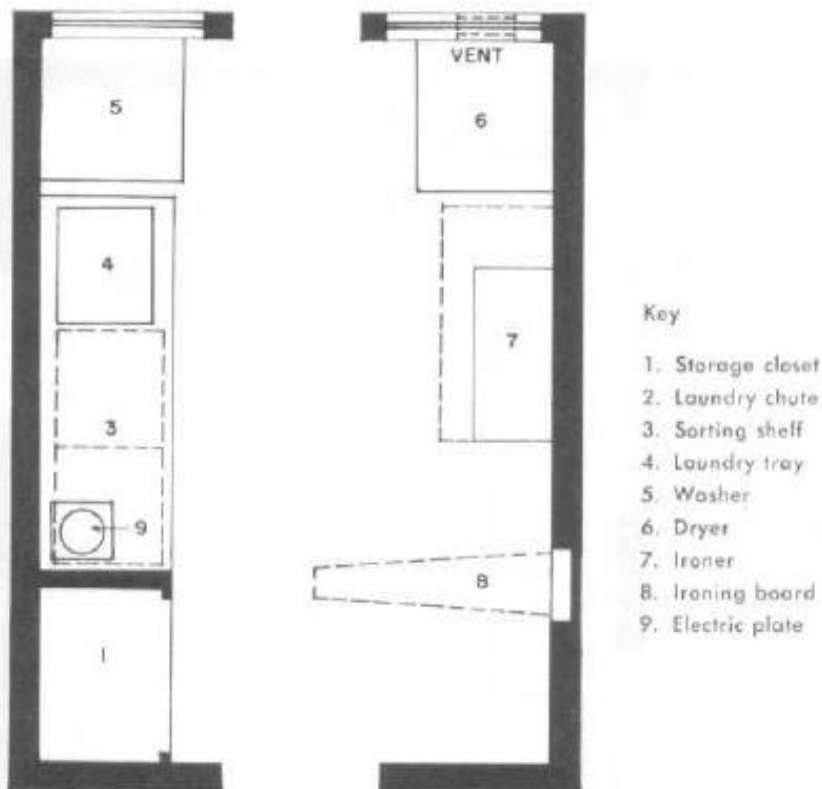


Fig. 5 Food traffic pattern.

ch.2 figure43 :food traffic pattern

2.3.6 Laundry room:

Laundering may be done in a room designed especially for this purpose, or in a multiuse room, designed also for food preparation, sewing, child play, and the like . The best location, of course, is convenient to other work centers, such as the kitchen and to the drying yard so that there will be a minimum of carrying necessary . Generally, basements are not considered desirable locations because of their inconvenience, dampness, and lack of adequate light . with minimum area of 5 m2.



ch.2 figure44 : laundry room layout

2.3.7 Staff room:

Some permanent living-in staff are usually employed
Lavatory accommodation. With minimum area of 40 m2.

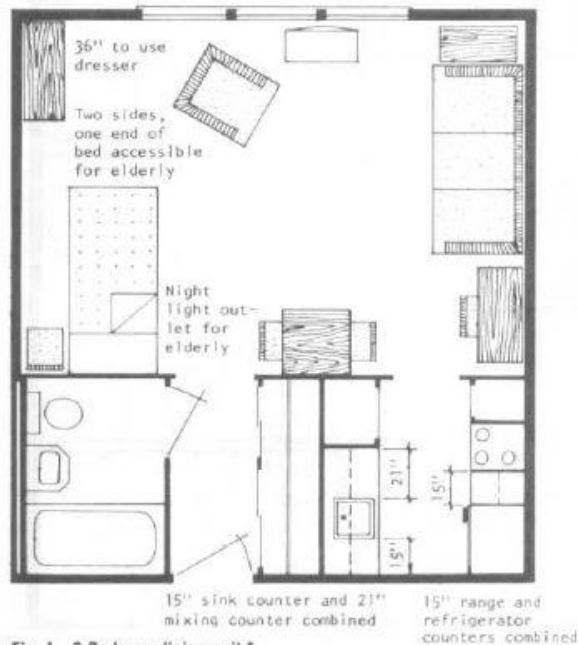


Fig. 1 0-Bedroom living unit.*

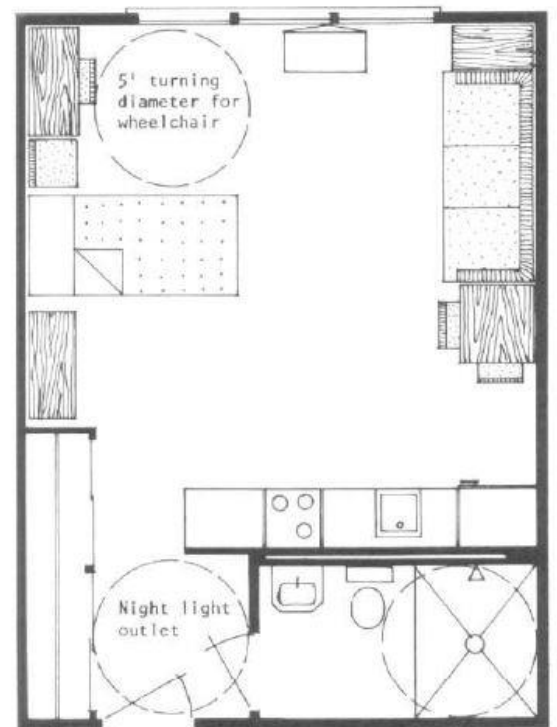
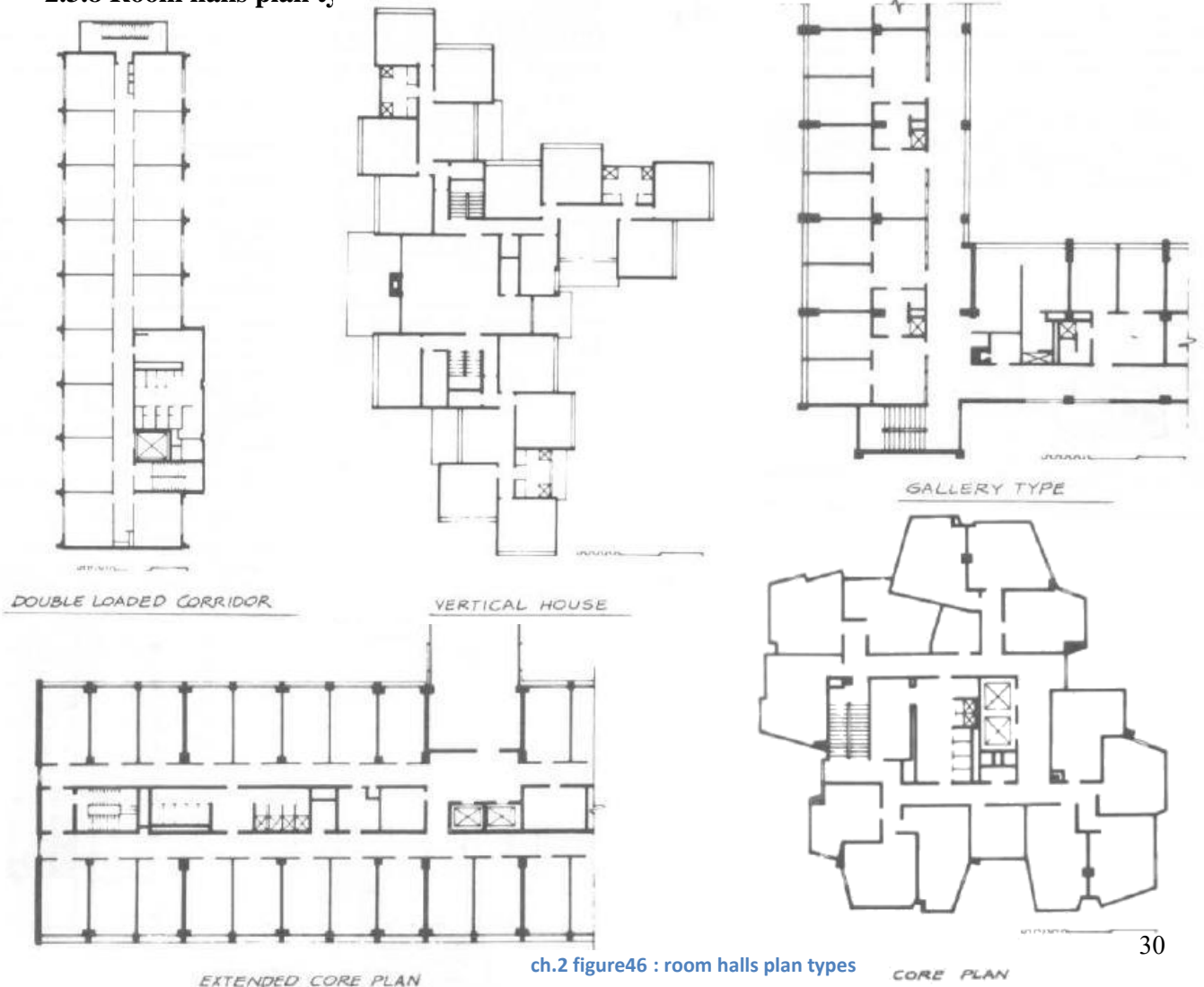


Fig. 4 0-Bedroom living unit for wheelchair user.*

ch.2 figure45 : staff rooms layout

2.3.8 Room halls plan types :



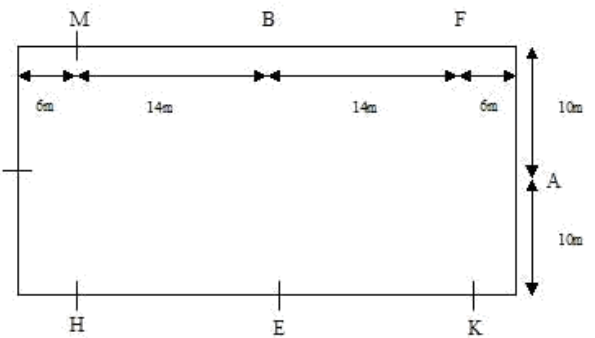
ch.2 figure46 : room halls plan types

2.4 Outdoor areas :

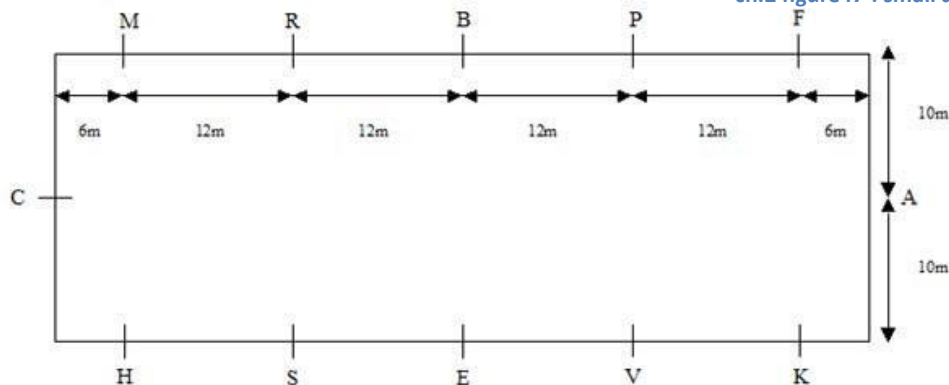
2.4.1 Outdoor Arenas :

-exercise arenas :

There should be more than one outdoor exercise arenas the dimensions varies between small arena (20*40m) to standard arena (20*60) the small one usually for new riders. with top quality customized fences for schooling purposes.



ch.2 figure47 : small arena plan



ch.2 figure48 : standard arena plan

-Show Jumping arena:

1-Size :

The recommended minimum size of a Show jumping arena for competition is 50m x 80m and larger when possible. An outdoor competition arena must have a minimum size of 4,000 sq m with a minimum width on the short side of 50m.



ch.2 figure49 : jumping arena

2- Slope:

Provide the riding arena 1% to 2% slope in all directions with the crown, or the highest point, down the arena centerline. This center crown design provides the shortest path for water travel off the arena as long as runoff water can be handled where it collects.

3-Material:

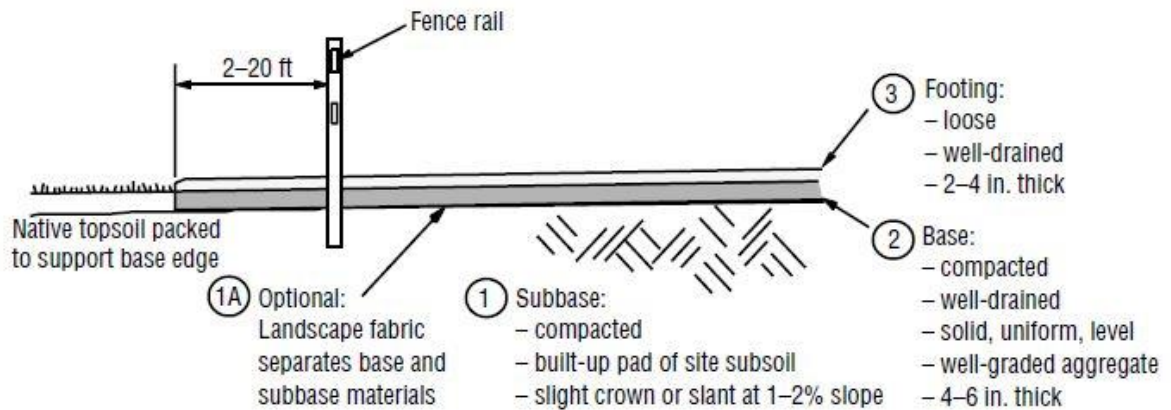
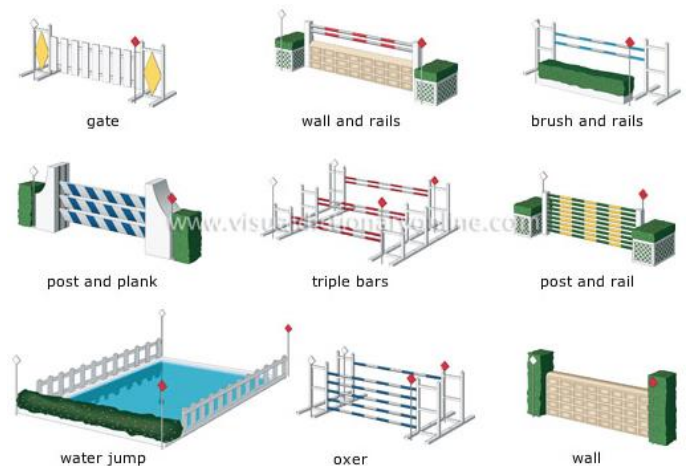


Figure 18.2. Outdoor riding arena construction is sloped for surface water drainage and includes a well-compacted subbase and base construction to support the riding surface material.

ch.2 figure50 : outdoor riding arena surface material

4- Obstacles:

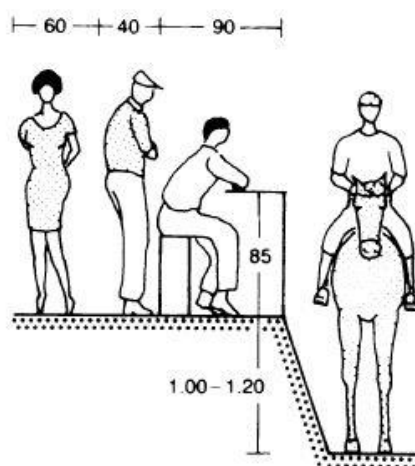
Obstacles are up to 1.6m high and spreads of 2m. Height, width, and number of jumps will depend on the level of competition. Beginners often start with low (46 cm) cross rails.



ch.2 figure51 : horse obstacles

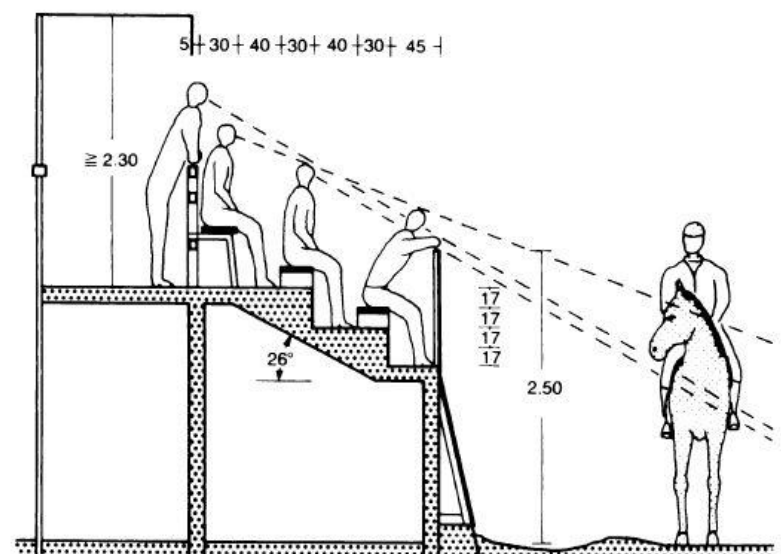
5-Spectators :

Spectators should not look down too steeply on the horses. An effective solution can be to use a spectator gallery, with the first row seating and the second row standing. behind this is room for two rows of circulating people. Or a three rows seating and the rest standing with storage beneath it.



13 Simple spectator stand

ch.2 figure52 : simple spectator stand



11 Spectator stand with access passage

ch.2 figure53 : spectator stand with access passage

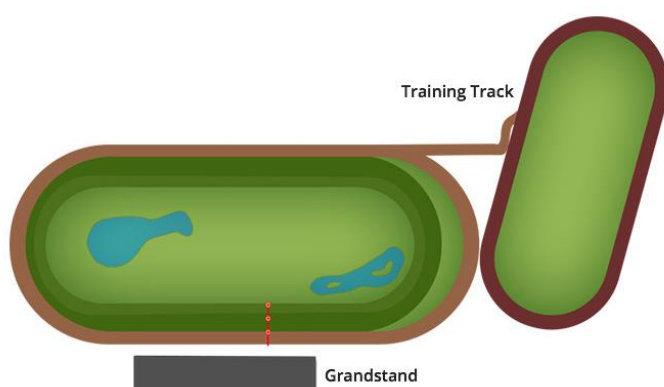
2.4.2 Horse racing track:

1-racing track:

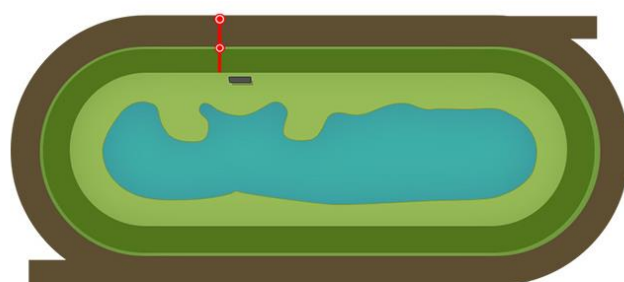
Flat racing is the most common form of racing seen worldwide. Flat racing tracks are typically oval in shape and are generally level. Track surfaces vary, with turf most common in Europe, dirt more common in North America and Asia, and newly designed synthetic surfaces, such as Polytrack or Tapeta, seen at some tracks.

Individual flat races are run over distances ranging from 440 yards (400 m) up to two and a half miles (4 km), with distances between five and twelve furlongs being most common. Short races are generally referred to as "sprints", while longer races are known as "routes" in the United States or "staying races" in Europe. Although fast acceleration ("a turn of foot") is usually required to win either type of race, in general sprints are seen as a test of speed, while long distance races are seen as a test of stamina.

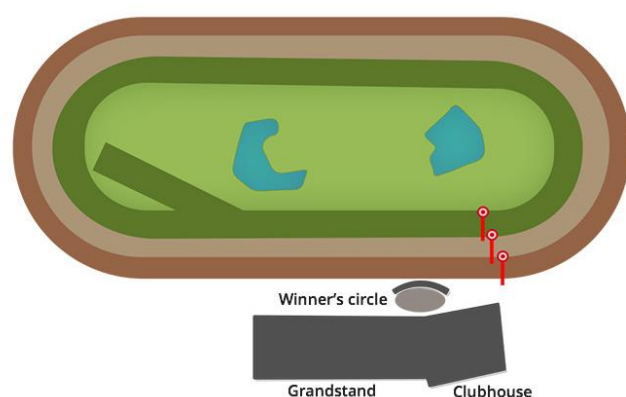
examples :



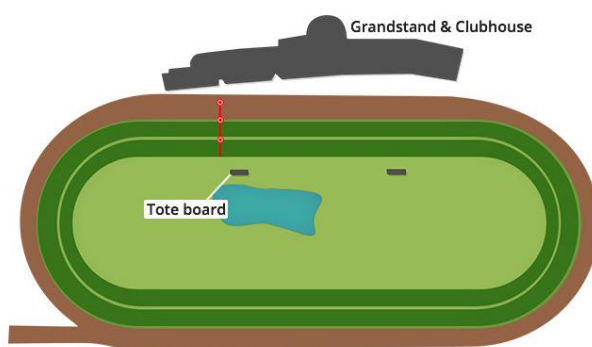
TRACK	LENGTH	DIST. FROM LAST TURN TO FINISH	
Dirt	7920 ft	2414m	1097 ft
Turf	6930 ft	2112 m	varies



TRACK	LENGTH	DIST. FROM LAST TURN TO FINISH	
Dirt	5280 ft	1610 m	-
Turf	4620 ft	1410 m	varies



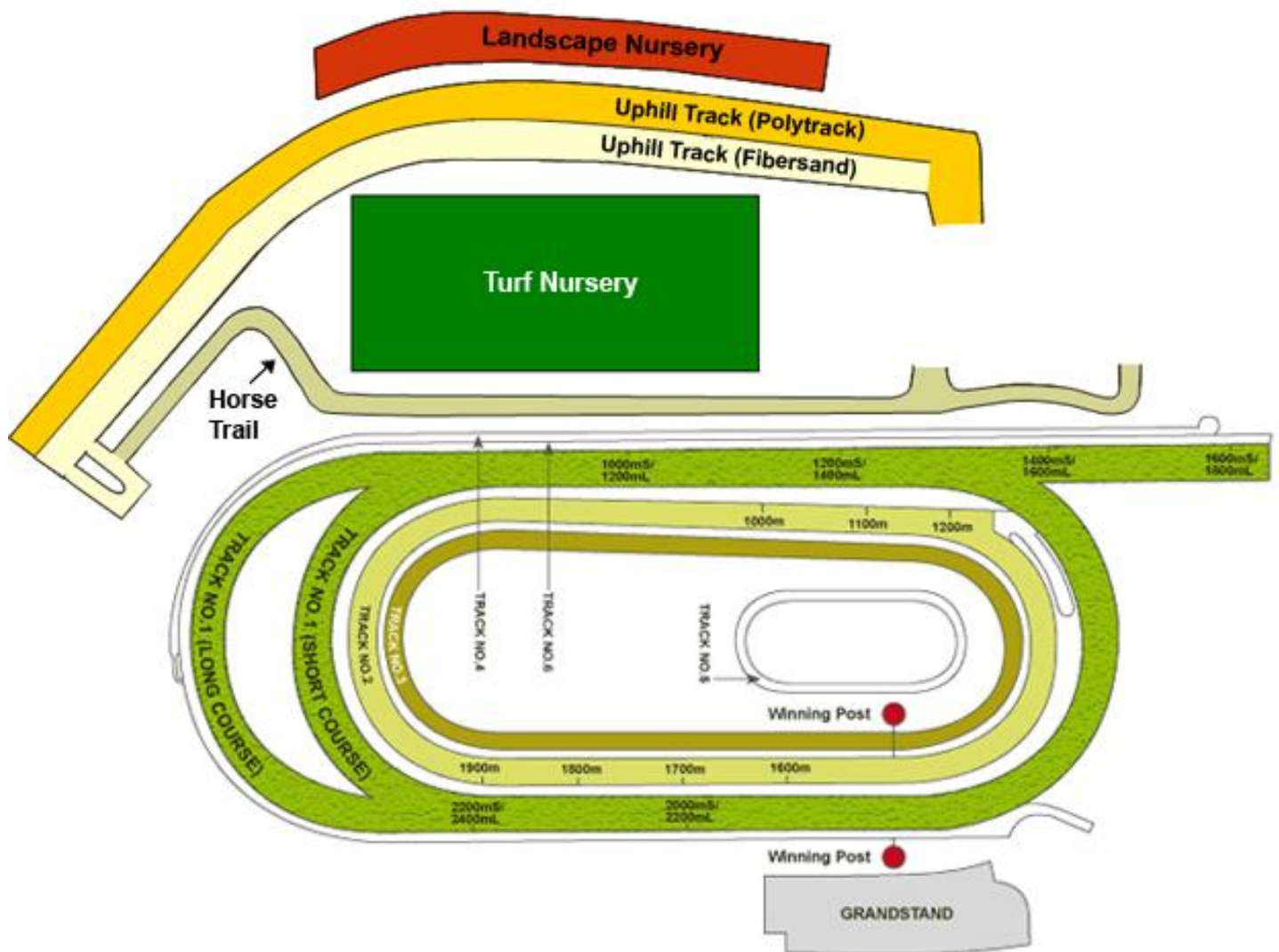
TRACK	LENGTH	DIST. FROM LAST TURN TO FINISH	
Dirt	5940 ft	1810 m	1155 ft
Dirt	5280 ft	1610 m	1155 ft
Turf	4663 ft	1420 m	varies



TRACK	LENGTH	DIST. FROM LAST TURN TO FINISH	
Dirt	5940 ft	1810 m	1144 ft
Turf	5378 ft	1636 m	varies
Turf	4624 ft	1410 m	varies

ch.2 figure54 : horse racing track layout examples

RACING AND TRAINING TRACKS @ KRANJI



ch.2 figure55 :horse racing track layout example

Racing track :

Track No 1 (StrathAyr Turf Track)

Course (Width) Length of Course

Course A : 31 meters Long Course : 2000 meters

Course B : 27 meters Short Course : 1800 meters

The 1,500 meters long 25 meters wide Polytrack is also used regularly for racing.

Training is conducted on either one of the four excellent tracks:

1,500 meters long and 25 meters wide Polytrack (Track No. 2);

1,300 meters long and 20 meters wide sand track(Track No. 3);

1,000 meters long and 10 meters wide Tapeta Track/Polytrack (Track No. 4) outside of the

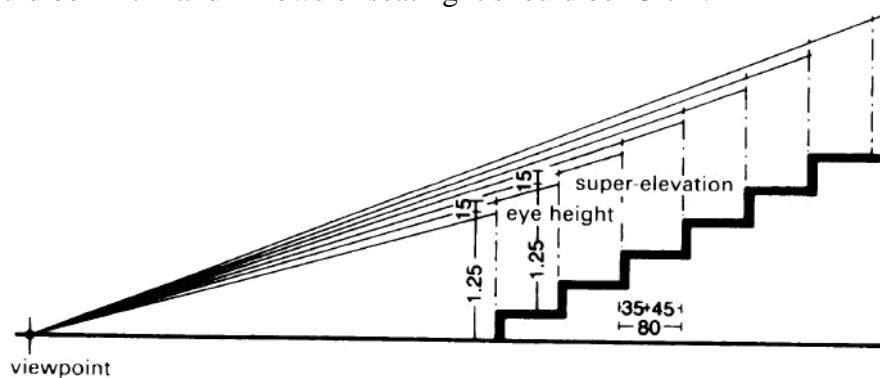
backstraight of the turf track and 500 meters long and 8 meters wide trotting sand track (Track No. 5) in the Infield.

2.5 Spectators :

Depending upon the planned capacity, seating is provided either along the long side of the ground (to take advantage of the shortest viewing distance) or for capacities above 10000, around the whole grounds. As most events take place in the afternoon, the best position for spectators is in the west side so that the sun is at their backs.

2.5.1 Sightlines:

To improve viewing conditions in the multi-row layout, there has to be sufficient super-elevation. In smaller grounds with up to 20 rows of terracing or 10 rows of seats, a linear gradient of 1:2 can be taken as a basis. In all other grounds the linear gradient should ideally be replaced with one which is parabolic. In this case the gradient for seating and standing places is to be set using a construction based on the spectators line of sight. In terracing stands the super-elevation should be 12 cm and in rows of seating it should be 15 cm.



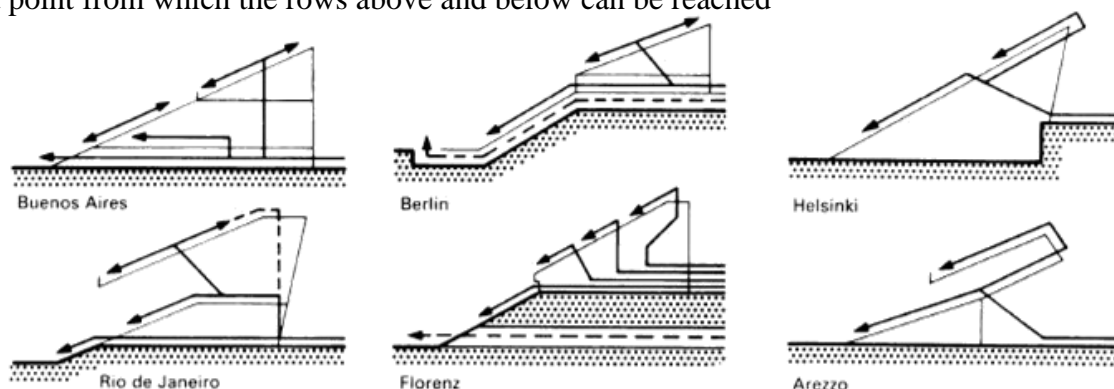
ch.2 figure56 : construction of sightlines

2.5.2 Orientation:

The orientation of ancient arenas were determined by the variable timing of contents – axes ran west to east or south to north. In Europe today the main axis is usually north-east to south-west so that a maximum number of spectators have the sun at their backs

2.5.3 Access :

Access gates are therefore situated to the east. The turnstiles are positioned so as to direct the stream of visitors to the various stadium entry points. Access in to the stadium is often through the embankment formed from excavated earth or via stairways leading halfway up the terraces to a point from which the rows above and below can be reached



ch.2 figure57 : access arrangements

2.5.4 Seating areas :

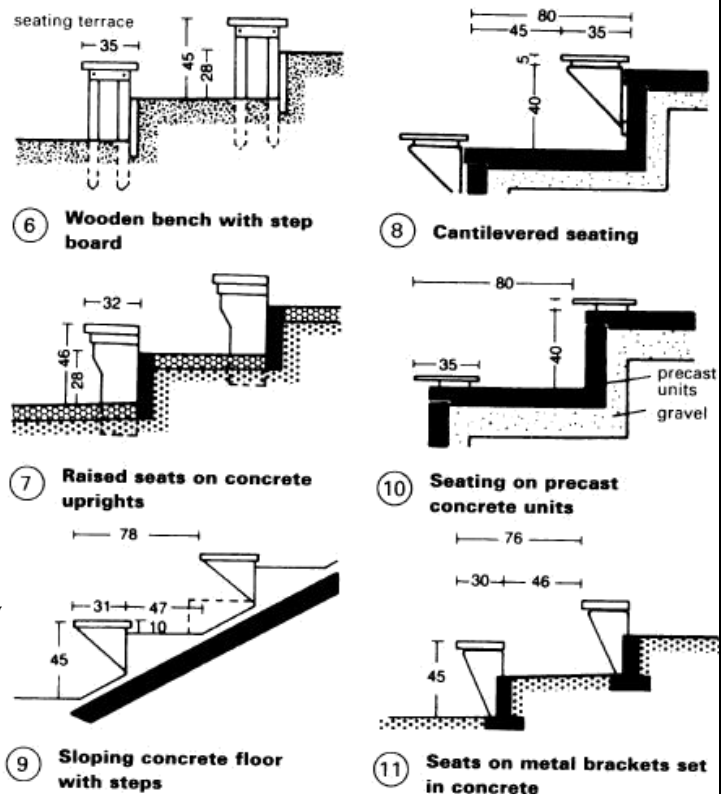
the necessary space for seating areas is calculated as follows:

Width of seat	0.5 m
Overall depth	0.8 m
Of which	
Seat depth	0.35 m
Circulation	0.45 m

Rows of seats (benches) as well as single seats can be planned. Seats with back rests offer greater comfort. Depending on the arrangement of entrances and exits, each row can comprise :

On each side of passage	
In shallow rising rows	48 places
In steeply rising rows	36 places

Seating and standing areas must be separated by fences. For every 750 seats an escape route (stairway, ramp, flat surface) with minimum width of 1.00 m must be provided.



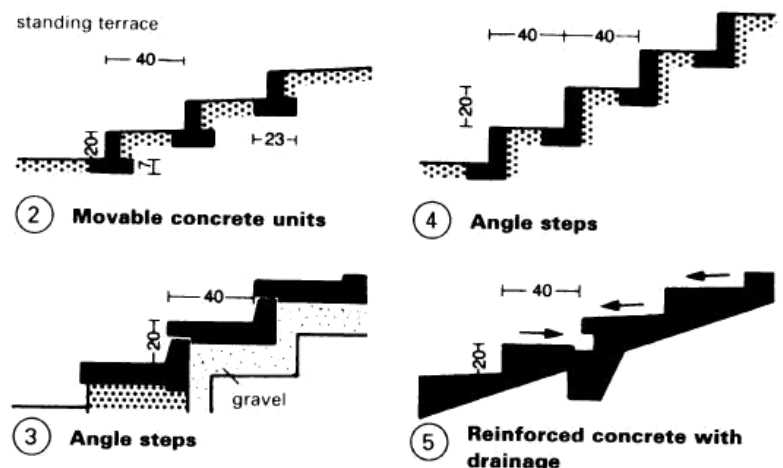
ch.2 figure58 : seating areas diminutions

2.5.5 Standing areas :

The necessary space for standing spaces is calculated as follow :

Width of standing space	0.5 m
Depth of standing space	0.4 m

To allow standing areas to fill and empty evenly, and to prevent dangerous overcrowding, they should be divided into groups or blocks of around 2500 places. Each block should have its own entry/exit points and should be separated from the others by fences.



ch.2 figure59 : standing areas diminutions

Inside the blocks of standing places a staggered arrangement of crush barriers will be necessary to prevent diagonal crowd surges. It must also be ensured that there is suitably strong barrier with a height of around 1.10 m between every ten rows of standing spaces.

2.5.6 Aisle Width and Spacing:

Recommended aisle width is 3 ft 0 in (1.00 m). Spacing of aisles is usually every 14 to 15 seats. Where seating sections abut a wall or railing, the dead-end distance should not exceed 7 seats.

2.5.7 Crossovers-Width and Spacing:

Crossover aisles will be needed at one or more locations which run horizontally parallel to the seating rows and connect the vertical aisles with vomitories leading under the seating to exits and promenades. However, crossover width should be between 4 and 6 ft (1.2 - 1.8 m) depending upon spacing of vomitories. It should be kept in mind that a bulkhead will be required at the rear side of the crossover and the tread of the first row behind it raised to a height to allow sight lines not to be interrupted by the lower seats. Where site conditions permit, it is ideal to have both a lobby/promenade and a crossover aisle at or near grade level. The seating can then be split with approximately one-half below grade and one-half above, which very much simplifies exiting problems. Crossovers at the top of balconies should generally serve not more than seven rows of seats. Aisles running up from a crossover and dead-ending at a wall or bulkhead should not serve more than 18 to 20 rows.

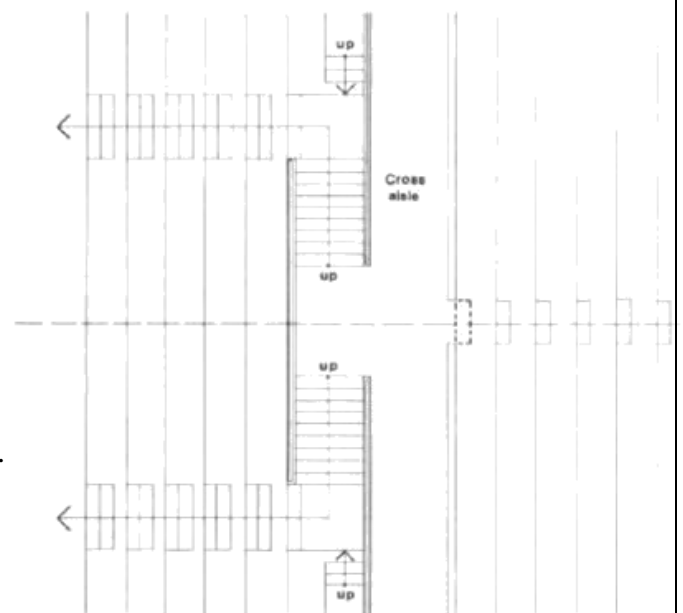
2.5.8 Vomitories:

As stated earlier vomitory width and spacing will be governed by local code conditions. When they are used in connection with horizontal crossovers, stairs will be required to reach the first row to the rear of the crossover which must be elevated 4 to 5 ft (1.2-1.5).

Two types of vomitories are illustrated :

Vomitory Type A

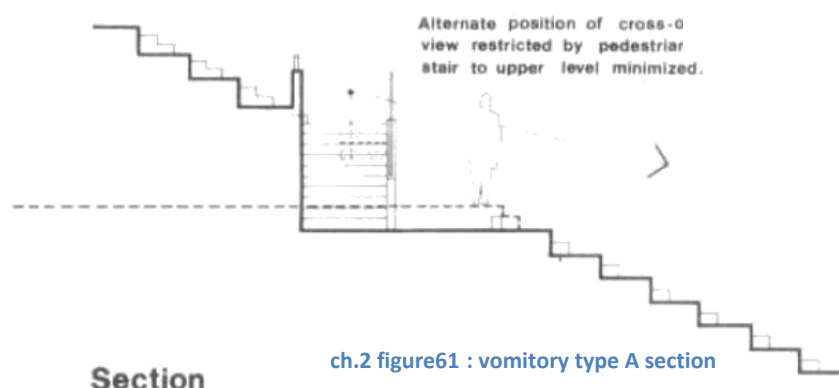
Here a stair leading to the upper seating flanks either side of the Vomitory passage. These stairs are entered at their lower end before reaching the crossover and thus minimize crowd congestion. The crossover all the lower level minimizes visual interference for spectators in the upper seating from those walking the crossover and is the preferred alternative. The other option does reduce the height of the bulkhead and thus the number of steps required to reach the upper seating. Railings on these stairs and bulkheads should be solid for their lower portions with open pipe rail above. The total height should be kept as low as allowable to prevent sight line interference.



Plan

Fig. 10 Vomitory - Type A.

ch.2 figure60 : vomitory type A plan

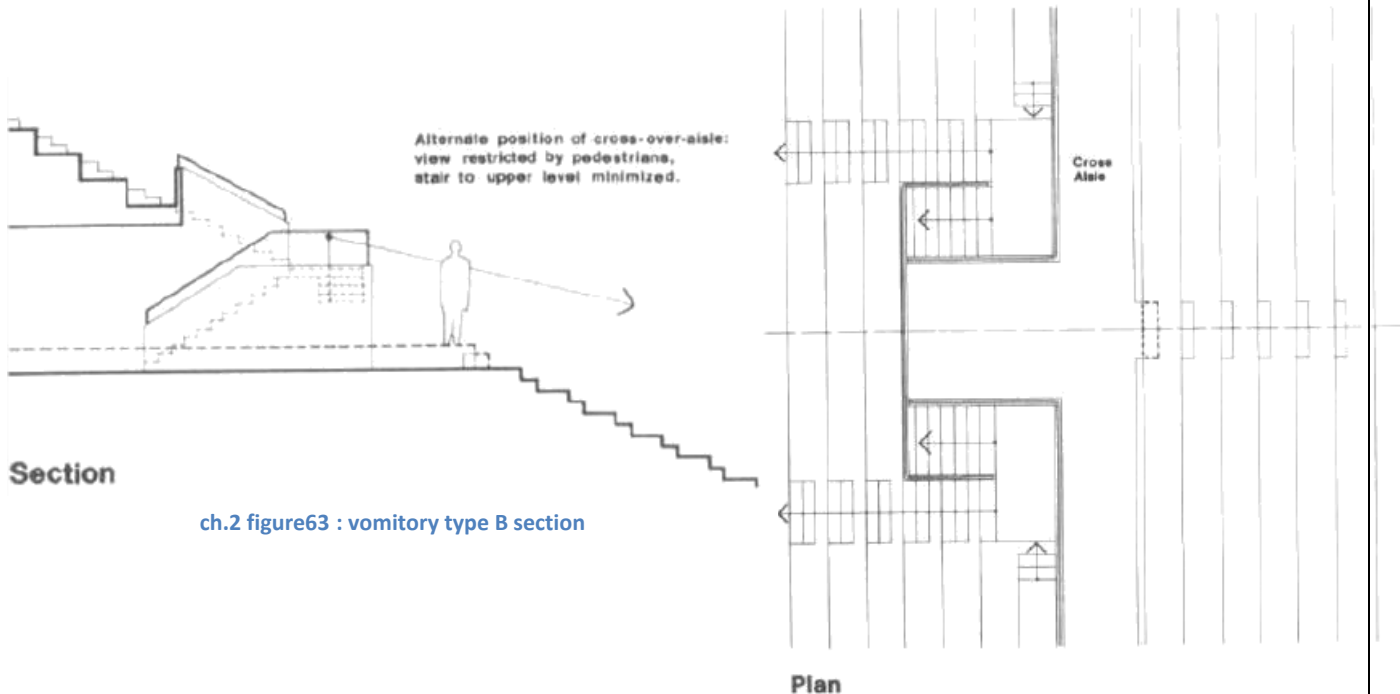


Section

ch.2 figure61 : vomitory type A section

Vomitory Type B (Fig . 11).

This detail may be used either as part of a full vomitory or as a stair access only to upper seating tiers. It is not as desirable as Type A in a vomitory situation, as the stairs empty into the traffic path between crossover and vomitory and can cause excessive congestion .



ch.2 figure63 : vomitory type B section

Fig. 11 Vomitory — Type B.

ch.2 figure62 : vomitory type B plan

2.5.9 Guest of honor :

These special private seating sections located within stadiums, arenas, and other sporting and entertainment venues, are typically located in the midsection and/or main stand or grandstand, usually providing the best views of the event. Some have glass panels that can be opened, in order for the spectators to feel closer to and more immersed in the action of the event.



ch.2 figure64 : guest of honor room (VIP room)

2.5.10 Toilet Rooms:

Sets of men's and women's rest rooms should be provided at one or more locations on each public level . Their layout must provide for peak load* when hundreds of patrons will pass through each room . Within, the space should be divided with the water closets and urinals located near the entrance and the lavatories in a space near the exit . Also it is desirable if possible to design each toilet room so that half of the space can be closed off by some means during events of small attendance . This will save a good deal of operating cost for cleaning .

2.5.11 Scoreboard:

At least two units will be required so that all spectators will have a proper view . Very often the building management will arrange for advertising display to be incorporated into the scoreboard design as a revenue-producing device . If so, the decision should come as early as possible, as it will have obvious effect on size and detailing. The boards, of whichever type, must have provisions for the major sports that are likely to use the arena and have a portable control console that can operate from several positions depending on the sport involved .



ch.2 figure65 : scoreboard

2.5.12 Restaurant:

Most new arenas will include a restaurant facility . Its often tied to the purchase of season tickets and their use restricted to these patrons. Capacity might vary from 150 to 300 people. This facility should be located within easy reach of the seating area and also be accessible to patrons at hours other than when the building is open to the general public for events . A typical commercial kitchen will probably be required and should be so located as to be easily serviced from the central trucking/receiving area . This kitchen may also serve to cater food to other parts of the building such as the press lounge.

Table6 : restaurant dimensional standards and areas

type	chair occupancy per meal	kitchen area required (m ² /cover)	dining area required (m ² /seat)
exclusive restaurant	1	0.7	1.8-2.0
restaurant with high seat turnover	2-3	0.5-0.6	1.4-1.6
normal restaurant	1.5	0.4-0.5	1.6-1.8
inn/ guesthouse	1	0.3-0.4	1.6-1.8
approx. 80% supplement is added for storage rooms, personnel rooms etc. cover = seat × no. of seat changeovers			

⑩ Floor area requirements

tables	seats	waiter service (m ² /seat)	self-service (m ² /seat)
square	4	1.25	1.25
rectangular	4	1.10	1.20
rectangular	6	1.05	1.10
rectangular	8	1.05	1.05

⑪ Total space requirements for dining rooms:
1.4-1.6 m²/place

main aisles	min 2.00m wide
intermediate aisles	min 0.90m wide
side aisles	min 1.20m wide

⑫ Aisle widths

2.5.13 Administrative Offices:

Areas for the building manager, accounting, personnel, booking, publicity, and engineer are generally provided within the building . In addition, office space may be required for the various teams who use the building, whether they are only tenants or are owned by the arena owner . Additionally, office space should be available for use by shows booked into the arena for an extended period (circus, ice shows, etc.) . Also, the owner of the arena, if it is a private venture, will usually require a suite of rooms including his office, private bath, and a conference/meeting room suitable for entertaining dignitaries .

2.5.14 Ticketing Facilities:

This area will vary depending upon the intended scope of events to be booked . However, in most situations, ticket booths will be required in the lobby area or an outer lobby . They should be accessible to the public during nonevent periods without losing security to the remainder of the building. Immediately to the rear of the booths should be a large ticket room for storage and sorting advance sale tickets. Also required will be a money room with vault, group sales office, ticket manager's office, and a work area for storing event posters.



ch.2 figure66 : tickiting area

2.5.15 Storage:

Large bulk storage areas will be needed for a variety of uses . The temporary seating setups for the arena floor will require space to store both chairs and riser platforms. All of these should be so located relative to the arena floor as to minimize time and cost for the setting up of each event.

2.5.16 Locker and Changing Rooms:

If the arena is the permanent home of professional team, a home team changing room will be required. Also toilets, shower room, and the trainer's office . A pair of rooms for visiting teams somewhat smaller than the room for home team, can be located adjacent to or nearby with home team room. Several smaller changing and interview rooms should be planned in this area . Some can be for individual use, others for four to six people, and each with appropriate toilet facilities . All these spaces should be located at arena floor level with convenient vomitory access to the playing floor . Public exiting traffic should be routed away from the dressing area corridors .dimensions in page 6-7.



Fig. 12 Dressing rooms.

2.5.17 Press Facilities:

A press workroom with adjacent toilet should be located near the lower seating area . It is also desirable to include a lounge in this group with facilities to set up a small food service from the main kitchen . A small photographer's work area and darkroom should also be provided at the arena floor level . Location of the press seating varies widely . Many arenas which have been built with elaborate press booths high above the floor have discovered them unused, reporters preferring to sit at courtside near the action . Radio and TV announcers, however, usually prefer to sit high for an overall view of the action . Booths for this purpose can be located over vomitory openings or suspended from the ceiling or balcony structure.



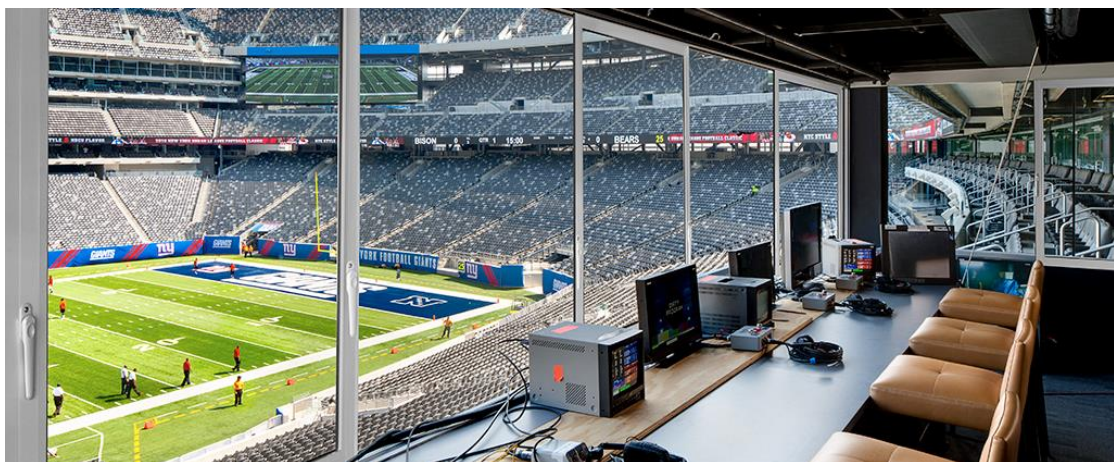
ch.2 figure68 : press room

2.5.18 Vendors 'Storage:

Large bulk storage areas will be required for the kitchen 'supplies of dry food goods, beverages, meat, general supplies, souvenirs and programs . This may include walk-in refrigerator space and cold rooms as specified by the operator . Ample vendors' stations will be needed at several points around the arena. They must be located within easy reach of the seating and be laid out to allow fast refill of the seat vendor's stock. Separated in/out doors are helpful.

2.5.19 Television Broadcasting:

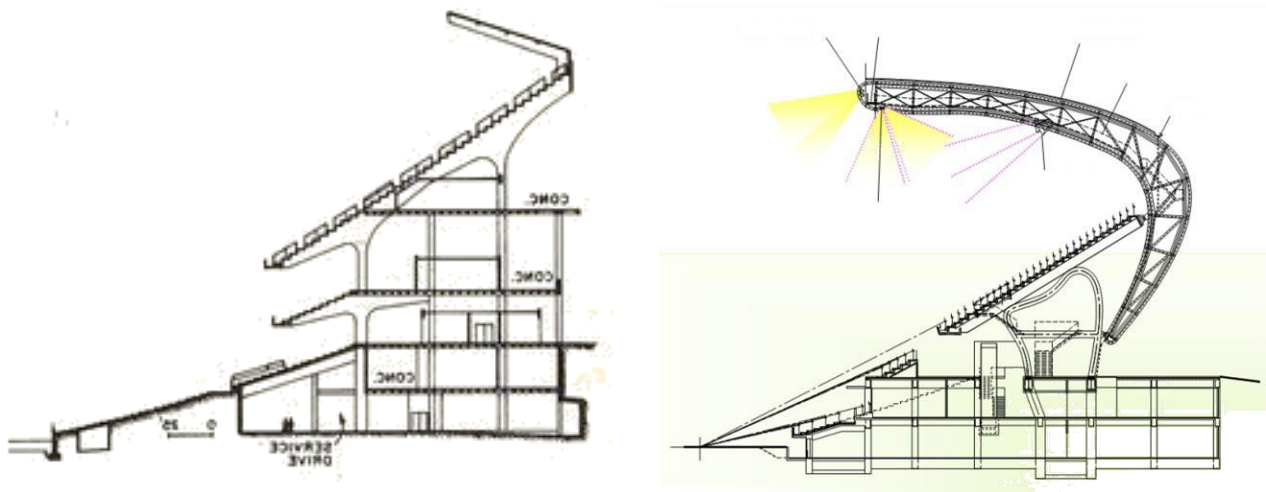
Facilities appropriate for the telecasting of events are an important ingredient of all new arenas . Consensus as to number, location, height, and angle of camera positions is hard to find, especially if several networks or local stations are likely to be working out of the building at various times. However, an attempt should be made during the design/planning stage to meet with those broadcasting groups most likely to use the building and build in as much as possible such items as camera platforms and cable runs . Space will also be needed for the station's remote truck, preferably at the building truck area, or a permanent TV monitor room .



ch.2 figure69 : broadcasting room

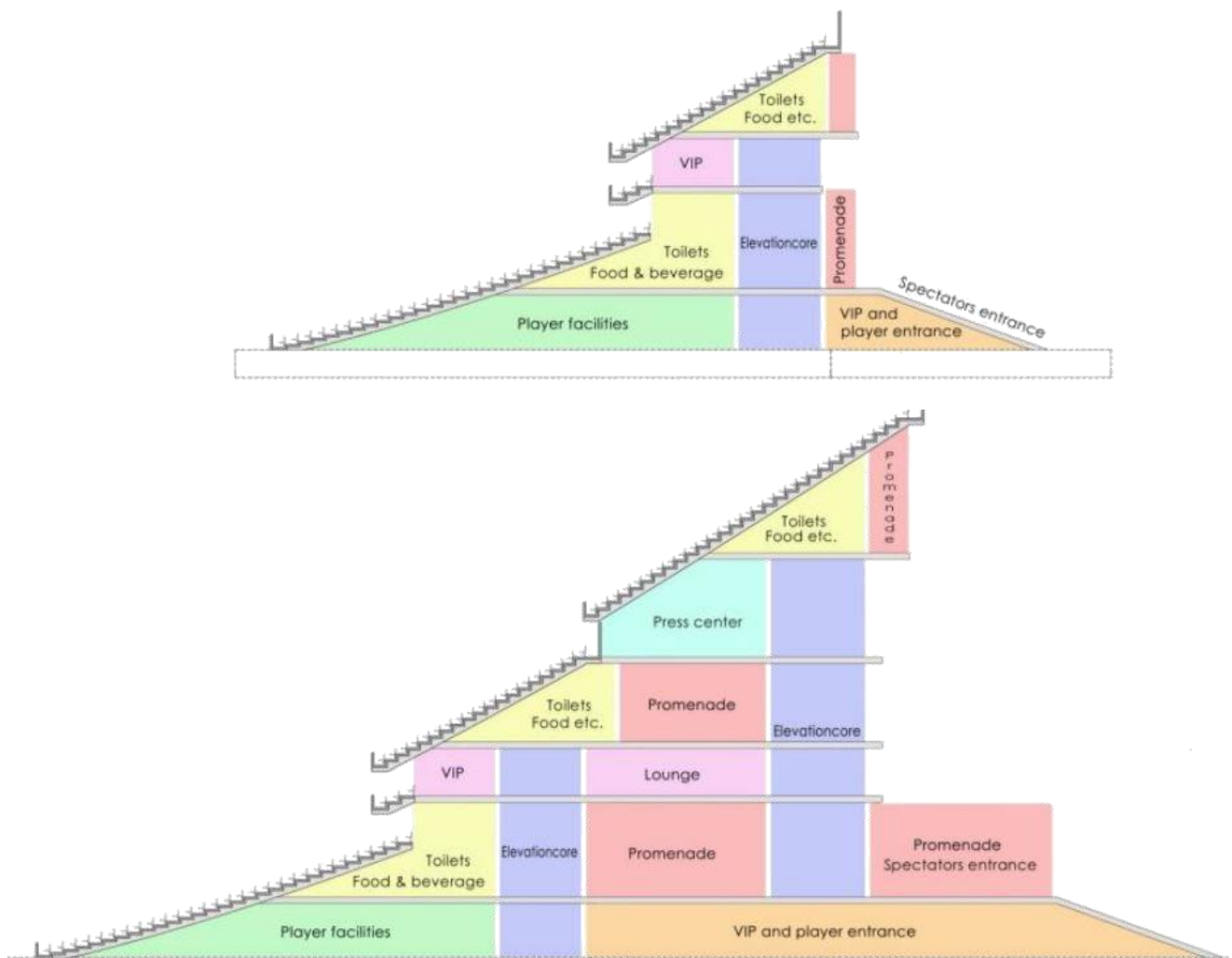
2.5.20 Roofing of stands :

Covering as many places as possible should be the aim. By designing overlapping stands the number of covered seats can be increased.



ch.2 figure70 : stands/spectators roofing

2.5.21 Spectator function layout :



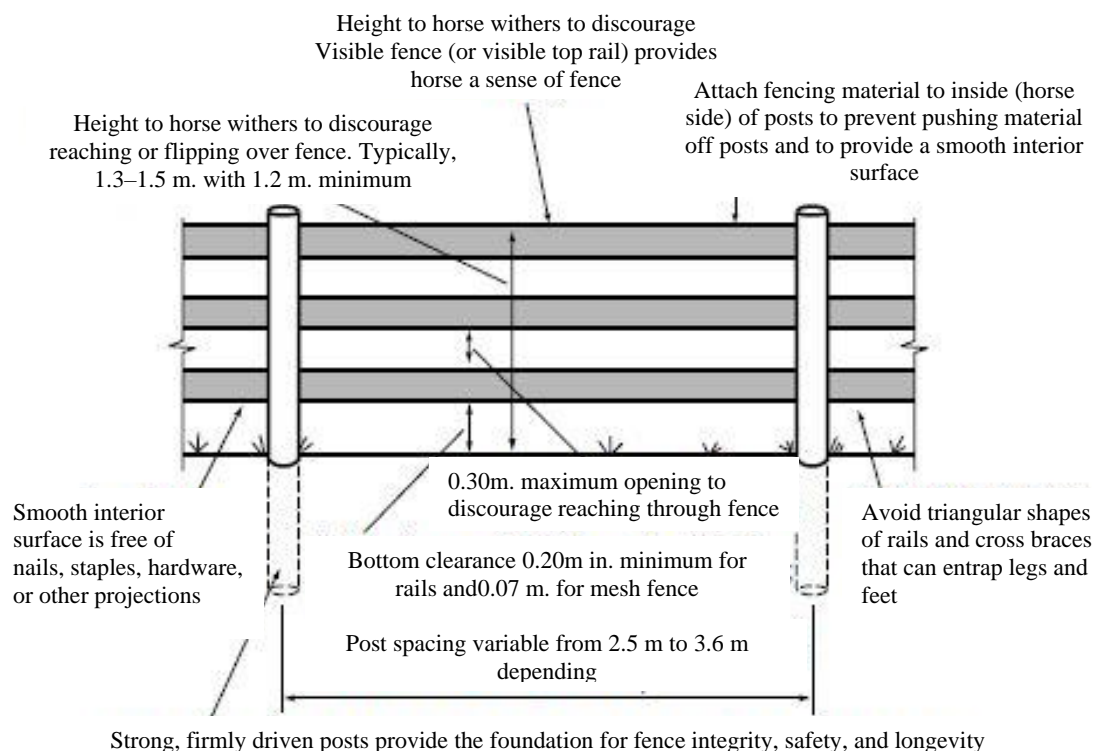
ch.2 figure71 : spectator functions and locations example

2.6 Fence planning :

A “perfect” fence should be highly visible to horses. Horses are far-sighted and look to the horizon as they scan their environment for danger. Therefore, even when fencing is relatively close, it needs to be substantial enough to be visible. A fence should be secure enough to contain a horse that runs into it without causing injury or fence damage.

2.6.1 Good Fence Attributes:

Figure 14.5 shows features of a good horse fence made from solid rail material. Horse fences should be 1.3-1.5 meters above ground level. A good rule for paddocks and pastures is to have the top of the fence at wither height to ensure that horses will not flip over the fence. Larger horses, stallions, or those adept at jumping may require even taller fences. At the bottom, an 0.20m clearance will leave enough room to avoid trapping a hoof yet will discourage a horse from reaching under the fence for grass. A bottom rail with clearance no higher than 0.30m will prevent foals from rolling under the fence. Visible fences will prevent playful horses from accidentally running into them. A frightened horse may still hit a visible fence while he is blinded with fear. A forgiving fence that contains the horse without injury is better than an unyielding brick wall. Wire fences are the least visible, so boards or strips of material are often added .



ch.2 figure72 : fence dimensional standards

2.6.2 Gates:

1-Gate Design:

Gates should have the same strength, safety, and height as the fence. Gates can be up to 4.8 m wide, with a minimum of 3.6 m to allow easy passage of vehicles and tractors. Horse and handler gates should be no less than 1.2 m wide, with 1.5 m preferred. Human-only passages are useful for chore time efficiency.

2-Gate Location:

In most horse operation, gates are positioned toward the middle of a fence line because horses are individually moved in and out of the enclosure. This eliminates trapping horses in a corner near a gate.

Fencing along driveways and roads has to provide room to maneuver vehicles to access gates. Entry driveway surfaces are often 4.8 m wide with at least 2.1 m on each side storage, and clearance for large vehicles. Remember that when driving through a gate while towing equipment, substantial room may be needed to turn between fence lines. The easiest option is to position gates so that machinery can drive straight through the gate. Position gates where good visibility along a road will provide safety for slowly moving horse trailers and farm equipment that are entering and exiting the road. Place gates at least 12 to 18 m from a road to allow parking off the road while opening the gate.

2.6.3 Trees:

Trees should be fenced off. Horses usually strip off tree bark left within their reach, and dead branches pose a safety hazard. Some trees are poisonous to horses, while dead limbs can impale them.

2.6.4 Fence options:

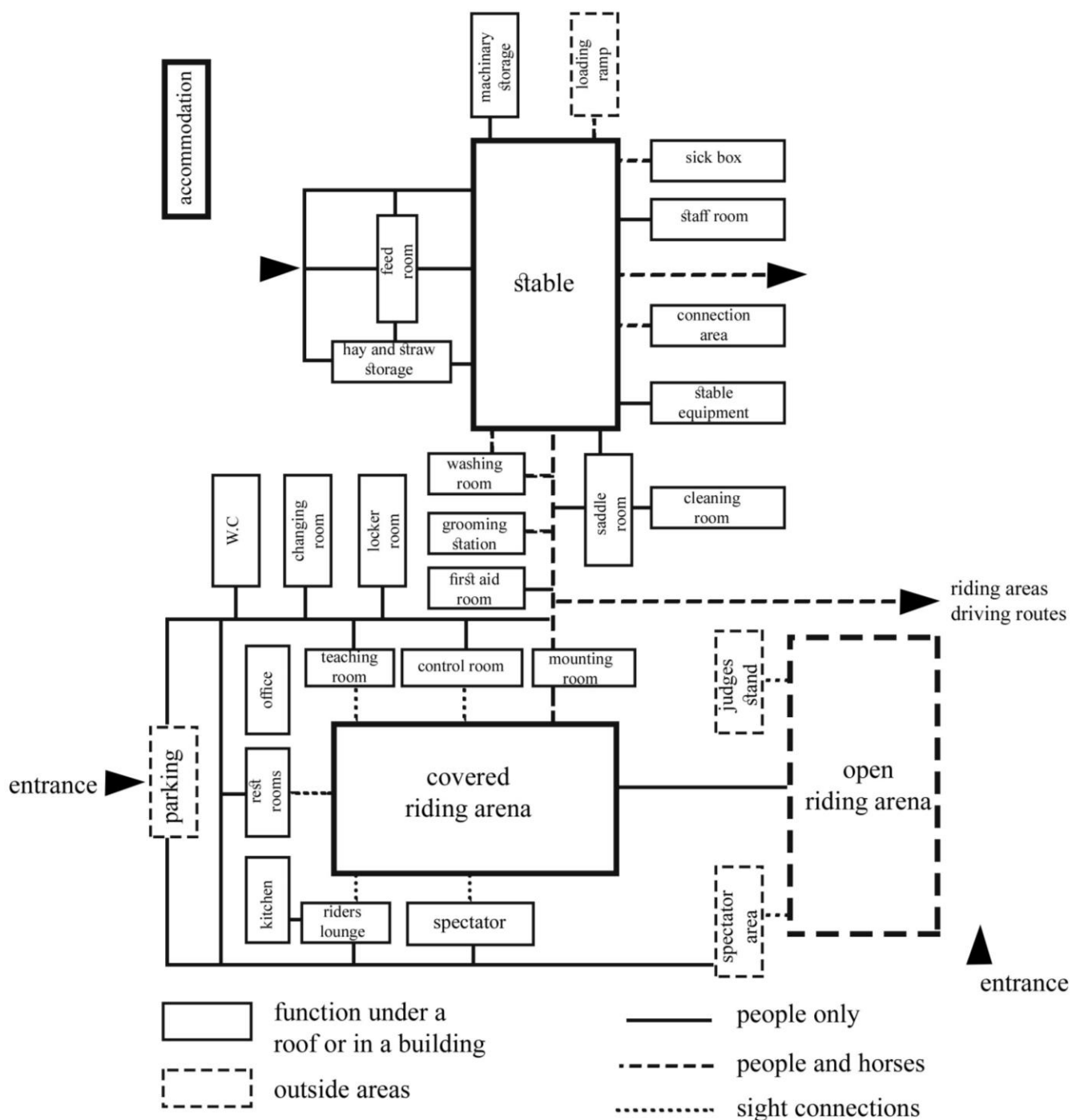
1-Board-style fence :

- Wood Board
- Rigid Polymer Board

2- Mesh fence:

- Wire Mesh
- Plastic Mesh

2.7 Equestrian center basic layout :



ch.2 figure73 : Equestrian center basic layout

Chapter three

Case studies

3.0 Study cases

3.1 Ploiesti Racetrack :



ch.3 figure1 :Ploiesti race track

Table 7:Ploiesti race track project information

Architects	studioBASAR
Location	Ploiesti , Romania.
Area	350,000 m ²
Project Year	2010
Competition	First place
Source	www.archdaily.com

What is the project :

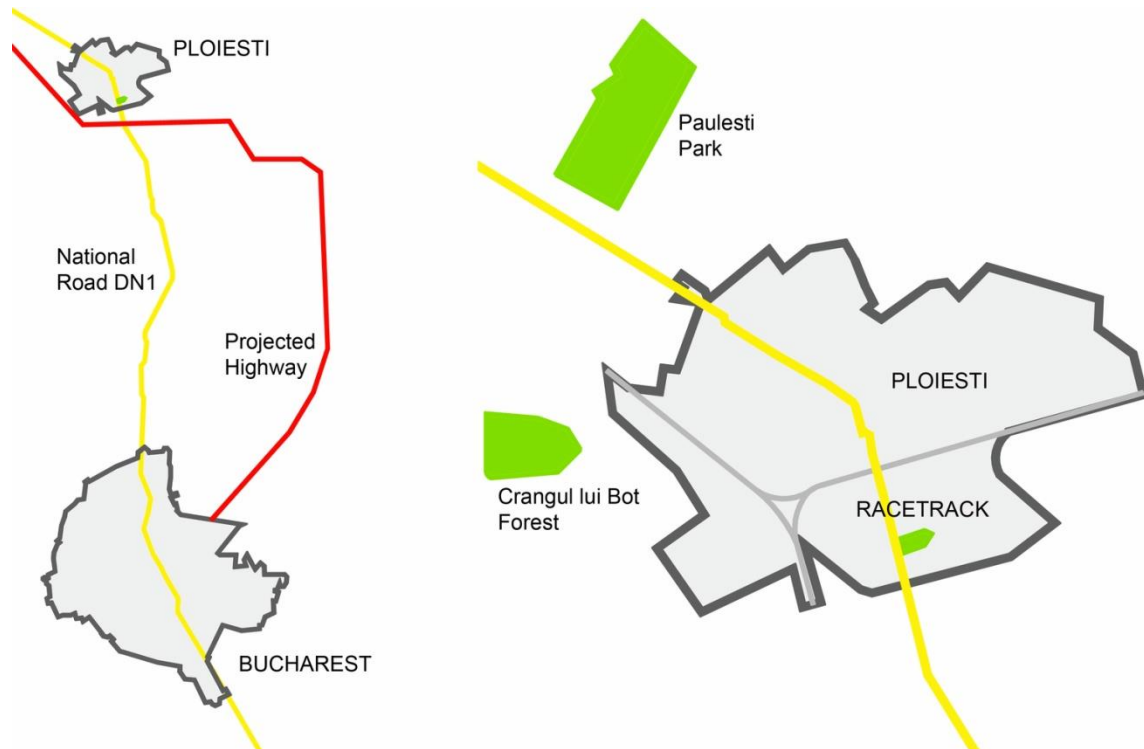
With the intention of creating a gateway for the city of Ploiesti, **studioBASAR**'s functional and architectural rehabilitation of the Ploiesti Racetrack is a direct response to the current chaotic conditions surrounding the site. Their intervention has led them to a more functional equestrian and leisure center dividing the design into three zones that each represents different atmospheres and qualities.



ch.3 figure2 :site surrounding

Location of the project :

The site where The Racetrack is located is mentioned as early as the 1920's as one of the 3 possible parks out of the Ploiesti city limits. The site is 3km away off the future highway that links Bucharest with the mountain resorts at the North of the country, and it's location near the city limits facilitates an easy access from the capital city. The position near the main access boulevard in the city and the proximity of the Oil and Gas University to the site makes this place a kind of City Gate, as defined in the administration's strategy.

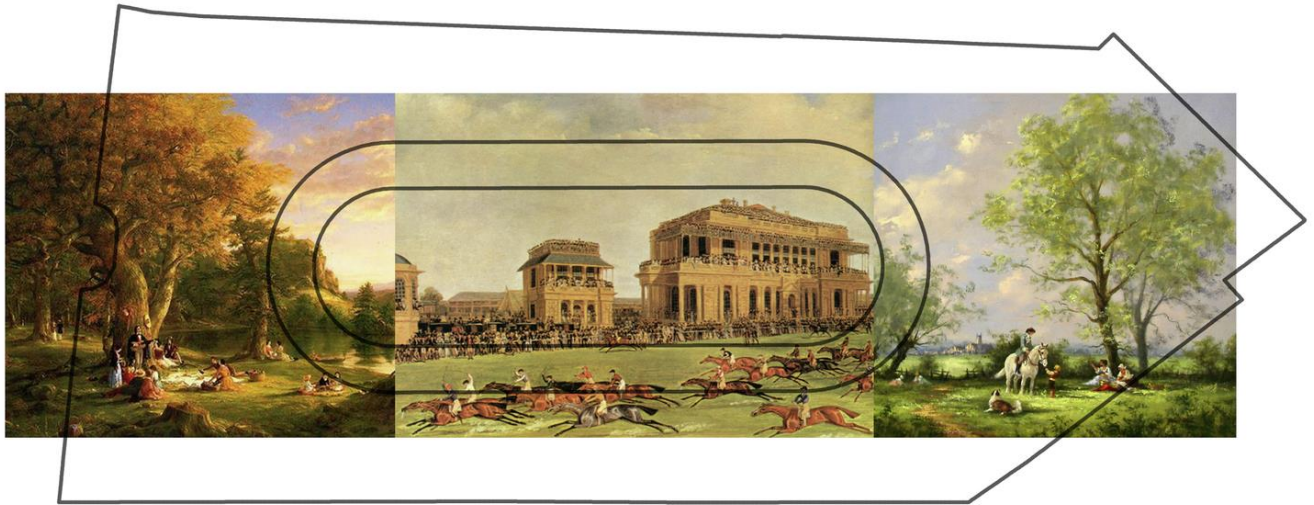


ch.3 figure3 : site location

Project plan :

The site's internal organization grew in time by gradually added buildings without a coherent direction with the outcome being chaotic with a somehow inaccessible functionality. We propose some of the existing buildings to be demolished (the stock buildings, the stables and the tribune that are in a bad functional and structural shape), some to be restored/renovated (the gate, the old stable, the water tower and the administration building). The first intervention on the site is to modify the landscape as a reaction to the surface and the shape of the racetrack and to the main access direction, creating a natural earth bank, which is slightly raised and can be used as a kind of natural tribune for watching the event.

the site was divided and proposed 3 functional zones:



ch.3 figure4 :site zones

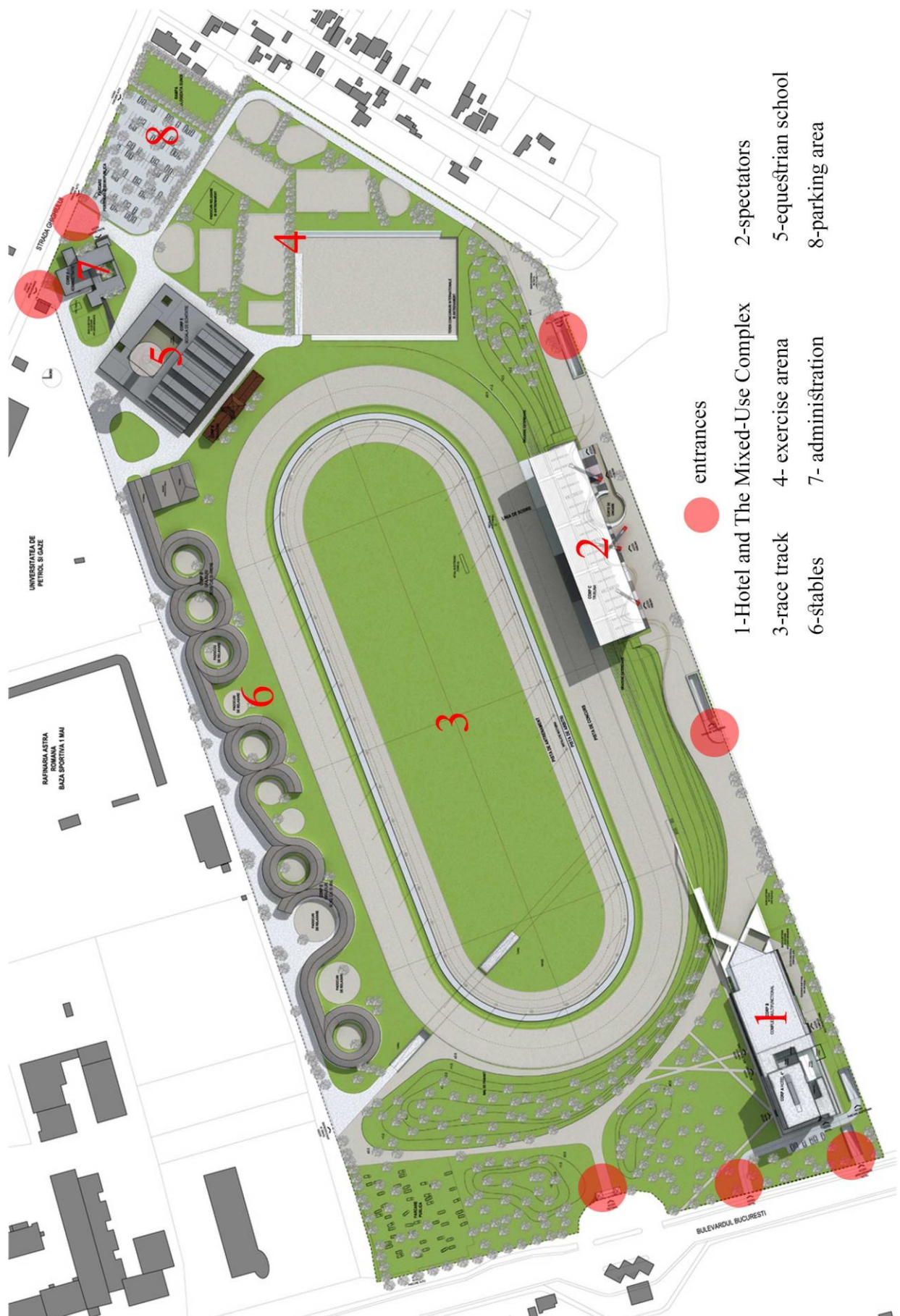
West area – with the main access from the boulevard, the Leisure zone, where it was propose to restore the fair function, as it was before the WWII, through the building of the expo area together with a 4 stars hotel.

Central area – with the race track in the middle and the spectators on one side and the horses on the other (it was proposed that the tribune and the stables to face each, for the spectators to have in sight the race preparations across the track).

East area – with the sport function – The Equitation School and the Administration facilities.

These 3 areas have different atmospheres and qualities: West – a landscape filter, between the city and the racetrack; Central area – distance, with the empty space of the racetrack in the middle, East – informal arrangement of the different training fields and paddocks. There are also 3 different landscape attitudes: Forest/ Plain/ Garden

Site :



ch.3 figure5 : site plan

1- The Hotel and The Mixed-Use Complex :

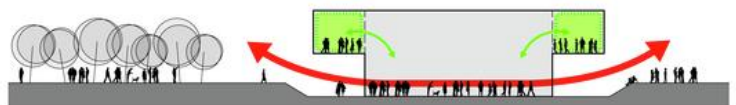
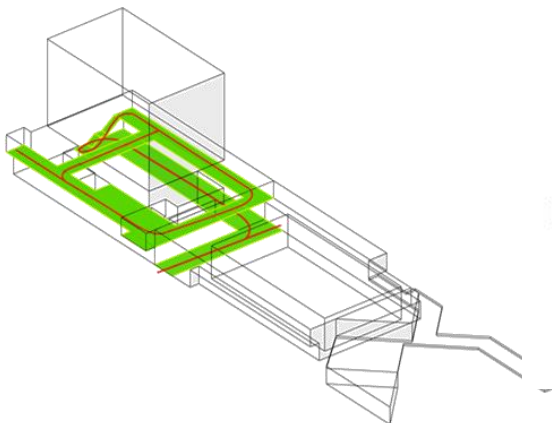


ch.3 figure6 :hotel and mixed use complex

Their functions being complementary, The Hotel and the Mixed-Use Complex are placed together. Their public functions are connected through a snake like path that is also materialized in the facades. For some types of events, the exhibition space of the main multi-use hall can be extended outside in the park and in the back, through the glass openings of the facades.

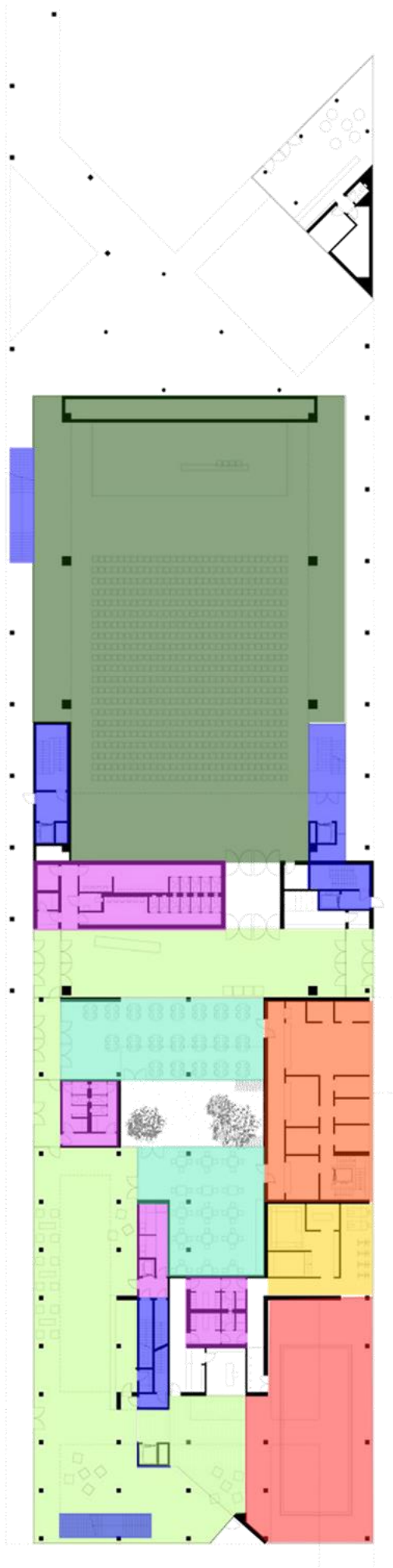


ch.3 figure7 :hotel and mixed use complex



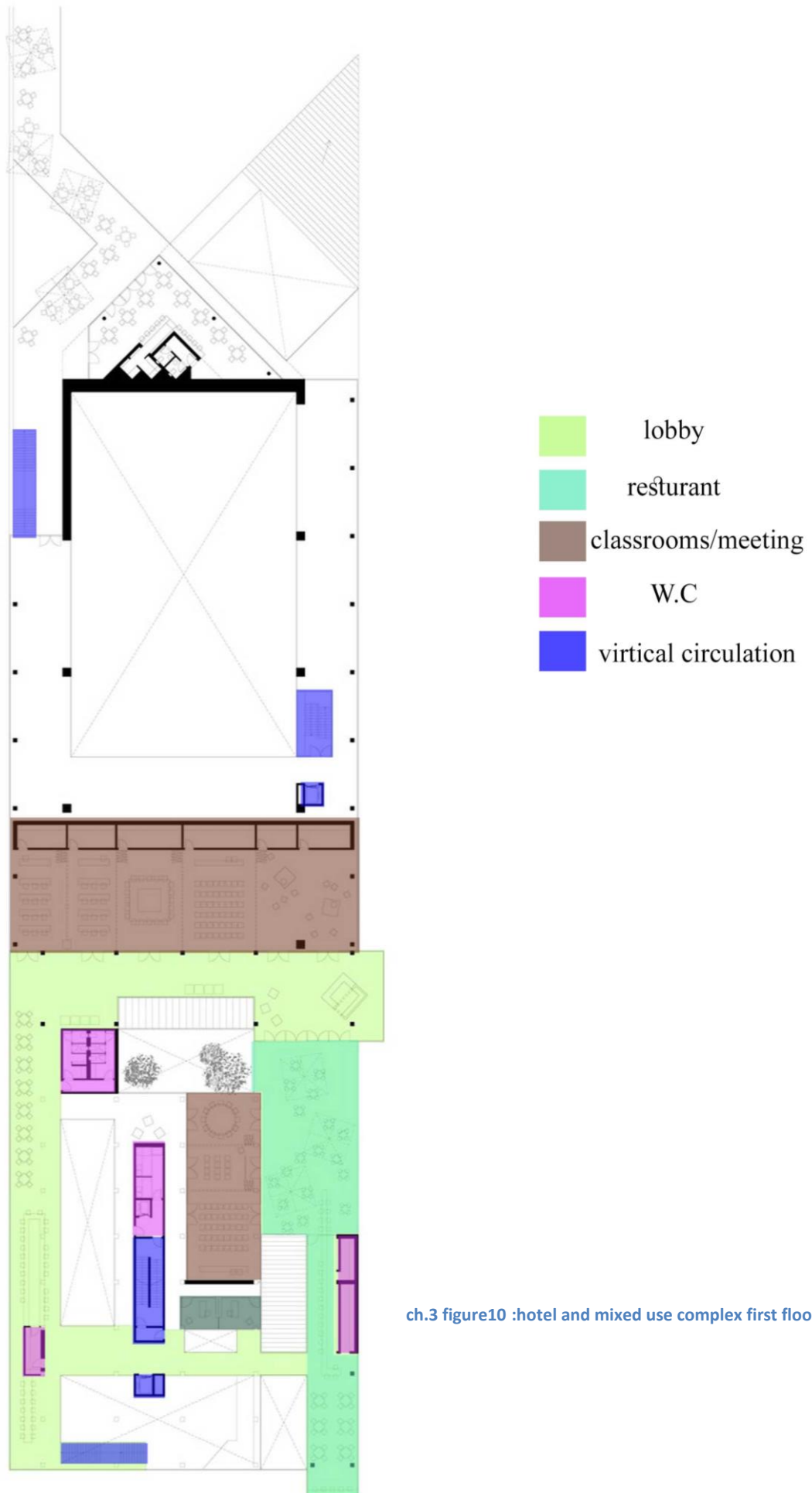
ch.3 figure8 :hotel and mixed use complex circulation

Plans :



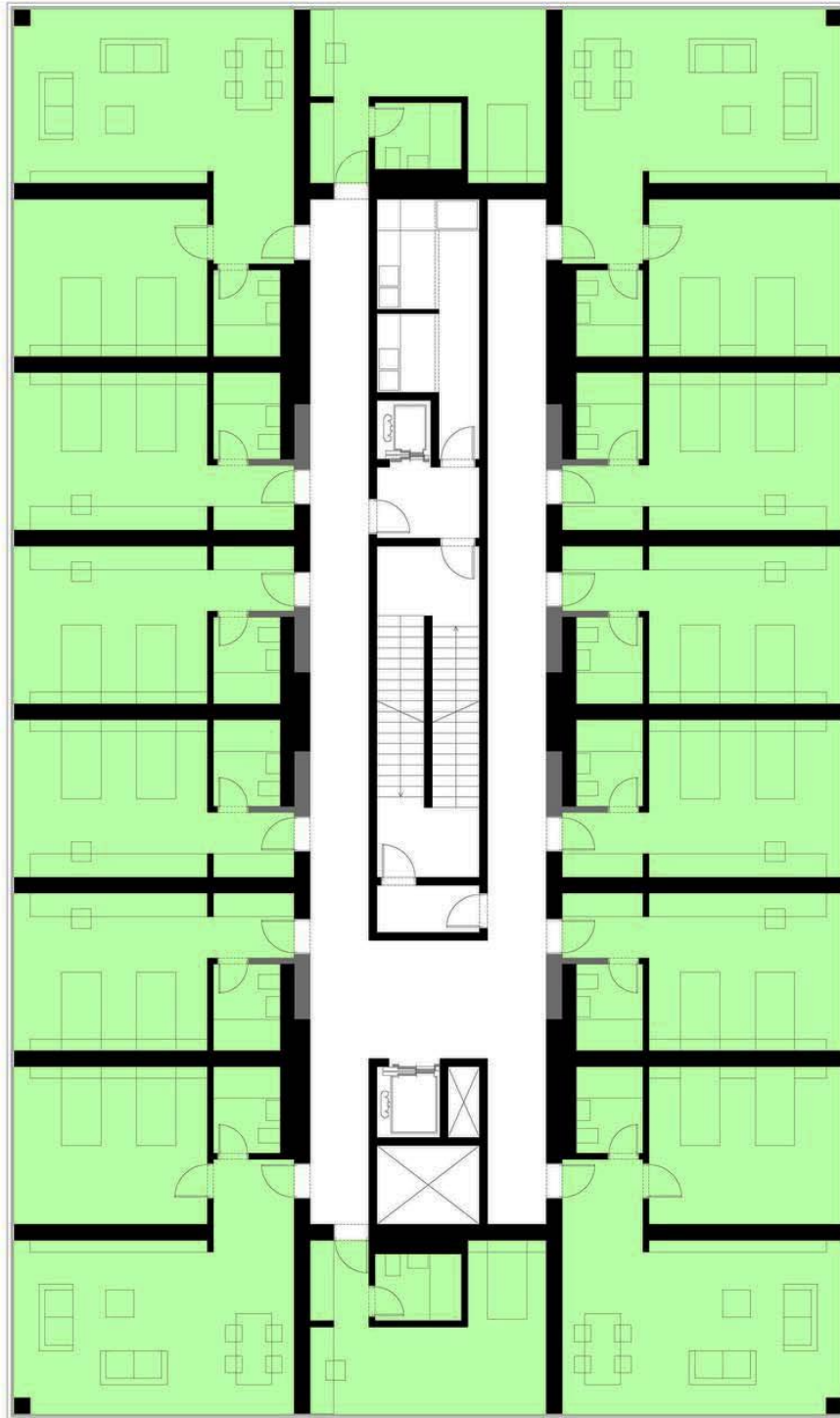
- entrance
- lobby
- restaurant
- kitchen
- W.C
- vertical circulation
- auditorium

ch.3 figure9 :hotel and mixed use complex ground floor



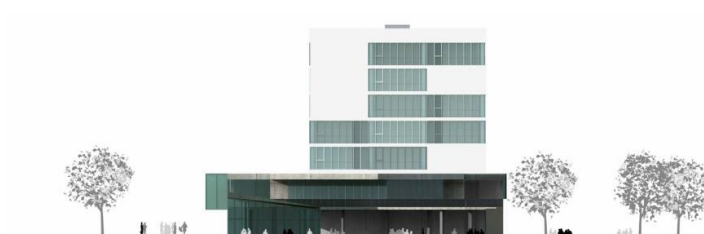
ch.3 figure10 :hotel and mixed use complex first floor

+



ch.3 figure11 : hotel typical floor plan

Elevations :

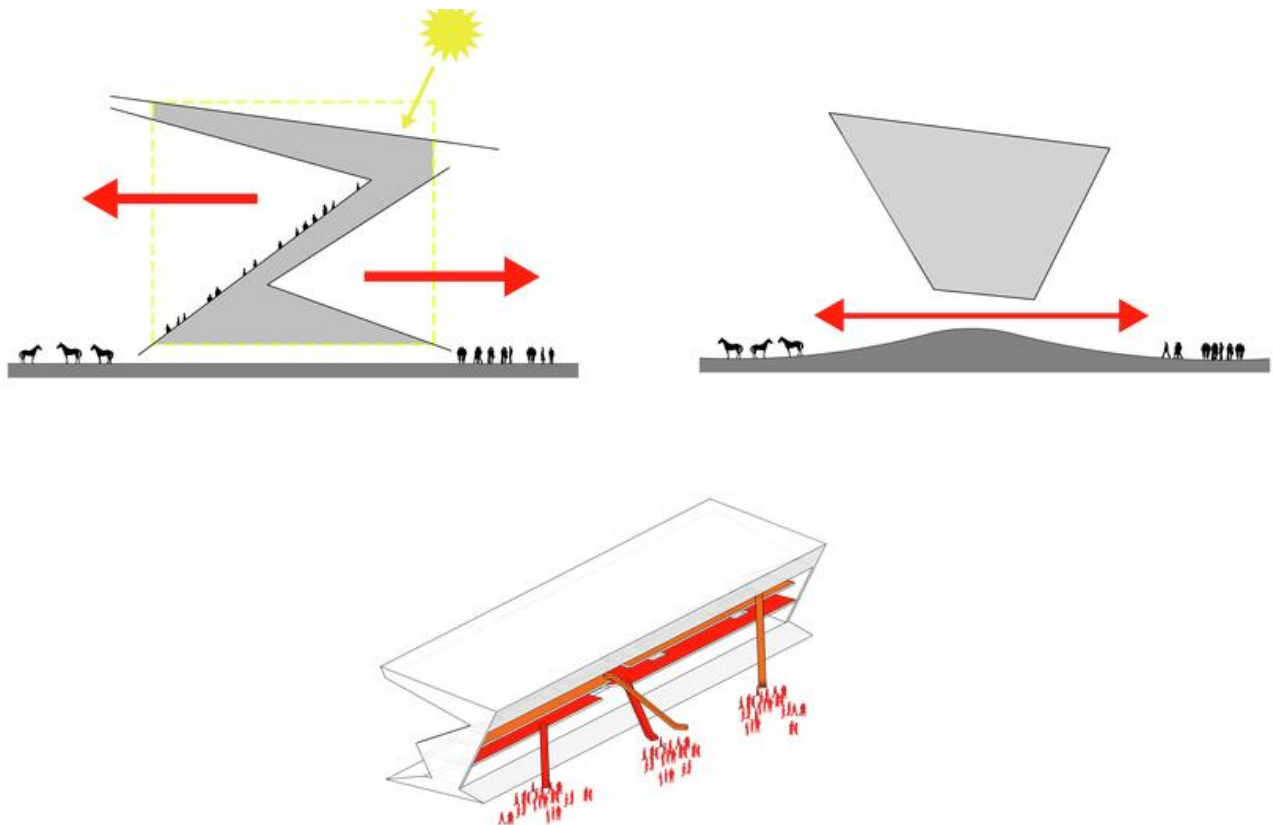


2- Spectators :

The volume of the tribune is modeled by 3 main cuts: 1. the spectators' standings, 2. a protected public space in the main access area (the back of the tribune) and 3. the optimum orientation of the roof for solar panels. The volume is lift on columns above a generous public space which contains the betting booths, shops, and the court of honor which is like an amphitheatre for the horse parade before the race. The public functions from the first and second floors are connected with the public plaza on the ground floor through 4 escalators.

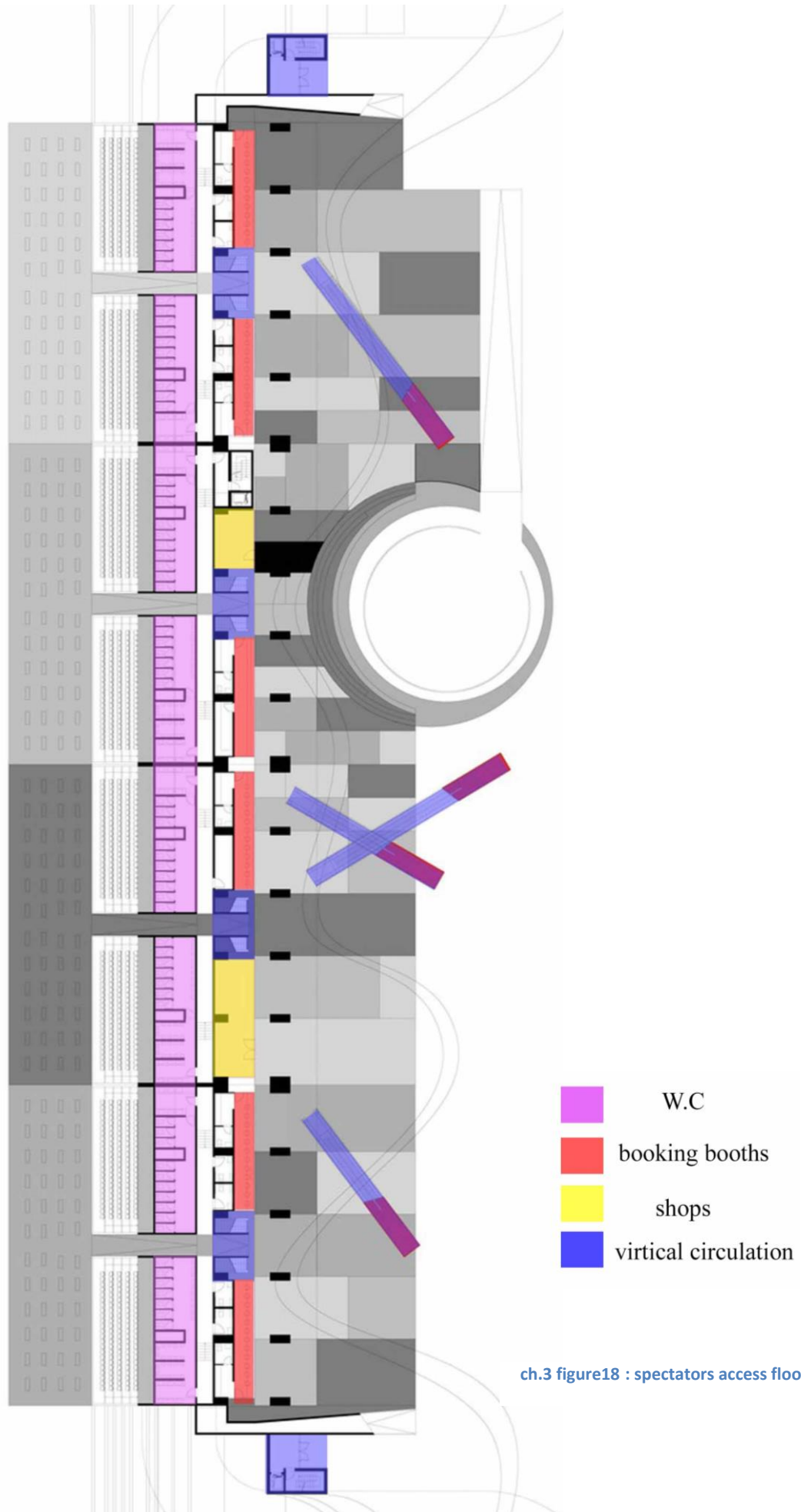


ch.3 figure16 :Ploiesti race track spectator

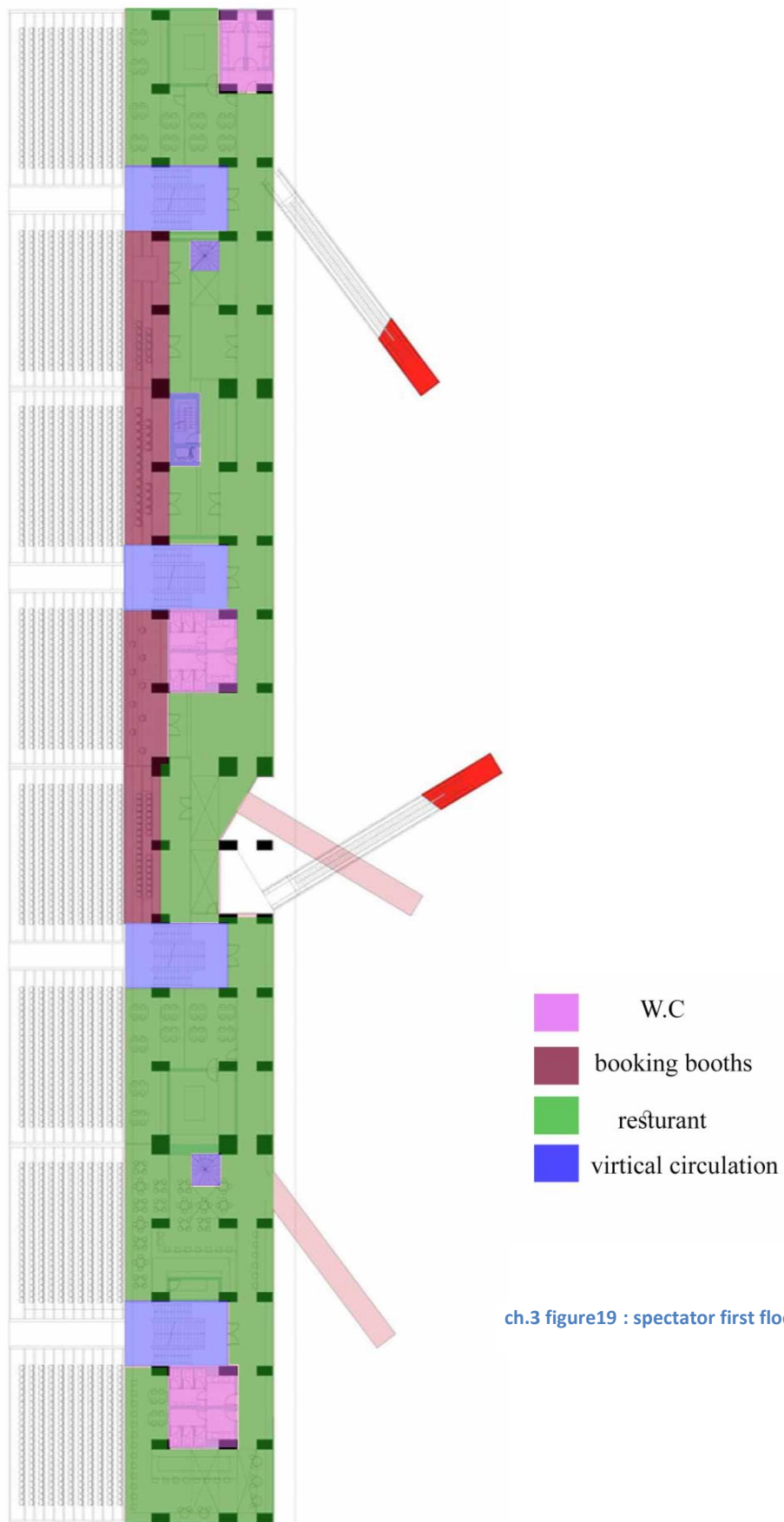


ch.3 figure17 :spectator shape concept

Plans:

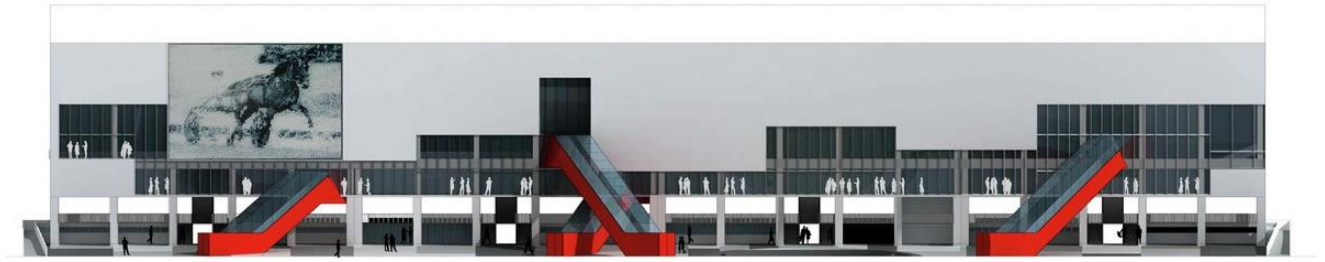


ch.3 figure18 : spectators access floor



ch.3 figure19 : spectator first floor

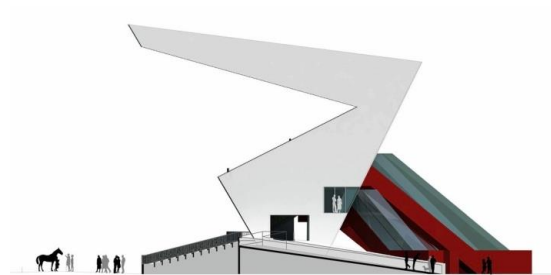
elevations:



ch.3 figure20 : spectator south elevation

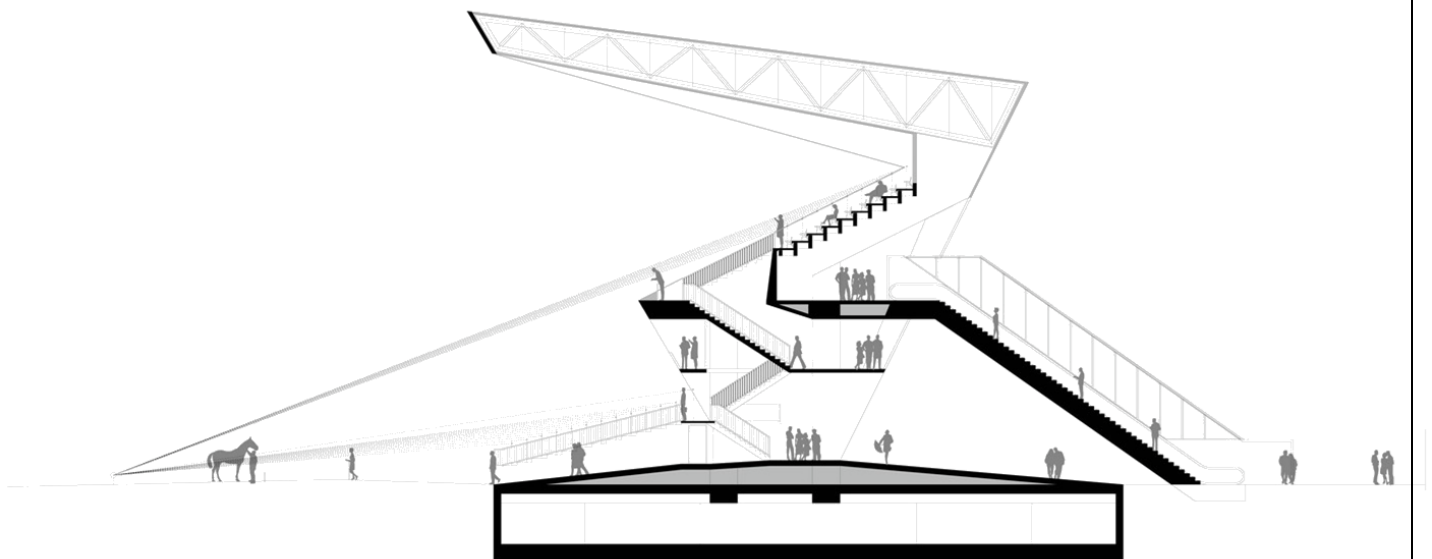


ch.3 figure21 :spectator north elevation



ch.3 figure22 :spectator west elevation

section:



ch.3 figure23 :spectator section

3- Stables :

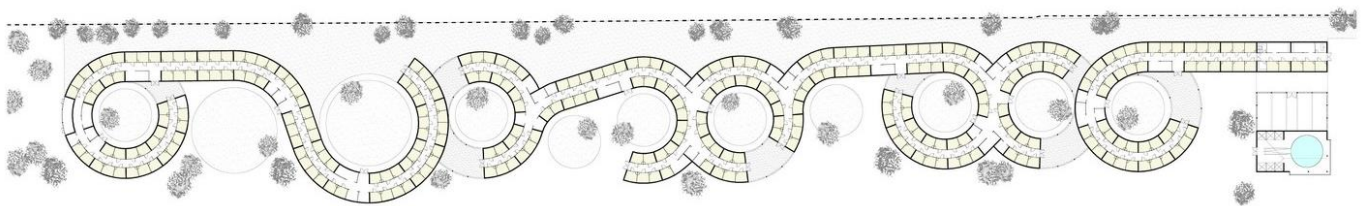
the housing and the relaxation and walking facilities of a typical horse stable were grouped into a single circular shape building around the paddock using in this way more efficiently the limited space of the site. The 300 stables are distributed in a village like shape formed by 9 circular units, with a network of curved spaces.



ch.3 figure24 : stables

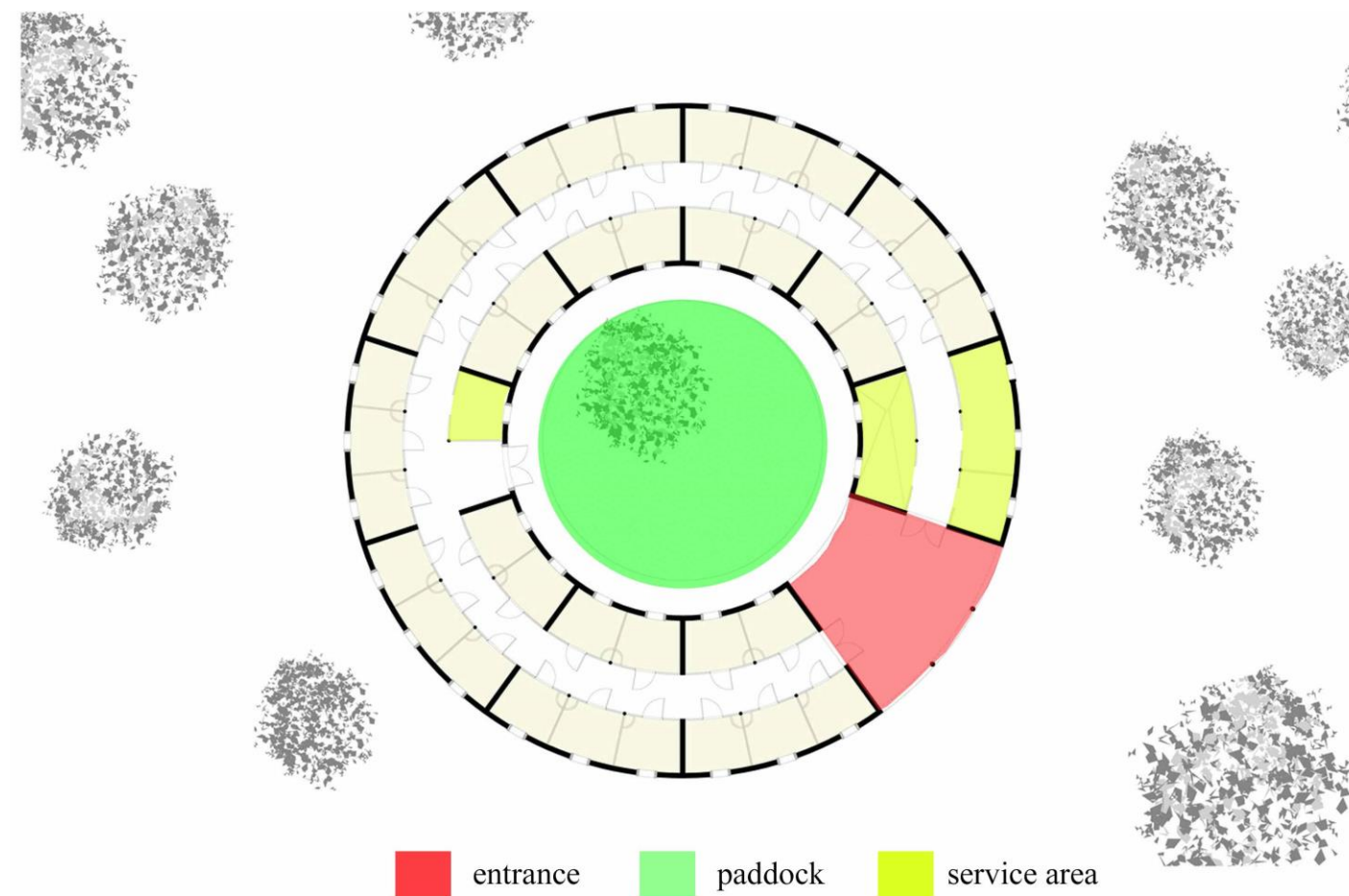


ch.3 figure26 : stables concept



ch.3 figure25 : stables site plan

plan :



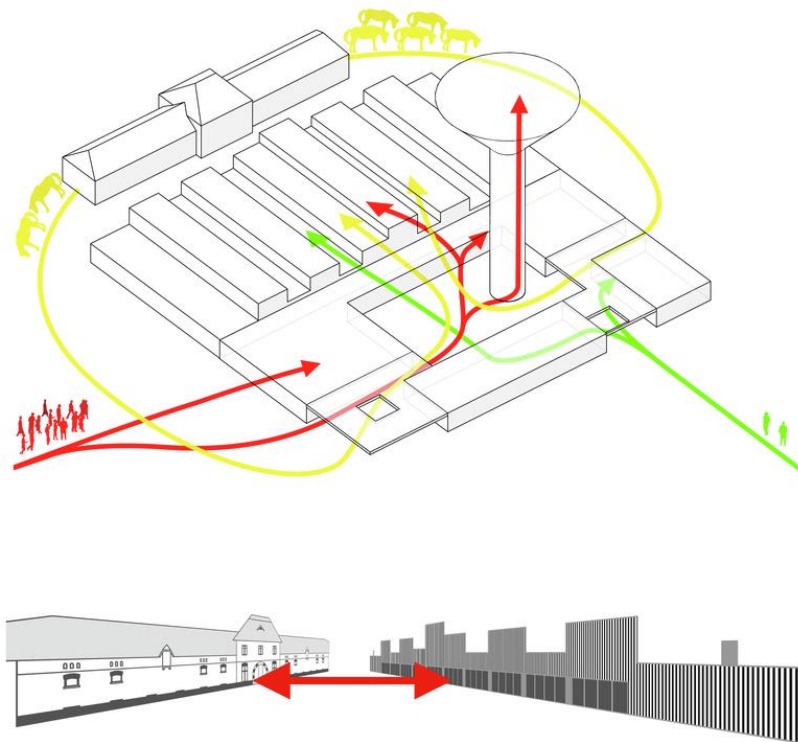
ch.3 figure27 : stable unit plan

4- Equestrian school :

The Equitation School is close to the old existing stable building and from the inside of the school one can see the old building like a background for the riding events. All the other spaces of the school – coffee shop, locker rooms, teaching school, administration area are placed around a central medieval like open court, with the water tower acting as the campanile. All the different internal paths of people meet in this central area. An elevator and a stair are placed in the interior of the water tower to reach the panoramic bar above.

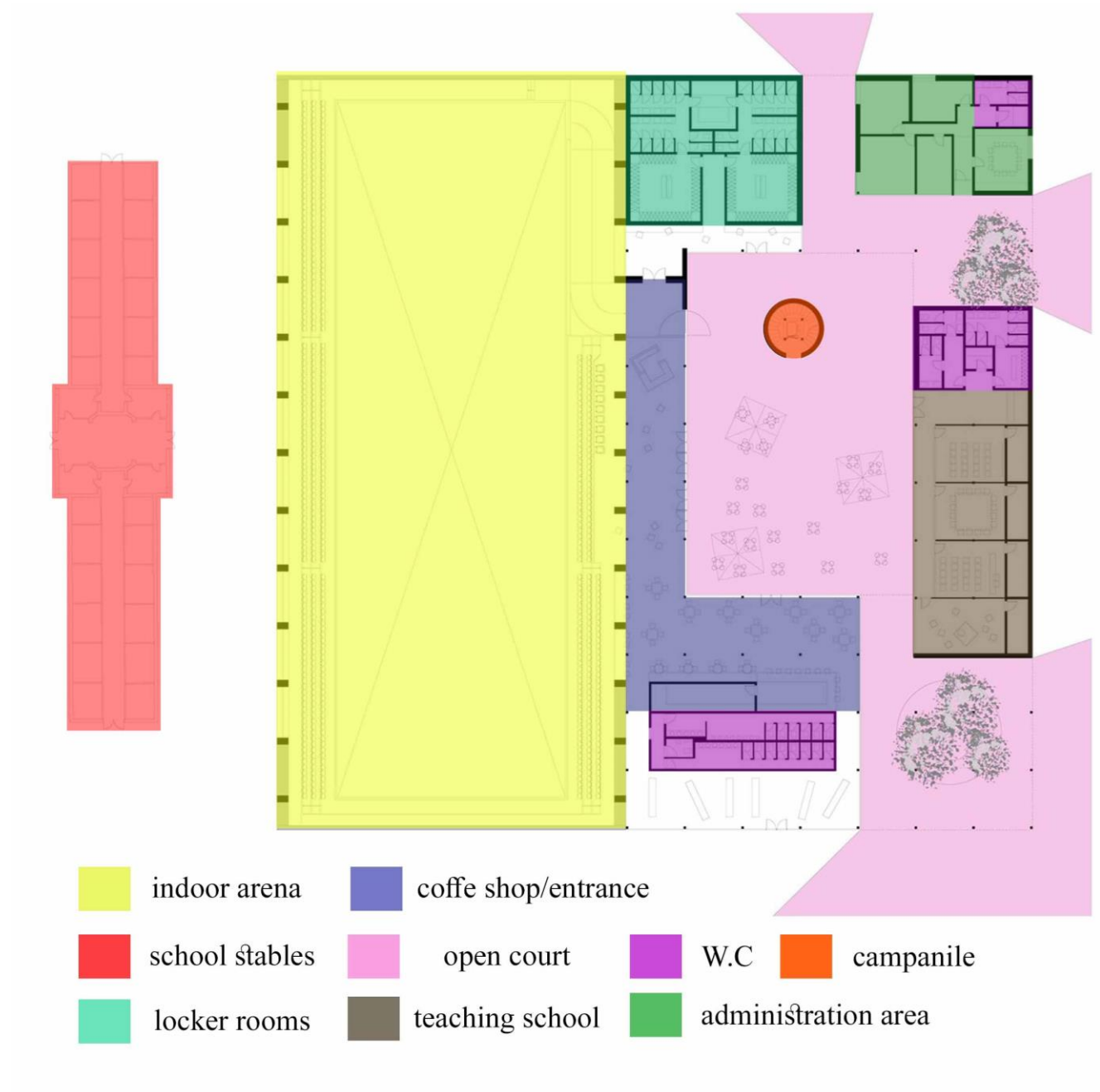


ch.3 figure29 :Equestrian school

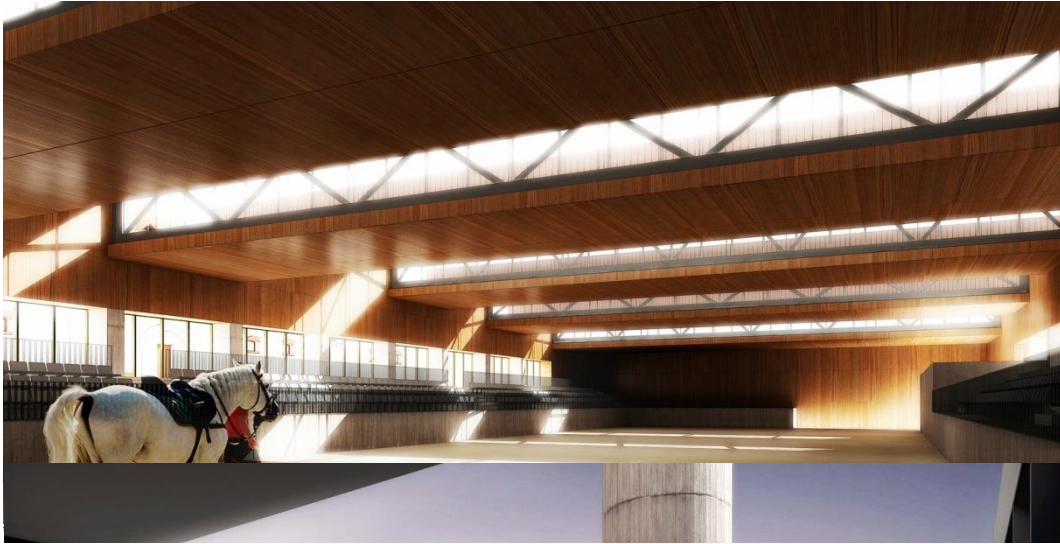


ch.3 figure28 :Equestrian school circulation paths

Plan :



ch.3 figure30 :Equestrian school plan

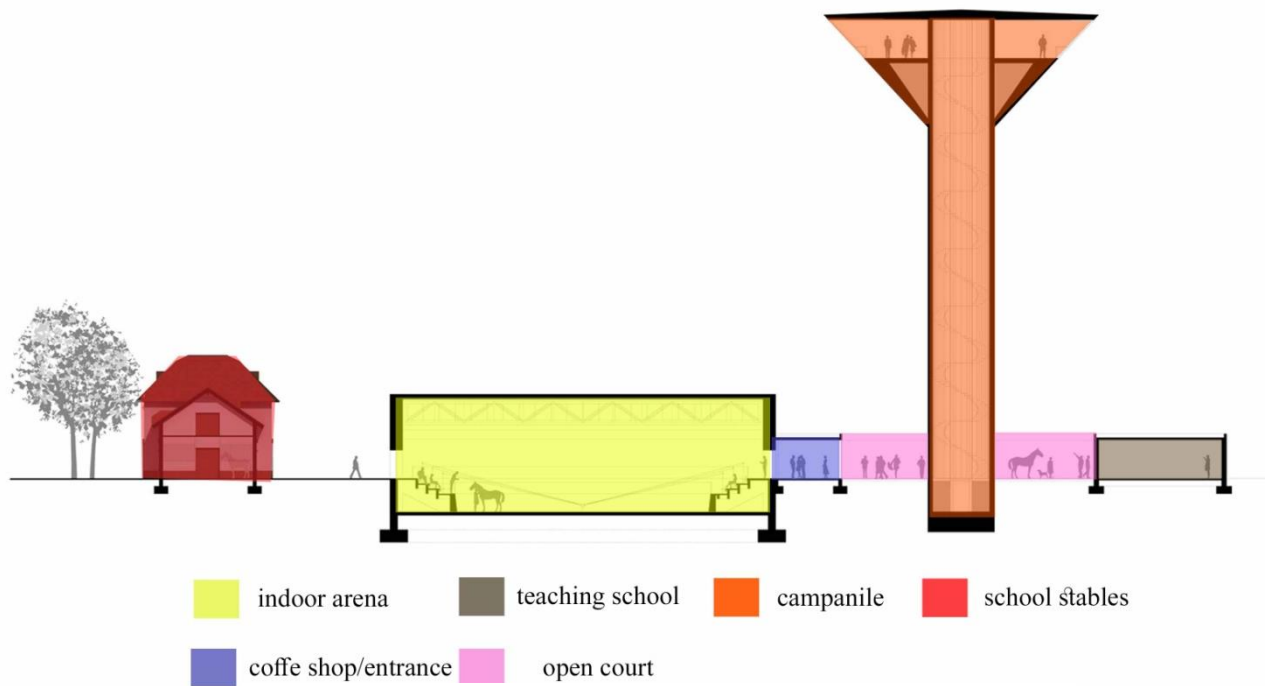


ch.3 figure31 : Equestrian school indoor arena



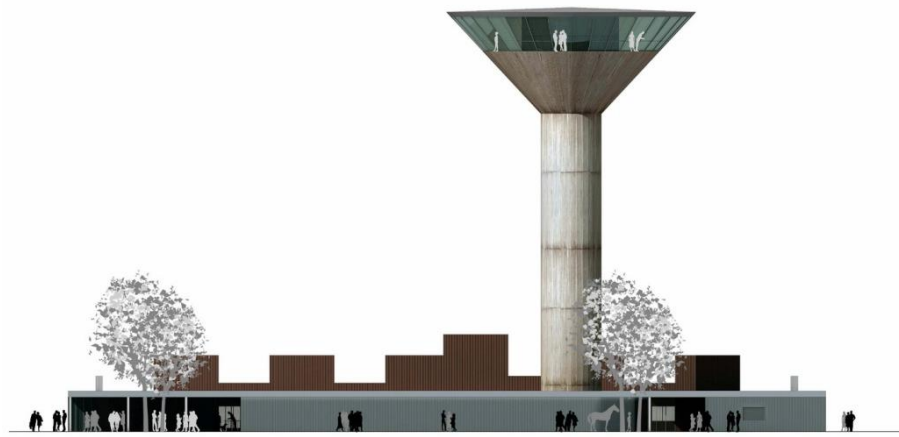
section :

ch.3 figure32 : Equestrian school court



ch.3 figure33 : Equestrian school section

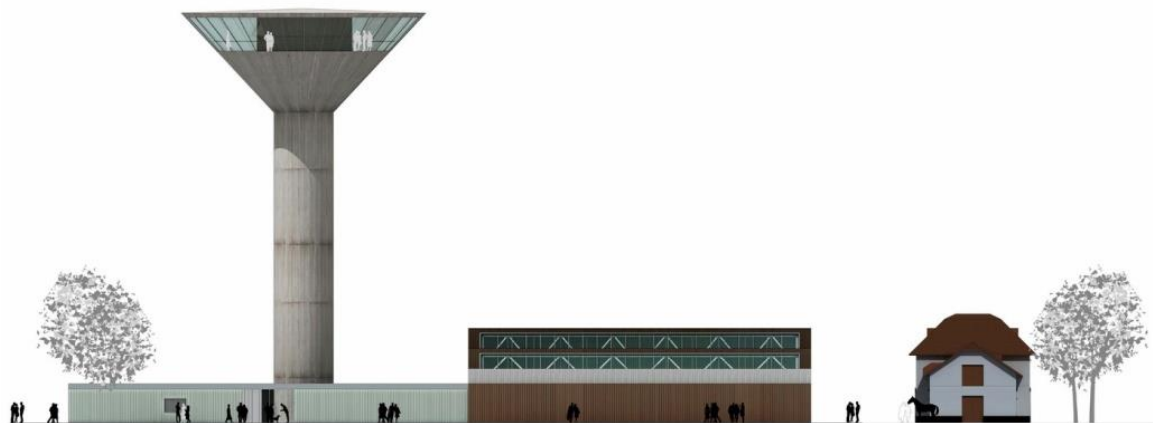
elevations :



ch.3 figure37 :Equestrian school east elevation



ch.3 figure36 :Equestrian school west elevation



ch.3 figure35 :Equestrian school north elevation



ch.3 figure34 :Equestrian school south elevation

5- Administration building :



ch.3 figure38 : administration building

3.2 Horse Stables in Finca Ganadera:



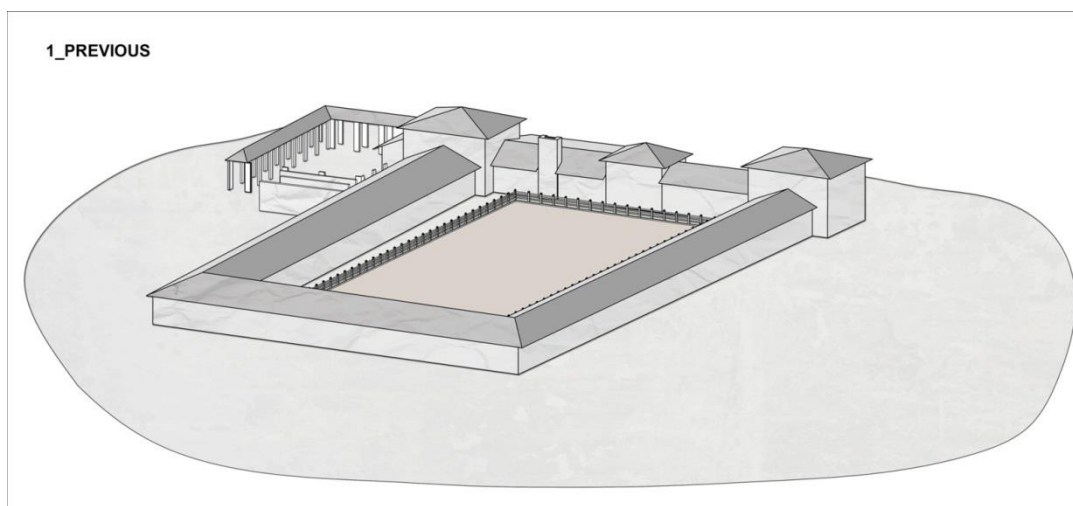
ch.3 figure39 :Horse Stables in Finca Ganadera

Table 8:Horse Stables in Finca Ganadera project information

Architects	OOIO Arquitectura
Location	Madrid, Spain
Area	2350.0 m2
Project Year	2018
Source	www.archdaily.com

What is the project :

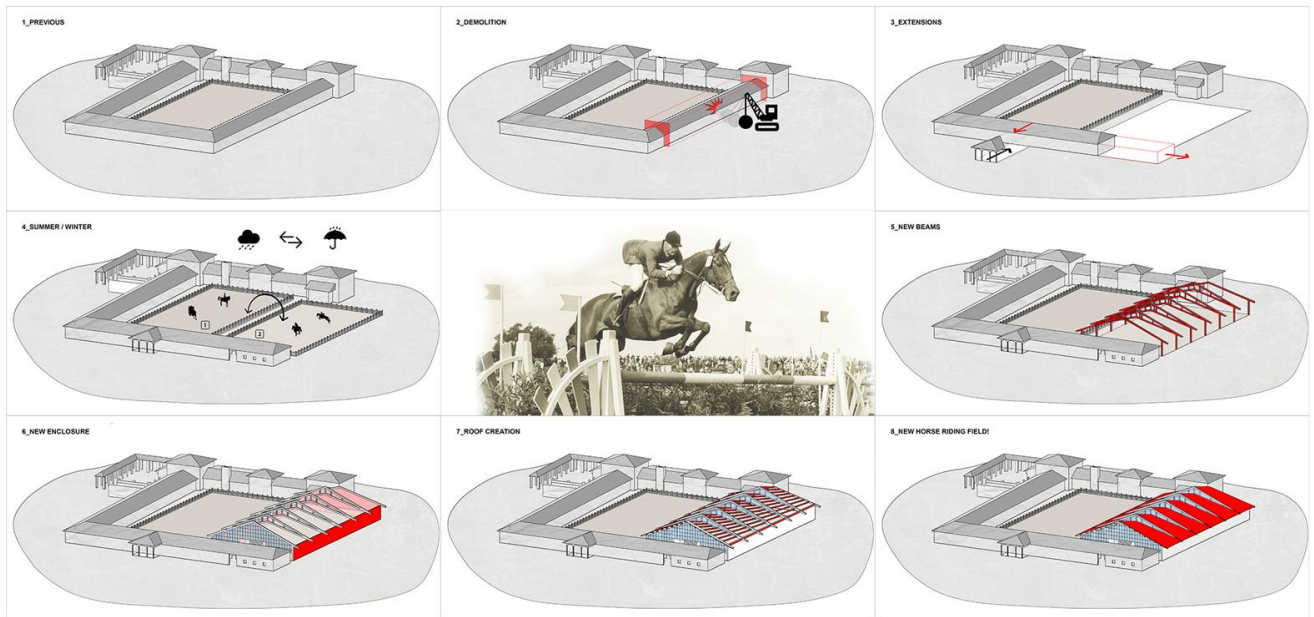
OOIO Architecture developed a deep restoration in a cattle farm, located in a privileged enclave of the fields of Castilla, to adapt it to sports facilities for the training and care of jumping competition horses.



ch.3 figure40 :cattle farm

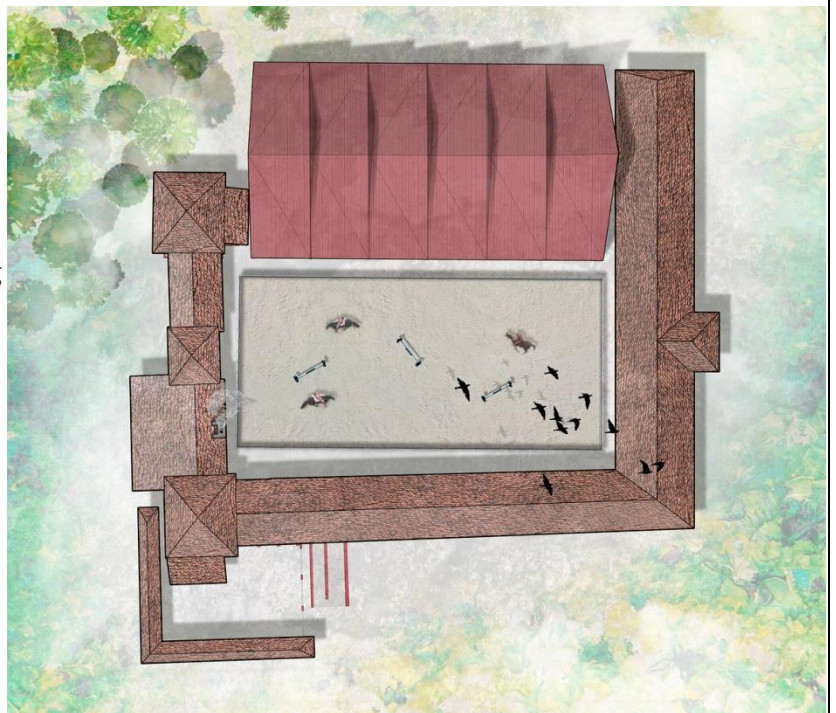
Project plan :

The architects task consisted of integrating a horse riding field into a large traditional country house and reforming old stables to bring them up to date, so the new group of buildings will become first class riding horses facilities, at the service of some beautiful competition horses, which They are undoubtedly the real protagonists of this place, where every detail is designed for them, so that they feel as comfortable as possible.



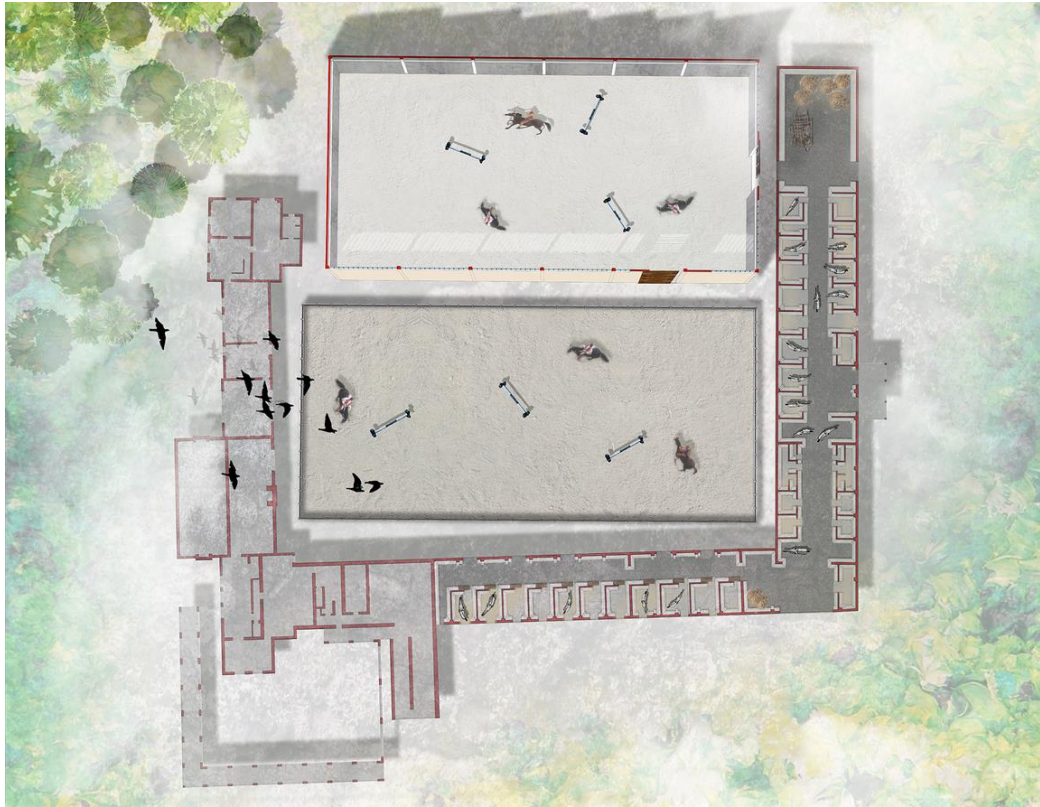
cn.3 figure41 : project plan/concept

The original building was in the shape of a rectangle, with a central courtyard that acts as an outdoor arena and, in order to train on rainy days, it is decided to build the new covered riding arena, demolishing one of the arms of the rectangle and integrating the new construction with the rest of the great country house.



ch.3 figure42 : site plan

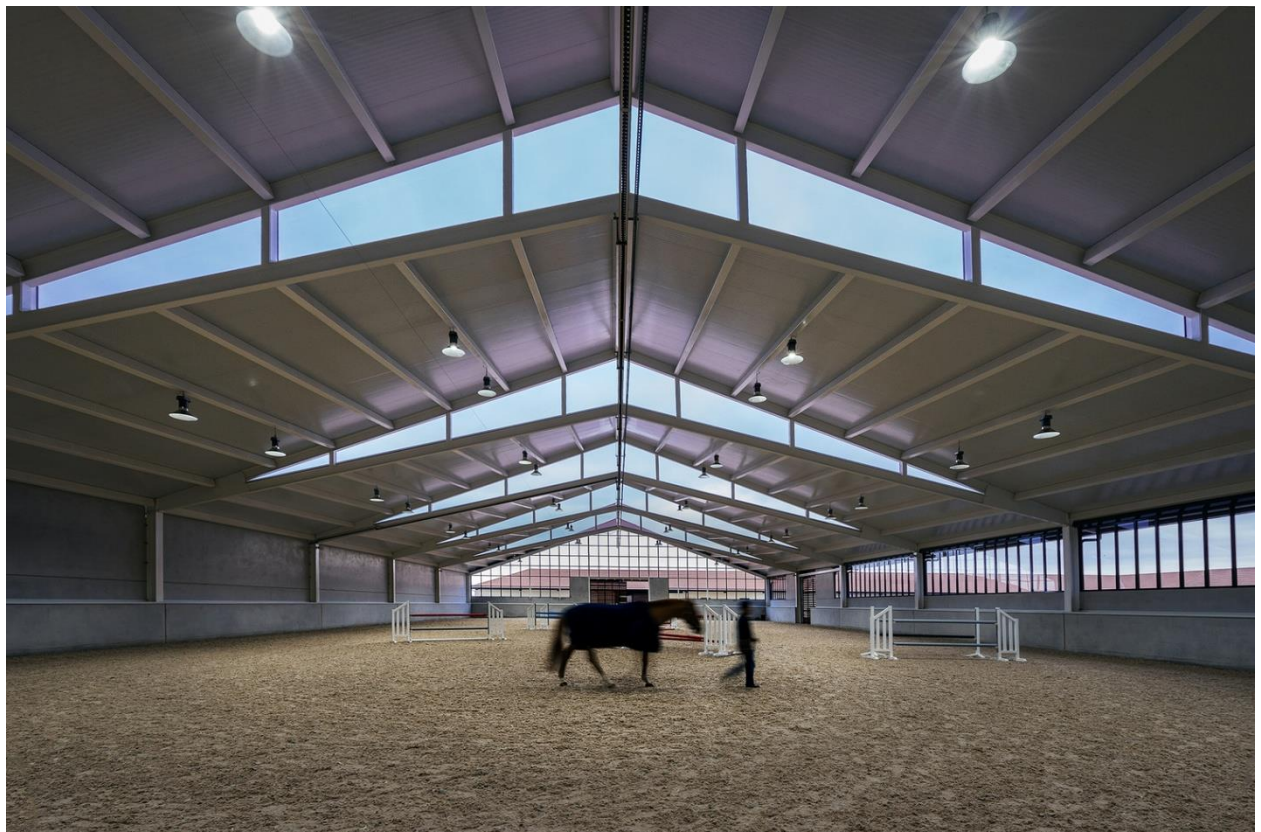
Plan:



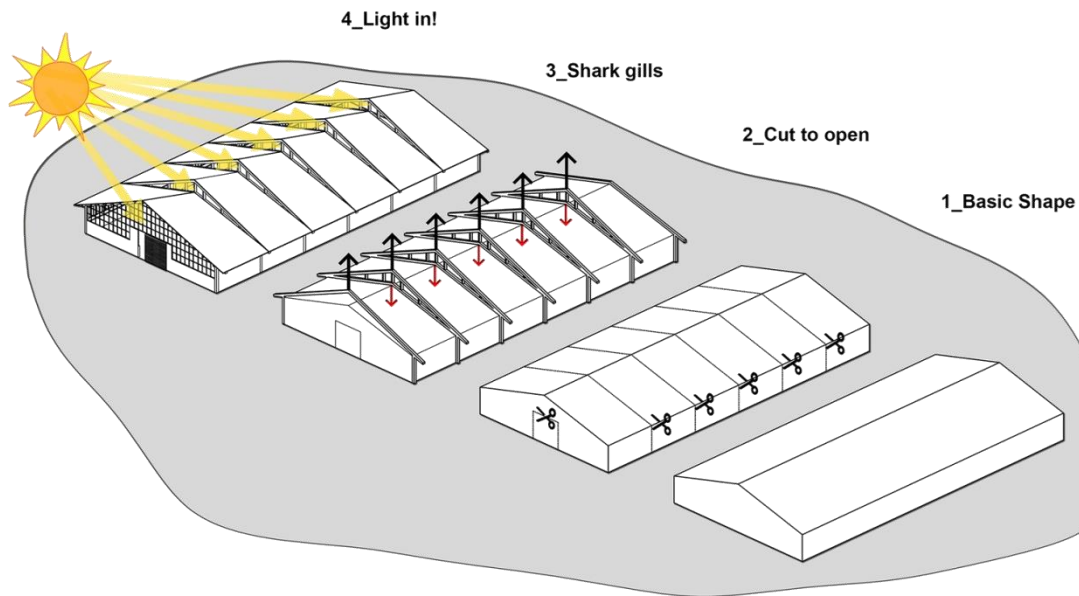
ch.3 figure43 : floor plan

1- Indoor arena :

The new building has as its ultimate goal to protect from inclement weather, but also had to have good lighting as neutral as possible. Lots of light but well distributed, they did not want shadows that could distract or confuse the horses when jumping, so it is decided to open skylights on the north deck, which fill the interior with natural light, without a single ray of the strong Spanish sunlight inside.



The arena was then solved by large porches that spaced a distance of 30 meters each, with broken triangular beams that make up a singular gable roof, integrated with the rest of the building, which opens to the north light with a succession of skylights in peak that let light through the soul of the beams of each portico, as if it were the gills of a shark. The new roof formed by that repetition of skylights, and seen from the distance in the beautiful the landscape around the farm, is shown as a repetition of frozen waves in the middle of a vast expanse of field around it.



ch.3 figure45 : indoor arena concept



ch.3 figure46 : indoor arena

2- Outdoor arena :



ch.3 figure47 : outdoor arena

3- Stables :

The blocks that surround the new piece, were refurbished and adapted to become first level sports facilities, fully equipped. So the riders, caregivers and, mainly the horses can enjoy, train and rest comfortably.



ch.3 figure48 : stables

Sections :



ch.3 figure49 :section 1



ch.3 figure52 :section 2



ch.3 figure50 :section 3



ch.3 figure51 :section 4

3.3 Klagshamn's Equestrian Center :



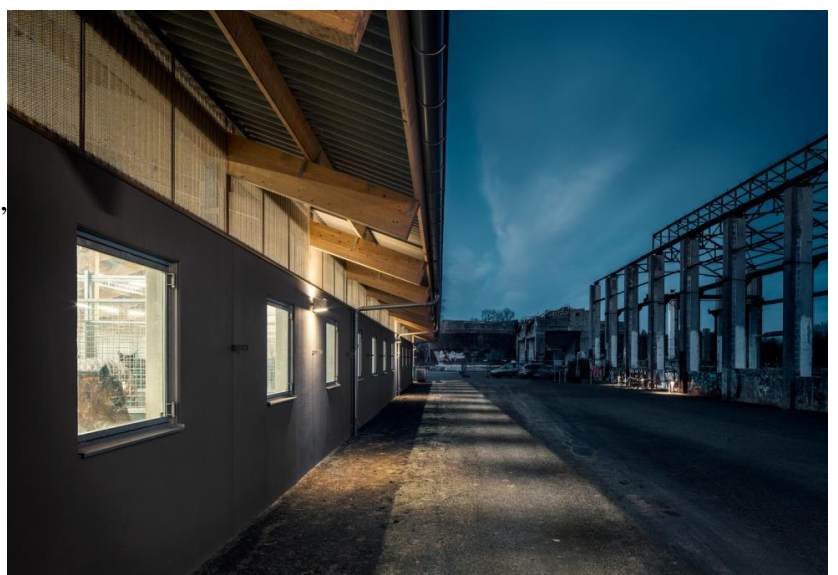
ch.3 figure53 : Klagshamn's Equestrian Center

Table 9:Klagshamn's Equestrian Center project information

Architects	FOJAB arkitekter
Location	218 51 Klagshamn, Sweden
Area	4600.0 m2
Project Year	2015
Source	www.archdaily.com

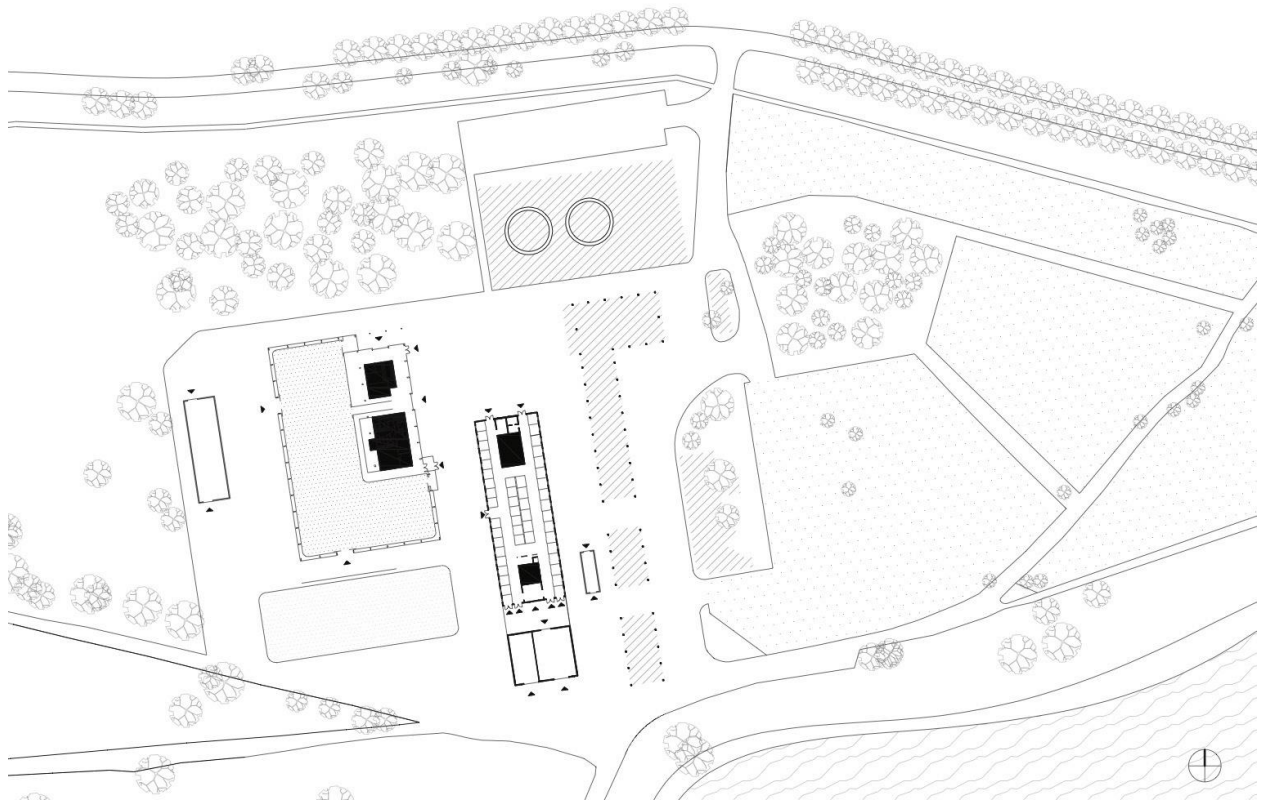
Location of the project :

Klagshamn's Point is located about 10 km south of Malmö and extends into the strait of Öresund. To the south, there are long sandy beaches that are excellent for horseback riding. Until recently, Klagshamn's Riding Club was located in a former concrete plant. When Malmö City planned for a new equestrian center, it was natural to build in the same place as the concrete plant. The city also chose to make the ruins of the concrete plant into a park.



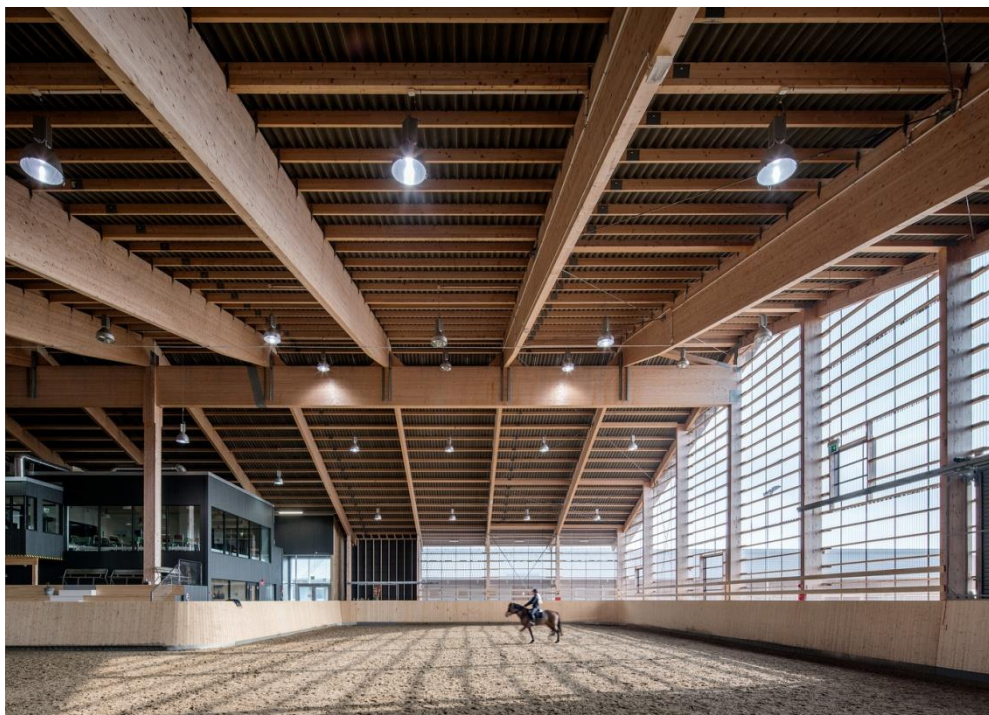
ch.3 figure54 : Klagshamn's Equestrian Center

The sitting of the buildings runs parallel to the ruins of the concrete factory. The two main buildings, stable, and riding center have distinctive, connected roof surfaces that bridge the different functions of the facility. The buildings have been positioned so that a variety of spaces are created in and around the ruins, the entrance courtyard, farm, and riding track.



ch.3 figure55 : site plan

The character of the buildings is that of open shells with clearly demarcated spaces (buildings within buildings), depending on temperature and functional requirements. Working with horses means that movements in and out of the buildings must feel natural, without a sharp border between indoors and outdoors.



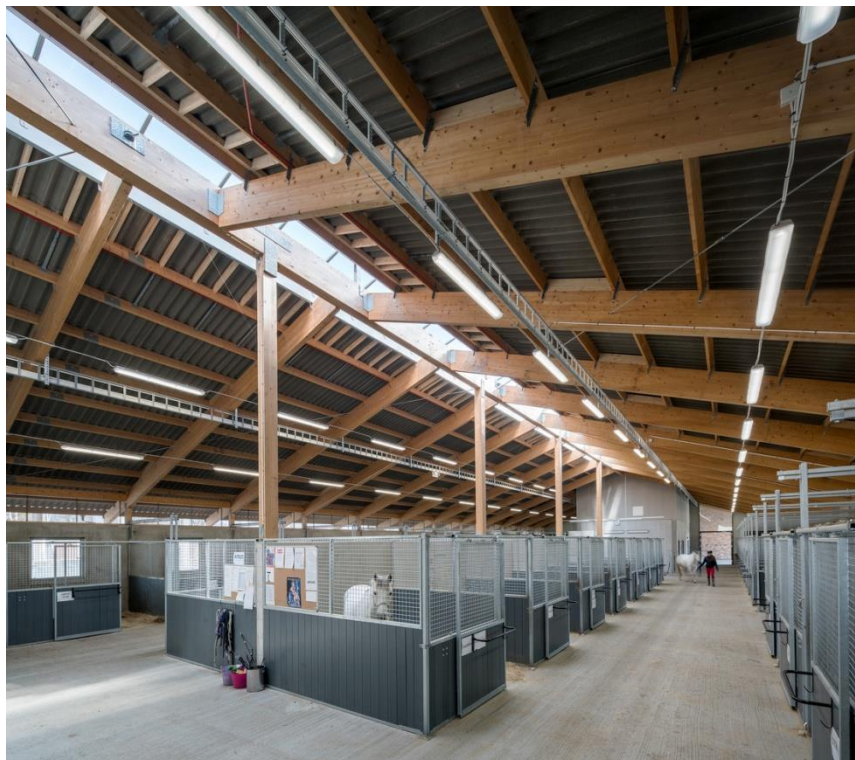
ch.3 figure56 : Equestrian Center indoor arena

Wall and ceiling materials are simple and directly linked to function and building physics. The concrete elements closest to the ground in the plinth and the wall are resistant to machines, horses, snow, rain, wind, etc. The wall and ceiling are lattice constructions in the form of columns and beams that clearly reflect the building's supporting structure. Perforated sheet metal in the facade gives several concurrent effects - natural ventilation, daylight, views in and out, and sound absorption. In addition, it is cost-effective. In particular, perforated sheet metal ensures that the moisture balance is guaranteed by natural air exchange.



ch.3 figure57 : Equestrian Center elevation material

1- Stables :



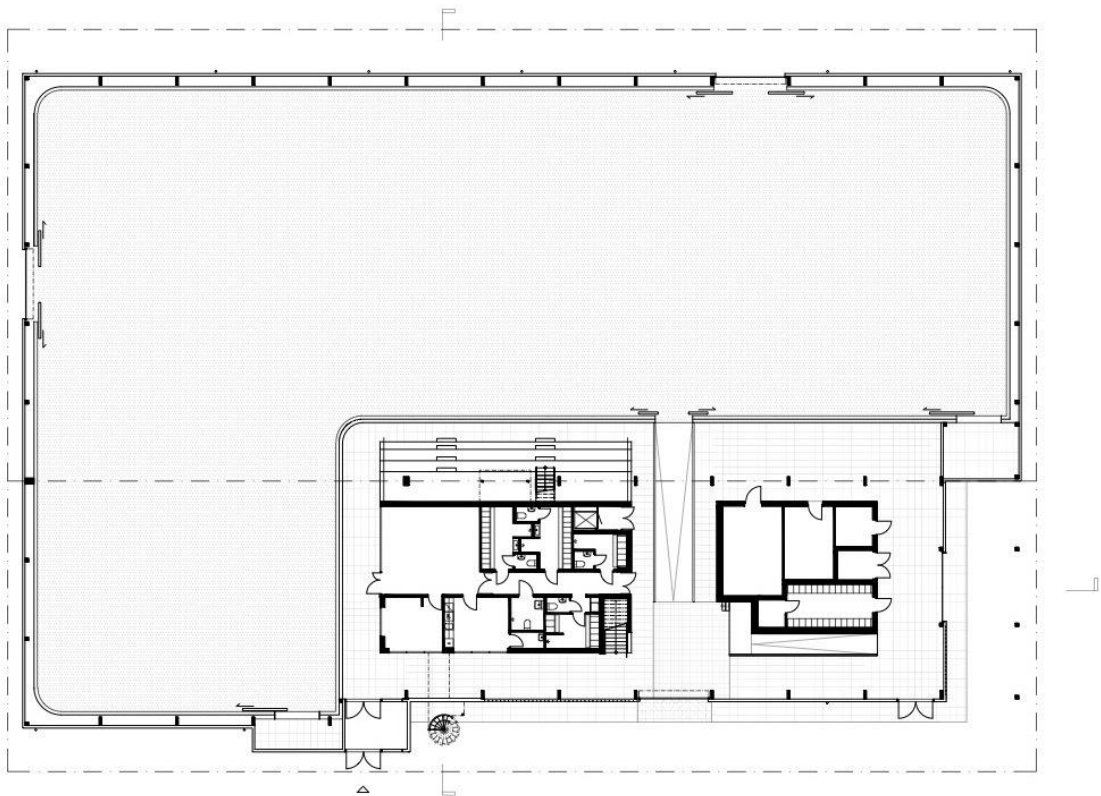
ch.3 figure58 : stables

2- Equestrian school :



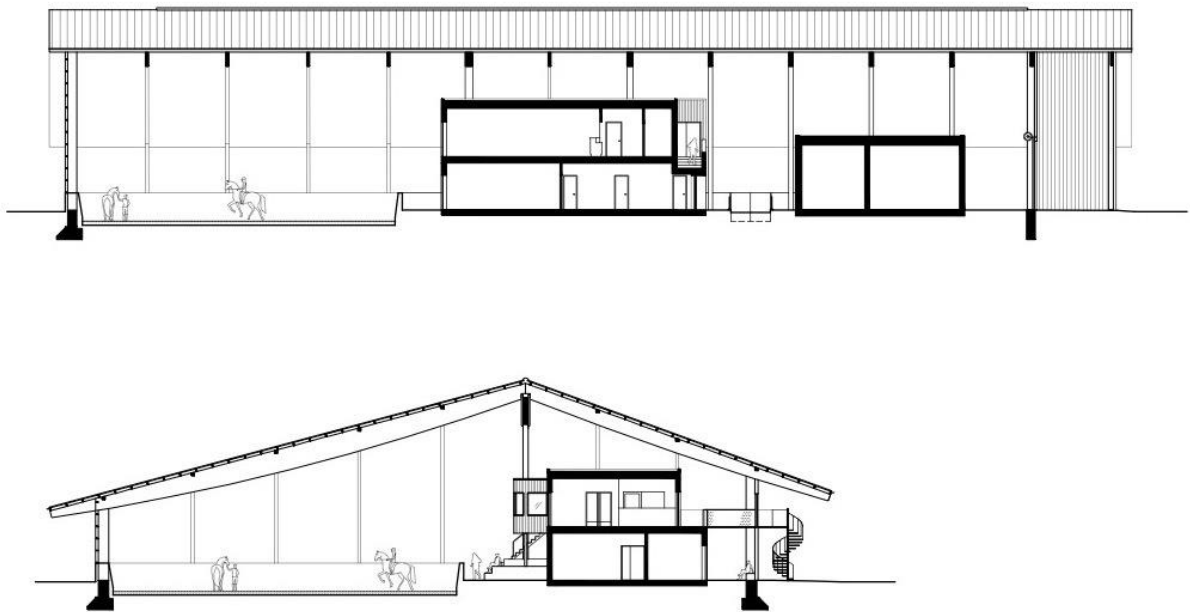
ch.3 figure59 : Equestrian Center

Plan :



ch.3 figure60 : Equestrian Center floor plan

sections :



ch.3 figure61 : Equestrian Center sections



ch.3 figure62 : indoor arena

3.4 Paris Longchamp Racecourse :



ch.3 figure63 :Paris Longchamp Racecourse

1

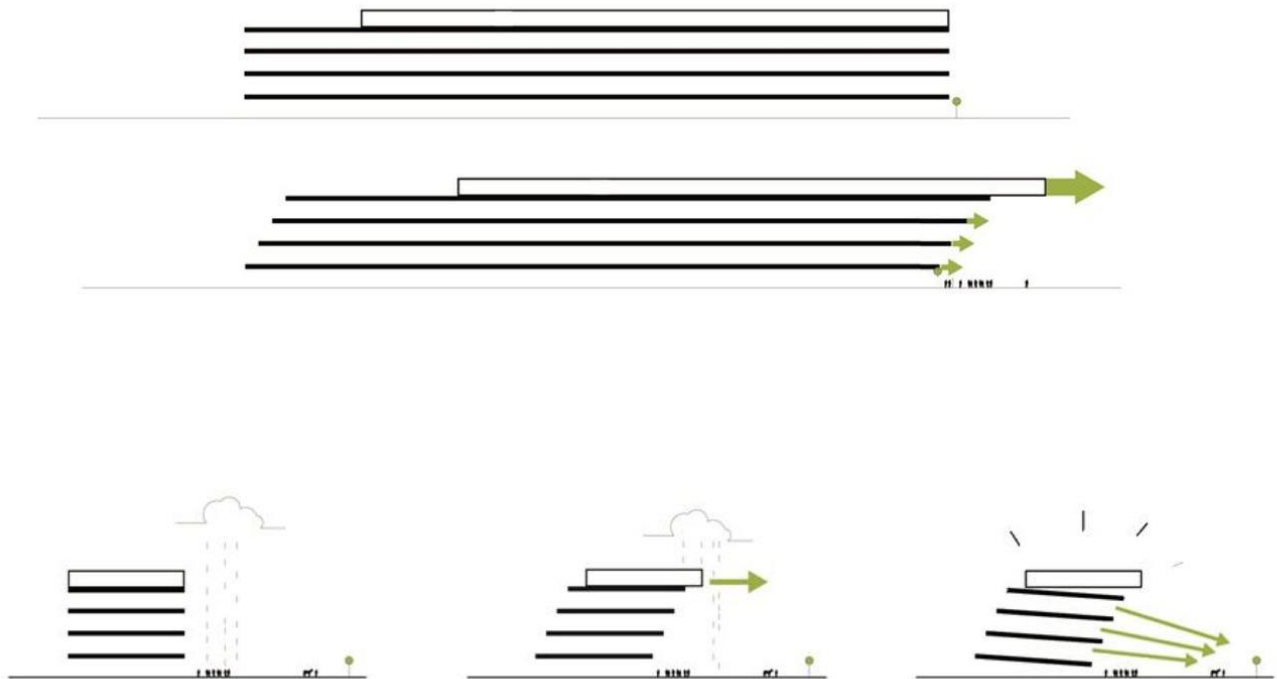
Architects	Dominique Perrault Architecte
Location	2 Route des Tribunes, 75016 Paris, France
Area	60000.0 m2
Project Year	2018
Source	www.archdaily.com

What is the project :

ParisLongchamp is recognised worldwide as a highly challenging course. After two years of construction work, Longchamp racecourse has become ParisLongchamp. The new racecourse treats visitors to a whole new racing experience. The race for the Prix de l'Arc de Triomphe is the highpoint of the life of the racecourse. Therefore, the main challenge of this project is for it to be able to host this event, which draws up to 60,000 spectators, under exceptional conditions, while also welcoming a much smaller crowd on ordinary racing days.

Spectator :

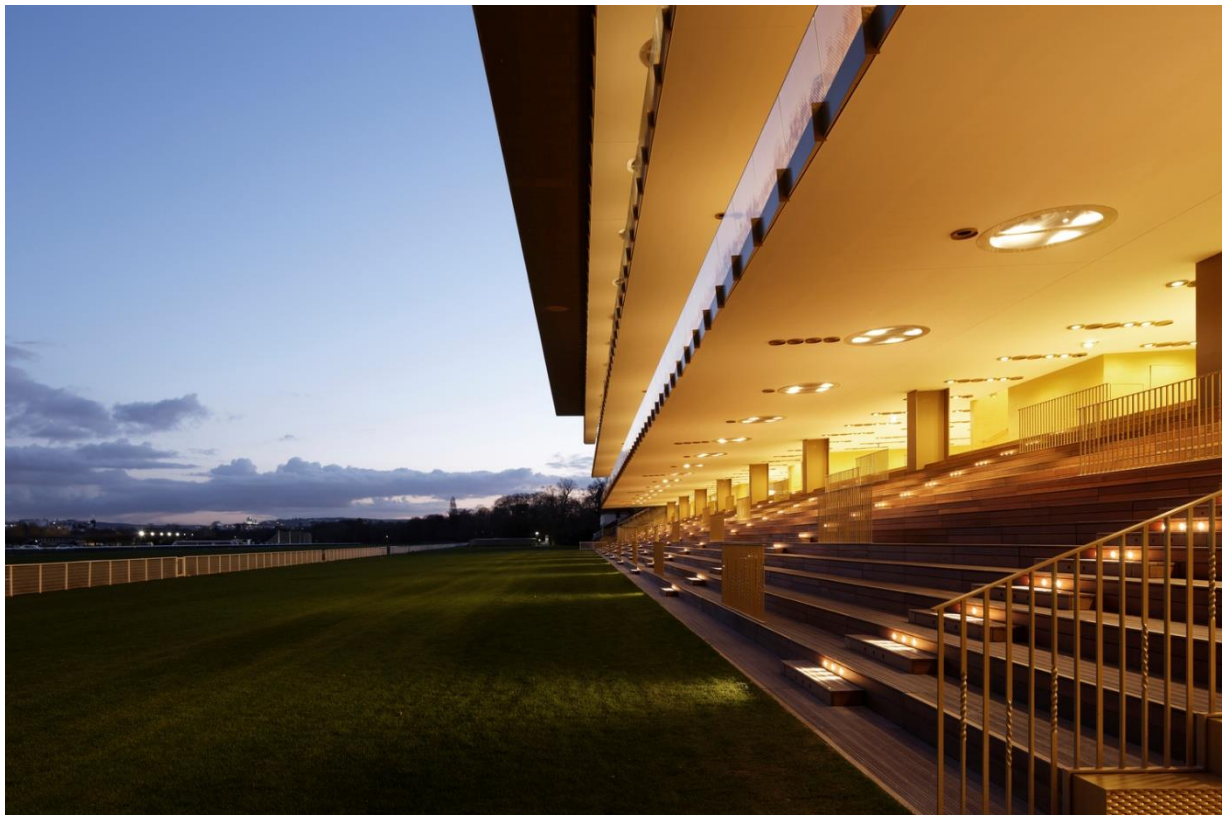
The architecture of the stand is in motion, like a galloping horse. A slight overhang orients the interplay of superimposed stands toward the finish line. But this gap on the racecourse side creates stands that overlook the course, while on the side of the parade ring, a balcony stand is formed. In fact, all the features—terraces, walkways, transparencies, and open staircases—will provide permanent views of the entire racecourse with, of course, privileged views over the parade ring and over the course itself. The architectural concept is one of transparent “shelves”, with neither front nor back, enabling spectators to go back and forth from a view over the stables to a view over the racecourse.



CONCEPT

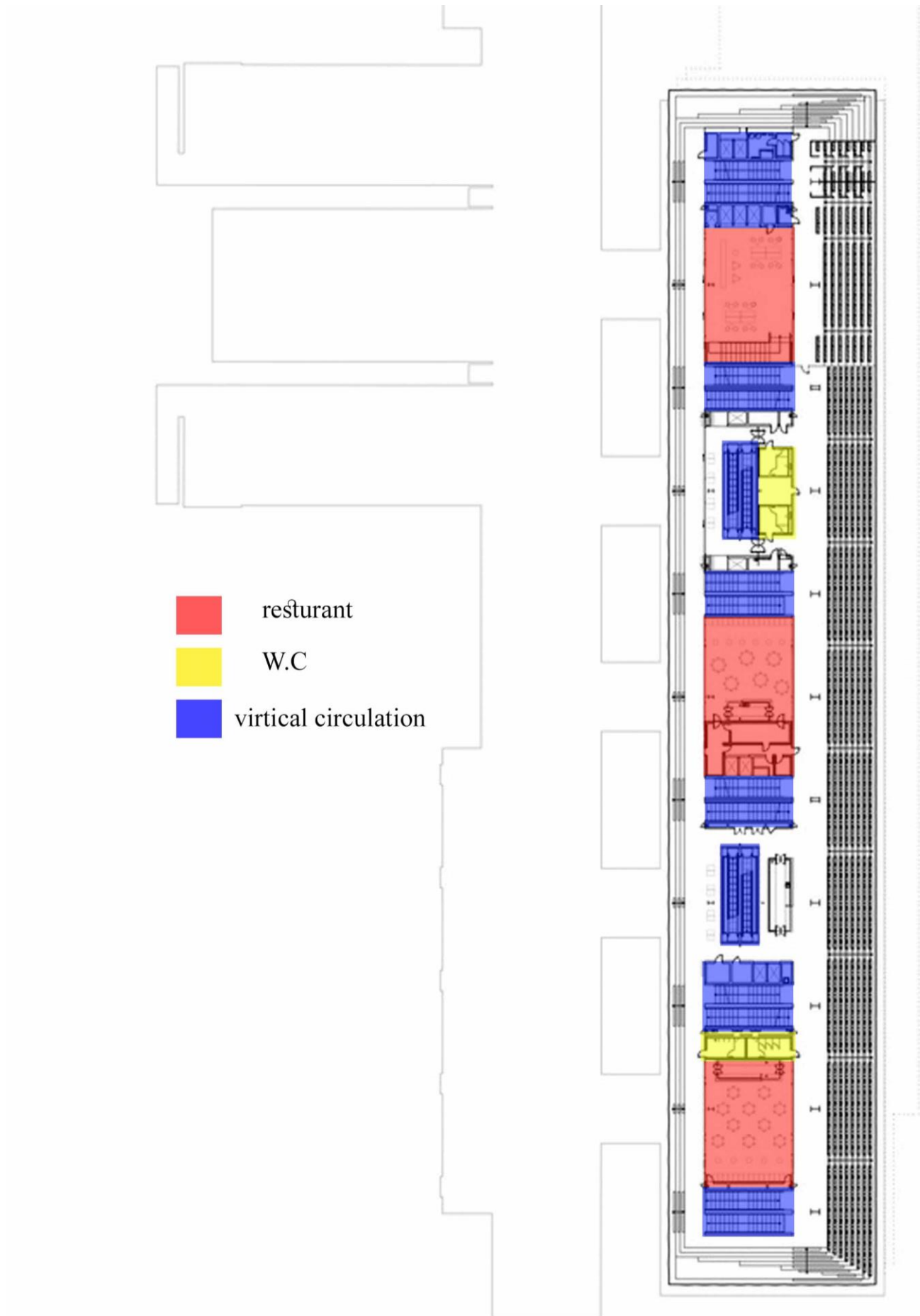
28

ch.3 figure64 : Paris Longchamp Racecourse spectator concept



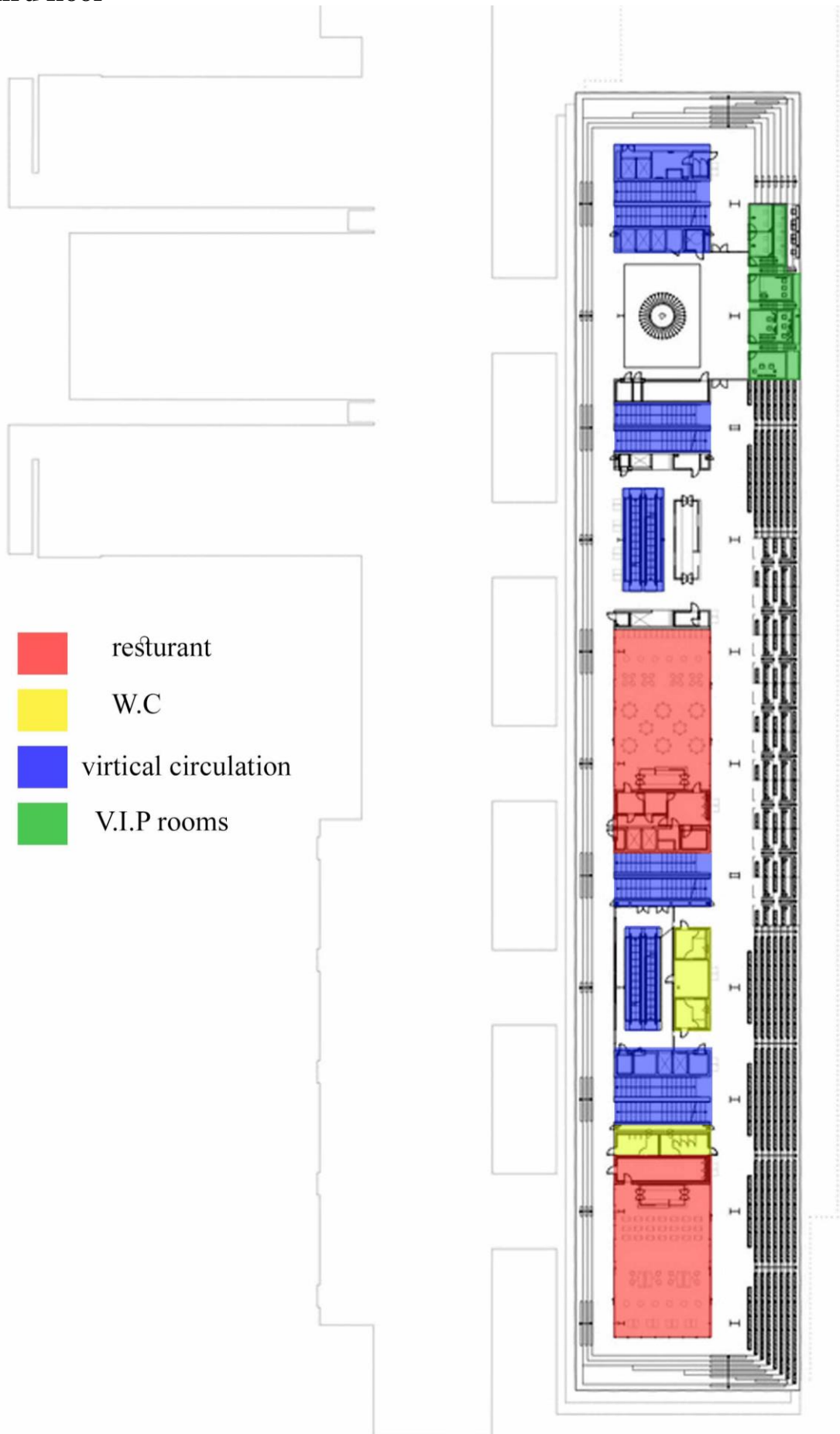
ch.3 figure65 :Paris Longchamp Racecourse spectator

Plans :second floor

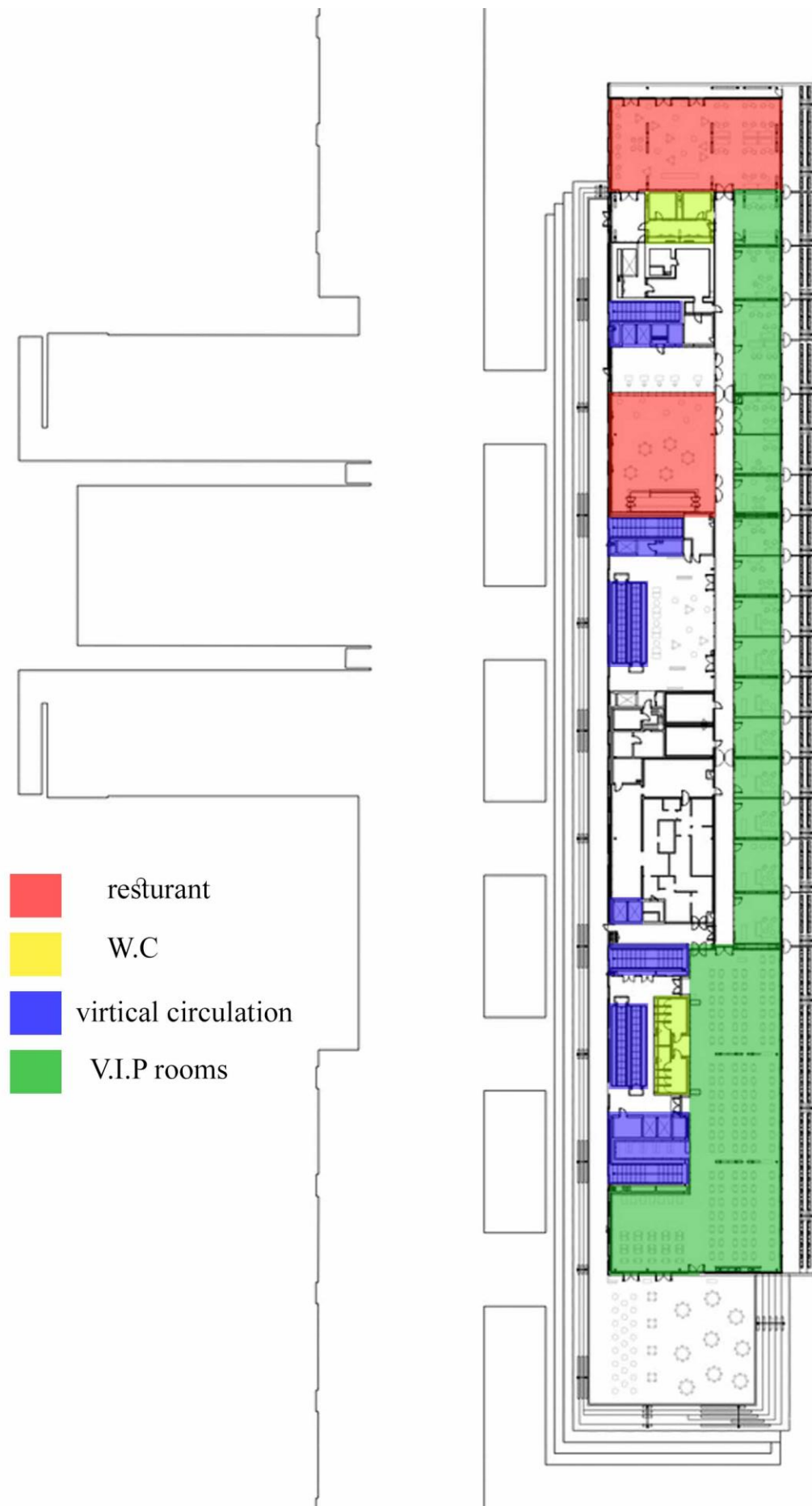


ch.3 figure66 : spectator second floor

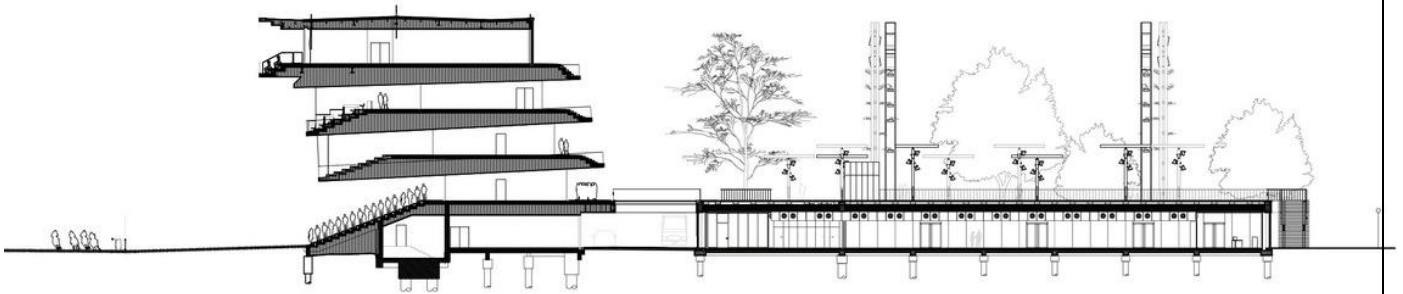
Plans :third floor



Plans :fourth floor

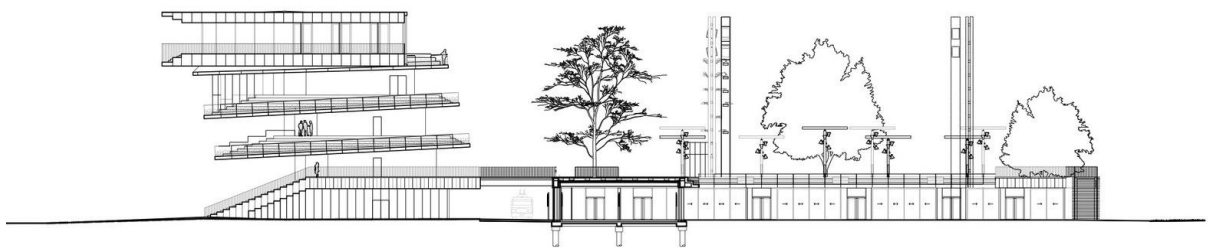
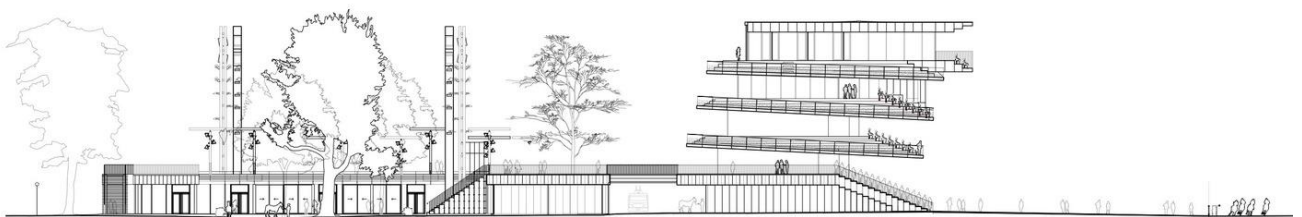


Section :



ch.3 figure69 :spectator section

ELEVATIONS .



ch.3 figure70 :spectator elevations

Chapter four

Site Analysis

4.0 Site:

4.1 General description and Reasons for selection:

- Site location:

The site is located near bait-dajan near Nablus city in a valley shaped area

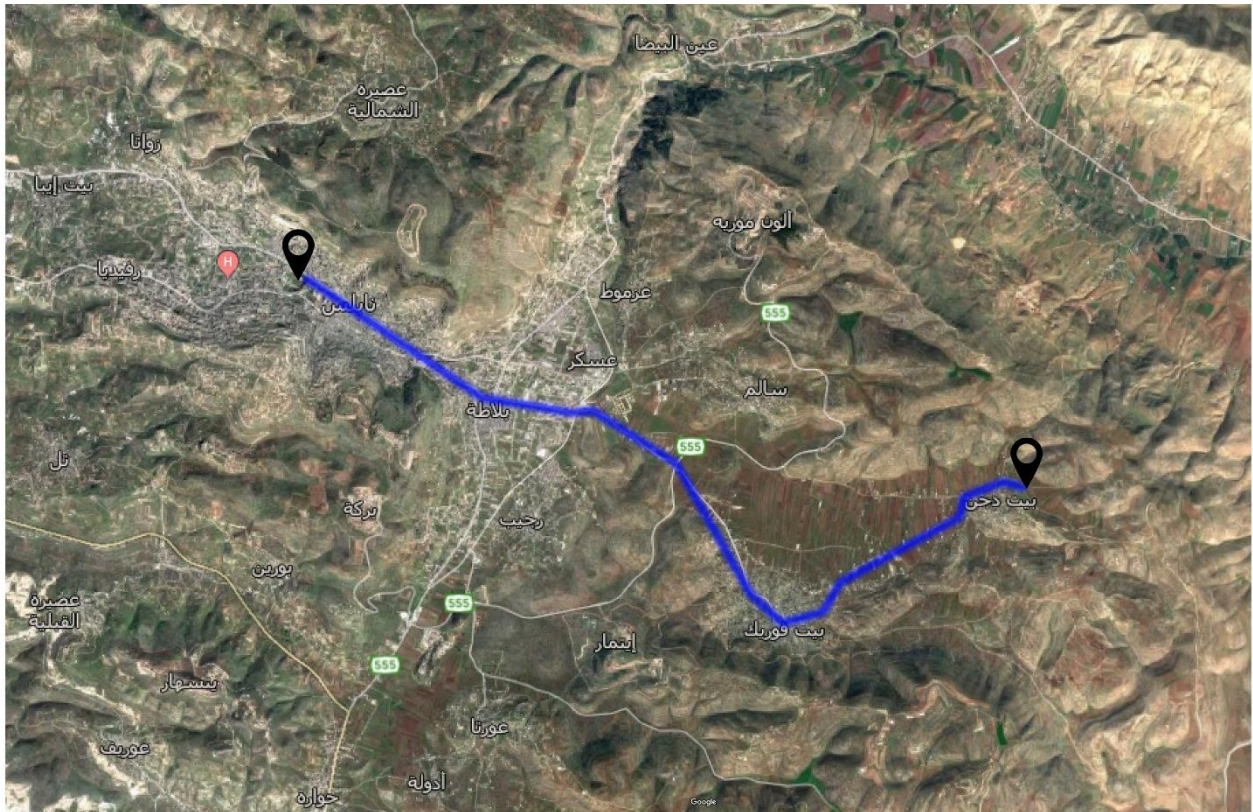
- Reason for choosing the site:

- 1- Nature of the site (open, away from population and naturally ventilated).since horse racing facilities need large and open areas.
- 2- It has the needed slope that work with the concept.
- 3- It has large area.



4.2 Site location :

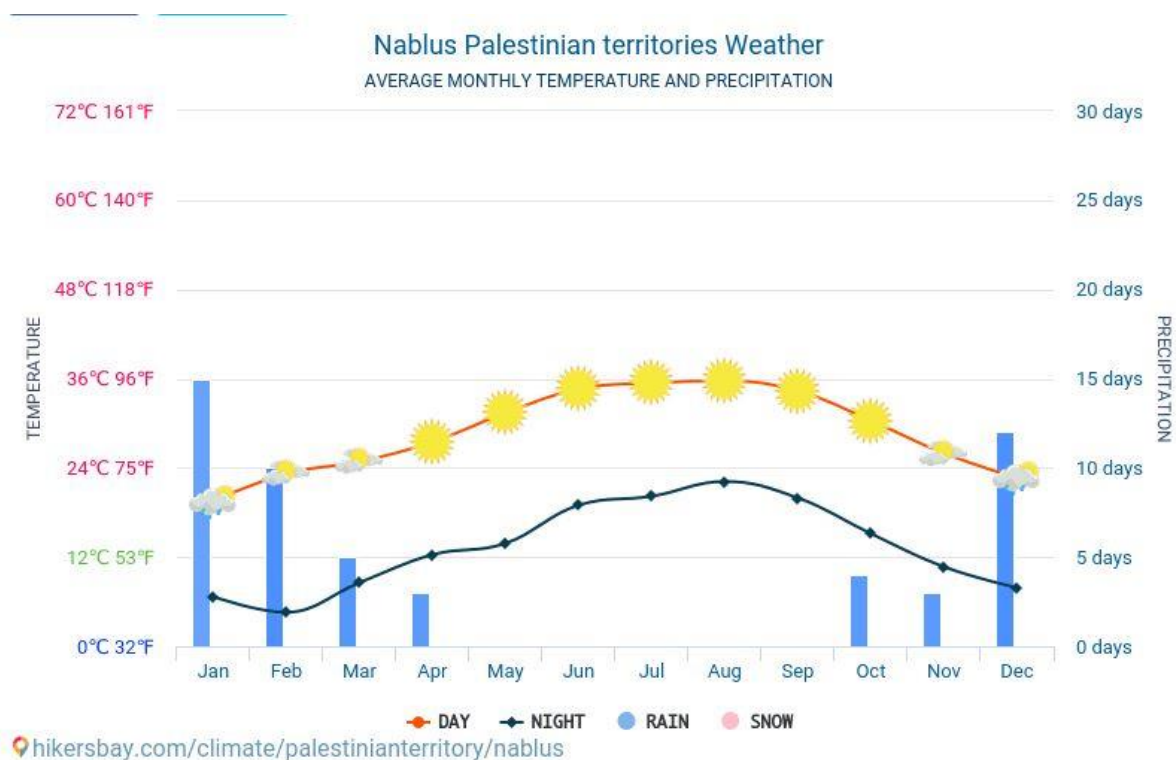
The site is located near bait-dajan near Nablus city in a valley shaped area .



4.3 Environmental analysis:

Nablus Monthly temperatures 2015 - 2019

	January	February	March	April	May	June	July	August	September	October	November	December
Daytime Temperature	20°C	23°C	25°C	27°C	31°C	35°C	35°C	36°C	34°C	30°C	26°C	23°C
Night-time Temperature	7°C	5°C	9°C	12°C	14°C	19°C	20°C	22°C	20°C	15°C	11°C	8°C
Rainy days	15	10	5	3	0	0	0	0	0	4	3	12
Snow days	0	0	0	0	0	0	0	0	0	0	0	0



Chapter Five

Project program

5.0 Project program

5.1 Equestrian school :

It's a covered riding arena for teaching the sport of dressage along side with some teaching rooms for theoretical stuff and all needed services.

Functions included:

- 1- riding hall (40*60) including small seating areas.
- 2- Teaching rooms with the capacity of 20 student per class.
- 3- Administration Area.
- 4- riders lounge which contains a seating area, couple games, vending machines and small kitchen .
- 5- First aid room that provides the basic care in case of a minor injury.
- 6- changing rooms/lockers/showers unit per sex.
- 7- W.C + services
- 8- Parking 1 space per teaching staff 1 space per 2 ancillary staff 1 space per 4 students over age 17

Table11 :Equestrian school functions area

Equestrian school			
function	#	area	total
riding hall	1	2700 m ²	2700 m ²
Teaching rooms	3	50 m ²	150 m ²
Administration Area	1	200 m ²	200 m ²
riders lounge	1	200 m ²	200 m ²
First aid room	1	15 m ²	15 m ²
changing rooms/lockers/showers	2	100 m ²	200 m ²
W.C + services	2	30 m ²	60 m ²
total			3,525 m ²
circulation 30%			1,058 m ²
total area			4,583 m²
Parking number			20

5.2 Stable barn:

The stables are intended to house 200 horses along with the services needed to take care of them and also the stables are going to offer a long term care for horses.

Functions included:

- 1- horse stalls for 200 horses.
- 2- Saddle room for keeping saddles and tacks.
- 3- Grooming station 1 room per 20 horses.
- 4- Washing room 1 room per 20 horses.
- 5- Feed room 1 room per 40 horses.
- 6- Short-Term Storage.
- 7- Sick Box for taking care of sick horse bigger than normal stalls.
- 8- Tool and machinery storage for keeping heavy equipment and tools
- 9- exercise area per horse outdoor areas attached to the stalls 10 m² per horse
- 10- Office and staff Accommodation small office recurred in addition to sleeping area for the staff in charge.
- 11- Accommodation for Trailers that used to move horses

Table12 : Stables functions area

Stable barn			
function	#	area	total
horse stalls	70	14 m ²	980 m ²
Saddle room	5	25 m ²	125 m ²
Grooming station	2	14 m ²	28 m ²
Washing room	2	14 m ²	28 m ²
Feed room	1	20 m ²	20 m ²
Short-Term Storage	2	50 m ²	100 m ²
Sick Box	2	20 m ²	40 m ²
Tool and machinery storage	2	80 m ²	160 m ²
exercise area per horse	70	10 m ²	700 m ²
Office and staff Accommodation	1	60 m ²	60 m ²
Accommodation for Trailers	10	20 m ²	200 m ²
total			2,441 m ²
circulation 30%			976 m ²
total area			3,417 m²

5.3 Sleeping areas - dorms:

for students, riders and others specially during horse racing season or in case of joining the school. with the variety of room types .

Functions included:

- 1- Lobby.
- 2- Single/double Rooms.
- 3- Suites .
- 4- group showers for dorm rooms single/double.
- 5- Common room a shared living room for the guests.
- 6- Dining room.
- 7- Kitchen that provide meals for the gusts.
- 8- Laundry room .
- 9- Staff rooms for the supervisors and the permanent staff in the project.
- 10- Parking:1 space per bedroom, plus restaurant at 1 space per 5 m2 GFA. Resident staff at 1 space per 3 staff on duty

Table13 : Dorm functions area

Sleeping areas - dorms			
function	#	area	total
lobby	1	150 m ²	150 m ²
Single Rooms	5	30 m ²	150 m ²
Double rooms	5	35 m ²	175 m ²
Triple rooms	5	40 m ²	200 m ²
Common room	1	80 m ²	80 m ²
Dining room	1	70 m ²	70 m ²
Kitchen	1	70 m ²	70 m ²
Laundry room	1	30 m ²	30 m ²
total			925 m ²
circulation 25%			231 m ²
total area			1,156 m ²
Parking number			20

5.4 Outdoor areas:

Outdoor exercise areas different sizes, a show jumping arena with international size and a horse racing track

Functions included:

- Outdoor Arenas
 - 1- exercise arenas size (20*40)& (20*60)m.
 - 2- Show Jumping arena size (50*80)m.
- Horse racing track
 - 1- racing track (length 1100 m).
- storage areas for obstacles and tools
- Indoor / outdoor stadia 1 space per 3 staff 1 space per 3 players / competitors 1 space per 3 spectators

Table14 : outdoor areas total area

Outdoor areas			
function	#	area	total
Outdoor Arenas			
exercise arenas	2	1,200 m ²	2,400 m ²
Show Jumping arena	1	4,000 m ²	4,000 m ²
Horse racing track			
racing track	1	34,000 m ²	34,000 m ²
storage	1	100 m ²	100 m ²
total			40,500 m ²
circulation 30%			12,150 m ²
total area			52,650 m²

5.5 Spectators:

A spectator that can hold up to 10,000 spectator with all the services needed .

Functions included:

- 1- Seating areas 0.4 m² per person
- 2- Guest of honor (VIP)(100people)
- 3- Restaurant.
- 4- Cafeteria for fast food and snacks during events.
- 5- Vendors 'Storage for the supplies of both the cafeteria and restaurant.
- 6- Administrative Offices.
- 7- Storage .
- 8- changing rooms/lockers/showers.
- 9- Press Facilities for holding conferences.
- 10- Television Broadcasting rooms
- 11- Parking 1 space per 3 staff 1 space per 3 players / competitors 1 space per 3 spectators

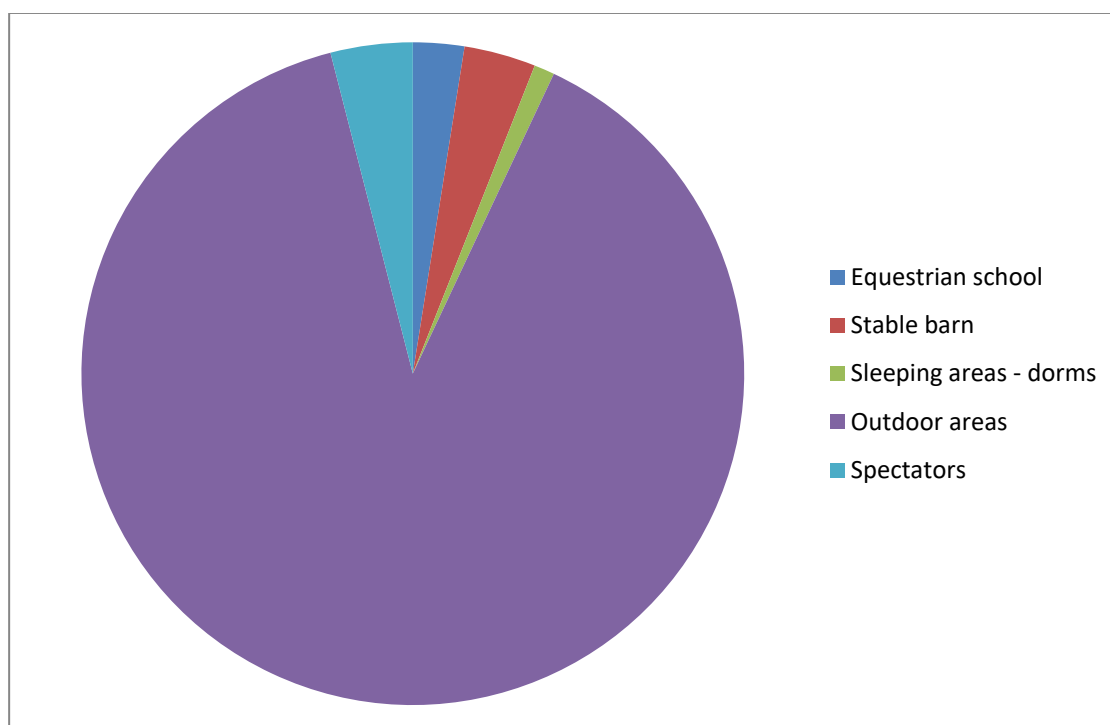
Table15 : spectator area

Spectators			
function	#	area	total
Seating areas	1	1,000 m ²	1,000 m ²
Guest of honor (VIP)	2	80 m ²	160 m ²
W.C	12	20 m ²	240 m ²
Restaurant	1	200 m ²	200 m ²
cafeteria	3	150 m ²	450 m ²
Vendors 'Storage	1	50 m ²	50 m ²
Administrative Offices	1	200 m ²	200 m ²
Ticketing Facilities	3	25 m ²	75 m ²
Storage	2	100 m ²	200 m ²
changing rooms/lockers/showers	2	70 m ²	140 m ²
Press Facilities	2	100 m ²	200 m ²
Television Broadcasting	2	50 m ²	100 m ²
total			3,015 m ²
circulation 40%			1,206 m ²
total area			4,221 m ²
Parking number			300

5.5 Total area of the project :

Table16 : total area of project

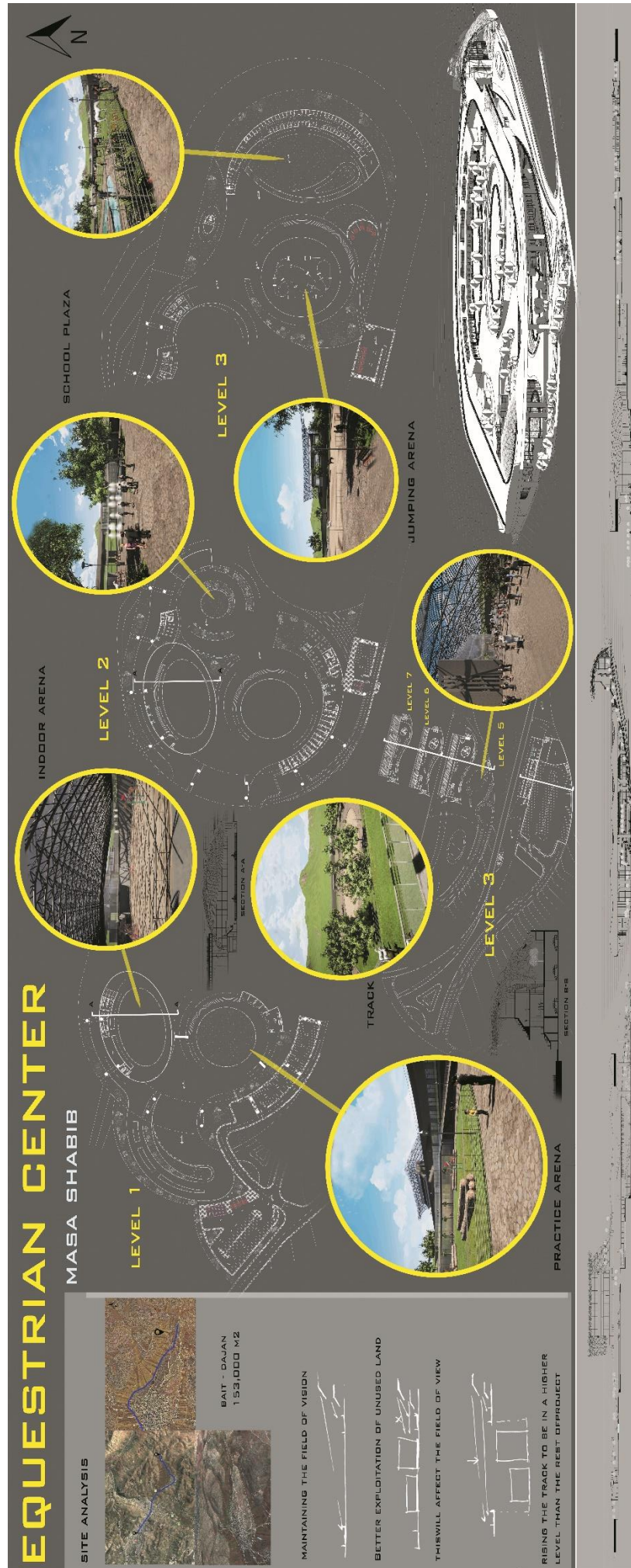
Project	
Function	Area
Equestrian school	4,583 m²
Stable barn	3,417 m²
Sleeping areas - dorms	1,156 m²
Outdoor areas	52,650 m²
Spectators	4,221 m²
total area	66,027 m²



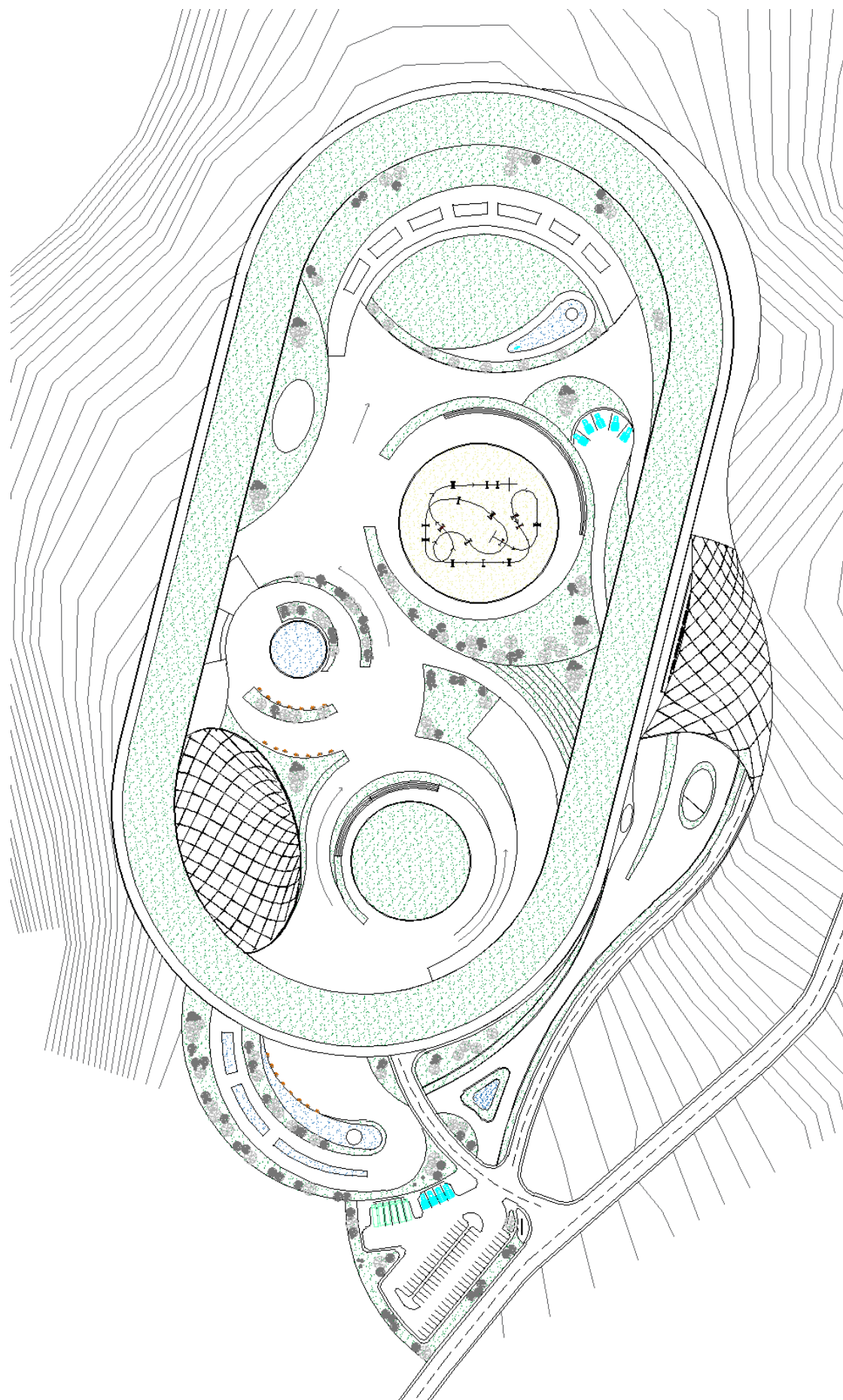
Chapter Six

Project

Poster:

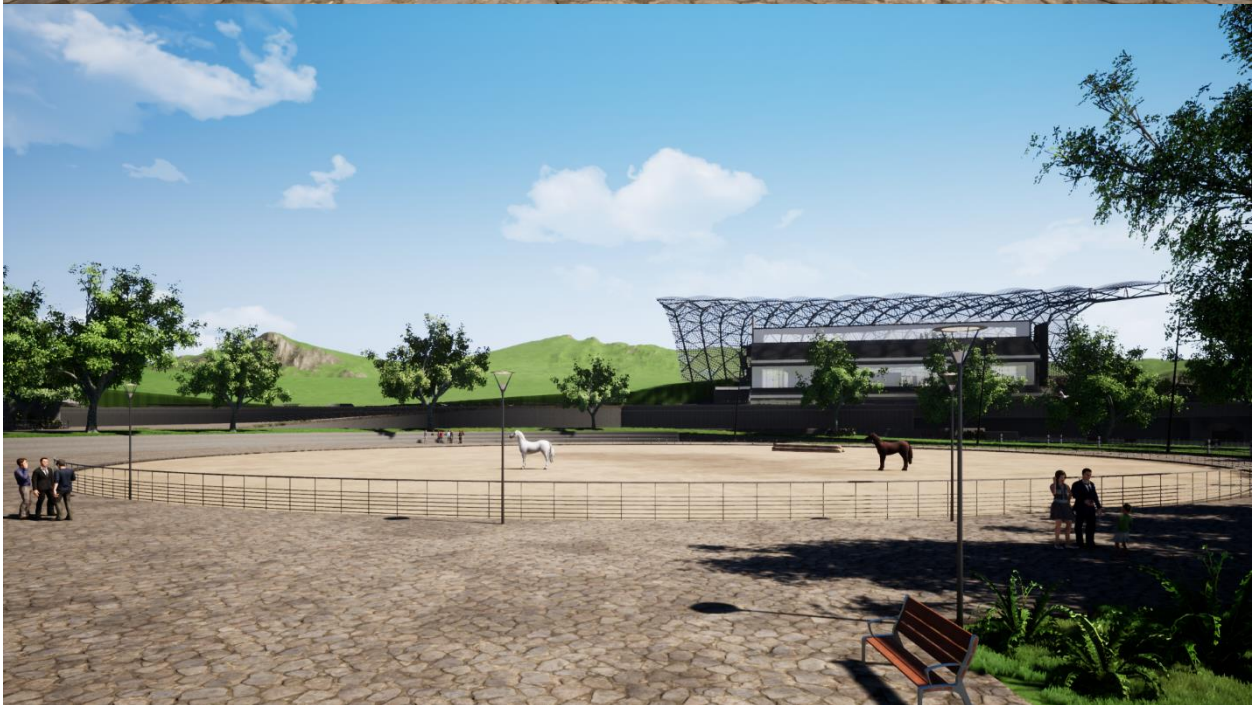
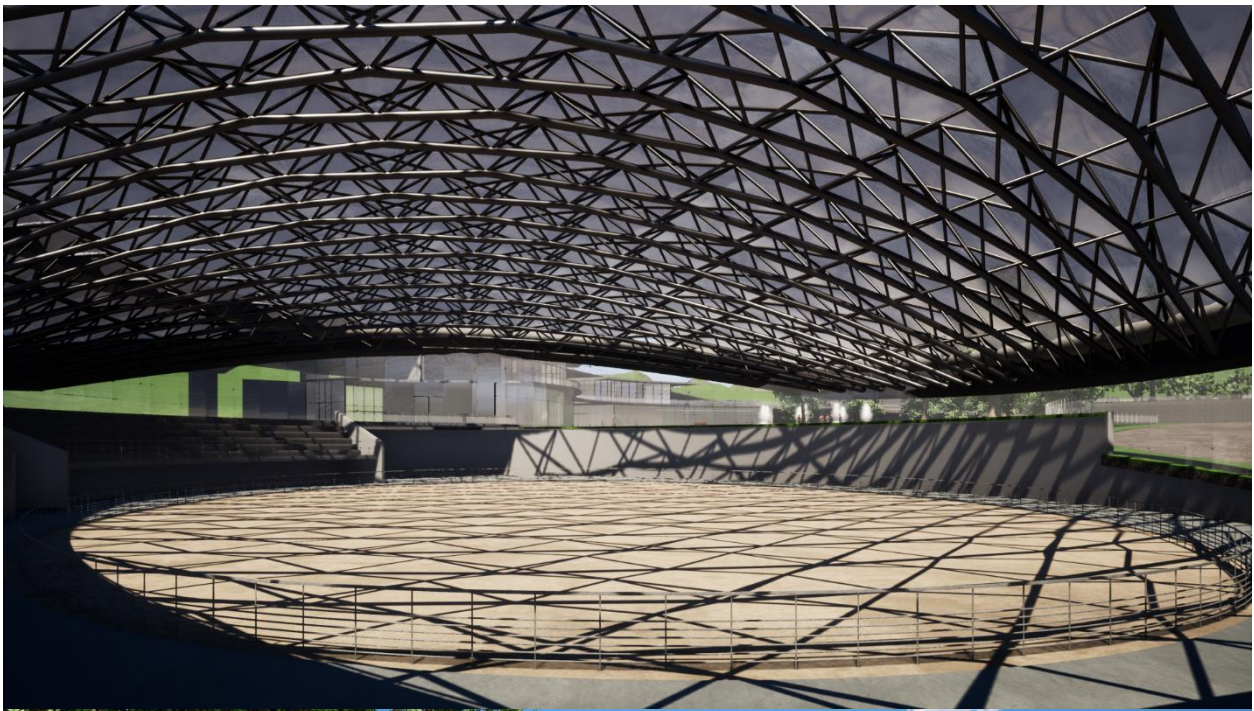


Site:



Render:







Model:



References :

Horse Stable and Riding Arena Design, Eileen Fabian Wheeler, 2006.

Neufert 3d addition

Time saver

Sport England, Pozzoni Architects and Abacus Cost Management Ltd (Design Services)

Sport England, Robin Wilson Consulting, S&P Architects and DJ Deloitte

<https://www.dressage-academy.com/training/the-dressage-arena/>

<https://www.horsejournals.com/acreages-stables/barns-stables/building-indoor-riding-arena>

<https://www.palmatin.com/7-things-to-know-about-horse-stables/>

<https://www.dsr.wa.gov.au/support-and-advice/facility-management/developing-facilities/dimensions-guide/sport-specific-dimensions/equestrian>

http://www.visualdictionaryonline.com/sports-games/equestrian-sports/show-jumping/competition-ring_1.php#jury34786

<http://www.nsw.ponyclubvic.org.au/site/ponyclub/nsw/downloads/Coaches%20Newsletter/RUNNING%20A%20SHOWJUMPING%20EVENT%20for%20newsletter.pdf>

<http://www.turfclub.com.sg/Industry/StablesAndTrainingFacilities/RaceTrack/Pages/TypeOfTracks.aspx>

www.archdaily.com