



DESIGNING RIDING SCHOOL (USING ENVIRONMENTAL APPROACH)

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ABSTRACT

Subject of the present study is designing a riding school, in which required facilities for holding riding competitions and also theoretical and practical trainings of this sport are provided. Firstly, the project subject has been discussed in terms of historical, national and religious perspectives and sports associated with horse. It should be noted that the project subject is different from other sport places; although it is related to designation of a sport school. This is because; here sport instrument is a live and also valuable living thing, which has possessed wide part of the project. However, range of theoretical trainings of the mentioned sport is significantly wider than other ones, since in addition to theoretical trainings in field of riding sports, it needs deep knowledge about horse and methods of maintaining, breeding and diagnosing and treating its diseases. The main objective of the present study is investigating designation of riding school (using environmental approach). According to nature of research in this study, it is a descriptive-analytical and comparative work and required data have been collected using field and documentary methods.

Keywords: Riding, Environmental Approach, Sport School

INTRODUCTION

Horse riding and relevant sports are being implemented using a specific method around the world adjusted with local and behavioral characteristics of people. The method can be raised from daily needs of that people and would be so different that it is impossible to provide a unit regulation for them and to globalize them.

Since early decades of 20th century, some

efforts have been taken in order to unify methods of holding competitions and providing unit regulations, which have been finally resulted in establishment of International Riding Federation. The organization has codified special regulations for 6 fields of these sports and relevant fields till now. The organization has also covered holding world and international

competitions in these fields under control of its planning and regulation (**Ibrahim Pour, 2005**).

Importance of sports is being increased in the current society considering youngness of the population. In order to meet needs of the huge wave, application of infrastructural establishments and suitable places for believing the physical and mental need seems inevitable.

In the current life and after invention of automobile and urban life, human has become away from environment, sports and riding that has been a part of life during history of human life. However, riding sport is still being applied in many countries for purpose of sport or transportation vehicle.

Through designing such places, one can make human become far from urban life and conduct people toward heart of the natural environment or some places like the environment. This sport can cause closeness of the current modern people to wild life and natural environment and also friendship with environment. Unfortunately, because of lack of information and facilities in regard with this field in Iran, conditions for growth of the sport have been destroyed. Through providing eye catching architecture and attractive places, one can attract different classes of people toward the attractive exercise. At the present study, designation of riding school has been

investigated based on environmental approach.

Research literature (training riding in Iran and in the world)

In late 16th century, a protestant university was established in Saumur and now, a riding academy has been established in the same location. In 18763, Louis XV transferred reorganization of French Cavalry to Duke Schwazol. He established “The Most Beautiful School of the World” in Shardneh for officers and group leaders of cavalry. The school continued its activity up to 1788 and then after a long interval, National Academy was replaces instead it in 1814. It was a professional institution for training horse and cavalry and academic training of military riding, in which techniques of military riding used to be trained to horse riders. Brilliant operations of rider units used to be practiced in this school. Iranians are among the earliest growers of horse in the world and the sport has been emphasized and has been common in pre-history ages and post millenniums. In the second millennium B.C, when the Arians had probably many professional horse riders while passing Eurasique Plains in South of Russia toward Iranovich. The riders were the first coaches, who used to teach art of using horse from wide geography of that time in Iran to all people around the worlds. Some great historians like Herodotus,

Xenophon and Strabo and also some researchers like Wagner, Hurtle and Buffon have considered Ancient Iran as the center for horse breeding. According to Hurtle, horse riding in Ancient Iran has been one of the main concerns for great people in the country and some characters such as Eskandar Maghdooni and Charlemagne have learnt horse riding from Iranians. Hurtle writes that following order of Kourosh Hakhamaneshi, armed officials and courtiers used to grow horses and to attend horse riding competitions. According to Hurtle, Iranians have been pioneers of horse riding and also innovators of Chogan game and post couriers.

METHODOLOGY

According to nature of the study, it is in kind of a descriptive-analytical and comparative study and required data have been collected using field and documentary methods.

At the present study, collected data have been analyzed as follows: first, available references and sources about the desired subject have been studied and data have been collected through interview. Through analyzing and comparing the data, a series of data collected by previous studies have been obtained, so that they can finally be applied to present some solutions to help the study for purpose of achieving its objectives. Finally, a set has been designed

in regard with previous studies in a specified site and in consistence with the desired research subject. Using the set, all solutions and suggestions in this regard have been emerged and obtained results have been also appeared.

Orders of environmental sustainable architecture in position of horse breeding

Primary conditions of establishing a place for horse breeding are as follows: in general, construction of a suitable place can be considered as a good investment. However, there is no necessity for building a very luxurious stable, but it should be considered adjusted with needs. Although construction of a place is a main investment, in many cases, the cost is itself a kind of capital and can cause increase in assets and properties. Place for horse breeding, constructed with any kind of materials and in any form, should include some conditions as follows (Irani, 2001):

- a) Should be dry and hot
- b) Should have well-designed drainage and its infrastructure should be also dry
- c) Should have well-embedded air conditioner, so that fresh air can be supplied in sufficient rate without humidity
- d) Should have water and power
- e) Should have suitable light (natural and artificial light)

- f) Should be designed in a manner that least workers can be needed
- g) Should include sufficient safety and wires and lamps should be protected in good manner
- h) Should be protected against fire

In general, place of constructing of stable should be resistant against dry humidity and should be higher than adjacent surface. A place that is permeable against water and flood can't be a good place for construction of this station. If a stable is constructed in wrong and wet place, its surface should be higher than adjacent surfaces and also drainage channels should be also embedded on the floor and surrounding areas.

Suitable structures and facilities can provide desirable conditions for caring after horses and can also facilitate duties of owners of horse. Two main factors that should be considered in regard with designing horse station are as follows:

- 1- Preserving health and hygiene of animal is important not only for the horse, but also for individuals related to the horse and even those people, who live close to the horse.
- 2- Considering stability of the structure, safety and facility of operations and also adaptation of different parts of the buildings and surrounding area

Relevant standards of designing riding,

horse riding and training horse club

In this section, obtained results from studies and investigations have been analyzed that are considered as main guidance for specific spatial features and then the data have been determined as a series of orders and regulations. References of expressions of scholars and analyzing samples have been several journals and books. Horse riding has various branches that would be categorized generally in two groups.

Horse riding competitions: the competitions have been existed since ancient ages in many civilizations such as Greece and Ancient Rome such as trot and gallop (distance of these competitions is among 1000, 1600 and 2400m) competitions. Another kind of gallop competitions is along with barrier and the horse should jump over them, which is one of the common competitions associated with horse riding. Various branches can be included in other riding competitions, in which the aim is not winning running race: Weightlifting (exhibitive actions of trained horses), in which relationship between rider and horse would be evaluated; jumping competitions, which is one of the most common riding competitions in the world; strengthening races, which are aimed in going a long distance (between 20 and 160km) in one and sometimes two days. Arab horses are the best strains for these competitions, since

they have a small body and resistant against hot weather and hard practices. English horses have gained also a lot of attention in this regard because of their speed. Chogan that is the oldest group sport has been common in ancient Iran and is known as “Game of Kings”. Today, Chogan is being rarely considered by people because of high costs.

Different types of horses (classification based on color) include Samand (Dun), Ghare Kahr (Nagorno-Dun), Kahr, Crend and Chestnut.

Types of horse movements include stroll and conventional walking and trot. Trot is a kind of running that is a slow gallop and a mode between running and walking. Gallop is a mode, in which horse moves with maximum speed and is also known as “For Snipers” (<http://www.horse.ir>).

Several terms in horse riding

Jockey: the term refers to a person, who is fluent, swift and lissome in regard with riding. The term can be applied for course riders. Veteran rider: the term refers to a skillful and experienced rider with many experiences in this field. Hippodrome: the term refers to riding field, which is applied for purpose of incursion. Manj (field): refers to a place and academy for riding and training horse. Horseshoe: the term refers to a toric iron, which is attached to the horse hoof, so that its hooves can be protected

against crashes with stones and other objects (<http://www.horse.ir>).

Riding track: the term refers to a field with dimensions of 60 in 20m, which has a distance to 20m from watchers’ place (<http://www.asb.ir/shop>).

Required equipments

Equipments of horse riding sport include stick or horse guiding whip, horse saddle and relevant paraphernalia, required facilities and equipments inside the stables, required instruments for washing horse, mill for preparing horse’s food, instruments for training and domesticating horse, instruments for blacksmith and required equipments for veterinary and maintaining horses.

Clothes and equipments for horse riding

Riding clothes include pants, boots and hat. However, the pants are loose from upper part and become tight in part of knees. Riding equipments are known as outfitters that include horse saddle, on which rider sits; pedal: made for horse riders to put their feet and is embedded on both sides of horse, stomach; spur: an ironic part, which is embedded on talon of riders to hit on hips of the horse to make it running faster. The part is known as Asb Angiz in Persian; harness: an ironic part embedded in mouth of the horse in specific form and a leather rope is passed from sides of the harness, through which the rider make horse moving in right

direction (Baher).

Locating riding stadiums

Construction location;

In order to choose right place for construction of riding stadiums, one should consider some conditions carefully as follows:

Size

Desired land should have capability for constructing course track, jumping field, dressage field, and horse and riders camp with enough capacity for watchers and all side spaces such as locker room, shower, office and parking lot and future development plans. One of the main projects in this field can be construction of hotels or dormitories for camping. According to public need, one can design and construct jumping or course in regard with construction of riding stadiums.

Location (choosing land for stadium)

Sport places, in addition to consider geographical location and position such as climate, should be available in terms of local geographical location and should not be basically beside crowded public centers or those places that need calmness such as hospitals, residential complexes and so on. It is preferable to construct such places outside the cities and beside forest parks or plains. In addition, required access to main passages should be also provided such as highways and main streets and public

transportation services.

Locating construction

Location of these places should be in a manner that terrain accidents can be absolutely applied for purpose of designing and constructing the places and also artificial factors can be also applied and some factors should be also considered such as sun, wind and rain.

Stadium location

According to previous studies in credible laboratories, further studies are required on surface waters and waterways, underground faults, vegetation, potential capability of soil, permeability and soil mechanic; so that some problems can be prevented such as landslide and level differentiation as a result of land immerge, etc.

The place should also have easy access to parking lot and public places.

Effective factors in choosing place for maintaining horse

1. The place for horse breeding should have linking road with cities or villages.
2. The place for horse breeding should be far from residential zones and factories, so that it can't cause pollution in these places. The place should be selected in a manner that wind direction can't cause transition of pollution towards residential places.

3. The location for horse breeding should be back to the direction of local winds and should be mostly constructed in the direction of east. Planting trees in margins of the location can decrease coldness of winter winds and severity of warmness in the summer.
4. The location for construction of horse breeding place should be close to sport centers and places for holding international, national and provincial competitions as much as possible.
5. It would be better to consider the location for horse breeding center in non-cultivated and marginal lands.
6. The place for construction of horse breeding place should be in a region that supplying drinkable water for animals can be possible; otherwise, water supplement for pumping and transferring it to the station would be so expensive (Khoshnoud, 2011).
7. In order to construct horse breeding station, the place should be designed in manner that it can utilize maximum sunlight in winter and be protected from direct sunlight in the summer.
8. In order to supply safety of horses, the station should not be in the direction of seasonal storms and

floods and seismic faults. If the station is constructed in such places, required predictions should be considered in regard with stability of the station against earthquake. In addition, some measures should be also taken in regard with unpredicted dangers.

9. The horse breeding station should be close to centers for supplying forage and animal feed and lands for cultivating forages as much as possible.

As it was mentioned, water should be available in the location of horse breeding station. Meanwhile, the water should be drinkable and healthy and if the water is polluted with microbes and chemicals or has high rate of salt, authorities should take action to treat the water and remove salt. Average daily water requirement for horse is equal to 70L and water salinity and limitation for using it should be considered.

Location and geographical directions of horse breeding station

Under different climates, direction and location of horse breeding station would be varied. Geographical location of the station is so important and air conditioner rate, humidity and temperature of the station is significantly depended on direction of the stable. Construction of the stable in north direction can expose the stable in direction

of northern winds and hence, turbulences would be so distressing for horses (Imam Gholi, 2009).

The best direction for horse breeding station in tropical zones is southern or west direction, so that in such station, sunlight in the afternoon can maintain the stable warm in night and such place can be a suitable place for rest of horses that have physical activity and sweating. In northern and central zones of the country, stables should be constructed face to southeast part, so that morning sun can shine on horses. In general, it should be noted that the direction of construction of buildings and establishments of horse breeding should be in a manner that they can be resistant against eastern and western winds. In fact, it is necessary to consider the main gate of stables back to wind direction and required lightness should be provided through making doors and windows, so that it can prevent rise of temperature of the stable in summer. In mild zones, doors and windows would be embedded face to the east. In such mode, the weather inside the station would be protected against northern cold winds and would not be also exposed to midday warmth in the summer (Ibid).

Designing procedure

Natural environment and architecture

Natural environment is achievement of the best architect, who is the Almighty God,

and has been mostly the best source for inspiration. Human beings have applied the natural factors as a main and important element for purpose of utilizing and constructing homes, workplace or any kind of place from early ages. Human architecture by that time of the history has encompassed clearly two subjects of forms and functions. Using natural forms in architecture can be a sign for trend of human towards The Creation and its effects. On the other hand, forms of natural environment in previous times have been respected in different nations and cultures because of their effective role in both functional and aesthetics fields. For example, animals and birds in different countries and in different societies have had specific sanctity based on their cultural background. According to Paul Klee (author and artist of Swiss 1879-1940), relationship with natural environment is the main and basic condition for artists; it is nature and is a part of nature and among natural space. Human has applied constantly architecture as an instrument in order to live in the natural environment. It has been observe that when people use an instrument for purpose of overcoming the natural environment, the instrument would be raised against the people and endanger them to the stage of destruction. The best sample in this regard can be using industry instrument for

purpose of protecting human against natural dangers, achieving more welfare and mechanizing modern life. Same instrument is destroying human's life in an irrevocable manner through pervasive noise, visual and environmental pollutions. Hence, the phenomenon has been unavoidable in the desperation stage and many great architects in the 20th century have considered it and showed positive view toward it. On the other hand, people and architects have considered some approaches about the natural environment and have respected it since last times. The study has considered natural environment emphasizing concepts of "romantic", "tangible" and "intangible". It has also cleared the subject through referring strategies of "considering natural environment", conducted by architects like Frank Lloyd Wright, Le Corbusier and Alvar Aalto. Focus of the study is mainly on tangible aspects and imitative courses of the environment and finally, its focus is on need for experiencing different natural environments and designing practices based on the natural environment. Unfortunately, currently the natural environment can be observed in form of types of structures, which seems that have nothing in common at the first view.

Over the recent decade and after Modernism Movement, worldwide efforts have been conducted for creating elegant, warm and

exciting space and it has been attempted to make the natural environment to have more basic role in life and work of people. However, an important question would be raised as follow: "how our architectural language should be against the natural environment?" To which direction one can move: interaction or contradiction or similarity and other direction? However, geometry of artificial space should be complementary for natural geometry.

According to the mentioned, it could be found that the natural environment can teach people many valuable lessons. However, it doesn't mean that they construct their buildings based on natural patterns and forms, since through this selected structure would be gained just because of attraction of a specific natural pattern instead of permitting the form to be created based on needs and environmental limitations and conditions. In other words, it would be better to consider effective elements in these forms instead of selecting a form and it would be also better to seek for the concept and search those principles that guarantee growth, evolution and life of organisms in the environment. There is no doubt that form-oriented perceptions on the environment can be resulted in an absurd and without identity architecture. In fact, presence of soul of natural environment in architecture can result in its improvement.

Site analysis

Reasons for selecting site: pervasion in sport spaces, wide site and being located in the capital and being far from resident places, which is so significant and being close to highways that can provide suitable conditions for transportation. Currently, there are many useless niches in the sit. Proposed project in this field as a riding college has considered pervasion of riding sport among different classes and attraction of youth toward the sport more than before. Because of lack of topography and natural open space and being exposed to northern mountains of zone 22, it can be considered as a main application with environmental approach.

Designing multifunctional spaces can be designing riding school and considering

spaces for horse breeding and holding competitions. Equipments of the desired site, because of being closed to Azadi Stadium, can cause it to have more capability for attracting people compared to other riding stadiums. As a result, considerable part of potential demand of people in this region can be determined for the mentioned facilities. Moreover, as the project is close to Tehran as an important economic and social center, it can be capable to be a national and even international center. Desired site has been located in northern part of Tehran-Karaj Autobahn from km12-18 and has an area of 32ha.

Process of designation in regard with effect of environment on architecture

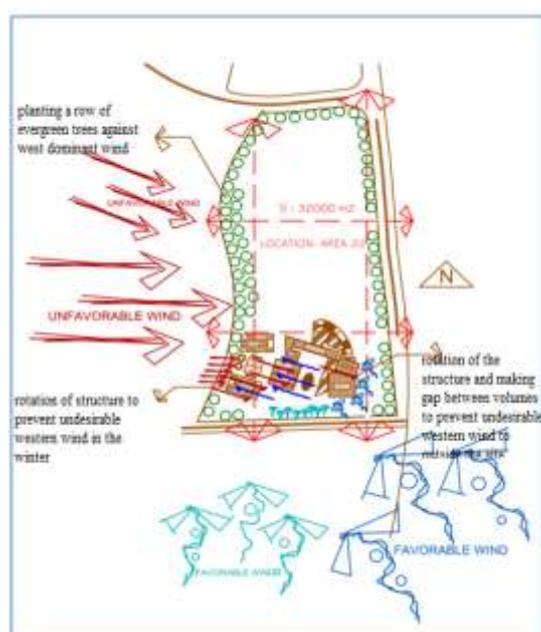


Figure 1: diagram of noise pollution around the site

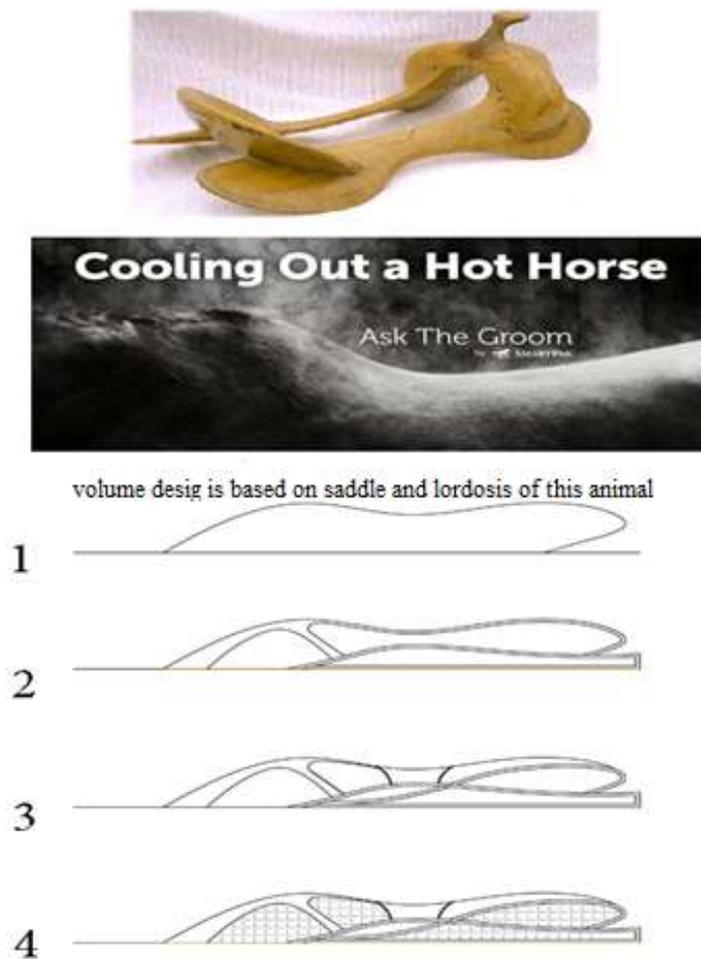


Figure 2: Designing process



Figure 3: Schematic

DISCUSSION AND CONCLUSION

Every structure should be designed in a manner, so that it can meet desired needs during whole its useful lifetime. Their loading systems should transfer imposed loads with the absolute safety. Construction of them should cause least accuracy and cost and cost for maintenance should be low as much as possible. In addition, capacity of utilization and its features during utilization should not be changed widely.

In other words, survival or stability of the structure should be also provided. Suitability of buildings for utilization and meeting needs from building the structure are basically related to architectural design. However, its loading system should be adjusted with the design. There is no doubt that supplying all points of view such as being safe, least completion time and least costs and also stability of the structure can be provided at the same time and some of them should be ignored in benefit of other items.

At this project, two types of saddle and pre-stressed structures have been applied, which have been described as follows.

Pre-stressed structure: pre-stressed structure is a kind of structure that can be built through combining steel and concrete tendons. Steel bars would be exposed to tension in the process of construction or after it. Such consideration can cause

existed concrete in the structure to be under compressive stress. As strength of concrete against stress is so higher than its strength against tension, applying external loads on the structure can cause reduction of compressive stress in the concrete instead of creation of tensile stress in it. Hence, the concrete would not be under tensile stress or would tolerate low rate of tensile stress. This can cause the structure to have capability of tolerating load with under-stress concrete, more than similar structure without pre-stressing.

Contents

- Advantages of pre-stressing
- Types of pre-stressing

Advantages of pre-stressing: in order to understand advantages of pre-stressing in better manner, it is useful to have some information about properties of concrete. Concrete is resistant against compression; although it is so weak against tension. For example, when a tensile force is being activated in its section, it would be cracked. Conventionally, when in concrete structures a load is applied on concrete slab or beams similar to load of a car in parking, the beam would be bended. Such deformation can cause strain in the lower part of the beam. Usually, such strain is enough for making cracks in the concrete. Steel reinforced bars would be embedded in the concrete for purpose of reinforcing tension to limit width

of the crack. Bars embedded in the concrete can act as passive forces and would tolerate no force until the time that swelling in concrete achieves stage before creation of crack. Same tendons of pre-stressed steels would act as active forces in the system. In pre-stressed system, steel acts as resistant and effective factor, so that creation of crack in the concrete would be impossible. Pre-stressed structures can be designed in a manner that lowest rate of swellings and cracks are created in the structure, even if they are under complete loading.

Under the conditions, pre-stressing can be explained through placing a pair of beads on two ends of rubber strip, so that through twisting the beads one can make blocks to become close to each other in lower part and finally, they would compress each other strongly. Under the condition, if the collection is lifted from two end parts, the collection of blocks would not be separated and they would preserve their position beside each other. The rubber strip is in fact same tendon in real scale, which can be fastened by wedge controlling devices in end part (**Ibid, 103-104**).

Types of pre-stressing: in general form, two main pre-stressing are existed:

- Unbonded
- Bonded (grouted)

In unbonded mode, steel bar of cable has no attachment with the surrounding concrete.

Most unbonded systems are in form of single-strain, which can be applied in slabs and beams of structures, parking formations and slabs on the ground surface. A strand is formed of seven wire rod strands, which have been covered by a kind of grease for purpose of protection and whole set has been placed in a polyethylene cover. At the beginning and end of the cables, a pitted steel plate with several two-part steel wedges is applied and these wedges are designed in a manner that they can maintain the cable inside them. In bonded systems, two or more strands are passed throughout a metal or rubber channel; while the channel has been embedded in the concrete in buried form previously. Strands are controlled by a big tensile jack. Then, duct is filled using grout, which is a material made of cement. Using the grout can cause protection of corrosion of steel cables and can also transmit tensile force among strands and duct to create certain length of tendon in surrounding area. Buffer walls of soil and rock are also in kind of bonded systems; although they are slightly different in steps of implementing anchoring, so that the desired hole would be created in the place for purpose of preventing downfall of soil and rock using drilling device and a casing device. This may be conducted also on walls of a tunnel or a sheet pile buffer wall and soil mass on its back. Then, operations of

injecting grout would be started. After the grout has achieved to desired resistance, then tension operations would be started. In mode of stabilizing slabs or walls of tunnels, anchoring can cause maintenance of weak soil and rock and can attach them to each other, so that when the inside excavation operation is started, the back pressure would be neutralized using pre-stressing force of the anchor and sheet pile wall would be

stabilized in its position (**Khaloo, 2003, 105**).

Saddle roofs: as it is obvious from their name, these roofs are similar to horse saddle and are also known as anti-classic roofs. The layered roofs can tolerate high range of load in addition to be beautiful. The roofs may be in conical, parabolic or hyperbola forms.



Figure 4: pre-stressed tensile system (Khaloo, 2003)



Figure 5: pre-stressed structure (Khaloo, 2003)

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