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Designing a Multipurpose Bodybuilding Club in District 3 of Tehran

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Abstract

While the sport plays an important role in the society and has a long history among the modern societies, in Iran few studies are conducted on designing and constructing sports clubs which consequently makes serious problems for the society because of the lack of principled and scientific infrastructures. Therefore, this study aims to design a multipurpose sports club in district 3 of Tehran. The method of this research is descriptive-analytical and in terms of the goal, it is practical. In addition, two clubs in district 3 of Tehran have been field visit and were analyzed by simulation. The results of the research considering climate, geographical position, site analysis, the type of sports activity, and the application of complex in urban and conceptual scale are in line with the designed results including facade, floor plans, sections, and internal and external three-dimensional designs.

Keywords: Multipurpose bodybuilding club, Sports club design, Sports architecture, Architecture plan, Gym.

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1. Introduction

From the distant past to the present, the position of bodybuilding sport has been determined for everyone. The studies show that not only the bodybuilding has evolved over the centuries, but also the space related to this sport has also developed. This space which nowadays is known as gym or club has complex elements and standards related to the world modern science, and every day the clubs are designed which remove the past restrictions and encounter the science with new challenges. Today, in designing the clubs, all the effective physical mental factors such as psychological, medical, architectural, cultural, sociological, and etc. issues should be considered at the global standards level. Bodybuilding or fitness is a sport in which the bodybuilder tries to enhance all aspects of muscles ability by doing different exercises on muscle strength and endurance, also proper nutrition and of course, adequate rest [6]. The promotion of physical fitness (in two aspects of strength and endurance of the muscles) is the result of these exercises. Other sports athletes use the bodybuilding exercises, too and the bodybuilding somehow is a base sport. There are various tools to nurture each group of muscles. In the past, springs, stretches, weights (various forms), and sticks were used, but today, all devices are turned into the devices working with weights; because some of those devices did not operate accurately (such as springs) and they could be dangerous during the heavy use of them. The location of bodybuilding and aerobic salons establishment should cover following conditions and positions:

1. The extension of the intended land should be vast enough to encompass the necessary capabilities of the standard sports places' construction with sufficient capacity for the sports activities, and all ancillary spaces such as locker rooms and showers, administrative places, buffet, and etc.
2. The geographical position of the salons should be such that consider the statuses like weather, and be easily accessible for the users. It is preferred that it be established beside the residential complexes, educational centers such as schools, high schools, and universities in order to provide the necessary access to the readily available streets like highways and main streets, and public transportation lines.
3. The location of the structure (or location of the construction) should be chosen in a way that the factors such as sun, wind, and rain be regarded, and all aspects of the land and artificial agents (construction) must be used optimally.
4. It should have the possibility of construction or access to the parking and public places.

With respect to the items mentioned above, there are some deficiencies in the existing gyms weakening the athlete's performance. Hence, the main purpose of this study is to promote the quality of the designed spaces and organize the sports complex in order to achieve the maximum performance of the athletes (Gale, 2009).

1.1. The role of architecture in diagnosis of the muscles in bodybuilding

In architectural design, the architect tries to create the conditions for the athlete making the person challenge his/her skeletal muscles. Of course, under such conditions, the mind and spirit of that person is involved, too and s/he experiences the feelings of the strong nervous system and self-confidence, that the architect can manage wisely all these performances to the culmination point. The architect by putting a monitor in front of the treadmill and applying the lights, colors, and acoustic systems properly can lead the athlete to spend more time on aerobic sports by treadmills that automatically strengthens the athlete's cardiovascular system. If an architect does not know how a muscle progresses and what devices there are for engaging each group of muscles, s/he will face with problems in designing the sport places or layout designing, because s/he does not know that each device occupies what extent of the space and which devices should be placed beside the each other and which devices are irrelevant to each other. How would define the free weights and dumbbells' relationship with the gym devices? Is there any relation between the space where the aerobic activities are conducted and space where endurance exercises are performed? In order to reach the design which responses to these questions and the athletes' requirements, the architect ought to have a comprehensive or even experimental recognition of these sports. In the first step, the difference of designing bodybuilding club and other gyms is the type of exercises which requires its own tools and devices and in order to provide these devices, it should be known that which device is embedded for which muscles. Following a general image of the muscles that the athlete is training and kneading them, and also general movements for each muscle and space which should be allocated are represented. The architect should operate in designing in a way that every three body types (ectomorph, mesomorph, and endomorph) can do their specific exercises and achieve the goal they are exercising for. For example, a person with endomorph body system needs a spaces where can do more exercises rather than ectomorph body system and since has a high weight requires auxiliary horizontal bar device in contrast to the mesomorph body system that can easily do many movements of horizontal bar only with a straight bar mounted at a height and without any specific device (Lynch, 2013).

1.2. The factors affecting the space formation in the gym

- The role of the mirror in the gym: in a gym, at least a side of the wall is covered by the mirror. The most important reason is that the athlete should be able to see his/ her movements and check the accurate move in the mirror and detect the wrong move. This wrong move even can be on the angle of doing the movement with few degrees of difference from the intended angle causing that does not impose the pressure to the muscle. The athlete can see the weak points of the body constantly in the mirror and plan for them, and on the other hand, can determine the strengths and pay attention to them less. The person becomes aware of his progress or retrogression quickly, because spends many times in front of the mirror and can find the pros

and cons of his program and decide for keeping on or changing of his plan. One of the most important disadvantages of the clubs is their limited and mostly small space that this problem is partially solved with the aid of the mirror and the extent of sports space is significantly increased. The natural and artificial lights are amplified by the mirrors providing a desirable bright place for the athletes.

- Color: the color can be very effective in terms of climate. It is true that the colors blue and green slow down the blood flow and orange color is a stimulant cure causing emotional state and accelerating the blood flow in the body. In this case, designing a space with visual perception is possible (every color besides having specific and symbolic meanings in every culture has some global meanings and concepts; for instance, blue is the color of peace and color everywhere). Accordingly, engagement and interaction between the architects and anthropologists are inevitable, and both groups are required to well know the colors and their features and thus, they should try to organize the meaningful and with identity places beside and with the help of each other. When the colors are placed beside each other, the reduction or acceleration of their effects on the space and also the direction of the colors are emphasized. Every horizontal, vertical, diagonal, circular or a combination of these directions have their own specific concept. For example, diagonal directs create a concept of mobility and give a deep vision. As the range of chosen colors is wider, its effect will be more. The use of colors for coordination or harmony means “a favorable arrangement of parts of a whole” and it displays in all aspects of life such as music, poetry, color, or even a beautiful cake. Visually, the coordination is that delights the eyes. This coordination attracts the viewer and creates the feelings of regulation and balance. When something is inconvenient, it is boring or terrible. In bodybuilding sports places, the main colors of the walls consist of three colors blue, red, and green which are used because of their pureness and deep effect on the athlete. The main colors are used lonely or beside the neutral colors. The color of the floor often is gray or cream. The mirror is one of the main elements of the gyms and covers at least one side of the wall causing these colors and lights combine in the heart and depth of it while keeping their independence and character which create a work of art making a three-dimensional space from a two-dimensional surface. It invites the athletes to a somewhat virtual space (Nsirzasde et al, 2015).

1.3. Sports space standards in the design process

The standard in sports space is the heart of design process which increases the sports efficiency.

1.3.1. The standards of bodybuilding salons

The required area for this activity depends on the tools and equipment of this field and their appropriateness with the number of athletes using them. Usually, the bodybuilding equipment is placed in salons proportionate to the coach’s knowledge level and efficiency, the welcome of athletes and investors during the years. The dimensions of the salons with above items should be at least 15 × 6 m², and height of the roof at least should be 3.2 m. The club level 2 should be about 110 m² and level 1 should be 150 m². These dimensions and heights, in addition to creating proper ventilation impact the athlete mentally and psychologically.

1.3.2. The standards of equipment

The standard equipment in bodybuilding actually means the use of suitable materials for making them, observance of all principles of human ergonomics (engineering body measurements) in design and manufacture, and finally, considering the biomechanical movements produced by them. The material of weights, barbells, and other bodybuilding apparatuses has to be stainless steel (grade 314), or Chromium coated steel or polymeric coating. Their plastic parts are made of abs (compact plastic) which are non-recyclable and the wire ropes must have a special strength. The parts which need lubrication or grease should be lubricated regularly, and the weight of barbells, dumbbells, and cast iron or steel plates of the weights ought to be accurate. The stands of bodybuilding devices, the parts that place on the ground should be as small as possible. The joints of the stands together must be at least 15 cm above ground level to enable the easy cleaning of the environment. The big devices like treadmills, stationary bikes, elliptical should be easy to displacement. There is no national standard in these cases; therefore, there is no accurate control on them. So, it is suggested that the experienced experts be employed for controlling their manufacture. For the aerobic activities, the extent of the spaces depends on the number of the athletes. Usually, about 2 to 2.5 m^2 should be dedicated to every athlete. The floor of bodybuilding or aerobic salons has a prominent role in the proper performance of the movements and athlete's stability and balance. These salons' floor should be soft, durable and sturdy, and resistance against the slippery. In painting and lightening the bodybuilding salons, the use of bright and mild colors and avoidance of direct and dazzling radiations will be effective in the calmness and peace of the athletes. The mirrors should be on the walls and should be installed from the cornice along the walls (15 to 20 cm from the floor) to a height of 2 meters. The lateral spaces of gyms include dressing rooms, showers, toilets and if possible, saunas and watering equipment., fitness and exercise room, a place of rest and recuperation, examination rooms and medical equipment, office, and warehouse of fitness equipment. Beside these salons, the aerobic salon also can be established, too (Dalir, 2016).

1.3.3. Attractive and pleasant environment

Creating a better environment in bodybuilding clubs is possible. For example, the floor can be designed with a set of colors and patterns to create very beautiful and unique layouts in the spots salons. One way is to choose one color for the activity place and another for the corridors; the walls can be painted in a different way in order to make a pleasant and comfortable atmosphere. However, the use of many colors is confusing and affects the light. Indirect lighting or lighting from above contributes in creating a better and brighter. Using the more lamps is another way to supply adequate lighting.

1.3.4. Roof, lights, and windows

The ceilings should be made of light-colored materials resistance against the humidity. The emergency power must always exist, particularly for the swimming pools. In addition, some lamps must be installed directly above on top of the dressing rooms to provide sufficient light. The windows embedded on side walls should be far from the ceiling about 60 cm (24 inches) and a height of 90 cm (36 inches).

1.3.5. The temperature of sports salons and spaces

The permanent temperature of the sports salons should be 10 to 22 ° C. At the time of athlete's entry to the salon or beginning of the exercises, the salon's temperature is set to 20 ° C; but after warming up and activity beginning, the degree less than 20 ° C is appropriate. Regarding the athletes' activity, the temperature of the competition and exercise venue should be 10 to 15° C.

1.3.6. Insulation

In order to control the voices and noises, temperature, and humidity, the sports salons have to be insulated. Insulation has different types including:

A. *The floor's sound insulation*: the most noises of the clubs originate from the weights' collision with the floor. Therefore, the floorings should be used which are sound insulation.
B. *The walls insulation*: for insulating the walls, some sticks, compact silencer plates, and vertical cement blocks. The insulation of rooftops is the most major surfaces controlling the sounds which ought to be designed in a way that reflects the sound in a maximum of two seconds.
C. *Humidity insulation*: the humidity insulation of rooftop's floor prevents the infiltration of rainwater and melted snow, and also the walls exposed to rain should have this type of suitable insulation.
D. *Temperature insulation*: in addition to thermal installations, the walls and ceilings must have thermal insulation. In order to control and regulate the temperature of sports salons, almost the central heating system is used (Jalali, 2009).

1.3.7. Proper ventilation

In order to maintain the moisture monotonous and provide the fresh air, one of the requirements of sports clubs is air circulation and ventilation. The ceiling fans can be used for air ventilation, and when the opening and closing the windows are needed for ventilation, their distance from the ground surface has to be as much as that they can be controlled from the surface (Organization of management and programming, 1995)

1.3.8. Fire safety regulations

In design and implementation of sports salons, the safety conditions specified in one of internationally recognized standards such as section 6 of the BS 5588 standard or tissue 12 of the journal of the technical studies and criteria book must be considered to protect the athletes and coaches. The doors which connect the salon to other parts of construction may be fire-resistance and auto-closing doors. But the doors opened to an exterior space must be fire escape doors. Fire escape doors are closed from outside and can be opened from the inside so that they are used easily and immediately at the time of emergency. Such doors must be produced and installed in a way that its interior side, when the door is closed should be placed on the same surface of adjacent walls. The standard of the walls around the stairs and the protected escape routes in terms of performance and stability against the fire ought to be chosen proportional to the amount of risk. However, the resistance of any type should not be less than 30 minutes. The necessary facilities for the usage of disabled people in an emergency must not be forgotten in designing the fire escape pathways. The facilitating factors of evacuation and contribution in fire-fighting should also be estimated. The smoke ventilation system must be designed somehow that the natural or electrical evacuation is carried out by the alternative air. The protected escape routes must be protected against the infiltration and emission of smoke by the fire doors during the evacuation (equipped with flexible gaskets). Moreover, the ventilation tools must be controlled in order to prevent the movement and transfer of the smoke. This control can be performed naturally or using following mechanical instruments.

- *Natural ventilation*: basically, the natural ventilation is enough for the time of fire-fighting and this type of control should be carried out by trained firefighters using the windows and appropriate openable valves.
- *Mechanical ventilation*: the mechanical ventilation system should operate based on the BS 5588 standard part 4 or someone similar, by the acceleration of air pressure in escape protected routes, and in unprotected routes, the ventilation is done by an appropriate fan. The exit ways must be determined so that the athletes can find them at emergency and leave the salon easily. The hazardous areas such as mechanical installations powerhouse, power station, warehouses, etc. have to be designed in such a way that they would not be accessible to the public.

1.3.9. Alarms and fire suppression systems

In designing the sports salons, considering the criteria of complexes, a fire alarm system must be embedded, and for extinguishing fire in these buildings the automatic and manual types of extinguishing should be used (Deputy of technical affairs, 1995).

2. Materials and Methods

The method of current research due to its nature was a qualitative method with an interpretivist approach. For interpretation, the simulation and modeling techniques were used. For this purpose, two sports clubs in district 3 of Tehran were visited, and the results can be used in Organization of Physical Education, Municipality, Ministry of Education, and Bodybuilding and fitness federation. The modeling and simulation of the gathered data using thinking, reasoning, and logic were analyzed through inductive argumentation. Some standards and patterns were obtained by desk and field methods and observations and they were applied as a base and criterion.

3. Results

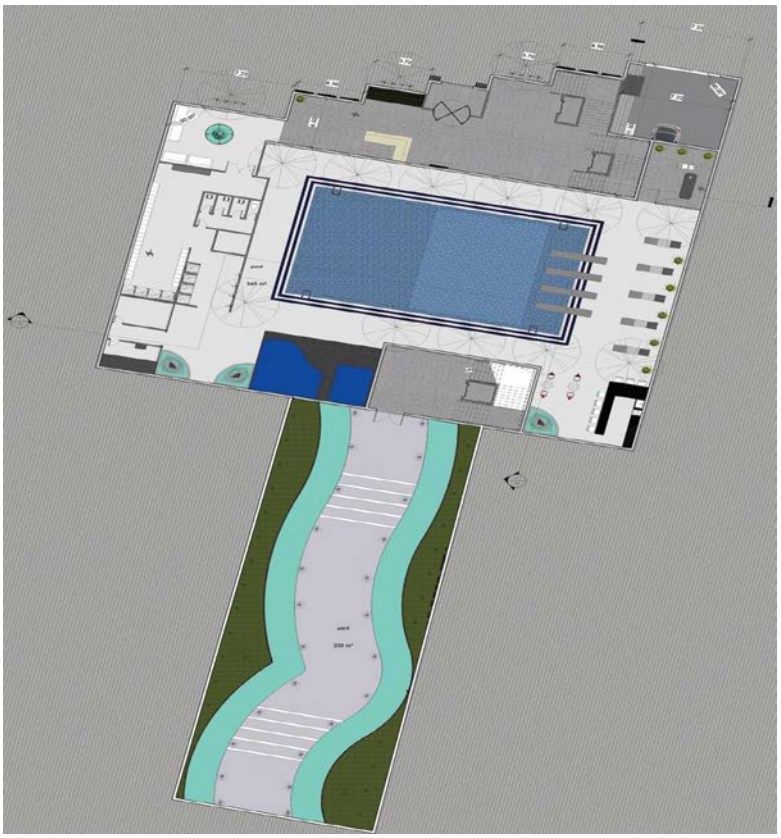

Figure 1. Ground floor plan, Jafari entrance

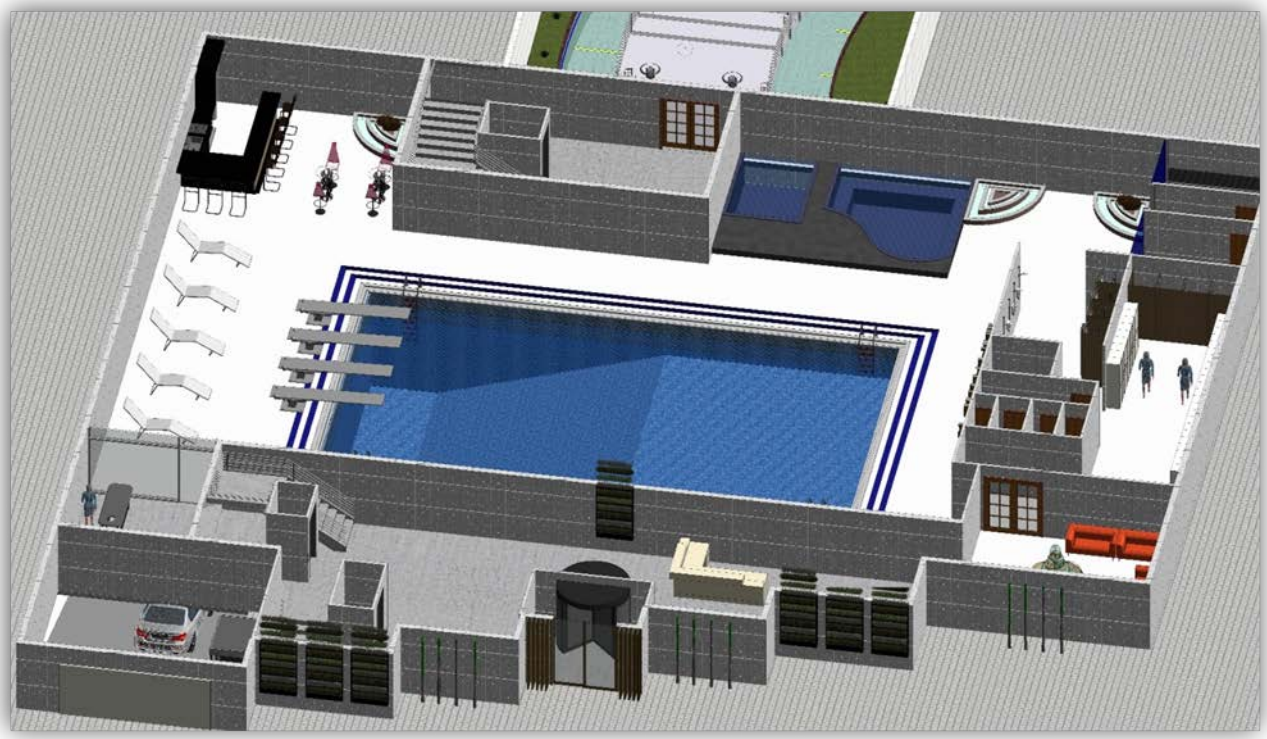

Figure 2. The horizontal section of the first floor

In figure 1, all spaces of the ground floor are modeled in 3D.

After entering to the complex and passing through the filtering space, then is lobby whose left side there is stairs and elevator facilitating the vertical access. In the right side of the lobby, there is a reception that is a prelude to the swimming pool. After the shoe reception, there is a campus for waiting and relaxing which includes a pond in the middle. Then, dressing rooms and lockers are placed. After passing the lockers, the toilets and bath cabins and wall showers, and later, sauna and Jacuzzi and pool can be observed. Beside the pool, the buffet and massage room are located. From the lower can be entered to the courtyard, and after that, the elevator and stairs which make the bodybuilding gym accessible.

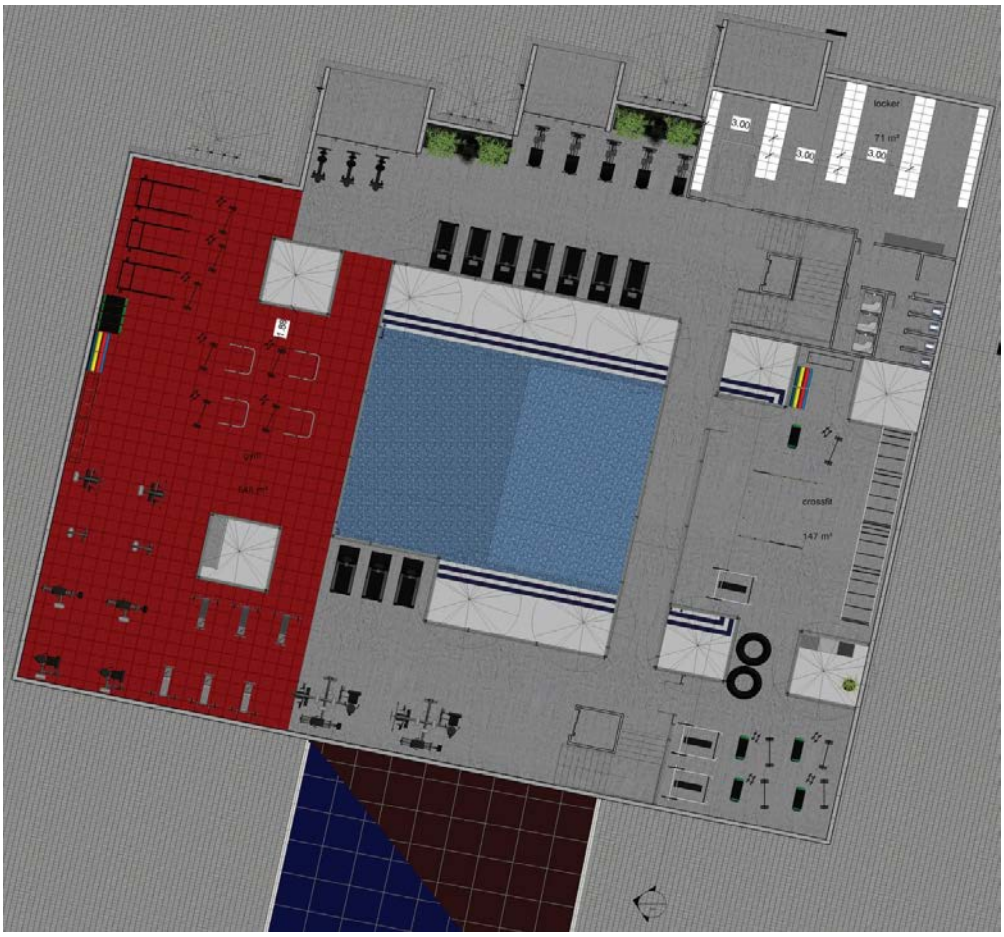

Figure 3. Second Floor Plan

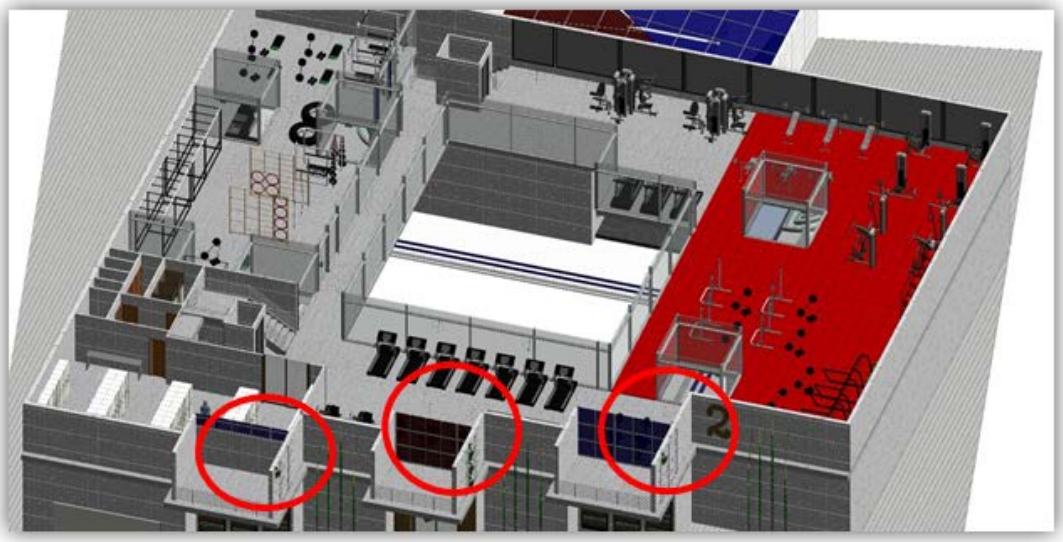

Figure 4. The horizontal section of the second floor

Figure 3 illustrates all spaces of the second floor in 3D. In the second floor, upon exiting the stairs or elevator user can enter to the dressing room. After the dressing room, there are some aerobic machines to warm up. A set of these machines is arranged around the pool. After that, a bodybuilding club with red flooring can be seen. The cross fit club is separated by glass curtain walls and is located next to the dressing room.

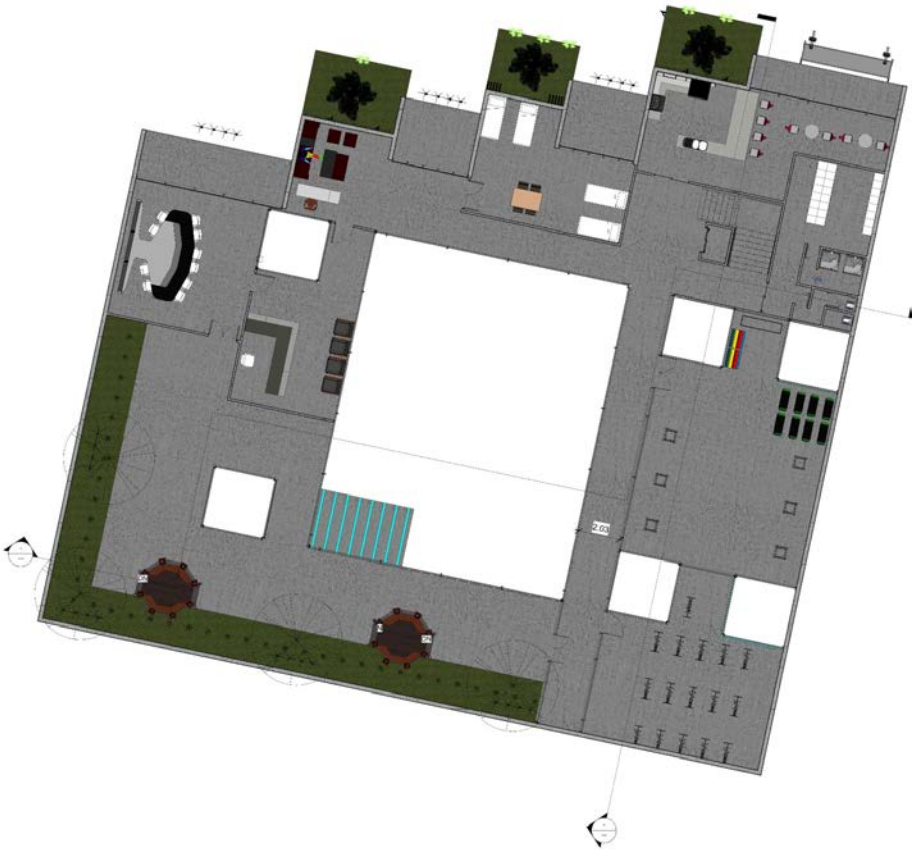

Figure 5. Third floor plan

Figure 6. The section of the third floor

In the third floor, after exiting the stairs or elevator determined by a red circle, the restaurant is located in the north which is regarded to serve all the people in the sports complex. In the west, the administrative places including the dormitory and the place of coaches' relaxation, waiting room, management and clerk room, and conference hall. There is a pathway from the conference hall to the management room and roof garden. In the south, there are sports spaces including TRX and its truss structures and spinning and its particular bikes. Roof garden also has green space and pergola which has provided a favorable environment on the rooftop. In the east, the dressing room and toilets are located.

Figure 7. North elevation

Figure 8. B-B section

Figure 9. A-A section

4. Discussion

In designing a bodybuilding club, the architect should accommodate the different spaces such as cross fit, bodybuilding, TRX, and etc. in a sports complex to athletes with different sports fields exercise together, or even a gym wins the championship of the bodybuilding in different fields. Today, the flexible spaces greatly contribute to the coaches and their athletes. Many specialized movements can be performed in these spaces such as plyometric and endurance exercises. For the recovery, sauna and massage in terms of architecture are very efficient. In addition, consideration of the standards can be divided into two fields: first in the field of designing the sports devices and second in the field of designing the sports space that the architect even can design the sports devices. The observance of the standards mentioned above sometimes is important insofar as the life of the athlete depend on it.

Regarding the simulation of the sections and plans of the first to third floors as well as club's view, it was concluded that the entrance of the gym can have an important and positive impact on the mind. In this club, there is an artificial river that the water flows in it. Hearing the water sound and passing this space helps the athlete to forget whatever has happened during the day and start the exercise with a mind devoid of any intellectual conflict and achieve the necessary focus for an energetic exercise. Triangular colorful ceilings and various lightings and aqueous curved path surrounding both sides, all help the athlete to forget the world out of the club and enter an elegant world made of energy. Observance of the spatial hierarchy in designing the gym leads the users to feel that they are going to try and achieve a special goal

and whose gaining is not easy and that is the health of mind and soul. The designed corridor has contributed to creating this spatial hierarchy. In addition, as it can be seen in the three-dimensional figure, a console is created in the facade of the second floor because of two reasons:

- Determinacy of the floors' height in façade
- Creating a place for taking care of the climber plants whose soil and garden box is placed on this console. Of course, a space-form structure is implemented on the concrete of façade walls of this floor in order to control the climber plants on the façade which are determined with red circles in the above perspective.

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