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Spatial planning of stadiums according to international regulations in Turkey

Nazlı ARSLAN[1], Tan Kamil GÜRER[2]
[1] nzarslan@yildiz.edu.tr • Department of Architecture, Faculty of Architecture, Yıldız Technical University, Istanbul, Turkey
[2] tgurer@itu.edu.tr • Department of Architecture, Faculty of Architecture, Istanbul Technical University, Istanbul, Turkey

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Abstract

As one of the largest structures of the city, stadiums are remarkable building typologies that bring together a high number of users. In these buildings, ensuring the comfort and safety conditions of users who actively participate in venues - from the players to the spectators - is a priority. Therefore, national and international guidelines that are published by the federations contribute to the development of qualified stadium designs. They also recommend separating the users according to the spatial requirements and creating competent, qualified architectural spaces by having suitable types of equipment. Ensuring compliance with these standards is also very essential to be able to host possible international organizations. Moreover, qualified stadiums that provide these conditions contribute to increase the brand value of sports clubs.

In this study, eight stadiums built between 2000 and 2016 in Turkey are analyzed according to the technical requirements of the International Federation of Association Football. Spatial organization schemas, that FIFA introduced in guidelines to increase comfort and safety, are compared with the spatial structures of eight stadiums. In addition to that comparison outcomes are discussed whether the findings can guide future stadium designs.

Keywords
Stadium, Design, Comfort, Security, International regulations.

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1. Introduction

Nowadays, due to international sport organizations, not only the sustainability of sport activities is ensured, but also architectural value perception is developed by the way sport structures built. This process also contributes to the brand value of sports clubs which have social and technical importance.

Stadiums bring many spectators together and increase the sharing among them. By football, stadiums contribute to the transformation of the social environment as well as the physical transformation of its surroundings. Especially international organizations, such as FIFA, organize various forums under the title of "Football for Hope" and discuss the role of football in social integration. In the report titled "Football for Hope: Football's Commitment to Social Development" published in 2005, FIFA states that solid bridges between football and development are intended to be build. In the integration process, stadiums that bring fans together have an important role (Kellison, Trendafilova & McCullough, 2015).

As great buildings, covering large areas inside the city plans, the relationship with their physical environment and their design criteria is very important. In recent years, they have been designed as mixed-function buildings that can respond not only to sports activities but also to different functions, such as concerts, cinemas, shopping, and exhibitions. On match days, fans' ingress and egress, service space, socializing areas - beverage and resting - and the diversity of merchandising activities around the stadiums are the factors that increase the use of these places (Paramio, Buraimo & Campos, 2008). Therefore, stadiums could host various professional competitions and organizations as long as they are built on the standards set by national and international institutions such as FIFA, UEFA, and local federations. While these global boards are giving support for the mixed-use stadia, they also keep the safety and comfort of spectators and players at a high level. In accordance with the situation all over the world, in recent years, the construction of stadiums which are designed under international standards is also increasing rapidly in Turkey. Accordingly, in this study, the general planning principles of current stadiums built in Turkey and their compliance with the international regulations will be analyzed.

This study aims to reveal planning features that provide appropriate comfort and safety conditions by comparing the built stadium plans with the optimum schemes of the international regulations. Beyond the furnishing features of individual places, it focuses on the relationship of the spaces and circulation schemes. After keeping a short projection on the historical, cultural and structural background of the stadiums, the design criteria of the two most important international regulations that stadiums are obliged to comply with are included. Since the furnishing features of the stadiums subject to the study comply with the UEFA criteria, they have received permission to host national and international games. However, beyond the furnishing features, the plan schemes may differ while spatial relations and basic rules remain the same. Hence, it is worth investigating the compatibility of the relationship between spaces with comfort and security conditions. As a result, spatial relations of stadiums based on the type of the user, elevation and stand characteristics are interpreted in line with FIFA and UEFA, which are similar, schemes and general planning properties are investigated.

1.1. History

The contemporary stadium is defined as a building that not only provides facilities for team sports and athletic games but also offers the opportunity to watch the spectators. The name comes from the fact that the stadiums built during the Roman period are equal to 1/8 of the length of the Roman shaft which is called a stadium (Hasol, 2008). The antique ones refer to an open racetrack surrounded by the spectators' stands, where athletic competitions are held in the name of the gods. Those with a 600-foot long runway were associated with the sacred places in the early days but later used only for sports purposes (Saltuk, 1995).

Since the sport was perceived as entertainment rather than competition in Roman times, the activities in the stadiums have also changed. During

this period, gladiator and wild animal fights were one of the most popular performances. Due to having fewer amphitheaters for these Roman activities, stadiums were commonly used. Later, rectangular stadiums with the semicircular end (sphendone) were built and the venue was brought closer to the amphitheater. One of the most important features that distinguish the 19th and 20th-century stadiums from the ancient ones is that they are designed for a specific sport within the scope of their intended use and requirement programs. It is seen that football as a sport branch attracts attention all over the world due to increasing audience and investments, therefore the stadiums only serving for football are built (John, Sheard & Vickery, 2007).

For many years, stadiums are designed in different ways in terms of form and ground. While the basic logic remains the same, stand capacities, playground, and ground characteristics are improved and differentiated in the light of technological developments. Structure of the ground was the soil in the first stadium buildings, but today artificial or natural grass is being used.

1.2. Geometry of stadiums

Stadiums can be analyzed in two main groups according to their geometric forms and spatial arrangements. They have three main geometric forms: Horseshoe-shaped, elliptical, and rectangular. According to their spatial arrangement, they are structured in two forms as open and closed. (John, Sheard & Vickery, 2007).

The rectangular is the most commonly used form and it has gradually raised stands on all sides of the pitch. Therefore, it is a preferred form especially in stadium designs that serve for only football sport (Gürel & Akkoç, 2011). In bad weather conditions, the comfort of spectators is affected by whether the roof is open or closed. The design and location of the stands also affect wind strength which is an undesirable factor on the playground.

One of the basic principles in stadium designs is to organize the space and user relationship by separating the circulation areas in a hierarchical order. According to the user profile of the space, created within the framework of need, separation from each other is one of the most important elements. Consequently, the stadium and its surroundings consist of four main categories from inside to outside.

- Zone 1; playground; pitch, center area (Players)
- Zone 2; spectators' area; stands (Fans)
- Zone 3; stadium; circulation and service areas
- Zone 4; stadium complex; park, sport, activity, etc. located around the stadium (Nixdorf, 2008).

1.3. Urban value

Modern stadiums serve as mixed-function public buildings with space arrangements that allow different activities rather than merely serving sporting ones. In addition to these activities from antiquity to the present, it also serves for meetings and events where a large area is required. The environment of stadiums, which have become an important point for economic development with sports and leisure events, are being used outside the match days to ensure that the building and its surroundings remain alive (Aksu, 2011). As a matter of fact, stadium buildings that cover large areas in urban plans are now influencing transportation plans, urban landscape, infrastructure, and the superstructure, therefore constitute an important focal point for urban transformation and development.

2. The effect of international organizations on stadium design criteria

2.1. FIFA stadium design criteria

"Technical Recommendations and Requirements for Stadiums" instruction issued by FIFA periodically provides guidelines for newly designed and revised stadiums. The fourth version of the work was made available in 2007 but the revised fifth edition was published in 2010. Each version has been developed according to the preceding one and contains new information and recommendations. Directives on the equipment and measurements necessary for the space serving to the spectators, players, referees, media, and other employees;

it contains important information to ensure comfort and safety in stadiums. The stadium and its surroundings are evaluated under a total of 12 main titles. These are; pre-construction decisions, safety and security, parking and orientation criteria, playground, players and match delegation, spectators, hospitality, media, lighting and power systems, communication and additional areas, futsal and beach soccer, temporary facilities.

The pre-construction decisions of the stadiums are important because of factors such as location, orientation and settlement which are the decisions that cannot be changed in the future. The most important of these decisions is the location of the site in a north-south orientation. In this way, the negative effects of sun's movement can be prevented both on the game and the media. *The safety and security* of the stadiums affect the number of active spectators coming to the stadiums. Different stadium users such as spectators, referees, media employees and so, should be isolated from each other by various regulations and it should be ensured that the competitions can be played safely. *Parking and Orientation* criteria are one of the most crucial issues in stadium buildings that serve to high number of users. In order to ensure that the spectators can easily reach the stands and service units, they need directions on the ticket and inside the stadium. Parking requirements in stadiums are quite high in proportion to the number of users; therefore, they should be numbered for orientation purposes and be separated from each other. It is particularly important for users such as players and match delegates to reach the stadium directly. Thus, private parking, pick up, and drop off areas located near the mixed zone is preferred for security reasons (DelMont, Botta & Reddy, 2011).

According to the FIFA 2010 criteria, the *playground* is 68 X 105 m, the edge of the field is 8.5 m and the back of the goal post is 10 m wide and the total area of the field is 125 X 85 m. The ground should be natural or artificial turf and drainage systems must be used to drain the water. Substitutes' benches, that can accommodate 21 people, are produced with unbreakable material. Security doors opened to the field of play should be opened in the direction of the field and max 2 m in height. All linking stairs must meet the doors. Not only fences can be used for separating the tribunes from the playing area, but also moat and arena-type tribune systems can be applied. Safe and fast access to places such as locker rooms, referee rooms, health rooms, etc. reserved for the P*layers and the Delegation* of the match are the requirements of modern stadiums. Passage to changing rooms should be in an isolated area, separate from the spectators' entrances and exits, within easy reach of team buses, ambulances, and match officials. There should be four changing rooms, and especially in international matches, the changing room of both teams should have equal conditions. At least one room must be reserved for referees. The changing rooms should be located on both sides of the road leading to the exit tunnel. There is a need for areas where the entire team can make warm-ups before the match and the substitute players during the match. In the stadiums, there should be a health room to intervene in case of any injury to the players, and a doping control room for doping control. A room should also be designed for delegates in matches (DelMont, Botta & Reddy, 2011).

One of the factors affecting the decision of the *spectators* to come to the stadium is the general comfort standards. Hence, the stadium should be split into at least four sectors, each with its transportation points, toilets, spectator health center, security, and food and beverage points. Each sector is kept separate from each other by barriers or fences. Notification of emergencies and transmitting warning messages to lots of spectators are a requirement for the stadium security. The control center which is established for making and controlling announcements is located in a place that can see the stands clearly. To conduct ticket checks quickly and accurately, the turnstiles should be coded separately for each sector and matched with the tickets; thus, the spectators can reach the correct stands. Activities other than football matches should be provided with the conditions of *Welcome and Hospitality*. Stadium space should be able to meet different venue needs

such as weddings, restaurants, and meetings. In football matches or other events, the equipment and features of the VIP and VVIP areas are superior to other spectators' ones. VIP areas are located in the center of the western stand with the best point of view and direct access to the playground, dressing rooms, media, and foyer places. Their entrance should be close to the main entrance and high-security prevention should be taken (DelMont, Botta & Reddy, 2011).

It is important that *Media* essentials can perform fast and functional tasks in and around the stadium. Media officials working in stadiums should have comfortable, convenient conditions and crucial equipment. These are also required conditions for accurate and rapid information transfer to the spectators following the match. For this reason, stadiums should be designed according to media employees' requirements, such as accreditation office, media tribune and match commentary room, stadium media center, press conference room, interview and multi-purpose area, studios and outdoor broadcast areas (OB-VAN). Television infrastructure and camera positions should be suitable for visual recording of the match and live broadcast. The cameras are located where they can see the whole match and the areas where critical positions can occur. Studios are also needed for living broadcasts and programs. There must be at least three studios for important matches. *Lighting and Power Systems* should ensure that the stadium is well lit and that the field can be viewed at any point in the stands, especially during night matches. Stadium ingress and egress should also be enlightened to confirm the safety of the stadium and the spectators. Technically, the lighting system can be located on the roof as well as it may have its own structure. In case of a power failure, a generator or batteries, capable of providing four hours of power, should be expected to be available. Advanced technology arrangements should be made with *Communication and Additional Areas* to meet the communication needs of many users in stadiums. Live broadcast facilities, building management system, ATM, clock system, common TV and antenna system, fire alarm service, food service, lighting control, mobile telephone service, police, and fire radio, roof control, telephones, scoreboard, electronic pass system, detector scanning, security telephone system, security video system, markings, audio systems, video screens, wireless internet, ticketing systems should be placed in the stadium. There should be a control room that manages all systems and these rooms should be located separately from the electrical ones (DelMont, Botta & Reddy, 2011).

Table 1. *Space definitions and equipment characteristics according to UEFA criteria.*

UEFA DESIGN CRITERIA			Stadiums	
PLAYERS AND MATCH OFFICIALS	Football pitch	Soft and flat surface	✓	All stadiums examined are allowed to play matches as they meet all relevant equipment specifications.
		Natural or artificial turf: approved by FIFA, suitable with international requirements, marked with green and white lines.	✓	
		Drainage system	✓	
		Underfloor heating	✓	
		There should be no objects less than 21 m high from the pitch	✓	
	Projector	min 350 lx	✓	
	Warm up areas	along the touch line or behind the billboards of the back of the goalposts	✓	
	Goalpost	width: 7.32 height: 2.44, white aluminium or similar material	✓	
	Substitutes' bench	2 substitutes' bench, each for at least 13 people and at least 5m away from the touchline	✓	
	Flagpole	At least 5	✓	
	Dressing rooms	Players' dressing room: at least 5 showers, 3 toilets, seating for 25 people, 1 massage table and 1 tactical board	✓	
		Referee dressing room: 1 shower, 1 toilet, 5 chairs and table	✓	
		Safe and quick access to the field	✓	
	Delegation room	Easy access to team and referee rooms and has telephone, fax and internet access	✓	
	Medical room for players and match officials	Appropriate and sufficient equipment	✓	
	Doping room	Next to the dressing rooms, isolated from the spectators and media	✓	
		At least 20 m2: waiting room, test room and toilet	✓	
		Waiting room: 8-person seating area, dressing area and cabinets, refrigerator	✓	
		Test room: 1 table, 4 chairs, 1 sink, lockable cabinet and toilet	✓	
		Sanitary area in test room: 1 toilet, sink and shower	✓	
	Parking	For teams and match officials: at least 2 buses and 10 cars	✓	
		Easy and quick access from dressing rooms	✓	
SPECTATORS	Spectators' stands	Each seat is fireproof, unbreakable, numbered with min 30 cm back	✓	
		Beverage areas in every stand	✓	
	Guest spectators' stand	At least 5% of the capacity of the stadium, separated from other stands	✓	
	Ingress and degress	Turnstiles	✓	
		Separated circulation for each stand, signs for stands' information around the stadium bowl	✓	
		Stairs of spectators on the stands should reach the playing field, but the doors opening to the field at the time of the match should be controlled.	✓	
		Exit, entrance gates and other gates should be marked with international symbols	✓	
	Emergency lighting	Emergency exits and stairs should be indicated with lights	✓	
	Announcements system	It must be able to operate in any power outage inside and outside the stadium.	✓	
	Sanitary	it should be in every stand, be hygienic. Sink, toilet paper and soap should be available.	✓	
		1 toilet, 2 urinals per 250 men, 1 toilet per 125 women	✓	
	Medical room	It should be in every stand with necessary equipment	✓	
	Disabled spectators	Inside the stadium, marked with signs	✓	
		easy access to the disabled stand	✓	
		Private beverage areas and sanitary areas	✓	
		1 WC per 15 wheelchairs disabled	✓	
	VIP seating	Specially separated, close to the centre line and in the middle of the 2 penalty lines	✓	
MEDIA	Media working area	At least 1 room with desks, power supply, telephone and internet access	✓	
	Cameras	The main camera should be positioned in the grandstand, in the middle and at the height that can capture the appropriate viewpoint, in the direction of the middle line, with a slope of 15-20 degrees.	✓	
	Media stand	In the middle of the grandstand with clear viewing angles, has easy access to other media working areas	✓	
		tables with power supply and least 3 chairs	✓	
		At least 1 match commentator desk / room with internet access	✓	
	OB-VAN	As close as possible to the stadium, on the same side with the main camera platform, on solid ground and has power supply	✓	
		It should be positioned in an open and clear area where it can be easily seen from the satellite	✓	

2.2. UEFA stadium design criteria

The European Football Association (UEFA), which has adopted the minimum design criteria set by the World Football Association (FIFA) for stadiums, has also issued "Qualified Stadiums" instruction as a regulator in the organization of its championships. Although this directive shows great similarities to FIFA, it focuses more on the construction areas, height, capacities, spatial needs and ecological values of stadiums and it is also revised in line

with the conditions of the day and published periodically (Fenwick et al., 2011). The qualitative and quantitative values of the stadium units are included in these guidelines that designers and investors can make more efficient planning and site selection (Table 1). Compliance of stadiums, with criteria in international organizations taking place at the European level, is taken into consideration with the help of this instruction. The limits and values of the criteria vary depending on the level of the organization, and the compatibility of the stadiums where the clubs will play matches is inspected (Platini & Infantino, 2010).

3. Spatial planning features of stadiums in line with FIFA regulations

When all the criteria related to FIFA for the stadiums are considered, it is observed that the spatial needs change according to the user profile. Therefore, new stadiums built in Turkey between 2002 and 2019 were generally designed under these criteria of FIFA. But the new structures have differences in terms of the organization of space depending on the characteristics of their designers and capacities. In this section, the planning features of built stadiums in the aforementioned period in Turkey will be discussed according to defined categories.

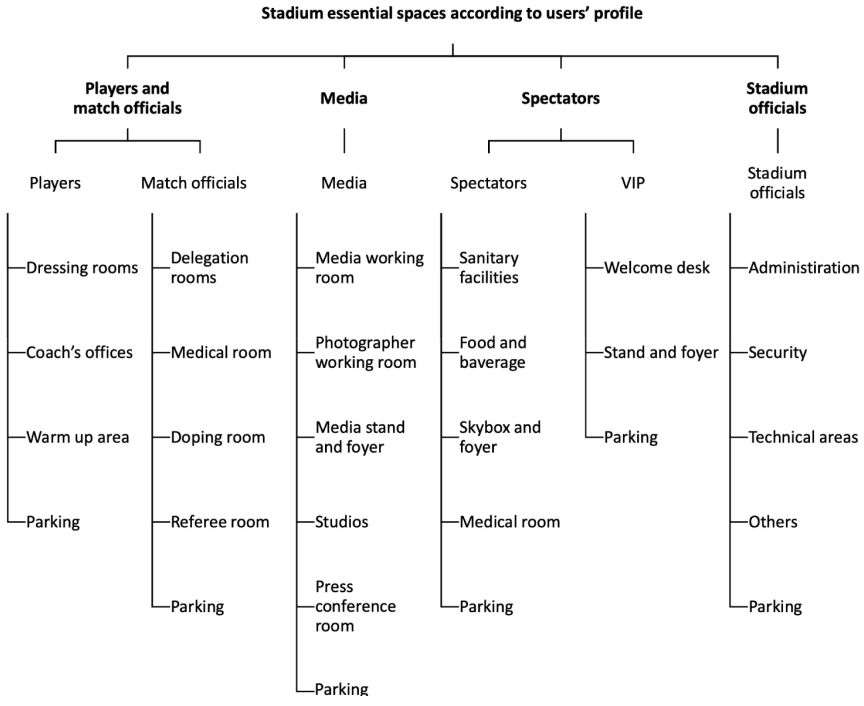
3.1. Space planning features by user profile

Required and used space by each user group in the venue differs in their planning features. The separation of areas healthily and conveniently is the most important cornerstone of stadium security. Players and match delegations, press, spectators, and stadium officers are the four main user groups in the stadiums (Table 2).

3.1.1. Spaces created for players and match delegations

It is very important for the players and match delegation to enter and exit the stadium safely. It is compulsory to have separate entries and exits from the spectators and other users, and they have a direct connection to the playground. The spaces should be organized by considering the mixed zone as the center. Accordingly, the team dressing rooms are separated from each other by positioning on both sides of the mixed zone, and a direct transition from the parking area, where the team buses drop the players off to the stadium, should be provided. Match delegation spaces such as federation representative room, medical room, doping room, referee rooms, press areas are connected to the mixed zone with different corridors.

Table 2. *Spaces created by user profile.*



The circulation differs for each unit, and it is connected to a single space, namely a mixed zone. When the proposed projects and stadium plans are compared, it is seen that these are mostly complied with the FIFA rules and for that reason, an effective circulation is provided. Such as the planning scheme proposed by FIFA for players and match delegations is in line with the plan of Konya Stadium in Turkey (Figure 1).

3.1.2 .Spaces created for media

The space created for the media members should be directly connected uninterruptedly. Media entrance, accreditation center, press conference room, stadium media center, media stand, studios, interview areas, and media parking lot should be in contact with each other, and special floor connection with stairs and elevators should be provided for quick and easy access. As seen in Mersin Stadium, it is observed that the media areas are positioned to provide direct access to the mixed zone and have a specialized circulation network to enable the press members to work in the most effective and fastest way (Figure 2).

3.1.3. Spaces created for spectators

Factors such as the cleanliness of the stadiums, food and beverage services, parking areas, and crowd control affect the comfort of the spectators and their participation rates of the match. For this reason, spectator areas must be designed with comfort standards. These comfort standards are determined and supervised by international organizations such as FIFA, UEFA (Wakefield and Sloan, 1995).

It is necessary and important to ensure the comfort of fans and VIP guests. Just like the separation of players and officials from the spectators, they must be separated within themselves. Principally for VIP guests, access to the VIP stands should be provided with staircases and elevators that are isolated across all floors, starting from the parking lots, so that they can safely enter and exit the

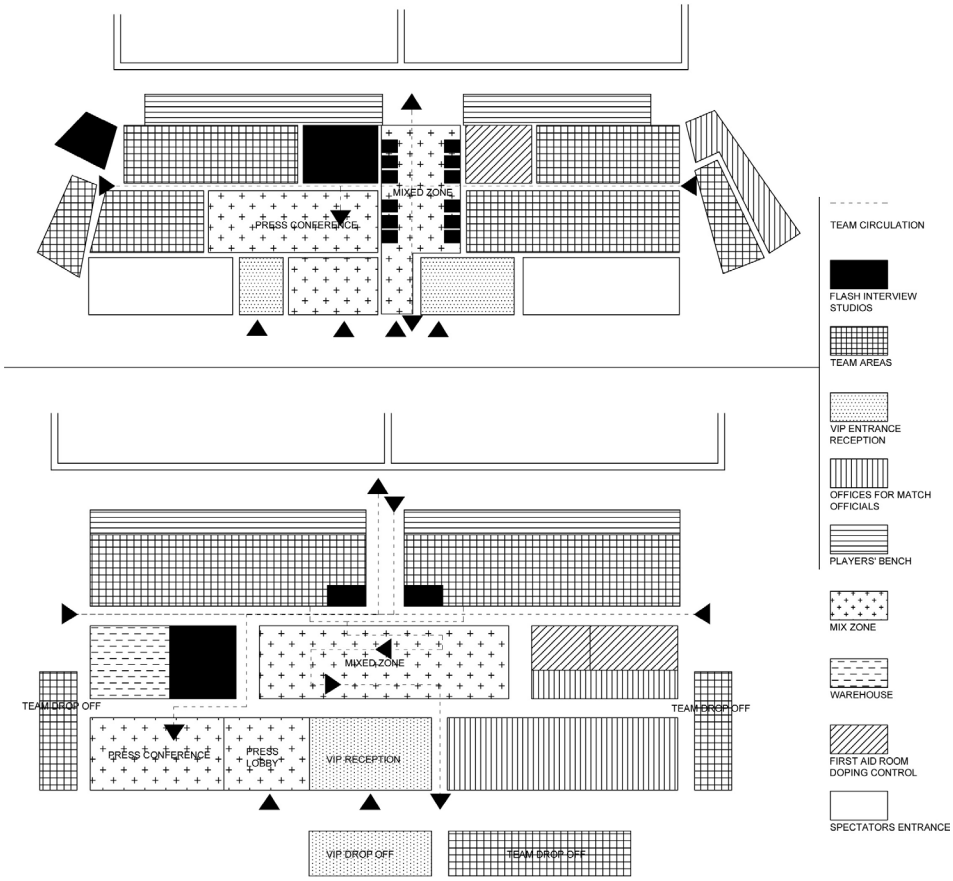


Figure 1. *Konya Metropolitan Stadium team area plan (above) and schematic plan recommended by FIFA for team areas (below).*

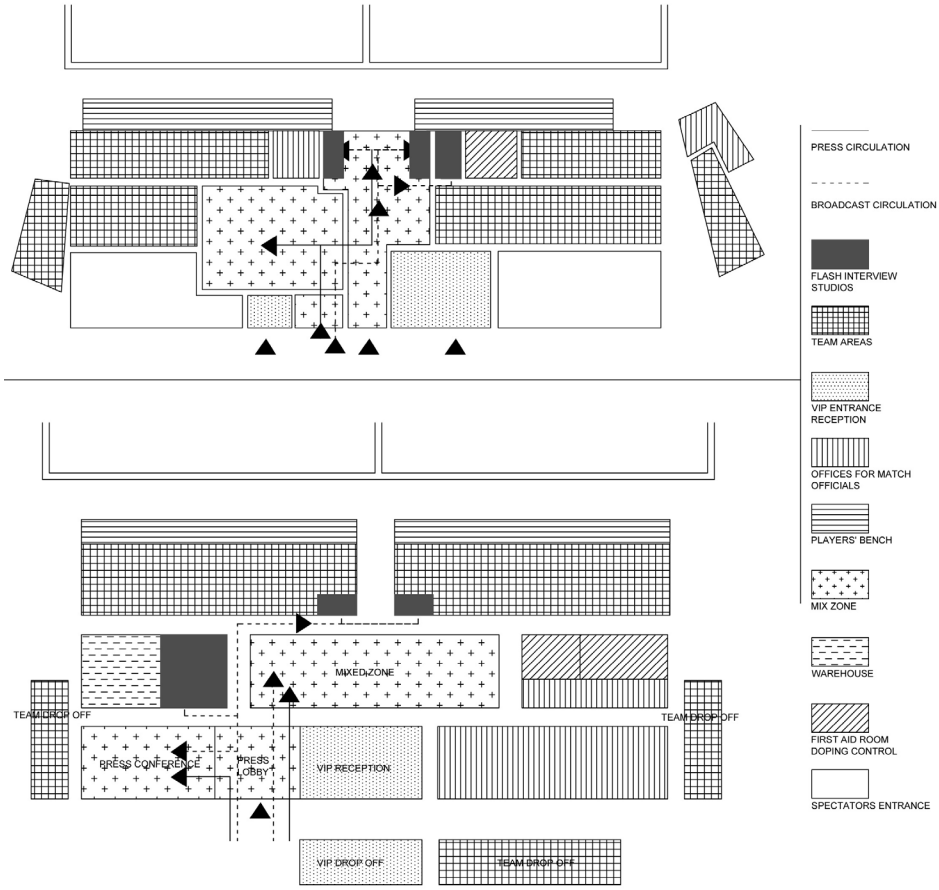


Figure 2. *Mersin Stadium media areas, mixed zone, and dressing rooms plan (above) and schematic plan recommended by FIFA for media areas, mixed zone and dressing rooms (below).*

stadium. Sanitary areas, medical rooms, foyers, and service areas also should be located at the back of the VIP tribune as in general spectators. Consequently, security can be provided at the highest level. As it can be seen in Kayseri Kadir Has Stadium, it is important to locate the foyer and sanitary areas special to VIP guests behind the VIP stand, as in the scheme proposed by FIFA (Figure 3).

3.1.4. Spaces created for stadium officials

Many spaces are created in the stadiums that serve to users such as management, security, technical staff, and employees responsible for food and beverage activities. The management unit for each stadium can be located in different sections and the access of the unit should be provided separately and be isolated from the others. In general, although there is no definite recommended place for the location of the management unit in the stadium, when all spaces are designed, the remaining sections are used for the stadium workers.

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3.2. Customized floor plans

Although each stadium is designed in different geographies, capacities, and styles, they are quite similar to each other due to the compulsory plan requirements. One of the important reasons for this is to comply with the

requirements of FIFA. In addition to that it has a spatial structural character, which is based on space placed around the circulation route in the stadium and rises on certain floors. For this reason, it is not only the circulation that differentiates the stadiums, but also their formal features. Due to the general rules and effective stadium orientation, the necessity of which spaces should be located in which stands, and how the spaces are separated from each other based on floors, and which spatial solutions are enriched by the space-foyer relationship, are the elements that make the designs differentiate.

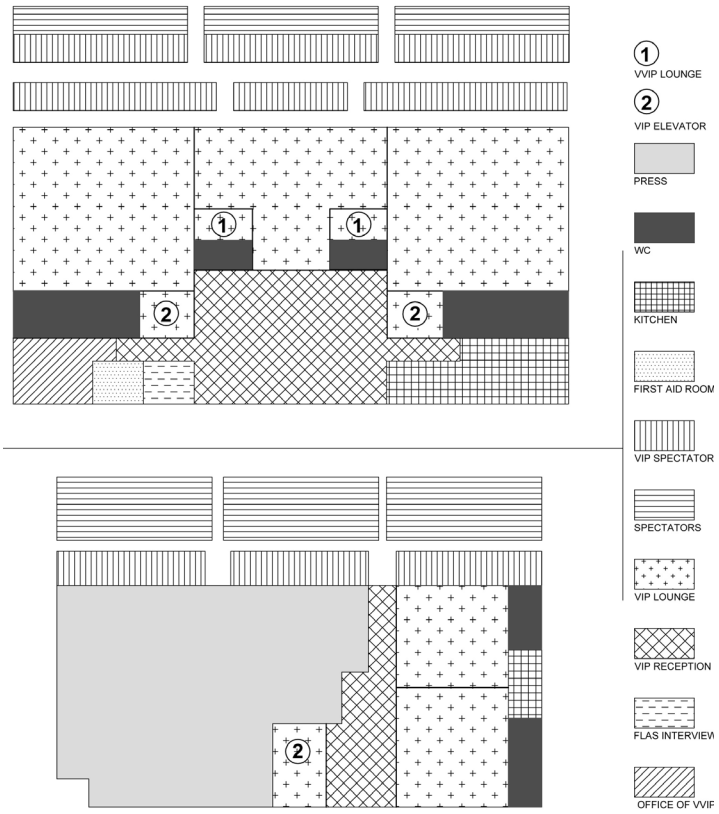
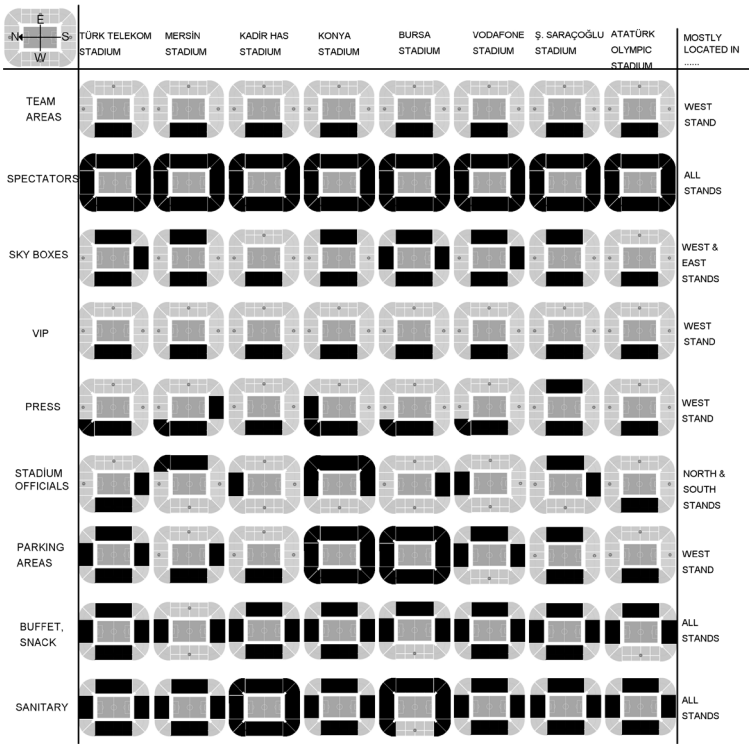


Figure 3. *Schematic plan of VVIP and VIP areas (above) proposed by FIFA and VIP tribune and foyer plan of Kadir Has Stadium (below).*

Table 3. *Stand locations of the functions in the stadium.*



When stadiums in Turkey are compared, it is understood that the plan schemas on certain floors of each unit are similar to others. When these are evaluated and compared, it is observed that a common language exists in planning. The stand locations of the spaces serving for different users in eight stadiums are summarized in table 3. Accordingly, it has been determined in which stands these spaces are densely located. Although it has been observed that high-security areas such as the press, team, and VIP match with the grandstand value recommended by FIFA, the spectator stands, commercials, foyers, and parking can be located in different stands depending on the design approach and capacity of the stadium (Table 3).

3.2.1. Plan features of ground floors in stadiums

The ground floor of stadiums includes space created not only for players and match officials but also the stadium officers and commercial ones. The ground floor of the west stand of each stadium is designed for player ingress and egress, and all related spatial needs are solved in this area. Due to the orientation of the stadiums in the north-south direction, the east and west tribunes have much larger areas. Therefore, the need for adequate space can be provided in these stands.

For the players to reach the dressing rooms easily and safely, taking the entrance from the ground level (road level) is seen as the most effective solution. In addition, Media and VIP entrances are also drawn from the ground level. While the ground floor of the western stand consists of spaces created for players and match delegations, in the eastern stand, there are spaces for the stadium officials. By

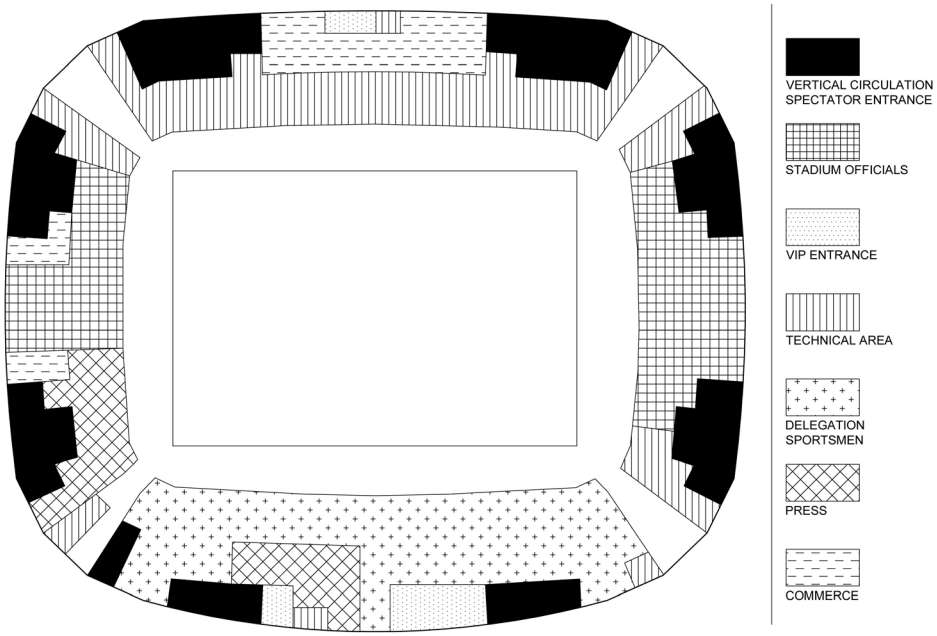


Figure 4. *Example ground floor plan; Konya Metropolitan Stadium.*

locating these facilities on the ground floor, more space can be created for the spectator foyer on the upper levels. The space created for the stadium officials can also be located in the north and south stands. On the other hand, commercial ones can be located on the periphery of the north, south and east tribune, so that the fans can be directly involved from the outside. In this way, the spectators can benefit from commercial activities without being included in the stadium. The entrance of the spectators to the stadium is provided by the east, north, and south stands but players, media, and VIP entrances are provided from the west stand. If it is correctly separated from private entrances, spectators' entrance can be given from the Western stand. Technical space can be located in diagonal corners of the stadium. The openings in the diagonal corners of the ground floor can be connected directly to the road, allowing rapid intervention of the emergency vehicle entry and exit. Generally, the openings in the corners are on both sides of the western tribune and there is a medical room next to these openings.

In the analyses of Konya Metropolitan Stadium, it is seen that the ground level of the western stand is completely formed by the functions reserved for players, media, and match officials, while the other

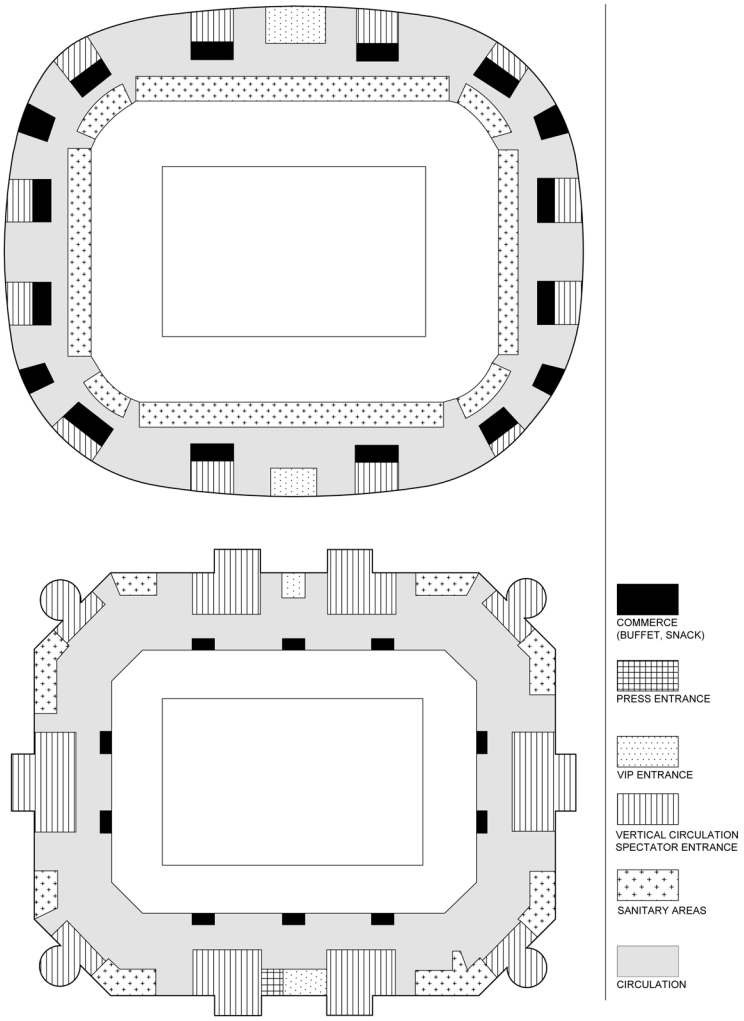


Figure 5. *Sample spectator stand and foyers plan; TT Stadium (above), Kadir Has Stadium (below).*

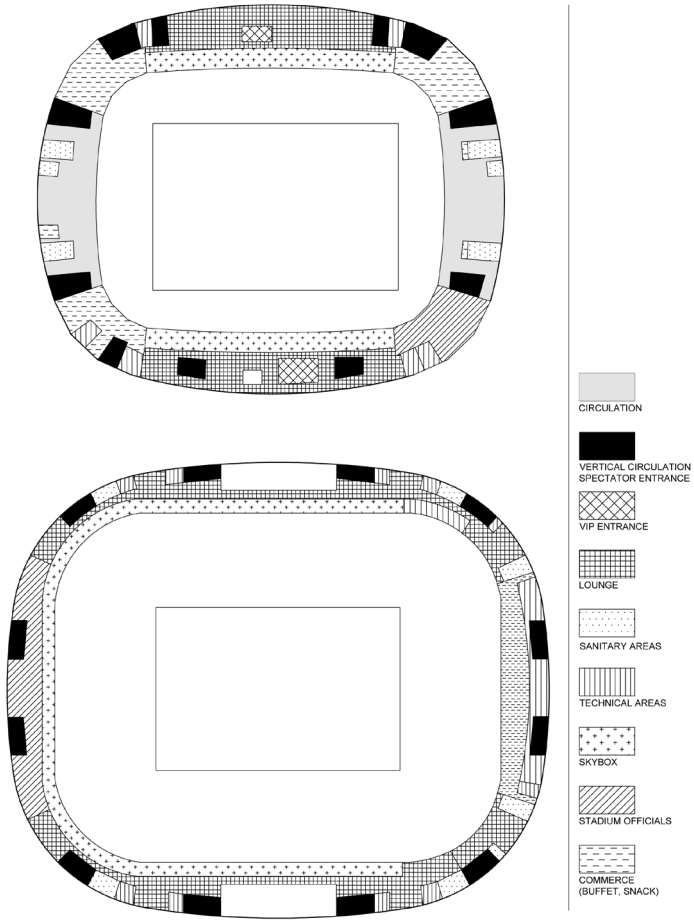


Figure 6. *Sample skybox floor plans; Konya Metropolitan Stadium (above), TT Stadium (below).*

stands serve for the match officials and the commercial functions. In the ground level of the Western stand, only match officials, players, and media entries are located, while spectators' entries are provided from other stands (Figure 4).

3.2.2. Plan features of upper floors in stadiums

The upper floors of the stadiums are mostly designed for spectators and fan's foyers behind each stand. In the foyers, there are functions such as areas where the spectators perform eating, resting activities, sanitary, and infirmary. Spectator's foyers are distinguished according to the user profile. Separate foyers are created for VIP, skybox, guest, and host team spectators so that security and comfort can be offered. Service units in the foyer have been designed with different approaches in each stadium and the main purpose has been to provide the spectator with comfortable and easy access from the stands to the foyers.

It is seen that the foyer areas in the Turk Telekom Stadium, where there are sanitary areas and food and beverage units behind the stands, are separated by structural elements, namely east, west, south, and north (Figure 5).

When two examples of the design of the service units are analyzed, it is possible to find out different approaches. For example, in the TT Stadium above, while the sanitary areas are located in the inner wall just behind the tribune, it is considered appropriate that the kiosks are freely located in the middle circle in the foyer. In the example of Kadir Has Stadium below, the opposite is preferred, and the sanitary areas are gathered in the outer wall, while the buffets are located in the inner wall behind the stands. In both examples, it is seen that the middle axis of the foyer is left empty to ensure the circulation of the high-density spectator, so the service areas are located in the inner and outer walls (Figure 5).

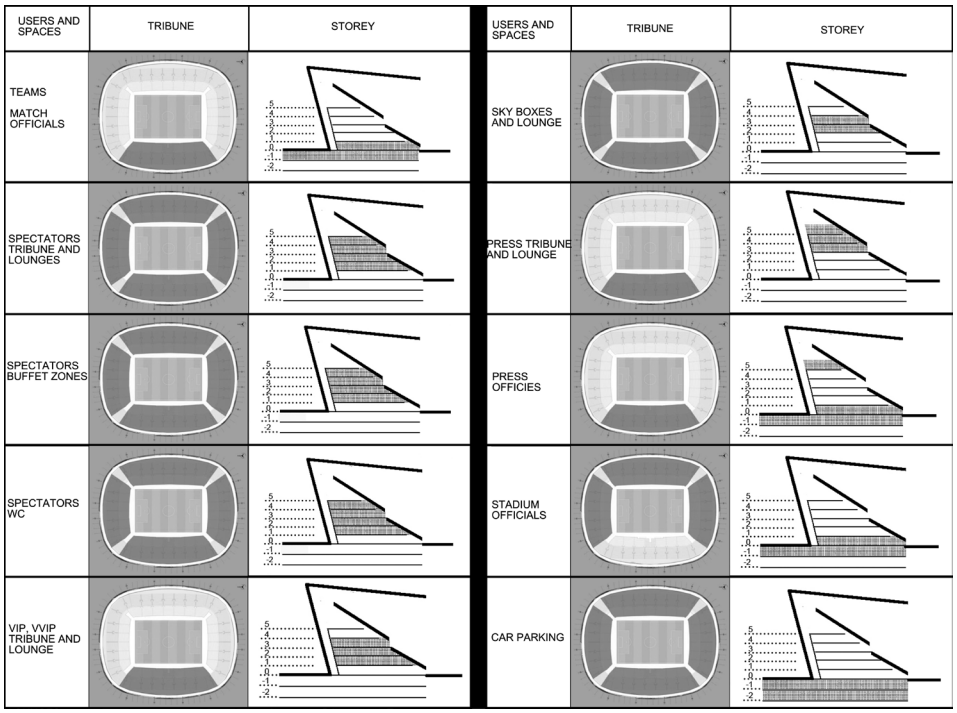
From the private staircases and elevators on the upper floors of the areas such as VIP and Media, entrance and exit are not provided to non-VIP spectator's foyers, so that the circulation areas of different user groups can be safely separated. In Kadir Has Stadium, a customized circulation network has been established on the ground floor, by separating VIP entrances from other spectators.

3.2.3. Plan features of skybox floors in stadiums

Floors with skyboxes in the stadiums are specialized ones. They are located at a distance that can see the field at an optimum level. Therefore, they are located in the area between the upper and lower tribunes. Depending on the design decision, the skyboxes are in the east and west stands, while in some stadiums they can also be located in all the stands for economic reasons. Access to these skyboxes is provided by separate stairs and elevators from the ground to the upper floors. Since the skybox is located on the entire floor, the foyer is common and is not separated with any barrier.

Two different design decisions can be observed between Konya Metropolitan

Table 4. *Schematic plan and section of the relationship between the floor and the grandstand.*



and Türk Telekom stadiums. According to this, since the skyboxes in Konya Metropolitan Stadium are located only in the west and east tribune, the spectator and the skybox foyers are separated from each other by various space. Restaurants and management units in the diagonal corners divided the foyers, thus, beverage and sanitary areas are designed in each foyer. In Türk Telekom Stadium, the foyers are not divided from each other since the skyboxes are located in all three stands of the floor (Figure 6).

3.3. Relation between the floor and stands in the stadium

The location of the space in the stadium has common features in line with the planning requirements. By analyzing the floor and grandstand relationship of the stadiums reviewed in Turkey, the generic features of the main decisions in designs can be understood.[1] As shown in Table 3, the locations of certain space in the stands show similarities between all the stadiums. Results of the examination on stadiums, it has been observed that the functions which serve different users are located in similar stands. Accordingly, the space created for players and match officials, as a rule, is located in the west stand in all the stadiums. Although spectator foyers can be found in all stands, VIP and its foyer, the media and its working area which are very important for the press conference room is located on the western side. Locations of the skyboxes vary according to the design decisions. The east and north grandstands are used intensively for stadium officials and employees. Parking lots can be located under separate stands, based on the transportation axes of the city. By considering the values in table 4 it is proven that a common design language has been formed within the framework of spatial needs.

It is critical to comply with national and international stadium design criteria to ensure correct and safe circulation. For that matter, it is natural that similar typologies appear in the stadiums that comply with the criteria. When the sections of the stadiums in Turkey analyzed, it is understood that the levels of the functions are similar. According to this, depending on the condition of terrain the spaces created for players and match officials are located on the ground or basement floor, spectator foyers are located on all floors beginning from the ground to upper levels; the media can be

found mostly on the ground, 3rd or 4th floors with the media working areas. VIP stands and foyers, skyboxes are usually located between the upper and lower stands. While the basement and ground floors are utilized to stadium officers and employees, basement floors are additionally preferred for parking lots (Table 4).

4. Conclusion

The stadiums are large-scale structures and their environmental effects can spread across the city, that's why they should be designed very precisely. Especially, the stage of making pre-construction decisions plays an important role in terms of considering opportunities and weaknesses. It is possible to create safe stadiums that provide comfort conditions if the subsequent stages of construction and usage processes are planned and implemented correctly.

Associations such as FIFA and UEFA, which manage football around the world and TFF on a local scale set standards for the spatial properties and define technical requirements for qualified stadium constructions. Therefore, space arrangements that provide these standards for the users can increase the number of qualified stadiums in Turkey which enables people to come together under the phenomenon of football the biggest unifying power in the country.

As a result of the analysis, today, it is seen that stadiums should be able to serve different users at a spatial level, and most of them should be separated from each other with a secure circulation network. Therefore, each unit must operate and be equipped sufficiently. Access from outside the stadium to the destination point must be separated according to the characteristics of each unit-user profile, and the functions within the stadium must be properly correlated.

The existence of recommendations and requirements for a building typology is an indication that the technical infrastructure of that typology must be constructed correctly. Eight stadiums, which were analyzed in line with the schemes suggested by international regulations, have similar plans due to comfort and safety conditions. According to these, it is observed that user-oriented functions are located in certain stands due to technical requirements. These layouts also bring along special plan types based on elevation. The circulation network established by the individual spaces located at certain elevations and stands within the framework of the user needs causes the formation of similar floors in each stadium. Consequently, the connection network organized by the spaces not only in the plan but also in the section is important; hence, it is understood that similar functional units are located on certain floors and stands. These plan and section features can claim to provide comfort and safety conditions if they comply with the recommendation schemes of international regulations that optimize complex circulation networks. It is also an important argument, especially in terms of hosting international matches.

The stadiums in this study and the new ones under construction have met the requirements proposed by international associations and this has allowed them to host many important organizations. Among them, Atatürk Olympic Stadium hosted the 2005 Champions League final, while Şükrü Saraçoğlu and Vodafone Park Stadium hosted the 2009 UEFA Cup and 2019 Super Cup finals. Hence, the most prestigious football events taking place in Turkey have created a favorable impression in the international community in terms of stadium infrastructure.

This study also demonstrates that, alongside the comfort and security conditions, facilities such as accommodation, transportation, food, and beverage to be created around the stadium ensure both active participation of local and foreign fans and increase the brand value of sports clubs in Turkey. That's why, not only the stadium but also the services and transport units complying with international requirements, will turn the stadium into one of the important centers of attraction in the city as a social catalyst.

Endnotes

Eight stadiums are selected from among the stadiums with a capacity of forty thousand and above, which were built in accordance with the guidelines issued by FIFA and UEFA. These are; Vodafone Stadium, Türk Telekom

Stadium, Şükrü Saraçoğlu Stadium, Atatürk Olympic Stadium, Bursa Metropolitan Stadium, Kadir Has Stadium, Mersin Stadium, and Konya Metropolitan Stadium

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