Design Criteria of In-Campus Sport Facilities with Reference to World University Sports Competitions
A Case Study in IZTECH Campus

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A Dissertation Submitted to the
Graduate School In Partial Fulfillment of the
Requirements for the Degree of

MASTER OF URBAN DESIGN

Department:  City and Regional Planning
Major: Urban Design

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September 2000
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ACKNOWLEDGEMENTS

First, I would like to thank my supervisor Assist. Prof. Dr. Erkal SERİM for his critics, his inspiring ideas and patiently guidance during the study.

I am particularly indebted to Res. Assistant Tankut Gökçen for his contributions and for his enthusiastic support. Furthermore, I want to thank my cousin Architect Özlem Gürtan for her critics, advices and technical help. Didem Çaylan, Feral Geçer and Neşe Köse have all made their technical contributions in project process.

Finally, I would like to thank my family for their belief and support during my thesis study.
The topic of this research is: to define the major programming issues and design principles of sports facilities in universities’ campus areas that will contribute to the organization of citywide and countrywide sports competitions as well as to serve for the recreational utilization of all the ordinary university students and the staff, and to design a sports complex in newly developing IZTECH campus with respect to those planning and design considerations.

To generate the terminology for provision of sports facilities, firstly, sport is to be understood in all its social, recreational and professional dimensions, so that, as a starting point, concept of sport and its relatively increasing importance in human life is described. Then, sports activities are classified according to their nature and interested groups. This classification, furtherly contributed to examine which types of sports are accepted as official and commonly provided to students in universities. Under this initial information, adequate spatial requirements and capacities for sports facilities relative to the population sizes in campus areas are examined with respect to examples of universities from foreign countries and Turkey. Moreover, official standards for World University sports competitions are presented to understand spatial and organizational requirements needed for the sports facilities. It allowed generating the design guidelines and dimensional standards for planning of purposed sports facilities, which are implemented in the case study area at the final step of the research.

Initial studies before the design process of the project showed that, sports facilities in majority of Campus Universities do not only respond to recreational use of students in their spare time but also respond to competitive activities and multi-level events as well. Because of this result, it is aimed in the final project that how sports facilities in IZTECH campus designed most effectively with respect to the standards of world university sports competitions which is the best event for guiding the design process of such a project.
Bu tezin konusu: üniversite kampüslerinde, öğrencilerin, akademik ve teknik personelin eğlence amaçlı kullanımına yönelik olduğu kadar, ulusal ve uluslararası spor müsabakalarının düzenlenmesine olanak sağlayacak spor tesislerinin, programlanması ve tasarım kriterlerinin saptanması; bunun ışığında da henüz gelişmekte olan İzmir Yüksek Teknoloji Üniversitesi’nin kampüs alanında bir spor parkı tasarlanmasınıdır.

Spor tesislerinin programlanması ve tasarımına yönelik terminolojiyi anlamak için, öncelikle, sporun sosyal, kültürel ve profesyonel anlamındaki boylamaları kavrayabilmek gerekliktir. Bu sebeple, başlangıç noktası olarak; genel anlamda spor ve sporun insan hayatındaki artan önemini tanımlanmıştır ve daha sonra ise spor tesis aktiviteleri doğal yapılar ve ilgi gruplarına göre sınıflandırılmıştır. Bu sınıflandırma, çalışmaların sonraki aşamalarında; hangi tür sporların resmi olduğunu ve dünyada hemen her üniversitedeki öğrencilere ortak olarak sağlandığının saptanmasına yardımcılık olacaktır. Bu ön bilgilerin ışığında ve yabancı ülkelerden ve Türkiye’den seçilen örnek üniversitelerden edinilen bilgiler doğrultusunda spor tesisleri için nüfusa göre gerekli açık alan gereksinimleri ve kapasiteleri belirlenmiştir. Buna ek olarak, dünya üniversitelerarası spor müsabakaları için gerekli mekan standartları verilmiştir. Tüm bu standartlar ve kapasiteler, spor tesislerinin planlamasında gerekli tasarım kriterlerinin saptanmasına ve çalışma alanında uygulanmasına olanak sağlamıştır.

Final projenin tasarım süreci öncesinde yapılan çalışmalar, üniversite kampüslerindeki spor tesislerinin sadece eğlence amaçlı kullanılmadığı, birçok müsabakalar ve değişik kapsamlardaki organizasyonlara sahne olabildiğini göstermiştir. Bu sebeple, final projede amaçlanan; İzmir Yüksek Teknoloji Enstitüsü kampüsünde yer alacak spor tesisleri, daha önce belirtilen standartlara uygun olarak en efektif biçimde nasıl tasarlanması gerektiğiidir.
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Chapter 1

INTRODUCTION

Sports exist at a variety of levels—from child’s play to international, in a multiplicity of forms and may be used by numerous institutions such as educational, commercial, political and etc. for their own purposes, or paid just for fun and personal satisfaction. In such a situation, two questions emerge to assert the aim of the sport: Is sport played principally for its own sake, for immediate satisfaction, or in order to achieve aims external to the sport itself? Second, it should be asked whether sport is encouraged mainly for the benefits it brings to individuals, or because of benefits to society, such as the productive use of excess energy and free time or the success of the group in any kind of competition. However, in general means, sports examine the potential of particular activities for fulfilling such broad aims as; self-realization; cooperation and social competence; community development and maturity. Participation in sport can improve the individual’s health and sense of well-being; promotion of sporting excellence can help to growth of civic and national pride. (Geraint, J.& Campbell, K., 1993, p:3)

In a world where people are becoming more concerned with quality of their life for themselves and future generations, sports have an important contribution in terms of spending their leisure time and concentrating on individual interests. As observed from the change that has been experienced in history, time separated for sporting activities has increased enormously from early 19th century till today in many respects. This is, in a way, the result of the expansion in leisure hours relative to the working hours. But the more important result is the realization of social and economical benefits of sports to communities. The increasing trends in defending the necessity of sports activities both in human life and social phenomenon, brought a sensitive approach to the provision of facility areas to fulfill peoples’ requirements.

Location and organization of facilities are directly related with the type and nature of sports. Today, there are nearly uncountable types of sports activities generated in different periods and different localities. Some types of sports are attributed to special
regions which are not practical for any other locations. These are generally the natural sports which are directly bound to climatic conditions. On the other hand, some sports are traditional for typical countries while they haven’t been recognized on other regions yet. In contrast to these, some groups of sports are accepted as official sports which take place at variety of competitive levels. In order to understand spatial and organizational features of those concerned sport types, there have been made certain classifications according to the characteristics of all sports. These classifications are necessary for the aim of the research, to be able to evaluate sport types in different respects and to understand in which part of those classifications do the competitive sport types take place.

Sports can take many forms, and exist in many different environments with reference to their classifications and spatial requirements. For example; natural sports do not need to take place on specific play areas, while organized sports, which are generally competitive sports, require highly specialized facility areas. Sports can be team based or structured around the individual and facilities may be situated in urban areas, on the fringes of towns, in the countryside or on the coastlines. Each activity and location has its own special characteristics, its own requirements; however, all these are proof of the wide ranging benefits that sports can bring. Within the increasing trends in defending the benefits of sports facilities in human life, the organization and planning approaches gain a serious importance in maximizing the utilization and satisfaction of sports facilities.

Sports facilities are presented to serve in a variety of scales with different locations to serve for communities. Provision of these facilities, including; the capacities, supporting uses, specialties and priorities, change according to their nature; as competitive or recreational and according to the social groups it will serve for. In this research, universities’ campus areas are selected as the major study area and planning of professional sports facilities within those areas is examined. Universities, especially the ones that have the potential for space requirements, hold on a big share in provision of sports facilities in most of the cities. They are also able to give service for large populations, but the most important for young generation. In such a situation, evaluation for sports facilities in university campuses emerged as favorite concept for determining the research topic. The starting point of this research was the world university sports
competitions that require well-organized sports facilities to carry out a professional sports event.

1.1. Aim of the Research:

In this research, the major aim is determining the key concepts for planning, programming and design considerations of sports facilities within the scale of university campuses that will be capable of serving for professional sports competitions. Design of sports facilities in universities is particularly chosen for the topic of this research other than concentrating on a random sports facility. In this respect, world university sports competitions are examined in order to generate an adequate planning guide for design of the facilities. Because these events require a sensitive planning, for the provision of facilities, as well as the other organizational considerations. In many respects, planning of sports facilities for such kind of organizations is different from planning of any recreational sports facility. For the first one, provision of play is to be acquired at professional levels and utilities should be programmed by taking into consideration the excessive demand of probable users and spectators.

Within the research, these considerations would be examined and, final planning and design principles would be determined for the facilities that propose to witness those types of events. Those generated principles would further be applied to the case study area, which has been determined initially; as the campus area of Iztech in İzmir Metropolitan Area. The case study area has an important effect here, in terms of encouraging the selection of the research topic. Furthermore it has several advantages for observing the arguments of the research on a real example. First of all, it is a newly developing site, which means it has flexibility to new planning and design aspects through the provision of any proposed facility. In addition to this, there is an existing need, at present, for provision of necessary sports facilities within the concerned campus area. Secondly, it is located on an excessive land off the city. This gives opportunity to impose the available land for variety of purposes that require spatial expansion. And lastly, today, there are many attempts to attribute the organization of Universiade of 2003 to İzmir Metropolitan Area. This would be an attractive guide to learn more about those competitions, which may be followed in determining the standards for the project.
Under these circumstances, it is observed that Iztech campus best fits the aim of the research topic and proposed project area.

1.2. Methodology:

The concept of the research focuses on the organization of sports facilities in universities, which are presented, for world university sports competitions that brings large numbers of university students together. To put the objectives of such a program, means of sport and their reflections on spatial terms are to be evaluated in all respects, so that, there has been made a general literature survey for the formation of background information related to the concept of sport with its all aspects.

At the beginning of the research, there is an introduction part which tries to make the interested people become familiar with the research topic. The second chapter gives the related theoretical definitions. As sport can be thought as a means of leisure activity, general meaning of leisure, its dynamic structure within the close history and the place of sport within leisure time is explained in this part. Additionally, the sporting activity is discussed as to how it is a social, recreational and competitive action at the same time, and classifications about sports types are examined. This would give a general understanding for which types of sports are accepted as official and suitable for university athletes.

In order to examine, how sports facilities in campus areas that will also allow for professional and competitive events, will be programmed and designed in terms of spatial considerations, there should be made a wide spherical evaluation about the characteristics of modern sports and related competitions throughout the world universities. So that, in Chapter 3, necessity of sports facilities in campus areas is told and sample campus universities are evaluated with respect to their sporting opportunities. Moreover, recent organizations about university sports competitions and the related foundation, FISU, with its organizations, are described in this part. The major method for collecting the data about sample universities and university sport competitions was the Internet survey.
In Chapters 4 and 5, major planning principles and design guidelines are generated respectively. Spatial and organizational requirements are identified to attain effective functioning of proposed sports events. While doing this, official standards for spatial organizations and other supporting social requirements have been taken into consideration. Requirements are determined according to the probable level of demand that may be witnessed in such any kind of sport event. Specifications that are made on these two parts are tried to be sensitive because they were directly to affect the case study.

Chapter 6 consists of the case study that is to be held on İztech campus area in İzmir. In the process of case study; a general field survey is done for the related site within the campus, including all the natural and environmental features. In addition, detailed information related to the whole campus area and the recent planning studies for the sports facilities, held by foreign planners and architects, is collected to be a guideline for the final. Finally, a new project is developed for the campus area with respect to final future demand and intensity of use. Within the project two major problems are experienced. First one was the determination of types of facilities and the amount of area needed. This problem is solved by contrasting the facilities and their capacities of sample universities that are expressed in chapter 3. And the second problem was the process of true physical design. This is solved similarly following the planning and design principles, which are generated in previous chapters, and converting them to the application rules for the project.

In the last chapter, which is the conclusion part of the whole research, a general evaluation is made about the process of planning programming and design considerations of facilities that will take place on a campus area in order to serve for an extensive use of universities’ populations.
Chapter 2
THEORETICAL DEFINITIONS AND EXPLANATIONS

2.1. Concept of Leisure

‘In general terms, leisure is the time left over after: sleep, necessary personal chores and work. It is especially the time available for doing as an individual likes, within the range of his interests and abilities.’(Clawson, M. & Knetsch, J.) Leisure is a broad concept including variety of activities that take place all the time beyond the existence. Those activities may occur both indoors and outdoors and take many forms as to being active or passive. Leisure is understood generally as the same with recreation, but they are totally different in fact. ‘Leisure is a time of many kinds while recreation is one of the major activity chosen for such available time.’(Fisher, D., 1974, p:18)

The interest, chosen among the leisure kinds, directly changes according to the work and routine duties of the individual. Because, the distinction between work and fun is narrow for some part of the population, while being wide for others. Some people attempt to participate in a physical activity they wish at times and places other than work, but others find their work physically tiring and spare their leisure time for rest. It is within the limits of choice that the individual tries to balance hours of work and hours of leisure.

Leisure should be considered as to when it takes place and how large pieces it has in daily life of individuals. It is a relative process that may be one of the major time consuming activity for some people, while it may hardly take place in other’s daily life. The time separated for leisure can be grouped in three categories:

• Some leisure is daily for the individuals whatever their fields of work are. People generate time for leisure during the lunch break, in late afternoon or after work.
• Other leisure is weekly in its pattern. For most of the students and workers, it is the days out of school or off work, generally Saturdays and Sundays. On these days, the activities are undertaken that are impossible on workdays.
• Other than these, leisure is also for vacation time. For students, this may extend through the whole summer. For workers, it is likely to be a few weeks. But obviously, many kinds of activities are possible in such time periods that were out of the question in shorter free periods.

All these three forms of leisure types take place in some amount within peoples’ lives, however the amounts are bound to other factors such as social structure, occupation, age, gender and so on. But, in fact, the most important, the type of the interest for a leisure time is bound to another critical factor as well as the available time and above factors, that is the economical situation. Income of an individual directly affects the use of leisure time. Everyone is objected to select their interest to deal with in their vacant time, according to the limits of their discretionary income. In this case, some of the people, for example, go abroad in weekly leisure time or in vacation time, while some of the people are used to stay at home in these available times because of incapable amount of their income. However, many types of outdoor recreational activities for leisure can be chosen which will not affect the budgets of people. Especially, urban areas serve many opportunities such as activity parks, sportive and cultural facilities, open green areas, clubhouses and many social interaction places for people that are to be used effectively in relation to individuals’ interests. People have the chance to choose the place and time for having leisure in order to achieve physical and emotional maturity. Therefore, provision of outdoor activities for people living in urban areas requires a sensitive recreation planning and policy making.

2.1.1. Planning and Policy Implications In Terms of Dynamic Structure of Leisure Time

Leisure is the time for choosing the activities other than the necessary actions for subsistence like sleeping, eating, working and resting. In fact, time remaining for leisure after these routine needs change according to individual’s physical and mental capabilities; working hours and conditions and economical affordability. The timing and the size of leisure amount also differ for every individual in terms of age, and social life. People try to create spare time for such kinds of activities according to all above factors in order to relax, have fun or motivate themselves.
In general, it can obviously be expressed that time separated for leisure activities have changed considerably since the beginning of industrialization till today. Technological developments contributed to the generation of scientific societies rather than labor-force societies, because they made work easier than it was for people. With reference to the characteristics of technological changes, work hours have diminished relatively and people has obtained the chance to separate much more available time for their personal interests and needs. Following table shows the use of time in three different periods for the last century for the example of United States. As, technological changes have been experienced to some part in majority of the countries, it may be generalized that leisure time has considerably increased all over the world especially through the last century.

<table>
<thead>
<tr>
<th>USE OF TIME</th>
<th>1900</th>
<th>1950</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total time for entire population</td>
<td>667</td>
<td>1329</td>
<td>2907</td>
</tr>
<tr>
<td>Sleep</td>
<td>256</td>
<td>514</td>
<td>1131</td>
</tr>
<tr>
<td>Work</td>
<td>86</td>
<td>132</td>
<td>206</td>
</tr>
<tr>
<td>School</td>
<td>11</td>
<td>32</td>
<td>90</td>
</tr>
<tr>
<td>Housekeeping</td>
<td>61</td>
<td>68</td>
<td>93</td>
</tr>
<tr>
<td>Preschool population, nonsleeping hours</td>
<td>30</td>
<td>56</td>
<td>110</td>
</tr>
<tr>
<td>Personal care</td>
<td>61</td>
<td>68</td>
<td>93</td>
</tr>
<tr>
<td>Remaining hours, largely leisure</td>
<td>177</td>
<td>453</td>
<td>1113</td>
</tr>
<tr>
<td>Daily leisure hours</td>
<td>72</td>
<td>189</td>
<td>375</td>
</tr>
<tr>
<td>Week-end leisure hours</td>
<td>50</td>
<td>179</td>
<td>483</td>
</tr>
<tr>
<td>Vacation</td>
<td>17</td>
<td>35</td>
<td>182</td>
</tr>
<tr>
<td>Retired</td>
<td>6</td>
<td>24</td>
<td>56</td>
</tr>
<tr>
<td>Other, including unaccounted</td>
<td>32</td>
<td>26</td>
<td>16</td>
</tr>
</tbody>
</table>

Table 2.1: National time budget and time division of leisure for United States

Changes in time separated for employment and leisure must also be considered in a larger framework of general social change. Further from the technological changes, educational standards also tend to rise and occupational structure is likely to change day by day. People are more conscious about the need to create available time for physical and mental health. As seen from the values, total leisure was about 27 percent of the total national income in 1900’s and 34 percent in 1950’s but it is nearly 40 percent of the total time budget in by the year 2000.

In this situation, leisure planning is expected to be a necessary experience in urban planning issues. Because a considerable percent of time in time budget of an individual
is separated for leisure activities which requires available and accessible facilities to utilize from. Especially urban cities, in which demand for such activities are relatively higher, should serve great freedom to individuals and social groups to choose alternatives among various types of activities. There has been a great rise in outdoor recreation and sports in recent years. In relation to increasing interests of people, proper recreation planning must be concerned not only with the amount but also with the kinds of open space and facilities that are needed particularly. ‘Activities and outdoor recreation facilities are related with the degree to which the technological requirements of activities can be met by the characteristics of the facilities. Two steps, then, need to be considered: first to investigate the nature of the elements of the system which are different population groups, outdoor recreation activities and the facilities for the concerned activities; then to explore the interactions among them to achieve maximum utilization.’ (Fisher, D., 1974, p: 18)

2.1.2. Place of Sport within Leisure Time

There are many kinds of activities having a wide range from the most energetic activities to resting that take place in available leisure time. Within this scheme, sport is one of the most famous activities, which individuals deal with in their leisure times. Millions of people are interested in sports passively as spectators in their favorite sports, so they go to facility areas to watch the matches and competitions or they follow those activities from televisions. Spectator activities are very common leisure types nearly in most of the societies.

From another point of view, sport is a participant activity and has great contributions to physical and mental health of the individuals that they seek to obtain in their available time remaining after work or other compulsory duties. ‘Participating in sports is much more attractive for a great percentage of people when contrasted with other leisure types, because it gives opportunity to maintain and improve health and find companionship.’ (John, G. &Campbell, K., 1993, v: 2, p: 3) In contrast to other leisure types, participating in sports offers much more advantages rather than being a way of spending spare times. It provides a context of discipline, self-awareness, and self-satisfaction to people and presents the experience of working with and for others and achieving the proposed goals. ‘Sport is intensely preferred as a major leisure type as to
its contributions to achieving personal maturity. It also removes the stress of work and pressures of daily life by opening a path to relaxation.’ (John, G. & Campbell, K., 1993, p: 3)

People’s satisfaction from leisure times may only be increased with the provision of demanded facilities within the cities. As sports hold one of the biggest shares in various leisure types in terms of participation, efficient utilization from sport facilities emerges as a significant factor in recreation planning. For provision of sports facilities, the main criterion that is to be considered is the demands of different age and interest groups to wide ranging types of sports. In societies, adults for example, are the most crowded population group that separates a great amount of time for sport activities when they are contrasted with other age groups. They are advantageous in terms of physical abilities and time availability. Moreover, they have the opportunity to utilize from the facilities of educational establishments they attend to as well as local public facilities, so they are able to deal with sports in accordance with their education. With reference to above attractions, the topic of the research is determined as the planning and programming of sport activities in universities that will serve for the potential population group, which are adults.

2.2. Concept of Sport

There have been many definitions made for sport. In most general terms, sport, is the physical body movements that can be done individually or collectively and generally gives reason to inter-competitions under the definite regulations and conditions. ‘It is a discipline that educators offer for the development of individual’s personality and the features of the characteristics and is a method that is used by the managers to form the energy and catalyze the spirit of struggling.’

‘Sport is a technical and physical effort to win, from the point of view of the participant at the first glance. Secondly, it is an esthetical process based on the thought of competing from the point of view of spectators and finally, a mirror that sometimes reflects the conflicts and features of the society or a tool that sometimes direct the society itself.’ (Erdoğan, M., 1986, p: 5)
Sports exist at a variety of levels—from child’s play to international, in a multiplicity of forms and may be used by numerous institutions such as educational, commercial, political and etc. for their own purposes, or played just for fun and personal satisfaction. In such a situation, two questions emerge to assert the aim of the sport: Is sport played principally for its own sake, for immediate satisfaction, or in order to achieve aims external to the sport itself? Second, it should be asked whether sport is encouraged mainly for the benefits it brings to individuals, or because of benefits to society, such as the productive use of excess energy and free time or the success of the group in any kind of competition. However, in general means, sports examine the potential of particular activities for fulfilling such broad aims as; self-realisation; cooperation and social competence; community development and maturity. (Haywood, L., 1994, p: 118)

2.2.1. Sport as an Individual and Social Activity

Sport offers the opportunity to millions of people from different ages, to maintain and improve their health and find companionship. Further from its physical contributions, it provides the condition for encouraging the relationship between individuals. So, a community approach to sports activities requires sensitivity to issues that are significant in the wider context of sports and also a matter of social concern more generally. Because sports should not be merely thought only as an individual action, but as a collective action as well in terms of gathering people in either a recreative or competitive scene. Sports are basically divided into two as to being individual sports and team sports. Interaction seems to be more intensive, especially, in team sports because of the nature of play; however, individual sports also require the deal between the opponents. Within this scheme, sport should inevitably be characterized as a social action in wider sense.

Moreover, sports include many other social factors with respect to interested groups. First of all, sports may be criticised according to their structure and nature of play that directly affect the gender of dealers. Some sports are available to only men or only women in terms of the required skills for play and participation, while some of them are potentially available to either sex. The important point is to provide equal opportunities and access for playing of each sex. Sports should be a positive action of social life both for men and women.
As a further issue, racial and ethnic differences are also significant features of social structures that may come into picture in sporting life. Sport is a common social activity for all of the people and may take different positions according to the aim of the interest. It is sometimes a recreational activity for individuals, and sometimes a profession to compete with others. Especially, competitive sports at national or international levels collect many people from different cultural or racial groups and give reason to them, to express their abilities within the same scene. There emerges a broad social interaction during the games, which allows a cultural inter-flow between the interested groups. In this case, sport is to be marked independent from racial differentiation because it is based on ability rather than colour or ethnicity. It should be of concern to the providers of sports facilities that are responsible to present an environment for interaction of multicultural groups, to attempt to present equal opportunity and avoid any separation according to social status or cultural diversity.

2.2.2. Sport as a Recreational Activity

Recreation is a planned activity that refers to the human emotional and inspirational experience arising from the act of recreating. It contracts with work and the mechanics of life, because it is a desired activity rather than being a compulsory action. Recreation has a close relation with leisure but it is different from it in terms of including a conscious activity. Recreation may be defined practically as the active use of available leisure time. Recreation may be carried on both indoors and outdoors. Additionally, there are some borderline activities that may take place either indoors or outdoors. Sports activities are the most common recreative activities that may take place both indoor and outdoors. (Clawson, M.&Knetsch, J., 1966, p:6)

Further from the division made according to where it is carried on, recreation may be separated also into two whether it is organised or informal. Sports activities are the best examples of organised recreation while activities like fishing; picnic and etc. are some popular examples of informal recreation. There is variety of recreative activities ranging from relaxing or energetic ones as sports to cultural or intellectual ones as going to theatre or concerts. The choice for the type of the recreation is bound to many factors such as physical abilities, economical conditions and available time. An individual is
able to make a choice of his favorite recreational activity from which he gets the most physical and emotional satisfaction, according to above dynamic factors.

'Beyond those various activities, participating and spectating at sports are one of the most popular recreative activities in towns and cities. Expansion of demand to sports, in fact, goes back to late 19th century, which experienced redevelopment of urban places in order to renovate inner cities. Within this process, many recreational areas and sports fields are inserted in urban cores as the substitutes for old uses.' (Williams, S., 1995, p: 184) This attempt contributed the development of an alternative recreative activity for all the people and especially for the young generation. Especially modern sports have gained a considerable importance with respect to traditional sports. Following the attempts experienced in previous decades, cities and towns became ideal venues for many sporting activities. There have been significant developments and planning approaches of sports providers in meeting the diverse demands that are created by sporting participation in urban areas. Similarly, sports facilities in educational institutions, both in public schools and universities, gained a peculiar position to contribute the satisfaction of adults both physically and mentally; and also fulfillment of their leisure time with participating in their favorite games. Adults are the major interested ones that contributed to the expansion of sporting events, especially participation in sports activities. This is mostly because of their physical abilities and the opportunities they have in terms of time and available facilities. The following table interprets the level of dealing with sports with respect to other types of recreative events among adults in Britain in 1990.

<table>
<thead>
<tr>
<th>Type of the activity</th>
<th>Percentage participating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visiting parks and open public spaces</td>
<td>72</td>
</tr>
<tr>
<td>Visiting pubs and working clubs</td>
<td>58</td>
</tr>
<tr>
<td>Swimming</td>
<td>35</td>
</tr>
<tr>
<td>Visiting cinemas</td>
<td>26</td>
</tr>
<tr>
<td>Participating in sports</td>
<td>26</td>
</tr>
<tr>
<td>Visiting theatres</td>
<td>21</td>
</tr>
<tr>
<td>Visiting discos, clubs, etc.</td>
<td>12</td>
</tr>
<tr>
<td>Jogging</td>
<td>9</td>
</tr>
</tbody>
</table>

Table 2.2: Major recreational activities amongst adults  
Source: Williams, S., 1995, p: 12
The case is nearly the same for all countries. There is a great deal of concern for sports, both for spectating and participating, all over the world. Not only people deal with sports in their leisure times, they also create additional spare time for getting their personal satisfaction. It is obvious that, sporting events, today, are one of the most common social and recreational practices for all countries.

2.2.3. Sport as a Competitive Discipline

There is a common definitional problem of what actually constitutes sport. Sport may be considered as a subset of recreation that an individual consciously chooses for his own sake, however, it inevitably needs to be recognised as the expression of physical effort and acquired skills in a competitive environment. Because: ‘Sports are inherently competitive in the sense that they all imply a challenge that refers to winning and losing of participants.’ (Haywood, L., 1994, p:118) ‘It will be too slack to accept sport as being no more than a recreational activity in terms of its nature within a conventional, rule-bound context.’ (Williams, S., 1995, p:185) Sports may be thought in two terms as pure traditional sports for recreative purposes and modern sports for competitive purposes as well. Pure traditional sports tend to have a valuable place in previous centuries; however, modern sports have gained a stable place all over the world from the last decades of 19th century.

Expansion of modern sports brought many experiences with itself in addition to professional dealers. Further from temporary contests between sporting individuals or groups, various leagues, tables, matches emerged both at national and international levels in time. Both growth of participation and spectatorship has led providers to present more qualitative and completely official sports facilities. It also led people to promote issues not directly related to the activities. ‘Growth of the newspapers, television and broadcasting industry parallel to the institutionalization of sport gave way to the formation of a strong relation between the media and sport and the development of spectatorial side of sports.’ (Haywood, L., 1994, p:118)

Sport is an interest for all. Today, almost all of the people are interested in sports either as a participant or spectator. Millions of people take part in sport or physical recreation and millions more watch or follow sport events. As sport has a dynamic competitive
nature, sporting successes whether it is national or local, bring pleasure and pride to all of them.

'It is inevitably to be recognized that sporting events bring many benefits as well as its value to national prestige. It is not only matters of national pride through international events, but also, people go out and play for their local side. Every town, every city, every school, draws some part of its spirit and identity from the performance of its sporting teams.' (John, G.&Campbell, K., 1993, p:2) As to be understood, sportive events may take place at a wide range of level, from the contests between public schools or universities’ teams to international matches between different nations. This lends to evaluation of sport, as a profession other than as a recreational activity.

2.3. Need for Provision of Sports Facilities

As sport has been socially accepted as a major recreative activity and institutionalized at various levels with its competitive nature, significance of provision of indoor and outdoor sporting environs has increased and still increasing respectively. Various types of urban multi-purpose sports and leisure centers are developed in cities, towns and suburbs. The same impression effected the provision of such kind of facilities in public schools and universities. Today, there are many organisations and institutions in the world countries, either cooperating with central and local governments or working as voluntary independent bodies that deal with provision of sports facilities in urban areas. Within the emerging concept of sports and recreational planning, these institutions generated the basic rules and policies for provision of recreative and sports facilities.

Those planning policies are significant in terms of achieving the required conditions and quality in provision of activity places. Sports and physical recreation agencies should examine the potential of particular activities for fulfilling such broad aims as self-realization, co-operation and social competence as well as community development. ‘Activities should also go in accordance with the community ideal so that providers should seek to facilitate sports that permit open access, maximum levels of participation, full of enjoyment, emphasis on sociability and sensitivity to diverse abilities and needs, to be achieved.’ (Jensen, C., 1995, p:78) The planned facilities should meet the certain necessary conditions for the welfare of both participants and
spectators. 'The quality of both built environment and outdoor environment, the space it affords, its design, layout, interest, cleanless and safety, its capacity to excite or relax, to provide a pleasurable playing condition and such kind of factors will have an impact upon the quality of sporting experience, simply because most forms of sport activities are dependent upon the interaction between individuals or groups and the considered environment.' (Williams, S., 1995, p: 184)

Moreover, institutions for sports planning generate strategies for activating people to participate in sports and increase the use of sports facilities effectively. One of the major institutions, Sports Council, has developed significant strategies from 1988 till 1998, which are, in summary:

- To advocate the principle of 'sports for all',
- To increase participation of young and women,
- To emphasize education and training as a means of introducing people to sports,
- To improve coordination between educational institutions and sport,
- To encourage the development of dual-use provision, especially at schools and higher education units,
- To improve the qualities of existing indoor and outdoor sports facilities,
- To provide highly qualified facilities. (Williams, S., 1995, p: 207)

Planning and design of adequate sports facilities with reference to above principles and strategies, give opportunity communities to widely utilize from facilities, to find convenient places to express their abilities and skills, and achieve the maturity for their personal, emotional and social satisfaction. Because of these features it emerged as a subgroup of urban planning and design issues. Today, sports facilities are one of the common land use types in urban areas, which have their own design aspects in general urban design terminology.

2.4. Classification of Sports Activities

A number of systems have been developed in order to classify such separate factors as the skill, and the nature of competition and the interaction in sports. A comprehensive model is generated for the nature of sport, which examines three major dimensions;
a. The characteristics of the basic challenge present in any given sport:

The challenge takes two forms that are environmental and inter-personal. Environmental challenge sports are the games played with gravity or friction, and may be subdivided into two as natural (water, snow sports) and artificial (trampolines, vaulting horses). Those sports can be described as purposive or aesthetic. (See Figure 2.1) These terms differentiate according to whether the outcome is central or not. Many natural environmental sports can easily be converted to inter-personal competitions, such as ski-racing and speed climbing, and also most artificial sports can be competitive, such as gymnastics and athletics. (Haywood, L., 1994, p:118)

Inter-personal challenge sports, on the other hand, are competitive, and the outcome is the goal which all action is focused. Winning, losing and drawing are the typical features of these sports. In these sports, the outcome is not central, on the contrary, these sports can be played for fun or can be seen as the tests of individual or collective powers. In other words, inter-personal sports are the comparison of skills and abilities. They can be examined in two groups as combat and contest sports. (See Figure 2.2)
Combat sports are forms of fighting in which the objective is to strike or immobilize the opponent. Rules and equipment are basic and minimal, and these sports are exclusively individual. Contest sports, on the other hand may be individual or group activities and are much more complex than combat sports in terms of the equipment used like balls, bats, shuttlecocks. Furthermore, targets are diverse such as goals, boundaries, baskets and etc., and rules are also numerous and complex. Contest games are also subdivided into five groups according to the spatial relationships between individuals or teams together with the nature of play. Such kind of a division in contest sports is especially necessary to examine the required playing conditions and spatial organisations of related sports:

1- Aiming games; have shared territory and common targets such as golf and archery,
2- Net games; have own territory to defend and opponent’s territory to target such as volleyball and tennis,
3- Rebound / obstruction games; have shared and disputed territory and common targets such as squash, snooker and bowls
4- Batting games; have alternative uses of common territory and targets requiring different attacking and defensive skills such as cricket, rounder and baseball
5- Invasion games; have shared and disputed territory and separate targets such as football and basketball. (Haywood, L., 1994, p:120)

b- The conditions imposed upon that challenge;

The conditions imposed upon the environmental and interpersonal challenges have three main dimensions which are equipment, regulations and suitable land.' (Haywood, L., 1994, p:120) All sports have different regulations telling how the play, and most of them also need specific equipment needed for the nature of the game. Further from these conditions, each sport type has its own spatial requirements. Some sports need natural lands or extreme locations such as rocky hills as it is the case for climbing, while some sports seek for organised fields or courts including game territories and the related equipment such as; football fields, running tracks, tennis courts and all other field games.

c- The response resulting from the interaction of (a) and (b);
The nature of the response is directly related with the perception and the resulting behaviour of individuals or teams while playing. These are the skills and strategies generated from the rules and spatial regulations of sport types. These classifications of forms of sports are potentially important in determining the key concepts for the provision of sports facilities. Because sport is not a single and unique phenomenon, but it is numerous and diverse, and provide a range of different experiences, choices and opportunities, so that its spatial requirements and organisation considerations drives complex principles.

Further from the above theoretical separation of nature of sports, the International Olympiad Committee has generated the last and the current classification of sports in terms of their functions. It gives a further definition about how sports can be collected as to their nature, aims and targets and also as to whether they are held by teams or individuals. Within this approach, sports are separated into 9 major groups as follows;

1- Athletics
   a- Open field athletics (running and field games)
   b- Saloon athletics
2- Gymnastics
   a- Men’s gymnastics
   b- Women’s gymnastics
3- Defence sports
   a- Striking sports
   b- Target sports
4- Horsemanship sports
5- Water sports
6- Winter sports
7- Tourism sports
8- Team sports
9- Combined sports

Different from above separations, a more specific separation can be made whether the sport is played indoors or outdoors. (See Table 2.3) While doing this, sports may be listed with reference to the classification of the Olympiad Committee and separated as
to where they are played. Such a separation may be confusing because some types of sports are held both indoors or outdoors. However, it is useful to consider in terms of determining the required space allocations when it is needed to organize and plan a complex of sports facilities on a considered space.

<table>
<thead>
<tr>
<th>SPORT TYPES</th>
<th>SPORTS</th>
<th>Indoors</th>
<th>Outdoors</th>
<th>The facility/area needed</th>
<th>Status of the sport</th>
</tr>
</thead>
<tbody>
<tr>
<td>WATER SPORTS</td>
<td>Sailing</td>
<td></td>
<td>x</td>
<td>Suitable waterfront</td>
<td>Local</td>
</tr>
<tr>
<td></td>
<td>Rowing</td>
<td></td>
<td>x</td>
<td>River or lake</td>
<td>Local</td>
</tr>
<tr>
<td></td>
<td>Canoeing</td>
<td></td>
<td>x</td>
<td>Natural or artificial river</td>
<td>Local</td>
</tr>
<tr>
<td></td>
<td>Water skiing</td>
<td></td>
<td>x</td>
<td>Waterfront</td>
<td>Local</td>
</tr>
<tr>
<td></td>
<td>Water craft</td>
<td></td>
<td>x</td>
<td>River</td>
<td>Local</td>
</tr>
<tr>
<td></td>
<td>Swimming</td>
<td>x</td>
<td>x</td>
<td>Indoor/outdoor pool</td>
<td>Official</td>
</tr>
<tr>
<td></td>
<td>Water polo</td>
<td>x</td>
<td>x</td>
<td>Indoor/outdoor pool</td>
<td>Official</td>
</tr>
<tr>
<td></td>
<td>Synchronized swimming</td>
<td>x</td>
<td>x</td>
<td>Indoor/outdoor pool</td>
<td>Official</td>
</tr>
<tr>
<td></td>
<td>Football</td>
<td></td>
<td>x</td>
<td>Stadium or football field</td>
<td>Official</td>
</tr>
<tr>
<td></td>
<td>Baseball</td>
<td></td>
<td>x</td>
<td>Baseball diamond</td>
<td>Local</td>
</tr>
<tr>
<td></td>
<td>Softball</td>
<td></td>
<td>x</td>
<td>Baseball diamond</td>
<td>Local</td>
</tr>
<tr>
<td></td>
<td>Volleyball</td>
<td></td>
<td>x</td>
<td>Indoor hall or open volleyball field</td>
<td>Official</td>
</tr>
<tr>
<td></td>
<td>American football</td>
<td></td>
<td>x</td>
<td>Outdoor arena</td>
<td>Traditional</td>
</tr>
<tr>
<td></td>
<td>Basketball</td>
<td>x</td>
<td>x</td>
<td>Indoor hall or open basketball field</td>
<td>Official</td>
</tr>
<tr>
<td></td>
<td>Cricket</td>
<td>x</td>
<td>x</td>
<td>Indoor hall or grass cricket field</td>
<td>Local</td>
</tr>
<tr>
<td></td>
<td>Handball</td>
<td>x</td>
<td>x</td>
<td>Indoor hall or open handball field</td>
<td>Official</td>
</tr>
<tr>
<td></td>
<td>Hockey</td>
<td></td>
<td>x</td>
<td>Turf hockey pitch</td>
<td>Official</td>
</tr>
<tr>
<td></td>
<td>Netball</td>
<td></td>
<td>x</td>
<td>Indoor hall or open smooth netball field</td>
<td>Local</td>
</tr>
<tr>
<td></td>
<td>Five-a-side football</td>
<td>x</td>
<td>x</td>
<td>Indoor hall or grass pitch</td>
<td>Local</td>
</tr>
<tr>
<td>Individual Sports</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------</td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lacrosse</td>
<td>x</td>
<td>Grass field</td>
<td>Local</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shinty</td>
<td>x</td>
<td>Grass field</td>
<td>Traditional</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lawn bowls</td>
<td>x</td>
<td>Grass field</td>
<td>Traditional</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Korfball</td>
<td>x</td>
<td>Grass korfball field</td>
<td>Local</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rounders</td>
<td>x</td>
<td>Grass rounder field</td>
<td>Traditional</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Camogie</td>
<td>x</td>
<td>Grass field</td>
<td>Traditional</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hurling</td>
<td>x</td>
<td>Grass field</td>
<td>Traditional</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stoolball</td>
<td>x</td>
<td>Turf stoolball pitch</td>
<td>Traditional</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tchouk-ball</td>
<td>x</td>
<td>Indoor hall or grass field</td>
<td>Local</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tug-of-war</td>
<td>x</td>
<td>Grass pitch or indoor hall</td>
<td>Traditional</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field athletics</td>
<td>x</td>
<td>Track and field</td>
<td>Official</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saloon athletics</td>
<td>x</td>
<td>Athletics sports hall</td>
<td>Official</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gymnastics</td>
<td>x</td>
<td>Gymnasium</td>
<td>Official</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rythmic gymnastics</td>
<td>x</td>
<td>Gymnasium</td>
<td>Official</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tennis</td>
<td>x</td>
<td>Tennis court</td>
<td>Official</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Squash</td>
<td>x</td>
<td>Indoor squash court</td>
<td>Local</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lawn tennis</td>
<td>x</td>
<td>Lawn tennis court</td>
<td>Local</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Table tennis</td>
<td>x</td>
<td>Indoor hall</td>
<td>Official</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trampolining</td>
<td>x</td>
<td>Indoor hall</td>
<td>Local</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Archery</td>
<td>x</td>
<td>Grass or indoor wooded parcures</td>
<td>Official</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Croquet</td>
<td>x</td>
<td>Indoor croquet court or grass croquet court</td>
<td>Local</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight lifting</td>
<td>x</td>
<td>Indoor hall</td>
<td>Official</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Badminton</td>
<td>x</td>
<td>Indoor hall</td>
<td>Local</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roller hockey</td>
<td>x</td>
<td>Open smooth rink</td>
<td>Local</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roller skating</td>
<td>x</td>
<td>Open smooth field</td>
<td>Local</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Golf</td>
<td>x</td>
<td>Grass golf course</td>
<td>Local</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Artificial skii</td>
<td>x</td>
<td>Grass parcures</td>
<td>Local</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bicycle polo</td>
<td>x</td>
<td>Indoor hall or grass field</td>
<td>Local</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cycle speedway</td>
<td>x</td>
<td>Smooth outdoor paths</td>
<td>Local</td>
<td></td>
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<tr>
<td>Cycle racing</td>
<td>x</td>
<td>Velodrome or smooth outdoor rink</td>
<td>Local</td>
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<tr>
<td>Sports</td>
<td>Space</td>
<td>Status</td>
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<td>Fencing</td>
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<td>Official</td>
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<tr>
<td>Aikido</td>
<td>Indoor hall</td>
<td>Traditional</td>
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<tr>
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<td>Judo</td>
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<td>Grass field</td>
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<td>Grass or sand parcures</td>
<td>Official</td>
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<tr>
<td>Sports that require suitable weather conditions</td>
<td>Necessary equipment for required natural conditions</td>
<td>Mostly official</td>
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<tr>
<td>Parachuting</td>
<td>Necessary equipment on air</td>
<td>Partially official</td>
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<td>Gliding</td>
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<td>Parascending</td>
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</table>

Table 2.3: Classification of sports according to their space requirements and status

A general consensus can be obtained, about which sport types need which sports facilities, from the above chart. All of the sports, which are listed, also evaluated according to their status. Because some sports are known only within the original place they are founded such as korfball; a game of Dutch origin and kendo; a defence game of far-east origin, so these sports may be attributed to traditional sports. Similarly, some type of sports are played in specific regions, however, they are known in other regions but not played practically. These types of sports are accepted as local sports; such as American football and badminton. Traditional sports and local sports may be competitive in the places they are commonly played such as local leagues but they are hard to take place in international competitions. Different from these groups of sports, rest of the sports in the list is accepted as official. Because official sports are practically played nearly in most of the countries. They competitively take place in national or international organisations, so necessary facilities for those types of sports always have priority in attempts for provision of sports facilities in urban areas.

Official sports are the most common interests in many cultures. Sports facilities serving for those sports are widely seen most of the cities of different countries. They are one of the major land uses in urban areas such as stadia, running tracks, field houses, indoor sport halls, outdoor or indoor swimming pools and open tennis, basketball and volleyball courts.
Aim of the research concentrates on the provision of sports facilities in universities. In order to determine the necessary sports facilities in universities, status of different sport types should be understood. Universities may have different facilities according to favorite sports in their nations; however, facilities for official sports are generally included in the majority of world universities.
Chapter 3

SPORT FACILITIES IN UNIVERSITY CAMPUS AREAS

Higher education is accommodated in universities where young generation with different backgrounds, abilities and interests, live close to each other. The higher education in any country is an important factor, which contributes to the development of that country. Universities are the institutions that help students get mature professionally, socially and psychologically. Within these circumstances, quality of universities is a critical concept that is to be considered initially.

Universities are not only the educational associations, but also social and cultural units that encourage the students to interact with the others and give opportunity to deal with social and recreational activities as well as educational the facilities within the campuses. It includes variety of functional indoor and outdoor spaces that serve for students in different aspects. In this situation, the efficiency of a university should not be merely the physical setting in which formal activities of the university takes place. Both physical planning and structural organization should be included in emerging universities to increase the quality of education.

As universities have a big potential of students, there should be a great deal of both formal and informal interaction, meetings, entertainment and sportive activities to give a fully competent education to students, and to increase the quality of student life within a campus circle. A university campus generally has variety of facilities most of which have a close relationship between each other. These are educational facilities such as; faculties, libraries and laboratories, social facilities such as; gathering places and catering places, cultural facilities and other recreational facilities, which are physical education units and sports facilities. All of these functions should be successfully organized, planned and spatially designed in order to provide an effective utilization of students, academic stuff and other users.

University campuses are able to be thought as small-scale cities where students do their compulsory education, spend their spare time according to their interests, interact with
others, utilize form the accommodation units and so on. 'Organization of a campus area merely is not different from the general means of town planning. Actually, campus design is urban design, and urban design is the design and management of the public realm of public spaces more than the private realm of individual buildings. Precise control of public space allows for flexibility and change in individual buildings, and it should therefore be the principal instrument of physical university planning.'
(http://www.library.cmu.edu/Libraries/Arch/ACampusRenewed/index.html, 16.8.1999)

3.1. Functional Structure and Responsibilities of Universities

A campus should provide all the requirements of the users including the students, academic and the personal stuff and the other public dealers. These requirements are to be provided in order to achieve the well being of mostly the students both in mental and physical terms. Basic requirements expected from the physical structure of a campus area may be classified in five groups:

1. Behavioral needs: A campus is in a way a living environment so that it should meet all the necessary physical and social conditions for human life in order to act as a real environment. Therefore, a campus environment is to be modified to students’ behavioral needs, effectively with planning and design considerations.

2. Physiological, sociological and psychological needs: A campus should also meet the mental comfort of the students. Physiological needs refer to the basic human needs that take place in dormitories, social facilities, catering places and other supporting facilities of campus. Sociological needs refer to all social interactions that might take place in public spaces of a campus. Similarly, psychological needs are interacting necessity of people with each other in common places. So that, the organization of all functional units in a campus area including both indoor and outdoor spaces should encourage the students to live in such a social environment with effective interaction and utilization.

3. Needs for education and research activities: The most important need of the students is inevitably the presence of well-defined educational facilities. A campus should include educational buildings, laboratories and library for the social and scientific improvement of the students.

4. Needs for health, recreation and catering services: These services are the other supplementary facilities that take place in addition to educational facilities in
campuses. Health services are needed for the medical care of students and the academic staff. Recreational facilities refer to all open spaces, cafeterias, multipurpose halls and cultural activities. Catering services are also necessary for students which should serve for the whole day considering the ones stay in dormitories of the campus.

5. Needs for sport activities: Sport activities are necessary for the health and well being of both students and academic staff in addition to their compulsory and routine works. General layout of a campus should include effectively designed sports facilities allowing variety of sports types that will serve for students in their spare times.

All above terms are the necessary facilities that should be considered in functional and organizational planning of a university campus. Those facilities should be provided according to the expected enrollment and the spatial availability of the institution. Universities solve the problem of providing expected services in different conditions as to their location and physical structure. Therefore, in any case, a university space design is a critical concept, which should be evaluated in all respects.

3.2 Spatial Structure of Universities

Universities can be classified into two groups according to their location and physical structure as city universities and campus universities. (Benli, A., 1998, p: 2) Both of them have advantages and disadvantages in terms of their physical settings of functional units.

City Universities: are located in cities' developed sites. A city university can be clustered in the same area or scattered throughout the city. These universities are advantageous in terms of having close relations with the routine city functions, however, they are hard to expand their capacities of existing facilities or add new facilities, as to their limited land availability. Sometimes they may lack of some additional facilities and are subjected to use the opportunities of the city itself because of the same reason. A university that distributed its functional units among the city, also experiences the problem of loose relationships between its units. They are generally solved with partial plans in their nearby environment. Social and recreational services
and, the most importantly; dormitories are located far from educational units. This situation, in a sense, creates problem for students to utilize from university functions whenever they want.

**Campus Universities**: may generally be accepted as off-city universities. Mostly, university campuses need a continuous available land for intended facilities; however, they are able to expand within the limits of their locations. Campus universities are especially located at the outskirts of the city or in the suburbs, so that, they capable of presenting to students various types of activities with a desired enclosure. From this point of view, campus universities are much more advantageous than city universities. They seem to be disadvantageous as to being far from city utilities, but in general, most of the campus universities have their own functional utilities inside such as; different types of catering services, cultural services, banking and postal services, accommodations units, laundries and so on. In this case, if a campus site is planned well, then a campus student will find opportunity to live in a compact place without any need to go out of the campus. To achieve this, all of the functional units necessary for a student’s life should be provided abundantly within the site. This research aims to study on sportive activities for campus universities, because one of the necessary utilities in a campus area is sports facility, which is very commonly used by all the young generation.

3.3. Planning the Structure and Layout of a Campus University

A campus may be thought a self sufficient village that includes necessary functions for an ordinary life of a student, so that planning of a campus is a complete process that effects the design of each open or closed area within its borders. A campus, indoors and outdoors, should have a sense of place, and a heart. It must be well maintained; its landscaping must be pleasant and satisfying. Physical adjacencies must encourage cross-disciplinary faculty association. The paths faculty and students walk in their day-to-day business must be busy and pleasant. The unity of the campus with its all educational buildings, social facilities, dormitories, recreational and sports facilities and their easy access should be achieved to increase efficiency of use. Relations between the functional units should also be strongly established for a convenient circulation and
utilization. Facilities need to be more than serviceable; they must be designed in such a way as to encourage regular exposure to new ideas, new people, and new experiences. (http://www.wesleyan.edu/Pages/strategy/fac_final5.htm, 7.9.1999)

Today, as campuses become increasingly dense, demand for most of the facilities almost expands relatively. The important factor: that is to be considered in planning of campus facilities is, provision of available space in terms of probable future demand. All the facilities should be programmed allowing an expansion afterwards. If the opportunities of social and recreational facilities as well as the educational facilities within the campus are sufficiently planned and designed, then the satisfaction of students and other users will be maximized.

This research concentrates on the provision of sports facilities, which are one of the important components of campuses. Following this, in order to plan a site for sport activities in a university campus, general planning considerations should be evaluated for a whole campus site. Programming the capacities of sports facilities should be convenient for campus population, and also plan of the facility should be effectively inserted to general campus plan.

3.3.1. Physical Criteria for Campus Design

Before planning a functional zone in a campus, physical criteria for a campus design are to be examined. These are:
1. **Campus Landuse:** It refers to the available land, site configuration, access position, topography, micro-climatic condition, infrastructure and the nature of surrounding environment. These factors affect inevitably the layout of a campus proposal. ‘Campuses are different in each other. They vary in size, organization, their mission and resources. These differences are likely to yield alternative solutions for campus landuse in designing process.’ (Benli, A., 1998, p:98)
2. **Infrastructure:** It refers to the system that includes the circulation of infrastructure networks such as heating, drainage, electricity, water distribution and roads that are crucial part of the design of a campus site.
3. **Building Locations:** They constitute a physical pattern for a campus planning. Such a physical pattern is necessary to give reference to design of physical components,
facilities, landscapes and infrastructure. The physical pattern should be functional and attractive as well as being suitable for the university’s purpose and size. ‘Both buildings and their open spaces should be designed according to climate, wind, topography, inner and outer access and the existing natural landscape.’ (Benli, A., 1998, p:99)

4. **Functional Arrangements**: It depends on an organization diagram generated for different purposes. In general, in most of the campuses, academic buildings are located at the central parts and social building such as library, cafeteria, auditorium are located next to them. Educational buildings expand around this structure with a proper layout. In contrast to academic and administrative units, dormitories are generally separately located. In addition to these, recreational and sports buildings are located in convenient sites of the campus, not necessarily near the educational units, but generally close to accommodation zone. A functional arrangement for a campus is a critical design issue in terms of determining the effectiveness of use of utilities by students.

5. **Circulation networks**: refer to both pedestrian and vehicular flow within a campus. Circulation may change according to the general layout of the campus, because there are many types of layout forms such as centralized, decentralized, linear and etc. However, three types of circulation systems can be generated for a campus plan. These are:

- **Outer loop**: is a network which highly concentrates on a pedestrian circulation. A vehicular circulation surrounds the developed area avoiding entering through the closed structures.
- **Inner loop**: supports the outer loop with smaller loops passing through the structures. It gives more access when contrasted with outer loop, because it is a combination of both vehicular and pedestrian paths.
- **Spine**: is a linear path generally on direction of east-west or north-south. It has a limited access to specific nodes unlike they are supported with dead ends.

There are further objectives for generating an effective campus plan, which should also be considered for partial facility plans:
- Rigid zoning of land in which certain areas are separated specifically for specific purposes,
- Establishment of functional groupings with desirable demands,
• Provision of facilities to meet the social and recreational needs to students,
• Development of a unified campus layout with reference to important unifying elements,
• Creation of a physical environment, which emphasizes the natural beauty of the campus site,
• Separation of pedestrian and vehicular circulation,
• Development of adequate parking for all facilities,
• Creation of more pedestrian pathways and fewer streets,
• Reservation of land for inward expansion,
• Redevelopment of land for outward expansion. (Caudill, R., 1959, p:4)

All above planning considerations for a campus site are directly related with provision of any specific function within the site. There will inevitably be further details about planning and design of the specific components of a campus; however, these details should take reference from the general outline, form and resources of the campus.

3.3.2. Different Organizations for Facilities on a Campus Layout

A campus layout may take many forms as to its structural setting. There are different forms of campus layouts, as seen from world universities that give different impression to universities. These layouts also identify the best locations for the components of campus areas according to the imposed layout. Common layout organizations may be stated as follows:

• **Linear organization**: is a form that collects the activities on both sides of an alley according to their functional relations.
• **Centralized organization**: concentrates the center to administrative and academic functions while surrounding them with educational units. Other social and recreational uses take place on the peripheral parts.
• **Decentralized and non-linear organization**: distributes all the components on the campus site. It aims a physical division and distribution of functions.
• **Molecular organization**: seems to be a compact design with a hierarchy that allows a continuous expansion with adding new units. It is a flexible organization, however it limits the relations between different functions.
Grouping (zoning) organization: creates specialized areas for different functions such as; academic facilities, social facilities, sports facilities.

Above organizations are the initial conditions for a planning purposed for a functional facility on a campus site, because they determine the factor of site selection in planning process. Similarly, sports facilities in a campus should take place as to the general layout of the campus, which will be defined in detail in following chapter.

3.4. Provision of Sports Facilities in Campus Areas

Sports facilities are one of the most necessary utilities that must be concerned within university campus areas. As, university students are the young generation; they have variety of interests in many areas. The most common and favorite activities that university students are interest in their spare time are sports facilities, either at a professional or recreational level. For this situation, convenient areas should be separated and planned for sports facilities within campus areas. Provision of such kind of facilities is directly related with two factors, which are: the usable land within the campus area and demand of the potential users:

**Usable land:** In contrast to other educational foundations like primary schools or high schools, campus areas have generally the advantage of situating on excessive land off the city centers, which gives the opportunity to the planning of variety of facilities as well as educational functions. There should be separated suitable site within the campus areas, which will be mostly convenient for usage in terms of access considerations. In planning process of sports facilities in campus areas, there are also certain factors to be considered other than the available site selection, however, these factors are in further described in following parts of the research. In provision of sports facilities, perhaps, the most important things to be evaluated are: in which sport disciplines, the students are generally interested in and: what types of facilities are required for these favorite sports disciplines.

The spatial requirements are to be determined according to the nature of the favorite games and the minimum necessary clear space they need. Sports types that take place in campus areas are almost same in all over the world, which can be accepted as the official games. The important concept, here, is which of these facilities can be provided
in campus areas. Spatial layout and budget of universities limit the provision of all kinds of sports facilities. In such a position, generally the necessary facilities, which are determined according to the current use, are provided. Unlikely, if the facilities in a campus are thought to serve for public users or other special events as well as its usual students, then the scope of the facilities change inevitably. Because programming and planning disciplines go parallel with the scale of the type of the facility. (See Table 3.1) Large scale sports facilities such as Olympic villages or sport parks, are planned at macro levels which refer to the first three groups of planning disciplines in Table 3.1, however, specific and single sports facilities such as a sports hall or a swimming complex, are planned at micro levels that refer to the planning disciplines following the first three in Table 3.1.

Normally, local planning authorities at micro levels, deal with planning and organization of sports facilities in educational units. When the scale of facilities expands, the authorities that deal with provision of them may change respectively. For example, if there is an attempt to organize a facility that will serve for an international sports event, local planning authorities won’t be able to plan such a broad concept so that they should work with specific organization committees and macro level planning authorities, to come up with the emerging requirements and problems.

<table>
<thead>
<tr>
<th>PLANNING LEVELS</th>
<th>PROPOSED FACILITIES</th>
<th>CONTENT OF PLANNING PROGRAM</th>
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</thead>
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<tr>
<td>Territory Planning</td>
<td>An Olympic Facility</td>
<td>Central Olympic Village</td>
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<tr>
<td>Regional Planning</td>
<td>A Sports Village</td>
<td>Sports Academies, Sport Centers, Sport Clubs</td>
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<td>A Sports Center</td>
<td>Stadium, Sports Halls, Swimming Pools, Outdoor Sports Facilities, Track and Field Athletics</td>
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<td>A Sports Center</td>
<td>Stadium, Sports Halls, Swimming Pools, Outdoor Sports Facilities, Track and Field Athletics</td>
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<tr>
<td>Local Planning</td>
<td>Sports Facilities of Educational Foundations</td>
<td>Indoor and Outdoor Facilities of All Educational Units From Primary Schools to Universities</td>
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<tr>
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<td>Sports Clubs</td>
<td>Training Halls</td>
</tr>
<tr>
<td>District Planning</td>
<td>Outdoor – Indoor Sports Facilities</td>
<td>Open Sport Areas &amp; Covered Sport Halls</td>
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<tr>
<td>Single Unit Planning</td>
<td>A Sports Hall</td>
<td>Competition Hall</td>
</tr>
</tbody>
</table>

Table 3.1: Hierarchical Planning System of Sports Facilities
Source: Erdoğan, M., 1986, p: 12
**Demand of users:** The other important factor in provision of sports facilities in campus areas is the actual demand size. The current demand of users cannot be the only case in determining the size of facilities. Facilities should be programmed so flexible that it may be adapted to the use of larger crowds at specific times or it may be adopted to increasing number of ordinary users in time. While determining the demand that will affect directly the size and the level of supporting units of sports facilities, there should be made a population projection to achieve the peak load in usage and the peak hours of use. These values are to be the initial values of planning. ‘There are many groups such as academic and personnel stuff; public users, university teams and other officials, that are likely to use those sports facilities in addition to university students. They should also be considered in obtaining the amount of demand for providing necessary space allocations for facilities. This will give opportunity of equal time and space for both men and women team sports and substantial facilities for students, faculty and staff.’ (Dober, R.P., 1996, p:64)

3.5. Examples of Sport Facilities in Campus Areas of Specific Universities

In order to understand what level of importance is given to sporting activities in universities, a general consensus is to be developed from the worldwide universities. So that, in this part, various sample universities are selected from foreign countries and Turkey; and evaluated in terms of the efficiency of their existing sport facilities. The sample universities are the ones that especially have developed campus areas with respect to the population and the functional utilities included. Such an evaluation is thought to give opportunity to contrast facilities of universities according to different population sizes, different cultures and location features. Moreover, it may give a guideline for planning and design processes of the case study. In this situation; which types of facilities in what sizes will be projected in the case study will be determined according to the results of the evaluation of those sample universities.

3.5.1. Examples from Foreign Countries

**ILLINOIS STATE UNIVERSITY:**

Illinois State University is located in Bloomington, neighboring Chicago and St. Louis, in USA. The campus is comprised of 3439100 m², including 517888 m² of turf, which
presents a plenty green area for outdoor recreation facilities and lively natural environment. The university has a population of 24000; including 20400 students and 3700 regular staff. It has a large campus area with 153 buildings expanding on 5.5 million square feet and a broad open field for circulation and outdoor activities on the rest. (www.ilstu.edu/depts/admission, 4.4.2000)

It is a typical American university, which has competing university teams in favorite sports that participates in university leagues. This gives the opportunity to use the facilities off the campus borders for being the home for university’s matches. The University competes in eight men’s sports, which are baseball, basketball, cross-country, football, golf, tennis, track and field athletics; and eleven women’s sports, which are basketball, cross-country, golf, gymnastics, soccer, softball, swimming&diving, tennis, volleyball, track and field athletics. (www.redbirds.org) Other than those competitive sports, there are opportunities for recreational sports such as: volleyball, floor hockey, flag-football, monopoly, racquetball, fitness and weight-lifting.

**Facilities:**

1. Indoor facilities for above activities that take place within the campus area are:
   - **The Redbird Arena;** with a seating capacity of 10000 spectators which is also used for special events other than favorite sports such as soccer, indoor athletics, floor hockey and basketball,
   - **Mc Cormick Hall;** serving for gymnastics and swimming&diving and other court sports for recreational purposes,
   - **Horton Field House;** with a seating capacity of 5000 spectators for competitions of team sports such as basketball, volleyball, racquetball and gymnastics.
   - **The Student Recreation Building;** with a 464 m² saloon of strength and conditioning and fitness including fitness and weight gym programs, saunas and cafeteria,
   - **Athletic Study Center;** with a 372m² floor area for dedicating the physical education of student athletes, coaches and the sports administration,
   - **Bowling and Billiards center;** including a saloon with 10-lanes for bowling and a saloon with 27 tables for billiards.

2. Outdoor facilities for the activities within the campus area are:
   - **Adelaide football field;** for football, soccer and outdoor track and field events,
   - **A two lane running track,**
- Two basketball courts,
- Two volleyball courts,
- Three racquetball courts; for tennis
- Rechird baseball field,
- A softball field,
- Gregory fields; for outdoor recreation and golf.


Location of facilities within the campus layout:
All of the buildings and outdoor spaces in Illinois campus have a regular grid system. With reference to the grid layout, sports facilities including both indoor and outdoor facilities are located with the same direction in each other. Sports facilities are located on the northwest of the campus as a clustered functional group except for Mc Cormick Hall. Indoor sports buildings are differentiated from the educational buildings in shape and size.

Figure 3.1: Campus map of Illinois University
Source: www.ilstu.edu/depts/maps/maps.html, 4.4.2000
Indiana University is one of the most crowded universities in the U.S., which has a considerably large campus area that consists of 8 sub-campus areas including in total nearly a population of 85,000. Indiana University has always been committed to providing its student athletes with championship caliber facilities for training and competition. It has highly qualified sports facilities, some of which serve also for public use. The commitment to athletics at Indiana extends all the way through to providing Hoosier student athletes with a championship-quality sports complex. Facilities are constructed in international standards so that they are used for many championships and national/international competitions as well.

(http://www.indiana.edu/campus/index.html, 7.9.1999)

Facilities:

1. Indoor facilities within the total university area:
   - The Legendary Assembly Hall; with 17500 seating capacity which is the largest basketball facility within the state, also larger than 11 NBA arenas.
   - The John Mellencamp Indoor Practice Facility; with a 100,000 square foot floor area for training facilities. The artificial turf floor is provided for football, baseball, and softball. The size of the floor is regulated according to a football field and the height of the building accommodates batting and golf practice.
   - Intercollegiate Athletics Gym; featuring a 2500-seat gymnasium that is used for three sports which are volleyball, wrestling and women’s rowing.
   - The Consilman Billingsley Aquatics Center; having a floor area of 4148 m² for swimming and diving programs. The building features an eight-lane Olympic-sized pool with 2834 m², with depth ranging from 2.13 m to 2.44 m for different purposes.
   - Harry Gladstein Indoor Track Facility; with its seating capacity of 1600, is identical in size to that in Indianapolis so that it serves for valuable track events within the region. The track has two long jump, two triple jump and four jump runways, 8 pole vault areas, 4 pole vault runways and 2 shot put areas.
   - Tennis Pavilion; is the finest tennis facility in the country with its 8 indoor courts, locker rooms and a several hundred seating capacity. The complex hosts for the university’s matches in hard weather conditions. Including the 10 outdoor courts, it is the best collegiate tennis facility in the whole country.
2. Outdoor facilities within the total university area:

- **Memorial Stadium;** with a seating capacity of 51000, is the home field for Indiana University football team. It features a 37m to 37m-workout area and parking capacity for 12000 cars. The concave design of the grandstand provides an unobstructed vision from all sides of the stadium.

- **Bill-Armstrong Stadium;** with a capacity of 17000 including 8500 permanent seats and 8500 temporary bleachers. Playing surface measures 68m by 107m, the maximum dimension for a collegiate soccer field.

- **Golf Course;** with an area of 6700 yards, which is also, open for public.

- **Sembower Field;** with a capacity of 3000 seats which is designed for IU baseball play. The field also hosted for many amateur baseball tournaments because of being one of the finest field in the region.

- **The IU Softball Field;** with a seating capacity for 1000 spectators.

- **The Robert C. Haugh Track Complex;** with a seating capacity of 3100, serves for outdoor track and field events of the IU. It features a 3353m radius on expanding curves.

- **Cross Country House;** having a 500 meters cross country course of downhill and a 250 meters course of uphill. As it is optimal for competitions, it hosted for many championships of the state.

- **Lake Lemon Rowing Center;** on the lakefront within the campus area which is used for rowing.

(http://www.indiana.edu/~athlweb/graphic/faciliti.html, 7.9.1999)

**Location of facilities within the campus area:**
The academic part of the campus has a regular grid shape expect for the natural structure of the recreational park and the plan of dormitories. Sports facilities are dispersed along the north side of the educational units. Through the northeast, layout of the campus becomes more organic with reference to the location of golf course and the cross-country course. Approximately %70 of the area available for use is invaded by sports facilities in IU campus, which means a considerable amount, totally reserved for sports and recreational activities. (http://www.indiana.edu/campus/about.html, 7.9.1999)
THE UNIVERSITY OF NEW MEXICO

The university is one of the oldest university in United States and the largest campus university in New Mexico. There is a population of 23750 at the main campus and additional population of 6300 at the three branch campuses. University has variety of sport activities called as Lobo athletics in 24 men's and women's sports also including golf, rugby, ice-hockey, snow portal and skiing as well as common official sports. (http://www.unm.edu/~recsvcs/facilities.jc.html, 6.04.2000)
Facilities:

1. Indoor facilities within the campus area:
   - University Arena; which serves mainly for basketball events of the university. It is one of the most famous and recognizable buildings through the colleges. It has a seating capacity of stable capacity of 14820, may be increased by portable bleachers to 18000.
   - L.F.Tow Diehm Facility; is located next to stadium by contributing to the grandstand with 572 additional seats. It has totally 5574 m² area distributed on 3 floors including a training room with 1486 m²; a health and rehabilitation center with 790 m²; all sport weight room of 929 m²; strength and conditioning room with 929 m²; a saloon for wrestling with 74 m² area; a dance room; locker rooms with 124 lockers; staff and coach offices and a pavillon.
   - Armond H.Seidler Natatorium; is the home for aquatic events. It includes three separate pools which are an Olympic sized pool of 25 to 50 meters, a semi-Olympic recreational and a therapy pool including locker rooms for disabled.
   - 3 gymnasiums; for gymnastics and indoor athletics.
   - 8 racquetball courts; 2 of which are convertible to squash.

2. Outdoor facilities within the campus area:
   - The Stadium; is designed for football and track and field events which have a seating capacity of 30646 spectators.
   - 3 Pavillons; surrounding the stadium, which have access to Tow Diehm Facility. Pavillons have seating capacities of 125, 250 and 180 spectators respectively. They are available for group purchase on an individual game basis. Both pavilions are equipped with tents and chairs on the outside decks, and have chairback seating.
   - Lobo Field; is designed for baseball which has the dimensions of 340 down the right and left field lines, 378 to the gaps and 405 to straight away center.
   - 4-grass practice fields; located near the main stadium.
   - Golf course; separately on two campuses.
   - 17 tennis courts; on central campus
   - Various outdoor courts; available for recreational basketball and volleyball games close to departments. (http://www.unm.edu/recsvcs/recsports.html, 6.4.2000)
Location of facilities within the campus layout:
The university has three branch campuses that have independent layouts. Sports facilities are distributed among the campuses: stadium and Diehm facility building is in the south, golf course is in the north and south, and other closed facilities and tennis courts are in the central campus. (http://www.unm.edu/studentinfo.html, 6.4.2000)

Figure 3.3: Campus map of University of New Mexico
Source: http://www.unm.edu/~reconsrvs/campus.html, 6.04.2000
Key for facilities:

C-7, 307: Athletic Offices
C-7, 312: Gymnastics Gymnasiums
H-1, 6: Johnson, Physical Education and Recreation Center
C-7, 311A: Indoor Tennis Domes
C-7, 311: Lobo Tennis Club
H-1, 6: Johnson Center Swimming Pools
H-5, 60: New Mexico Students Union
C-5, 206: North Golf Course Clubhouse
C-7, 302: University Basketball Arena
C-8, 301: Stadium
C-8, 308: Tow Diehm Training Facility

ALFRED UNIVERSITY

Alfred University ranks among the top 15 universities in the north by World report-year 2000 edition of "America's Best Colleges." Appearing on newsstands this week, the magazine also ranks AU sixth in "Best Value" among regional universities in the north. Alfred is a residential campus, with the majority of its 2,400 students living in 23 residence halls on a campus area of 938672 m² set in the village of Alfred in the foothills of the Allegheny Mountains. The university has a total population of 37500. The University athletes compete in 12 official sport activities. Moreover, AU students are involved in nearly 100 clubs and organizations other that the campus facilities. The Department of Intramural Sports and Recreation in the university provides a broad based program of sports and leisure time activities including competitive sports and recreational sports that are designed to meet the diverse needs and interests of students, faculty and staff members. (http://www.alfred.edu/glance, 5.5.2000)

Facilities:

1. Indoor facilities within the campus area:
   - Mc Lane Education Center: is the center of athletic activities, containing:
     - 2 regulation size basketball courts
     - 4 racquetball and squash courts
• 4 badminton and volleyball courts
• Athletic training room, dance studio, sauna, karate rooms
• Complete fitness center
• An indoor track and a basketball court are located in the adjacent Davis Gym

  *Davis gym:* is the home of indoor track and field for practice. It includes the football team's weight room as well.

  *Mc Lane Pool:* with a seating capacity of 500 spectators is a 190 cm 6-lane pool having an area of 23m. It has a separate diving well including 2 to 1 meter boards and 1 to 3 meters board

2. Outdoor facilities within the campus area:

  *Merrill Field:* with a capacity of 5000 spectators is one of the finest football facilities in New York State. It is designated as the home for football, lacrosse and soccer teams of the university with a special artificial grass surface.

  *William T. Brown Tennis Courts:* are consisted of six regulation tennis courts adjacent to Mc Lane Center. The courts are used for varsity tennis, intramural and recreation for students, faculty and staff, two of which have lights for night play.

  *Tucker Field:* is an all grass field that serves as a practice field for football, soccer and lacrosse in the fall. In the spring, the grounds and maintenance staff transform Tucker into a regulation varsity softball field.

  *Jericho Hill Fields:* is situated on the scenic top of Jericho Hill as the home of Alfred University's cross-country course and men's lacrosse.

(http://www.alfred.edu/facilities/index.html, 5.5.2000)

**Location of facilities within the campus layout:**

Alfred University has a campus layout that is structured around a main alley connected to the outer loop with secondary service roads. All faculty buildings and the other social facilities are located on both sides of the alley through the outer loop. Within this respect, faculty buildings are situated on the middle parts of the alley while social and cultural facilities are situated next to them in both sides. Dormitories and sports facilities expand from the west end of the alley through the peripheral road and separated from each other by the concerned alley.
FERRIS STATE UNIVERSITY:

Ferris State University is located in Big Rapids, between the northern and southern ends of Michigan's Lower Peninsula. The large campus area of the F.S. University expands on an area of 600 acres, with its 114 buildings and valuable green fields. It has a population of 17200 that is consisted of 13400 students and 3800 academic and personnel staff. University has completely valuable sports facilities designed for the student athletes, which is extensively used by community and the local competitions as well.

Facilities:

1. Indoor facilities within the campus:
   - Sport Complex; have a multi-purpose gym and a combative area located next to the arena with a seating capacity of 500 spectators. Multi-purpose gym has an area of combination of 3 basketball courts. The area is used for varsity athletic practices, club sport practices and some evening intramural programs including basketball and indoor soccer. Combative area is used for wrestling, martial arts, cheerleading and dance teams.
   - An Indoor Ice Arena; available for ice-hockey and ice-skating with its seating capacity of 3000 spectators.
   - Indoor racquet facility; with 2 tennis courts.
• **Student Recreation Center**; that includes below utilities:
  - Fitness center; with a 557 m² feet saloon for aerobics and weight lifting.
  - Aquatic center; which includes a six-lane 23m pool with minimum depth of 122cm in shallow end and 365cm in the deep end. There is a one-meter diving board with a starting block in each lane.
  - A 10-person whirlpool.
  - Elevated indoor track; for walking, with a 1/9 mile four turflex lanes for walking, jogging, and running.
  - Main floor area; which consists of four recreation sizes of basketball/ volleyball/ badminton courts that can be separated by a curtain. This space is available for: student recreation, academic instruction, club sport team practices, special events and athletic practices.
  - Aerobics studio; with two 111 m² aerobics saloons.
  - Weight lifting room.

2. Outdoor sports facilities within the campus area:
   - *Katke Golf Course*; which lies over 6130 m² of the gentle rolling hills,
   - *Ferris State Track and Field*; for special events as well as football and field athletics with its 8 lanes running track with a capacity of 5000.
   - 4 tennis courts
   - Baseball field
   - Softball field
   - 2 inline skating courts
   - 11 basketball fields
   - 2 football practice areas
   - 4 volleyball fields

(https://about.ferris.edu/htmls/StudenLife, 7.4.2000)

**Location of facilities within the campus layout:**

Campus of Ferris State University is consisted of 4 branch campuses that are connected to each other with outer loops. Sports facilities are dispersed through those branch
campuses rather than being collected on a single area. The main sports hall and the baseball fields are located in the west campus while the pool, physical education center, ice-arena and the track and field is located on the main campus. South campus includes the open courts and the areas separated for horsemanship sports. The fourth campus in contrast to the others, named as the golf campus, totally separated for the golf course and the facility house lying on 6130 m² of green fields. (See Figure 3.4)

(http://www.ferris.edu/campustour/tour/tourmaincfm, 7.4.2000)

Figure 3.5: Campus map of Ferris State University
Source: http://www.ferris.edu/campustour/tour/tourmaincfm, 7.4.2000
**BRISTOL UNIVERSITY**

The University owns over 400 hectares of land in and around Bristol, in England, and makes use of over 370 buildings, including 85 listed buildings. The university organizes its academic affairs in some 60 departments and 15 research centers, which are arranged in 6 Faculties. Bristol University has a population of 17,852 that consists of 13,000 students and 4,825 staff. (http://www.bris.ac.uk/Depts/Info-Office/about, 2.5.2000)

The University has many facilities for support and recreation split between a numbers of sites as to the general physical structure of the University. Sportive activities that take place within the campus of the University are collected under four major headings. These are:

1. The swimming pool complex
2. Woodland House
3. Coombe Dingle
4. Other recreational facilities

(http://www.bris.ac.uk/Depts/SEHS/sport.htm, 2.5.2000)

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**Figure 3.6: Facilities map of Bristol University.**

Source: http://www.bris.ac.uk/Depts/SEHS/maps.htm, 2.5.2000
**Facilities:**

1. Indoor facilities for above activities, those take places within the campus area are:
   - *The swimming pool:* with a dimensional frame of 3353 cm to 1280 cm and a depth of 122 cm-366 cm, 152 cm including 6 lanes. It is a first class swimming complex situated underneath the Students union of the University including 2 meeting rooms for 25-30 people as well. The complex fully caters for: recreational and competitive swimming, water polo, synchronized swimming, aqua fit, sub-aqua and canoeing.
   - *Woodland House:* is the base for most indoor sports and exercise facilities located close to the pool within the campus. The complex includes:
     - 4 squash courts; both for training and competitions,
     - A sports hall; used for archery, five-a-side football, basketball, cricket nets, volleyball and badminton.
     - Trim gym; designed within the Woodland House for fitness training and conditioning, exercising for health or for advanced sports training. Numbers are limited with 50 in each saloon.
     - Free weights room; available for anyone wishing to train in weightlifting.
   - *Oddfellows Hall:* including a main saloon with the dimension of 558 m² and 4 additional rooms all of which have a training base for AU Martial Arts Club including: Aikido, Jui-Jitsu, Judo, Karate and Kick-boxing and Tae Kwon Do.
   - *The center for healthy living and sports medicine:* serves about Physiotherapy, massage, personal training, health and fitness.

2. Outdoor facilities for the activities within the campus area are:
   - *Coombe Dingle Sports Ground:* is the region of outdoor sport fields and courts situated on a 153748 m² site on Coombe Dingle. In addition to outdoor facilities it also consists of 3 meeting rooms up to 50 people. The site includes:
     **For winter sports:**
     - Football; with pitches which all have full sizes and grass surfaces,
     - Rugby: 4 pitches with grass surfaces,
     - Soccer practice: 1 pitch not in official standards,
     - Lacrosse: 1 pitch with its official standards,
     - Netball: 2 courts.
     **For summer sports:**
     - Cricket: 4 squares one which is artificial,
• Cricket nets: 3.

All year sports:
• Artificial hockey: floodlit (full size)
• Football: floodlit
• Indoor tennis court: 4 courts
• Tennis courts: 10 hard

• The House Saltford: is the site for boating facility of the University situated at Saltford. ([http://www.bris.ac.uk/Depts/SEHS/facility.htm, 2.5.2000](http://www.bris.ac.uk/Depts/SEHS/facility.htm, 2.5.2000))

**Location of facilities within the campus layout:**
The University campus has dispersed and organic layout. As mentioned before sport facilities are collected under four headings that are located in different regions of the campus. The two major indoor complexes, which are the pool and the Woodland House, are located in close distances to each other in central part while the outdoor sports Facilities, named, as Coombe Dingle Sports Ground is totally separated form the main campus area and expanded in the northwest of it. ([http://www.bris.ac.uk/Depts/SEHS/resource.htm, 2.5.2000](http://www.bris.ac.uk/Depts/SEHS/resource.htm, 2.5.2000))

![Campus map of Bristol University](http://www.bris.ac.uk/Depts/SEHS/resource.htm. 2.5.2000)

*Figure 3.7: Campus map of Bristol University*
*Source: [http://www.bris.ac.uk/Depts/SEHS/resource.htm, 2.5.2000](http://www.bris.ac.uk/Depts/SEHS/resource.htm, 2.5.2000)*
**UNIVERSITY OF ST. ANDREWS**

University St. Andrews is located in the North East of Scotland. It is the oldest in Scotland and the third oldest university in the UK. The University population including both the staff and students numbers is around 6,000.

(http://www.st-andrews.ac.uk/services/admissions/admissions2.html, 4.11.1999)

Sports and leisure facilities at the University of St. Andrews are also first class with 63 acres of playing fields and the sports complex, complete with all-weather facilities. The University provides a perfect setting for the preparation, training and playing of sport for all categories. There are also over 50 sports clubs to choose from the opportunities of Athletic Union. The facilities for sporting activity are considerably higher than most other similarly sized universities.

**Facilities:**

1. Indoor facilities within the campus area:

   - **The main Sports Hall**: for multi-purpose including variety of courts which are:
     - Badminton; 5 courts.
     - Basketball; one full size with a seating capacity of 1000 on the main floor and two half courts.
     - Floor soccer; 1 indoor pitch with a capacity of 500.
     - Cricket nets; 2 nets.
     - Indoor tennis: with 2 official courts and 4 mini-tennis courts.
     - Table tennis; 3 tables.
     - 2 squash courts. (3 courts are also available on the central campus)
     - Gymnasium: with traditional style including:
• Fitness suites.
• Dance/martial arts studio.
• Indoor climbing wall.
• *The East Fife Sports Medicine Clinic*; that serves about the treatment in the field of sports injuries.

2. Outdoor facilities within the campus area:

• *Astropitch*; full size soccer or hockey floodlit pitch.
• *Tennis*; with 4 all-weather Savannah courts one of which has a seating capacity of 400.
• *Athletics track*; with 4 lanes of 400 meters and a synthetic surface.
• *Cricket nets*; 3 for all weather.
• *Cricket squares*; 2 grass fields and 1 artificial.
• *Croquet lawn*; with official sizes.
• *A grass soccer pitch*; with a seating capacity of 1500.
• *4 Jogging trails*
• *1 Lacrosse pitch*; with official sizes
• *3 Rugby pitches*
• *Shinty pitch*; with official sizes
• *The University Boathouse*; located on the seashore of the campus.

Nearly all of the above facilities are at the Sports Center where a car park is available plus bike chains. Changing rooms and showers are available at the 3 sites of play, and a disabled toilet and shower facility exists at the main Sports Center. In addition there are two social areas in the Sports Center, viewing galleries over the main hall and squash courts. ([http://www.st-andrews.ac.uk/services/facilities.html](http://www.st-andrews.ac.uk/services/facilities.html), 4.11.1999)

*Location of facilities within the campus layout:*

University of St. Andrews has a satellite campus layout expanding through the seashore in St. Andrews. The central campus is divided into two and dispersed within the public buildings. The seashore is extensively used by the buildings for Maritime studies, leisure center, hospital and the boathouse. Through the inner parts, administrative and
faculty buildings are located. Dormitories and sports facilities expand on the west of the faculty buildings and separated from each other. Sports facilities lies on area of 254898 m² green fields, which means approximately %30 of the whole area, the university is situated on.

(http://www.st-andrews.ac.uk/maps/maps.html, 4.11.1999)

Figure 3.8: Facilities map of University of St. Andrews
Source: http://www.st-andrews.ac.uk/maps/webmap.html

Figure 3.9: Campus map of University of St. Andrews
Source: http://www.st-andrews.ac.uk/maps.html

**Key for facilities**

32. Boat House
31. Pitches / Running Track
84. Leisure Center
59. Andrew Melville Hall
70. New Hall

58. Albany Park
26. Physical Education/ athletic union
42. Grounds Department
68. John Burnett Hall
74. University Hall
UNIVERSITY OF CENTRAL LANCASHIRE:

University of central Lancashire is situated in Preston is which is one of the most endearing market towns in the north of England. University has variety of sporting opportunities including outdoor complex, indoor facilities and the Lake District for water sports that are used by competing university teams and be available for students, university staff, local sports clubs, schools and community groups.

(http://www.uclan.ac.uk/aboutuni/aboutind.htm, 18.5.2000)

Facilities:

1. Indoor facilities of the university campus area:

   - Indoor sport complex: is a multi-sports building that includes:

   - An indoor swimming pool of 25 meters,
   - A main sports hall; for the activities of athletics, badminton basketball, fencing, hockey, netball, volleyball and tennis,
   - 2 activity rooms,
   - 2 squash courts,
   - A conditioning room,
   - A fitness testing area;
   - An activities room; for aerobics/step and yoga classes, table tennis, martial arts and fitness training.
   - A community meeting room.

   - 2 changing pavilions; will accommodate up to 600 sports participants.

   - a reception building; providing changing facilities, reception and administration offices, fitness performance room, creche facilities and storage.

   - a cricket pavilion

   - maintenance pavilion choosing ground staff, workshops, equipment and stores.
2. Outdoor activities of the university campus area:

- **A great Outdoor Multi-sport Complex**: built on 24 hectares of rural land, integrates sports into student life and to achieving the full potential of students. It includes variety of outdoor fields and courts on the same land.
  - 4 grass soccer pitches; one of which is convertible to 4 five-a-side pitches or 2 hockey pitches
  - 4 grass rugby union/league pitches
  - International standard 8 lane athletics track, providing an excellent venue for athletics, football, rugby, hockey, cricket and netball.
  - 1 'Grass Master' multi pitch (Premier League standard): that can be converted to one full size cricket pitch, one rugby league pitch or four rugby union pitches
  - 2 all weather football/hockey pitches
  - 2 tennis courts
  - 2 netball courts
  - 1.7 km road racing cycle circuit
  - A covered training area
  - Trim track
  - Showers and changing rooms
  - Administrative buildings

- **Lake-District Club House**: serves for water-based sports, which are canoeing and windsurfing.

(http://www.uclan.ac.uk/student_services/sports/sprtcntr.htm, 18.5.2000)
Location of facilities within the campus layout:

Campus of the university is composed of three branch campuses named as west, north and south campuses. The general layout of the campus is a grid system. Indoor sport facilities within the system takes place at the end of the alley through the south campus, while great outdoor sport complex is located independently, 4 km. far away from the north campus on the north.

![Facility map of University of Central Lancashire](http://www.uclan.ac.uk/student_services/intro.htm)

Figure 3.10: Facility map of University of Central Lancashire.
Source: http://www.uclan.ac.uk/student_services/intro.htm, 18.5.2000

3.5.2. Examples from Turkey

**MIDDLE EAST TECHNICAL UNIVERSITY:**

Middle East Technical University is one of the largest and most developed Campus University in Turkey, located in the capital city. The university has a population about 24000, 20000 of which are the registered students. Middle East Technical University is an ideal sports and recreation environment for mental and physical health, which provides social interaction for students, members and graduates. Opportunities in sports facilities and areas that belong to university are open for all METU members other than public use. The Sports Center of the university that takes place within the indoor sports complex arranges the current sport activities. METU provides many services including present sports opportunities and activities to students, administrative staff and graduates.

There are 4 sports groups and various branches about gym, field and nature sports. Existing sport groups are:
Mountaineering and winter sports group
Physical education and sports group
Scouts group
Underwater group

Sports available within the campus area can be listed under two headings, which are:

1. **Room sports**; basketball, volleyball, badminton, swimming, water polo, boxing, fencing, wrestling, handball, judo, karate, taekwon-do, table tennis, aerobics, step and body building.

2. **Field sports**; track and field events, cricket, football, American football, softball, tennis, paddling and water sports, mountaineering, bicycle-triathlon, skiing and cross country running.

**Facilities:**

1. Indoor facilities within the campus area are:
   - **Big Sports Hall**; which is designed for gymnastics as well as other team sports. It includes volleyball and basketball fields having 4 dressing rooms and 14 showers.
   - **Steel Sports Hall**; includes handball, volleyball and tennis fields with 2 dressing rooms and 10 showers.
   - **Bodybuilding center**; is inserted within the main sport hall having a dimensional frame of 18m.x10m.x3m.
   - **Gymnastics Hall**; is inserted within the big sports hall having a dimensional frame of 20m.x12m.x3.70m.
   - **An indoor swimming pool**; with a dimensional frame of 50m.x20. and a depth of 2.20 meters, including 8 lanes in Olympic standards. It has a seating capacity of 500 spectators. It has fully utilized dressing rooms with 200 cabinets and 12 showers in each.
• *Table tennis;* is provided near the gymnastics hall including 8 tables. The activity is also available with the existing table tennis sets in variety of the departments.

2. Outdoor facilities within the campus area are:

• *The Stadium:* with a seating capacity of 10000, including a grass field for football, American football and field events surrounded by a six-lane running track. It is also serves for special events such as concerts and graduation ceremonies.

• *7 football fields;* 3 of which are in regular dimensions, 2 of which are in dimensions of 65meters to 50 meters, one of which is mini football field and the last remaining one is an artificial turf field.

• *Outdoor swimming pool;* having a dimensional frame of 25m.x 11.5m.x (1.30-1.90m.), which is available for use in summer.

• *12 tennis courts;* located in two different regions. 3 of the courts are antuka and the rest of them are asphalt.

• Outdoor basketball fields

• Outdoor volleyball fields

• *Jogging trails;* having routes of 6-km. Yalınçak track and 12-km. Çamlık track for cross country running.

• *Eymır Lake Boathouse and Rowing Facilities;* includes a boathouse that settled in 40 m². Area, 2 dressing rooms, 6 showers, an administrative room, a storage, 400 m², indoor local house, 4 strings of 1700 m, a course with steel rope and buoys, watching towers and a ceremony platform.

• *Elmadağ Skiing Facility;* includes a ski-house offering encamping with 40 beds capacity.

• *Uludağ Educational Facilities;* has a capacity of 250 beds available to all students and academic and personnel staff.

**Location of facilities within the campus layout:**

Educational buildings are designated on an alley surrounded with an outer loop in the campus. Facilities other than education are located on the northwest of the main alley independent from the layout of faculty buildings. These facilities are the cultural
complex, catering and shopping center, dormitories and the residences in range. Within
the general campus layout sports facilities are designated on the area among the social
facilities further from the faculties. Main sport hall and the tennis courts are located near
the catering center, which allows an easy access for students in break times. However,
indoor and the outdoor pool are situated next to the dormitories which mainly serves for
the dormitory residents. Outdoor fields and courts for basketball and volleyball are
dispersed through the faculties in order to serve for recreational use.

Figure 3.11: Campus map of Middle East Technical University

BILKENT UNIVERSITY:

Bilkent University is situated on Eskişehir Highway at the outskirts of Ankara. The
campus expands on area of 5000000m², 2000000m² of which is covered by green fields.
Green areas of the campus present considerable recreational and sports activities both
for the students and for the academic staff. It is one of the most valuable universities in
Turkey with its full of services and amenities as well as qualified education. Current
population of the campus is approximately 13500,10361 of which is composed of
students.

(http://www.bilkent.edu.tr/info.html)
1. Indoor facilities within the campus area:
   - **Physical Education and Sports Center**: that provides the environment and programs for the active participation on various present sport types within the campus.
   - **Main Sports Hall**: located at the main campus with a capacity of 1000 spectators including:
     - Basketball / Volleyball / Badminton courts
     - Fitness Room
     - Aerobic /Step Studio
     - Multi-Purpose Room
     - Table Tennis Room
   - **Sports Hall**: located at the west campus including:
     - Basketball / Volleyball / Badminton courts
     - Aerobic /Step Studio
     - Table Tennis Room
   - **Fitness Studio**: that takes places in Student Union Building.
   - **Indoor Tennis Court**: located in central campus.

2. Outdoor facilities within the campus area:
   - **Tennis Practice Wall**: in front of the central dormitories.
   - **7 tennis courts**: 2 of which are in west campus, 2 of which are in central campus and 3 of which are next to housing units.
   - **Basketball / Volleyball Courts**: next to dormitories on both campuses.
   - **2 mini football fields**: one of which is in central and the other in west campus.
   - **Regulation size Grass Football Field**: located in central campus, which is used for track and field athletics as well as football, baseball and softball.
   - **Mini Grass Football field**: in west campus.

(http://www.bilkent.edu.tr/campuslife.html)
Location of facilities within the campus area:

Bilkent University is composed of two separated campuses named as the central campus and the west campus. The major sports facilities, such as the big sports hall and the football field, are located in the central campus in which all of the important functional uses and majority of the faculty buildings are situated. All of the facilities in both campuses take place in close distance to dormitories. Reason for this is the considerable sloping layout of the whole campus area. In order to ease the access considerations, both indoor and outdoor facilities are located near the dormitories.

Figure 3.12: Campus Map of Bilkent University


SABANCI UNIVERSITY:

Sabançlı University is a newly developing university, which has a campus area, still in construction, at Tuzla on the south east of İstanbul. The campus has an extension area of 1360000 m² separated into two by E5 highway. The existing capacity of university is
250 students, however, the final plan of the campus is thought to serve for 3000 students. As to the spatial embodiment of Sabancı Universities educational philosophy, the campus will feature not only state-of-the-art technological infrastructure and equipment, but also house a full range of social and cultural activities, residence halls, indoor and outdoor sports facilities, lake and parks.

**Facilities:**

1. Indoor Facilities within the campus area:
   - *Multi-purpose Sports Complex*: including a main hall with a dimension of combination of 2 basketball fields, having a capacity of 1200 spectators. The complex consists of volleyball and squash as well as basketball.
   - *Closed Olympic Swimming Pool*: which has not been constructed yet but proposed for the later phases of campus development.

2. Outdoor Facilities within the campus area:
   - *Stadium*: that is used for football and track field events with a capacity of 3000 spectators.
   - *9 tennis courts*
   - *4 open basketball fields*: which are also convertible to volleyball fields.
   - *An Artificial Lake*: situated on an area of 50000 m² which is designed for outdoor recreation and suitable for trekking.

**Location of facilities within the campus area:**

Campus of Sabancı University is composed of 3 district zones, which are stated as the academic core, housing facilities and sports&recreation zone. The sports and recreation zone lies along the western edge of the campus, utilizing the former guarry as a lake and central focus. Along the T.E.M., the Sports Center forms an edge along the southern boundary of the lake with the stadium and outdoor fields placed along the highway. The northern end of the former guarry is developed as an open green space for recreational use and linked to the housing village with an amphitheater. (Mim. Dekorasyon, s: 85)

(See Figure 3.13)
KOC UNIVERSITY:

Koç University is currently located in the district of İstinye, on the European side of the Bosphorus. Seven years after its founding, the University is ready to open its doors to students at its new permanent campus in Fall Term 2000. Rumeli Feneri campus is on a hill close to the city in Sarıyer but far removed from the distractions of city life. It sprawls over 25-hectars of beautiful campus grounds, including 60 academic and administrative buildings, dormitories, faculty residences, social and sports facilities. Current population of the university is composed of 1114 students, which will tend to increase in future periods.

Facilities:
Available activities in campus may be collected as follows:
- Aerobics: Aerobics Dance and Step Dance Classes; Power Body, Tae Boxing
- Fitness, Body Building: Strength Training and General Conditioning; Personal Training
- Racquet Sports: Badminton, Tennis, Table Tennis, Squash
- Others: Skiing, Basketball, Volleyball, Handball, Soccer, Chess.

**DOKUZ EYLÜL UNIVERSITY:**

Dokuz Eylül University is a Multi-campus University dispersed throughout the city of İzmir at various locations offering undergraduate and graduate degree programs of study and research in 10 faculties, 5 schools, 5 vocational schools, 5 graduate schools.
and 5 institutes. The University experiences a new campus development in Kaynaklar and a new congress, cultural and sports complex construction in Urla. The whole university has a population composed of 38562 students and 4350 academic and administrative staff dispersed through the educational facilities within the city. The students of DEU have the opportunity to pursue their sporting or recreational interests indoors and outdoors.

**Facilities:**

1. Indoor facilities within the university:

2 sports halls; which can be used for a variety of sports such as basketball, volleyball, handball and wrestling and include a gymnasium with a fully equipped exercise/training room. In most faculties and schools, table tennis rooms are also available.

2. Outdoor facilities within the university:

University has extensive playing fields on every campus, i.e. one carpet–based mini football field, tennis, basketball and volleyball courts.

**Location of facilities of the university:**

As the university is dispersed through the various parts of the city, sports facilities, especially the outdoor fields and courts are distributed among those locations. Further from these, there will be an opportunity of collective sports facilities, which will be constructed within the purposed congress, cultural and sports complex in Urla. The complex will be constructed on an extensive area near the seashore in Urla, 6000 m² of which is separated for sports and recreational facilities. Facility site will include both indoor and outdoor activities and serve for surrounding housing units as well as the university population and city visitors.

(See Figure 3.15 & Figure 3.16)
Figure 3.15: Site plan of DEU Congress, Culture and Sports Complex. Source: Tasarım, 99, March 2000, p:86

Figure 3.16: View from the model of the complex. Source: Tasarım, 99, March 2000, p:87
ÇUKUROVA UNIVERSITY:

Çukurova University occupies a foremost place among other Turkish universities with its 10 faculties, 3 colleges, 7 vocational colleges, 3 institutes and 25 research and application centers. The university campus is located 10 kilometers away from the city center near Seyhan Lake. Campus of the university expands on an area of 2200000m² through the lake. The university has a total population of 19540 consisted of 18000 students. As well as expanded educational facilities, university offers its faculty and students a variety of recreational facilities including: an indoor sports center and swimming pool, a boathouse and a variety of sports grounds. Students can make the best of their leisure time in any of the 21 student clubs.

Facilities:

1. Indoor facilities within the campus area:
   - **Main Sports Hall**: designed for competitive activities with a capacity of 1600 spectators. It has a construction area of 4500 m² including a main competition hall, an additional training saloon and one strength and conditioning saloon.
   - **A gymnasium**: including a saloon for wrestling and a table tennis room composed of 20 tables.
   - **Closed swimming pool**: designed in Olympic sizes.

2. Outdoor facilities within the campus area:
   - **3 football fields**: with regulation sizes for football and track and field events.
   - **4 mini football fields**: for training.
   - **8 open basketball fields**: which are also used for volleyball.
   - **6 tennis courts**.
   - **2 open handball fields**.
   - **An open running parcure**: with a length of 3000 meters.
   - **Boathouse and a water sports center**: located near Seyhan Lake for sailing and rowing activities.

There have been provided additional outdoor fields and courts outside the campus area for profession schools of the university, which are located off the campus boundaries.

(http://www.cc.cu.edu.tr/english/cumenuen.htm, 06.05.2000)
Uludağ University is one of the most crowded universities in Turkey. It is located in Bursa and holds a population approximately about 39000 people, 36635 of which are the students. Campus of the university has many advantages in terms of both sports facilities and sport clubs. Official sports that in campus are football, handball, basketball, volleyball, tennis, athletics, wrestling, weight-lifting, table tennis, fencing, skiing and horsemanship sports.

**Facilities:**

1. Indoor facilities within the campus area:
   - 4 indoor sports halls
   - An Olympic size swimming pool; under construction

2. Outdoor facilities within the campus area:
   - A regulation size grass football field.
   - 2 non-grass football fields; for training.
   - 4 clay, 4 asphalt tennis courts; enlightened also for night use.
   - 5 basketball fields; with asphalt grounds
• Outdoor track; for athletics.
• A running parcure

EGE UNIVERSITY:

Ege University is one of the oldest and the largest university in turkey. The campus of the university is settled on an area of 345000 m² in Bornova region of İzmir. It has a population of 33491, which is consisted of 27061 students, 2661 academic, and 3769 administrative personnel. The university serves various opportunities for sport activities with its facilities in the campus area as well as the existing clubs for the sports that are held off the campus. Active sport activities are basketball, volleyball, football, handball, swimming, water polo, table tennis and teak-wondo; in addition, there are sport clubs such as mountaineering and deep diving. (http://www.ege.edu.tr/about/index.htm, 16.4.2000)

Facilities:

1. Indoor facilities within the campus area:
   • Main sport hall; including a competition saloon with a seating capacity of 4000 spectators, 2 training rooms, one strength and conditioning saloon and one gymnastics saloon.
   • Indoor swimming pool; with Olympic standards with a dimension of 50 to 25 meters having a seating capacity of 2500 spectators.
   • Mini-sport hall; used for volleyball with a seating capacity of 500.

2. Outdoor facilities within the campus area:
   • Outdoor track; with eight lanes including a grass field with a seating capacity of 300 spectators. The facility is designed for track and field events and football.
   • 2 training football fields; one of which has a capacity of 150 spectators.
   • 8 tennis courts: in two different regions within the campus.
   • 9 open volleyball courts; close to different faculties.
   • 12 basketball fields; close to different faculties.

Location of facilities within the campus layout:
Main indoor facilities, which are the big sports hall and the swimming pool, are located close to each other in the central part of the campus. Outdoor facilities, which refer to basketball and volleyball fields, are located at the neighboring yards of the faculty buildings. Orientation of both indoor and outdoor facilities is convenient to the general layout of the campus buildings.

3.5.3. Comparison of Provision of Sports Facilities in Foreign Universities and Turkish Universities:

In order to understand planning and design considerations for sports facilities in campus universities, various sample universities from foreign countries and Turkey, are collected and evaluated on the same basis. The results of the evaluation will be modified into a diagram in the last chapter, to make an effective contrast between different universities. Such a contrast is necessary to generate the major program of the project that will be worked as the case study of the research.

In general terms, it is useful to mention that foreign universities have different planning approaches from Turkish universities in terms of the included sports facilities. Sporting activities in foreign countries generally have a professional scheme and students dealing with sports are accepted as potential university athletes. There is variety of sport activities that are provided in foreign universities both in professional and recreational levels. Universities have their own clubs in competing activities. Especially in American Universities, leagues between the teams and clubs of universities are as important as various local sports leagues. Because of these reasons, facilities in those universities are designed in high quality. Further from the professional use, extensive use is the other concept that foreign universities are familiar with. In addition to the current university population, public population and some local teams also use the available facilities within the campus areas. As a result of these, typical features of sports facilities in American and European campus universities can be stated as follows;
- Indoor sports facilities have the priority in terms of outdoor facilities for many sport types such as basketball, volleyball, hockey, handball and etc. As those activities have a competitive nature, indoor facilities are preferred to outdoor ones. Climate is
also a criterion for this preference. Indoor halls or arenas are much more effectively used because they are independent from the outer weather conditions.

- Facilities in foreign universities are designed with large spectator capacities independent from the populations of the universities. Capacities are determined according to probable special events or competitions rather than the current users within the campus populations.
- As well as the official sports, foreign universities have facilities for regional and traditional sports; for example, baseball and softball pitches, regulation size rugby fields in American Universities; shinty, lacrosse, cricket and croquet courts in English Universities. The facilities are also competitive in nature and serves for leagues of universities.
- Facilities for popular sports are separately provided as recreational or competitive. Further from the competitive sports halls, foreign universities generally have student recreation centers that present various saloons, courts and training fields indoors for recreational uses.
- Foreign universities generally have specialized departments related with the current sporting activities within the universities' bodies named as Athletic Study Centers. These centers include the administrative units, rooms of coaches, physical education teachers and the related personnel, sports planning departments and classes. Responsibilities of these centers are to program the use of facilities; inform the participants; to serve the university athletes; to organize sporting events and study on planning of new sports facilities. These centers are sometimes provided as individual buildings, sometimes provided in recreation centers.
- Both outdoor and indoor facilities are provided close to each other at the suitable regions of campus areas, generally in a short distance with the housing units and dormitories. The most commonly used facilities such as; student recreation centers or athletic study centers are located in the central parts of the campus close to other social facilities.

That is to say, for majority of the foreign universities, sports facilities are accepted as one of the most effective facilities that determine the quality of the university. Provision of valuable sports facilities is the way of expressing the prestige of the universities and attracting large amounts of undergraduate students.
In contrast to foreign universities, the situation in Turkish universities is considerably different. Sports facilities are taken into consideration in late phases of the general campus planning. Sports are thought as time-consuming activities for leisure rather than a profession. So, sports planning in educational institutions are not as sensitive as in the ones in foreign countries. As a comparison with foreign universities, typical features of Turkish universities can be described as follows in general terms:

- **Budget** is an important factor in determining the level of social services. Especially in public universities, in contrast to private ones, investments separated for sports facilities are limited. Multi-functional activity areas are being constructed in order to serve for immediate needs.

- **Current demand of the university population** is not the major determinant in identifying the capacity and quality factors in facilities planning. Budget and availability of land are more crucial factors for planning and construction.

- **Facilities are not planned at the beginning of the site development.** They are constructed day by day parallel to the availability of the budget. This brings about a lack of sports planning in general layout of the campus areas. Furthermore, capacities for the facilities are determined according to immediate demand in terms of the future demand of universities’ populations.

- **Facilities are provided according to most common official sports.** It is hardly seen special facilities designed for traditional, local or newly popular sports such as baseball, softball, golf, badminton and etc.

- **Especially indoor facilities are limited in number and quality contrary to outdoor sports.** Universities generally have one main sports hall in which most of the activities takes place inside. They are used both for competitions and training events so they are objected to an extensive use.

- **Outdoor activity areas are more acceptable for Turkish universities because they are easily inserted in terms of design, construction and budget considerations.** However, they cannot be used for competitions but for recreational use only.

The comparison between universities abroad and Turkey determines the key concepts that are to be taken into consideration in the case study. Study area is the campus of a newly developing Turkish university in which a sports park will be projected. So, above
will give way to generation of the program and the site plan of the case study project.

3.6. Impacts of Competitive Events on Design of Sports Facilities in Universities

Majority of sport types, either they are team or individual based, have a competitive nature because of their playing features. For so many years, there has been organized various types of leagues, championships and sports events all over the world. These events vary in scale ranging from local level such as institutions leagues to international level such as Olympic events or world cups, however, all competitive sport events require the same standards and playing conditions which may vary only with respect to capacity.

One of the most usual sporting events are the leagues of educational institutions especially universities in urban areas, because, university students always had a big share within the people that deal with sports at a professional discipline. The reason for this is mostly the opportunities provided them within the universities they attend to. As may be observed from the sample universities, selected through the world and evaluated on previous pages, universities present various types of facilities for sports in their campus areas and clubs for off-campus sports as well. These facilities are generally separated into to as recreational sports and professional sports. University leagues are important events for university students in whom they take place both as participants and spectators.

Sports competitions between different universities traditionally take place within the city or at citywide level. Organization of professional competitions between universities both at national and international levels has a long history in the world. They have been organized since the beginning of 19th century with the contributions of universities’ athletes. An international competition is an upper level organization that collects athletes from different countries. Whatever the type or scale of the events, sport competitions require professional playing conditions and standardized activity areas so that they inevitably effect the planning policies of universities. Because competitions between universities may be held in the facilities of those related universities’ campus areas. In order to compete in such kind of leagues or events, universities should provide
convenient activity areas in terms required standards for participators and spectators. Adequately planned facilities not only contribute to the organization of competitions but also give effective service for the whole campus population.

3.6.1. World University Sports Competitions

World university sports competitions are the most important and professional organizations directly related with universities. They are positive attempts in terms of bringing sports facilities, which are provided for university students, to an internationally competing level and, by the way, connecting people from different nations in many social respects. International sports competitions have many contributions to the participating athletes and countries and also to the hosting city and the university. These contributions may be summarized as follows:

- World university sports competitions bring the athletes of various countries together without any consideration of age, race, gender or ethnicity.
- Universities catch the chance to compete with each other in a friendly competition at an international level.
- The university, which will be the host for a world university competition and the city that the concerned university is located on, will have the chance to introduce them worldwide about such a professional scene.
- Universities gain the chance to have their own sports and other supporting facilities be renovated or newly constructed with the funds of government and contributions of related associations which they cannot provide with their own capabilities.
- Provision of highly qualified sports facilities arouse great interest for both university students and public users, as they soon will have important spin-offs for the university and the entire city. Because they are to fill a social function afterwards.
- New installations related with variety of sports activities contribute to the organizations of further multi-sports competitions or other social events that will be held within the city.
Organization of worldwide sports competitions collects a great numbers of athletes, officials and spectators at an international level, which contributes, to an effective tourist circulation through the event site.

(http://www.ulb.ac.be/assoc/fisu, 11.10.1999)

World University Sports Competitions are especially examined within the research because it is believed to have a useful contribution to the achievement of adequate sport facilities in campus areas. Structural and spatial requirements that are required in these games may be accepted as a guide in determining the key concepts for planning and programming of sports facilities in Campus Universities, and the design of the case study area as well.

**Definition of FISU and its Functions**

The complete name of FISU is; International University Sports Federation. It is the organization that undertakes the supervision of World University Sport Events. FISU is composed of a General Assembly, which includes the members of 113 National University Sports Federations and acts as a main body. It was formed within university institutions in order to promote sporting values and encourage sporting practice in harmony with, and complementary to the university spirit. To promote sporting values means encouraging friendship, fraternity, fair-play, integrity, co-operation and application amongst students who will one day hold responsibilities in many study fields. Promoting sporting values and sporting practice also means giving a new dimension to the university spirit in study, research, and discipline, through the strong affirmation of the full humanist development of the individual and of the society at large. This development is not just intellectual, but also moral and physical.

A university student should be able to practice sport at his own chosen level within his university. Even if he reaches a high level of competition in his sport, the student will not look upon these competitions as an end in themselves, but as an element in the development of his own potential for his maturity, in the same way as he prepares for his professional life.

With its international dimension, FISU brings together the university community in the wider sense, necessarily removing the conflicts, which divide countries and peoples, to
achieve an academic excellence and professional sport competitions arena. The World University Sporting Movement also aims to become a powerful channel of communication for bringing together the various communities who diversify in many respects such as culture, economy, politics and social structure.

In order to promote its philosophy and to fulfill its mission, FISU generally concentrates on the following objectives:

- to bring together the university student athletes of the world to a friendly competitive organization,
- to ensure the quality of their sports events by entrusting the members of its commissions to guarantee that specifications and the regulations are properly sent to the organizers,
- to control the adequate provision of required facilities in cities which will act as the host city in World University Competitions,
- to develop its respect within University and Sporting circles, to enhance its credibility, and that of the Sports Movement,
- to develop existing National Federations in the various countries and to support them in their dealings with Government, to contribute for strengthening the links between universities, the Sports Movement and the students,
- to approach political and economic authorities and the media to obtain new means of financing for developing University Sports in all countries,
- to identify a sports development program through education, and establish a set of moral standards with evolution of contemporary sport and education issues throughout the world.

FISU’s main responsibility is the supervision of both Universiades and the World University Championships under the philosophy of promoting World University Sports Competitions. Both Universiades and World University Championships are organised in different periods at different countries. These two events are different types of organizations in terms of the types of activities and nature of competitions included within their programs. (http://www.universiade21.org.cn, 11.10.1999)

The Universiades: The name; "Universiade," comes from the combination of "university" and "Olympiad" , which means Olympic games for students. It is an
International Sports Competition for university students that take place every two years in odd-numbered years. It is hold on as two events, Winter Universiades and Summer Universiades, which are organized in two years and consecutively between each other in different cities. The time of the year they are held depends on the hemisphere where the organizing country is situated. The Universiade is recognized by sportsmen and women throughout the world as one of the most important competitions at an international level, even the second in importance after the Olympic games. Many entrants in the Olympic games participated in Universiades organized by FISU. (See Tables 3.2 and 3.3) Many aspects of Olympic Games are featured in University Games: The Universiade Village, sport conferences and cultural festivals that take place in the Olympic Games while the games are in progress, are also recognized in Universiades. The protocol system for both events is very similar.

<table>
<thead>
<tr>
<th>YEAR</th>
<th>CITY</th>
<th>COUNTRY</th>
<th>NUMBER OF COUNTRIES</th>
<th>NUMBER OF COMPETITORS</th>
<th>NUMBER OF SPORTS</th>
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Table 3.2: Comparison of Universiades with Olympic Games

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<tr>
<th>YEAR</th>
<th>CITY</th>
<th>COUNTRY</th>
<th>NUMBER OF COUNTRIES</th>
<th>NUMBER OF COMPETITORS</th>
<th>NUMBER OF SPORTS</th>
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Table 3.3: Comparison of Universiades with Olympic Games

The Summer Universiade consists of ten compulsory sports and up to three optional sports chosen by the host country, last gathered in 1997, in Sicily, Italy, a record 5280 participants from 124 countries. The ten compulsory events are stated as:

- Athletics
- Basketball
The Winter Universiade consists of 6 compulsory sports and one or two optional sports also chosen by the host country, and gathered at its last edition of January, 1998, in the Poprad-Tatry region, in Slovakia, a record 1412 participants from 40 countries. The six compulsory events are stated as:

- Alpine Skiing
- Nordic Skiing
- Short-Track Speed Skating
- Figure Skating
- Biathlon

**The World University Championships:** The spreading of the university sport in the world created a new series of meetings and competitions to complete the program of the Universiade. FISU supports the competitions, which represent the continuity of university sport. World University Championships are the other important sports events of FISU. It is an organization, which can be held in a host country for a required specific sports type. The types which can be chosen for a championship are; judo, cycling, handball, table tennis, rowing, golf, taekwondo, horse riding, karate, futsal, windsurfing, badminton, chess, squash, triathlon, canoe, skiing, archery and wrestling.

(http://www.ulb.ac.be/assoc/fisu, 13.6.1999)

**Recent Experiences of FISU until Today:**

Tradition of university sports, in fact, trace backs to the roots of sports activities in Greek gymnasiums in academic education. However, previous attempts related with
organizations through university sports will be examined from the beginning of the 19th century, within the concept of this study.

FISU was born in 1949 as an effective mediator for international university sports movement. It is completely different from the previous unions in terms of its devotion and ambition in organization of valuable events between universities. It has put its aims and objectives around the creation of a human friendship based on understanding and trust, at its foundation and are still defending them today. FISU brought a reunification through the sports movement and collected the separate foundations under the roof of itself.

<table>
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<tr>
<th>YEAR</th>
<th>CITY</th>
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Table 3.4: The evolution of Universiades since 1959.

Recent developments of FISU are especially given within this research because it is necessary to examine how the event of Universiades developed in time and to which
level the scope of the event became today. The following table explains the considerable expansion of participation to Universiade despite the fluctuations in particular years.

Within the recent organizations of FISU, especially the developments related with the Summer Universiades are described, because the experienced in world university competitions are best observed in Summer Universiades. Winter Universiades and other events are more special organizations when contrasted with Summer Universiades. For example special environmental conditions are required for winter games, so they may be organized only in specific cities with limited competitive events. Similarly, the Championships are organized in one specific program as well. However, Summer Universiades includes various types of sports events and well-organized spatial requirements. These requirements are to be examined, because the case study of a probable organization for Summer Universiade in İzmir will be evaluated in terms of the recent experiences of Summer Universiades.


3.6.2 Spatial Requirements Related With Sports Facilities

The most important part of responsibilities of the candidates is the provision of certain adequate sports facilities partially within the university and within the city. There are specific requirements related with the functioning of the competitions during the world university competitions. To be a candidate for a Summer Universiade, first of all, the basic requirements of the compulsory sports should be presented effectively. These requirements considering the nature of each compulsory game are determined by FISU as follows:

- **Athletics**: should be conditioned according to the IAAF regulations. There should be provided an 8-lined running track, which may be convertible to 10 lines for 100 meters speed track. Official athletics equipment and a twelve-digit electronic scoreboard are needed. Track should be designed according to a spectator capacity of 25,000.

- **Basketball**: should be conditioned according to FIBA regulations. There should be provided 6 halls for competitions with official standards and 6 additional halls for training of competing teams with electronic scoreboards. Competitive halls are to be covered with parquet only. The halls, which will witness the
elimination competitions, should include a capacity of 1000 spectators and the
hall, which will witness for the final game should include a capacity of 5000
spectators.

- **Fencing**: should be held on an indoor sports hall with a capacity of minimum
500 spectator seats for final competitions. There should be provided totally 12
tracks for competitions separated from training tracks and competitive tracks
should be designed in same characteristics. Each track needs its own scoreboard.

- **Football**: should be held on 4 fields designed according to FIFA regulations
with same characteristics. One of these fields should have a seating capacity of
10000 for half-final and final matches. There should also be provided 8 training
fields with a turf ground if possible.

- **Gymnastics**: should be held on a suitable saloon having an accordance with FIG
regulations and with the dimensional frame of 70m.x40m.x15m.. There should
be inserted a podium of 64m. to 34m., suitable technical equipment and a full-
electronic scoreboard. In addition to this, two halls for men’s training and one
hall for women’s training should be provided including the necessary
equipment. The main hall should be designed according to a spectator capacity
of 4000.

- **Swimming**: should be provided on either an indoor or outdoor competitive pool
organized according to FINA regulations. The pool should be designed with a
length of 50m. including eight lanes and with a depth of 1.9m.. There is a need
for an additional training pool having a dimension of 25m. to 10m. and a depth
of 1.8m.. Competitive pool should have a capacity of 2000 spectator seats and a
twelve-digit electronic scoreboard.

- **Diving**: should be conditioned according to FINA regulations. Suitable diving
trampolines and platforms should be provided on a pool having a dimension of
12m. to 15m. and a depth of 5m.. Height of the platform should be 10m. with an
outline of 5m. to 7m. Trampolines should be 1m and 3m. in height with the
outlines of 2m. to 3m. and 2m. to 5m. respectively. Pool should have a capacity
of minimum 1000 spectator seats and a twelve-digit scoreboard.

**Water Polo**: should be provided on a suitable indoor or outdoor pool, which is
designed according to FINA regulations. Outline of the game is to be determined
on a dimension of 30m. to 20m. and a depth of 2m. with allowing ample spaces
of 1m. on each side and 0.5 behind the goal-post. Competition pool should have a capacity of minimum 1000 spectator seats. There is also a need for training pool having a dimension of 25m. to 12m. and a depth of 1.8m.

- **Tennis:** should be held on minimum 16 courts, 4 of which should be designed indoors in the case of probable rainy weather. If possible, all of the courts are to be designed with spectator seats, if not possible, two of them should have seats. These two courts should have a spectator capacity of minimum 3000 and 500 respectively. The courts need to be enlightened according to international regulations.

- **Volleyball:** should be conditioned according to FIVB regulations. There should be provided 6 competitive halls with a dimensional frame of 34m.x19m.x12.5m., and nearby, adequate training halls. Competition halls should be designed properly that there won’t be any obstacles on the distance of 40m.x25m.x12.5m., and each of them should be designed in the same manner with electronic scoreboards. One of the halls should include a capacity of 5000 spectators for final games and the other should include a capacity of 1000 spectators.


Above requirements are much more important within the contents of the research because the aim of this research is to define the major planning and design responses of sports facilities which are to be constructed for the aim of: serving on world university sports competitions. The subject is directly related with spatial organizations and is encouraged with a case study at the final. So, above requirements are the major clues to guide to a new sports facilities project in terms of spatial organization and design process.

**THE EXAMPLE OF ‘PALMA UNIVERSIADE, 1999’:**

Universiade of 1999 was an important organization in history because it was the 50th anniversary of foundation of FISU. Palma Universiade is especially discussed as an example, because it was the last Universiade witnessed and considerably a large organization as to its special reason.
Palma witnessed 12000 participants including athletes, officials, journalists and guests from 130 countries in Universiade of 1999. 12 sport disciplines were taken into program in the Universiade: 10 compulsory sports and two additional sports, which were sailing and judo. Existing sports facilities were renewed and new facilities were constructed within the city. University of Balaeric Islands contributed to the organization with its available facilities. The facilities provided for the competitions on 12 sports disciplines can be described as follows:

- **Swimming and Diving**: were held in Son Hugo Aquatic Complex which has an open-air swimming pool of 50m.x25m.x2.1m., and an inside pool of the same size which can be divided into two pools of 25m.x25m. It was a real innovation that, bottom of the indoor pool consisted of an adaptable platform, which allowed a depth of 8m. inside the pool for diving competitions. The fixed seating capacity was determined as 2000, which could be increased to 4000 with mobile seats.

- **Tennis**: took place in Nova E. Tennis Club which has ten clay courts, a central court and an additional new court. The club also has an open-air swimming pool, four dressing rooms, medical service unit and a massage room. The central court has a seating capacity of 1000 and the additional court has a seating capacity of 400.

- **Volleyball**: was held in four covered sports centers, which all comply with the requisites established for international matches and have a perimeter of 40m.x 25m. with a supported height of more than 12m. Competitions were distributed to these four complexes according to whether they are women’s event, men’s event or final competition. Capacities of facilities are; Galatzò complex with 1000 seats, Sant Joseph complex with 800 seats, Son Moix complex with 5000 seats and the complex of Balaeric Islands University with 1500 seats.

- **Gymnastics**: were held in Principes E. Sports Complex, including a covered pavilion with 12m high and an area of 60m.x40m. Judo competitions, which were one of the two optional sports, also took place in this complex. The fixed capacity of the complex was 2000, which were able to increased to 4000 by mobile seats. There was an additional training area of 50m.x30m. with a height of 8m. located 10meters far from the main complex. Son Hugo was also used for some competitions in gymnastics.
• **Athletic**: events took place in the Son Moix Municipal Stadium next to the Son Moix Sports Complex within the city. The stadium has a synthetic 400m. track with eight lanes and ten lanes along the finishing straight. It is also available for division of the land for different athletic events and able to hold 30000 spectators with fixed seats.

• **Football**: competitions had four scenarios planned within the city. Four different stadia were used, all of which comply with the technical regulations for holding international matches. The four grounds have the basic facilities and similar features for staging the matches. Capacities of them were; 3000, 3000, 1000 and 1000 seats.

• **Fencing**: took place at FICOBASA Pavilion within the city, which has an area of more than 5000m² and has all the services needed for the requirements. 18 pistes of 18m. to 2m. were installed and six more pistes were separated for training as well as an elevated piste for the finals. Seats were distributed to initial pistes and the final piste by 700 and 1000 seats respectively.

• **Basketball**: competitions were distributed to five different sports complexes, all of which comply with the technical regulations for holding international matches. They have an area of 45m.x27m. with a required height of 8m.. Final matches took place in Son Moix Sports Complex, which had a capacity of 5000 fixed seats. The matches were held in remaining four, which have capacities of 1500, 1500, 3500 and 2000 fixed seats.

• **Waterpolo**: was held in three different places. Preliminary matches took place in two complexes; the first of which was Principes E. Sports Complex with a pool area of 50m.x25m. and the second one was the swimming complex in B.A. University Campus with an area of 33m.x20m.. The final matches were held in Son Hugo Aquatic Complex in which swimming and diving competitions took place. The fist complex had a capacity of 1000, the universities’ swimming complex had 800 and the last one had a capacity of 4000 seats.

Evaluation of Palma Universiade:

Generally, competitions in Universiades are many in numbers and minimum on 11 sport types. In addition to the variation, competitions should also finish in ten days. In such a situation, they should be inevitably distributed to facilities, which have the same characteristics. As seen from the functioning of sports program, all the competitions of 12 sports disciplines that took place in Universiade of 1999 were distributed among the facilities within the city and partially within the university.

Palma didn’t witness any international sports events up to 1999. This was a disadvantage for the city to be accepted as the host for Universiade, however, its candidature is accepted because, the three major emblematic fixtures guaranteed, at the first impression, to host effectively for the Universiade. These three fixtures were Son Moix Stadium, the Son Hugo Complex and B.I. University Sports Complex. It means that the facility within the university had a significant contribution to the organization the event. As the city was chosen to be the host, B.I. University has taken the advantage of further opportunities of the organization. Before the Universiade, the university had a multi-sports hall. In addition to it; a 30m. covered swimming pool, a synthetic football field and a series of tennis and basketball courts have been constructed within the campus of the University. These would be a heritage to ordinary university students and the other users afterwards. It is obviously seen that, with its particular contribution to Universiades’ events, B.I. University has attained a specific prestige as well as variety of newly constructed sports facilities. It means that, participation of the University gave it the opportunity of having been recognized by other nations’ universities at an international level. If it did not have such kind of facilities, all of which comply with the technical regulations for holding international matches, University of Balaeric Islands wouldn’t be able to introduce itself at a worldwide event.

Universiade of 1999 is evaluated in terms of the process experienced by the contributing university rather that the city itself. Because the major argument of this sub-topic is: what is required from a university in order to contribute to an international sports competition. In this case, University of Balaeric Islands has been a useful example in terms of guiding the case study of IZTECH campus area.
Chapter 4

MAIN PLANNING PRINCIPLES FOR SPORT FACILITIES

Certain principles, procedures and features should be considered in design and construction of the areas intended for sports facilities in campus areas that will serve for great amount of users and probable university competitions. In order to provide such a facility area, a hierarchical planning guideline should be followed from the major decisions to minor construction details. This will able to be achieved by a comprehensive planning of overall facilities.

![Diagram](image)

Figure 4.1: Overall considerations in planning process
Source: Dixon, C., 1991, p :122

The instructing guideline for planning should begin with the suitable site selection and continue with the supporting design criteria for the provision of effective activity fields and courts. The emerging concepts that should be included in planning guideline for sport facilities area in a campus can be stated as follows:

4.1. Site selection:

Provision of sports facilities is mainly related with the purposed population of all users and their requirements. Demand that will be created by the students and other visitors determines which type of facilities might be included and what amount of area and environmental conditions are needed. The site, that is to be selected for such kind of
facilities, need to be searched after the spatial requirements are determined. Selection of an appropriate site is the most important and the initial principle in planning of sports facilities.

There are certain specific situations that should be included in site selection process:

- It should be examined that what constitutes land, usable for built facilities,
- Where detailed requirements of a development site are to worked out related to the characteristics of the local environment (e.g., an area of high landscape quality or etc)
- Open space required for the purpose is to be definitely calculated,
- Where land for a large new sports facility is needed and where location requirements in respect of adjoining uses and other siting matters should be specified,
- Potentials and restrictions of land for a successful implementation of sports provision should be evaluated,
- Requirements for built sport facilities, drainage and landscaping within the purposed site is to be considered,
- Area that is to be selected, should be considered in terms of the relationship between sport, natural conservation, landscape protection and similar objectives in order to evaluate its suitability,
- Area that is to be selected should have its own plan and have an adequate relationship with the general campus plan in terms of location and access. (See Figure 4.2)

(John, G. & Campbell, K., 1993, v:1, p:19)

In site selection for sport facilities, which will be provided for public uses, general attempt is to distribute the activity areas properly within the campus in order to achieve full of utilization by students or to collect the activities on a convenient site to serve a compact activity area.

These type of facilities need to planned on available lands because they are expected to include various types of activities and supporting units close to each other. They should not be disturbed by circulation and adjoining uses. In these cases, these types of facilities mostly take place off the city.
4.1.1. Location:

The concept of the study mainly concentrates on the facilities in universities’ campus areas, which are designed, professionally for large events. In fact, these types of facilities can only be considered within big university campuses because they require a considerable ample space. Location of facilities in campus areas should be evaluated in two levels, the location of the campus within the city and the location of facilities within campus.

Location of a campus, which will be the host for competitive events, is an important concept in terms of including required facilities and related supporting units and organizing the whole utilities for the welfare of participants. Citywide or countrywide competitive events give universities many responses such as provision of staying, catering, training and transportation of participants. Because of these reasons, relationship between the city and campus should clearly be identified.
Location of sports facility is directly related with the aim and frequency of use and the user potential. In order to determine the best location for sport facilities that will be constructed and developed in a campus site, locations of the other uses in the campus site should be examined and the relations between those uses such as educational units, dormitories, social facilities and etc. should be clearly established. The area should be selected considering the general layout of the campus plan and accessibility considerations. As mentioned in previous chapter, there are different types of campus layout, which organizes the functional units with different combinations. Therefore, in site selection process of designing sports facilities, an important concept is how to insert facilities in order to fit to the accepted organization of the campus.

(See Figures from 4.3. to 4.8)
Figure 4.5: Location of sports facilities within a centralized organization
Source: Benli, A., 1998, p: 100

Figure 4.6: Location of sports facilities within a molecular organization
Source: Benli, A., 1998, p: 100

Figure 4.7: Location of sports facilities within a horizontal grouping organization
There are also other factors to be considered in finding best location. Facility areas need to be inserted on a proper place to achieve a convenient and safe environment for a comfortable play. It should not be disturbed with transportation modes or surrounding uses. However it should allow easy ingress and egress through the other uses related to site. If possible, they could be centrally located, collected further from the educational units or distributed among the campus. The important concept is to keep the distance minimum between the facility area with dormitories and other social units because the most frequent flow of students is seen from and through these units.

Further from the competitive events, sports facilities in campus areas are most common uses of ordinary students of universities in educational life. They are the places from where students support in time they separated for leisure, so that, the utilization from the facilities should be maximized. Selection of the most convenient location within the whole campus site will inevitably ease the access of students from other uses like educational units, dormitories and etc.

4.1.2. Accessibility;

As the concept of study concentrates on the facilities in universities concerned especially with international organizations, factor of accessibility will be defined in terms of location of concerned university within the city.
In the university campuses that are located at city centers, in other words, at densely constructed sites, there is a limited chance to select a suitable place for sports facilities. Because the boundaries of the campus area is limited with the outstanding frame of constructed environment, sport facilities inevitably will take place under the given opportunities of the campus area. In any case, consideration of accessibility to the campus area or the distances between different uses within the campus will not be so crucial in such a framework. There will be a little or no chance to question the suitable natural conditions or the best accessible place in relation to other uses that take place within the campus boundaries. The concepts of natural conditions and accessibility will be the same with the situation that the whole campus faces of. Similar to that, the establishment of the relations between the educational units and the sports facilities will not need to be sensitively considered in the general layout of the campus. Because the distances will be in human scale and there will be no transportation consideration to ease access.

However, in contrast with inner city campuses, off-city campuses require much more sensitive planning decisions in terms of their scale and increasing potential related to it. Off-city campuses generally spread on the lands those of which are located in the outskirts of cities. These kinds of campus areas have the opportunity of providing various types of sports facilities to students effectively. Sports facilities of university campuses, especially the ones that will be designed and constructed to serve for citywide or countrywide events and to be a scene for major sports competitions as well, should experience a clear feasibility work for convenience. In such a situation, accessibility to those campus areas will emerge as a real problem for the participators and the spectators.

First of all, the transportation facilities should be solved properly between the campus and the city layout. Planning should make easy for persons to reach the site where activities are carried on. In broad competitions related to universities, some of the activities may take place in different places other than the facility areas in campus itself. In such a case convenient access of participants and spectators should be presented between the campus and the other facility areas in the city. University competitions generate a large flow of participants, technical staff, spectators and media groups through the facilities located in campus area of the host university. For a comfortable
access, available transport modes should be occupied to transfer people coming from both inner-city and other cities or countries. For a university; to be a host for an international sports organization, facilities’ area should be supported by effective public transport modes and private transport to increase the visits to the area and frequency of usage. In addition to this frequency of transport modes should be convenient to keep the relationship active between the utilities in the city center and the campus. There should be easy access from airport as well as other transportation terminals to the area for foreign visitors.

In addition to provision of access to the facilities’ area from outer regions, inner circulation within the campus area is also an important factor to be considered. Access from other units to the sports facilities in the campus area should also be solved adequately. In special organizations, other social facilities are effectively used for the support of visitors. For example: dormitories, catering services, cultural units, laundries and other utilities serve for visitors to provide adequate conditions during the events. Comfortable circulation between these units is needed to increase efficiency of use of facilities. The typical solution for transportation within the whole campus is to generate a periodical ring circulation. There should be a main route and ring services should collect people from other units and distribute them to training fields and major activity areas in sports facilities site. Such a service will not only contribute to the organization of professional competitions and also help the functioning of ordinary circulation within the campus any time.

4.2. Natural and environmental conditions;

As another preliminary stage in planning of sports facilities, the relation of the layout of sport areas with the surrounding environment need to be established. ‘Because the relation between sport and the environment is not an ignorable factor but is an essential condition for sports practice, the element characterizing even the expectations and motivations of those practicing sport and wanting this experience to also be an occasion of healthy life in a pleasant environment.’ (Spaziosport, 1996, n: 2) In that case, sports facilities must be organized so as to respect the environment and guarantee its sustainable development.
Organization of sport areas help not only to designs of areas and volumes but especially in terms of recovering the identity of the place, its culture, the aesthetic value of landscape identity, the sense of living. ‘When we are talking about aesthetics of environment for sport, we are referring not to the single properties of single products or of more or less privileged areas, but it is rather an overall aesthetics based on the link between man, nature and environment.’ (Spaziosport, 1996, n:2)

In an era when people are becoming more conscious of the environmental impacts of modern life, interaction of pleasurable sport areas and environment helps to increase that awareness. Of course, sporting activities can sometimes create potential conflict with conservation of environment, but through an adequate planning and good management, disturbance will able to be minimized. Environmental sensibility should be considered for any kind of organization, especially for the ones that require expansion natural environment. If organized well, sport areas will promote the quality of the physical environment in many aspects:

- Sport, within itself; can be important instrument of sensitization to environmental subjects (energy saving, use of particular materials and etc.) according to what established and promoted.
- Sport, outside it, can develop a model planning and building facilities capable not only of safeguarding and providing the physical needs but improving the environment.

For cities; sport can certainly assume this task and carry it out in the various parts such as recovering the old sites, functionally and architecturally requalifying the marginal sites or outskirts. (Spaziosport, 1996, n: 2)

If the plan of a facility area and its relations with the related uses and the natural layout is absent, then it loses its potentialities of planning doctrine, from an environmental point of view, and becomes a simple construction project of standard necessities. That is to say, it will not be able to take the respects of the interested groups because of lack of environmental quality. Here is necessary to remind that the Olympic games of the year 2000 have been assigned to Sydney for the ecological quality of its plan. These kind of significant events, like Olympiads, seek for the places that fit the required conditions best. As understood from the given example; ‘Therefore, the great importance concerns
the evaluation of the environmental impacts of such great events and the relative utilities, but also the link between the environment, life quality and sports for all that also importing events can produce.’ (Spaziosport, 1996, n: 2)

In order to assure a satisfactory plan including the environmental sensibility as well as the overall related factors, the project area should be examined with its natural potentials and restrictions. Within the boundaries the adequate space and supporting equipment is to be surveyed. ‘Factors to be covered by the survey should include the existing grade or elevations, type and structure of soil, rock outcrops or ledges, water and drainage conditions, the size and type of existing natural landscape and other natural features that would effect the planning of the site. The important concepts also are the location and size of storm and sanitary sewers, water supply system, gas mains or electricity lines that will serve the area.’ (Butler, G., 1958, p: 5) Environmental insertion can only conceptually be isolated from the other planning aspects; since it is considerably influenced by them and in its turn influences them. It can be maintained that the planning quality of the sports area is the complex result of those balanced factors relating to all and each one of the aspects considered.

Further from the natural conditions, construction materials and systems must also establish a significant relationship with the built and natural surrounding environment. The sports facility is adequately inserted into the chosen environment, when a good architectural quality of work is associated to a good urbanistic quality of environmental planning.

As mentioned in this whole chapter, most of the planning decisions and their practices effect the physical environment surrounding the concerned area. These aspects may be grouped as below:

- **Methods of access and flow in infrastructures of public and private mobility;** a sports facility, especially a large one, where the problems of access and flow of users and spectators have not been completely solved, can imply serious problems of environmental compatibility due to traffic, parked cars, people concentration and such things.

- **Mobility inside the facility and area of the facility;** the mobility system of the area and facility is to be evaluated and adequately solved. Also in this case, the
environment can be damaged if the movement of spectators and the various users of structures is not opportunely solved. The number of users, here, is a critical point solving the system of mobility.

- **Dimensional and formal relationships between the various components and with the surrounding environment;** the importance of the planning choices relating to planimetric and volumetric dimensions, the formal relationships with the surrounding environment are absolutely evident. This subject is complex and cannot be solved by regulative and simply technical sources but to the complex rules of architectural planning.

- **The safety of users;** creation of secure environment inside and the close surroundings offer the participants and the spectators a comfortable scene. Such a comfort will inevitably achieved by certain design criteria.

- **The choice of materials, building techniques, colors and superficial maintenance;** using construction materials and techniques is necessary for expressing this planning content, and solving purely functional exigencies. The critical point is the matter of identifying the architectural value of the intervention, through: typological, dimensional, relational choices and through the shapes, materials, technology, colors, etc...chosen.

- **Facility planning and technological choices relating to lighting, water treatment, waste elimination and environmental conditions;** a lighting system for large outdoor facilities can favor glare phenomena conditioning the relationship with the surrounding area. Technical systems of sound diffusion or inadequate systems acoustic isolation can produce significant consequences on the surrounding environment and on the people living in it. Also an air and water treatment systems can have repercussions in the relationship with the environment, in particular concerning the risks of deriving from eliminating polluted water and fumes.

- **Manageability;** efficient management and the maintenance regulate the instructions for use and contributes to continuance of future quality of the environment despite the frequency of the action on the related site. (Spaziosport, 1996, n: 2)
Obviously, the problems depend on the type of facility analyzed; for each facility it is necessary to identify particular conditions of environmental impact to be gradually adequately solved.

4.3. Planning Team;

Planning an area for sports facilities is a professional workshop and a high degree of technical skill because planning decisions and further design considerations occur at a multi-level scene including physical, social, economic and technical concepts. 'Planning principles must take into account which of the activities will take place; the ones who will benefit from the activities at what times of the day, week or year; what the use of frequency is; what the staffing needs will be; and how the costs of operation will be met.' (Shepard, G. & Jamerson, R., 1953, p:95) So, variety of competent people from different kinds of professions should involve in determining the solutions of above considerations. These actors take part in the whole process as to their interests.

Administrators and trainers are needed to inform the facility organizers in terms of the needed functions, their physical and social characteristics and the necessary relations between them. They should put the initial criteria properly, to achieve fullest possible use. If the area is to be planned for professional competitions, then, the data gathered from those interested groups gain additional significance. Planners and architects are responsible from the preparation of acceptable project according to the given potentials and constructions. Moreover, engineers are needed for the provision of drainage and construction of both indoor and outdoor facilities and their physical outline. As the environmental plan and the project of the facility area are applied, it's efficient management and maintenance come into picture. The plan should sensitively indicate all play areas, game courts, pools, indoor complexes as well as the pedestrian and vehicular circulation networks, additional services, existing natural features and the proposed landscape. While indicating these, the plan should also be prepared as to seek for the cost effectiveness of construction and maintenance. In such a broad scheme, an efficient workshop of different professions is inevitable to achieve the best solution.

The whole process is experienced step by step: first of all, the managers, administrators, coaches and physical education trainers determine the necessities for functional
usability and the standards that are to be considered in planning process. The results are transferred to the environmental planners, architects and landscape architects to guide them in designation of sports facilities and furnish the technical skills. They should understand clearly what specific activity elements are to be planned for it, what service radius it is to have and what population will be using it. They should also examine the surrounding area to ensure that plans are compatible with the environment, climatic factors and the accessibility considerations. Under these factors, they primarily prepare a detailed map of the area including all the topological survey and natural affections. The information about the facilities are connected with the environmental conditions, existing natural resources and the estimates of demand projections to achieve the final plan.

After the general plan and the detailed project have been generated, engineers and the technical staff start to work on the construction of the facility places. Parallel to this, financial program for the facility is generated by economists in terms of both the amount of money that can be spent to develop it in the present and what might be spent in later construction. It is also determined what kinds of staffing works will be put, so that the plans provide the most efficient use and for effective control.' (Kraus,R.&Curtis,J., 1982, p:126) Process of construction should be controlled by the planning team in every stage. The effectiveness of the control over the provision of facility areas contributes to the easiness of maintenance and repair conditions.

As programming of those facilities reflect the needs and wishes of all future users, the process should involve them also in data gathering, needs identification, and decision making processes. It is required that when a planning team is given the assignment of organizing such kind of facility, they must consult directly with the interested groups of people and submit their proposed designs at various stages for their approval.' (Kraus,R.&Curtis,J., 1982, p:120)

4.4. Basic User Requirements;

User requirements are the necessary conditions for the individuals or the groups to act in sporting activities effectively. These requirements define the basic features that the space allowed for the related purpose should carry on. In other words, they are the
necessities or standard services that should be included in facility areas. So that, the sport facilities whatever the type of group will benefit from, should permit the fullest possible utilization with the overall including.

Within this concept, type of the potential users should be defined first. Because user expectations from a social facility change according to age, sex, occupation and personal desires. The basic requirements of the participants related with sports facilities, in general, can be classified as follows:

- **Physiological needs**: are the basic human requirements such as playing, resting, cleaning, getting prepared and suffering from air and water, expected from the physical environment either it is outdoor or indoor.
- **Safety**: is the necessary condition for participants and spectators expected from the activity areas for a secure utilization.
- **Social needs**: are the gathering and interacting request of participants while they are interested in sports. It is especially a necessity for group sports rather than individual sports, however, sports facilities, inevitably, should serve for an effective social interaction in terms of supporting services such as dressing and cleaning facilities, catering areas, exercise fields and etc.
- **Personal needs**: are desires of the individuals to reflect their own capabilities and successes in their favorite sports. Sport facilities, especially the ones designed for professional playing events, are the only suitable places that players may benefit from and show, their capabilities on a computational level.
- **Acting needs**: are the needs of individuals to experience their physical performances and obtain the desired maturity and satisfaction. (Erdogan, M., 1986, p:24)

When above requirements are evaluated in terms of the interrelations between requirements, necessities and standards; the results will determine the basic standards in organization of spaces allocated for sports activities and supplementary services. Furthermore those requirements are the main issues, which affect the design and construction process of sports facilities both in social and physical terms.
All of the functional units that should be provided in activity areas can be collected in three major groups with reference to above requirements:

1- **Basic functions;** are the main activity areas such as field, court or track related with the type of sport. Collection of all the basic functions including; both competitive and recreational courts as well as exercise areas, create the whole facility area.

2- **Additional functions;** are the units, which do not affect the continuity of the basic functions when they are ignored in programming of the facility site. Management units, spectator seats, training halls and other social gathering units are accepted as additional functions. To make clear, indoor sport saloons can be given as an example: If those units are separated from the main playing areas, continuity of the game will not be disturbed.

3- **Technical and service functions;** are the units generated in support of the basic functions. Cleaning, repairing and heating, water supply and other infrastructure services are the technical units. Units that directly serve for users such as, dressing rooms, toilets, shower cabinets, emergency rooms and so far are the service units. Both technical and service units should be provided in activity areas in order to maximize comfort and the efficiency of use. (Erdoğan, M., 1986, p:24)

Units that refer to technical and service functions are always the same, whatever the major aim of the use of activity areas is. However, the units that are included in basic and additional functions may change between each other, according to the type of use. For example; if a facility is designed for professional competitions, then, most of the spectator seats provided for different play fields are accepted as basic functions, but if the area is designed only for recreational purposes, then, spectator seats may be included in additional functions.

Not only do the basic user requirements determine different functional units, but also generate the factors to be taken into consideration in design process of sports facilities. ‘Obtaining the list of requirements, before the construction of facilities, give planners and developers an indication of the full range of infrastructure and services likely to be required as a result of their proposals.’ (John, G. & Campbell, K., 1993, v: 1, p: 19)
general terms, the emerging factors from basic requirements, which will guide for initial planning, are:

- The adequate spaces for different types of activities,
- True dimensions for areas and necessary equipment encouraging competitive games,
- Multi-purpose courts and fields for maximization of use,
- Suitable surface covering for courts and fields whether they serve for outdoor sports or indoor sports,
- Provision of portable sports equipment for different activities on same courts and fields,
- Sufficient storage areas for facilities’ equipment,
- Provision of safe use,
- Air ventilation, heating and lighting considerations for facility areas.
- Designation of suitable areas for resting, cleaning and dressing of users for full of satisfaction.
- Provision of social facilities to participants in evaluating their breaks between the activity periods and interacting with other users.
- Effective management units and technical staff for maintenance to obtain fullest satisfaction for users.

Above factors, generating from basic user requirements can be enlarged according to the scope of proposed facilities and to demand that will be created by the potential users. Those factors will be explained in detail within the following chapter as design considerations.

4.5. Types of Activity Places;

The other concept, that is to be considered in planning sports facilities, is which types of activities are to be included within the program of facilities. Provision of essential areas and activities should clearly be determined according to users’ requirements. For such a supply, the questions of what specific program of facilities will be planned, what service radius it will have and what population of interested group and other users will support from. ‘Major of primary features which make possible the activities that are in greatest demand need to be planned first; minor or incidental features should receive secondary
consideration in the allocation of space or locations on the area which is separated for sports facilities.’ (Butler, G.D., 1958, p:5)

While programming the activity areas to be included, initially, space requirements should be considered distinctly. Adequate space for the facilities will able to be provided by understanding the spatial characteristics of proposed facilities. ‘In order to assure satisfactory play; equipment, game courts, playing fields and other features must be organized on ample space.’ (Butler, G.D., 1958, p:6) Further than the satisfactory play, the spaces required for facilities should permit any kind of contesting game.

The concept of study especially concentrates on facilities, which are proposed being organized within universities’ campus areas. For planning of sports facilities in campus areas, firstly, requirements of students, secondly, expectations of other probable users should be examined within the potentials and the restrictions of the campus site. It’s almost impossible to generate radical decisions about organizations of those kinds of facilities for the universities, which have already developed. However, newly developing campus areas need to be planned with reference to overall future needs related with social activities. For example, if there is an attempt in supervision and construction of sports facilities within a newly developed or developing university campus, future possibilities of sports competitions are better to be taken into consideration.

Sports facilities in universities are inevitably different from the ones in the schools before high education in terms of scale, frequency of use, variation in activities for differentiating demand and ongoing opportunities. Time separated for sports activities is relatively high in campus life especially for the ones who stay in universities’ dormitories. Furthermore, specialization in favorite sports and participation in competitive level are high in universities. Because of these factors, provision and planning of sport facilities should be programmed much more sensitively in universities.

Especially in universities, which are developed on large sites, all the natural potential of the areas should be employed to maximize the use of participants from various kinds of sports that require specific courts or fields. Furthermore, the climatic conditions related
with the seasons should also be considered in provision of sports activities. Participants require supporting from the sports facilities that they are interested in, whenever they want. Full of satisfaction will be achieved by effective organization of both outdoor and indoor facilities. It is also needed to collect variety of activities on the same available land with spatial conversions in order to use the area efficiently. In general, big university campuses have the opportunity to include both indoor and outdoor sports facilities with their spatial capabilities.

The most common sports that university students are interested in, are football, basketball, volleyball, handball, archery, baseball, softball and tennis from field and court games and gymnastics and defense games from saloon sports and swimming as well. These sports are also the common competitive sports that may take place in competitive organizations between universities. Except for gymnastics and defense games, most of the games may be played on outdoor and indoor areas according to climatic conditions. Related with this situation, the activities should better be provided both in indoor and outdoor areas. In general, necessary facilities that should be planned and constructed to present a scene for above activities on a campus area are a main gymnasium that may be arranged for athletic events and defense games, an indoor swimming pool, open fields and courts and a football field. Indoor gymnasium may be organized in the form of a large sports hall including a main hall for court games and an additional hall for athletic events. However those are the major requirements for campus areas, the universities’ program take the spatial organization of them into consideration in some level up to their capabilities.

4.6. Flexibility;

Determination of space and dimension requirements according to the existing user capacity and their related demands is not a completely accurate criterion in terms of the dynamic features of user requirements. It is hard to predict how user requirements will change over time in physical and mental terms, so that, architectural and environmental planning considerations should inevitably permit dynamic solutions to changing situations in the future.
The sportive functions and the related technical systems change rapidly in time. The functions that carry on the same performance conditions can take place on same spaces like the activities in an indoor sports hall. In this situation, the main objective should be to create a dynamic solution and to provide the continuity of accordance between the activities on such kind of areas.

Dynamic solution means, for an indoor sports hall for example, is taking the previous situation after a physical change in shape or, in other words, giving response to changing demands without experiencing any structural change. In fact, this is the flexibility that the proposed structure will show when it meets with a change in users’ demands. (Erdogan,M., 1986, p:26)

According to a study of Kizultan, flexibility is the determination of the change in order of a sports facility that will service for different types of activities, which may take place during the daytime or is accepted as the convertibility of the design materials and the equipment within the hall for different purposes.

Flexibility in sports facilities, which can be accepted as adaptability to changing conditions, especially in indoor ones, can be evaluated in two categories. These are adaptability to different uses and adaptability to constructional changes.

4.6.1. Adaptability to different uses:

It refers to the multi purpose sports halls and fields that service for different functions without any need in constructional change on the existing activity places. Here, the critical point is the determination of the suitable and the sufficient space requirement for the maximum number of events that are available to be held within the related area. ‘The areas planned according to this criteria will be competent for the users’ demand in terms of providing optimum flexibility.’ (Erdogan,M., 1986, p:26) In such a solution, various types of sports will able to held on the same particular field or court. Different sport activities, that may be kept together related with the construction size, is studied by English Sports Council and finally defined by the institution as follows:
<table>
<thead>
<tr>
<th>TYPE OF THE COMPLEX</th>
<th>COLLECTIVE SPORT ACTIVITIES</th>
<th>DIMENSION (m.)</th>
<th>AREA (msq)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Width</td>
<td>Length</td>
</tr>
<tr>
<td>Sports complex</td>
<td>• Basketball</td>
<td>18.3</td>
<td>36.6</td>
</tr>
<tr>
<td></td>
<td>• Volleyball</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Tennis</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Badminton</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Local sport complexes</td>
<td>32</td>
<td>36.6</td>
</tr>
<tr>
<td></td>
<td>• Professional competitions</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Boxing</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>• Judo</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Trampoline</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Fencing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Table tennis (4 tables)</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>• Rhythmic gymnastics</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Floor exercises</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Balancing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Rhythmic exercises</td>
<td>21.34</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>• Fencing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Saloon Croquet exercises</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Saloon shooting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Saloon archery</td>
<td>12</td>
<td>30.5</td>
</tr>
</tbody>
</table>

Table 4.1: Collective sport activities in a single sport complex
Source: Erdoğan, M., 1986, p:26

The main idea in collecting those events within the same boundaries, is converting the existing outline of the area into different forms with the help of new organizations or additional equipment, so that providing sufficient scenes for various types of sports activities. There are many examples of convertibility can be given to express the ways of making areas flexible. Some of these conversion methods that has been mentioned on 1. National Symposium of Sport Sciences, are; painting colored boundaries for collecting different games on the same ground such as volleyball, basketball and handball, supplying portable equipment or movable game tools such as bleachers, goal posts or crucibles, and dividing panels to create sub-areas such as hydraulic panels in swimming pools to control the depth.
If the related area separated for sports facilities is not flexible, then, there is no chance to convert it to different functions in itself. In this case, there may be other interference's to obtain the suitable areas and conditions for required activities. However, this can be achieved if the purposed area has adaptability to constructional changes.

4.6.2. Adaptability to constructional changes:

It refers to the interference's that are to be made on the existing activity places. If flexibility in use of the areas is not capable of serving the users' demand, constructional changes should be taken into consideration on the activity places. Planning of sports facilities, adaptable to constructional changes, should include variable construction and design elements, rather than having definite forms and materials for particular activities. This can be achieved with preliminary design considerations such as separating the technical and social services from the active playing saloon. (Erdoğan, M., 1986, p:26)

As user requirements are the main determinants in planning of sports facilities, the areas separated for the activities should be physically designed by considering the factors of accordance, changeability and expandability.

1- Changeability; is needed when existing demands require a functional change in existing use of the structure. In this case, changes in sports facilities refer to the changes that supports any kind of functional development or any change in form occurring as a result of increasing demand, and relatively, changeability refers to the organizations of the sportive functions as well as the expansion of the volume to serve for newly generating activities. (Erdoğan, M., 1986, p:26)

2- Expandability; comes into the picture when the existing structure is unable to support the peoples' needs because of increasing numbers of users, spectators and functions. However the previous plans are made by taking into account the future demands, it may become insufficient in space requirements. In such a situation, expandability is an inevitable intervention. In order to give way to expandability, construction of the facility should be made by considering the direction and limits of the expansion. Probability of expansion is bound to three main factors, which are stated as:

- Suitability of land to expansion
• Availability of proper infrastructure
• Accordance with architectural and environmental plans for horizontal expansion

(ERDOĞAN, M., 1986, p: 26)

Expandability mostly depends on the organization of the main circulation network with giving reference to probable future expansion. Not only with the additional units attached to main body, expandability, can also be experienced with independent units, which are in further connected to the main circulation network.
Chapter 5

DESIGN CRITERIA FOR SPORTS FACILITIES

In provision of effective sports facilities, certain design considerations should be met, after the major planning principles are clearly identified. Decisions that have been taken in planning process become the main expectations for design criteria such as the natural and environmental conditions of the selected site, basic requirements of probable users, proposed activities and frequency of use of the site. The most important design guidelines that directly affect the design stage of sports site is explained in this chapter according to the sequence of concern.

5.1. Landuse:

Landuse is the most important factor in planning and design of any function within a campus. Landuse refer to the overall considerations with the reserved land for the purpose such as site configuration, access position, natural and environmental characteristics of the surrounding site, and topographical, geological and natural conditions of the environment. The factors that are present in the selected area for plan proposal create the basic tresholds in project development. The space restricted with concerned tresholds should have a convenient layout with the predicted effects of those tresholds.

Available land and its location within the reserved area for expansion of the sports facilities are the most important factors in landuse consideration for the development of the project. Available land is directly usable land within the reserved area determined after the site analysis is made. If the activities are dispersed through the campus area, natural and environmental factors in landuse considerations become similar with the overall campus. However, if an excessive land is separated for sporting activities that will be designed as a functional zone, scope of the landuse considerations will expand inevitably. The reserved area for sport activities should have a convenient arrangement with the other related functions in campus. Access position of the reserved area should
be solved with reference to related functional uses in the campus. Whatever the distance is between the site and other functional districts, adequate circulation network is to be provided for the facilities’ area.

Natural potential and restrictions of the concerned site should also be successfully evaluated for the purposed project. Restrictions of the land should be tried to serve as potential in many respects. As a major, physical factor, topography is one of the site characteristic that may act both as a potential or restriction. Sporting activities require smooth surfaces for insertion of facilities in true dimensions. Project area should have a convenient slope that may allow suitable cut and fill processes for construction. Totally flat surfaces do not create any problem for insertion of facilities. However, if the reserved area has a considerably sloping surface, suitable grading is required to create flat surfaces. Leveled terraces will be a positive intervention for spatial organization of activity areas. Especially, outdoor fields and courts that are inserted to different leveled spaces may also contribute to obtain a dynamic space for the concerned site.

Other than topography, existing situation of watertable and presence of riverbeds are to be questioned. Unsuitable situation of watertables may be solved with certain drainage processes; unlikely presence of riverbeds may create more disadvantageous position for project development. Riverbeds may be processed by changing the directions of flow with canals for the adaptation of purposed facilities. The other effective way of reformation is to use the riverbeds as a potential for the concerned site. As sport activities have recreational nature, waterbeds may be used as a water element on extensive open areas on which the outdoor fields and courts are to be located. In this case, it contributes to the increasing the quality of the site.

Further from above factors, natural and environmental features of the site are also important for the analysis before determining the general layout. Location of differentiating functions will be determined according to the available spaces remaining after the determined thresholds. Facilities, especially the outdoor activity areas should take place at the site with reference to microclimatic conditions for adequate play. Similarly, existing landscape is a natural element to be included in generation of the layout. Natural
potential of the surrounding environment may be used to contribute to vegetation consideration.

5.2. Layout:

The general layout of the sporting site is determined according drawings of both characteristics of the site and general layout of the whole campus area. First of all, reserved area of a sports site generates from the spatial organisation of the functions within the campus. Spatial organization for differentiating functions may take various forms such as linear, centralized, decentralized or molecular as mentioned in previous chapters. Sports facilities act as a component of the whole pattern; however, it may offer a different spatial language in itself. As to the nature of activities and their orientation considerations, playing fields have a geometric clarity that requires a general orthogonal pattern basically. Addition of this geometric pattern to the whole campus pattern is probably the most critical factor in design process. The outer frame should be in relation with the outer campus in terms of circulation network and directional references. Especially vehicular circulation should be effectively connected to the present campus network. The major access nodes to the sports site for pedestrians should have the potential to collect the interested groups and the open spaces should have inviting characteristics to attract these groups to the site. Open spaces should take place on the main pedestrian routes to orient people to activities. Closed sport activities are better be located surroundingly in order to create the required level of enclosure for outdoor activities. Closed facilities are to be easily perceived from the pedestrian routes as well.

The relationship between the related outdoor activities and closed structures should be encouraged to direct people in terms of present activities on the site. Similarly, identical outdoor fields and courts are to be located close to each other and different activity areas are to be clearly separated by circulation network. This attempt will inform the interested groups about which activity is held where. It also contributes to a more adequate circulation at the inner parts of the sporting site. While collecting the identical fields or courts together, creation of identical open spaces and a monotonous view is to be avoided. As a positive attempt, open spaces may be graded to promote a dynamic structure within the site, whatever the topological position of the site is.
Briefly, in generating the layout for a sports site, the most important concern should be to obtain a dynamic and architecturally qualified structure with the given standardized activity areas. It should also be considered to establish the balance between the geometric forms of the activity site and the general settlement pattern of campus indoors and outdoors.

5.3. Circulation:

Circulation is probably the most effective factor in creating the general layout of the sports site. It determines the location of both outdoor and indoor activities in terms of their interrelations between each other and the relation of them with the excluding campus.

Circulation within the sports area should be concerned all levels of transportation. These levels may be evaluated as below:

**Vehicular Circulation:** should be designed parallel to the main circulation network. Site should have easy access from related functional zones of the campus. Vehicular entrance to the site should also be close to the main entrance of the campus in order to provide easy access for the people coming from outside of the campus. Vehicular circulation should be compatible for free flow of vehicles in crowded events, however they should not interfere with the pedestrian circulation. Dense vehicular circulation is not a required condition for outdoor playing fields and courts in terms of safety and people’s interaction. Vehicular network is preferred being designed as a combination of service roads and parking areas. Parking areas are as important as the circulation route, because facilities, which are designed for competitive sports and have considerable spectator capacities, need extensive car parks for probable competitions or other types of events. Car parks should be designed close to facilities in order to provide easy ingress and egress. Especially indoor ones should have service entrances close to buildings.

When considering vehicular circulation for sport facilities bus rings should also be provided to students within the campus. Bus ring that serve in campus areas should reach the sports site to easiness the students’ access and also to decrease the density of
vehicular circulation. Convenient bus stops should be inserted close to open and closed activity areas. Other than cars and buses, bicycle circulation is to be provided within the site. Students commonly use bicycles within the campus. So that bicycle routes through the activity areas and bicycle ranks should be provided.

**Pedestrian circulation:** is much more important than vehicular circulation in such a sports park in a campus area. Pedestrian network should combine all the related uses in the campus with the sporting area, because, walking is the most common transport mode in a human scale campus area. Sports facilities in campus areas are composed of many outdoor fields as well as indoor facilities. These open fields are the most common places for students' interaction. So that, pedestrian network is to be designed effectively between the activity areas. If possible, the site is better being designed free from traffic and with full pedestrian circulation. They should combine fields and courts together with the greenery but not interrupt them. Pedestrian routes should create certain gathering places within the site. These gathering places are especially needed in front of the competitive activity areas in order to provide convenient accumulation of spectators. Moreover, pedestrian network should include open refreshment areas near the playing areas for the comfort of participators. These areas are needed mainly to relax after play. If they are effectively located within the activity areas, people will have the chance to use them to watch the others' playing.

5.4. Functional Arrangements;

Functional arrangement is one of the most important factors in organising the spatial feature of a sports site. Functional arrangements for sports facilities may take various types that differ according to the area reserved for sport activities. The functional layout will be different when sports facilities are independently dispersed through the campus fields and when they are collected on certain piece of land. However, in general terms, functional arrangements in design process should be concerned in two levels, which are, firstly, the functional relationship between the sporting site and the whole campus area; secondly, the functional relations of purposed activities within the sporting site itself.
First of all, sporting areas should be thought as one of the major functions in the whole campus area. These areas inevitably have functional relations with some of the other uses within the campus in terms of access considerations. The site separated for sports facilities should be close to central campus in which majority of the students gather. Students should have chance to use sports facilities in their break time between lectures. Moreover, site should also be accessible for the students that stay in dormitories. Majority of the students are likely to utilize from sports areas at nights after lecture times, so that they won’t prefer to take a considerable distance from dormitories to act in sports activities. Unlike the location factors considered for central campus and the dormitories, sport areas are better be located far from educational facilities in order not to interrupt people because of probable noise.

The second level of functional arrangement is to be thought for each activity within the sporting site. There are various types of activity areas in the site separated for different sports. Some of these activities have interrelations each other. Especially outdoor and indoor facilities that are designed for similar purposes have functional relations. For example, changing and shower facilities and other types of supporting units generally take place in closed facilities. Students that will use outdoor fields are generally used to support from the utilities of indoor facilities. So that, related outdoor and indoor facilities should take place close to each other for convenient usage. If supporting utilities are to be provided independent from main closed facilities, then they should be located in convenient distance to outdoor facilities. Refreshment areas and catering units are also one of the other necessary functions in sporting areas. These areas may take place within the closed facilities or outdoors. If they are provided outdoors they should be designed in a place that have an optimum distance to majority of the outdoor fields and courts.

Functional arrangement is also an important concern for the architectural layout and form of closed facilities. All the functions that will take place in a closed facility should be designed with reference to inner circulation of users and spectators. Changing units, showers and lockers should have a direct relationship with outer access and the main playing area for the convenient circulation of participants. Similar to this, spectator gates, seats, gathering places and catering services should have a direct relationship between each other, for the convenient circulation of spectators.
5.5. Locations and Forms of Indoor Facilities:

Building locations create the physical pattern of a campus layout. They are designed with the neighbouring open spaces because they also give reference to their outdoor surrounding environs. Locations of buildings are generated from the functional arrangements designated for the whole campus area. Sporting activities as one of the common uses in a campus area are also to be considered within the decisions taken for the whole campus.

Sports facilities include closed structures as well. Locations of those indoor facilities are directly related with the area thought for them within the campus. If they will take separately within the campus structures independent from the outdoor sporting activities, each of them should be located on the central parts of the campus, to which the students will have easy access. Therefore, they are better be located close to central uses such as recreational buildings, catering services which have the potential to gather majority of the campus students. Sport buildings should also take easy access from vehicular network in terms of service considerations. They are to be close to distribution of collective transport modes such as bus rings. Location of indoor facilities should also refer to the physical pattern of surrounding buildings to some extent, however they don’t have to have the similar forms with the other educational buildings.

If the sporting activities, both indoors and outdoors, are proposed to be located together in a different place as a separate functional zone in the campus, then their locations should be evaluated according to their interrelations inbetween. Closed structures should take place near the related outdoor activities if there is a direct relationship in terms of use of the supporting uses. In determining the locations of indoor facilities, concept of closure is a potential factor to be concerned. Outdoor fields and courts are are extensive open spaces which need to be identified with surrounding environment as to scale considerations. Indoor sport facilities may be organized to enclose the extensive sport fields and courts to some extent in order to create well-defined subspaces for outdoor activities and emphasize the sportive identity of the site within the layout of the whole campus area. As well as emphasizing the function with location, physical form can also be used to give the similar impression related with the function.
As sport buildings have special functions, their forms are inevitably different from the other buildings in the campus as to the activities they include inside. Physical forms of the buildings are in a way, the reflections of their function. Solid forms of the buildings are generated according to the size of the activity areas and capacity of spectating facilities. Because the main functions that need considerable clear spaces are main activity areas and spectator seats. For example indoor pools should have a form that may include a pool in required dimensions and spectator seats around in required numbers. Similarly, indoor halls should have a form according to the official standards of included activities and again to the spectator seats in required numbers.

However, these solid forms may have variations in creating the outer physical structure. Certain architectural solutions may be drawn related to the facades and roof structures of the buildings. Those architectural interventions contribute to the perception of the building parallel to its function, so that they can easily be recognized from the approaching directions to the structure.

5.6. Orientation of Outdoor Facilities:

Games that are purposed to being provided within the campus should serve campus student in all seasons so that the optimum orientation is to be achieved to increase utilization. Orientation of outdoor sport fields and courts is an important criterion in terms of providing a comfortable play for the participants. The main determinant of the orientation of such areas is the nature of the play. Direction of the sunlight and glare is to be set according to the characteristics of the game, which will be held on the related area. Local weather conditions also affect the sensitivity for orienting the fields and courts, because it defines how often the courts and fields are in use within the whole seasons.

However, weather conditions and the nature of play, alone, are not capable of determining the location of those areas. 'Because many times it may not be possible to get the best orientation of the field because such factors as topography, shape of area and the location of other facilities may dictate some variations.'(John,G.&Campbell,K.,1993, v:1, p:169) As to all these considerations, the courts and fields should be oriented, firstly,
to give protection to players and second to spectators, with major consideration to the
players who need it most.

To achieve a suitable orientation for a comfortable play, the following effects of sunlight
and glare should be determined:

Direct-intensity sunlight; is received by straight looking upwards the sky. It extremely makes unable
to see the action for players on the field, so that it is the most important criteria to be avoided in solar orientation.

Indirect glare; may be created by atmospheric conditions such as cloudy, smoggy and humid air
which reduce direct intensity while increasing indirect glare as diffuse from the sky. This creates uncomfortable vision for both players and spectators.

Reflected glare; is associated with walls or paved surfaces that reflect the direct sunlight into people's eyes.

The nature of the related game; controls the design considerations of glare reducing. Many games have a direction of player concentration. For example; tennis as an eye-level game and upward straight-forward looking games extremely
depend on avoidance of direct and indirect glare. Volleyball additionally requires upward looking and avoidance of direct sunlight. On the other hand, the games that depend on downward looking require the avoidance of reflecting sunlight from the opposite end of the court’s surface.

**Surface conditions:** are sometimes effected by reception of direct sunlight. Both artificial and organic materials respond negatively to solar conditions. Turf and porous materials dry unevenly according to the coming sunlight. In the instance of turf, an uneven growth, blade texture, mixture and color may make uniform play impossible. Many porous surfaces depend on even moisture evaporation for uniform surface conditions. Nonporous surfaces with uniform surface drainage do not get affected by sun and shade variations. However, court surfaces often vary in color value from sun to shade, producing discontinuity to vision. These variations are to be considered before orienting the court in order to achieve a uniform play.

**Nonuniform reflectance:** may be created by game objects, such as balls, when is hit or thrown through a sun and shade atmosphere. This should be also avoided because human eye cannot adjust quickly enough the path of the game object in such an atmosphere.

Above solar conditions have variability according to different seasons. (See Figure 5.7) The critical factor, here, is to achieve the average values of all of those factors for comfortable play. During summer midday, the sun’s angle to earth is at an extreme elevation. Players may often look south at midday without direct glare. But they are faced with such glare during morning and afternoon in the northeast and northwest directions respectively. The winter season produces a condition opposite to that of summer. Sunrise and sunset occur south of east and west. The sun’s midday angle of altitude is low in the sky. Players are subject to direct sun glare when forced to look south during midday. Intense direct glare will be experienced when looking southeast during the morning and southwest during the afternoon. (Alpern,A., 1990, p: 194)
fact, weather controls many outdoor sports facilities and therefore, limits certain activities to specific seasons.

Figure 5.7: Diagrammatic seasonal variation in solar azimuth and elevation. Source: Alpern, A., 1990, p: 194

According to the average conditions of seasonal variations, fields and outdoor courts should be oriented so that the late afternoon or early morning sun rays will intersect the general path of the flight of the ball at an angle of approximately 90 degrees. Otherwise players on the easterly end of the field or court will have to face the late afternoon sun. In rectangular fields and courts, the general pattern of the ball's flight is parallel to the long axis of such areas. Therefore, the long axis should be generally at the right angles to the late afternoon sun rays. After the location of the sunset position for the mid-season of the sport, orientation of the field or court can be done accurately. (National Facilities Conference, 1947, p:31)

'On many fields, the general pattern of the ball's flight does not parallel any axis; instead it covers an arc of more than 90 degrees.' (National Facilities Conference, 1947, p:31) The field cannot be oriented to give equal protection to all players and spectators; therefore a choice must be made. So that some of the game fields are oriented according to the nature of the play while some are oriented according to the vision of the spectators. Detailed orientation guidelines for the outdoor areas of special events are accepted as below:

'In consideration of football fields, the long dimension of the field should be approximately north and south so that players do not have to face direct sun light.' (A&M College, 1948, p:2) 'If possible, preferably, it may be oriented west of north and east of south.' (Butler, G.D., 1958, p:131) Most of the wind will be across the field
instead of lengthwise so that no great advantage is gained by either team. ‘The athletic field should be oriented by north and south, if possible, it can be oriented by west of south and east of south.’ (Butler, G.D., 1958, p:132)

‘The baseball fields are oriented according to the rule to protect the players in hazardous positions. These positions are batter, catcher, and pitcher. A line drawn through these positions is used as the axis for orienting the field. This axis is placed approximately at a right angle to the late afternoon sunrays. This places home plate in a general north by east or south by west location at one end of the axis. However, professional baseball fields aren’t oriented in this manner, since the primary concern is the comfort of spectators rather than the welfare of the players.’ (Shepard, G. & Jamerson, R., 1953, p:100)

‘Tennis courts should be laid out approximately north and south to avoid interference from the sun during morning and afternoon play. Where more than one court is to be constructed in the same area, approved standards recommend a minimum of 10 feet between the courts and 20 feet clear space at each end at the same direction.’ (A&M College, 1948, p:2)

Similar to tennis courts, open basketball and volleyball courts are also better be oriented by north and south direction to protect, in a way, players from direct sunlight both at the morning and in the afternoon. (A&M College, 1948, p:2)

In order to generalize the concept of orientation for a range of sports, National Playing Fields Association has generated a standard chart with reference to seasonal variations in direction of sunlight. (See Figure 5.8)
Orientation of activity areas should be determined best for both players and spectators only according to all above considerations and, by the way, able to increase the time of the use of such areas.

Figure 5.8: Orientation Diagram for outdoor fields

5.7. Scale:

Scale factor is another concept to be included in design of sports facilities. As it is the starting point for design of many areas, human scale is one of the most critical factors in design of sport areas. Majority of indoor and outdoor sports facilities need extensive spaces because of required dimensions for proposed sport types. However they aim to serve for peoples' needs, they may create unpleasable environs when their design lack of scale considerations. Scale factor may be separately evaluated as solids and voids for indoor and outdoor activity areas.

Solids: refer to the indoor playing areas such as sport halls, indoor pools, arenas and etc. Indoor sporting areas include various types of sporting activities inside of their walls. Proposed activities that will take place within the sports buildings require large clear spaces and heights for true play, so the closed structures are generally huge masses in terms of their use of space both horizontally and vertically. The other characteristic of these structures is that they seem to be functionally isolated. The activities fully take place within the walls, so that these structures have no direct relationship with the outdoor activities. They generally don’t have large openings on their facades that will
permit the interaction between outdoors and indoors. These features may give the effect of scale contrast in such an interactive human-scale scheme. However, certain architectural solutions may be generated in order to balance the scale factor between the closed and open spaces within the site. Different levels may be created to obtain dynamic heights. This will give opportunity to hide the activities under the ground level, which need no direct opening the outdoors. It may also contribute to lower the height of the buildings and prevent to construct bulky structures. Use of aesthetical construction materials is also an effective way of expressing the scale of the indoor facilities as a positive attribute of the site. Structures that are expressed in different architectural conceptions increase the aesthetical value and quality of the site as to their visual impressions.

**Voids:** refer to the outdoor fields and courts such as football fields, basketball and volleyball fields and courts, which vary in dimensions horizontally. When planning a site for sports activities, similar types of fields are located close to each other because of access considerations. When they take place next to each other, there occurs a huge open field. Sometimes they are surrounded with fences, which may give the influence of third dimension, however they are generally hard to perceive vertically from far. As they have generally hard surface covering materials, they do not give a visual pleasure for people. Especially when they are dispositional, they may create a monotonous view and loose horizontal vision. Such kind of scale problems can be covered with suitable attempts in design stage. Grading is one way of breaking the monotonous view of open playing fields. Identical fields that are proposed to be located next to each other, may be inserted to different levels to create separate spaces, by the way, provide a dynamic ground level through eye's vision. The other way of breaking disturbing horizontality that occurs as a result of neighbouring fields and courts is planting. Creating green belts that surround the playing areas may contribute to breaking the continuous view of hard surfaces. Sporting areas in majority serve for recreational purposes in which people purpose to relax both physically and mentally. For this purpose, sporting areas should not be tiring in terms of visual perspective. They should be lively environs that are to be designed in human scale. So that, open fields and courts are better being designed moreover than the combination of smooth surfaces on a single huge ground.
5.8. Focus:

Focus is a desirable element in design of places that contains extensive outdoor uses because it provides a vertical perception in a horizontal layout and a directional vision as well. In design of a recreational or a sports park, one of the major functions or a monumental structure may be selected and designed a landmark for the whole site. It is a common way of thought in designing such kind of areas. For example, majority of the Olympic villages in many cities have a focal function that is perceived from other sites. A sports park has an advantage for designing such a sculptural structure because all the activity places have potential to be a focal point as their functions. Especially indoor facilities require extensive areas and relatively considerable heights. Sports buildings also have different architectural forms when considered with surrounding uses. So that, those types of functions may be designed as a landmark within the general layout of the site. Especially if the site has a variable topography, such a landmark may easily be observed from reaching directions. This will provide a visual pleasure as well as orienting people to the site.

5.9. Complementary Design Objectives:

- **Dimensional Standards for Activity Areas:**

The factor that will affect the design stage of sports site in a campus is the necessity of creating activity areas in required dimensions. These dimensions should be concerned in determining outlines of both indoor activities and outdoor activities. Accuracy in outlines and dimensions of activity courts and fields is one of the most important concerns for the provision of truly games whatever the scope of the activities is; professional, semi-professional or recreational. ‘Any discontinuity in dimension through design or construction oversight may reduce the facility’s usefulness for any kind of competition.’ (Alpern, A., 1990, p: 191) So that, design process is bound to those physical dimensions that are set under the rules and regulations of various activities. Although, these regulations are under the responsibility of construction professionals, physical educators should control the process whether certain official standards are met or not.
There are many organizations in the world that generated such kind of dimensional standards in order to guide for newly constructed sports events. ‘For example, in United States, the American Alliance for Health, Physical Education and Recreation has recommended minimum standards for space allocations for new gymnasiums, and the National Cooperation in Aquatics has developed minimum standards for pool construction.’ (Ezersky, M., & Theibert, P., 1976, p:34) Similarly, London Sports Council and National Playing Fields Assoc. collected the data for standards of playing fields, supporting facilities and ancillary work to guide for adequate facility design.’ (John, G., & Campbell, K., 1993, v:1, p:170) Physical educators should make the major contribution to the planning process by introducing the designers with those major organizations whose recommendations generally fit the standards of professional games.

Furthermore, all of the supporting facilities and additional units that serve for users should be designed according to basic construction standards as well as the main play field and courts. In this case, basic standards related to shape and size of activities is determined by concerning for the whole frame of events. Single courts or fields have fixed outlines for necessary game conditions. In fact, multi-purpose play areas and large-scale field events have dynamic standards in terms of including variety of sports at the same time. So, they require a greater deal of concern to present all of the game conditions and space allocations for supporting functions for intended sport events.

**Multi-purpose Outdoor Facilities:**

**Stadium:** may be designed in many shapes according to type of activities that will be included. The plan of all stadia is determined first by the regulation size of the activity and supplementary areas. The activity space is bounded by the first row of spectators. The outer edge of the plan of a stadium is determined by the desired capacity. The general outline of the stadium and the necessary space to be allocated are determined according to the scope of probable events considered within the facility. Pitches are rectangular for football and rugby, while for athletics the rectangle is increased by semi-circular ends that are shown in Figure 5.9 and Figure 5.10 respectively.
The Field House: provides enclosed and unobstructed space adaptable to indoor and outdoor sports activities. Typical functions are included in field houses are interscholastic athletics, horsemanship, competition, informal play, demonstrations and exhibitions which attract large crowds of spectators and commencement exercises. 'Field house should not be considered as a substitute for the gymnasium, because it includes indoor complementary and supplementary facilities, such as gathering places for community uses, recreational activities and catering places, as well as the outdoor activity areas’ (John, G. & Campbell, K., 1993, v:2, p:94) The size of the field house should be determined by careful study of its functions; considerations should be given to the size and number of groups likely to participate in the program. There should be a minimum of interference of groups with each other. The area surrounded by a one eight mile track can include the following facilities: a basketball court, a tennis court on each side of the basketball court, broad jump, high jump and runways, and a shot put area. The minimum length of the field house should accommodate a sixty-yard (55m) straight away for men’s track. Six regulation lanes are desirable. The track around the portable or permanent basketball floor should of such size as to be a convenient fraction of a longer standard distance. (National Facilities Conference, 1947, p: 107)

Track and Field Athletics: may be provided in stadia or field houses by converting the area for athletic events or provided as an actual athletic track. The important criterion is to achieve a suitable space allocation for each activity including the suitable clearances between each other. Whatever the type of the facility is, the optimum dimensions and the best space organization for adequate track events should be as in the Figure 5.11. ‘A
400m, 6 to 8 lane running track including the central area, which is suitable for competitions, requires a minimum area of the right shape of about 2 ha. In addition, a width of 6m. should be allowed around the circuit of the track for circulation. These requirements might take up 0.5 ha.’ (John, G. & Campbell, K., 1993, v: 1, p: 174)

Figure 5.11: Dimensional standards for track and field athletics. Source: John, G. & Campbell, K., 1993, v: 1, p: 174

**Special Indoor Facilities:**

**Swimming Pools:** may be designed outdoors both for recreation and competition. However, competition pools are better designed as an indoor facility to increase the time of usage and level of comfort. Swimming pools are most-practically designed in rectangular shape to provide straight and uniform racing lanes. ‘There may also be modifications, as ‘T’ or ‘L’ types, to provide proper distances for competition in the English units of measure while the length in the other direction can provide metric distances. The top of T or the base of L is often constructed to be used as a diving area.’ (National Facilities Conference, 1947, p: 85) These cases present efficient use of space for different purposes. Different from that, diving is held on a small deep pool, when the main competition pool is rectangular.
Standard lengths are 50m, 25m, and 20m for swimming pools. In competitive terms 50m pools are referred to as long course and 25m as short course. (See Figure 5.12) A 50m pool can be divided into two or three for other water events as shown in Figure 5.14 and Figure 5.15 respectively. Diving competitions can be organized on one side of the main pool or on a different pool next to the main pool with an outline of 16.5m to 25m. (See Figure 5.13) International-level competitive pools are mostly separated into 8 to 10 lanes with each at least 2.5m wide while others may have less. Competition pools should also have a depth no less than 0.9/1m to 1.8/2m. (John, G. & Campbell, K., 1993, v:3, p:6) Further from this, depth for diving pool should be considered sensitively according to the height of board. Depth of pools may be changed also by using flexible sections for desires of usage.

**Gymnasiums:** are suitable for gymnastics as well as other dry sports if the indoor area is arranged effectively, considering standards of each proposed facility. It should be designed according to the event that requires the largest space, which is mostly the gymnastics. Smaller area should be considered for warm-up in order to get the final
outline of a typical gymnasium. ‘The overall area required for gymnastics is 73m. to 33.5 m determined according to Olympics. Events area is 50m. to 26m. (See Figure 5.16) and warm up area is 33m. to 17.5m. the hall may be used by other sports with convertibility of the floor and equipment.

![Gymnastics space diagram](image)

Figure 5.16: Gymnastics space diagram
Source: John, G. & Campbell, K., 1993, v:2, p:95

**Sport Halls:** are the multi-purpose sport buildings that vary in scale according to the included range of sports and related spectator demand. They may be composed of one hall for dry sports only or may be composed of a hall, indoor pool, ice rink or other specialized features. A sport hall is basically designed with reference to dimensions of a badminton court. ‘Normally based on 1-2 badminton court sized halls serve for the populations up to 6000. Relatively larger scale sport halls are based on the size of four badminton courts and capable of serving 25000 people. (See Figure 5.17) It requires smaller training halls and a swimming pool. Large-scale halls have 6-9 badminton courts capacity and are often combined with indoor pool, ice rink and other leisure attractions. They have the greatest status for competitive events.’ (See Figure 5.18) (John, G. & Campbell, K., 1993, v:2, p:52)
Arens: are nearly the largest indoor facilities with spectators around a central activity area. They satisfy various kinds of activities like concerts, exhibitions, entertainment, conferences and etc. as well as common international sports. Sports events that can be staged in indoor arenas can be categorized in three groups:

1. sports that have develop mainly indoors, e.g.: badminton, basketball, boxing, gymnastics, handball, snooker and volleyball
2. sports where indoor and outdoor rules and technical requirements are same, e.g.: rugby, baseball, bowls, ice-hockey, netball and tennis
3. outdoor sports of an international level, which have been modified to fit the more limited space available indoors, eg: track and field athletics, cycling and soccer.

Size of an arena is determined according to the scale of probable events and spectator demand. (See Table 5.1)

<table>
<thead>
<tr>
<th>Size of the indoor arena</th>
<th>Floor space</th>
<th>Minimum number of seats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>6-lane,200m.athletic track, 8000-12000 (5000 fixed, 3000 movable)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>100m.*50m. Infield</td>
<td></td>
</tr>
<tr>
<td>Type 2</td>
<td>4-lane,200m. athletic track, 5000 (%80 fixed, %20 movable)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>100m.*50m. Infield</td>
<td></td>
</tr>
<tr>
<td>Type 3</td>
<td>64m.*34m. Infield</td>
<td></td>
</tr>
<tr>
<td>Type 4</td>
<td>46m.*30m. Infield</td>
<td></td>
</tr>
<tr>
<td>Covered Stadium</td>
<td>110m.*55m. Infield</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3000 (optional)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5000 (optional)</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.1: Types of arenas
Further from the major sports structures, official standards related to singular courts and fields, which are purposed for professional competitions, are given with their plans in Appendix.

**Height considerations for indoor halls:** is an important criterion to obtain a true play for each type of sport. To provide the adequate height for an indoor sport area, initially, playing nature of all purposed sports should be evaluated. As sport building includes various types of sports, the general height should be determined according to the game that requires the biggest height. Suitable heights for major sports activities are recommended by British Sports Council as below:

- Badminton requires minimum 6.1m. for clear height,
- Tennis and trampolining require 8.4m. (Approximately 30 feet),
- Handball is satisfied with 9m. high,
- Volleyball stands for a height of 10.5m.,
- Basketball and netball can be satisfyingly played at a height of minimum 9.2m.,
- Gymnastics, athletics and defense sports are not bound to height considerations; however, enough clear height is required for spectators' vision.

Further from the adequate play, determination of height also effects site, which the indoor facility has been located, in terms of urban design considerations. The outdoor vision of sports hall, about whether it has a horizontal continuity with outdoor activities or not, will be developed according to outer dimensions of the building not as an area but as a volume.

**Lighting:**

Lighting of sports areas is an important criterion in terms of the efficient use of fields and courts. It can be evaluated in two terms as: indoor lighting and outdoor lighting.

**Indoor lighting:** is the necessity for indoor sports arenas which are to be considered according to the size and shape of the complex as well as the materials used in the construction. The power of the lights and their placement are determined by not only the sunlight that the complex gain form the openings, but also the frequency of use of the
related facility in professional level. In fact, most of the indoor arenas need to be enlightened because the sunlight will be insufficient for lighting. By the way, they will attract many people with availability for use in extended hours and visual comfort. Indoor lighting may be provided with variety of esthetical lighting structures designed for both vertical and target lighting. Desired intensities of lighting for different indoor games are given in Appendix. (John, G. & Campbell, K., 1993, v:2, p:207)

Outdoor lighting: is to be considered much more sensitively when contrasted with indoor lighting because there are no walls and ceiling to reflect light into the focus points of facility areas. Lighting of outdoor arenas is not a necessity, as it is for indoors, however, it has many advantages for the efficient use of the outdoor fields. These advantages can be stated as follows:

- It increases the hours of use of existing facilities and gives possibility of scheduling more events.
- It attracts a greater number of people both spectators and participants who are not able to utilize from such activities during the daytime.
- It prevents people from unfavorable heat in warmer seasons or special localities, and provides more comfort for them.
- It facilitates the use of such kind of activity areas for other purposes like concerts, festivals, commencement ceremonies and etc.
- It retains a favorable and safe environment during the activity hours. (John, G. & Campbell, K., 1993, v:1, p:59)

Outdoor lighting should be considered for the overall functions as well as the specific play areas. ‘Areas that need to be enlighten are various such as seats, aisles, entrances, exits and parking areas that support the main activity areas.’ (Shepard, G.E. & Jamerson, R., 1953, p:118) ‘The emerging concepts in provision of lighting such as; the shape of lighting units, their heights, number and spacing of poles, proper distances from the fields, the materials they are made of and the power of the lights should accurately be designated to increase the efficiency of enlightenment.’ (National Facilities Conference, 1947, p: 30)
In planning artificial lightening of outdoor activity area, several precautions should be observed. These can be stated as follows:

- direct light rays should not strike the eyes of players or spectators.
- glare should be avoided.
- all shadows and spottiness should be eliminated or minimized.
- no obstructions should interfere with the lines of vision.
- care should be taken to avoid annoyances to neighbors due to stray light beams.
- wiring should be located underground to avoid overhead wires.
- moisture-proof lighting units should be used.
- suitable structures should be selected for lighting to ease maintenance.

(National Facilities Conference, 1947, p: 31)

'The football field, baseball field, croquet fields, tennis courts, basketball and volleyball courts, open swimming pools and skating areas are the most common and available sports facilities that can take place outdoor for night use.' (National Facilities Conference, 1947, p: 30) Lighting organization for favorite sport activities that can be held outdoor as well as indoor can be expressed as below:

**Football:** For recreational play fields, 80-foot candles of lighting are available. For professional play fields, 100-foot candles of floodlights are required. (Recommended averages of I.E.S) Floods can be located at the sides of the field, three on one side and three on the other side, with equal distances from each other. They can also be placed at the four end-corners. Side floods should be located 30.50m(100feet) from the sidelines while end floods should be distant by 15.25m(50feet). They should as high as practical above the field (generally 2.00m(80feet)) to minimize the direct light in players. 1500 watt of clear lighting power is needed. (Williams, W., 1958, p: 261)

**Basketball:** Less illumination is required for outdoor basketball than for indoor play because it's preferred for recreational plays rather than competitions. An even distribution of light above the court is required to see the court and the backboards. Eight enclosed floodlights, two on each side, are required with 30-foot candles illumination. (Recommended averages of I.E.S) Floods are better-located 6.00m(20feet) distant from the sides. The sources of light should be positioned to minimize direct glare.
Volleyball: Lighting of outdoor volleyball courts is similar with basketball courts. Eight enclosed floodlights are required, two on each side, with 30-foot candles illumination. (Recommended averages of I.E.S) They should be located with a distance of 20 feet from the sides. 1000 watt of clear lighting power is needed. (Williams, W., 1958, p: 274)

Swimming pools: A great number of pools use one type of lighting only which is the overhead or the underwater type. The accurate type of lighting both for indoor and outdoor pools, especially the ones for competitions, is the combination of both types. Overhead lighting provides safety and adaptation of swimmers and vision of spectators. So there should be ten enclosed floodlights with 20-foot candles. (Recommended averages of I.E.S) No specific distance is found for the placement of the floods. 1500 watt of clear lighting power is needed. (Williams, W., 1958, p: 266)

Underwater lighting helps the guards to watch the swimmers below the surface water. These types of lighting equipment should be placed 45cm (1.5 feet) below the water surface and 3.60m (12 feet) apart. Large pools should have these lights on all four sides, while small pools may have on the long sides only. 1000 watt of clear lighting power is needed. (Williams, W., 1958, p: 266) In addition to overhead and underwater lighting, a special type of lighting is desired for spotting the diving board area. It provides a clear vision for the spectators through the divers on the board.

Tennis courts: Tennis is a very suitable game for night play. Lighting is especially needed for the players to see the net line and the central part. Four floodlights are required for the court with 30-foot candles. (Recommended averages of I.E.S) Placement of floods can be two on long sides or four at the corners. In each position 20 feet distance is available from sides. 1000 watt of clear lighting power is needed. (Williams, W., 1958, p:275)

Above fields and courts are the play areas for the most common sports that take place usually outdoor. Further from these, there are many kinds of sport activities suitable for outdoor play. Recommended intensity of enlightenment for those activities is given by illumination levels and in Appendix. Locations of lighting structures for those outdoor sport activities are given with their plans in.
Fencing is another detail that is to be considered in the design process sport facilities. It is generally required around the facilities in order to isolate the activity that take place from the surrounding area.

For indoor sports facilities, fences help to segregate the participants from the spectators and protects the action form the outer interruptions. As seatings are so close to the field or court in an indoor facility, fencing is a necessity to provide well being of players, simplify the supervision of games, provide safe and satisfactory space. ‘It is also needed to protect the property form any kind of damage, by the way facilitate maintenance.’ (National Facilities Conference, 1947, p: 29) However, height of such interior fences should be kept at minimum to aid in controlling area. Because high fences will interfere the vision of the spectators and create an unnecessary isolation.

Fencing is much more necessary for outdoor sports facilities because outdoor areas do not have walls or ceilings that can be accepted as boundaries. ‘It serves for security and protects the facility from abuse when not in use. Especially, it controls access during hours of use and contains game equipment, such as balls, form a fluent play’ (John,G.& Campbell,K., 1993, v:1, p:60) Moreover, fencing on outdoor facilities segregates the field or court from the surrounding natural environment. This provides visual aesthetics in terms of giving information about the related piece of land such as: where the entrance is, which path should be used to reach the court, where surface covering of the court begins and where it meets with the natural land covering. Fencing of outdoor fields should also be considered accurately in order to create meaningful boundaries. Exits and entrances from boundary fences through the fields should be strategically located to provide safe, easy and direct flow in and out. The flow of surrounding traffic and pedestrian circulation should not interfere with the spectators or participants. Fences for the area will also serve as a buffer against noise and will aid in creating a park-like atmosphere.

Fencing is a required feature for most of the outdoor sports facilities, but it is a must term especially for some types. These are stated as follows:
Athletic fields: Since these kinds of fields are used for special events, entrances and exits should inevitably be under control, so that high fence is necessary. Further from the main fences, additional ones are required in front of the ticket boxes located near the gates. These fences should be made of durable materials in order to regulate the crowd especially in special events' days. (Butler, G.D., 1958, p: 144)

Running track: There has to be provided a fence between the bleachers and the tracks is needed to keep spectators off the track. Protecting the track is often needed when the area within the oval boundaries is to be used for football. (Butler, G.D., 1958, p: 137)

Tennis courts: They should have fencing of 30cm(12 inches) high, placed 55cm(21 inches) behind the base line and extending 25cm(10 inches) beyond the sidelines. (National Facilities Conference, 1947, p: 29) It is not essential but desirable to fully enclose tennis courts.

Swimming pools: Outdoor swimming pools need also adequate barriers to separate the pool deck from the surrounding landscape area in terms of the effects of prevailing winds. The surrounding area should be well drained and, if possible should be covered with a light roof to avoid contamination due to surface water or dirt washing into the pool after any probable rain. Outdoor swimming pools are also open to environmental conditions. There should also be barriers between the surrounding environment and the pool in order to prevent outer penetration.

Supporting Facilities:

Further from the technical considerations that affect the design criteria such as space dimensions and the related equipment, supporting services are also need to be examined in provision of sufficient sport areas including both in outdoor and indoor facilities. Supporting services are generally the social services that directly affect the comfort and satisfaction of participants and the spectators from the utilities in sports areas. These services vary in scale and type according to the expansion of the facility site, location of the activity places, and sizes of the activity places and the existence of indoor and outdoor sports. However they vary in scale, the crucial point is the necessity of provision of these facilities to allow satisfactory action in sports areas. The general organizational considerations within the supporting facilities are given in the Figure 5.19.
Supporting services may be separated in two main groups as; participant services and the spectator services. For some of those services; the type of the activity place, whether it is indoor or outdoor, is an important criterion for design considerations. Within this separation, the size and the location of those supporting services will change immediately.

**Participant facilities:**

These services need to be provided to maximize the satisfaction and comfort of participants to the activities;

1. **Convenient circulation:** is required for the whole site, especially within the indoor facilities to allow participants to achieve their aims in a particular sequence such as; getting prepared for playing, entering the activity and resting and relaxing after playing. Convenient circulation of players brings the designation of the relationships between activity areas and supporting participants' units with itself. These relationships can be defined with typical diagrams:
Convenient circulation should also be concerned for outdoor activity areas for the comfort of users. Circulation between car parks, changing facilities and the main fields and courts should be kept at minimum. Similarly, pedestrian paths should effectively be designed to give easy access to main activity areas.

2. *Dressing rooms, showers and rest rooms:* are needed, for a comfortable preparation of players before and after the activity. Adequate spaces for dressing rooms, equipment rooms, showers and rest rooms should be provided both for indoor and outdoor activities. An indoor facility includes participant utilities within the building. An outdoor facility should have separated supporting units, close to activity areas, other than the ones for indoor facilities. In general, the number of men participants is bigger than the number of women participants. This condition inevitably affects the supply of supporting units, which should be designed according to sex. Approximately, utilization from dressing rooms and wet floors is accepted as %60 for men and %40 for woman. So, clear area that should be separated for men’s utilities should be higher in square meters relatively.

Further from sexual division, allocation of utility spaces also changes according to the type and size of the facility. Required spaces for supporting units in sports halls are determined by taking the twice of full number of players on the main playing area. On the contrary, spaces for supporting units are not determined according to the number of
swimmers. A swimming pool requires relatively more abundant space for wet floors when contrasted with sports halls. As users need to be prepared before entering the pool and after swimming, showers and dressing rooms with separated cupboards should be convenient in number, for preventing congestion and dirtiness.

Approximate requirements for swimming pools are:

- one shower for each 7 singular cupboards
- 1.35-2.15m² space for each shower
- one toilet for each 40 male users
- one toilet for each 25 female users. (Neufert, E., 1983, 440)

Approximate requirements for indoor halls:

<table>
<thead>
<tr>
<th>type of facility</th>
<th>dressing room</th>
<th>showers and sinks</th>
<th>wc</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>number</td>
<td>area(m²)</td>
<td>number</td>
</tr>
<tr>
<td>small scale gymnasiums</td>
<td>1</td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>medium scale gymnasiums</td>
<td>2</td>
<td>20-30</td>
<td>2</td>
</tr>
<tr>
<td>large scale gymnasiums</td>
<td>2</td>
<td>20-30</td>
<td>2</td>
</tr>
<tr>
<td>sports halls</td>
<td>4</td>
<td>20-30</td>
<td>2</td>
</tr>
<tr>
<td>training room</td>
<td>1</td>
<td>25</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 5.2: Requirements for supporting participant units
Source: (Neufert, E., 1983, 433)

3. Training areas and halls: are needed for the preparation of participants before competitive games or for ordinary trainings of teams or individual athletes. Training areas should be located near main outdoor activity areas, while training halls should be provided in places within indoor facilities. They may not be covered with highly qualified surface materials or supported with other equipment or technical services such as scoreboards, seating facilities, fencing and etc. However, they should be presented in optimum conditions for training of participants and for decreasing the intensive use of main activity areas in addition to actual games.

4. First aid service: should be, firstly, provided to take care of the players in accidents or any kind of injuries that can be experienced in activities. All of the organized facilities should include their own first aid units within themselves for immediate cases. In addition
to serving for participants, these units are inevitably necessary for competitive games or organized events, which attracts large numbers of spectators.

**Spectator facilities:**

These are the utilities organized for the comfort of spectators. Spectators create a real demand to get effective utilization from sport events, especially at professional levels so that facility areas should be planned to supply full of comfort for spectator in as much as the participants and various kinds of activities. Following utilities for spectators are given according to the order of expected behaviors of spectators as they enter a well-organized sports park.

1. **Information booths or boards:** are one of the utility boxes serving for spectators. They are especially needed for competitive facilities to inform spectators about the place and time schedule for activities. They should be located conveniently for spectators, and in places that do not interfere with any vehicular or pedestrian traffic. The best places for adequate fixtures are important junctions, gathering places and in front of major activity fields or buildings.

2. **Ticket booths:** are especially needed in facility areas which includes professional fields and courts used for sports competitions and other utilities such as cultural events, ceremonies or graduation celebrations. Within the outdoor facilities stadiums and athletic fields are the most common areas for such kind of events. They should be located and distributed, conveniently, near the major entrances. ‘Booths are better located within the stadium walls to provide easy access and widely distribution around the outside of the outer stadium enclosure.’ (National Facilities Conference, 1947, p: 106) At indoor sport events, lobbies should be designed large enough to administer ticket sales without giving any reason to probable congestion. Approximately two-thirds of the lobby should be planned for accommodating box offices and ticket purchasers; the remainder should be reserved for ticket holders who would have direct access to admission gates. (National Facilities Conference, 1947, p: 106)
3. **Entrances and exits:** should be well distributed to care for anticipated attendance to both indoor and outdoor facilities. Entrances and exits are to be separated for spectators and participants to ease handling the crowd, and providing safety and comfort. The ones allowed for spectators should be more than one for convenience. Design considerations related with the supporting structures like; height of stair risers, ramps, width of aisle treads, avoidance of stairways, adequate aisles and railings are also important to control the safe ingress and egress of spectators. Especially for large-scale areas such as stadia, an effective planning should be made for safe circulation. ‘For example; stadia should be designed for slow and controllable filling, but, rapid and orderly disposal of crowds; about eight minutes should be the maximum time required to empty the stadium.’ (John, G. & Campbell, K., 1993, v:1, p:74) ‘Stadia may be built to the advantage of natural slope with the spectators’ general entrances at the top and players’ passages to the places underneath the stands for easy access to the field.’ (Butler, G.D., 1958, p:140) The other concept that is to be achieved in design of entering the fields is convenient access form entrances and exits to parking areas.

4. **Seats:** are the most dynamic part of supporting facilities provided for spectators. In design of seating, several considerations should be evaluated such as; the kind of contest or game, the comfort and convenience of spectators, probable attempt of spectators through the activity area and effective arrangement for maximum seating capacity without decreasing the level of comfort. Regardless of all design considerations, safety is the primary concept for the supply of seating.

According to whether the facility is indoors or outdoors, certain design principles for; construction materials, the numbers and arrangements of the seats, their distance to activity areas, their storage and maintenance change relatively.

**Outdoor seating:** is generally made of permanent seats with various shapes as standing on one or both sides of the field, or in the shape of a horseshoe, oval, bowl or crescent.’(Shepard, G. & Jamerson, E., 1953, p:114) If there is a suitable natural slope, seating facilities may be constructed on the contours as a form of amphi-theater. On the other hand, it may be constructed as a grandstand in the form of a building. This type of seating also provides another opportunity to organize the space underneath the seats for
supporting facilities such as management units, dressing rooms, showers, storage rooms and rest rooms. (See Figure 5.22) Below figure shows a successful example of organization.

Figure 5.22: Plan of supporting units below the seats of a stadium, Colorado High-school
Source: Butler, G.D., 1958, p:140

'Generally accepted standard for seating specify a width of 45cm, a depth of at least 25cm, and a height of 40-45cm with bracket supports 1.20m on centers. Appropriate space should be left for footrests and for passage of spectators between the rows. Risers in the aisle should not exceed 18cm and tread should be at least 30cm wide.' (John, G. & Campbell, K., 1993, v:1, p:74)

Figure 5.23: Section of typical seat rows

Stadia, baseball arenas, field and track events are the most favorite outdoor facilities that require differently organized seating utilities. Seats may be arranged in any shape surrounding the whole field for stadia like horseshoe model, oval or bowl. Track and field events also require different arrangement of seating utilities. As starts and finishes of most events take place on one quarter of the track, seats are better arranged linearly on the west side of the track. This will also prevent spectators from afternoon sun.' (Butler, G.D., 1958, p:139) Above events may take place on a same multi-purpose field, in such a case, seating facilities should be provided with an effective arrangement of both
permanent and portable seats, by considering most of the events. For a field, which is used both for football and field and track events, the effective arrangement for seating is the linear permanent seats on both sides and bleachers for the rest of the field. A well-defined seating facility for outdoor events is shown in Figure 5.24.

![Figure 5.24: Organisation of a recreation center in Minnesota in terms of spectators](image)

Source: Butler, G.D., 1958, p:143

For sport activities that require smaller play field relative to above facilities, seating utilities should be provided according to the scope of probable games. If the proposed facilities are to serve for competitional games at professional level, ample space should be separated for seating. These intended facilities mostly take place on rectangular fields or courts such as tennis, basketball, volleyball, handball and etc.

**Indoor seating:** is usually arranged according to the availability of indoor spaces. Indoor sport facilities are limited with walls and ceilings, so the concerned areas should be organized effectively to provide full of utilization form variety of sports. In fact, it is nearly impossible to separate ample space for each type of activities. For that reason, the indoor area should be used for combination of sports with successful conversion of space dimensions and related equipment. Seats are one of the most important factors that effect convertibility. In many cases, telescopic bleachers are used to occupy considerable floor space. (Shepard, G.& Jamerson, E., 1953, p:116) Capacities of the seats in closed facilities should be determined according to scope of the activities and related events purposed within the facility.
5. Rest rooms: should be separated for spectators for wherever they serve, indoor or outdoor. ‘They should be designed with great care for light, ventilation and sanitary care and placed in adequate number on convenient locations with reference to sex.’ (National Facilities Conference, 1947, p: 104) If they are to serve outdoor activities, they may be designed as good-looking boxes, but located in minimum distance from spectator seats. Similarly, if they are to serve in indoor facilities, they should be located in convenient places within the buildings not to intervene to the main circulation. For large event fields, such as stadiums and arenas, one toilet for each 500 male spectators and one for each 40 female spectators should be provided.

Other services related with the site

1. Parking: should be provided to users including participant, spectators, technical stuff and other visitors in order to support the access function to the site. ‘If this responsibility is to be met satisfactorily, advance preparations are necessary. These preparations include designating and properly marking the required space to be used, engaging attendants to supervise the parking of cars so that the space provided is utilized effectively and providing a secure parking facility.’ (Shepard, G. & Jamerson, E., 1953, p:116) Especially for games that attract large numbers of people, ample space should be allocated for parking. Several design considerations for parking areas are:

- choosing location of specific parking facilities for intended activities near the entrances or exits of those activity areas,
- providing general parking areas remote from site for important events
- providing special parking areas for specific groups such as; team buses, vans of media facilities, formal visitors and probable disabled visitors.
- allowing suitable space for circulation of crowds moving from the parking areas to activity areas or buildings,
- selecting suitable surface material for preventing probable dust or collection of excess water after rain,
- lighting of parking areas for night games or competitions.
2. **Structural and fabric considerations**: are the required conditions for the well-being of players in the games which directly effect design and construction phase of the sports facilities. The common headings related to these considerations are given in Figure 5.25.

![Figure 5.25: Structural and fabric organizations in design process](source: Dixon, C., 1991, p.122)

3. **Storage**: is necessary in large scale sport facilities in order to collect game equipment and supplies for different activities, excess temporary bleachers or box seats and maintenance equipment and repairing tools. There should be separated convenient within particular rooms for such things. In addition, there should be specific rooms for personal equipment of regular participants. Storage of personal equipment will encourage the participants to utilize form the activities without carrying any load. Easy access to storage units is a desired condition for participants comfortably to take part in the activities and for technical stuff to obtain necessary tools on the right time for presenting adequate playing condition.

4. **Management**: is the most necessary facility for sport facilities in order to present an effective, healthy, pleasurable and furthermore adequate playing conditions for participants and environment for spectators. There should be well-organized
management departments for purposed facilities, which will regulate the ordinary functions and take the decisions for necessary services.

Responsibilities of a management unit can be collected under four headings:

1-For both indoor and outdoor fields and courts:
   - Regulate a time schedule for activity areas,
   - Organize the secretarial work between other associations for probable competitions,
   - Allocate the main activity and training areas for physical education of students or teams for different games of university in specific periods.

2-For supporting participant units:
   - Inform the participants about the available sports activities,
   - Organize the use of dressing rooms, showers and rest-rooms by participants,
   - Control whether the cleaning of participants’ units is properly done or not.

3-For supporting spectator units:
   - Organize the announcements for events to inform spectators,
   - Control the functioning of ticket booths and administration desk,
   - Control whether the seating facilities are cleaned properly or not and whether they any repair or not.

4-For technical and service units:
   - Regulate the ordinary cleaning and repairing of all main and additional units that will be run by maintenance staff,
   - Occupy the technical stuff for ventilation, heating, air and water circulation of necessary areas,
   - Control the healthy and cleanliness considerations of catering services of the facilities,
   - Control the functioning of first-aid service,

5. Other provisions: are also needed to provide maximum utilization from activity areas and present the conditions that professional sport activities require.
   - Scoreboard and timing devices should be inserted.
• Press boxes, board-casting and television boxes should be provided within or near the fields and courts and inside the buildings for national and international organizations.

• Accommodations must be presented for members of press and media facilities.

• Adequate technical units should be inserted for heating, ventilation, watering and lighting and energy conservation is better being considered.

• Catering services should be provided both located on the site and close to outdoor activity areas and inside the activity buildings.

• Drinking fountains, utility boxes for refreshments and other needs should be located within the site, in accessible locations for both participants and spectators.

• Proper signage, including identification, directional and regulatory signs, should be coordinated to provide essential information for usage and a design unity for facility areas.

• Accommodation of disabled people should be provided for ingress, egress and circulation within the activity areas and utilization from seating, parking and catering facilities.

(John, G. & Campbell, K., 1993, v:1, p:75)

• **Surface Covering Materials:**

In reality, there is no one surface which satisfactorily meets all criteria for all activities so the important point is to choose the most suitable one with joint consideration of both cost and performance with reference to natural and environmental conditions. Materials used for covering the surface of outdoor fields and courts and the floor of indoor halls are completely different.

1. **Outdoor Surface Materials:**

There are various kinds of surface types to meet the requirements of specific games. The most typical surface types may be classified as follows according to their favorite sports:

- **Concrete:** is suitable for many kinds of activities such as badminton, basketball, volleyball, tennis, shuffleboard, handball, netball, cycle-racing and table tennis.
• **Asphalt concrete and cement concrete:** cannot be accepted as a suitable surface for competitional games but for recreational ones only.

• **Asphalt paving:** is generally suitable for training fields but it is still used as competitional surfaces for netball, five-a-side football, tennis and physical education facilities.

• **Common brick or pavers:** are suitable for the areas that require minimum solar reflection and heat radiation.

• **Turf:** is nearly the most suitable surface covering for many kinds of court games arranging from recreational to professional. The favorable games that should use turf surfaces are baseball, football, field athletics, golf, archery, lawn balls, cricket, croquet, rugby, hockey, lacrosse and polo. (John, G. & Campbell, K., 1993, v:1, p:59)

• **Sandy clay:** is mostly used for recreational play rather than competitional one. The favorable competitional game that is played on sand is beach volley. The other games that may use firm sand, are croquet, boules, badminton, basketball, skeet shooting and trapshooting. (Alpern, A., 1990, p: 204)

• **Artificial turf:** is a synthetic reproduction of natural turf grasses. When grass is not feasible, an acceptable surface can be skinned infield with the outfield turfed or synthetic grass can be used to give the similar comfort.

• **Sheet/Carpet synthetic surfaces:** represent nearly all characteristics of natural surfaces so that they present smooth surfaces for variety of sports. The most common ones that may be played on synthetic surface are basketball, tennis, track and field athletics, cricket and hockey. They are also excellent surfaces for non-sport events such as concerts, student fairs, exhibitions and ceremonies, because of their visual appearance, easy maintenance, and durability. (Ezersky, E. & Theibert, R., 1976, p:54)

2. **Indoor Floor Materials:**

Despite the outdoor field and courts, indoor floors are not exposed to external factors like climatic factors so that selection of surface material for activities is mainly determined according to the nature of play. The mostly used material used for indoor floor is wood, timber and composition, which is suitable for ball, interacted games. Sometimes synthetic materials and sheet floor coverings, especially portable coverings, are also used for such kind of games. Other than ball interacted games, athletic events,
defense games and physical education facilities are favorite sports that are held indoors. These sports additionally require mats because of playing nature.

• **Grading and Drainage:**

Outdoor activities are bound to natural and environmental factors, so that, a proper grading is required for presenting an adequate playing nature. As grading has a close relationship with drainage considerations, it should be evaluated together with the proposed drainage system.

Planning of a sport activities site should include provision of grading in order to facilitate the quick drying of all outdoor fields and courts and also to create health and aesthetic values. Level areas are best suited for most of the organized games and sports and for many recreation purposes. Sometimes the surfaces that are to be built on sports field may not be smooth. In such a situation the type of the activity should be reconsidered as to its space requirements. As grading is the process of changing the existing level of the area, it facilitates the removal of surface water in addition to facilitating to visual aesthetics of the area. Planning of such a sport activities site should include provision of overall drainage and grading in order to facilitate formation of courts and fields after natural conditions. ‘Water allowed to collect and stand on sports areas interferes with satisfactory play or actually makes the areas unfit for use.’ (Butler, G.D., 1958, p:8) But drainage makes, possible longer periods of play condition, by removing excess surface and ground water.

• **Vegetation:**

Greenery of the sporting areas is a required condition to increase the comfort as well as the natural beauty. It should not be randomly provided, but should be concerned in detail as to its functionality. Other than the general plan, a landscape plan is needed for large-scale sports facilities. Plants, trees and other vegetation elements should be differentiated according to purposed they would be used. Purposes of vegetation elements may be as follows:
- To differentiate the site from surrounding use
- To create a green belt for activity areas
- To give shade to outdoor fields and courts
- To provide a monumental view in required places
- To create a lively environment for natural sports to prevent the interruption of games from any probable wind factor.

**Safe use:**

One of the most important principles in planning and programming of areas for sport facilities is the provision of safe use. User satisfaction with a facility is related to how safe and secure the users feel. It should be examined in two terms which are; safety of users for hazards that may generate from design and construction of facility areas, and; safety of the areas for vandalism that may be created by both participants and spectators.

In order to keep the facilities effective, protection of activity areas and the related equipment should be considered initially as well as the protection of future users. To generalize the safety concern, overall protection may be defined in two major stages:

1- **Design criteria for protection:** are the attempts to eliminate possible safety hazards and vandalist effects in the initial planning process. These attempt begin with major planning principles such as selection of the site and continues with the decisions taken in the whole design and construction processes. The major protection interventions that might be taken initially are to be listed according to their turns:

- Site should be selected by taking into consideration of the existing natural environment and the concept of access.
- Vehicular and pedestrian network both for the inner parts and the outer environment should be truly solved to protect the users from probable traffic hazards.
- Entrances and paths within the site should be located in a manner that provides safe ingress, egress and circulation.
- Proper drainage and grading will contribute to safe and satisfactory use.
• Selection of adequate surface covering materials for specific play areas reduces the risks of game hazards to minimum.

• High-risk construction materials should be avoided both for probable injuries and vandalist approaches.

• Activity areas should be designed with appropriate dimensions and space allocations to avoid dangers that may occur from the nature of play.

• There should be an appropriate design for high-risk sports to eliminate possible physical dangers.

• Lighting is an efficient way of providing comfortable play, but especially for outdoor activities, it is a must utility in terms of safety considerations. Lighting provides a wide perspective of vision and helps to keep all the outdoor areas under control for vandalist approaches as well as safe use.

• Fencing materials such as guardrails, barriers, retaining walls and etc., should be used to separate the activity areas from surrounding places for safe use.

2. Management for protection: is the attempt to minimize the hazards with suitable organizations and programming related with the use of facilities. Under the intended organizations, efficient regulations should be prepared to determine a schedule for when the facilities are available for use; how the play areas and related equipment can be used to play the games truly; and which type of actions are to avoided for the nature of the play. There should also be additional regulations related with the technical staff, in order to provide an attractive and well-maintained facility, and to repair or replace damaged areas or equipment as soon as possible.

• Maintenance:

Maintenance is one of the most important considerations in operation of sports facilities. Efficient planning principles for creating such kind of facilities require a complete maintenance program after the facilities are available for active usage. ‘Once a facility has been completed, it is ready for operation. At this point, the maintenance function becomes all important in promoting full and effective utilization of both indoor and outdoor facilities by the participants within the related facility area.’ (Kraus, R. & Curtis, J., 1982, p:134)
Good maintenance contributes to the earning of participants respect for the sports facilities and encouraging the participation as well as lengthening the life of the facilities and the supporting equipment.' (Kraus, R. & Curtis, J., 1982, p: 134) In addition to these, maintenance of the facilities and the equipment will also prevent the dangerous conditions and accidents that the participants may face of. Especially for competitive facility areas, maintenance gains more importance for achieving a comfortable and accurate game.

The most significant duty within the maintenance facilities is general care of the surfaces of fields and courts. As physical conditions affect the surface covering, maintenance should be provided according to whether the activity area is indoor or outdoor. In addition to this, supporting facilities and equipment should also be kept properly. An indoor facility should be kept bright, clean, cheerful and regularly painted. Similar to indoor facilities, an outdoor facility should have an effective maintenance, especially for surface covering, in order to provide an adequate play.

In general, management and maintenance of facility areas require managerial personnel and a technical stuff. Availability of those groups gives opportunity to prepare an effective maintenance plan for the related activity areas. Maintenance plans are necessary because they provide an effective cleaning and repair program if practiced regularly. In developing an effective maintenance plan, it is necessary to establish goals or basic principles, and then to categorize the types of services that must be carried on. The maintenance plan can be categorized under three headings;

A-minor repair and daily-use care; includes the daily works of the technical staff,
B-major repair program; includes general repair works that are handled in specific periods of the year.
C-major repairs and renovations; includes the constructional changes or adaptations in larger scales. These types of repairs are taken into consideration when it becomes inevitable. (Kraus, R. & Curtis, J., 1982, p: 134)

As above tasks are considered successfully, efficiency of the use of sports facilities will be maximized relatively.
Chapter 6

A CASE STUDY IN IZTECH CAMPUS AREA

The study area, on which a project of sports facilities will be generated within the concept of thesis research, is ‘campus area of Izmir Institute of Technology’ (IZTECH), the third university in Izmir Metropolitan Area. The main objective, that is to be considered in the case study, is to generate a plan proposal for sports facilities in a campus university, with reference to the determined planning principles and design guidelines that are expected to serve for the probable future demand.

There are specific reasons for choosing the campus area of Izmir Institute of Technology for the project as a case study of this research. These reasons may be stated as follows:

- The major reason for choosing the campus area of Izmir Institute of Technology in such a design project is the suitability of characteristics and the potential of the campus site, which is still being in a development process. There exists a plan proposal for the sports facilities that will take place within the campus area; however, it needs to be reevaluated according to the newly prepared site plan of the campus as a whole.
- The second reason for choosing the site is the flexibility to interventions related to reorganisations and creative proposals that refer to the layout of the campus plan and the relations between the facilities. As the area separated for sports facilities has not been constructed yet, it has the potential to be provided according to the planning principles and design guidelines that are mentioned in previous chapters.
- Thirdly, there is a great advantage that IZTECH campus is the potential of the expansion area both for educational units and supporting social facilities. According to the previous plan made by Italian architects, the area designed for sporting activities in IZTECH campus is 57928 meters square, which supports the idea of being organised in a manner that can be used for extensive sports activities and special events.
Moreover, campus site is suitable for variety of sport types as to its environmental features. The site has a waterfront available for water sports and wide green fields for organization of outdoor sports.

Weather conditions are also appropriate for provision of various sports. As well as the indoor activities, open field and courts are to be considered within the campus area sensitively because the weather conditions give opportunity to the use of open sports facilities nearly in every seasons except the extreme cold days. Outdoor fields and courts and other open utilities on the facility site will be serving for university population with maximum effectiveness.

Finally, the campus has the availability for accumulating the necessary information related to the site characteristics of the campus area. Those site characteristics and potential of the site for the case study will be examined below in order to create a guideline for the final project.

Under the situation of those advantages, IZTECH campus area has been chosen as a study area for the development of sports activities. Within the study, the campus area will be evaluated with all its features including site characteristics, natural and geological aspects, environmental values and the other functional and administrative information. As a final stage, a sufficient sports facility area with its indoor activity spaces, open courts and fields and related social services will be planned for future use. While studying on the project proposal, the major planning principles and the design criteria of sports facilities that is mentioned in research process of the thesis will be followed consciously.

6.1. Characteristics of IZTECH Campus Site:

In order to design a site for sports facilities within IZTECH campus, preliminary planning considerations should be discussed according to the whole campus plan. Site selection, accessibility and infrastructure considerations for the facilities should be processed convenient to the general site layout. So, major physical criteria of the campus is examined below as to their effects on design process of sports facilities.
Izmir Institute of Technology is located in Urla about 50 km. away from the city center of Izmir. The campus area of IZTECH is a newly developing site, with an extension from the main highway from Çeşme to İzmir, through the seashore. The site has a great...
scenic beauty and uncontaminated environmental condition, with a view of the sea along
the entire northern side.' (Pisciotti, 1994, p: 1) The physical boundaries for the
expansion of campus area are: İzmir-Çeşme highway on the south, Barbaros village and
Kocadağ Hill on the west, proposed İzmir-Karaburun highway and Urla Municipality on
the east, privately owned lands of Gülbahçe Village residents on the north. (See Figure
6.1)

The university is still being in a development in terms of construction within the campus
and increasing population. The final future population is determined nearly as 10500 that
consist of 8500 students and 1700 academic and technical staff.

**Landuse:**

The campus area will develop on area of 3500 hectares; 497634 meters square of which
are determined as the total construction area according to the final plan. İZTECH
campus is first designed by Italian Architects Luigi Pisciotti and Uberto Siola. This initial
plan offered a L-shaped linear arrangement for the general layout of the campus. (See
Figure 6.2) The main argument of this layout was the location of administrative and
academic units on both sides of a main alley. The alley is designed as a considerably long
axis in a north and south direction passing through old İzmir-Çeşme highway. According
to the plan, sports facilities would be located at the south end and the social facilities at
the north end of the alley. Circulation network was thought to be as an outer vehicular
loop supported by dead ends that would give service to the functional units. Pedestrian
network was designed in a grid system composed of pedestrian roads intersecting the
main alley lying on the south and north direction. (Pisciotti, 1994)

However, the initial plan is evaluated as insufficient according to several reasons and has
been redesigned. (See Figure 6.3) Current plan offer a layout close to a centralized
arrangement for the campus site. Administrative units are located on the center of the
academic campus and surrounded by the academic and faculty buildings. Within this
arrangement, accommodations, social housing units and sports facilities are located in
some distance to the center as the satellites. According to the plan, buildings are located
and being constructed conveniently with reference to topography, geological constraints
and climatic conditions which were ignored in the initial plan. Circulation network is formed as an outer loop supported by inner loop and convenient car parks. Pedestrian network is structured as a main alley in east and west direction.

Figure 6.2: Initial Plan of Academic Campus of IZTECH
Source: Pisciotti, 1994, p: 12
Circulation Networks:

Current access to the campus area is provided from existing Karaburun road. Main entrance of the campus, designed according to current plan, will be constructed on the east side of the administrative part that will take access from the proposed İzmir-Karaburun Highway. The initial plan offered a limited vehicular network consisted of a single outer loop, so that; it is redesigned with supporting inner vehicular loops. Moreover, pedestrian network was in challenge with the existing topography and scale.
Sports facilities that will be planned within the campus will also have indoor areas as well as outdoor fields and courts. It is inevitably expected that facilities should take place with reference to related uses especially dormitories in order to achieve an effective utilization of the students. However, location and orientation of the buildings and the outdoor courts don’t have to be in accordance with the general grid system of the campus. They should be oriented according to playing nature and sunlight direction.

**Infrastructure:**

As university campus will serve for a large population, infrastructure facilities should be sensitively installed. The infrastructure system will effect the functioning of all facilities within the campus area so that capacities should be determined according to the total capacities of facilities. The case project is the design of sports facilities, which requires an adequate site selection in terms of infrastructure network as well as other physical criteria so that the future service network is to be evaluated at the preliminary process of the project.

**Purifying System:** is organized with purifying pools that will be proposed to serve for a population of 20000. The system can be enlarged according to an upward shift of the population. Purifying system will also available for sports facilities, but there is a need for additional attempts for special uses. Swimming pool requires a special purifying system for sanitary considerations of the pool, so the problem should be solved independently within the pool construction.

**Water resources:** is one of the most important factors in design of sports facilities, because water usage in activity areas is considerably high, when contrasted with other facilities within the campus. Especially the proposed swimming pool will require large
amount of water that is to be blocked and a purifying system within the pool. Daily water consumption for one person is accepted as 250 lt/day for summer values. For sport facilities water requirement is thought to be 1.00 lt/hour. The future population is determined as 10000 people. The whole water requirement for the campus is determined as 35.08 lt/hour. Underground water resources are limited on the site. There are several wells that will contribute water supply. But the main domestic water will be supplied from Urla-Yağcilar village basin and additionally from Tatar, Kavaklı and Karapınar streams.

Heating: is thought to be central for the whole campus area. Central heating unit will be located at the southwest of the campus. All the buildings will have their own boiler room. Indoor sport facilities, which are the sports hall and swimming pool, should have effective heating boiler rooms in order to provide the optimum heat for a comfortable usage.

Electricity: will be provided from the high-tension cable, which is parallel to İzmir-Çeşme local road and distributed to buildings with transformers that will be inserted near the buildings. Provision of electricity is also important for sports facilities. As well as the indoor sport facilities, outdoor fields and courts also need to be enlightened in order to give opportunity to night use.

(Koçbıyık, C. & Taner, T., 1994)

6.2. Evaluation of The Initial Plan for Sports Facilities:

The whole campus plan of IZTECH was planned with all its functional amenities previously. (See Figure 6.4) Sporting activities were inserted in the west part of the campus lands, which are seperated with İzmir-Çeşme old highway. Access to the facility site was solved with two vehicular entrances from the local road. Those entrances were to be connected with an outer loop that surrounds the whole facility site. The main alley that would be oriented on the south and north direction, was to be strenghtened towards the end of the facility site where the stadium would be inserted. According to the plan, all the activities are located on both sides of the alley following a grid system. Same activity courts and fields are located next to each other.
Proposed sport facilities within the site are as follows:

1. **Indoor Facilities:**
   Total area separated for indoor activities is 15322 m², and includes below facilities:
   - *Swimming pool*; with a total area of 3840 m² that includes: an outdoor pool, indoor management units, foyer, first-aid room, personnel units, changing and shower facilities, pre-entrance pools, cafeteria, solarium and steam bath. (Plans and section of the pool is given in Appendix)
   - *Sports hall*; with a total area of 5855 m² that includes: a large hall for basketball, handball and volleyball, practicing halls for basketball and volleyball, gymnastics, judo and wrestling area, table tennis area, meeting rooms, seating facilities, media room, management units, first-aid room, foyer, cafeteria and exhibition hall.

2. **Outdoor Facilities:**
   Total area separated for outdoor activities is 32606 m², and includes below facilities:
   - *Stadium*; proposed on an area of 14971 m², with a seating capacity of 3500 spectators,
   - *11 tennis courts*; having an expansion area of 2500 m²,
• 10 open basketball fields; having an expansion area of 3000m²,
• 5 open volleyball fields; having an expansion area of 750 m²,
• 3 mini football fields; having an expansion area of 2400 m²,
• Fields of exercises; having expansion area of 14700 m².

Total expansion area for sports facilities including the indoor facilities and outdoor fields except for the circulation area is 57928 meters square.

The initial plan seems to be appropriate in terms of collecting all of the sporting activities on a clustered site, however it has several failures that are to be renovated:

• Facility is considerably far from the other functional units within the central campus.
• The site separated for facilities is located on a critical earthquake region, which creates a danger especially for closed sport facilities.
• The general outline for the functional arrangements is done within the plan, however, the whole plan lacks of detailed outdoor design and landscape considerations.
• Access through the site is not solved properly considering the local road that divides the unity of the campus.
• The alley with an orientation of north-south direction is completely altered in the current plan. It was accepted as a special axis that would connect the sports facilities and the religious center at the north and south ends of the campus. As, it is altered it lost its meaning within this situation.
• Capacities of indoor facilities are are not sensitively determined considering the future population of the campus and the probable public use for special events as well.
• Outdoor fields and courts lack of spectator seats except for the stadium and one tennis court.
• Spectator facilities for outdoor activity areas such as catering services, information boxes, concession booths, ticket boxes, restrooms, fountains and etc. are ignored.

In spite of its above challenges, the plan prepared for sports facilities is successful for some respects. First of all, all the activity areas are designed with official standards for
far play. Ample space is separated for activity areas and supporting units in closed facilities. Those closed facilities refer to the proposed pool and the sports hall. However, they are objected to an argument of whether the seats are convenient or not. This argument is necessary because facilities aim to serve not only for recreational use of campus students, but also give opportunity to the organization of sport competitions in professional levels.

The other effectiveness of the initial plan is the adequate orientation of outdoor fields and courts. Stadium is situated on the northwest and southeast direction. Open basketball, volleyball fields and tennis courts are situated on the north-south direction. This arrangement is successful in terms of comfortable playing conditions.

Furthermore, independent from the initial plan, a new sports hall construction has started on the central part of the academic campus. It is definitely located next to the health center on the west side of the rectorate building. It will also include several outdoor tennis courts and a separated car park. The new hall is thought to have a seating capacity of 2500 spectators. Such an attempt to construct a new sports hall further from the proposed sports park is to give service to students, which have limited time to utilize from sport facilities in academic campus.


The new proposal has accepted the potentials and constraints of the current site separated within the campus, because the research made for site selection process in the case study implemented that the most available and extensive land in the campus is the considered site for such a broad centre of required activities. As a result, sports facilities will take place on the south side of the central campus at the other side of the local Çeşme-İzmir Road.
OUTLINE OF THE PROGRAM:

Site is planned as a sports park for the use of whole campus population and other sporting events as well. It includes both indoor and outdoor activity areas connected to each other with a landscape design. While generating the new program, initial plan is evaluated as to its advantages and disadvantages. The final program of the facilities is determined according to the combination of 4 major factors:

1. Values taken from the comparison of sample universities selected from abroad and Turkey. Those values are:
   - Population of the universities
   - Campus area of the universities
   - Proportion of the area separated for sports facilities to the whole campus areas of the universities
   - Types and capacities of the sports facilities, both indoors and outdoors in universities’ campuses.

2. Spatial requirements of FISU, related with the organization of competitive athletic events in universities.

3. Planning & design considerations in sports’ planning, described in Chapters 4 and 5.

4. Program of the initial plan made for sport facilities that will take place in İYTE campus.

As to above factors, program of the activity areas can be stated as follows at a comparative scene:

Indoor Facilities:

Sports Hall:
- Initial plan offers a sports hall with a total construction area of 5855 m². The hall includes a main competition saloon composed of dimensions of 3 basketball courts and practicing halls for field sports and defence sports. Main hall has a clear space of 1110 m², practicing halls for volleyball and basketball has a clear space of 600 m² and finally practicing halls for defence sports and gymnastics are 400 m². The facility has a spectator capacity of 5000 seats.
• Independent from the initial plan, a new sports hall construction has stated outside the area separated for sports facilities. It is located at the central campus near the construction of health centre. It has a floor area of 2935 m² and a total construction area of approximately 4600 m². The hall is composed of a main saloon having a dimensional frame of 3 basketball courts with a seating capacity of 2500. It has no practicing halls so that it is not sufficient enough to serve for the whole campus in terms of the limited saloon and capacity.

• In addition to the hall under construction, new plan offers a new sports hall with a seating capacity of 4000 spectators. Such a capacity is convenient for professional competitions as mentioned by FISU, which organizes the world university sports competitions. Total construction area will be nearly 4250 m².

Functional units that will be included within the proposed sports hall are:

**Main saloon:** will have a outline that is designed according to dimensions of saloon handball. It requires an area of (22m x 45m) 990m².

**Seating facilities:** will have capacity of 4000 spectators. It will approximately have an area of 1200 m².

**Media room:** that is needed for professional competitions or special events requiring a space allocation of 200 m².

**Foyer:** with an area of approximately 100 m²

**Cafeteria:** with an area of approximately 250 m².

**First-aid room:** with an area of 40 m².

**Volleyball and basketball practicing halls:** will be 2 in numbers having an area of 320 m² and 180 m² respectively.

**Rooms for gymnastics and defence sports:** one room for gymnastics with an area of 290 m² and one room for defence sports such as wrestling, judo, taek-wondo, boxing and etc. that has an area of 150 m².

**Supporting units for participants:** refer to changing rooms, showers and toilets for participants, requiring an area of totally 150 m².
Swimming Pool:
- Initial plan offers an Olympic swimming pool with a dimensional frame of 50m to 25m. Capacity determined for the spectators is 2500 seats. The whole construction area will be 3840 m².
- New plan offers an Olympic pool with a dimension of 50m. including 8 lanes and a depth ranging from 2 m. to 5m. A platform and 2 trampolines will be inserted on the deep side of the pool that will be used for diving. Other side of the pool that has a depth of 2m., will give opportunity to the organization of water polo. Spectator capacity is lowered to 2000 seats as to population of the university. This capacity is also convenient for competitive events as mentioned by FISU. The indoor pool will have a construction area of 3160 m² and will include the following supporting functional units:

Management and personnel units: dealing with the regulations for pool and participant units that require an area of nearly 40 m².
First-aid room: serving at an area of 30 m².
Participant units: composed of changing rooms, showers, toilets and a steam bath requiring totally 120 m².
Pre-entrance pools: used before entering the main pool for sanitation. They are located at the exits of men’s changing and women’s changing rooms and generally require an area of (30 m²×2) 60 m².
Filtration area: requiring an area of 200 m².
Storage: used for the pool equipment requiring an area of 40 m².

Student Recreation Center:
Student recreation center is a popular indoor facility that is commonly provided in majority of foreign universities. Recreation centers generally include leisure activities different from professional purposes. Turkish universities generally have those functions inserted within the sports halls or other indoor facilities. However, proposed program offers a recreation center for İYTE Sports Park in order to collect administrative facilities as well as leisure activities for the comfort of all users.
According to the program, the whole construction area for the included activities is 1700 m². The functions that will take place within the center are listed as below:
**Athletic Union Department:** is composed of the rooms of coaches requiring an area of 60 m², classes for physical education requiring an area of (30m².x4) 120m², 2 meeting rooms with an area of nearly (20m².x2) 40 m².

**Administrative Units and Offices:** are composed of the rooms of manager, secretarial staff, and information desks, which require an area of approximately 70 m². Those units are responsible for the organization of sports activities and timetables for the usage of facilities.

**Foyer:** with an area of approximately 100 m².

**Aerobics Saloon:** with a clear space of 100 m².

**Weight-lifting & Strength and Conditioning Saloon:** with a clear space of 100 m².

**Table Tennis Room:** composed of 6 tennis tables requiring a space of 200 m².

**2 Squash Courts:** with a clear space of (65x2) 130 m².

**Billiards Saloon:** composed of 5 billiards tables requiring a clear space of 120 m².

**Supporting Facilities:** refer to changing rooms, wet areas and inner circulation areas for participants, requiring an area of totally 350 m².

**Cafeteria:** serving for the whole participators of the recreation center with an area of approximately 200 m².

**First Aid Room:** with an area of 30 m².

**Racquet Facility:**

New plan offers a closed racquet facility including 2 tennis courts, one of which will include a spectator capacity of 500 seats. The courts will be designed for couples’ play requiring a clear space of (10.97m x 23.77m x 2 courts) 520 m². Racquet facility will give opportunity to students play tennis in uncomfortable weather conditions.

**Outdoor Facilities:**

**Stadium:**

- Initial plan offers a stadium for athletic competitions, matches and special events, requiring an area of 14971 m². Spectator capacity is determined as 3500.
- The stadium proposal of the initial plan is adequate as to its features. New plan accepts the given features of the stadium. Facility is designed in a semi-circular
stadium outline that gives opportunity to the use of the field for track and field athletics as well as football. It has an 8-lane running track around the grass field. The capacity determined by the initial plan corresponds with the future population of the university. It also allows the organization of sports competitions and special events.

**Football Fields:**
- Initial plan offers 5 football fields, 3 of which are mini fields. The overall clear space separated for mini fields is 2400 m². Other 2 football fields are designed as training fields requiring a clear space of 14700 m². All of the football fields except stadium will serve for recreational uses and training facilities so they have no seating facilities.
- New plan offers 3 football fields for the site. 2 of the fields are mini football fields that require a clear space of (65m x 50m x 2) 6500 m². The third field is a carpet field with a clear space of 390 m². Carpet field will have a spectator capacity of 150 seats for probable recreational matches.

**Basketball Fields:**
- Initial plan offers 10 outdoor basketball fields, none of which has spectator seats. The overall clear space separated for the fields is (26m x 14m x 10 fields) 3640 m².
- New plan offers 6 outdoor basketball fields, one of which will include a spectator capacity of 250 seats. According to world university competitions; 6 halls are required for competitions and 6 fields are required for training. Those fields are convenient for training activities as well as the ordinary use of students for recreational purposes. The clear space separated for the fields is (26m x 14m x 6 fields) 2184m².

**Volleyball Fields:**
- Initial plan offers 5 outdoor volleyball fields, none of which has spectator seats. The overall clear space separated for the fields is (18m x 9m x 10 fields) 810 m².
- New plan offers 4 outdoor basketball fields, one of which will include a spectator capacity of 200 seats. Those fields will serve for training activities as well as the ordinary use of students for recreational purposes. The clear space separated for the fields is (18m x 9m x 4 fields) 648m².
Tennis Courts:

- Initial plan offers 11 outdoor, one of which has spectator seats. The overall clear space separated for the fields is \((10.97\text{m} \times 23.77\text{m} \times 11\text{ courts})\) 2890 m\(^2\). All of the courts are designed for the games of couples that require a larger court outline. It is not so practical that majority of the students prefer individual play in tennis.

- New plan offers 6 outdoor tennis courts, one of which will include a spectator capacity of 500 seats. The courts will serve for competitions as well as the ordinary use of students for recreational purposes. 2 of the courts will be designed for couples’ play requiring a clear space of \((10.97\text{m} \times 23.77\text{m} \times 2\text{ courts})\) 520 m\(^2\). Rest of the 6 courts will be designed for individuals’ play requiring a clear space of \((8.23\text{m} \times 23.77\text{m} \times 4\text{ courts})\) 780 m\(^2\). The overall clear space separated for the courts is 1300 m\(^2\).

Open Swimming Pool:

According to the proposed program, there will be an outdoor swimming pool that will serve for recreational use of the university population in summer season. The outdoor pool will be located in a close relationship with the Olympic pool, so that the users will be able to use the supporting facilities provided within the Olympic pool. It has a rectangular shape with dimensional frame of 25m to 12.5m and a depth ranging from 1.60m to 2m.

The reasons for provision of an outdoor pool despite the closed pool are stated as below:

- Campus has suitable site characteristics and climatic conditions that allow a popular use for an outdoor pool.
- Campus is located at a considerable distance from the city. There will be students who are objected to stay at the campus because of summer schools or practices as well as the ordinary academic and administrative staff. Such an outdoor pool will give opportunity to the campus population swim outdoors in summer season.
- Indoor Olympic pool is provided for professional uses, swimming lessons and swimming competitions. In contrast to it, the outdoor pool will serve for recreational use.

Jogging Trail:

The site allocated for sports facilities in İYTE campus is totally 57928 m\(^2\) which an extensive area both for indoor and outdoor activities. As well as the proposed activities,
there is suitable amount of land between the facilities that will serve for circulation and
landscape. The program offers a long-distance jogging trail that will surround the whole
sports park.

**Treking Parcures:**
Similar with the jogging trail, there will be treking routes expanding through the hills on
west side of the sports park. Climatic conditions and existing natural landscape
encourages the provision of treking activity on the facilities site.

**Water Sports:**
The university has a large amount of campus area that expands through the seashore. It
is evident that the seashore of the region is suitable for the presence of various water
sports. According to the proposed sports program for the university, there will be a
center for water sports on the seashore of area that has been allocated for dormitories in
the initial plan. The center will include an information desk, a boathouse and supporting
services for the students dealing with sailing, surfing and rowing.

**6.4 Design Stage of Project Proposal:**

**Landuse:**

The general landuse for the whole campus area based upon functional zoning
arrangements. According to zoning, academic campus, dormitories, social housing
facilities and sporting facilities are located in different places. However, there are various
attempts to establish convenient relationships between those functional zones. Despite
these attempts, sporting site is seen as out of frame because of old İzmir-Çeşme road,
which separates the sports site from the academic campus.

According to the whole campus landuse, final area reserved for sports activities is the
land between old İzmir-Çeşme road and İzmir-Çeşme highway which is located on the
south of academic campus. The reserved area has many potential and restrictions that
directly effect the preparation of the plan for sporting activities. (See Figure 6.5)
However, the area seems to be an excessive site for construction, useable land is limited
because of certain natural factors. First of all, the site lies between two hills, which have unsuitable slope for purposed activities. As sport fields and courts need large smooth spaces, the plan proposal has avoided expanding on slopes of the hills. The other factor that effected the generation of plan is the presence of fault lines that are passing from the outskirts of the hills on a direction of close to north-south. However they may be ignorable for outdoor fields and courts, they create a real problem for closed facilities. Because of these reasons sporting site is designated virtually at the middle of those hills, distant from the fault lines. The real project area expands on approximately 190000 m²; and, 41000 m² of which is reserved for main activity areas and the remaining is reserved for all kinds of circulation and other uses. The sporting site composed of various activity areas is inserted in a condense layout within a vehicular loop close to the academic campus rather than expanding through the inner valley. The reason for such a collective plan was to hold the distance to the central campus minimum by the way, to increase the frequency of use. The other restriction that comes from the given land is the presence of various riverbeds. In order to create a safe settlement on the concerned area, riverbeds are tried to being used as potential for the project. There are two major riverbeds, one of which comes from the academic campus and the other comes from the hill located on the west of the project area. Effectiveness’s of those riverbeds have been decreased by cut and fill processes and also, their directions has been changed by using canals. The one coming from the academic campus used as a decorative water element on the main pedestrian alley. The other is accepted as a natural potential for the area of natural sports that lie close to it.

The area on which the project is designated, also were to have a sloping condition but the slope is acceptable when contrasted with the ones on hills. The smooth slope under the project area is used to create attractive terraces on which outdoor fields and courts are designated.

Other than the restrictions, the area serves some potential for the purposed facilities. The concerned area has an attractive natural landscape and scenic beauty, which is thought to contribute to the planting of the project area. Because recreational and sporting activities strongly need a landscape plan in order provide lively spaces to visitors.
As the general landuse with reference to natural and physical characteristics of the area is obtained, layout of the project has been established.

Figure 6.5: Site Analysis for the Proposed Project Area
When contrasted with the initial plan prepared for sports facilities, the new plan offers a different layout in many respects. (See Figure 6.6) As mentioned in previous pages, academic campus has a grid settlement pattern of which buildings are located in south-north or east-west direction. Sports site has the same language with the academic campus; somehow it differentiates in terms of its whole pattern. The general layout is composed of an orthogonal system in a direction close northwest-southeast, which is superimposed on the present grid pattern of academic campus. Superimposed pattern generates from the break out point of the pedestrian axis that comes from the center of academic campus. (See Figure 6.7) The concerned axis forms the central spine of sports site on either side of which open fields and courts are assembled. One end of the axis interprets the top of the hill located in the academic campus and reaches out to connect with the stadium as a focal point. The entire open fields and courts, except for the stadium, lay on north-south direction, which is convenient to the present layout the academic campus at the same time. Similar to them, the pedestrian paths that lay between the open courts and fields have the same direction with present campus pattern. However, closed facilities are oriented according to the superimposed orthogonal pattern. Reason for such a variation in orientation is to encourage the direction of the main spine of the site and develop a dynamic layout as well. Convenience of the closed structures to the existing pattern is provided with the arrangements for the outdoor spaces in front of them.

The whole activity area is encircled with a vehicular service loop that gives access to the activities from their backgrounds. Inside of the loop is designed with a geometric clarity with reference to layouts of indoor and outdoor facilities. The natural slope is cut and filled to create smooth terraces for intended activities. Similarly, full pedestrian circulation is formed according to the created geometric structure. In contrast with the smooth orthogonal pattern inside of the loop, south of the activities’ area which is reserved for trekking and jogging is left as a natural environment. Pedestrian paths and the jogging trail are designed with minimal interventions in order not to interrupt the natural potential of the site.
Figure 6.6: Site Plan of Academic Campus and Sports Facilities
Figure 6.7: Conceptual Plan for Proposed Sports Facilities
Circulation:

Circulation system is better being understood in two phases:

**Vehicular Circulation:** for the sporting site is provided with a network totally independent from campus traffic circulation, however the network is convenient with the general system established for the academic campus. The main access to the site is from the roundabout that is proposed at the southwest of the incubator building. The roundabout will give access both to the academic campus on the north and to the sports facilities on the south from İzmir-Çeşme local road. The second access to the sporting site is from the road passing through the south side of the concerned area. The road has a junction point with İzmir-Çeşme local road on the northeast of the site. Vehicular network for the project area is thought as an outer loop, system similar with the academic campus, surrounding the whole sport activities. Inside of the loop is totally free from vehicular circulation. The outer loop gives access through the indoor and outdoor facilities with car parks that are located on the peripheral parts along the loop. Car parks are connected to activity areas with pedestrian routes. Capacity of the car parks is determined according to the required standards for each activity. One car park is provided to each 30-spectator seat for sport activities and one car park is provided to each 50 m² construction area for recreational activities.

**Pedestrian Circulation:** has a much more dominating characteristic within the site. Inside of the vehicular loop is designed to encourage full of pedestrian circulation. Pedestrian network refers to the overlapping two grid patterns that form the layout of the site. The main pedestrian paths are formed in different directions that end with closed structures. The main alley passing through the site generates from the pedestrian path coming from the central part of the academic campus. This pedestrian path is located at the north and south direction. It makes a break point at the upside of Çeşme road and meets the main alley of the sports site. The alley has a direction close to the northwest and southeast direction in which stadium is oriented. The northwest end of the axis virtually focuses the hill located at the main campus and the southeast end focuses the stadium. Main pedestrian path is separated into two both of which reach to the area proposed for natural sports. The pedestrian path of secondary importance is connected
perpendicular to the main alley and meets the sports hall at the end. Similarly, third and
the fourth pedestrian axis separates from the second alley and meets the other closed
facilities at their end points. Remaining pedestrian paths also refer to the concerned and
give access to the outdoor fields and courts. The entire pedestrian network is designed to
provide a sportive and recreational site free from vehicular traffic.

**Functional Arrangements:**

Activities within the sports site are located according their functional relations between
each other. They are virtually separated into smaller functional zones and pedestrian paths
are used as separators for those functional zones. Such a separation in terms of
functionality helps directly orienting the users and spectators to the activity areas they are
interested in. It also creates an order in utilization of the activities. According to this
functional zoning approach, related indoor and outdoor activities are tried to be collected
together and their access considerations are solved collectively. (See Figure 6.8)

Stadium is designated at the end of the main alley. In relation to it, training football fields
and mini-football field lay on the east the alley near the stadium. Similarly, open volleyball
and basketball fields are located in a close distance to the sports hall in order to serve as
an alternative to it for training. This arrangement also gives players on the outdoor fields,
the chance of utilizing from the supporting units that take place within the indoor hall. As
for the same reasons, outdoor tennis courts are located in front of the indoor racquet
facility. Students who want to play on outdoor tennis courts may use the changing and
shower facilities designed inside of the racquet facility. The other closed facility, closed
swimming pool, is thought to have a direct relationship with the outdoor pool. Other than
the main activity areas, supporting units that include changing facilities, showers,
fountains, buffets and telephone boxes are separately dispersed through the outdoor fields
and courts. Those units are located in a close distance between the car parks and the
activity areas. The other functional units that take place on the site are refreshment areas.
They are designed on each functional activity zone in order serve for relaxing after play.
Further from these, catering utilities are also necessary functions to be considered on the
site. Indoor facilities are designed with their own catering services inside. For the outdoor
fields and courts, a central catering facility is designed on the main alley. It is proposed to
be located at the central part of the alley in order to have the optimum distance with the entire outdoor fields and courts for utilization of visitors.

Figure 6.8: Site Plan of Sports Facilities
Locations and Forms of Indoor Facilities:

There are four closed facilities except for the stadium within the site, which are the sports hall, indoor pool, racquet facility and the student recreation center. They are inserted to the area according to several factors.

- The major factor in determining their locations on the site was the attempt to balance the solids and voids on the area. Closed facilities at the concerned sporting site are located close to each other on the west side of the area. The reason for this is to obtain an enclosure through the hill that is located at the west part of the area. The other natural sides surrounding the area serve for natural sports so that they have to have circulation relations with the activity areas. In contrast with those areas, the hill expanding behind the close facilities has only a visual scene rather than being designed for a specific purpose. In such a case, the enclosure that is created with indoor facilities will define the outdoor spaces; by the way prevent the site to have a probable loose view that may be created by neighbouring outdoor activity areas.

- The second important factor in determining the locations of the closed facilities was the frequency of use. The most commonly used indoor facilities are tried to be located close to the academic campus. For example; student recreation center, which includes daily leisure activities, is located at the pedestrian entrance of the site in order to convenient access for pedestrians. Similarly, sports hall and the indoor pool are located on the major pedestrian axis in order to be easily perceived by pedestrians.

- The third factor for the location considerations of indoor facilities was the concern of access factor. The entire closed structures are located at the peripheries along the vehicular loop in order to take the necessary service and the vehicular access. Further from vehicular access, pedestrian access also effected the locations of closed structures. All of them meet an important pedestrian route, which allow a clear perception for the visitors.

- Fourthly, it may be accepted that closed structures gives an identity to the site as to their solid forms in architectural means. When they are located on the west side, it is proposed to meet the vehicular road that reaches the site. So that, they may emphasize the ones approaching from the vehicular way, the identity of the site with the contribution of they vertical characters.
As well as the location factor, forms of the closed facilities were also to be considered in design stage of the considered site. Forms of the buildings are generated from the activities they include. Before the design stage, program of the closed facilities are determined as to which activities would take place and what amount of area they require. After the generation of the program, circulation of both spectators and participants are solved for the inner space. The circulation diagrams have played the major role in formulating the conceptual layout of the structures. As, the required activities have standardized dimensions; forms of the structures at the site have a common language in terms of their physical features. However, they have variations on their final layouts, they have orthogonal forms on the basis. Closed structures may also be architecturally differentiated in terms of their facades or roofs with the materials used in constructions. Final projects of the closed facilities will be under the responsibility of the architects when they are concerned to be constructed.

**Orientation of Outdoor Facilities:**

There are many open fields and courts varying in size and number that are proposed for the sporting site. Orientation of those fields and courts are determined according to the given standards in the previous chapter under design guidelines. (See Figure 6.9) According to those design guidelines, the best orientation for outdoor playing fields ranges between the angle from north-south and 5 degrees to the west from north-south direction. All of the fields and courts on the site that are football fields, tennis courts, basketball and volleyball fields are oriented in north and south direction. Not only do the orientation of outdoor fields is convenient for the given standards, it also refers to the general orthogonal layout of the academic campus buildings. At the same time, their orientation is the main factor that generates the directions of other closed facilities and the pedestrian network within the sporting site. When contrasted with above courts and fields, the only outdoor activity that has a different direction is the stadium. It is oriented on a direction between north-south and northwest-southeast. However it lays on a different situation, its orientation is still convenient to the standards given for playing comfort. The reason for such a variation is to locate the stadium in the same direction with the alley, by the way, meet the visitors at the end of the alley who are approaching towards the stadium.
Proposed project offers various outdoor activity areas and special closed facilities for sport events. Excluding the circulation areas and other supporting utilities, the expansion area of the facilities is nearly 50000 m², which refers to an extensive use of space on the site. Spatial arrangements of the purposed activities are evaluated according to their functions. There has been created differentiating zones to separate the independent functions, especially the outdoor fields and courts. According to this arrangement, similar open fields are located next to each other. While generating the project, scale factor has emerged as a critical concept that is to be concerned in design of those extensive uses. The major potential, which may contribute to balance the scale factor within the project area, was the natural slope of the land. (See Figure 6.10 and Figure 6.11)

As a positive intervention to the site, neighbouring fields and courts are designated on grading levels combined with a natural smooth slope. The terraces on which open fields take place, also contributed to break the autonomous perspective of the open spaces and create a dynamic structure within the site. Spectator seats of the fields are inserted to the natural slope in order to hide the concrete walls behind that will create probable disturbing view from the pedestrian routes.
Similar with the outdoor fields and courts, closed sport facilities are also designated with reference to the diminishing slope of the area. As the space requirements of the indoor activities are not so flexible for many instances, forms of the buildings could not be changed. Those buildings are expected to have large construction areas and considerable heights. However, their heights are tried being held at optimum within the proposed project. For some buildings, such as the racquet facility, indoor field is depressed under the ground level; in order to decrease the roof level, by the way obtain a relatively slender structure. Large forms of the indoor facilities may further be evaluated in architectural design and construction processes. Attractive roof forms or facades may be designated and different construction materials may be used to hide bulky forms of the structures. Further architectural interventions will contribute to formatting the site into human scale.

Focus:

The major element that affects the whole layout of the site is the main pedestrian alley passes through the activity areas. The alley starts from the academic campus and separates the activity areas into two with a diminishing slope along the axis. Most of the outdoor fields and courts are located on both sides of the alley. Reason for such a locational approach was to provide pedestrians to watch the activities at the courts that surround the alley. A strong horizontality is perceived on both sides of the alley. However, situation is different on the front view of the alley. Stadium, which is designated at the end of the concerned axis, provides a vertical perspective to the pedestrians that walk through the main alley because; horizontality of the football field is enclosed with spectator seats. The most important reason in determining the location the stadium was to create a focal point for the site. This focal point is thought being perceived as a landmark from the upper levels of the main pedestrian alley. It may also help attributing an identity to the site with its perceptible visual scene. (See Figure 6.10)

Complementary Design Objectives:

- Dimensional Standards for Activity Areas: are also concerned in design process of the activity areas. Most of the sporting areas including both indoor and outdoor activities are allowed with ample space. The outdoor fields and courts, except for the training football fields that are located near the stadium, are designed in official
standards. Those two training fields have smaller dimensions when contrasted with an official football field. The major outdoor facility, stadium, is designed according to the standards that give opportunity to track and field events at the same time. Indoor sports facilities are proposed to serve as multipurpose facilities, which are convenient for various types of sports. Indoor pool has Olympic dimensions in order to serve for competitive swimming, waterpolo and diving. Similarly, indoor racquet facility includes two competitive tennis courts, one of which may be converted to three badminton courts in official standards with simple arrangements. Sports hall is the other multipurpose facility proposed on the site. Main saloon of the hall is offered with a dimensional frame of combination of three basketball courts. It has permanent seats around the hall. Saloon is convertible to single basketball court, which gives opportunity to use the remaining space for additional spectator seats. Saloon may also be altered for gymnastics or other kinds of events with related equipment.

- **Lighting:** is another objective included in case study area. Sporting site separated in IYTE campus is considerably far from the academic campus and the dormitories. In this case, suitable conditions for night use should be provided to students, which are not able to utilize from the area in daytime because of access and time factors. Because of location situation of the sporting site, most of the outdoor activities are enlightened for night play. Lighting is necessary especially for safe use of the area at night so that the whole site including the pedestrian paths and car parks is enlightened with convenient lighting structures as well as the main activity areas.

- **Fencing:** is provided for majority of the open playing areas in the project area. Fences around the fields and courts are inserted to prevent the interruption of the play, by the way provide a comfortable and safe playing condition. Other than these advantages, fences that surround each activity area also serves for an additional purpose. They are designed in varying heights in order to separate different activity areas. With the contribution of fences as vertical elements, open fields and courts become more identifiable on the large open spaces. Tennis courts have fences in 5 meters height, volleyball and tennis courts have fences about 3 meters in height and the carpet fields has fences about 7 meters in height. These heights are determined according to nature of the games. Other than those, Stadium is also fenced in
convenient dimensions to control the access. Different from these activity areas, training football fields have no fencing structures around because of their considerably larger dimensions. (See Figure 6.10)

- **Supporting Facilities:** are tried to be concerned in all instances as mentioned in previous chapter under design objectives. Supporting facilities thought for the site may be evaluated in three categories:

1. **Participant facilities:** are the units directly related with the active users of the site such as changing utilities, first aid services and training facilities. For indoor facilities, these units are provided within the structures according to the capacities of indoor activities. Clear spaces separated for wet areas and circulation for participant utilities are determined under the given standards in previous chapter. Amount of the area provided for those units are given in the program chart in previous pages in the same chapter. For outdoor facilities, separated structures are provided close to the activity areas. Football fields, volleyball and basketball fields have their own supporting units. Those units include dressing rooms, showers, restrooms and storage rooms inside. Circulation of participants between activity areas and supporting units are tried to being held in minimum distances both for indoor and outdoor activities. Moreover, convenient access is provided from car parks to the facilities.

2. **Spectator facilities:** refer to utilities directly related with visitors of the site. These utilities are needed especially when there is a competitive sport event or other special events that require a considerable spectator capacity. As the concerned site is designed to serve for such kind of events as well as daily recreational use, spectator requirements are also included in design process. Information boards that interpret the current location are inserted to important nodes. Ticket booths are thought within the closed facilities for probable sports competitions. Convenient car parks are provided close to the entrances of activity areas. Ample spaces are separated for main axis through the activity areas for comfortable circulation of spectators. Further from these, sufficient spectator seats are designed for required sport areas. Spectator capacities of indoor facilities are determined according to required standards for competitions as mentioned in generation of the program for the site. One field or court for each type of outdoor activity is determined as the main court or field and designed with sufficient spectator seats. Seats of the outdoor
fields and courts are inserted to the natural slope of the site. Other than seating utilities, suitable refreshment areas are reserved for spectators to relax and watch the activities from a distance at the same time.

3. Other services related with the site: refer to the services that should be maintained for comfortable use. One of the most necessary services is provision of sufficient car parks. Car parks are distributed to all indoor and outdoor activity areas separately according to required capacities. In design of parking areas for sports facilities, one car park is provided for each 30-spectator seat. In design of recreational buildings, one car park is provided for each 50 m² space. Other than car parks, ample space for bus parking is also separated for probable visitors in days of special events. Storage was another factor to be considered at the site. Storage units for closed facilities are provided within each building. For outdoor facilities, storage rooms are provided within the units designated for supporting participant utilities. Probably, the most important factor for such a big scale sporting area is the concept of management. Managing bodies for the project site is thought within the indoor athletic union center. All of the secretarial works related with competitions and determination of the schedule for daily use of the activity areas as well as the office rooms take place within the Athletic Union Center. The other function of the management units is to control the maintenance of the facilities. Maintenance units are separately provided in the area working in correlation with managing bodies. Closed facilities include maintenance rooms inside the buildings that are responsible for daily care and general care of the facilities. Similarly, outdoor activities have storage rooms and maintenance rooms thought in the supporting units that are located close to activity areas. (See Figure 6.10)

- **Surface Covering Materials**: are the other design objectives in order to increase the frequency of use of activities and quality of the project area. Outdoor fields and courts are offered being covered with best surface materials required for the nature of games. Grass is the suitable cover for main football field and training fields. Carpet field requires a synthetic surface material for best use. For open tennis courts, hard porous or synthetic surface and for volleyball and basketball fields concrete surface may be used. Indoor tennis and badminton courts within the racquet facility require suitable non-slippery synthetic surfaces. As another closed facility, indoor hall is proposed to have a multi-functional feature so that the floor condition should be able
to be adapted to different game requests. Surface covering is not only thought for fields and courts, but also thought for remaining outdoor spaces other than the activity areas. For example, main pedestrian alleys are offered to being covered with different materials to emphasise their functions. Gathering places on the pedestrian alleys are also differentiated with their surface materials. Furthermore, refreshment areas are design with natural surface materials to give people feeling of relaxation.

- **Grading and Drainage:** is especially important for the project, because watertable of the proposed land is high. Facilitating the quick drying of outdoor fields and courts are to be considered for adequate play. For this reason, outdoor activity areas are inserted to levelling terraces. In order to prevent accumulation of water on the site, catch basins of riverbeds are tried to being controlled with canals. Further, drainage applications are also to be considered in application process of the project. (See Figure 6.10)

- **Vegetation:** is especially thought for the project area, which needs to be planted as to being expanded on a large natural piece of land. Vegetation for the open activity areas is concerned to serve for different purposes. These purposes in planting may be stated as follows:
  - The vehicular loop is planted with identical trees on both sides.
  - A green belt is provided between the vehicular loop and the pedestrian paths inside.
  - Main pedestrian alleys that connect with special indoor facilities are designed as densely tree-lined axis.
  - West sides of the open fields and courts are densely covered with leaf intensive trees in order to provide shade for afternoon sun.
  - Refreshment areas are covered with plants to provide comfort for relaxing.
  - Leaf intensive trees are inserted to car parks to create convenient shade.
  - South of the sporting area, which is separated for trekking and jogging, is assembled with variety of plant types to emphasize the surrounding natural environment. (See Figure 6.10)
• **Safe use:** has been also considered in design process. The major disadvantage that would affect safety of users was the location of site. As sports facilities is separated from the academic campus with İzmir-Çeşme road, safe access of students to the sporting site was a real problem. So that, an underpass is offered for the local road in order to provide safe access of pedestrian visitors. In addition to pedestrian access, vehicular circulation is also established independent from the local road and present campus ring. (See Figure 6.11)
Figure 6.11: View from the model of the project of Sports Facilities in IZTECH Campus

The aim of this research was to create a guideline for planning and design of sports facilities with reference to data gathered as a preliminary study, and in further, use it for planning a facilities site on a typical campus university as a case study.

IZTECH campus was chosen for the case study project, which is a newly developing campus in Izmir. Before the generation of the project, several steps are experienced...
Since the beginning of Industrial period, leisure activities have gained a particular importance all over the world as a result of technological improvements. People are today much more conscious about the necessity of separating time for individual interests in order to fulfill themselves both physically and mentally. Recreational activities are one of the most common time consuming activities for most of the cultures. With reference increasing trends especially in recreational activities, recreation planning emerged as a favorite discipline in urban design. Today, there are varieties of recreational activities that serve for different age groups. However, sporting activities, in fact, are the most popular ones that attract millions of people in the world.

Sports may come into picture in any period of an individual’s life, but the most suitable period that an individual may effectively participate in sports is the adulthood. In this sense, provision of sports facilities in educational foundations directly determines the level of maturity, which an adult obtains from participating in sports.

The research especially concentrates on provision of sports facilities in campus universities which have the fullest opportunity to serve for such kind of activities as their educational structure, mission and their responsibilities about serving for university students in various fields of interests. Campus universities include many other amenities such as cultural, recreational, accommodation and sports activities as well as educational functions. Every activity should be sensitively concerned within the concept of campus planning, so that, planning of sports facilities in campus universities is evaluated in terms of both sports planning and campus planning approaches. The aim of this research was to create a guideline for planning and design of sports facilities with reference to data gathered as a preliminary study, and in further, use it for planning a facilities site on a typical campus university as a case study.

IZTECH campus was chosen for the case study project, which is a newly developing campus in Izmir. Before the generation of the project, several steps are experienced
within the research. The most important solutions that are to be drawn for the initial research may be stated as follows;

1. General classification of sport types contributes to the planning of facilities that should take place within a university campus. Sports can have different features such as being traditional, recreational or official. In order to determine which types of activities are to be included in planning of a facility, first of all, characteristics of the population should be determined to whom it would serve. Today, there are more than 4500 universities and colleges that are situated on various fields of the world. These universities carry on the their own missions which are determined according to the social, cultural and economical structure of the nations they belong to. In this situation, one of the most critical part of the research emerged as the evaluation of sample universities, selected from America, Europe and Turkey, in order to obtain a general consensus about provision of sporting activities in different regions. Universities in different regions include facilities for their traditional sports as well as the official sports that are common all over the world.

2. It is observed that in foreign universities, sports are accepted as one of the most favorite activity for advertising the name and mission of universities. Leagues between university teams, especially in America, are very famous events that take place within the nation. Because of this situation, there is a great concern for provision of extensive facilities in those campus universities to encourage students for taking part in competitive events and provide a valuable sporting environment for recreational purposes as well. Sports facilities of those universities are extensively used for competitive activities and special events so they are planned with capacities of more than current university students. Great open spaces are separated for facilities and planned according to sensitive design guidelines for sport activities. In contrast to those foreign campus universities, Turkish universities have considerably limited opportunities for sporting activities within their campus areas. Except for the several developed ones, majority of the universities have insufficient indoor and outdoor facilities for the utilization of students. First reason for the destiny of Turkish Universities is the lack of sport and recreational planning in Turkey. The second reason is that competitive events between universities have not achieved a great concern yet. And finally, universities have limited budget to
provide such kind of facilities, unless they are supported by the government or other institutions. Such a comparison between foreign and Turkish universities contributed to the generation of the design program for the case study area, which is a newly developing Turkish university.

3. The other result drawn from the initial study is the contributions of world university sport competitions to planning and programming sport activities in universities. These competitions have a short history, which aims to encourage university students to deal with sports by collecting them on a competitive scene. The major contribution of the event is expressing the importance of value of sports facilities in campus areas to prepare the university athletes to such kind of competitions. It draws certain principles and standards for facilities, which may be adapted to future projects about sports.

With reference to above evaluations, a program is generated for developing a site for sports in IZTECH campus. As the site has a potential for extensive landuse, a convenient site for facilities could be designed which might further be a successful example for newly developing universities in Turkey. The major aim in the project was to design valuable indoor and outdoor facilities in official standards that will serve for professional use as well as the temporary use of the campus population. So, design guidelines and standards are determined according to the requirements for professional sport events and capacities are determined with taking into account the final future population of the campus and probable community use.
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## APPENDIX A

### DIMENSIONAL STANDARDS FOR OFFICIAL SPORT ACTIVITIES

**IN CASE STUDY PROJECT**

<table>
<thead>
<tr>
<th>GAME</th>
<th>SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>m</td>
</tr>
<tr>
<td>TRAMPOLINE</td>
<td>5.2 x 3</td>
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<tr>
<td>BOXING</td>
<td>6.1 x 5.1</td>
</tr>
<tr>
<td>WRESTLING</td>
<td>12 x 12</td>
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<tr>
<td>FENCING</td>
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<tr>
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<tr>
<td>JUDO</td>
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<tr>
<td>KARATE</td>
<td>8 x 8</td>
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<tr>
<td>KENDO</td>
<td>11 x 10</td>
</tr>
<tr>
<td>SNOOKER/BILLIARDS</td>
<td>3.7 x 1.9</td>
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<tr>
<td>POOL</td>
<td>2.7 x 1.4</td>
</tr>
<tr>
<td>SQUASH</td>
<td>9.7 x 5.4</td>
</tr>
<tr>
<td>AMERICAN SQUASH</td>
<td>9.7 x 5.6</td>
</tr>
<tr>
<td>SQUASH: DOUBLES</td>
<td>13.7 x 7.6</td>
</tr>
<tr>
<td>BADMINTON</td>
<td>13.4 x 6.1</td>
</tr>
<tr>
<td>TENNIS</td>
<td>23.8 x 8.2</td>
</tr>
<tr>
<td>BOWLING (COMP. SIZE)</td>
<td>40 x 9</td>
</tr>
<tr>
<td>ARCHERY (6 ARCHERS)</td>
<td>22 x 7.5</td>
</tr>
</tbody>
</table>

**Small-Bore Shooting:**

- **Rifle**
  - 25 x 4.2
  - 82' x 13'8"
- **Pistol**
  - 25 x 6.4
  - 82' x 21"
- **5-A-SIDE SOCCER**
  - 36 x 28
  - 118' x 91'8"
- **INDOOR HOCKEY**
  - 40 x 20
  - 131'2" x 65'6"
- **BASKETBALL**
  - 26 x 14
  - 85'3" x 46"
- **NETBALL**
  - 30.5 x 15.2
  - 100' x 50'
- **TEAM HANDBALL**
  - 40 x 20
  - 131'2" x 65'6"
- **VOLLEYBALL**
  - 18 x 9
  - 59' x 28'2"
- **ICE RINK**
  - 61 x 26
  - 200' x 85'3"

---

**Figure A.1:** Dimensions of General Official Sports
Figure A.2: Football Field
A Plan of playing area.

a. Court, playing area.
b. b1. Run out area.
c. Officials and players benches.
d. European free-throw area.
e. US free-throw area.
f. Sections.

B1 Basket height dimensions.
B2 Clear height dimensions.
C1,2 Backboard and basket dimensions.
D Multiple courts with possible seating.
E Championship court with seating.

Notes:
- Court should have hard surface.
- Width and length of court can vary by 1m and 2m, respectively, but proportions are to remain the same.
- Spectators to be a minimum of 2m from court.
- Uniform lighting required, preventing glare.

Figure A.3: Basketball Field
Figure A.4: Volleyball Field
Figure A.5: Handball Field
A Tennis court plan:
a. Back wall or spectators.
b. Additional zones for officials (all sides).
c. White lines (included within limits of court).
d. Net elevation with heights.

e. Services zone.
f. Multiple courts (recommended maximum 5 in a line) with possible seating, eg club.

g. Single championship court with tiered seating.

Notes:
- Back walls preferably green (to minimum 3m/9.8’ above finish floor level).
- Court surfaces vary (e.g., cement, asphalt, carpet etc.).

Figure A.6: Tennis Court
A Badminton court plan.

a Back wall or spectators.
b Additional zone for officials (all sides).
c White lines (included within limits of court 3.8cm/1.5" wide).

B Net elevation with heights.
d Services zone.

e Multiple courts with possible seating (undivided).

D Multiple courts with dividers. Seating can also be placed on alternative court for tournament.

E Single championship court with tiered seating.

Notes:
- Back walls preferably dark.
- Floor to be non-slip and usually timber.
- Draft free environment required.

Figure A.7: Badminton Court
A Squash plan.
B Elevations.
B1 Back wall.
B2 Side wall.
B3 Front wall.
C Options for wall type/viewing.
C1 Competition-type court with seating. Glass walls to appear white (internally).
C2 Club-type court with solid walls and viewing gallery.
a Flush door.
b Seating (walls to be glass). Glass wall common on back wall.
c Clear height to lowest projection for championship play.
d As c for club play.
e Services zone (ventilation, lighting).

Figure A.8: Squash Court
A, B Snooker/billiards.
A1 Plan.
A2 Section.
a Table.
b Lighting above table. Recommended 575 lux at table surface.
B1 Multiple tables within space.
B2 Recommended space for 1 table (competitions).
C Pool.
C1 Plan.
C2 Section.
c Table.
d Lighting above table.

Figure A.9: Billiards
Table tennis sizes.

A Plan of table with recommended playing space requirements.
- a Recreational play (5x7m/16x23ft).
- b Tournaments (multiple tables) (5x8m/16x26ft).
- c Club matches (6x10m/20x33ft).
- d Inter-state/county (6x12m/20x39ft).
- e International matches (7x14m/23x46ft).

A2 Section showing recommended clear heights.
(Net height is 15cm/6" above table level.)

B Space requirements.
- B1 Tournament (multiple tables). Low partitions/screens are often used. Individual lighting for each table.
- B2 Inter-state matches.
- B3 International matches.

Note. Each demountable table requires 1.4x1.6x0.5m/55x63x20" storage space.

Figure A.10: Table Tennis
A Boxing.

A1 Plan.

A2 Section.

a Raised ring, minimum 3.6x3.6m/12x12ft for practice.
b Judges table.
c Circulation, minimum 1.2m/47", 2m/79" (national); 5m/16'4" (Olympic). Storage space required if ring is demountable. Recommended clear height 7m/23'9".

B Wrestling.

d Wrestling area.

e Mat.

f Safety area, 1-2m/39-79" for club matches, 3m/10ft for national competitions. Storage for mats required. Recommended clear height 7m/23'9".

C Fencing.

g Piste length varies depending on weapon used.
h Judges.
i Safety area (ancillary circular). If electronic scoring, metal mats can be used. Storage required for pistes.

Note: Specialist advice on lighting requirements is recommended.

Figure A.11: Combat Sports
Aikido.
B Judo.
C Karate.
D Kendo.
a Mats.
b Judges/officials zone.
c Safety area.
d No mats.
e Danger area.

Notes:
• Regional competitions require a minimum of 3 combat areas.
• Recommended clear height 7-7.5m/23-25ft.

Figure A.12: Martial Arts
Men's gymnastics apparatuses and areas required for competition purposes.

1. Pommel horse.
2. Rings.
3. Vaulting horse.
4. Floor exercise.
5. Fixed horizontal bar.
6. Parallel bars.

Notes:
- Unobstructed clear height of 6.7-7.8m/22-25ft is recommended.
- If possible a permanent area is recommended as equipment is large and cumbersome.
- If permanent area is not available and a hall/activity space is used, large storage area is required.

Figure A.13: Men's Gymnastics
Women's gymnastics apparatuses and areas required for competition purposes.

1. Balancing beam.
2. Vaulting horse.
3. Floor exercise.
4. Asymmetric bars.

Notes:
- As stresses exerted on the equipment are great, the structure of the building must be capable of supporting all weight-bearing equipment.
- Equipment suppliers and specialists should be consulted when designing the area.

Figure A.14: Women's Gymnastics
APPENDIX B

PROJECT PROPOSALS FOR INDOOR FACILITIES IN THE CASE STUDY AREA

Figure B.1: Functional Diagram of Sports Hall
Figure B.2: Upper Level Plan of Sports Hall (Scale 1/500)
Figure B.3: Ground Level Plan of Sports Hall (Scale 1/500)
Figure B.4: Lower Level Plan of Sports Hall (Scale 1/500)
Figure B.5: Sections of Sports Hall (Scale 1/500)
Figure B.6: Functional Diagram of Olympic Pool
Figure B.8: Lower Level Plan of Olympic Pool (Scale 1/500)
Figure B.9: Sections of Olympic Pool (Scale 1/500)
Figure B.10: Functional Diagram of Student Recreation Center
Figure B.11: Ground Level Plan of Student Recreation Center (Scale 1/500)
Figure B.12: Section of Student Recreation Center (Scale 1/500)
Figure B.13: Functional Diagram of Racquet Facility
Figure B.14: Upper Level Plan of Racquet Facility

Figure B.15: Lower Level Plan of Racquet Facility (Scale: 1/500)

Figure B.16: Section of Racquet Facility (Scale: 1/500)