

Healing Landscape

Analysing the Landscape Design of Fiona Stanley Hospital

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Abstract | Even though the nature has an effective role in healing and promoting the well-being of human beings, this issue is overlooked in the modern world, and most of therapeutic spaces rely solely on medical technologies and advancements. As a result, the hospital environments have turned into bland and lifeless spaces. The Fiona Stanley Hospital project in West Australia is a successful example where landscape is designed to promote healing. This paper seeks to provide an analytical and explanatory overview of the design of one of Australia's largest and most important projects

Therefore, multiple databases and sources related to therapeutic and healing spaces are studied in this paper. This paper aims at investigating the key features of landscape design that can promote the healing process in Stanley Hospital; a successful contemporary example.

In this hospital, the design strategies for creating a healing landscape are beyond formalistic or objective ideas reflected in the site. These strategies are considered as landscape ideas that offer a context for coherent coexistence of human and other species that benefit from common resources in life. This project considers a holistic approach in design and planning to create a healing landscape that focuses on the features of the context and human behavior. Defining human scale for spaces, creating integrated and diverse spaces, representing indigenous landscape embedded with conceptual design and natural viewpoints are the prominent measures in formation of Fiona Stanley hospital. Historical experiences also indicate the effective role of green nature, sunlight, and fresh air in promoting the healing process in the therapeutic spaces. Thus, contacting with nature is a promising solution to improve the quality of health centers.

Keywords | Fiona Stanley, Healing Landscape, Hospital Areas, Healing Garden.

Introduction | The healing gardens possess a curative sense in human body and soul; not only for offering objective and aesthetic aspects, but also for providing a context for human interaction with nature through the five senses.

Hospitals are places where people go to heal. So, it is not surprising that architects at HASSELL sought to create a natural space to promote healing; a space that allows the patients to recover indoors or outdoors through contacting with nature.

The collaboration team used the advice of a health-care designer on an evidence-based design before designing. Roger Ulrich, the consultant on the hospital's design, conducted studies showing that green vistas, natural sunlight, and access to natural surroundings all work together to improve patient psychological and physical wellbeing and reduce the recovery period and the need for sedatives. His study also showed that easily accessible outdoor spaces can also benefit hospital staff seeking a brief respite from their stressful work environment (landarchs.com).

The History of Healing Gardens

Throughout history, nature has received much attention in everyday life of humans. Human life has encountered various problems when detached from nature due to the change of life style, scientific advancement or lack of facilities. In these situations, human beings have turned back to nature to provide a balance in their lives. Gardening and livestock breeding were the initial forms of conquering and domination of nature. The early gardens were the simplified forms of nature that were created to benefit people by applying the least changes in natural forms. Using natural herbs dates back to 3000 B.C. in Mesopotamia and China (www.Gardensit.com). According to the evidence in the Eastern civilization, the early paintings and information models of gardens, date back to 1800 BC in Egyptian civilization in which nature was usually designed as a relaxing element alongside the temples (Turner, 2005). Nature has been an integral part of Iranian life in Iranian civilization. In 500 BC, the Iranians designed the enclosed gardens which were an allegory of paradise, with a picturesque and desirable environment for recreation and relaxation. The Islamic Garden in the Middle East is considered as a beautiful place, a shelter against the harsh environment, and a place for relaxation that embody the attraction of Islamic garden. In the Western civilization, Aesculapius in ancient Epidaurus was one of the first places in which nature was used not only for relaxation and leisure purposes, but for treating patients. The monastic sanatorium was established in the middle Ages in Western Europe to accommodate and take care of pilgrims. These spaces helped people regain

the health of their bodies and bodies and soul through presence in nature. During this period, the gardens were formed alongside religious places, and nature, like the religious spaces, was a source of human tranquility and spiritual well-being (Souter- Brown, 2015). However, by the gradual demoting of monasticism in 17th century, the therapeutic spaces that were integrated with nature gave their place to hospitals with lifeless spaces. In the 17th century, in England, nature regained its significance, and home-garden hospitals were built at that time (Souter-Brown, 2015). During the late 18th century, the most famous theories about the healing character of nature were presented by a German theorist; He believed that gardens should be built adjacent to hospitals. The viewpoint observed from the window and the motivating natural scenes enhance patients' healing process and encourages them to be physically active. The designer should locate the rest and sitting area adjacent to the natural elements and propose a viewpoint to beautiful vistas embellished with colorful flowers. A garden-hospital should evoke a sense of enjoyment of nature and thus promote the level of health in life (Ibid). In the Renaissance, with the advancement of science and a change in attitude toward man and life, once again the status of nature in human's life was dimmed. But the emergence of romanticism reminded us of the role of nature in restoring the body and soul, in the following in the cities; Parks were built for the physical and mental health of the residents. Following the growth of population and lack of facilities to treat patients over time, the therapeutic spaces were replaced by high-rise buildings, which were economically feasible. In the new hospitals, the gardens were substituted with parking lots and service ramps which resembled that of office buildings. In the following decades of the twentieth century, the traditional attitude towards the healing process was reintroduced (Ibid). Gardens were recognized as a tool for healing. In the contemporary era, nature does not only contribute to human health, but also contributes to the sustainability of spaces. As a result, after two thousand years from the construction of the Epidaurus Healing Center in Greece, human beings have returned to the first point that emphasizes on a new perception of body and soul and the importance of nature in the healing process.

Advantages of Landscape Design in Therapeutic Areas

Roger Ulrich, a researcher of therapeutic spaces, believes that having a view to green sceneries and natural day light and having access to the natural surroundings bring many advantages to patients and hospital staff. He believes that positive distraction is an environmental feature or situation that can promote an advanced emotional level in a person and reduce worrying thoughts. It also leads to

improvements in physiological systems such as low blood pressure and stress hormones (Ulrich, 1979). Presence in nature to involve the five senses is one of the best solutions in creating positive distraction. In a medical setting where situations and procedures are often stressful, terrible and painful, positive distraction is very important (Souter-Brown, 2015).

Theoretical Foundation

The main function of healing gardens in hospitals is to ease the healing process. However, several groups of people such as doctors, hospital staff and patients' family go to hospitals. The hospital spaces should be an appropriate place to meet the needs of all these people. In fact, the designer must design an appropriate place for a variety of physical and non-physical activities including the observation of nature even from a window of a room, sitting, reading, relaxing, worshipping, walking, doing sports, gardening, social interactions, and children's playing ...in the Therapeutic Spaces. A healing landscape is configured in the basis of landscape components and its relation with the patients' health.

The special characteristics and features of these gardens distinguish them from other type of gardens. It is necessary to consider the general principles for designing gardens with a healing approach because these gardens will have effectively influence the healing process in physical and mental illnesses (Yucel, 2013). According to Barnes and Cooper, three general principles are considered in the healing landscape:

- 1- Contact with nature and viewing natural scenery
2. Responsiveness of the environment to the individual's needs
3. Social interactions

He believes that the principles for designing the healing landscape are used to create the following goals:

- To create legibility in landscape
- To create a sense of security in space
- To create a perfect setting for mental relaxation
- To offer opportunities for choosing (seeking isolation and privacy, being or seeking to join community groups and group activities to benefit from social support)
- To provide places for involving with nature
- To create a familiar environment
- To create positive and clear features in landscape design (Barnes); (Cooper & Barnes, 1999).

In his article, Gökçen Firdevs Yücel also mentioned the principles and criteria for designing the outdoors of the hospital. In his view, the physical space of the site also plays an important role in landscape design with a healing approach. In fact, designed spaces can provide a relaxing atmosphere which is good for all individual to stay in the outdoor spaces. The criteria proposed by Gökçen for

designing the healing gardens are as follows:

Ease of Accessibility

This is an essential requirement, both within the hospital and in its environment. Gardens may be designed and set up attractively, but people need to be aware that they exist, that they are easily accessible through entrances and paths and useable regardless of people's age or disability, and that they facilitate certain activities. Within the garden, visitors follow internal circulation routes, typically between walls, but occasionally crossing open spaces. Paths help people to find their way in hospitals, and differentiating them can help patients and visitors find their way (Piotrowski, 2007).

Legibility

The more a garden is legible, the more its activity areas and paths will be preferred. At least one outdoor space should be legible and clearly visible from the main entrance. Patients' rooms should have views of the garden so they can enjoy it even if they are unable to visit it (Sadler, 2007).

Sense of Security

Research shows that a feeling of lack of control can lead to or depression, high blood pressure, and malfunction of the immune system. A sense of control in the garden can be enhanced by involving users in its design; and different types of spaces and layouts can enable them to make their own choices – for example, a variety of pathways, of types of nooks where they can sit, of furniture (if some is moveable), or of views, ranging from close to distant (Cooper, 2010).

Feeling of Control Over One's Environment

Patients often feel both physically and psychologically vulnerable in hospitals; so, a feeling of security should be provided. This includes sufficient lighting and public telephones in isolated areas so people can call for help, and sufficient facilities and elements to make the garden safe. Broadly speaking, there should be a feeling of safety without a sense of being observed. Features should include handrails and seating at frequent intervals, particularly near the entrance, to assist the elderly, the disabled or mobility-impaired, and to avoid paving materials like asphalt that reflect a strong glare (Kaplan, 1992).

Physiological Comfort

As hospital patients are often sensitive to temperature (burn patients, for example, generally have to keep out of direct sunlight), options such as sunny and shady areas should be provided, as well as seating shielded from breeze by plants or structures. Various medications require patients to benefit from nature without being exposed to the sunlight (Cooper & Barnes, 1999). Moreover, some patients might

be afraid of catching a chill if they go outdoors. Others patients have trouble getting up on their feet, so the garden should have garden seats with arms and backs, and benches on which one can lay and lean (Sadler, 2007).

Quiet

Research on four hospital gardens showed that users were disturbed by sounds of machines like air conditioners and traffic noise. Therefore, areas to be used as garden spaces should be planned in advance, away from traffic, parking areas, delivery driveways, and helicopter landing pads (Kaplan, 1992).

Familiarity

Hospitals may cause stress for patients and their families, as they are unfamiliar with environments. They can be made more comforting and familiar if they include the aspects of nature. People working in hospitals similarly experience stress, and need to have access to familiar and relaxing garden settings. The aesthetic of the health-care environment should therefore be based on this fundamental need and provide spaces on a human scale as well as familiar plants and furniture; this is particularly important in facilities for Alzheimer's patients and the terminally ill ones (Kaplan & Kaplan, 1983).

Flexibility

Exterior spaces should attract people, invite them in and engage them; they should be designed based on when (at what times and in what weather conditions), by whom, and

how they are currently used (for example, for a lunch break, exercise, or socializing). They should present how their usage may be shaped in the future. To maintain interest and year-round interaction, for instance, they should be studied to see how they are used in different seasons, and then designed with different seasonal blooms and colors and different weather conditions in site.

Sustainability

Resources should be allocated intelligently when designing outdoor spaces: every material used does not have to be green, and some hard surfaces like concrete can help prevent storm water run-off. Using indigenous vegetation reduces maintaining costs and leads to economic sustainability. Furthermore, devising irrigational and water infrastructure can result in ecological sustainability as well. Nature trails enable users to have exercise, education and a natural aesthetic at a minimal cost; and solar-powered lights and water features that recycle rainwater can also be cost effective and sustainable (Franklin, 2012).

Project introduction

The Fiona Stanley Hospital was the largest single building project ever undertaken in Western Australia at the time of its development. The \$2 billion project opened in October 2014 and it is one of the three major hospitals in the southern region of Perth. The building includes medical, research and educational departments, integrated in an area of 32 hectares. The hospital facilities including a lake, a public park, private rehabilitation courtyards, roof gardens



Pic 1 : Fiona Stanley Hospital- Main facade . Source: Landezine.com.

and communal areas play a vital role in its performance. Over \$ 21 million has been invested in designing green spaces alongside a set of hospital buildings. The Fiona Stanley Hospital was innovatively designed by the Hassel Design Group (www.hassellstudio.com).

Holistic Objectives of Landscape Design of Fiona Stanley Hospital

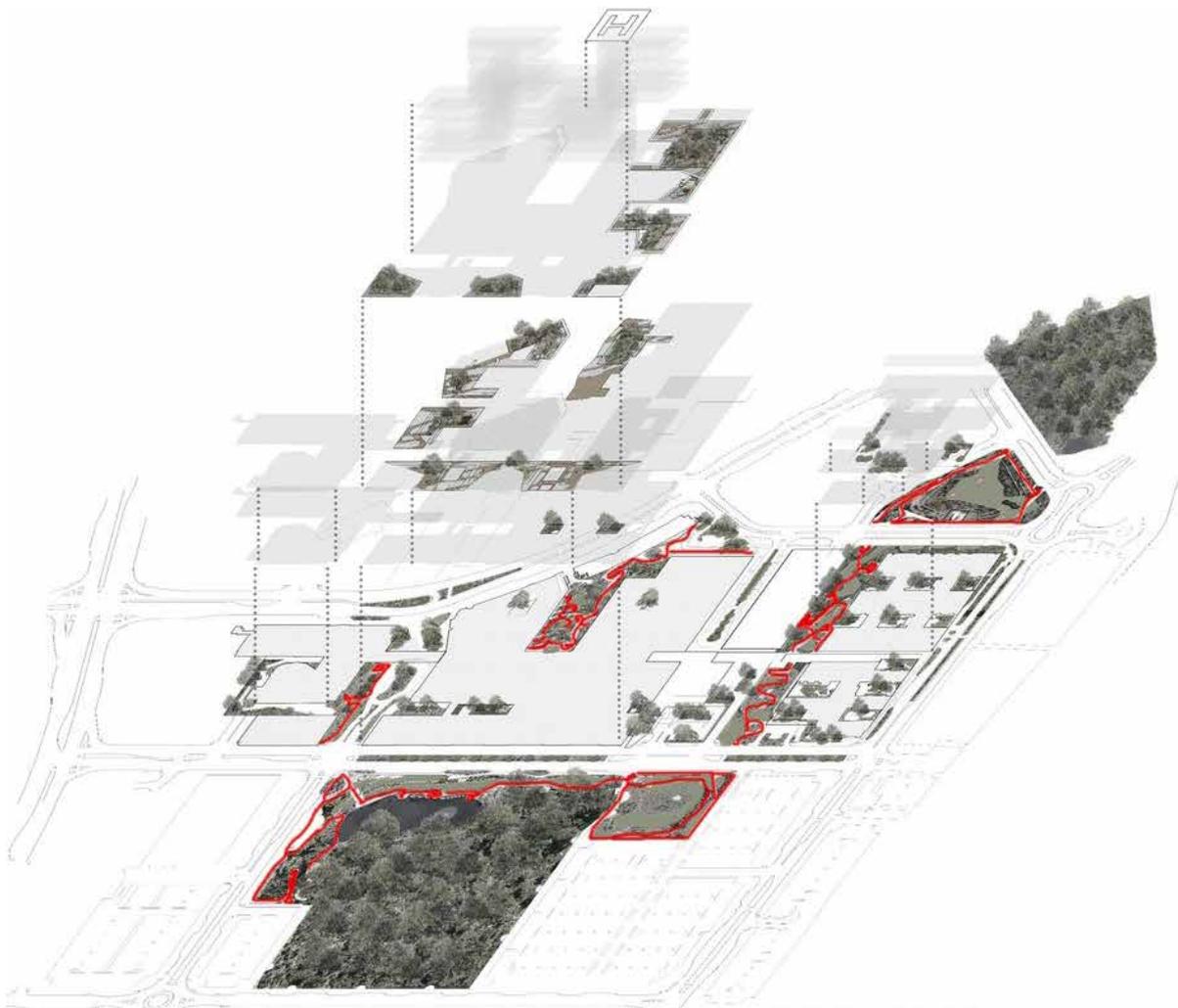
The hospital site, with a surface area of 32 hectares, is of great importance due to its remarkable natural capacity and rare qualities for an extant landscape in Perth which adds to the significance of this therapeutic complex design. Conditions for clearing in preparation for building were constrained by the Environment Protection and Biodiversity Conservation Act; They included protection of conservation areas (about 10 percent of the site), offsite mitigation measures and a highly prescribed palette for plant species used within the constructed landscapes (publicsector.wa.gov.au). In fact, sustainability and healing promoting landscape design are the two major objectives

for managers and landscape architects in this design (Pic.1).

Fiona Stanley Hospital Landscape Designing Strategies and Actions

The strategies and measures in designing this site all follow certain goals such as creating legibility, continuity and space integration as well as promoting a sense of affiliation and safety. Regarding the main objectives of the design and minor goals identified by the design team, it can be noted that the planning, design and implementation process in this project were defined in accordance with healing promoting landscape design. In the following, the strategies and measures that were taken into consideration to realize the design and objective goals are described thoroughly.

- The team has designed a 400 meter pathway in this site that turns around the site, linking the inside and outside of the building and passing all of the main open spaces



Pic 2 : The continuity of the pathways has created a rhythm of space that is repeated throughout the whole site. Source: Landezien.com.



Pic 3 : The façade of building of the Hospital has designed in shape of a plant which was inspired from the native plant of the region called Banksia. Source: andezine.com.

and plazas that invites people to move freely with ease throughout the campus. Regardless of the form of this path, its continuity has created a rhythm of space that is repeated throughout this site. In addition to continuity, it has created a legible and accessible space that has inspired a sense of security and encouraged people to attend the site (Pic.2). In the small scale, measures such as the design of harmonic pavement have influenced the creation of an integrated and accessible space. In order to provide visual consistency, the designer has also designed the building facade in shape of a plant which was inspired from the native plant of the region called Banksia (Pic.3); (worldlandscapearchitect.com).

- The targeted combination of natural and artifact spaces is one of the effective factors in creating a healing environment. The effect of nature on providing a sense of place is undeniable and humans always feel interspersed with nature. The designer has used green spaces for separating the spaces. Also, the use of a specific planting plan in a site is a good solution for creating the continuity and unity of a space on the site (Pic. 4).

- The landscape of the Fiona Stanley Hospital is designed



Pic 4 : the use of a specific planting plan in a site is a good solution for creating the continuity and unity of a space on the site. Source : Landezine. Com.

in different scale aiming at encouraging the patients to use the designed outdoor. Including these actions in holistic scale is the design of communal spaces (Pic. 5). Planning and designing communal spaces inside and outside the building in a proper location on the site, and the design of indicative elements have created a legible and different space quality, and the lifeless spaces have turned to places with character. In addition to the communal spaces, a variety of private and public spaces with different spatial qualities emphasizes on contradiction and contrast on the site. These spaces have created a suitable place for social interactions and formed shared memories that are relaxing and frustrating for patients and improve the mental and physical health of the patient (Nezamvazifeh & Motedaen, 2014: 3); (Pics. 6 &7). In addition to communal spaces, designing pathways that are organically formed and blended with native nature, and creating corridors of visions on the site are among other macro-scale measures that seem to be a good solution to create a healing atmosphere. Key circulation routes and strategic zones within the buildings are designed to capture views of the natural environment, and carefully selected artworks offering vibrancy and interest. In a small scale, there are also varied furniture

that suits the needs and physical condition of patients, legible lighting, harmonious pavement and native planting plan, which links each component to other components and creates a whole. Planning and designing this spatial organization, coupled with hierarchy of design, inspires a sense of security and curiosity, thus giving the patient more incentive to attend the site. According to Ulrich, this strategy can help the therapist to improve and measure the process and improve the patient's health.

- Designing according to the basic needs of all people, such as rest, social interactions and ... is considered as a significant design process that was mentioned earlier. Therapeutic areas are often designed for patients, and less likely to create spaces suitable for other people, such as doctors, patient companions and hospital staff. The health and performance of these people are influenced by the presence of a stressful atmosphere in the hospital. Therefore, the psychological needs of these individuals, which have a direct impact on the patient, also affect the patient's mental and physical health to a great extent. For this reason, at a holistic scale, paying attention to the needs of all people in a healing environment will improve the health of the community and reduce the cost of treatment



Pic 5 : Designing the various monument in different scales in the hospital. Source : Landzine. Com



Pic 6 : The public space in the outdoor space of the hospital. Source : worldlandscapearchitect.com.



Pic 7 : The public space in the indoor space of the hospital. Source : worldlandscapearchitect.com.



Pic 8 : The 'backyard' terraces are sheltered from the weather allowing the spaces to be used year-round . Source : worldlandscapearchitect.com.

that guarantees the projects sustainability. Landscape design and the use of natural elements in the healing of spatial design have played a very important and influential role. In fact, the designer has used every opportunity to communicate with nature by creating windows that open to the natural scenery and the design of green spaces on the floors, for instance. The 'backyard' terraces are sheltered from the weather allowing the spaces to be used year-round. They can be broken up into smaller zones that can be occupied comfortably by more than one patient at a time (Pic. 8). The idea of combining the natural spaces inside the building not only increases the quality of the interior space of the hospital, but also serves to create a relaxing environment that can improve the mental condition of everyone. Stanley in the field of general health believes that "There's evidence that supports the fact that if you're looking out onto a nice environment, you actually get better quicker, which means patients return home quicker, also Employees who are under the stress of the hospital environment can continue to work in this space by viewing and staying in a more natural environment." This means that using nature to promote healing is proved to be a successful approach in designing healthcare and

therapeutic spaces. In fact, the combination of artifact space with natural elements can provide an opportunity to relax and avoid stress and environmental challenges (www.landezine.com).

-In addition to creating the identity and enhancing economic and social sustainability, the designer has tried to create environmental sustainability by preserving and restoring its valuable natural properties. The pristine forests around the site are one of the factors, which has greatly affected the landscape design, orientation of the building and its plan. The orientation of the building and the opening of the rooms are often designed based on nature and landscape (Pic.10). Also, as stated above, the overall form of the building was inspired from a native pattern. In addition, visual continuity and consistency help to absorb solar energy and generate heating and energy dissipation in the hot summer days that contribute to the environmental sustainability of the building and its landscape. The designers also used as many native species of plants as they could to further cut down extra water needs. More than 2,100 trees and 160,000 shrubs, mostly native like Lemon Trees, Orchids, Ferns, Grevillea (an ever green species), Bavnksia, Hakea and Eucalyptus, were



Pic 9: Installation of water ponds, lakes, and underground reservoirs to collect surface water and restore it in the irrigation system. Source : worldlandscapearchitect.com.



Pic 10 : The orientation of the building and the opening of the rooms are often designed based on nature and landscape.
Source : worldlandscapearchitect.com.

used to reestablish greenways and connect the site to two surrounding bushland conservation areas.

- Installation of water ponds, lakes, and underground reservoirs to collect surface water and restore it in the irrigation system are also other measures to manage and maintain the water system for a long period of time on the site (Pic. 9). Using landscape elements such as vegetation and water is not merely intended to create beautiful open spaces. All elements are used with a functional purpose for the realization of the project objectives. The conservation of vegetation and animals, the promotion of ecological values of the region, environmental sustainability and targeted use of it have majorly contributed to create a healing environment (www.publicsector.wa.gov.au).

Table 1: Goals, Strategies & Actions in designing the landscape and architecture of the Hospital in integrated approach.
Source: Authors, 2017.

Measures	Strategies	Minor goals	Main objectives
Paving pathways	Designing a continuous path	Legibility	Healing
Designing a native façade	Linking the green spots	Visual consistency	
Designing organic form	combining artifact and natural space	presence encouragement	
Design sign	Design attractive corridors		
Separating the public and private spaces	Creating communal space	Feeling of Control	
Offering a variety of furniture design and attention to implementation details according to the needs of the addressees	Creating a sense of individual control over the environment	responding to addressees' needs	Sustainability
creating lighting	Offering spatial diversity	Protection of natural capacity inthe site	
using native plant species	designing calm spaces		
creating openings	Paying attention to human Scale		
designing terraces	Enabling easy access		
Creating an artificial lake			
Designing the form according to the considerations of energy consumption			
collecting surface water in a system			

Conclusion | Throughout history, nature has had a significant role in daily life of human beings. In the past, humans designed nature in various styles alongside religious places such as monasteries, Egyptian temples, and so on. But with the change in human thinking in the modern era, the attitude toward nature and the importance of its use in human environments diminished, and the same level of mental and physical health was reduced. It takes no long after the modern era, humans again turned to nature and healing properties to increase the level of public health. And the design of healing gardens is not limited to religious sites and they are used directly in Health centers. Achieving the good quality and calm in life is a challenge for human. So healing approach based on the

general principles of healing landscape consider as a useful tool for responding to human needs and improving their health. The Fiona Stanley Hospital project in Australia has been recognized as one of the successful examples not only in preserving and restoring ecological diversity, but also as a hospital, which cause the satisfaction and improve the patient's health.

The success of the project as a healing landscape depends on several factors. Firstly, the landscape architects have considered the landscape as system in which the planning and spatial organization of the project should be holistically reviewed. Presenting solutions in spatial organization of the building in different scales with a holistic approach, has contributed to the achievement of sustainability goals

in social, economic and environmental aspects. In a micro scale, context-based design in accordance with geographical nature and cultural context has been one of the leading discussions for landscape architects in designing this site.. Also, nature and the use of its capacities have a major role in designing a general structure and as biodiversity grows, harmony and stylization of the spaces on the site will bring the plan closer to the integrity and sustainability. All

measures in the design of this complex in macro scale such as creating visual attractiveness, designing natural shaped pathways, designing legible furniture and illumination,... have been used independently and in interaction with other measures to offer unity, integrity and identity of the landscape. Ultimately the landscape is designed as has an efficient, dynamic and healing complex (Table1).

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