

AUTISM CENTER

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Abstract

The proposed project is an autism center designed to respect and to take into consideration of autistic children behaviour and preserve of external and internal space. The project will help to treat Autism spectrum disorder (ASD) children correctly by raise the awareness of autism in Saudi Arabia and to light on the point that is missed during designing a place for ASD Children. The project will highlight on educational and social which is the most important objective for autism. The proposed facilities consist of educational zone, sport zone, administration zone, exhibition zone, day-care zone, awareness zone, support services, biking lines, playground area, track and field, and landscape. Site evaluation was conducted based on the criteria of accessibility, visibility, utilities, noise level, surroundings, safe area, shape and proportional, as well as future development plans, and the chosen site is located at Al-Nahadah, Al-Safa Street near to King Abdulaziz Road. This will help to engage autistic children in different activity (sports, workshops, handcraft) also help the families of autism and people from the community to understand more about autism.

Keywords -- Autism Spectrum Disorder (ASD), Autistic Children, Autism Center, Educational

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INTRODUCTION

Autism is a neurobehavioral disorder that includes social interaction, obstacles to developing language and rigid communication skills, and repetitive behaviours [1]. The prevalence of autism in Saudi Arabia is 1.4 to 29 per 10,000 [2]. Autism centers are designed to be a formal educational institution for autistic children that serve their needs, supports their talent and to help in raising community awareness about autism by increasing the understanding and acceptance of people with autism [3, 4]. Autism centers aims to provide a suitable and safe environment for children of autism and their families and to train and qualify autistic children to integrate into society to achieve psychological and social harmony [5, 6]. Finally, the main aim of all autism centers is to support autistic children and their families.

Autism friendly center aims to be an educational center with a suitable environment that helps children of autism to learn and socialize through different activities the design of this environment will depend on the behaviours of the autistic children [7, 8]. The center helps to educate families and public about autism and train them to know the suitable way to interact and communicate with autistic children. The center encourages autistic children to communicate with other and teach them a different sport. All these functions will be under consideration of the architectural aspect and its impact in its external forms and its internal spaces on the treatment and rehabilitation of autistic children.

The autism friendly center is integration of an educational and training center that cares about autistic children and their families. In addition, the center also provided with sport facility, edutainment section and an administrative section.

CASE STUDIES

There are three educational center and school for autistic children were considered for the case studies. The educational center for the autism is carefully designed to provide them a comfort environment which equipped with advance and useful facilities. The chosen case studies are:

a) Learning Spring School, New York, United States

- b) North Brother Island School, New York, United States
- c) Design Home for Autism Children, Copenhagen, Denmark
- d) Western Autistic School, Laverton, Australia

Learning Spring School, New York, United States

The Learning Spring School is designed by Platt ByardDovell White Architects (Figure 1). The school is located in a mixed-use area containing retail, residential, and community facility uses. Public elementary and middle schools and a public playground are all located across the street [9]. Beside this the school site affords the students an opportunity to interact with other students who are part of the wider general education population. It is located across the street from public elementary and middle schools, as well as a community playground. Administrators in all four schools take advantage of these adjacencies by organizing inter-school activities and sharing playground facilities.

The school mass is composed of an eight-story portion occupying two-thirds of the site at the corner and a three-story portion on the remainder of the property. The composition creates a strong presence at the corner, while easing the transition to adjacent lower buildings along the avenue. Classrooms are located along the South and East perimeter of the floor-plates. While this location affords them the most light and views, it also places them along the noisiest areas in the building. A special environmental analysis was conducted to determine the most effective noise mitigation for these spaces. Enhanced acoustic isolation between the interior and exterior spaces, keeps students focused on their learning. Once inside, it is hard to tell that the school is located in the middle of New York City [9].

North Brother Island School, New York, United States

The North Brother Island School is designed by Frances Peterson and Ian M. Ellis (Figure 2). The North Brothers Island School Project is a proposal to provide an integrated learning school for autistic children on North Brothers Island. Hence, the proposal of the North Brother Island School for autistic children designs to provide an essential resource for the Bronx [10]. In terms of schools for children with autism spectrum disorders, services in this area are seriously insufficient. The project also aims to eliminate the negative branding of the island, stabilize its natural

growth as a bird habitat, and introduce research and education programs to provide the public, parents and children with the most advanced learning environment.

The main concept of designing the school and its landscapes is to be crafted and designed specially to be suitable for different types of users. Hypersensitive children need control, similarity, predictability, and safety as they seek to discover, texture, sound, and sensory experience. So, the school environment designed to serves these two different users. The Hyposensitive need for increase sensory input meanwhile hypersensitive need for reduced sensory input. In response, the school designed three rows of classrooms, which look like three unique courtyards [10].

Design Home for Autism Children, Copenhagen, Denmark

The Design Home for Autism Children is designed by CREO ARKITEKTER A/S, JAJA Architects (Figure 3). It fulfils all the desires to create future house models for children with special needs. In addition, the proposal is based on existing buildings on both wings, which creates a unique arrival situation, while making the house independent of the road and its neighbors. Two wings open to the southwest and the green environment, creating a frame for the charming outdoor area adjacent to the edge of Hareskoven [11].

Design Home for Autism Children proposal is split into 2 volumes. The first is based on the existing footprint, forming a distinct arrival situation and easy access for the residents from the road. The second, breaking down the scale into smaller, individual housing units with direct access to the beautiful surrounding forest. Finally, the skylight roof provides the space with good daylight; also give a building a sense of home [11]. In addition, the new space plan is much larger than the current situation, so it is necessary to maintain the scale of the residential street and maintain an open path to the green environment [11]. The proposed building is divided into two floors, of which the top floor marks the clear arrival of residents, and it's designed with function closely connected to the road to facilitate passage.

Western Autistic School, Laverton, Australia

The Western Autistic School is designed by Hede Architects Pty Ltd (Figure 4). The Design of Western School grew up from the teaching methods used by teachers with spaces designed specifically for the education for children with autism [12]. The design creates a small "city" where in students can study in quiet and directly accessible areas with small changes in shape. This helps their sense of order and their learning. Moreover, the building reflects the brief in its forms and gives a new approach to education for students with autism and future teachers. It challenges the children in its colour and spaces to prepare them for their later education at conventional schools. Planning and related design also incorporate a range of ESD functions, including natural lighting and ventilation. By using solar panels and night purging and water harvesting, costs can be saved.

The building is consisting of 3 Pods. The Concept of using 3 pods is to give a sense of progression accentuated by colour schemes for students as they progress through the school. However, each pods it's for specific level and age. The pods produce sub school environment with differing options depending on the age and nature of the student. The building has two other major support spaces of administration and multipurpose where the students and teacher training share a large space. These two components are 'kite' shaped. They each draw all their water to central tanks for recycling. The third component is staff areas with a pool for training students, as they have no fear of water. The building reflects the brief in its forms and gives a new approach to education for students with autism and future teachers. It

challenges the children in its colour and spaces to prepare them for their later education at conventional schools.



Figure 1. Learning Spring School, New York, United States [9]



Figure 2. North Brother Island School, New York, United States [10]



Figure 3. Design Home for Autism Children, Copenhagen, Denmark [11]



Figure 4. Western Autistic School, Laverton, Australia [12]

SPACE PROGRAM

Based on the analysis of case study, the assumption of building capacity is 450 users, 250 are students, 100 staffs and 100 public users. The space program of the project building is tabulate din Table 1, which consists of several primary zones namely educational zone, sport zone, administration zone, exhibition zone, day-care zone, awareness zone, and support services. The space program of the outdoor space is shown in Table 2, which consists of biking lines, playground area, track and field and landscape. In addition, the number of parking required is 112 parking lots, and the parking area is 3375 m².

In the educational zone, children with different ages receive their education in ways that fits to their condition. In addition, families

and public can also attend educational courses about autism and how to deal with autistic children. This zone is a full educational section that includes classes, workshops, library, sciences labs, language labs, exhibition area, therapy areas, sensory garden, art classes, dining and support services.

Sport facility zone is a sports area with different sports that an autistic child can play and interact with other children and exterior world. The sport facility is consists of main lobby, reception, swimming pool, karate arena, taekwondo arena and support services.

Administration section is the main place for staff and employee to practice their duties to achieve goals and keeps the center in good level. This section will include reception area, lobby, lounge for staff, meeting room, interview room, and multipurpose hall and support services.

In the exhibition zone, families and public can watch children work on art pieces children in the same time is the zone where children present their work of art and sale it to make a funding for the center. This zone will include an exhibition area, lobby, reception and support services.

The function of day-care zone is to provide a day-care service for families. This zone helps the families in their time work or busy day to leave their children during day time for certain time of hours. This section will several sub-unit such as playing area, sleeping area, books and story area, art area, change room, one toilets, learning area, visual area, administrative and clinic office. In the awareness zone, families can attend their children therapy (hearing, speech and language, psychological, voice) and also can meet the therapist of their children. In this section there will be a zone for children and family interaction therapy and workshops for families and public to learn and to be educated about autism.

Table 1. Space program of each department

Departments	Use Percentage (%)	GFA (m ²)	Number of Floor	Footprint (m ²)
Educational Zone	39	5252	2	2626
Sport Zone	15	2020	3	676
Administration Zone	13	1818	2	909
Exhibition Zone	8	708	1	708
Day-care Zone	11	1498	2	749
Awareness Zone	9	1207	2	604
Support Services	5	656	1	656
Total	100	13159	13	6928

Table 2. Space program of the outdoor space

Spaces	Use Percentage (%)	Area (m ²)
Biking lines	20	1291
Playground area	30	1936
Track and field	20	1291
Landscape	30	1936
Total	100	6454

The design principles of autism should be considered at the design stage to ensure a better environment for autistic children, such as acoustics, spatial order, zoning, escape space, transition zone, sensory zoning and safety.

The acoustic environment should be measured to minimize background noise, echo and reverberation in the space used by

ASD patients. The level of sound control should vary depending on the focus level, skill level, and severity of the autistic patient required performing activities in the space. For example, high-focus activity or sensory design theory based on "low-stimulus areas" should allow for a higher level of acoustic control to minimize background noise, echo and reverberation.

Space ordering is based on the concept of using autistic individuals' affinity for routine and predictability. It requires the organization of areas in a logical order according to the typical planned use of such spaces. The space should flow as seamlessly as possible from one activity to another through one-way circulation, and use transition areas to minimize interference and disturbance.

Zoning is to define and limit the sensory environment of each activity, organize the classroom and even the entire building into multiple compartments, and each zone should include a clearly defined function and corresponding sensory quality. The separation between these zones does not have to be too harsh, but can be achieved by differences in furniture layout, floor coverage, differences in levels and even changes in light. In order to provide each space with minimal ambiguity about the user's expected sensory cues, the sensory quality of each space should be used to define its function and separate it from the adjacent compartment.

The escape space provides a space for autistic users to relax from overstimulation in their surroundings. Such a space may include a small separation area or a crawling space in the form of a quiet corner in a quiet area of the room or the entire building. These spaces should provide a medium-sensory environment with minimal stimulation.

The presence of the transition zone can help users recalibrate their sensations when they transition from one stimulation level to another. Such an area can take various forms, and can be anything from different nodes that indicate cyclical transitions to a complete sensory room that allows users to recalibrate their sensations.

These spaces should be organized according to their sensory quality, not according to the typical architectural methods of functional zoning. For example, the spaces are grouped according to the allowable stimulation level of the space, and the spaces are organized into "high stimulation" and "low stimulation" areas. The former may include areas requiring high alertness and physical activity, such as physical therapy and space for building general motor skills.

The design needs to consider user safety, such as precautions against hot water / objects, and avoid sharp edges. This is an important point that cannot be ignored when designing a learning environment. Children's environmental awareness may change, and their safety is particularly important.

SITE SELECTION AND ANALYSIS

There are two site locations were proposed. Figure 5 shows site 1 is located at Al-Nahadah, Al-Safa Street near to King Abdulaziz Road. The site area is about 25483 sqm. The site features are near to the city center also surrounded by different function such like school, residential units and malls.

The site has the opportunity of future extension and built in a middle of residential area. Figure 6 shows site 2 is located AL-Zharaa, Prince Sultan Street with site area of 15550 sqm. The site features are surrounded by different function such like residential units, malls and office building. The site faced to main a commercial street which is Prince Sultan Street.

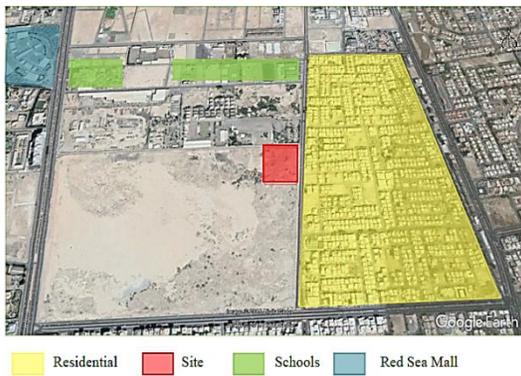


Figure 5. Site 1 [13]

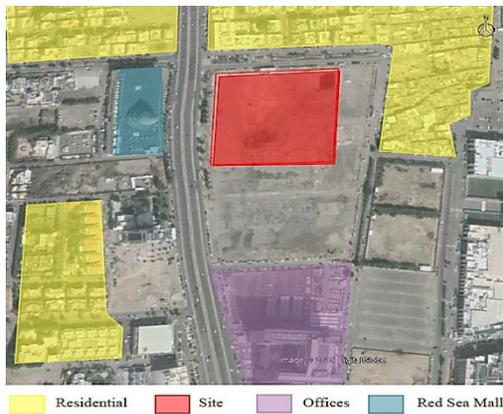


Figure 6. Site 2 [14]

The site evaluation is based on the criteria of accessibility, visibility, utilities, noise level, surroundings, safe area, shape and proportional, and future development plans. Each criterion is given the numbers 1, 2, 3, 4 or 5 depending on the level of importance, where 1 is very low level of important and 5 is very high level of important. The site evaluation result is tabulated in Table 3.

Table 3. Site Evaluation Result

Criteria	Important	Site 1	Site 2
Accessibility	5	3	3
Visibility	5	2	3
Utilities	3	3	3
Noise Level	5	3	1
Surrounding	4	3	2
Safe Area	3	2	1
Shape and Proportional	2	2	2
Future Development Plans	2	3	3
Total Rating	29	21	18

The site evaluation result from Table 3 shows that the best site to be chosen is Site 1 as the sums of the score result is 21/29. The site is reachable from more than one road from different part of the city. The site can be reached through several routes from different parts of the city namely King Abdulaziz Street Prince Sultan Street, A1-Safa Street, and AbdurhmanAldakhal Street. The site has a good visibility of the project and can be easily seen by passers. Since the location in near to city center of Jeddah is utilities and services is fairly available. The site has availability of good connection with water supply and other services such as sewer, gas lines and electricity. The site is less noisy and away from main road and traffic noise, also near to residential area. The selected site location has a square shape and proportional.

The selected site is located in undeveloped residential area and the site is surrounded by empty land from two sides. This indicates the ability of future expansion is available.

ZONING AND PROJECT DESIGN

Figure 7 demonstrates the site zoning of the project. There are two entrances are designed for student and public in order to distribute the crowdedness. The students can access to the educational and day-care directly from the specific entrance, where public can visit the exhibition hall and consult the administration directly from the specific entrance (Figure 8).

Autistic children are part of the society and reserved to be educated and must provide them with the right suitable environment that helps them to heal. The project philosophy is depending on studying the architectural aspect and its impact in its external forms and its internal spaces on the treatment and rehabilitation of autistic children.

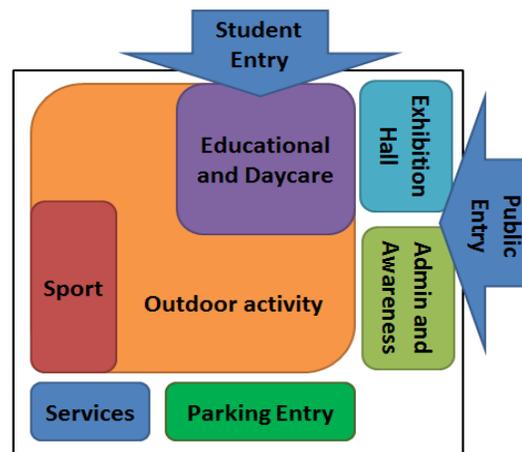


Figure 7. Final Site Zoning

The main concept of the project is to produce friendly autism center that respect the social engagement and environmental factors affecting people with autism. The educational center it's the main heart of the project which will be surrounded by different facilities that helps children with autism to involve in the society and to develop their social and educational abilities by providing different exterior and interior green spaces, different sport spaces, outdoor and indoor cafeteria and exhibition space (Figure 9). This will help in producing the project as an enjoyable, comfortable and friendly autism environment. The main perspective view of the project is demonstrated in Figure 10.



Figure 8. Main entrance (Public entrance)



Figure 9. Outdoor view



Figure 10. Main perspective view

CONCLUSION

The proposed project autism center is to create better life opportunities for autistic children by providing them right suitable environment that helps children to express their feelings and facilitate their interactions with the external environment. In addition, this project considers the architectural aspect, effectiveness on the treatment and rehabilitation of autistic children. The proposed buildable space program consists of educational zone, sport zone, administration zone, exhibition zone, day-care zone, awareness zone, and support services. While, the outdoor facilities are biking lines, playground area, track and field, and landscape. The selected site location of the project is located at Al-Nahadah, Al-Safa Street near to King Abdulaziz Road based on the evaluation criteria of accessibility, visibility, utilities, noise level, surroundings, safe area, shape and proportional, and future development plans. This project expected to improve the lives of all children and families with autism by assisting children to reach their full potential and improve their quality of life. In addition to, raise awareness to society and create a better understanding of autism.

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