

SCHOOL FOR AUTISM

A THESIS

Submitted in partial fulfillment of the requirements for the award of

Bachelor of Architecture degree

By

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**DEPARTMENT OF ARCHITECTURE
SCHOOL OF BUILDING AND ENVIRONMENT**

SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY) Accredited**

With Grade "A" by NAAC

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MAY 2024



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BONAFIDE CERTIFICATE

This is to certify that Thesis Report is the bonafide work of **Aarthi D (39210097)** who carried out the Thesis entitled "**School for Autism**" under our supervision from November 2023 to May 2024.

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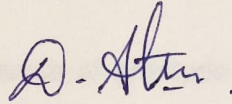
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DECLARATION

I, **AARTHI D** hereby declare that the Thesis Report entitled "School for Autism" done by me under the guidance of **Ar.Catherine Selvaraj** (Internal Guide), **Ar.Seetha Visalakshi** (Internal Review Member) and **Ar.Meenakshi** (External Guide) Sathyabama Institute of Science and Technology is submitted in partial fulfillment of the requirements for the award of Bachelor of Architecture Degree.

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AARTHI D

THESIS SYNOPSIS

Autism spectrum disorder (ASD) is a nervous disorder with disability in behaviour, sensing, physical activity, communicating and interacting. It has a different symptoms and level of autism which varies from person to person. There is a difference found in the brain of autism children compared to normal children but, the causes are not yet known. These kind of children will have difficulties in maintaining and developing relationship and communication with others. So, they need special attention and care to be taken apart from others. May some autism children have new skills or lose skills. Autism disorder will be treated by reducing the symptoms found in the children by having an individual schedule plan with improved daily function, environment and quality of life.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Autism spectrum disorder (ASD) is a nervous disorder with disability in behaviour, sensing, physical activity, communicating and interacting. It has a different symptoms and level of autism which varies from person to person. There is a difference found in the brain of autism children compared to normal children but, the causes are not yet known. These kind of children will have difficulties in maintaining and developing relationship and communication with others. So, they need special attention and care to be taken apart from others. May some autism children have new skills or lose skills. Autism disorder will be treated by reducing the symptoms found in the children by having an individual schedule plan with improved daily function, environment and quality of life. Autism – also referred to as autism spectrum disorder—constitutes a diverse group of conditions related to development of the brain. About 1 in 100 children has autism.

Types of ASD:

Sensitivity based:

- Hypo sensitivity
- Hyper sensitivity

Function based:

- High functioning
- Intermediate functioning
- Low functioning

Features:

- Impairments in social communication

- Restricted activities and interests
- Intellectual disabilities and language delay
- Motor and sensory abnormalities
- Sleeping order
- Behavioral problem
- Hyperactive and inattention
- Anxiety and mood disorder
- Gastro and intestinal disorder
- Infection

Therapy:

- Applied behaviour analysis (ABA)
- Relation development intervention (RDI)
- Play therapy
- Equestrian therapy
- Speech therapy
- Cognitive-behavioural therapy
- Music therapy
- Sensory integration therapy
- Occupational therapy

1.2 NEED OF THE PROJECT

Education is the basic needs and right to everyone to pursuit it, autistic children are not to be exceptional of that. Regarding the context this project aims to provide opportunity for learning, physical skills and schooling experience as like as other children. To have create an interactive space and multiple facilities. Through this project, we except to normalize autism in society and create a healthier community.

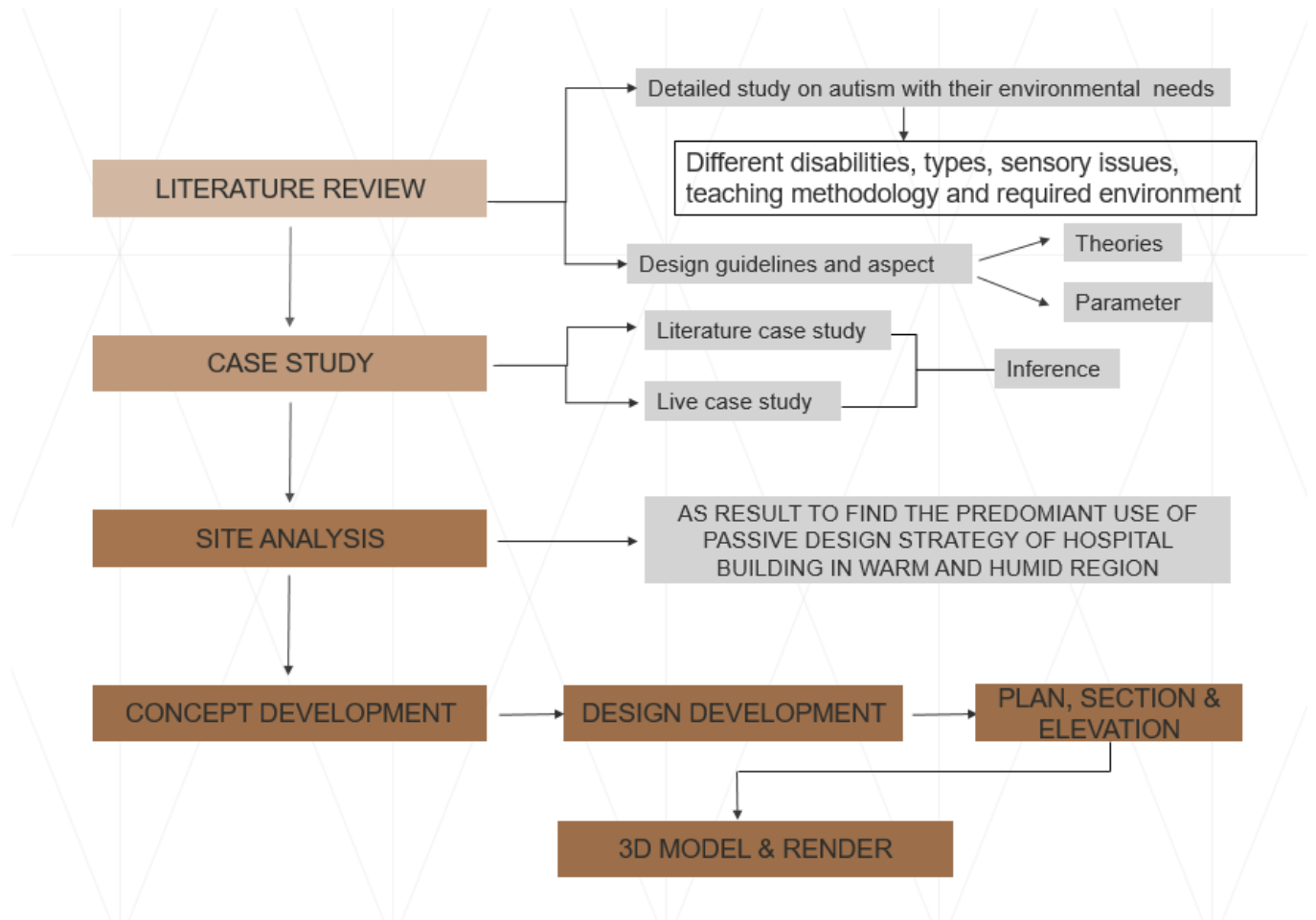
1.3 AIM

The aim is to design a school for autism children with special requirements for the student to learn and to further train their skills. Also, it intent to give green environment and energy efficient building through passive design.

1.4 OBJECTIVE

- To understand autism, teaching methodology and environment requires for autism children.
- To review the architectural design and its impact in the daily life of autism children and its betterment.
- To identify the function, spatial needs, design guidelines and requirement for the respective school typology.
- To integrate the academics, treatment venue and skill training in a friendly environment.

1.5. METHODOLOGY



CHAPTER 2

LITERATURE CASE STUDIES

2.1 NORTHERN SCHOOL OF AUTISM

Location: Reservoir Australia

Area: 20500 sqm

Climate: Semi arid

Architect: Hede architects

Year: 2013

Students: 220

Classroom: 26



Fig 2.1: view of Northern school of autism

The Reservoir Campus is located in Gertz Avenue, Reservoir. This campus is a brand new purpose built school providing state facilities designed in line with international, autism specific. Northern school of autism is redevelopment of the Burbank primary school which completely of demolition of existing building.

- Awards – best new construction 2013, Victorian architecture award 2013, CEFPI regional award 2013.

Orientation – southeast to northwest



Fig 2.2: plan of Northern school of autism

Age : 5 to 18 years

- 5 to 8 early school
- 9 to 12 middle school
- 13 to 15 intermeditiate school
- 16 to 18 senior school

2.1.1 SPACIAL FACILITIES:

- Play therapy room
- Music room
- Student library
- Visual art room
- Student kitchen
- Multipurpose room
- STEAM building
- Three gym (occupational therapy)
- Classroom with outdoor courtyard
- Bike riding tracks

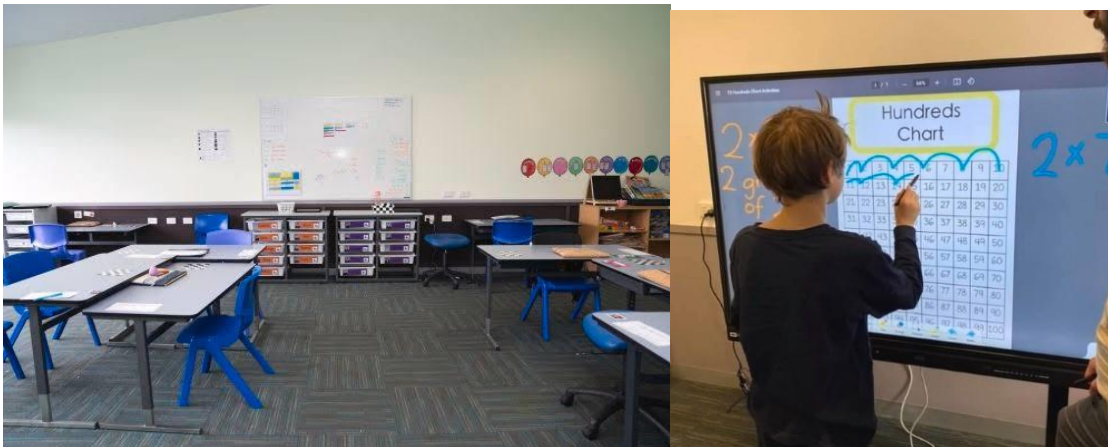


Fig 2.3: spacial facilities



Fig 2.4: spacial facilities

2.1.2 SPATIAL PLANNING:

- The 4100 sqm single level building contains wing for each of the early, junior, intermediate, senior school together with an administration and multipurpose room. Library and art room as supporting area.
- Due to open space in center gives good natural ventilation and daylight to the surrounding classrooms.
- Thus reduced mechanical electrical needs in classrooms.
- Use of cut roof edging to allow north sun penetration to all room and covers outdoor learning space.
- Curved circulation routes that are purposely non interactive with learning area to reduce distractions.

Site area – 20500 sqm

Build up – 4100 sqm – Single level building

Soft landscape area – 5000 sqm

Artificial grass area – 5400 sqm

Asphalt road / car parking – 3700 sqm

Concrete / rubber paving – 1700 sqm

Future sensory garden – 600 sqm



Fig 2.5: Site plan



Fig 2.6: Southwest elevation



Fig 2.7: Southeast elevation



Fig 2.8: Northwest elevation

2.2. PEARL NATIONAL CENTER FOR AUTISM.

Location: London, England

Area: 3500 sqm

Climate temperate oceanic climate

Architect: penoyre & prasad

Year: 2008

Students: 80

Classroom: 14

Age: 4 to 18 years



Fig 2.9: view of pearl national centre for autism

Through education they seek to transform the lives of children with autism and the lives of their families. It is designed to support ABA technique in a specialist environment which strikes the right balance between the familiar and stimulating.

Student to staff ratio: 1:1

Type of learning method: Applied behaviour analysis (ABA)

2.2.1 SPATIAL FACILITIES:



Fig 2.10: spacial facilities

The school is built in residential zone where less noise and traffic with greenery environment around it. Surrounding neighbourhood has two primary schools, a farm land, green pumping station and wood tree land.

The first floor of the building has straight access to the play area. Open façade and windows are located in a ribbon around the whole building.

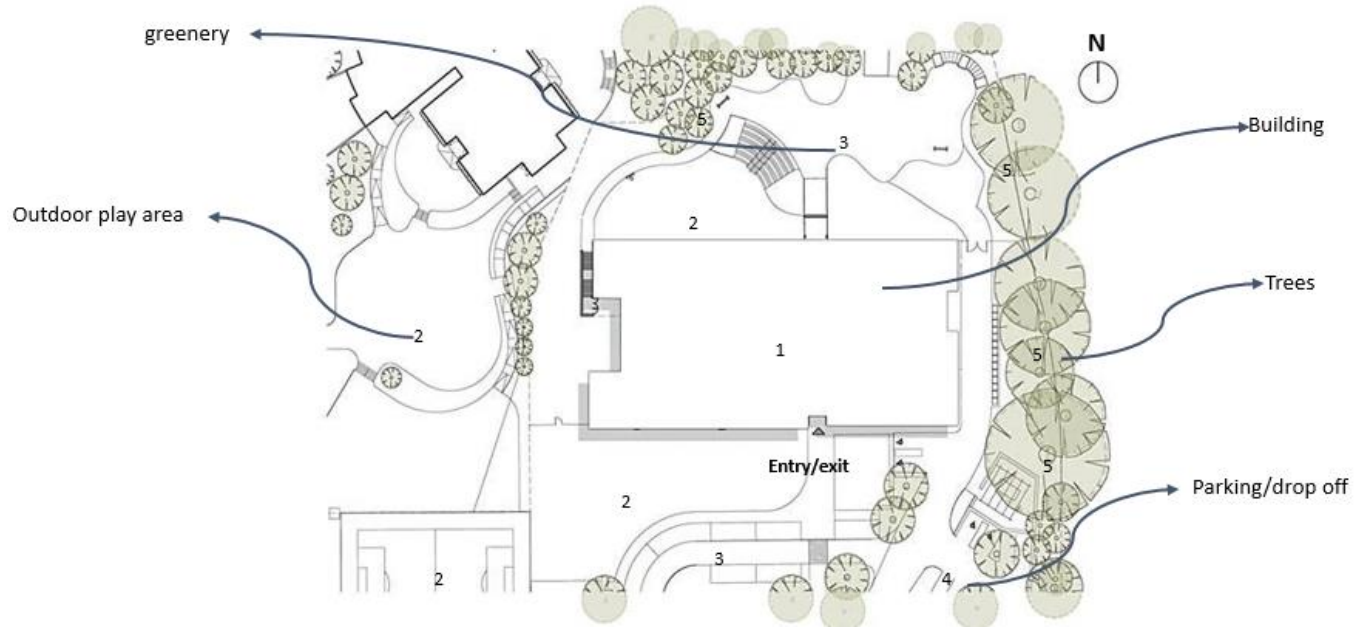


Fig 2.11: site plan

2.2.2: SPATIAL PLANNING:

Ground floor plan

The plan designed to have two halves one bring student focused and the other is staff centre. The classroom zone are separated and the activity and sensory zones are separately plan. And then shared classroom to make opportunity to the children to interact with others.

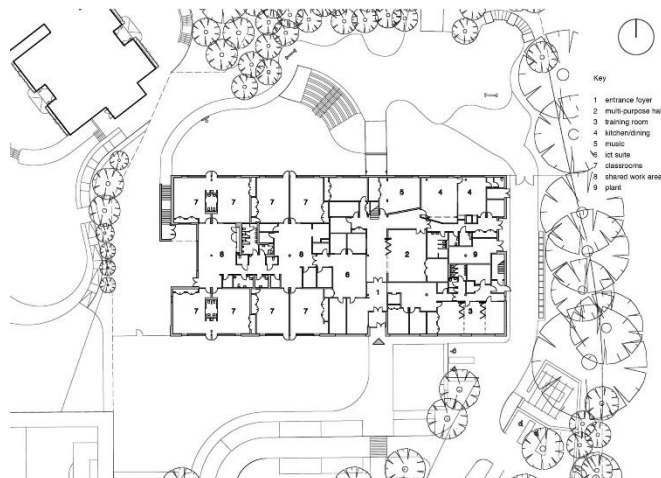


Fig 2.12: ground floor plan

First floor plan

Similarly the activities separated as student focused and staff. The ground and first floor has same plan to avoid confusion among the students. Adults room mostly used by parents and guest. Board member room are in ground floor and staff room in first floor. Inclined roof of green is used and the windows are more in longer side and shorter side has less. First floor has access to outdoor area is designed to connect nature play, learning, greenery rest area is add around the courtyard

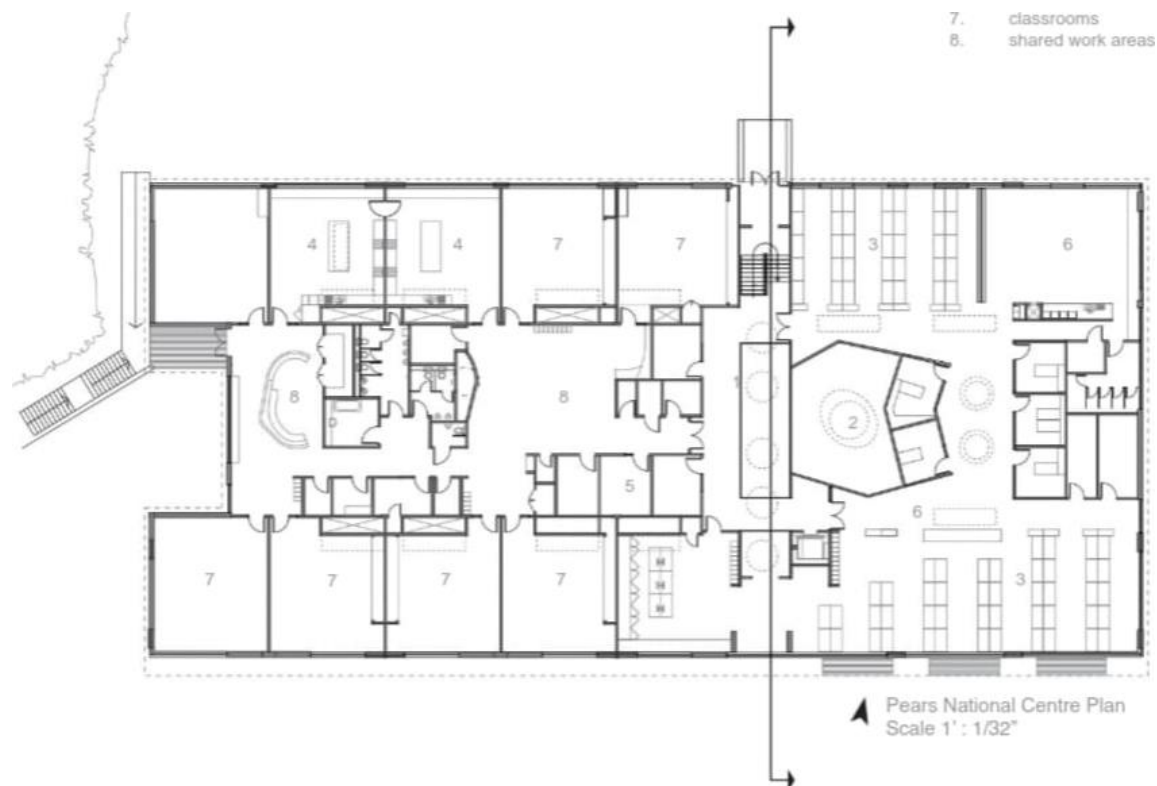


Fig 2.13: first floor plan

2.2.3: SUSTAINABILITY:

Use of natural resource strategies; passive cooling and heating system. Building is predicted to use 67 percentage less energy from other schools. 10 percentage of derived from renewable energy sources (ground coupled air pipes). Skylights are vary in sizes, shapes and vertical extent, depend on program needs. Overhangs provides shade in the summer their perforated

nature allows for a gradient of daylight year round. Double height brings the lights well to the bottom floor.

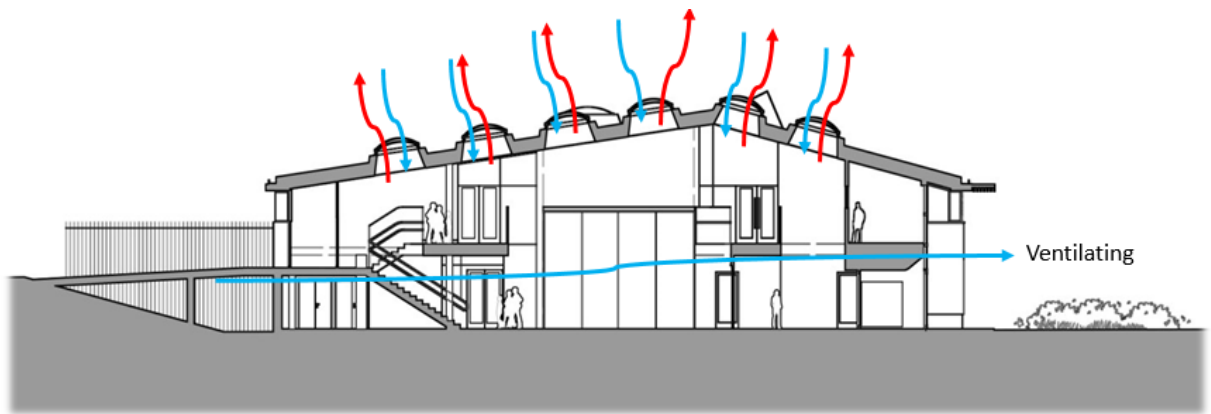


Fig 2.14: light well for ventilation

2.2.3: MATERIAL:

Transparent, earthy and neutral materials are used.

- Transparent louvers, overhangs and light well: Maximize sunlight and steel holds the transport element.
- Earthy wood and bricks: Façade, atrium, shared space, wood flooring and wood louvers shutters.
- Neutral white and grey: Individual classrooms, permanent architecture element in neutral finish on the wall and base concrete.



Fig 2.15: Interior material

2.3. ACTION FOR AUTISM.

Location: New delhi

Area: 600 sqm

Climate: hot and dry

Year: 2006

Students: 60

Classroom: 10

Age: 3 to 34 years



Fig 2.16: Action for autism

The center is consist of 4 storey building 8 classrooms for the secondary children, 5 parent – children intervention room, 2 occupational therapy room, library and research unit. They train for their future independent. The employ their own high functioning autistic adults in their office.

Student to staff ratio : 2:1

Student : 60

Teacher : 25

Orientation: Northeast to southwest

2.3.1: SPACTIAL PLANNING:

The school is design have public access area in ground floor which has reception and office and café where children will also access it and then head to classrooms. Play area outside the building. Swimming pool is used during summer which is a sensory therapy. Reception is designed with spacious area it sell the children made art and craft products in the counter. Corridor is 1.5m width which is narrow and difficult for children to walk.

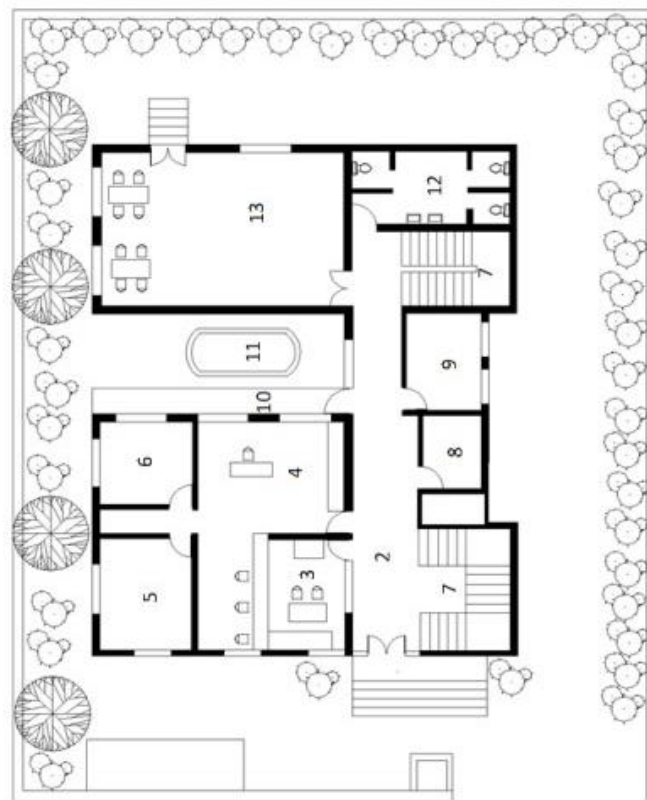


Fig 2.17: ground floor plan

Parent children room – area is an early intervention zone where the parents of the children below 3 years is trained to understand the complication of the disorder. With understanding of behavioural and culture aspects of children.

Sensory room – one to one intervention area where the projection videos and pictures on wall for low function children because of less area the space is congested.

Semi play area – play area is for low functioning children to promote social interaction cover with MS grill.

Circulation path – narrow corridor with 1m.

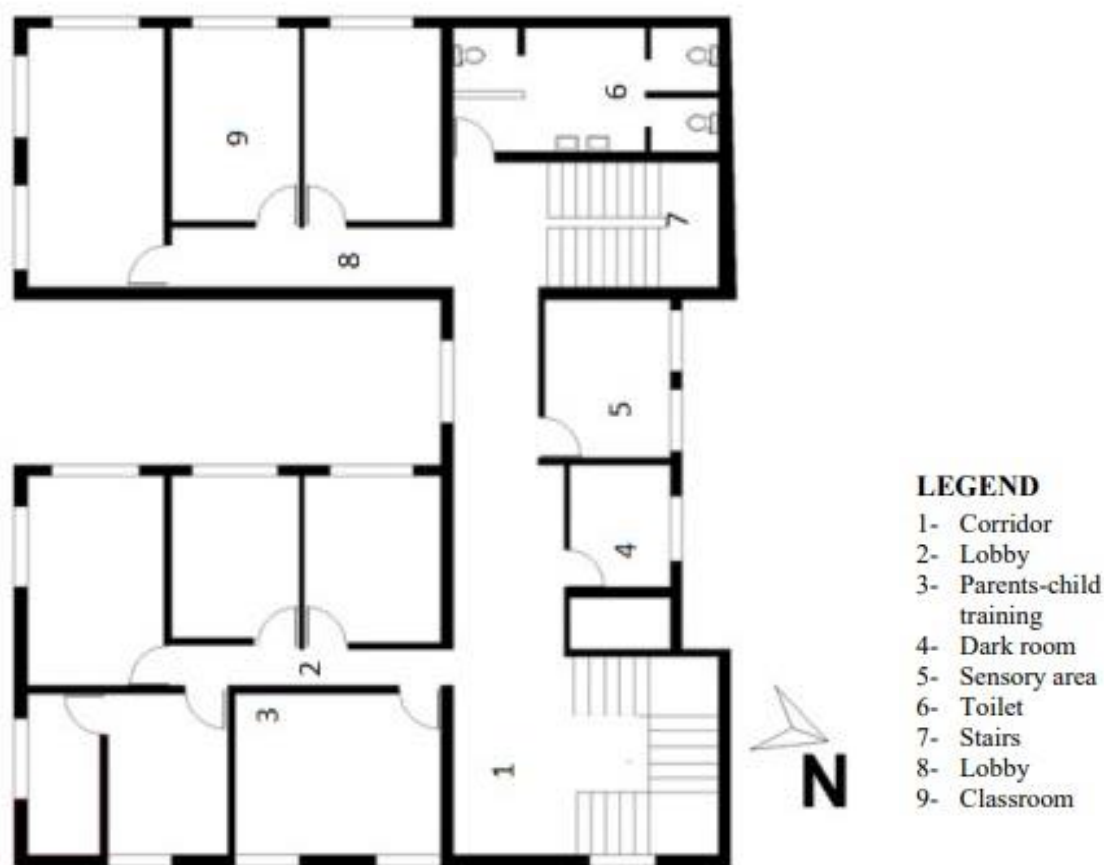


Fig 2.18: first floor plan

Classroom for secondary children – 10sqm for six children and one teacher spaces with sitting, weaving, computer education and storage space.

Classroom for primary children – 10sqm for five children and one teacher, 3 to 10 years old.
Circulation in every floor is narrow which is also accommodate with many activities.

Width = 1.5m to 1m.

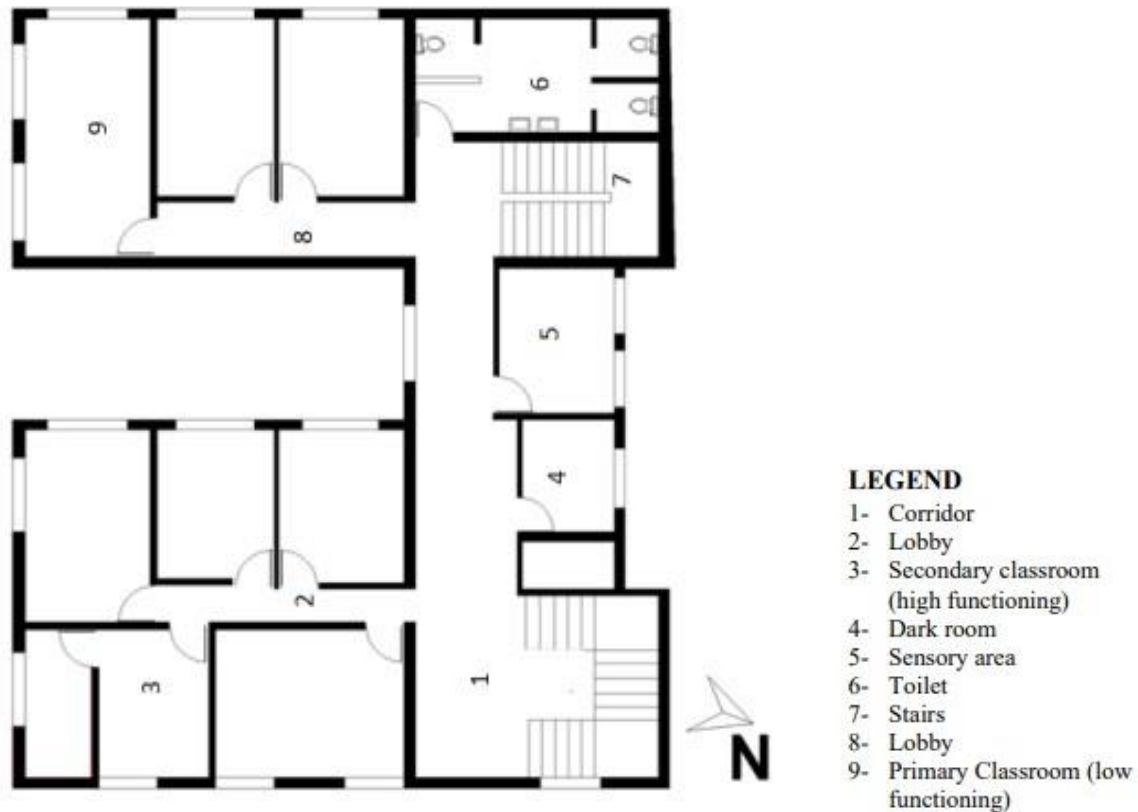


Fig 2.19: second floor plan

2.3.2: SUSTAINABILITY:

Natural ventilation - The class room are ventilated and daylighted with windows due to the distraction to the children, windows are covered with the opaque sheets and screens. The corridors are narrow with no ventilation and lighting only artificial lighting.

Material - The exterior is designed with brick and the interior is designed with normal wall plastering with white color and rough texture in toddler classroom is decorated with sensory materials. In primary children classroom flooring are color to make recognition of their space.

Acoustics - The surface are not acoustically treated this make distraction noise from road and traffics on one side. Screen are used as an acoustics materials in some area.



Fig 2.20: interior views



Fig 2.21: class rooms

2.4. SANKALP – THE LEARNING CENTRE & SPECIAL NEEDS SCHOOL.

Location: poonamallee, Chennai.

Area: 36000 sqm

Climate: warm and humid

Year: 2016

Students: 130

Age: 3 to 18 years



Fig 2.22: sankalp – the learning centre and special needs school

The campus includes well-equipped Classrooms and Vocational rooms. The campus is disabled-friendly with Ramps, Signage and Restrooms with grab bars and handles that allows students to navigate easily within the campus. Our campus is powered by Solar Energy and includes Rain Water Harvesting and Grey Water Treatment Plant.

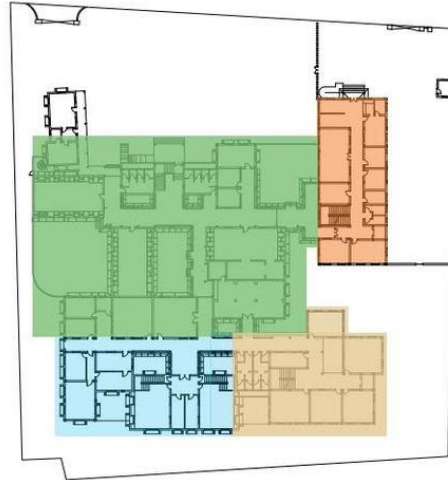


Fig 2.23: different blocks of school

The units of the Sankalp Trust are as follows:

1. The Learning Centre and The Early Intervention Centre – For children with Autism Spectrum Disorder (ASD)
2. Sahayika - Skill training centre for adolescents with ASD
3. The Open School - For children with Specific Learning Disability (SLD).
4. Akaraah - Early Intervention Centre For Children ASD



Fig 2.24: site plan

2.4.1: SPATIAL PLANNING:

Flexible and adaptable design, non – distracting Space, Controllable environment, predictable, non – threatening, sensory motor attuned, non –institutional, safety.

Building as learning aid (BALA – Architect Kabir Vajpeyi has done extensive work on this) outdoor Activities and landscaping, verandah, Natural lighting, colours and materials, interiors – classroom Furniture.



Fig 2.25: landscape and corridor

2.4.2: DESIGN STANDARD:

Classroom dimensions:

7.5 X 7.5 m - typical room in ground floor

10 X 5 m - primary children classroom

12.4 X 8.2 m - senior & intermediate classroom

6.3 X 11 m - typical room in first floor

Toilet:

1.5 X1.5 m - 4 to 6 no.of toilet. Each floor has two toilet.

Corridor:

Minimum of 2.5 m to maximum of 3 m wide corridors.

Staircase:

Tread = 0.30 m

Riser = 0.15 m

Width = 1.6 m

Colour Schemes used in the design of Sankalp School.

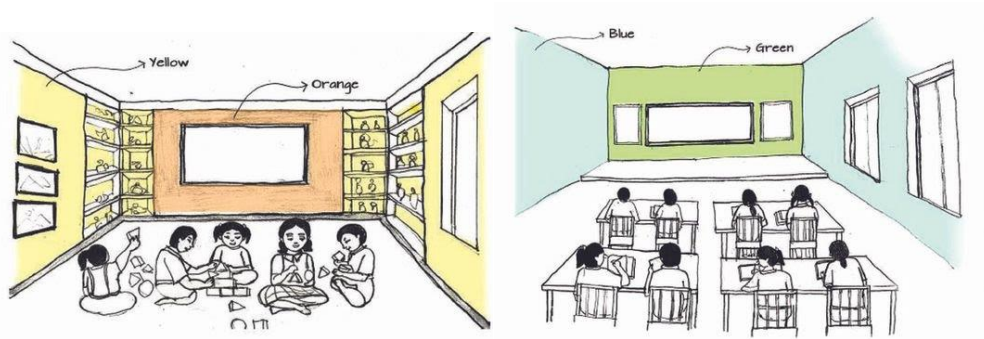


Fig 2.26: color pallette



Fig 2.27: classroom

2.5. NEWLEAF SCHOOL FOR CHILDREN WITH SPECIAL NEEDS.

Location: neelankarai, Chennai.

Area: 370sqm

Climate: warm and humid

Year: 2019

Students: 25

Classroom: 8

Age: 3 to 5 years

3 to 9 years - early intervention, smaller activities like puzzle etc.

10 to 15 years – academics, National institute of open exam. Up to 12th standard of mild autism.

Above 15 years - vocational training, skill development activities like weaving, stitching etc.



Fig 2.28: Newleaf school for special need children

2.5.1: SPATIAL PLANNING:

The school is designed in residential type for the student to feel comfort and secure. It consist of 4 classroom such as early intervention, vocational therapy, academics and occupational therapy with supporting area of multipurpose hall, kitchen, lobby and office room.



Fig 2.29: lobby and primary classroom

Acoustics:

There is no specific acoustics treatment was done. Since its away the main road and traffic with calm surroundings.

Circulation:

Circulations are act as central space connectivity for classroom and other room. Current area for circulation is sufficient for 25 students.

Materials:

Wall and flooring are smooth finish. Most of the area with neutral color and few rooms area are colored and decorated with paints, elements and future.

Lighting and ventilation:

Adequate windows are provided for ventilation and lighting in addition with mechanical ventilation.

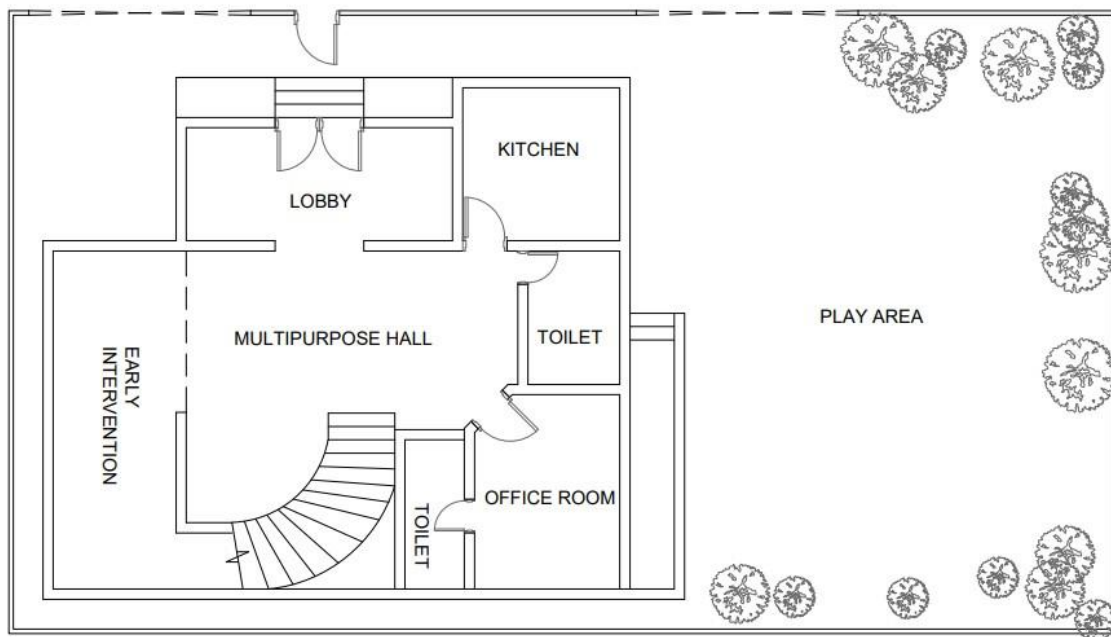


Fig 2.30: ground floor plan

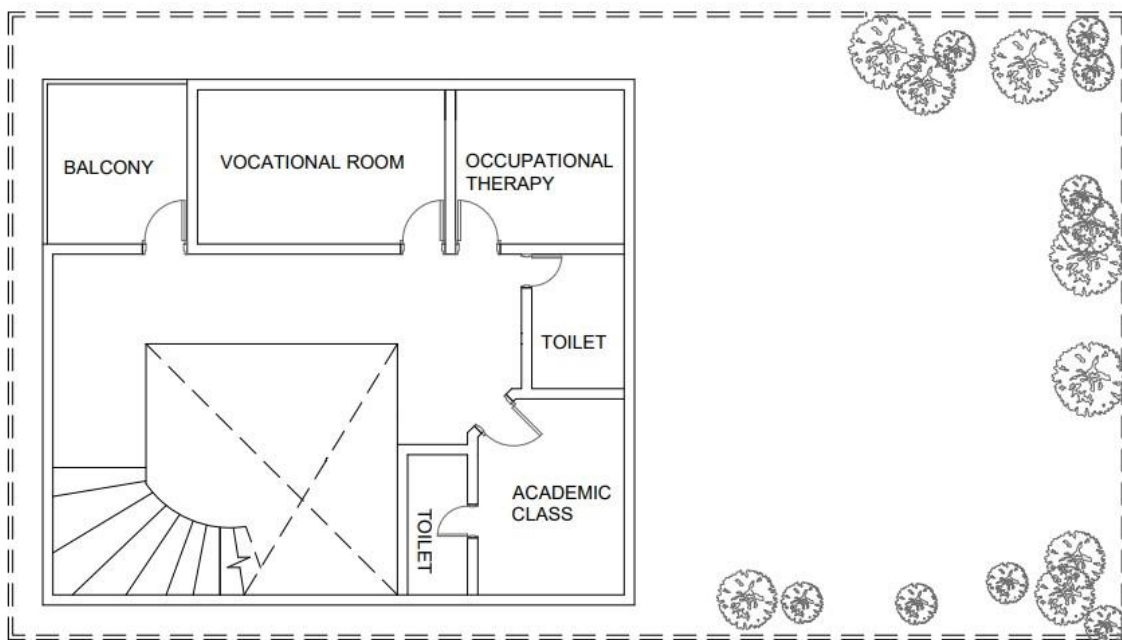


Fig 2.31: first floor plan

2.6. COMPARISON.

Case study	Northern school for autism, Australia.	The pears national centre for autism, London.	Action for autism, New Delhi.
Location	It is located in the residential area, surrounded by housing. 	It is located in the commercial area where it is surrounded by houses, school and farm land. 	It is located in the commercial area where it is surrounded by house, school, and hospital. 
orientation	Cut edge shaped building oriented towards southeast to northwest. 	Rectangular building oriented towards south to north. 	Rectangular building oriented towards northeast to southwest. 
Area	20500sqm	3500sqm	600sqm
Accessibility	Has separate entry for bus, staff, early and senior student with secure perimeters	Same way is used for both entry and exit but with secure boundary	Single entry and exit with secure compound wall
Method	Play therapy, sensory therapy, music therapy, occupational therapy, speech therapy, cognitive behaviour therapy.	Applied behavioural analysis (ABA), music therapy, sensory therapy.	Sensory therapy, occupational therapy, relation development intervention (RDI).
Lighting	Natural lighting from central play area, windows and artificial light. 	Skylight, windows, open façade and artificial light. 	Windows and artificial lighting. 
Ventilation	Cross ventilation from windows and openings and mechanical. 	Skylight, cross ventilation and mechanical ventilation. 	Windows and mechanical ventilation. 
Circulation	Separated zone for early, middle, senior children and admin. Centre with play area and outdoor.	Separated into two zones as staff and children focused area to avoid intersection.	Administration and office area are zoned in ground floor. Students learning on first and second floor and third floor is for research unit.
space	Play therapy room, music room, occupational room, visual arts room, student kitchen, multipurpose, library, classroom with outdoor courtyard, bike riding track, garden and play ground.	Classroom, shared classroom, paint room, music room, multipurpose, kitchen, training room, ICT suite room, medical room, staff room.	Toddler classroom, secondary classroom, primary classroom, parent children intervention room, sensory room, occupational room, library, research unit.
Materials	wooden flooring, cut edge roof sheet, exterior with brick finish.  	orange brick, natural timber, glass cladding, color carpet in floor, smooth wall plates in neutral tone.  	Exterior with brick finish, interior is white in color with rough finish, color flooring in same spaces.  

2.7. INFERENCE.

By analyzing above case studies the spatial and function planning are oriented, different design aspect and element are incorporated through architecture and how all these are impact in everyday learning of autism children and various design standards and furniture design for these specific category student were observed as well as negative aspect and few cons were also found in some areas of design.

CHAPTER 3

DESIGN GUIDELINES AND STANDARDS

There is no proper guidelines and standards are found in NBC. But there are different many design requirements, special facilities needs for the autistics children were derived by various researchers. And few design. Here few design aspect for autism are discussed.

2.1. GENERAL DESIGN GUIDELINES AND STANDARDS.

According to Magda Mostafa's, Architecture for autism: autism aspects in school design.

Acoustics

Autistic students will easily get distracted by sound and noise. And also get hyper sensitive to the sound. So the space should be treat with acoustics.

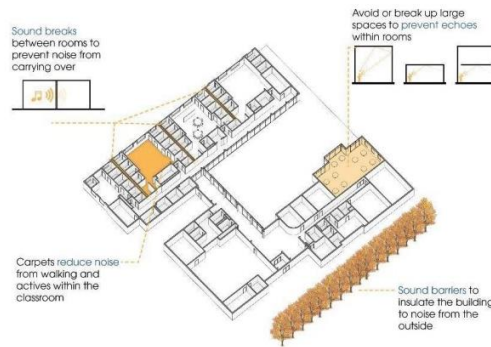


Fig 3.1: acoustics

Spatial sequencing

Spaces are to be in sequence of routine and predictable to the student to avoid distraction and confusion.

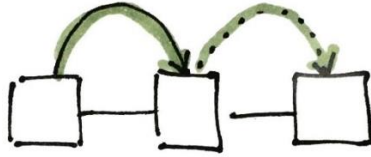


Fig 3.2: spatial sequencing

Escape space

Escape room is also called as quite room where the high function and hyper sensitive student is separate from the class to make them calm.

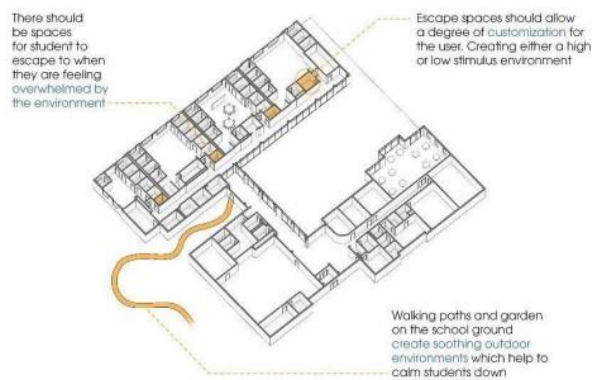


Fig 3.3: escape space

Compartmentalization

Compartmentalization will help the student to be focused in the particular activity where all activity spaces is organized.

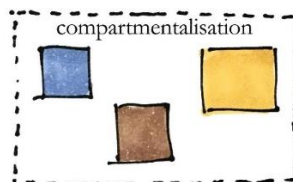


Fig 3.4: compartmentalization

Safety

Autistic children are more sensitive, it is important avoid using harmful texture, sharp edges and corner.

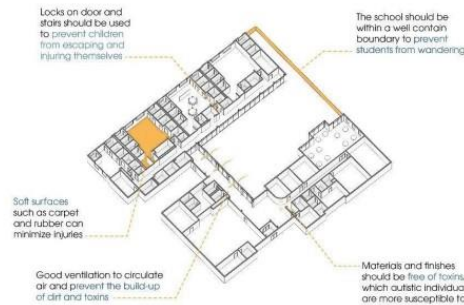


Fig 3:5: safety

Sensory zone

Sensory should be design from high to low with sequential order where student can understand. Intense sensory can be avoided.

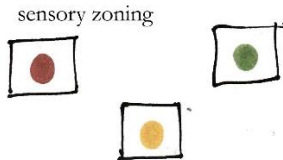


Fig 3.6: sensory zone

Transition zone

It is transition zone helps autistic children to transfer from one activity to another. Where normally autistic children find hard to multiple activity and avoid obsession in particular activity.

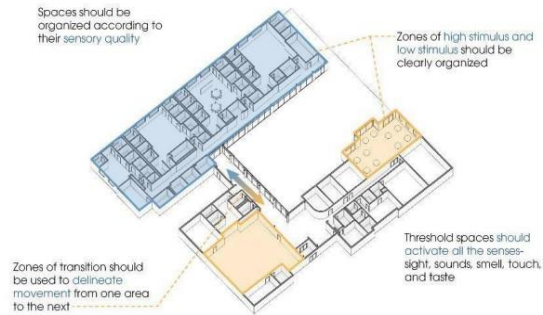


Fig 3.7: transition zone

2.2. OTHER ASPECTS.

Color

it is recommended not to use more intensity color. Usually, to autistic children colors will look neutral tone or in fluorescent tone. So, having a contrast color shows them the difference and to use calm color.

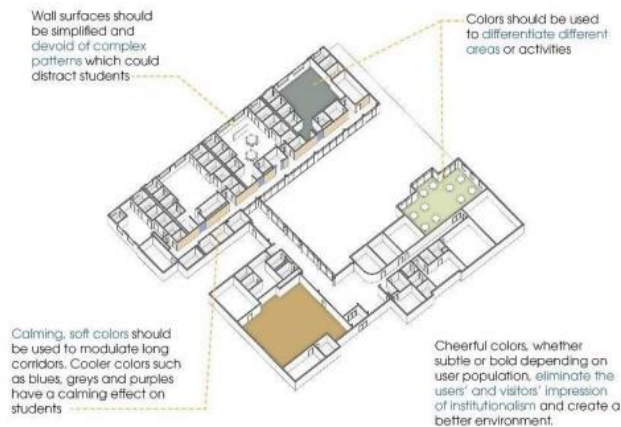


Fig 3.8: Color

Lighting

The colors are looks different to autistic children so bright help will make them hyper and irritate which may affect their learning.

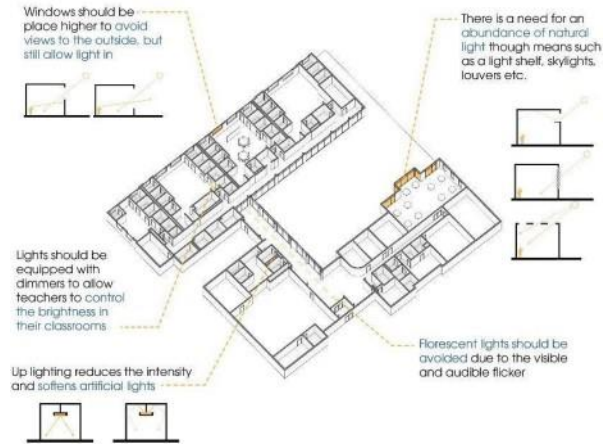


Fig 3.9: Lighting

Material and elements

Using more neutral color or tone will confuse the children differentiate the space and smooth flooring or surface will look like a wet surface to the autistic children.

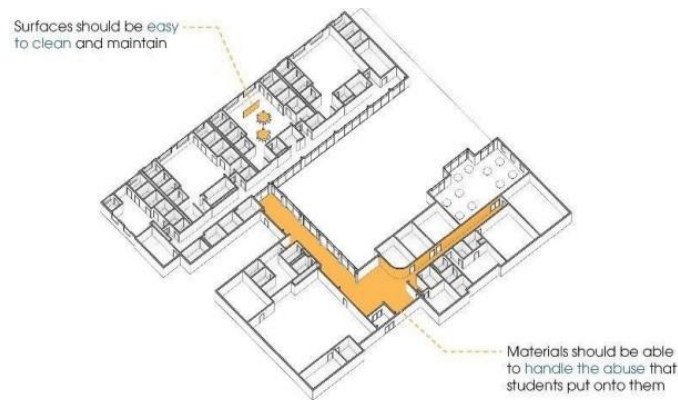


Fig 3.10: Material and elements

Texture

when comes to texture no harsh texture to be used it may injury children. But texture will help the children where they learn though various texture.

Smell

Autism have both the hyper and hypo sensitive to the smells where the hyper children don't like of kitchen and toilet odor. While designing kitchen and toilet should be placed separately from learning area.

Visual character

A class should be design in a way where it should not be too small to feel suffocating and too big to get easily distracted. So, it should be designed to avoid distracting characters.

CHAPTER 4

SITE STUDY AND ANALYSIS

4.1 SITE SELECTION:

Location: Race course, gopalapuram, Coimbatore

Area: 4.5 acres.

Orientation: south to north

Climate: warm and humid climate

Wind direction: southwest to east



Fig 4.1: site

4.2 SITE JUSTIFICATION AND FEASIBILITY:

Coimbatore is the second developing cities in tamilnadu after Chennai city. Its starts footing in every in field and opportunity to develop it as a industrial and automobile city. It also has many educational and institutional buildings available to the people but when it come to the special school like school for autism seem less compared to chennai and there are some existing autism school which has less space, small schools and the training and play area are limited due to its land available. so having a autism school or centre with greater space and multi facilities for educating looks ideal for autism and special children in the coimbatore locality.

According to the first rigorous estimate of the country's autism prevalence, roughly 23 of every 10,000 children in India have autism. Studies also point that there is a dramatic increase over the rate estimated a decade ago. The cause of the increase, like cause of autism in general, is still unknown. In Coimbatore 12 percent to 18 percent of children are diagnosed with autism or learning disabilities said by Deepa Malini, certified developmental therapist.

4.3 SITE ANALYSIS:

4.3.1 Neighborhood Context:

The site is located in gopalapuram which is in southern part of Coimbatore and its also surrounded by a residential property. Located on race course area.

Neighborhood around 5km radius.

- Government arts college
- Gedee car museum
- Bishop appaswamy college of arts and science.
- Nirmala matriculation girls higher school
- Income tax office
- Nehru ladies park
- Cosmo kids parks
- Gknm hospital

4.3.3 View:

There is a good 105m view from the front side and all other are cover with residence and vegetation which gives a privacy and undisturbed environment to the children.

4.3.4 Noise:

There is a found from the road side. Except from the road all other side are surrounded by a residence and vegetation which act as a sound barrier to the site.

4.3.5 Smell:

No odor smell is found around or in the site since it surrounded by a residence and vegetation.

4.3.6 Connectivity:

Site is located at a minimum proximal distance to the nearest bus stand.

The site can be accessed by one road abutting the site.

There are two bus stand near the site

Bus stand 1 = 220m

Bus stand 2 = 300m

Coimbatore airport in 20km

Coimbatore railway station in 1.7km

Gandhipuram central bus stand in 2.8km

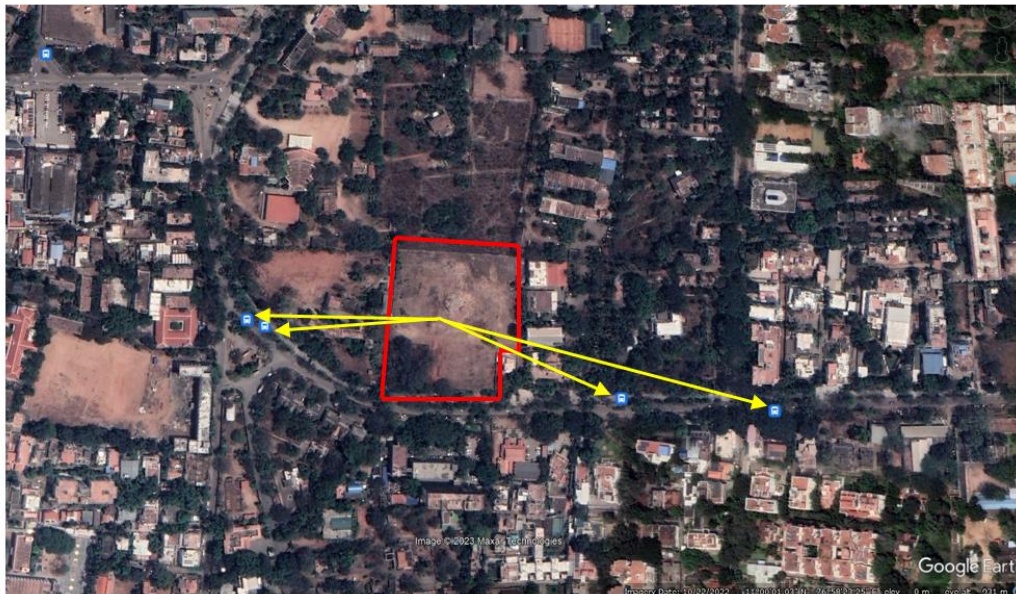


Fig 4.2: site connectivity

4.3.7 Climate:

Temperature

Average temperature = 30 `c

Maximum temperature = 36.3 `c

Minimum temperature = 23.9 `c

Warmest month = April (38.28`c)

Coldest Month = January (18.85°C)

Coimbatore - Average temperatures (1991-2020)						
Month	Min (°C)	Max (°C)	Mean (°C)	Min (°F)	Max (°F)	Mean (°F)
January	19.2	31	25.1	67	88	77.1
February	20.3	33.3	26.8	69	92	80.3
March	22.4	35.7	29	72	96	84.3
April	23.9	36.3	30.1	75	97	86.2
May	23.8	35	29.4	75	95	84.9
June	23	32.5	27.7	73	91	81.9
July	22.3	31.6	26.9	72	89	80.5
August	22.3	31.9	27.1	72	89	80.8
September	22.4	32.6	27.5	72	91	81.5
October	22.3	31.8	27.1	72	89	80.7
November	21.4	30.3	25.8	70	86	78.5
December	19.6	29.7	24.6	67	85	76.3
Year	21.9	32.6	27.2	71.4	90.8	81

Fig 4.3: climate

Rainfall

Average annual rainfall = 95 cm

Wettest Month = October (207.84mm / 8.18in)

Driest Month = January (15.59mm / 0.61in)

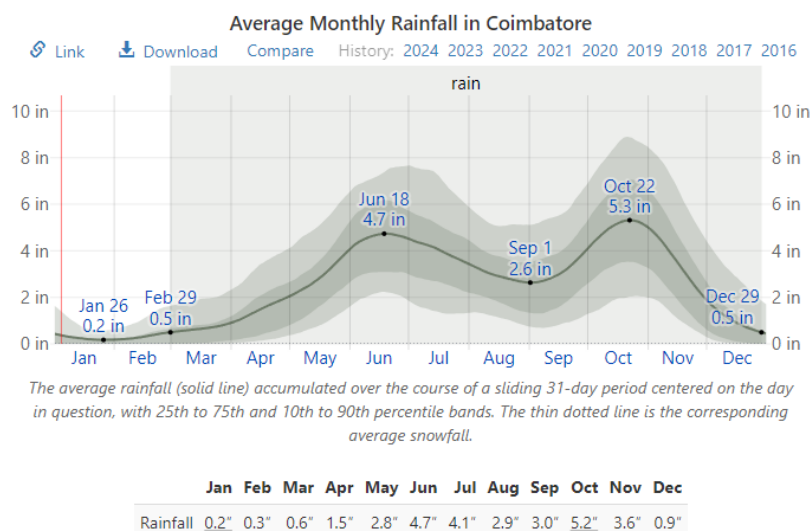


Fig 4.4: Average rainfall

Wind:

Average wind speed = 9kmh | 5.5mph

Maximum wind speed = 17.0kmh | 10.56mph

Minimum wind speed = 3.0kmh | 1.86mph

Average gust wind = 10.97kmh | 6.82mph

Maximum gust wind = 25.0kmh | 15.53mph

Minimum gust wind = 6.0kmh | 3.73mph

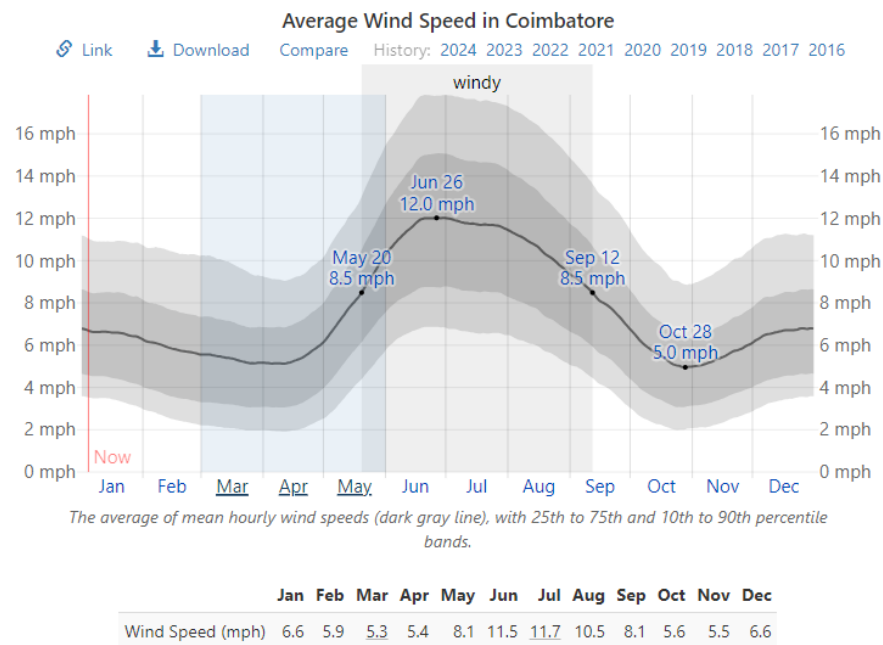


Fig 4.5: Average wind speed

4.3.8 Topography:

Topography of the site flat without any elevation. But slope surface and sand pit can be design for sensory effect for the autism children.

4.3.9 Soil:

Red soil.

Red soil has a great impact on strength, imperviousness and anti pest control. After conducting all these tests, red soil is found suitable for concrete as an admixture of it which can be used in construction of buildings.

Pile foundation is preferable for foundation.

4.3.10 Water:

There are two major sources of supply of drinking water to Coimbatore City: Siruvani and Pilloor schemes. The corporation is maintaining the distribution of water supply. The entire supply of water from Siruvani is by nature of gravity whereas pumping is being done in the Pilloor scheme

Apart from that ground water level in the site is 20 m.bgl.

4.3.10 Circulation:

Since the site is in residential area of the city it is covered more by the internal roads and street which makes the site more lively without any traffic and pollution and sound. Thus, this provide a calm environment and school campus to the autistic children.

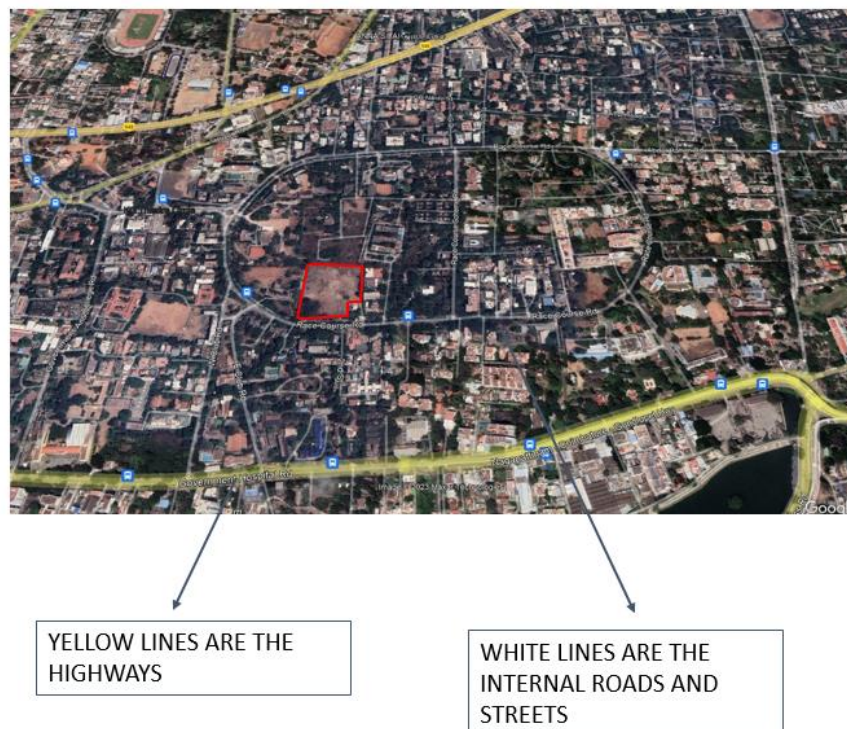


Fig 4.6: circulation

4.3.11 Sun path:

The sun path travels from the south east in the morning, it goes all along the south ward in the afternoon, then goes down towards the west at the evening.

Through the sun path analysis the window in the west and the east with the narrow building orientation toward the north and south where the building will get more sun shade. In the more sun exposure direction sunshade or overhang can be provide to diffuse the sun light. Since the autistic children has sensitive to lights.

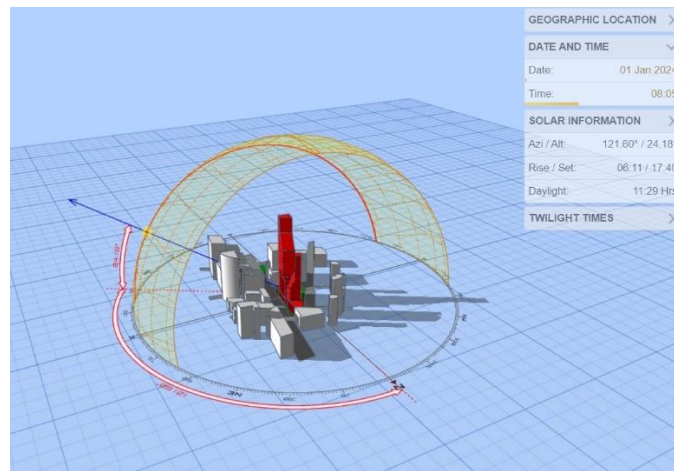


Fig 4.7: Morning sun angle

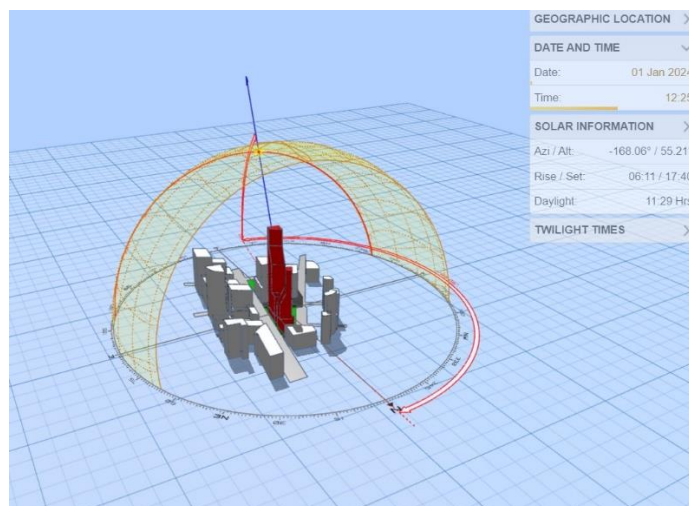


Fig 4.8: Afternoon sun angle

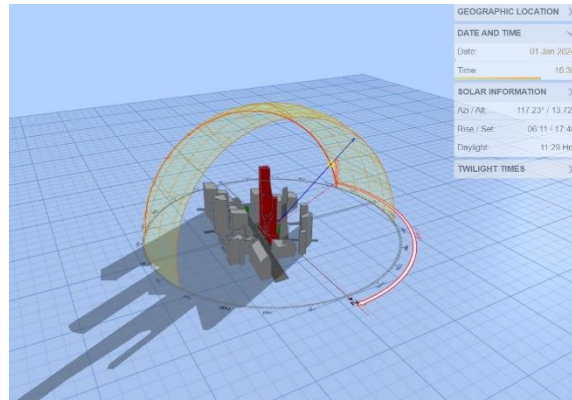


Fig 4.9: Evening sun angle

4.3.12 Vegetation:

Vegetation identified in the site are native trees like neem tree and anjan tree and both trees used as a medicinal trees in tamil medicine. The quantity of trees in site less, but in the entrance there is a bunches of trees which can used as a park, play area or leave as OSR.

4.3.13 Immediate surrounding:

The major immediate surrounding is the residential zones and institutional zones which may be give our campus friendly environment to the autistic children. And we can also have collaboration study or workshop with the near schools and institutional to improve the children's social interaction and communication.

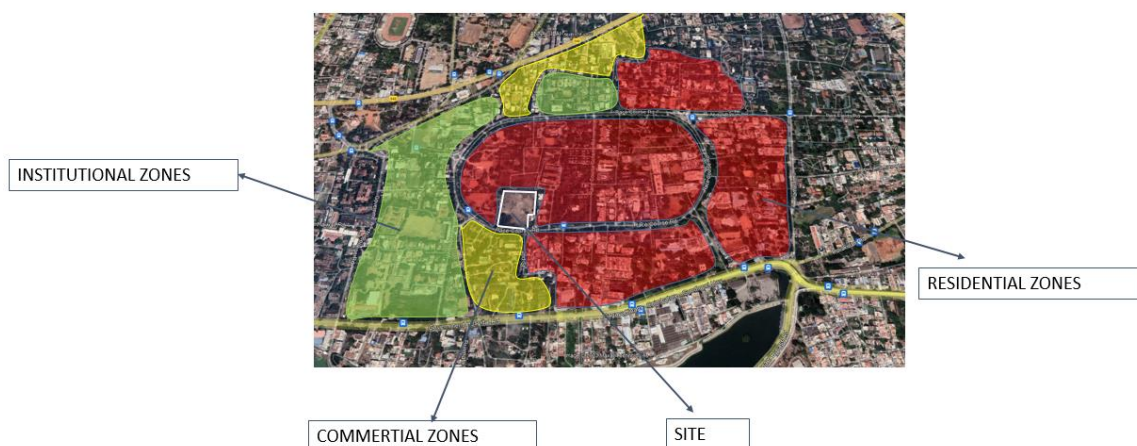


Fig 4.10: Immediate surroundings

CHAPTER 5

ARCHITECTURAL DESIGN

5.1 SPATIAL REQUIREMENTS

ADMINISTRATION	No. of. room	Per room area m2	Total area m2
Lobby	1	15	15
Reception	1	15	15
Counselling room	2	12	24
Director room	1	18	18
Staff room	1	20	20
Accounts room	1	15	15
Meeting room	1	25	25
Play room	1	20	20
Pantry	1	10	10
Medical room	1	15	15
Electrical room	1	15	15
Toilet	1	35	35
Total			227 m2

SKILL TRAINING ZONE	No. of. room	Per room area m2	Total area m2
Lobby	1	15	15
Cooking studio	1	70	70
Baking room	1	110	110
Sewing	1	70	70
Weaving	1	70	70
Paper product making	1	70	70
Art & craft room	1	40	40
Pottery (outdoor)	1	85	85
Gallery space	1	20	20
Staff room	1	25	25
Changing area	2	15	30
Toilet	2	40	80
Total			685 m2

ACADEMIC BLOCK	No. of. room	Per room area m2	Total area m2
Entrance lobby	1	20	20
Library	1	80	80
Primary Classroom	6	45	270
Junior classroom	5	45	225
Inter classroom	5	45	225
Senior classroom	5	45	225
Computer lab	2	40	80
Science lab	1	48	48
Multipurpose hall	1	135	135
Dining area	1	45	45
Store room	1	10	10
Kitchen	1	10	10
Pantry	1	10	10
Staff room	1	20	20
Toilet	2	40	80
Total			1895 m2

THERAPY ZONE	No. of. room	Per room area m2	Total area m2
Speech therapy	2	15	30
Occupational therapy	2	50+15	65
Music therapy	1	15	15
Sensory playroom	1	15	15
physiotherapy	1	30	30
Entrance lobby	1	15	15
Staff room	1	25	25
dining	1	50	50
Pantry	1	10	10
Toilet	1	50	50
Total			305 m2

CAFETERIA	No. of. rooms	Per room area m2	Total area m2
Dining area	1	120	90
Kitchen	1	60	60
Counter	1	10	10
Store room	1	15	15
Toilet	1	35	35
Total			200 m2

COMMERCIAL ZONE	No. of. room	Per room area m2	Total area m2
Shops	2	70	70
Store	2	10	20
Total			90 m2

ACCOMODATION	No. of. rooms	Per room area m2	Total area m2
Standard room	6	25	150
Staff accomodation	1	20	20
Dinning	1	60	60
Cafeteria	1	30	30
Toilet	1	35	35
Office room	1	5	5
Total			270 m2

Total site area	29105 m2
Total built up area	4353 m2
OSR 10%	2910 m2

Fig 5.1: Area requirements

5.2 MATERIALS AND CONSTRUCTION THECHNIQUE:



Fig 5.2: Materials and construction techniques

5.3 DETAILED DRAWING AND MODEL:



Fig 5.3: Master plan



Fig 5.4: site plan



Fig 5.5: Academic block



Fig 5.6: Administration block

THERAPY BLOCK

11 | TRIUMPH
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SCALE : 1:100

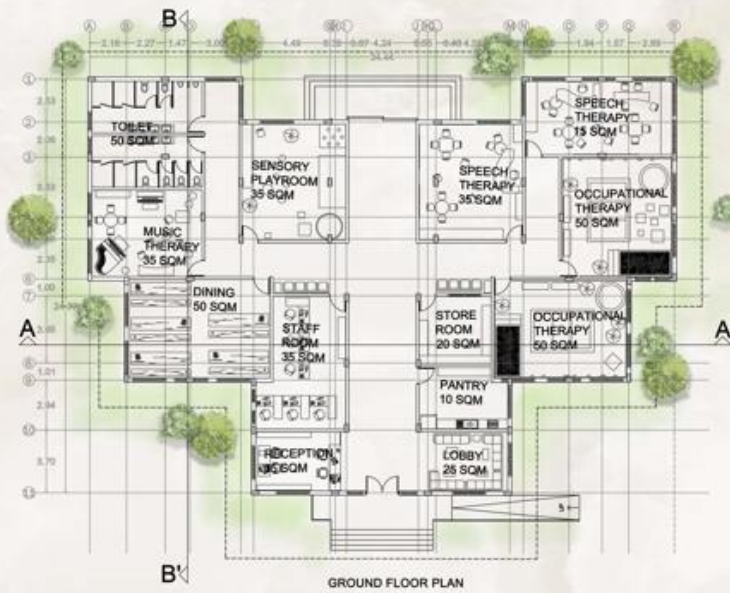


Fig 5.7: Therapy block



Fig 5.8: Therapy block



Fig 5.9: Accomodation block

CHAPTER 6

REFERENCES

6.1 Journals:

1. https://www.researchgate.net/publication/340687186_Autism_Spectrum_Disorder_Review_Article
2. <https://www.frontiersin.org/articles/10.3389/fpsy.2023.1096769/full>
3. https://www.academia.edu/8647652/Review_of_Research_on_Children_with_Autism_Spectrum_Disorder_and_the_Use_of_Technology
4. <https://www.sciencedirect.com/science/article/pii/S2772598722000654>
5. https://issuu.com/akhila.anil/docs/04_akhila.a_inclusive_design_for_children_with_aut
6. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8085719/>
7. https://www.researchgate.net/publication/285345281_Architecture_for_autism_Autism_and_spectss_in_school_design
8. https://www.researchgate.net/publication/268444432_CENTER_FOR_AUTISTIC_CHILDREN_AN_ARCHITECTURAL_INTERVENTION
9. <https://issuu.com/rashibhavsar1/docs/designdessertation101>
10. https://issuu.com/akhila.anil/docs/04_akhila.a_inclusive_design_for_children_with_aut

6.2 Websites:

1. <https://www.scribd.com/document/515633537/Autism-Design-Standards>
2. https://issuu.com/magdamostafa/docs/the_autism_friendly_design_guide
3. <https://www.integrityinc.org/what-are-the-5-types-of-autism/#:~:text=There%20are%20five%20major%20types,developmental%20disorder%20%E2%80%93%20not%20otherwise%20specified>
4. <https://www.bennykuriakose.com/post/school-for-children-with-autism-and-special-learning-disabilities>
5. https://issuu.com/magdamostafa/docs/the_autism_friendly_design_guide
6. https://issuu.com/anrivanderwath/docs/architecture_thesis_-_centre_of_res

7. https://issuu.com/rachelwalchonski/docs/final_book_layout
8. https://www.academia.edu/36587477/School_For_Autism
9. <https://www.voyagecare.com/news/autism-and-colour/#:~:text=Colour%20therapy%20is%20a%20successful,and%20reinforce%20concepts%20and%20ideas>
10. <https://www.choosingtherapy.com/levels-of-autism/>
11. <https://my.clevelandclinic.org/health/diseases/8855-autism>
12. [https://www.nimh.nih.gov/health/topics/autism-spectrum-disorders-asd/#:~:text=Autism%20spectrum%20disorder%20\(ASD\)%20is,first%202%20years%20of%20life](https://www.nimh.nih.gov/health/topics/autism-spectrum-disorders-asd/#:~:text=Autism%20spectrum%20disorder%20(ASD)%20is,first%202%20years%20of%20life)