

UNIVERSITY OF MUMBAI

KENDRIYA VIDYALAYA, MALAD
A UNIVERSAL DESIGN APPROACH

MADE BY
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DESIGN DISSERTATION
FINAL YEAR B.ARCH

ANJUMAN-I-ISLAM KALSEKAR TECHNICAL CAMPUS
SCHOOL OF ARCHITECTURE

UNIVERSITY

ACKNOWLEDGEMENT

I solemnly acknowledge the efforts of my guide Ar. Sonam Ambe for helping me all throughout the year.

I even acknowledge my parents for being patient with me and being supportive throughout.

LITERATURE STUDY

SYNOPSIS

HYPOTHESIS

RESEARCH

STATISTICS

PEOPLE WITH DISABILITIES ACT

SITE JUSTIFICATION

SYNOPSIS

A school, as an institution, leaves a deep imprint on the young developing minds and therefore school is chosen as my thesis topic. Inclusion is the need of the hour and it is the law, that all students should receive equal education. A school has a direct impact on the development and the understanding of a child. It is responsible for the physical, emotional, mental, social, cultural and intellectual development of a child. Campus environments are places where structured teaching and learning takes place and one can benefit from this. An inclusive school will provide opportunities for all physically disabled children to participate in education along with the non- disabled children in the mainstream school. Since the disabled students deprive the societal acceptance at the tender age, and are look down upon creating a sense of fear of socializing. We need to remove this stigma from the society and encourage an open mindset through the children in school. This school will help the children grow up socially and achieve a sense of independence and will polish their skills in various vocational trainings.

All the existing structures in the society do not always meet the needs of every individual. The universality in the design of the structure is not seen. It is either done on a temporary basis or the versatility of the humans is ignored. The statement 'Architecture is an art in combination with technology used to satisfy

the human needs' is in context to all kinds of human beings. So, my design thesis will be catering to the human diversity.

According to the data in Mumbai Human Development report 2009, section elementary education, most of the illiteracy is seen in the lower class people and there almost negligible schools in the city that cater to the disabled children in a lower level schools, my school will be a municipal school which will be universally designed.

Existing scenario

A school, Amar Jyoti High School in New Delhi is one such school that follows the concept of Inclusion and has made provisions in the school to meet the needs of the individual. Working under the Amar Jyoti Rehabilitation Trust, it does not take fees and is beneficial for the lower class people in the surrounding area.

In Mumbai, Students with disabilities are not enrolled in the mainstream schools, given the reason, lack of facilities and absence of trained teachers and if admitted the child has to struggle throughout. Average number of inclusive schools are almost negligible in the city and the ones present have huge amount of fees which is not affordable by the lower class people. Municipal schools in the city do not have the provisions for the physically disabled children, as a result there is illiteracy amongst them.

Site

Mumbai is highly attracted to migrants in search of employment, especially the lower class. These people are incapable of admitting their wards in the high expensive schools for education. Moreover, if their child has some disability, admitting them to a special school or an inclusive school (which too less in number in Mumbai) becomes unaffordable and the child remains illiterate. According to the statistics provided in the People's Vision Document: For Mumbai's Development Plan (2014 - 2034), SECTION 2, there are six problematic wards in the city namely; M/E, M/W, G/N, H/E, L, P/N. Out of which the most problematic ward, after tallying the slum population and the requirements of the schools, is the P/N ward which covers the extents of Malad, Dahisar, Goregaon. The slum population is higher in this ward than the other mentioned wards. The site taken is a Central government property in Malvani, Malad (west), opposite to the BMC colony and will be apt for the school since it will follow the CBSE pattern as mentioned earlier.

Objectives

To design a school that will include the disabled children along with the non-disabled children in the mainstream school providing a structural setup for the human diversity.

To design a school for the lower class people.

To create a barrier free design since it is missing in most of the schools.

To design classrooms, such that it benefits the student in all aspect and meet his/hers educational requirements.

To design a space that will cater to the requirements of all types of users so that the students don't experience the same space differently.

To design spaces for therapeutic sessions, prosthetic and orthotic unit and vocational training for a self-dependent future.

To design spaces that will create a sense of belongingness in the people and enhance the feeling of societal acceptance.

To design spaces according to the anthropometric data of the disabled children and with respect to their age group.

Methodology:

The aims and objectives will be achieved by

Studying the different type of children in an inclusive school.

Studying their behavior in the surrounding.

Studying their physical and educational requirement.

Studying the various aspects of universal design and their application to ones benefits.

Studying the details required.

Studying the anthropometric data.

Studying the various technologies available for the required field.

Hypothesis

Can the physical environment have a powerful and determining impact on the users?

Since people with all different background and abilities use a space, the impact that each space gives to a human being differs individually. A person may lose his self-esteem and confidence if a space doesn't makes him feel comfortable. A sense of belongingness is missed out. The way a space is designed shows its efficiency by the functioning of it and the user's experience in the same.

My thesis will be taking into the consideration the user experience of the physically disabled children which will include visually impaired, hearing impaired, speech impaired and the physically disabled.

Since the design is of a school, the requirements of the child starting from the circulation around the campus till the study requirements to gain education will be taken into account.

Approach

The design will focus on the movement pattern of the children around the campus and enhance the use of the abilities they possess. Various design technologies will be used to enhance their learning experience.

Guidelines of Universal design learning will be considered while designing a universal classroom.

These will even focus on the minute details of hand rails, grab bars to floor mats and their materials.

Since it's a lower level school, the design will not be too contemporary, but will be a low cost structure, so the people don't hesitate to approach. The children of the nearby slums and the BMC colony will be my main users.

P.S.:

This thesis is an attempt to design an inclusive school incorporating the requirements of the physically disabled students in a mainstream school and not the unique nature of the disability. The nature and the severity of the disability could cause certain challenges and experiences which should not overshadow the philosophy of providing equal opportunities to all learners. My thesis will not be considering children with mental and multiple disabilities.



HYPOTHESIS

Can the physical environment have a powerful and determining impact on the users?

The environment is filled with different types of space; each having varying functions, size and shape.

Since people with all different background and abilities use a space, the impact that each space gives to a human being differs individually. A person may lose his self-esteem and confidence if a space doesn't makes him feel comfortable. A sense of belongingness is missed out. The way a space is designed shows its efficiency by the functioning of it and the user's experience in the same.

A space may also give the physical comfort to a person if it designed based on the individuals needs and comfort. The way a space is designed fosters the use and experience of the place.

How better ones design can make it feasible for every individual to experience it in a positive way with the sense of belongingness and coping with the ability one possess is what makes one design the best.

The built environment can contribute to a more equal, inclusive and cohesive society if the places where we live, the facilities we use and our neighbourhoods and meeting places are designed to be accessible and inclusive.

The full diversity of this experience needs to be considered if all users are to be comfortable and feel that a particular space or place belongs to them.

In this briefing we look at a broad meaning of inclusion – not just access – starting with what an inhospitable built environment looks and feels like, and the unintended social, cultural and economic inequalities that follow.

ARCHITECTURE AND HUMAN BEHAVIOUR

The quality of buildings and spaces has a strong influence on the quality of people's lives. Decisions about the design, planning and management of places can enhance or restrict a sense of belonging. They can increase or reduce feelings of security, stretch or limit boundaries, promote or reduce mobility, and improve or damage health. They can remove real and imagined barriers between communities and foster understanding and generosity of spirit. Even though accessibility has improved over the last decade, and planning policy has shifted, with investment providing new facilities to once-excluded communities, the fact remains that poor and disadvantaged people are far more likely to live in poor quality environments. Social, cultural and economic inequalities are still being literally built into new places, and planners and designers need to examine more closely the impact of their decisions.

Architecture can impact or affect human behavior in positive and negative ways, and impact or affect the health and well-being of humans, as well as human performance; which has an effect on human behavior. In particular, it is varying architectural designs that impact or affect human behavior. Humans spend the majority of their lives in built environments and less of their lives in natural environments; therefore, it is inevitable that architecture regardless of whether it is residential or commercial architectural designs will indeed impact or affect human behavior in positive and negative ways. The direct and indirect

consequences of architectural designs can either be functionally appropriate and aesthetically pleasing to humans; therefore, fostering positive behavior or functionally inappropriate by imposing restrictions on behavior.

An examination of the environment's influence on well-being, behavior. Also, it examines the experiences of humans, and individuals' influence on the environment; in regards to factors that influence environmental behavior and means of encouraging behavior that is pro-environmental.

It is the interplay between the individual and his or her natural and built environment.



Stress on inclusive education for special kids

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KOLKATA: Saranagopy, an interactive seminar aimed at addressing the needs of special children and educating teachers, was organized by The Heritage School in its premises recently.

The brainchild of vice principal Meenakshi Atal, this seminar provided a platform for teachers from several city schools. The seminar began with renowned educationist John Mason speaking on the advantages of inclusion. He narrated various positive experiences with special children which he came across during his tenure as the principal of St James.

He also talked about the benefits of inclusion for mainstream children. Stressing on the modifications necessary to make inclusion possible, he emphasized the need for a calmer, gentler and kinder society.

Mason was followed by Vikram Sen, secretary, school education, West Bengal, who spoke in favour of social inclusion. He talked of the underprivileged and how education for all would benefit the economy and presented the government's perspective on this issue. Padmadhri De Sudha Kaul, founder of Indian Institute of Cerebral Palsy and its present vice-chairperson, discussed the suggested changes to the existing law and the eight principles which guided the formulation of the New Disability Rights Bill. She stressed on education of the disabled and how reasonable accommodations can lead to inclusion in mainstream schools.

The Heritage model of inclusion was introduced by Meenakshi Atal, who spoke of her journey of inclusion which began 10 years back with one special educator and a handful of children. She said participation was the key to inclusion and how she, over the years, has ensured participation of the children with special needs in all mainstream activities to the best of their abilities. Academic inclusion and different strategies made to enable children to learn at both the junior and senior level was shared by the special needs department of The Heritage School. The elements of emotional quotient and advantages of social inclusion were also discussed.

The post-lunch session started with Nont Khullar sharing the Akshar model of inclusion. The principal of Akshar School showed how her school deals with the special children within the class. Dr Reena Sen, executive director, Indian Institute of Cerebral Palsy, spoke of curricular modifications and benefits of open schooling. Implications for curricular modifications were explained by her. She concluded by appealing for access to ensure success for all. Founder of West Bengal Autism Society Indrani Basu's speech on how to include children with autism into a mainstream school was one of the highlights of the day.

The audience was given an opportunity to interact with the panellists and were given time to put forward their questions to the speakers of their choice. This seminar was an eye opener for several educators and ended by generating lots of positive energy which, if channelized in the right direction by the schools of the city, will transform the learning experience for children with special needs.

Inclusive education – an alternative?

The national policy on education- 1987 emphasized inclusion while launching schemes for integrated education. Integrated education represent a supportive approach to serving those with special needs and is based on the principles of inclusion. International declaration, recommendations and world conference and national seminar etc all agree to the right of education for all childrens with special needs. With the scheme of inclusive education all government programs can realize the national philosophy and policy of education for all. The 1983 world programe of action , 1989 convention on the rights of the child the 1990 world declaration for education for all and now the UN standard rule on the equalization of opportunities and finally in 1994 the salamanka statement – all focused on the same thing in different ways- the child with special needs. Inclusive education means what it says include the child with special needs in the same way in which you include any other child the approach recommends education of childrens with special needs in over all educational structure of a nation. This also means beginning education at the very start beginning of childhood and continuing it right to the whole education system. It will also mean adapting the entire school structure and building furniture. The teacher training curriculums and the arritudes of the sibilings, parents and public to include children with special needs in a regular school system. It should lead to an educational system which is explicitly disabled friendly in 1988 the UNSCO consultation on special education had recognized that the responsibilities for special education was that to the total education system it stated that there should not be two different systems of educational provision yet special schools in india cum under the purview of the welfare ministry. While integarted education is the responsibility of the department of education, ministry of human resources development. Separate special education system lead to special segregation and insolation of the disable , thus creating separate worlds for them in adult life. Inclusive education has the potential to lay the

foundation of the more inclusive society where being different is accepted, respected the value. The school is the first opportunity to start the disable and yet difficult process. It is difficult because it is wrought with fears and appreciates on the part of parents, teachers and other childrens.

Continue need for specialized services :-

Inclusive education does not mean that the need for specialist will be any less. There will always be a need for special schools in our country for children with several disabilities. Such school will take on new rules and their responsibilities will include the planning and execution of education as a whole special education should be seen as a comprehensive and flexible design to meet the period.

In order to gauge the national response towards inclusive education of children with disabilities, it is vital to know the magnitude of childhood disability. It is difficult to estimate the number of children with disabilities in India. The Census of India 2001 reports 7.73 million children and young adults in the age group 0-19 years. Singal (2006) has cited office of the Chief Commissioner for Persons with Disabilities (2003), which notes that the figures available are highly unreliable and range between 6 million and 30 million children with disabilities in India. It further notes that the Rehabilitation Council of India takes the figure of 30 million children with disabilities as the best estimate. There are noted discrepancies related to education of children with disabilities. Singh (2003) reported 3 to 4 percent of children with special needs had

access to education with or without support services and Mukhopadhyay & Mani (2002) deduced that only 1 percent of children with disabilities in the 5-15 age group had access to education. A recent World Bank Report (2007) highlighted that 38 per cent of the children with disabilities in the age group 6-13 years are out of school. Irrespective of the estimate, in India the fact remains that a majority of children with disabilities do not have access to education. In the context of the right to education for children with disabilities as laid out in CRC and more illustriously in UNCPRD, this research seeks to understand the experiences of children with disabilities in inclusive schools in Mumbai, India.

II. Research Context and Rationale

The concept of inclusive education was introduced in India by Jangira in 1997 when he referred to the UK Warnock Committee Report. However, Mani (2000) noted that he had pioneered inclusive education in India, in the 1980s while referring to the concepts of 'dual teaching model' and the 'multi-skilled teacher plan' (see Singal 2005). In practice though, inclusive education gained momentum in India during the 1990s in response to international developments which advocate inclusive education (e.g. Convention on the Rights of the Child 1989, UN Standard Minimum Rules 1993) and was largely influenced by the Salamanca Statement (UNESCO 1994). This declaration marked the incorporation of inclusive education in the official documents of many signatory countries (Holdsworth, 2002 cited in Singal 2006), including

India.

It would be interesting to construct a historical trail for inclusive education in India in order to build a discourse and help the audience understand the context. However lack of documentation on education of children with disabilities in the nineteenth century in India is a major constraint (Alur 2002a). The first attempt to integrate was initiated by the Royal Commonwealth Society for the blind and the Christopher Blind Mission. The visually challenged children were integrated in regular classrooms where they were expected to devise self-learning mechanisms during sessions where oral repetition was a dominant pedagogy (Chaddha 2003). During the preindependence period, the provincial governments took sporadic interest in educating children with disabilities by dispensing ad-hoc grants to schools and institutions run by the voluntary sector The Kothari Commission (1966) which highlighted the importance of educating children with disabilities during the post-independence period. It expressed that the education of children with disabilities must be a part of the general educational system suggesting that educational facilities must be extended to the blind, deaf, orthopedically challenged and mentally challenged (Pandey 2006). In 1974, the centrally sponsored scheme for Integrated Education for Disabled Children (IEDC) was launched which is currently being implemented in over 90,000 schools in the country. The scheme was introduced to provide equal opportunities to children with disabilities in general schools and facilitate their retention. It provides facilities like expenses related to

books, stationery and uniforms, allowance for transport, reader and escort for students with disabilities. It also supports appointment of special teachers, provision of resource rooms and removal of architectural barriers (MHRD 2009).

In pursuit of the goal of providing basic education for all, the National Policy on Education (1986) and its follow-up actions have been major landmarks. The World Declaration on Education for All adopted in 1990 gave further boost to the various processes already set in motion in the country.

The Rehabilitation Council of India Act 1992 initiated a training programme for the development of professionals to respond to the needs of students with disabilities. The enactment of the People with Disability Act in 1996 provided legislative support. This act made it mandatory to provide free education to children with disabilities in an appropriate environment until the age of 18 years (UNICEF 2003). Even though the legislation (The Person with Disability Act, 1995) made access to regular schools easier, it was still not guaranteed as an equal right for all students.

What is inclusion?

Inclusion is the philosophy that brings students , families, educators and community members together to creat schools and other social institutions based on acceptance , belonging and community (salend, 2001). In theory, inclusion is practiced in schools to establish collaborative, supportive and nurturing environments for learners that are based on giving all students the services and accommodations that they need to learn as well as respective and learning from each others individuals. Inclusion is not necessarily just focused on the students with disabilities when implemented correctly it is also designed to be able to accommodate and respond to the needs of regular education students as well.

Factors that contributed to the movement of educate student in inclusive classrooms:-

- 1) Normalization- inclusion is rooted in this principle. Normalization aims to provide social interactions and experiences that parallel those of society to adult and childrens with disabilities. The philosophy of educating students with disabilities in regular education classrooms rests on the principles that educational opportunities for students with disabilities should resemble as closely as possible the opportunities and activities enjoyed by their peers who are not disable.
- 2) Deinstiutionalisation – up until very recently, people with disabilities were feared , ridiculed abandoned, or placed in institutions that isolated them from the general public. Because of the terrible conditions found in many institutions as well as a growing awareness of the negative of the institutionaliazation.
- 3) Early intervention and early childhood programs – effectiveness of early intervention and early childhood programe has promoted the

- 4) placement of students with disabilities in regular education classrooms this programs have increased the physical, motor, cognitive , language, speech, socialization and self-help skills of many children from birth of age 6. They have also reduced the likelihood that secondary disabilities occur, empowered families to promote the child's developments, and decreased the probability that children with disability will be socially dependent as adults.
 - 5) Technological advances – technological advances have changed the quality of life for many people with disabilities . technology has helped them to gain access, independence and achievement assistive and instructional technology allows student with communication, physical, learning and sensory disabilities to gain more control over their lives and environment , as well as greater access to society and regular educational classrooms.
- ▶ The quality of buildings and spaces has a strong influence on the quality of people's lives .
 - ▶ Decisions about the design, planning and management of places can enhance or restrict a sense of belonging.
 - ▶ They can increase or reduce feelings of security ,stretch or limit boundaries, promote or reduce mobility, and improve or damage health.
 - ▶ They can remove real and imagined barriers between communities and foster understanding and generosity of spirit.

**For me or not for me?
Why do people experience the same place differently**

- ▶ People experience the built environment differently according to who they are – their social, cultural and economic background.
- ▶ The full diversity of this experience needs to be considered if all users are to be comfortable and feel that a particular space or place belongs to them.
- ▶ Inclusive design takes into account people with specific mobility, dexterity, sensory, and communication impairments; learning disabilities; continence needs; and people whose mental well-being should be supported by a thoughtfully crafted and managed environment.

Inclusive design is about:

access with dignity – getting to, and into places, and using them. It is about physical access to places and services, including access to appropriate technology

treatment with respect – how people are dealt with, talked to and looked after; whether their needs are considered and whether they are respected and welcomed

relevant services – do places meet people’s particular needs? Are they designed with users in mind? Do they give people a sense that they have a right to be there?

- ▶ Inclusive environments will:
 - ▶ be responsive to people’s needs
 - ▶ be flexible in use offer choice when a single design solution cannot meet all users’ needs

- ▶ be convenient so they can be used without undue effort or ‘special separation’
- ▶ be welcoming to a wide variety of people, making them feel they belong
- ▶ accommodate without fuss or exception those who have specific requirements.

Children with Disabilities in Private Inclusive Schools in Mumbai: Experiences and Challenges

Abstract: *'Inclusive education' policy has been introduced in India, however the concept is in its infancy This qualitative study analyses the case of children with disabilities studying in private inclusive schools of Mumbai. It discusses the development of self concept, elucidates the benefits and challenges of children with disabilities in inclusive education. We then suggest recommendations for improvements in implementing inclusive education in India.*

Keywords: *Children with disabilities, Inclusive Education, Self Concept, Developing Countries, Mumbai.*

I. Introduction

There have been efforts internationally to include children with disabilities in the educational mainstream. Geoff Lindsay (2007:1) suggests that 'inclusive education/mainstreaming is the key policy objective for education of children and young people with disabilities'. Inclusive education entails 'increasing the participation of students in, and reducing their exclusion from, the cultures, curricula and communities of local schools' (Booth and Ainscow, 1998:2). The Salamanca Statement and Framework for Action on Special Needs Education (1994) adopted by the World Conference on Special Needs Education paved the way for inclusive education. The Statement solicits governments to give the highest priority to making education systems inclusive and adopt the principle of inclusive education as a matter of law or

policy. It emphasizes that every child has a basic right to education and every child has unique characteristics, interests, abilities and learning needs.

The Salamanca Statement maintains that 'inclusion and participation are essential to human dignity and the enjoyment and exercise of human rights' (quoted in CSIE 1997). Thus we see inclusive education as largely emanating from the human rights perspective which upholds that variations in human characteristics associated with disability, whether in cognitive, sensory, or motor ability, as inherent to the human condition and such conditions do not limit human potential (Rioux and Carbet 2003). The idea of children having rights independently of the adults around them is a relatively new concept of the past century and a common theme in early legislation was that children were seen as passive recipients, to be 'seen but not heard' (Munro 2001). The adoption of Convention on the Rights of the Children (CRC) in 1989 and the World Summit for Children in 1990 were promising enactments and it appeared that rights of children were seriously being considered by the governments and international community (International Save the Children Alliance 2001).

The rights of the children were envisaged at the CRC and reaffirmed through the recent UN Convention on the Rights of Persons with Disabilities (UNCRPD) (2006). The CRC remains a landmark document which comprehensively covers civil and political, social, economic and cultural rights of children. It takes due consideration of the survival, development, protection and participation needs of children. India ratified the convention in December 1992, thereby committing itself to protect and promote rights of all its children.

Though the member nations have ratified the convention there are reported good practices and violations all over the world. 'Disability' in children renders them even more vulnerable to violation of their rights. Children with disabilities have universally suffered discrimination, violence and abuse, poverty, exclusion and institutionalization (International Save the Children Alliance 2001:2). Jones' (2000) critic of the 'country reports' to the UN Committee on the Rights of the Child, is that in majority of the cases

children with disabilities were referred under Article 23 only focussing on rehabilitation and special care. Children were rarely mentioned under Article 28 (the right to education) and other Articles, indicative of 'welfare' rather than 'rights' approach of nations towards children with disabilities.

Societies develop their characteristic patterns of responding to disability, depending on the way disability is understood and their resources accordingly identified. Historical and cultural contexts, to a large extent, determine the criteria for normality and the definition of an ideal or acceptable person (Aristotle 1260 cited in Vehmas 2004). The rehabilitation practices of a society could be comprehended by taking a deeper look at the cultural nuances and responses to disability. Historical events, sacred texts and social institutions, all contribute to the social construction of disablement. In Indian and other Asian societies, the concept of *karma* governs basic assumptions about disability, where disability is seen as the result of one's deeds in previous births (Ghai 2001, Karna 2001 cited in Ghosh 29) has explored the cultural modelling of disability which has impacted societal attitudes. The association of bad deeds with sufferings such as disability together with ignorance on issues related to disability resulted in stigma and discrimination of individuals with disabilities.

Communicating with design:-

The last category of communication within the designed province, the ideas or emotions that are conveyed by the design of the structure itself is different to deal with. With some people find it hard to believe that the design characteristic of the building are capable of communicating any message but independent studies conducted by ifan.

Use universal design:-

Universal design means accommodating, to the maximum extent possible people with temporary and permanent changes in mobility, agility and perception acuity with the increasing both the number and severity of student with disabilities, universal design becomes an important design principle for school of architecture.

Design requirements for people with disabilities are often same as for people without disabilities. During the design and construction process. However economic, aesthetic, consideration, and other forces can compromise requirements. The average person may be able to adapt to such compromises but persons with disabilities may not.

Universal design dictates that school furniture should maximize comfort and minimize the potential for injury, eye fatigue, distraction by being free of protrusions and having rounded edges and non glare surface, likewise pedestrian walk, bus circulation, car circulation and service deliveries and parking should be physically separated. The clear delineation of this traffic pattern enhances.

Universal design learning

- **Multiple Means of Engagement**
 - Creating interest
 - Sustaining effort and persistence
 - Self-regulation
- **Multiple Means of Action and Expression**
 - Generate physical actions
 - Express and communicate
 - Goals and strategy setting
- **Multiple Means of Representation**
 - Options for perception
 - Options for language, mathematical expressions, symbols
 - Sense of understanding

Montessori education

The Montessori Method of education, developed by Dr. Maria Montessori, is a child-centered educational approach based on scientific observations of children from birth to adulthood. Dr. Montessori's Method has been time tested, with over 100 years of success in diverse cultures throughout the world. It is a view of the child as one who is naturally eager for knowledge and capable of initiating learning in a supportive, thoughtfully prepared learning environment. It is an approach that values the human spirit and the development of the whole child—physical, social, emotional, cognitive. Components necessary for a program to be considered authentically Montessori include multiage groupings that foster peer learning, uninterrupted blocks of work time, and guided choice of work activity. In addition, a full complement of specially designed Montessori learning materials are meticulously arranged and available for use in an aesthetically pleasing environment.

The teacher, child, and environment create a learning triangle. The classroom is prepared by the teacher to encourage independence, freedom within limits, and a sense of order. The child, through individual choice, makes use of what the environment offers to develop himself, interacting with the teacher when support and/or guidance is needed.

Multiage groupings are a hallmark of the Montessori Method: younger children learn from older children; older children reinforce their learning by teaching concepts they have already mastered. This arrangement also mirrors the real world, where individuals work and socialize with people of all ages and dispositions.

Dr. Montessori observed that children experience sensitive periods, or windows of opportunity, as they grow. As their students develop, Montessori teachers match appropriate lessons and materials to these sensitive periods when learning is most naturally absorbed and internalized.

In early childhood, Montessori students learn through sensory-motor activities, working with materials that develop their cognitive powers through direct experience: seeing, hearing, tasting, smelling, touching, and movement.

In the elementary years, the child continues to organize his thinking through work with the Montessori learning materials and an interdisciplinary curriculum as he passes from the concrete to the abstract. He begins the application of his knowledge to real-world experiences.

This organization of information—facts and figures—prepares the child for the world of adolescence, when thought and emotion evolve into understanding more abstract, universal concepts such as equity, freedom, and justice.

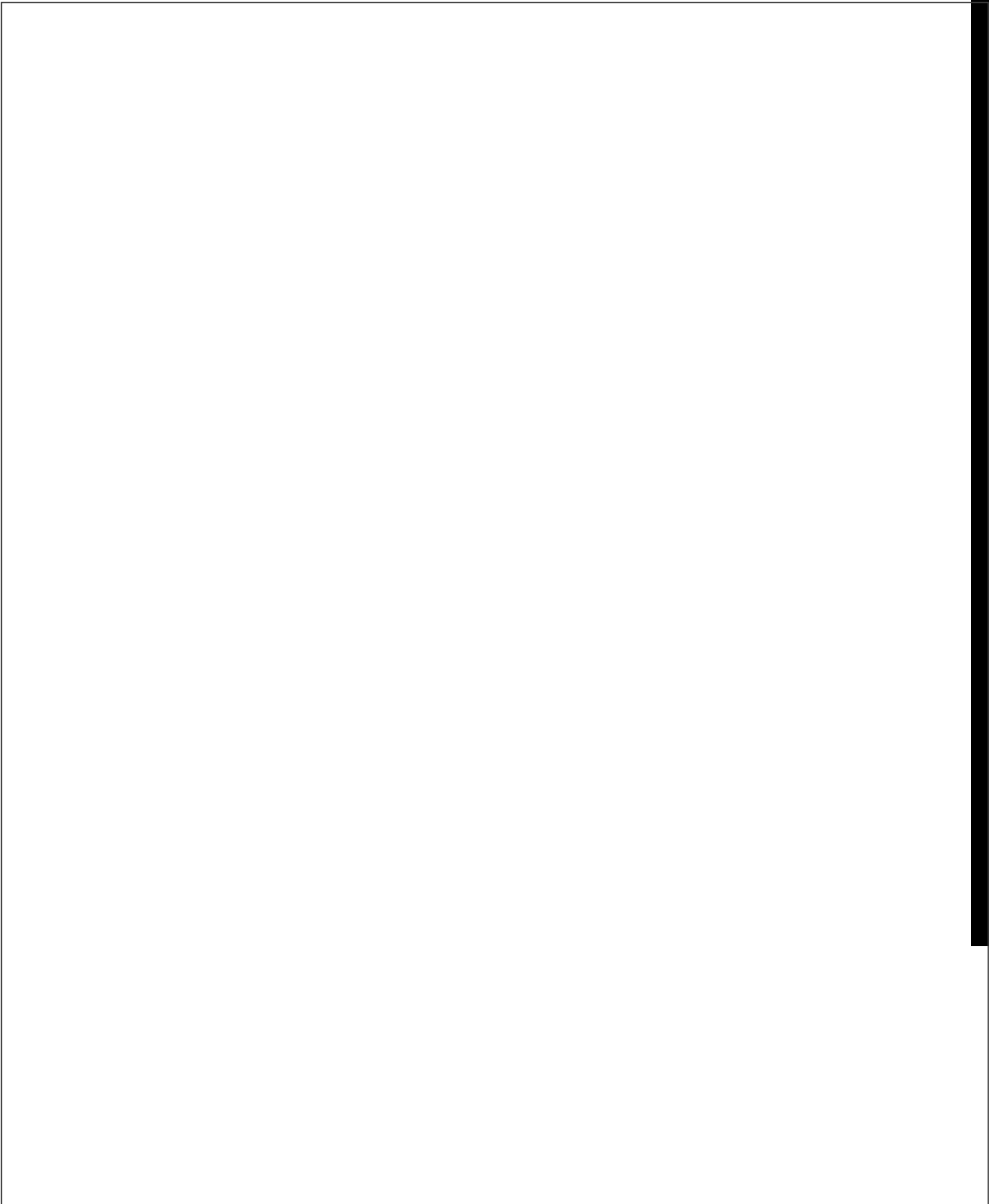
Benefits of Montessori Education

Montessori education offers our children opportunities to develop their potential as they step out into the world as engaged, competent, responsible, and respectful citizens with an understanding and appreciation that learning is for life.

- **Each child is valued as a unique individual.** Montessori education recognizes that children learn in different ways, and accommodates all learning styles. Students are also free to learn at their own pace, each advancing through the curriculum as he is ready, guided by the teacher and an individualized learning plan.
- **Beginning at an early age, Montessori students develop order, coordination, concentration, and independence.** Classroom design, materials, and daily routines support the individual's emerging "self-regulation" (ability to educate one's self, and to think about what one is learning), toddlers through adolescents.
- **Students are part of a close, caring community.** The multi-age classroom—typically spanning 3 years—re-creates a family structure. Older students enjoy stature as mentors and role models; younger children feel supported and gain confidence about the challenges ahead. Teachers model respect, loving kindness, and a belief in peaceful conflict resolution.
- **Montessori students enjoy freedom within limits.** Working within parameters set by their teachers, students are active participants in deciding what their focus of learning will be. Montessorians understand that internal satisfaction drives the child's curiosity and interest and results in joyous learning that is sustainable over a lifetime.

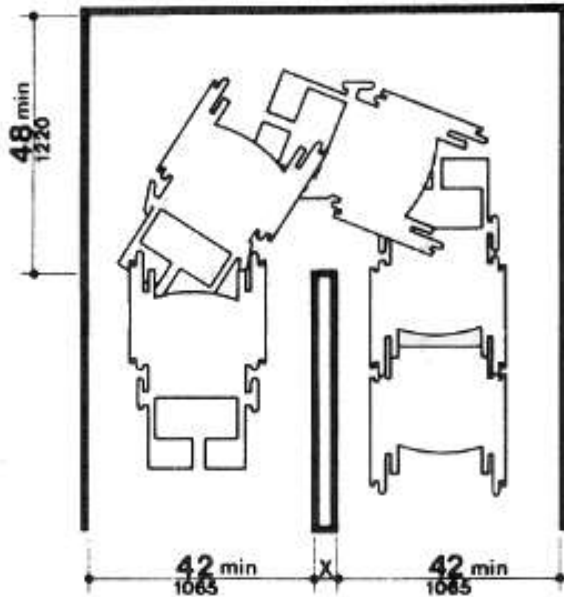
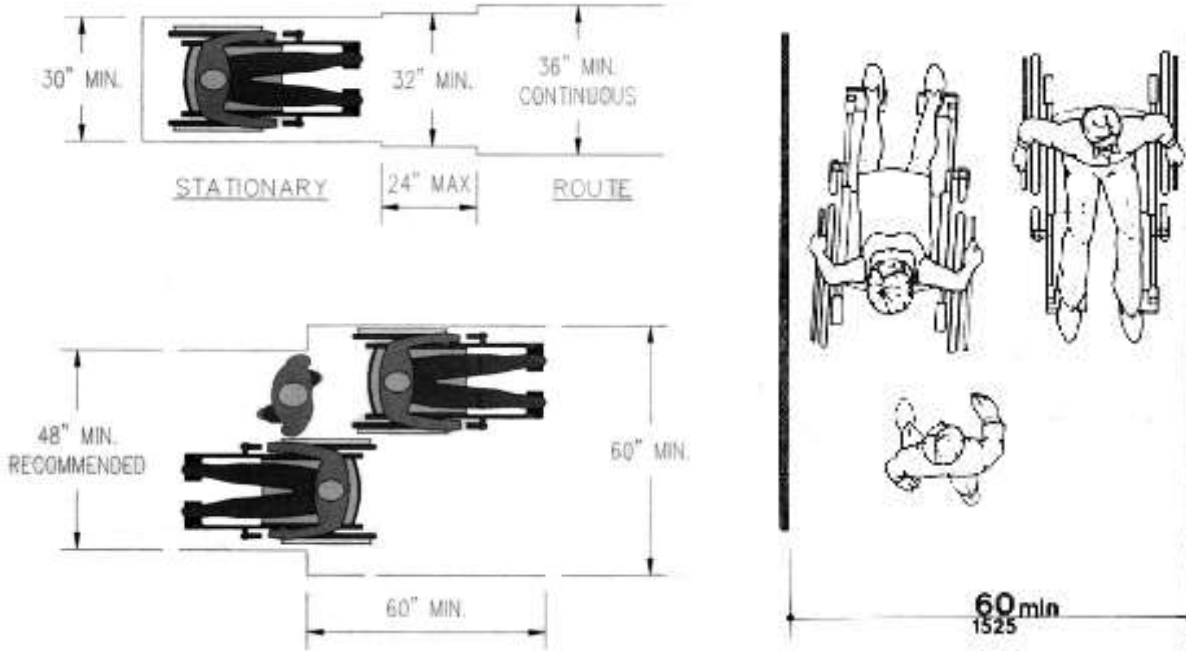
- **Students are supported in becoming active seekers of knowledge.** Teachers provide environments where students have the freedom and the tools to pursue answers to their own questions.
- **Self-correction and self-assessment are an integral part of the Montessori classroom approach.** As they mature, students learn to look critically at their work, and become adept at recognizing, correcting, and learning from their errors.

Given the freedom and support to question, to probe deeply, and to make connections, Montessori students become confident, enthusiastic, self-directed learners. They are able to think critically, work collaboratively, and act boldly—a skill set for the 21st century.

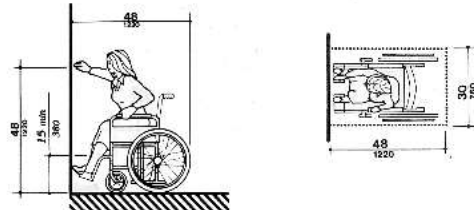


Americans with Disabilities Act Guidelines

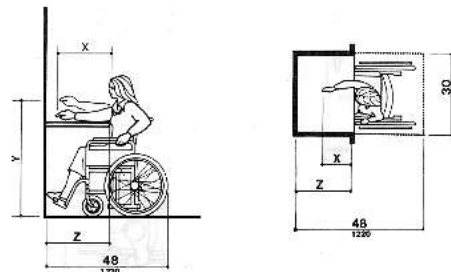
Physical handicapped



NOTE: Dimensions shown apply when $x < 48$ in (1220 mm).

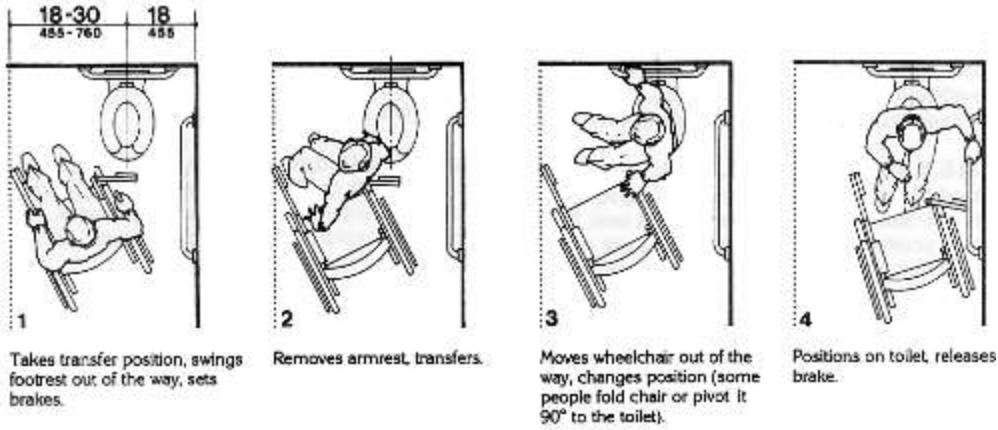


(a) High Forward Reach Limit

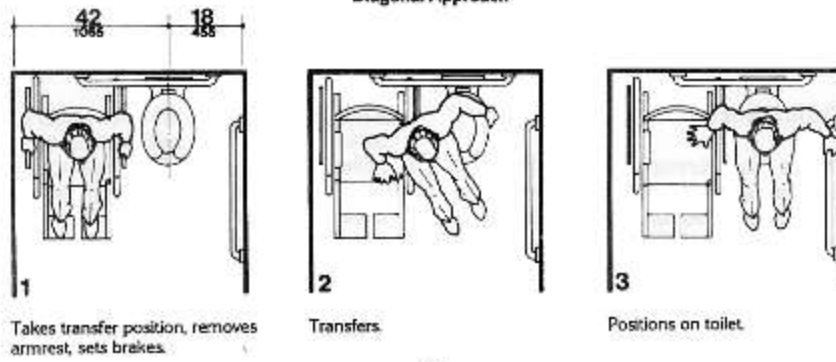


(b) Maximum Forward Reach over an Obstruction

NOTE: x shall be ≤ 25 in (635 mm); z shall be $\geq x$. When $x < 20$ in (510 mm), then y shall be 48 in (1220 mm) maximum. When x is 20 to 25 in (510 to 635 mm), then y shall be 44 in (1120 mm) maximum.



(a) Diagonal Approach



(b) Side Approach

Visually impaired

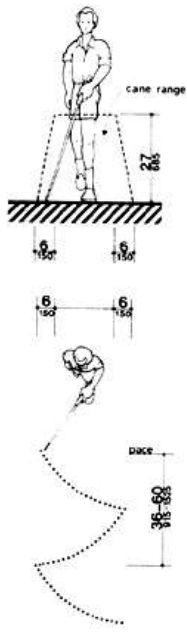
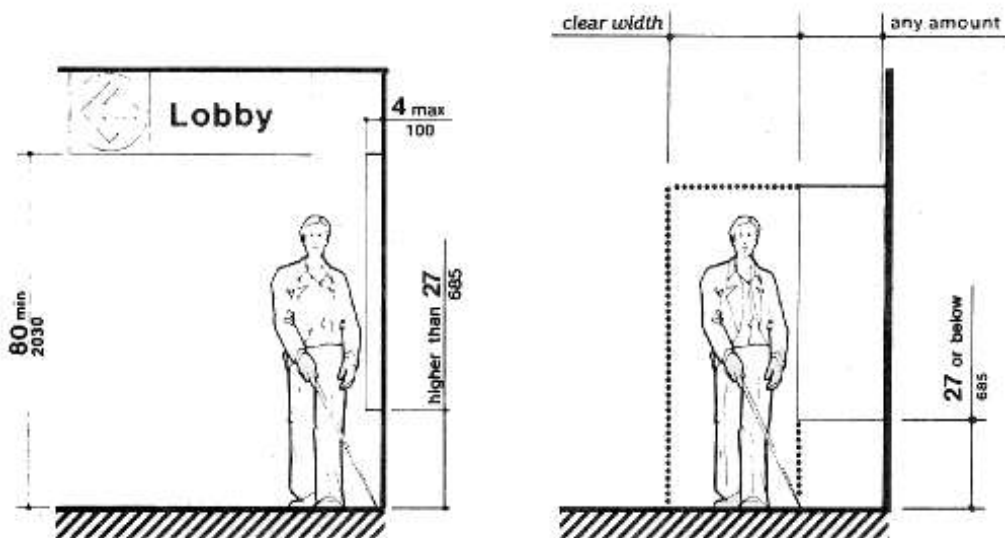
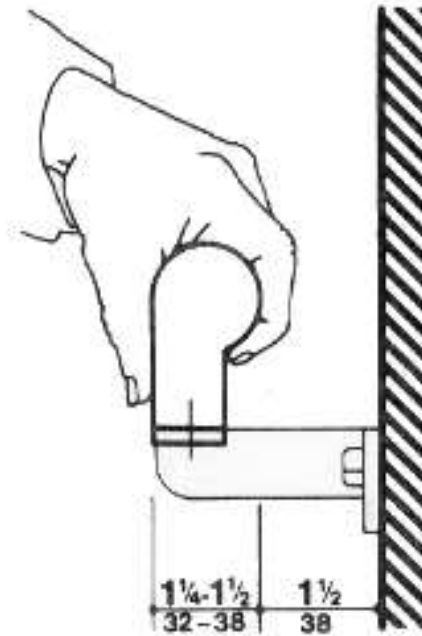
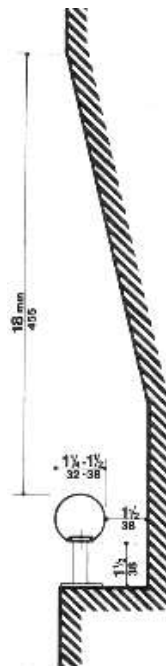
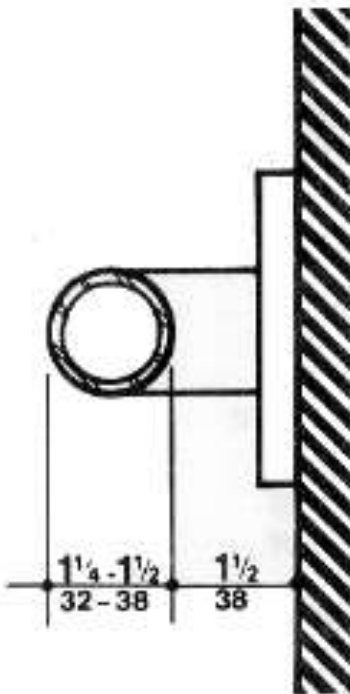
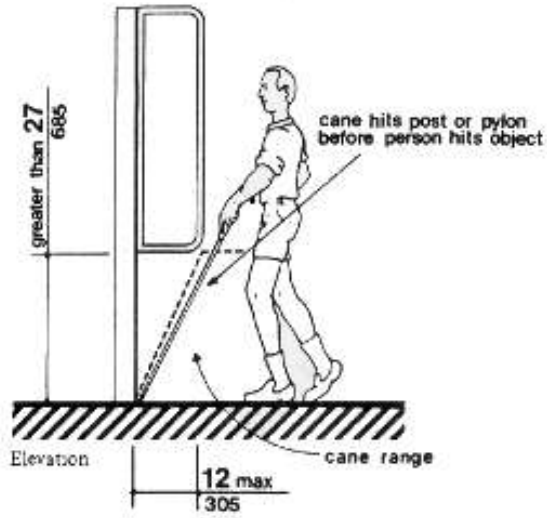
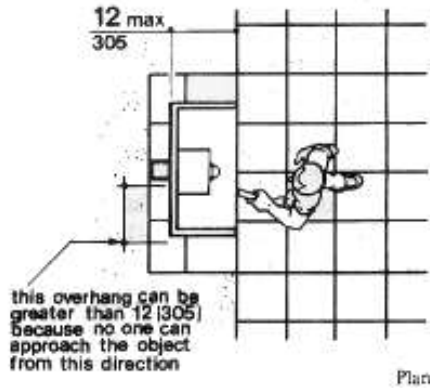
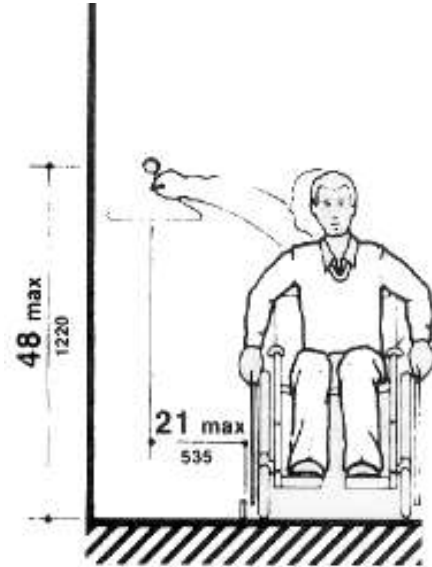
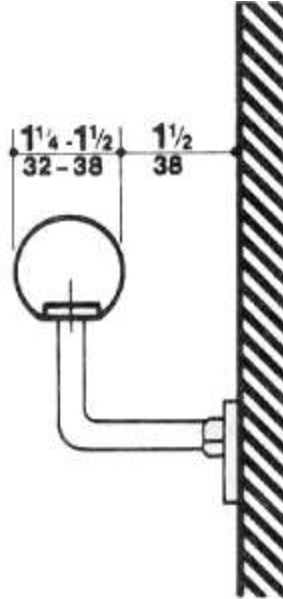
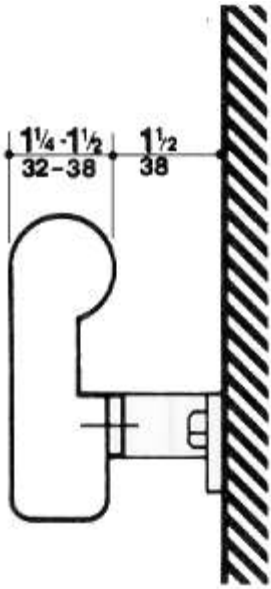
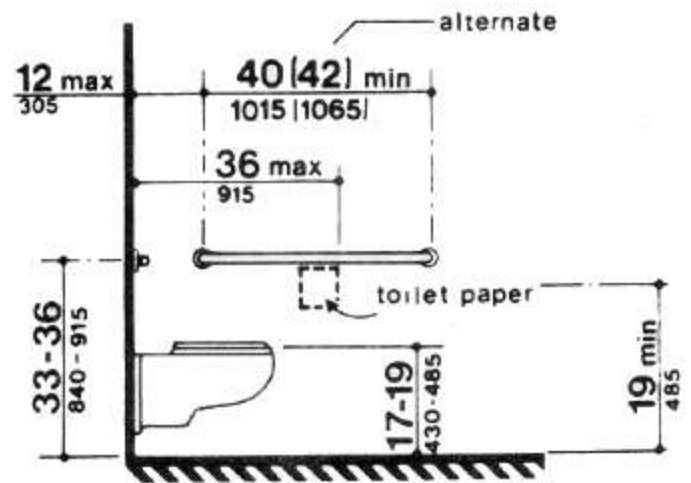
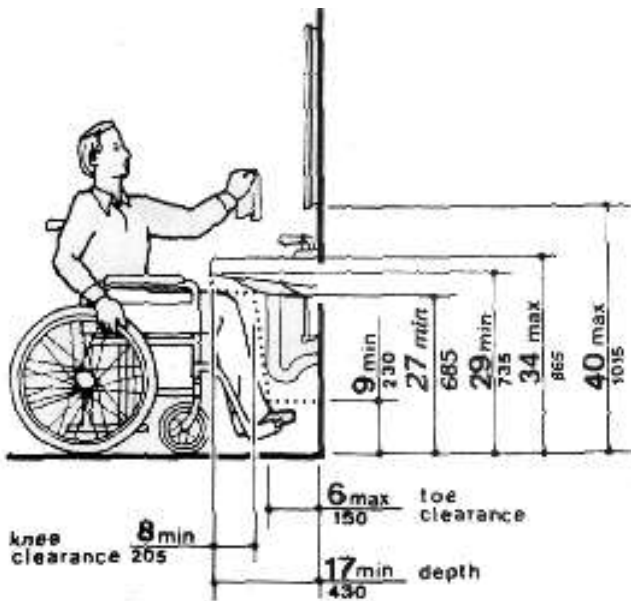
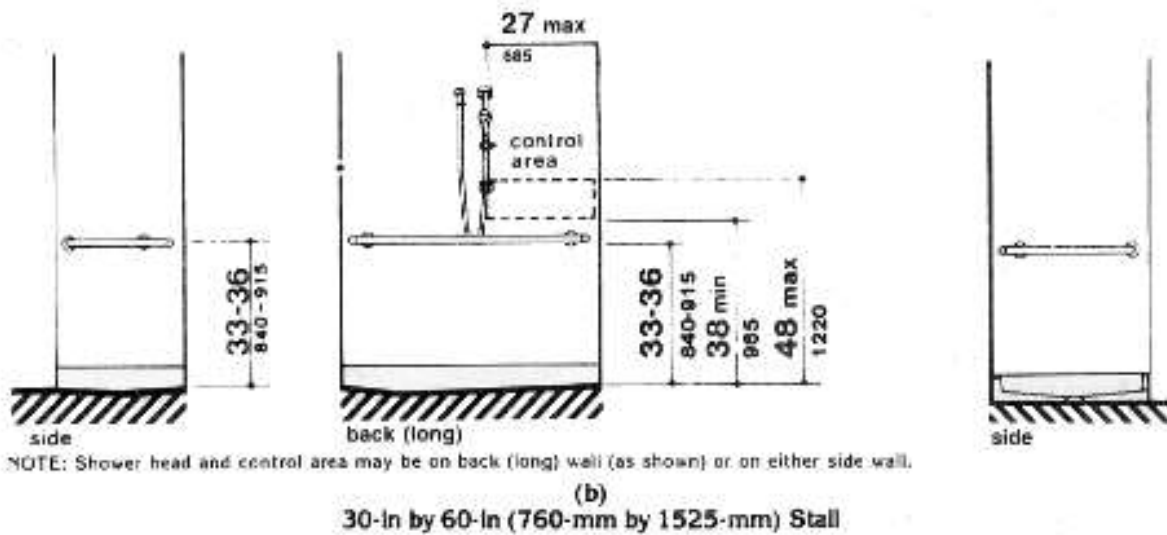
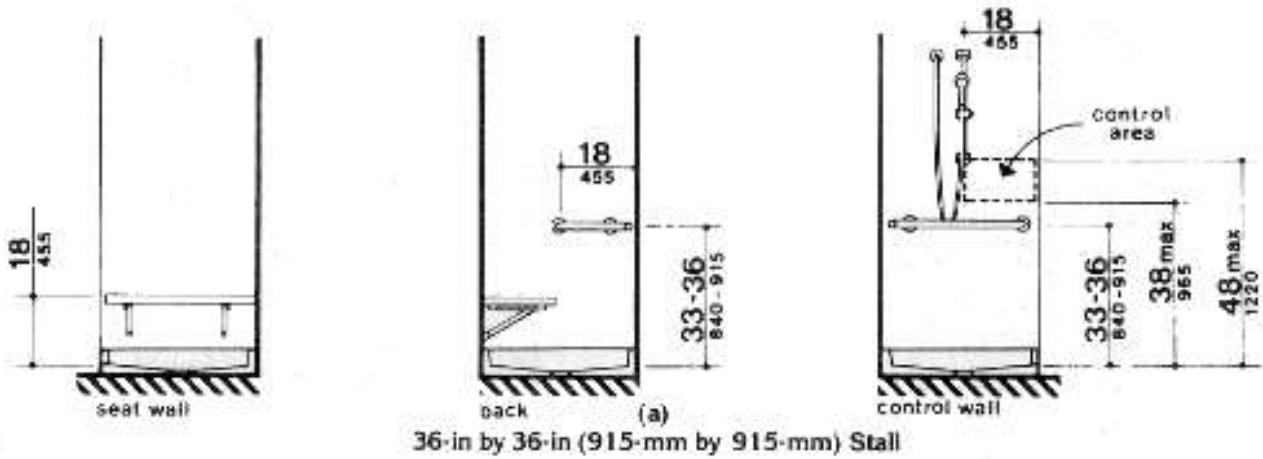


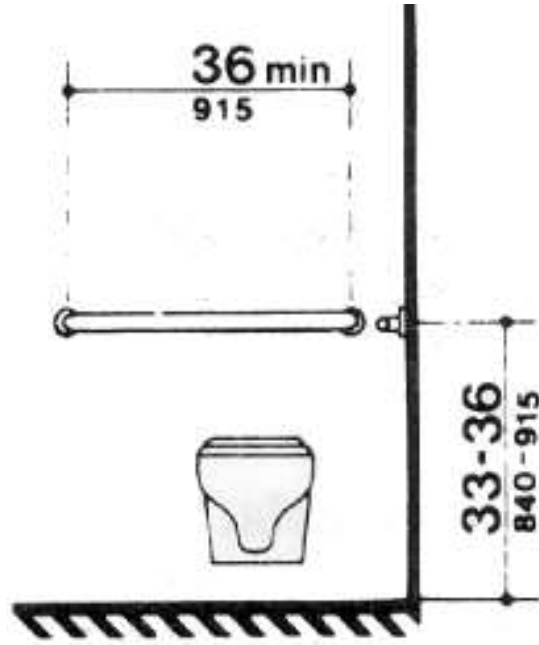
Fig. A4 Cane Technique











Persons with disabilities Act, 1995

- ▶ The 'Social Model' of disability, which perceives disability not as a mere medical issue but one of social exclusion and marginalization, has heralded a 'Human Rights' perspective into our understanding of disability.
- ▶ Access to universal and appropriate education is a key indicator of the manner in which society views its disabled members. India is a signatory to the Salamanca Statement and Framework for Action on Special Needs Education (1994) that emphasizes access to quality education for all.
- ▶ The Statement endorses the need for fundamental policy shifts required to promote the approach to inclusive education, namely, enabling schools to serve all children, particularly those with special education needs, by implementing appropriate strategies and changes.
- ▶ In keeping with the above, the Persons with Disabilities) Equal Opportunities and Full Participation) Act, 1995 (PWD Act) aims among other things, to provide access to free education in an appropriate environment to all learners with disabilities upto the age of 18.
- ▶ The PWD Act has been hailed as a landmark legislation by authors like Baquer and Sharma (1997).
- ▶ They opine that in a country like India where the disabled population is so large and societal attitudes towards disability so negative, only legislation can ensure long-term change by increasing access to a barrier free environment, education and employment.
- ▶ However noble and enlightened the provisions of the Act, the issue of implementation is critical.

Sharma and Deppeler (2005) maintain that if fully implemented, the PWD Act has the potential to change the educational status of more than 30 million disabled children who currently have no access to any kind of education. They identify the following challenges at the macro and micro levels that need to be addressed if the goal is to be achieved:

- ▶ **The challenge of poverty associated with disability:** The mutually reinforcing links between poverty and disability result in a condition of “simultaneous deprivation” which creates barriers in the participation of persons with disability in the normal activities and routines of the community including schooling.
- ▶ **The challenge of modifying deeply held attitudes:** The perception that disabilities (particularly the more profound and severe ones) are contagious, the Hindu belief in ‘Karma’ and the negative and exclusionary social construct of disability all mitigate against the inclusion and integration of disabled children in the educational system.
- ▶ **The challenge of providing adequate levels of training to Key stakeholders:** It is observed that the majority of school personnel in India are not trained to design or implement educational programs for disabled children in regular schools. Where training in special education is imparted practical training in integrated settings is missing. ‘The number of trained special educators is also extremely small considering the large number of children that need their services.

Principles

NEEDS

Follow Right to Education (RTE) norms for school infrastructure provision.

Create integrated schools

Locate integrated schools in informal settlements in consultation with the community. Schools within each 'neighbourhood' Provide schools with medium of instruction suitable to the demography of the neighborhood. The public school system must improve to sufficiently provide for basic aspirations and rights of our young citizens.

Accessibility

NEEDS

Educational amenities accessible to all classes of society

Integrated schools in informal settlements

A school within a 5-10 min walk from every house

No need to cross a major highway large junction or a railway track to get to the school.

Affordability

EXISTING

Private schools provide adequate facilities but with higher fees?

Municipal schools fail to provide such facilities but are affordable.

No cleanliness and lack of daily necessities

NEEDS

The number of secondary schools should be increased

More municipal schools

Integrated schools from the preprimary till 12th standard.

Scholarships should be encouraged so that more students complete high school.

Hygiene

NEEDS

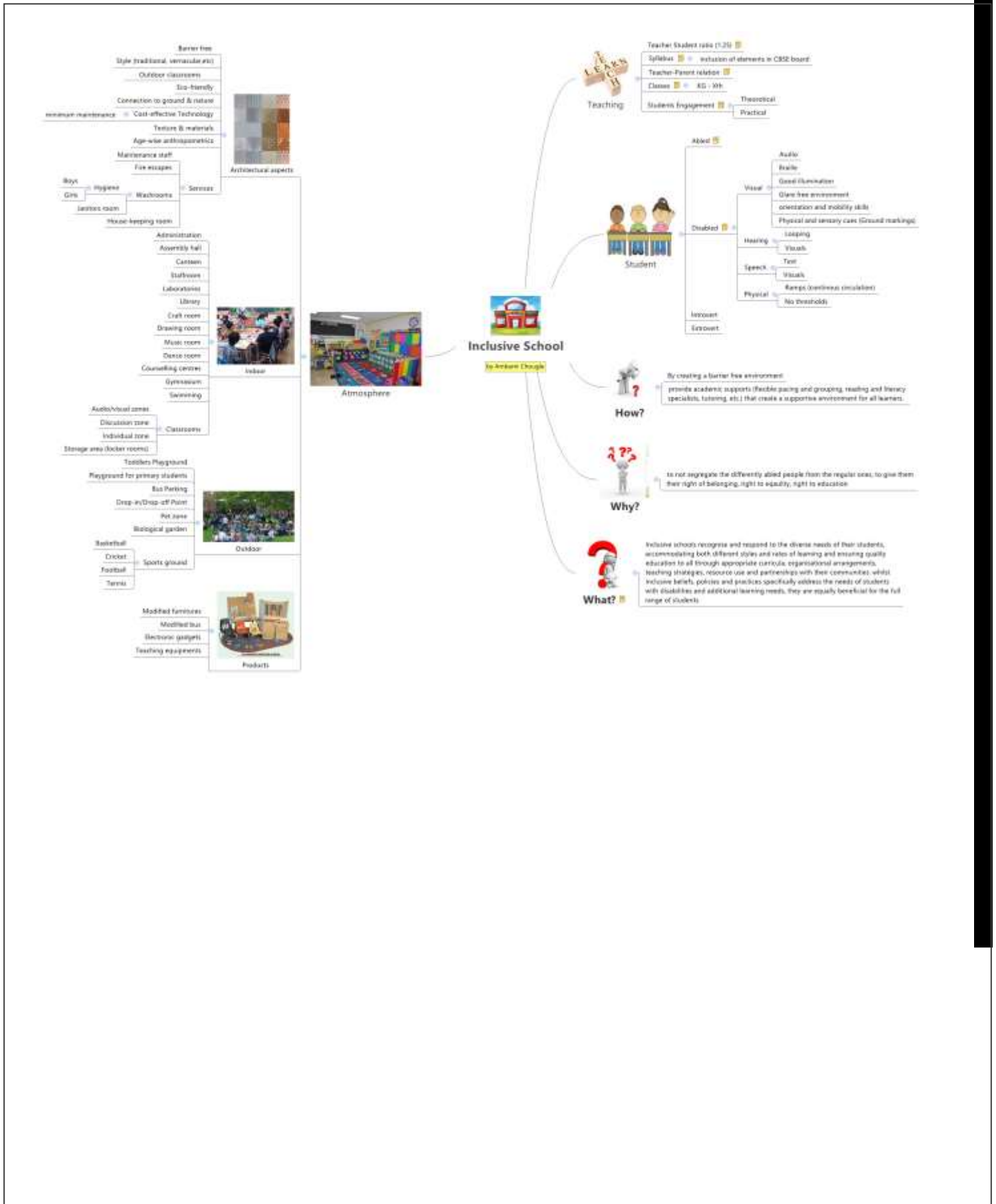
Segregated toilets for boys and girls
Dry and clean toilets for both students and teachers
Safe drinking water
A well kept kitchen where mid-day meals are cooked
Health programs undertaken by the government.
Clean and well lit campus
Girl child friendly campus.

Provision of basic amenities

Basic minimum Teacher-Pupil Ratio and teaching spaces
Adequate classrooms and extra curricular space.
Playgrounds and other open spaces.
Library providing magazines, newspapers and books on all subjects.
Storage for study materials
Appropriate fencing/boundary to the campus.
Sufficient emergency exits as per building norms.
Provisions for the physically challenged.

Source:

[PLANNING FOR MUMBAI : THE DEVELOPMENT PLAN FOR GREATER MUMBAI 2014-2034](#)



Spaces	Quantity	No. of Occupants	Area (m2)	Total area
Classrooms (pre-school, primary, secondary)	72	25-30 each	125	9000
Staffrooms+ staff reading room	3	30-40 in primary & secondary, 20-25 in pre-school	85-90 + 30-40	220
Administration				
Principal's office	1	1	20-25	25
Vice principal's office	1	1	20-25	25
Conference room	2	30-40 at a time	80-100	200
Office	1	8	65-70	70
Reception	1	1	15-20	20
Laboratories				
Computer labs	2	12-15 at a time	70-75	150
Science lab	3	12-15 at a time	70-75	225
Language lab	2	12-15 at a time	70-75	150
Medical unit				
Therapy rooms				
Speech therapy room	1	2-3	40-50	50
Occupational therapy room	1	6-7	30-40	40
Physiotherapy room	1	3-4	25-30	30
Prosthetic & orthotic unit	1	4-5	80-85	85
Testing Centre	1	2	20	20
Workshops				
Tailoring & cutting	1	5-8	50-55	55
Arts & craft	1	5-8	50-55	55
Jewelry making	1	5-8	50-55	55
Textile and weaving	1	5-8	50-55	55
Library	1	300	200	200
Canteen/mess	1	400-450	500	500
Common room	4	50-60 at a time	70-80	320
Multipurpose hall (music, dance, drama)	1-2	500-600	750-800	800
Physical training room (yoga, karate)	1	80-100	150	150
Amphitheatre	1	450-500	As per requirement	

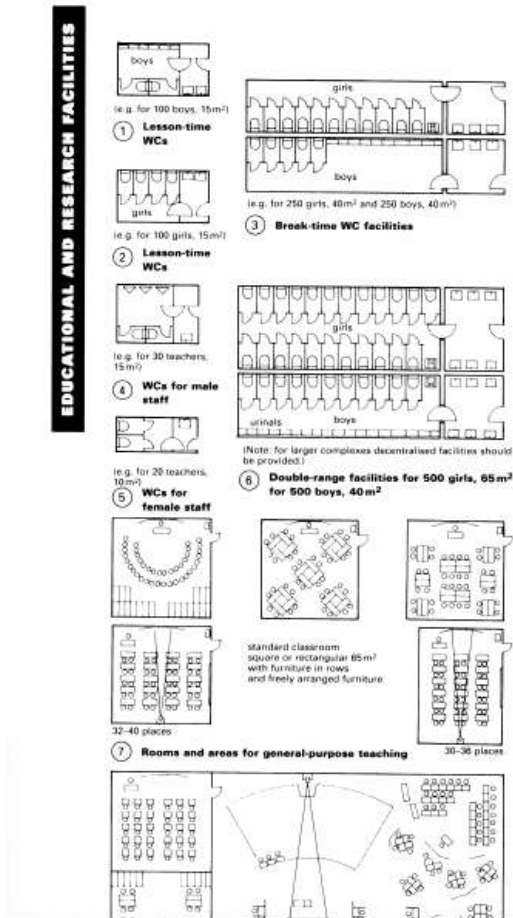
Sports ground	1-2	As per requirement	As per requirement	
Pet garden	1	Floating population	As per requirement	
Toilets boys/girls	As required	All students 2800/1400 approx	1.5*1.7 each cubicle	700

Notes:

Turning radius of a wheel chair: 1.6m

Slope of the ramp: 1:12

Space requirement per child in a class: 4.5 m² including ancillary space



SCHOOLS

Cloakroom facilities can be decentralised by allocating space outside the classrooms but directly linked to them. The number of toilets, urinals and wash-basins required, based on total number of pupils and separated according to sex, should be as set out in the local school building guidelines (e.g. → ⑬). Sanitary installations with direct daylight and ventilation are preferable, and there must be separate entrances for boys and girls. Examples of different toilet facilities for schools are shown in ① – ⑥.

Horizontal and vertical circulation usually doubles as an emergency escape route. Escape routes must have a clear width of min. 1m/150 people, but min. width of corridors in classroom areas is 2.00m or 1.25m for less than 180 people. Stairs in classroom areas must be 1.25m, other escape routes 1.00m. Max. length of escape routes: 25m measured in a straight line from the stairwell door to the furthest workplace, or 30m in an indirect line to the centre of the room. Capacity of stairs is dependent on number of users, average occupancy, etc. Width of stairs: 0.80m/100 people (minimum 1.25m, max. 2.50m). Alternatively: 0.10m/15 people. (Only the top floor is calculated at 100% occupancy, remaining floors at 50%.)

General-purpose teaching area includes standard classrooms, supplementary classrooms, extra-large classrooms, rooms for special courses, rooms for teaching languages and social studies, language labs, rooms for teaching material, maps and other ancillary rooms.

Space requirements: classroom for traditional teaching 2.00m²/pupil; for teaching in sets 3.00m²/pupil, for open plan teaching 4.50m²/place including ancillary areas needed for each subject.

Standard room shape: rectangular or square (12×20, 12×16, 12×12, 12×10); with a square room depth of 7.20m it is possible to have windows on one side only. → ⑦

Floor areas are: traditional classroom, 1.80–2.00m²/pupil; open plan 3.00–5.00m²/pupil. The clear height should be 2.70–3.40m.

Language labs should be within or directly related to the general-purpose teaching area, and close to media centre and library. Approximately 30 language lab. places per 1000 pupils will be needed → ③ – ⑫. The size of LT (listen/talk) and LSR (listen/talk/record) labs is approx. 80m²; booths 1×2m, number of places/lab. 24–30, i.e. 48–60m², plus ancillary spaces (e.g. studio, recording room, archive for teachers' and pupils' tapes). Artificially-lit internal language labs with an environmental control

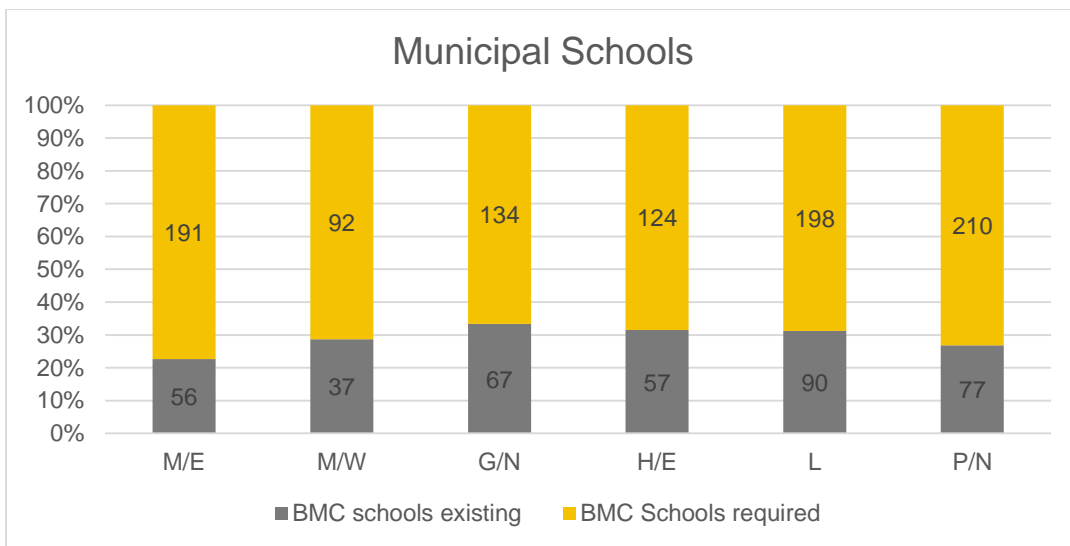
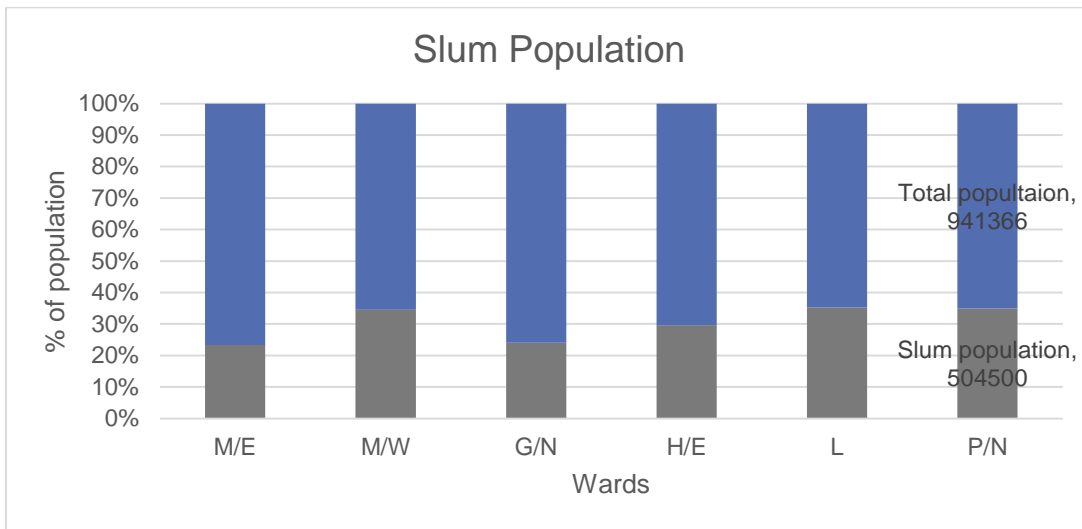
Laboratories : 4.5- 5m²per student

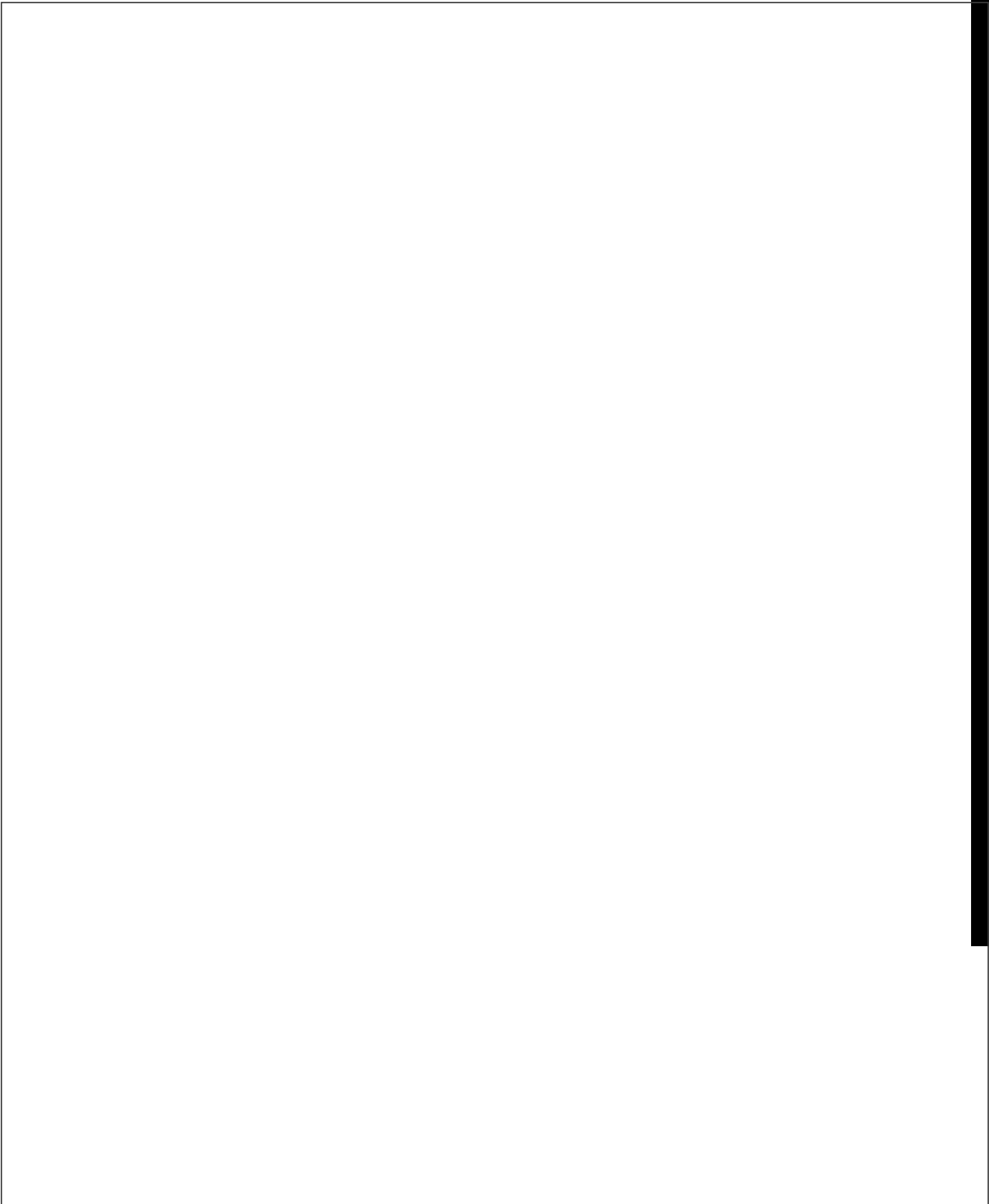
Library: 0.35-.55m² / pupil + 5m² workplace (issue & return) + Bookshelves space 20-40m² + Librarian and other media activities+ book aisle 4m²

W.C. : 1 for every 5 student

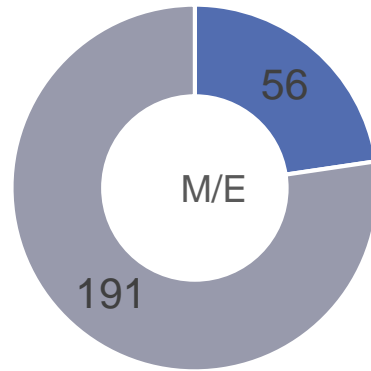
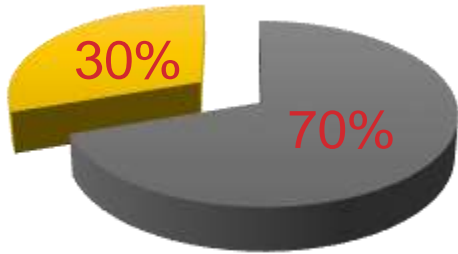
M/E	M/W	G/N	H/E	L	P/N
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AREAS	Chembur east	Chembur west	Dadar	Santacruz	Kurla	Malad
POPULATION	807720	411893	599039	557239	902225	941366
SLUM POPULATION	245300	217200	189600	234800	490400	504500
SLUM POPULATION %	30.37	52.73	31.65	42.14	54.35	53.59
MUNICIPAL SCHOOLS EXISTING	56	37	67	57	90	77
MUNICIPAL SCHOOLS REQUIRED	191	92	134	124	198	210
STUDENT-TEACHER RATIO	50	46	37	46	40	43

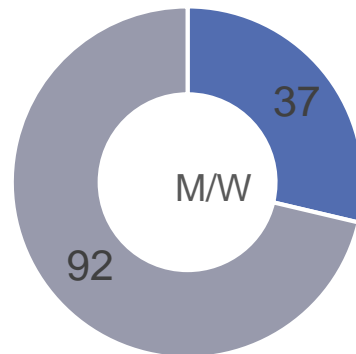
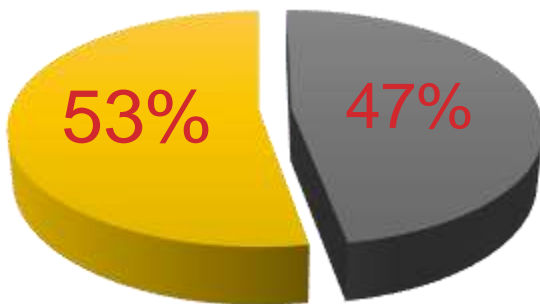




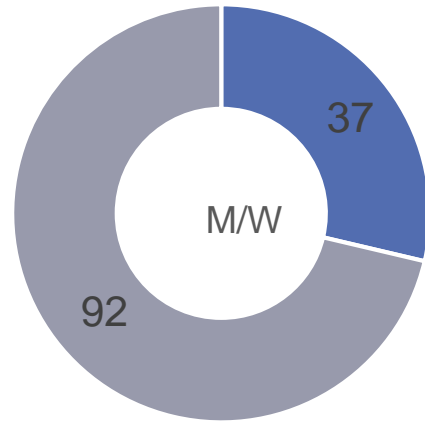
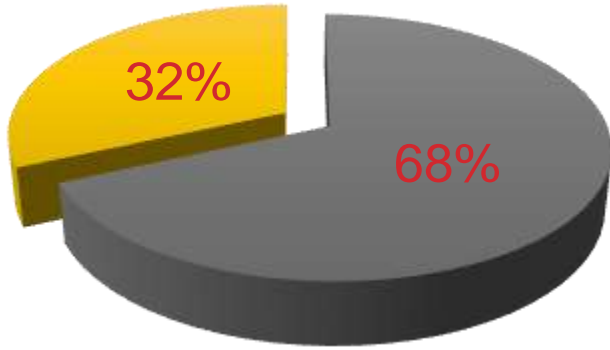
M/E ward



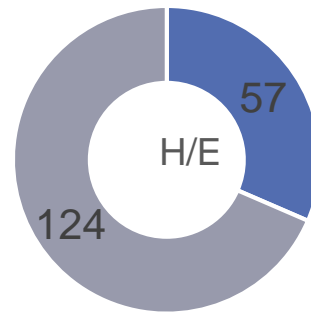
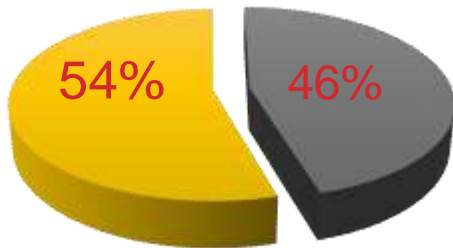
M/W



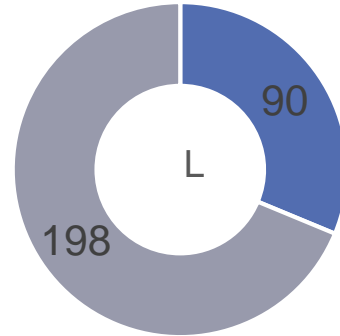
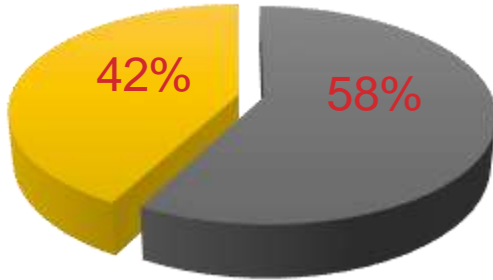
G/N ward



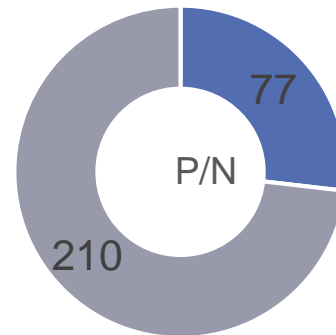
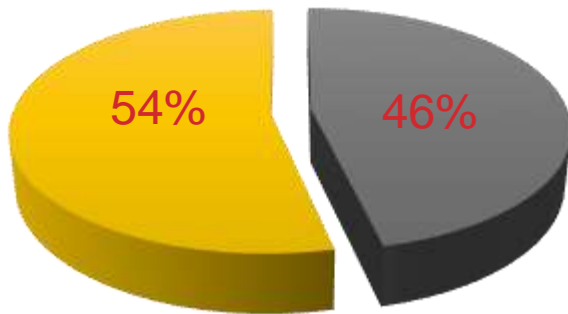
L Ward



H/E Ward



P/N Ward



Mumbai is a 600sq km area. A high population of people from the cities around migrate to Mumbai.

More than 50% of these migrate due to employment.

Mumbai is a commercial hub. There is a growth of capitalism here. There high amount of business and employment opportunities.

There is an increment in the population due to migrants.

15% of the total population in Mumbai are of migrants.

- **Visual Impairment/ Disability**

- Clear corridor spaces.
- Use of hard pavement
- use tactile marking
- Lesser use of reflective surface
- Appropriate lighting
- Use of contrast colors
- Use orientation and mobility instructions
- Use braille, talking books, tape recorders

- **Hearing Impairment/disability**

- Use of assistive devices such as hearing aid, loop systems.
- Use of visual vocabulary.
- Well lit rooms for the student to see your face for lip reading
- Reduce background noise

- **Speech Impairment /disability**

- Use visual mediums for teaching
- The space should be well-lit
- Use multi-sensory approach- kinesthetic, auditory, tactile.

- **Physical Disability**

- Adequate space and height of desk if the student is on wheel chair.
- Provision of continuous circulation in and around school and classrooms.
- Use of hard pavement everywhere.
-

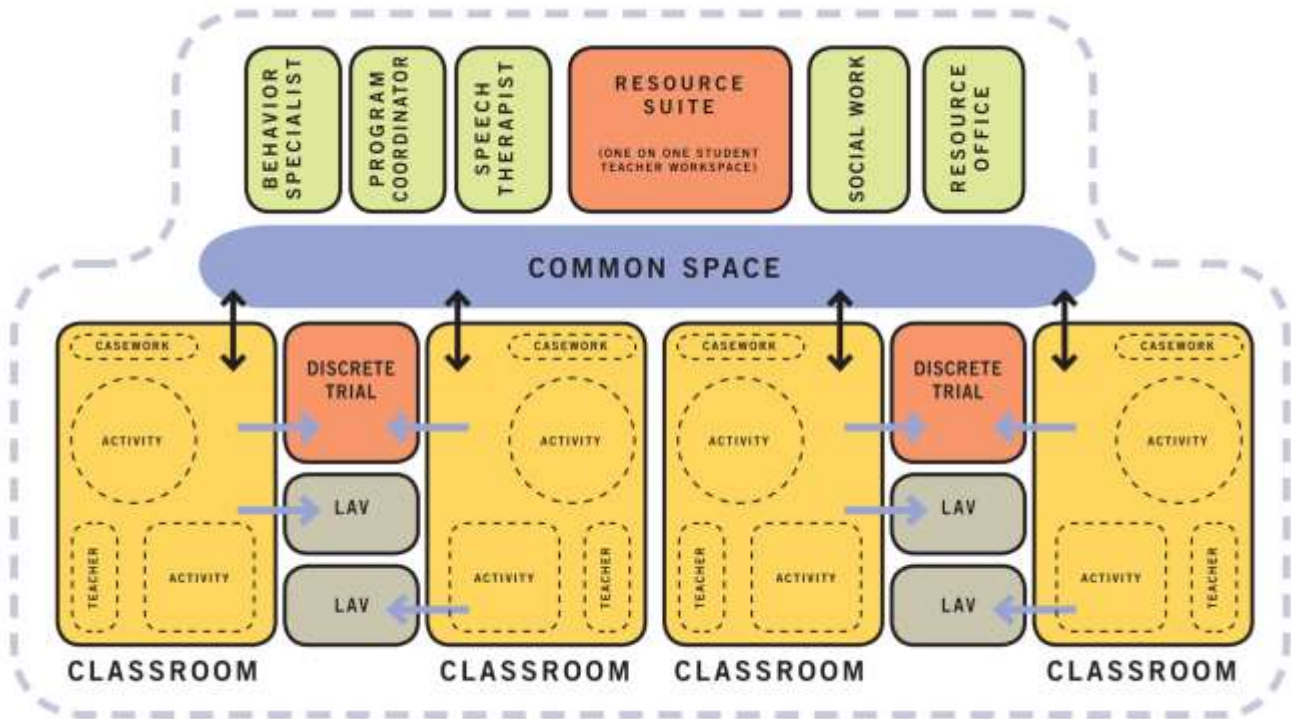
FORBUSH SCHOOL, BALTIMORE

While the original brief for the project was to design and construct a new 30,000 square foot school to replace an over-crowded and out-dated school on the campus of the Sheppard Pratt Health System in Baltimore. The existing private school served a mix of over 200 children about equally distributed between those with behavioral health disorders and autism spectrum disorders (ASD). The children came from many different school districts and were deemed unable to learn successfully in integrated classrooms in their own districts. A realization that children with ASD needed a different learning environment from the children with behavioral health disorders, combined with budget cuts and time constraints, necessitated an alternative to the original plan.

The surprising solution was to lease an existing one-story 1960's era warehouse building and its surrounding site in Hunt Valley, Maryland and reinvent it as a welcoming school. The single-story structure, size, low cost, and easy access to dominant travel routes in this part of Baltimore County made it a viable option. Not only was the interior renovation a challenge, but the design team at Cho Benn Holback + Associates, Inc. had to renovate the surrounding site to provide needed vehicular access, parking, and appropriate outdoor playground space for the school.

The new school contains classrooms, staff offices, therapy spaces, and a specially designed playground to meet the needs of children with ASD. Ramps are incorporated into the main and playground entries. Classrooms have accessible bathrooms and the rubber-padded linoleum floor system installed in the activity rooms reduces impact injury and noise.



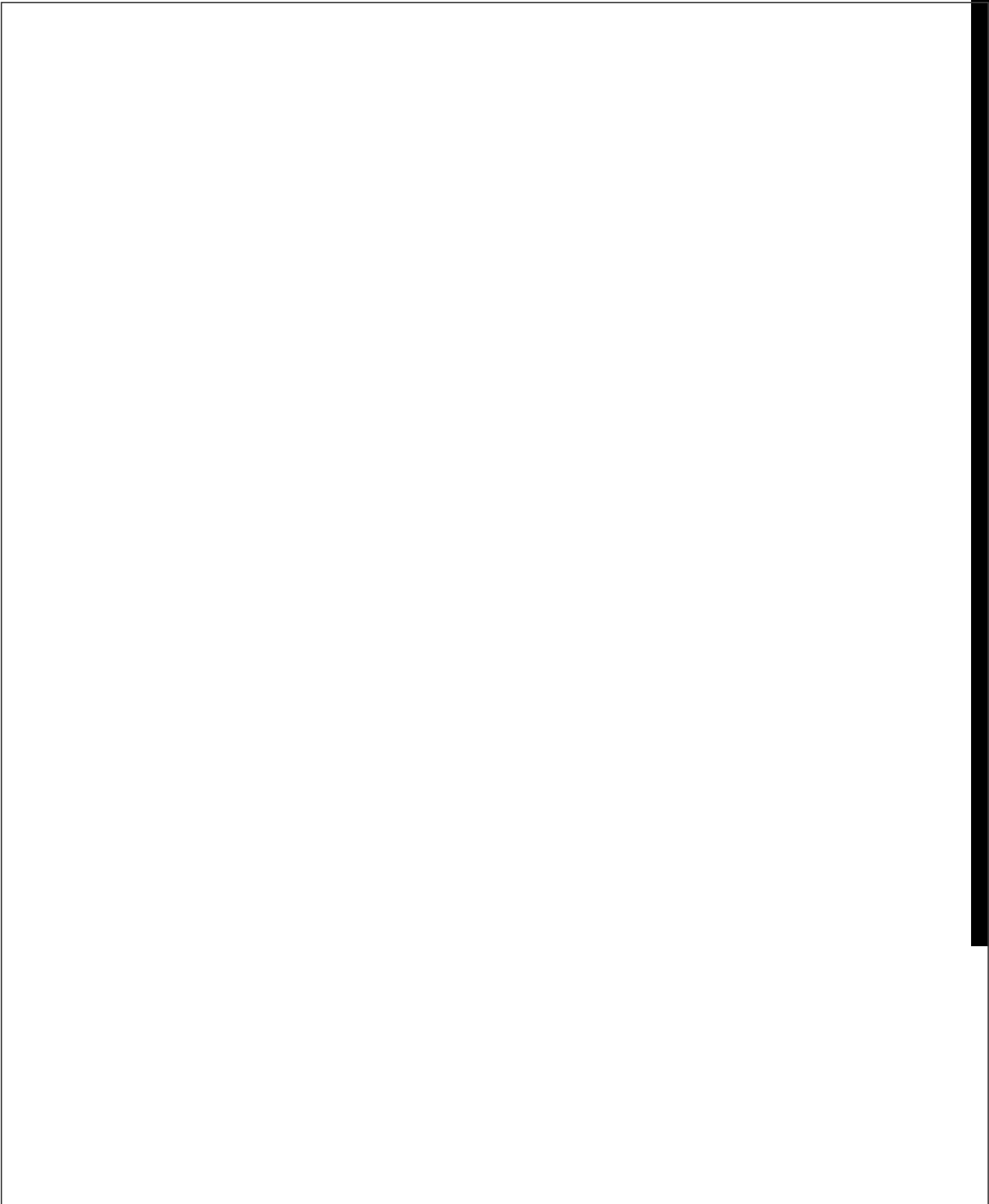




Universal Design Features

- Careful attention was paid to the proportions of spaces for both public common areas and classrooms. Ceiling heights and corridor widths were increased beyond code standards to accommodate the children's needs.
- Bringing in natural light was an important feature of the design. New window openings are introduced around the perimeter of the building to allow each classroom to have daylight.
- A playful pattern of circular skylights helps bring natural light to the common central spaces.
- Because children with ASD tend to be sensitive to the flicker associated with fluorescent lighting, several types of indirect/direct energy efficient fixtures were tested to select the most comfortable/flicker-free ones.
- The use of highly absorptive ceiling panels, quiet mechanical/air distribution systems, and wall materials that minimize transmitted sounds between adjacent spaces results in an acoustically comfortable environment. Amplified noise, echoes and reverberated noise are minimal despite the spaciousness of the place.
- Selecting sustainable materials and a calming uplifting palette of colors was critical for the well-being of the students and staff. With a tight budget of \$130 sf, the project targeted a balance of green materials with low off-gassing properties, durable/abuse-resistance, and cost effectiveness.

- A palette of 5 pastel colors was used in selecting colors for walls, floors and translucent accent panels. Color and texture accentuate special zones, identify key areas, create a flow between spaces, and soften the rigidity of the box.



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