DEVELOPMENT OF OUTDOOR AREAS OF SELECTED SCHOOL OF HALOL CITY UNDER THE CSR PROJECT OF SUN PHARMACEUTICAL INDUSTRIES LIMITED

APRIL 2020 **FATEMA DAHODWALA**

DEVELOPMENT OF OUTDOOR AREAS OF SELECTED SCHOOL OF HALOL CITY UNDER THE CSR PROJECT OF SUN PHARMACEUTICAL INDUSTRIES LIMITED

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INTRODUCTION

CHAPTER - I

INTRODUCTION

Children need outdoor physical environments that will support and promote their play process (Metin 2003).

Playgrounds have an important role in the modern child's world. The ideal outdoor playground should be a replica of natural outdoor environment for today's urban child. They should encourage physical, social, emotional, mental and creative play as well (Sheridan, 1999).

Playgrounds also need to allow children to experiment and control the environment that will provide an active learning atmosphere for facilitating their construction of knowledge. Though the use of the playground equipment the child is assisted to develop spatial and visual perception. Play is the child's way of learning. Through play, children receive information from the surrounding environment in order to use it in their physical and mental development. By means of play, children learn and develop as individuals and as members of the community. Play is an essential part of a child's life. It improves children's creativity, imagination, social connection and also behaviour [3].

Childhood play provides the opportunity to practice the social skills that are critical to becoming a successful person within school and society. It is within play that children practice a variety of roles, learn to read intentions of others, learn to initiate and follow others' leads and begin to experience acceptance from others (Nelson and Smith, 1995).

Several researches in the area of play in children suggests that the way children interact with each other can predict their social competencies, social skills development and abilities to establish and maintain social relationships (Ingam, 2005).

The child's play spaces and environment can contribute to child's development and behaviour and also support learning and exploration towards the environment. The design and layout of the exterior environment which also includes the building finishes, outdoor spaces, landscaping and play areas has a profound impact on a child's behaviour [1].

For a child, being outdoors is the only chance for exploring the world that surrounds the child. It is in the outdoors where children can freely experience their motor skills like running, jumping, climbing etc. It is also the most appropriate area for performing manipulative skills such as swinging, lifting and balancing. In most of the cases outdoors playgrounds have something more than physical benefits. As children play

outdoors, they are more likely to invent games and learn about the world in their own way (Metin 2003).

The growth of the creativity of children is established through the quality and presence of activities provided in school. Every school must raise levels of curiosity in young minds to turn out to be better human beings. A school is an educational institution designed to provide learning space and environment for the students under the direction of teachers. Children spend majority of their time in school therefore it makes schools as an influential place to promote learning and active play. Active play is described as a wide range of unstructured physical activity such as crawling, jumping, running, digging, lifting and carrying, planting, pushing and chasing which increases children's heart rate and makes them healthy and tough and also facilitates children's learning and development (Pellegrini 2009). Playing outdoors in school improves classroom behaviour which also helps develop social and physical skills. School playgrounds provide children the chances to build healthy bodies, develop decision-making skill, motor skills (Hyndman, Benson, Telford 2014) and include construction, imagination and creativity among them.

It is found that the area with fields and green spaces increases the odds of active play on school playgrounds (Willenberg et al. 2009). However, studies also found positive correlation in quantity of playground facilities and sporting facilities on school playground, which suggest that school playground designs should focus on providing substantial equipment to encourage active play (Jones et al.2010).

Children also read the environment differently than adults, not as a background to relax but as something to interact with (Stoecklin, 1999). The design spaces occupied by children must support active experimentation and risk taking for the development of the children without making the area unsafe for them. The exterior environment and equipment's in the outdoor areas must be arranged in such a way that minimizes hazards for the children. The spaces designed in the outdoor areas of the school needs to be suitable for the given activities (e.g. a pitch for cricket rather than plain surface) (Hyndman, Benson, Telford 2016). It is also important for the environment to be attractive to the eye, as they spend most of the time in outdoor play.

When the playground space is well organized with uncluttered pathways which leads to various areas on their own. They can also move without restrictions from one play area to another play area and giving the supervisor an opportunity to attend children according to the needs. When the supervisor spends more amount of time directing a group of children, they have less amount of time to assist individual children who have fewer chances to participate in free play.

The physical time spent by the children in playground is valuable. The children are naturally creative and learn more while experimenting with various materials such as paint, play equipment and plants around them. Whatsoever is planned in the playground must be flexible and easy going depending on the needs of the children and opportunities unseen during initial planning. The playground should be designed

according to the different age groups. It is a place of enjoying activities in natural setting. Playground designs should also incorporate equipment's for playing such as see-saw, swing set, merry-go-round, sand pit/sand box, balance rings and many others which helps in development of children and also encourages active play (Jones et al. 2010). Other than play equipment playgrounds should also provide facilities for free play such as jumping, running, ropes course and group games.

The outdoor area of the school encourages the children to develop mentally, physically and emotionally as well. The near environment should be particular to let the child grow. If play is a child's work, then the playground becomes his or her work setting (Ingram 2005).

Initial years of childhood and their development

Describing the initial years of childhood and their development some researches in the area of play in children suggests that children's interactions with one another can predict their social competence, social development skills and their ability to establish and maintain social relationships (Ingram, 2005).

Outdoor playing is the key to mental, physical and social wellbeing of the children. Playing outdoor games has an impact on almost every aspect of the child's development [2]. Due to increase in urbanization housing are built without playgrounds which again reduces the scope for having an outdoor play. Consequently, kids are not getting essential space and time to play during school days even in weekends and holidays.

Due to a huge decline in play for children there are trouble in behavioural challenges and tests, childhood obesity, less social, cognitive and creative development. Therefore, school playground and outdoor play are of great importance to children for their fun and relaxation time and also for their good health. School playgrounds play important role in their daily life for fulfilling their interest, development and learning needs. For this reason, "Child psychologists and educators have considered the school playground as an important venue for children's social and cognitive development." (Pellegrini, Davis, and Jones, 1995, p.846)

School playgrounds put a positive impact on children's learning and development. It also has huge impact on school readiness, attendance rate of primary and middle school, reduction in dropout. Its impact on children's mental and physical health affecting their learning resulted in good school results which has been proved through researches (Ingram 2005). Children come to school regularly due to the outdoor play areas of the school and stays longer even after school hours which gives them extra hours to play on school playground. School playgrounds makes the school an interesting place for children to learn and to play (Sharif 2014).

Improvement on child's mental and physical health has occurred due to the play facilities provided in the school premises. The children's come to school early to play

in the ground and attends the classes happily, peacefully and stress free. They rush towards the ground when they get free time which reduces their tiredness of the academic activities done in the classroom. Playgrounds are considered as supporting tool in learning and also for development of the children (Sharif 2014).

While designing the outdoor areas of the school some major components like playground surface, play structure, overall ambience and landscaping should be considered for making the outdoor area a pleasant place to conduct teaching and developmental process. The area needs a good selection of colour, texture, pattern and arrangement of these factor which suit the children and the selection of all these aspects should depend upon the functionality, economy, beauty and individuality which makes the outdoor area convenient and pleasant to work (Shukla 1988).

Significance of CSR under Sun Pharmaceutical Industries Limited

Now a day's industries also are involved in Social responsibilities and also plays a significant role in the development and upliftment of the society. This in turn leads for enhanced standard of living for the entire society or for the economy. It also brings wealth to the society, improves productivity, efficiency and also creates innovative opportunities for the rural area.

One such industry is Sun Pharmaceutical Industries which make good health inexpensive and accessible to the managerial communities and society at large. Health, education, water, livelihood, environment and disaster relief are some of their key priorities in the area of Corporate Social Responsibility (CSR) [4]. This policy, which includes the company's philosophy towards Corporate Social Responsibility (CSR) and also lays down the guidelines and mechanism for undertaking socially useful programs for the welfare and sustainable development of the community at large. Sun Pharmaceutical Industries is committed to ensuring the implementation of the proposed CSR programs in order to bring meaningful and sustainable development of underserved communities. This industry is supporting education and has taken up school playground designing as one of the priorities under CSR activities [4].

The playgrounds in public areas for more effective for training of the children. These playgrounds help the children in better learning of social rules and regulations and in acquire control over their feelings. The playgrounds are also important from two other points of view: such areas provide atmospheres for the children to get in direct contacts with the children of their own age and enable them to interact with the existing instruments at the playgrounds (Zeinab et. al 2010).

A well-developed playground and outdoor areas for the school and the surrounding were the first things that every child need in their childhood which depicts the need to design an outdoor area focusing on the development of the children.

Justification

Children need age appropriate environment that supports and also promotes child directed and child-initiated play. The play environment must promote and positively support child's interaction with space, materials and people. When the outdoor environment supports both functionality and easy to use environment it is easier for adults to focus on facilitating each child's play and learning. The school should promote child's optimal development by providing safe, interesting and appropriate environments that allow children to engage in developmentally appropriate activities. By understanding the multi-faceted issues and complexities of designing children's environment the designer can deliver integrated design solutions that are required for a child's need. Designing a high-quality environment has a great impact on student behaviour, attitude as well as achievement.

In India, interior designers have concentrated on designing commercial buildings and residences, but little concentration has been given on designing the play environment of school. School is a place designed to provide learning spaces and environment for teaching students under their guidance. School playground have recreational equipment such as swings, seesaw, merry-go-round and many more which helps children develop their physical coordination, strength and mental abilities. A well-developed school playground increases the children's ability in learning and also is a motivating factor for children to attend school programmes and activities. As generally observed, the school playground with less ground space may not have well-developed area. Hence a need was felt to asses and design the school playground provided by the Sun Pharmaceutical Industries Limited under the CSR project of Halol city.

Since the investigator belongs the to Family and Community Resource Management Department, it has been observed that nowadays many schools have playground but they are not developed according to the needs and requirements of the children. Review of literature revealed that much needs to be explored on designing school playground which motivated the designer to study this topic. This research is going to be beneficial for the Department of Family and Community Resource Management since interior designing is a course been offered to the students pursuing graduate and post graduate programme. It would also be very useful to the interior designing students, as they can learn to design outdoor areas. This study will serve fruitful to the younger student who want to enter into the architecture, interior designing, landscape designing or civil engineering as their professions, as they will know how to design need based outdoor areas looking into the requirements. Some related researches have been conducted such as "The Physical Infrastructure For The School Of Visually Impaired Children: Assessment And Redesigning" (Deshpande,2014), "Designing Terrace Garden For Commercial Building Vadodara" (Karuna,2013), "Assessing And Redesigning The Interiors Of Selected Anganwadi's From Vadodara City" (Dasgupta,2012), "Developing An Ideal Outdoor Garden Design For The Residence Of Vadodara City" (Doshi,2011), "Community Gardens: Utilization And Satisfaction Of The Residents Of Selected Residential Colonies Of Vadodara City" (Shah,2011),

“Effect Of General Lighting Fixtures On Visual Acquit Of Elementary School Children” (Umrajkar,2010), “Designing Electric Lighting For The Selected Schools Of Baroda City” (Dekhtawala,2006), “Designing an Integrated Interior Environment for the Selected Preschool” (Daga,2006), “Modular Furniture for Children’s Room” (Bhagchandani,2005), “Selection and Use of Colours By Families in their Homes” (Paraj,1986), “Design Development of Interiors of Residential Unit” (Padmakiran,2003), “The Study of Existing Interiors of Children’s Room of Residential Buildings of Vadodara” (Singhal,2001). However, the researches done are specifically not conducted on designing school playground.

The present study was focused on development of outdoor areas of the school provided by the Sun Pharmaceutical Industries Limited under the CSR project of Halol city. Therefore, it is expected that the design of the project will promote and support child’s interaction with space, materials and people. The designed environment will be functionally effective and will stimulate creativity and play within the children of various age groups of the school. The booklet will help school authorities and school principals in creating and developing a functional as well as an aesthetic environment in the outdoor areas of the school for the school children. The design concepts in the project will create a play environment that will encourage each child to function independently and also manage to the situation on their own, which will also improve their learning experiences. The present study will also motivate the professionals to undertake innovative research cum design projects for the development of the outdoor areas of the school.

Statement of the problem

The present study aimed to develop the outdoor areas of the school of Halol City provided under the CSR (Corporate Social Responsibility) project of Sun Pharmaceutical Industries Limited.

Objectives of the study

1. To assess the needs and requirements of the clients viz; authorities of Sun Pharmaceutical Industries Limited (Executive CSR and school principal) for the development of the outdoor areas of the school
2. To propose detailed design of the outdoor areas of the school of Halol City
3. To provide detailed cost estimation of the selected design and implementation of the selected design
4. To develop a booklet for suggesting essential requirements for the outdoor areas of the school.

Delimitation of the study

1. The study was limited to the outdoor areas of the school of Halol City, Gujarat, India.

REVIEW OF LITERATURE

CHAPTER - II

REVIEW OF LITERATURE

Research is concerned with the systematic gathering of information (Bhattacharya, 2000). The review of literature is a condensed version of an exhaustive literature survey (Kamath and Udipi, 2010). The review of literature is most important element of research. The present chapter is prepared by the designer to formulate a research problem avoiding any duplication of work done earlier. A survey of literature was undertaken to investigate the related theoretical content and research conducted in specific areas. The review of literature consists of technical writing and data from previous scientific papers, journals, articles, books, reports and other thesis on the same subject (Kamath and Udipi, 2010). In order to make review clear, the present chapter is classified into two sections:

Section 1- Theoretical Orientation

Section 2- Empirical Studies

2.1. Theoretical Orientation

2.1.1. Importance of outdoor area for children

2.1.2. Types of Play

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2.1.4. Traditional Playground Equipment

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2.2. Empirical Studies

2.2.1. Studies conducted outside India

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Conclusion

2.1. Theoretical Orientation

Theoretical orientation is the section which describes about the theoretical content related to the topic of the study. These are discussed independently in the succeeding description.

2.1.1. Importance of outdoor area for children

Parikh (1999) stated that for a child it is important that he has a sense of belongingness and it is incredible to how responsible, creative and self-expressed our children can be in environment that is built to their size and scale. Playing outside gives child the chance to explore the natural environment and have adventures. Our culture is taking away outdoor play from children through excessive use of electronic device. The outdoor areas help children connect with the environment and also helps in the development of physical and mental health.

The physical environment can either contribute to child's development and support staff and parent goals or create a permanent impediment to the operation of a high-quality program. The design and layout of the physical environment, which includes the building, interior finishes, outdoor spaces, selection of equipment and room arrangement has a profound impact on children's learning and behaviour and on teacher's abilities to efficiently do their jobs. Children need age-appropriate physical environment that support and promote child-directed and child-initiated play. The environment must promote and positively support the child's interaction with space, materials and people (Metin, 2003).

Cobb (1977) in her seminal work, The Ecology of Imagination in Childhood, pointed out that the innate connection with nature in childhood and poetic voice within us provides the basis of our creativity as adults. Natural materials such as sand, twigs and stones according to Cobb helps children in understanding the world through their construction play efforts. Petrakos and Howe (1996) reported that physical design of equipment and toys influences children's play. The idea that the physical arrangement of the play setting can directly influence the types of children's play and that in dramatic play centres stimulates more sophisticated group of dramatic play influences. Play is the work of children. In their play, they create and recreate their own world around them, act out their fantasies and fears and begin to term themselves in relation to their environment. Play is a natural process through which children grow and learn, which they do their best when they are enjoying themselves (Inside-Outside, Dec 2003). Children at this age are actively exploring their environment; exercising large muscle skills by running, jumping, galloping, riding wheeled toys and playing various ball games. According to the architect, Shah (2003) "The asymmetrical fluid shapes and the bold colour contrasts in the interiors foster uninhibited creativity in play and thoughts."

2.1.2. Types of Play

Playgrounds are places where children's play can take off and flourish. Good outdoor playgrounds should be large enough and designed in such a way that children's play can come to full expression, make a mess, run, jump and hide and explore the environment. A variety of factors determine the quality of the playground for children but particular emphasis should be placed on how the playgrounds encourage all forms of play (Johnson et. al.,2010).

2.1.2.1 Functional play (Sensorimotor play):

In functional play, the child deals with simple repetitive movements with or without objects such as rolling a ball or pulling a toy (Kenneth et. al. 1983; Papalia and Olds 1993). Functional play is identified in terms of physical development as it involves gaining strength, speed and co-ordination among children.

The goal of this type of play is to expose curiosity and motivate children to learn more in the exposed area. They will achieve this if they have an interesting and challenging environment filled with materials and objects that attract them and inspire their explorations (Metin, 2003).

2.1.2.2 Social play:

Play also has a social dimension as it is seen as an important element in the development of children's social skills. This type of play involves social interaction in a group with a sense of group identity and organized activity (Metin, 2003).

Social play provides unique child development opportunities to develop cooperation and leadership skills. During social play children develops a variety of skills, attitudes and social relationships. Their bodies, minds and emotions become integrated through play. They are able to explore their potential without the risk of failure which are sometimes present in real-life situations. They can imagine that they are someone else or try something new without the fear of consequences (Papalia and Olds 1993).

Through social play the children get together, communicate with one another and also learns social and cultural rules of different religions (Metin, 2003).

2.1.2.3 Constructive play:

Constructive play can be defined as the manipulation of objects to construct or create something (Papalia and Olds 1993; Wardle 2000). While children engage in different play, they have a chance to develop specific skills that enable them to create a sense of control and to develop positive self-esteem. In constructive play children can also frequently change the way they use materials by making them more complex, challenging and different. By frequently rearranging their materials, they create an environment to match their level of learning and they rarely get bored in a particular activity.

Explorative and manipulative play is essential for sensory development, fine movements and also hand-eye coordination among the children. This type of play help children to explore their environment through senses of sight, sound, smell, touch and taste (Sheridan 1999).

In general, this type of play with symbolic themes is popular in middle childhood where children perform physical activities together like running, jumping.

2.1.2.4 Pretend play:

Pretend play happens when the child starts to transform the physical environment into a symbol (Metin, 2003). Such as pretending to be a bird or that a piece of cloth is a pillow are example of simplest kind of fantasy or pretend play (Steward and Freedman 1987).

This kind of imaginative play is a significant step in the development of children. Understanding the feelings of others, learning new words, communicating new thoughts and separating real from unreal can be described as the benefits of pretend play or imaginative play (Metin, 2003). One of the most important forms of play is playing with ideas. Abstract thinking is play. When a child fantasizes, it means he/she is playing. They create play worlds, hopes, desires and wishes (Perry 2001).

Pretend play encourages creativity and divergent thinking. Susa and Benedict suggested that “divergent thinking is a cognitive ability that involves being able to produce a large number of relatively unique or unusual ideas in response to a given task constraint.” (Susa and Benedict 1994)

Pretend play with peers is not only significant in children’s cognitive development but it is important for their social and emotional maturation. Through this type of play, children comprehend more about different social roles and relationships. They create an imaginary situation in which rules of behaviour are formulated (Metin, 2003).

2.1.2.5 Games with rules:

During childhood, games with rules are most prominent form of play. Children become more socialized and logical which enables them to play games together (Piaget 1962). Games with rules dictate what the players can or cannot do within their defined roles.

Santrock defined games with rules as a multidimensional and complex concept. This type of play involves two or more sides, competition and criteria for determining the winner (Santrock 1994). Games with rules help children concentrate, understand limits and control their behaviour to stick to the rules (Metin, 2003).

2.1.3. Types of Playground

Playgrounds can be varied according to their types like adventure, contemporary and traditional (Metin, 2003).

2.1.3.1 Adventure Playground:

The concept of adventure playground is where children are free to shape their environment in their own way. The adventure playgrounds represent a real change from traditional playground concept in the last sixty years (Metin, 2003). The children in this playground are involved in planning, creating and building the area with different type of materials such as tires, sand, wood and other such materials. The play leader shows the children how to use the materials and help them to conduct various activities (Eriksen, 1985).

Adventure type of playgrounds enable creativity in terms of play with its 'loose materials'. Weinstein and Thomas (1987) emphasized the importance of loose parts that supports fantasy play. Wardle (2000) listed some of these loose parts that encourage constructive play on this type of outdoor playgrounds as: Large building rocks (plastic and wooden), Old tires, wooden crates, sand and sand toys, Water containers, Fine motor materials (clay, play dough, paints, small building blocks), active garden (flowers and vegetables).

A storage shed is also needed in this type of playground to store loose parts, materials and tools. Hooks for hanging tyres, buckets for sand toys, area for art work are also necessary elements to be provided in a playground (Metin, 2003).

2.1.3.2 Contemporary Playground:

Contemporary playgrounds are generally planned by designers. In general, they are quite expensive as large area is covered with concrete. These playgrounds are recognized by its sculptural quality and placement of equipment. Hard construction materials such as concrete and stone are used in order to provide durability and ease in maintenance. These playgrounds are aesthetically pleasing, they do not let children to recreate their own environment. Usually these playgrounds are used for social play like: retreat, quite play and talking (Metin 2003).

In this type of playgrounds, play equipment are sometimes decorated with bright colours and play sculptures. To enhance the interest in contemporary playgrounds, special features can be added like water jets, climbing hills and tunnels and the landscaping can be pleasant to the children.

2.1.3.3 Traditional Playground:

Playgrounds are traditionally considered as an area filled with traditional metal equipment designed primarily for muscle activities. The design of traditional playgrounds in the 20th century is still used today (Metin, 2003). Swings, slides, see-saw, climbers and merry-go-round can be stated as the most popular items which are generally used in playground designs (Metin, 2003).

Traditional playgrounds are characterized by large, metal equipment such as climbers, slides and swings on which children can exercise. Contemporary playgrounds usually include multi-purpose and linked structures that provide various means of entry and exit and areas of fixtures that promote dramatic play. Adventure playgrounds incorporate various types of movable materials and tools for children to use in constructing their own play structures. Each type of playground elicits different kinds or frequencies of behaviours. (Barbour 1999).

2.1.4. Traditional Playground Equipment

2.1.4.1 Slides

Slides are a popular play equipment as they attract many children as well as adults. According to Heseltine and Holborn, slides are the most common and useful pay equipment on a playground. Nevertheless, their selection and location on a playground is important in order to prevent playground injuries (Heseltine and Holborn 1987)

Stainless steel and plastics are the most preferred materials for slide surface. Although stainless steel is durable, it becomes extremely hot in direct sunlight and can also cause second degree burns. On the other hand, this kind of material constitutes important risk factors with sharp edges and corners. Currently, high density polyethylene slides solve the durability problem and add an element of permanent colour (Moore et.al. 1992). Along with narrow slides, different types of slides are also produced with different shape like wave, spiral, tunnel and slides with rollers which make the playground more interesting and playful.

2.1.4.2 Swings

Swings are a popular play equipment as well as dangerous on the playground. According to Heseltine and Holborn (1992), swings are classified as Standard swings, Group swings and Cantilever swings.

2.1.4.3 Climbers

Climbers are useful play structures in order to practice motor skills for children (Metin, 2003). Climbers are available in a variety such as tunnel, net and arch climbers. Although climbers are a popular play equipment, they are open for accidents where majority of accidents occur from falls. Climber height, climber size and fall zones are important factors in terms of safety concept (Metin, 2003).

In addition to the standard fall zone requirements, climbers should not have climbing bars or other structural components in the interior of the structure onto which a child could fall from a height of greater than 18 inches. Therefore, arch climbers are preferred over cube climbers because they do not have interior bars. (Moore et. al.,1992)

2.1.4.4 Balance equipment

Balance equipment gives children a physical challenge and a chance to interact socially. The balance equipment can be classified as two types; static and dynamic. Dynamic balance has more developmental value with various kind of opportunities. Cable, log bridges, rolling barrels are example of dynamic balance equipment. Whereas static balance equipment such as balance beams are generally used to link play structures because of their low height (Metin 2003).

2.1.4.5 See-saw

See-saws are popular for cooperative play on playgrounds (Metin, 2003). They are preferred on playgrounds by the easy installation and less required space than other equipment. The design of the see-saw has changed over a period of time where weight loaded was the oldest version and spring-loaded ones can be stated as the newest versions of the see-saws (Metin, 2003).

2.1.4.6 Merry-go-round

Merry-go-rounds are the children's favourite play structures due to its circular movements (Metin, 2003). They are customized in various colourful manners which makes the playground attractive and visually appealing. While installing a merry-go-round make sure that there is no space beneath it so that they can be entrapped (Moore et. al.,1992).

2.1.4.7 Multi-Play structures

Multi-play structures are a combination of different types of play units in one equipment (Metin, 2003). Multi-play structures are no convenient for fantasy or creative play of the children because of its crowded construction. According to Heseltine and Holborn, multi-play structures should be sited on a loose-fill or rubber poured surface to avoid the risk of accidents and injuries.

2.1.5 Design Criteria for Playground Equipment

While designing or installing any playground equipment these design criteria should be considered. They are;

2.1.5.1 Safety Factor

Wadell defines the term playground as, "An improved area designed, equipped, located and set aside for children's play. It includes play equipment, protective surfacing, fencing, signs, internal routes, internal landforms, vegetation and related structures." (Wadell 2001). The most important factor in designing a playground is to provide much fun with as much safety necessary. Height of equipment, surfacing materials, use zones and age appropriate separation are important safety factors that contribute to playground design.

Hard surfacing materials, such as asphalt and concrete are unsuitable for use under and around equipment of any height unless they are required as a base for a shock

absorbing unitary material such as rubber mat. Earth surfaces such as hard soil and hard packed dirt are not recommended because they have poor shock absorbing properties. Similarly, grass and turf are recommended because of their effectiveness in absorbing shock during a fall. (CPSC, 1997)

2.1.5.2 Materials

Wood, metal, plastic, rope and chain are mainly used materials in the manufacture of play equipment. According to Moore and his colleagues wood has been used longer than any other material in the manufacture of play equipment and keep its popularity over the years. Today, wood is used with a variety of materials such as metal alloys and moulded high-density plastics in composite play systems (Moore et. al., 1992).

Attractiveness and natural compatibility of wood meets the needs of a playground equipment. However, wooden play structures may cause trouble while it does not maintain well in the extreme heat or dryness (Wade, 1999).

Steel prevails as the basic playground equipment material owing to its high strength and ease of fabrication (Metin, 2003). But along with that rust is also a main problem which can minimize its life and also may result in structural failure. There are products available which may prevent rusting.

Another type of material mostly used for playground equipment is plastic. It is available with hundreds of different types and commonly used in order to provide fascinating environments by offering a great range of colour and form. Plastics are important in providing playground safety. They are used to round corners and also used as a coating on metals to prevent contact burns due to the direct sun light (Metin 2003).

Rope and chain are also flexible elements and are also visually appealing to children, but its low durability and condition requires frequent inspection and replacement. Moreover, harsh structure of chain may introduce pinch points for the users. It is recommended that chain should only be use if it is covered with a vinyl coating (Metin, 2003).

In table 1, the advantages and disadvantages of various playground materials are provided.

Table 1. Advantages and Disadvantages of various playground materials

MATERIALS	ADVANTAGES	DISADVANTAGES
Wood	❖ Easy to use. ❖ Looks natural ❖ Easy to repair if needed. ❖ Easy in attaching play equipment. ❖ Inexpensive. ❖ Can be moulded and designed as needed.	❖ It can cause splinters. ❖ Lots of maintenance is needed. ❖ Does not look classy.
Laminated Plywood	❖ Very colourful. ❖ Can be easily repaired. ❖ It is a natural material that lasts.	❖ It can chip and deteriorate quickly. ❖ Expensive.
Polyethylene	❖ Does not get hot. ❖ Initially bright and attractive. ❖ It has curved shapes which are safe for children. ❖ Usually used with metal.	❖ Colours can fade over time. ❖ Expensive. ❖ Limited number of uses and possibilities.
Steel / Aluminium **(coated, painted or untreated)**	❖ Strong. ❖ Large choice of paints and colours. ❖ Good for structural strength.	❖ Heats quickly. ❖ Almost impossible to repair. ❖ Expensive.
Recycled Plastics	❖ Can be cut and drilled. ❖ Doesn't rust or split. ❖ It is made from recycled materials.	❖ Has no structural integrity. ❖ Doesn't hold nails, screws and bolts as well as wood.

Source: Wardle, F. Outdoor Play: Designing, Building, and Remodelling Playgrounds for Young Children; Children Today; Mar/Apr 87, Vol.15, Issue 2

2.1.5.3 Accessibility

Accessibility should be considered one of the most important factors that will influence the overall design of the outdoor area. Accessible routes should be provided for children with disabilities and also make the area with challenging and interesting opportunities in order to develop their strength and skills. The accessible routes may include platforms, ramps, elevators and lifts. Additional features will assist in making play components more accessible to more children. Components with back support, increased space for manoeuvring adjacent to the play component that promote independent use are substantial features for disabled children on a playground (Metin 2003).

2.1.6. Planning Guidelines

Well-developed playgrounds are a treat to the eyes. Constructing a well-planned playground requires the aid of skilled professionals. The layout of the playground and the placement of fun structures need to be in sync to create a practical and pleasing atmosphere. This phase of the design process is space planning, which means arranging the spaces to satisfy the program and the needs of the client. One speaks of “planning” the space rather than designing the space since the primary concern at this point is solving the functional, physical and psychological needs of the client. This phase goes beyond addressing the aesthetic or visual issues of texture, colour or material. Although it is difficult to shape and manipulate certain concepts for use by children without thinking of all elements in a holistic “design” sense, this first stage of the design process is intended to establish order and functional relationships of the space and its inhabitants (Kilmer and Kilmer, 2013)

In planning a new playground or remodelling an existing one, the designer should address certain basic issues they are given by (Kilmer and Kilmer, 2013). These issues for design decisions include:

1. The user’s needs, characteristics, aspirations and activities.
2. The context of the area: location, orientation and relationship to the physical and societal patterns.
3. The economics or budgeted money for the project.
4. The aesthetic influences with respect to beauty and character that the designer and the client exert.
5. Sustainability, energy conservation and environmental concerns.
6. Possible long-term use or flexibility of the project.

Eric (2019) stated that in most education programs outdoor play yards is not valued as much as indoor program. The outdoor playground’s goal is to increase the quality, quantity and benefit of outdoor activity for children. Outdoor playground quality and design follow ten guidelines.

2.1.6.1. Adjacency

This design principle maximizes the use of the outdoor space effectively, expanding the size and richness of a given classroom by the size of the outdoor yard. Playgrounds should always be adjacent to the classrooms of the children.

2.1.6.2. Space

Playgrounds should always be large enough to contain the full variety of activities that children require for healthy development. This is a frequently ignored guideline as playground sizes are usually minimum which are too small to accommodate the full range of activities children require.

2.1.6.3. Layout

The playground should have open space and large enough for children to run freely with activity areas placed around the perimeter. The areas covered in the play equipment and structures should be less as compared to the open space provided. Playground needs open space for activities that offer free play.

2.1.6.4. Separation

The playground layouts should separate those different types of children's activities that might develop conflict with one another in order to avoid safety risk and supervision challenges. The playground should have appropriate combination of children's activity area.

2.1.6.5. Completeness

Healthy outdoor development can only happen when there is a full range of activities that is required for the development of the child. The playground is an outdoor classroom because everything which is done indoors is possible outdoors. Each activity provided outdoors needs a defined separate space and area for the complete activity to take place.

2.1.6.6. Materials/Equipment

In a playground a wide variety of materials/equipment is needed with emphasis on items that children can use. Children learn through interaction with their environment, the more they use the environment the greater opportunity they gain for learning. Typical playground equipment such as fixed climbing structures should be used equally with loose structures such as sand toys, tyres which they can manipulate and foster creativity, communication and teamwork.

2.1.6.7. Storage

There should be adequate outdoor storage to support the full variety of activities which children require for healthy development. Each activity area should have its own storage, it is unrealistic to expect teachers to move outside all the materials required for outdoor play.

2.1.6.8. Challenge

Playground should provide sufficient challenge that support development of the child. A challenge is defined as a reasonable risk such as a challenging physical activity to form the foundation for cognitive development. Children's also need challenges in other areas of activity, the opportunity to manipulate materials, solve problems, communication and teamwork.

2.1.6.9. Nature

Playgrounds and play yards are the best opportunity for children to experience nature. Playgrounds in many centres are dominated by concrete or asphalt, while the most common substance sand in fall areas is being replaced by poured-in-place rubber. Playgrounds emphasizing nature provides children new learning opportunities such as importance of environment and also provides the nurturing experiences that can only be found in nature.

2.1.6.10. Philosophy

A rich outdoor environment means nothing if the children are not allowed to freely participate in it. Additionally, children will not be successful if teachers are not actively engaged with what children are doing. Teachers must support children's initiative, imagination and creativity as they develop activities for themselves that create a context in which learning takes place.

2.1.7. Benefits of outdoor play

The American Academy of Paediatrics says lots of unstructured outdoor play is critical to the health of children, though many have experienced a marked decline in the time they spend in free play. There are various benefits one can obtain if outdoor play is an essential part of the life [15].

1. **Mental health:** Many children's have busy schedule with school and extracurricular activities due to which they experience stress. Physical activity in the form of outdoor play can help children reduce their stress. The Children and Nature Network says that contact with nature and environment can help reduce stress levels and increase positivity [15].
2. **Intellectual Development:** Outdoor play has benefits which are far more than mental health. Encouraging children to get outdoors can provide intellectual stimulation. It also encourages learning and problem-solving skills, which can

help children perform better in classrooms. Unstructured outdoor play also promotes creativity, which children can apply to their academic learning [15].

3. **Social Development:** When children's play outdoors, they engage with other children's, it encourages their social development. Outdoor play provides opportunities to learn and grow. They learn new skills and can overcome challenges which can promote self-confidence and help children learn how to develop healthy relationships and become leaders [15].

Development can be briefly defined as the change and continuity over time (Metin, 2003). Playgrounds also help children to display their genius. According to Senda, play structures are spontaneously enticing children into playing and they are the starting point for children to generate their play activities (Senda, 1992). Children experience the natural environment different than adults. They judge the natural setting not by its aesthetics, but rather by how they can interact with the environment (Metin, 2003). In terms of social growth, providing interaction areas for mixing children of different ages on a playground is an important criterion (Metin, 2003).

2.1.8. Principles of playground designing

Outdoor play spaces must be designed in a way that permits children to take risks and check their compatibility to defend things. Compared to indoors, outdoor play provides more kinds of activities for children to interact with the environment. The pleasure of being outdoors, away from adults, is a great experience for children (Metin, 2003).

Wardle emphasized the importance of playground designing that encourage a variety of play alternatives. Outdoor play environments are needed for improving important skills and developing critical cognitive concepts. These can be best supported and enhanced in the public playgrounds (Wardle,2000).

Playgrounds are more than just off the shelf pieces of equipment and proper playground design requires an understanding of what children do when they play, their different types of play and how to create an environmental space that is contusive to that play as well as meeting other necessary design criteria such as aesthetics, safety, cost and sustainability [8].

There is a list of elements that makes a well-designed play space for children [8].

2.1.8.1. Motion: A playground should encourage children to run, jump, throw, hop, slide, swing, climb and move. The playground should consist play equipment which has moving parts: swings, balance activities with movable parts. When designing the playground, consider how useful the space is and whether there is enough room for children to run around and create games of their own.

2.1.8.2. Incorporate nature: A great playground space should have the natural surrounding around them. The best playgrounds are where the equipment and playground markings work together with nature. A lot of green space is key for activity

and elements such as sand and water which give children a lively environment that allows them to use their manipulative skills.

2.1.8.3. Appearance: The appearance of the playground should look and feel interesting. Appearance can not only be enhanced by including equipment for play but it can simply be obtained by trees, surfacing materials and some playground variations. An ideal space has plenty of shade elements, chairs as well as benches. Not only appearance but it should also provide multi-sensory play opportunities (sight, sound, touch) and a safe surrounding for everyone. Playgrounds can be based upon themes and ideas of children's imagination. Themed playground designs are extremely popular in nurseries and schools. A themed playground design is good for creating a sense of place for children. It speaks to the location and culture of that community, incorporating all the things most important to them. If the school is colourful and creative, consider designing a playground that is full of vibrant colours and eye-popping designs that help capture the imaginations of the children.

2.1.8.4. Balance: The playgrounds should have unusual balance elements which helps in developing balance in their bodies. Monkey-bars, monorails, chain ladder are such equipment's that encourage upper body development.

2.1.8.5. Safety: The most important factors in evaluating the safety of any playground are proper surface, design and spacing and equipment inspection and maintenance. A proper playground surface is an important factor in reducing injuries. The surface under the playground equipment should be soft enough and thick enough to soften the impact of a child's fall as well as the playground equipment should be made of durable materials that won't fall apart or tear down by weather. Guardrails and protective barriers should be in place for elevated surfaces. There should be a fence surrounding a public playground in good condition to prevent children from running into surrounding traffic. The sandpit area should be checked for hazardous debris and be sure that the sand is free of bugs. The landcover should be of soft base that can cushion a child's fall.

Among the most critical design considerations are the amount and organization of both indoor and outdoor areas. Research studies confirm that limited space and poorly organized space negatively affect child behaviour (Australian Early Childhood Association, 1996). Moore (1987) stated that children in modified open playground facilities use significantly more activity setting than in either partially open or closed playground facilities, that is they move around more engaging in different activities throughout the day.

A number of technical design features have been found to be related to positive child outcomes, example; good acoustics, good climate control, good lighting and warm colour reviewed by Prescott and David (1976). Neatness can be encouraged by providing enough storage space Hawkins and Abbe (1948). Jones and Prescott (1978) pointed out that environment that are soft and responsive to touch such as elements

like grass, sand, dirt, swings, clay, paint and water are considered by many to be comfortable and less stressful.

2.1.9. Elements to be used in designing outdoor play area

There are some elements which are necessary for a play area. They are:

2.1.9.1. Surfacing material: The surface of the playground is one of the most important elements as the space can be used for a wide variety of purposes all year round. The surface should be safe, easy to look after, durable and something that is good for children to play on at the same time it should also complement the other elements installed in the playground. Asphalt is mainly used as a standard material for surfacing but at the same time it is open to many injuries as its hardness makes it particularly unsuitable for pre-schools and primary schools. Nowadays rubber poured flooring and sand is widely used in the playground which also gives cushioned protection to children when they fall. Artificial grass on ground is also used which is great for sports [23].

2.1.9.2. Place for sitting and eating: Places for sitting and an eating zone should be provided for children to socialize. These places provide simple pleasures and are easy to build and are also inexpensive to cater. There is a range of playground sitting including wooden benches, picnic tables, individual seats and even mini amphitheatres where large groups of children can sit together. Also, there are a variety of material used in constructing a bench or chair like wood, asphalt concrete, bamboo, tyres, metal etc [23].

2.1.9.3. Shelter: Including a shelter in a playground helps the children to stay protected from harsh weathers. Shelter equipment includes everything like large trees, octagonal shelters with decked floors, pergolas, sail shades, play huts and dens for small children [23].

2.1.9.4. Security cabin: Security cabins in schools are necessary for the safety of the children. There are several disturbances in school like fights between students, sneaking into school, leaving school premises without permission, accidents and mainly bullying. The security cabin should be near so that their presence can prevent additional injury or damage as well as they are trained to assess a threat and to address it in the least aggressive and most effective manner [24].

2.1.9.5. Parking space: Properly designed parking space are attractive, safe and easily and efficiently usable. The parking space should be planned with low maintenance costs and ease of alterations for any future changes. Parking spaces can be made with asphalt as well as it can be paved according to the use, size and function of the parking space.

2.1.9.6. Dustbins: The importance of putting litter in the bins is a lesson taught to students from an early age. The design and placement of the dustbins in the school environment should ensure that there are sufficient dustbins available for the students.

2.1.9.7. Drinking water facility: By providing drinking water facilities at several intervals in school environment helps children to stay hydrated and also provides a healthy alternative to sugar-sweetened beverages. Water facilities can be provided at several spots such as near parking lot, near canteen, near game areas as well as in the school premises.

2.1.9.8. Emergency exit: Providing emergency exits in school premises are important because they deliver a safe and clear way to evacuate the premises in case of any crises or danger. It is also important to plan the routes for the emergency exit and also to maintain them.

2.1.9.9. Plants: Even when the play area is small to provide a garden a few plants in pots should be made available. Potted plants can also be useful for decorating in special event days as well as it also provides fresh air and little shade. Incorporating plants in play areas makes the space alive.

2.1.9.10. Fencing: A secure fence surrounding the boundary wall of the play area is important, especially in rural areas where children tent to run out of school onto streets in front of traffic. It is also visually appealing if it is designed and installed properly.

2.2. Empirical Studies

2.2.1. Studies conducted outside India

Barbour (1999) conducted a study on The impact of Playground Design on the play behaviours of children with differing levels of physical competence. The impact of the outdoor learning environment on the play behaviours and peer relationships of 8 second grade children with different levels of physical competence was investigated using a qualitative case study approach. Settings of the study were playgrounds of contrasting design: one emphasizing exercise play, the other providing various play options in addition to exercise. Grounded theory procedures were used to analyse observation and interview data. Results indicated that playground design influenced subjects social as well as physical skill development by facilitating or constraining the strategies they used to manage their play with peers. A theoretical model was developed to describe interrelationships among playground design, physical competence and peer relationships.

Ingunn (2001) carried out a study on The Natural Environment as a Playground for Children: The Impact of Outdoor Play Activities in Pre-Primary School Children with the aim to focus on the affordances of the landscape for versatile play and to examine the impact of outdoor play activities in children's motor ability and mastering. An experimental study was carried out with five to seven-year-old children in kindergartens in Telemark, Norway. The groups were selected from three kindergartens of equal age groups. The results indicated the relation between versatile

play in the natural environment and the impact on motor fitness in children significant effects were found in balance and coordination abilities. There is a strong relation between the structures of the landscape and the functions of play.

Susan et. al. (2008) conducted a study on An Investigation of School Playground Safety Practices as Reported by School Nurses. The purpose of the study was to investigate school playground safety practices. Seventy-five questionnaires were distributed and 64 questionnaires were returned. The responses indicated that little attention is being given to providing safe playground environments in schools as measured by best practices of supervision, age-appropriate design, fall surfacing, and equipment maintenance. Participants pointed to the need for better supervision and supervision training, careful selection of age-appropriate equipment, maintaining adequate fall surfaces under the equipment, and ensuring that equipment is properly maintained and repaired. The study also revealed that school nurses believe they could play a role in playground injury prevention through the collection and analysis of injury data, communication to administrators about the need for comprehensive planning of the play environment, and becoming active members of playground safety committees.

Helen. L and Eager. D (2010) conducted a study on Risk, challenge and safety: implications for play quality and playground design with an aim to investigate children's play preferences and engagement in risky play using playground equipment typically available in community parks. The study examined the outdoor play choices and risk-taking behaviour of 38 children (25 boys, 13 girls) aged between 48 and 64 months from Sydney, Australia. Semi-structured interviews examined children's play preferences and playground equipment usage. Observations of play explored engagement in risk-taking behaviour were done. The findings demonstrate that the children engaged in a range of play behaviours involving mainly low levels of risk as well as exploratory behaviour whereby the children appraised the task in relation to their current ability.

Zeinab. A et.al. (2010) conducted a study on Design principle of playground's equipment's and spaces for children: An interaction education approach. The study found that children learning through playing games is more effective than traditional academic methods. Therefore, proper designing of the playgrounds aimed at offering effective training can be one of the ways for improving the children's capabilities and development. The results of the surveys conducted in the playgrounds of Tehran city show that their conditions are not at a satisfactory level in terms of interaction with the children in order to train them. The study was based on the interactions between the children and the play equipment and a checklist was prepared for designing interactive playgrounds for various skills for the children. Under this condition, it seems that playground design according to the mentioned checklist will result in a more secure and safe environment for kids.

Parsons (2011) conducted a study on Young children and nature: outdoor play and development, experiences fostering environmental consciousness, and the

implications on playground design. The purpose of this study was to understand the effects of children's experiences in outdoor play. Major goal of this research was to develop a set of guidelines for children's landscape to help foster strong child outdoor experiences. Outdoor play provides opportunities for creativity, imagination, social connections and learned behaviours. The findings of the study revealed that decreased interaction and decreased quality of interaction between children and outdoor environments has a negative impact on children's health. The environment used for play is important because different playscapes offer different opportunities.

Oloumi. S et.al. (2012) carried out a study on Evaluation of Outdoor Environment from the Viewpoint of Children. The study showed that children's leisure time was almost spent in non-physical activities, thus they have less opportunities to experience the environment. Qualitative research method was adopted for analysis. Conditions were observed on the basis of six environmental characteristic: scale, safety, amenity, accessibility, sociability and variety. The results showed meaningful differences between children and adults in usage of environment and children's preferences are influenced by developmental needs, physical and social factor.

Dyment. J and Timothy. S (2013) studied the impact of playground design on play choices and behaviours of pre-school children. The purpose of this study was to examine where and how children choose to play in four Australian pre-school centres with very different outdoor playgrounds. Using a momentary time sampling direct observation instrument, a total of 960 scans were taken of pre-determined target areas (paths, paved expanses, grass, soft fall, sand feature and natural) within four playgrounds over 30-day period. The results revealed that the children were using the four playgrounds differently. Across all centres, irrespective of target area, the dominant play activity was functional play followed by self-focused play. This study has also explained the relationship between the design of outdoor play spaces, children's choices of play locations and their play behaviours.

Acar (2014) studied Learning Environments for Children in Outdoor spaces. Learning continues permanently from start to the end of life. Considering the learning process in the childhood, play is the best communication and the most natural learning environment for children. The purpose of this study was to focus on the concept of child-environment relationships, learning environments and discuss the contributions of the physical environment to children's learning. The findings of the study describe with examples what a learning environment is, how to provide children with physical environments for learning, and which environmental characteristics contribute to learning. The importance of designing learning environments and the design of these environments are also discussed.

Khan et. al. (2019) conducted a study on Designing an outdoor learning environment for a primary school community: A case study in Bangladesh. In Bangladesh, school grounds are usually barren devoid of any designed features. The purpose of this study was to explore children's, teacher's and parent's views of what would constitute an effective ground for learning, socialising and playing at primary schools in rural

Bangladesh. Observation sheet was used as an instrument to gather data from the respondents. The results suggested that children want to connect with nature, to explore their environment, to challenge themselves, to be physically active and to socialize with friends. They also wanted their school ground to be more attractive. The parents highly valued gardening whereas teachers preferred area with loose materials where children could learn by themselves. None of the ideas were mutually exclusive and the subsequent design was able to incorporate elements from all groups.

2.2.2. Studies conducted within India

Darangadharia (1978) studied colour preferences of mentally retarded children from Chetan Balwadi, Mental Home and Spandan School. The sample consisted of 25 mentally retarded children. The child was asked to show the coloured garment of his choice and which was then removed from the table. This process continued until one garment was left. Second test was conducted 10 days after and the third test after few more days. The orders of the least liked colours by younger group were yellow, green and violet and older group were blue, yellow and green.

Dhingra et al. (2005) conducted a study on Play Pattern in Preschool Setting. The study was conducted to assess the play pattern in the preschool setting. The aspects covered including studying the play equipment available to the children, the nature and content of their play activity and the adult supervision. The sample consisted of 40 play sessions comprising of children in the age group of 2-5 years, studying in 20 preschools across Jammu city. The adults present were also observed for their direct or indirect participation. A combination of random and event sampling was used for sample selection. The tools used included non-participant observations and interviews. The results revealed that the play behaviour of the children did not undergo any alterations in the preschool setting. Opportunities for free play and outdoor activities were available at all the preschools. The play activities underwent alterations due to availability of space and play equipment. Gender and age differences were noted in the play behaviour of the children and were especially evident in homogenous groups. Presence of teachers helped in making the play activities more organized and stimulating.

Daga (2006) designed an integrated interior environment for a selected preschool. In the first phase she selected three preschools as her cases and presented them with detailed information regarding their existing status. The second phase consisted of design development of the preschool with the incorporation of the various essential components for preschool environment namely walls with smooth surface and triad colour scheme, ceramic textured tiles for floor, provision of fan and air conditioner, lighting design, various child friendly furniture pieces with round and tapered edges which included activity tables, doll houses, storage for toys etc. Lastly, the cost estimation was also given for the designs as per the prevailing market rates.

Dekhtawala (2006) designed electric lighting for the school. The existing lighting conditions in various areas of selected school were assessed against the illuminance

recommendations given by the Bureau of Indian Standards. Visual performance and visual comfort of the students under three selected illuminance levels were assessed. It was found that illuminance uniformity in all selected areas was low in contrast. The data of visual acuity revealed that there was a successive decrease in the accuracy factor and a successive increase in time taken on visual acuity test by the students under best lit to worst lit illuminance conditions, and there was successive decrease in the accuracy factor. Based on the data gathered, a well-planned electric layout was developed.

Dasgupta (2012) conducted a study on "Assessing and Redesigning the Interiors of Selected Anganwadis from Vadodara City" with an aim to assess the existing status of interior of selected Anganwadis from Vadodara City to identify the need and preferences of Anganwadi as perceived by the Anganwadi worker with regard to the various aspects of interior of selected Anganwadi, to redesign the interior space of selected Anganwadi and provide detailed working drawings of the same. The data were collected through observation schedule, questionnaire and interview schedule. The research study had two research design, case study and descriptive survey. The researcher purposively selected twenty Anganwadis from different areas of Vadodara city for conducting a descriptive survey. Out of twenty Anganwadi three Anganwadi were taken by the researcher for redesigning the interiors. The study revealed that most of the Anganwadis had a poor interior. They had faded paints chipping off from various places, uneven and dull floors, less walking space, lack of enough sitting arrangements, less storage space, no furnishings and accessories, no proper display boards, blackboards, lacks of play material and no place and play material for outdoor games. The Anganwadis using specific colours schemes. The existing rooms were reorganized, display boards and blackboards were added, lighting and storage cabinets were added and seating arrangements was improved. Existing presentation and working drawings, modified presentation and working drawings, electrical layout, tilling layout for modified drawings were developed. Cost estimation for the modification in the selected Anganwadis was also presented.

Tarun, S. et al. (2017) conducted a research on "An Evaluation of Outdoor School Environment to Promote Physical Activity in Delhi, India" with an aim to describe characteristics of the surrounding outdoor school environments that may promote children's physical activity in Delhi, India. The study conducted a structured observation of outdoor environments in a random sample of 16 private schools in Delhi using the Sport, Physical activity and Eating behaviour. The SPEEDY school audit measured six categories including; (1) access to the school, (2) surrounding area, (3) school grounds, (4) aesthetics, (5) usage and (6) overall environment. It resulted that out of the 16 schools, one had cycle lanes separated from the road while two school had cycle lanes on the road. Two schools had pavement on both sides of the road for pedestrians. One school had marked pedestrian crossing. No schools had school warning signs, road safety signs or route signs. Fifteen school had playground equipment and nine had courts for outdoor physical activity. The majority of the schools were shielded from the surrounding area by hedges, trees or fences. Two

schools had graffiti, seven had litter and 15 had murals or art. The majority of the schools did not have infrastructure to support physical activity such as cycle lanes, warning signs. However, most had playground equipment, courts and outdoor play areas and nearly all were free from vandalism and many had murals or art.

Jairam. M, Chopra. G. (2019) reviewed Play in Early Childhood Education Centres of India: A Review Article with an aim to investigate play during early childhood years, availability of play materials in early childhood education centre and to look for play spaces in early childhood education centres of India. The study was divided in two parts of selection of empirical studies for the review and skimming the selected studies. Those studies which focused only on play were taken into consideration. The results revealed that children of India demonstrated various forms of play like associative play, cooperative play, game with rules dramatic play, outdoor play and indoor play. Children's play was affected by age, culture and socio-economic status. Early childhood education centre had space constraints as some centres had separate playgrounds according to age while other did not even have one.

Conclusion

The review of literature collected on various components of the outdoor area gave an insight into the meaning, importance, planning guidelines, types of playground, types of play, design criteria, benefits of outdoor play and principles and elements of playground designing. The review was collected on various aspects of playground designing and its importance but dearth of researches was found on the practical designing of the outdoor areas of school playground as per the knowledge of the investigator. There were many studies conducted in India and outside India on Young children and nature: outdoor play and development, experiences fostering environmental consciousness, and the implications on playground design (Parsons, 2011), the natural environment as a playground for children: the impact of outdoor play activities in pre-primary school children (Ingunn, 2001), design principle of playground's equipment's and spaces for children: an interaction education approach (Zeinab. A et.al, 2010), conducted a study on Risk, challenge and safety: implications for play quality and playground design (Helen. L and Eager. D**,** 2010), evaluation of outdoor environment from the viewpoint of children (Oloumi. S et.al, 2012), an investigation of school playground safety practices as reported by school nurses (Susan et.al, 2008), the impact of playground design on the play behaviours of children with different levels of physical competence (Barbour, 1999), impact of playground design on play choices and behaviours of pre-school children (Dyment, 2013), designing an outdoor learning environment for a primary school community: a case study in Bangladesh (Khan et.al, 2019), learning environments for children in outdoor spaces (Acar, 2014). The researchers conducted in India focussed on colour preference of mentally retarded children form Chetan balwadi, mental home and spandan school (Darangadharia, 1978), play pattern on preschool setting (Dhingra et al. 2005), designing an integrated interior environment for a selected pre-school

(Daga, 2006), designing electrical lighting for school (Dekhtawala, 2006), assessing and redesigning the interiors of selected anganwadis from Vadodara city (Dasgupta, 2012), an evaluation of outdoor school environments to promote physical activity in Delhi, India (Tarun, S. et al., 2017), play in early childhood education centres of India: A review article (Jairam. M, Chopra. G, 2019). A dearth of researches was found on designing the various areas of the school playground according to the needs and preferences of the client. It was found to be a less explored area in India and outside India. Therefore, the investigator was interested in this less explored area.

METHODOLOGY

CHAPTER – III

METHODOLOGY

Research methodology is a science to study how research is done systematically and scientifically (Kothari, 2014). The research design and operational definitions of the terms used in the study are explained briefly in this chapter.

The main purpose of this present study was to assess the existing status of the selected components of the exteriors of the School provided by the Sun Pharmaceutical Industries Limited under the CSR project of Halol city. The study also equally focuses to gain insight of the School with regard to their existing exterior environment and to gather information on various learning and developmental activities carried out in the playground of the selected School.

The methodological procedure carried out in the present research is described here under the following heads:

3.1. Research Design

3.2. Operational Definitions

3.3. Sample and sampling procedure

3.4. Locale of the Study

3.5. Unit of Inquiry

3.6. Selection and Construction of Tool

3.7. Description of tool

3.8. Establishment of content validity

3.9. Data collection

3.10. Phase I: Assessing the available space of the Outdoor Areas of the School

3.11. Phase II: Identification of client's Need and Preference

3.12. Phase III: Design Development

3.13. Phase IV: Cost Estimation and Design Implementation

3.14. Phase V: Development of a booklet for Suggesting Essential Requirements for the Outdoor Areas of the School

3.1. Research Design

A research design is arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedures (Kothari, 2014). The present study aimed to design and develop the outdoor areas of the school of Halol city provided under the CSR (Corporate Social Responsibility) project of the Sun Pharmaceutical Industries Limited. An action design project was undertaken to design and develop the provided area according to the needs and requirements of the clients.

An action designing project was undertaken to fulfil the desired goal of the client by developing several designs and drafts which can be used to achieve the desired goal. It was fulfilled by a systematic approach by organizing design ideas, materials and drafting 2-D designs. Initially the client's problem was evaluated and solved by drafting ideas and designs, the cycle went on until the desired goal is achieved and the clients were satisfied.

3.2. Operational Definitions

To ensure the development of an appropriate tool for the present research, certain terms were operationally defined. They are as follows:

- **Outdoor areas**
  For the present research, the outdoor areas are the areas within the school premises having certain amenities for students such as landscape, play area, play equipment's, water facility, outdoor washroom, seating area, canteen, pathway and walkway etc.

- **Playground**
  For the present research, a playground is an area used for outdoor play or recreation, especially by children and often containing recreational equipment such as slides, swings, see-saw, merry-go-round etc.

- **Corporate Social Responsibility**
  Corporate Social Responsibility (CSR) is a management concept developed that helps private and government companies to be socially active by helping the society with economic, social and environmental needs. Whenever the company collaborates with CSR activities, they can be aware of various impacts they have on the society. For the present study, development of the outdoor areas of the school from Halol city was taken up as a part of CSR activity by the Sun Pharmaceutical Industries Limited.

3.3. Locale of the Study

The present study was conducted in Halol city, Gujarat, India.

3.4. Unit of Inquiry

The unit of inquiry were the authorities of the Sun Pharmaceutical Industries Limited (Executive CSR and the principal of the selected school of Halol city who had been running the school since past 7 years).

3.5. Sample of the Present Study

For the present study the sample was a school from Halol City which was provided under the CSR project of the Sun Pharmaceutical Industries Limited to the designer for redesigning the outdoor areas of the school.

The respondent comprised of the authorities of the Sun Pharmaceutical Industries Limited (Executive CSR and the school principal).

3.6. Selection and Construction of Tool

Selection of the tool

The present study comprised of observation sheet and interview schedule.

a) **Observation sheet**: This was selected as a tool to access the existing status of the outdoor areas of the selected school of Halol City. It was selected because of the following reasons:

- It was direct and speedy method of collecting the information (Kothari, 2012).
- It establishes a careful, organized watching of facts as they occur in course.
- The subjective bias is eliminated, if observation done accurately.
- The information under this method is related to currently prevailing situations.
- This method is independent to respondent's willingness to respond and as such is relatively less demanding for active cooperation on the part of respondents.

The observation sheet also contained some open-end questions for observation. The investigator herself observed and recorded the information in the observation sheet.

b) **Interview schedule**: This was selected as a second tool to collect information and data regarding the background information of the school regarding the design and development of the outdoor areas of the school. It was selected because of the following reasons:

- The researcher gets the detailed information about perception and opinions of the respondent.
- It ensures complete and detailed data.

Construction of the tool

Observation sheet and interview schedule were selected as tools for the present study. On the basis of objectives framed and review of literature reviewed the tools were constructed. Various sources such as journals and electronic media were used to make the tool for the present research. The feedback from the professionals like interior designers and academicians of related field from the Department of Family and Community Resource Management also assisted in making the tool for the present study.

3.7. Description of the tool

3.7.1. Description of observation sheet

The observation sheet comprised of three sections which are described as follows:

Section I

This section consisted of information regarding the physical structure of the School and the outdoor space provided for the development under the CSR Project of the Sun Pharmaceutical Industries Limited. The information included the date and time of survey, total build-up area of the school, total area of the school playground, number of classrooms and number of levels/floors of the school.

Section II

This section consisted of information regarding the various outdoor components of the School area and the questions to assess the existing status of the School building. The information was collected regarding the dimension of the outdoor area of the school, total area of the school playground, colour of the wall, intensity of the wall colour, texture of the wall, finish of the wall, material of construction, condition of the wall, provision of fencing on the compound wall, dimension of the compound wall, material of the playground surface and condition of the surface of the school.

Section III

This section dealt with the description of various activities carried out by the children in the School. The information was regarding the types of play equipment, material of play equipment, number of play equipment, placement of the play equipment in the school, seating arrangement for children, material of seating provided, condition of seating, type of soil, condition of soil, number of existing trees, number of potted plants if any, provision of MDM (Mid-Day Meal) area, dimension of MDM (Mid-Day meal) area, overall ambiance of the school playground and proper circulation space for children for doing play activities.

3.7.2. Description of Interview schedule

The interview schedule was prepared on the basis of indication supported by the review of literature. Care was taken while preparing the tool to include all questions that would elicit the needs and preferences of the clients viz; the authorities of the Sun Pharmaceutical Industries Limited (Executive CSR and the school principal) needed to obtain the objectives of the study. The interview schedule was divided into two sections which are described as follows:

Section I

This section contains information regarding the school which was to be developed under the CSR project of the Sun Pharmaceutical Industries Limited. The information included the name of the school, location of the school, the nature of construction, number of students studying in the school, age range of the students studying in the school, the medium of instruction and the approximate budget provided for the designing and development of the outdoor areas of the school.

Section II

This section contains information regarding the needs and preference of the client's viz; the authorities of the Sun Pharmaceutical Industries Limited (Executive CSR and the school principal) for the designing and development of the outdoor areas of the provided school of Halol city under the CSR project. The components included preference for the designs based on a theme, colour preference of the school building, types of play equipment, types of teaching material, preference of patterns and designs on the inner boundary wall of the school, provision of storage space, preference of outdoor furniture, material of the outdoor furniture, need of fencing on the boundary wall, provision of landscape, preference for artificial lighting fixtures, preference for seating arrangement, material of seating and description of various outdoor activities conducted in the school playground.

3.8. Establishment of content validity

On the basis of available existing literature, the observation sheet and interview schedule regarding selected components of School was prepared and given to a panel of 12 judges comprising of experts from the field of Interior Designing and faculties of Department of Family and Community Resource Management, Faculty of Family and Community Sciences. The judges were requested to judge whether the listed items were clear, ambiguous, relevant or irrelevant. The suggestions given were adopted which had 80% agreement among judges and the tools were modified and finalized for the data collection.

3.9. Data collection

The data was collected by the designer herself. Prior permission was taken with the concerned authorities, school principal and helper. Thereafter the data was collected on their convenient time and day.

3.10. Phase I: Assessing the available space for the outdoor area of the school

The physical space and the outdoor areas of the school provided under the CSR project of the Sun Pharmaceutical Industries Limited was personally assessed by the designer. The various components of the outdoor areas of the school were assessed in terms of quality, quantity, overall ambience and structure of the area in terms of redesigning the available space.

3.11. Phase II: Identification of client's Need and Preferences

The needs and preferences of the client's viz; the authorities of the Sun Pharmaceutical Industries Limited (Executive CSR and the school principal) an observation sheet and interview schedule was constructed with regards to the various aspects of the outdoor areas of the school provided under the CSR activity of the Sun Pharmaceutical Industries Limited in terms of pathway design, landscape design, boundary wall paint, mural paint, playground development and the overall ambience in the playground. The interview schedule also allowed the designer to collect information on the requirements of the client's need and preferences for the type of activities that would be carried out in the selected School.

3.12. Phase III: Design Development

On the basis of the needs and preferences of the client's viz; authorities of the Sun Pharmaceutical Industries Limited (Executive CSR and the school principal) alternatives were designed on the basis of information collected regarding the physical structure and the existing status of various components of the outdoor areas of the school provided. Efforts were directed to assess the various aspects of outdoor environment that contributed to the developmental behaviour of the school children. For creating various visual projections AutoCAD 2014 software was utilized for the present research. The schedule of the drawings are as follows:

SR. NO.	SCHEDULE OF DRAWINGS	NUMBER OF DRAWINGS
1	Existing Floor Plan of the School	1
2	Working Drawing of Existing Floor Plan of the School	1
3	Pathway and Landscape Design for the School	3
4	Working Drawing of Pathway and Landscape Design for the School	2
5	Folded Elevation of The Inner Boundary Area of The School	3
6	Wall Design Behind Mid-Day Meal Area of the School	4
7	Wall Design for the Placement of Branding Board	2
8	Branding Board Design	1
TOTAL DRAWINGS		17

Table 2: Schedule of Drawings

3.13. Phase IV: Cost Estimation and Design Implementation

In successful planning and implementation of any proposed design cost estimation plays a significant role. Thus, cost estimation was prepared after the selection of the designs for the development of the outdoor areas of the school by the client viz; authorities of the Sun Pharmaceutical Industries Limited (Executive CSR and the school principal) considering the actual price and labour cost of the proposed design of the selected School. The implementation phase took almost three months starting from November, 2019 to February, 2020.

3.14. Phase V: Development of a Booklet for Suggesting Essential Requirements for the Outdoor Areas of the School

One of the objectives of the present research was to develop a booklet for suggesting essential requirements for the outdoor areas of the school. The designer with the help of review of literature had developed an informative booklet. The developed booklet will prove to be helpful in designing and development of the school playground. The booklet included the following contents: Introduction, Types of Playground, Types of Play, Age appropriate equipment's, Playground design parameters and some

suggestions were also provided by the designer. A panel of experts from the field of interior designing and architecture were requested to validate the importance of topic, content and language clarity of the text. The suggestions given by the experts were incorporated and the booklet was modified accordingly.

FINDINGS & DISCUSSION

CHAPTER – IV

FINDINGS AND DISCUSSION

The present study aimed on developing the outdoor areas of the school of

The chapter was divided into 5 phases:

4.1. Phase I: Assessing the Physical Space of the Outdoor Areas of the School.

4.2. Phase II: Description of the needs and preferences of the clients viz; authorities of the Sun Pharmaceutical Industries Limited (Executive CSR and the School principal) for the improvement in the Outdoor Areas of the School.

4.3. Case study of the School of Halol City.

4.4. Phase III: Design Development.

4.5. Phase IV: Cost Estimation and Design Implementation.

4.6. Phase V: Development of a Booklet for Suggesting Essential Requirements for the Outdoor Areas of the School.

4.1. PHASE I: ASSESSING THE PHYSICAL SPACE OF THE OUTDOOR AREAS OF THE SCHOOL

The School for which the outdoor areas were to be developed given under the CSR project of Sun Pharmaceutical Industries Limited had a least developed playground structure and play areas for the children. The school provided affordable education to low income group students with minimum infrastructure for fulfilling the basic needs of the children.

This section deals with the various components of the outdoor play areas of the School such as dimension of the school's physical structure, dimension of the school playground, material of construction of the boundary wall, treatment applied on the boundary wall, colour of the boundary wall and school, condition of the boundary wall, provision of fencing on the boundary wall, surface of the playground, condition of the playground surface, types of play equipment in the school, material and condition of the play equipment, layout and condition of the existing pathway, type of playground soil, number of existing trees and its placement, provision of Mid-Day meal area for the children, dimension of the Mid-Day meal area and clearance space for performing various play activities.

The school was found to be a pucca school and it had a total area of 2329.11 sq. ft. Whereas the area of the school playground was of 994.25 sq. ft.

4.1.1 Boundary Wall

The components such as material of construction of the boundary wall, surface finish of the boundary wall, colour of the boundary wall and school, condition of the boundary wall, provision of fencing on the boundary wall are described here. Data gathered through observation sheet revealed that the inner surface of the boundary wall of the school was constructed with a height of 5'-6" and it was painted in cream (light) colour with patches of cement filling and white paint on some areas which were damaged and broken. The school used brick with plaster as a material of construction and was treated with rough plaster and whitewash. The condition of the inner surface of the boundary wall of the school was poor as it had various defects such as formation of algae in some areas, broken corners of the boundary wall, chipping off paint and plaster from the surface of the wall, dampness and broken construction from several places which made the walls appear visually unappealing. The entrance of the school was constructed with an iron gate which was painted in cream colour. The condition of the gate was poor as it had rusted due to the exposed weather. For the safety and protection of the children from the trespassers there was no provision of fencing on the top of the boundary wall.

Plate 1: EXISTING BOUNDARY WALL OF THE SCHOOL

To add a bright look in the outdoor areas of the school the existing boundary wall also consisted of a mural. The mural was painted on the wall opposite of the main school building. The mural was painted in white colour and had a border of blue colour to emphasize the painting, it was painted with a height of 3'-4" and width of 5'-9". The mural depicted the idea of an Indian mission named "Swatch Bharat Mission (Gramin)" which displayed certain points for maintaining personal hygiene like washing hands before and after every meal, brushing teeth two times a day and environmental cleanliness like maintaining clean and hygienic kitchen, regular cleaning of toilets and disposing waste in dry and wet waste bins accordingly, the information was provided in pictorial form of representation with captions in the local Gujarati language. The condition of the mural was moderately poor as the paint applied was faded from several areas and was muted, it looked monotonous because of less usage of bright colours to attract students to read and follow the given instructions. Moreover, there

Plate 2: EXISTING MURAL ON THE BOUNDARY WALL

were no wet and dry waste bins provided in the school campus or in the playground area of the school. For planting trees and plants near the boundary wall of the school a parapet partition of 5” of height was built near the boundary walls to separate the area from the rest of the playground.

4.1.2 Playground Surface

The playground surface of the school had loose sand in some areas of the ground whereas some areas had hard uneven soil surface. There was scarce uneven grass grown at some areas of the ground and the grass was not regularly trimmed which made the area less appealing. A hand-pump was provided near the corner of the outdoor washroom which was used by the children to clean themselves and by the school workers (staff and peons) to wash large utensils used for cooking food for the children under the mid-day meal programme. Moreover, the playground of the school also had an uneven and unfinished pathway made with the help of paver blocks of red and cream colour. The placement of the pathway was such that it led to the main gate of the school building from the entrance of the school and left midway. The pathway was also found uneven at some areas and also was laid disproportionately without any flow of the path. The open pathway was not well-planned and did not led to respective activities and areas provided in the school. The width of the pathway made from the entrance of the school to the main school building was 4’-1” and it increased to 12’-3” and 12’-0” in length in front of the main gate of the school building where daily prayers and morning meetings were held. The pathway of the school did not possess any solid border or any parapet wall at the edges of the pathway for the paver blocks to stay in place and not fall loose with its regular use. Due to this the paver blocks placed at the edges of the pathway fell apart and several paver blocks were broken.

In the playground of the school there were some scattered plants planted in the ground near the edges of the existing pathway, near the main gate of the school building and near the mid-day meal area of the school. The playground also had two large trees

planted near the main school building and near the outdoor washroom of the school which was used for shade and swinging by the children of the school. It was observed that efforts had been made to make the playground surface appear visually appealing by adding greenery to several areas of the playground. Due to the colours of boundary wall and the placement of plants in the playground made the playground surface look less interesting and it also missed a sense of personal space for children in the school. There was no provision of storage space in the outdoor areas of the school for storing toys and play equipment used by the school children. The surface of the playground was not well-planned for carrying out various play activities and developmental activities by the children.

Plate 3: EXISTING PLACEMENT OF PATHWAY

The overall ambience of the playground and the surface of the playground was not well-planned and well-developed which made the playground surface appear dull and visually unappealing.

Plate 4: SURAFCE OF THE SCHOOL PLAYGROUND

4.1.3 Play Area of the School

The play area in the school is the area where children spend their free and leisure time during lunch break and participate in various playing activities and socialize together. The data gathered by the designer revealed that the playground did not have separate space for different play and developmental activities. In the play area of the school playground there was only a small sand-pit of 7'-8" in length and 9'-4" in width. The sand-pit was built on the existing playground surface in between the school entrance and girls' toilet. The sand-pit provided in the play area did not have any boundaries near it which made the sand spill out of its place every time a child would play. Other than a sand-pit there were no other play equipment in the school playground for the children to play and stick around.

It was observed that there was no seating arrangement provided for the children of the school in the play area, the children would sit on the small parapet wall built for the

boundary plants and trees. The condition of the seating was poor as it was not convenient for sitting and also was at a very low height.

The playground of the school had sandy soil with large particles and pores between them. The condition of the playground soil was moderate as it was very dry, had small rocks in them and also had cracks at some areas. Moreover, sandy soil absorbs water quickly so it is not considered best soil for growing most plants. There were several large and medium sized trees planted in the playground, but the placement of the trees was not proper as it was planted abruptly. Other than large trees there were several small sized plantations in the playground near the existing pathway of the school and some near the boundary wall of the school.

Plate 5: PLAY AREA OF THE SCHOOL

Plate 6: PLACEMENT OF PLANTS IN THE PLAY AREA

The playground also comprised of a Mid-day meal area wherein the children are offered lunch in the school. The data gathered through the observation sheet revealed that the mid-day meal area was 16’-5” in length and had a width of 13’-2”. The mid-

day meal section of the school was not different form the rest of the play area, it had a plain hard soil surface same as the playground surface with some small plantation alongside the boundary wall. There was no provision of chairs and tables for the children to sit and eat during the time food was served. Moreover, there was no shed above the mid-day meal area which created inconvenience for the children in bright sunny day or in rainy days to eat outside. As the mid-day meal area was a part of the playground surface it did not make a good visual appearance and made it look like a part of the playground. The condition of the mid-day meal area was considered poor according to the data gathered by the designer.

Plate 7: EXISTING MID-DAY MEAL AREA

The playground of the school was not provided with any dustbins or garbage bins which made it difficult for the children to dispose of waste and due to which children tend to throw waste in the playground itself making the playground dirty and visually unappealing.

The school other than the play structure also has a rain water harvesting system for storage of rainwater in the school and reusing it in the time of need rather than allowing it to run off. The rain water harvesting system was built around the corner of the main school building with an above ground storage tank and three underground storage tanks for storing rain water.

Plate 8: RAIN WATER HARVESTING PLANT

There was an entrance gate of 8’-0” of width on the entrance wall of the school. the condition of the gate was poor as it had formation of rust and was also bent from the middle.

Plate 9: EXISTING ENTRANCE GATE OF THE SCHOOL

The designer observed that the school playground had sufficient activity space, storage space and circulation space for performing various activities but was not properly planned according to the needs of the children. The overall ambiance was planned moderately with the help of plants at several areas and common colour of the school building. So, by assessing this section the designer found that the existing status of the outdoor areas of the school was poor in all the exterior components.

4.2. PHASE II: DESCRIPTION OF THE NEEDS AND PREFERENCES OF THE CLIENT'S VIZ; AUTHORITIES OF THE SUN PHARMACEUTICAL INDUSTRIES LIMITED (EXECUTIVE CSR AND THE SCHOOL PRINCIPAL) FOR THE IMPROVEMENT IN THE OUTDOOR AREAS OF THE SCHOOL.

This section deals with the needs and preferences of the client viz; the authorities of the Sun Pharmaceutical Industries Limited (Executive CSR and the school principal) for the improvement in the outdoor areas of the school.

4.2.2 Needs and preferences of the clients for the improvement in the outdoor areas of the school.

In order to design the outdoor areas of the school an interview schedule was developed so as to assess the needs and requirements, likes and dislikes and preferences of the client. The data gathered form the interview schedule revealed that the outdoor playground space was to be redefined and restructured completely based on a colourful theme with bright colours that attracts the children of the school. The client indicated his preference for creating a spacious yet visually appealing look and that would provide adequate space for performing various outdoor activities. He listed various activities that the children would like to be involved in mostly. The client also gave some specific requirements and preferences for various aspects of the outdoor areas of the school. They included:

- **Outdoor play equipment**

The existing school did not have any play equipment for the children so the client indicated his preference for creating a well-designed sand-pit that would accommodate at least 5-8 children at a time. The client also wanted the sand pit to be safe for children. Other recreational play equipment for the children was not needed in the school as the children would tend to spend more time in playing rather than engaging in studying.

- **Teaching material**

The school campus did not have any material to provide information and notice to the children on daily basis. There was a need for a chart or a display board in the outdoor areas of the school where the children can be informed about the daily notice of the school, to display inspirational quotes and messages etc as perceived by the client.

- **Pattern and colour of the boundary wall**

All the boundary walls of the school were of plain cream colour so the client preferred the wall colours to be changed. The walls were preferred to have bright and bold colours which require nil maintenance. The colours were preferred to be plain solid and bright colours such as red, yellow, blue, orange and green. The pattern of the colours to be painted was preferred to be kept simple yet interesting. Other than boundary wall colours the client wanted murals on the wall near to the mid-day meal area. The murals designed for the wall of mid-day meal area needed to be happy and bright for the children. It could have messages in local Gujarati language and could also portray a message to the children. The mural was preferred to have bright colours yet should be calm for the children to sit and eat their meal.

- **Colour of school building**

The client expressed that the colours of the school building seems to be dull and looks monotonous which should be changed to a plain solid light colour. The condition of the colour of the building was relatively good.

- **Storage space**

There was no storage space provided for storing any play equipment, toys and poster and charts in the outdoor area of the school, on which the client preferred not to provide any storage as these items can be kept inside the school premises when not in use.

- **Boundary wall fencing**

The school did not have any fencing on the boundary wall for the safety and protection of the children as the children would jump off the boundary wall as it had a low height, on which the client preferred to have fencing to be provided all over the boundary walls of the school. The client insisted on having barbed wire fencing to be installed on the boundary walls of the school as it was the most reliable fencing for school.

- **Landscaping**

As the school had irregular placement of trees and plants in the outdoor areas of the school, proper placement of plants and trees was to be provided. The client preferred to have creepers in the mid-day meal area, whereas proper shrubs and potted plants were also needed. The surface of the outdoor area of the school was plain and it needed to be changed by adding little grass to the ground. The client also insisted on providing local names of potted plants, trees and shrubs which were suitable according to the climatic condition of the area and the condition of the soil of school.

- **Branding board**

The client gave some specific requirements for the branding board of the school which represented the name of the funding company as well as the name of the school. The branding board was preferred to be designed suitable for marble inscription with the letters to be in golden colour and marble of black colour.

- **Lighting**

The need of lighting in the outdoor areas of the school was nil as the area already comprised of certain light fixtures which were in good condition and need not to be changed.

- **Seating arrangement for children**

The playground of the school did not comprise any seating arrangement for the children, the parapet wall of boundary plants was used by children of the school to sit and socialize during free time. There were some plastic chairs used form the school premises when needed. The client preferred to have seating provided in the campus for the betterment of the children.

- **Infrastructural facilities for activities carried out in the outdoor areas of school**

The school children are involved in a wide range of activities and exploring their environment. Thus, to carry out different activities they tend to initiate their own activity by assessing appropriate materials. The school carried out simple activities which did not necessarily require any infrastructural facilities. The description of different activities carried out in the school are given below:

- *Activity 1:* Sand play

Existing facilities: Unstructured sand pit, small amount of sand and plastic equipment.

Needed facilities: Well-structured sand pit, playing sand.

- *Activity 2:* Cricket

Existing facilities: Bat, ball, wickets.

Needed facilities: Flat and even ground.

These are the two main activities that are played by the children of the school and needs structural facilities, while many activities which are played by the children including hide and seek, catch the culprit and various station games does not require any facilities to be provided.

- **Mid-day meal area**

The existing mid-day meal section of the school was unstructured and not developed at all. The client preferred to have a well-developed mid-day meal area with hard flooring surface. The mid-day meal was preferred to be look separated from the rest of the playground. As the mid-day meal section was out in the playground it required proper shade for protection of children against the temperature and climate. The client insisted in having some interesting and colourful mural with bright colours on the wall facing the mid-day meal area. The mural of the boundary wall also could have messages in local Gujarati language and could also portray a message to the children. The mural was preferred to have bright colours yet should be calm for the children to sit and eat their meal.

4.3 CASE STUDY OF THE SELECTED SCHOOL OF HALOL CITY

This section includes detailed discussion of the case study carried out in the selected school of Halol city with regard to their existing status. The redesigning was done on basis of the given suggestions for improvement. The case study was conducted in the selected school of Halol city with an aim to assess the existing status of the outdoor areas of the school. In this regard assessing the various components of the outdoor areas was considered essential for the research. The components included the surface of the school ground, boundary walls and essential outdoor needs for children.

The total area of the school provided was 2329.11 sq. ft. whereas the total area of the school playground was 994.25 sq. ft. with boundary walls of 5’-6” in height. The unit of inquiry were the authorities of the Sun Pharmaceutical Industries Limited (Executive CSR and the school Principal).

Existing status

The data gathered with the use of observation sheet and interview schedule revealed that the actual colour of the boundary wall of the school was cream (light) and also had patches of white paint on some areas which were damaged. The material of the construction was found to be of brick work with plaster. The texture of the walls was found to be rough and the condition of the walls was poor as it had formation of algae at various places, the plaster of the walls was chipping off, the corners of the walls were broken, it also had dampness all over the wall. The school also did not have any fencing on top of the walls for the safety and protection of the children of the school. A mural was found on one of the boundary walls facing the main school building. The mural was painted of white colour and had blue coloured borders around it, the mural was in moderately poor condition as paint was vanishing off and it also blended with the existing colour of the boundary wall which did not catch attention of the children of the school. The mural depicted the idea of the Swatch Bharat Mission which showed certain points for maintaining personal hygiene and environmental hygiene in a pictorial form with captions in local Gujarati language.

The surface of the outdoor areas of the school was moderately poor as it was uneven and had hard soil surface in some places and loose sand in some places. The surface also had grass developed in some scattered areas which made the surface look visually unappealing. The school also had uneven and unfinished pathway from the entrance of the school to the main school building and left midway without parapet wall or boundary. The placement of the pathway was poor as it did not have any route following towards the various areas of the school. The school ground also had some scattered plantations near the pathway and some trees near the boundary wall. The plantation in the school was not done properly as they were scattered and not arranged in a form. There was relatively less greenery in the outdoor areas of the school which made the area look dull and dry.

The play areas of the school did not comprise of any separate space for performing different play and various developmental activities. The playground only had a small sand pit which was poorly structured and was not developed at all, it also did not have any boundaries for the sand to stay put. The sand pit was just an area with some loose sand. Other than sand-pit there were no other play equipment or separate play space for the children to play and socialize. There was also no provision for any seating arrangements for the children and no dustbins were provided for waste disposal.

The playground also had a mid-day meal area between the pantry of the school and the primary school building wherein the children are offered lunch from the school. The mid-day meal area was not different from the other areas of the school as it was a part of the playground which had the same hard soil surface, no provision for sitting was provided for the children to sit and eat their meals. The condition of the mid-day meal area was considered poor as it was not constructed according to the needs and comfort of the children using it.

Other than the play structure the school also has a rain water harvesting system for storing the rain water and reusing it in the time of need. It was located around the corner of the main school building.

Description of activities carried out in the school playground

The children of the school were involved in a wide range of outdoor play activities like hide and seek, catch the culprit and cricket. The information was gathered from the school principal with the help of interview schedule and observation sheet prepared by the designer. The designer observed that the school playground was visually unappealing and was not functional for the children of the school.

Needs and preference of the outdoor areas of the school as perceived by the School principal.

The school principal expressed that the outdoor areas of the school which were not well developed like school playground including the landscape, school surface area, pathway placement, mid-day meal area and the colours of the walls needed to be

redesigned by the designer keeping in mind the needs and functionality of the area for children.

Conclusion

From the above section the designer concluded that the outdoor areas of the school needed to be re-designed as their existing status was found to be poor in terms of activity planning, landscaping and space development. So, the designer had done a detailed study on the outdoor areas of the school and re-designed the outdoor areas considering the needs and preferences of the client's viz; authorities of the Sun Pharmaceutical Industries Limited (Executive CSR and the school principal) by applying the principles of design.

4.4 PHASE III: DESIGN DEVELOPMENT

The development of these designs was based on the information gathered in the Phase-I of the present research on the infrastructural facilities required for various learning and developmental activities for the school children. The designer found some components of the outdoor areas of the school in poor condition, namely; boundary walls, playground surface, entrance and circulation pathways, mid-day meal area and landscape of the playground. Hence the designer felt a need to re-design the outdoor areas of the school considering the needs and preferences of the client's viz; authorities of the Sun Pharmaceutical Industries Limited (Executive CSR and the School Principal).

The ensuing paragraphs discuss the proposed designs of the outdoor areas of the school with regard to the design concepts followed by discussion on each component of design.

4.4.1 Design concept

The play area of the school is the area where the children engage in more free play and show great self-confidence. It is the area where the overall development of the children takes place. They actively explore the environment around them and it is necessary that the environment contribute in their development. In the present research the designer focused to design an environment which is fascinating for the children but not bright. The designer made an attempt to enhance the experience of the children and incorporated colourful and functional elements to the maximum extent as possible.

1. Boundary wall

- **Existing condition of the surface of the walls**

The present colour of the school boundary wall was light cream colour. The condition of the boundary walls was poor as plaster and paint was chipping off from several places, there was formation of algae on the walls due to the moisture contain during

rainy season, broken construction of the walls and dampness at some places. Moreover, there was no provision of fencing on the top of the boundary wall.

With regard to the boundary wall treatment the designer had three objectives ;(i) to create an interesting area, (ii) to brighten up the space, (iii) to offer a more encouraging impression.

- **Suggestions given by the clients viz; authorities of the Sun Pharmaceutical Industries Limited (Executive CSR and the school principal)**

The clients preferred to have bold, bright and solid colour on the boundary wall which require nil maintenance. The clients also preferred to have a mural on the wall falling behind the mid-day meal area.

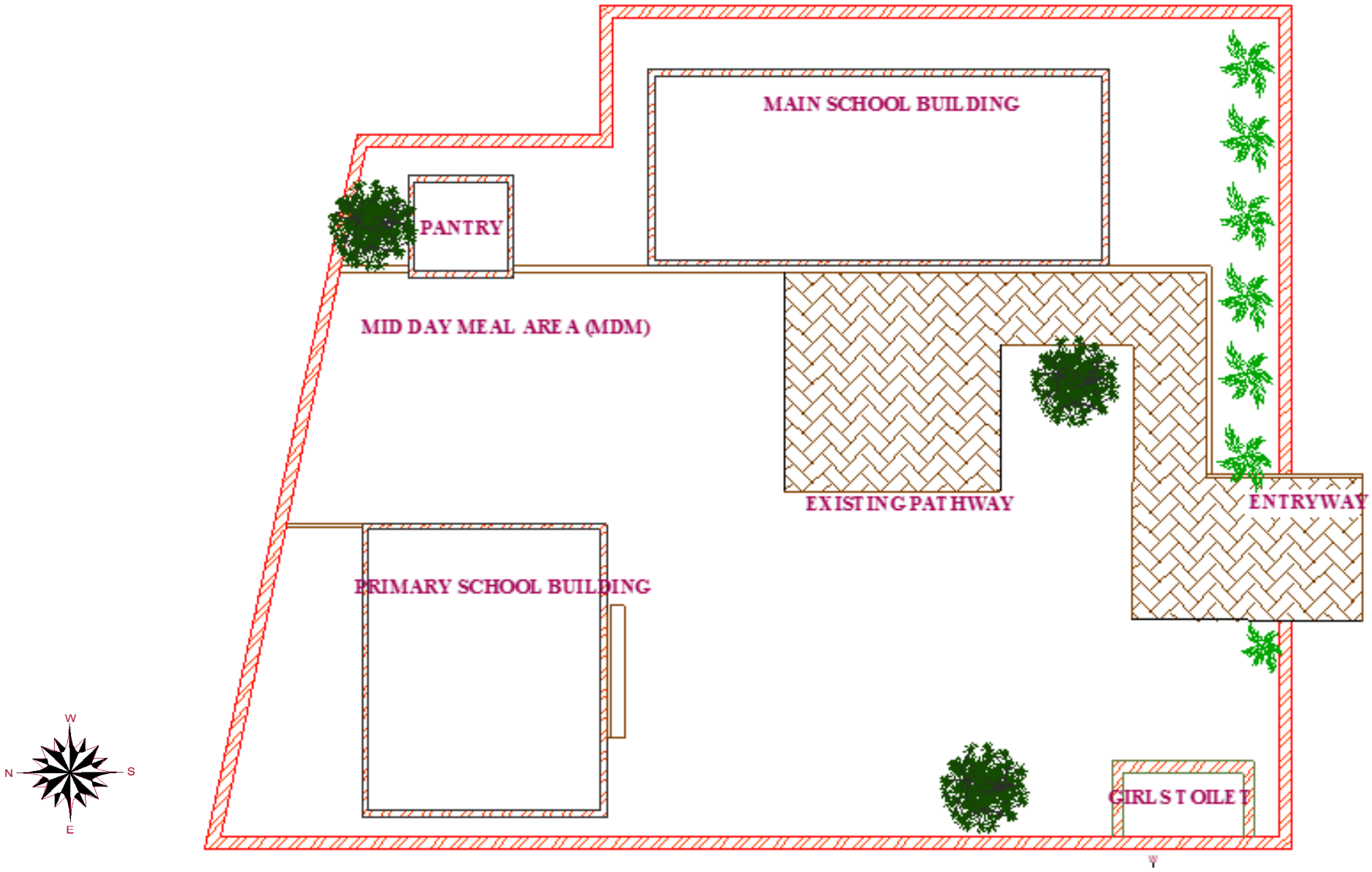


FIGURE 1: EXISTING FLOOR PLAN OF THE SCHOOL

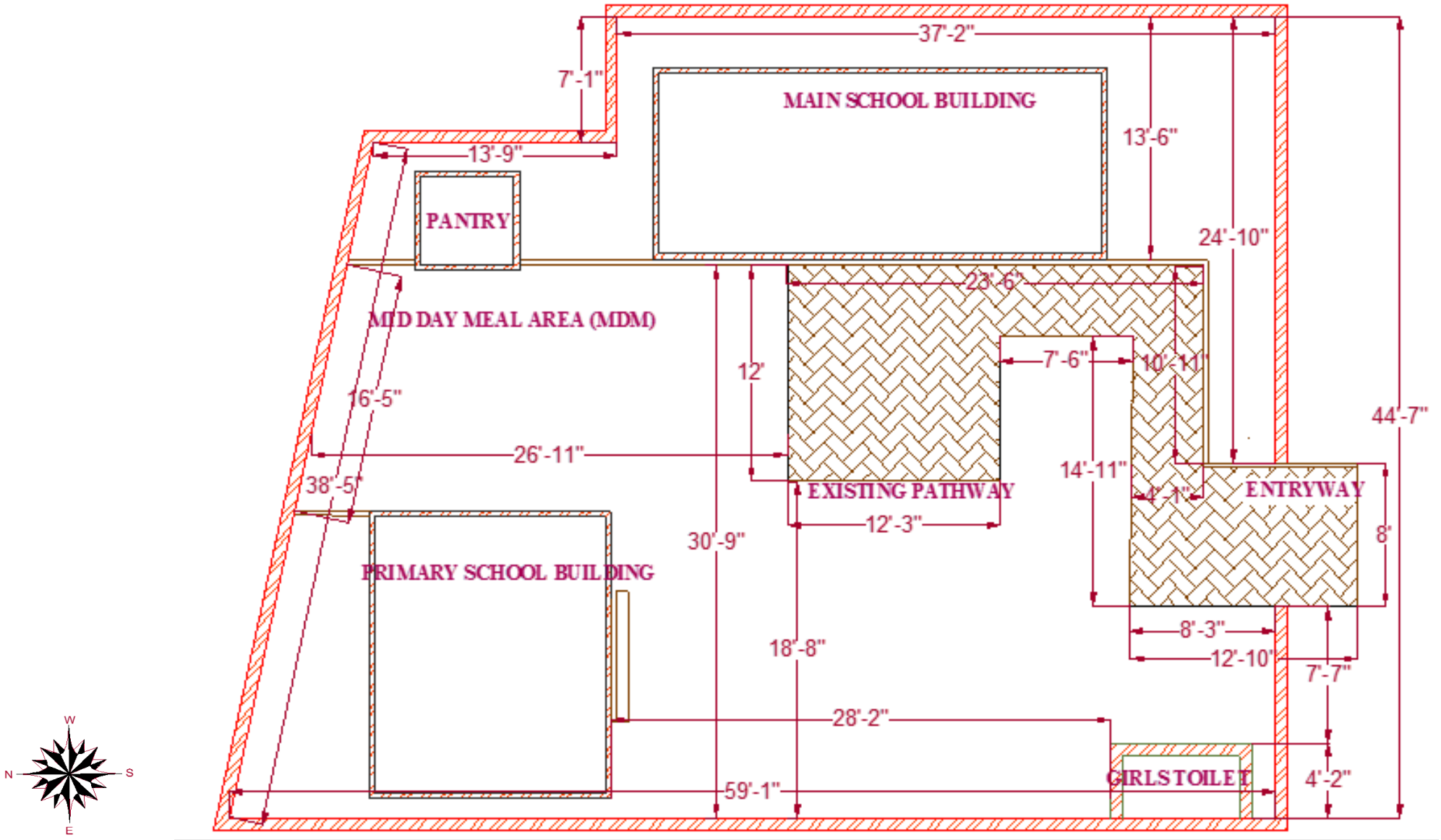


FIGURE 2: WORKING DRAWING OF EXISTING FLOOR PLAN OF THE SCHOOL

- **Suggestions given by the designer**

On the basis of the needs and preferences of the clients there was reapplication of plaster and limewash and coats of waterproof paint on the boundary walls of the school because of its poor condition. There were 3 options provided by the designer according to the preference of the clients.

OPTION I

Wall AB: The total length of the wall was 44'-7" and height of 5'-6". This wall was the entrance wall of the school, it had a wide iron gate of 8'-0" of width. The condition of the gate was poor. The designer suggested an iron gate which was painted with two coats of oil paint which resists to the regular wear and tear. The designer suggested the wall to be plastered and then coated with limewash. The colours which were used to colour the wall were red, yellow, orange and blue. The blue colour was applied on the top 7" all over the boundary length. Red, yellow and orange colours were applied in the form of vertical strips below the blue colour. One strip of colour was painted with the height of 4'-8" and width of 6'-10". The rest 3" from the bottom was left as it would be covered with soil. Between each strip of colour, a cartoon representation of pencil and children were designed. There were 3 cartoon representation suggested by the designer. The cartoons were painted using bright colours which would attract the children and also encourage them to read and write.

Wall BC: The total length of the wall BC was 50'-11" and height of 5'-6". This wall falls behind the main school building and the pantry of the school. The rain water harvesting system of the school was situated beside the main school building. The rain water collected on the terrace was transferred to a tank through a pipe placed on the back side of the school. The designer suggested the wall to be plastered and then coated with limewash. The colours used to colour the wall were red, yellow, orange and blue. The blue colour was applied on the top 7" all over the boundary length. Red, yellow and orange colours were applied in the form of vertical strips below the blue colour. One strip of colour was painted with the height of 4'-8" and width of 6'-10". The rest 3" from the bottom was left as it would be covered with soil. Cartoon representation of pencil and children were not designed on this wall.

Wall CD: The total length of the wall CD was 38'-5" and height of 5'-6". This wall falls behind the mid-day meal area and the primary school building. The colours used to colour the wall were red, yellow, orange and blue. The blue colour was applied on the top 7" all over the boundary length. Red, yellow and orange colours were applied in the form of vertical strips below the blue colour. One strip of colour was painted with the height of 4'-8" and width of 6'-10". The rest 3" from the bottom was left as it would be covered with soil. Cartoon representations were not suggested on this side of the wall. The mid-day meal area of the school was suggested to be re-structured with PEB (Pre-Engineered Building) structure to provide shade for the children. The surface of the mid-day meal area was suggested to be filled with PCC filling with elevated 10" of height and two opening on the sides with two steps of 4" each. A parapet wall of 2'-0"

was suggested around the mid-day meal area excluding the openings for entry and exit.

Wall DA: The total length of the wall DA was 59’-1” and height of 5’-6”. This wall falls behind the outdoor girl’s washroom of the school. The designer suggested the wall to be plastered and then coated with limewash. The colours used to colour the wall were red, yellow, orange and blue. Blue colour was applied on the top 7” on all over the boundary wall. Red, yellow and orange colours were applied in the form of vertical strips below the blue colour. One strip of colour was painted with the height of 4’-8” and width of 6’-10”. The rest 3” from the bottom was left as it would be covered with soil. Three alternatives of cartoon representation were designed in between each colour. The cartoons were suggested to be painted in bright colours which would attract the children to read and write.

OPTION II

Wall AB: The total length of the wall AB was 44’-7”and height of 5’-6”. This wall of the school has an entrance gate of 8’-0” which was founded in poor condition. The designer suggested an iron gate painted with two coats of oil paints which resists regular wear and tear. The designer suggested the walls to be plastered and then coated with limewash. The colours selected in the second option were red, green and blue. The colours were suggested to be applied horizontally one above the other all around the boundary wall with an individual height of 1’-10”. Some musical keys were also suggested to be painted in black colour and randomly arranged on the boundary wall.

Wall BC: The total length of the wall BC was 50’-11” and height of 5’-6”. This part of the wall falls behind the main school building and the school pantry. A rain water harvesting plant was installed on this area of the school beside the main school building. The designer suggested the wall to be plastered and then coated with limewash for smooth finish. The colours used for painting were red, green and blue. The colours were suggested to be applied horizontally one above the other all around the boundary wall with an individual height of 1’-10”. The musical keys were suggested not to be painted on this side of the wall.

Wall CD: The total length of the wall CD was 38’-5” and height of 5’-6”. This wall falls behind the mid-day meal area of the school and the primary school building. The mid-day meal area of the school was suggested to be re-structured with PEB (Pre-Engineered Building) structure to provide shade for the children. The surface of the mid-day meal area was suggested to be filled with PCC filling with elevated 10” of height and two opening on the sides with two steps of 4” each. A parapet wall of 2’-0” was suggested around the mid-day meal area excluding the openings for entry and exit. The walls were suggested to be plastered and coated with limewash. The colours used were red, green and blue. Horizontal pattern was suggested for painting where colours were applied one after the another with an individual height of 1’-10”. The musical keys were suggested not to be painted on this side of the wall.

Wall DA: The total length of the wall DA was 59’-1” and height of 5’-6”. This side of the wall falls behind the outdoor girl’s washroom of the school. The designer suggested the wall to be plastered and then coated with limewash. The colours suggested for the walls were red, green and blue. The colours were painted in a horizontal pattern one above the other all around the boundary wall with an individual height of 1’-10”. Musical keys were suggested on this side of the wall.

OPTION III

Wall AB: The total length of the wall AB was 44’-7” and height of 5’-6”. The entrance gate of 8’-0” of the school falls on this side of the wall, the condition of the gate was found to be poor. The designer suggested and iron gate with two coats of oil paints for the entrance gate of the school. The boundary wall of the school was suggested to be plastered and then coated with primer for smooth finish. The colour suggested for painting this side of the wall was grey colour.

Wall BC: The total length of the wall BC was 50’-11” and height of 5’-6”. This side of the wall falls behind the main school building and the pantry of the school. A rain water harvesting plant was installed on this side of the wall beside the main school building. The wall was suggested to be plastered and then coated with limewash for a smooth finish. The colour suggested for this wall was grey.

Wall CD: The length of the wall CD was 38’-5” and height of 5’-6”. This side of the wall falls behind the mid-day meal area of the school and the primary school building. The mid-day meal area of the school was suggested to be re-structured with PEB (Pre-Engineered Building) structure to provide shade for the children. The surface of the mid-day meal area was suggested to be filled with PCC filling with elevated 10” of height and two opening on the sides with two steps of 4” each. A parapet wall of 2’-0” was suggested around the mid-day meal area excluding the openings for entry and exit. The wall was suggested to be plastered and coated with limewash. The colour suggested to be painted in grey colour.

Wall DA: The length of the wall DA was 59’-1” and height of 5’-6”. Wall DA falls behind the outdoor girl’s washroom of the school. The wall was suggested to be plastered and then coated with limewash. This side of the wall was suggested to be emphasized from the rest of the walls. The colours chosen would make the outdoor area look bright and fresh. Red, yellow and blue colours were chosen for painting the wall and were applied vertically one after the another with the height of 5’-6” and individual width of 1’-10”. Black colour was suggested to be applied from the top with 3’-0” of height and 1’-6” of width and with 6” of space between two set of black colours. The colours were applied in such a pattern that it depicted a piano instrument.

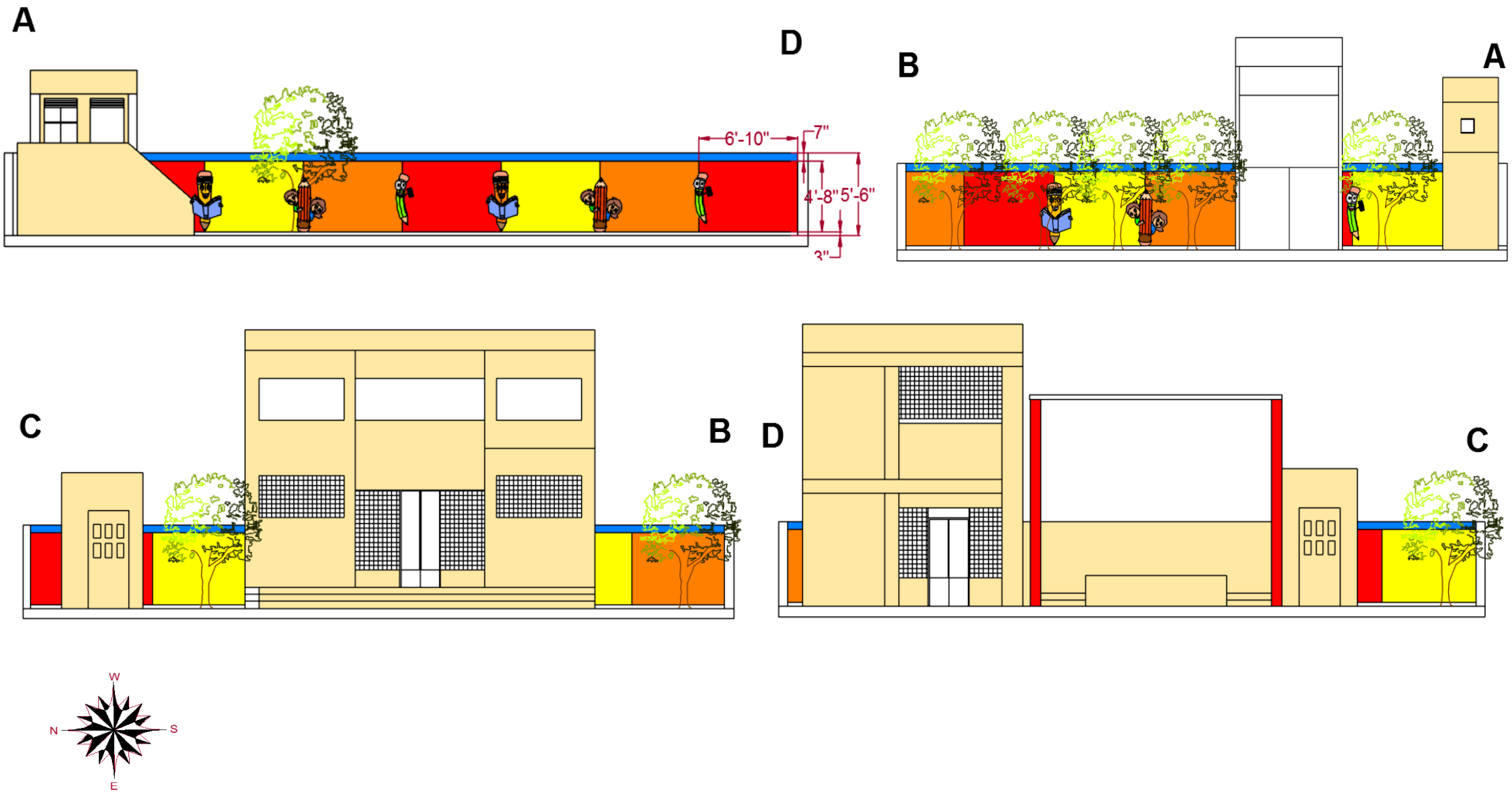


FIGURE 3: PROPOSED BOUNDARY WALL OPTION-I

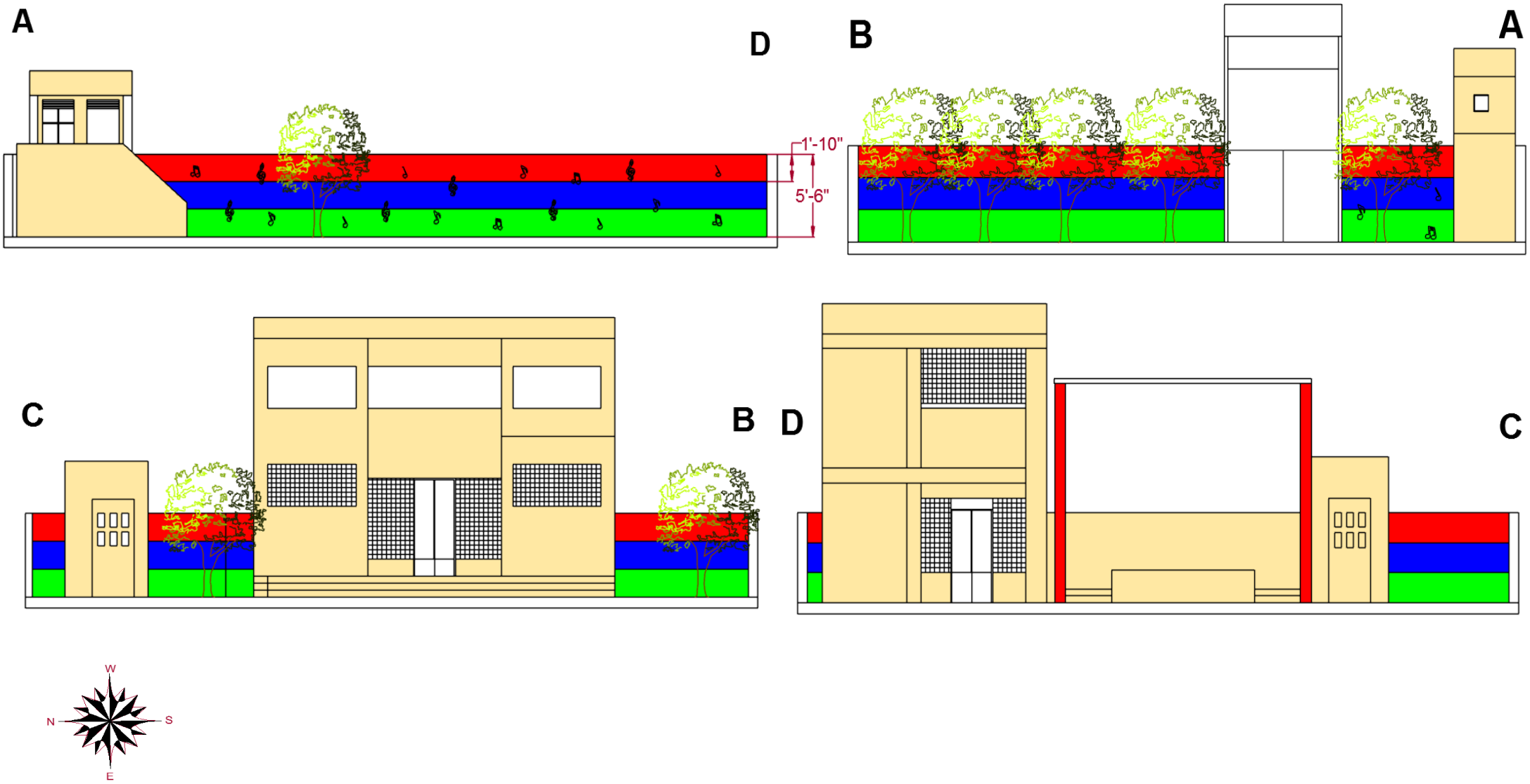


FIGURE 4: PROPOSED BOUNDARY WALL OPTION-II

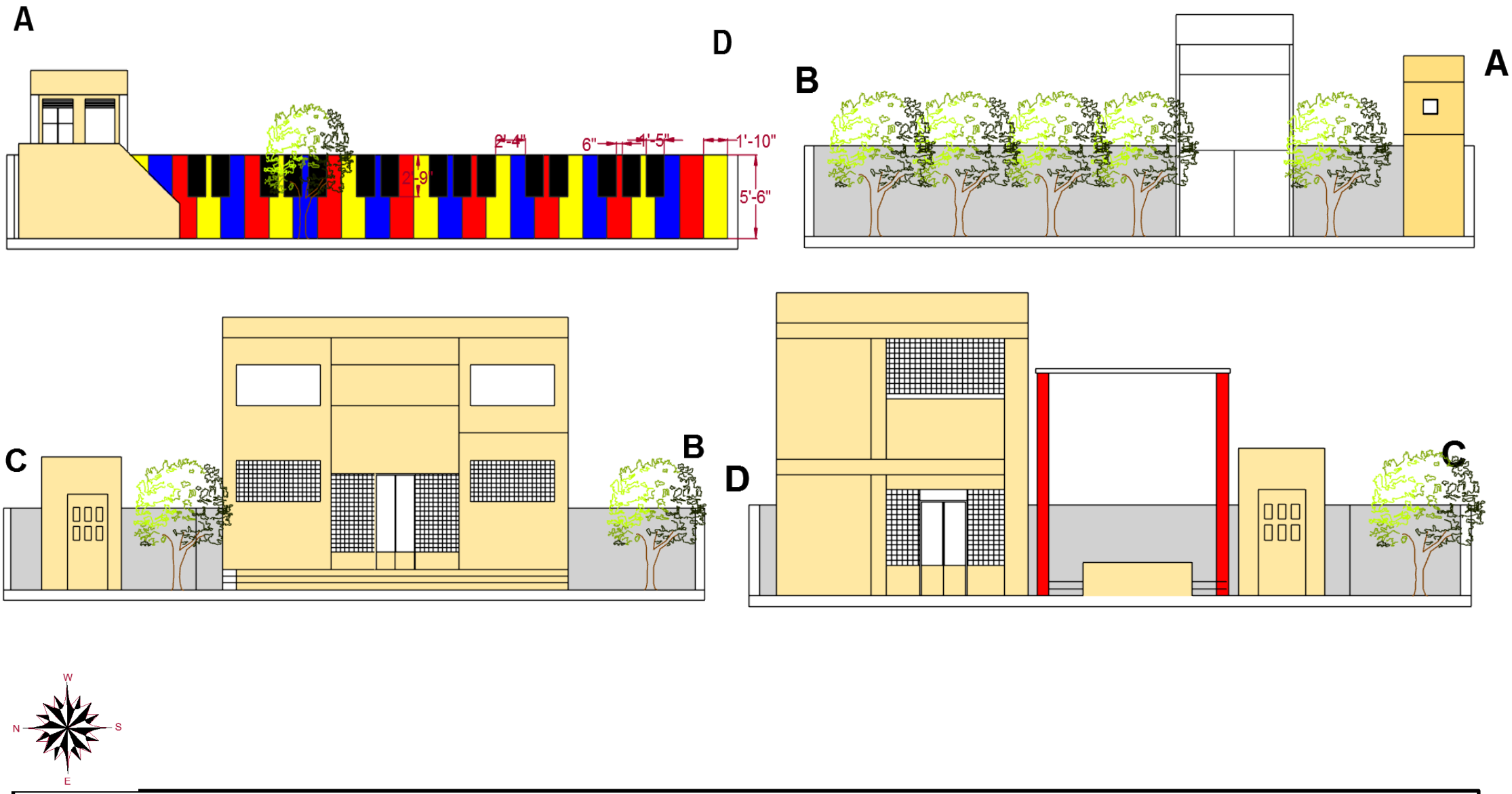


FIGURE 5: PROPOSED BOUNDARY WALL OPTION-III

Along with the painting on the boundary walls the designer suggested to include a concertina wire fencing running all over the boundary wall of the school. Providing a fencing on the outer walls of the school reduces the risk of any disruptions in the school by the children and it also increases the safety of the children.

2. Playground surface

- **Existing condition of the playground surface**

The surface of the playground was uneven having hard sandy soil with rocks and scattered long grass in some of the area making the surface look visually unappealing. The surface was also covered with uneven and unfinished pathway made with red and cream coloured paver blocks. The pathway was laid inappropriately and did not have a sense of flow. There were plants planted in the outdoor areas of the school which were not placed properly and made the area look less interesting.

- **Suggestions given by the clients viz; authorities of the Sun Pharmaceutical Industries Limited (Executive CSR and the school principal)**

The client's suggested to increase the landscaping of the ground by including grass whether natural or artificial, incorporating nature by adding plants and trees suitable with the climate of the area. The client also insisted on making the pathway more functional and well-placed which leads to the various outdoor areas of the school without any extra effort.

- **Suggestions given by the designer**

From the preferences given by the client's (authorities of the Sun Pharmaceutical Industries Limited (Executive CSR and the school principal) the designer suggested two options which included the placement of the pathway, placement of trees and plants and overall landscape of the outdoor area of the school. The designer designed the pathway and entrance of the school that was inviting, familiar and child friendly. To maximize the space the designer thought essential that the circulation between entrance and the outdoor areas of the school should be as direct as possible. The pathway of the school was planned in such a way that it provided access to the primary school building and direct access was made possible to the play areas and mid-day meal area. Moreover, the designer planned a well-organized space with open pathways that lead to different spaces of the school and they can move freely from one place to another. The designer also incorporated natural elements to the maximum extent possible and also found essential to plan the outdoor areas of the school with a variety of spaces to support various activities of the children.

OPTION I: Keeping in mind the preference of the client's (authorities of the Sun Pharmaceutical Industries Limited (Executive CSR and the school Principal) the designer suggested that the surface soil should be reshuffled and should be set evenly in the ground. The placement of the pathway was suggested in such a way that the

existing pathway from the entrance to the corner of the main school building was to be remained the same and it would be extended to the primary school building in the same form. The shape of the pathway in front of the main school building was extended in the shape of an arc with the length of 8’-4” from the midpoint. The arc shape of the pathway also acted as the entryway to the playground. Parapet wall on the border of the pathway was suggested with 2’-0” in height and 9” wide as it would help the paver blocks to stay put. On the outer area of the parapet wall which faced the play area of the school, the designer added half-cut tyres with the support of thick wood sticks on the height of 1’-0” from the bottom. The tyres were suggested to be planted in solid bright colours as red, yellow, blue and green which would also complement the colours of the boundary wall. Plantation of button roses was suggested inside the half-cut tyre which would enhance the look and would give a colourful appearance to the parapet wall as well as to the play area of the school. The tyres suggested would be reused from scrape.

Near both opposite parapet wall natural grass was suggested with the same length as covered by the parapet wall and would be 3’-8” in width. Full tyres were placed around the borders of the grass to separate the playground surface and the grass surface. The tyres placed could also be used as balancing equipment by the children as well as to sit on while in play. Along with that, natural grass was also suggested near the rain water harvesting plant to add more greenery to the area. The design established a particularly child-oriented environment which was considered safe and developing learning environment for the children.

For the trees in the outdoor area, Mahua / Mahwah / Madhuka was suggested as it is a fast-growing tree and is suitable for warm and humid region. The tree also grows best in sandy soil which is suitable for the outdoor areas of the school.

For boundary plant of the school which would be planted along the boundary wall of the school, red-tipped photinia was suggested as it grows on its own with minimum maintenance and also adds colour to the outdoor area of the school. The plant only needs trimming to maintain its shape and evenness all-round the coverage area.

Plate 10: PROPOSED PAVER BLOCKS FOR THE PATHWAY [29]

Plate 11: PROPOSED TYRE PARTITION AROUND THE PATHWAY [30]

Plate 12: PROPOSED HALF TYRES ON PARAPET WALL OF PATHWAY [31]

Option II: The designer suggested the surface soil should be reshuffled and should be set evenly in the ground. The placement of the pathway was suggested in such a way that it was turned to an angle near the corner of the main school building or near the rain water harvesting plant. The rest of the pathway placement was kept same as the first option. Concreting was done on the borders and tyres cut in half were placed on all around the pathway instead of building a parapet wall. The tyres placed near

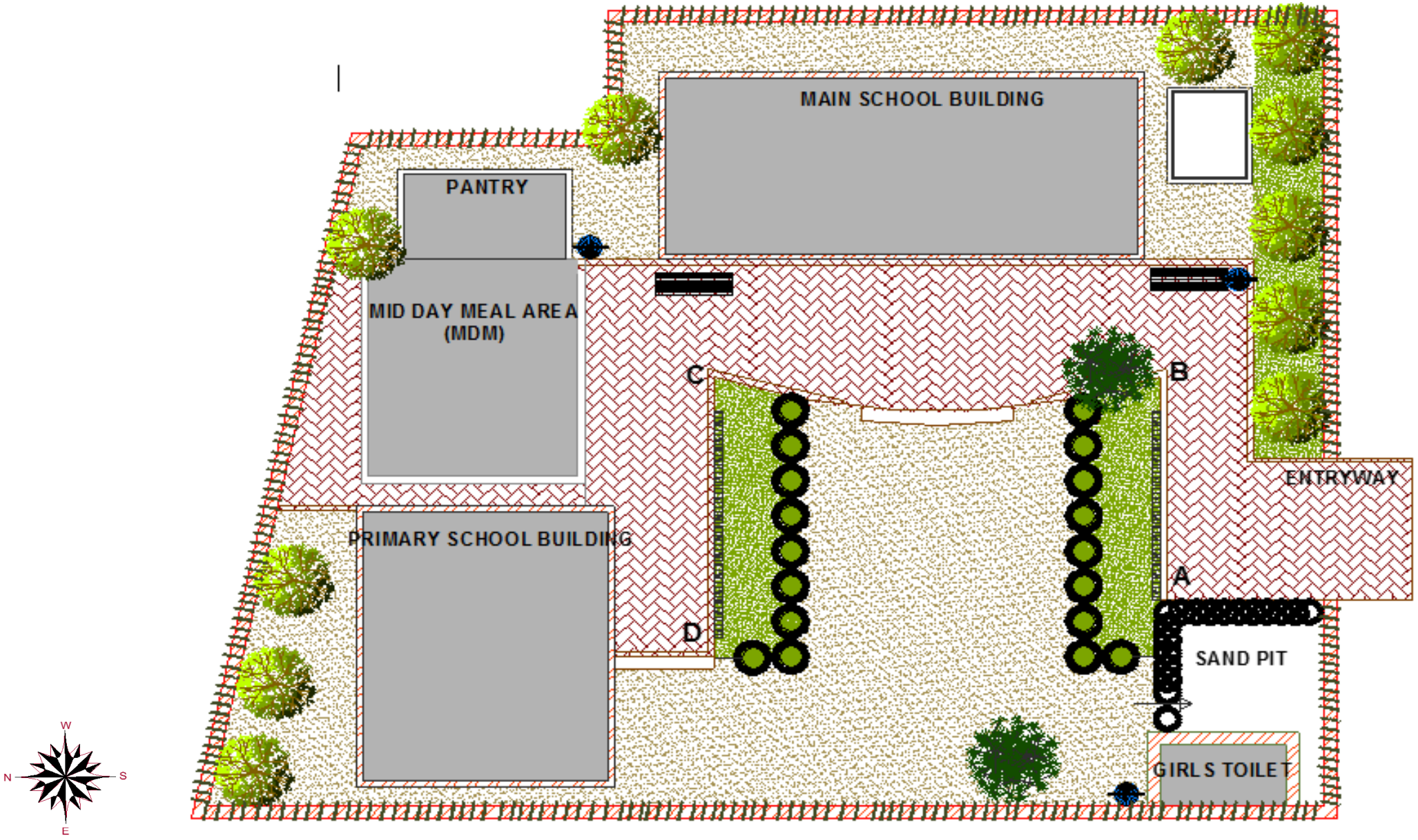
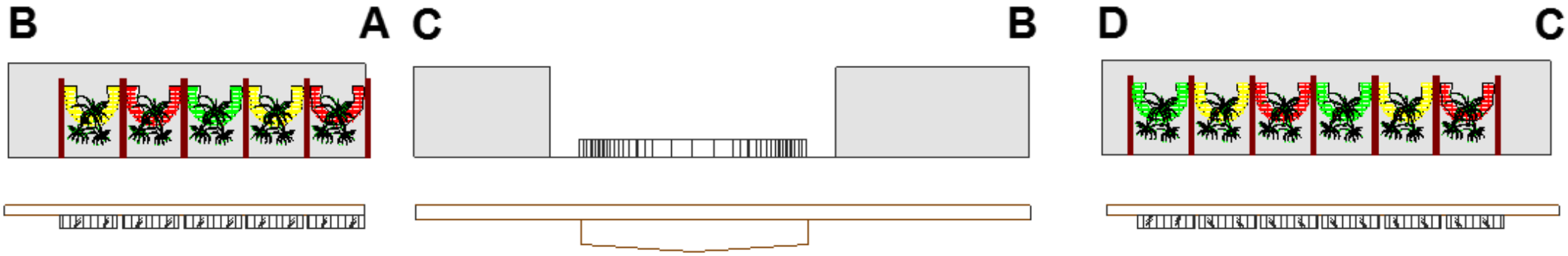


FIGURE 6: PROPOSED LANDSCAPE AND PATHWAY DESIGN OPTION-1



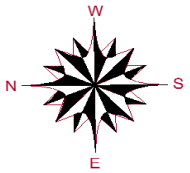


FIGURE 7: PROPOSED PARAPET WALL DESIGN

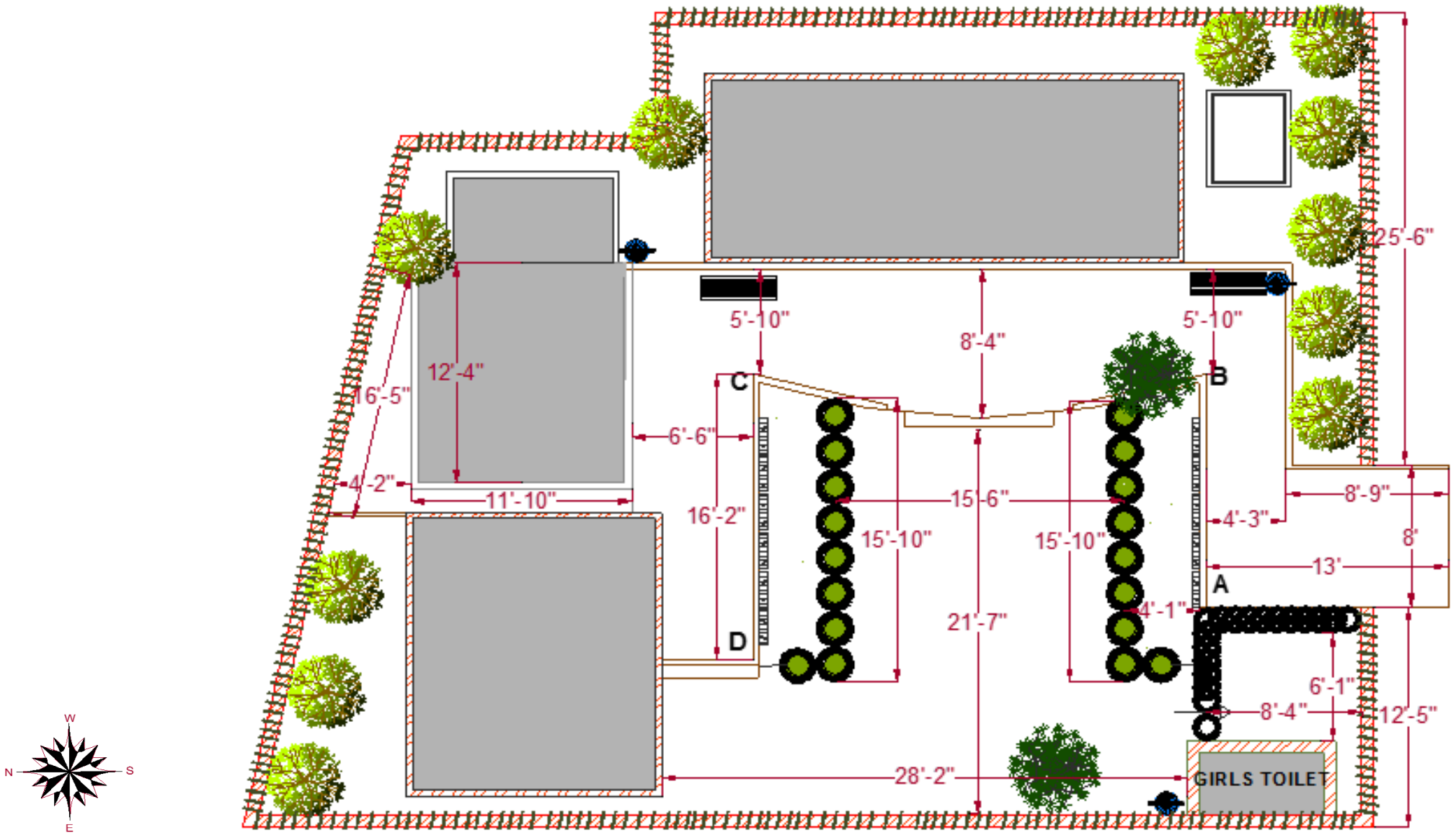


FIGURE 8: WORKING DRAWING OF PROPOSE LANDSCAPE AND PATHWAY DESIGN OPTION-I

the edges can also be utilized as seating for the children. Each tyre was suggested to be coloured in red, yellow, blue and green which emphasizes the look and placement of the tyre in the pathway, as well as the bright colour on the tyre would lighten up the space in terms of colours of the boundary wall and overall accessories. The concreting borders of the pathway was suggested to be coloured in blue colour. The main aim of decorating the area with tyre was to reuse the waste materials available at a very low cost with low installation cost and low maintenance cost as well. The design established a distinctly child-oriented environment which was considered safe and nurturing learning environment for the children.

Moreover, shrubs were planted near the border of the pathway behind each tyre. In the middle of the playground surface grass was laid in a circular shape area with 7’-0” of diameter and tyre boundary around it to separate the green space from the rest of the playground. The purpose of adding an element of natural grass in the middle of the play area was to enhance the outdoor area and to add greenery to the area.

For the trees in the outdoor area, Mahua / Mahwah / Madhuka was suggested as is a fast-growing tree and is suitable for warm and humid region. The tree also grows best in sandy soil which is suitable for the outdoor areas of the school.

For boundary plant of the school, red-tipped photinia was suggested as it grows on its own with minimum maintenance and also adds colour to the outdoor area of the school. This plant would be planted near the boundary wall in the boundary provided. The plant only needs trimming to maintain its shape and evenness all-round the coverage area.

While ferns were suggested as shrub to be planted behind the tyre of the pathway border of the playground surface.

Along with plants in the pathway border, the designer also suggested to place bricks along the pathway edges. Adding bricks along the pathway gives a good visual appearance. The placement of the bricks was placed diagonal one before the other in a line. The brick work along the border is not overstimulating or flashy but gives a decent look to the viewer and is also a cost-effective method for decorating the area. The bricks were suggested to be placed along every border of the outdoor area of the school such as along the pathway edges, along the boundary wall to separate the surface and grass area, near the water harvesting plant and around the sand-pit area as well.

Plate 13 PROPOSED MAHUA / MAHWAH / MADHUKA TREE FOR THE OUTDOOR AREA OF THE SCHOOL

Plate 14: PROPOSED RED-TIPPED PHOTINIA FOR BOUNDARY PLANTS

Plate 15: PROPOSED BUTTON / CHINESE ROSES

Plate 16: PROPOSED DIAGONAL BRICK EDGING

Plate 17: PROPOSED TYRES FOR PATHWAY EDGING [32]

3. Outdoor area and play area of the school

- **Existing condition of the outdoor area and play area of the school**

The existing play area had a small sand-pit area with no boundaries and proper sand. The school did not have proper provision for the seating of the children as well as it did not have any dustbins around the campus. The mid-day meal area of the school was poorly structured without any shade on top and without any proper surface for the children to sit and have lunch. The outdoor area of the school had sufficient circulation space for performing different free play activities.

- **Suggestions given by the clients viz; authorities of the Sun Pharmaceutical Industries Limited (Executive CSR and the school principal)**

The client's (authorities of the Sun Pharmaceutical Industries Limited (Executive CSR and the school Principal) preferred to have a proper sand-pit suitable for children of the school structured with reusable materials. Provision of seating and dustbins was needed in the outdoor area of the school. As well as the structure of the mid-day meal area

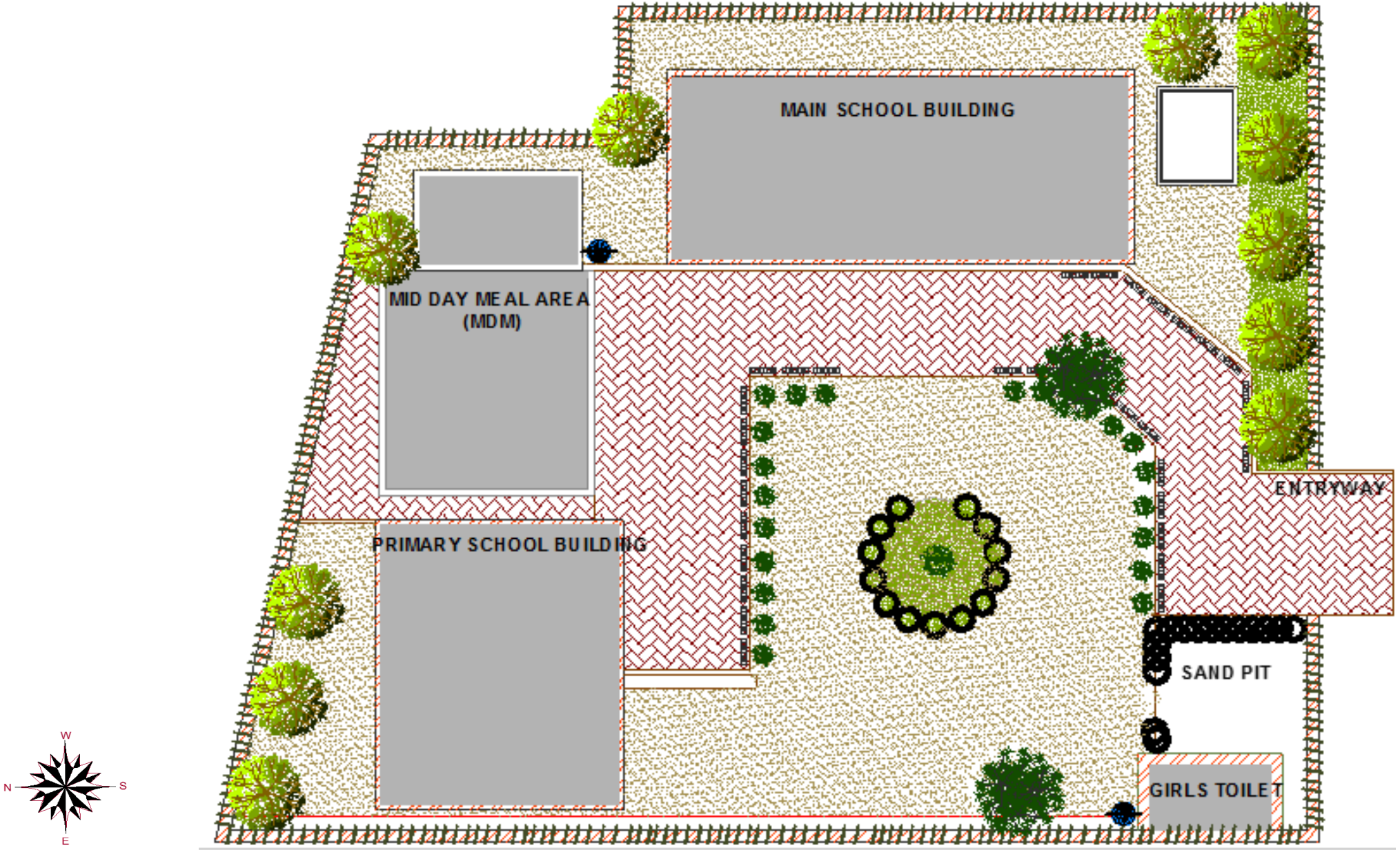


FIGURE 9: PROPOSED LANDSCAPE AND PATHWAY DESIGN OPTION-II

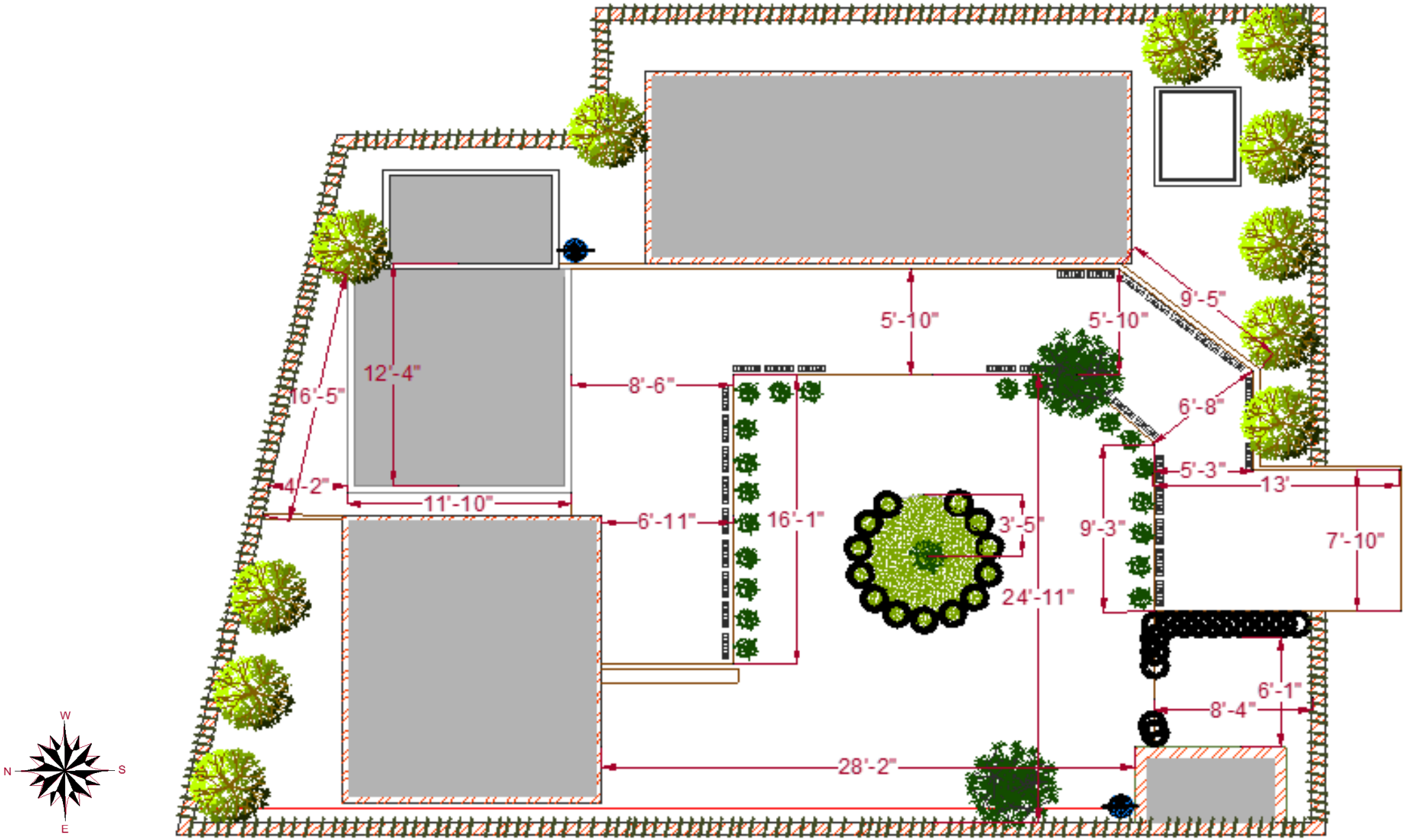


FIGURE 10: WORKING DRAWING OF PROPOSED LANDSCAPE DESIGN OPTION-II

needed to be changed and made more attractive and should be seen different from the rest of the playground.

- **Suggestions given by the designer**

The designer suggested the changes to provide a safe and nurturing learning environment for the children. An environment that attests to a high level of commitment in providing appropriate, well-thought-out and beautiful environment for the children. The outdoor areas were designed keeping in mind the sensitivity of a child's scale, including how they will use and experience the space provided.

As per the preference of the client's (authorities of the Sun Pharmaceutical Industries Limited (Executive CSR and the school Principal) the designer provided a sand-pit between the main entrance of the school and girls toilet. The sand-pit was suggested with the length of 6'-3" and 8'-3" of width. The boundary of the sand-pit area was made with the use of tyres, two layers of tyres were placed one on the other near the boundary of the sand-pit area and an entrance of 1'-10" width was provided for the entry and exit of the children. The sand-pit area was to be filled with loose small sand without any dirt or hard substance.

As for the seating, benches were provided near the school building and the tyres which were laid in the pathway border could also be utilized as seating by the children. Dustbins were also placed at several intervals in the outdoor areas of the school for the children to throw waste.

For the outdoor mid-day meal area of the school the designer suggested that the surface of the mid-day meal area should be made with asphalt concrete. As hard concrete surface will not be damaged with regular wear and tear and would also provide stiff seating for the children to sit and have their meal during the day. The concrete surface would be supported with a parapet wall of 2'-0" height and width of 9". The mid-day meal area will have two opening of 3'-0" of width on the corners of the front part of the parapet wall, one opening to be used as entry and other to be used as exit from the mid-day meal area. A PEB (Pre-Engineered Building) shed was suggested by the designer over the mid-day meal area with structured metal column fixing which would provide shelter to the children during their meal. The shed would provide shelter from heat, dust, rain and cold to the children of the school. The surface of the mid-day meal where children would sit and was elevated by 10" in height from the ground level and two steps of 5" each were provided to access the mid-day meal area. The mid-day meal area developed will be attached with the existing pantry of the school to minimize efforts in delivering food to the children. For washing hands after meal large basin area with 4 taps was already provided behind the pantry area. The surface level of the pantry and the suggested mid-day meal area will be equal. The parapet walls of the mid-day meal area were suggested to be coloured in same colour as the colour of the school which is light cream colour.

For the wall behind the mid-day meal area, murals were suggested by the designer. The murals were developed with a width of 16’-5” and a height of 5’-0”. There were 4 options provided by the designer for the development of the wall facing the mid-day meal area.

Option I: For the area to look bright and cheerful enough the designer designed a colourful mural. The mural covered the wall area of 16’-5” of width and 5’-0” of height. The mural represented a message for the children to go to school and learn by designing a school building with exposed brick walls, many windows, a door and a clock at the top of the school building. Images of children from primary, secondary and higher secondary school sections were designed with uniforms to motivate the children to go to school. The mural also depicted a rainbow with 7 colours and images of books of yellow and red colours flying in the sky were shown. The background of the mural was kept light blue as the colour of the sky. A slogan in the local Gujarati language (Vidhya Vinay Thi Shobhe Che) was designed on the wall in solid black colour.

Plate 18: IMAGES COLLECTED FOR DESIGNING WALLS OF MID-DAY MEAL AREA-1

FIGURE 11: PROPOSED WALL DESIGN BEHIND MID-DAY MEAL AREA OPTION-I

Option II: Another option provided by the designer was with an idea of making the surrounding clean. The mural covered the width on 16'-5" and height of 5'-0" of the wall facing the mid-day meal area. The mural depicted a family of 5 with various cleaning equipment and a board which had a saying in the local Gujarati language (Swatchta no Deep Pragtaviye Gandki ne Bhagaviye) and coloured in solid black colour which could be visible from a distance and clearly readable by the children of the school. Along with that two other school children were shown throwing waste in the dustbin for making the surrounding clean and tidy. The background of the mural was kept of a light-yellow colour and it also had grassland of lavish green colour. Scattered clouds of blue colour were painted in the clear sky.

Plate 19: IMAGE COLLECTED FOR DESIGNING WALL OF MID-DAY MEAL AREA-2

Option III: Another alternative designed for the wall facing the mid-day meal area of the school was designed with 16'-5" of width and covering 5'-0" of height. This alternative was designed with more of calm and subtle colours and it had a pictorial representation of 4 seasons that occur every year. The image in the middle represented a large tree which was equally divided into 4 parts; the first part presented the winter season and was portrayed by snowflakes and a snow-man at the bottom, the second part presented the autumn season which was portrayed by the orange-red leaves falling form the tree, a fox sitting near the tree and the yellow-green grass. The third part presented the spring season and was portrayed by the colourful flowers at the bottom and on the tree as well, butterflies flying around the flowers and bright green colour of the grass and lively leaves of the tree. The fourth part of the mural presented summer season which was portrayed by a bright shining sun in the sky, a kite flying in the sky and a river flowing down the hill. Along with the seasonal image the logo of mid-day meal by the government was designed on the left side of the wall with solid black, orange and dark blue colour and the logo of Sun Pharmaceutical Industries was designed on the right side of the wall with solid black colour. The background of the logo wall was kept of blue in colour.

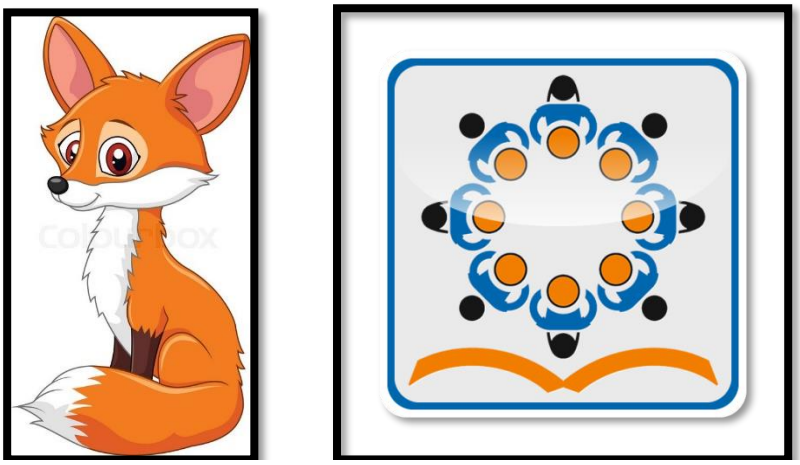


Plate 20: IMAGES COLLECTED FOR DESIGNING THE WALL OF MID-DAY MEAL AREA-3

Option IV: The fourth option designed by the designer for the wall behind the mid-day meal area with a height of 5'-0" and width of 16'-5" was with the motive to stay fit and happy. The design portrayed the silhouette of the steps of Suryanamaskar in a circle of yellow colour. Some musical keys were designed around the wall background. The colour of the background of the wall was suggested in orange colour which keeps the mind calm. Along with that a scenery of a cartoon character with rainbow, clouds, flowers, birds and grass mountains was designed. The colours chosen for the scenery were cool and subtle. Along with the steps of suryanamaskar and the scenery, a logo the Sun Pharmaceutical Industries was designed on the right side of the wall with solid black colour. The background of the logo wall was kept of the same orange colour.

Plate 21: IMAGE COLLECTED FOR DESIGNING THE WALL OF MID-DAY MEAL AREA-4

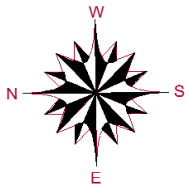
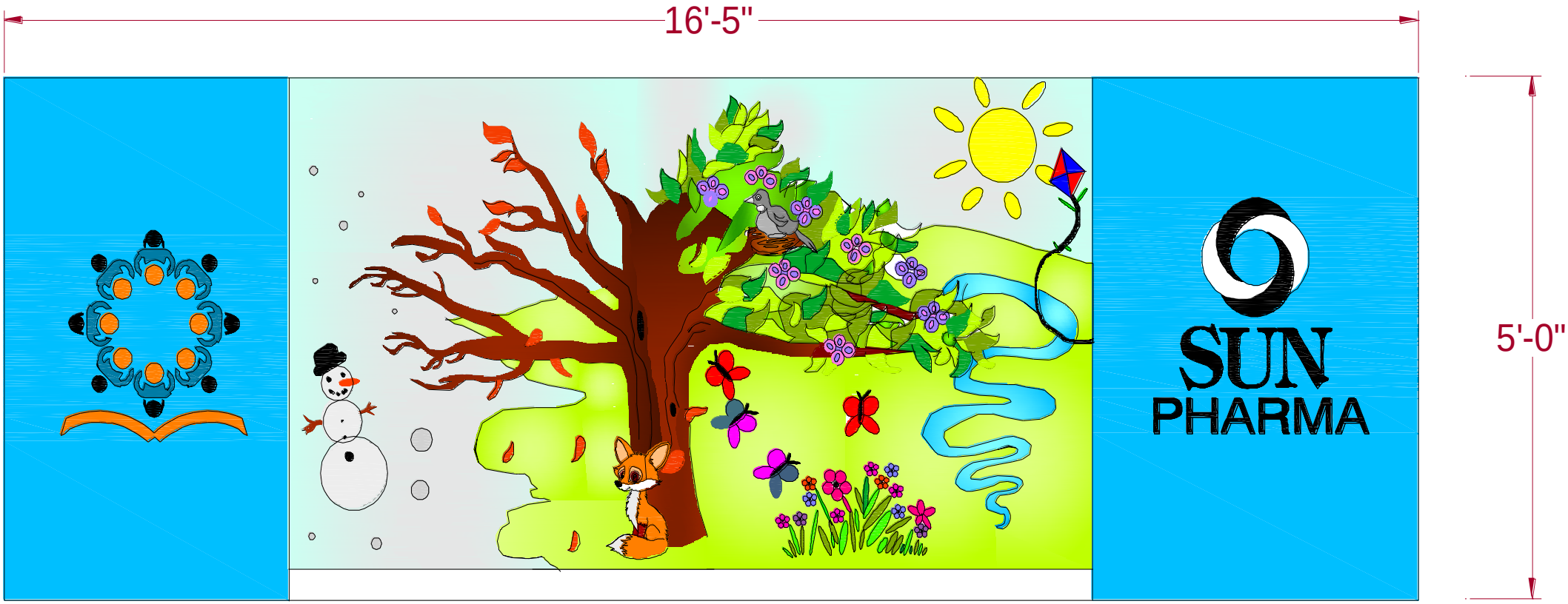


FIGURE 12: PROPOSED WALL DESIGN BEHIND MID-DAY MEAL AREA OPTION-II



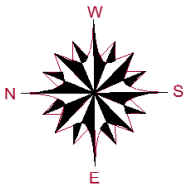


FIGURE 13: PROPOSED WALL DESIGN BEHIND MID-DAY MEAL AREA OPTION-III

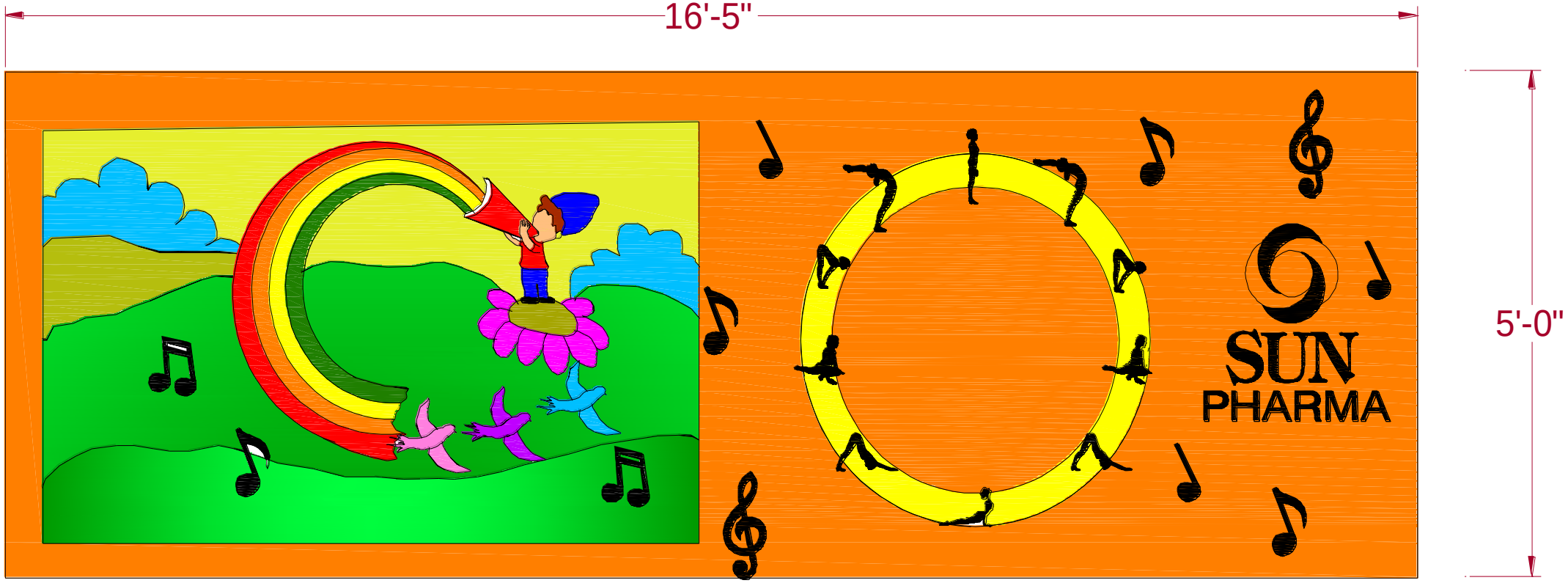
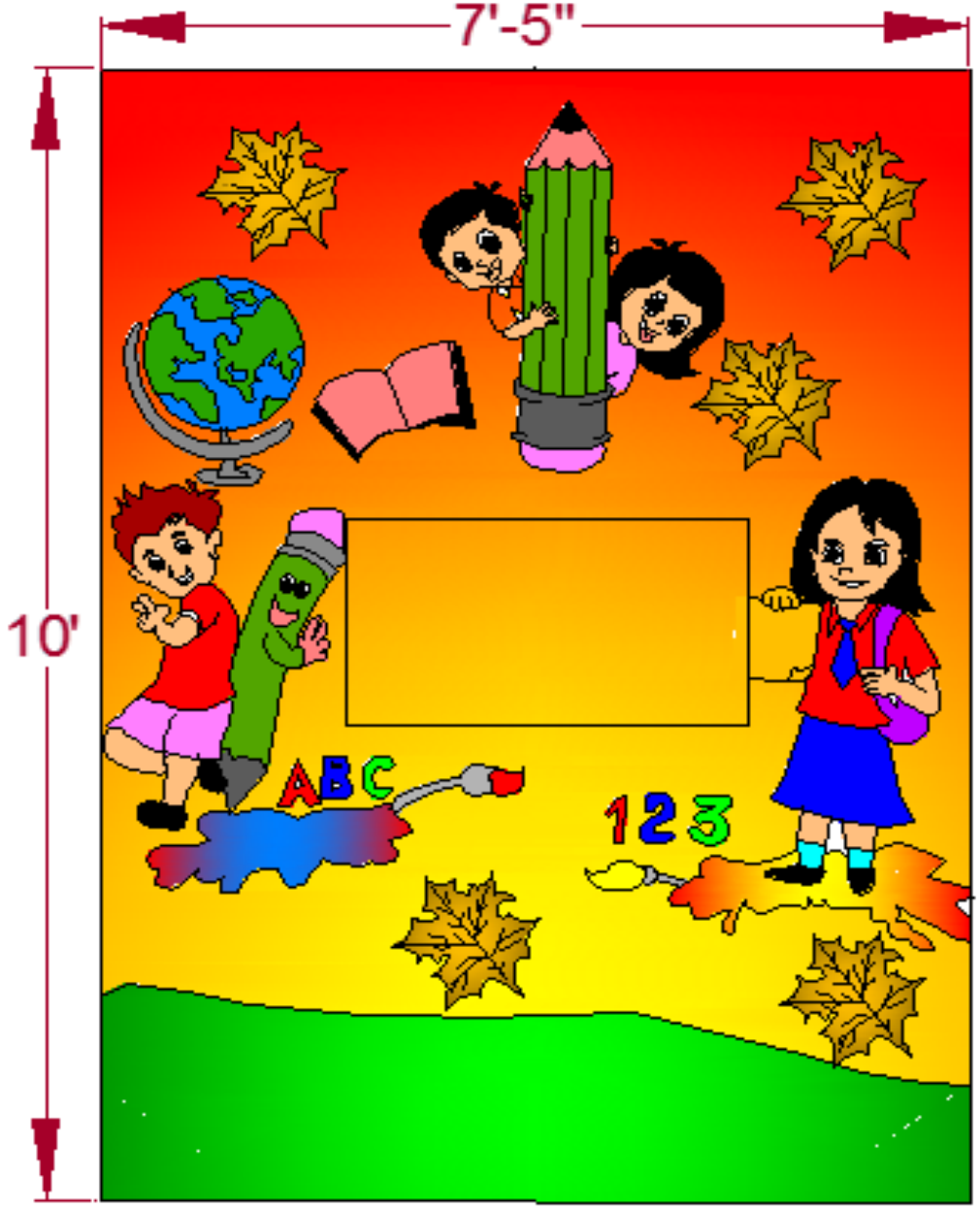


FIGURE 14: PROPOSED WALL DESIGN BEHIND MID-DAY MEAL AREA OPTION-IV



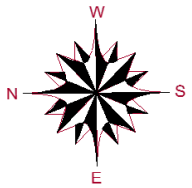
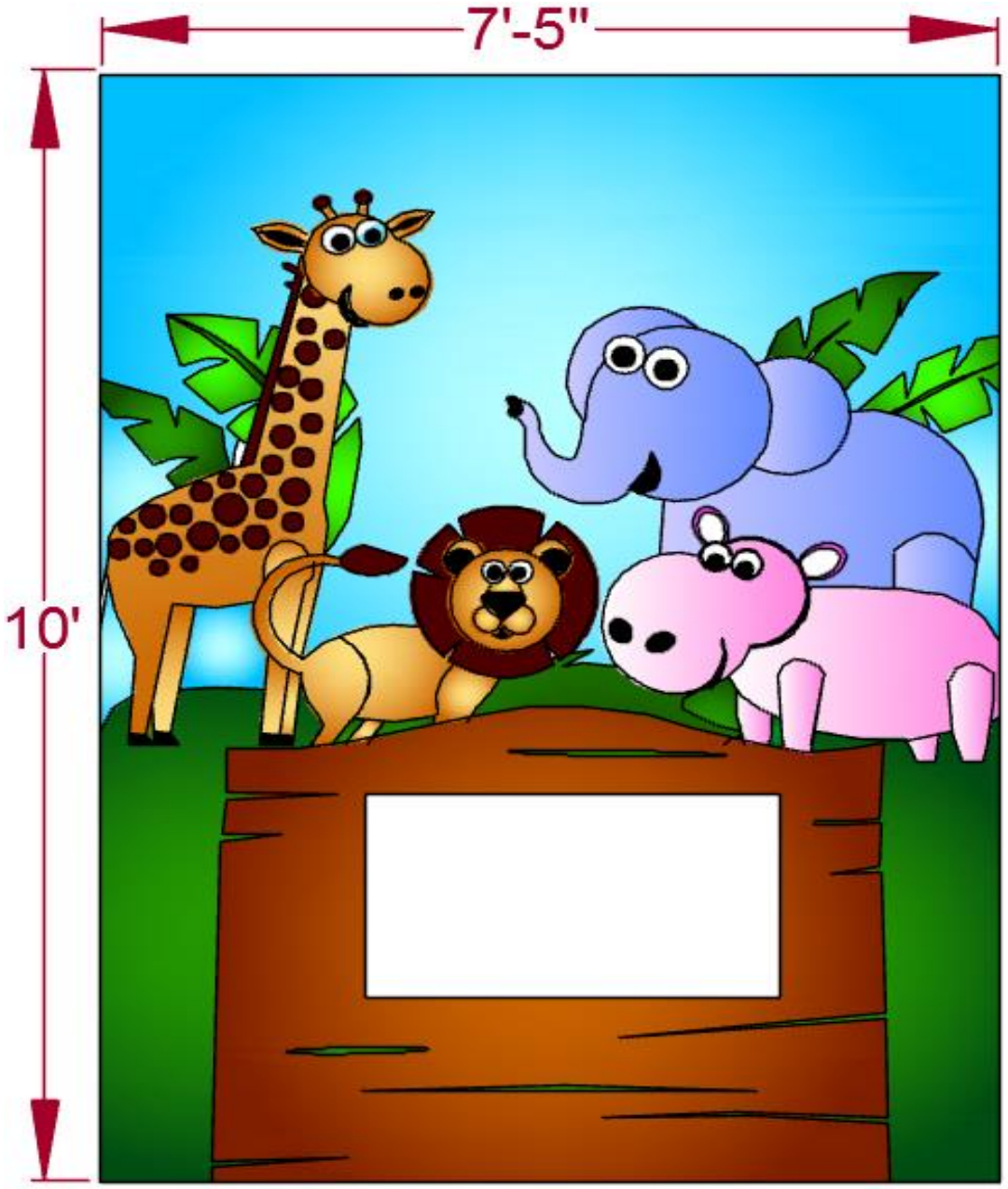


FIGURE 15: PROPOSED WALL DESIGN FOR PLACEMENT OF BRANDING BOARD-I



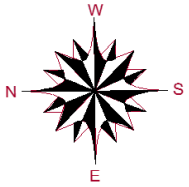


FIGURE 16: PROPOSED WALL DESIGN FOR PLACEMENT OF BRANDING BOARD-II

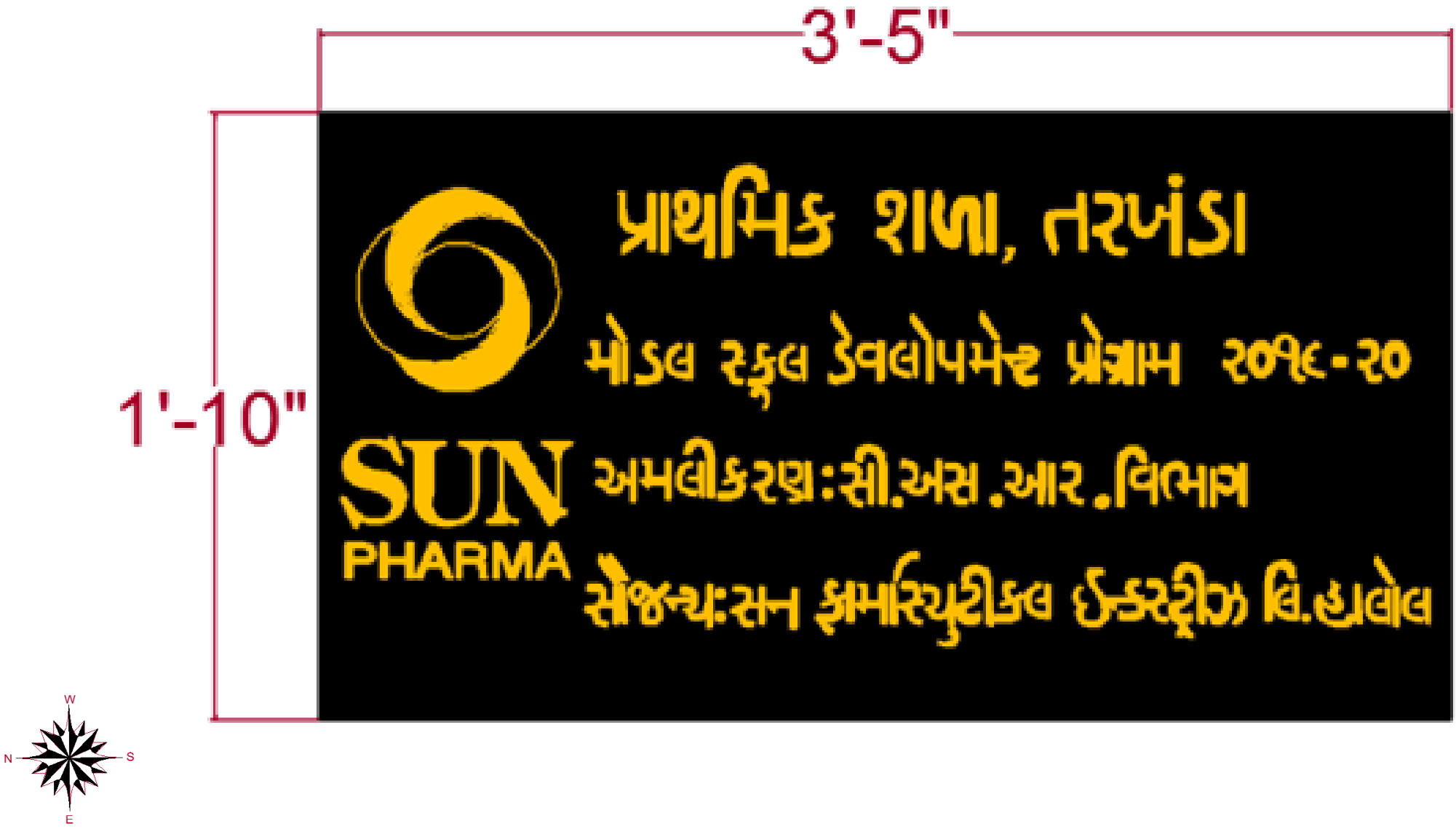


FIGURE 17: PROPOSED BRANDING BOARD DESIGN OF THE SCHOOL

4. Wall Design for the Placement of Branding Board of the School

A branding board wall where the branding board would be placed and a branding board was also designed by the designer. The wall of branding board was situated inside the school premises with a height of 10’-0” and width of 7’-5”.

Option I: In the first option suggested by the designer the wall of branding board to be designed with scattered objects on the wall. The objects used were autumn leaves, a globe, open book, a school girl holding a piece of paper, a school boy and a pencil, a boy and a girl peaking from behind a pencil and splash of colour. The background of the wall was painted with red-yellow colour and green colour depicting grass at the bottom. A rectangular box of 1’-10” of height and 3’-5” of width was drawn in the middle of the wall for placing the branding board.

Option II: The second option for the wall of branding board placement was suggested with a forest theme. The design was suggested with animals such as; giraffe, lion, hippopotamus and an elephant with sky, leaves and green land. A wooden board was also designed within which a rectangular box of 1’-10” of height and 3’-5” of width was designed for placement of branding board.

The branding board of the school was designed on a marble plate with letters in golden colour and background of black colour. The branding board was designed with the size of 1’-10” of height and 3’-5” of width with the logo of Sun Pharmaceutical Industries Limited, CSR, the name of the school, the locality of the area.

4.5. Cost Estimation and Design Implementation

In successful planning and implementation of any research project cost estimation plays a significant role. It is necessary to plan the cost estimation at the planning stage itself. Thus, the cost estimation was prepared considering the actual price and the labour cost of the proposed project of restructuring the outdoor areas of the selected school of Halol city. The cost estimation of the designed project was done on the rates prevailing in the market as on November, 2019. The detailed cost estimation of individual components of the outdoor area of the school are given in the following tables.

Table 3: Cost Estimation of Mid-Day Meal Area

Component	Total Area	Material	Colour	Company	Quantity Required	Cost in ₹	Labour Cost	Total Cost in ₹
Mid-Day Meal Shed (PEB) (Pre-engineered building)	-	Steel and Metal	Red and Yellow	-	-	-	-	₹1,60,151
Mid-Day Meal Area (Surface Filling)	147.87 sq. ft.	Cement	-	Ambuja Cement	17 Bags	₹310 per bag	₹10 per sq. ft.	₹8876
		Sand	-	-	2346 Kg	₹700 per ton		
		Aggregate	-	-	1615 Kg	₹300 per ton		
Mid-Day Meal Parapet Wall	39.32 ft. (running ft.)	Red Clay Bricks	-	-	930 pieces	₹5 per piece	₹10 per sq. ft.	₹8337
		Cement	-	JK Cement	8 Bag	₹310 per bag		
		Sand	-	-	600 kg	₹700 per ton		
		Limewash	-	-	4 litres	₹300 per litre	-	₹2500 (Including Material and Labour cost)
Total Cost								**₹1,79,864**

(The cost estimation is based on the rates prevailing in market as on November, 2019)

Plate 22: PROPOSED PEB SHED *[33]*

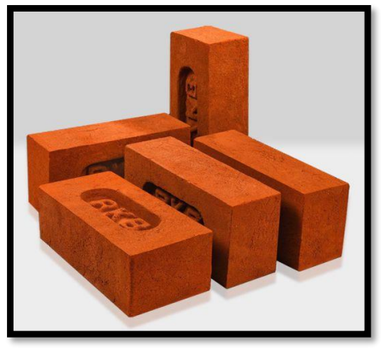


Plate 23: PROPOSED RED CLAY BRICKS *[34]*

Table 4: Cost Estimation of Outdoor Area of the School Option II

Component	Total area	Material	Colour	Company	Quantity Required	Cost in ₹	Labour Cost	Total Cost in ₹
Pathway	408 sq. ft.	Concrete Paver Blocks	Red and Cream	-	1600 pieces	₹33 per sq. ft.	₹15 per sq. ft.	₹29,200 (including material and labour cost)
Tyres	-	-	Black	-	70 pieces (1 tyre=6.5Kg)	₹9 per Kg.	-	₹12,500 (including material and labour cost)
Fencing	58,600 sq. ft.	Concertina Wire	-	-	-	-	-	₹1,81,505 (including material and labour cost)
Sand Filling in Play Area	-	-	-	-	-	-	-	₹38,600 (including material and labour cost)
Garden Development	-	-	-	-	-	-	-	₹4,500 (including material and labour cost)
Entrance Gate	-	Iron	Black	-	1	-	-	₹5000
Branding Board	-	Granite	Black and Golden	-	-	-	-	₹5800
						Total Cost		**₹2,77,105**

(The cost estimation is based on the rates prevailing in market as on November, 2019)

Plate 24: PROPOSED CONCRETE PAVER BLOCKS [29]

Plate 25: PROPOSED CONCERTINA FENCING [35]

Table 5: Cost Estimation of walls of the School

Area	Total area	Material	Colour + Area	Company	Cost in ₹	Quantity Required	Labour cost	Total cost in ₹
Boundary wall (inside area)	645.33 sq. ft.	Wall putty	-	Asian Paints	₹70/ kg	13 kgs	-	₹1050 (including material and labour cost)
		Wall primer	-	Asian Paints	₹650/ litre	7 litres		₹4950 (including material and labour cost)
		Acrylic distemper (murals)	Various Colours	Asian Paints	-	-	-	₹73,878 (including material, tools and labour cost)
		Acrylic Distemper Paint	Red (182.98 sq. ft.)	Asian Paints	₹290/ kg (excluding pigment paste)	2 kg		
		Acrylic Distemper Paint	Yellow (182.98 sq. ft.)	Asian Paints	₹290/ kg (excluding pigment paste)	2 kg		
		Acrylic Distemper Paint	Orange (182.98 sq. ft.)	Asian Paints	₹290/ kg (excluding pigment paste)	2 kg		
		Acrylic Distemper Paint	Blue (96.39 sq. ft.)	Asian Paints	₹290/ kg (excluding pigment paste)	1 kg		
Wall behind Mid-Day Meal Area	82 sq. ft.	Wall Putty	-	Asian Paints	₹70/ kg	1 kg	-	₹4320 (including material, tools and labour cost)
		Wall Primer	-	Asian Paints	₹650/ litre	1 litre		
		Acrylic Distemper Paint	Various Colours	Asian Paints	-	-		
Wall for placement of Branding Board	74.16 sq. ft.	Acrylic Distemper Paint	Various Colours	Asian Paints	-	-	-	₹3190 (including material, tools and labour cost)
						Total cost		**₹87,388**

(The cost estimation is based on the rates prevailing in market as on November, 2019)

Table 6: Total cost Expenditure

SR. NO.	COMPONENTS	TOTAL COST IN ₹ INCLUDING MATERIAL, TOOLS AND LABOUR COST
1.	Mid-Day Meal Area (PEB) Shed Installation	₹1,60,151
2.	Mid-Day Meal Area Development (Surface Filling + Parapet Wall)	₹ 17,213
3.	Sand Filling in the Playground	₹ 38,600
4.	Garden Development	₹ 4500
5.	Entrance Gate	₹ 5000
6.	Branding Board	₹ 5800
7.	Pathway Development	₹ 41,700
8.	Concertina Wire Fencing	₹ 1,81,505
9.	Painting on Inner Boundary Wall	₹ 79,828
10.	Mural Painting on wall behind the Mid-Day Meal Area	₹ 4320
11.	Painting on wall for the placement of Branding Board	₹ 3190
	TOTAL COST EXPENDITURE	**₹ 5,41,807**

Design Implementation

In this phase, the designs and alternatives developed by the designer according to the needs and requirements of the client viz' authorities of the Sun Pharmaceutical Industries Limited (Executive CSR and the school Principal) the designs were selected and were implemented in the outdoor areas of the school. The implementation stage of design was started on 19th November, 2019 and was completed by 27th February, 2020.

Design Implementation on Boundary wall

The design selected for the boundary wall of the school was the first option provided by the designer.

Plate 26: DESIGN IMPLEMENTATION ON BOUNDARY WALL OF THE SCHOOL

Barbed wire fencing was installed on the top of the boundary wall of the school for the safety and protection of the children. The barbed wire was installed in two steps: the first step included of installation of wire supporter on the boundary walls. The wire supporter was made of wood and was built in “Y” shape to hold the barbed wire in between. The second step comprised of installation of the barbed wire on the supporters provided.

Plate 27: INSTALLATION OF FENCING ON BOUNDARY WALL OF THE SCHOOL

Development of Mid-Day Meal area

The mid-day meal area was developed in three stages. First the installation of mid-day meal shed was held.

For the installation of the mid-day meal shed first the columns of the shed were installed and screwed to the bottom. Shade was developed and secured for the shade to rest upon. The shade was provided with gauge metal roofing material, this material is long-lasting and also is a cost-effective method.

Plate 28: INSTALLATION OF PEB STRUCTURE IN MID-DAY MEAL AREA OF THE SCHOOL

Plate 29: FINAL PEB STRUCTURED IN MID-DAY MEAL AREA OF THE SCHOOL

In the second stage, the surface of the mid-day meal area was developed. The surfacing of the area was done by P.C.C (Plain Cement Concreting) method. The boundaries of the surface were secured with parapet wall of 2'-0" of height.

Plate 30: DEVELOPMENT OF THE MID-DAY MEAL AREA

Plate 31: FINAL MID-DAY MEAL AREA OF THE SCHOOL

In the third stage, the wall facing the mid-day meal area of the school was developed by painting murals on the wall. The mural was selected by the client from the designs provided by the designer.

Plate 32: DESIGN IMPLEMENTATION ON WALL BEHIND MID-DAY MEAL AREA

Development of Pathway of the School

The development of the pathway was completed in the school referring the pathway design provided by the designer. The pathway was rearranged, developed and coloured according to the provided design.

Plate 33: PLACEMNET AND BEAUTIFICATION OF PATHWAY OF THE SCHOOL

Plate 34: RESHUFFLING OUTDOOR SURFACE AREA OF THE SCHOOL

Development of wall for the placement of Branding Board of the School

The branding board and the wall for the placement of the branding board of the school was developed inside the school premises as per the design provided by the designer.

Plate 35: BRANDING BOARD WALL OF THE SCHOOL

Plate 36: BRANDING BOARD OF THE SCHOOL

4.6. To develop a Booklet for Suggesting Essential Requirements for the outdoor areas of the school.

The designer with the help of review of literature had developed an informative booklet. The booklet included Introduction, Types of Playground, Types of Play, Age appropriate equipment's, Playground design parameters and suggestions by the designer were also incorporated in the booklet. A panel of experts from the field of interior designing and architecture were requested to validate the importance of topic, content and language clarity of the text. The suggestions given by the experts were incorporated and the booklet was developed accordingly.

SUMMARY

CHAPTER V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Children need outdoor physical environments that will support and promote their play process (Metin 2003).

Playgrounds have a significant role in the modern child's world. The ideal outdoor playground should be a replica of natural outdoor environment for today's urban child. They should encourage physical, social, emotional, mental and creative play as well (Sheridan, 1999). Children create and recreate their own world around them in various forms of play. The environment of schools and the school playgrounds should be designed such as that helps children explore the real world around them.

For a child, being outdoors is the only chance for exploring the world and the near surroundings. It is the outdoors where children can freely experience their motor skills like running, jumping, climbing etc. It is also the most appropriate area for performing manipulative skills such as swinging, lifting, and balancing. Most of the cases; outdoors have something more than physical benefits. As children play outdoors, they are more likely to invent games and learn about the world in their own way (Metin 2003). Children spend majority of their time in school therefore it makes schools as an influential place to promote learning and active play. Active play is described as a wide range of unstructured physical activity such as crawling, jumping, running, digging, lifting and carrying, planting, pushing and chasing which increases children's heart rate and makes them healthy and tough and also facilitates children's learning and development (Pellegrini 2009).

It is found that the area with fields and green spaces increases the odds of active play on school playgrounds (Willenberg et al. 2009). However, studies also found positive correlation in quantity of playground facilities and sporting facilities on school playground, which suggest that school playground designs should focus on providing substantial equipment to encourage active play (Jones et al.2010). The design spaces occupied by children must support active experimentation and risk taking for the development of the children without making the area unsafe for them. The exterior environment and equipment's in the outdoor areas must be arranged in such a way that minimizes hazards for the children. The spaces designed in the outdoor areas of the school needs to be suitable for the given activities (e.g. a pitch for cricket rather than plain surface) (Hyndman, Benson, Telford 2016).

The time spend in playground by children is valuable. Children are naturally creative and they tend to learn more while experimenting with various free play materials like paint, play equipment and plants around them. Whatsoever is planned in the playground must be flexible and easy going depending on the needs of the children and opportunities concealed during initial planning. The playground should be designed according to the different age groups. It is a place of enjoying activities in natural setting. Playground designs should also incorporate equipment's for playing such as see-saw, swing set, merry-go-round, sand pit/sand box, balance rings and many others which helps in development of children and also encourages active play (Jones et al. 2010). Other than play equipment playgrounds should also provide facilities for free play such as jumping, running, ropes course and group games.

The outdoor area of the school promotes flexibility and impulsiveness among the children, the outdoor environment must be comfortable, pleasing, cleanly organized, inviting and engaging for the children to develop and learn. If play is a child's work, then the playground becomes his or her work setting (Ingram 2005).

While designing the outdoor areas of the school some major components like playground surface, play structure, overall ambience and landscaping should be considered for making the outdoor area a pleasant place to conduct teaching and developmental process. The area needs a good selection of colour, texture, pattern and arrangement of these factor which suit the children and the selection of all these aspects should depend upon the functionality, economy, beauty and individuality which makes the outdoor area convenient and pleasant to work (Shukla 1988).

During the review of literature, numerous studies in India and abroad were found that provide information on the outdoor areas of the school and designing the areas according to the needs of the children. However, a dearth of researches was found by the designer on developing and designing the outdoor areas of the school. Thus, the present topic was undertaken for research.

The findings of the study would act as a guidance for the students beginning in the field of interior designing, landscape designing and the school community for designing a well-planned outdoor area for school with the necessary requirement needed for the outdoor areas of the school.

Statement of the problem

The present study aimed to develop the outdoor areas of the school of Halol City provided under the CSR (Corporate Social Responsibility) project of Sun Pharmaceutical Industries Limited.

Objectives of the study

1. To assess the needs and requirements of the clients viz; authorities of Sun Pharmaceutical Industries Limited (Executive CSR and school principal) for the development of the outdoor areas of the school

2. To propose detailed design of the outdoor areas of the school of Halol City

3. To provide detailed cost estimation of the selected design and implementation of the selected design

4. To develop a booklet for suggesting essential requirements for the outdoor areas of the school.

Delimitation of the study

1. The study was limited to the outdoor areas of the school of Halol City, Gujarat, India.

Methodology

Project designing was adopted for conducting the present research. The unit of inquiry of the present research was the principal of the selected school who had been running the school since past 7 years. Observation Sheet and Interview Schedule were used as an instrument to gather the needed information and to obtain the objectives of the study.

The observation sheet was used by the designer and was divided into three sections.

Section I dealt with the background information of the school which included the type of school, total build-up area, total area of the school playground, number of classrooms and number of floors.

Section II comprised of questions regarding various components of the school area and questions to assess the existing status of the school building and the outdoor areas of the school.

Section III included the description of various activities carried out by the children in the school. Information was gathered regarding types of play equipment, placement of pathway, condition of pathway, provision of Mid-Day meal area, condition of Mid-Day meal area, overall ambience of the school playground and circulation space for children for performing various play activities.

The interview schedule was prepared on the basis of indication supported by the review of literature. The interview schedule was divided into two sections which are described as follows:

Section I

This section contains information regarding the school which was to be developed under the CSR project of the Sun Pharmaceutical Industries Limited. The information included the name of the school, location of the school, the nature of construction, number of students studying in the school, age range of the students studying in the

school, the medium of instruction and the approximate budget provided for the designing and development of the outdoor areas of the school.

Section II

This section contains information regarding the needs and preference of the client's viz; the authorities of the Sun Pharmaceutical Industries Limited (Executive CSR and the school principal) for the designing and development of the outdoor areas of the provided school of Halol city under the CSR project. The components included preference for the designs based on a theme, colour preference of the school building, types of play equipment, types of teaching material, preference of patterns and designs on the inner boundary wall of the school, provision of storage space, preference of outdoor furniture, material of the outdoor furniture, need of fencing on the boundary wall, provision of landscape, preference for artificial lighting fixtures, preference for seating arrangement, material of seating and description of various outdoor activities conducted in the school playground.

The validity of the tool was established by a panel of 12 judges comprising of experts from the field of Interior Designing and Faculty of Family and Community Resource Management. The judges were requested to judge whether the listed items were clear, ambiguous and relevant or irreverent for the research study. Those suggestions which had 80% of the agreement among the judges were adopted and the tools were modified and finalized for the data collection.

The research was carried out in five phases in which the first phase comprised of assessing the available space for the outdoor area of school, the second phase identified the client's need and preferences, the third phase consisted of design development of the outdoor areas of the school, the fourth phase dealt with the cost estimation and design implementation and in the last phase the designer developed a booklet for suggesting essential requirements needed for the outdoor areas of the school.

Major Findings of the Study

The present research constituted detailed discussion of the case study of the selected school of Halol city with regard to their existing outdoor environment. Efforts were made to describe the various learning and developmental activities carried out in the outdoor areas of the school.

Case study

This section constituted detailed discussion of the case study carried out in the selected school of Halol city with regard to the existing outdoor area.

In this regard assessment of various outdoor areas were considered for the research study. These included the dimensions of the school area, dimensions of the outdoor

area of the school, boundary wall, landscape, pathway, mid-day meal area, branding board and overall ambience of the school.

Existing status

The school undertaken had an area of 2329.11 sq. ft. of area whereas the playground of the school was found to be of 994.25 sq. ft. The condition of the boundary walls of the school was poor as there were patches of paint on some damaged areas from where the plaster was chipping off, there was formation of algae on some areas of the wall, broken corners of the wall, dampness and broken construction from several places. There was no provision of fencing on the top of the walls for safety and protection of the students. There was a mural painted on one side of the wall which was in bad condition and looked monotonous because of less usage of bright colours to attract. However, there were no dustbins and seating in the outdoor areas of the school.

The surface of the playground was built of loose sand and the ground surface was found uneven which was open for several accidents and injuries. The school also had an uneven and unfinished pathway and it was laid disproportionately without any flow of the path. The pathway was not well-planned as it led to nowhere in the outdoor areas of the school. Landscaping on the playground was scarce and not well-planned. There were several large and medium sized trees planted in the playground, but the placement of the trees was not proper as it was planted abruptly. Other than large trees there were several small sized plantations in the playground near the existing pathway of the school and some near the boundary wall of the school.

The data gathered by the designer revealed that the playground did not have separate space for different play and developmental activities. In the play area of the school playground there was only a small sand-pit of 7’-8” in length and 9’-4” in width. Other than a sand-pit there were no other play equipment in the school playground for the children to play.

The mid-day meal section of the school was not different form the rest of the play area, it had a plain hard soil surface same as the playground surface with some small plantation alongside the boundary wall. Moreover, there was no shed above the mid-day meal area which created inconvenience for the children in bright sunny day or in rainy days to eat outside. The school other than the play structure also has a rain water harvesting system for storage of rainwater in the school and reusing it in the time of need rather than allowing it to run off.

Needs and Preferences of the client

The client of the undertaken project was the principal of the school. The client indicated his preference for creating a spacious look in the outdoor areas, the boundary walls of the schools were to be given a new look with bright colours, the colours of the boundary wall was asked to be of solid colours such as red, blue, green, yellow. The

client gave some specific requirements and preferences on designing the wall facing the mid-day meal area. The surface of the playground was needed to be reshuffled and the mid-day meal area needed to be developed. The pathway of the school was preferred to be changed and designed in such a way that it would lead to various areas of the school. Moreover, overall ambience and landscape of the outdoor area of the school was preferred to be redesigned.

Design Development

For the development of the boundary wall there were three options provided by the designer. The first option included yellow, orange, blue and red colour. The selected colour would form an analogous colour scheme which was chosen because it gave bright yet soothing feeling to the area. The total height of the boundary wall is 5'-6" from which blue colour will be applied horizontally on the top 7" all round the wall area and red, yellow and orange colours will be applied in the form of vertical strip. One strip will cover the height of 4'-8" and will be 6'-10" wide. The rest 3" from the bottom will be left as it will be covered with soil. Between each strip of colour, a cartoon representation of pencil and children were designed.

The second option included red, green and blue colours. These colours were chosen due to its bright and cheerful impact to the area. The colours were applied horizontally one above the other all over the boundary wall area with individual height of 1'-10". Along with that, some musical keys were also designed by the designer. The musical keys were placed randomly all over the wall surface. The keys were suggested black in colour as it enhances the background wall and also does not mix with the colours of the boundary wall.

The third option of the boundary wall included emphasizing only the wall facing the main school building. building to be emphasized and the rest of the walls to be painted in a solid colour. The colours chosen for the emphasizing wall were red, blue and yellow. These colours form a triad colour scheme which enhances the entire area with the bright colours. The colours were applied vertically one after the other with the height of 5'-6" and individual width of 1'-10". The colours were applied in such a pattern that depicted a piano instrument. It also had black keys on the top with individual height of 3'-0" and 1'-6" of width.

A fencing all over the boundary wall was also suggested by the designer.

For the playground surface and pathway area the designer suggested two option. Both the options focused on rearranging the pathway area and making the surface even. The pathways were suggested in such a way that they lead to various activities in the outdoor areas of the school. Along with pathway design the designer also suggested plantation and landscaping around the pathway and in the outdoor areas of the school to add more greenery to the area.

The mid-day meal of the school was restructured and reconstructed according to the suitability of the children of the school. The mid-day meal area developed with solid

surface with an elevated height of 10” with parapet around with height of 2’-0”. Murals were suggested on the wall-facing the mid-day meal to make the area more visually appealing.

Moreover, essential requirement for the outdoor area of the school were suggested by the designer. The important consideration which should be included in designing the outdoor areas like appropriate circulation space, storage space, drinking water facilities, washroom facilities, canteen, sitting and relaxing area were discussed. The safety of the children of the school should be considered first while developing the area, along with safety the pathways and walkways, landscaping, play equipment, dustbins and sitting area, security cabin and first aid facility should also be provided.

Cost estimation and Design Implementation

After the completion of the designs the cost estimation was prepared for the selected designs by the clients viz’ authorities of the Sun Pharmaceutical Industries Limited (Executive CSR and the school principal) according to the prevailing market rates in the local market as on November, 2019. The total estimation was carried out for the boundary wall, development of mid-day meal area, playground surface area, and overall ambience; and the total cost estimation for the whole project of development of the outdoor areas of the selected school was **₹5,41,807**. The implementation of the selected designs provided by the designer was completed in almost three months starting from 19th November, 2019 to 27th February, 2020.

Conclusion

The exterior environment of the school affects its operational quality and has a profound impact on the behaviour and development of the children. The environment of the school was designed by the designer in such a manner that it would help children’s natural instinct and creativity. Efforts were made by the designer in designing the environment that boosts the mood of the children, motivates the children to come to school and would increase creativity among them. The designer designed the environment taking into consideration the comfortability of the children. Different spaces were developed by the designer which would encourage the children to use the outdoor areas of the school to the maximum.

Implications of the Research

Based on the findings of the present study, designer brought out number of implications for the concerned users, interior designers, landscape designers, school authorities and school children.

For the Department of Family and Community Resource Management

Interior designing is an integral part of the curriculum of the Department of Family and Community Resource Management wherein courses like Residential and Commercial Space Designing, Landscaping and Gardening are offered. The findings of the present research, the booklet and the designs proposed for the outdoor areas of the school will make them aware about the significance of an integrated and developed outdoor area and will enhance their ideas and views for developing outdoor areas for the school. The information gathered would enlighten the students about the efficiency and importance of a well-developed environment.

For School Children

The quality of the environment of the school in the present project will have a profound impact on the children's cognitive, social and creative development. It is anticipated that young children will learn more through interaction with their physical environment created by the designer.

For Interior Designers

The role of designers is very crucial in the overall development of any design project. With regard to the indoor areas, the outdoor environment also plays a vital role in making the space look more appealing. Further, the present study will motivate the professionals to undertake innovative research cum design projects for the development of the outdoor areas of the school.

For Landscape Designers

The booklet provided in the present research which reflects various aspects to be considered in designing a playground for children will be helpful for the landscape designers to develop better surroundings for the children.

For School Authorities and school principal

The school authorities can use the findings of the present research in creating and developing a functional as well as an aesthetic environment in the outdoor areas of the school for the school children.

Recommendations for Future Research

1. Researches could be carried out to develop the outdoor areas of the school according to the age group of the children.

2. Research studies can be carried out to assess the impact of various components of the outdoor areas of the school on the learning behaviours of the children.

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APPENDICES

APPENDIX - I

A. OBSERVATION SHEET

SECTION I. Background information of the school

1.School centre: Private / Government

2. School type: Kutcha / pucca / semi pucca

3.Date of Survey: _____

4.Time of Survey: _____

5.Total build-up area of the School: _____sq. ft

6.Total area of the School Playground: _____sq. ft

7.No. of Classrooms:

_____

8.No. of levels/floors:

_____

SECTION II. Description of various physical components of the school outdoor area

1. Dimension of the School outdoor area: Length - _____ ft.

Width - _____ ft.

Height -_____ft.

2. Total Area of the School playground: _____ft.

A. WALL

Components of the outdoor area	Colour shade (a)	Colour hue (b)	Texture (c)
Compound wall			

(a) Colour shade: 1. Red, 2. Blue, 3. Yellow, 4. Green, 5. Purple, 6. Grey, 7. Black, 8. White, 9. cream

(b) Colour hue: 1 Light shade, 2. Medium shade, 3. Dark shade

(c) Texture: 1. Smooth, 2. Medium, 3. Rough

I. Finish of the wall

Wall / Finish	Unfinished	Whitewash	Distemper	Oil/ Enamel paint	Rough plaster	Finished Plaster	Any other
East wall							
West wall							
South wall							

North wall							

II. Material of construction:

Wall / Material	Bricks / stone Plastered	Brick Unfinished	Concrete	Mud	Any Other specify
East wall					
West wall					
South wall					
North wall					

III. Condition of the wall:

Wall / Condition	Good	Chipping off paints	Plaster chipping off	Damp	Construction broken at places
East wall					
West wall					
South wall					
North wall					

IV. Fencing Provided:

☐ Yes
☐ No

V. Dimension of the Compound wall:

Length _____ ft

Breadth _____ ft

Height _____ ft

B. PLAYGROUND SURFACE

I. Material of the playground surface:

- ☐ Cement
- ☐ Mosaic
- ☐ Paver Blocks
- ☐ Kota stone
- ☐ Any other specify

II. Condition of the Flooring:

- ☐ Uneven Flooring
- ☐ Even Flooring

SECTION C. Description of play area

I. Types of play Equipment

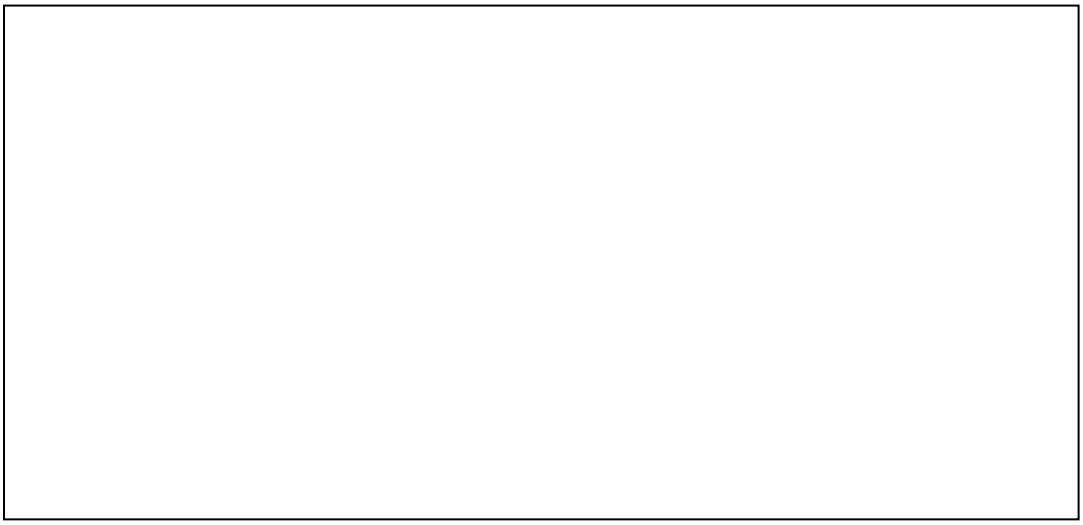
- ☐ Swings
- ☐ Slides
- ☐ See-saws
- ☐ Merry-go-round
- ☐ Playground climbers
- ☐ Tubes
- ☐ Nets
- ☐ Sand pit
- ☐ Animal springers
- ☐ No equipment

II. Material of play equipment

- ☐ Solid rubber surfacing
- ☐ Wood chips
- ☐ Wood
- ☐ Metal
- ☐ Steel
- ☐ Any other specify

III. No. of play equipment _____

IV. Placement of play equipment in the existing playground



V. Seating arrangement for children:

- ☐ Nothing
- ☐ Chairs
- ☐ Bench
- ☐ Stool
- ☐ Any other specify

Are they sufficient for the number of children using them?

- ☐ Yes
- ☐ No

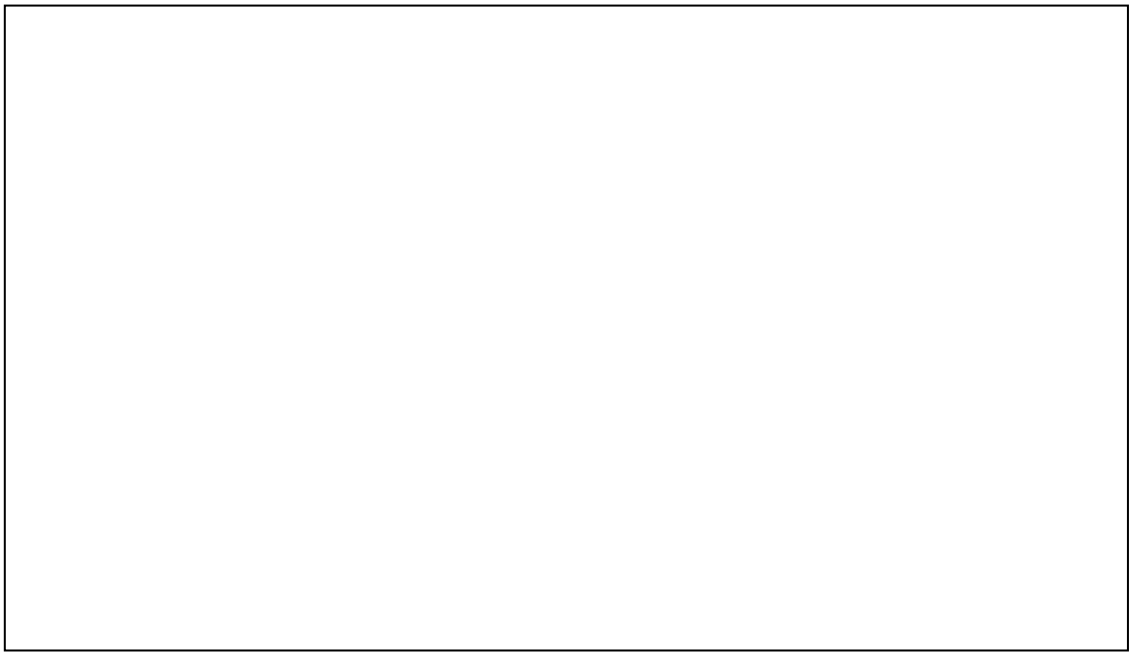
Material of seating provided

- ☐ Steel
- ☐ Plastic
- ☐ Wood
- ☐ Cane
- ☐ Stone
- ☐ Aluminium
- ☐ Any other specify

Describe: _____

Condition: Good_____ Moderate_____ Poor_____

VI. Design of the existing pathway in the school playground



VII. Type of soil

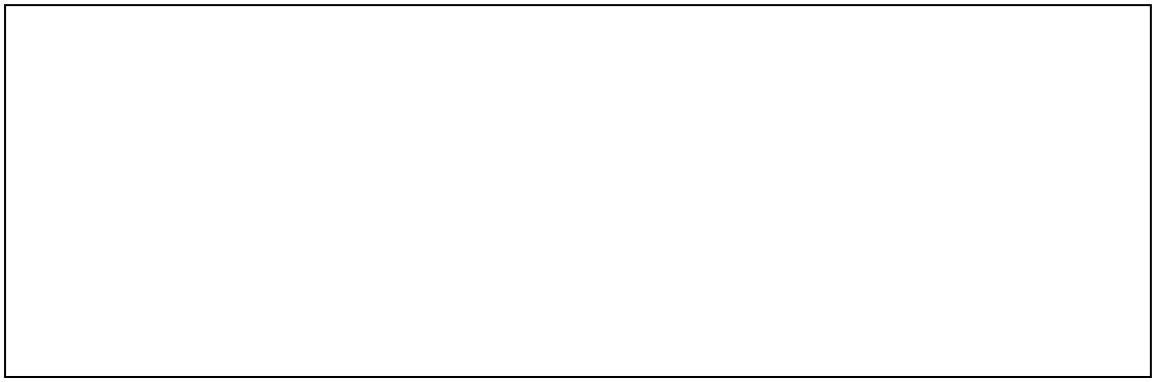
- ☐ Sandy soil
- ☐ Silt soil
- ☐ Clay soil
- ☐ Loamy soil

Soil condition: Good_____ Moderate _____ Poor_____

VIII. No. of existing trees: _____

IX. No. of potted plants if any: _____

Placement of trees in the playground



X. Provision of MDM Area:

☐ Yes
☐ No

XI. MDM Area: Length _____ ft. Width _____ ft. Height _____ft.

XII. List of other existing accessories in the school

_____
_____
_____
_____
_____
_____

XIII. Description of overall ambiance of the school playground

_____
_____
_____
_____
_____
_____

Space provided for outdoor play activities: Yes _____ No_____

Clearance Space for doing play activities:

☐ Less

☐ Medium

☐ High

APPENDIX – II

B. INTERVIEW SCHEDULE

I. BACKGROUND INFORMATION OF THE CLIENT

1. Name: _____

2. Age: _____

3. Staying in the same area:

☐ Yes

☐ No

4. Address: _____

5. Telephone No.:_____

6. Designation: _____

7. Education:

☐ H.S.C

☐ S.S.C

☐ Graduate

☐ Post Graduate

Any other specify

8. Years of Experience in the School:_____

BACKGROUND INFORMATION OF THE SCHOOL

1.Type of School: Private / Government

2.Name of the School:

_____

3.Location of the School:

_____

_____

_____

4.Nature of Construction:

☐ Construction

☐ Renovation

☐ Redefining space

5.Years of Construction: _____

6.Number of Students studying in the school: _____

7.Age range of the students studying in the school: _____

8. Medium of instruction:

☐ Hindi ☐ Gujarati ☐ English

9.Approximate budget for designing the outdoor play areas of the school: _____

PREFERENCES OF THE CLIENT WITH REGARDS TO THE OUTDOOR PLAY ENVIRONMENT OF THE SCHOOL

1. Would you like to have the design based on a theme?

☐ Yes ☐ No

2. If Yes, which themes would you prefer?

SR.NO.	THEME	PREFERENCE
1.	GARDEN	
2.	ANIMAL	
3.	UNDERWATER	
4.	COLORFUL	
5.	EDUCATIONAL	
6.	ANY OTHER SPECIFY	

3. What colour would you prefer for the school building?

_____

4. Please tell whether the following things/ items are available in the School? (Y/N). If not then are the things/ items needed? (Y/N). if yes, please tell your preference.

SR. NO	NAME	AVAILABLE		NEEDED		PREFERENCE
		YES	NO	YES	NO	
I	**Outdoor play equipment:**					
1.	Slide					
2.	Multi PlayStation					
3.	Swing					
4.	Merry go round					
5.	Seesaw					
6.	Net climbers					
7.	Tyre swings					
8.	Football goal					
9.	Sand pit					
10.	Any other specify					
II	**Teaching material**					
1.	Charts					
2.	Display boards					
3.	Educational charts					
4.	Any other specify					
III	**Pattern of the boundary wall**					
1.	Floral					

2.	Natural					
3.	Geometric					
4.	Cartoons					
5.	Scenic					
6.	Textural					
7.	Plain solid colour (Specify colour)					
IV	**Colour of School Building**					
1.	Light colour a. Pink b. Light green c. Light blue d. Cream/ Off white e. Grey f. Any other specify					
2.	Dark colour a. Violet b. Black c. Brown d. Blue e. Any other specify					
V	**Storage space for**					
1.	Games					
2.	Play equipment (bat, ball, racket etc)					
3.	Toys					
4	Poster and charts					
VI	**Furniture**					

1.	Chair					
2.	Table					
3.	Storage cupboard					
4.	Any other specify					
VII	**Material of furniture**					
1.	Steel					
2.	Plastic					
3.	Wood					
4.	Cane					
5.	Waste tyre					
6.	Tree barks					
7.	Any other specify					
VIII	**Boundary wall fencing**					
1.	Barbed Wire fencing					
2.	Glass piece fencing					
3.	Metal framing					
4.	Razor blade fencing					
5.	Any other specify					
IX	**Landscaping**					
1.	Boundary trees					
2.	Shrubs					
3.	Grass a. Artificial b. Natural					
4.	Creepers					
5.	Potted plants					
6.	Any other specify					
X	**Branding board**					

1.	Board painting					
2.	Marble inscription					
XI	**Lighting**					
1.	Light fixture					
2.	Lamp					
3.	Any other specify					
XII	**Seating arrangement for children**					
1.	Chairs					
2.	Bench					
3.	Stools					
4.	Tree trunk					
5.	Any other specify					
XII	**Material of seating provided**					
1.	Steel					
2.	Plastic					
3.	Wood					
4.	Cane					
5.	Stone					
6.	Aluminium					
7.	Any other specify					

5. Description of outdoor activities carried out in the school.

SR NO.	NAME OF THE ACTIVITY	AVAILABLE		PREFERENCE		INFRASTRUCTURAL FACILITIES PROVIDED TO CARRY OUT THE ACTIVITY
		YES	NO	YES	NO	
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						

APPENDIX – III

CERTIFICATE OF SUN PHARMACEUTICAL INDUSTRIES LIMITED

Sun Pharmaceutical Industries Ltd.
Tandalja, Vadodara - 390 012, INDIA.
Tel. : 91-265-6615500/6615600/6615700
Fax : 91-265-2354897
CIN : L24230GJ1993PLC019050

SUN PHARMA

Date: 19/12/2019

To,

Ms. Fatema Dahodwala
Sr. MSc Student
Department of Family and Community Resource Management,
Faculty of Family and Community Sciences,
The Maharaja Sayajirao University of Baroda,
Vadodara

Subject: Letter of Appreciation

Dear Ms. Fatema Dahodwala,

It is my immense pleasure to extend appreciation towards your remarkable contribution in designing the Outdoor Play Areas of the Tarkhanda Primary School of Halol Block under the CSR project. Your dedication of time, efforts and commitment in the work assisted leads in the overall success of the project.

Seeing your diligence and focus has been a source of motivation for the rest of the team. My best wishes and warm regards with you for your bright future endeavours.

Thank you,
Yours sincerely,

Brajesh Choudhary
General Manager (CSR)

ABSTRACT

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The environment of the school has a profound impact on the development and growth of the children. The school environment should be designed to help to enhance the children's creativity and imagination. The ideal environment of the outdoor areas of the school is that which reflects the presence of the child, which is fascinating, rich as well as challenging for the children, should be interesting and thought-provoking but not flashy. The present research encompassed of project designing of the selected school of Halol city with regard to the assessment of the existing environment of the outdoor areas of the school and acquiring the need and preferences of the client's viz; authorities of Sun Pharmaceutical Industries Limited (Executive CSR and the school principal). The observations and the data collected by the designer revealed that efforts had been made to create a child-friendly environment in the outdoor areas of the school. The overall ambience of the outdoor areas of the school was not well-planned and developed according to the needs of the children, it created a dull and monotonous environment. It also exhibited that the boundary walls of the school had broken construction at several places, patches of cement were applied on damaged areas of the wall and the paint of the walls was chipping of from several areas, it also had formation of algae on several places on the wall, the pathway was not laid appropriately as it did not lead to various areas of the school. The placement of the plants and trees of the school was not suitable to the environment. Moreover, the mid-day meal area of the school was not developed and the surface was not separate from the rest of the playground, the outdoor area of the school also required proper outdoor seating, display boards and there was lack of play materials and play equipment for various outdoor games. The designer redesigned the outdoor areas of the school according to needs and requirement of the client by using some specific colour schemes and designs suitable to the age group of the children of the school. The designer provided two layouts for the pathway of the school by reorganizing and rearranging the pathway which leads to various areas of the school, more plantations were added, for the boundary walls of the school. The designer provided four alternatives by including bright colours and murals on the walls according to the interest of the children and a sense of personal space. The Mid-Day meal area of the school was structured and developed with proper shade and surface for the convenience of the children of the school. The designer made an attempt to plan a well-organized space with open pathways, enough landscape and bright and colourful atmosphere. The outdoor area of the school was planned with small as well as large open areas. Various modified drawings for the boundary wall, pathway and landscape of the school, mid-day meal area of the school, branding board and the placement of the branding board were developed. A detailed cost estimation for the designs selected for the implementation by the client were provided by the designer. The implementation phase for the selected designs by the clients took the time of three

months. Moreover, the designer also developed a booklet for suggesting various essential requirements needed for the outdoor areas of the school. The findings of the present research project will be beneficial to the authorities of the school and school principal, interior designers, landscape designers, architects and students of interior designing.