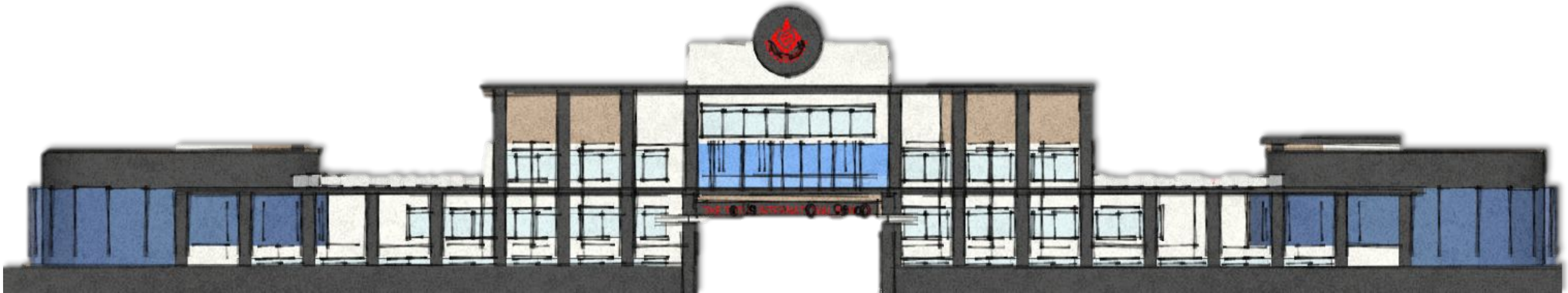
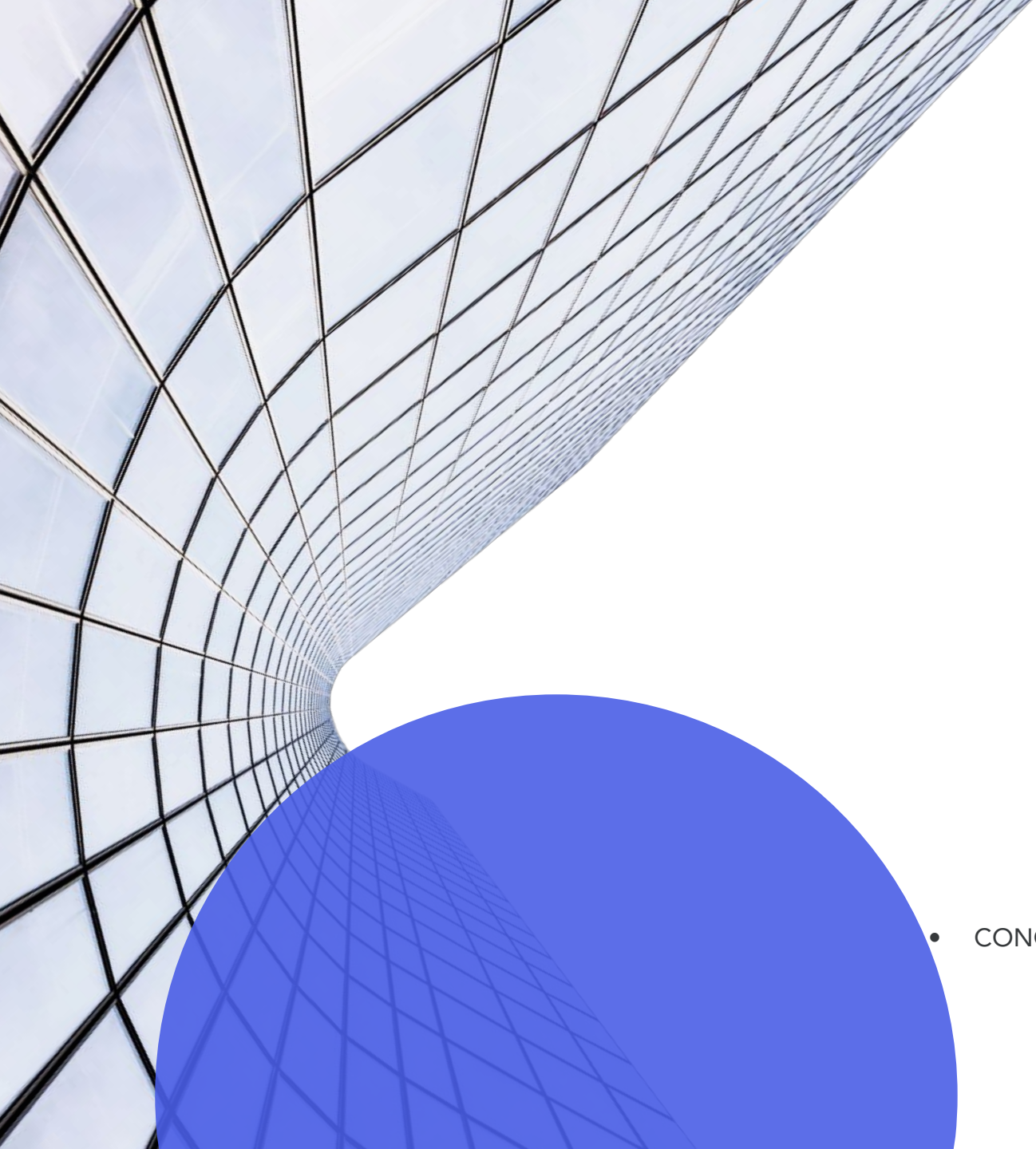
THE TOTUS INTERNATIONAL SCHOOL

PRE-FEASIBILITY STUDY





AGENDA

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PROJECT OVERVIEW

- Proposed CBSE School
- Nursery to 12th class
- Total Strength of School – approx.1200 students
- Total staff in the school – approx. 50
- Total site area approx. 6 acres (~24,000sqm)(~2,60,000sqft)(future expansion to 10acres)
- Total built up area – Approx.5562sqm(60000sqft); first floor+2 structure (3 storied structure)
- Designed on Biophilic and Green building norms with sustainable ideology
- Total Project cost projection – Approx. 10-15Cr.

SITE LOCATION AND TARGET DEMOGRAPHIC

- Site to be finalised , ideally to be located between Tada and Sullurpeta to tap into the industrial area of Tada and ISROs employee families in Sullurpeta.
- Approximately 6 acres + 4 acres (future expansion) considered.
- There are few local schools in these localities. However, school's biophilic design, green building principles, and student activities will differentiate it from other local schools:
  - •Holistic Learning Environment
  - •Environmental Stewardship
  - •Hands-On Learning through Farming
  - •Knowledge and Science Park
  - •Comprehensive Extracurricular and Sports Facilities
  - •Competitive Edge in Education

KEY STAGES IN THE PROJECT

- PRE CONSTRUCTION PHASE:
  - 1. Site Planning and Land Acquisition
  - 2. Feasibility Study and Budget Planning
  - 3. Architectural Design
  - 4. Soil Testing and Geotechnical Investigation
  - 5. Structural Design and Engineering
  - 6. Zoning and Land Use Approval
  - 7. Building Plan Approval
  - 8. Environmental Impact Assessment (if applicable)
  - 9. Fire Safety Design and Approval
  - 10. Water Supply and Sanitation Planning
  - 11. Electrical and Mechanical Design
- CONSTRUCTION PHASE:
  - 12. Foundation Laying
  - 13. Superstructure Construction
  - 14. Utilities Installation (plumbing, electrical, HVAC)
  - 15. Interior Finishing (flooring, painting, carpentry)
  - 16. Safety and Security Installations (CCTV, fire alarms)
- POST CONSTRUCTION PHASE:
  - 17. Furniture and Equipment Installation
  - 18. Landscaping and Playground Development
  - 19. Final Inspection and Compliance Checks
  - 20. Occupancy Certification

BUILDING PERMISSIONS LIST

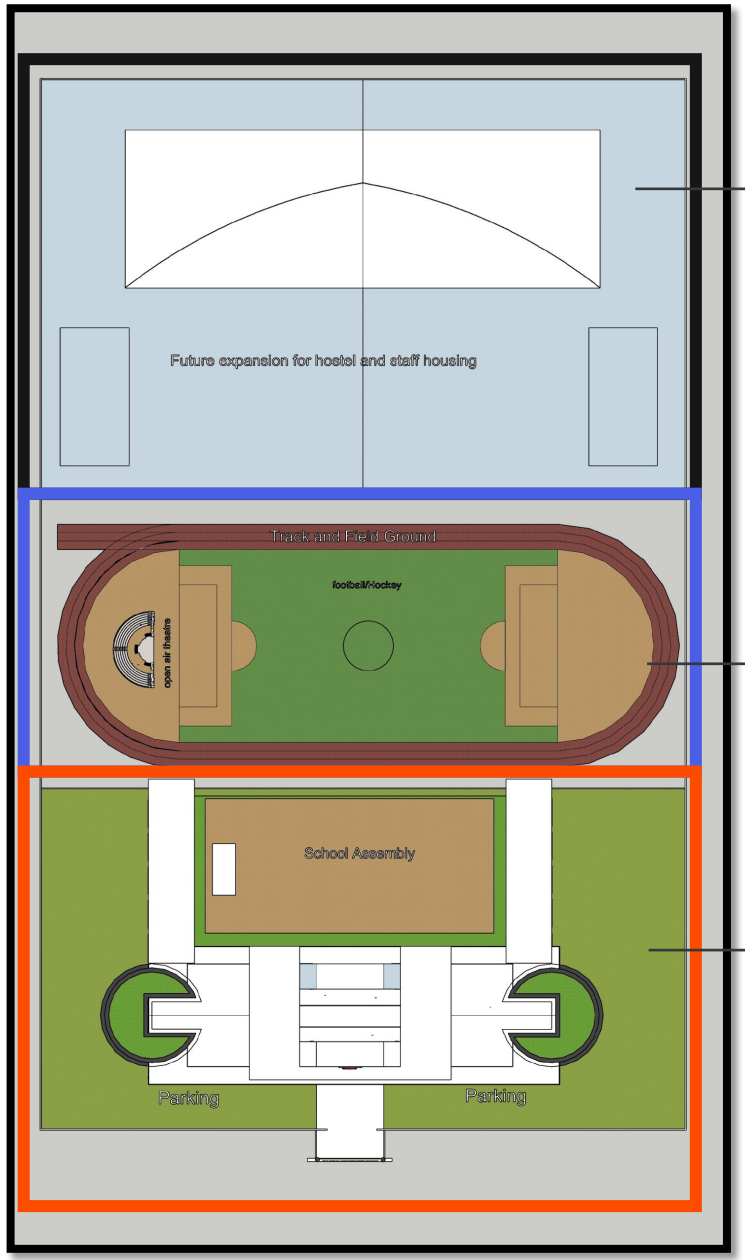
- List of all the permissions required for constructing a school building in India:
- 1. Zoning Approval from the local municipal or panchayat authority.
- 2. Land Conversion Certificate (if applicable) from the revenue department, converting agricultural land to non-agricultural (educational) use.
- 3. Building Plan Approval from the local municipal corporation or development authority.
- 4. Environmental Clearance from the State Pollution Control Board (if applicable).
- 5. Fire Safety Clearance from the local fire department.
- 6. Water and Sanitation Approval from the local water and sanitation department.
- 7. No Objection Certificate (NOC) from the State Education Department.
- 8. Approval from Electricity Board for electrical installations and load requirements.
- 9. Sewage and Waste Disposal Clearance from the local health or sanitation department.
- 10. Structural Safety Certificate from a certified structural engineer.
- 11. Occupancy Certificate from the local municipal corporation after construction completion.
- 12. Affiliation Approval from CBSE (post-construction) after ensuring compliance with all norms.
- 13. Green building certification - Solar panels, rain water conservation, smart lighting solutions, passive heating and cooling techniques etc.

AREA STATEMENT

- Area Statement and breakup for schematic design:
- Total classes = 15 (Nursery to 12th) ; Sections per class (Assumption)= 2
- Max no of students per class=40; Total number of students (Assumption) = 40 x 2 x 15= 1200
- Total number of teachers (as per CBSE norms, 1 teacher per 30 students) = 1200/30= 40 ; Total non-teaching staff (Assumption) = 10
- Total staff (Assumption) = 50
- Total site area (Assumption) = 6 acre (approx. 24000sqm) (2,60,000 sqft) (future 10 acres)
- Total built up area: 5562sqmt (60,000 sqft)
    - First floor= 2610 sqmtr (28,000sqft): Second floor= 1944 sqmtr (21,000 sqft): Third floor= 864 sqmtr (9,300 sqft) : fourth floor=144 sqmtr (1,550 sqft)
- Total number of class rooms: 15 x 2 = 30
    - Total size of classrooms (as per CBSE norms) = 30 x 8 x 6 = 1440sqm = 14400 sqft
- Total number of labs: 4 (Physics, chemistry, Biology, AV lab)
    - Total size of labs (as per CBSE norms) = 4 x 9 x 6 = 216sqm = 2200 sqft
- Total number of staff rooms: 6
    - Total size of staff rooms= 6 x 8 x 6 = 384 sqm = 4000 sqft

- Total number of libraries = 1
    - Size of Library (as per CBSE norms) =1 x14m x 8m = 112 sqm = 1200 sqft
- Total number of computer labs: 1
    - Total size of labs (as per CBSE norms) = 1 x 9 x 6 = 54sqm = 600 sqft
- Total number of mathematics labs: 1
    - Total size of labs (as per CBSE norms) = 1 x 8 x 6 = 48sqm = 500 sqft
- Rooms for Extracurricular Activities
    - ● Requirement: Separate rooms for music, dance, arts, and sports or a multipurpose hall of adequate size.
- Playground:
    - Adequate ground for a 200-meter athletics track and other sports like kabaddi, kho-kho, volleyball, basketball
- Drinking Water, Toilets, and Other Physical Facilities (As per national building code)
    - ● Water: Adequate potable drinking water on each floor.
- OTHER UNIQUE FACILITIES LIKE FARMING, OPEN AIR AUDITORIUM, OPEN CLASSROOMS, ROOF GARDENS, DINING AND KITCHEN FACILITIES.
- BUILDING ALSO FOLLOWS NATIONAL BUILDING CODE, GREEN BUILDING NORMS AS AND WHEN NECESSARY.

SPACE REALISATION AND SITE UTILISATION



ZONE 3:
Future expansion for Hostel and Staff housing (4 acres)

ZONE 2:
Full fledges sports ground with open air auditorium, science part , football field/hockey field and 800m track. Adjacent to this ground we have tennis courts, volleyball, basketball and farming/nursery facilities

ZONE 1:
School building with open school assembly in the centre. The structure is predominantly a first + 2 floor structure divided into 3 blocks(1 main central block and 2 wings on both sides)

- *ASSUMING A 6 ACRE SITE
- Total Footprint of school building is 2600 sqm (28,000sqft)i.e., 10% of ground coverage.
- 90% open area including sports facilities.
- School building should be ideally oriented as per site condition after site selection.
- Total built-up area= approx. 5562sqmtr (60,000sqft).
- An additional 4 acres for hostel and staff housing with other amenities for future augmentation.

CONCEPTUAL DESIGN OF SCHOOL

The overall school building concept is based on 6 core concepts: G.R.O.W.T.H. School Concept

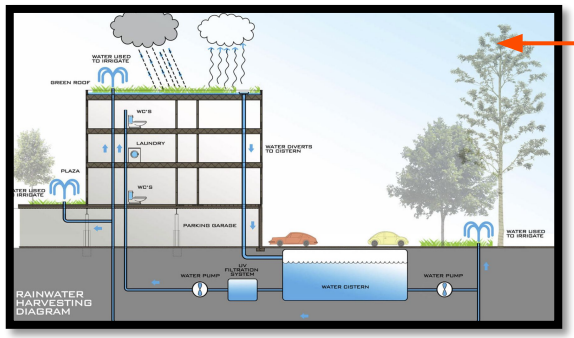
- G - Green Building Principles
- R - Recreational and Extracurricular Excellence
- O - Outdoor & Experiential Learning
- W - Wellness through Biophilic Design
- T - Technology and Innovation Hub
- H - Holistic Education Advantage

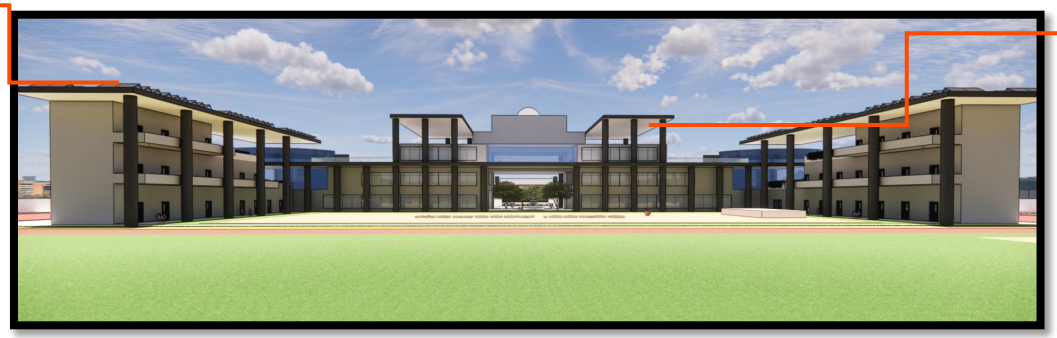
The School incorporates all the above aspects of the GROWTH school concept in one way or the other in various building elements by virtue of design

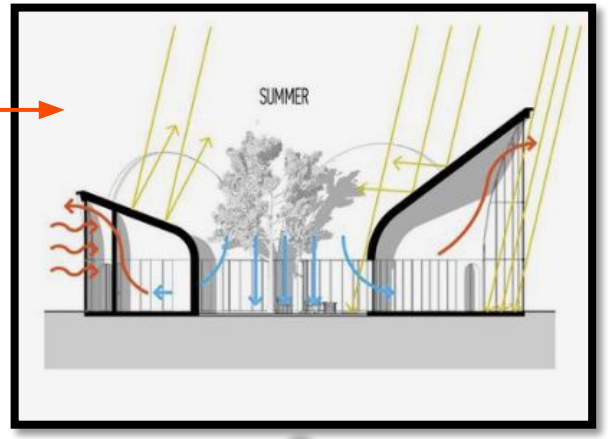
G - Green Building Principles:

Commitment to sustainability with energy-efficient, eco-friendly architecture and operations.

- By principle follows Biophilic design ideas.
- Overall building designed as Tetris blocks to shade itself.
- Solar roof top energy generation.
- Rain water harvesting pits.
- Punctures in the building elevations to scoop in wind from all sides to the interiors.(Funnel effect)
- Rooftop green spaces that keep the solar heat gain to a minimum and in turn reduce the energy consumption of the building.



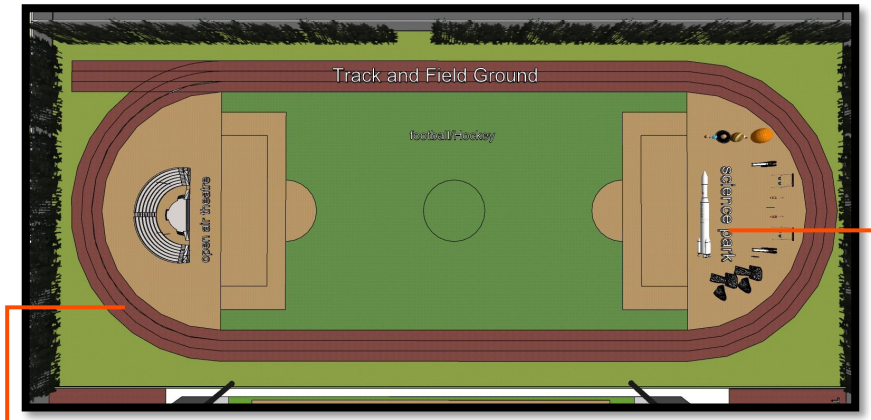


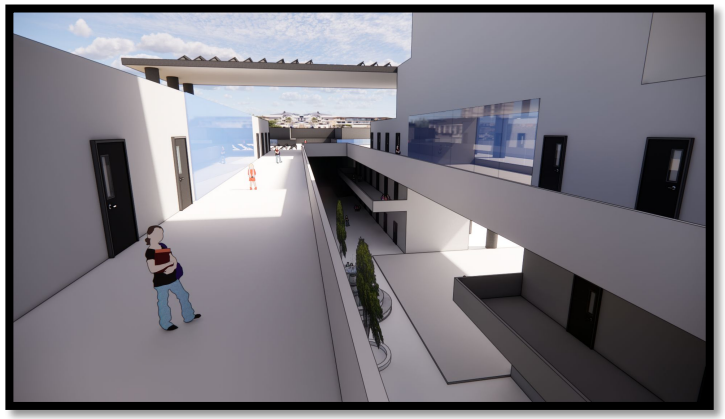


•R - Recreational and Extracurricular Excellence:

•Comprehensive sports, arts, and extracurricular facilities supporting holistic student development.

- Ample space for all kinds of sports and extracurricular activities.
- Semi open / open spaces for outdoor teaching.
- Rooftop outdoor spaces that can be used as multi functional spaces.
- Dedicated Dance/ music halls.

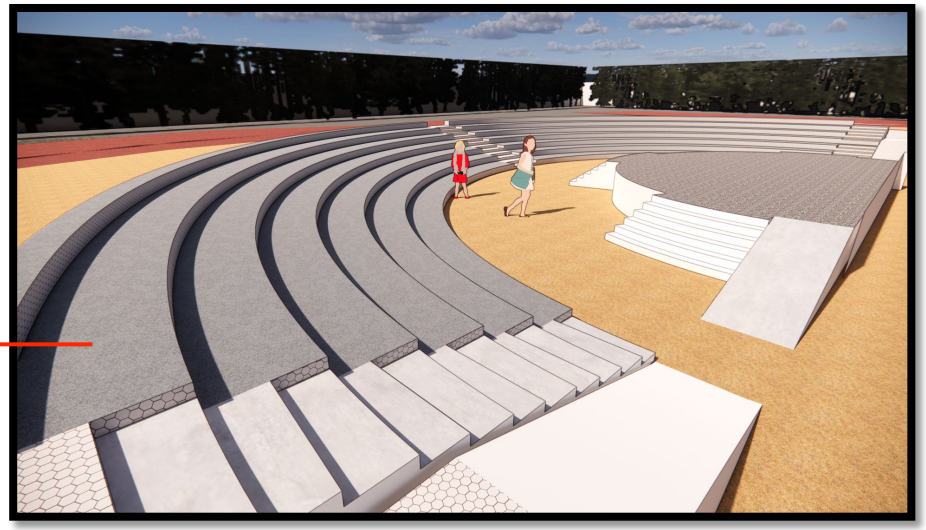


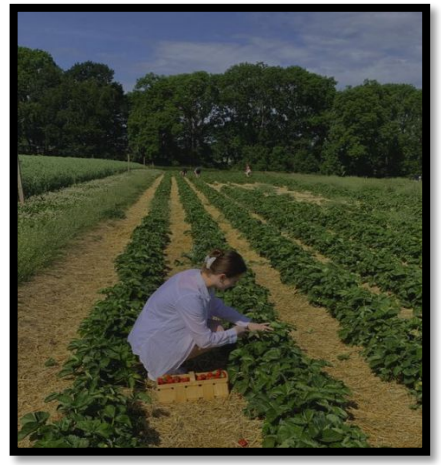


•O - Outdoor & Experiential Learning:

•Hands-on activities like on-campus farming and knowledge parks, fostering real-world skills and environmental awareness.

- Almost 90% of campus is open.
- Science park with life size models that encourage children to learn while playing.
- Many feature of the building itself can be an experiential learning about sustainability to students.

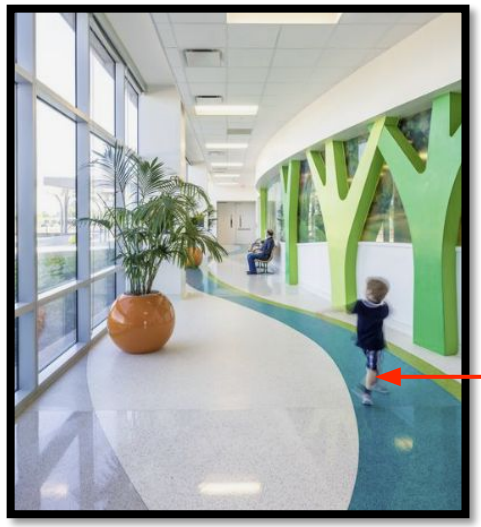


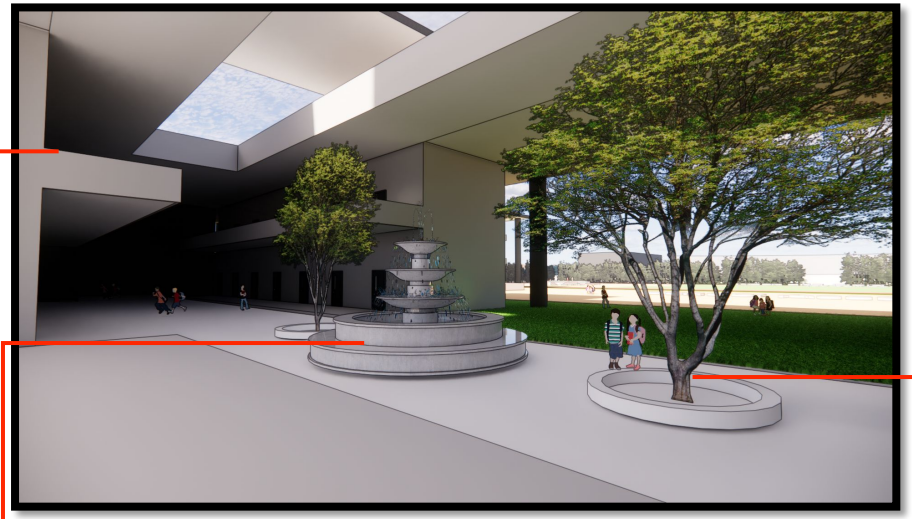


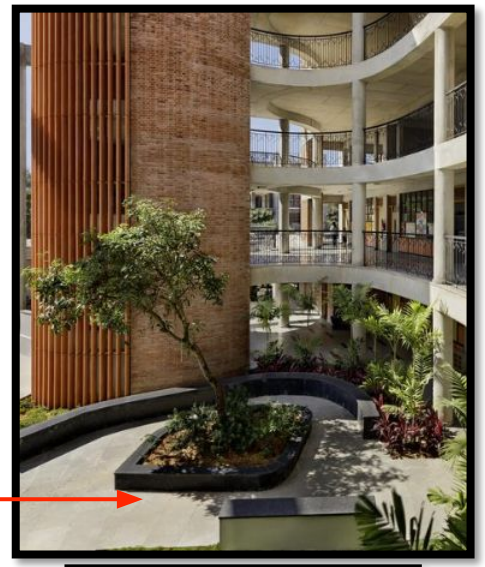
•W - Wellness through Biophilic Design:

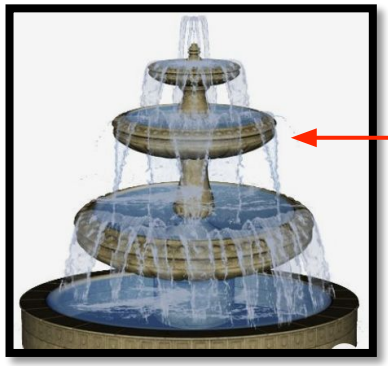
Natural elements integrated into the school environment to promote health, creativity, and well-being.

- Farming area to bring students closer to nature
- Most multipurpose areas and common areas have green spaces connectivity directly or indirectly that keeps students connected with nature.
- Quite zones, nature trials for wellness.
- Indoor plants and water feature to bring in calmness and soothing environment to the interiors.





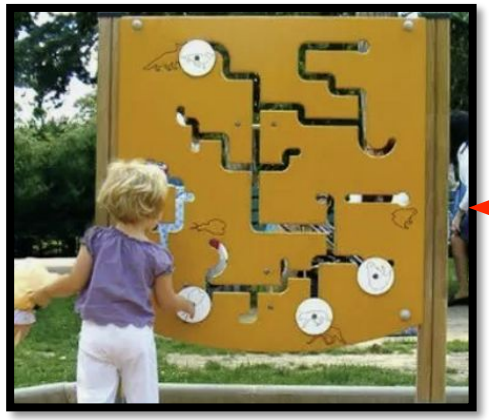




•T - Technology and Innovation Hub:

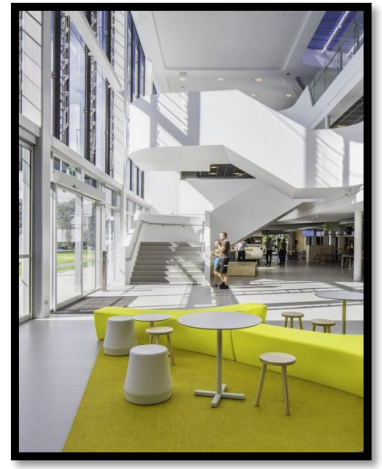
State-of-the-art science park and learning spaces focused on STEM education and fostering innovation.

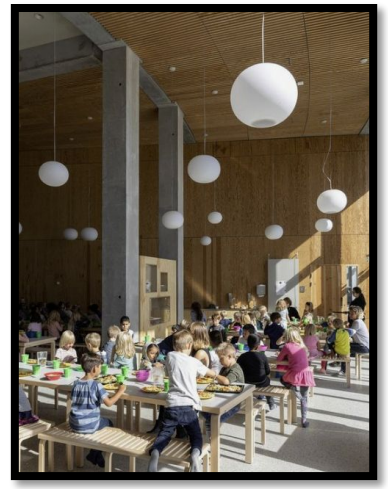
- Full fledges labs with equipment.
- Smart audio-visual classroom setup
- Robotics and electronics labs for higher classes.
- Multiple spaces that students can use to have interactive discussions and innovative ideas.



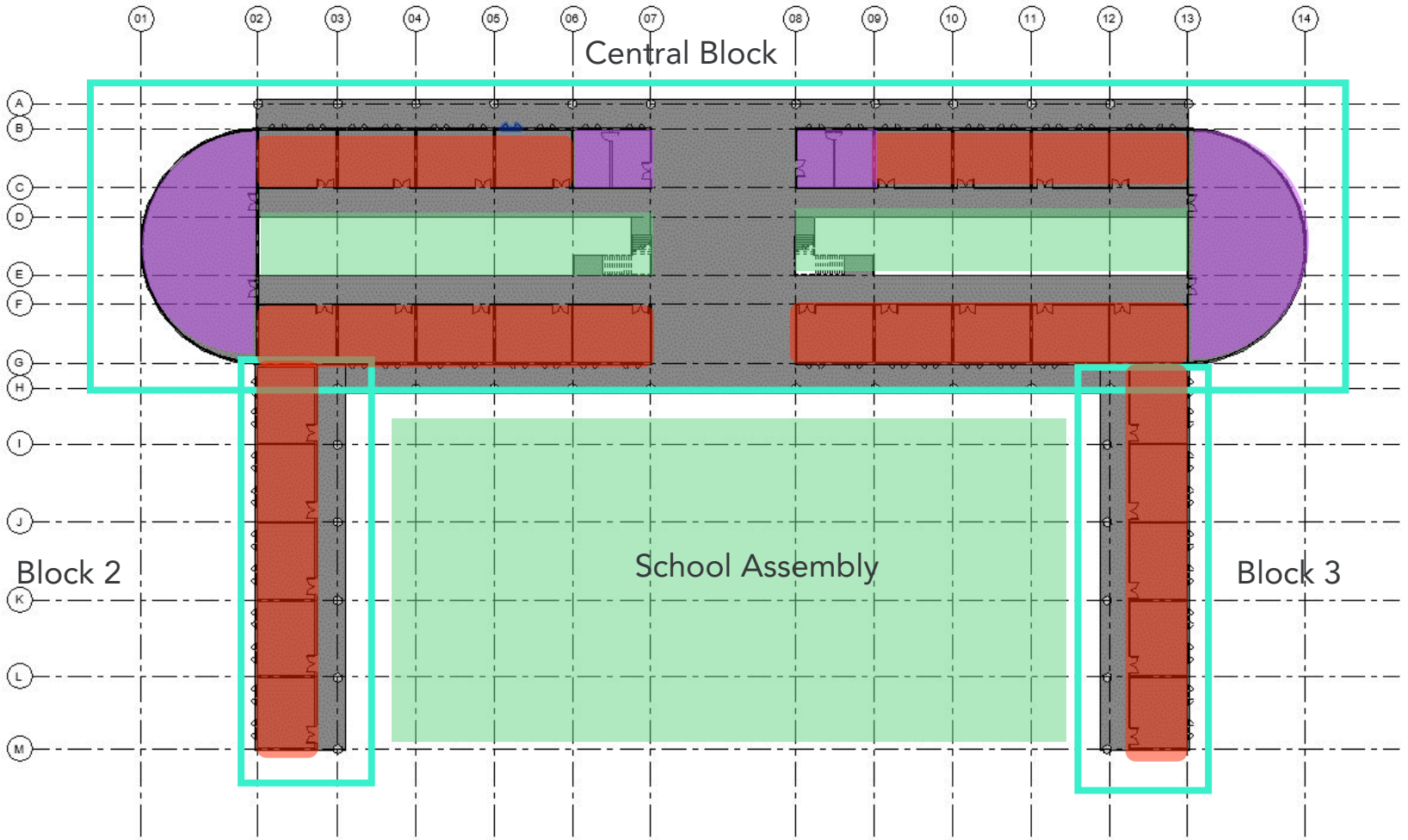
•H - Holistic Education Advantage:

- A unique blend of sustainable architecture, experiential learning, and a wide range of activities that set the school apart from others in the locality.





FLOOR PLANS



Classrooms/ Staff rooms

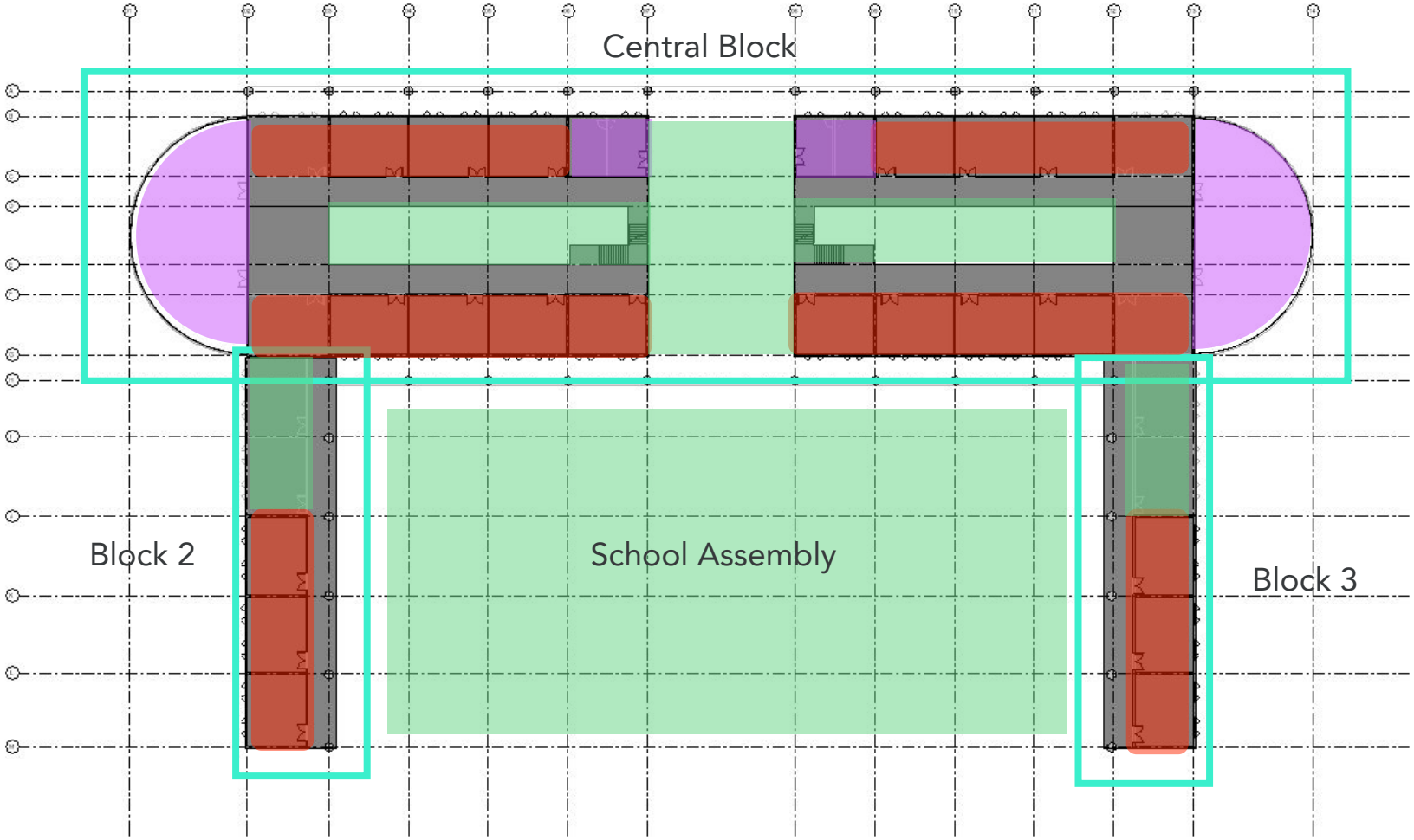
Recreation/ Admin spaces

Open Areas/ Gardens

Corridors/ circulation spaces

FIRST FLOOR LAYOUT

FLOOR PLANS



Classrooms/ Staff rooms

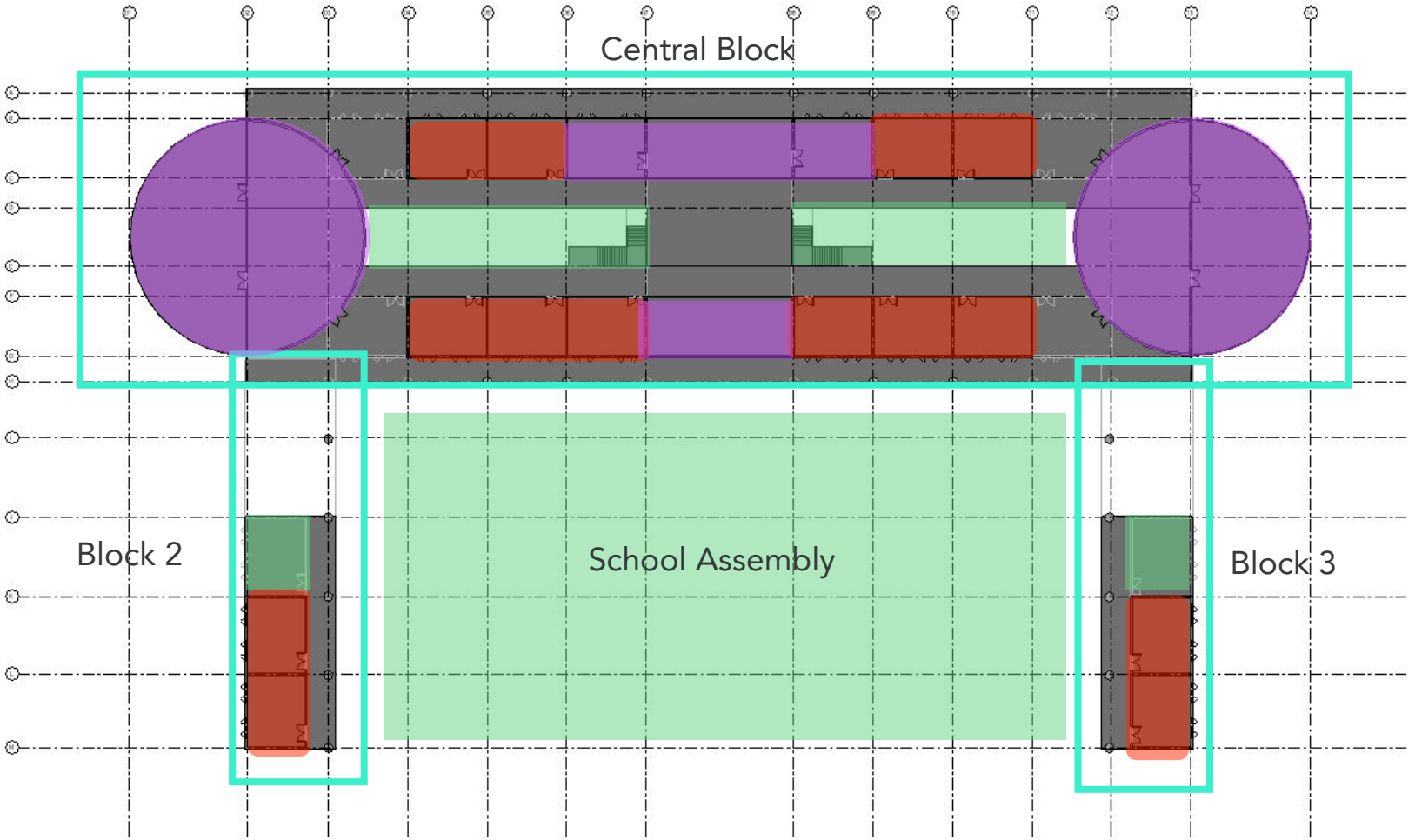
Recreation/ Admin spaces

Open Areas/ Gardens

Corridors/ circulation spaces

SECOND FLOOR LAYOUT

FLOOR PLANS



THIRD FLOOR LAYOUT

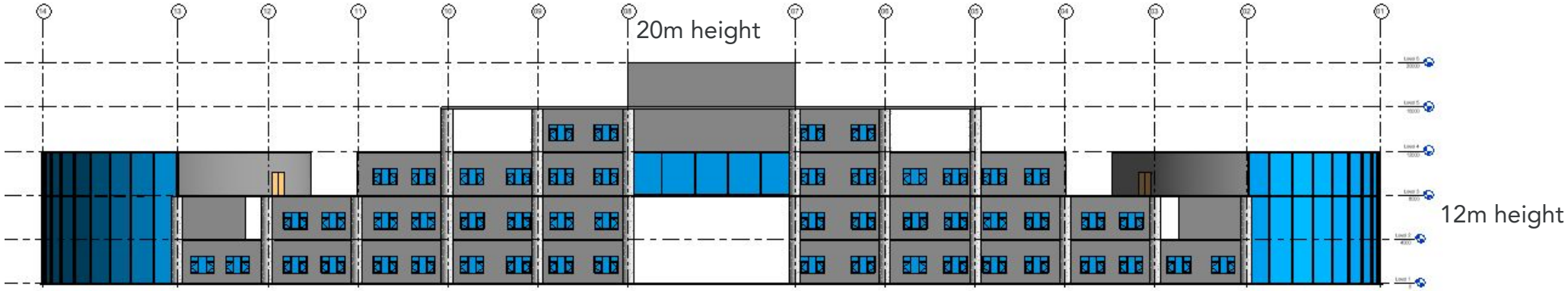
Classrooms/
Staff rooms

Recreation/
Admin spaces

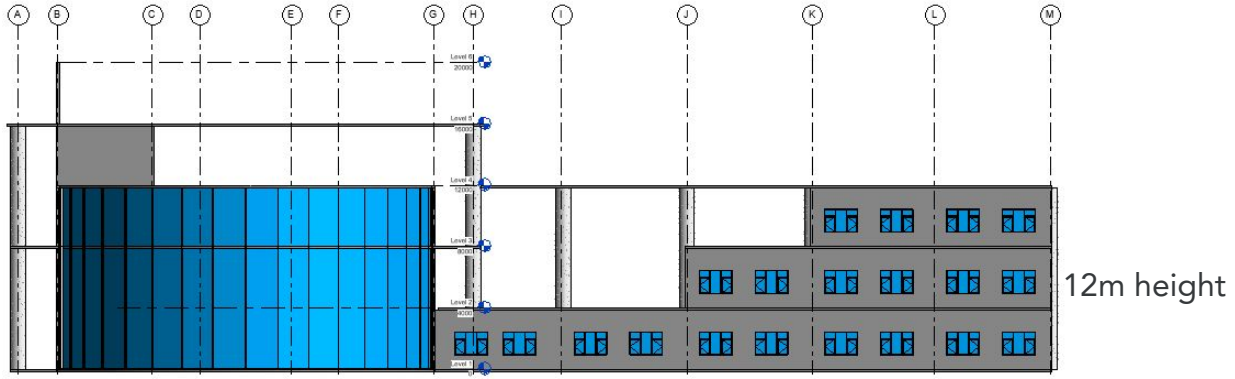
Open Areas/
Gardens

Corridors/
circulation
spaces

ELEVATIONS



FRONT ELEVATION



SIDE ELEVATION

3D VIEWS

3D VIEWS

3D VIEWS

3D VIEWS

CBSE NORMS

- The following are CBSE norms for a school to be affiliated to CBSE curriculum.
- Classrooms
  - ● Minimum Size: 8m x 6m (approximately 500 sq. ft.).
  - ● Floor Space: At least 1 sq. mtr. per student.
  - ● Requirement: One room per class.
- Science Laboratory
  - ● Minimum Size: 9m x 6m (approximately 600 sq. ft.) for each lab.
  - ● Types: Composite lab for Secondary or separate labs for Physics, Chemistry, and Biology for Senior Secondary.
  - ● Requirement: Labs must be fully equipped.
- Library
  - ● Minimum Size: 14m x 8m, with reading room facilities.
  - ● Books: Should include a variety of age-appropriate books, including e-books, fiction, non-fiction, reference books, encyclopaedias, periodicals, magazines, journals, and newspapers.

- Computer Laboratory
  - ● Minimum Size: 9m x 6m (approximately 600 sq. ft.).
  - ● Minimum Computers: 20 computers with a 1:20 computer-to-student ratio.
  - ● Internet: Must have good-speed internet connectivity.
  - ● Labs Required: Minimum of one lab for up to 800 students; additional labs for every additional 800 students.
  - ● Safety: Adequate cyber safety provisions must be in place, with supervised student access.
- Mathematics Laboratory
  - ● Size: Must be at least the size of a regular classroom.
- Rooms for Extracurricular Activities
  - ● Requirement: Separate rooms for music, dance, arts, and sports or a multipurpose hall of adequate size.

- Drinking Water, Toilets, and Other Physical Facilities
  - ● Water: Adequate potable drinking water on each floor.
  - ● Toilets: Separate, clean, and hygienic toilets for boys, girls, and staff on each floor, with facilities for primary students separate from others.
  - ● Accessibility: Ramps, auditory signals, and other facilities for wheelchair users in accordance with RPWD Act-2016.
  - ● Furniture: Suitable furniture in classrooms.
  - ● Safety Compliance: Compliance with safety guidelines from the Supreme Court, National Disaster Management Authority, and other statutory bodies.
  - ● Playground: Adequate ground for a 200-meter athletics track and other sports like kabaddi, kho-kho, volleyball, basketball.
- Enrolment and Section Restriction
  - ● Maximum Students: 40 students per section, with 1 sq. mtr. of built-up floor area per child.
- Rights of Persons with Disabilities
  - ● Infrastructural Facilities: Ramps in toilets, auditory signals in lifts, and other facilities as per RPWD Act-2016.
  - ● Inclusion: Promotion of inclusion for students with special needs, in line with the Rehabilitation of Persons with Disabilities Act 2016 and National Policy of Education.

BIOPHILIC ARCHITECTURE

- BIOPHILIC IDEAS IMPLEMENTATION STRATEGY:
- Incorporating biophilic design into a school creates a learning environment that connects students and staff with nature, enhancing well-being, productivity, and creativity.
- 1. Natural Lighting and Ventilation
    - ● Maximize Natural Light: Design classrooms with large windows, skylights, and light wells to allow ample natural light. Use glass walls where possible to enhance visibility of outdoor spaces.
    - ● Cross Ventilation: Ensure that classrooms and other spaces are designed to promote natural airflow, reducing the need for artificial cooling and enhancing indoor air quality.
- 2. Green Spaces and Outdoor Learning
    - ● Outdoor Classrooms: Create designated outdoor learning areas with natural seating arrangements (logs, stone benches) surrounded by greenery.
    - ● Gardens and Green Roofs: Incorporate school gardens where students can learn about plants, gardening, and sustainability. Green roofs can also be used as outdoor classrooms or recreational spaces.
    - ● Nature Trails: Develop walking paths around the campus with native plants, trees, and educational signage to encourage outdoor exploration.

- 3. Indoor Greenery
    - ● Indoor Plants: Place potted plants in classrooms, hallways, and common areas to purify the air and bring nature indoors. Use low-maintenance, air-purifying plants like snake plants, spider plants, or peace lilies.
    - ● Living Walls: Install vertical gardens or living walls in prominent indoor spaces like the lobby, library, or cafeteria to create a lush, natural atmosphere.
- 4. Natural Materials and Textures
    - ● Wood and Stone Elements: Use natural materials like wood, stone, and bamboo for flooring, furniture, and wall finishes to create a warm, organic feel.
    - ● Textures Inspired by Nature: Incorporate textures that mimic natural elements, such as wooden beams, stone walls, or woven textiles, to create a tactile connection with nature.
- 5. Water Features
    - ● Indoor Fountains: Install small water features or fountains in common areas to introduce the soothing sound of running water.
    - ● Rainwater Harvesting: Integrate visible rainwater harvesting systems that collect and store rainwater, demonstrating sustainability in action.

- 6. Nature-Inspired Colors and Patterns
    - ● Earthy Color Palette: Use a color scheme inspired by nature, such as greens, blues, browns, and other earthy tones, to create a calming and cohesive environment.
    - ● Biophilic Patterns: Incorporate patterns that mimic natural forms, such as leaves, waves, or organic shapes, in wall art, flooring, and other design elements.
- 7. Connection to Surrounding Environment
    - ● Views of Nature: Position classrooms and common areas to provide views of outdoor landscapes, gardens, or distant natural features like mountains or rivers.
    - ● Integration with Local Ecosystem: Plant native species around the school grounds and design the landscape to attract local wildlife like birds, butterflies, and bees.
- 8. Sustainable Practices
    - ● Energy-Efficient Design: Incorporate solar panels, rainwater harvesting, and energy-efficient lighting to reduce the school's environmental impact.
    - ● Waste Management: Set up composting bins and recycling stations around the school to promote sustainability and teach students about waste management.

- 9. Wellness Spaces
    - ● Quiet Zones: Create designated quiet areas indoors or outdoors where students can relax, meditate, or engage in reflective activities surrounded by nature.
    - ● Healthy Cafeteria: Design the cafeteria with views of nature and serve organic, locally sourced food to promote a connection to natural, healthy eating.
- 10. Educational Integration
    - ● Environmental Curriculum: Integrate biophilic design principles into the curriculum, teaching students about ecology, sustainability, and the importance of nature in human life.
    - ● Interactive Installations: Create interactive nature-based installations or exhibits that allow students to engage with natural processes, such as a butterfly garden or a weather station.

GREEN BUILDING CERTIFICATION

- Creating a green and sustainable school building involves integrating environmentally responsible practices throughout the design, construction, and operation phases. Here's a brief overview of key strategies:

- 1. Site Selection and Planning
  - ● Optimal Orientation: Position the building to maximize natural light and ventilation, reducing the need for artificial lighting and heating/cooling.
  - ● Minimal Site Disturbance: Preserve existing vegetation and natural features, and minimize land disruption during construction.

- 2. Energy Efficiency
  - ● Passive Design: Utilize passive solar heating, natural ventilation, and daylighting to reduce energy consumption.
  - ● High-Performance Insulation: Install high-quality insulation in walls, roofs, and windows to improve thermal efficiency.
  - ● Renewable Energy: Incorporate solar panels, wind turbines, or geothermal systems to generate on-site renewable energy.

- 3. Water Conservation
  - ● Rainwater Harvesting: Collect and store rainwater for use in irrigation, toilets, and other non-potable applications.
  - ● Low-Flow Fixtures: Install water-efficient fixtures to reduce water consumption.
  - ● Greywater Recycling: Implement systems to recycle greywater for landscaping and other uses.

- 4. Sustainable Materials
    - ● Local and Recycled Materials: Use locally sourced, recycled, or renewable materials, such as bamboo, recycled steel, and reclaimed wood.
    - ● Low-VOC Products: Choose paints, adhesives, and finishes with low volatile organic compounds (VOCs) to improve indoor air quality.
- 5. Indoor Environmental Quality
    - ● Natural Ventilation: Design spaces to promote natural airflow, improving indoor air quality and reducing reliance on HVAC systems.
    - ● Daylighting: Maximize the use of natural light through large windows, skylights, and light wells to create a healthy, bright environment.
- 6. Waste Reduction
    - ● Construction Waste Management: Plan for recycling and repurposing construction waste to minimize landfill impact.
    - ● Sustainable Operations: Implement waste reduction practices, such as recycling programs and composting, throughout the school's operation.
- 7. Biodiversity and Green Spaces
    - ● Green Roofs and Walls: Install green roofs and living walls to improve insulation, reduce heat islands, and provide habitat for wildlife.
    - ● Outdoor Learning Spaces: Create gardens, courtyards, and outdoor classrooms to connect students with nature and promote environmental education.

- 8. Sustainable Transportation
    - ● Bicycle Facilities: Provide bike racks and showers to encourage cycling.
    - ● Public Transport Access: Ensure easy access to public transportation to reduce car dependency and associated emissions.
- 9. Energy and Water Monitoring
    - ● Smart Systems: Install energy and water monitoring systems to track usage, optimize performance, and identify areas for improvement.

- By following these strategies, the school building will not only reduce its environmental footprint but also serve as a living laboratory for sustainability, inspiring future generations to value and protect the environment.
- We can further get the school certified under:
- ● LEED (Leadership in Energy and Environmental Design): One of the most widely recognized green building certification programs globally.
- ● IGBC (Indian Green Building Council): Offers a Green Schools rating system specifically tailored for schools in India.
- ● GRIHA (Green Rating for Integrated Habitat Assessment): A national rating system in India, which also offers specific criteria for educational institutions.

PROFORMA COST ESTIMATION

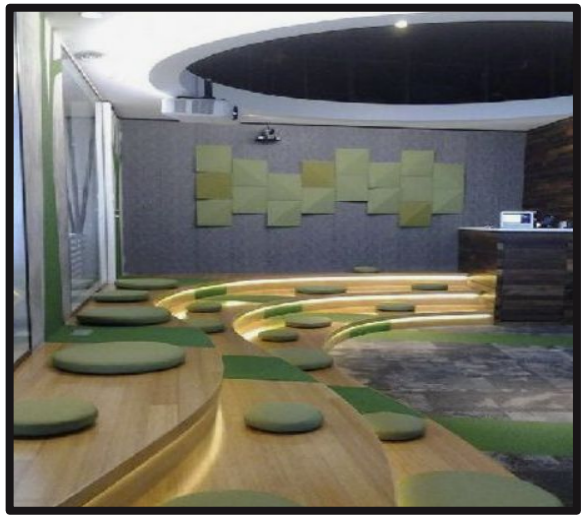
- 1. Civil Works (50-70%)
  - ● Bricks: ~15-20% of total construction cost
  - ● Cement: ~10-15% of total construction cost
  - ● Steel (Reinforcement): ~15-20% of total construction cost
  - ● Concrete (including cement and aggregates): ~10-15% of total construction cost
- 2. Finishes (21-32%)
  - ● Flooring (tiles, marble, etc.): ~8-12% of total construction cost
  - ● Plastering and Wall Finishes: ~5-8% of total construction cost
  - ● Paints and Coatings: ~3-5% of total construction cost
  - ● Doors and Windows (including frames): ~5-7% of total construction cost
- 3. Services (17-25%)
  - ● Plumbing and Sanitary Work: ~5-7% of total construction cost
  - ● Electrical Works: ~7-10% of total construction cost
  - ● HVAC (Heating, Ventilation, Air Conditioning): ~5-8% of total construction cost
- 4. Miscellaneous (10-19%)
  - ● Landscaping and External Development: ~3-5% of total construction cost
  - ● Fire Safety Installations: ~2-4% of total construction cost
  - ● Furniture and Fixtures: ~5-10% of total construction cost
- 5. Contingencies (3-5%)
  - ● Contingency Fund: ~3-5% of total construction cost (for unforeseen expenses)
- 6. Professional Fees (7-12%)
  - ● Architectural and Engineering Fees: ~5-8% of total project cost
  - ● Approval and Legal Fees: ~2-4% of total project cost
- These percentages can vary depending on the location, size, design complexity, and quality of materials used. The overall cost distribution may differ based on regional construction practices and market conditions.
- Approximate Estimate:
- Total area= 5562 sqmtr x Rs. 20000(per sqmt construction cost) =Rs.11,12,40,000

SMART CLASSROOMS

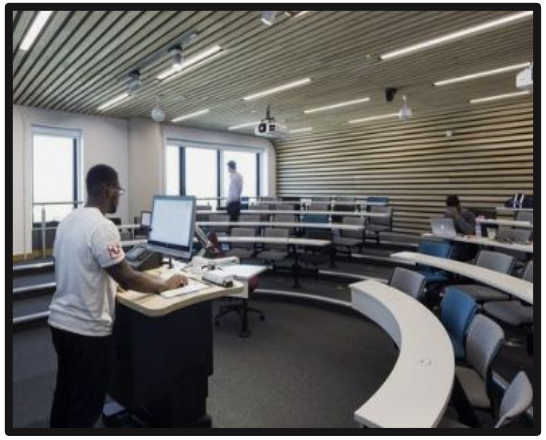
Features of the Smart Classroom

1. **Interactive Smart Boards**
   - Touch-enabled screens for interactive lessons, multimedia presentations, and real-time collaboration.
2. **High-Speed Internet Connectivity**
   - Seamless access to online resources, educational content, and video conferencing for remote learning.
3. **Digital Learning Tools**
   - Integration of tablets, laptops, and e-learning platforms for personalized learning experiences.
4. **Audio-Visual Aids**
   - High-definition projectors, speakers, and microphones to enhance audio-visual learning and improve classroom engagement.
5. **Cloud-Based Learning Management Systems (LMS)**
   - Centralized platform for managing assignments, assessments, and real-time feedback for both teachers and students.
6. **Student Response Systems**
   - Tools like clickers or apps to facilitate interactive quizzes, surveys, and instant feedback during lessons.
7. **AI-Powered Learning Analytics**
   - Track student performance and learning patterns to offer personalized learning experiences and real-time interventions.
8. **Smart Classroom Management Software**
   - Tools to help teachers manage student activities, control devices, and ensure smooth lesson flow.
9. **Collaborative Learning Spaces**
   - Flexible seating arrangements and mobile devices to foster group activities, teamwork, and collaborative problem-solving.
10. **Virtual & Augmented Reality (VR/AR) Tools**
    - Immersive learning experiences with virtual field trips, 3D visualization of complex subjects, and interactive simulations.
11. **Energy-Efficient Design**
    - Smart lighting and temperature controls for optimized energy usage and comfortable learning environment.
12. **Security & Monitoring**
    - Classroom monitoring tools like CCTV and controlled access for a secure and safe learning environment.

CONCEPTUAL VIEWS OF SMART CLASSROOMS

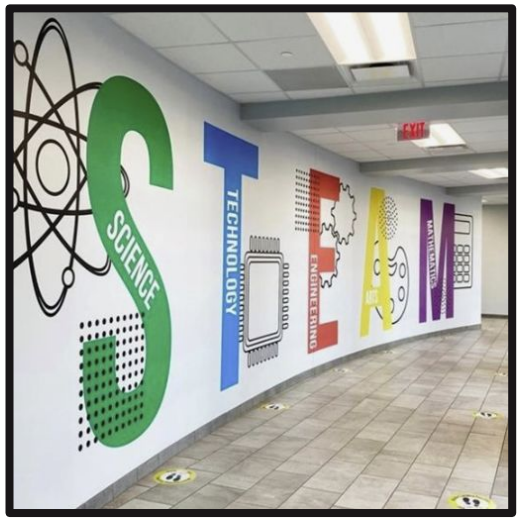


PRIMARY / MIDDLE LEVEL MODEL CLASSROOM



SECONDARY LEVEL MODEL CLASSROOM

CONCEPTUAL VIEWS OF MULTIPURPOSE AREAS / DINING / LIBRARY /COMMON AREAS

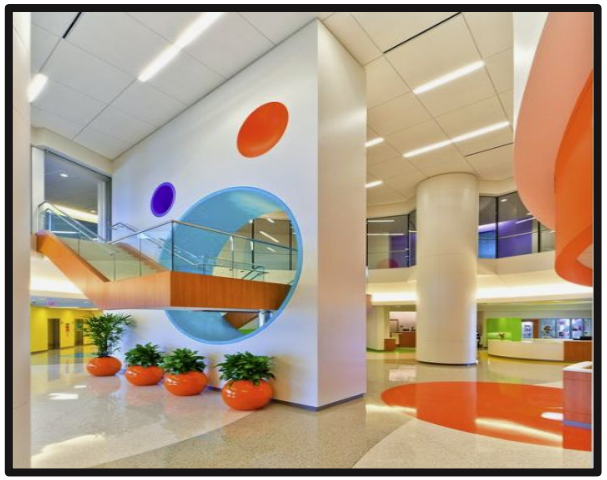


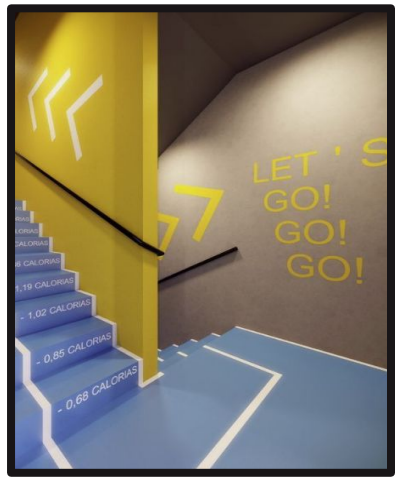
CORRIDORS

DINING AREA

LIBRARY AREA

COMMON AREAS



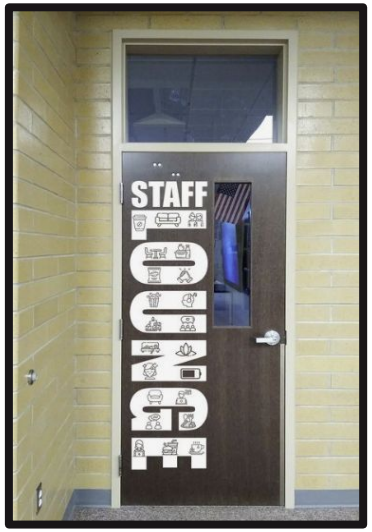


STAIRS/LOBBY

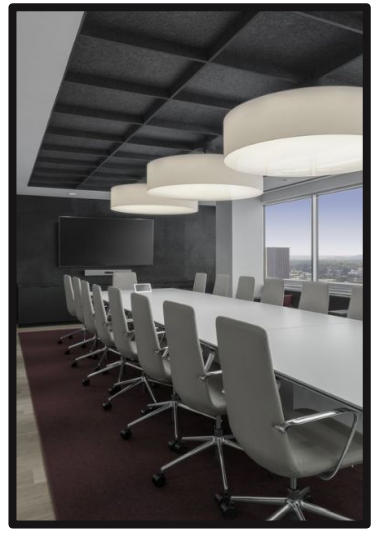
COMPOUND WALLS / PARTITIONS

CONCEPTUAL VIEWS OF STAFF ROOMS / PRINCIPAL ROOM / LABS

PRINCIPAL OFFICE



STAFF ROOMS / MEETING ROOMS



CONFERENCE HALL

COMPUTER LABS

SCIENCE LABS

THANK YOU

SublimeSpaces

ARCHITECTURE | INTERIORS | LANDSCAPE