

# Psychological Impact of Built Environment on Cadets studying at Sainik Schools in India

Sarthak M Bhor<sup>1</sup>, Neha Kawane<sup>2</sup>

<sup>1</sup>Student, Sipna School of Planning and Architecture, Amravati, India

<sup>2</sup>Asso. Professor, Sipna School of Planning and Architecture, Amravati, India

**Abstract**—This study looks at how the buildings and surroundings of Sainik Schools affect the minds and behavior of the students. Sainik Schools are known for their strict rules and military-style training. The research focuses on how things like the layout of buildings, open spaces, and overall look of the school impact how students think, feel, and act. The study used different methods, such as surveys, watching student behavior, and talking to both students and teachers. It looked at how features like school design relate to stress, discipline, teamwork, and motivation. The results show that the simple and strict design of these schools helps build discipline and strength, but it can also increase stress and limit personal freedom. The study suggests improving the design of Sainik Schools to better support both learning and mental well-being.

## 1. INTRODUCTION

Sainik Schools in India are special schools that give students both regular education and military training. These schools help students grow in many ways by focusing on physical fitness, discipline, and academic success. Many students from Sainik Schools go on to join the armed forces or other important professions. While there is a lot of focus on training and studies, one area that is often ignored is the design of the school buildings and spaces. The way dormitories (where students sleep), classrooms (where they study), training grounds (where they exercise), and recreational zones (where they relax and play) are built can affect how students feel and behave. A good school environment can make students feel more comfortable, focused, and motivated. On the other hand, a poor design might lead to stress, lack of focus, or even health issues. For young cadets who stay away from home, the design of their surroundings plays an important role in their daily life and growth.

This study aims to understand how the physical design of Sainik Schools affects students' mental well-being, discipline, academic performance, and overall development. The goal is to find out what kind of spaces help cadets do their best and feel their best.

## 1.2 AIM

To analyse and understand how the architectural design and built environment of Sainik Schools psychologically influence the performance, behaviour, and well-being of cadets.

## 1.3 OBJECTIVE

Identify key architectural elements that affect cadet psychology:

- Lighting
- Room layout
- Open spaces
- Ventilation
- Noise levels
- Space arrangement

Evaluate the link between built spaces and cadet performance in:

- Academics
- Discipline
- Stress management

Study the role of spatial planning in:

- Promoting order
- Increasing motivation
- Creating a sense of belonging

Propose design improvements to enhance the cadet experience and well-being.

#### 1.4 SCOPE

This study explores how Sainik Schools in India are designed and how their surroundings are planned. It looks closely at things like the structure of the school buildings, how well they blend with the natural environment, and how the different areas within the school are arranged. The research uses information from books, previous studies, and real examples of Sainik Schools to better understand how these physical spaces affect the minds, emotions, and behavior of the students who live and study there.

#### 1.5 LIMITATIONS

The research relies on secondary data and existing literature due to constraints in conducting primary field studies.

Variations among different Sainik Schools in terms of design and location may limit the generalizability of findings.

#### 1.6 LITRATURE REVIEW

**Biophilic Design and Psychological Restoration:** Biophilic design, which incorporates natural elements into built environments, has been shown to reduce stress and enhance cognitive function. A study on student hostels found that rooms with higher biophilic quality scores were associated with greater perceived restorativeness and emotional stability among students .

**School Environment and Adolescent Anxiety:** Research indicates a significant correlation between school environments and anxiety levels in adolescents. Factors such as classroom design, lighting, and spatial organization can influence students' mental health .

**Impact of Crowding in Educational Settings:** Overcrowded classrooms and dormitories can lead to increased stress and hinder cognitive development. Studies on Ashram Schools have highlighted the negative effects of crowding on student performance and health .

## 2. CASE STUDIES

### 2.1 Sainik School, Gorakhpur

Overview:

Sainik School in Gorakhpur is one of the newer schools of its kind in India and was designed by a group called Design Forum International (DFI). Its buildings are inspired by the values of the Indian military, combining meaningful symbols with practical design. The school's layout is made to help cadets develop leadership, discipline, and emotional strength.

Design Features:

#### 1. Ceremonial Plaza and Axis Planning:

The school has a large open area in the center, which is the main part of the campus. It is used for gatherings, parades, and important events, helping cadets feel united, proud, and disciplined. The buildings are arranged in a straight line, showing the organized and structured style of the military.

#### 2.Spatial Hierarchy and Zoning:

The campus is divided into separate areas for studying, living, and relaxing. This clear layout makes it easier for cadets to focus, manage their time well, and maintain a balanced daily routine.

#### 3. Biophilic Design and Landscaping:

The architects kept many of the old trees and included them in the overall design of the school. They also added green courtyards and shaded paths, so cadets can spend time in nature often. This helps lower stress and improve focus.

4. Cultural and Symbolic References:

The campus includes things like murals, military symbols, and statues that help cadets feel proud of their country, culture, and school. The main entrance and building front are designed to look grand and strong, which helps build confidence and the right mindset in cadets.



Fig. a Site plan



Fig. b The central ceremonial plaza

Psychological Impact:

**Emotional Stability and Pride:**  
The central plaza and the balanced design of the buildings create a sense of discipline, helping cadets feel connected to the school's traditions. This makes them feel proud and like they truly belong.

**Stress Reduction and Focus:**  
Natural features like old trees, green spaces, and shaded walkways help cadets feel calm and think

more clearly. Being around nature every day can lower stress and improve focus.

**Leadership and Social Interaction:**  
Shared spaces like the main plaza and open hallways give cadets chances to talk, work together, and build leadership skills. These areas help create a strong sense of community and respect among students.

Relationship Between Built Spaces and Cadet Performance:

A. Academics

Built Environment Elements:

- **Classroom design:** Proper daylighting, ventilation, acoustics, and furniture ergonomics directly influence attention span, participation, and comfort.
- **Library and Study Areas:** Access to quiet, well-lit, and comfortable study zones promotes deeper focus and academic success.
- **Spatial connectivity:** Logical campus circulation helps cadets manage time effectively between classes, study, and training.

B. Discipline

Built Environment Elements:

- **Hostel layouts:** Spatial organization affects routine formation, hygiene, and peer monitoring.
- **Visibility and supervision:** Corridors, dorm entries, and common areas with high visibility promote order.
- **Circulation hierarchy:** Clear zoning of academic, recreational, and residential areas supports structured movement.

C. Stress Management

Built Environment Elements:

- **Access to nature:** Green spaces, trees, and shaded sitting areas offer cadets a mental break.
- **Private vs. communal zones:** Balance between personal space (e.g., beds, lockers) and shared zones reduces social stress.

- Recreational areas: Sports grounds, reading zones, and indoor games areas help in emotional decompression.

Study the role of spatial planning :

#### 1. Promoting Order

- Zoning: Clear separation of academic, residential, and physical training zones supports structured routines.
- Linear Circulation: Straight, axial paths reduce confusion and guide cadets between key areas (hostel mess class drill).
- Visibility: Open corridors and central courtyards enable easy supervision, reducing indiscipline.
- Repetition & Symmetry: Uniform design reinforces discipline and routine.

#### 2. Increasing Motivation

- Symbolic Spaces: Placement of parade grounds, trophies, and murals in visible locations keeps cadets inspired.
- Progressive Access: Senior dorms or exclusive areas reflect growth and reward performance.
- Proximity to Goals: Sports arenas, academic halls, and success walls near circulation paths drive ambition.

#### 3. Creating Sense of Belonging

- House-Based Dorms: Encourage identity and group bonding.
- Common Areas: Shared lounges, dining halls, and open spaces support social connection.
- Legacy Elements: Wall displays, cadet-designed murals, and name plaques help cadets leave their mark.

#### 2.2. Sainik School, Kunjpura, Haryana, India

Overview:

Sainik School in Kunjpura is one of the oldest and most well-known Sainik Schools in India. Its buildings are designed to reflect military discipline while also helping cadets develop leadership, work well in teams, and build mental strength.

Design Features:

##### 1. Open Courtyards and Spacious Dormitories:

The layout of the campus includes large open courtyards surrounded by dormitories. These spaces promote free movement and social interaction, which is essential for emotional health and developing interpersonal skills.

##### 2. Symmetry and Order:

The school's buildings are laid out in a balanced and organized way around central open spaces, showing military-style precision. This neat design doesn't just look good—it also helps students think more clearly and stay focused and disciplined.

##### 3. Green Spaces and Nature Integration:

The school is surrounded by lush green fields, a significant biophilic design element. Cadets have access to nature, which has been linked to reduced stress and improved mood. Natural surroundings are particularly beneficial in boosting cognitive function and emotional well-being.

Psychological Impact:

**Sense of Belonging and Identity:** The school's design, with military symbols and special school signs, helps students feel proud and connected to the school. This creates a strong bond between students and the school.

**Leadership and Teamwork:**

The way the school is designed encourages students to work together and develop leadership

skills. Open spaces and areas for group activities help students practice teamwork and social skills, which are important for military training.

Stress Reduction:

The green areas and peaceful courtyards give students a chance to relax and unwind. These parts of the school help reduce stress and improve students' mood, playing an important role in their mental health.

Relationship Between Built Spaces and Cadet Performance:

#### A. Academics

Built Environment Factors:

- Classroom design and layout: Adequate daylight, ventilation, acoustic control, and ergonomic seating are crucial for effective learning.
- Library and study rooms: Quiet, well-lit, and accessible spaces enhance focus and independent study.
- Connectivity and access: Efficient circulation between hostels, academic blocks, and study areas helps cadets manage time effectively.

#### B. Discipline

Built Environment Factors:

- Dormitory design: Room size, privacy, and supervision impact cadet behavior and adherence to rules.
- Open spaces and parade grounds: These are crucial for physical training and instilling military discipline.
- Visibility and supervision: Corridors and common areas with good visibility help maintain order and discourage misconduct.

#### C. Stress Management

Built Environment Factors:

- Access to natural and recreational spaces: Gardens, sports fields, and shaded outdoor areas provide relief from academic and physical stress.
- Private and communal balance: Personal spaces help cadets retreat and relax, while communal areas foster social bonding.

Study the role of spatial planning :

##### 1. Promoting Order

- Zoned Master Planning: Clear segregation of academic blocks, dormitories, mess, parade ground, and recreation areas enables a structured daily routine.
- Grid-Based Circulation Paths: Orthogonal pathways with defined start/end points guide movement, reduce confusion, and support time management.
- Visual Supervision: Strategic openness and corridor visibility enable passive monitoring by staff and senior cadets, encouraging self-discipline.
- Routine-Oriented Design: Proximity of key activity areas (hostel → mess → parade ground → classroom) supports cadet scheduling and punctuality.

##### 2. Increasing Motivation

- Formal Architecture with Identity: Heritage-style structures and formal geometries evoke institutional pride and a sense of prestige.
- Well-Lit, Ventilated Learning Spaces: Properly designed classrooms and libraries improve cognitive performance

- **Display of Achievements:** Trophy rooms, notice boards, and central courtyards with symbolic elements inspire cadets to excel.
- **Recreational Zoning:** Dedicated sports fields and creative zones (music, art) motivate cadets by providing breaks and outlets for talent.

3. Creating a Sense of Belonging

- **House-Based Residential Clusters:** Dorms grouped by house foster teamwork, competition, and identity among cadets.
- **Courtyard-Centered Hostel Design:** Promotes interaction, shared routines, and informal bonding.
- **Community Spaces:** Common mess halls, reading rooms, and prayer spaces create inclusive environments for cadets of diverse backgrounds.
- **Ceremonial Spaces (Parade Ground):** Central gathering for flag hoisting, drills, and celebrations builds shared purpose and unity.

Key Architectural Elements (Sainik School Gorakhpur & Kunjpura )

Criteria	Sainik School Gorakhpur	Sainik School Kunjpura
Lighting of Classrooms	Natural lighting with LED lights; fairly modern infrastructure	Ample natural lighting due to large windows; recently renovated

Room Layout	Compact and modern with efficient use of space	Traditional design; more spacious but older in layout
Open Space	Adequate open space for drills and activities; planned campus	Extensive open grounds; large parade and sports areas
Ventilation of Building	Well-ventilated with cross-ventilation in classrooms and dorms	Excellent ventilation in older structures; large windows common
Noise Level	Low noise; located on the outskirts with minimal disturbance	Very low noise due to large campus and buffer from city areas
Space Arrangement	Structured zoning for hostels, academics, and activities	Spread-out arrangement; more spacious but may involve more walking

3. CONCLUSION:

This research establishes that spatial planning in military-residential institutions like Sainik School Gorakhpur and Sainik School Kunjpura plays a vital role in shaping cadet development across academic performance, discipline, motivation, and psychological well-being. Through a comparative architectural analysis, it becomes evident that both schools, though differing in design age and layout philosophy, strategically utilize space to support their institutional goals.

Sainik School Gorakhpur, with its compact, modern, and efficiently zoned campus, promotes structured routines, quick transitions, and spatial clarity elements that directly contribute to time management.

In contrast, Sainik School Kunjpura employs a more traditional and expansive spatial layout, allowing for generous open grounds, enhanced natural ventilation, and strong visual connections to the surrounding landscape, all of which contribute to cadet motivation, physical activity, and emotional relief.

The comparative chart further supports this by highlighting key architectural factors such as lighting, ventilation, room layout, and spatial organization. These elements—when thoughtfully integrated—do not merely serve functional purposes but actively contribute to the behavioral conditioning, social bonding, and mental clarity of cadets.

In conclusion, the built environment in Sainik Schools is not just a backdrop for military education—it is a formative tool that reinforces the values of discipline, resilience, and unity. For architectural planners and educational policymakers, this study underscores the importance of designing institutional spaces that are not only efficient but also psychologically responsive to the needs of students. Future Sainik Schools or similar institutions should prioritize spatial planning that balances structure with openness, and tradition with innovation, to holistically support cadet development.

#### REFERENCE

- [1] Asim, F., & Shree, V. (2020). The impact of Biophilic Built Environment on Psychological Restoration within student hostels. *Visions for Sustainability*.  
<https://ojs.unito.it/index.php/visions/article/view/3534>
- [2] Pande, B., & Pandey, P. (2023). To Examine the Effect of The School Environment on Anxiety Levels Among Adolescents. *International Journal of Indian Psychology*, 11(1), 716-722. <https://ijip.in/articles/to-examine-the-effect-of-the-school-environment-on-anxiety-levels-among-adolescents/>
- [3] Nagar, D., & Pandey, J. (2005). Psychological Impact of Crowding in Ashram Schools. *Indian Educational Review*, 41(1). [https://www.academia.edu/1812546/Psychological\\_Impact\\_of\\_Crowding\\_in\\_Ashram\\_Schools](https://www.academia.edu/1812546/Psychological_Impact_of_Crowding_in_Ashram_Schools)
- [4] Design Forum International. (n.d.). The Sainik School by Design Forum International. <https://media.biltrax.com/the-sainik-school-by-design-forum-international/>
- [5] Wikipedia contributors. (n.d.). Biophilic design. *Wikipedia*. [https://en.wikipedia.org/wiki/Biophilic\\_design](https://en.wikipedia.org/wiki/Biophilic_design)
- [6] <https://ojs.unito.it/index.php/visions/article/view/3534>
- [7] <https://www.forbesindia.com/article/k-j-somaiya-institute-of-management/green-spaces-and-mental-health-the-importance-of-green-campuses/94519/1>
- [8] <https://link.springer.com/article/10.1007/s43995-025-00098-0>