

Design of Juvenile Rehabilitation Center with Vocational Training Hub

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Abstract: This research focuses on designing a Juvenile Rehabilitation Center that combines therapy and vocational training to help young offenders rebuild their lives. The idea is to not only address the emotional and psychological challenges they face but also teach them valuable skills that will help them find jobs and successfully reintegrate into society. The paper looks at existing rehabilitation centers and highlights how programs that teach practical skills, like carpentry or computer work, can lower the chances of these young people reoffending. It argues that by offering both support and real-world skills, these centers can help break the cycle of crime and give juvenile offenders a better chance at a successful future.

Keywords: Juvenile rehabilitation, vocational training, recidivism reduction, youth empowerment, and social reintegration.

1. Introduction

In today's world, many young people who commit crimes are not inherently dangerous or malicious. Often, they come from difficult backgrounds marked by poverty, broken families, or a lack of guidance and support. This paper explores how we can rethink juvenile justice not as a matter of punishment, but as an opportunity for transformation.

Background Context: Juvenile delinquency remains a pressing issue globally. While the justice system has traditionally focused on confinement and discipline, modern approaches are shifting toward rehabilitation, with an emphasis on education, therapy, and personal growth. Architecture plays a vital role in this shift, as the physical environment deeply influences behaviour and emotional healing.

Importance of Designing: Designing for rehabilitation requires more than basic functionality. A well-planned space can foster calmness, provide safety, and support mental well-being. It can promote dignity and a sense of purpose. In the case of juveniles, design can bridge the gap between their troubled past and a hopeful future by integrating classrooms, workshops and communal areas that support both emotional and vocational growth.

Purpose of the Research Paper: The main aim of this research is to investigate how architectural design, paired with vocational training, can support the complete rehabilitation of young offenders. It questions how space can shape behaviour, offer opportunities, and encourage self-improvement.

Significance: This paper is significant because it contributes to the growing conversation around humane juvenile justice. Instead of focusing solely on confinement, it presents a model that values growth, dignity, and reintegration. By addressing not only the physical design but also the social and educational components, the study lays the foundation for more impactful rehabilitation solutions that can reduce repeat offenses and change lives.

A. Objectives and Scope of the Study

The key objectives of this study are:

- To explore how architecture can support the rehabilitation of juveniles.
- To identify vocational training strategies that promote personal growth.
- To examine successful case studies and derive applicable design strategies.

The scope includes institutional design, educational programming, and the psychological and social well-being of juvenile residents. It focuses on integrating learning and rehabilitation into a unified spatial experience.

2. Literature Review

A. Literature Case Studies



Fig. 1. View Illinois state correctional center

Illinois state correctional center, Hillsboro, Illinois

Location: Hillsboro, Montgomery County, Illinois, United States

Establishment Year: 1980

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Facility Type: Medium-security adult male state prison
(Note: Primarily adult, but useful for understanding Illinois vocational training strategies)

Area Covered: Approximately 50 acres

Administered By: Illinois Department of Corrections (IDOC)

Inmate Capacity: Approx. 1,500 inmates

1) Positive Aspects

- *Large Site Area (Approx. 50 acres):* Allows for spatial segregation of functions—potential for zoning of rehabilitation, training, and living areas.
- *Existing Vocational Infrastructure:* Presence of training workshops (e.g., automotive, culinary, building trades) offers a functional model for skill development.
- *Natural Landscape Setting:* The semi-rural surroundings provide a quiet environment, beneficial for reflection and mental well-being.
- *Dedicated Educational Spaces:* Includes classrooms and program rooms that support structured rehabilitation efforts.
- *Facility Modularity:* Its medium-security layout enables some adaptability for less restrictive rehabilitation models with careful planning.

2) Negative Aspects

- *Primarily Designed for Adults:* The spatial design is security-heavy and not psychologically suited for juveniles (harsh fencing, surveillance-dominated layout).
- *Institutional Ambience:* Stark interiors and rigid circulation patterns may reinforce punitive rather than reformative experiences.
- *Limited Informal/Green Zones:* Few therapeutic outdoor areas for recreation or open-air vocational activities.
- *Overemphasis on Security:* High walls, limited transparency, and restricted visual connection between spaces hinder a sense of openness and trust.
- *Lack of Community Integration:* Physical and symbolic detachment from society reduces opportunity for real-world training and gradual reintegration.

B. Live Case Studies

David Sasson Industrial School, Matunga West, Mumbai, Maharashtra

Name: David Sasson Industrial School

Established: 1843; managed by the Children's Aid Society since 1939

Legal Status: Certified as a Special Children's Home under Section 9 of the Juvenile Justice (Care and Protection of Children) Act, 2000

Campus Size: Approximately 32,164 square meters (~6 acres)

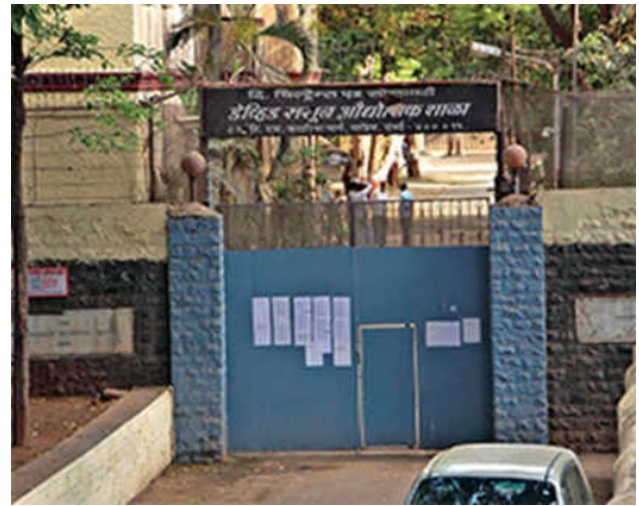


Fig. 2. David Sasson industrial school

1) Positive Points

- *Spacious Campus (~6 acres):* Offers ample room for segregation of activities like education, training, recreation, and residential functions.
- *Heritage Architecture:* High ceilings and colonial-style buildings provide a sense of openness, character, and identity.
- *Integrated Facilities:* Includes classrooms, dormitories, workshops, medical units, recreational areas, and green spaces—all within one campus.
- *Natural Ventilation & Light:* The traditional architectural style supports better airflow and natural illumination, which promotes comfort and psychological well-being.
- *Zoning for Rehabilitation:* The design allows for a structured environment where vocational training and daily routines are well-organized.

2) Negative Points

- *Aging Infrastructure:* The heritage structures, though aesthetically valuable, may require significant renovation to meet modern standards for safety, accessibility, and technology.
- *Limited Technological Integration:* Vocational training areas may not fully support modern equipment or digital learning methods without retrofitting.
- *Institutional Appearance in Some Zones:* Some blocks still resemble outdated institutional settings, which could conflict with a rehabilitative ambience.
- *Accessibility Concerns:* Older structures may not be universally accessible for children with special needs without architectural intervention.

C. Stakeholder Challenges & Site Constraints

- *Graham Correctional Centre, Illinois:*
 - Stakeholders face challenges adapting adult-oriented infrastructure for youth needs.
 - Strict security protocols limit freedom of movement, affecting training delivery.

- Large site presents maintenance and zoning challenges for efficient management.
- David Sassoon Industrial School, Mumbai:
 - Stakeholders must balance heritage preservation with modern needs.
 - Coordination with multiple government agencies delays infrastructure upgrades.
 - Urban constraints limit campus expansion; high population density complicates spatial redesign.

D. Regulatory and Design Guidelines

Juvenile Justice (Care and Protection of Children) Act, 2015 (India): Specifies the rights of juveniles and standards for their care and rehabilitation.

United Nations Standard Minimum Rules for the Administration of Juvenile Justice (Beijing Rules): Emphasize rehabilitation, education, and humane treatment.

National Building Code of India: Provides guidelines for safety, accessibility, fire protection, and ventilation.

Universal Design Principles: Encourage inclusive, accessible, and human-centered environments.

NCERT & Skill India Recommendations: Suggest integration of life skills and vocational training into juvenile programs.

These guidelines form the basis for designing centers that are not just secure, but nurturing and growth-oriented environments.

3. Methodology

A. Research Approach

Research Approach: The research adopts a qualitative approach to understand the architectural and social dynamics involved in juvenile rehabilitation. This includes observational studies, spatial analysis, stakeholder interviews, and the evaluation of institutional environments through a user-centric lens. The intent is to gain in-depth insights into how existing rehabilitation centers function and to identify key design aspects that influence the success or failure of vocational training and reformation.

This approach also involves a comparative study of national and international models to highlight best practices and region-specific challenges. The human experience within these environments—comfort, safety, emotional well-being, access to education, and community engagement—are core to the evaluation. The research is iterative and reflexive, considering

feedback from field visits and stakeholder interactions to refine the design and conceptual framework.

B. Data Sources

The study utilizes primary data from live case visits and interviews, along with secondary data from academic journals, government reports, and NGO publications.

Architectural Case Studies: Data collected from live case visits highlighted poor infrastructure, lack of privacy, and minimal vocational training opportunities. In contrast, international models emphasized dignity, comfort, and education. The analysis revealed that environments with natural light, open spaces, and learning zones showed better behavioral outcomes among juveniles.

C. Design Analysis Framework

The analysis is structured around key design elements—spatial planning, user experience, security, accessibility, and the integration of learning environments within rehabilitative settings.

- *Spatial Zoning and Layout:* Examines the organization of spaces—residential, academic, recreational, and vocational—and how they support or hinder movement, interaction, and function.
- *Circulation and Flow:* Analysis how juveniles and staff navigate the facility. Efficient, non-intrusive flow supports daily routines, reduces stress, and enhances safety.
- *Environmental Comfort:* Focuses on natural light, ventilation, acoustics, and thermal comfort, which directly influence mental well-being.
- *Security Integration:* Considers how security measures are embedded in the design without creating an oppressive atmosphere. Balance between safety and normalcy is key.
- *Accessibility and Inclusivity:* Evaluates how universally accessible the facility is for juveniles with different physical and psychological needs.
- *Educational and Vocational Integration:* Assesses the placement and design of learning environments—classrooms, training workshops, libraries—and their accessibility and flexibility.
- *Therapeutic and Green Spaces:* Measures the availability and design of outdoor areas, therapy rooms, and relaxation zones.

These criteria guide the architectural critique and form the

Table 1

Parameter	Graham Correctional Centre, Illinois	David Sassoon Industrial School, Mumbai
Location	Hillsboro, Illinois, USA	Matunga West, Mumbai, Maharashtra, India
Site Area	~50 acres	~6 acres
Target Users	Originally for adult inmates; adapted for juveniles	Juvenile boys (under legal custody and care)
Design Orientation	Institutional, security-focused	Heritage + reformatory educational layout
Vocational Training Infrastructure	Present but limited due to security zoning	Integrated into daily routines; includes crafts, trades
Security Level	High-security (fences, checkpoints)	Moderate, with open movement allowed in parts
Spatial Layout	Linear blocks; limited interaction zones	Courtyard-based, promoting interaction and recreation
Natural Light & Ventilation	Limited; window openings restricted for security	Good; traditional design allows cross-ventilation
Green/Open Spaces	Ample but underutilized due to restrictions	Limited but actively used for activities
Architectural Limitations	Not youth-centric; lacks emotional warmth	Aging infrastructure; needs modernization
Positive Aspects	Large land; vocational facilities present	Holistic approach; mix of therapy, education, and care
Challenges	Not designed for juveniles; high-security hinders rehab	Heritage constraints and limited space for expansion

backbone of design recommendations proposed in the study.

D. Explanation of Data

- *Location and Setting:* Graham Correctional Centre, located in a semi-rural area, benefits from a calm, expansive environment suitable for zoning and potential therapeutic use. David Sassoon Industrial School, situated in a dense urban area (Mumbai), has limited spatial flexibility but stronger access to urban resources and community engagement opportunities.
- *Site Area and Planning:* Graham spans approximately 50 acres, allowing for clear zoning and vocational expansion, but it lacks a juvenile-specific design. In contrast, David Sassoon's 6-acre campus, though smaller, uses its space efficiently with a more youth-focused layout that incorporates therapeutic and educational zones.
- *Building Typology and Architecture:* Graham was built primarily for adult incarceration, featuring high-security zones, rigid circulation, and an institutional aesthetic. David Sassoon, despite being older and in need of modernization, incorporates heritage elements and an open campus that feels less punitive and more nurturing.
- *Vocational and Educational Integration:* Both facilities include vocational training, but David Sassoon integrates it more meaningfully into daily routines, linking workshops to academic support and therapy. Graham's vocational offerings, while substantial, are compartmentalized and not fully integrated into the holistic rehabilitation process.
- *Environmental and Emotional Quality:* The institutional atmosphere at Graham may lead to emotional isolation due to limited visual and physical access to nature. Meanwhile, David Sassoon emphasizes open spaces and greenery, contributing to a more emotionally supportive atmosphere despite infrastructural aging.

This analysis confirms that rehabilitation is not merely a program but a spatial experience. Design decisions—ranging from zoning and daylight to circulation and aesthetics—can either support or undermine reformative goals. David Sassoon's youth-oriented, adaptive layout provides valuable lessons for future facilities, while Graham's scale and vocational scope offer insights into operational potential if restructured around juvenile needs.

4. Key Elements

- *Zoning:* Clearly defined zones for residential, vocational, academic, and recreational uses ensure clarity in function, support routine, and prevent overcrowding.
- *Natural Light & Ventilation:* Critical for psychological well-being, these elements reduce stress, improve sleep cycles, and foster a healthier living environment.
- *Flexible Classrooms & Workshops:* Modular spaces that can adapt to different skills and training types enhance

long-term usability and cater to changing vocational demands.

- *Safe Interaction Zones:* Semi-supervised communal areas that encourage healthy interaction help develop social skills and trust.
- *Green Spaces:* Landscaped areas and courtyards serve as therapeutic environments for reflection, relaxation, and informal learning.

5. Recommendation

Based on the analysis of case studies, site visits, and evaluation frameworks, several recommendations can be made to enhance the effectiveness of juvenile rehabilitation centres with integrated vocational training:

- *Youth-Centric Design Approach:* Prioritize designs that reflect the psychological and developmental needs of adolescents. Avoid harsh, institutional layouts and instead opt for environments that are calming, stimulating, and growth-oriented.
- *Integrated Vocational Zones:* Vocational training facilities should be centrally placed within the campus, ensuring easy accessibility from residential and academic areas. Programs must align with local employment opportunities and be updated regularly based on skill demand.
- *Therapeutic Landscape Design:* Incorporate green zones, sensory gardens, and open courtyards. These not only improve mental health but also encourage informal interactions and self-reflection.
- *Modular and Flexible Spaces:* Design multipurpose classrooms and workshop areas that can be easily adapted to various training modules. This ensures long-term usability and relevance.
- *Community Engagement:* Allow limited, supervised interaction with the outside community through visiting professionals, workshops, or exhibition spaces. This reduces stigma and aids reintegration.
- *Upgrade of Existing Structures:* In older institutions like David Sassoon, modernization should include the introduction of passive design features (light, air, acoustics), improved sanitation, and integration of technology in classrooms and workshops.
- *Policy Integration and Support:* Collaborate with local governments, NGOs, and educational boards to ensure that rehabilitation centres follow consistent guidelines, receive funding, and track long-term outcomes.
- *Staff Training and Inclusion:* Educators, guards, and caregivers should be trained in adolescent psychology and rehabilitation methods to ensure a nurturing, respectful atmosphere.

6. Discussion

- *Architectural Design Impact:* The design of a Juvenile Rehabilitation Centre greatly influences rehabilitation outcomes. A well-planned environment can promote positive behaviour, while harsh, institutional designs can

hinder progress.

- *Importance of Spatial Organization:* Clear zoning of spaces (residential, educational, and vocational) supports structured routines and engagement. Overly institutional designs with strict security measures can lead to stress and hinder emotional healing.
- *Vocational Training Significance:* Vocational training programs integrated with daily routines offer juveniles valuable skills and a sense of purpose. Successful centres, such as David Sassoon Industrial School, show improved outcomes when education and vocational training are merged.
- *Role of Nature and Natural Elements:* Centres with access to natural light, green spaces, and open areas reduce stress and contribute to a calmer, more therapeutic environment. Lack of these elements, like in Graham Correctional Centre, can result in negative emotional states.
- *Design Analysis Framework:* Emphasizes that juvenile centres must consider psychological, emotional, and social needs, not just functional design. Flexibility in space and program design is key to addressing the diverse needs of offenders.
- *Community Engagement:* Incorporating community and family interaction enhances reintegration. Centres that encourage social connections help juveniles rebuild trust and prepare for life after release.
- *Security Integration:* While security is essential, it must be integrated seamlessly to avoid creating a hostile atmosphere. A balance between safety and normalcy is crucial to ensuring a supportive environment.

A. Challenges and Limitations

1) Challenges

- *Limited Data Access:* Restricted access to real-time data from juvenile rehabilitation centres made it difficult to gather first-hand insights, relying instead on secondary case studies.
- *Diverse Facility Models:* Juvenile centres vary greatly in design, size, and security, which makes it challenging to generalize findings and design recommendations across different settings.
- *Balancing Rehabilitation with Security:* Designing spaces that foster rehabilitation while maintaining necessary security measures proved to be a complex challenge.
- *Stakeholder Engagement:* Engaging all stakeholders

(juveniles, staff, policymakers) with varying views on rehabilitation made it difficult to develop a universally accepted design solution.

2) Limitations

- *Geographic and Cultural Variations:* The case studies drawn from different regions may not be universally applicable due to differing legal and cultural contexts in juvenile justice systems.
- *Data Availability:* Limited information on long-term outcomes of design interventions in juvenile centres restricts the ability to fully assess the impact of architectural changes.
- *Resource Constraints:* The study's scope was constrained by time and resources, meaning some innovative models and centres were not included.

7. Conclusion

This research demonstrates that architectural design plays a crucial role in juvenile rehabilitation. By integrating vocational training with rehabilitative spaces, centers can foster emotional, psychological, and social growth, helping young offenders reintegrate into society. Balancing security with rehabilitation remains a challenge, but spaces that promote learning, dignity, and opportunity can reduce recidivism and improve long-term outcomes. Ultimately, designing with empathy and purpose can transform juvenile rehabilitation centers into environments of hope and positive change.

References

- [1] UNODC – Juvenile Justice and Rehabilitation. <https://www.unodc.org/unodc/en/justice-and-prison-reform/juvenile-justice.html>
- [2] NIJ – Designing Juvenile Correctional Facilities. <https://nij.ojp.gov/library/publications/designing-juvenile-correctional-facilities>
- [3] The Sentencing Project – Vocational Training in Juvenile Justice. <https://www.sentencingproject.org/publications/the-role-of-vocational-training-in-juvenile-justice/>
- [4] UNICEF – Global Juvenile Justice Practices. <https://www.unicef.org/reports/juvenile-justice>
- [5] David Sassoon Industrial School, Mumbai – Government Archive. <https://mumbai.gov.in/public-utility/david-sassoon-industrial-school/>
- [6] Illinois Department of Corrections – Graham Correctional Center. <https://www2.illinois.gov/idoc/facilities/Pages/grahamcorrectionalcenter.aspx>
- [7] Prayas Juvenile Aid Centre – TISS, Mumbai. <https://www.prayaspune.org/>
- [8] Archnet – Universal Design in Institutional Architecture. <https://www.archnet.org/>
- [9] JJ Act (India) – Ministry of Women and Child Development. <https://wcd.nic.in/juvenile-justice-care-and-protection-children-act-2015>