Proposed Conservation Plan of Sri Ram Chandra Library Complex in Baripada, Odisha

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1. Background

The Jubilee Library, also known as Sriram Chandra Library, is a historical landmark in Baripada, Odisha, dating back to its establishment in 1902. Originally founded to commemorate Queen Victoria's golden jubilee, the library has grown into a significant cultural and educational center for the city. Situated on the eastern bank of the Budhabalanga River in Mayurbhanj district, Baripada serves as the cultural heart of northern Odisha.

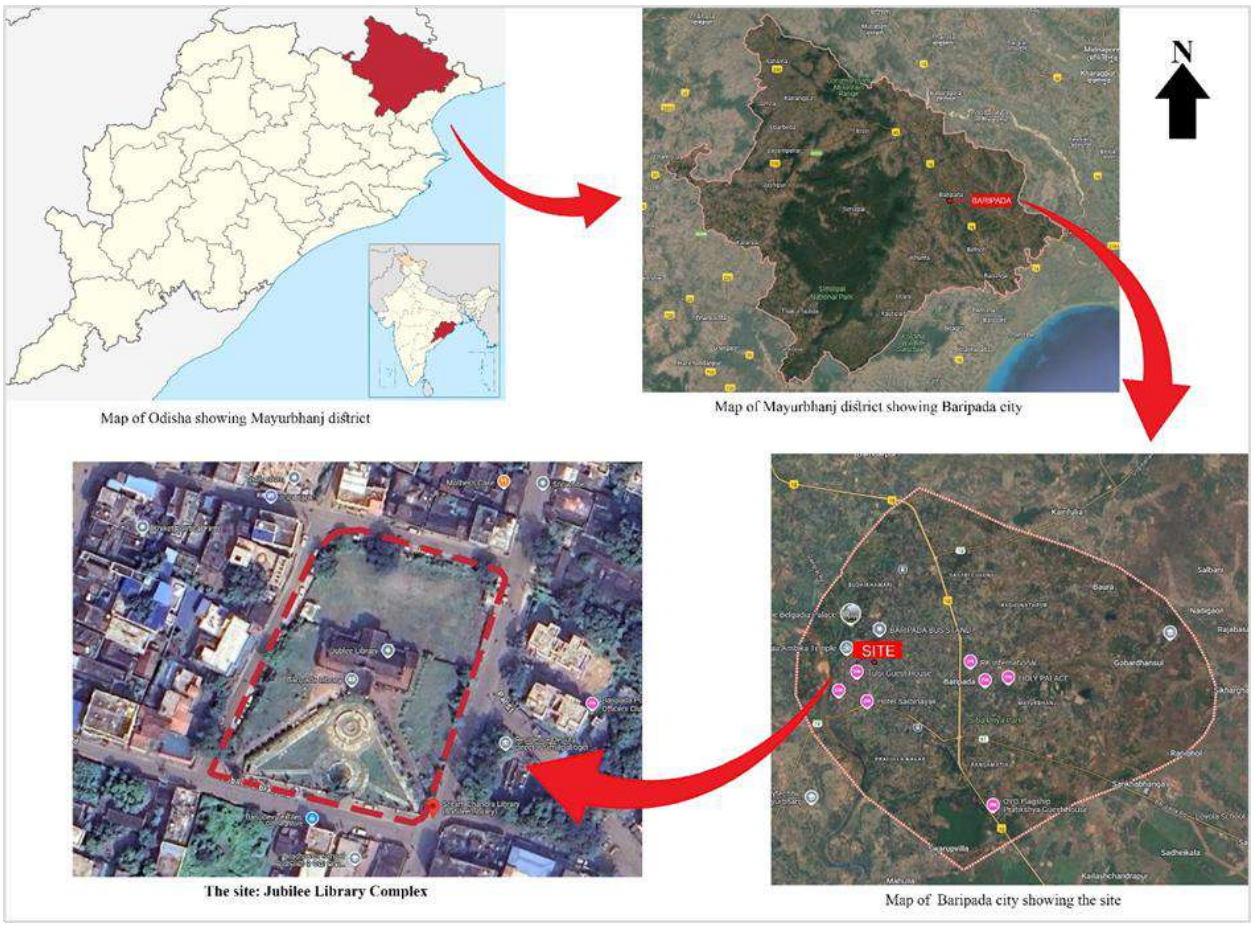


Figure 1: Map showing the site location

On invitation, a team from IIT Kharagpur visited the site and conducted a reconnaissance survey on 17th February, 2025. A preliminary report on the basis of the observations made on site visit is provided here. The objective was to conduct a rapid visual analysis of the structural and architectural integrity of the heritage building and identify the necessary conservation measures. Additionally, plans for a new annex building and other functional improvements were discussed for proposal. The reconnaissance survey involved an initial visual assessment, documentation of existing damages, and outlining the required interventions for restoration and future use.

2. Proposed Master Plan of Sriram Chandra Library Complex along with Conservation Plan for the heritage structure

Details of the proposed project are elaborated below.

A. Proposed Master Plan of the Library complex

In addition to the restoration and conservation efforts, a new Annex building is proposed to enhance the functionality of the library complex. The proposed spaces included the following.

a) **Adaptive Reuse of the heritage building into a Museum**: The library would integrate a museum (art and historical artifacts), including a well-planned layout, controlled entry, and central reception.

b) Relocation of the existing uses: (i) Stacking of books, (ii) reading rooms, and (iii) convention hall; to be relocated to the proposed Annex building.

c) Proposed Annex building:

(i) Library (relocated existing uses)

(ii) Digital Library & Study Cubicles: Space for 20-30 study cubicles for competitive exam preparation with digital access.

(iii) Art / Exhibition gallery

(iv) Senior Citizen Corner: A dedicated reading space.

(v) Kids' Corner: A specialized area for young readers.

(vi) Convention Hall

d) Site development:

(i) Integrating the existing plaza with the Master Plan as an Open-Air Theatre (OAT)

(ii) Removal of the existing toilet block present in the site and integrating it with the proposed Annex building.

N.B.- The proposed uses were determined based on stakeholder discussion and interaction.

B1. Assessment of structural health and evaluation of site conditions

To gain a deeper understanding of the structural stability, the following assessments were identified as necessary as prerequisite for the preparation of Master Plan and Conservation Plan.

1. **Soil Test & Groundwater Level Analysis**: To determine the foundation's stability and water table depth for moisture entrapment.
2. **Crack Assessment**: To evaluate the root cause and extent of structural damage.

3. **Roofing & Structural Systems**: Inspection for necessary replacement and steel truss members.
4. **Drainage System Analysis**: To assess the rain water drainage and to mitigate waterlogging issues.
5. **Moisture Penetration Test**: To assess rising dampness and its impact on walls.
6. **Surface Treatment**

B2. Restoration and Conservation Plan of the Library complex

Based on the preliminary reconnaissance survey, it is suggested that the heritage building needs the following structural and architectural interventions for its restoration and conservation.

1. **Walls:** Cracks and unevenness on the wall surfaces to be restored by lime mortar grouting.
2. **Floors:** Need mosaic finish.
3. **Roof:** (a) Removal of false ceiling, (b) replacement of the entire truss system damaged due to sagging and rusting, (c) Use of synthetic roofing underlayment for water-proofing.
4. **Openings:** Louvered doors and windows should be reinstated as per the original design.
5. **Furniture:** (a) Creating an inventory of existing antique furniture, (b) Needs repair and restoration.

3. Project team

Project team members are as follows:

I. **Dr. Arup Das,** Asso. Professor, Dept. of Architecture & Regional Planning, IIT Kharagpur
II. **Dr. S. P Bhattacharya,** Asso. Professor, Dept. of Architecture & Regional Planning, IIT Kharagpur
III. **Dr. Damodar Maity**, Professor, Dept. of Civil Engineering, IIT Kharagpur
IV. **Sulagna De**, Research Scholar, Dept. of Architecture & Regional Planning, IIT Kharagpur

4. Proposed Master Plan for the Sri Ram Chandra Library

The proposal includes two principal components – (i) Renovation of the existing building and (ii) Construction of new annex building.

A tentative area programming is presented in Table 1, highlighting the proposed functional spaces of the existing as well as the new annex building.

Table 1: Tentative Area Programming of the New Annex Building and existing Library building

Sl. No.	New Annex Building (G+1)	Area (sq-ft)
1	Digital library with 50 computer cubicle space + server	2000
2	Library Management Office + reception	500
4	Utility Service spaces (Janitor, store and electrical room)	650
5	Exhibition/Art Gallery	2000
6	Senior citizen reading room (20 user)	780
7	Kids' reading room (20 user)	840
8	Central stacking space with reading space (30 user)	3600
9	Convention Hall (2 floors)	4000
10	Toilet blocks	950
11	Utility Service spaces (Store, Janitor and electrical room)	200
	Tentative total area of construction	**15520**

Sl. No.	Existing Library Building	Area (sq-ft)
1	Museum Gallery	2800
2	Conference Room (2 nos.)	2500
3	Office + reception	400
5	Utility Service spaces (storage and electrical room)	300
	Area of the existing block	**6000**

The new annex building will tentatively account for an area of **15,520 sq.ft.**

A tentative budget estimate of **Rs. 6.5 crore** is prepared based on the two components and presented in Table 2.

(i) Construction cost of the new annex building includes the following components -

- Excavation and earthwork cost
- Material cost (sand, coarse aggregate, cement, brick, steel, tiles etc.),
- Finishing cost
- Labour cost

(ii) Renovation cost of the existing building involves the following components –

- Crack detection and repair
- Restoration of windows

- Surface repair of the lime plasters
- Flooring repair to enhance the mosaic finish
- Installing roof tiling
- Repair of the roof structure (truss)
- Installing rainwater system

Table 2: A tentative budget estimate of the project

Sl. No.	Items	Cost (INR in Crore)
1	Construction cost of two Annex buildings	3.1
2	Renovation cost	2
3	Site preparation and Landscaping cost including street furniture and lighting	0.4
4	Furniture, furnishing, fittings and equipment	1
	Tentative Project Cost	**6.5**

Part 1- Status Report

1. Structural overview and observations of the heritage library building

The site features a library building with approximately 300 members and a collection of around 40,000 books. It is accessible through three gates—two on the southern side and one on the northern side, though the northern gate is currently non-operational. There is a one-meter elevation difference between the site and the road along its northern boundary. The northern and western sides of the site are surrounded by residential plots, while the southern and eastern sides are occupied by public, semi-public buildings, and commercial establishments.

The office of the District Collector has demarcated an area within the site to create a paved public plaza featuring a fountain. Following the collapse of a section of the eastern wall, the Public Works Department (PWD) of Odisha promptly initiated the repair work. PWD is responsible for maintaining the heritage structure. The existing conditions of the site were recorded through photographs and field observations.

A reconnaissance survey was conducted to document the structural condition of the existing heritage library building. The primary observations included the following.

Structural condition	Image
Existing status of the heritage library building undergoing repair work by PWD, Odisha	

Structural condition	Image
Cracks in walls: Visible cracks are present in various sections, particularly near the keystones, corners, and around the openings (windows and doors).	 
Tilting of east wall: The east wall seems tilted, indicating structural distress.	
Dampness in walls: Rising moisture resulted into dampness of the surfaces and formation of mosses in the affected areas.	
Roof and trusses: The roof structure and trusses showed signs of rusting and charring, requiring	

Structural condition	Image
urgent attention. Additionally, it was observed that the ongoing false ceiling work at site, attempts to cover up the real structural damage of the building.	
Wall Putty: External wall surface treatment with putty over lime plaster was observed.	
Wall material (Plaster): Many walls exhibited deterioration, with original plaster (lime) falling off in several areas. Many portions have been repaired over the years using cement mortar (which does not bind well with the lime mortar).	 

Structural condition	Image
Flooring: The original ceramic mosaic flooring has been altered with vitrified tiles.	 
Louvre doors and windows: There has been alteration in the windows. Classical louvred windows are replaced with ordinary board and batten windows.	 
Rose windows (upper-level circular ventilators) are suppressed by the newly added false ceiling. The closed doors and windows, added with the upcoming false ceiling contributing to minimum ventilation (reduction in ceiling height) and daylighting.	 

Structural condition	Image
Moisture Penetration: Waterlogging was noted at the building perimeter due to the concretization; lack of proper drainage further contributed to rise in dampness and structural weakening.	 

Structural condition	Image
Rusting of Metal Grills: The metal grills have developed rust, leading to additional crack formations in the adjoining walls.	  
Tampered landmark nameplate: The landmark nameplates near the entrance have been insensitively altered by adding a blackboard ruining the enriched mosaic finish of the heritage building.	

Structural condition	Image
Antique furniture: The furniture is of antique value. However, they are damaged, left carelessly and unaccounted.	
Damage of architectural works: Intricated curved mouldings on plinth wall are damaged and suppressed due to concretization.	 

Part 2: Strategies for Conservation

1. Proposed Master Plan of the Sriram Chandra Library Complex

The proposed Master Plan has a new Annex Building on the northern side of the site. The Annex building will house a modern library building with digital library provisions. It will also contain multistoried open exhibition halls for different gatherings and exhibitions. The existing library facilities are recommended to be shifted to the Annex building and it is proposed to use existing heritage structure as a District Museum. This not only allows to showcase and celebrate the luminaries who rose up to eminence from this District but also, provides the needed ventilation and air-flow through the existing structure. Much of the moisture retention in vertical and horizontal surfaces can be attenuated by facilitating cross ventilation through the structure. At present the existing structure hardly receives any cross ventilation due to the nature of current activities in the building.

The conservation strategies proposed in this report have been drawn based on best practices conducted elsewhere and the recommendations can only become fruitful if trained and experienced contractors – masons – workmen who have prior experience in handling similar conservation projects are involved for the restoration of this heritage structure.

The proposed Master Plan involves significant construction/development of the existing site. The new development was designed and placed in a manner that the minimum disruption/obstruction occurs to the existing structure. Also, the designed space in the Annex building had been kept low-key so as not to over power the existing heritage building and its timeless charm.

The Master plan also adopted accepted principles of sustainability in spirit and practice. The zoning of the new complex was done to keep the heritage structure in the foreground and highlight it as the major feature of the site. The following new development have been proposed:

a. Construction of new library complex with modern facilities like digital library
b. Multiple exhibition halls for community conglomerations and events
c. Cafeteria with souvenir shop
d. Open Air Theatre
e. Basement parking (few dedicated surface parking has also been proposed)
f. Public plazas integration the new building and the old building
g. Retention basin for stormwater management within the site which would also double up as waterbody near the cafeteria

Some spaces like café/souvenir shop and exhibition halls have been proposed in view of the scope for revenue generation and financial sustainability of this public place.

Some amendments to the existing site features have also been proposed

i. Change in ingress and egress from the site to maintain better safety and security in the site and not disturbing the local traffic
ii. Removal of the toilet block and replacing it with proper service cores in every designed space

iii. Barrier free spaces throughout the campus with provision of ramps and lifts for differently abled and aged users

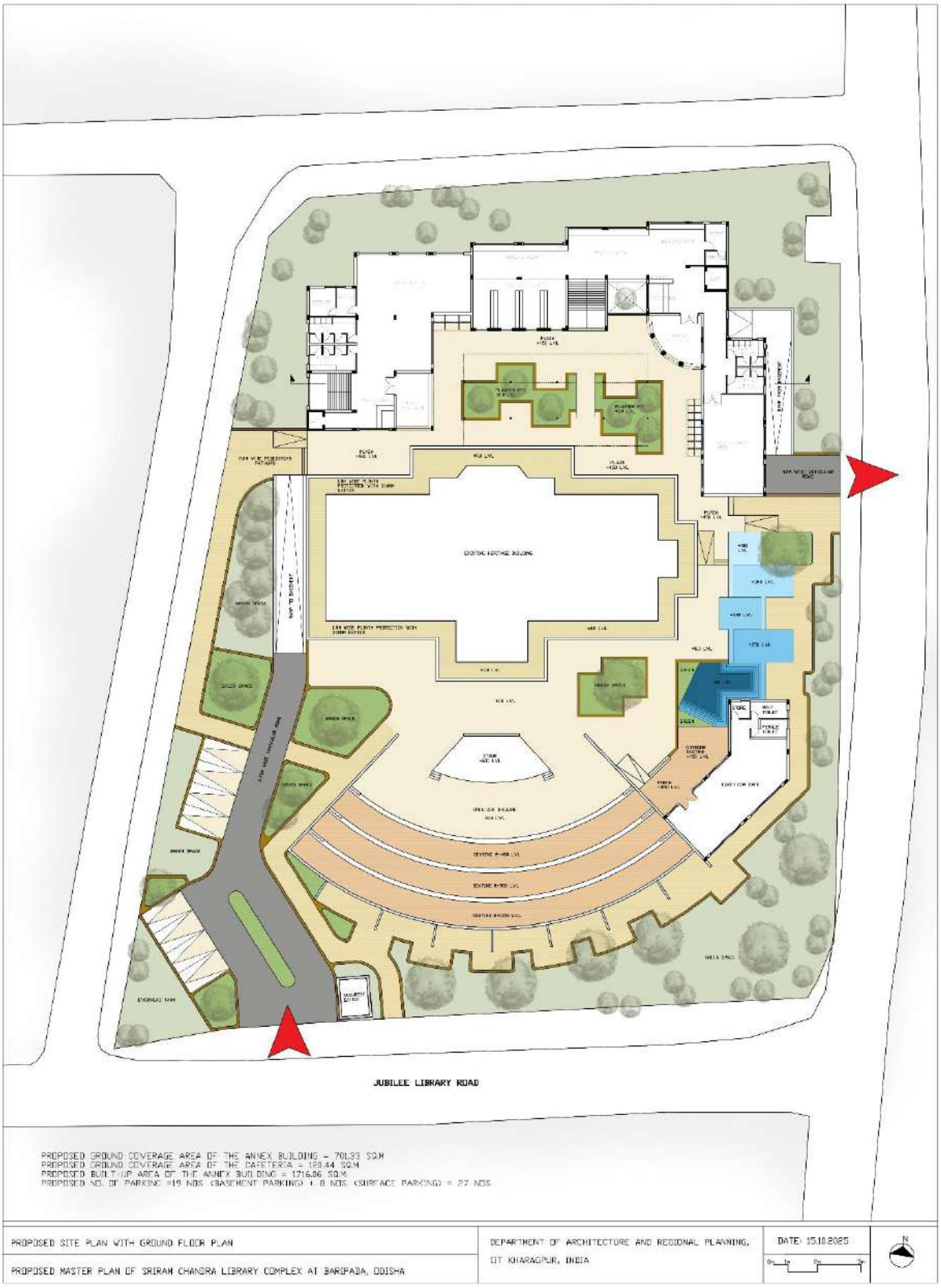


Figure 1: Proposed Master Plan of the Sriram Chandra Library Complex

2. Restoration and Conservation Plan for Heritage Building

The future interventions should respect historic authenticity and use of traditional techniques wherever required for long term stability.
Based on the preliminary survey, it is suggested that the heritage building needs the following structural and architectural interventions for its restoration and conservation.

A. Roof

Structural Condition:

- **Roof and Truss**: The building's roof is mainly of corrugated sheets supported by truss systems. Rusting and sagging of truss members has been observed. Original clay tiles with timber truss have been replaced.

- **False Ceiling:** interior ceiling has been newly added which is concealing the existing damage and not addressing the structural issues.

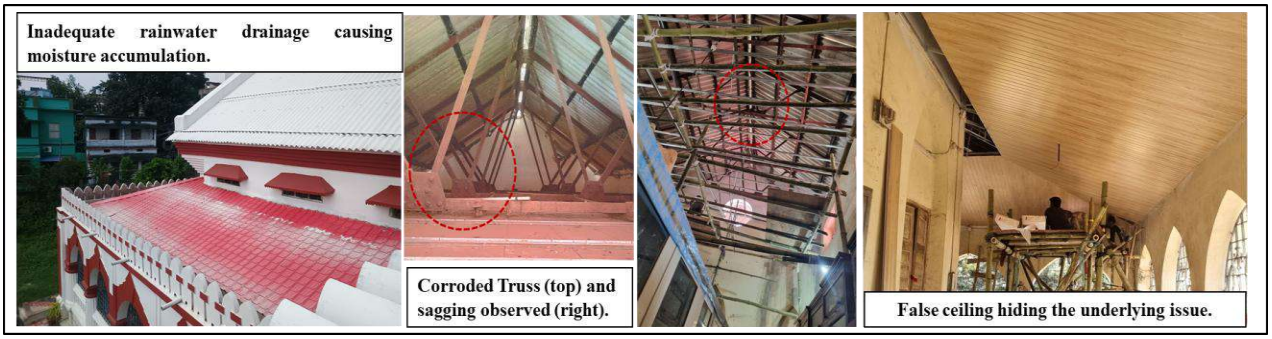


Figure 2: Current Roofing Condition

Recommendations:

- **Roof and Truss:** Removing all the sheets and damaged trusses.
  inappropriate replacements have been carried out hence, these should be restored back to the original and authentic roofing materials.
  Materials: Reintroducing clay tiles and using galvanized steel trusses as they are more durable.

- **False Ceiling:** Removal of false ceiling panels and restoring original ceiling with lime plaster repair work.

- **Roof water Management:** continuous corrosion resistant gutters to be provided at the eaves and valley lines to prevent leakage and carried to the drains along plinth protection. The water collected from the gutters can be channelized to the proposed retention basin in the eastern side of the site.

B. Walls

1. Structural Issues:

- **Settlement and Tilting:**

  The walls exhibit localized sinking, particularly from one corner, resulting in visible tilting of the east wall. This indicates settlement or movement in the foundation and poses significant structural distress.

Figure 3: Structural settlement of east wall

Damage of architectural works: Intricated curved mouldings on plinth wall are damaged and suppressed due to concretization.

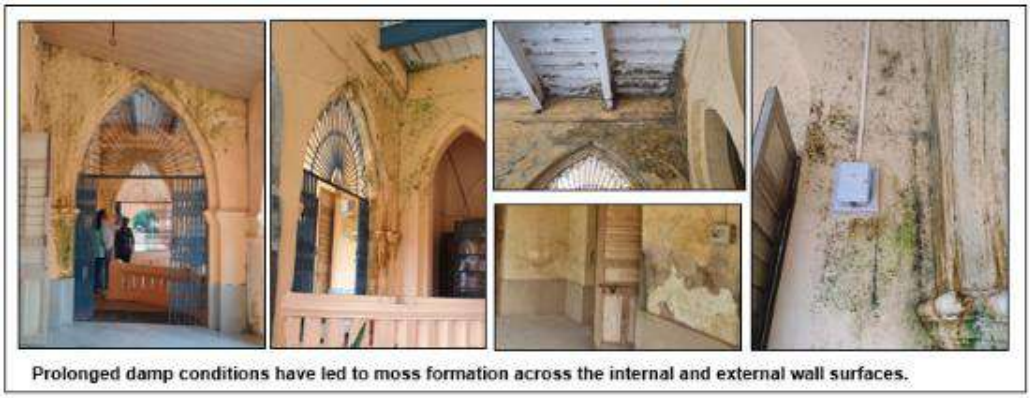
- **Cracking:**

  Cracks are present near keystones, corners, and around openings such as windows and doors. Such patterns suggest stress concentration and possible foundation instability.

Figure 4: Cracks in the walls

2. Rising Moisture and Surface Dampness:

Dampness is prevalent throughout the wall surfaces, leading to moss formation in affected zones.



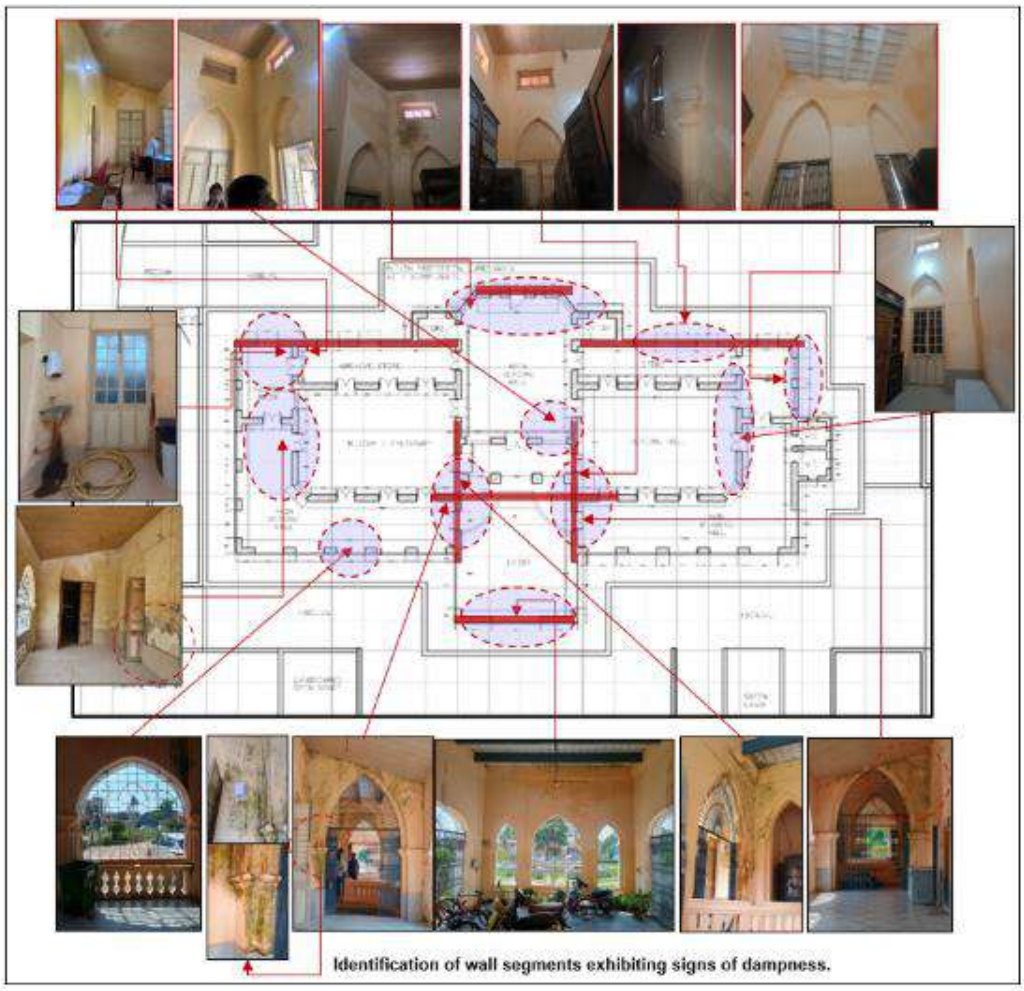


Figure 5: Identification of Problem Areas

- **Moisture Penetration via Plinth (Ground Level) Perimeter:**
  Concretization and inadequate drainage around the building perimeter has caused waterlogging. The absence of plinth protection is allowing moisture ingress through peripheral paver blocks, further exacerbating both structural and moisture issues.

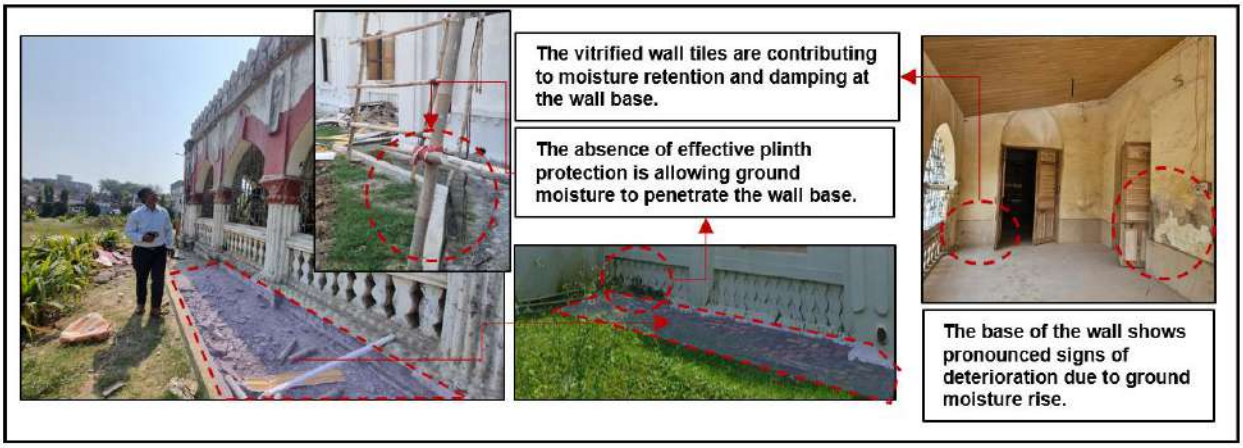


Figure 6: Damping source at ground level

Recommendation:
Provide a continuous 1.8 m wide plinth protection along the building perimeter, supplemented by a drainage gutter to direct water away from the foundation.

- **Roof-Level Water Entrapment:**
  Rainwater from the upper roof tier is being directed and accumulated onto the lobby roof. Due to the blocked drainage openings and the window directly exposed to the slab surface, water becomes trapped on the roof. Additionally, seepage from the clerestory window penetrates between the concrete (impervious layer) and the lime plaster (porous layer), resulting in prolonged dampness and moisture retention within the roof assembly.

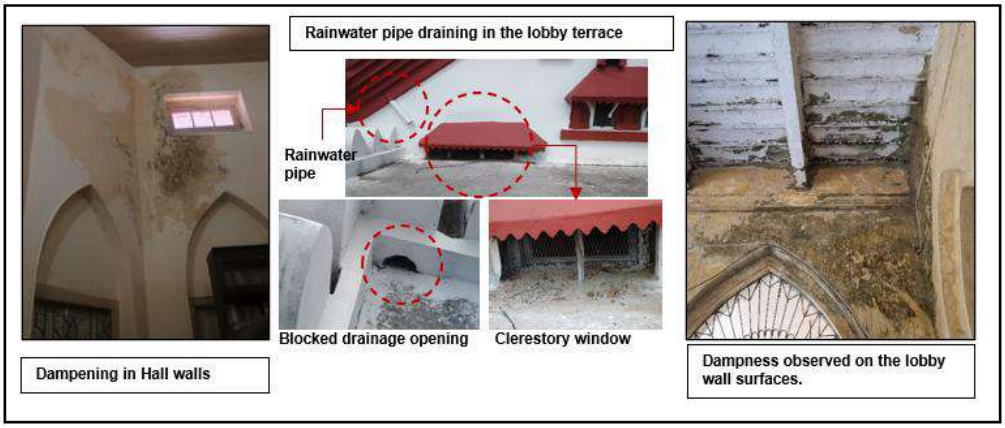


Figure 7: Roof-Level Water Entrapment - Cause (Centre) and Effect (Left & Right)

Recommendation:
Remove the concrete layer from the roof, and ensure that window openings are unobstructed, allowing for cross-ventilation and natural drying of internal spaces.

3. Wall Finish and Material Issues

- **Plaster Deterioration:**
  Several wall sections display falling-off and degraded lime plaster. Over time, repairs have been performed using cement mortar, which does not adhere well to original lime mortar substrates.

Figure 8: Plaster deterioration

- **Surface Treatments:**
  External walls finished with non-breathable white putty and plastic paint over lime plaster restrict moisture evaporation, aggravating existing dampness.

Figure 9: White putty treatment on the surface topped with plastic paint

Recommendation:
Strip all non-original plaster layers, clear deteriorated surfaces, and reapply fresh lime mortar to restore wall breathability and minimize further dampness.

C. Door and Window Openings

There has been alteration in the windows. Classical louvred windows are replaced with ordinary board and batten windows.

1. Doors

The library currently has three types of doors:

1. Type A: Original wooden frame doors with louver panels
2. Type B: Wooden frame doors with solid wood panels
3. Type C: Wooden frame doors with glass panels

Figure 10: Types of doors in the Library

Condition: Doors with solid wood and glass panels are modifications, while the original louvered doors have largely lost functionality due to multiple layers of paint. In some cases, new louver panels were added with different section details, making them decorative rather than functional. Additionally, wooden frames at several locations exhibit cracks, localized decay, and general wear.

Figure 11: Problems arising in the current doors and openings.

Recommendations:
A detailed door schedule should be prepared to document all existing types. Only the original louvered doors (Type A) should be retained to restore uniformity and preserve the cultural and architectural significance. Old paint should be carefully removed, damaged areas infilled with appropriate wood filler, and the doors repainted to prevent further deterioration.

2. Windows

- **Rose windows** (upper-level circular ventilators) are suppressed by the newly added false ceiling. The closed doors and windows, added with the upcoming false ceiling contributing to minimum ventilation (reduction in ceiling height) and daylighting.

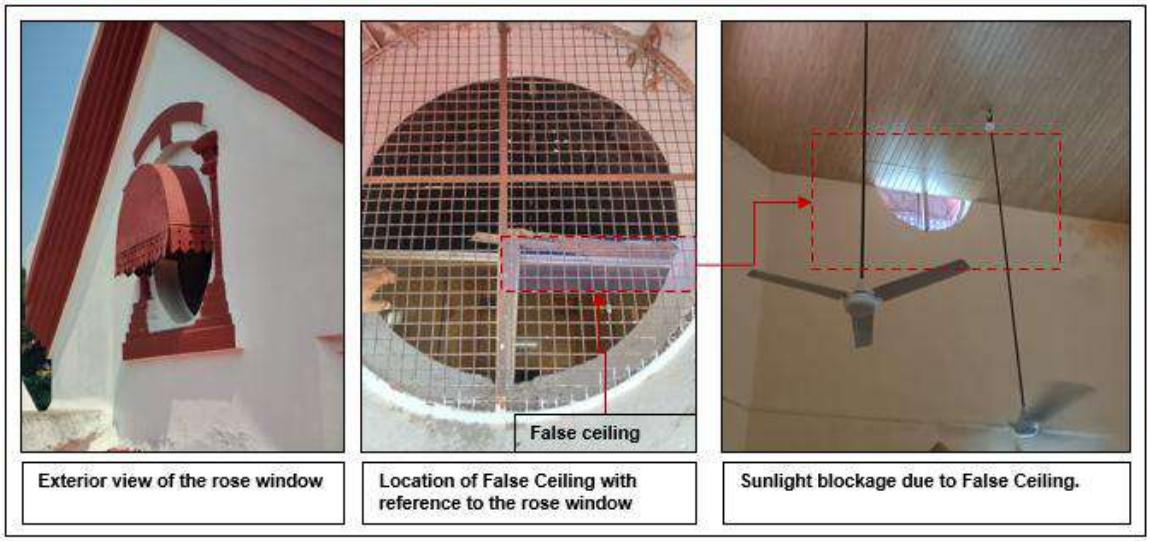


Figure 12: Rose Window and the false ceiling

Recommendations:
The false ceiling conceals the rose windows, diminishing their architectural prominence and visual grandeur. It is recommended that the rose windows be left open to restore both natural light and ventilation within the space.

- **Window openings**
  Condition:
  Over time, original louvered windows have largely lost functionality due to multiple layers of paint. In some cases, new louver panels were added with different section details, rendering them decorative rather than functional. Additionally, wooden frames at several locations exhibit cracks, localized decay, and general wear.

Clerestory windows feature metal jalis that show signs of damage and corrosion, requiring repair and repainting to restore both function and aesthetics.

Figure 13:Windows as observed

- **Metal grills:**

Several window and arch openings in the library have metal grills installed.

Figure 14:Various Types of Metal Grills used in the openings

Rusting of Metal Grills:

Condition: Several windows and arch openings have metal grills installed, which have developed rust over time. This corrosion has contributed to additional cracking in the adjoining walls.

Figure 14: Corrosion of metal grill causing cracking in the adjoining wall

Recommendation: All such additional grills should be removed from window openings to protect the original structure and prevent further damage. Additional grills that are installed need to be removed from the window openings.

D. Flooring

Condition:

The original mosaic flooring has been altered in different areas and has been replaced with vitrified tiles. In many years the flooring has experienced surface wear over time and loss in pattern.

Faded decorative finishes: extensive surface abrasion and pattern loss due to use and age.

Figure 15: Original mosaic flooring

The following image shows the location where there has been change in material.

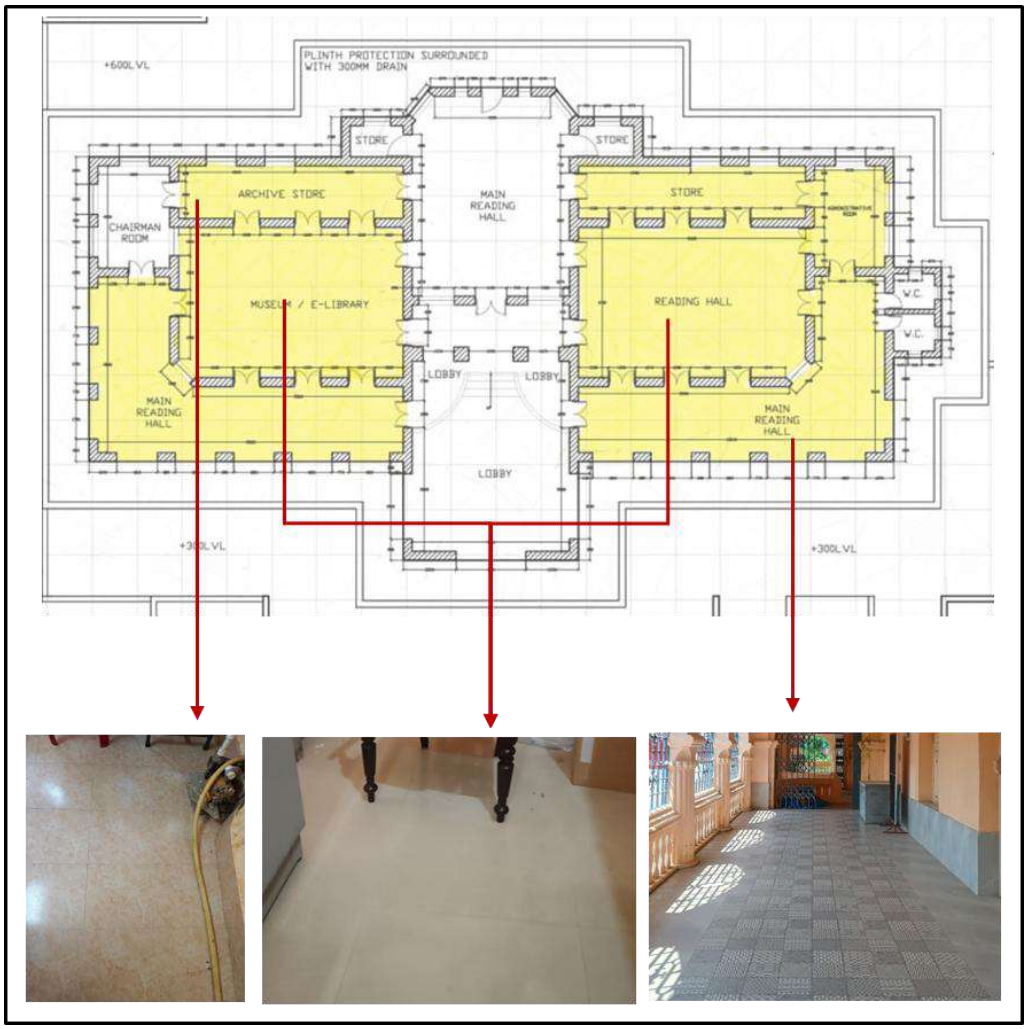


Figure 16: Map showing locations of new tiles

Recommendations:

- Removing all the non-original vitrified tiles and replacing them again with mosaic pieces set in lime mortar.
- Wherever replacing is not possible,
- Repairing, or relaying the original flooring. All re-laying, fixing, and bedding to be carried out with traditional lime mortar. Wherever replacement is unavoidable, sourcing similar materials.

- Original or historic patterns to be retained.

E. Antique Furniture

The library houses a collection of antique wooden furniture of significant heritage value, including wooden chairs with cane infills, a wooden elliptical conference table, and wooden bookshelves. However, much of this furniture has been neglected, left unaccounted for, and improperly cared for.

Condition:
Structurally, the furniture is generally sound, and the original wood remains in good condition. Nevertheless, the care and maintenance of these pieces have been inadequate. The original cane infill chairs are particularly affected, with cane either torn or missing. In many cases, plywood has been used to replace the cane, compromising the original aesthetic and design integrity. Additionally, the original wood grain and finish have been obscured due to surface painting, further diminishing the furniture's historical and visual value.

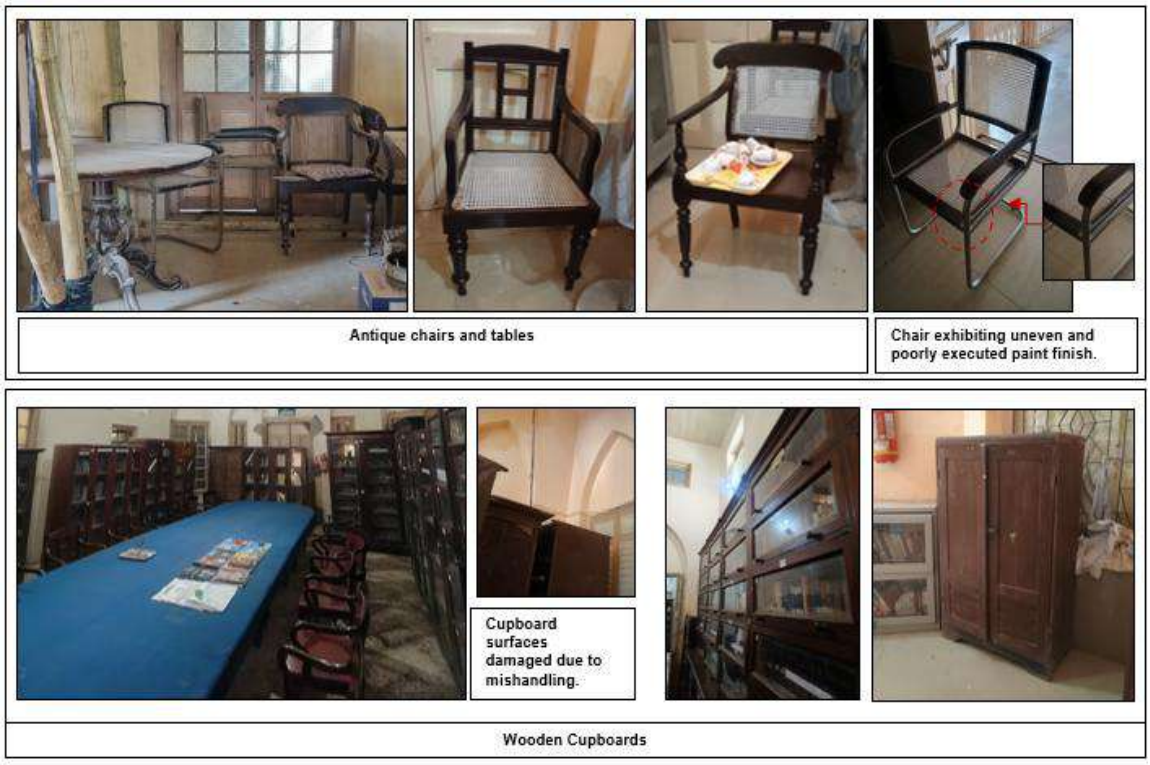


Figure 17:Antique furniture

Recommendation: The antique furniture should be carefully restored to preserve its heritage value and design integrity. Damaged cane infills must be replaced with traditional handwoven cane instead of plywood to retain authenticity. Existing paint layers should be gently stripped

to reveal the original wood grain, followed by surface treatment with natural oils or polish to protect and enhance the material. Structural joints and components showing wear should be repaired using compatible wood and joinery techniques. A regular maintenance routine, including cleaning, polishing, and protection from moisture and sunlight, should be established. Finally, all furniture pieces should be properly documented through inventory and photographs to ensure accountability and guide future conservation efforts.

F. Landmark nameplate:

Condition:

The landmark mosaic nameplates near the entrance have been insensitively altered by the addition of a blackboard, compromising the original design and obscuring the intricate mosaic finish. Years of neglect have further led to cement deposition, surface deterioration, and loss of visual clarity.

Figure 18: Landmark Nameplate

Recommendation: The mosaic nameplate should be carefully cleaned using non-abrasive methods to remove cement deposits and surface grime. Damaged or missing tesserae must be repaired with matching materials and lime-based mortar. The surface should then be treated with a pH-neutral cleaner and sealed with a breathable protective coating.

2. Conclusion

The conservation plan for the library ensures a sensitive and systematic approach to restore its original architectural character. By prioritizing the authentic materials, addressing moisture and structural issues along with following heritage conservation standards, the proposed interventions will help safeguard the library's historical integrity, prolong its life and preserve its cultural significance for future generations.

The successful execution of these work is also linked to the quality and craftsmanship of labor engaged on site. Conservators, masons, and craftsmen must be well-trained in heritage techniques and supervised by experienced conservation architects and engineers, as specified by best practices.