



ST. XAVIER'S COLLEGE

(AUTONOMOUS)

5, Mahapalika Marg, Mumbai - 400 001,
INDIA.

☎ 2262 0661/65

STRUCTURAL AUDIT: 2019-2020

(External)



Alinde

PRINCIPAL
ST. XAVIER'S COLLEGE
(AUTONOMOUS)
MUMBAI - 400 001.

Date: 8th June 2021

VISUAL INSPECTION REPORT FOR:
St. XAVIER'S COLLEGE
5, MAHAPALIKA MARG, MUMBAI 400001



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Project Name : Visual Inspection for St. Xavier's College
Date of inspection : 27-09-2019 to 05-10-2019
Present: : Mr. Kamal (Administrator- Xavier's College)

Introduction:

The buildings were constructed between 1900-1980. Most of the structures are composite structures. Following are buildings are on the college campus that were inspected.

- A. Admin Building
- B. Science Building 1
- C. Science Building 2
- CI Social Science Building
- D. Chapel Building
- E. Hall Building
- F. Gymkhana Building
- G. Cardinal Gracias Building (XIMR Building)
- H. XIC Building
- H1 Hostel Building

Scope of inspection:

Scope of our inspection includes checking condition of buildings from structural aspect and suggesting methods of repairs and renovation

Detailed scope includes

1. Study of general condition of structural elements such as column beam and slabs, walls, jambs & sills of the windows, terrace waterproofing, parapet wall, coping & chajja, arches, separation cracks between walls and structural members, seepages from flooring and dampness of wall etc.
2. Review of general condition of common areas like staircase, toilets, common passages, entrance foyer and canopy.

Limitations of inspection:

1. In some areas false ceiling is provided and/or columns are encased by paneling.
2. Some of the classrooms/labs were closed.
3. We were provided only architectural drawing hence our observations are based on these drawings.

Hence the report is for visible and accessible areas of the building.

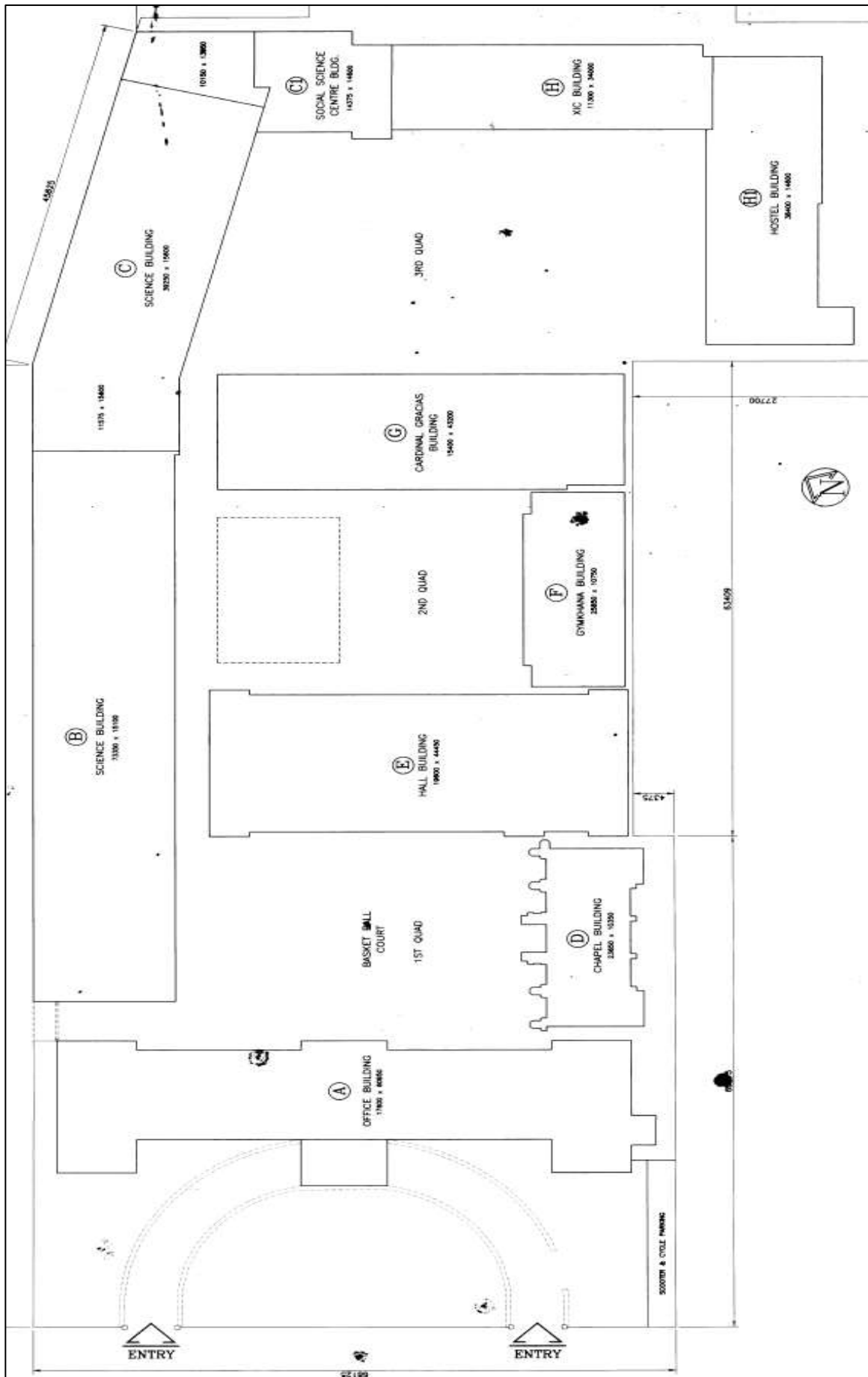


Fig 1. Layout of St. Xavier's College

Executive Summary

The visual survey indicates some areas of weathering, corrosion, and leakage. Most of the issues are not difficult to remedy and good maintenance and upkeep are recommended so that one may avoid further ingress of water (and subsequent dampness and leakages), reduce the spalling of the concrete and arrest further corrosion of the reinforcement.

The joint between the science building and the hall has been a source of cracks, and settlement due to the movements of the two buildings at the point since many years. A comprehensive long-term solution needs to be agreed upon, to address the niggling problem.

Overall, for an educational complex of its vintage, the buildings have weathered reasonably well and an annual budget dedicated to its maintenance will go a long way in avoiding very large expenditure at a later date.

The report highlights building-wise areas of distress observed. The report concludes with identifying areas that need urgent attention and gives a general direction for the way forward in terms of methodologies to repair and rehabilitate the distressed and damages areas.

Summary of Visual Observations Building wise

A. Admin Building

Major observations

1. Dampness on walls observed due to Leakage from roof / wall.
2. Windows frames were damaged due to leakages from the wall
3. Cracks in columns, beams & slab of corridor between the office building and Chapel due to corrosion of reinforcement in concrete
4. Reconstructed mezzanine with structural steel. (Ground Floor)



Fig 2. Dampness and leakage marks on third floor Dining room admin building



Fig 3. Vertical deep crack in column passage between the admin building and Chapel



Fig 4. Dampness and leakage marks on first floor office building

B. Science Building

Major observations

1. Separation crack in connection between hall & science building due to outward movement of science building that creates stress at the connection of both buildings. **Requires further investigation.**
2. Uneven floor surface in the passage area towards science building due to movement of science building.
3. Reinforcement is exposed and plaster is falling in the staircase area between the hall building and Science Building-B due to leakages. Reinforcement is corroded.
4. Bulging observed in the column of physics lab Ground floor science building B
5. Leakage is observed in the staircase area from terrace floor to ground floor



Fig 5. Cracks observed in the floor and wall near the separation crack in hall & science building



Fig 6. Bulging observed in the column of physics lab Ground floor science building B



Fig 7. Reinforcement is exposed and plaster is falling in the staircase area between the hall building

C. Social Science Building

Major observation

1. Deep Crack observed in the wall of Botany Laboratory 1 external wall. (Fourth Floor)
2. Major leakage and dampness observed in botany laboratory 1. (Fourth Floor)
3. Leakage marks and dampness observed on walls in Blatter Herbarium department. Due to Leakage through external wall.
4. Leakage observed near the W.C. area in staircase passage due to leakage through the sunken area.



Fig. 8. Deep Crack in the wall of Botany Laboratory 1 external wall (Fourth Floor) Social Science Centre Building



Fig. 9. Vertical and Horizontal deep separation crack in external wall of Botany Laboratory. (Fourth Floor) Social Science Centre Building



Fig. 10. Leakage and dampness observed in the Bank (lecture room no.4) on the external wall

D. Chapel Building

Major observations

1. Steel trusses are supporting the terrace slab and vault (arch slab of chapel). Steel members in the trusses are badly corroded. Cover concrete of vault is spalling. Reinforcement is corroded.
2. Major distresses found in Passage (1m. wide) Chapel Building First Floor due to corrosion of reinforcement in concrete.
3. Slab Reinforcement is exposed at ground floor ceiling in Inter-Religious Study Department due to spalling of cover concrete.
4. Termite attack in the inter-religious study department is noted, needs immediate attention.



Fig 11. Rusting of Structural Steel Members above vault.



Fig 12. Exposed reinforcement in loft area and falling of concrete.



Fig 13. Major distresses found in Passage (1m. wide) Chapel Building First Floor.

E. Hall Building

Major observations

1. Floor landing slab reinforcement is exposed due to spalling of cover concrete in between Hall Building and Science Building staircase area.
2. Slab reinforcement in the staircase section is exposed between Hall Building and Chapel Building at 2nd floor.
3. Dampness on window jambs of Library (First Floor) Hall Building due to leakage from external wall.
4. Cracks observed in column at Vault.
5. Vertical Crack in column of Makeup Room is noted; this may be due to corrosion of reinforcement in concrete.



Fig 14. Exposed reinforcement in landing area of stair case between Hall Building and Science Building



Fig 15. Vertical Deep Crack in column Makeup Room (Ground Floor)



Fig. 16. Exposed reinforcement in the staircase section between Hall Building and Chapel Building at 2nd floor

F. Gymkhana Building**Major observations**

1. Major leakage in office area at 2nd floor due to leakage from overhead water tank bottom slab.
2. Leakage marks are observed in the staircase area from 2nd floor to 1st floor.
3. Peeling of paint observed in badminton court.



Fig 17. Major leakage in office area 2nd floor, Gymkhana Building



Fig 18. Leakage marks are observed in the staircase area from 2nd floor to 1st floor

G. Cardinal Gracias Building (XIMR Building- Xavier's Institute of Management & Research)

Major observations

1. Leakage observed through expansion joint in the passage area between science building and XIMR building.
2. Delaminated plaster is observed in the Passage area.
3. Vertical crack in column in Indoor games room at first floor noted
4. Vertical cracks observed in columns in passage area. These cracks are due to corrosion of reinforcement bars in concrete.



Fig 19. Vertical crack observed in column below the column beam junction 2nd floor passage area



Fig 20. Leakage observed in the wall in the portion near Expansion gap between science building and XIMR building



Fig 21. Leakage observed in the wall in the portion near Expansion gap between science building and XIMR building



Fig 22. Vertical crack at floor level and Colour peeled off near the expansion joint

H. XIC Building (Xavier's Institute of Communication)

Major observations

1. Leakage marks observed in Social Science Centre on external wall.
2. Peeling of paint in Hostel superintendent office (used as Department of History) Ground floor observed.
3. Dampness observed in the staircase area due to leakage from the external wall.



Fig 23. Sagging observed in the wooden beam above staircase area



Fig 24. Leakage marks observed in Directors cabin 1st floor



Fig 25. Dampness observed in staircase area

H1. Hostel Building

Major observations

1. Cracks observed at mummy slab and beams and lift room slab and beams of Hostel Building.
2. Leakage & delamination of plaster in toilet area observed.
3. Major leakage observed in room no. 520.
4. Reinforcement is exposed in the slab of toilet area due to spalling of cover concrete.
5. Vertical crack in column is noted at second floor.



Fig. 26. Lift room exposed slab reinforcement

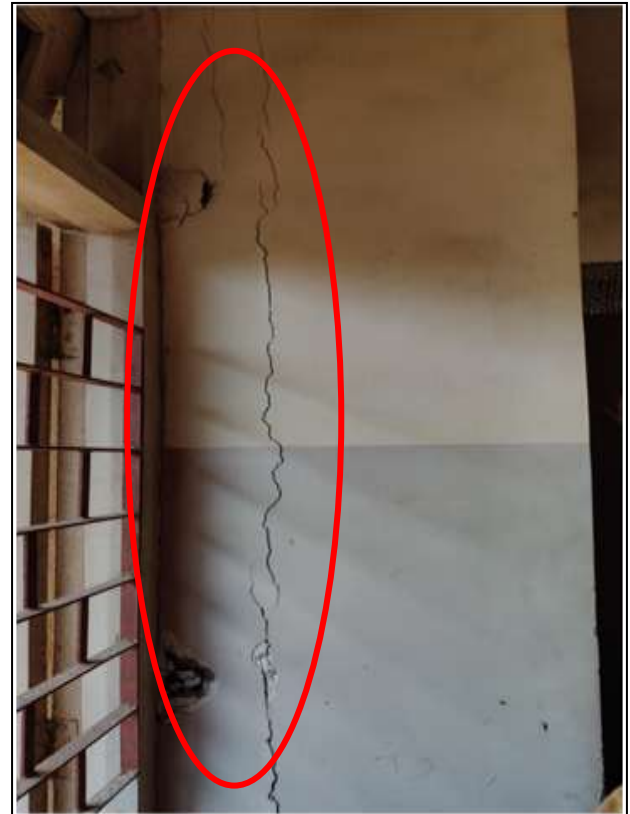


Fig. 27. Vertical crack in column 2nd floor



Fig. 28. Horizontal crack in Beam bottom in room no 414

Following areas require immediate repair work:

1. Cracks in columns, beam & slab of corridor between the office building and Chapel.
2. Separation crack in connection between hall & science building.
3. Steel trusses supporting terrace slab and vault (arch slab of chapel). Steel members of trusses that are badly corroded.
4. Cover concrete of vault that is spalling and the reinforcement that is corroded.
5. Exposed Reinforcement in Slab of Chapel Building (First floor) Inter-Religious Study Department
6. Termite attack in the inter-religious study department
7. Leakage marks and dampness on walls in Blatter Herbarium department. Cause Leakage through external wall- Social Science Building
8. Leakage observed through expansion joint in the passage area between science building and XIMR building.
9. Exposed reinforcement in slab of toilet area.
10. Major leakage in room no. 520.

• Recommendation for Repair/ Strengthening Work :

1. From the visual observation we find that in most of the places where reinforced concrete has been used, there are durability issues such as spalling of cover concrete and corrosion and exposure of reinforcement. We suggest that these structural members shall be thoroughly repaired with polymer mortar, epoxy mortar and micro concrete depending upon the gravity of the damaged/distress in the member. Detailed measures can be decided only after opening of the cracks in column, beam and slab.
2. Leakages can be arrested the proper water proofing, sealing of joints in the wall, filling the gaps between the window frames and masonry wall.
3. Further investigation is required for the gap/cracks between the science building and library building.
4. Strengthening / replacement of the steel trusses is required in chapel building
5. Urgent repair of vault is suggested.
6. Routine audit and repairs of the campus is suggested.
7. A detailed documentation of cracks in wall slab, beam /leakages distress are carried out separately.