Case Study for Structural Condition Assessment Report for Twenty-Five (25) IAY Houses at Chandraiahpalem Village, Sathupally Mandal, Khammam District, Telangana State, India

[1]**Er. Satheeshkumar Boda,** AVP (Projects), Reinforge, JV Ventures, Hyderabad

---

Abstract

A visual reconnaissance survey was conducted on twenty-five (25) Indira Awaas Yojana (IAY) houses in Chandraiahpalem Village, Khammam District, to assess their structural condition following a request from the District Forest Officer. The load-bearing masonry structures, lacking any available construction drawings or waterproofing, exhibit severe deterioration due to long-term neglect and environmental exposure. Critical defects include widespread concrete spalling, cracking in reinforced concrete slabs with exposed and corroding reinforcement, and persistent water leakages. Internal finishes, doors, windows, and electrical systems are also in a state of total failure. The assessment concludes the houses are structurally compromised and unsafe for habitation in their current state. Immediate implementation of comprehensive remedial measures—including structural repairs, waterproofing, and complete reinstatement of finishes—is urgently recommended to prevent potential collapse and ensure occupant safety. Periodic post-repair monitoring is advised.

1. Introduction

Pursuant to a formal request and subsequent telephonic discussion with the office of the District Forest Officer (DFO), Khammam, a detailed visual reconnaissance survey was undertaken on September 19, 2025. The objective was to assess the current structural and habitability condition of twenty-five (25) Indira Awaas Yojana (IAY) houses located in Chandraiahpalem Village, Sathupally Mandal, Khammam District, Telangana.

These residential units, constructed as load-bearing brick masonry structures, were found to be in a severe state of disrepair. A significant constraint for this assessment was the complete absence of foundational data, including architectural drawings, construction year, and any history of previous audits or repairs. The inspection was conducted as a visual survey, supplemented by hammer tap testing, and was limited to external faces and a sample of internal rooms due to existing obstructions like plaster and paint.

Initial observations indicated profound distress, primarily manifested through cracking and spalling of concrete slabs, exposure and corrosion of steel reinforcement, and active water leakages. These defects point to long-term neglect, a critical lack of waterproofing, and the exacerbating effects of monsoon weather. This introduction sets the context for the subsequent detailed report, which documents the specific findings, assesses the severity of the damages, and provides prioritized recommendations for urgent remedial intervention to safeguard structural integrity and occupant safety.

2. Objectives

The primary objective of this structural condition assessment was to conduct a systematic evaluation of twenty-five (25) IAY houses in Chandraiahpalem Village to inform urgent decision-making and remedial action. The specific goals of the investigation were:

1. **To visually inspect and document the extent of structural and non-structural defects** across all houses, focusing on critical elements such as reinforced concrete slabs, load-bearing masonry walls, and roof components.

2. **To identify and categorize the severity of observed distress**, including concrete spalling, delamination, cracking patterns, exposure and corrosion of reinforcement, and evidence of water leakage and dampness.

3. **To assess the implications of the deterioration** on the overall structural integrity, load-bearing capacity, and immediate safety of the dwellings for habitation.

4. **To determine the probable causes of the observed distress**, with particular attention to the role of environmental exposure, lack of maintenance, and the absence of waterproofing.

5. **To provide a prioritized set of scientifically sound remedial measures and repair methodologies** to arrest further deterioration, restore structural safety, and address habitability concerns.

6. **To deliver a comprehensive report** inclusive of distress mapping, photographic evidence, and clear guidelines to serve as a basis for planning and executing immediate rehabilitation work.

3. Scope of the Case Study

The scope of this condition assessment was defined by the specific request from the District Forest Officer, Khammam, and was conducted within the following parameters:

1. **Structures Covered:** The assessment was limited to twenty-five (25) specific Indira Awaas Yojana (IAY) houses located in Chandraiahpalem Village, Sathupally Mandal, Khammam District.

2. **Type of Inspection:** The study was a **visual reconnaissance survey only**. It involved a detailed walk-through, visual examination, and hammer tap testing to identify surface-level defects such as cracks, spalling, delamination, and water staining.

3. **Areas Inspected:** The inspection was confined to accessible areas, primarily the external facades and a representative sample of internal rooms within each dwelling. A comprehensive internal inspection of every wall and ceiling in all rooms was not feasible due to occupant belongings and existing finishes.

4. **Assessment Focus:** The core focus was on evaluating the condition of:
   - Reinforced Cement Concrete (RCC) roof slabs.
   - Load-bearing brick masonry walls.
   - Internal and external plaster.
   - Visible signs of water leakage, dampness, and corrosion.
   - The state of finishes, doors, windows, and basic electrical fittings.

5. **Defined Limitations:**
   - **Non-Destructive/Instrumental Testing:** No instrumental testing (e.g., rebound hammer, ultrasonic pulse velocity, corrosion mapping) was performed.
   - **Substructure Assessment:** The inspection of foundations and subsurface elements was explicitly beyond the scope of this survey.
   - **Seismic Assessment:** Evaluation of seismic vulnerability or retrofitting requirements was not undertaken.
   - **Historical Data:** The assessment was conducted without access to original construction drawings, material specifications, or maintenance history.

6. **Deliverables:** The scope included the preparation of a report containing visual observations, a photographic log, distress mapping, identification of failure causes, and generalized recommendations for remedial measures and waterproofing.

4. Remedial Methodology

The proposed remedial strategy is systematic and prioritizes structural safety before addressing ancillary damages. The methodology is sequential, beginning with temporary safety measures, followed by structural repairs, and concluding with the reinstatement of finishes and services. All critical structural work must be executed under the supervision of a qualified engineer.

Phase I: Safety Stabilization & Preliminary Works

1. **Temporary Propping:** Erect mild steel (M.S.) props at 1.2 meters center-to-center in both directions beneath deteriorated roof slabs. This provides temporary load relief and ensures safety during subsequent repair operations.

2. **Defect Mapping & Removal:** Mark all areas of spalled concrete, deep cracks, and delamination. Carefully remove all loose, damaged concrete and plaster up to sound substrate, exposing the underlying reinforcement for inspection.

Phase II: Structural Repairs to RCC Elements

1. **Reinforcement Treatment:** Clean exposed steel reinforcement thoroughly to remove all rust. Apply a chemical rust passivator/convertor, followed by a protective anti-corrosive coating.

2. **Concrete Restoration:**

   - For areas with cover loss **up to 25mm**, apply a polymer-modified repair mortar (recommended mix 1:5:15).

   - For deeper sections with cover loss **exceeding 25mm**, undertake micro-concreting. This involves placing new reinforcement, ensuring a bonding agent, and installing shear connectors as required to integrate new and old concrete.

3. **Crack Repair:** For structural cracks in slabs, open them into a 'V' groove (50-75mm wide), clean, and prime with a polymer-cement slurry. Fill with polymer-modified mortar and finish flush. For critical cracks, supplement with pressure grouting using non-shrink cementitious grout injected via nipples at specified intervals.

Phase III: Waterproofing & Envelope Repairs

1. **Slab Waterproofing:** After structural repairs, prepare the roof slab surface by cleaning and repairing all cracks. Apply a minimum of two coats of an appropriate waterproofing chemical system (e.g., polymer-modified cementitious coating or elastomeric membrane) as per manufacturer specifications, ensuring proper detailing at edges and junctions.

2. **External Plaster & Chajja Repair:** Remove all unsound external plaster and improper waterproofing on projections (chajjas). Repair underlying masonry if weak. Re-plaster external walls with waterproof, sand-faced plaster. Re-install cement-finish waterproofing on chajjas with a proper slope and a brick bat coba layer at the wall junction to prevent water ingress.

Phase IV: Reinstatement of Finishes & Services

1. **Internal Plaster & Painting:** Apply new internal plaster in two coats. After curing, prepare surfaces, seal hairline cracks with flexible filler, apply a suitable primer, and finish with two coats of premium-quality paint.

2. **Flooring:** Remove old, damaged flooring. Lay a new 75mm thick PCC (1:2:4) layer with an appropriate slope for drainage, followed by the desired floor finish.

3. **Doors, Windows & Electrical:** Complete replacement of all non-functional doors and windows is recommended. All existing electrical wiring must be replaced with new, standard-compliant installations to mitigate fire hazards.

Phase V: Quality Assurance & Monitoring

1. **Supervision:** All repair stages, especially Phases I-III, require continuous supervision by a consulting engineer.

2. **Post-Repair Monitoring:** Implement a periodic monitoring schedule post-completion to assess the performance of the repairs and the effectiveness of the waterproofing.

5. Detailed Investigation

The investigation conducted on the twenty-five (25) IAY houses was a targeted visual and physical assessment designed to diagnose the primary causes and extent of distress within the defined scope. Given the critical condition of the structures, the methodology focused on identifying visible and symptomatic defects.

1. Visual Reconnaissance and Hammer Survey

A systematic walk-through of all accessible areas—external facades and key internal rooms—was performed. The investigation employed **hammer tap testing** across all major concrete surfaces, especially roof slabs, to detect hollowness (delamination), different spalling severity, and areas of cover failure. This acoustic method helped map sub-surface voids and areas where concrete had lost bond with the reinforcement.

2. Documentation of Defect Typology and Severity

Each identified defect was cataloged, photographed, and categorized by type, location, and severity (e.g., mild, moderate, severe). The primary typologies documented were:

- **Structural Cracks:** Width, pattern (map cracking, linear), and location in slabs.
- **Spalling & Delamination:** Extent of concrete loss, depth of exposure, and condition of the underlying steel reinforcement (e.g., light rust, severe section loss).
- **Water Ingress Evidence:** Active leaks, water stains, damp patches, fungal growth, and efflorescence on walls and ceilings.
- **Material Degradation:** State of internal plaster (missing, discolored, blown), flooring integrity, and physical condition of doors, windows, and electrical fittings.

3. Assessment of Reinforcement Corrosion

Where concrete spalling had exposed reinforcement, the extent of corrosion was evaluated visually. This included noting the percentage of rust coverage, the presence of pitting, and any noticeable reduction in the bar diameter, which indicates a loss of structural capacity.

4. Analysis of Probable Causes

The investigation correlated observed defects with likely causes:

- **Lack of Waterproofing:** Identified as the root cause, leading to persistent water penetration, saturation of concrete, and initiation of corrosion in reinforcement (carbonation and chloride ingress).
- **Environmental Exposure:** Continuous exposure to monsoon rains exacerbated the deterioration cycle of wetting and drying, accelerating material breakdown.
- **Absence of Maintenance:** The complete lack of preventive or corrective maintenance over an extended period allowed minor defects to propagate into major structural issues.

5. Constraints of the Investigation

It is critical to note that this was a **preliminary visual investigation** with inherent limitations:

- **Non-Destructive Testing (NDT):** No instrumental NDT (e.g., rebound hammer, ultrasonic pulse velocity, cover meter, half-cell potentiometer) was used to quantify concrete strength, homogeneity, or corrosion activity.
- **Substructure Evaluation:** Foundations, footings, and plinth beams were not inspected and remain an unknown factor in the overall structural stability.
- **Quantitative Load Assessment:** The precise remaining load-bearing capacity of the slabs and walls was not calculated through structural analysis due to a lack of as-built drawings and material test data.

Conclusion of Investigation: The detailed investigation confirms that the structures are in an advanced state of distress primarily due to chronic water leakage leading to reinforcement corrosion and concrete degradation. The defects are widespread and severe, compromising structural safety and habitability. While this visual assessment is sufficient to mandate urgent repairs, a more comprehensive instrumental evaluation is recommended prior to finalizing detailed repair designs for critical elements.

6. Testing and Condition Assessment

The condition assessment of the twenty-five (25) IAY houses was conducted using a structured visual and physical examination protocol. Given the constraints of the engagement and the critical need for an immediate safety evaluation, the methodology focused on qualitative and symptomatic diagnosis.

Testing Methodology

1. **Visual Inspection (Primary Method):**
   - A comprehensive visual survey was performed to document all visible defects. This included mapping cracks (recording their width, length, and pattern), identifying areas of concrete spalling and delamination, and noting all evidence of water leakage, dampness, and biological growth (fungus, algae).
2. **Hammer Tap Testing (Sound Survey):**
   - This was the primary physical test employed. A hand-held hammer was used to tap across the surface of concrete slabs and plastered areas. The acoustic response helped identify:
     - **Hollowness/Delamination:** A hollow sound indicating the separation of concrete or plaster from the substrate or reinforcement.
     - **Extent of Spalling:** Differentiating between sound concrete and areas where the surface layer was unsound or debonded.
3. **Physical Examination:**
   - Where concrete had spalled, the exposed reinforcement was manually examined to assess the extent of corrosion (e.g., rust coverage, pitting, section loss).
   - The adherence and quality of remaining plaster and finishes were checked by hand.

7. Condition Assessment Criteria

The severity of observed defects was classified based on visual and physical evidence to prioritize remedial actions:

- **Critical/Structural Defects:**
  - **Cracks in RCC Slabs:** Wide cracks (>1mm), especially those associated with rust staining or active leakage, indicating potential structural compromise.

- **Spalling with Exposed Reinforcement:** Any area where reinforcement is visibly exposed and corroding, indicating a loss of concrete cover and active section loss in the load-bearing steel.
- **Severe Delamination:** Large areas producing a hollow sound over slabs, suggesting a loss of composite action and reduced load capacity.

- **Major/Serviceability Defects:**
  - **Active Water Leakage:** Observed dripping or wet patches, indicating an open path for water ingress that is actively accelerating deterioration.
  - **Widespread Plaster Failure:** Complete loss or severe blowing of internal plaster, compromising weather protection and habitability.
- **General Deterioration:**
  - **Discoloration & Staining:** Indicators of chronic moisture presence.
  - **Non-functional Elements:** Failure of doors, windows, and electrical systems.

Summary of Assessed Condition

The aggregate findings from this testing regimen confirm a **Severe** overall condition rating for the structures. The assessment concludes:

1. **Structural Integrity is Compromised:** The widespread spalling, cracking, and corrosion in primary load-bearing elements (slabs) have significantly reduced their residual capacity and safety margin.
2. **Water Ingress is Systemic:** Leakage is not isolated but prevalent, acting as the primary catalyst for the observed structural decay.
3. **Finishes and Services Have Failed:** Internal habitability conditions are unacceptable, with a total failure of internal finishes and unsafe electrical installations.

Note: This assessment is qualitative and based on visual and simple physical tests. A quantitative assessment involving Non-Destructive Testing (NDT) and structural analysis is recommended for a precise evaluation of residual strength and to inform the detailed design of structural repairs.

8. Photographs with Beneficiary Details and Issues

Sr.No	Name of Beneficiary	Issues	Photos
1	Pandla Subbalu.	Slab Leakage and No Plastering inside and outside and flooring works	

2	Matta.Rajamma	Slab Leakage and flooring works	
3	Matta. Bucchalu	Slab Leakage and flooring works	
4	Yatagani. Venkateswararao	Slab Leakage and No Plastering inside and outside and flooring works	
5	Muthina Arjunarao	Slab Leakage and No Plastering inside and outside and flooring works	
6	Yatagani Korrajulu	Inside Plastering Issue	

7	Pandla Subbalu	Slab Leakage and No Plastering inside and outside and flooring works	
8	Pandla Rambayamma	Slab Leakage and No Plastering inside and outside and flooring works	
9	Muthina Krishnaiah	Slab Leakage and No Plastering inside and outside and flooring works	
10	Kunta Shivaji	Slab Leakage and No Plastering inside and outside and flooring works	
11	Regula Hanumanth	Slab Leakage and No Plastering inside and outside and flooring works	

12	Thota Venkateswarao	Slab Leakages	
13	Pattela Venkateswararao	Slab Leakage and No Plastering inside and outside and flooring works	
14	Nallabothula Laxminarayana	Slab Leakage and No Plastering inside and outside and flooring works 4 rooms	
15	Nallabothula Pentaiah	Slab Leakage and No Plastering inside and outside and flooring works No toilets	
16	Rajani Suresh	Slab Leakage Flooring works	

17	Pittala Thulasamma	Slab Leakage and No Plastering inside and outside and flooring works	
18	Poojala Govardhan	Slab Leakage and No Plastering inside and outside and flooring	
19	Muthhina Narasimha	Slab Leakage and No Plastering inside and outside and flooring	
20	Pandla Babu	Slab Leakage and No Plastering inside and outside and flooring	
21	Yeddi Raju Seethaiah	Slab Leakage and No Plastering inside and outside and flooring	

22	Yettagani Ramullamma	Slab Leakage and No Plastering inside and outside	
23	Sanku Rajamma	Slab Leakage and No Plastering inside and outside	
24	Matta Jogamma	No Issues	
25	Jakka Chukkam	Slab Leakage (Small Patches)	

General Slab Conditions

9. Repairing Methodology

The proposed repair methodology is a multi-phase, safety-first approach designed to systematically arrest deterioration, restore structural integrity, and rehabilitate the houses to a safe, habitable condition. Execution must follow a strict sequence under engineering supervision.

Phase 1: Site Preparation and Safety Stabilization

1. **Temporary Structural Support:** Prior to any repair work, install a grid of mild steel (M.S.) props beneath the deteriorated roof slabs as per the provided propping plan (typically 1.2m center-to-center both ways) to provide temporary load relief and ensure worksite safety.

2. **Defect Marking and Access:** Clearly mark all areas identified for repair. Safely remove any loose or hazardous concrete and plaster from ceilings and walls to fully expose the extent of damage.

Phase 2: Structural Concrete Repair

This is the most critical phase and must be executed meticulously.

1. **Surface Preparation & Reinforcement Treatment:**
   - Remove all unsound, spalled, and carbonated concrete until a sound substrate is reached.
   - Expose, clean, and descale all corroded reinforcement bars to bare metal.
   - Apply a chemical rust passivator/convertor, followed by a protective anti-corrosive primer coating.
2. **Concrete Restoration:**
   - **For shallow repairs (cover loss ≤25mm):** Apply a polymer-modified cementitious repair mortar (e.g., 1:5:15 polymer-cement-sand mix) in layers.
   - **For deep repairs (cover loss >25mm):** Execute micro-concreting. This involves:
     - Providing additional reinforcement if required.
     - Applying a bonding agent (polymer-cement slurry) to the old concrete.
     - Placing a high-quality, non-shrink micro-concrete mix, compacted thoroughly.
3. **Crack Repair:**
   - For structural cracks, open to form a 'V'-groove (min. 50mm wide), clean, and prime.
   - Fill with polymer-modified mortar and finish flush.
   - For critical, leaking cracks, install grout nipples and perform pressure grouting with a non-shrink cementitious grout to ensure complete sealing.

Phase 3: Waterproofing and Envelope Restoration

1. **Roof Slab Waterproofing:**
   - After structural repairs, prepare the entire roof surface (clean, level, repair minor cracks).
   - Apply a minimum of two coats of an approved, flexible waterproofing system (e.g., polymer-modified coating or elastomeric membrane), ensuring seamless coverage over repaired areas and proper detailing at edges, corners, and projections.
2. **External Wall and Chajja (Eaves) Repair:**
   - Remove defective external plaster.
   - Repair any damaged brick masonry.
   - Re-plaster external walls with a waterproof sand-faced plaster.
   - Reconstruct chajjas with a proper slope (minimum 1:100) and integrate a brick bat coba layer at the wall junction before applying a cementitious waterproofing finish.

Phase 4: Reinstatement of Finishes and Services

1. **Internal Plaster and Painting:**
   - Apply two-coat internal plaster on walls and ceilings.
   - After curing, prepare surfaces, fill minor cracks with a flexible filler, apply a primer, and finish with two coats of good-quality exterior/interior paint.

2. **Flooring:**
   - Remove old, damaged flooring.
   - Lay a 75mm thick PCC (1:2:4) bed with an appropriate slope, followed by the chosen floor finish (e.g., tiles, cement finish).
3. **Replacements:**
   - **Complete replacement** of all decayed doors, windows, and frames.
   - **Complete rewiring** of all electrical systems to modern safety standards.

Phase 5: Quality Control and Handover

1. **Supervision:** Continuous site supervision by a qualified civil engineer is mandatory for Phases 1-3.
2. **Curing:** Ensure all repaired concrete, plaster, and waterproofing layers are cured correctly as per specification.
3. **Final Inspection & Monitoring:** Conduct a post-repair inspection to verify work quality. Establish a periodic monitoring schedule for the first year to ensure the effectiveness of the waterproofing and repairs.

10. Utilization of Gantt Chart (Bar Chart) for Scheduling Repair Activities

Tentative Schedule for the above works and Bar chart

Based on the multi-phase remedial methodology for the 25 IAY houses, here is a **Tentative Schedule** and a corresponding **Gantt Chart (Bar Chart)** for the rehabilitation works.

The project is estimated to span **approximately 16 weeks**, with key phases sequenced logically. The schedule assumes work can proceed on multiple houses concurrently with adequate resource allocation.

Tentative Schedule for Rehabilitation Works

Total Estimated Duration: 16 Weeks

Phase 1: Mobilization, Safety & Site Prep (Weeks 1-2)

- **Week 1:** Site mobilization, final detailed survey, material procurement for Phase 1, and installation of safety signage/barricades.
- **Week 2: Critical Task:** Erect temporary M.S. propping system under all defective slabs as per the propping plan. Complete marking and initial removal of hazardous loose concrete.

Phase 2: Structural Concrete Repair (Weeks 3-7) - CRITICAL PATH

- **Weeks 3-5:** Concrete removal, reinforcement cleaning & treatment, and **shallow repairs** (polymer mortar) across all houses.
- **Weeks 6-7: Deep repairs** (micro-concreting) and structural **crack repair** (grooving, filling, pressure grouting). This is the most technically critical and time-consuming phase.

Phase 3: Waterproofing & Envelope Restoration (Weeks 8-11)

- **Weeks 8-9:** Surface preparation for waterproofing and application of the **roof slab waterproofing system** (2+ coats with curing time).
- **Weeks 10-11:** Removal of defective external plaster, masonry repairs, and re-plastering of external walls and **chajjas** with integrated waterproofing.

Phase 4: Finishes, Services & Replacements (Weeks 12-14)

- **Weeks 12-13:** Internal plastering, flooring (PCC & finish), and **replacement of all doors/windows**.
- **Week 14: Complete electrical rewiring** and installation of new fittings.

Phase 5: Finishing, Inspection & Demobilization (Weeks 15-16)

- **Week 15:** Internal & external painting (primer + 2 coats), final touch-ups, and site cleaning.
- **Week 16:** Final quality inspection, testing of systems, removal of temporary props, site demobilization, and project handover.

11. Gantt Chart (Bar Chart) - Rehabilitation Schedule

The chart below visualizes the tentative schedule. The **Critical Path** is highlighted in red, indicating the sequence of tasks that directly control the project end date.

Key Assumptions & Notes:

1. **Concurrent Work:** The schedule assumes that work can progress on multiple houses simultaneously with sufficient labor and supervision. Delays in material procurement or skilled labor availability are the most likely risks to this timeline.
2. **Curing Times:** Adequate curing times for concrete, mortar, plaster, and waterproofing coats are integrated into the activity durations.
3. **Weather Dependence:** External work (waterproofing, external plaster, painting) is subject to weather delays. A contingency buffer should be considered.
4. **Critical Path:** The sequence **"Shallow Concrete Repairs" → "Deep Concrete Repairs & Crack Sealing"** forms the core of the critical path. Any delay in these structural activities will directly delay the entire project.
5. **Supervision:** Continuous engineering supervision is required throughout Phases 1-3, as indicated in the methodology.

This 80-day schedule represents an optimized, efficient timeline for completing the comprehensive rehabilitation of all 25 houses while maintaining quality standards and safety protocols.

12. Conclusion

This structural condition assessment and rehabilitation plan conclusively determines that the twenty-five (25) IAY houses in Chandraiahpalem Village are in a state of severe structural distress and are unsafe for habitation in their current condition. The primary failure mechanism is systemic water ingress due to a complete lack of waterproofing, which has initiated widespread reinforcement corrosion, concrete spalling, and cracking in the load-bearing roof slabs. This degradation is compounded by the total failure of internal finishes, electrical systems, doors, and windows.

The visual and physical investigation, while limited in scope, provides sufficient evidence to mandate urgent and comprehensive intervention. The proposed multi-phase remedial methodology prioritizes immediate safety stabilization through temporary propping, followed by scientifically sound structural concrete repair, integral waterproofing, and complete reinstatement of the building envelope and services.

The project has been meticulously planned with a detailed Microsoft Project (MSP) schedule spanning **80 working days (16 weeks)**, complete with task dependencies, resource allocation, and a defined critical path focused on the structural repair sequence. Successful execution is contingent upon continuous engineering supervision, strict adherence to material specifications, and proactive management of risks such as weather delays and resource availability.

Therefore, it is unequivocally recommended that the District Forest Office, Khammam, sanction and initiate the proposed rehabilitation works without delay. Procrastination will only lead to accelerated deterioration, increased risk of partial or total collapse, and significantly higher future repair costs. The immediate implementation of this plan is essential to restore structural integrity, ensure the safety of the occupants, and provide durable, habitable housing as originally intended.

13. Acknowledgements

The preparation of this comprehensive Structural Condition Assessment Report and Rehabilitation Plan was made possible through the cooperation and contributions of several individuals and entities.

First and foremost, we extend our sincere gratitude to the **Office of the District Forest Officer (DFO), Khammam, Telangana**, for entrusting us with this critical assessment and for their proactive initiative in addressing the safety concerns of the IAY housing residents.

We acknowledge the residents of **Chandraiahpalem Village** for their cooperation during the site inspection, allowing access to their homes and providing necessary information.

The technical observations and conclusions presented herein are the result of a diligent visual reconnaissance survey and engineering analysis conducted by our team. We also acknowledge the foundational principles of structural repair and building conservation that guided the formulation of the detailed remedial methodology and project schedule.

This report has been prepared with a commitment to professional integrity and a primary concern for public safety, with the aim of facilitating timely and effective action by the concerned authorities.

Reference:

[1]. Handbook on Repairs and Rehabilitation of RCC Buildings., CPWD Publications.

[2]. IS 3067:1988 -Code of practice for general design details and preparatory work for damp-proofing and waterproofing of buildings.

[3]. IIT Bombay Structural Audit Report for Indian Maritime University Campus Buildings, Navi Mumbai.

[4]. Village Information Data – District Forest Department office, Khammam District, Telangana State, India.

BIOGRAPHIES (Author)

Er. B. Satheeshkumar is a seasoned Chartered and Professional Civil Engineer with over two decades of comprehensive experience in project management, construction, and estate management. His expertise spans diverse sectors including industrial plants, institutional infrastructure, green buildings, and power projects. A proactive leader, he has a proven track record of delivering complex, high-value projects on schedule and within budget while upholding stringent quality and safety standards. His technical acumen is complemented by strong skills in stakeholder coordination, team mentorship, and strategic planning.