



VISVESVARAYA NATIONAL INSTITUTE OF TECHNOLOGY  
South Ambazari, Road, NAGPUR – 440 010 ( INDIA )

DEPARTMENT OF CIVIL ENGINEERING

सभा दि. 21/08/2022

विषय, ३३

The Amt. Z.P. Shikshak Sahakari  
Bank Ltd. Amravati R. No.116

AGT- 416/CE-6241/ 3785

Date: 1 8 AUG 2022

To,  
Chief Manager,  
The Amravati Zilha Parishad Shikshak Sahakari Bank Ltd.,  
Congress Nagar Road, Near Railway Bridge, Amravati -444606

Inward No. 1006 Dt. 19/8/2022

**Subject:** Structural audit of Head Office Bank Building at Amravati

**Reference:** Your letter No. Q/2022 Dated: 08/07/2022

**Preamble:**

Vide above reference, it was asked to conduct structural audit of Head Office Bank Building situated at Hamlpura, Amravati. The site visit was conducted on 14<sup>th</sup> August 2022 for inspection and conducting Ultra Sonic Pulse Velocity test (UPV) and rebound hammer test. The G+2 storey building was constructed thirty years back and in part as per requirement. The original building is load bearing. Later on upper storey were constructed by taking columns from outside from left hand side of building only. The beams of first floor are fixed in left side columns and rest on brick wall constructed over existing wall on right side. Second floor roof is truss roof. The condition of building is bad and it is deteriorated. The column, beam and slab were selected randomly for testing to check the overall quality & strength of concrete and stability of structure. The results of visual inspection and NDT testing are presented below along with conclusions and recommendations.

**1. Observations from Visual Inspections:**

- The heavy dampness can be seen in right hand side of wall from inside as well as outside. This wall is load bearing. Due to dampness the plaster from inside & outside is started falling down. Please refer Photograph No. 2,3,4 & 5.
- The chajjas from both side and on all floors are deteriorated badly. Bottom concrete cover is falling down and reinforcement exposed at many locations. At one location chajja is completely fall down. Please refer Photograph No. 6,7 & 8.
- The outside columns are cracked. Please refer Photograph No. 9 & 10.
- Some of the beams are cracked. Please refer Photograph No. 11, 12 & 13.
- Dampness in slabs at some location is observed. Also, concrete cover falls down and reinforcement exposed. Please refer Photograph No. 14, 15 & 16.



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Photo 1: Front View of Building

*Rawlance*





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**Photo 2: Dampness in wall from inside**



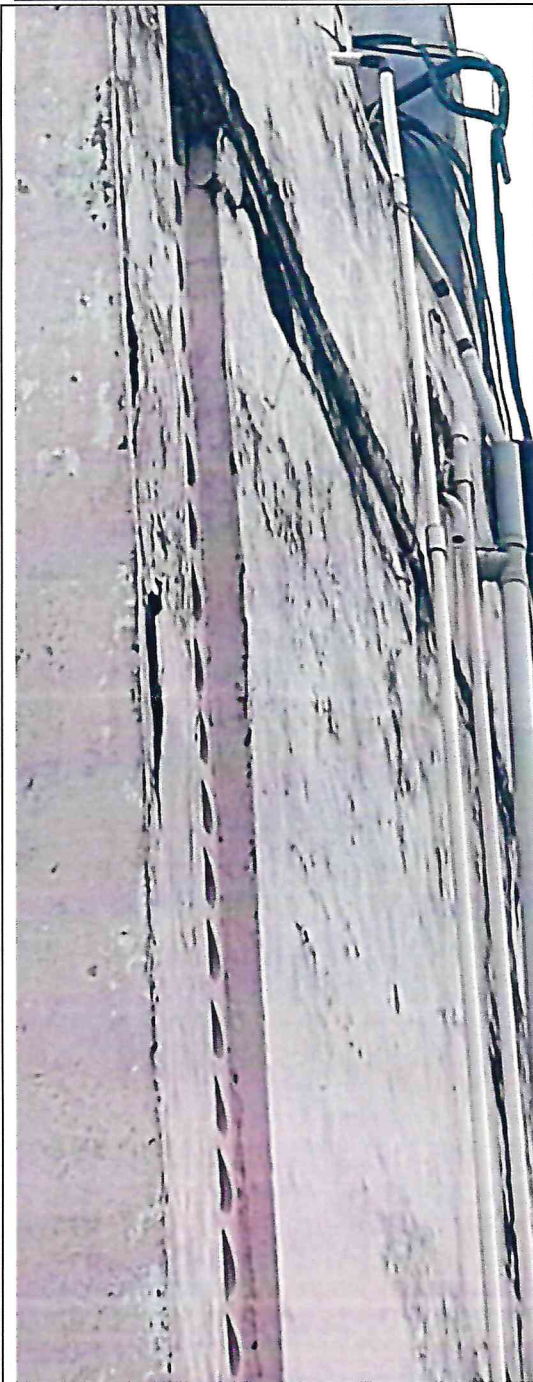
**Photo 3: Falling of inside plaster**

*Chawla*



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**Photo 4: Dampness in wall from out side**



**Photo 5: Falling of outside plaster**

*Fawolore*





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**Photo 6: Chajja fall down completely**



**Photo 7: Chajja reinforcement exposed**



**Photo 8: Chajja reinforcement exposed**

*Pawale*





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Photo 9: Cracks in column

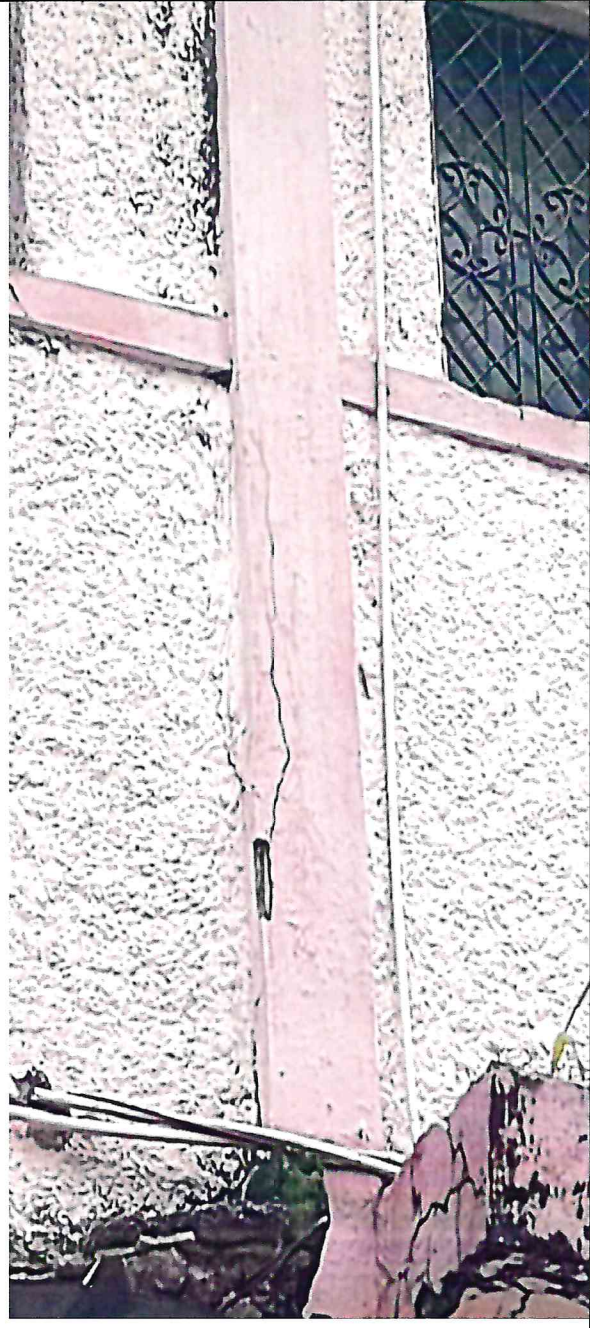


Photo 10: Cracks in column

*Pawalare*





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**Photo 11: Cracks in column & Beam. Beam Reinforcement exposed.**



**Photo 12: Crack Lintel Beam**



**Photo 13: Crack slab level Beam**

*Pawale*



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**Photo 14: Dampness in slab in Cashier room**



**Photo 15: Dampness in slab in Locker room**



**Photo 16: Exposed reinforcement of slab in front verhandaha**

*Paula*





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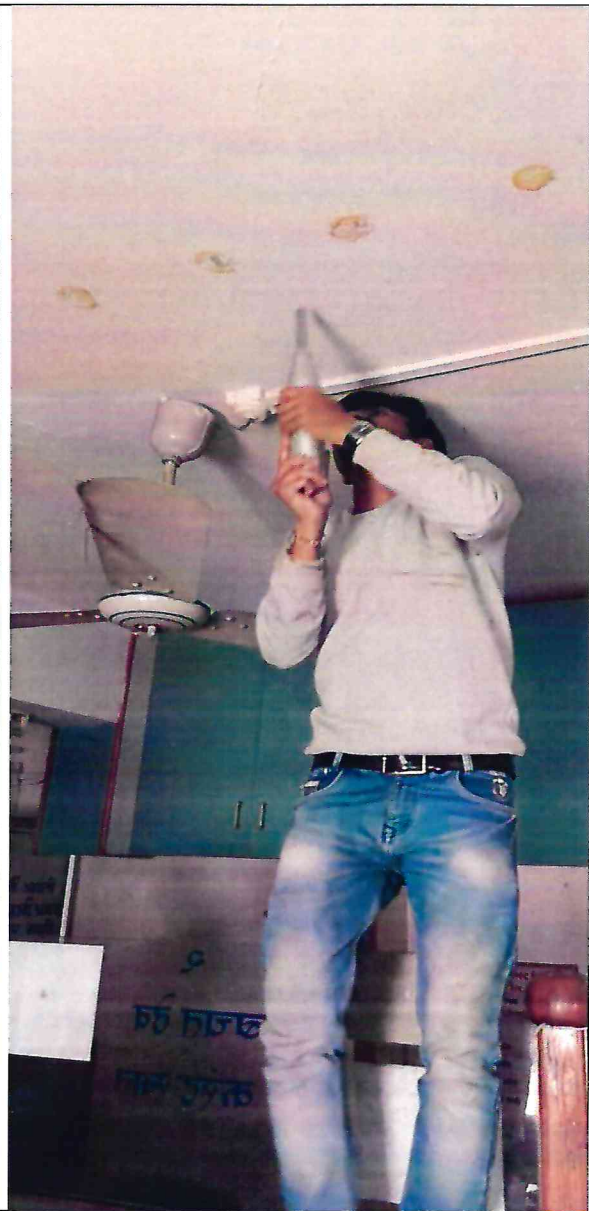
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## **2. Results of Non Destructive Tests (NDT)**

After visual inspection NDT had been carried out to decide the quality of existing concrete, by ultra sonic pulse velocity test (UPV) as per IS 516 Part 5 2018 and rebound hammer as per IS 516 Part 4 2019. The photographs 17, 18, 19 & 20 show NDT on site. The UPV test & rebound hammer test conducted on columns, beams and slabs on every floor after selecting them randomly. The results of test are presented after photographs.



**Photo 17: UPV Test on slab**



**Photo 18: Rebound Hammer Test on slab**

*Pauldane*



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Photo 19: Rebound Hammer Test on Beam



Photo 20: UPV Test on Beam

*Pawale*





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**UPV Test Results**

Test Method : Indirect

Distance : 300mm

Location ID	Point	Velocity (m/s)						Average	Corrected	Concrete Quality
GROUND FLOOR	Cloumn-1	2800	2763	2263	2463	2569	3012	2645	3145	Poor
	Cloumn-2	2688	3158	2457	2775	2175	2650	2651	3151	Poor
	Cloumn-3	2179	1923	2964	2780	2611	2843	2550	3050	Poor
	Cloumn-4	2456	2445	2356	2159	2258	1950	2271	2771	Poor
GROUND FLOOR	Slab 1	1984	1603	1581	2882	2177	1613	1973	2473	Poor
	Slab 2	1580	1639	1564	1549	2651	2596	1930	2430	Poor
First floor	Beam 1	1400	1901	2415	2276	1700	1504	1866	2366	Poor
	Beam 1	3802	2519	1600	2836	2157	2451	2561	3061	Poor
	Beam 1	1499	2935	1058	1993	2019	1456	1827	2327	Poor
First floor	Slab 1	1780	1504	1425	1546	1510	1485	1542	2042	Poor
	Slab 1	949	1211	1885	1843	2213	2458	1760	2260	Poor

**Rebound Hammer Test Results**

Location ID	Point	Rebound Number						AVERAGE	Concrete Strength
First Floor	Beam 1	30	34	30	34	34	30	32	Moderate
	Beam 2	26	30	28	28	28	26	28	Moderate
	Beam 3	30	32	32	30	32	30	31	Moderate
	Slab 1	38	34	32	34	34	34	34	Moderate
	Slab 2	34	36	30	36	30	36	34	Moderate
Ground Floor	Column -1	30	28	30	34	22	28	29	Moderate
	Column -2	32	28	30	32	30	26	30	Moderate
	Column -3	30	32	28	30	28	26	29	Moderate
	Column -4	28	32	32	36	32	32	32	Moderate
	Column -5	28	30	32	30	34	28	30	Moderate
	Beam 1	28	28	30	30	24	26	28	Moderate
	Beam 2	28	28	30	26	28	30	28	Moderate
	Slab 1	30	30	28	28	30	30	29	Moderate
	Slab 2	28	26	26	26	22	20	25	Poor

*Paulare*



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3. Conclusions and Recommendations

- i. From visual inspections, it is observed that condition of building is deteriorated. Cracks are developed in structural members like columns & beams.
- ii. Dampness is observed in right side load bearing wall which carrying the half load of the building. Falling of plaster and concrete cover of structural elements are warning before failure.
- iii. UPV test indicates that concrete quality of structural members is poor.
- iv. The results of rebound hammer test indicate that the concrete strength is moderate (but not good).
- v. It is concluded that the durability and stability of existing building is poor as it is showing all indications before major failure.
- vi. It is recommended to demolish the building to the earliest to avoid any major mishap.

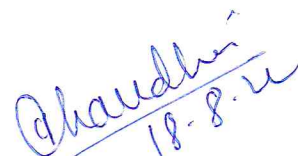
Remark:- This report is based on the visual inspection and NDT tests carried out on 14<sup>th</sup> August 2022. The VNIT, Nagpur will not be responsible for any future distress and failure of building or any of the structural members due to non-implementation of recommendations.

  
17/8/2022

Dr. Abhay Tawalare  
Assistant Professor

  
18.8.22

Prof. Y.B. Katpatal  
HOD Civil Engg.

  
18.8.22

Prof. (Mrs) M.A. Choudhari  
Dean (R & C)