STRUCTURAL STABILITY CERTIFICATION OF EXISTING BUILDING FOR BAL BHARATI PUBLIC SCHOOL AT BAL BHARATI PUBLIC SCHOOL, EDUCATIONAL BUILDING AT BRIJ VIHAR, DISTRICT GHAZIABAD UTTAR PRADESH - 201011

Principal
Bal Bharati Public School
Brij Vihar, Ghaziabad (U.P.)

PREPARED BY

PERCEPTIONS
11/165, VASUNDHARA, GHAZIABAD
UTTAR PRADESH - 201009

Proof Checked
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Executive Summary and Line of Action

1. Structural crack or other deterioration has not been observed during visual inspection. Protection from rain-water ingress, moisture ingress from bathroom and toilets, roof waterproofing along with anti-carbonation repainting is suggested to overcome the ageing effects.

2. In order to check the quality of construction and deficiency analysis of used construction material **Rebound hammer, USPV and Core Tests** were conducted to know in-situ strength of concrete at present.

- The rebound hammer hardness indices show that the surface condition of the concrete is variable bu mostly good, and there is no evidence of blistering on the concrete surface except in the small area th has been corroded.

- **The concrete cubes have an average in-situ equivalent characteristic strength of 11 MPa, which is the M10-M15 grade range.**
- There is no reliable information regarding the original grade of concrete because the design plans structural drawings of the current structure and its structural components are not available. Although t structure had a design concrete strength of 15 MPa, it was designed according to the then-prevailing code of practise and was constructed in the early 1990s with the same grade of concrete as was used in design. Given the age of the structure and the lack of information regarding the concrete grade, i presumed that the original construction used concrete with a minimum structural grade of M15 for R sections. This assumption is based on IS 456: 2000.
- So, the presence of in-situ concrete (M10-M15) indicates the presence of non-structural grade concret per the upgraded building code, despite the fact that it was a permissible grade of concrete in this compared to the building codes that were followed during the building's construction.

3. **Cover - Carbonation depth, pH and Resistivity** methodologies were adopted to know the positio embedded reinforcement and condition of passivating film surrounding the reinforcing steel bars whet will lose the stability and will start to break down or deteriorating agent will expose the steel to corrosio

- Measured **concrete cover thickness** were compared found to be adequate and satisfactory which is en to protect the reinforcement on all RCC members.
- The carbonation effect was found globally. It can be concluded that the overall structure's incut period is not over but most locations are in deterioration period which would require anti-carbo treatment as presence of all the deterioration agents are on the higher side. So, building demands restu of moisture ingress to minimize the effect of carbonation and possibility of corrosion. Building's co

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Executive Summary

Load combination 1 & 2		Dead Load Live Load	
Components	Deficient in section size	Deficient in reinforcement	Demand of Structural Repair
Column	√- No	√- No	Not Required
Beam	√- No	√- No	Not Required
Slab	√- No	√- No	Not Required

Load combination (All critical load combinations) as per present updated seismic code IS 1893:2016 (code has been revised the post construction)			Live Load + Dead Load + EQ
Components	Code		Seismic zone IV
Column	1	Deficient in section size	√- Yes
	2	Deficient in reinforcement	x- No
Beam	1	Deficient in section size	√- Yes (beams are failed in Shear)
	2	Deficient in reinforcement	x- No
	3	Demand of Structural Repair due to design deficiencies	Not required unless imposed live load is t the 300 kg/Sqm or any further modificat done in the existing building
Slab	1	Deficient in section size	x- No
	2	Deficient in reinforcement	x- No
	3	Demand of Structural Repair due to design deficiencies	Not Required but load is limited up to kg/Sqm

Following the old seismic code (which was available at the time of construction), all beams are stable an adequate to take all kinds of forces. Most of the beams passed the shear and deflection criteria, and the b members were adequate to carry the applied loading condition because all beams have sufficient membe (effective depth). It was designed according to the then-prevailing IS code of practise.

If the building authority is not interested in upgrading the building's performance following the new sei guidelines, a sensor can be installed to monitor the deflection of the critical section 24X7 and the behav the structure during operational load.

So, the existing building is stable and safe for the existing live load and dead load. But the buildin demands shear strengthening if authority wants to upgrade the building's seismic performance as per u earthquake code **IS 1893:2016. All beams except the red-marked ones (with a width of less than 3 don't have to be strengthened, as long as their flaws are evaluated according to the new seismic which was updated in 2016.**

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will not be durable to resist the possible deteriorating corrosive effects unless it will be kept in the dry state.

- Statistics indicate a changeable potential difference pattern. Only a few patch locations have low corrosion risk; otherwise, the majority of the structural members have 50% corrosion probability. This indicates that there is no active corrosion in the reinforcement, but it also suggests that there may be uncertain (50% risk) probable risks of active corrosion in the reinforcement in the future, which could activate the corrosion in the reinforcement

4. Reinforcement percentage and dimensional size of the structural members

GAD along with the reinforcement mapping of the structural members has been recreated and required dimensions of the members have verified at the site.

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