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on Fire and Building Safety in Bangladesh

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Identified Priority 2 Concerns

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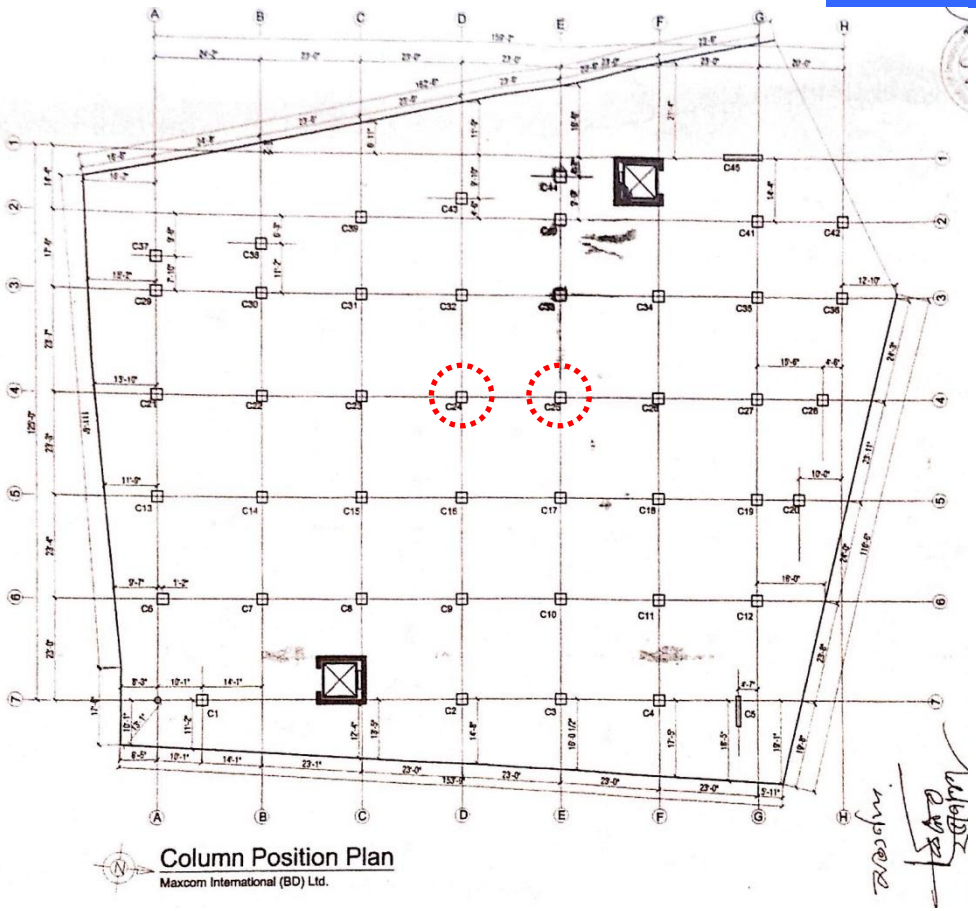
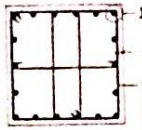
1st Priority 2 Concern



The main building is claimed to have an imposed load rating of 150psf per floor (7.18kPa). Having run the column run-down analysis, using 7.18kPa on all floors causes a **RED** warning. However, applying 10% live load reduction to the 1/F, and 20% live load reduction on 2/F to 8/F brings the column into an **AMBER** warning. Furthermore, reducing imposed load of 1/F to 8/F to 3.0kPa maximum live load returns the column to a **YELLOW** warning.

Fortunately, site conditions suggest an actual imposed load of much less than the design load, and so reducing the imposed load limit to 3.0kPa on all floors except G/F is considered reasonable.

, C8, C9,C10, C11, C14, 5, C16,C17, C18, 9,C22,C23,C24,C25, 6,C27,C30,C31,C32, 3,C34,C35,C40,C41	25 Nos	30"x30"	 18-Ø25mm 3" Clear Cover 10 Ø @ 6"C/C at L/4 Length bottom & top & @ 8"c/c at mid L/2 L=Free Length of Column.

Column unstable under full live load

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Identified Priority 3 Concerns

1st Priority 3 Concern

Building 03 is the existing factory, which is now unused. It dates back in various forms to around 1985, where it originated as a single storey concrete shed outhouse, and was subsequently expanded to its current form.

A building survey has been carried out by a local engineer, and some structural drawings have been produced. The survey comprised the following:

1) Ferro-scan of some column and beam elements
2) Exposure of concrete surface to carry out Schmidt Hammer testing
3) ETABS and SAFE model to re-calculate structure

We have concerns regarding the survey which was carried out as well as the validity and accurateness of the results. This is based on our inspection of the survey report.

1) Schmidt Hammer testing is not considered an accurate representation of concrete strength
2) Ferro-scanning was carried out without full knowledge of the limitations of the hardware and interpretation of results. In this case, the determination of rebar size is considered unreliable and unrealistic.
3) No concrete cores were taken for compressive testing, and no intrusive tests were done to determine real rebar size or layout.
4) Inaccessible areas of structure were not made accessible by partial breaking out of obstructions
5) No foundation checking has been carried out

Structural Records of Building 03 are inaccurate and overestimated

1st Priority 3 Concern

In particular, the following concerns arising from the recommendations of the engineer in his report should be re-considered:

1) 125 psf (approx. 6.0kPa) for imposed is considered too high and does not incorporate a reasonable factor of safety
2) Material strengths and rebar sizes may be too high, thus the values used for subsequent modelling of the building are over-estimated
3) Partition loads have not been considered in the loading calculation
4) The foundation has not been considered in the determination of the allowable loads
5) Visual inspection of the building appeared to illicit areas where the structure did not look logical – especially in the areas around the original single-storey shed structure and the column positions on the upper floor

It is therefore recommended that a full detailed engineering investigation is carried out to establish the true and actual condition of the structure on site with a view to ascertaining a more realistic representation of the building. This should be completed and approved prior to any renovation works being carried out on the building.

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Problems Observed Summary

ITEM 1: (1st Priority 2) Structural Capacity of Column in Building 01 appears to have a very low factor of safety when the building is fully loaded

ITEM 2: (1st Priority 3) Structural Survey of Building 03 and reproduced structural drawings seem unrealistic

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Item 1 and actions

Structural Capacity of Column in Building 01 appears to have a very low factor of safety when the building is fully loaded

Priority 1 (Immediate – Now)	• None required
Priority 2 (within 6 – weeks)	• Ensure that all loads on all floors (except G/F) are kept within 3.0kPa, with the allowance for loading up to 7.2kPa in localised areas only • Prepare loading plan for each floor identifying areas of the floor which can be loaded up to the original design loading capacity
Priority 3 (within 6-months)	• Maintain loading plan and ensure strict compliance with the loading conditions

Item 2 and actions

Structural Survey of Building 03 and reproduced structural drawings seem unrealistic

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Priority 1 (Immediate – Now)	• None required
Priority 2 (within 6 – weeks)	• None required
Priority 3 (within 6-months)	• Full structural survey of the building using intrusive and non-intrusive methods to be carried out • Based on the detailed findings of the structural survey, the structural drawings are to be prepared, and any remedial works or strengthening works to be proposed and actioned prior to any renovations

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