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27.MARCH.2014



ACCORD
on Fire and Building Safety in Bangladesh



Identified Priority 1 Concerns

1st Priority 1 Concern



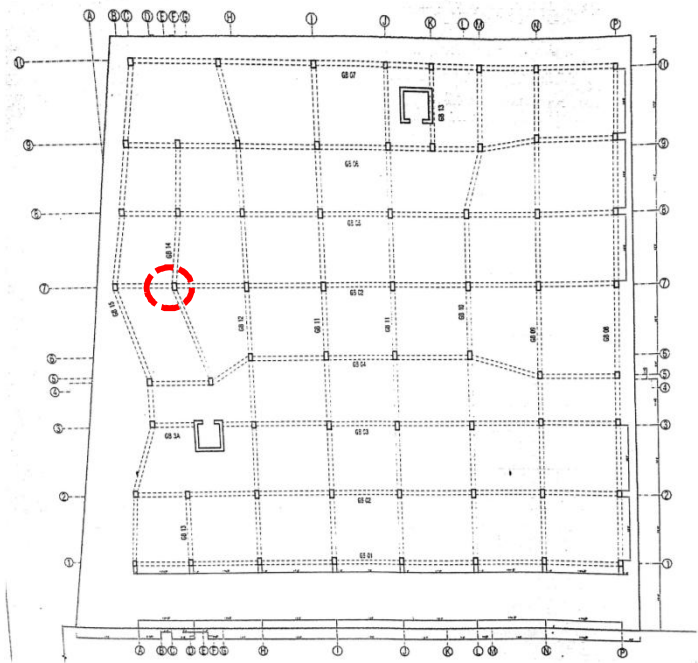
Each roll of fabric is estimated to be approximately 30kg. As they are stacked 8 rolls high, and arranged 7 rolls per layer, the weight of each layer is approx 210kg, resulting in a total weight of 1680kg (16.5kN) per stack.

Based on a plan area of 1.5m x 1.5m per stack, the equivalent live load per stack is estimated to be:

$$16.5\text{kN} / (1.5 \times 1.5)\text{m}^2 = 7.33\text{kPa}.$$

The allowable live load is max. 3.0kPa

Excessive Storage Height on Level 5



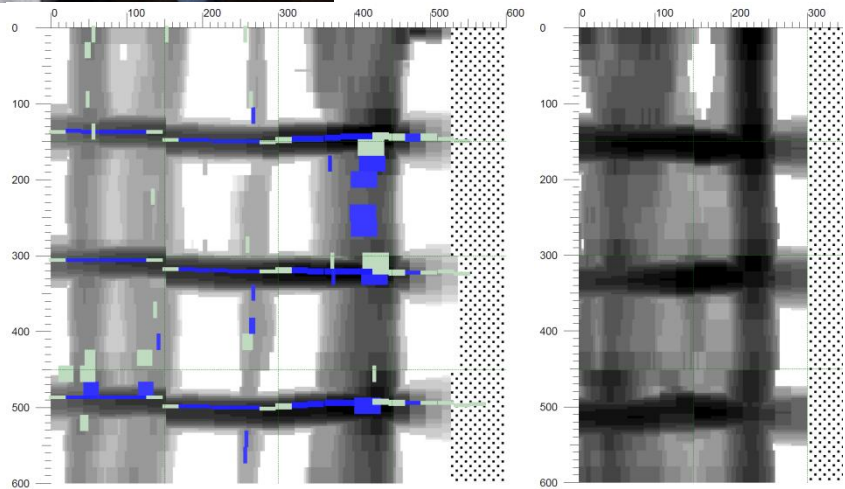
2nd Priority 1 Concern



The original structural drawings denote that column C3 (circled in Red) has an RC detail of 24 no #6 bars. However, the ferroscope of the column at G/F level revealed only a maximum of 12 bars. Further investigations were carried out to determine the composition of the structure

COLUMN SCHEDULE

Column No	Up to GB	GB to 1st Floor	1st Floor to 2nd Floor	2nd Floor to 3rd Floor
C1	8 - # 6 bar 10 mm Ø @ 4"-8"-4" c/c	8 - # 6 bar 10 mm Ø @ 4"-8"-4" c/c	4 - # 6 bar + 4 - # 5 bar 10 mm Ø @ 4"-8"-4" c/c	2 - # 6 bar + 2 - # 5 bar 10 mm Ø @ 4"-8"-4" c/c
C2	16 - # 6 bar 10 mm Ø @ 4"-8"-4" c/c	16 - # 6 bar 10 mm Ø @ 4"-8"-4" c/c	10 - # 6 bar + 6 - # 5 bar 10 mm Ø @ 4"-8"-4" c/c	6 - # 6 bar + 4 - # 5 bar 10 mm Ø @ 4"-8"-4" c/c
C3	24 - # 6 bar 10 mm Ø @ 4"-8"-4" c/c	24 - # 6 bar 10 mm Ø @ 4"-8"-4" c/c	12 - # 6 bar + 12 - # 5 bar 10 mm Ø @ 4"-8"-4" c/c	12 - # 6 bar + 12 - # 5 bar 10 mm Ø @ 4"-8"-4" c/c
C4	8 - # 6 bar 10 mm Ø @ 4"-8"-4" c/c	8 - # 6 bar 10 mm Ø @ 4"-8"-4" c/c	4 - # 6 bar + 4 - # 5 bar 10 mm Ø @ 4"-8"-4" c/c	2 - # 6 bar + 2 - # 5 bar 10 mm Ø @ 4"-8"-4" c/c



Rebar of Column C3 is not in accordance with structural drawings

NOTE

MATERIAL PROPERTIES

- 1) $f_y = 60000$ psi
- 2) $f_y = 40000$ psi (Tie & Link)
- 3) $f_c = 4000$ PSI (1:1.5:3 with well graded Stone chips & Properly Clean & Wash)



The original drawings specify a concrete using stone aggregate, and using high-yield steel for the main bars, and mild-steel bars for the ties and links. It was noted on the roof floor that high-yield bars were used, but the concrete used contained brick aggregate.

In addition to the ferroskan, exposing the rebar also appeared to indicate that the bar was mild steel instead of high yield steel, as no rib pattern was observed on the rebar.

With this in hand, and based on the observed loading conditions, i.e. imposed load of factory floor not envisaged to exceed 2.0kPa with the exception of the storage floor at level 5, the column load rundown returned an AMBER warning, meaning that there was a very small factory of safety remaining in the loading capacity of the column.

In summary, the column was found to have the following problems:

- 1) Brick aggregate instead of stone aggregate
- 2) Mild steel bars instead of high-yield steel bars
- 3) 12-#6 instead of 24 #6 rebars (19mm diameter)
- 4) Greatly reduced loading capacity

Rebar of Column C3 is not in accordance with structural drawings

Identified Priority 2 Concerns

1st Priority 2 Concern



The current planning and permission drawings do not permit any activities on the roof floor, and only 6 storeys (G/F, 1/F-5/F) have permitted usage. It is worth noting that the original building use was intended to be commercial from G/F-3/F, and residential for 4/F and 5/F. The roof floor houses some factory facilities (although partially decommissioned), such as printing room, and dining area.

In order to maintain accordance with the planning drawings, all activities on the roof should cease and the buildings be demolished.

Additional roof level occupied floor doesn't have a permit

Problems Observed Summary

ITEM 1: (1st Priority 1) Excessive storage height of fabric on Level 5

ITEM 2: (2nd Priority 1) Reinforcement and aggregate of concrete does not match with the design drawings

ITEM 3: (1st Priority 2) Additional roof activities and buildings are not permitted, according to the approved planning drawings

Item 1 and actions

Storage area on Level 5 appeared to have stored materials exceeding the permissible floor load.

Priority 1 (Immediate – Now)

- Redistribute fabric rolls around the floor area to ensure that no stack exceeds 300kg/m²

Priority 2 (within 6 – weeks)

- Implement loading plan and oversee that storage of finished goods and raw materials are stored in accordance with the loading plan.

Priority 3 (within 6-months)

- Maintain loading plan

Item 2 and actions

Reinforcement provision and concrete composition does not match with the record drawings. Load rundown shows that the concrete column is loaded to a very low factor of safety

Priority 1 (Immediate – Now)

- Factory Engineer to review design, loads and columns stresses in all areas
- Verify insitu concrete stresses either by 100mm dia. cores or existing cylinder strength data.

Priority 2 (within 6 – weeks)

- A full structural survey of the building is to be carried out using intrusive and non-intrusive methods to ascertain the overall accuracy of the existing record drawings.
- All roof activities and buildings are to be terminated and demolished respectively

Priority 3 (within 6-months)

- Prepare new as-built drawings and a new loading plan for each floor which should be maintained and monitored regularly

Item 4 and actions

Additional roof activities and buildings are not permitted, according to the approved planning drawings

Priority 1 (Immediate – Now)

- None required

Priority 2 (within 6 – weeks)

- In accordance with the actions in Item 2, terminate all activities on the roof, and demolish the existing buildings to free up loads from the roof.

Priority 3 (within 6-months)

- Apply waterproof treatment to the roof to ensure no water seepage to the floor below.