

Libas Textiles Ltd (9500)

Nishchintopur, Mouchak, Kaliakoir, Gazipur, Bangladesh.

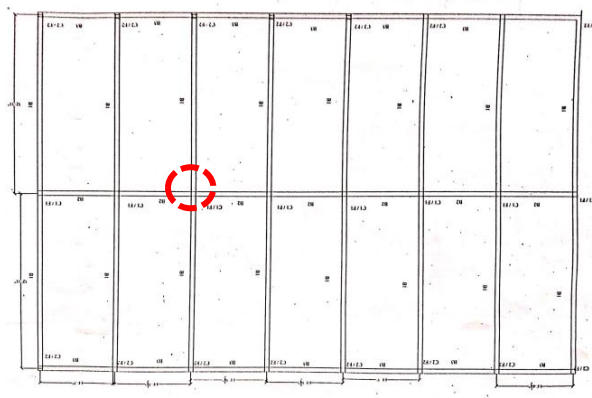
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22.MARCH.2014



Identified Priority 1 Concerns

1st Priority 1 Concern



Based on the load rundown analysis following the agreed minimum design live load assignment, the columns seem significantly insufficient in carrying the dead and live loads from the 3 storey in building 02, giving a firm RED warning. The building was constructed before 2005, with brick aggregate, with total of 3 storeys (including roof). In addition, the ferroskan indicated a steel provision which was not in accordance with the record drawings

Building 2 Column rundown with scanned rebar is insufficient (RED)

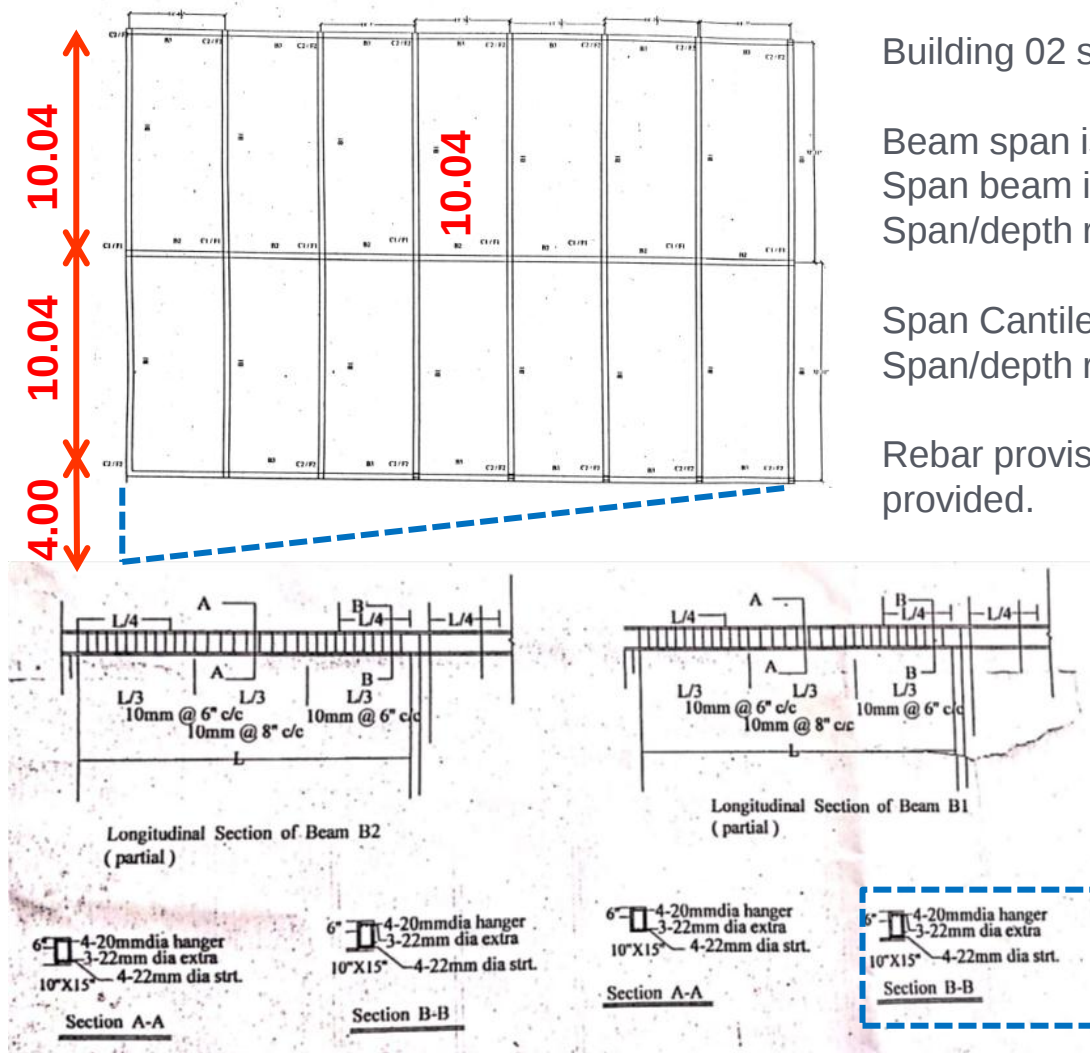
2nd Priority 1 Concern

Building 02 structural layout appears to be dangerous:

Beam span is excessive, and beam size is too small.
Span beam is 10.04m ,beam size is 381x254 mm:
Span/depth ratio is $10,040/381 = 26.35 > 20.0$

Span Cantilever is 4.00m Beam section is 381x254 mm :
Span/depth ratio is $4,000/381 = 10.5 > 7.0$

Rebar provision also appears to be seriously under-provided.



Building 02 structural layout appears to be dangerous

3rd Priority 1 Concern



During the inspection, we accessed the roof. Even a slight foot shuffle caused major vibration of low frequency to the structure, and deflection of the roof was physically detectable by visual as well as feel. As can be seen the upstand beam has a span of 10m, and appears to be seriously undersized.



Building 2 Vibration on roof is a significant cause for concern

4th Priority 1 Concern



Temporary steel post



Top and Bottom connection



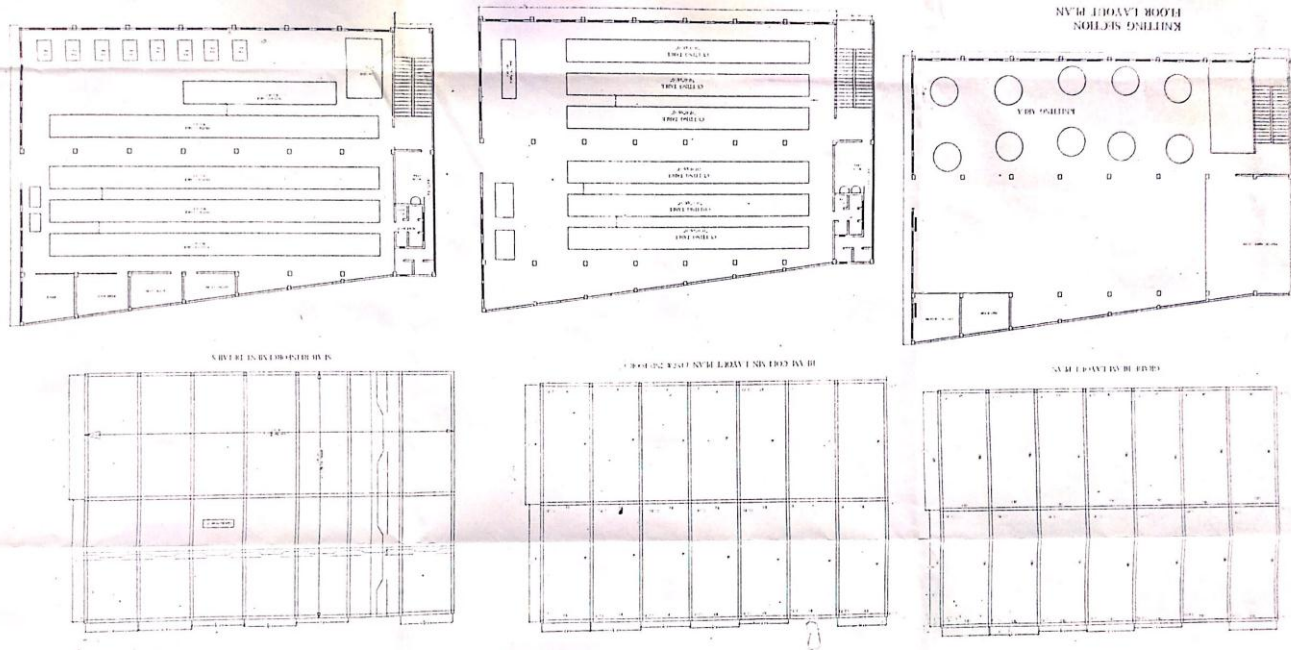
A previous inspection by a structural engineer also proved that the structural integrity of this building is of major concern. Steel props have been added to the mid-span of the beam as a temporary measure to provide stability, however their installation was not considered to be safe, as none of the surface finishes of the beam were removed, and the punching shear on the floor slab is also of major concern, as there is no foundation directly beneath these posts.

Building 2 Beam is propped at midspan by temporary steel post on ground-bearing slab

5th Priority 1 Concern

According to the original layout drawings, the architectural layout and structural layout are different. The architectural drawing shows the tapered edge of the building, whilst the structural plan remains rectangular.

The tapered section of the building is completely cantilevered, with no columns or footings to support.



Building 2 Old structural plan does not reflect structural layout, and new structural drawings are incorrect

Identified Priority 2 Concerns

1st Priority 2 Concern



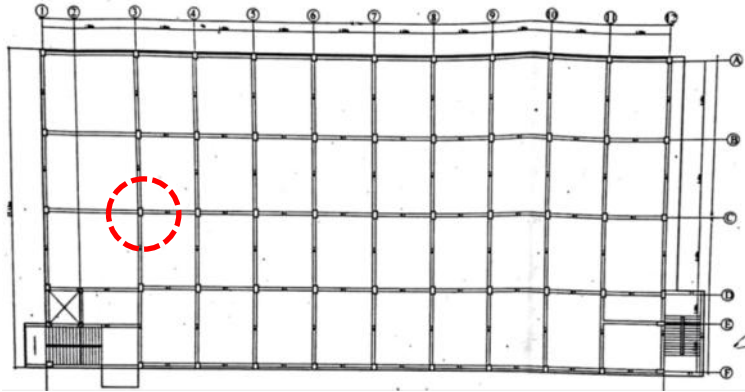
The fire escape staircases were added by the factory owner after completion of the building.

These staircases are deemed to be unfit for their purpose as the structural framing does not appear to be able to withstand emergency crowd loading. The balustrades are also not designed to take lateral crowd loading, and all the members have not been galvanised. Significant rusting of all the steel members was observed



Fire escape staircases are not suitable for emergency use

2nd Priority 2 Concern

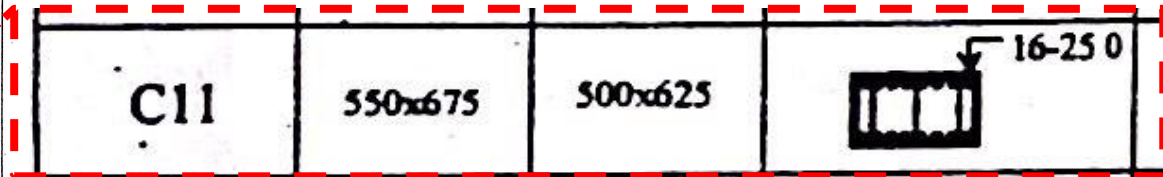


Rebar number of Column C11 is not in accordance with structural drawings. On site condition rebar number of column C11 is 10 $\varnothing$ 25 only, instead of 16 $\varnothing$ 25 as shown in the drawings

COLUMN SCHEDULE

Column Type	Column Size Below G.B. Above G.B.	FOUNDATION TO 2ND FLOOR	3RD & 4TH FLOOR	5TH FLOOR	TIES
C1	425x550	375x500	8-20 0	4-20 0 + 4-16 0	8-16 0
C2	350x450	300x400	10-20 0	8-20 0	8-16 0
C2'	350x600	300x550	10-20 0	8-20 0	8-16 0
C3	425x550	375 x 500	8-20 0 4-16 0	8-20 0	8-20 0
C4	550x675	500x625	10-20 0	8-20 0	8-20 0
C5	425 x 550	375 x 500	12-20 0	8-20 0	8-16 0
C6	550x675	500x625	8-20 0 4-25 0	8-20 0	8-20 0
C7	550x675	500x625	8-25 0 4-20 0	8-25 0	8-20 0
C8	550x675	500x625	12-25 0	8-25 0	8-20 0
C9	550x675	500x625	12-25 0	8-25 0	8-20 0
C10	550x675	500x625	14-25 0	10-25 0	10-20 0
C11	550x675	500x625	16-25 0	12-25 0	8-20 0
C12	500x500	450x450	12-20 0	8-20 0	8-16 0

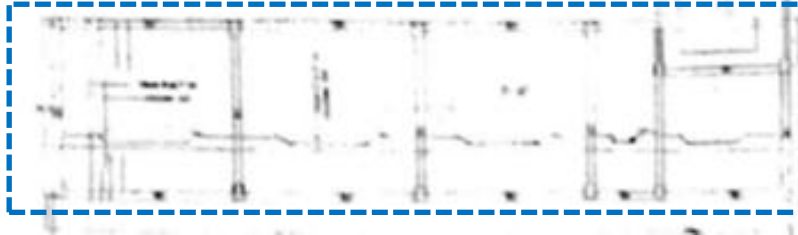
DETAILS OF COLUMN SPACES



Rebar of Column C11 is not in accordance with structural drawings

3rd Priority 2 Concern

EXTENSION OF GARMENTS BUILDING



R.C Framing
structural system in
Drawing

Flat slab of extension of Building 1 has no detail.
In the drawings, only the roof slab was detailed (comprising a beam and slab system).

A full structural inspection and checking is required.



Flat slab structural
on site condition.

It was advised that the flat slab was 229mm thick, although this could not be confirmed

Flat slab of extension of Building 1 has no detail. A full structural inspection and checking is required.

4th Priority 2 Concern



Each water tank is estimated to have a maximum weight of approximately 2000kg. As there are 4 tanks arrangement is closed the total weight of 4 tanks is about 8000kg. (78.5kN) . Based on a plan area of 3.5mx3.5m, the equivalent live load is estimated to be: $78.5\text{kN}/(3.5 \times 3.5)\text{m}^2 = 6.4\text{kPa}$. The allowable live load is believed to be max. 3.0kPa in Building 01

Water Tank are arranged close on Roof at Building 01

Identified Priority 3 Concerns

1st Priority 3 Concern

There are original drawings from 2005 and new structural drawings from 2014. The new structural drawings were allegedly created by a combination of back-calculation of the structure, as well as some kind of in-situ investigation. However, the drawings have been proven to be significantly different from the original drawings which we believe have been used to construct the buildings.

We therefore believe the new structural drawings to not be satisfactory and non-representative of the site conditions. We would also advise that the structural safety certificate to be revoked as Building 02 has already been deemed to be structurally unsafe to a significant degree.

A full structural review of the as-built structure should be carried out to establish the actual site condition, and new detailed structural drawings should be developed. We would advise that the drawings must be completed prior to the construction of the final floor of the building.

Problems Observed Summary

- ITEM 1: (1st Priority 1) Preliminary load take-down calculations suggest that structure does not comply with the BNBC regulations with regard to required design loading in Building 02.**
- ITEM 2: (2nd Priority 1) Building 2 structural layout appears to be dangerous**
- ITEM 3: (3rd Priority 1) Building 2 Vibration on roof is a significant cause for concern**
- ITEM 4: (4th Priority 1) Building 2 Beam is propped at midspan by temporary steel post on ground-bearing slab**
- ITEM 5: (5th Priority 1) Building 2 Old structural plan does not reflect structural layout, and new structural drawings are incorrect**
- ITEM 6: (1st Priority 2) Fire escape staircases are not suitable for emergency use**

Problems Observed Summary (Continued)

- ITEM 7: (2nd Priority 2) Rebar of Column C11 is not in accordance with structural drawings**
- ITEM 8: (3rd Priority 2) Flat slab of extension of Building 1 has no detail. A full structural inspection and checking is required.**
- ITEM 9: (4th Priority 2) Water Tank are arranged close together on Roof at Building 01**
- ITEM 10:(1st Priority 3) There are original drawings and new structural drawings. The new structural drawings do not match with the original structural drawings, NOR do they reflect site as-built condition. A full structural review of the as-built structure should be carried out to establish the actual site condition. The new drawings are unreliable.**

Item 1,2,3,4,5 and actions

Building 02 is deemed unsafe for usage due to unsafe structure on all aspects.

Priority 1 (Immediate – Now)

- Cease operations in Building 02 immediately
- It is deemed that the building is unusable based on the current structural layout

Priority 2 (within 6 – weeks)

- None required

Priority 3 (within 6-months)

- None required

Item 6 and actions

The Steel escape staircase is deemed unfit for its purpose as an emergency structure

Priority 1 (Immediate – Now)

- None required

Priority 2 (within 6 – weeks)

- Consider to replace the staircase and design in accordance with emergency escape regulations with regard to loading
- Apply galvanised coating to all steel members if a new steel structure is chosen.

Priority 3 (within 6-months)

- None required

Item 7 and actions

Structural record drawings do not reflect the as-built condition

Priority 1 (Immediate – Now)

- None required

Priority 2 (within 6 – weeks)

- Building Engineer to fully check loading from the building from both current loading as well as future loading cases to establish whether or not the as-built column is able to sustain the loading

Priority 3 (within 6-months)

- Carry out works in accordance with the priority actions of Item 8 and Item 10

Item 9 and actions

Water Tank are arranged close on Roof at Building 01.

Priority 1 (Immediate – Now)

- None required

Priority 2 (within 6 – weeks)

- Re-arrange the water tanks on roof , and ensure that the live load is less than 3.0Kpa

Priority 3 (within 6-months)

- None required

Item 8, 10 and actions

As-built structural detail does not match with the drawings

Priority 1 (Immediate – Now)

- None required

Priority 2 (within 6 – weeks)

- Carry out full building survey using both intrusive and non-intrusive techniques.
- Carry out concrete cores of structural elements to determine concrete strength

Priority 3 (within 6-months)

- Based on the building survey, develop full structural records, and also propose strengthening works or repair works if the as-built structure appears to be insufficient in any way.