

Ragadi Textiles Ltd

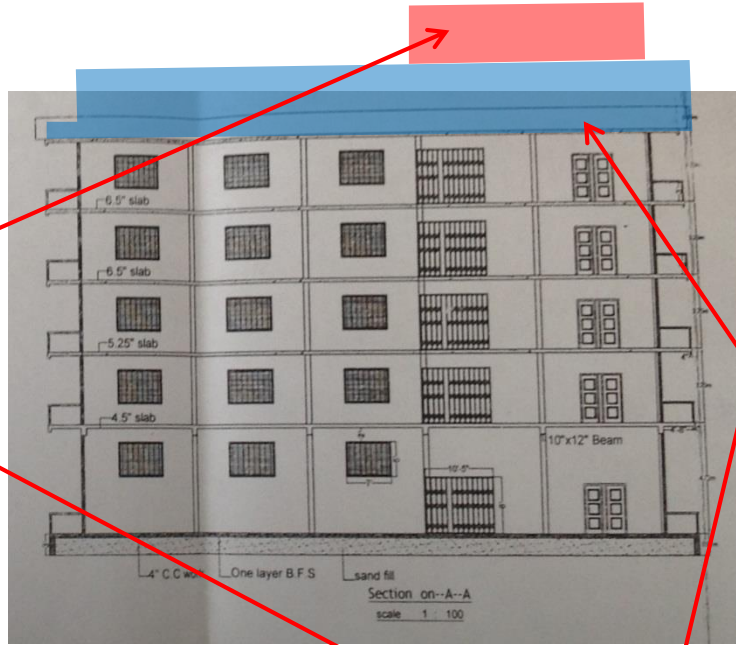
Kainjanul, Mirazapur, Dhaka
(24.0788N, 90.3569 E)

30 October, 2013



Check on columns required

Not shown on
either
Engineering OR
Permit drawings



Not shown on
permit drawings,
but shown on
engineering
drawings

4 storey + roof permit has
been obtained. 5 stories plus
additional roof structure has
been constructed so far –
engineering drawings show 6
storey building, but no roof
structure.

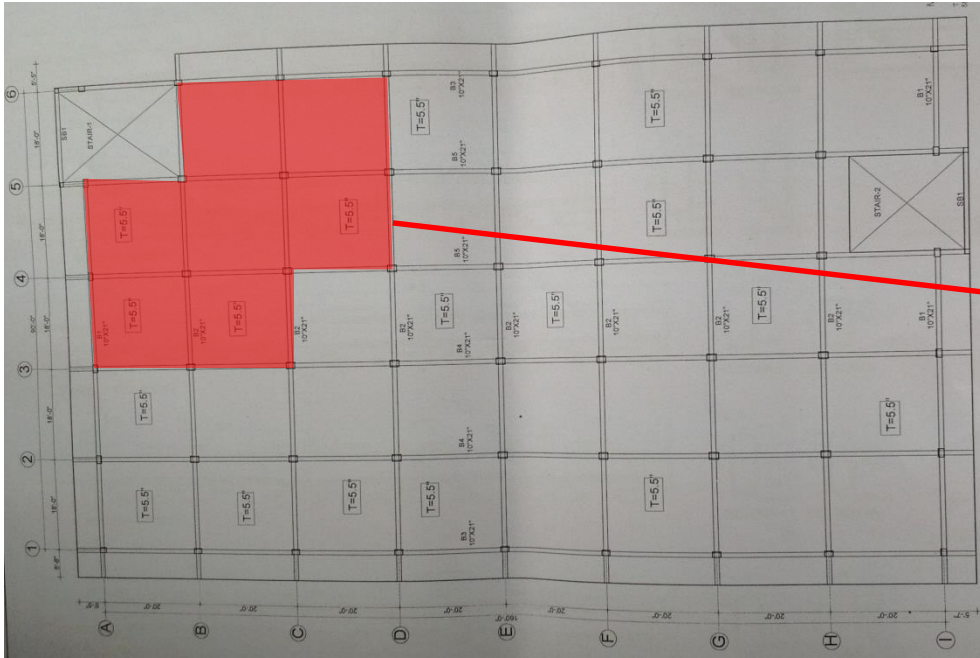


Building Extents



Unreinforced masonry walls and concrete roof

6th floor/roof level



Extent of constructed additional roof structure

Check on additional floor and roof additions required

Existing Column Strengthening

Cursory calculations indicate column working stress is NOT at high risk level – 9MPa interior columns, 11MPa corner columns.

Current steel strengthening measures appears ineffective as it seems steel is not in contact with concrete

Steel jacking of interior columns at Ground Level

Steel belting and partial concrete jacking of exterior columns at Ground Level, and 3 corner columns at Levels 1 and 2.



Check that steel is in contact with concrete (not render). Where there is a gap, gap is to be packed with suitable material to transfer load.



Engineer is to provide evidence that the as-built structure with strengthening is adequate for the constructed building, including partial roof extension.

Uncertainty over future roof use/loading



**Starter bars left to
continue further
construction of columns**



**Position of empty water tanks on
roof to be confirmed with engineer
prior to filling and connection**

**Check on additional floor
and roof additions required**

Uncontrolled loading of floors

Uncontrolled loading on 4th Floor



**Check on column loads and
design required**

Ground floor column steel belting exposed to weather

Steel belting placed through exterior wall and welded during installation



Exterior steel belting exposed to weather

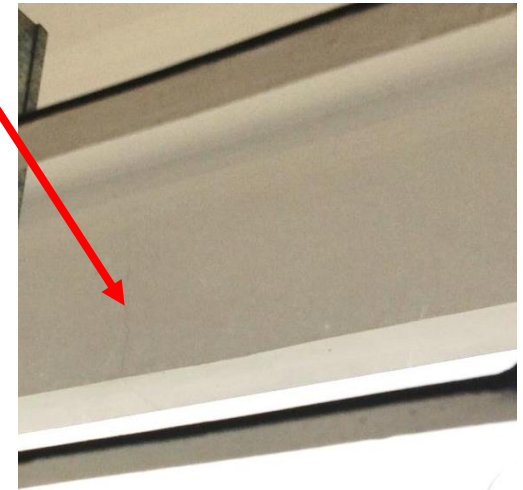


Protect exterior steel belting

Non Structural Observations



Non-structural hairline cracks in parapets, likely caused by shrinkage of concrete



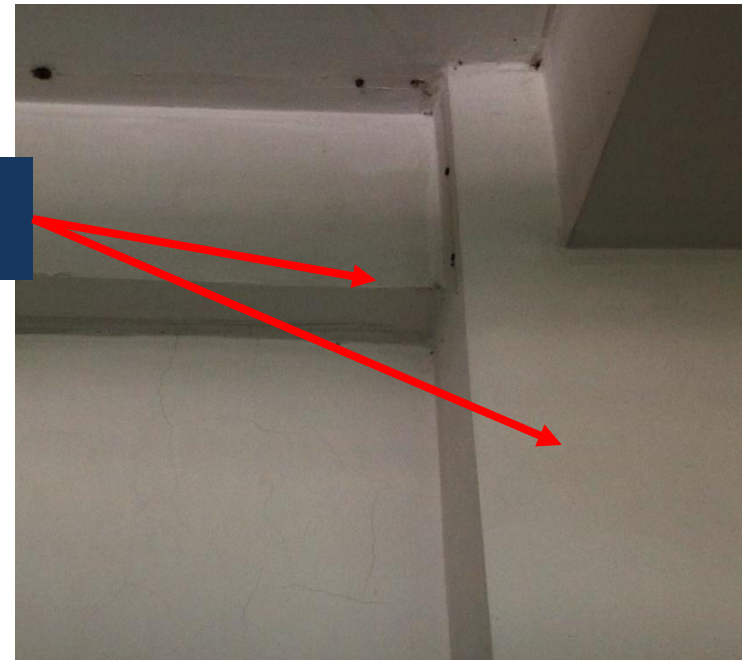
Non-structural hairline cracks in brick in-fill, likely caused by beam movement



Non-structural hairline cracking



**Non-structural hairline cracks
in brick in-fill wall and beam**



**Non-structural hairline cracks
in stair wall brick in-fill, likely
caused by deflection of
cantilever landing**



**Evidence of some crack repairs
noted. Repair method
provided to factory owner by
BUET**

Non-structural hairline cracking

**Handrail missing from fire
escape stairs**

**Manager gave assurances this
would be rectified within the
next week.**



Fire escape handrail

Water damage to wall on rear elevation in stair cores both internal and **external**

No evidence of structural damage or deterioration of concrete elements



Water damage near concrete

Priority Actions

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Column check for additional floors and high loading	Further construction of roof additions to cease.	Immediate - Now
2	Column check for additional floors and high loading	Factory Engineer to review design, loads and columns stresses particularly beneath roof additions.	Immediate - Now
3	Column check for additional floors and high loading	Verify in situ concrete strength either by cores or existing cylinder strength data for the ground floor columns.	Immediate - Now
4	Column check for additional floors and high loading	A Detail Engineering Assessment of Factory to be commenced, see attached Scope	Immediate - Now
5	Column check for additional floors and high loading	Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.	6-weeks
6	Column check for additional floors and high loading	Detail Engineering Assessment to be completed	6-weeks
7	Column check for additional floors and high loading	Further construction of roof additions to cease unless Detail Engineering Assessment shows existing structure can support the additional loads	6-weeks
8	Column check for additional floors and high loading	Continue to implement load plan	6-months

Detail Engineering Assessment

This Schedule develops a minimum level of information, Analysis and testing expected as part of a Detail Engineering Assessment.

The Building(s) have been visually assessed and it is deemed necessary that a detailed engineering assessment be carried out by a competent Engineering Team employed by the factory Owner.

This Request should be read in conjunction with the BUET developed Tripartite Guideline document for Assessment of Structural Integrity of Existing RMG Factory Buildings in Bangladesh (Tripartite Document), the latest version of this document should be referenced. This document also gives guidance on required competency of Engineering Team.

We expect that the following will be carried out:

1. Development of Full Engineering As-Built Drawings showing Structure, loading, elements, dimensions , levels, foundations and framing on Plan, Section and Elevational drawings .
2. The Engineering team are to carry out supporting calculations with a model based design check to assess the safety and serviceability of the building against loading as set out in BNBC-2006, Lower rate provisions can be applied in accordance with the Tripartite Guidelines following international engineering practice, justification for these lower rate provisions must be made.
3. A geotechnical Report describing ground conditions and commenting on foundation systems used/proposed.
4. A report on Engineering tests carried out to justify material strengths and reinforcement content in all key elements studied.
5. Detailed load plans shall be prepared for each level showing current and potential future loading with all key equipment items shown with associated loads.
6. The Engineering team will prepare an assessment report that covers the following:
 - As-Built drawings including
 - Plans at each level calling up and dimensioning all structural components
 - Cross sectional drawings showing structural beams, slabs, floor to floor heights, roof build-ups and Basic design information of the structure
 - Highlight any variation between As-built compared to the designed structure
 - Results of testing for strength and materials
 - Results of geotechnical assessment and testing/investigation
 - Details of loading, inputs and results of computer modelling
 - Commentary on adequacy/inadequacy of elements of the structure
 - Schedule of any required retrofitting required for safety or performance of Structure

Any proposals for Retrofitting to follow guidance developed in the Tripartite Document

Item No.	Observation	Recommended Action Plan	Recommended Timeline
9	Uncontrolled loading on 4th Floor	Remove uncontrolled loading from area beneath roof additions	Immediate - Now
10	Uncontrolled loading on 4th Floor	Implement load plan as per item 1	6-weeks
11	Uncontrolled loading on 4th Floor	Continue to implement load plan described in item 1	6-months
12	Uncertainty over roof loading	Further construction of roof additions to cease until column check (Item 1) is complete.	Immediate - Now
13	Uncertainty over roof loading	Location of water tanks to be confirmed with engineer.	6-weeks
14	Uncertainty over roof loading	Include water tank locations in loading plan	6-weeks
15	Assess existing column strengthening	Check that steel is in contact with concrete (not render). Where there is a gap, gap is to be packed with suitable material to transfer load.	6-months
16	Assess existing column strengthening	Engineer is to provide evidence that the as-built structure with strengthening is adequate for the constructed building, including partial roof extension.	6-months
17	Protect exterior steel belting from the environment	Protect exterior steel belting with render or epoxy/chemical waterproofing.	6-months