

Dragoni Fashions Ltd.

Kulgaon, Baluchara, Chittagong
(22.410032N, 91.820060E)

21st May 2014



Non-structural Observations

Lack of Edge Protection at Roof Level



An immediate concern was raised with factory management regarding the lack of edge protection at the balconies on the building.



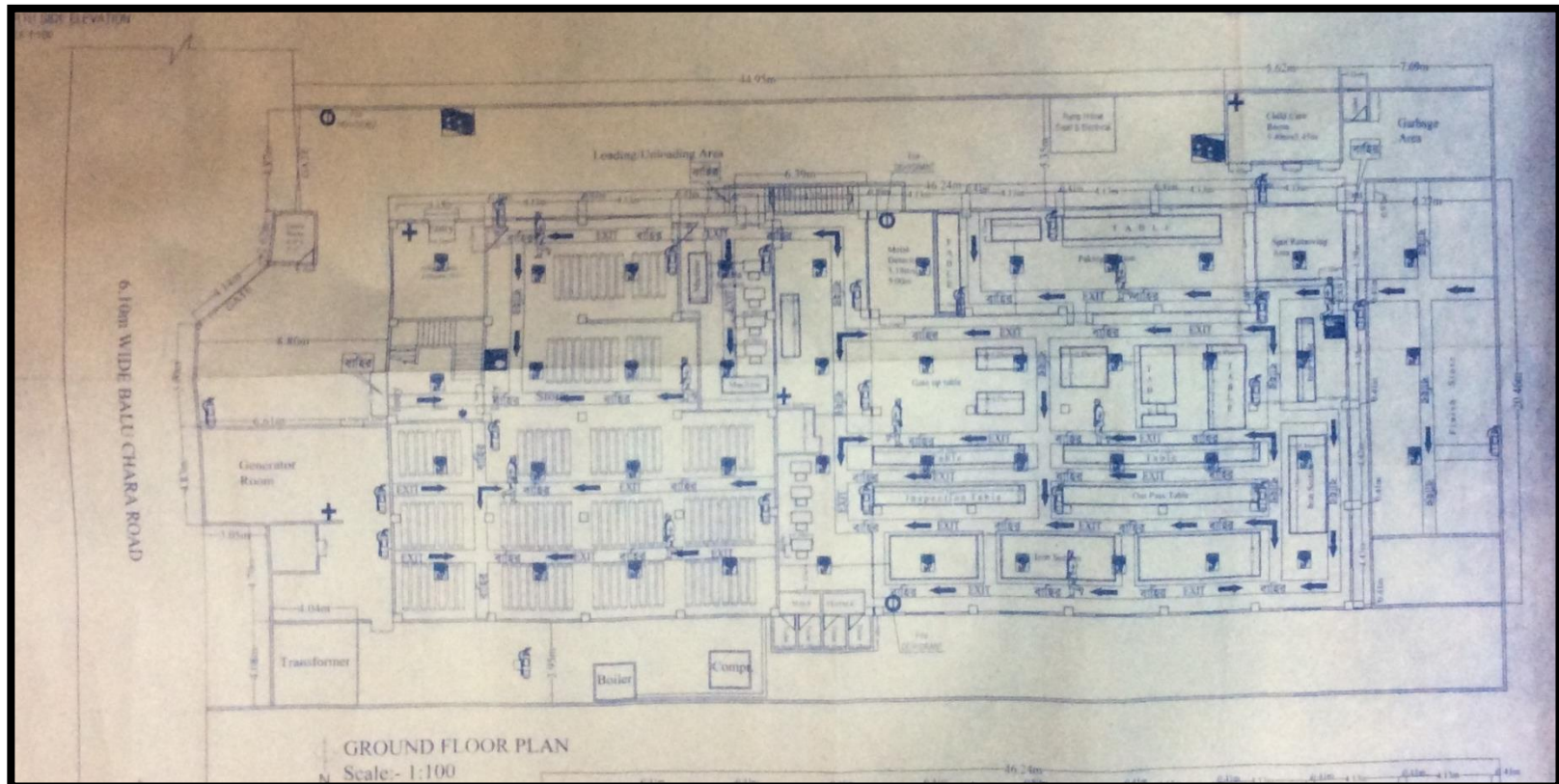
Lack of edge protection

Observations

High Stress Levels in Columns

Observation

- Outline calculations indicate all columns at the Ground Floor and Level 1 are highly stressed under their current loading condition
- Some columns (particularly those supporting toilets) are very highly stressed.

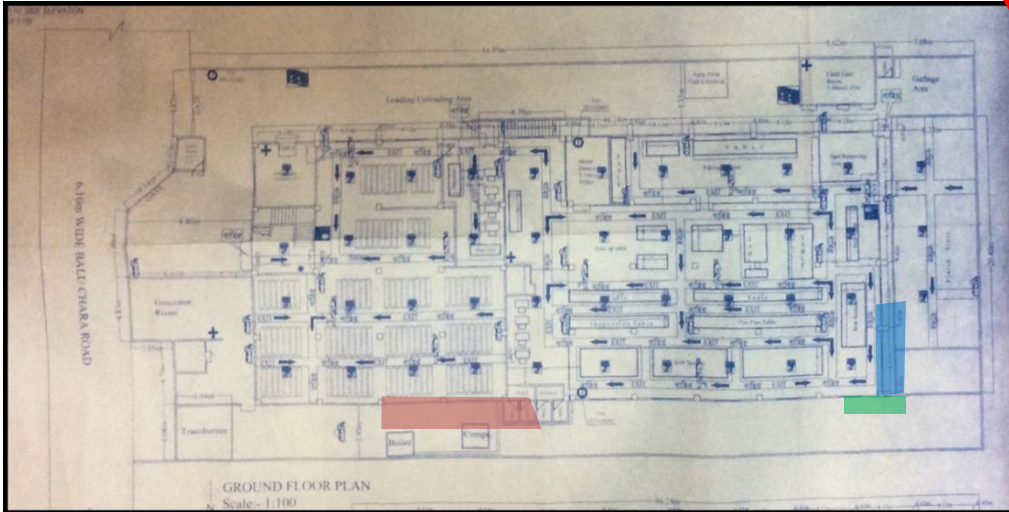


High Stress Levels in Columns

Observation

High loading in toilet areas on cantilevers

High loading was observed on cantilevers, especially in toilet areas with floor build-up.



Toilets at Levels 1, 2 & 3

Toilets at Levels 1, 2, 3, 4 (toilets are positioned at different locations within this zone at each level)

Toilets at Levels 4 only



High Loading in Toilet Areas on Cantilevers

Cracking on floor surface

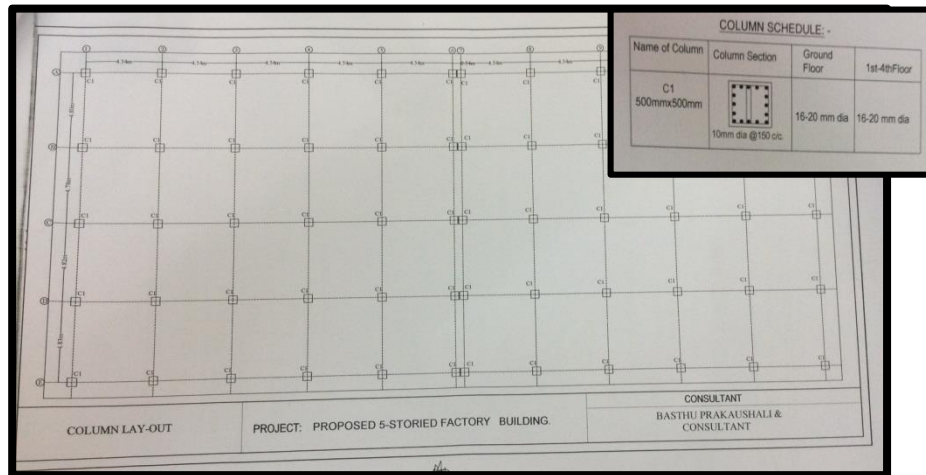
Cracking was observed in the surface of the floor slab finish generally along the lines between columns.



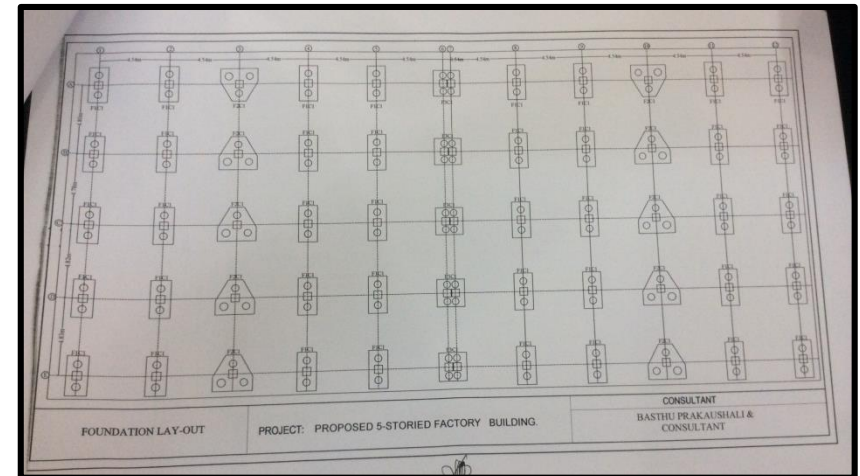
Cracking in Floor Slab Surface

Discrepancies between site observations and information on drawings

Discrepancies between Drawings and Actual Observations



Column layout drawing



Pile layout drawing

Structural drawings which were provided contradicted several observations made, and architectural drawings were unclear – most notably:-

- The structural drawings showed columns of 500 x 500 across the entire grid; however, 300 x 380 internal columns and 300 x 300 perimeter columns were observed. The number of bars scanned in columns also differed from the drawings.
- Structural drawings neglected to show cantilevers which extended from all four faces of the building.
- Pile layout was provided, whilst the site investigation recommended pad foundations.
- Architectural drawings misrepresented the locations of some toilet areas and stairs.

Apparently non-engineered roof structures

Apparently non-engineered structures - Main Building



Circular post does not provide any support to roof frame.



Roof trusses in Canteen area appear to lack internal members and have deflected.

Apparently non-engineered structures - external structures



Waste Store Roof - sagging in roof beams.



Roof to canopy at main entrance – deflection of roof supports.

Priority Actions

Problems Observed

1. Stress levels in columns
2. High loading in toilet areas on cantilevers
3. Cracking on floor surface
4. Discrepancies between site observations and information on drawings
5. Apparently non-engineered roof structures

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Stress levels in Columns	Factory Engineer to review design, loads and columns stresses in all columns.	Immediate - Now
2	Stress levels in Columns	Verify insitu concrete stresses by taking 100mm diameter cores from a minimum of 4 columns. Verify grade of steel reinforcement used.	Immediate - Now
3	Stress levels in Columns	A Detail Engineering Assessment of Factory to be commenced, see attached Scope.	Immediate - Now
4	Stress levels in Columns	Make structural alterations as advised by Engineer.	6-weeks
5	Stress levels in Columns	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	Stress levels in Columns	Detail Engineering Assessment to be completed.	6-weeks
7	Stress levels in Columns	Continue to implement load plan	6-months
8	High loading in toilet areas on cantilevers	As part of the Detail Engineering Assessment (see Item 1), Factory Engineer to investigate if the applied loading can be safely carried by the slabs, beams and by the columns,.	6-weeks
9	High loading in toilet areas on cantilevers	Carry out load reduction and/or any remedial work as directed by the Factory Engineer.	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 Elevation 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
10	Cracking on floor surface	As part of the Detail Engineering Assessment (see Item 1), Factory Engineer to investigate if the cracking is structural or exists only in the screed finish	6-weeks
11	Cracking on floor surface	Carry out any remedial work as directed by the Factory Engineer.	6-months
12	Discrepancies between site observations and information on drawings	As part of the Detail Engineering Assessment (see Item 1), Factory Engineer to update the engineering drawings.	6-weeks
13	Apparently non-engineered roof structures	Building engineer to check the capacity of the lightweight roofs and make any necessary alterations.	6-months