Ahmend Fashions

34/1, Darussalam Road, Dhaka
(23.783165 N, 90.351141 E)

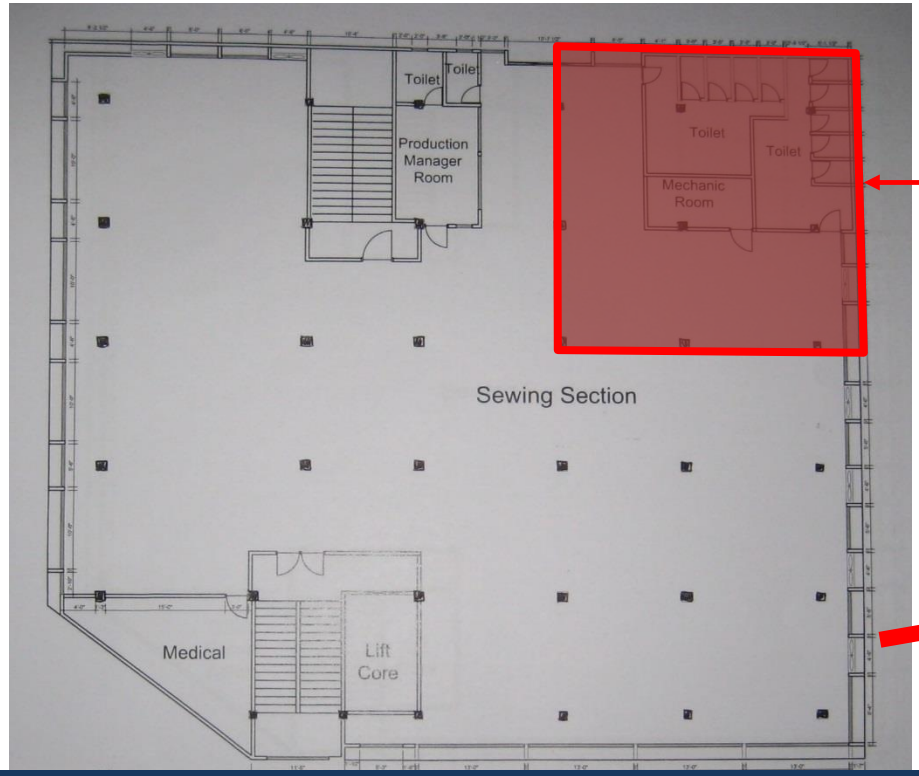
Survey Date: 4th March 2015

ACCORD on Fire and Building Safety in Bangladesh

ARUP

Observations

Highly-stressed columns



This area on **ALL** floors must be **IMMEDIATELY VACATED AND CORDONED OFF.**

Highly-stressed columns

- Cursory calculations indicate that all columns are very highly stressed, in particular those adjacent to the toilets in the north west corner.
- The permit drawings do not show cantilevers around the building edge and show the 6th floor as a roof, not a factory. Furthermore, the toilets have been built over a much larger area than shown on the permit drawings. This has significantly increased the load on the columns
- **IMMEDIATE ACTION:** The area highlighted above must be immediately vacated and cordoned off on **ALL** floors (including ground and basement).
- The floor loading in other areas of the factory should not be increased, and in any case must be limited to 2kPa.
- The Detail Engineering Assessment already in progress should prioritise the checking of the columns, in particular those in the area shown in red.

Observations

Heavy Loading on Roofs over east and west stairs

Sand on roof over east stair

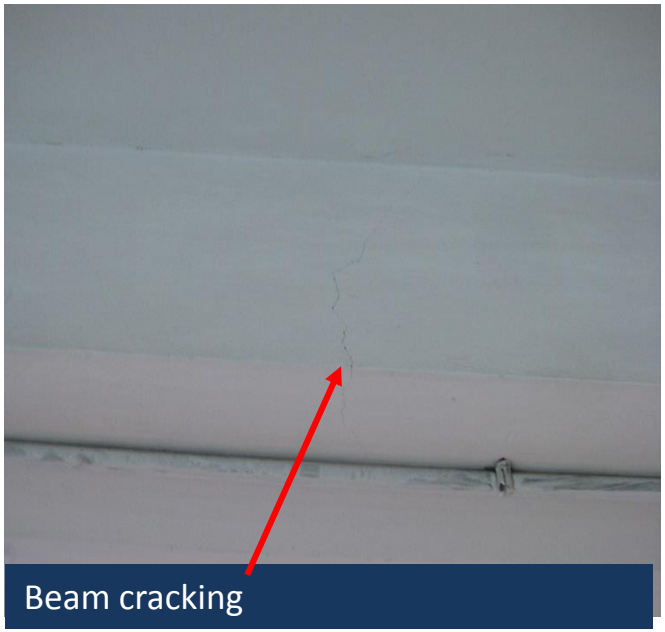
Water tanks on roof over west stair

Heavy Loading on roof

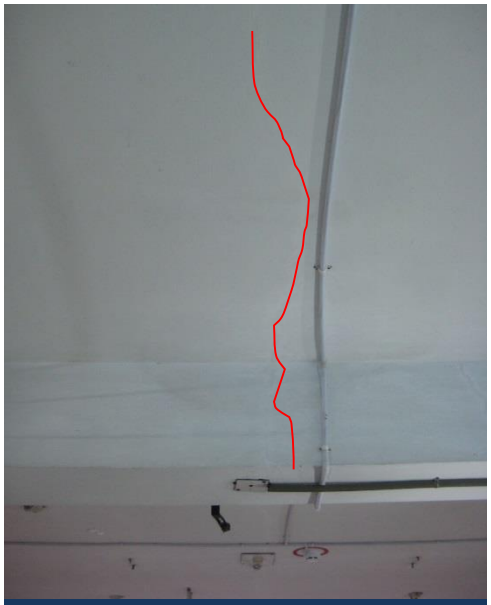
- There is a layer of sand approx. 400mm thick over the west stair.
- There are 6 no. 1000 litre water tanks on the roof over the east stair.
- Building engineer to check structure for load from water tanks and sand, and remove if required.

Observations

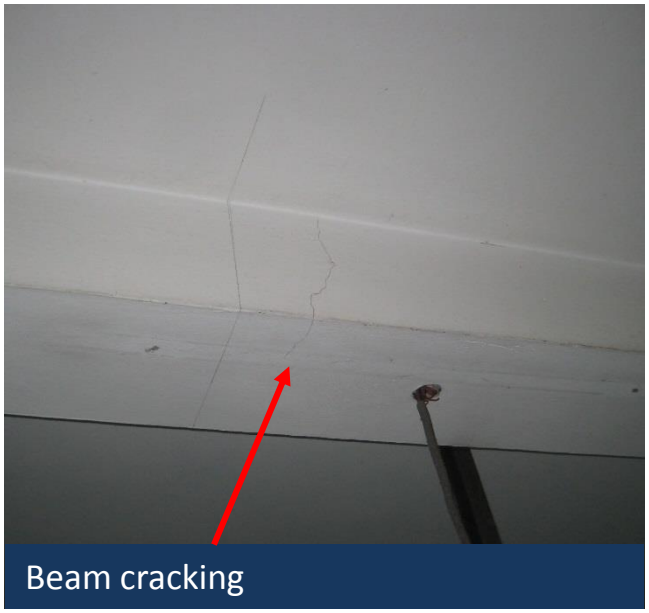
Beam and slab cracking at all floors



Beam cracking



Crack continues up side of beam and into slab



Beam cracking

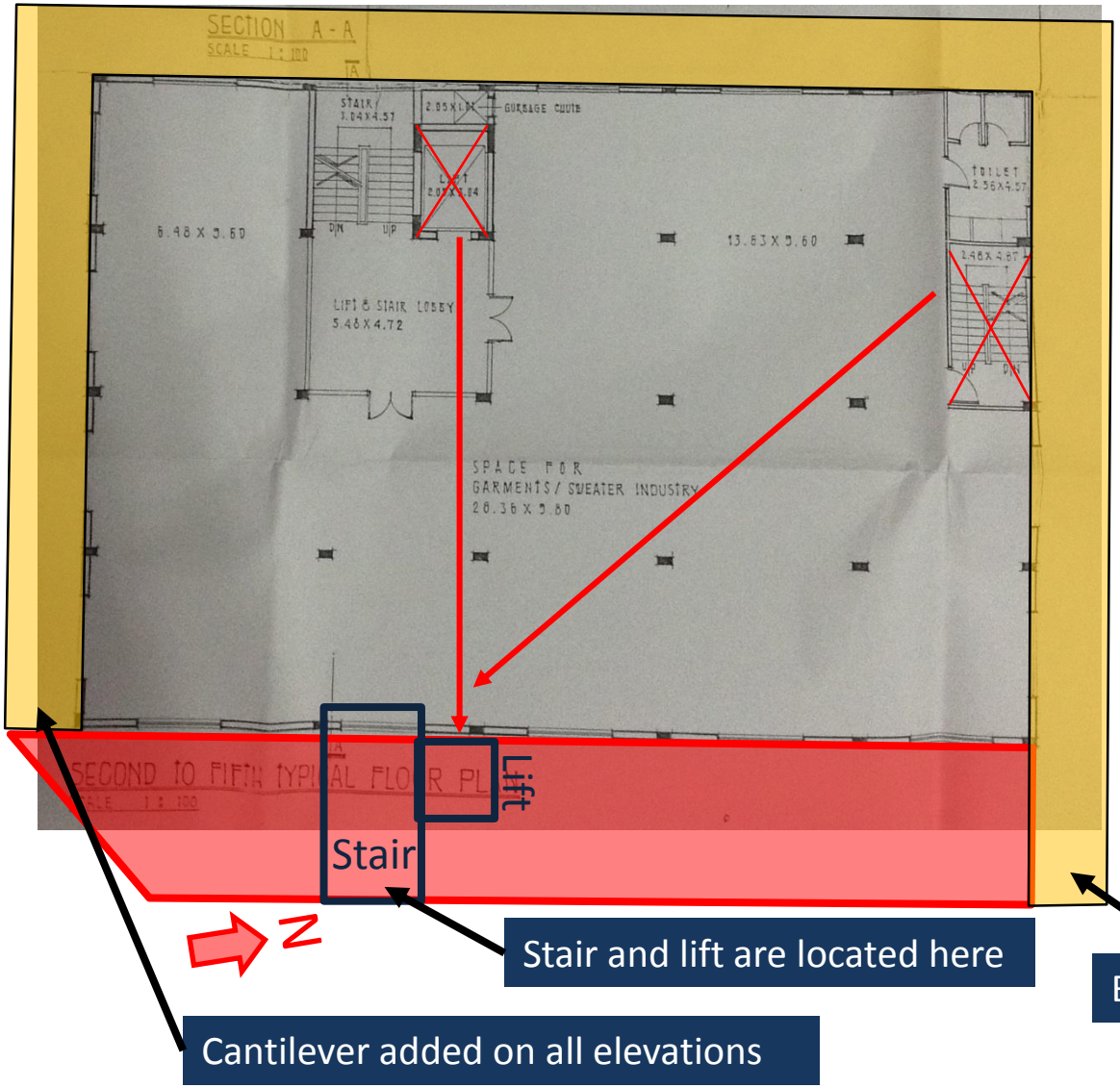
Cracks have been filled and painted

Beam and slab cracking

- Cracking to underside of beam noted on all floors.
- Some cracks continue up the side of the beam and into the slab.
- Some cracks have been filled and painted.
- Building Engineer to investigate cracks and determine if they are structurally significant.

Observations

Drawings not consistent with as-built structure



Inconsistencies with Permit Drawings

- Cantilevers have been added on all elevations.
- Building has been extended to the east.
- Grid dimensions do not match.
- Stair & lift in different location.
- Roof is now a production floor.
- Toilets cover much larger area.

As-built structure should be checked as part of the ongoing Detail Engineering Assessment.

Observations

ACCORD on Fire and Building Safety in Bangladesh ARUP

Column in Delivery Area vulnerable to impact from vehicles

Vulnerable Column

- Column in the delivery area in the south east corner of the building is susceptible to impact loading from vehicles.
- Building engineer to check column for vehicle impact loading, and provide protection to column as required.

Observations

Priority Actions

Problems Observed

Item 1: Highly-stressed columns

Item 2: Heavy Loading on Roofs over east and west stairs

Item 3: Beam and slab cracking at all floors

Item 4: Drawings not consistent with as-built structure

Item 5: Column in Delivery Area vulnerable to impact from vehicles

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. T his 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
1	Highly-stressed columns	IMMEDIATE ACTION to vacate and cordon off area indicated above at all levels.	**Immediate - Now**
2	Highly-stressed columns	Loading in all other areas should not be increased and in any case must not exceed 2kPa.	**Immediate - Now**
3	Highly-stressed columns	Factory Engineer to review design, as-built column sizes, loads and column stresses in all areas, prioritising the area identified in red above.	**Immediate - Now**
4	Highly-stressed columns	Verify insitu concrete strengths by 100mm diameter cores from min. 4 columns at ground floor level (but not those beneath the toilets).	**Immediate - Now**
5	Highly-stressed columns	The Detail Engineering Assessment of Factory currently under way is to be continued - see attached Scope.	**Immediate - Now**
6	Highly-stressed 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**
7	Highly-stressed columns	Detail Engineering Assessment to be completed.	**6-weeks**
8	Highly-stressed columns	Implement load reductions as required by the Detail Engineering Assessment.	**6-weeks**
9	Highly-stressed columns	Continue to implement load plan.	**6-months**

Item No.	Observation	Recommended Action Plan	Recommended Timeline
10	Heavy Loading on Roofs over east and west stairs	As part of the Detail Engineering Assessment (see Item 1), Building Engineer to check the capacity of the structure to carry the load from the water tanks and the sand.	**6-weeks**
11	Heavy Loading on Roofs over east and west stairs	Remove water tanks and/or sand from roof, as required.	**6-weeks**
12	Heavy Loading on Roofs over east and west stairs	Carry out any remedial structural works as required after assessment.	**6-months**
13	Beam and slab cracking at all floors	Sections of plaster finish to beams and slab to be removed to investigate if cracks penetrate the building structure.	**6-weeks**
14	Beam and slab cracking at all floors	As part of the Detail Engineering Assessment (see Item 1), Building Engineer to carry out design check on beams and slab taking into account the effect of the cracks on the structure	**6-weeks**
15	Beam and slab cracking at all floors	Carry out any structural remedial works to cracks as required following assessment.	**6-months**

Item No.	Observation	Recommended Action Plan	Recommended Timeline
16	Drawings not consistent with as-built structure	As part of the Detail Engineering Assessment (see Item 1), Building Engineer to survey as-constructed building, noting where discrepancies exist between drawings and actual layout.	**6-weeks**
17	Drawings not consistent with as-built structure	Structure (including foundations) to be checked based on the as-constructed layout, taking into account actual loads, material strengths, geometry and the use of the 6th floor as a factory floor.	**6-weeks**
18	Drawings not consistent with as-built structure	Updated drawings to be prepared which accurately represent the as-constructed layout.	**6-months**
19	Column in Delivery Area vulnerable to impact from vehicles	As part of the Detail Engineering Assessment, Building Engineer to review column design and the potential for vehicle impact to columns in delivery area.	**6-weeks**
20	Column in Delivery Area vulnerable to impact from vehicles	Provide impact protection to column if required.	**6-months**