Genesis Fashions Ltd
Columbia Apparels Ltd

228/1, Tin Sarak, Luxmipura, Joydevpur, Gazipur- 1700
(23.99435N, 90.40443E)

2nd March 2014

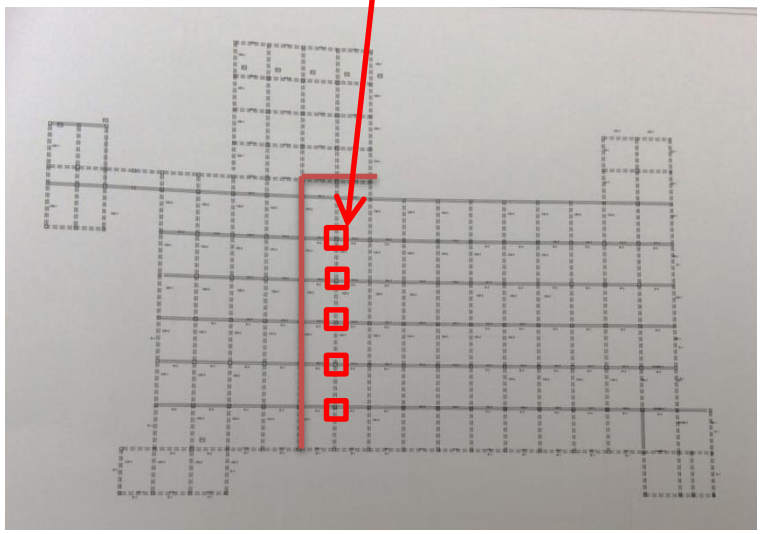
ACCORD on Fire and Building Safety in Bangladesh

ARUP

Observations

Concrete Strength (Overstressing)

Cursory calculations indicate that columns indicated appear to be smaller than required by code for the applied dead and live load, assuming typical concrete strength **Columns smaller** than typical internal columns and seem to have less reinforcement than design drawings



Columns appear to be stressed in excess of normal design limits

High loading- water tanks or storage

High storage loads on L4 slab

6no. water tanks on L4 slab above wash rooms

High loading- water tanks or storage

ACCORD on Fire and Building Safety in Bangladesh ARUP

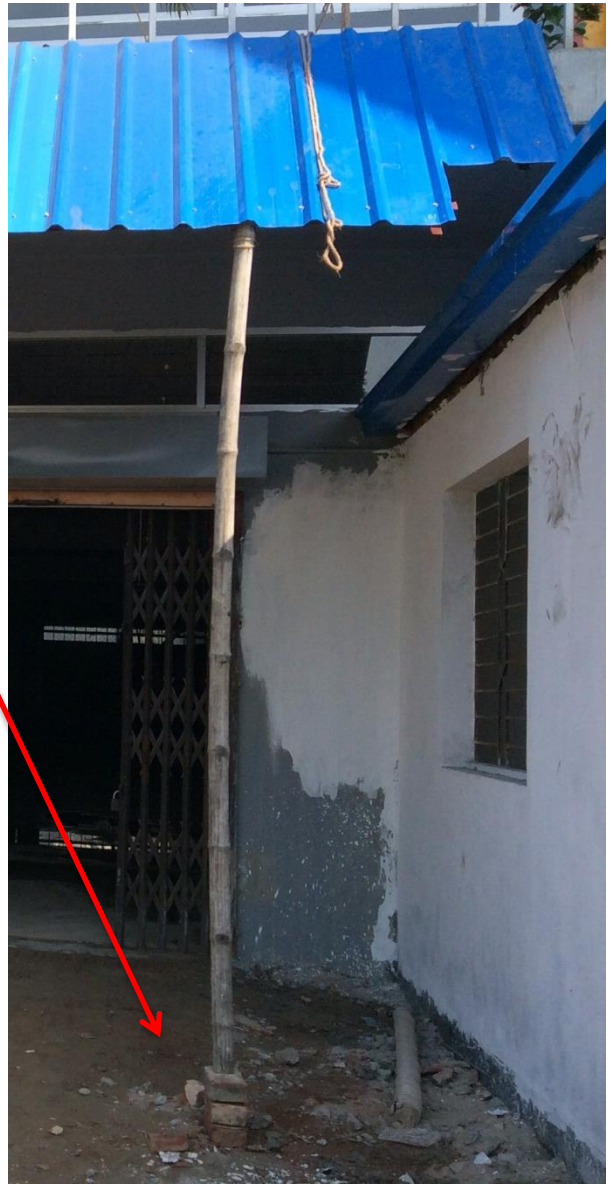
Column exposed to vehicle impact

Column supporting several stories exposed to vehicle impact in loading area
No physical barrier to collision

Risk of vehicle impact to column

ACCORD on Fire and Building Safety in Bangladesh ARUP

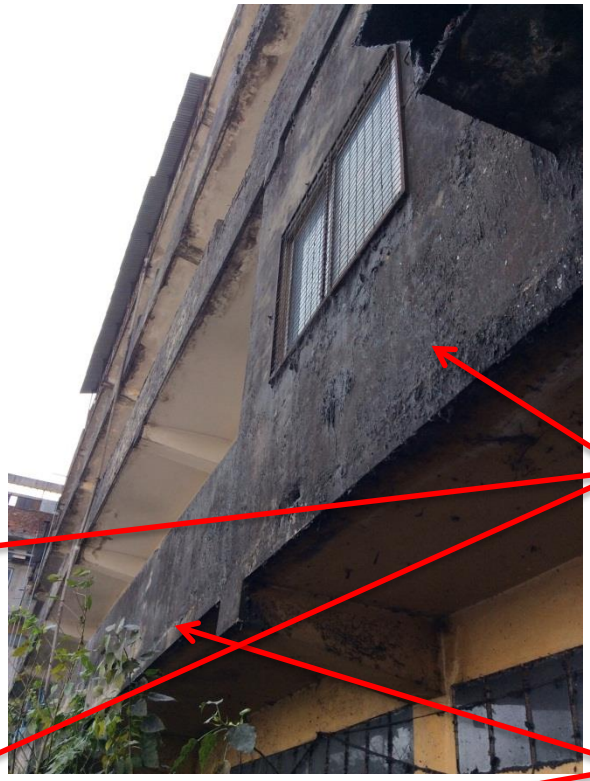
Non-engineered structures

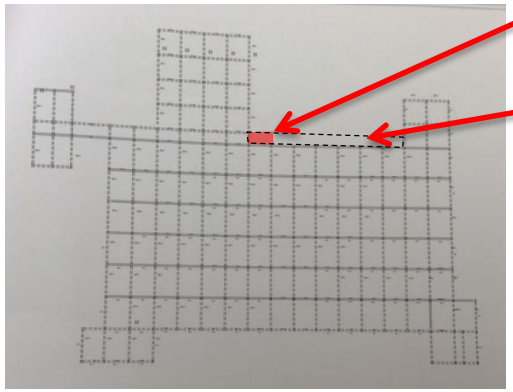


Canopies and supports seem unstable
Danger of localised collapse

Non-engineered structures - canopies

ACCORD on Fire and Building Safety in Bangladesh ARUP





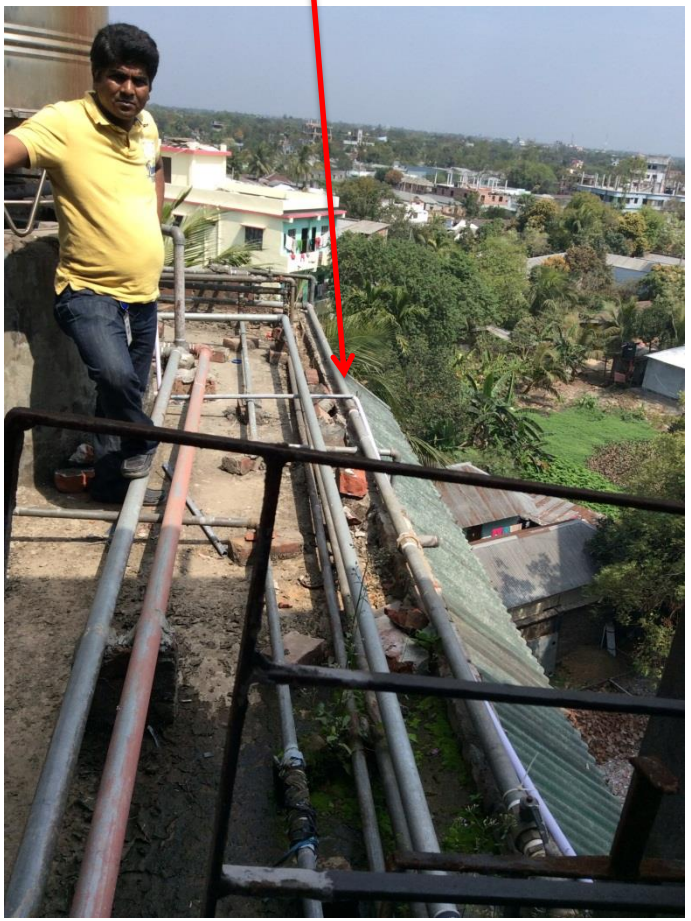
Factory floor built out onto balcony with additional masonry walls built to full storey height

Normal balcony (not shown on drawings)

Non-engineered structures – extension onto balcony

Non engineered railing to balcony at high level

Lack of edge protection near water tanks

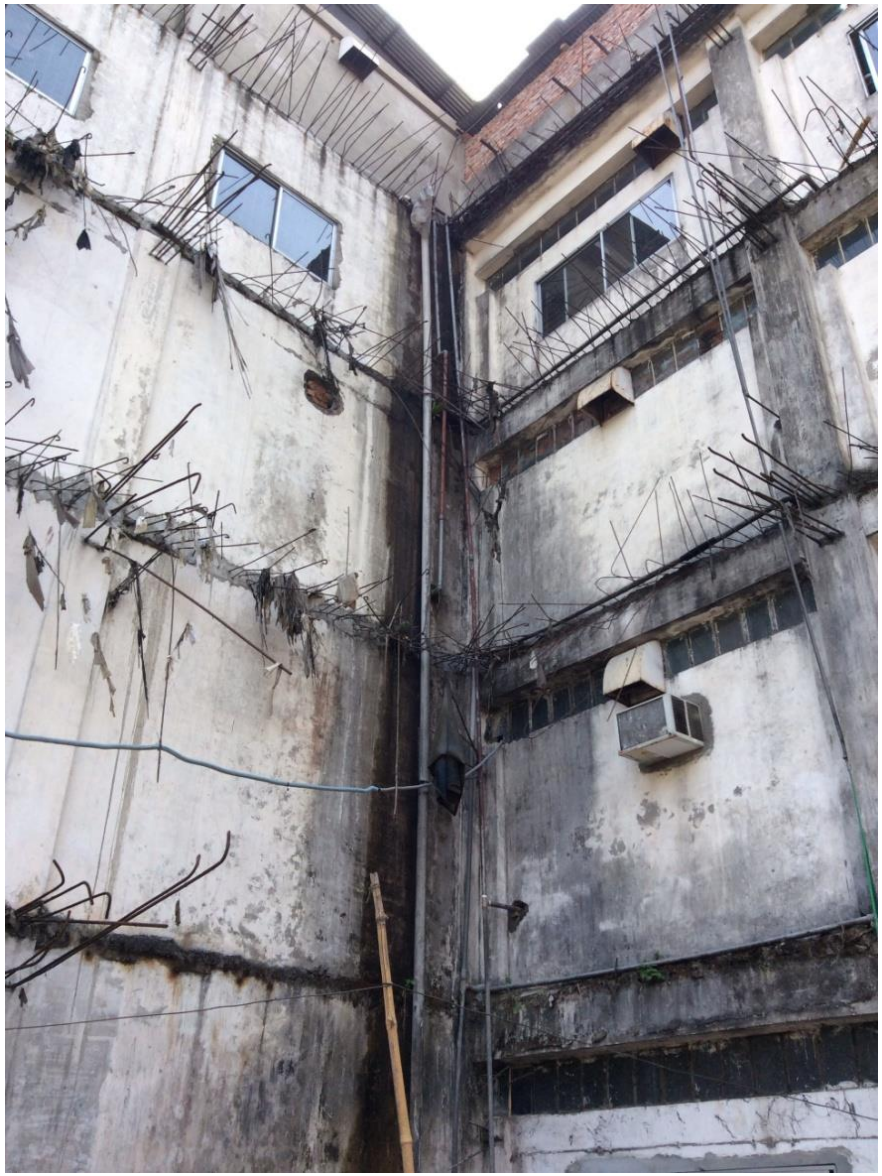


Non-engineered structures – edge protection

ACCORD on Fire and Building Safety in Bangladesh

ARUP

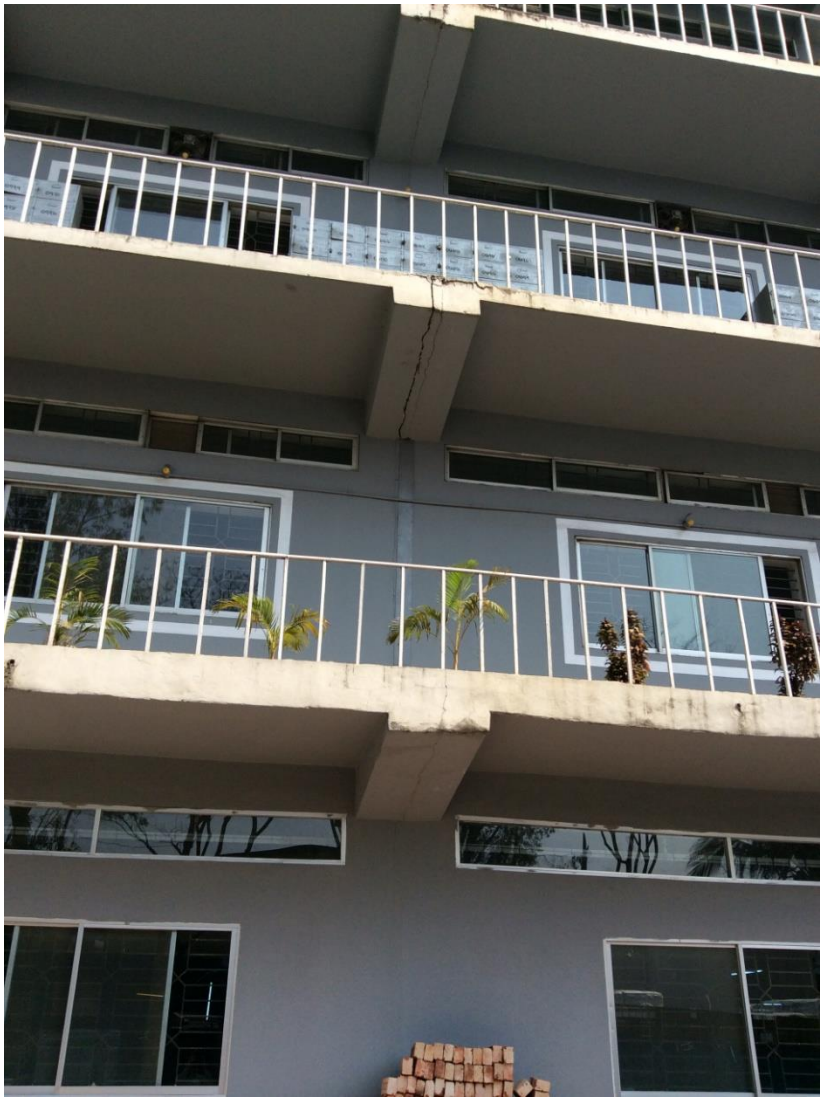
Water causing damage and corrosion

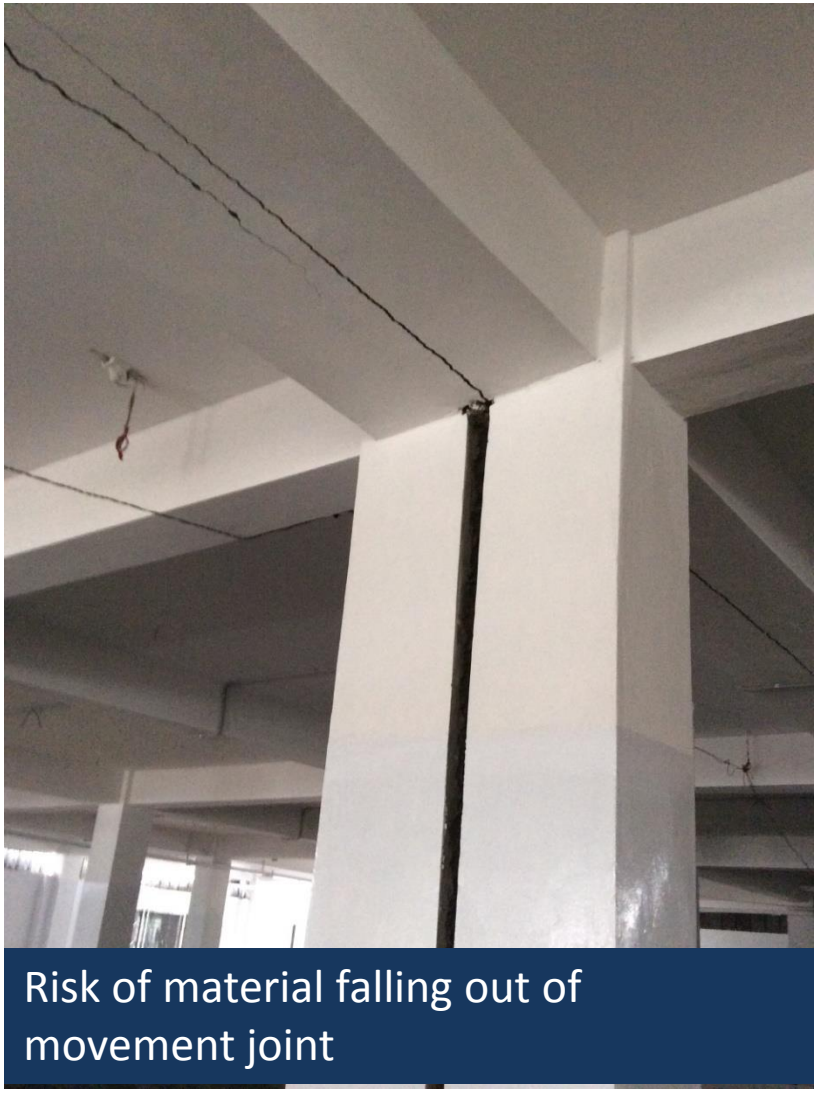


Reinforcement unsuitable for use in future horizontal extensions due to corrosion

Water causing damage and corrosion

Movement joint cracking (non-structural)





Risk of material falling out of movement joint

Movement joint cosmetic cracking

ACCORD on Fire and Building Safety in Bangladesh

ARUP

Priority Actions

Problems Observed (Main Building Unless Noted)

ITEM 1: High column stresses in localised areas
ITEM 2: High loading on slab from water tanks
ITEM 3: High/uncontrolled storage loads
ITEM 4: Column exposed to vehicle impact
ITEM 5: Blockwork on edge of cantilever at Level 1
ITEM 6: Apparently non-engineered additions (canopy)
ITEM 7: Water causing damage and corrosion
ITEM 8: Leaning wall in Security Building

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Verify concrete strengths in columns (Line of columns 1 bay of east of expansion joint)	Maintain current use of the floors and don´t change use or increase occupation, either of which could increase loading.	**Immediate - Now**
2	Verify concrete strengths in columns (Line of columns 1 bay of east of expansion joint)	Factory Engineer to review design, loads and columns stresses in all columns.	**Immediate - Now**
3	Verify concrete strengths in columns (Line of columns 1 bay of east of expansion joint)	Verify insitu concrete stresses either by 100mm diameter cores or existing cylinder strength data for cores from 4 columns.	**Immediate - Now**
4	Verify concrete strengths in columns (Line of columns 1 bay of east of expansion joint)	A Detail Engineering Assessment of Factory to be commenced, see attached Scope.	**Immediate - Now**
5	Verify concrete strengths in columns (Line of columns 1 bay of east of expansion joint)	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	Verify concrete strengths in columns (Line of columns 1 bay of east of expansion joint)	Detail Engineering Assessment to be completed.	**6-weeks**
7	Verify concrete strengths in columns (Line of columns 1 bay of east of expansion joint)	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. 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
8	Check required on roof structure from localized high loading from water tanks.	Building Engineer to check that slab has sufficient capacity to support fully filled water tanks and relocate if necessary – note also Item 1 actions	**6-weeks**
9	Materials stacked in dense piles / storage racks	Ensure that stacks of materials are separated by a 0.5m gap all around.	**6-weeks**
10	Materials stacked in dense piles / storage racks	Building Engineer to check capacity of existing structure to carry storage loads	**6-weeks**
11	Materials stacked in dense piles / storage racks	Building Engineer to create controlled loading plans (see also Item 1) for all floors designating where storage can be placed	**6-weeks**
12	Materials stacked in dense piles / storage racks	Continue to implement loading plan	**6-months**
13	Column at loading bay of main building vulnerable to vehicle impact	Provide physical barrier or other protection to column to prevent vehicle impact.	**6-weeks**
14	Building extension onto cantilever balcony requires engineering check	Building Engineer to check the cantilever beams and slabs to ensure adequate load carrying capacity. Note also Item 1 requirement for DEA	**6-weeks**

Item No.	Observation	Recommended Action Plan	Recommended Timeline
15	Canopy and supports at main building appear non-engineered	Building Engineer to check the supports and propose revised supports to ensure stability under dead, live and accidental loading.	**6-weeks**
16	Canopy and supports at main building appear non-engineered	Support details to be upgraded as per building engineer's design.	**6-weeks**
17	Water causing damage and corrosion on façade due to unmanaged drainage	Manage drainage from above levels and water tanks to downpipes to avoid structural corrosion due to continuous moisture.	**6-months**
18	Water causing damage and corrosion on façade due to unmanaged drainage	Exposed reinforcement not to be used for any structural applications	**6-months**
19	Rear wall of security hut/boundary wall appears non-engineered and leaning.	Factory engineer to check stability of wall and propose remedial actions.	**6-weeks**
20	Rear wall of security hut/boundary wall appears non-engineered and leaning.	Wall to be upgraded as per engineer's design.	**6-weeks**