Rezaul Apparels (Pvt.) Ltd.

Plot No : 371-372, BSCIC Industrial Estate, Konabari
(24.008837N, 90.324597E)

19th December 2017

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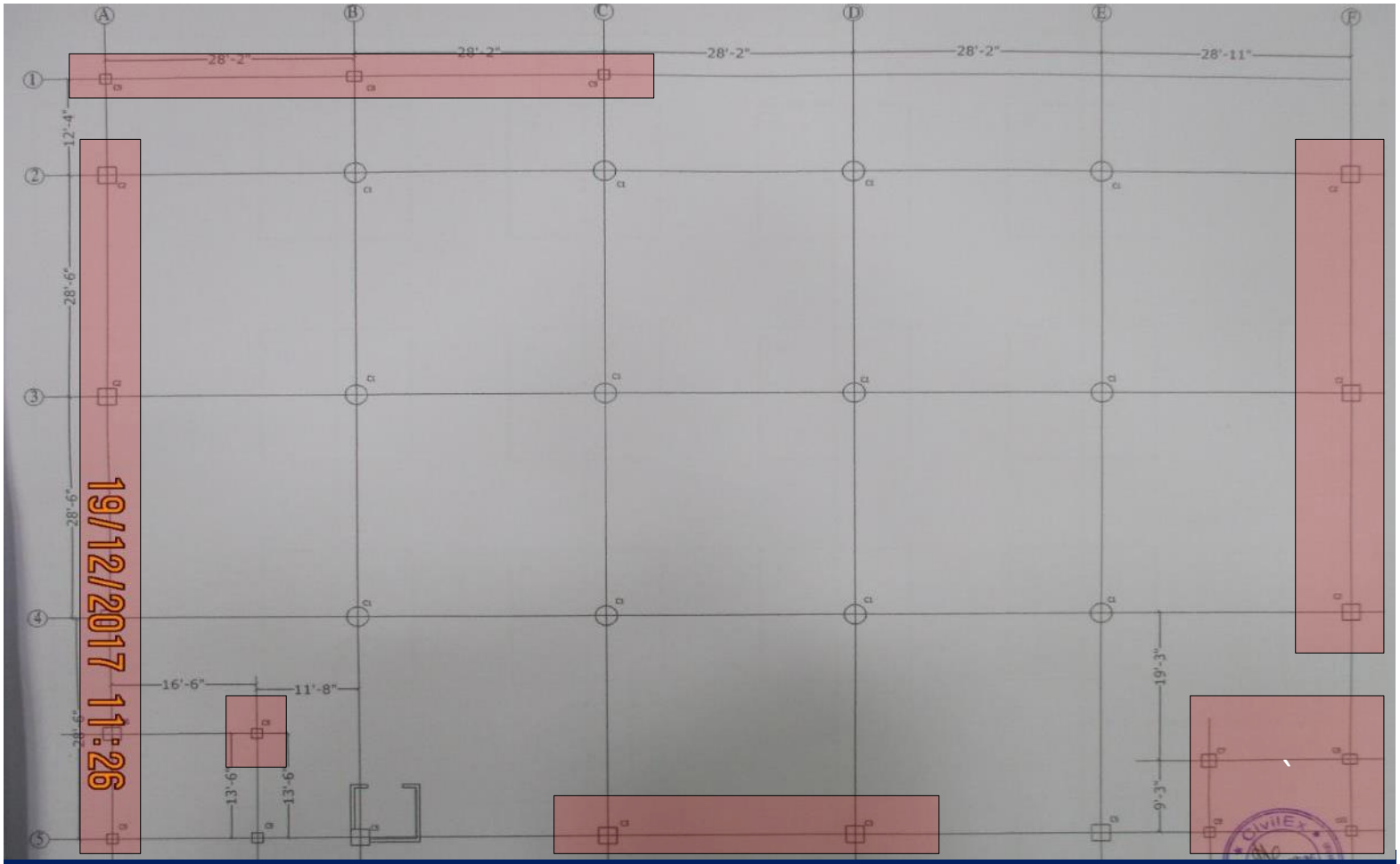
on Fire and Building Safety in Bangladesh

Observations

Columns appeared to be stressed in excess of normal design limits

Observation : Factory Building



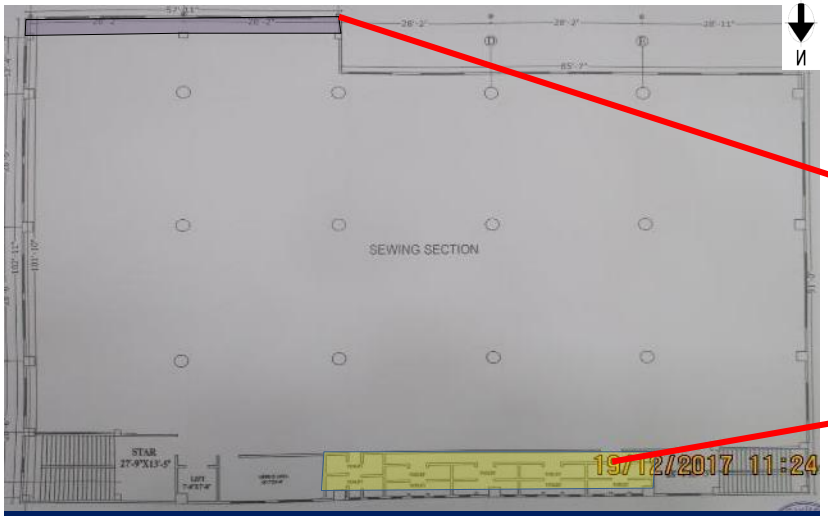
Cursory calculation indicates that highlighted columns appear to be stressed above normal design limits due to over head water tank, brick wall of toilet area and large grid dimension. Factory engineer need to check column stress and a Detail Engineering Assessment (DEA) must be carried out and factory should take necessary action according to report.

Observation : Factory Building

Roof Layout

Water tank
(4.8mx3.9mx1m)

Water tank
(4.9mx2.4mx1m)



Typical floor layout

1.3m wide cantilever

125mm built-up and
125mm thick outer brick
wall on toilet area

Observation : Factory Building

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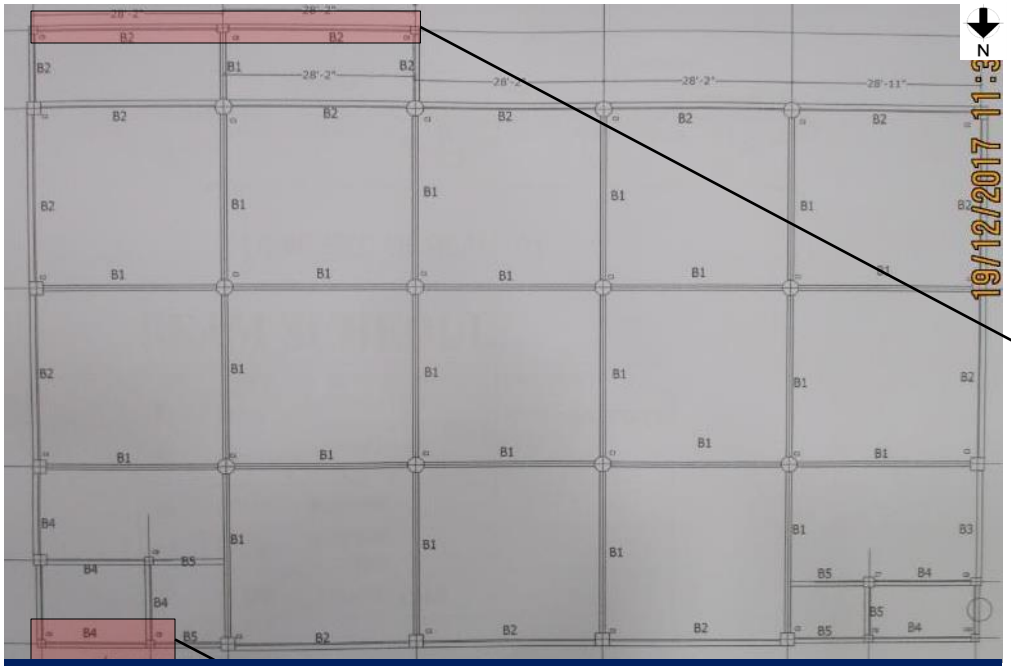
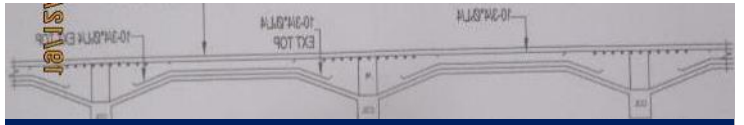
Discrepancies between provided drawing and on site condition

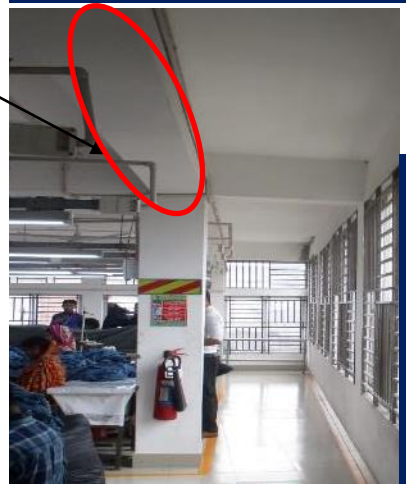
Observation: Factory Building



Typical beam layout in provided drawing



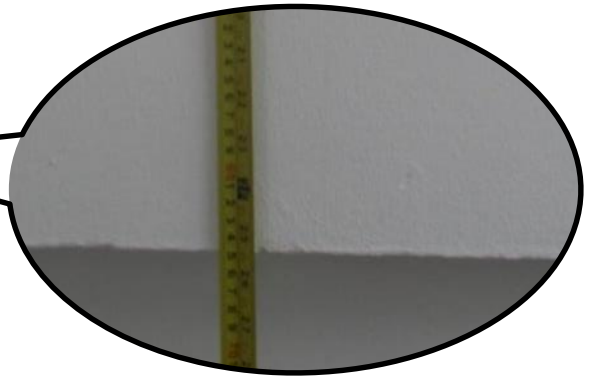
Long section of B-2 type mentioned in beam schedule



Uniform beam was found instead of tapered beam on south side cantilever part

B4	10"X20"	3-3/4"ØST. 2-5/8"ØST.
B5	10"X20"	2-3/4"ØST.CONT.

Beam schedule for B-4 type where depth was shown 20inch (500mm)



B-4 type beam on staircase was measured 625mm instead of 500mm

Observation: Factory Building

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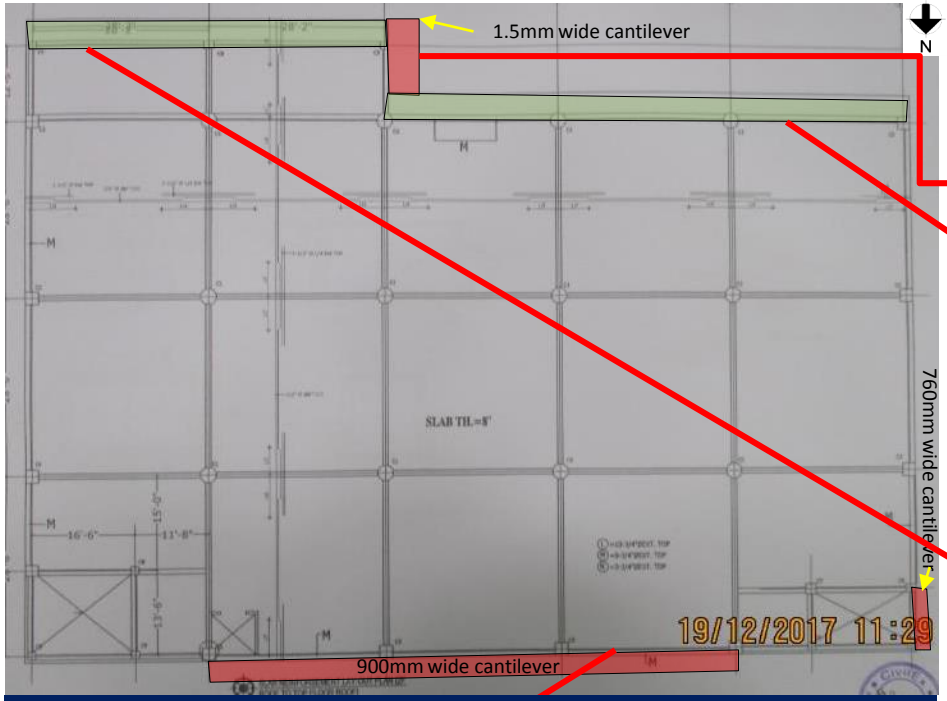
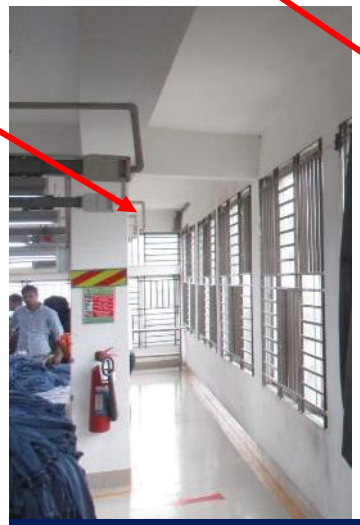


Typical slab plan with beam layout

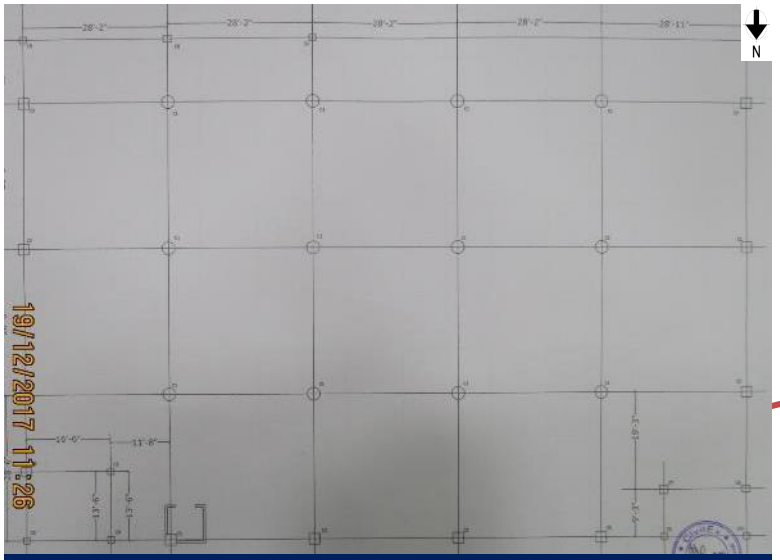
The marked cantilever on south side was not mentioned in as built drawing



Both uniformed and tapered beams were found on south side however the beams were not mentioned in drawing

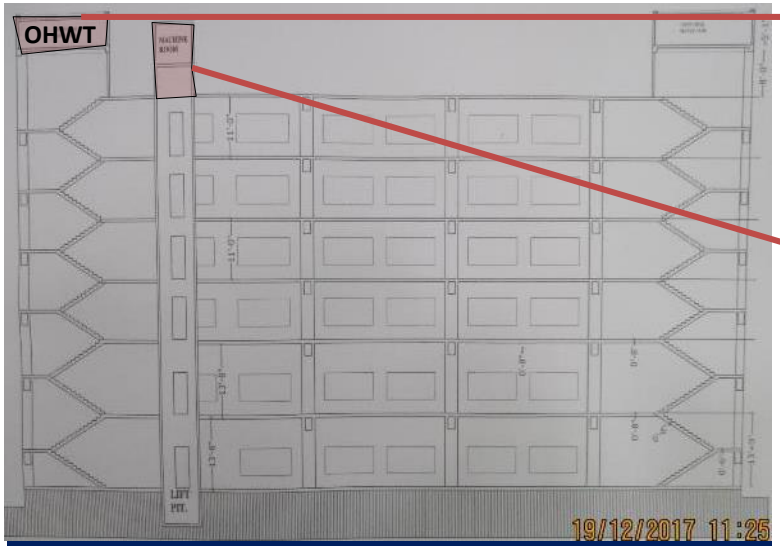
In north side cantilever portion some toilets were found which were not shown in as-built drawing.

Observation: Factory Building



Core wall layout in typical column layout

No core wall was found around the lift, only L-shaped column found



Cross section of the building

Height of the lift machine room was measured 6.5m instead of 4m. Also, the over head water tank height was measured 1m in place of 1.6m

Observation: Factory Building

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Problems Observed

Factory Building:

Item 1: Columns appeared to be stressed in excess of normal design limits

Item 2: Discrepancies between provided drawing and on site condition

Priority Actions

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Columns appeared to be stressed in excess of normal design limits	Factory Engineer to review design, loads and columns stresses in all columns.	**Immediate - Now**
2	Columns appeared to be stressed in excess of normal design limits	Verify in-situ concrete stresses by taking 100mm diameter cores from a minimum of 4 columns. Verify grade of steel reinforcement used.	**Immediate - Now**
3	Columns appeared to be stressed in excess of normal design limits	A Detail Engineering Assessment of Factory to be commenced, see attached Scope.	**Immediate - Now**
4	Columns appeared to be stressed in excess of normal design limits	Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.	**6-weeks**
5	Columns appeared to be stressed in excess of normal design limits	Detail Engineering Assessment to be completed.	**6-weeks**
6	Columns appeared to be stressed in excess of normal design limits	Make structural alterations as advised by Engineer.	**6-months**
7	Columns appeared to be stressed in excess of normal design limits	Continue to implement load plan	**6-months**
8	Discrepancies between provided drawing and on site condition	Building engineer to survey the building and produce as-built documentation reflecting the as constructed condition.	**6-weeks**

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 ACCORD DEA guideline , ACCORD standard for Assessment of Structural Integrity of Existing RMG Factory Buildings in Bangladesh (Tripartite Document), the latest version of these document should be referenced. These 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 ACCORD DEA guideline , ACCORD standard 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 see ACCORD DEA guideline & ACCORD standard more details.
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 ACCORD DEA guideline & ACCORD standard (http://bangladeshaccord.org/factories/resource-centre/).

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