Nipa Knitwear Company

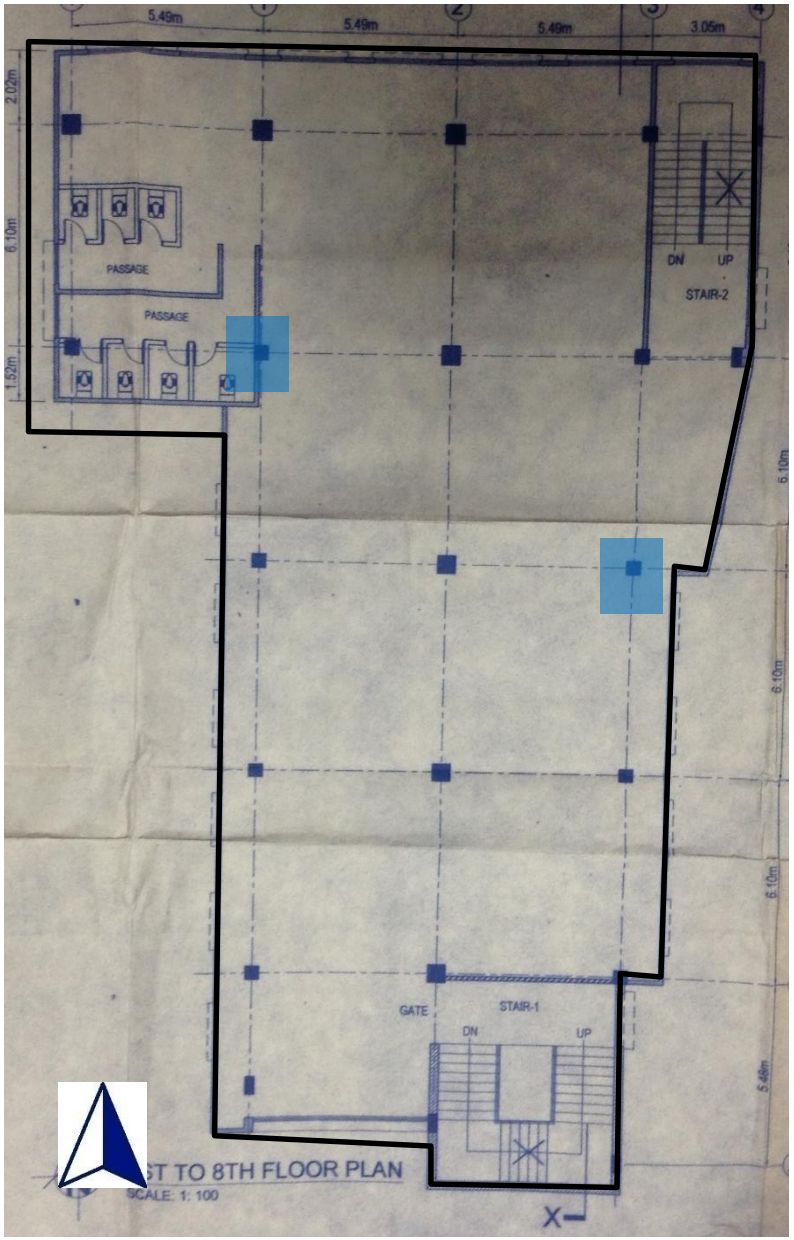
Selina Tower-04: Islambag, Holan Road, Dhakhin khan, Dhaka-1230
(23.857029N, 90.431212E)
18th February 2015

ACCORD on Fire and Building Safety in Bangladesh

ARUP

Observations

High stress levels in perimeter columns carrying cantilevers



Cursory calculation indicate that the working stress of some perimeter columns are at a high level mainly due to the load of the walls, some build-ups and the cantilever.

Observations – Production Building

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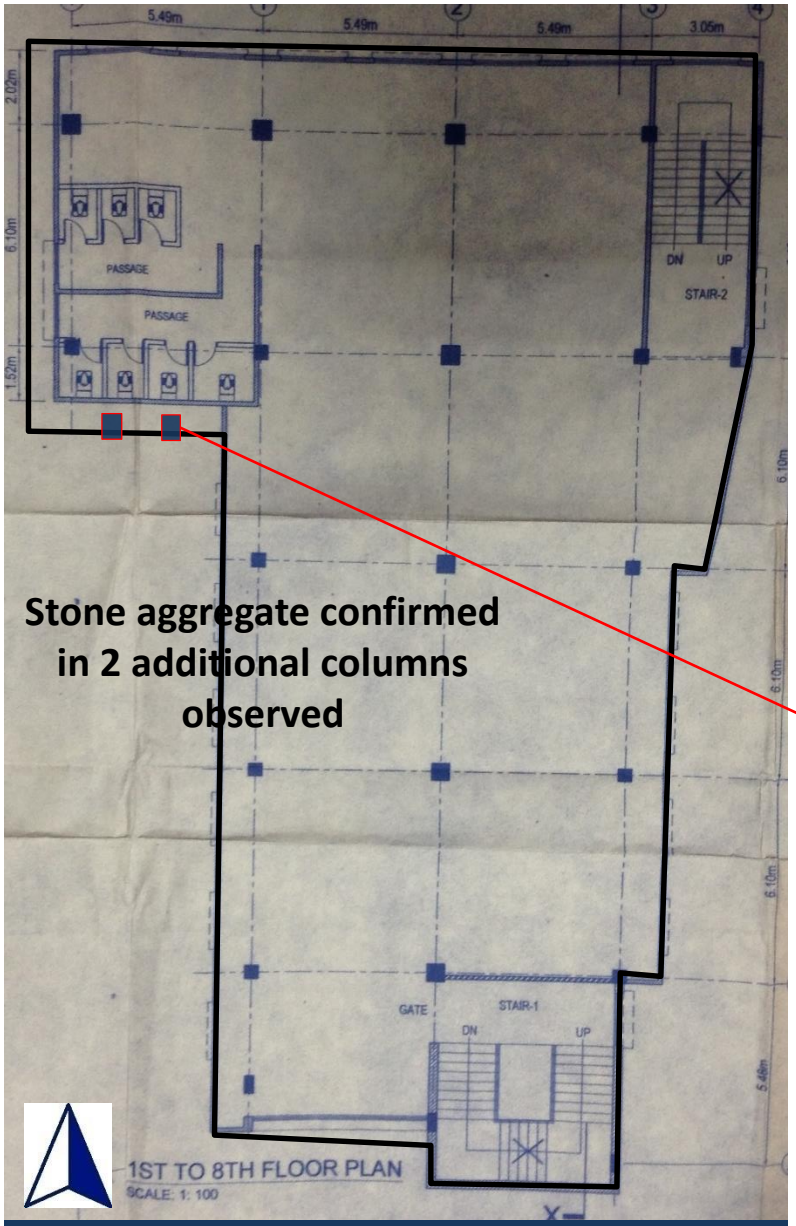
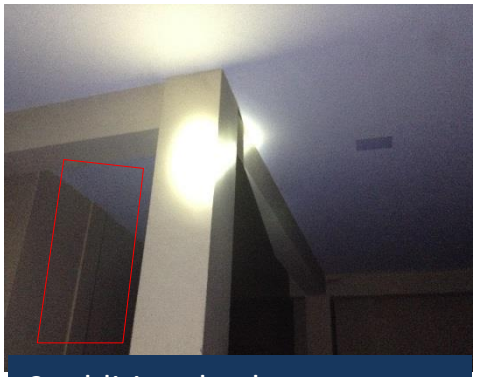
Discrepancies between the permit drawing and the as-built structure

Observations



Stone aggregate confirmed in 2 additional columns observed

Typical floor plan



2 additional columns observed

2 additional columns observed

2 additional columns observed

Observations Production Building

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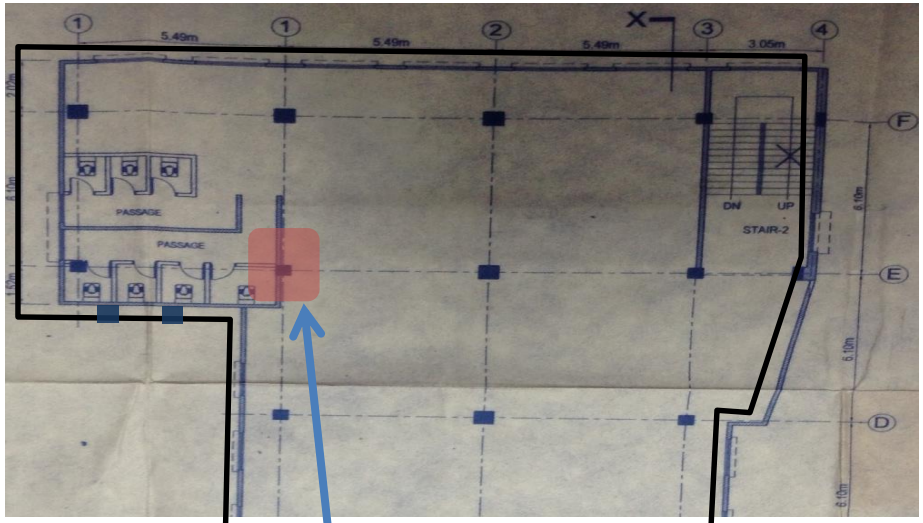
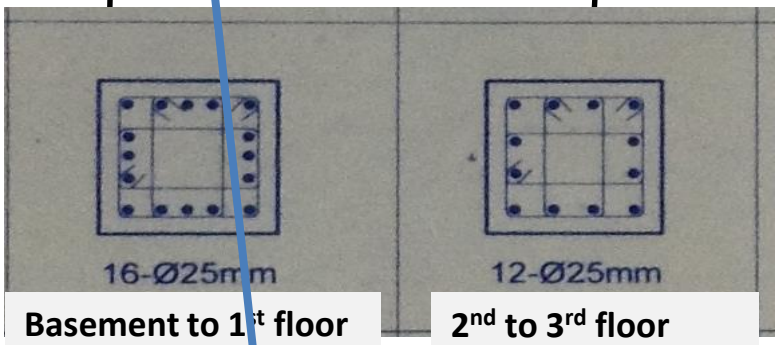
Structural elements which are not shown on the original design drawings

Staircase

Column on the 4th floor

Observations Generator House





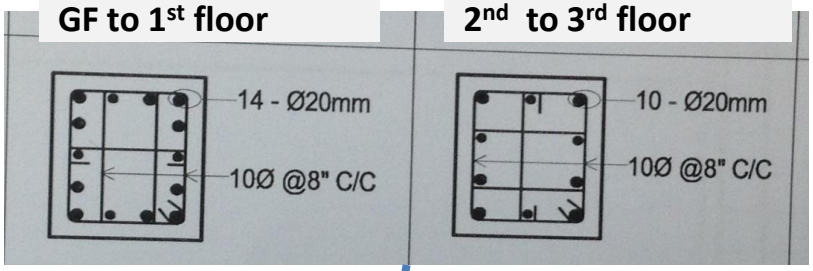
Basement to 1st floor

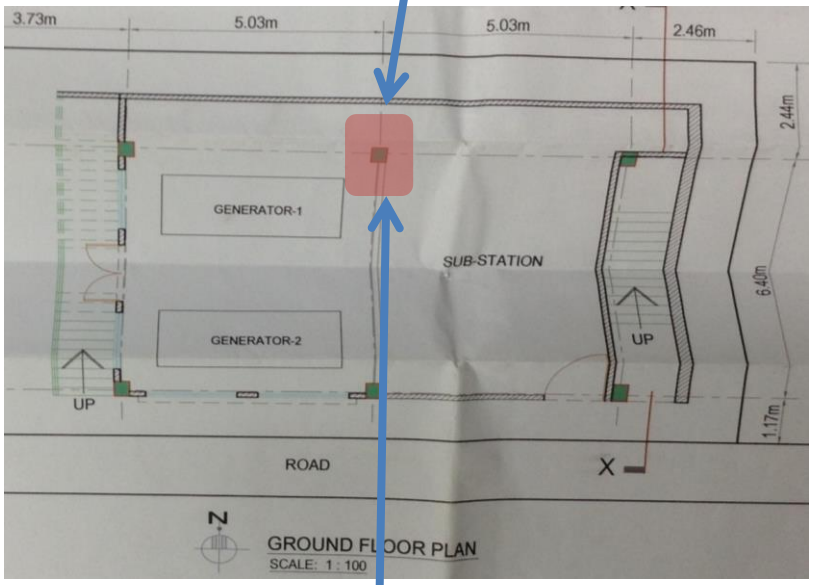
2nd to 3rd floor

- Production Building Basement: 4 rebar bars were found on both sides for a total of 12 bars. However, structural drawing shows 16 bars at this level.

GF to 1st floor

2nd to 3rd floor





- Generator House 1st floor: 4 bars were found on each side for total of 12 bars. However, structural drawing shows 14 bars at GF level.

Tests

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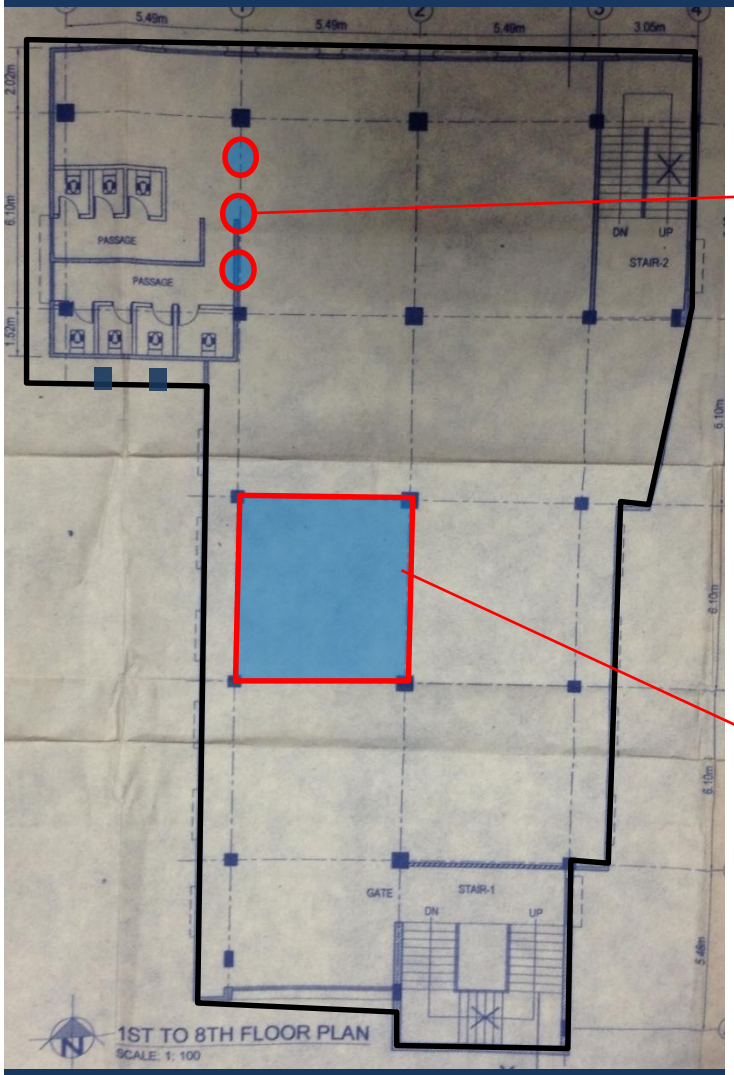
Uncontrolled storage and heavy loading (Water tanks, toilet build-up, storage)

Observations

Heavy loading from water tanks



Production Building – Typical floor plan

3 Water tanks on roof – 5000 litres each (total 1500 kN)

Water tank on 8th floor
Tank is not a full floor height, so it has an additional slab. Dimension 3.05m x 2.75m x 1.75m.

Observations – Production Building

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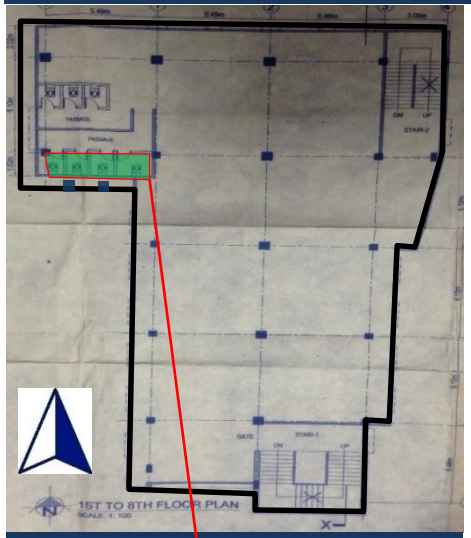
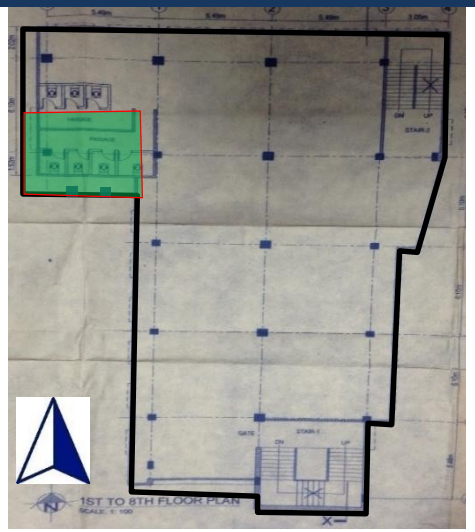
Toilet build-up



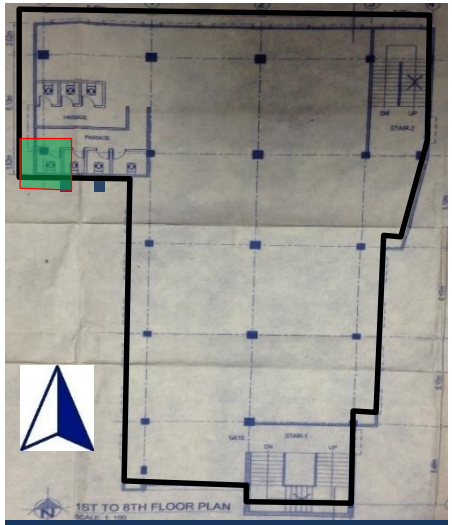
8th floor plan

Build-ups 250mm

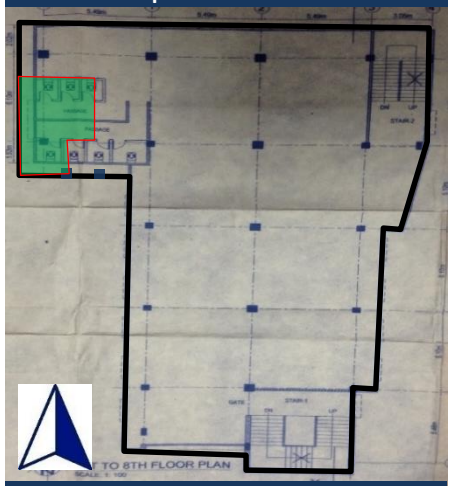


2nd, 4th, 5th, 6th, 7th floor

150 mm build up on every floor



1st floor plan



3rd floor plan

Observations – Production Building

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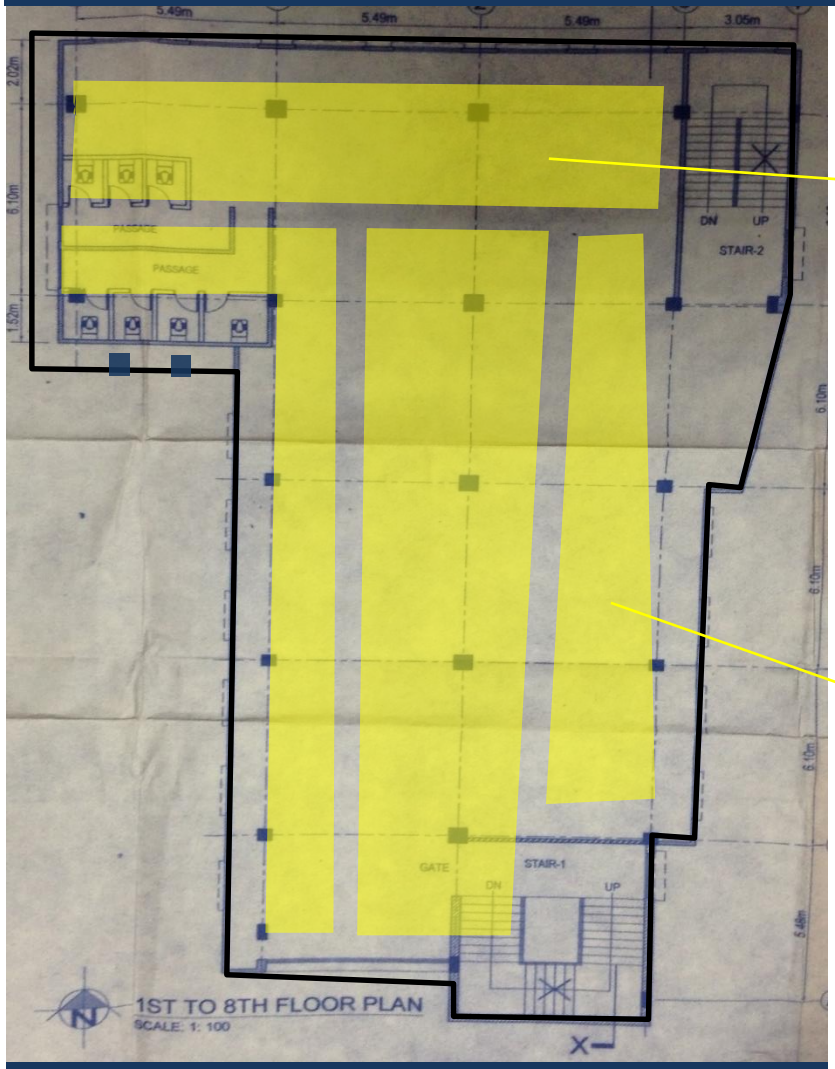
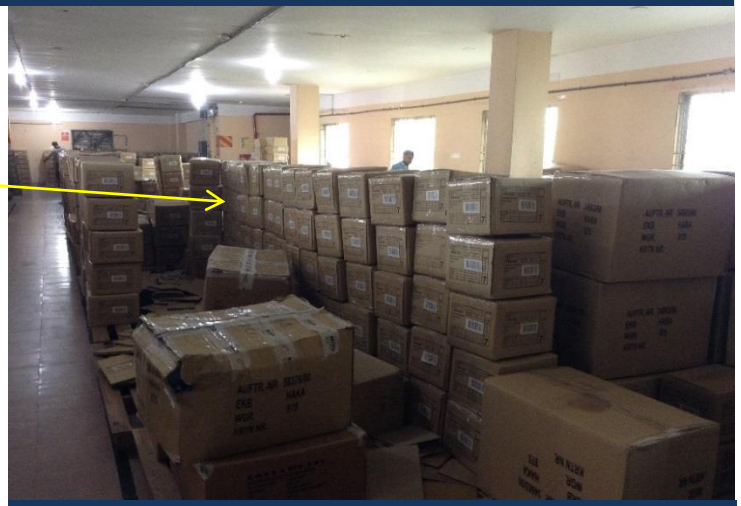
Heavily-loaded storage



Ground and 1st floor loaded area



1.5m high boxes on entire 1st floor

1.3m high fabric roll on entire ground floor

Observations – Production Building

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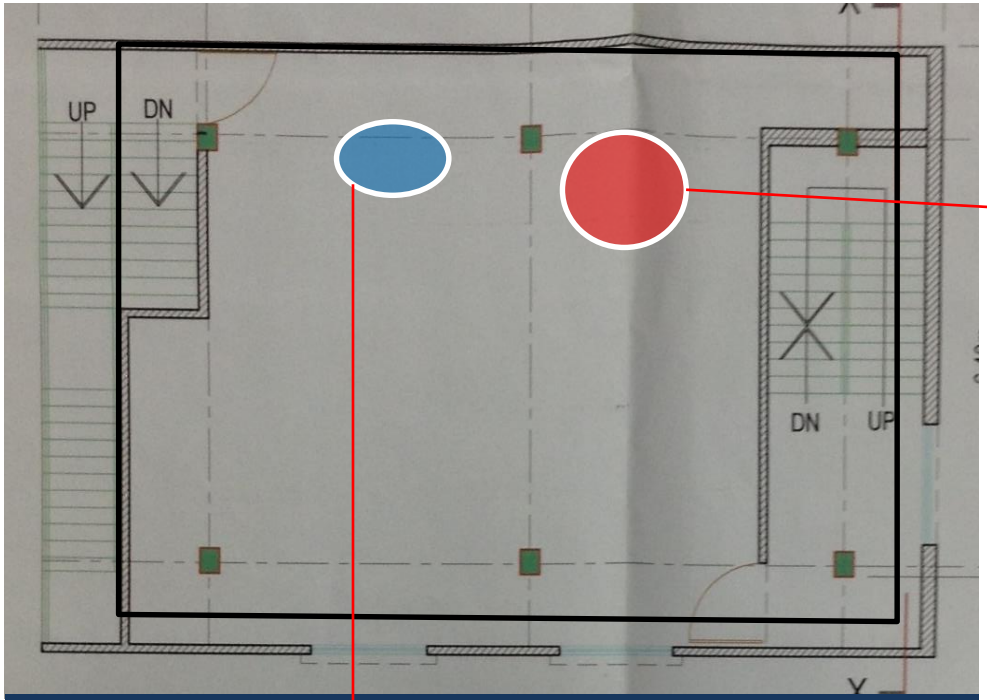
Heavy loaded areas on the 1st floor (Gen. house)



Typical floor plan

40-50KN boiler on 1st floor

500L water tank on 1st floor

Observations – Generator House

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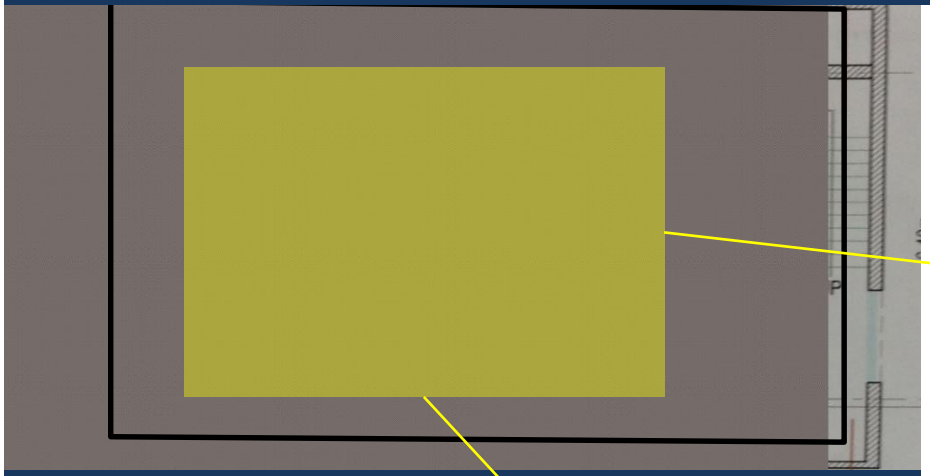
Heavily-loaded uncontrolled storage



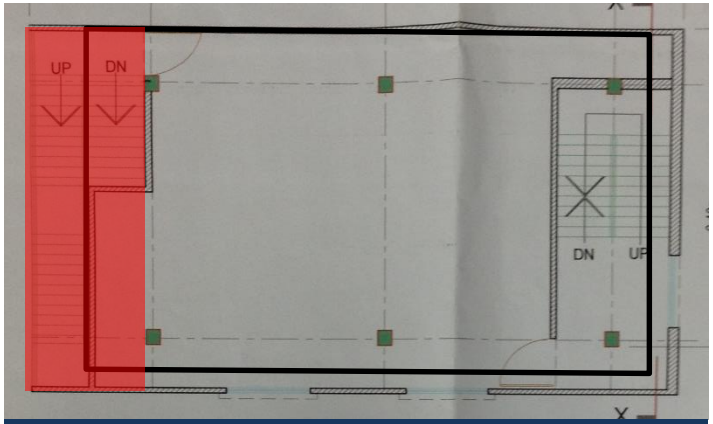
Typical floor plan

1.3m high fabric roll on 2nd and 3rd floor

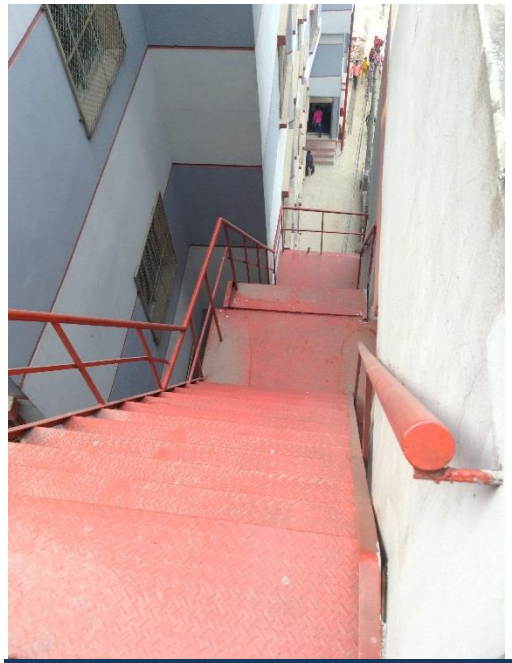
2m high lightweight storage on 4th and 5th floors

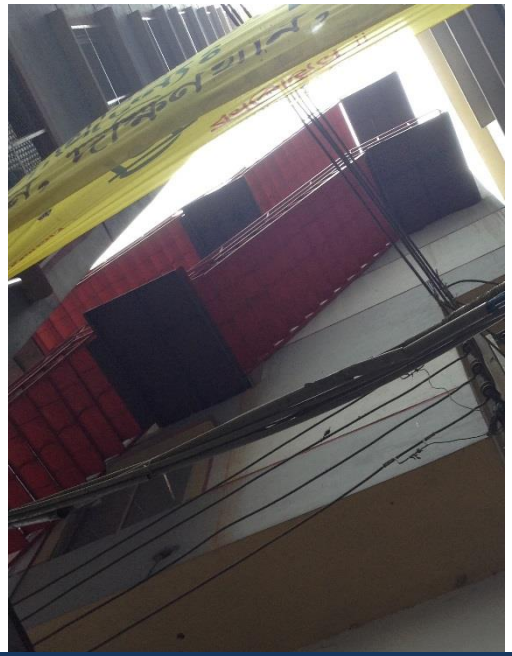
Observations – Generator House

Apparently non-engineered lightweight steel stair structures



Typical floor plan





Non-engineered steel stair structure

Observations – Generator House

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Priority Actions

Problems Observed

1. High stress levels in Perimeter Columns – Production Building
2. Discrepancies between the permit drawings and the as-built structures – Production Building and Generator House.
3. Uncontrolled storage and heavy loading – Production Building and Generator House.
4. Apparently non-engineered lightweight steel stair structures in Generator House.

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	High stress levels in Perimeter Columns – Production Building	Maintain current use of the floors. Don´t change use or increase occupation, either of which could increase loading.	**Immediate - Now**
2	High stress levels in Perimeter Columns – Production Building	Building Engineer to review design, loads and column stresses in the edge columns attracting loads from cantilevers.	**Immediate - Now**
3	High stress levels in Perimeter Columns – Production Building	Verify in-situ concrete stresses by 100mm dia. cores from min. 4 no. perimeter columns at basement level.	**Immediate - Now**
4	High stress levels in Perimeter Columns – Production Building	A Detail Engineering Assessment of the Production Building to be commenced, see attached Scope	**Immediate - Now**
5	High stress levels in Perimeter Columns – Production Building	Live load in cantilever/undocumented perimeter slab areas to be limited to 2.0kPa, pending outcome of Detail Engineering Assessment	**Immediate - Now**
6	High stress levels in Perimeter Columns – Production Building	Detail Engineering Assessment to be completed	**6-weeks**
7	High stress levels in Perimeter Columns – Production Building	Produce and actively manage a loading plan for all floor plates within the Building giving consideration to floor capacity and column capacity.	**6-weeks**
8	High stress levels in Perimeter Columns – Production Building	Actions identified in the Detail Engineering Assessment to be implemented.	**6-months**
9	High stress levels in Perimeter Columns – Production Building	Continue to implement the load management 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 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	Discrepancies between the permit drawings and the as-built structures – Production Building and Generator House	Building Engineer to commence update of the drawings to reflect the as-built structure and loading levels at all floor levels, including as built floor finishes thickness.	**6-weeks**
11	Discrepancies between the permit drawings and the as-built structures – Production Building and Generator House	Complete update of as-built drawings	**6-months**
12	Uncontrolled storage and heavy loading – Production Building and Generator House	Building Engineer to confirm design loading of slabs and take appropriate action by removing storage loads where required. This measure to be performed for the Production Building and the Generator House.	**6-weeks**
13	Uncontrolled storage and heavy loading – Production Building and Generator House	Building Engineer to design a loading plan for the building.	**6-weeks**
14	Uncontrolled storage and heavy loading – Production Building and Generator House	Spread the load of the roof water tanks on a bigger area.	**6-weeks**
15	Uncontrolled storage and heavy loading – Production Building and Generator House	Building Engineer to continue to implement loading plan.	**6-months**
16	Apparently non-engineered lightweight steel stair structures in Generator House	Building Engineer to assess adequacy of the lightweight steel stairs to withstand code vertical and wind loads, including connections to the Generator House.	**6-months**
17	Apparently non-engineered lightweight steel stair structures in Generator House	Carry out reconstruction or remedial works arising from the assessment.	**6-months**