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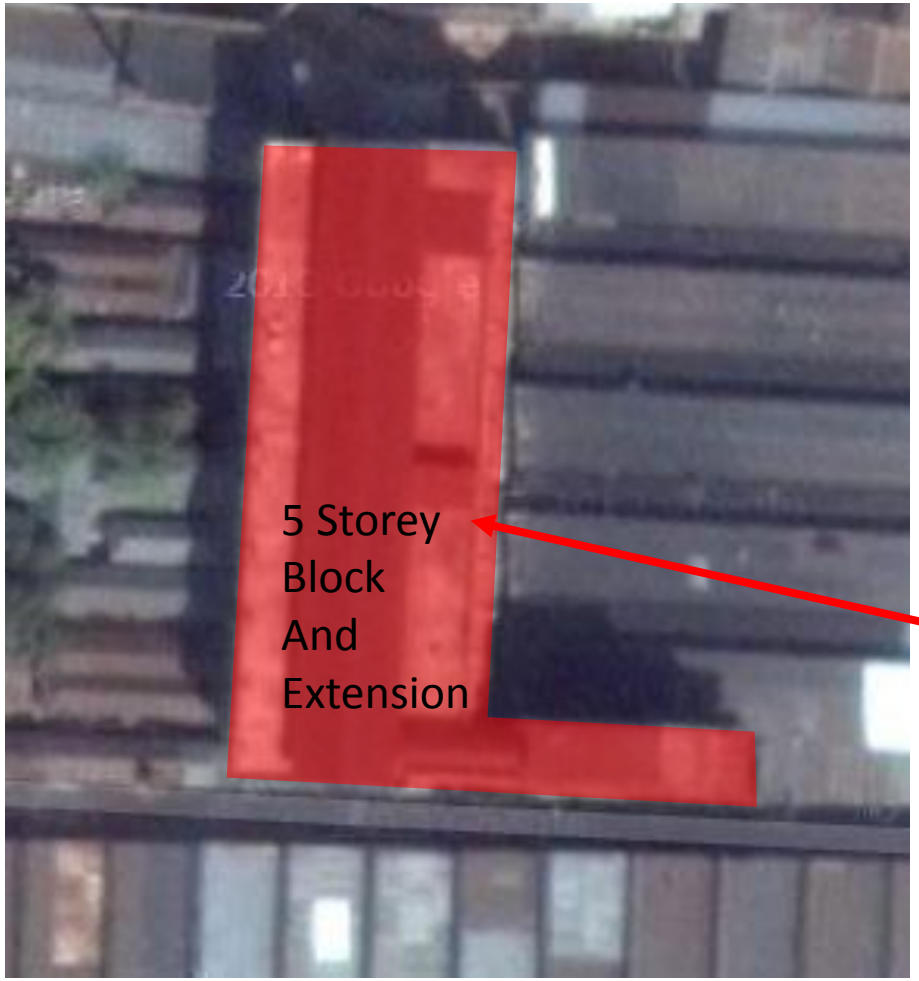
ACCORD on Fire and Building Safety in Bangladesh

ARUP

Check on Column stress levels immediately required to the 5 storey block

Item 1 High Stress to Building internal columns

Verify concrete strengths in internal columns and reduce loads



Remove all personnel from this building until results of columns strengths and Building Engineering assessment is complete

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Heavy water tank, not on design drawing.

Limited North-South stability, only pairs of columns, no in-fill walls

Water ingress causing corrosion to structure and facade

Check Of South Extension required

Steam rejection causing constant wetting and corrosion

Check Of South Extension required

Check Of South Extension required

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Check on roof additions required

Lightweight steel structure, not on permit plans

Roof drainage causing corrosion to structural masonry wall

Check on roof additions required

Lightweight steel structures, not on permit plans, open to wind uplift

Inadequate tie-down details

Check on roof additions required

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Check on Building Interface Required

Interface large steel shed roof and 10-storey building

Check on building interface required

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Lateral load from large steel shed roof is imposed on building columns between floor levels

Reinforced concrete column of 10-storey building

Check on building interface required

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Priority Actions

Problems Observed

ITEM 1: High Stresses on Internal Columns Observed to 5 Storey Block , We require removal of personnel now, with column strength checks and the production of a Detailed Engineering Assessment before this building is used again

ITEM 2:(5 storey building) South extension building has low lateral strength, large loads at roof and is corroded.

ITEM 3: (5 storey building) Lightweight steel roof additions do not appear to be strong enough for severe wind events or access loading

ITEM 4: (5 storey building) Roof drainage is not managed as is causing damage to structural load bearing masonry walls.

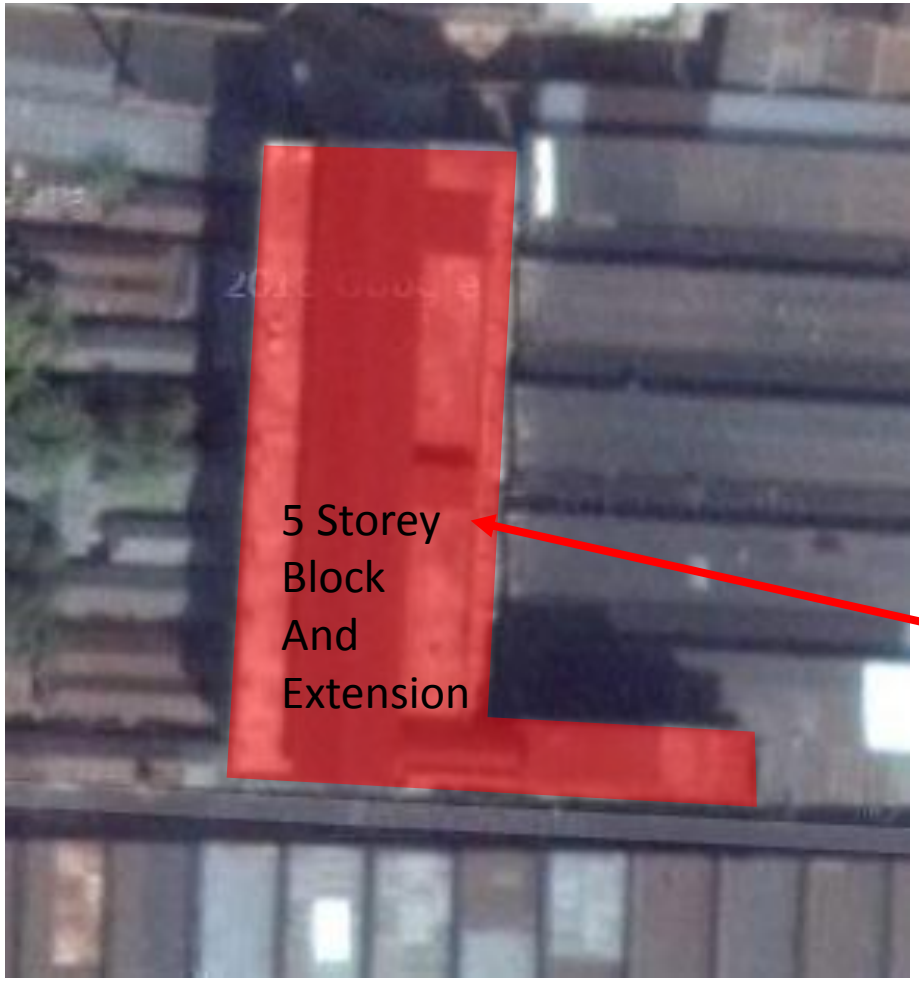
ITEM 5: (10 storey building) Adjacent large steel factory roof is imposing lateral loads on concrete columns between floors

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Verify the structural adequacy of all building columns at all levels in the 5 storey Block based on as built dimensions and material properties , Evacuate Building	Remove all Personnel from the 5 storey block and extension pending a full check on column strengths and Detail Engineering Assessment.	Immediate - Now
2	Verify the structural adequacy of all building columns at all levels in the 5 storey Block based on as built dimensions and material properties , Evacuate Building	Detailed Engineering Assessment of as built structure to be commenced as per attached scope.	Immediate - Now
3	Verify the structural adequacy of all building columns at all levels in the 5 storey Block based on as built dimensions and material properties , Evacuate Building	Verify insitu concrete strengths and existing reinforcement for all columns	Immediate - Now

Item No.	Observation	Recommended Action Plan	Recommended Timeline
4	Verify the structural adequacy of all building columns at all levels in the 5 storey Block based on as built dimensions and material properties , Evacuate Building	Detailed Engineering Assessment to be completed	6-weeks
5	Verify the structural adequacy of all building columns at all levels in the 5 storey Block based on as built dimensions and material properties , Evacuate Building	Produce and actively manage a loading plan for all floors within the building giving consideration to floor capacity and column capacity.	6-weeks
6	Verify the structural adequacy of all building columns at all levels in the 5 storey Block based on as built dimensions and material properties , Evacuate Building	Continue to implement load plan	6-months

Item 1 High Stress to Building internal columns

Verify concrete strengths in internal columns and reduce loads



Remove all personnel from this building until results of columns strengths and Building Engineering assessment is complete

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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
7	(5 storey building) South extension building has low lateral strength, large loads at roof and is corroded	Engineer to prove existing lateral stability works to code, or propose a retrofit.	6-weeks
8	(5 storey building) South extension building has low lateral strength, large loads at roof and is corroded	Sources of water corrosion to be removed.	6-weeks
9	(5 storey building) South extension building has low lateral strength, large loads at roof and is corroded	Complete structural retrofit and repair corrosion to facades and structure, or demolish.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
10	(5 storey building) Lightweight steel roof additions do not appear to be strong enough for severe wind events or access loading	Addition structures should be Designed and upgraded to support code vertical and wind loads by the building Engineer, or they should be vacated and removed.	6-months
11	(5 storey building) Roof drainage is not managed as is causing damage to structural load bearing masonry walls	Engineer to inspect load bearing masonry walls including the exterior and propose a suitable repair. Roof drainage system to be installed	6-months
12	(10 storey building) Adjacent large steel factory roof is imposing lateral loads on concrete columns between floors	The building Engineer should verify the column strength in bending, or design an alternate load path for the loads from the large steel roof	6-months