

H.B. KNITEX LTD.

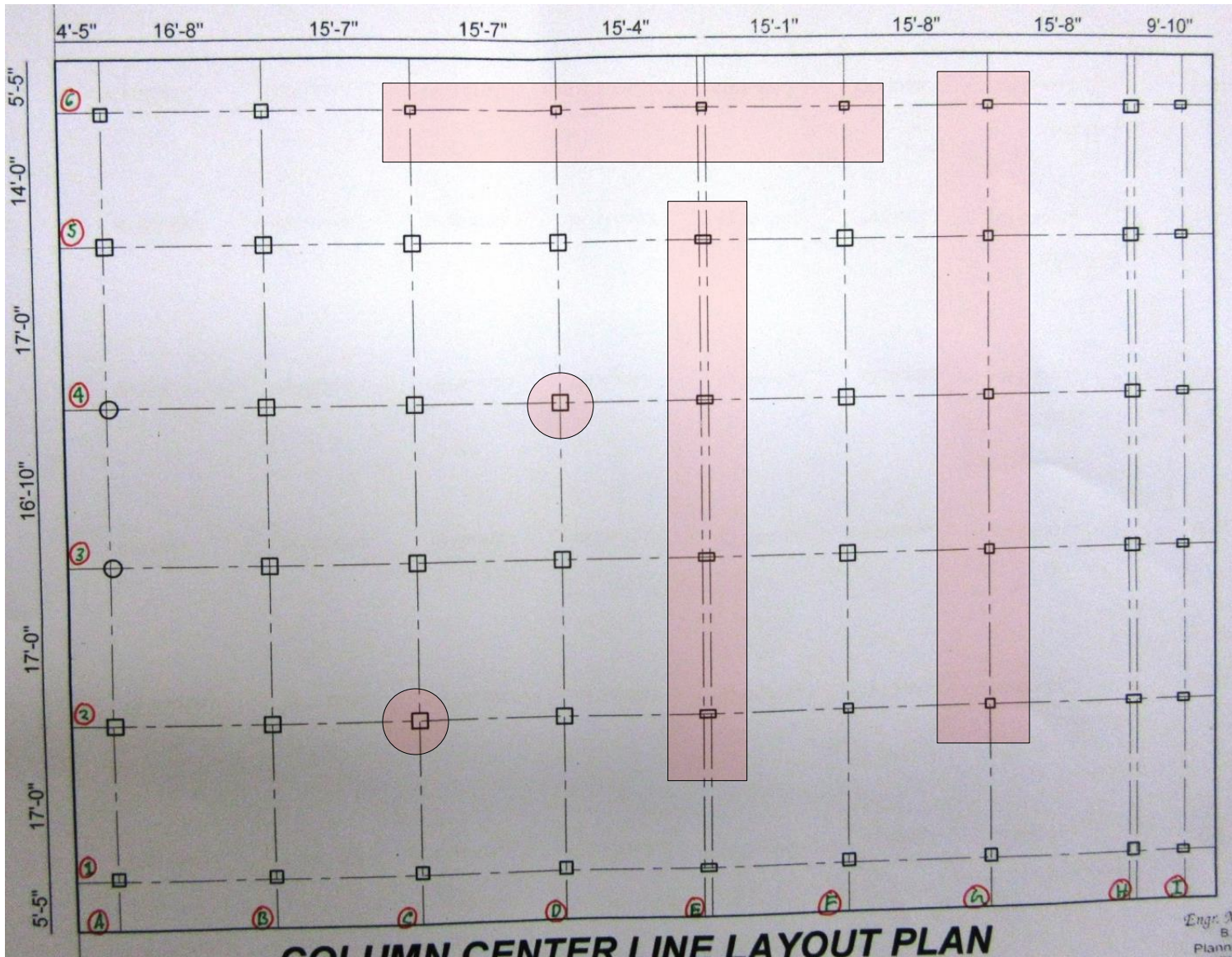
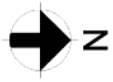
Plot # B26 (P) & B27, Faujdarhat BSCIC Industrial Area, Block-A, Sagorika Road, Custom Academy, South Kattali,
Pahartoli, Chittagong
(22.355954N, 91.773893E)

10 November, 2015



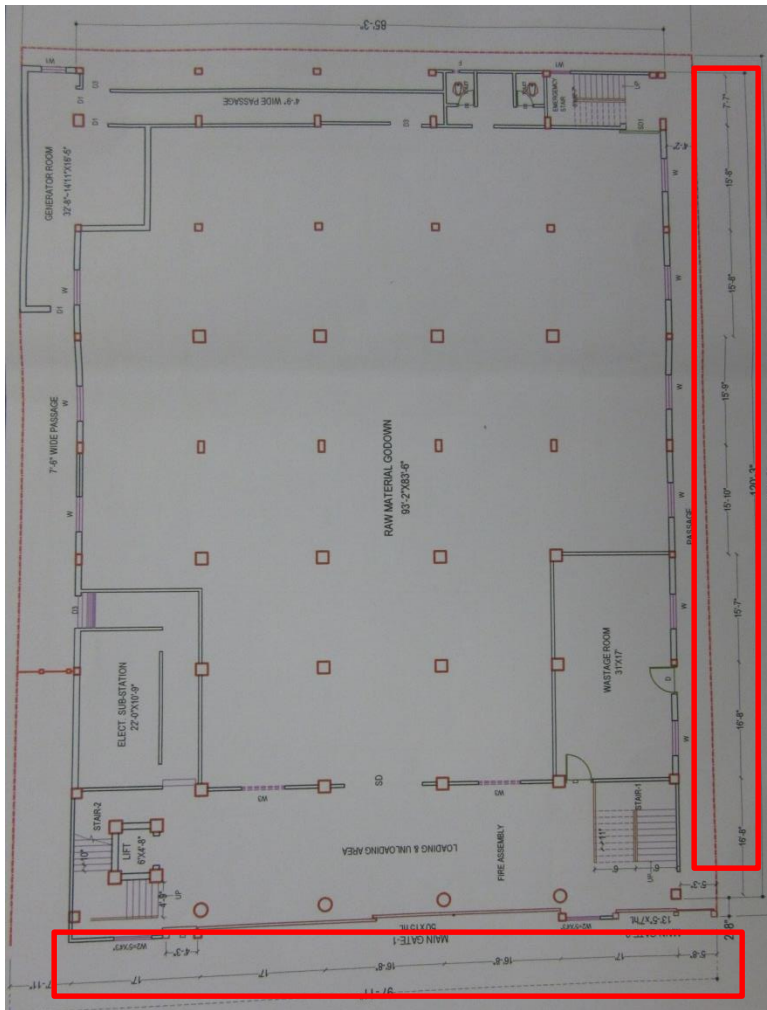
Observations

High Stress at Columns

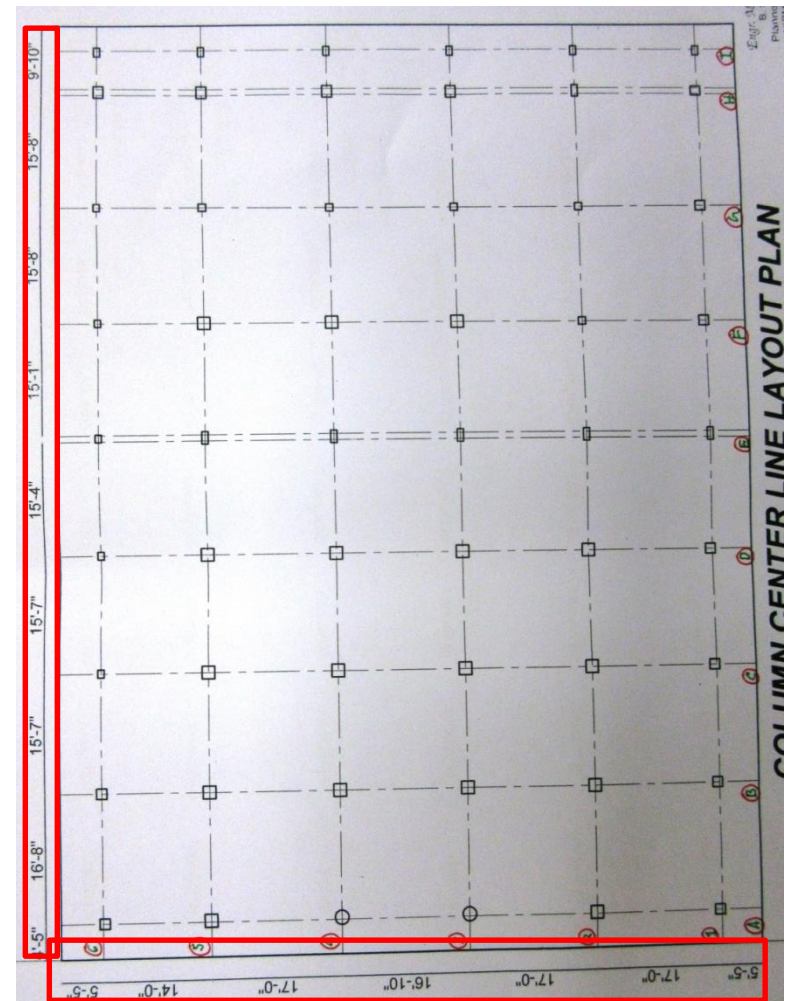


Primary calculation shows the marked columns are highly stressed under gravity loads

Discrepancies between Structural Drawings and As-Built Structure

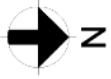


AS built Architectural Drawing

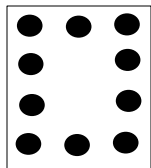
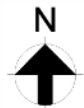


Structural Design Drawing

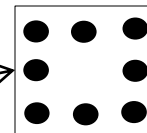
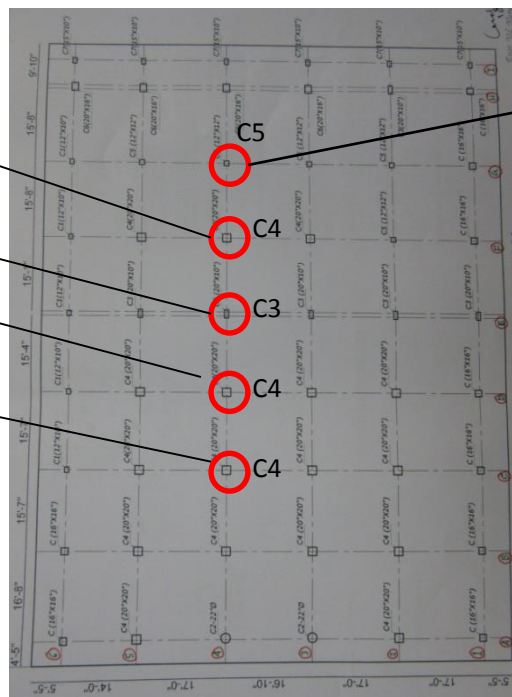
Grid dimensions shown on as-built architectural drawing, do not match with structural drawing. Site observations match with as-built architectural drawing.



Observed dimension and orientation of many columns do not match with structural drawings.



Found reinforcement



Found reinforcement



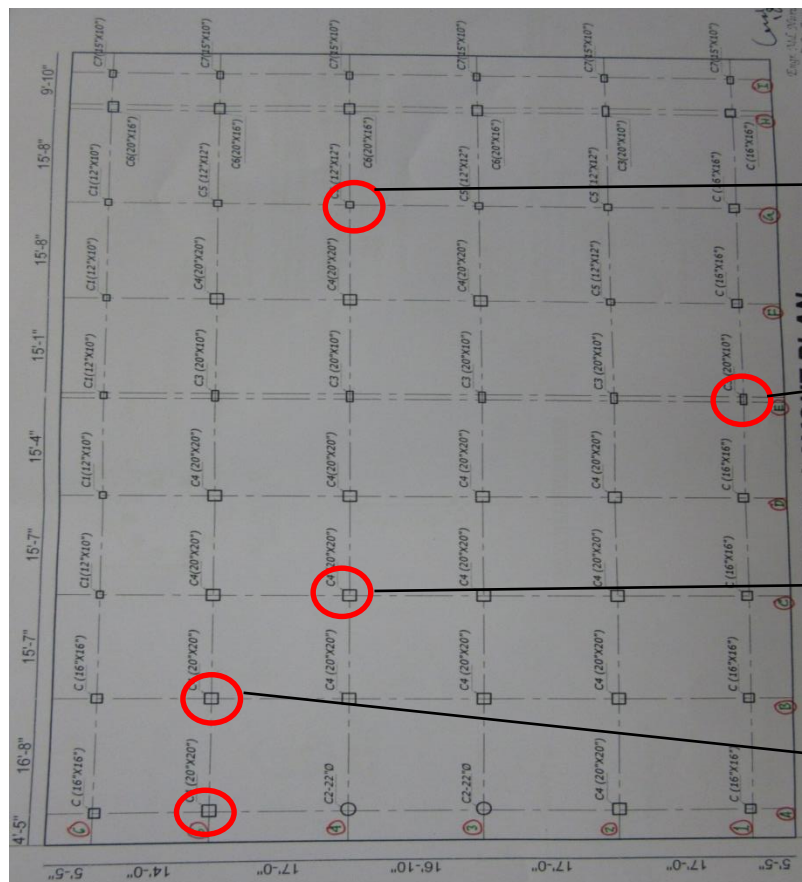
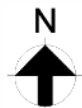
Ferroscope test executed at several columns at ground floor.

COLUMN SECTION

SCHEDULE OF COLUMN SIZE AND REINFORCEMENT

COLUMN NAME	C	C1	C2	C3	C4	C5
FLOOR						
SHORT COLUMN						
UP TO 4TH FLOOR						

The design reinforcement did not match with ferroscreening data



Internal Column
(brick)



Edge Column
(brick)

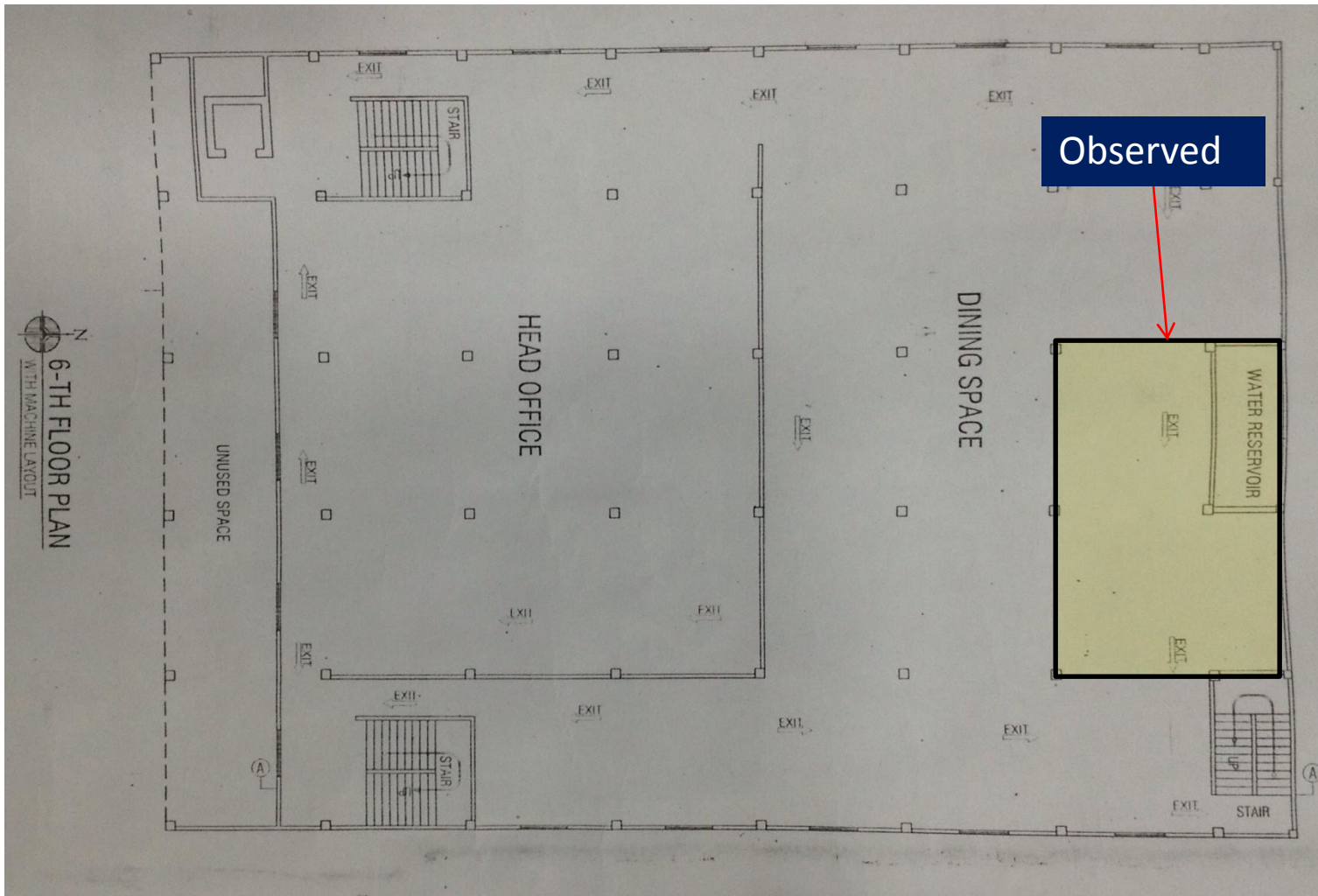


Internal Column
(Stone)



Lift core Column
(brick)

Some ground floor columns had brick aggregate and some had stone. Structural drawings indicated all RC members to be cast with stone aggregates.



Over head water tank dimensions did not match with the Permission Drawing.

Errors due to Poor Workmanship

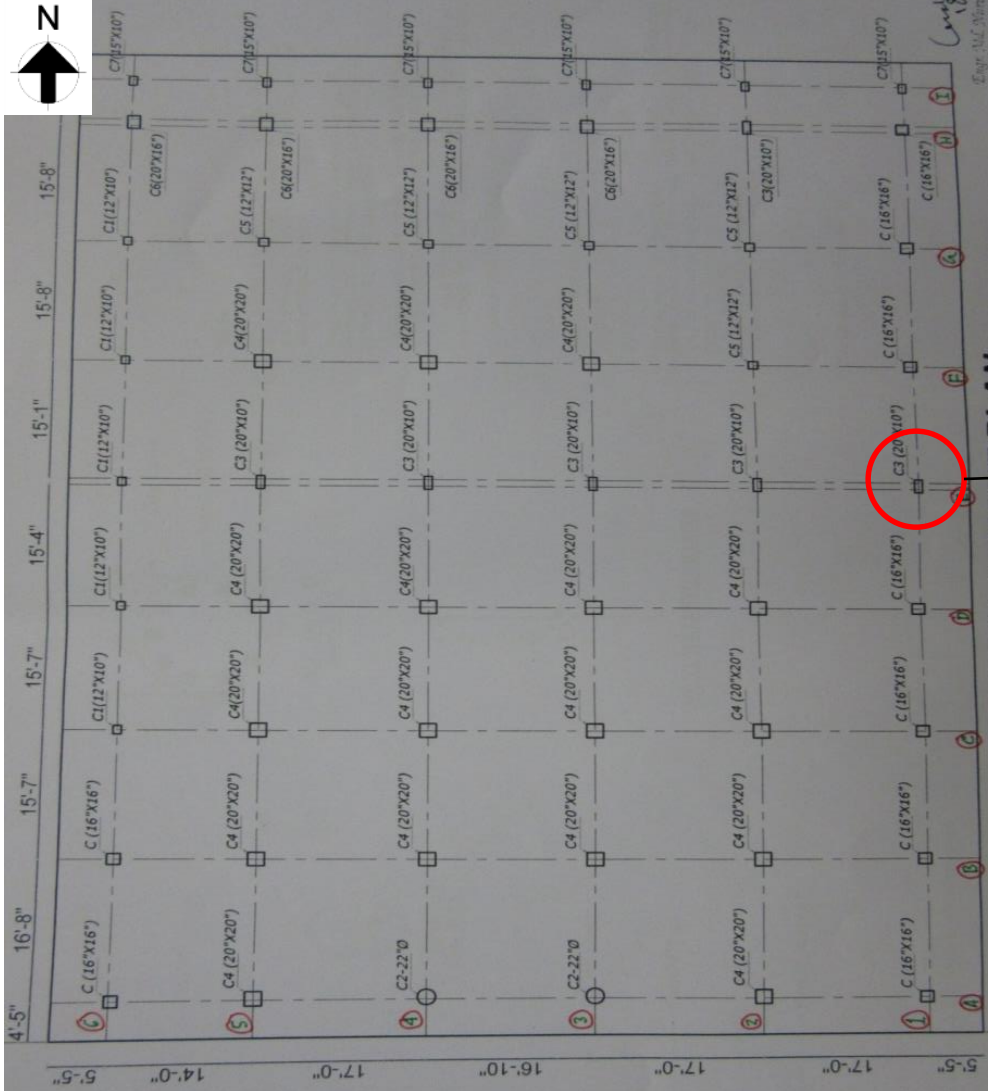


Column was twisted on 5th floor



Gap was found between column and slab

Crack on Edge Column's Plaster



At ground and 1st floors column at grid E1 had plaster crack on outer and inner face. (Crack confirmed not to penetrate into concrete.)

Priority Actions

Problem Observed:

ITEM 1: Highly Stressed Columns

ITEM 2: Discrepancies Between Design Drawings and as-built structure

ITEM 3: Errors due to poor workmanship

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Highly Stressed Columns	Qualified Structural Engineer is to review the design, loads and stresses in all columns as part of a Detailed Engineering Assessment (DEA) (see scope below).	Immediate - Now
2	Highly Stressed Columns	Engineer is to verify in-situ concrete strength by testing 100mm diameter cores taken from 4 no. columns (minimum). Qualified Structural Engineer to determine safe locations for coring. Prior to coring, the floor beams supported by the column should be propped through all levels to ground floor. The column reinforcement should be exposed to ensure that it will not be damaged during coring. Following coring, the column should be repaired using suitable repair mortar before de-propping the floor beams.	Immediate - Now
3	Highly Stressed Columns	Live load must not be increased on any floor. Fitting out works must stop on any incomplete floors until DEA complete.	Immediate - Now
4	Highly Stressed Columns	Consideration should be given to strengthening the 250x250 and 300x300 columns.	Immediate - Now

Item No.	Observation	Recommended Action Plan	Recommended Timeline
5	Highly Stressed Columns	Detailed Engineering Assessment to be completed.	
6	Highly Stressed Columns	Provide calculations showing the structural adequacy of all columns. Provide results of concrete strength tests.	6-weeks
7	Highly Stressed Columns	Develop remediation measures as required by findings of DEA.	6-weeks
8	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
9	Highly Stressed Columns	Implement remedial actions required by DEA.	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. This 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 Design Drawings and As Built Structure.	As part of the DEA comprehensive As-Built drawings are to be produced.	6-weeks
11	Errors due to Poor Workmanship.	As part of the DEA workmanship errors are to be identified and assessed & appropriate remedial action taken.	6-weeks