

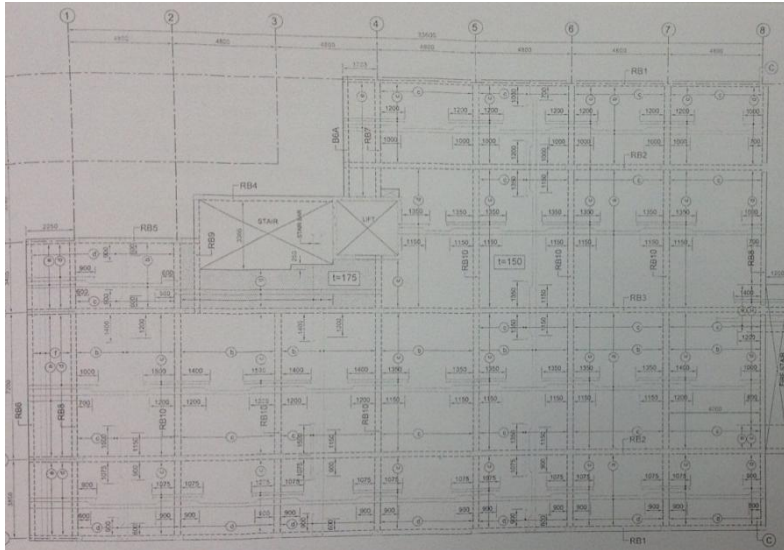
The Shanin Corporation Ltd

12/1 Hossain Uddin Khan, 1st Lane Lalbagh, Dhaka -1211
(23.720837, 90.377902)
8th April 2014



Observations

Building 1: Concrete Stress Levels in Columns

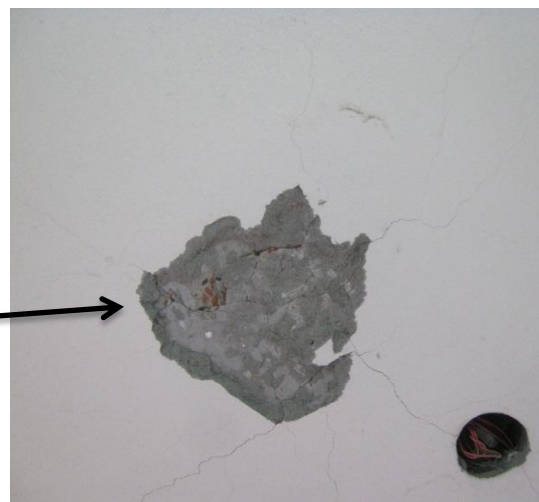


Preliminary calculations indicate that column working stress is at a high level in Building 1. Significant loading was observed arising from the additional rooftop factory area and the concrete water tank, and in particular columns supporting large bays and cantilever structures were found to be highly stressed.

A **Detail Engineering Assessment** of the building is required (see attached scope). The engineer is to perform detailed calculations based on the as-constructed structural arrangement, material properties and loading to verify column size suitability. If required, column loading shall be reduced, and columns possibly strengthened.

Building 1: High Column Loads

Building 2: Level 1 suspended slab showing signs of distress



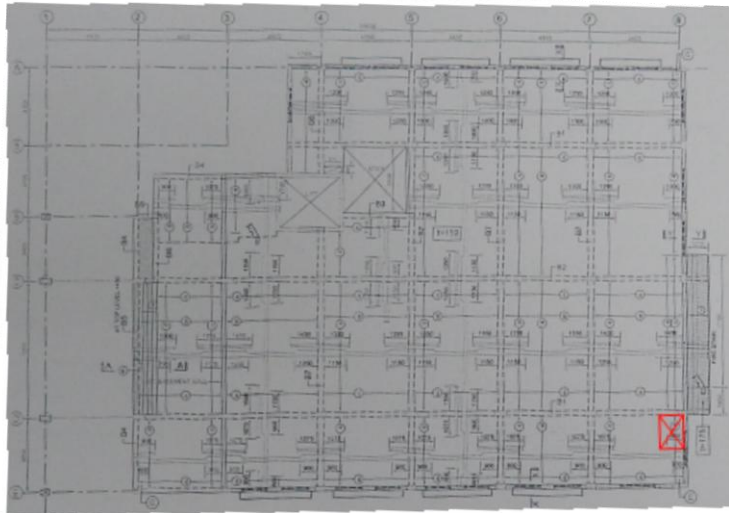
To the underside of the Level 1 slab the plaster has cracked and locally fallen-off, and the underside of the structural slab is exposed which also appears to be cracked. This cracking is located under one of the boilers located on the Level 1 slab above.



Building 2: Level 1 suspended slab showing signs of distress

Building 1: Apparently non-engineered opening in ground level slab

An opening has been formed in the ground level (suspended) slab for the insertion of stairs down to the basement. Cut ends of the reinforcement bars are exposed. Cracking was observed in the soffit of the Ground level slab from the corner of the new opening near the centre of the slab panel.



Building 1: Apparently non-engineered opening in Ground Level slab

Building 1: Unclear lateral stability system to Level 7 steelwork roof



It is believed that the steelwork roof structure over Level 6 is stabilised by column cantilever action, but this could not be verified. No vertical bracing or 'plan' bracing was evident.



Building 1: Unclear lateral stability system to Level 7 steelwork roof

Building 2: Cracks in column plaster

The plaster to the corner column of Building 2 is cracked adjacent to the door frame.



Building 2: Cracks in column plaster

Priority Actions

Problems Observed

1. Building 1 - Concrete stress levels in columns.
2. Building 2 - Level 1 suspended slab showing signs of distress.
3. Building 1 - Apparently non-engineered opening formed in Ground Level slab for insertion of new Basement stairs.
4. Building 1 - Unclear lateral stability system to Level 7 steelwork roof.
5. Building 2 - Cracks in column plaster.

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Building 1 - Verify load capacity of all columns	Maintain current use of the floors and don't change use or increase occupation, either of which could increase loading	Immediate - Now
2	Building 1 - Verify load capacity of all columns	Building Engineer to review loads, design, and concrete stress for all columns in building	Immediate - Now
3	Building 1 - Verify load capacity of all columns	Verify insitu concrete stresses either by 100mm diameter cores or existing cylinder strength data for minimum 4 columns	Immediate - Now
4	Building 1 - Verify load capacity of all columns	A Detail Engineering Assessment of Factory to be commenced - see attached scope	Immediate - Now
5	Building 1 - Verify load capacity of all columns	Produce and actively manage a loading plan for all floor plates within the factory giving consideration to column capacity	6-weeks
6	Building 1 - Verify load capacity of all columns	Detail Engineering Assessment to be completed	6-weeks
7	Building 1 - Verify load capacity of all columns	Produce as-constructed general arrangement structural drawings	6-months
8	Building 1 - Verify load capacity of all columns	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. 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
9	Building 2 - Level 1 suspended slab showing signs of distress	Building Engineer to ascertain the load-carrying capacity of the Level 1 slab and beams within the building and make proposals for remediation measures (such as load reduction and strengthening), if required	6-weeks
10	Building 2 - Level 1 suspended slab showing signs of distress	Implement actions arising from engineering review	6-months
11	Building 2 - Level 1 suspended slab showing signs of distress	Produce and actively manage a loading plan for the Level 1 floor plate within the building, giving consideration to floor capacity, column capacity and foundation capacity	6-months
12	Building 1 - Apparently non-engineered opening formed in Ground Level slab for insertion of new Basement stairs	Building Engineer to investigate and monitor diagonal crack in soffit of slab at corner of formed opening	6-weeks
13	Building 1 - Apparently non-engineered opening formed in Ground Level slab for insertion of new Basement stairs	Engineer to advise on load repair and strengthening of the slab if required	6-weeks
14	Building 1 - Apparently non-engineered opening formed in Ground Level slab for insertion of new Basement stairs	Engineer to specify measures to reinstate corrosion protection to ends of exposed cut slab reinforcement	6-weeks
15	Building 1 - Apparently non-engineered opening formed in Ground Level slab for insertion of new Basement stairs	Implement actions arising from engineering assessment	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
16	Building 1 - Unclear lateral stability system to Level 7 steelwork roof	Building Engineer to investigate the structural adequacy of the roof, with particular regard to the lateral stability system	6-weeks
17	Building 1 - Unclear lateral stability system to Level 7 steelwork roof	Engineer to specify any remedial measures that may be required, such as strengthening	6-weeks
18	Building 1 - Unclear lateral stability system to Level 7 steelwork roof	Implement actions arising from engineering assessment	6-months
19	Building 2 - Cracks visible in column plaster	Building Engineer to investigate whether column cracks are restricted to the plastering	6-weeks
20	Building 2 - Cracks visible in column plaster	Engineer to make proposals for remediation measures in column structure if necessary (e.g. load reduction, column strengthening, etc.)	6-weeks
21	Building 2 - Cracks visible in column plaster	Implement actions arising from engineering assessment	6-months