

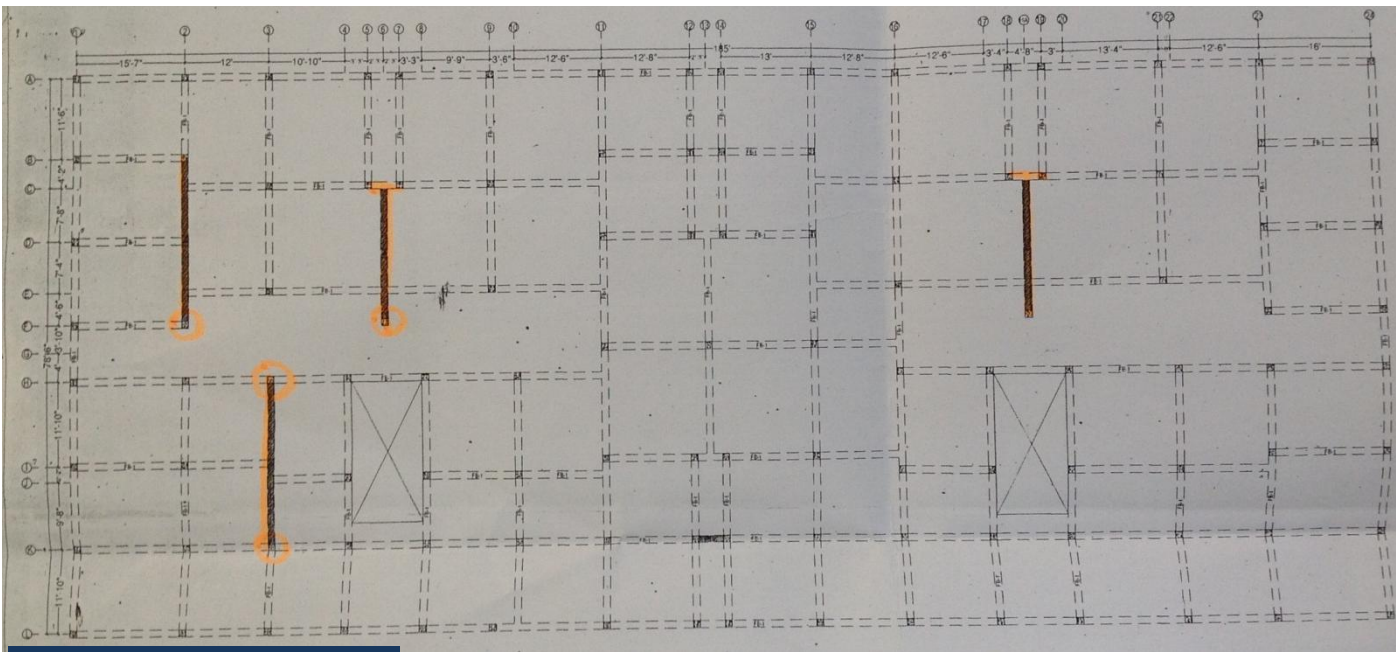
W. Apparels Chancellor Garments Ltd.

295/JA/4 Rayer Bazar, Dhaka
(23.74143N, 90.36202E)
08 March 2014



Observations

**Columns appear to be stressed in excess of
normal design limits**



Typical column layout



Tested Ground Floor Column – Brick aggregate

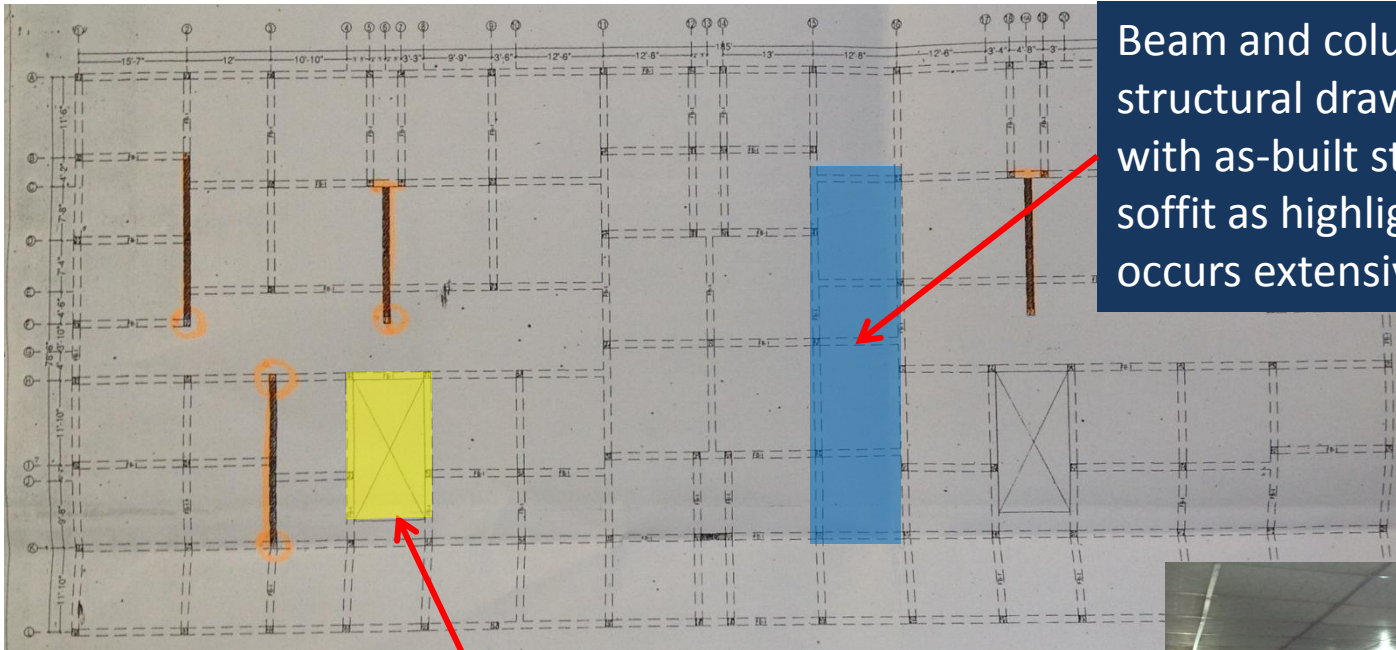
Cursory calculations indicate that column working stress is in excess of normal design limits.

Building Engineer is to perform detailed calculations including a Detail Engineering Assessment (See attached scope) and concrete tests to prove column size and (if required):

- Reduce loads by vacating floors
- Reinforce columns

**Structural drawings not consistent with the
as-constructed arrangement of the factory**

Beam and column arrangement on structural drawings not consistent with as-built structure on 2nd floor soffit as highlighted. Discrepancy also occurs extensively on 1st floor soffit.



Structural Floor Plan



Stair ope in-filled

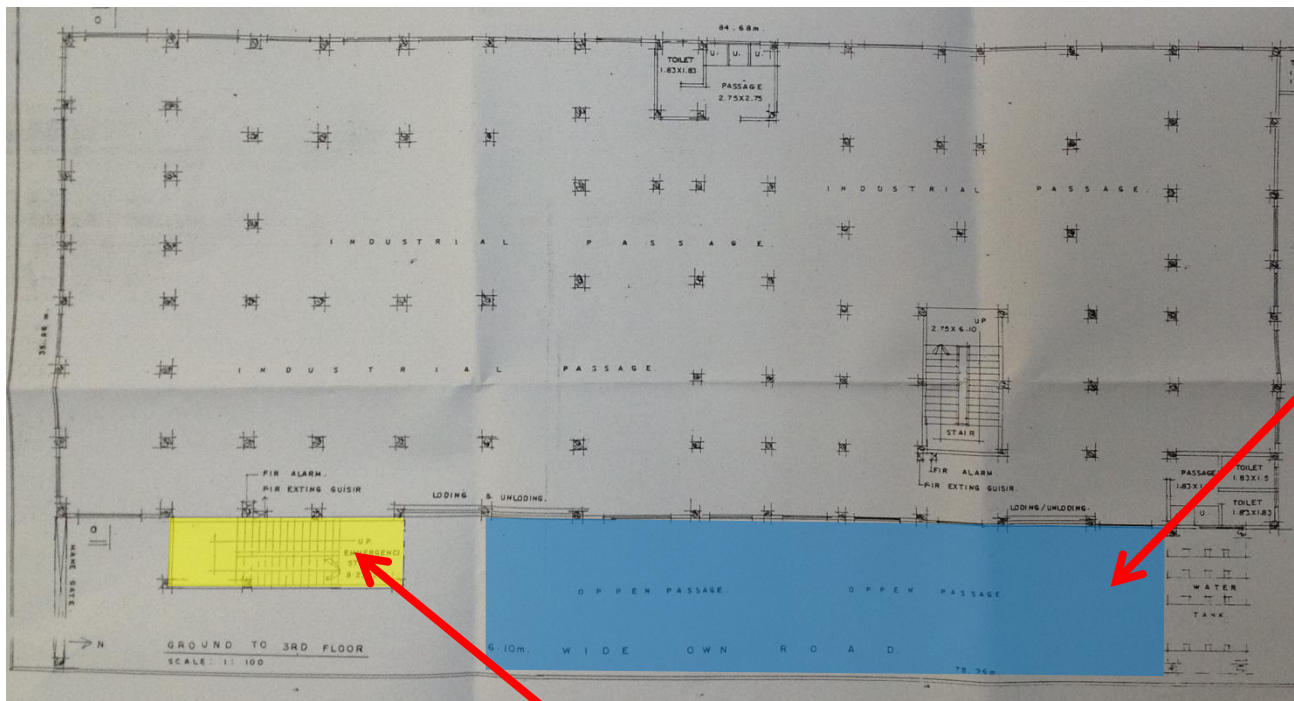


4th floor column layout differs from Ground to 3rd floor column layout

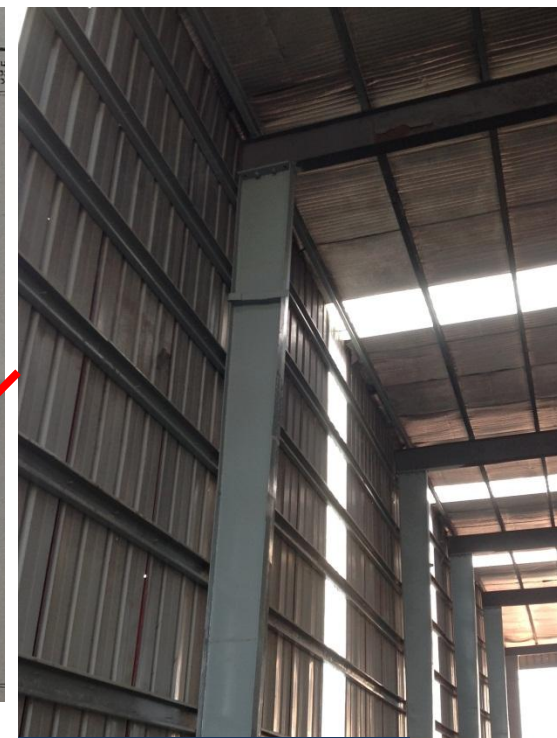
The building structure should be surveyed and a set of accurate “As-Built” drawings prepared consistent with the current structural arrangement

Structural Drawings

Check required to confirm that steel frame to lean-to entrance structure and steel stairs is adequately braced and designed to resist high wind loading and that connections are adequately designed and confirmed to be as-built



Site Plan



Steel lean-to structure



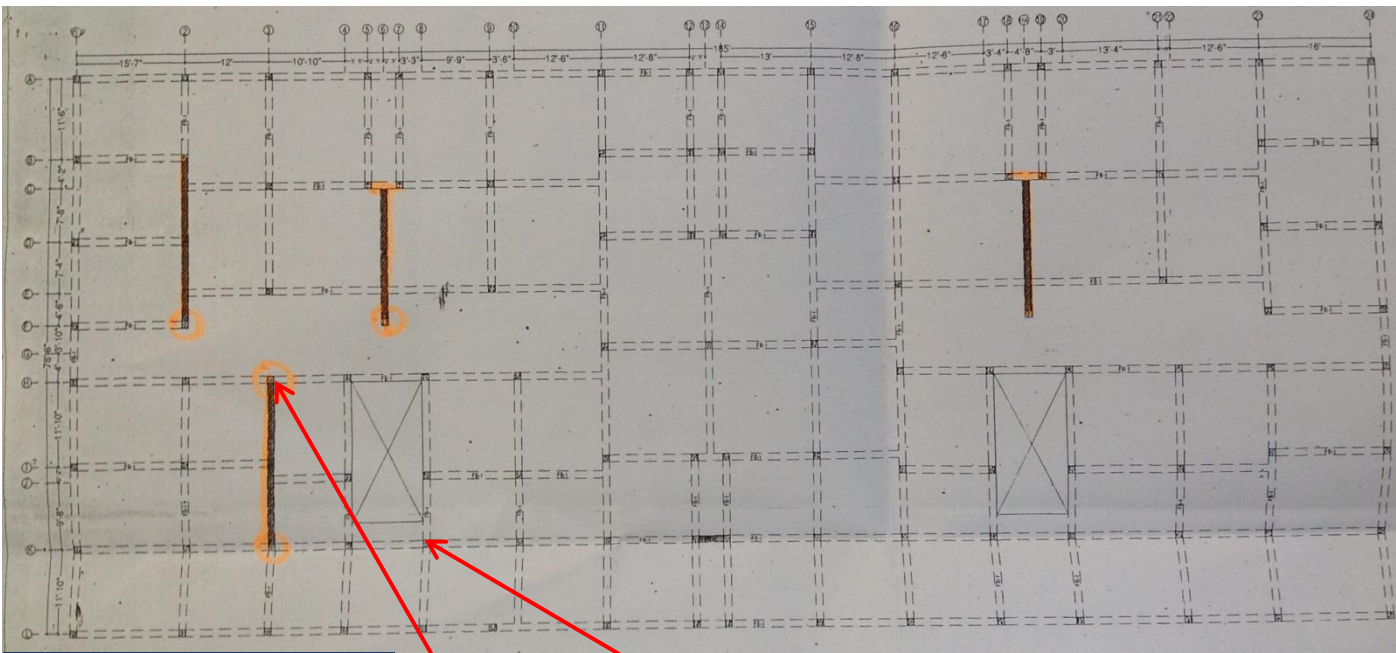
External steel stairs

Additional steel stairs and lean-to structure not on structural drawings.

Engineer to check design of steel structures to resist high wind and lateral loads and completeness of connections on site.

Steel stairs and lean-to structures

Cracking of 2 No columns on 3rd floor and cracking on the soffit of 3rd and 4th floor slabs

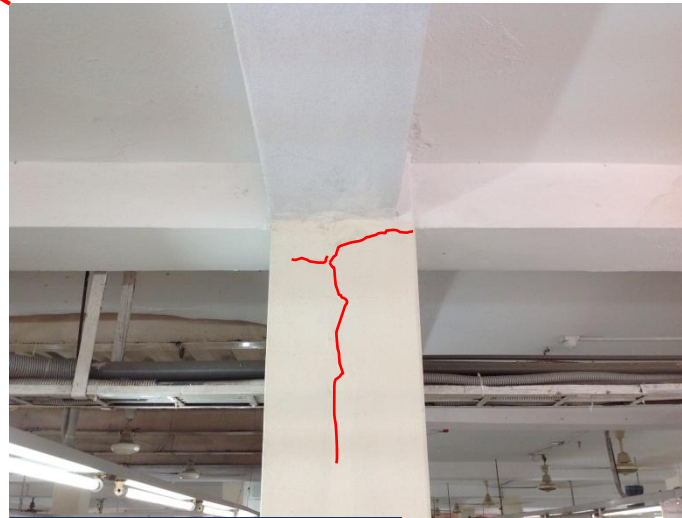


Typical Floor Plan

Column cracks to be reviewed by removing plaster to confirm that cracks do not extend into structure.

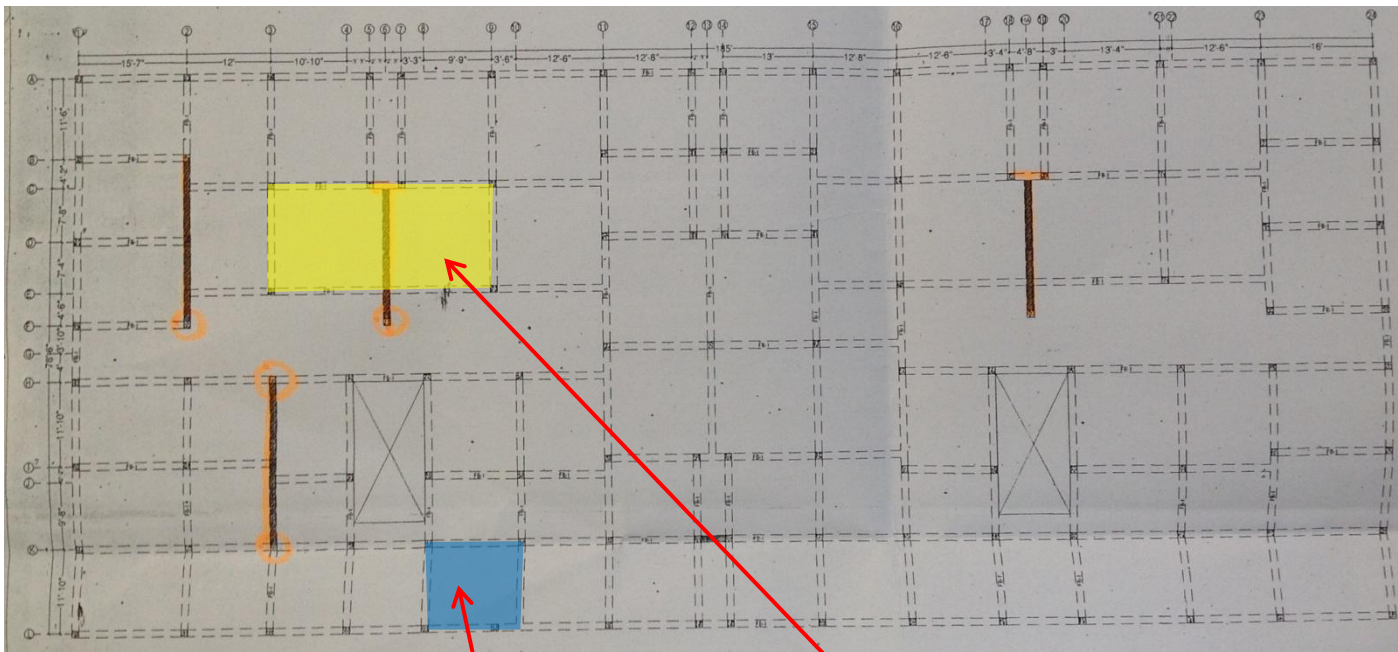


Column cracking



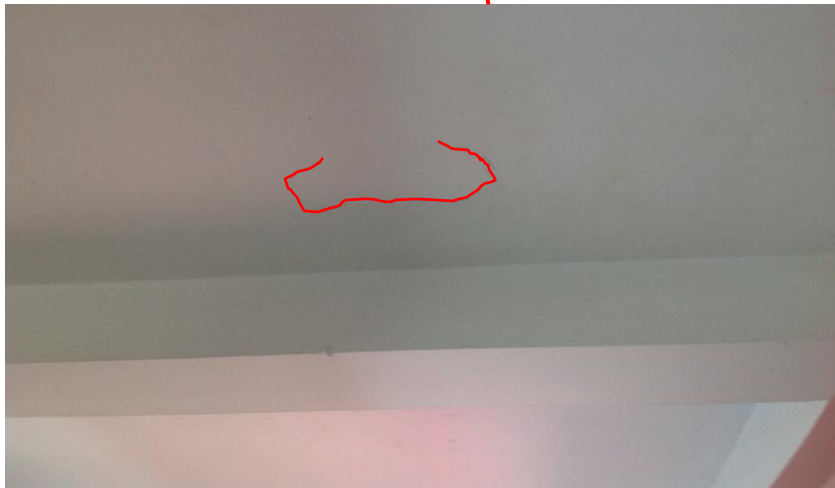
Column cracking

Cracking of columns and slabs



Typical Floor Plan

Beam and slab cracks to be reviewed by removing plaster to confirm that cracks do not extend into structure.



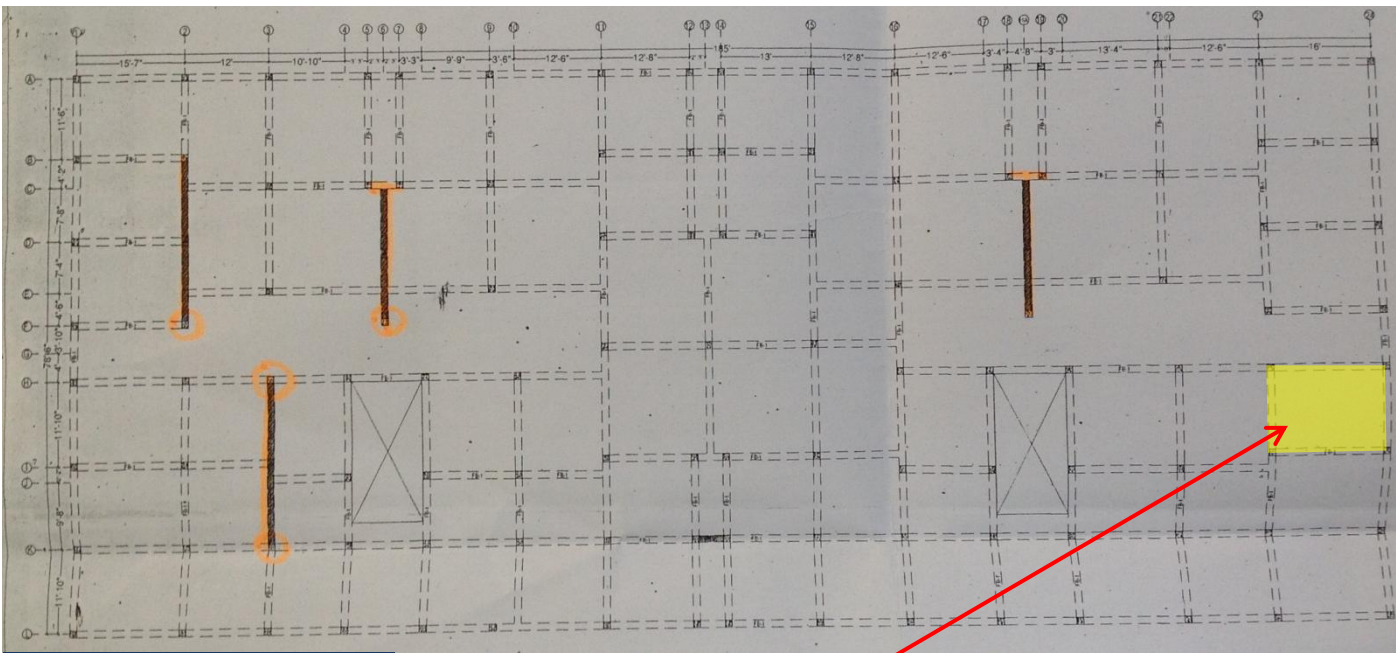
3rd Floor crack in slab soffit



2nd Floor crack in slab soffit

Cracking of columns and slabs

Management of loads on 3rd floor



Typical Floor Plan



3rd Floor storage area

Building Engineer to create controlled loading plans for all floors which will designate where storage can be placed.

Management of floor loads

Cracking of beams on soffit of all floors



Beam cracking

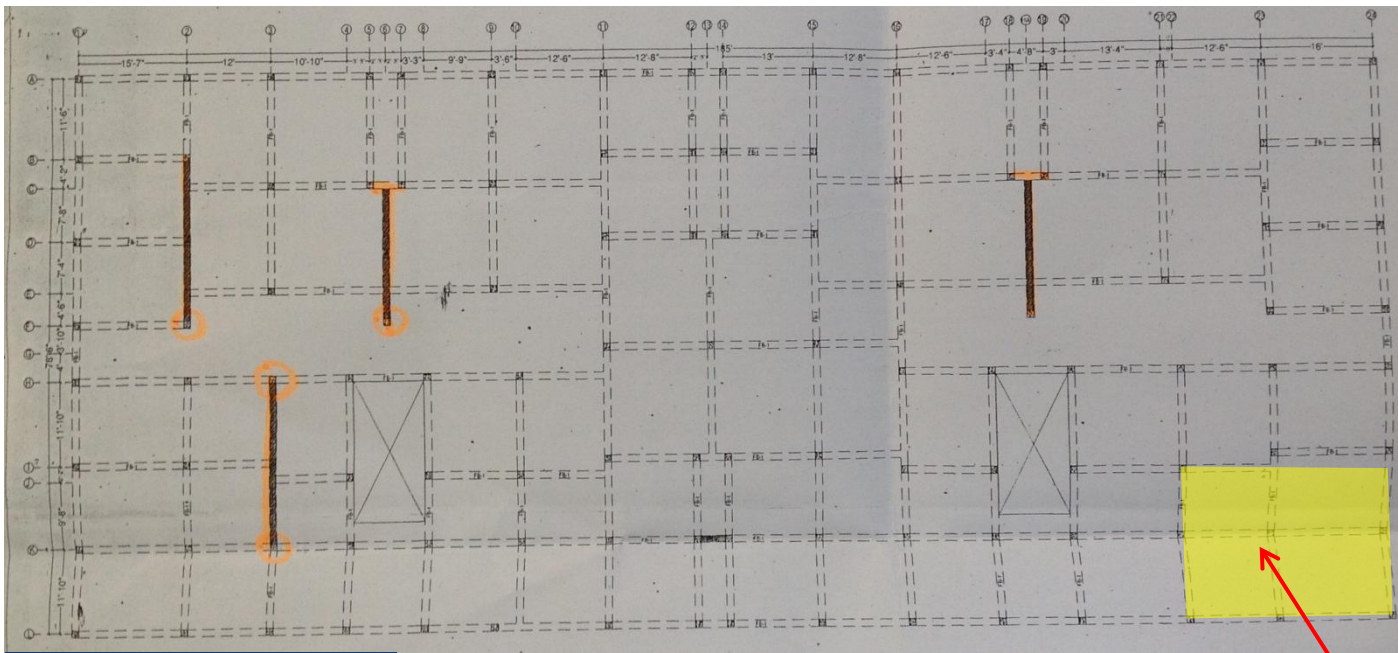


Beam cracking

Beam cracks on all floors to be reviewed by removing plaster to confirm that cracks do not extend into structure.

Cracking of downstand beams

Design check required for floor build-up in toilet area on 3rd floor to confirm floor slab load capacity



Floor Plan

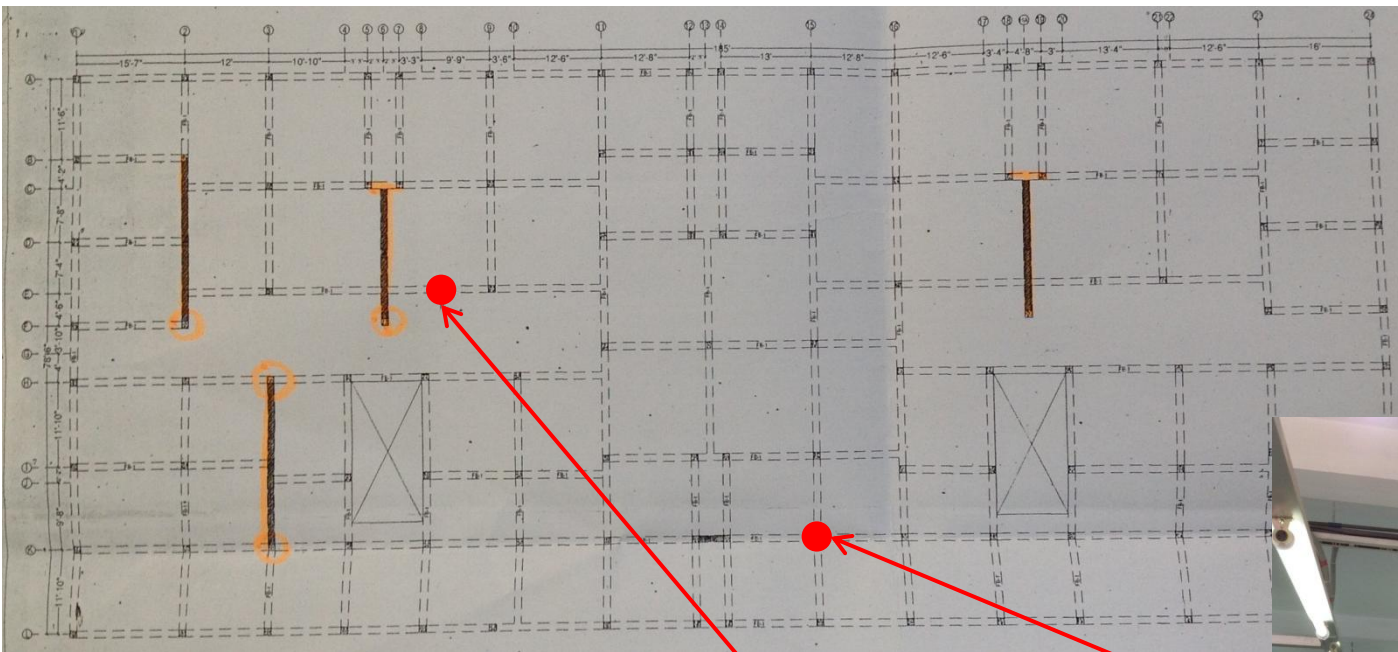
Building Engineer to review and confirm floor slab load capacity to carry floor build-up loading in toilet area.

Floor build-up design check



Floor build-up in toilet area

Redundant brick columns on 3rd floor may be supporting beam/slab above



Floor Plan

**2 No brickwork columns
(locations shown on plan)
to be removed**



Brickwork Column



RC Column



Brickwork column



Brickwork column

Redundant brick columns

Priority Actions

Problems Observed

ITEM 1: Columns appear to be stressed in excess of normal design limits

ITEM 2: Structural drawings not consistent with the as-constructed arrangement of the factory

ITEM 3: Check required to confirm that steel frame to lean-to entrance structure and steel stairs is adequately braced and designed to resist high wind loading.

ITEM 4: Cracking of 2 No columns on 3rd floor and cracking on the soffit of 3rd and 4th floor slabs

ITEM 5: Management of loads on 3rd floor

ITEM 6: Cracking of beams on soffit of all floors

ITEM 7: Design check required for floor build-up in toilet area on 3rd floor to confirm floor slab load capacity

ITEM 8: Redundant brick columns on 3rd floor may be supporting beam/slab above

Item No.	Observation	Recommended Action Plan	Priority
1	Columns appear to be stressed in excess of normal design limits	Detail Engineering Assessment of as built structure to be commenced as per attached scope. Verify insitu concrete strengths (using min. 4 no. 100mm dia. Cores) and existing reinforcement for all columns	Immediate - Now
2	Columns appear to be stressed in excess of normal design limits	Detail Engineering Assessment to be completed	6-weeks
3	Columns appear to be stressed in excess of normal design limits	Produce and actively manage a loading plan for all floors within the building giving consideration to floor capacity and column capacity.	6-weeks
4	Columns appear to be stressed in excess of normal design limits	Continue to implement load plan	6-months
5	Structural drawings not consistent with the as-constructed arrangement of the factory	As part of Detail Engineering Assessment, Building Engineer to commence re-survey of as-built structure and update drawings including a verification of the location of columns and floor beams.	Immediate - Now
6	Structural drawings not consistent with the as-constructed arrangement of the factory	Complete as-built survey and Detail Engineering Assessment	6-weeks
7	Structural drawings not consistent with the as-constructed arrangement of the factory	Produce and actively manage a loading plan for all floors within the Factory giving consideration to floor capacity and column capacity.(Refer to Item 1)	6-weeks
8	Structural drawings not consistent with the as-constructed arrangement of the factory	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	Priority
9	Check required to confirm that steel frame to lean-to entrance structure and steel stairs is adequately braced and designed to resist high wind loading.	Steel roofs to lean-to entrance structure and steel stairs - design should be checked by the Building Engineer to confirm that it includes the provision of a horizontal stability system and, if required, upgraded to support code vertical and wind loads.	6-weeks
10	Check required to confirm that steel frame to lean-to entrance structure and steel stairs is adequately braced and designed to resist high wind loading.	Completeness of steelwork connections should be checked on site.	6-months
11	Cracking of 2 No columns on 3rd floor and cracking on the soffit of 3rd and 4th floor slabs	Sections of plaster finish to columns and slabs to be removed to investigate if cracks penetrate the building structure.	6-weeks
12	Cracking of 2 No columns on 3rd floor and cracking on the soffit of 3rd and 4th floor slabs	Building Engineer to carry out design check on columns and slabs to confirm that these cracks are non-structural.	6-weeks
13	Cracking of 2 No columns on 3rd floor and cracking on the soffit of 3rd and 4th floor slabs	Building Engineer to prepare Allowable Floor Loading Plans.	6-months
14	Management of loads on 3rd floor	Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity. (Refer to Item 1)	6-weeks
15	Management of loads on 3rd floor	Continue to implement load management plan	6-months

Item No.	Observation	Recommended Action Plan	Priority
16	Cracking of beams on soffit of all floors	Sections of plaster finish to beams to be removed to investigate if cracks penetrate the building structure.	6-weeks
17	Cracking of beams on soffit of all floors	Building Engineer to carry out design check on beams to confirm that these cracks are non-structural.	6-months
18	Cracking of beams on soffit of all floors	Building Engineer to prepare Allowable Floor Loading Plans.	6-months
19	Design check required for floor build-up in toilet area on 3rd floor to confirm floor slab load capacity	Extent of build-up loading within toilet areas to be surveyed and capacity of floor slab to be assessed to confirm that the floor slab is designed to carry these loads.	6-weeks
20	Design check required for floor build-up in toilet area on 3rd floor to confirm floor slab load capacity	Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity including floor slab and column capacity.	6-weeks
21	Design check required for floor build-up in toilet area on 3rd floor to confirm floor slab load capacity	Continue to implement load plan.	6-months
22	Redundant brick columns on 3rd floor may be supporting beam/slab above	Building Engineer to confirm that brick columns are non structural and that they may be removed to avoid providing an alternative support point to the beam above which will not have been allowed for by the building designer.	6-weeks
23	Redundant brick columns on 3rd floor may be supporting beam/slab above	Following confirmation by the Building Engineer, two plastered brick columns to be removed.	6-months