Radisson Garments Ltd.

Plot # B-84, BSCIC, Tongi, Gazipur-1710
(N23.8930°, E90.4136°)
4th April 2015

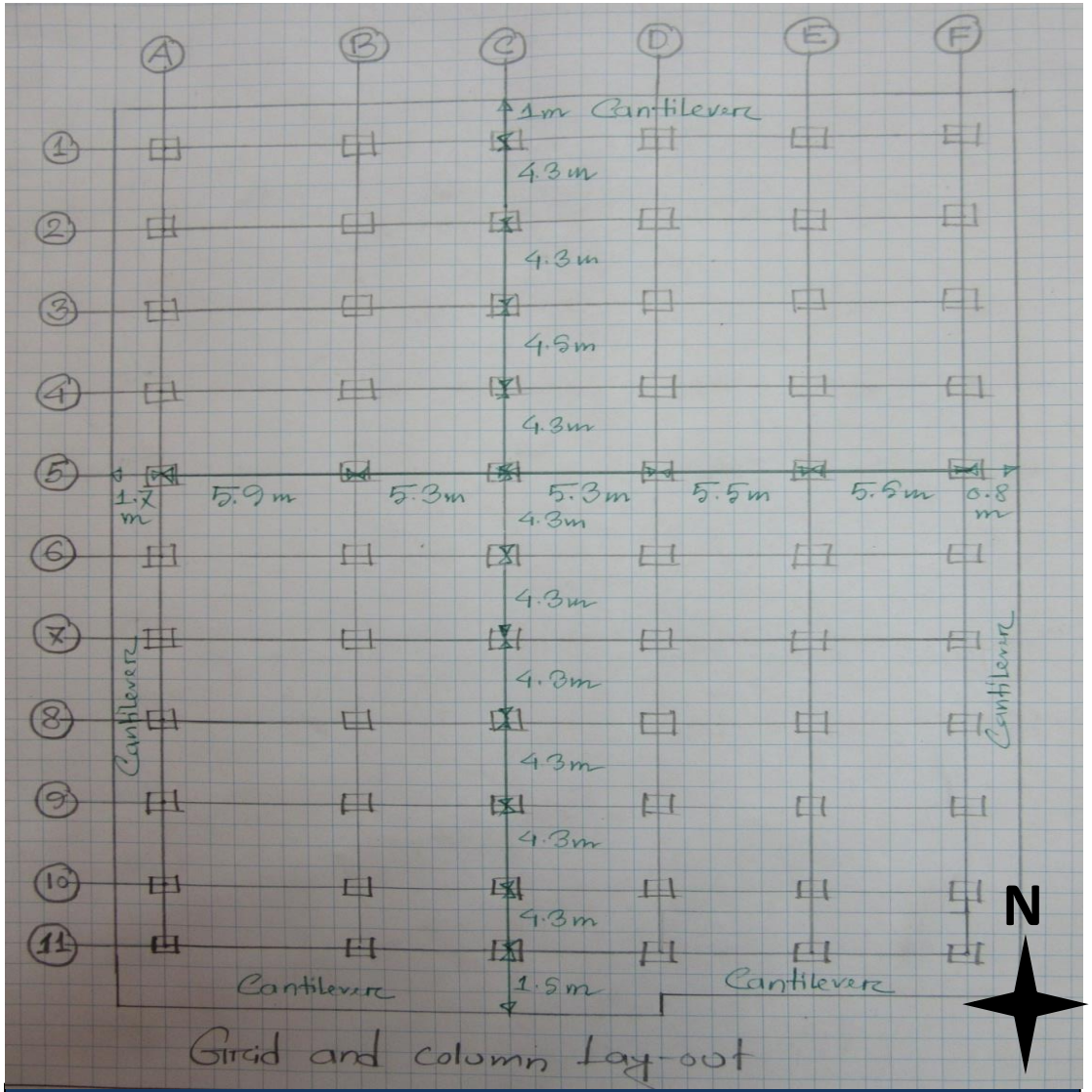
ACCORD on Fire and Building Safety in Bangladesh

ARUP

Observations

Apparently high stress levels in the columns

Observations



Cursory calculations indicate that the columns at the Ground Floor are highly stressed.

Observations

ACCORD on Fire and Building Safety in Bangladesh ARUP

Heavily-loaded areas

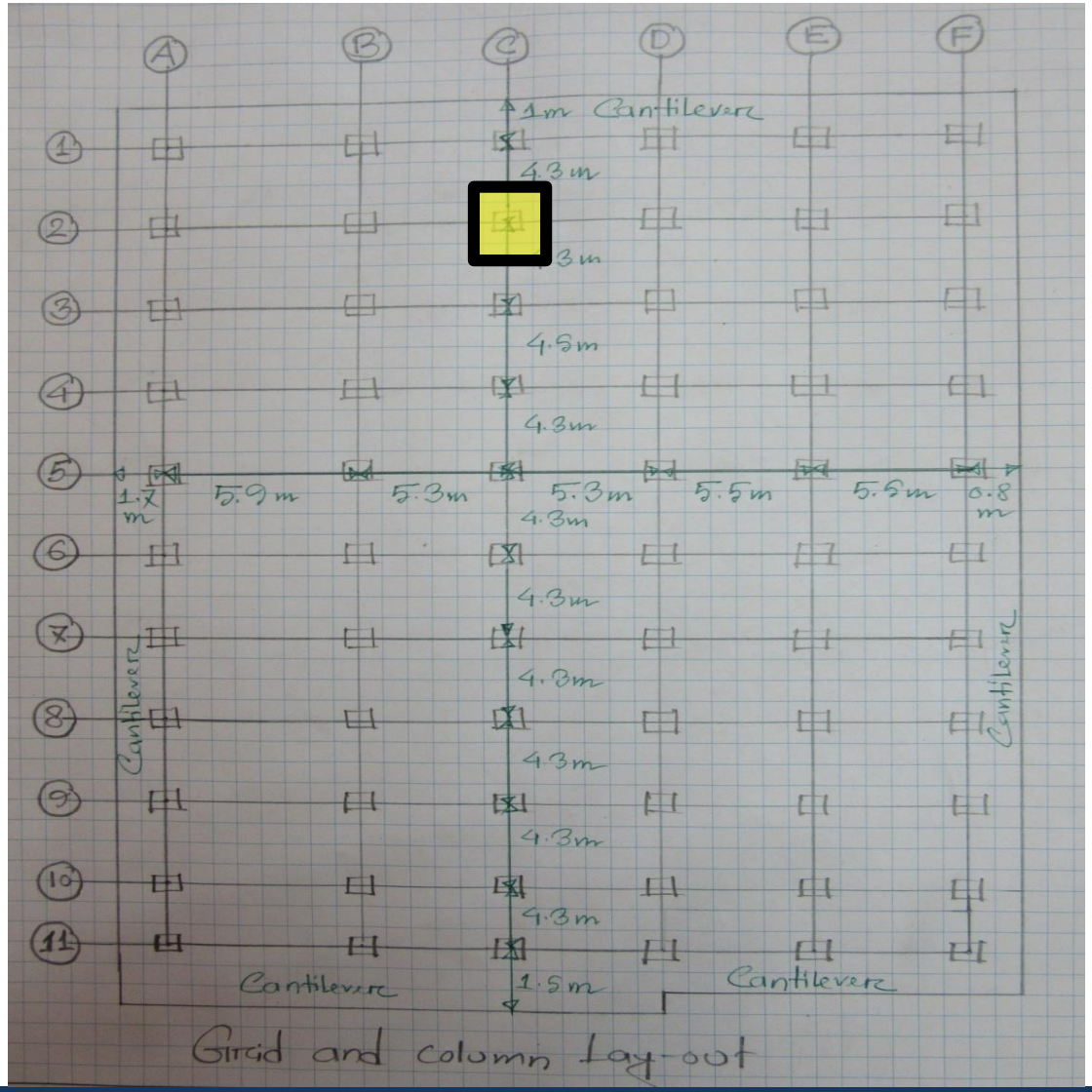
Observations

Loading of finished goods on 2nd and 1st floor level

Observations

Apparently small sized load transfer structure

Observations



The indicated column is present in the upper floors but absent on Ground, First and Second floors. Instead there are apparently small sized load transfer structure which is not indicate in the Design documentation. In the original design documentation the column is present all the floors.

Observations

ACCORD on Fire and Building Safety in Bangladesh ARUP

Cracks in the structural elements

Observations

Cracks in different structural elements

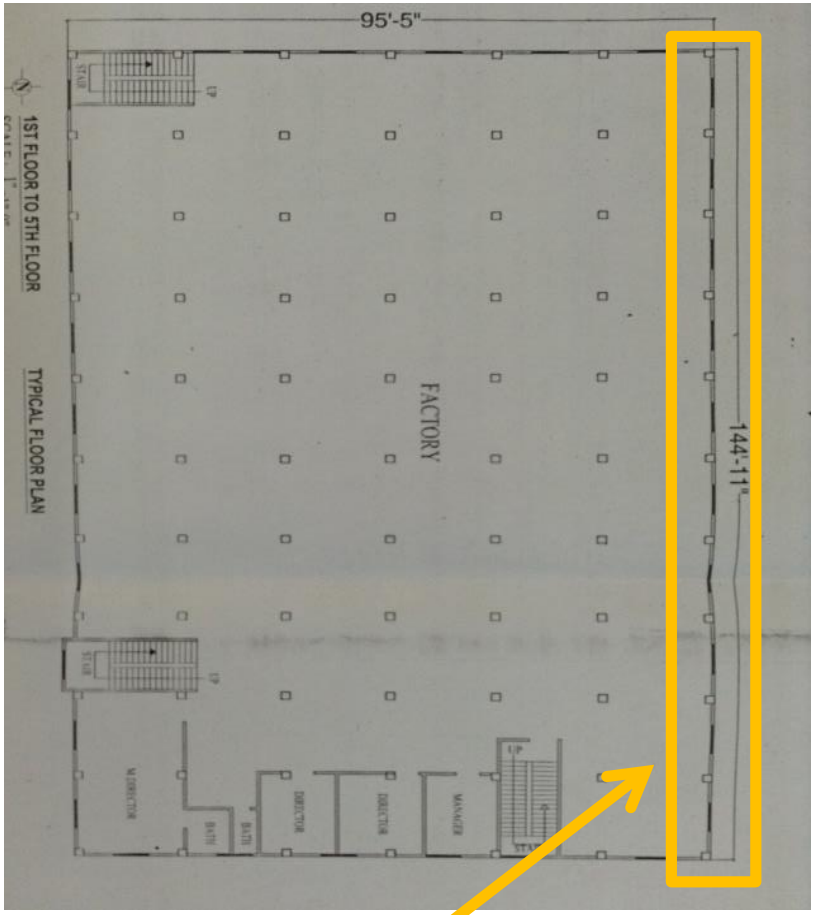
Observations

ACCORD on Fire and Building Safety in Bangladesh

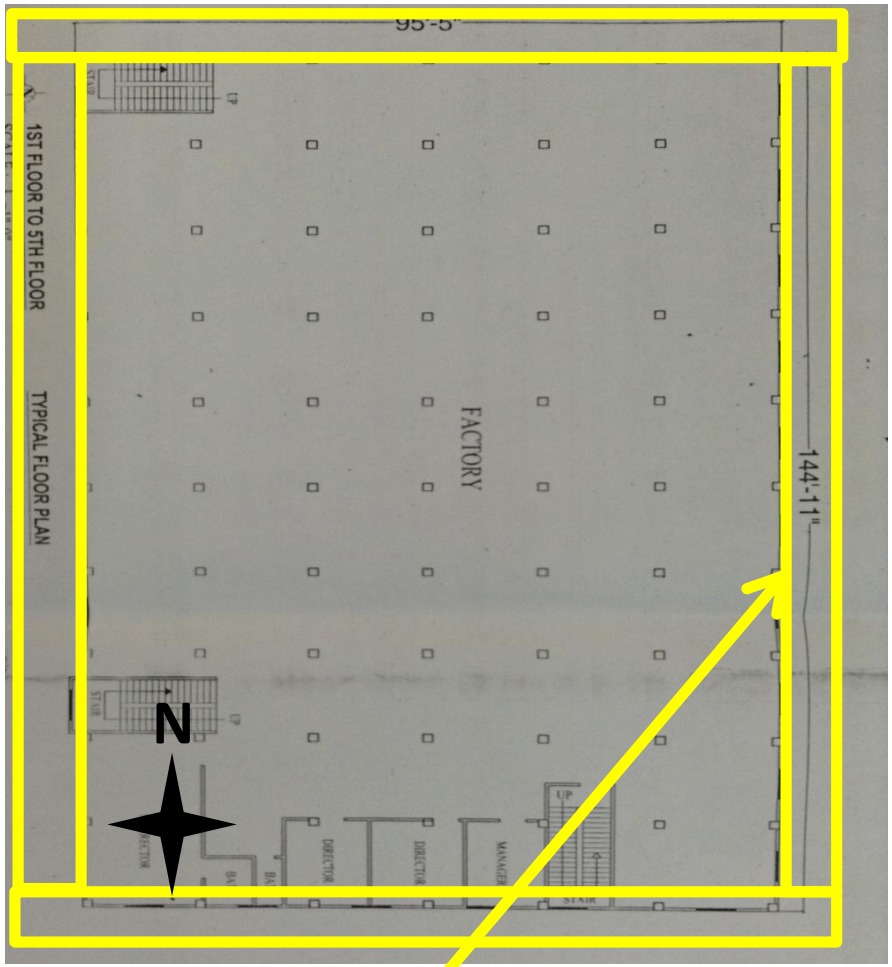
ARUP

Discrepancies between permit drawing, design drawings and as-built structure

Observations



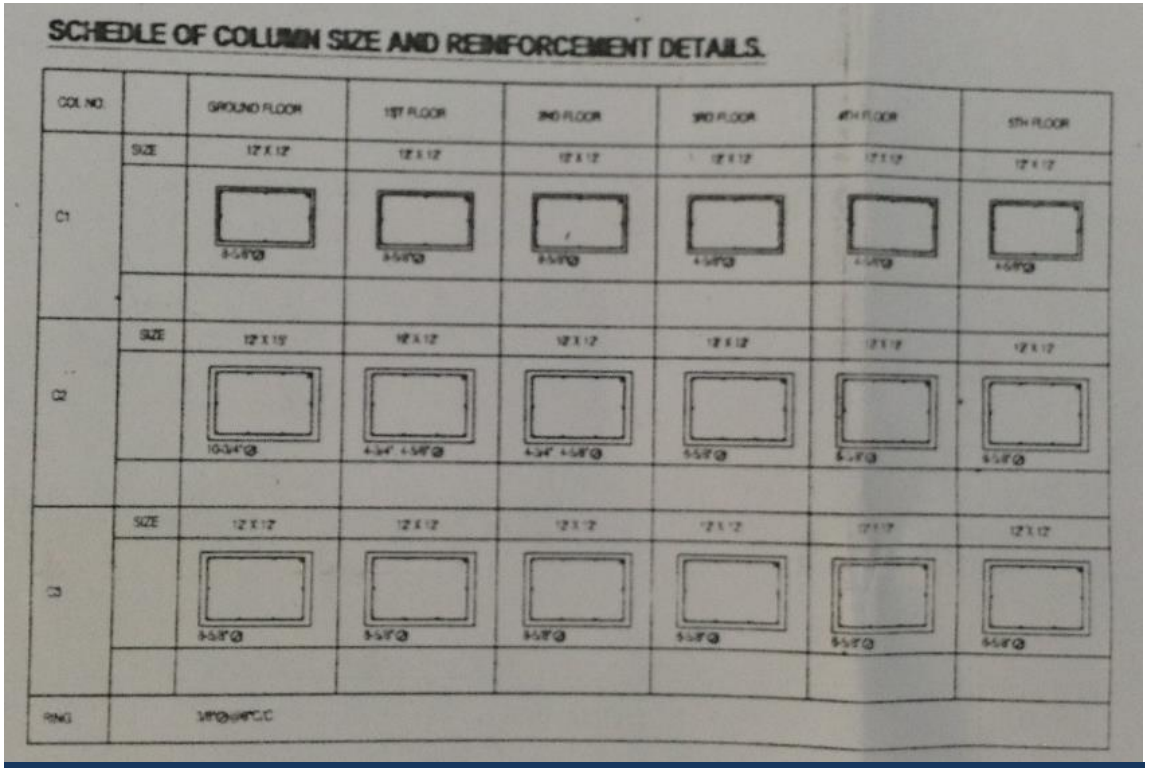
This row of columns shown in the permit drawings is absent in the as-built structure



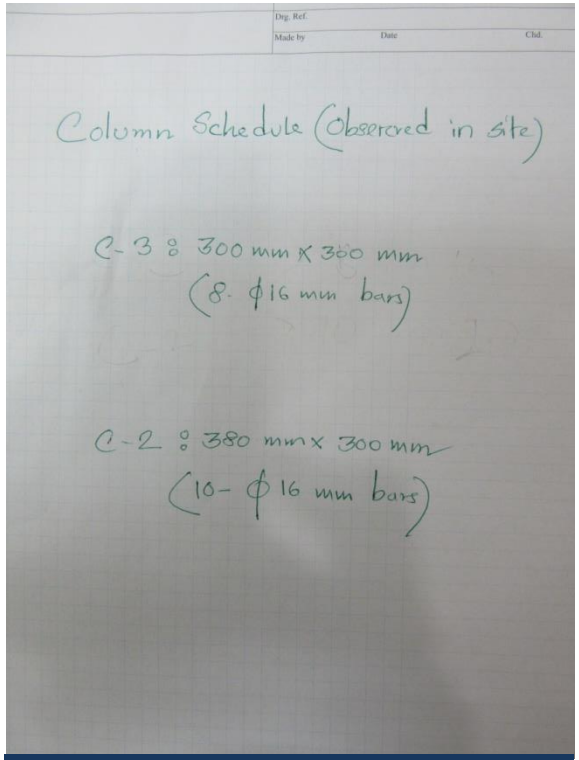
Cantilevers at four sides (5th & 4th floor) and at north and east sides (3rd ,2nd and 1st floor) are not shown in the permit drawings

Observations

ACCORD on Fire and Building Safety in Bangladesh ARUP



Column dimensions in drawing schedule



Observed column details

Column dimensions and reinforcement details shown on the drawing schedule differ from what we observed on site

Observations

ACCORD on Fire and Building Safety in Bangladesh

ARUP

Non-permitted additional rooftop structures

Observations

Additional rooftop structure for mobile transmission tower was not shown in the permit drawings.

Observations

Additional rooftop structure for RC water tank was not shown in the permit drawings.

Observations

Problems observed

1. Apparently high stress levels in the columns.
2. Heavily-loaded areas.
3. Apparently small sized load transfer structure.
4. Cracks in the structural elements.
5. Discrepancies between permit drawing, design drawings and as-built structure.
6. Non-permitted additional rooftop structures.

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Apparently high stress levels in the columns	Building Engineer to review design, loads and column stresses in all columns.	**Immediate - Now**
2	Apparently high stress levels in the columns	Verify in-situ concrete stresses by 100mm dia. cores from 4 min. columns in each building.	**Immediate - Now**
3	Apparently high stress levels in the columns	A Detail Engineering Assessment to be commenced, see attached Scope.	**Immediate - Now**
4	Apparently high stress levels in the columns	Live load to be limited to 1.5kPa at all levels, pending outcome of Detail Engineering Assessment	**Immediate - Now**
5	Apparently high stress levels in the columns	Detail Engineering Assessment to be completed	**6-weeks**
6	Apparently high stress levels in the columns	Produce and actively manage a loading plan for all floor plates within the Buildings, giving consideration to floor capacity and column capacity.	**6-weeks**
7	Apparently high stress levels in the columns	Actions identified in the Detail Engineering Assessment to be implemented.	**6-months**
8	Apparently high stress levels in the columns	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
9	Heavily-loaded areas	Pending the outcome of the Detail Engineering Assessment (see Item 1), live load to be limited to 1,5 kPa at all levels.	**Immediate - Now**
10	Heavily-loaded areas	As part of the Detail Engineering Assessment (see Item 1), Building Engineer to confirm design loading of slabs and incorporate it into the loading plan for all floor plates within the Building.	**6-weeks**
11	Heavily-loaded areas	Continue to implement the load management plan	**6-months**
12	Apparently small sized load transfer structure.	As part of the Detail Engineering Assessment (see Item 1), Building Engineer to carry out a design check to the load transfer structure on all the floors.	**6-weeks**
13	Apparently small sized load transfer structure.	Reconstruct or repair load transfer structure as necessary to ensure code adequacy.	**6-months**
14	Cracks in the structural elements	As part of the Detail Engineering Assessment (see Item 1), Building Engineer to investigate the reasons for the crack formation.	**6-weeks**
15	Cracks in the structural elements	Define the necessary remedial works.	**6-weeks**
16	Cracks in the structural elements	Monitor cracks to beams, slabs, columns and facades. Engage a Building Engineer to investigate if cracks are only in the internal plastering.	**6-months**
17	Cracks in the structural elements	Building Engineer to advise on load reduction and repair and strengthening of the structure if required.	**6-months**

Item No.	Observation	Recommended Action Plan	Recommended Timeline
18	Discrepancies between permit drawing, design drawings and as-built structure	As part of the Detail Engineering Assessment (see Item 1), Building Engineer to survey the as-built structure, including as-built floor finish thickness.	**6-weeks**
19	Discrepancies between permit drawing, design drawings and as-built structure	Building Engineer to produce accurate as-built drawings.	**6-months**
20	Non-permitted additional rooftop structures	As part of the Detail Engineering Assessment (see Item 1), Building Engineer to assess the additional rooftop structures in terms of their own engineering robustness and stability, and also their effect on the supporting structures.	**6-weeks**
21	Non-permitted additional rooftop structures	Repair or remove the additional rooftop structures as directed by the Building Engineer.	**6-months**
22	Non-permitted additional rooftop structures	Carry out any structural works as required to the supporting structures.	**6-months**