Fiat Fashion Ltd

878,879 Sharifpur, Gazipur Sadar, Gazipur, Dhaka
(+ 23.966146 N, 90.37799 E)

07 November 2013

ACCORD on Fire and Building Safety in Bangladesh

ARUP

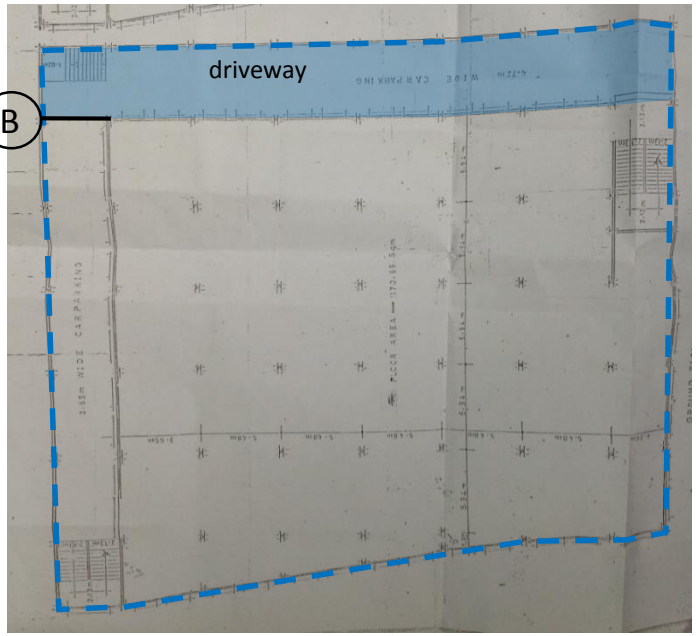
Building Observations

Check required on column design

Cursory calculations indicate column working stress is at high level for edge columns and along Grid B

Engineer is to perform detailed calculations and concrete tests to prove column size and (if required) :

- Reduce loads by vacating floors
- Reinforce columns

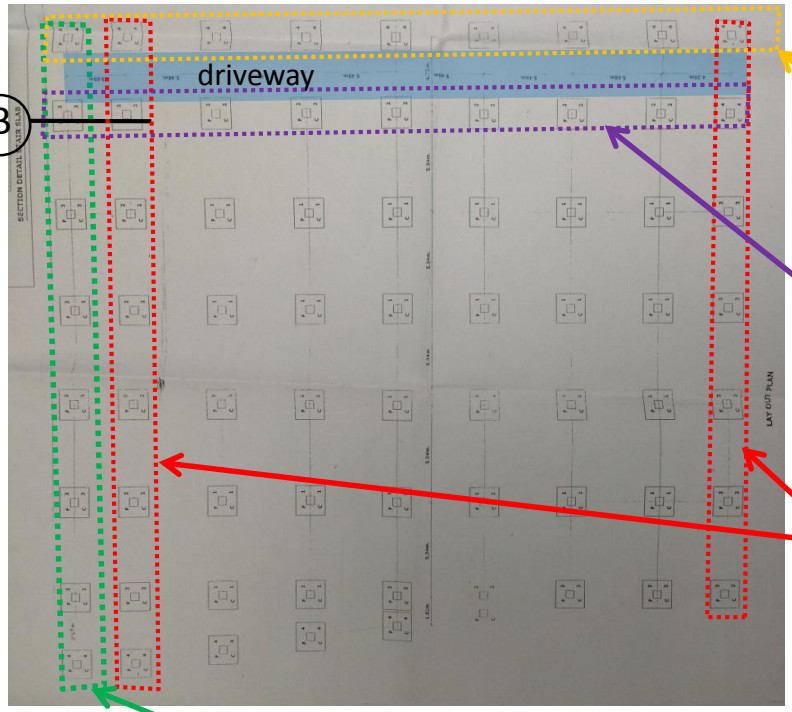


Testing carried out.
Column material is found to be brick chip aggregate

Check column design required

ACCORD on Fire and Building Safety in Bangladesh ARUP

As built drawings

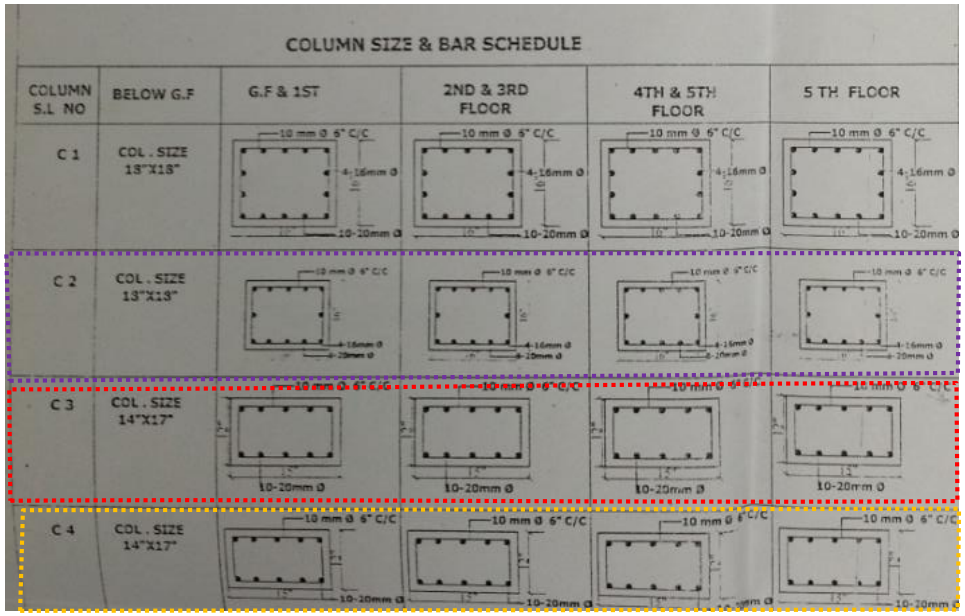


Edge Columns
Per drawing: 356mm x 430mm (14”x17”)
Measured on site: 250mm x 370mm

Grid B Columns
Per drawing: 457mm x 457mm (18”x 18”)
Measured on site: 380mm x 300mm

Edge columns support a 2m cantilever slab, which is not represented on the drawings

This column line does not exist

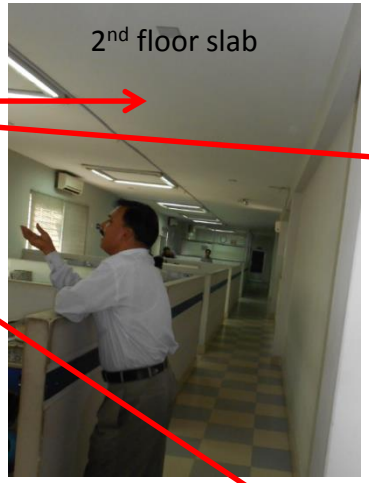


Current structural drawings do now match the as built conditions – accurate as built drawings are required

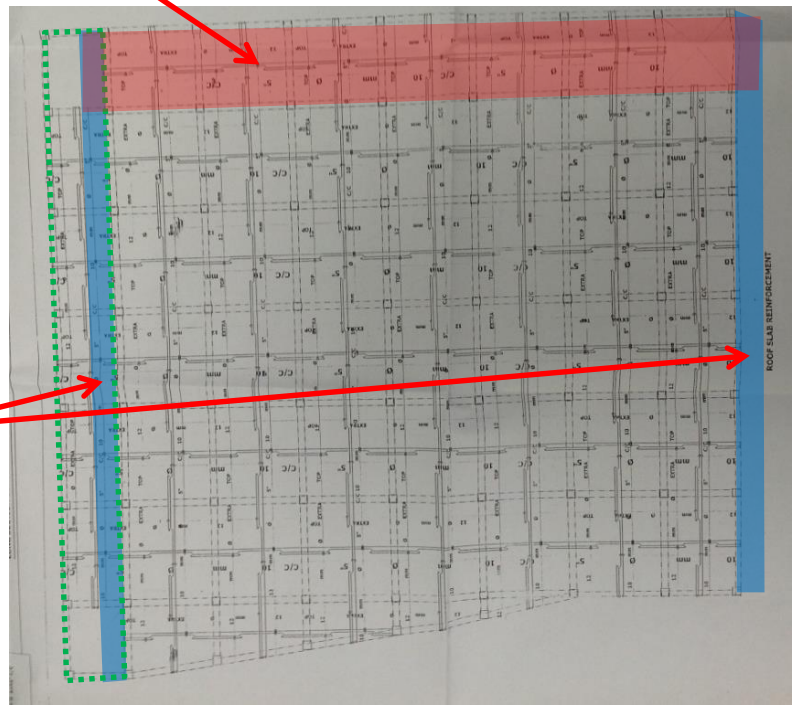
As built drawings

ACCORD on Fire and Building Safety in Bangladesh ARUP

No downstand beams in this area. This is not reflected on the drawings



2m cantilever is not shown on drawings



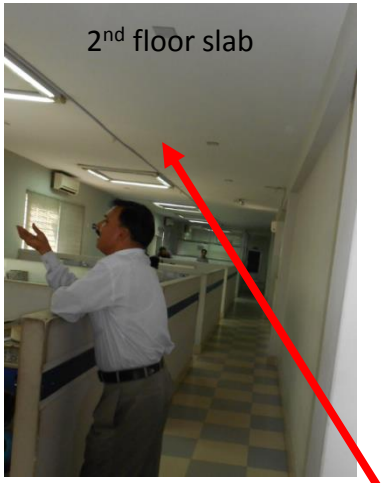
Current structural drawings do now match the as built conditions – accurate as built drawings are required

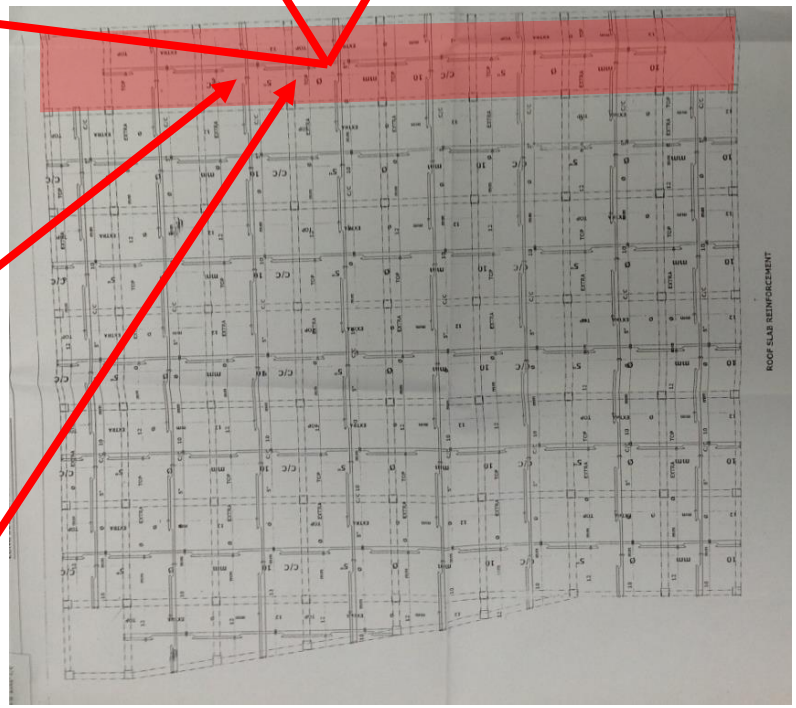
As built drawings

ACCORD on Fire and Building Safety in Bangladesh

ARUP

Check required on slab design





Heavy additional loads due to 500mm raised floor on 1st floor office area

As built condition shows no beam at this location (Drawings assume beams at in all bays)

Check on slab design required

ACCORD on Fire and Building Safety in Bangladesh ARUP

Load Management

Permanent loading due to raised floors and partition walls:

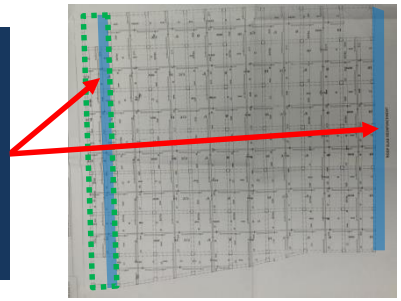



Factory loading on cantilevers and in storage areas:



Engineer to produce loading plans based on as built conditions.
Load management set in place.

Cantilever slabs are not part of the existing design drawings



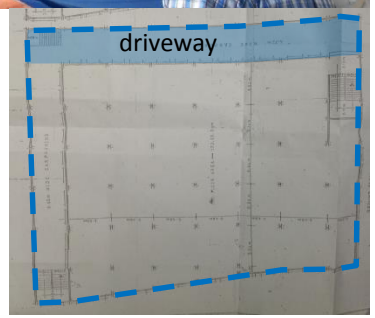
Load Management

ACCORD on Fire and Building Safety in Bangladesh ARUP

Fabric bag pile loading perimeter columns

Fabric bag pile loading perimeter columns

Do not store loads against wall and columns, on either side of the wall



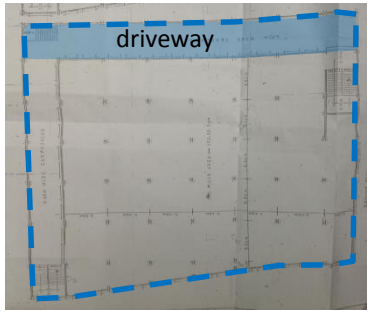
Loading

ACCORD on Fire and Building Safety in Bangladesh

ARUP

Protect columns from Vehicle Impact

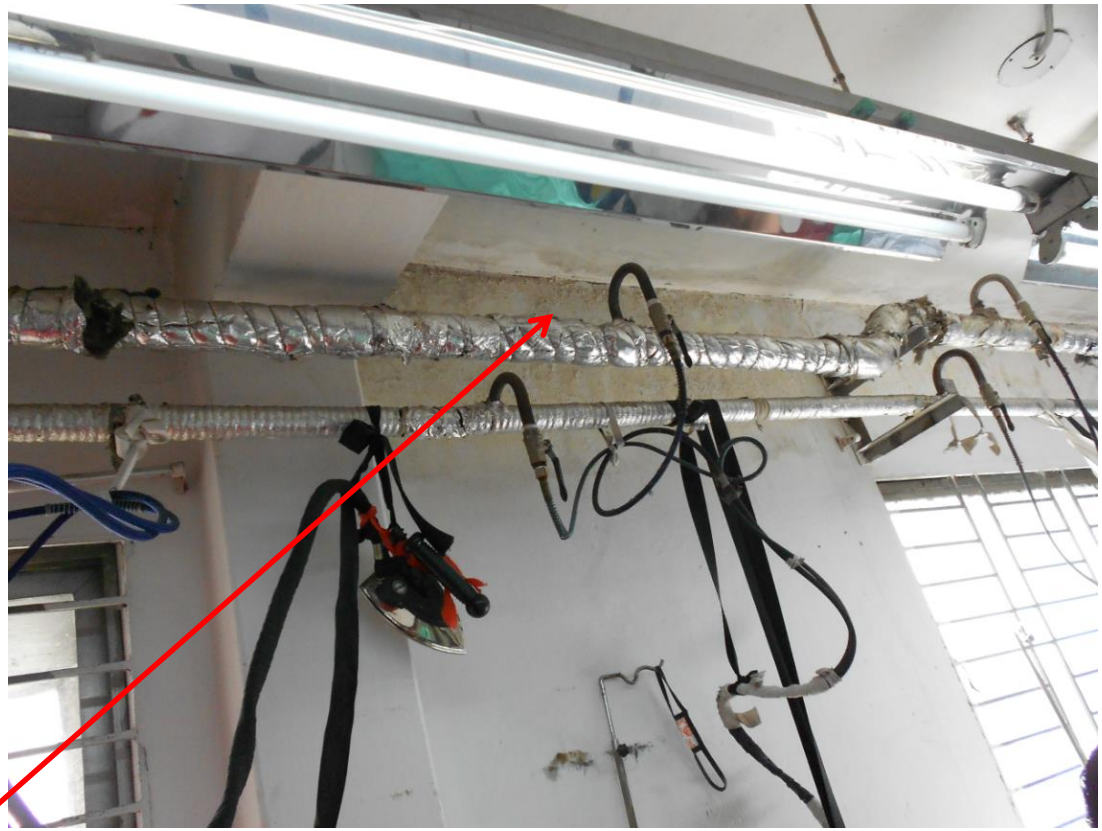
Columns on all sides of the driveway to be protected from vehicle impact



Vehicule Impact Protection

ACCORD on Fire and Building Safety in Bangladesh ARUP

Water causing damage and risk or corrosion



Water damage due to condensation from ironing

Water causing damage and risk of corrosion

ACCORD on Fire and Building Safety in Bangladesh ARUP

Priority Actions

Problems Observed

1. Engineer to check column stress and in-situ column strengths
2. Engineer to check slab and beam design and provide loading plans (cantilevers not on plans, beams missing, high build up loads)
3. Accurate as-built drawings shall be produced
4. Protect ground floor columns in delivery driveway from vehicle impact
5. Do not use driveway as loading area to avoid lateral loading on edge columns until column design is verified
6. Risk of water damage and corrosion to beams along ironing tables

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Engineer to check column stress and in-situ column strengths	Remove storage loading and other heavy loading from all cantilever bays and bay above drive way. Do not use these areas for storage of loads. Maintain loads below 2kPa	**Immediate - Now**
2	Engineer to check column stress and in-situ column strengths	Engineer to review design and calculations based on as built condition.	**Immediate - Now**
3	Engineer to check column stress and in-situ column strengths	Verify insitu concrete stresses either by cores or existing cylinder strength data.	**Immediate - Now**
4	Engineer to check column stress and in-situ column strengths	A Detail Engineering Assessment of Factory to be commenced, see attached Scope	**Immediate - Now**
5	Engineer to check column stress and in-situ column strengths	Propose strengthening if required	**6-weeks**
6	Engineer to check column stress and in-situ column strengths	Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.	**6-weeks**
7	Engineer to check column stress and in-situ column strengths	Detail Engineering Assessment to be completed	**6-weeks**
8	Engineer to check column stress and in-situ column strengths	Continue to implement load plan	**6-months**
9	Engineer to check slab and beam design and provide loading plans (cantilevers not on plans, beams missing, high build up loads)	Engineer to verify design of cantilever slabs and slab areas with high build-up of loads (eg bay at 1st floor over driveway – see pg. 17). See also Item 1 and requirement for Detail Engineering Assessment	**6-weeks**

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
10	Engineer to check slab and beam design and provide loading plans (cantilevers not on plans, beams missing, high build up loads)	Carry out strengthening or load reduction if required	**6-months**
11	Accurate as-built drawings shall be produced	Accurate as built drawings shall be produced – see also Item 1	**6-weeks**
12	Protect ground floor columns in delivery driveway from vehicle impact	Implement protection measures to prevent vehicle impact on columns	**6-weeks**
13	Do not use driveway as loading area to avoid lateral loading on edge columns until column design is verified	Avoid lateral loading on edge columns until column design is verified	**Immediate - Now**
14	Risk of water damage and corrosion to beams along ironing tables	Provide sufficient ventilation to avoid further damage due to condensation	**6-months**