SQ Birichina Ltd Unit 2

(previously SQ Colblanc Limited & SQ HUES LTD.)

SQ Station, Jamirdia, Bhaluka, Mymensingh
(24.283 N, 90.392 E)
19 October 2015

ACCORD on Fire and Building Safety in Bangladesh

ARUP

Observations

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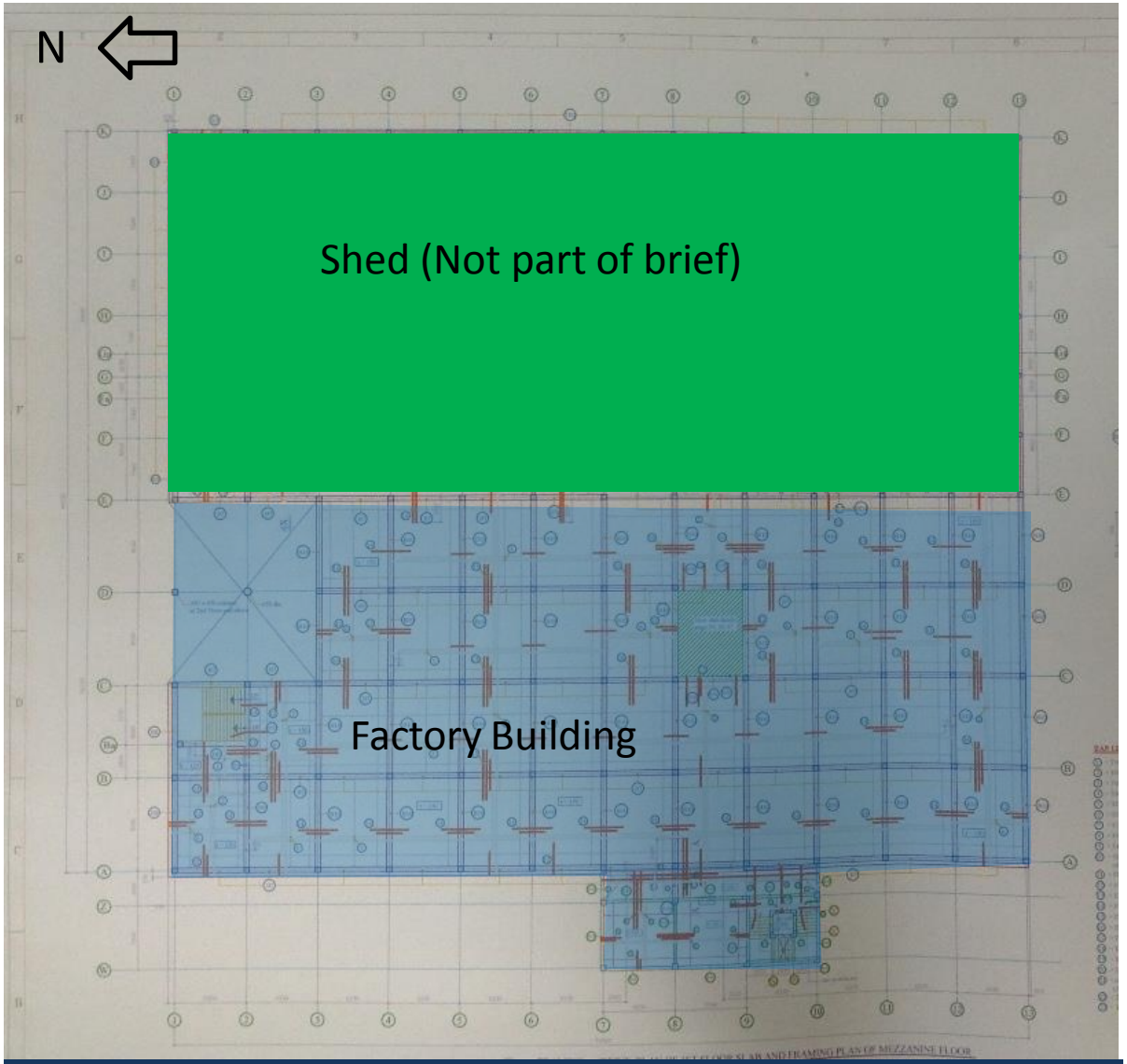
- Heavily loaded columns at ground floor particularly at eastern side
- High punching shear around flat slab columns (2^{nd} – 4^{th} floors)
- Machinery on the 1^{st} floor. Heavy floor loads
- Discrepancies between structural drawings and “as constructed” drawings.
- Composite beams appear to be underdesigned
- Column in loading bay is unprotected from traffic impact. (Possible signs of previous collisions)
- Water Tank on roof resulting in heavy loads

Heavily Loaded Columns



Heavily Loaded Columns (all columns)

All columns are heavily loaded under current loading conditions at ground and first floors and should be reviewed immediately.

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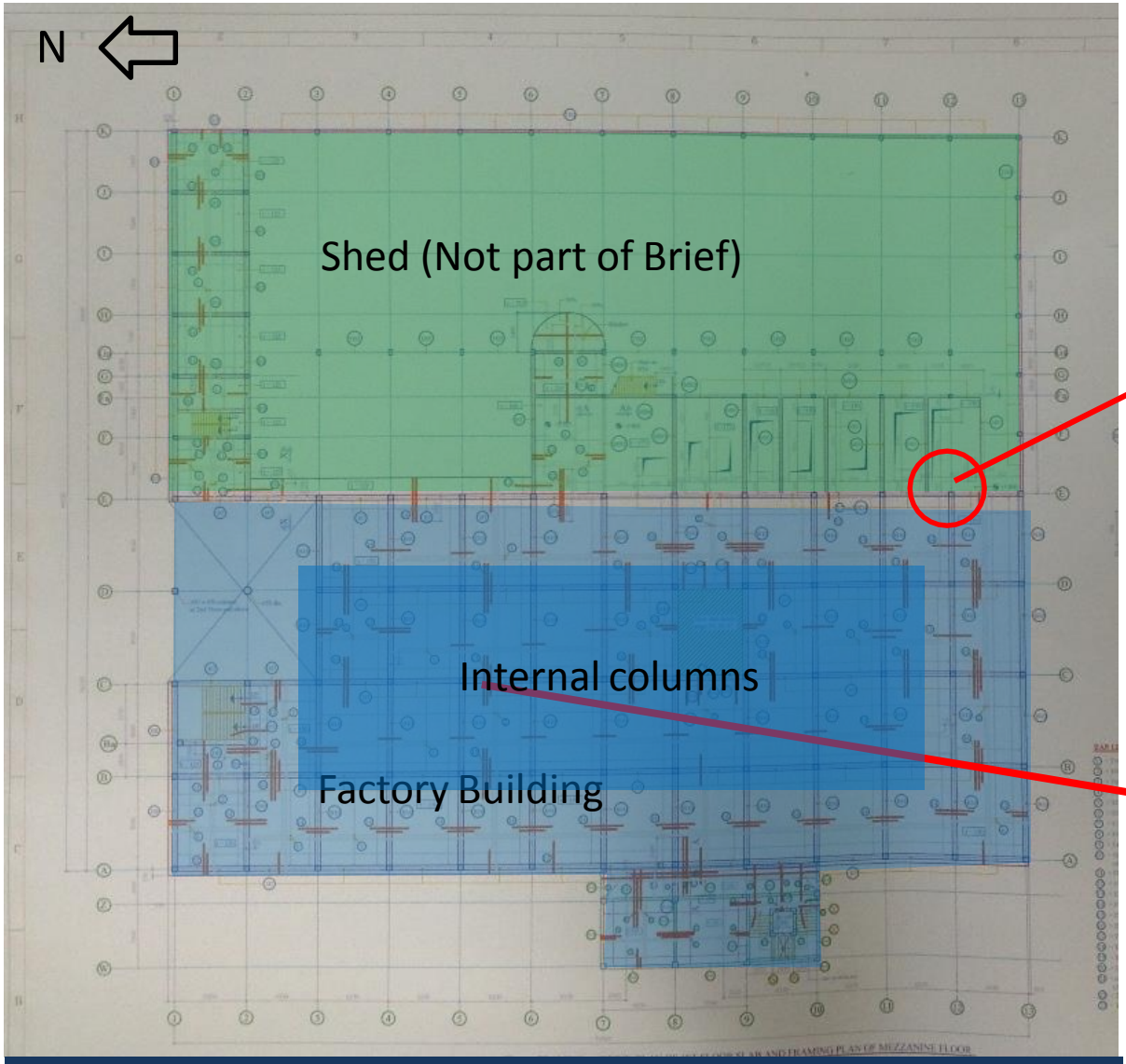

Heavily loaded columns (all columns)

Crane adds loading to some perimeter columns.

Water tank adds additional loads to some columns.

Water tank

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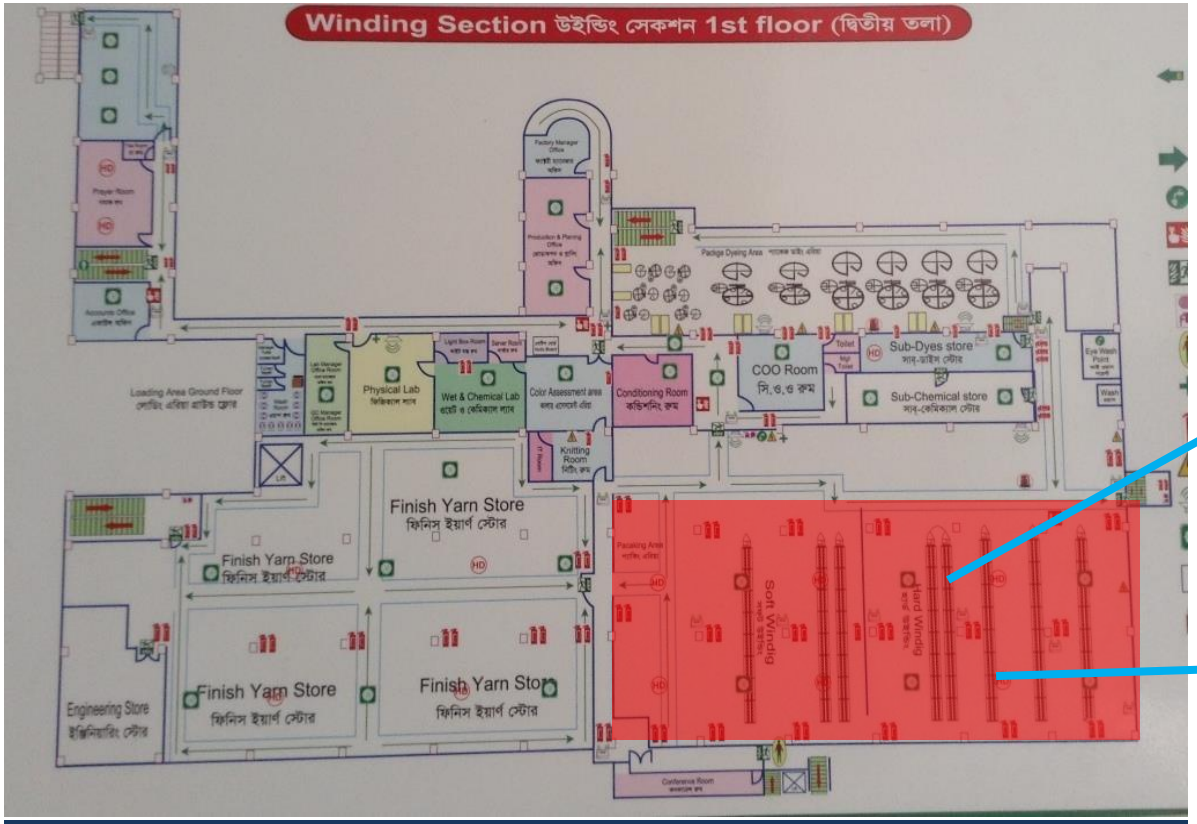
Heavy floor load



Heavy machinery on the 1st floor

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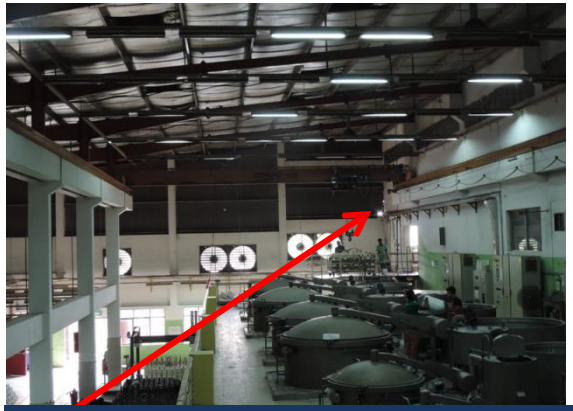
Discrepancies between structural drawings and “as constructed” drawings

N

The shape of mezzanine is different on the drawings.



No gantry crane shown on drawings.

Tanks are not shown on the drawings.
Different mezzanine configuration.

Different use from that shown on drawings

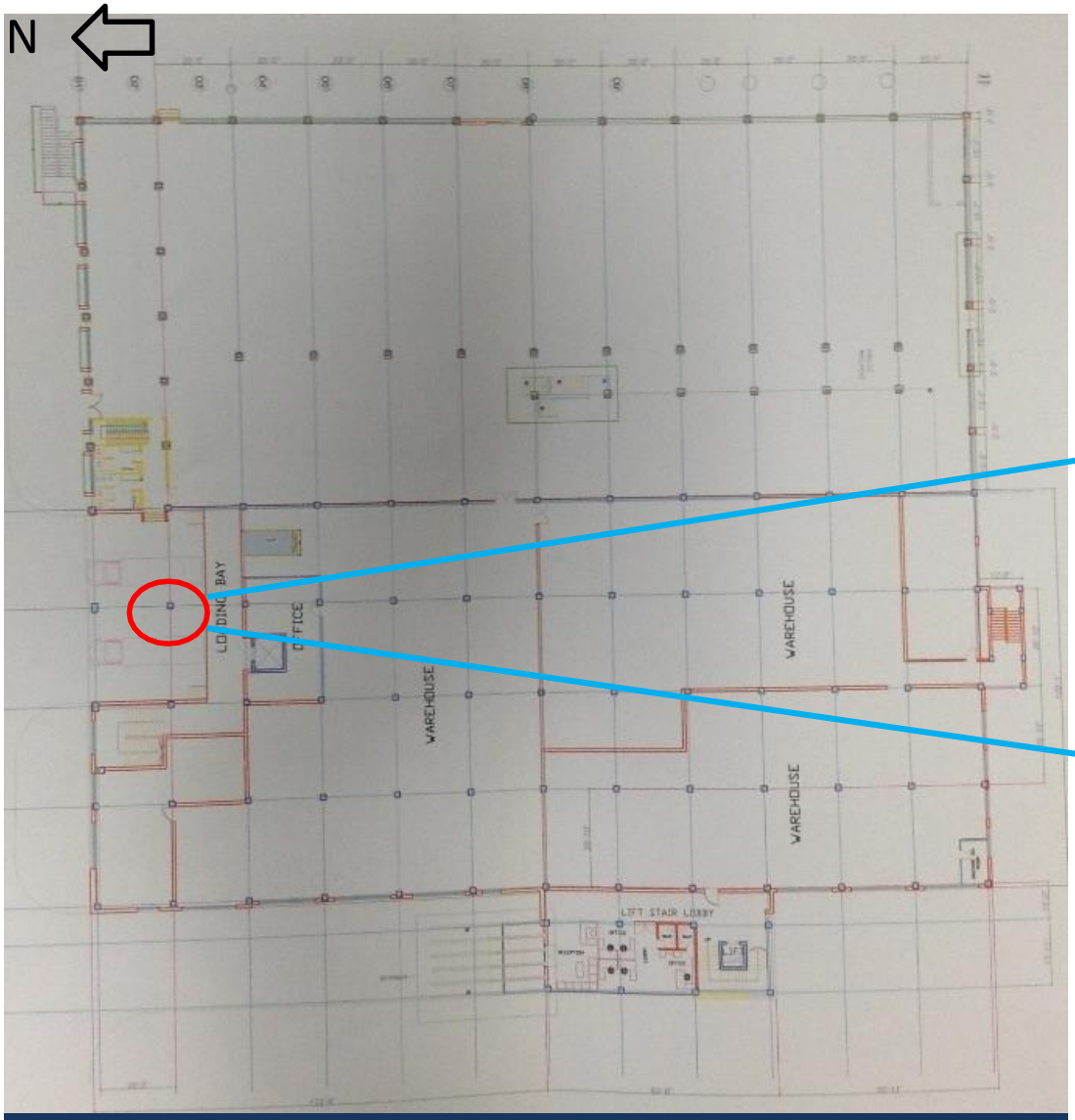
Factory Building Plan

Observations

Composite beams appear to be under-designed

Composite beams appear under designed. Flange thickness circa 5mm.

Column in loading bay unprotected from truck impact



Factory Building Plan

Unprotected column in front of loading bay at north . Signs of impact on side of column

Observations

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Water tank on composite deck roof

Water tank adjacent to lift room. Partially supported by lift core and partially supported on roof deck

Observations

Priority Actions

Item 1:- High stresses in all columns

Item 2:- High punching shear around flat slab columns (2^{nd} – 4^{th} floors)

Item 3:- Machinery on the 1^{st} floor. Heavy floor load

Item 4:- Discrepancies between structural drawings and as constructed.

Item 5:- Composite beams appear to be light

Item 6:- Column in loading bay unprotected from traffic. (possible signs of previous collisions)

Item 7:- Water Tank on roof resulting in heavy loads

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Heavy loaded columns	Maintain current use of the floors and don´t change use or increase occupation, either of which could increase loading. Restrict Crane loading to 2 tonne.	**Immediate - Now**
2	Heavy loaded columns	Factory Engineer to review design, loads and columns stresses in all columns at ground floor and first floor.	**Immediate - Now**
3	Heavy loaded columns	Verify in situ concrete strength either by taking 100mm diameter cores from a min of 4 columns in the original building or by using existing cylinder strength data. Verify grade of steel reinforcement.	**Immediate - Now**
4	Heavy loaded columns	A Detail Engineering Assessment of Factory to be commenced, see attached Scope. This should include an assessment of the as built pad foundations.	**Immediate - Now**
5	Heavy loaded 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**
6	Heavy loaded columns	Detail Engineering Assessment to be completed.	**6-weeks**
7	Heavy loaded 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. 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 Elevational 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	High Punching shear around flat slab columns (2nd – 4th floor)	As part of the DEA Building Engineer to review design, loads and columns stresses in areas identified above. Verify insitu concrete strength either by 100mm dia. cores or existing cylinder strength data for slabs.	**6-weeks**
10	High Punching shear around flat slab columns (2nd – 4th floor)	Carry out any load reduction and maintain restriction based on recommendations made by the Building Engineer.	**6-months**
12	Machinery on the 1st floor. Heavy floor load	Building engineer to check the capacity of the floor slab to carry the machinery and storage on 1st floor level as part of the DEA noted at Item 1 above.	**6-weeks**
13	Machinery on the 1st floor. Heavy floor load	Carry out any load reduction and maintain restriction based on recommendations made by the Building Engineer.	**6-months**
15	Discrepancies between structural drawings and as constructed.	Building Engineer to carry our a full survey and update drawings as part of the DEA.	**6-weeks**

Item No.	Observation	Recommended Action Plan	Recommended Timeline
18	Composite beams appear to be under-designed	As part of the DEA the Engineer to verify the capacity of the composite beams at roof level	**6-weeks**
19	Composite beams appear to be under-designed	Carry our any alterations as required by the DEA	**6-months**
21	Column in loading bay unprotected from traffic (possible signs of previous collisions)	Design column protection to prevent traffic impact	**6-weeks**
22	Column in loading bay unprotected from traffic (possible signs of previous collisions)	Install column protection	**6-months**
24	Water Tank on roof	As part of the DEA the composite deck to be checked for loading from tank/machinery room	**6-weeks**
25	Water Tank on roof	Carry out alteration as per recommendations from DEA	**6-months**