

Liberty Knitwear Ltd. Unit-2 (Extension)

G-88/1, Chandra, Pallibyddut, Kaliakoir, Gazipur.

(24.036699N, 90.253709E)

27th May & 3rd June 2018

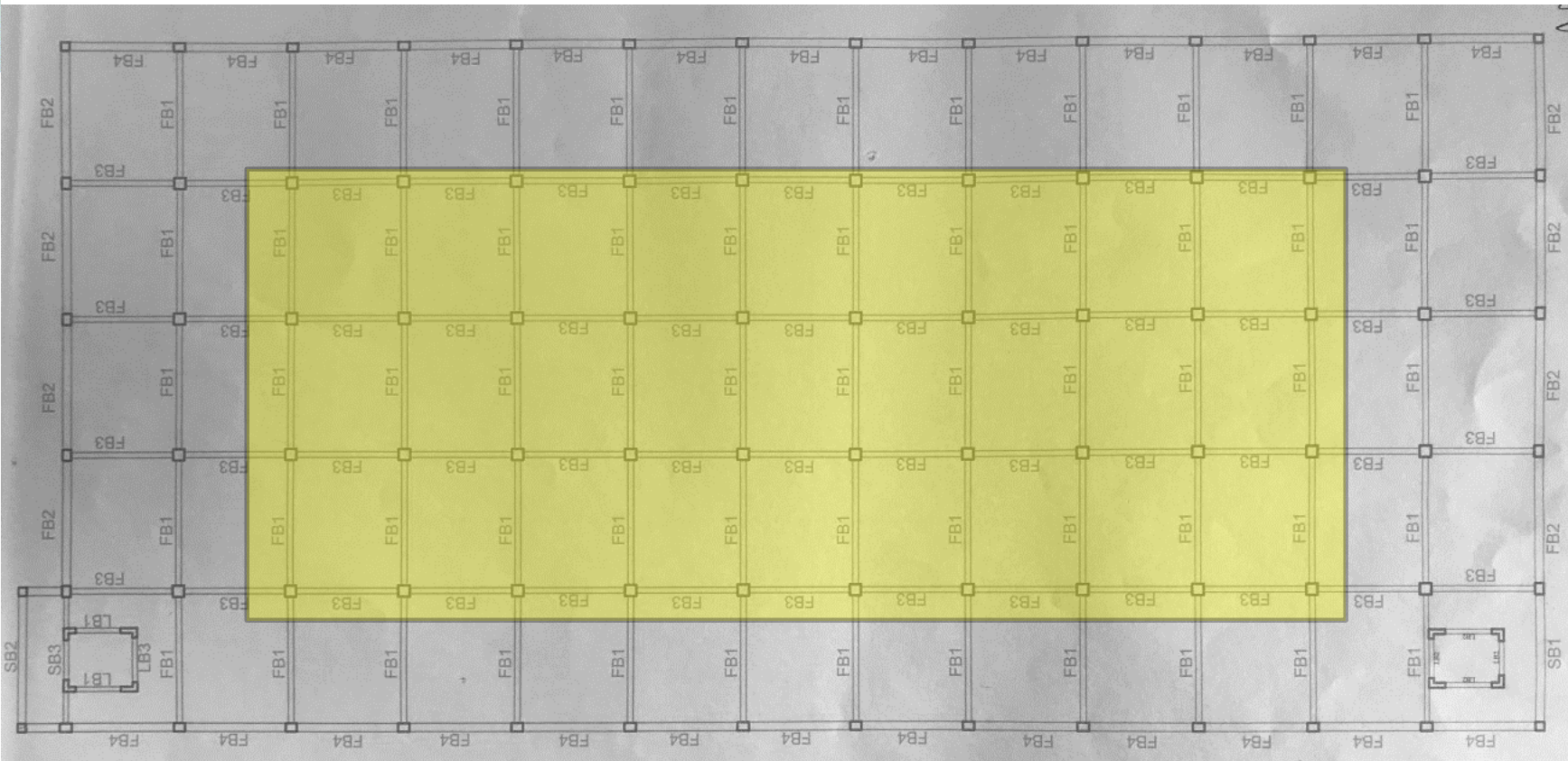




Observations

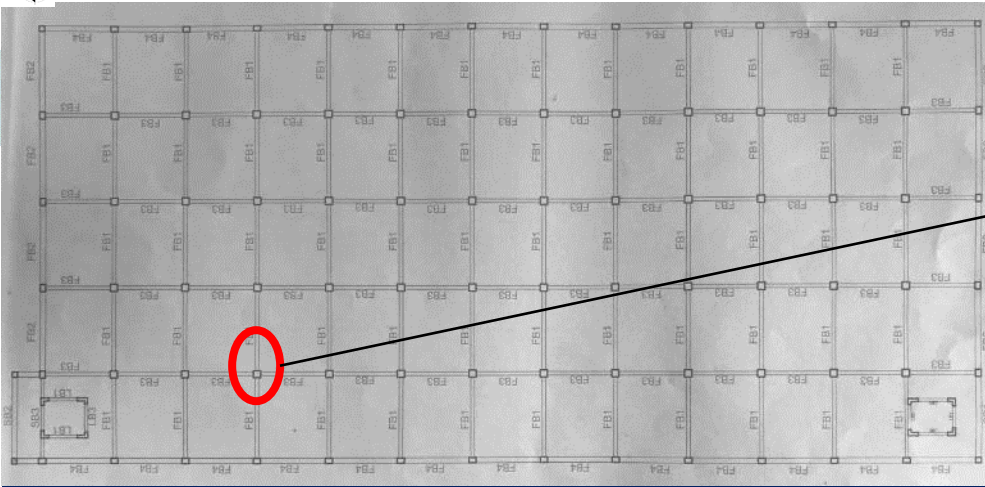


**Columns appeared to be stressed in excess
of normal design limits**

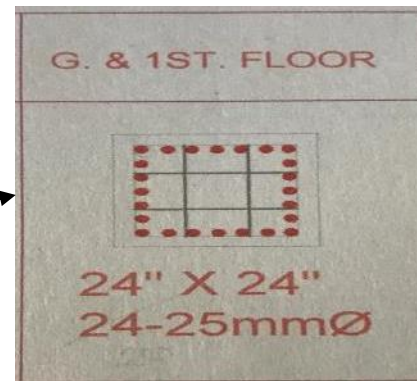


Cursory calculation indicates that highlighted columns appear to be stressed above normal design limits due to large grid dimension and less reinforcement found from ferro scanning compared with that of column schedule. Factory engineer needs to check column stress and factory should take necessary action according to report.

Observation: Printing tower building



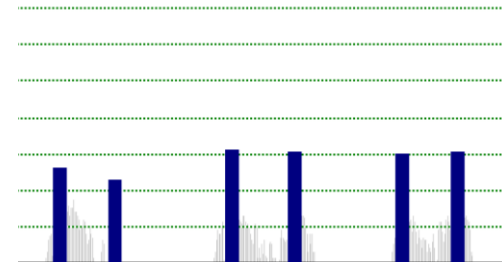
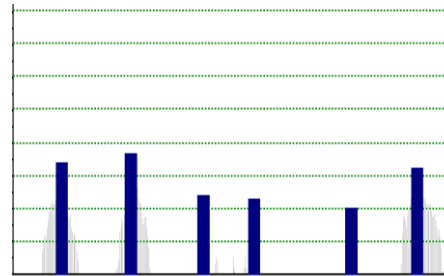
Typical internal grid dimension 7.3m x 6.1m



Column schedule of C-1 column for ground & 1st floor



Typical beam-column framing system



20nos. Rebars (6x6) were found in C-1 column

5 Observation: Printing tower building

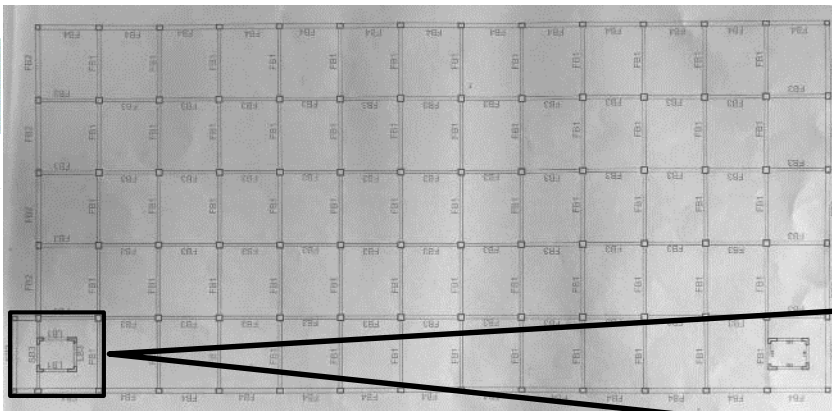


Discrepancies between as-built drawings and on-site observation

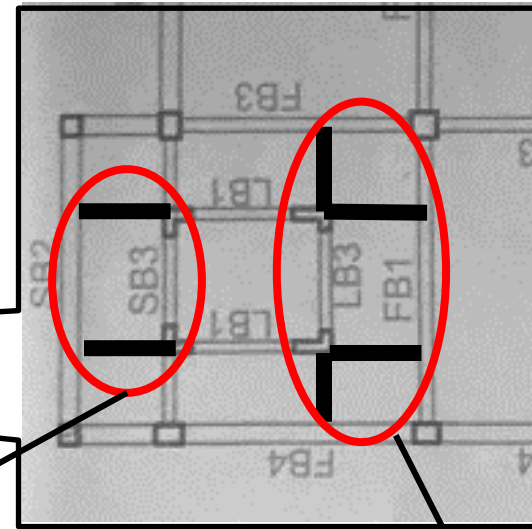
6 **Observation: Printing tower building**



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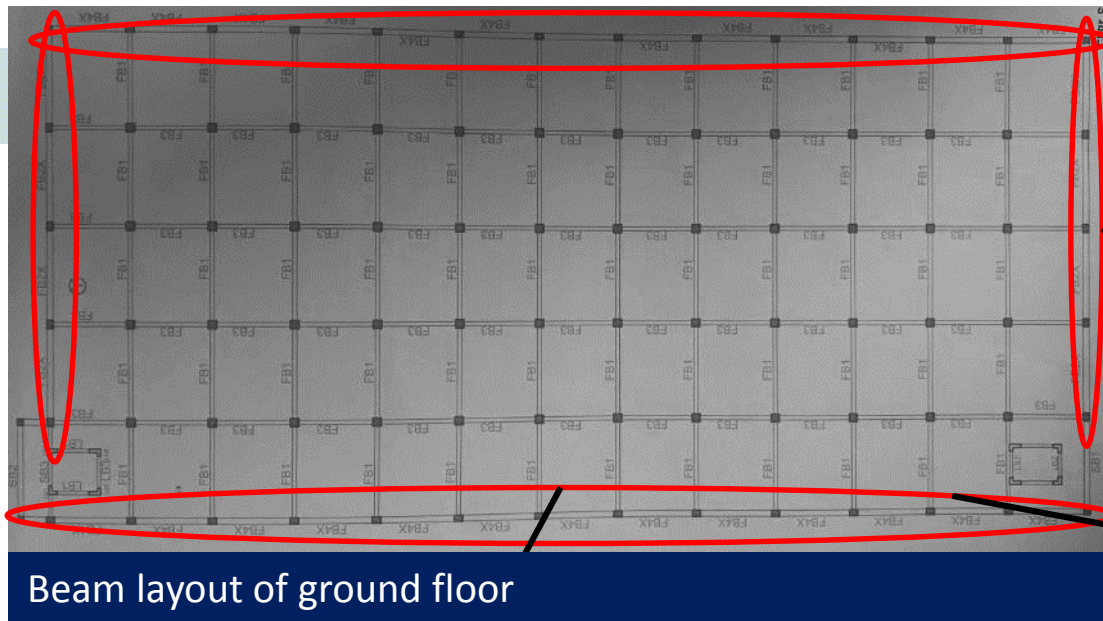
Typical beam layout



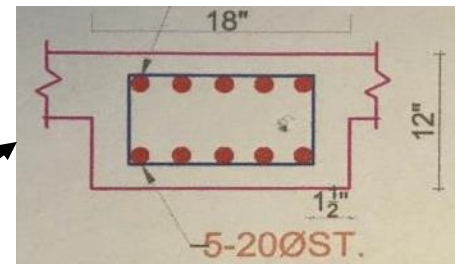
Beam layout of North-West side stair case



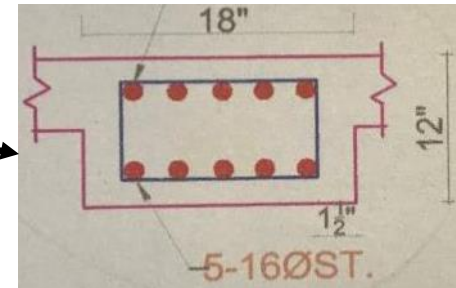
Some extra beams were found in the stair case in every floor which were not in as-build drawing.



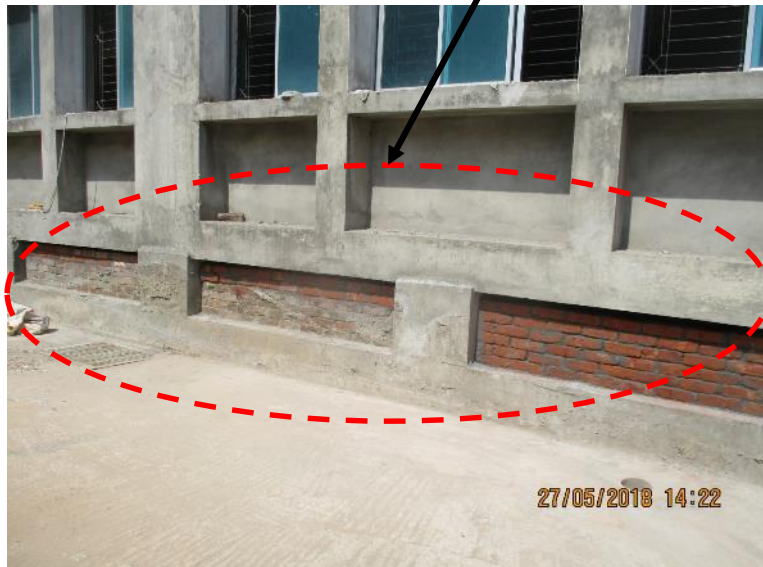
Beam layout of ground floor



Detail of FB2X beam



Detail of FB4X beam



Inverted beam was found on west side

Inverted beams were observed on all side of the building at ground floor level. But in the as-built drawing's beam schedule, the beams were not shown as inverted beams. Factory is required to update the as-build drawing.



Dampness observed on Basement wall

Observation: Printing tower building

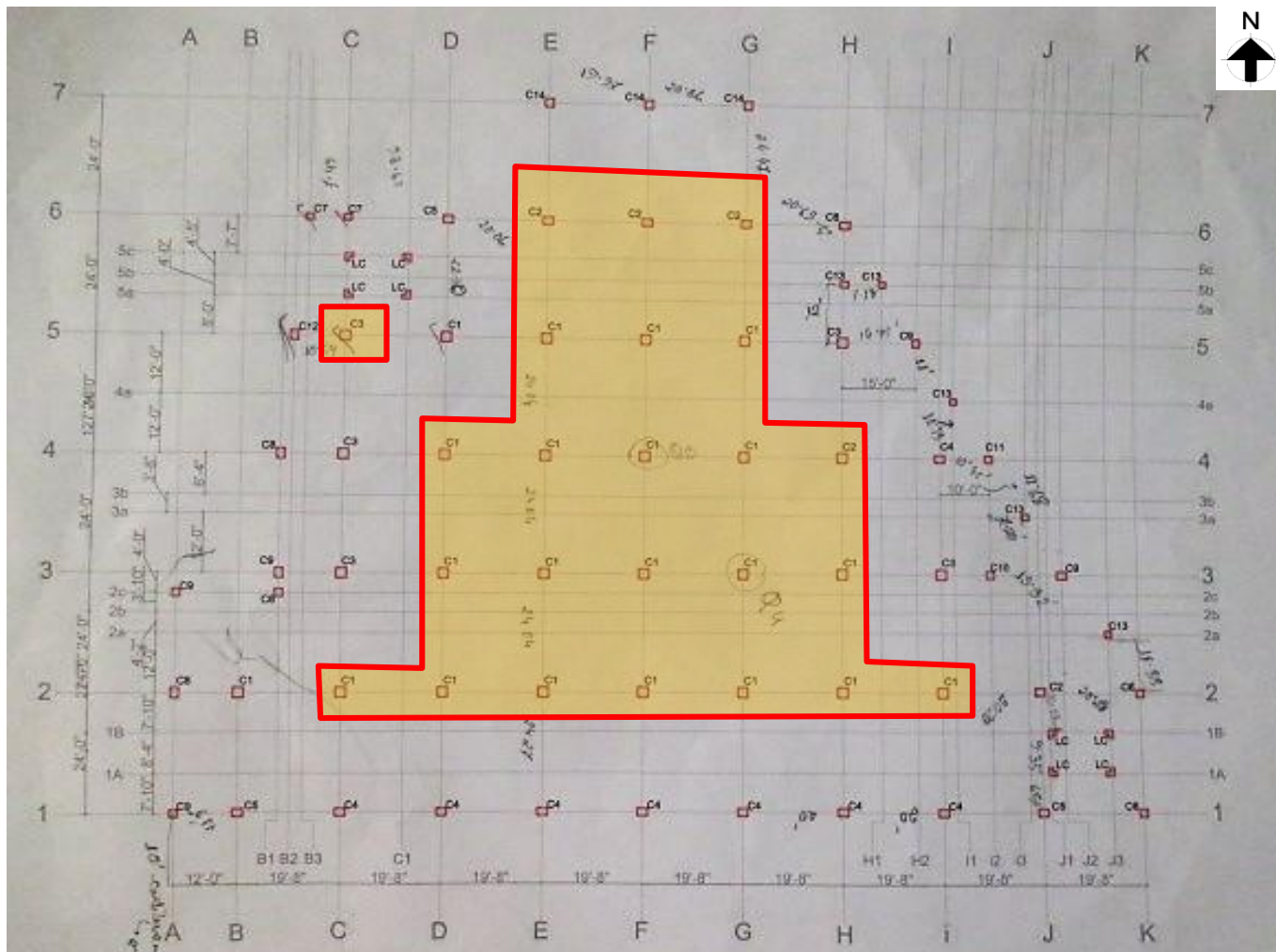


Dampness observed on several places in the basement wall. Factory Engineer is required to investigate the extent of dampness and suggest necessary remedial action.



Columns & foundations appear to be stressed in excess of normal design limits

Observation : New Admin Building



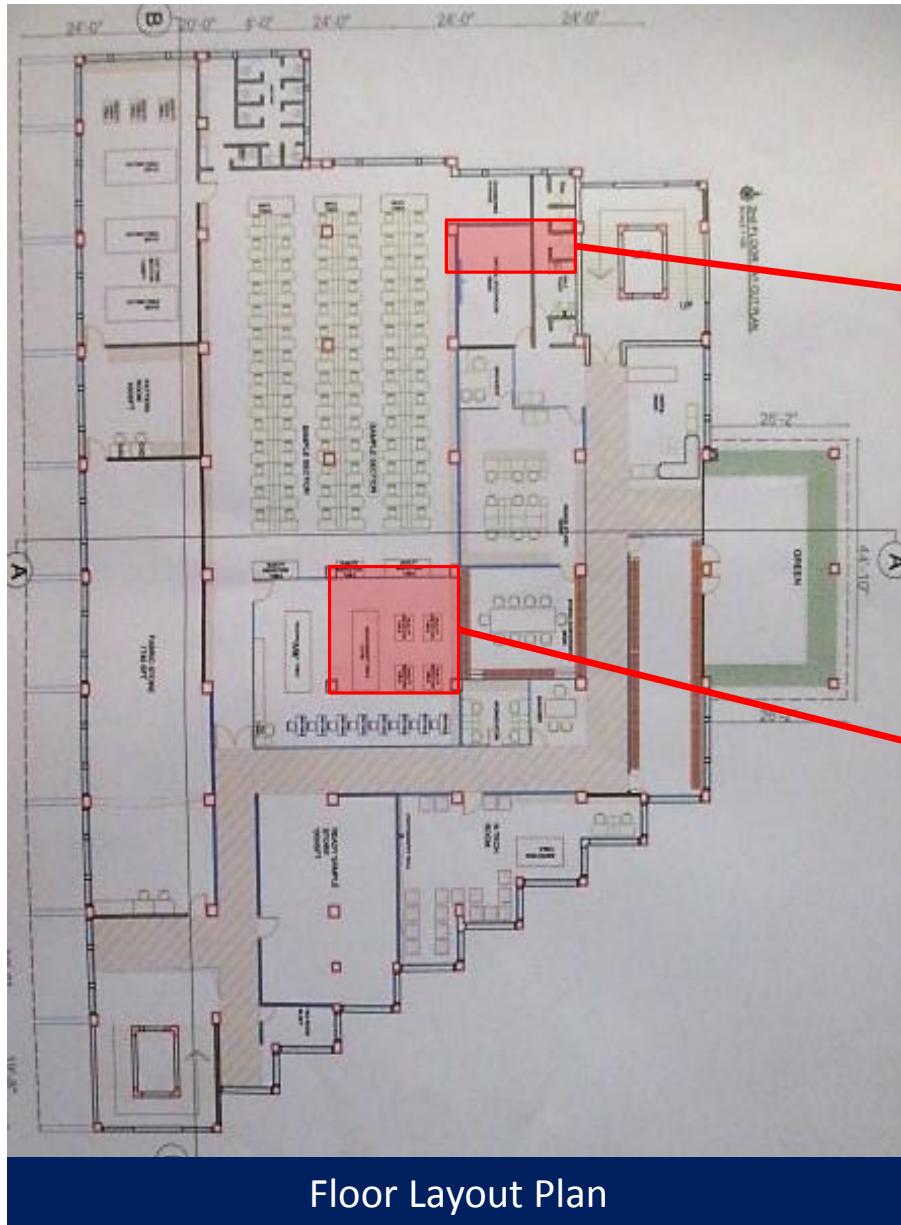
Cursory calculation indicates that highlighted columns appear to be stressed above normal design limits. Factory engineer needs to check column stress and a Detail Engineering Assessment (DEA) must be carried out and factory should take necessary action according to report.

Observation : New Admin Building



Cursory calculation indicates that highlighted foundations appear to be stressed above normal design limits. Factory engineer needs to check foundation stress and a Detail Engineering Assessment (DEA) must be carried out and factory should take necessary action according to report.

Observation : New Admin Building



Floor Layout Plan



Temporary Water Tank



Helipad

Observation : New Admin Building



Construction debris and materials piled up on roof, exceeding design loading for current roof

Observations: New Admin Building



Construction debris and material piled up on current roof, which may exceed the design floor loading capacity. Building engineer is required to ensure that loading does not exceed the floor capacity.

Observation : New Admin Building



Water clogging and lack of drainage system on roof

Observation: New Admin Building



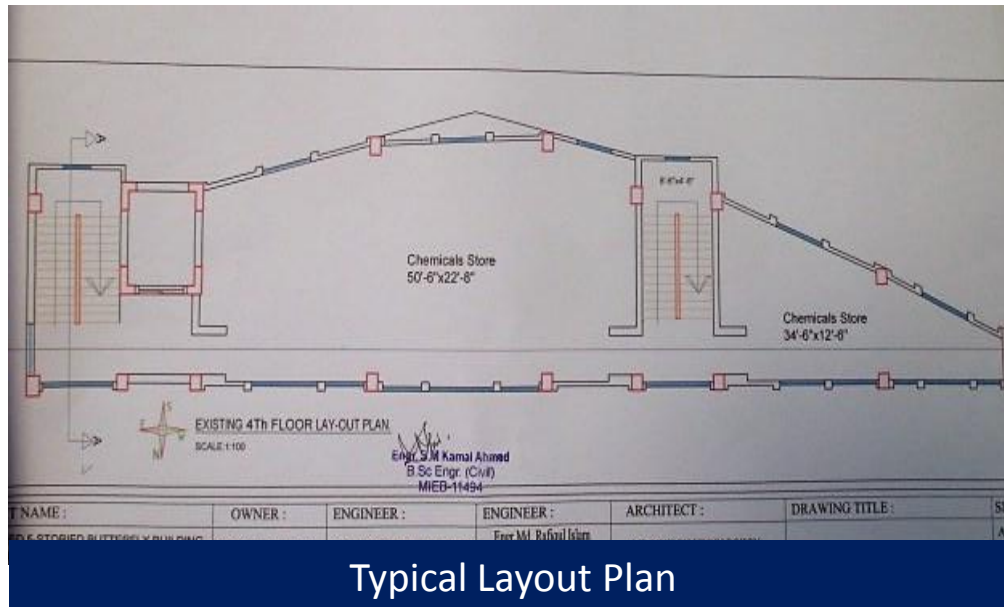
Water clogging was observed on roof top which indicates poor drainage system. Factory engineer is required to provide water proofing material with appropriate sloping and improve drainage system.



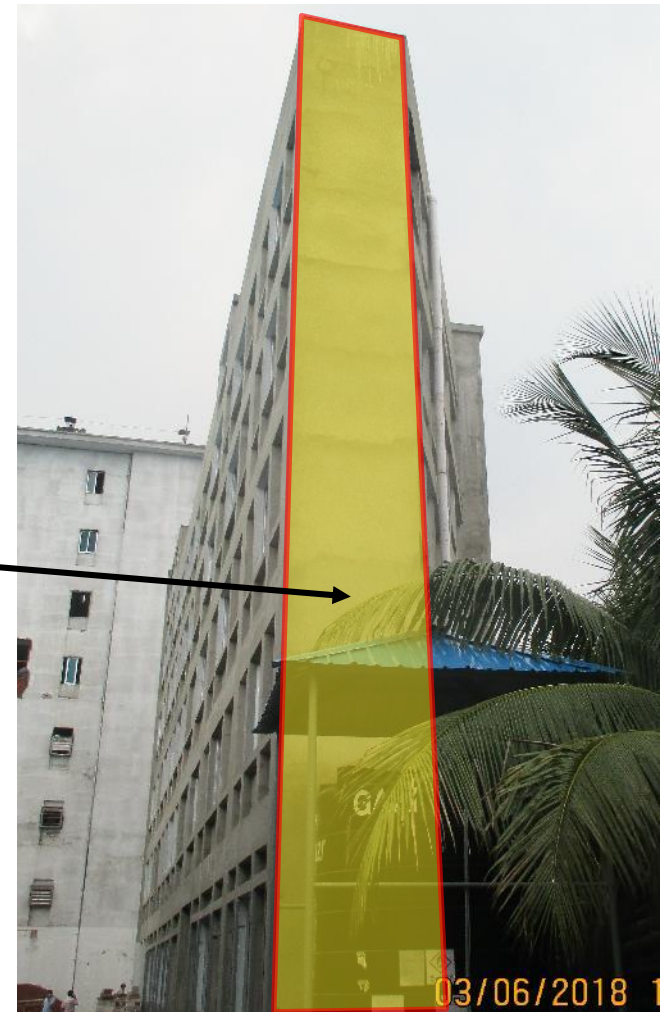
Observation : New Admin Building



Apparent lack of lateral stability



Typical Layout Plan



Factory engineer to check lateral stability of the building against lateral load combination for poor aspect ratio. The structural arrangement in tall slender building may result in net tension in structural element.

Observation: Butterfly Building



Water clogging and lack of drainage system on roof



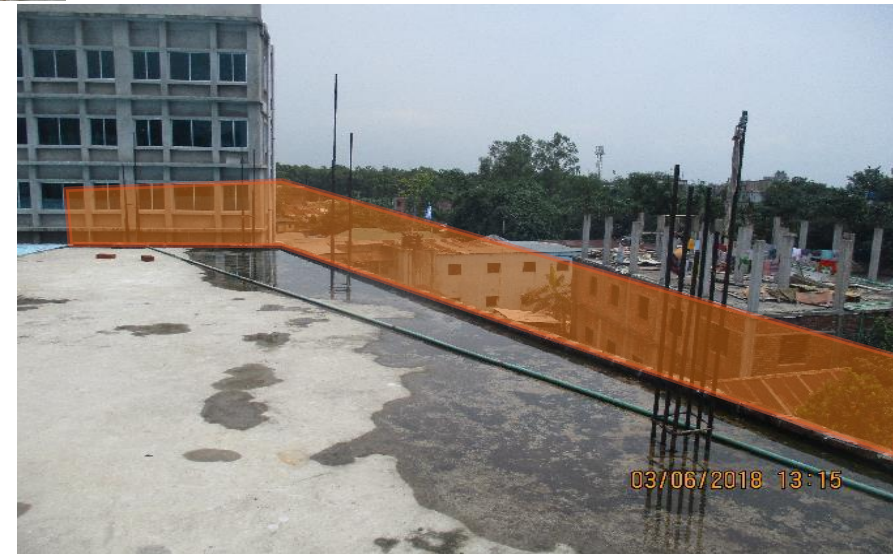
Water clogging was observed on roof top which indicates poor drainage system. Building engineer is required to provide water proofing material on the roof top with appropriate sloping and improve drainage system to prevent water ponding.

Observation : Butterfly Building



Falling hazard on roof top

Observation : Watch Tower Building



No edge protection was observed against falling hazard. Necessary protection to be provided to prevent falling hazard from roof top.

Observation : Watch Tower Building



Corrosion observed on exposed rebar and lack of drainage system on roof

Observation : Watch Tower Building



Water clogging on roof top



No obvious drainage system was observed



Exposed rebar on roof



Corrosion observed on exposed rebar

Water clogging was observed on the roof top which indicates absence of drainage system. Moreover, corrosion was observed on exposed rebar on roof top. Drainage system to be improved. Also, exposed rebars are to be protected from corrosion.

Observation : Watch Tower Building



Water clogging on roof top



During inspection, water clogging was observed on roof top at several areas. Factory is required to improve the water drainage system and provide water proofing with necessary slope for preventing the water clogging as well as dampness in concrete roof slab.



Problems Observed

Printing Tower building

Item 1: Columns appeared to be stressed in excess of normal design limits.

Item 2: Discrepancies between drawings and on-site observation.

Item 3: Dampness observed on Basement wall.

New Admin Building

Item 4: Columns & foundations appear to be stressed in excess of normal design limits.

Item 5: Construction debris and materials piled up on roof, exceeding design loading for current roof.

Item 6: Water clogging and lack of drainage system on roof.

Butterfly Building

Item 7: Apparent lack of lateral stability.

Item 8: Water clogging and lack of drainage system on roof.

Watch Tower Building

Item 9: Falling hazard on roof top.

Item 10: Corrosion observed on exposed rebar and lack of drainage system on roof.

Knitting building

Item 11: Water clogging on roof top.



Priority Actions



Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	(Printing tower building) Columns appeared to be stressed in excess of normal design limits	Factory Engineer to review design, loads and columns stresses in all columns.	6-weeks
2	(Printing tower building) Columns appeared to be stressed in excess of normal design limits	Verify in-situ concrete stresses by taking 100mm diameter cores from a minimum of 4 columns. Verify grade of steel reinforcement used.	6-weeks
3	(Printing tower building) Columns appeared to be stressed in excess of normal design limits	Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.	6-weeks
4	(Printing tower building) Columns appeared to be stressed in excess of normal design limits	Make structural alterations as advised by Engineer.	6-months
5	(Printing tower building) Columns appeared to be stressed in excess of normal design limits	Continue to implement load plan.	6-months



Item No.	Observation	Recommended Action Plan	Recommended Timeline
6	(Printing tower building) Discrepancies between drawings and on-site observation	Factory engineer is required to survey the structural elements properly and produce correct as built drawings.	6-weeks
7	(Printing tower building) Dampness observed on Basement Floor	Factory Engineer is required to investigate the extent of dampness and suggest proper remedial measures accordingly.	6-weeks
8	(Printing tower building) Dampness observed on Basement Floor	Carry out remedial works as per recommendation of investigation report.	6-months



Item No.	Observation	Recommended Action Plan	Recommended Timeline
9	(New Admin Building) Columns & foundations appear to be stressed in excess of normal design limits	Factory Engineer to review design, loads and stresses in all columns and foundations.	6-weeks
10	(New Admin Building) Columns & foundations appear to be stressed in excess of normal design limits	Verify in-situ concrete stresses by taking 100mm diameter cores from a minimum of 4 columns. Verify grade of steel reinforcement used.	6-weeks
11	(New Admin Building) Columns & foundations appear to be stressed in excess of normal design limits	Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor, column and footing capacity.	6-weeks
12	(New Admin Building) Columns & foundations appear to be stressed in excess of normal design limits	Detail Engineering Assessment to be completed.	6-weeks
13	(New Admin Building) Columns & foundations appear to be stressed in excess of normal design limits	Carry out remedial works where necessary.	6-months
14	(New Admin Building) Columns & foundations appear to be stressed in excess of normal design limits	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 ACCORD DEA guideline , ACCORD standard for Assessment of Structural Integrity of Existing RMG Factory Buildings in Bangladesh (Tripartite Document), the latest version of these document should be referenced. These 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 ACCORD DEA guideline , ACCORD standard 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 see ACCORD DEA guideline & ACCORD standard more details.
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 ACCORD DEA guideline & ACCORD standard (<http://bangladeshaccord.org/factories/resource-centre/>).

Item No.	Observation	Recommended Action Plan	Recommended Timeline
15	(New Admin Building) Construction debris and materials piled up on roof, exceeding design loading for current roof.	Implement better control to prevent overloading of floors due to construction materials and derbies.	6-weeks
16	(New Admin Building) Water clogging and lack of drainage system on roof	Water proofing material with required sloping is to be applied on roof slab and drainage system to be improved.	6-weeks
17	(Butterfly Building) Apparent lack of lateral stability	Factory engineer to check the stability of the structure under vertical and horizontal loads.	6-weeks
18	(Butterfly Building) Apparent lack of lateral stability	Carry out remedial works resulting from engineering assessment if necessary.	6-months
19	(Butterfly Building) Water clogging and lack of drainage system on roof	Water proofing with required slope is to be applied on roof slab and drainage system to be improved.	6-weeks



Item No.	Observation	Recommended Action Plan	Recommended Timeline
20	(Watch Tower Building) Falling hazard on roof top	Secure the appointed areas of hazards and provide an appropriate fall protection.	6-weeks
21	(Watch Tower Building) Corrosion observed on exposed rebar and lack of drainage system on roof	Factory engineer to suggest and implement proper remedial measures to protect steel from corrosion.	6-weeks
22	(Watch Tower Building) Corrosion observed on exposed rebar and lack of drainage system on roof	Factory engineer required to improve the water drainage system and provide water proofing layer for preventing the water clogging and dampness of roof slab.	6-weeks
23	(Knitting building) Water clogging on roof top	Factory engineer is required to improve the water drainage system and provide water proofing layer with proper sloping to prevent the water clogging and dampness of roof slab.	6-weeks