

AR Jeans Producer Ltd.

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(23.916243, 90.294055)

20th March 2018





Observations



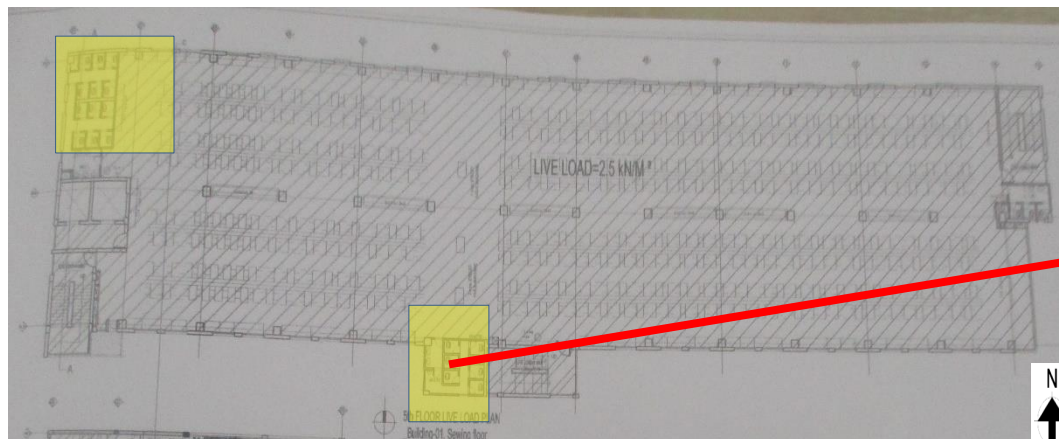
**Column and Footing to be stressed above
normal design limits**



Cursory calculations indicate that few Columns under toilet area & water tank would appear to be stressed in excess of normal design limits, assuming minimum concrete strength. Building Engineer to review design, loads and columns stresses. Also, prepared load plan need to be revised based on floor, column and foundation capacity.

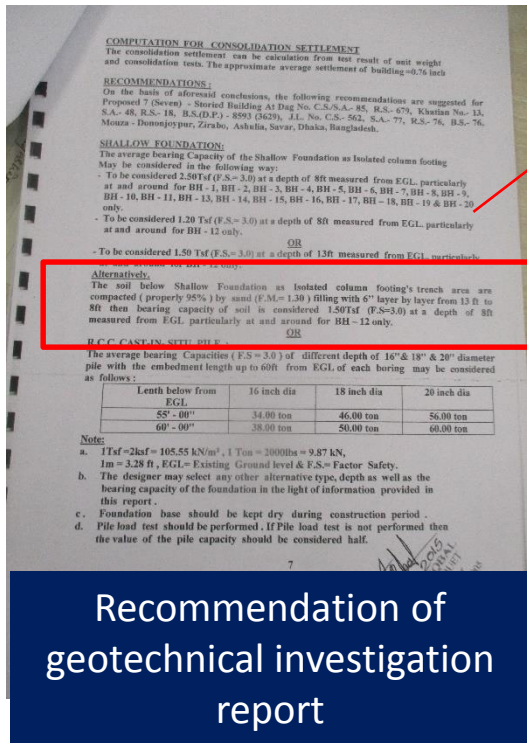
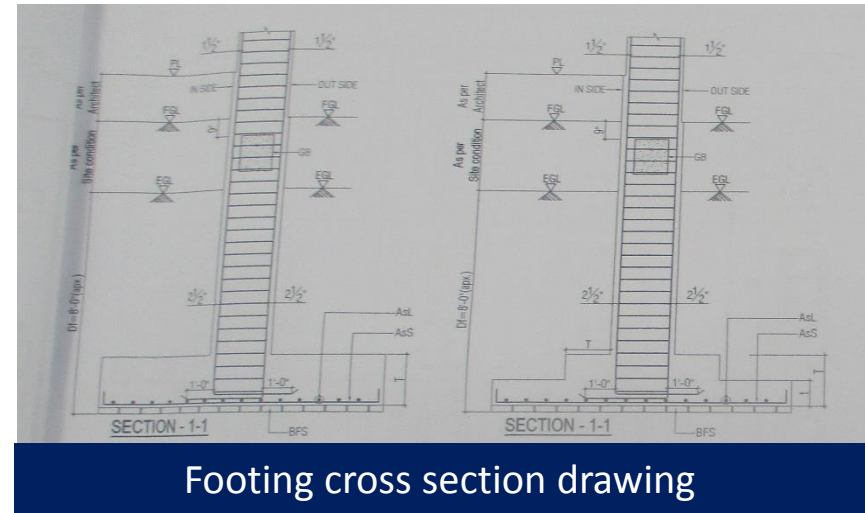
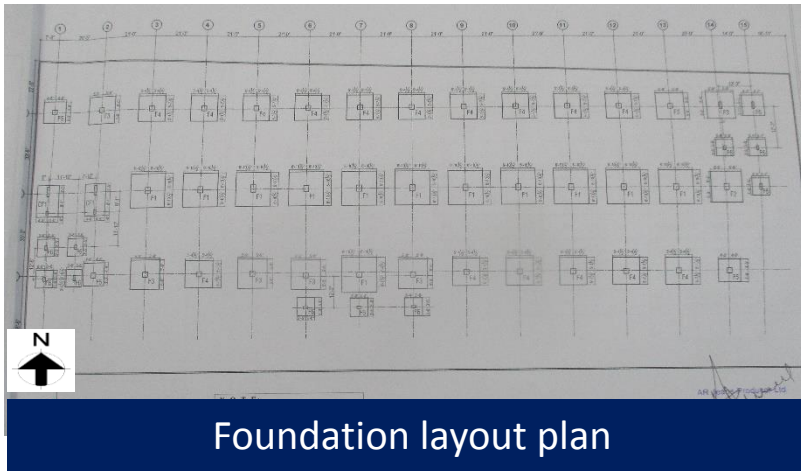


Roof layout plan



5th floor load plan





Alternatively.
The soil below Shallow Foundation as Isolated column footing's trench area are compacted (properly 95%) by sand (F.M.= 1.30) filling with 6" layer by layer from 13 ft to 8ft then bearing capacity of soil is considered 1.50Tsf (F.S=3.0) at a depth of 8ft measured from E.G.L particularly at and around for BH - 12 only.

OR

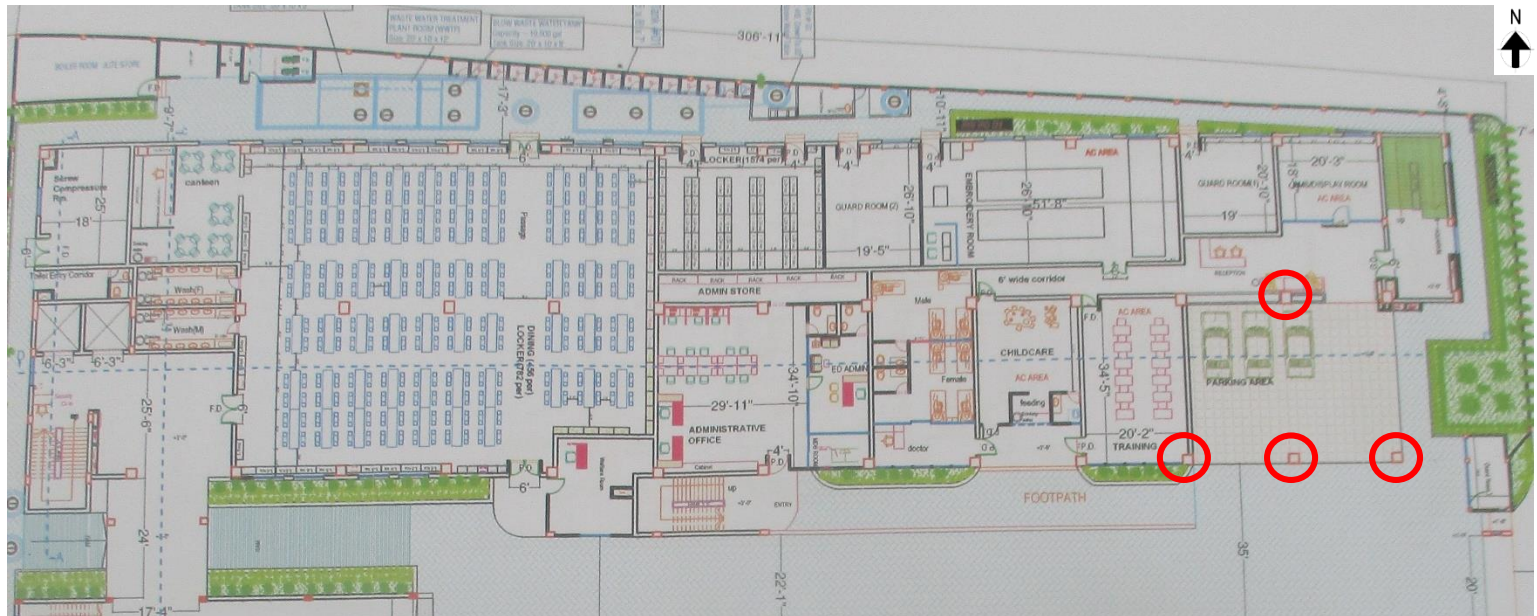
P.C.C CAST IN SITU PILE

Recommended soil bearing capacity 1.5 Tsf for 8 ft. (2.44 m) depth, Considering FoS = 3 around borehole-12.

Cursory calculation indicates that footing appears to be stressed above normal design limits. Factor of safety (FoS) is less than the minimum requirement BNBC. Factory engineer is required to review the adequacy of footings considering actual depth and bearing capacity of footing and comply with BNBC.



Columns susceptible to vehicle impact



Ground floor layout plan

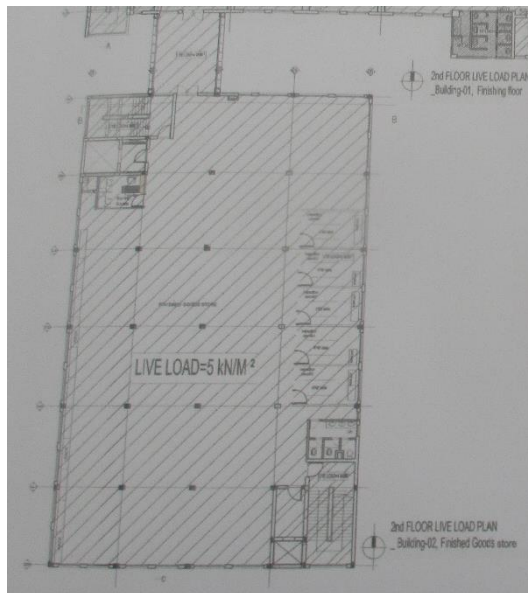
Impact protection not provided to columns at loading –unloading area. Columns are susceptible to impact loading from vehicles.



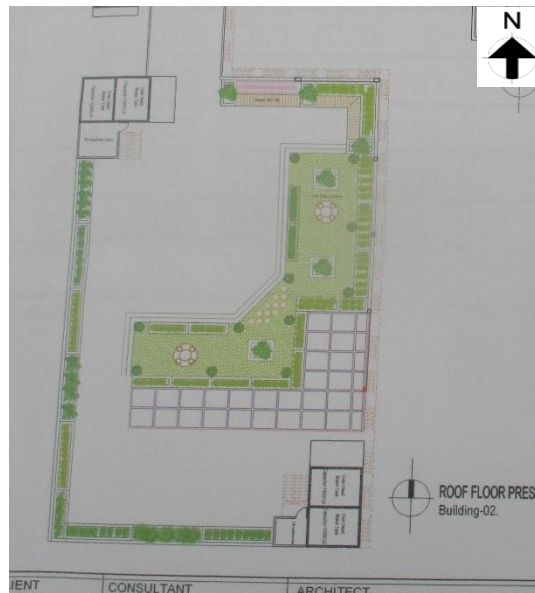


Column and Footing to be stressed above normal design limits

Observations: Building-2



Load Plan of 2nd floor



Layout Plan roof



Toilet partition wall

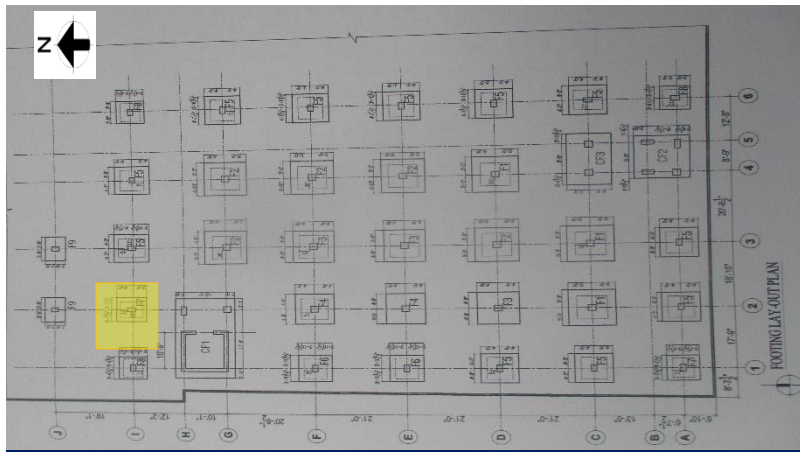


Loading on 2nd floor

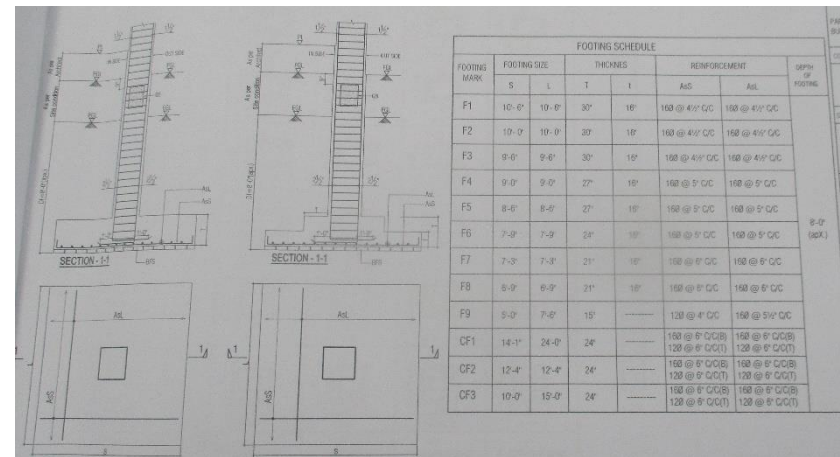


Toilet area with build up

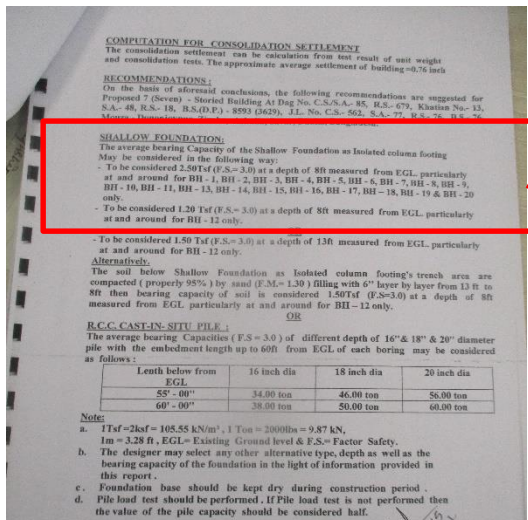
Factory engineer has prepared a floor load plan considering 5kpa live load. Cursory calculations indicates that columns appears to be stressed above normal design limit based on 3 kpa live load. So, prepared load plan need to be revised based on floor, column and foundation capacity.



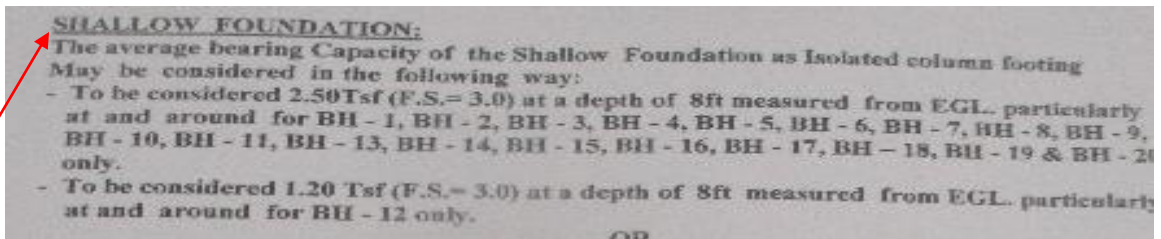
Foundation layout plan



Footing schedule & cross section



Recommendation of geotechnical investigation report



Recommended soil bearing capacity 2.5 Tsf for 8 ft. (2.44 m) depth, Considering FoS = 3 around BH-3, 4, 5 & 6.

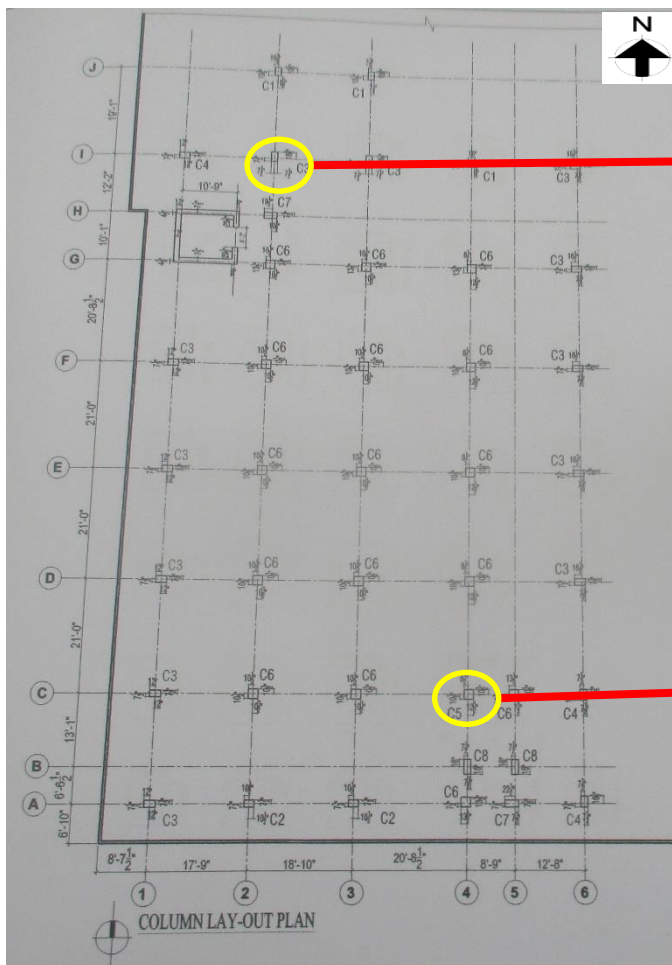
Cursory calculation indicates that footing appears to be stressed above normal design limits. Factor of safety (FoS) is less than the minimum requirement BNBC. Factory engineer is required to review the adequacy of footings considering actual depth and bearing capacity of footing and comply with BNBC.

Observations: Building-2



Discrepancies between provided drawings and on site condition

Observations: Building-2



C-1 type column



C-5 type column

COLUMN INDEX	COLUMN SCHEDULE			
	BELOW SLAB	LEVEL 1 & 2	LEVEL 3 & 4	LEVEL 5 & 6
C1				
C2				
C3				
C4				
C5				
C6				
C7				
C8				

Number of rebar for C-5 column does not match with column schedule. 16 nos. of rebar are found by ferro scan whereas 20 nos. of rebars are shown in column schedule. On grid I-2, C-3 type column is shown in layout but that column size is similar to C-1 type column.





Lack of architectural drawings and mismatch in structural drawings

Observations: Utility structures (Building: 3, 4, & 5)



Boiler Building



Generator Building



Sub-station Building

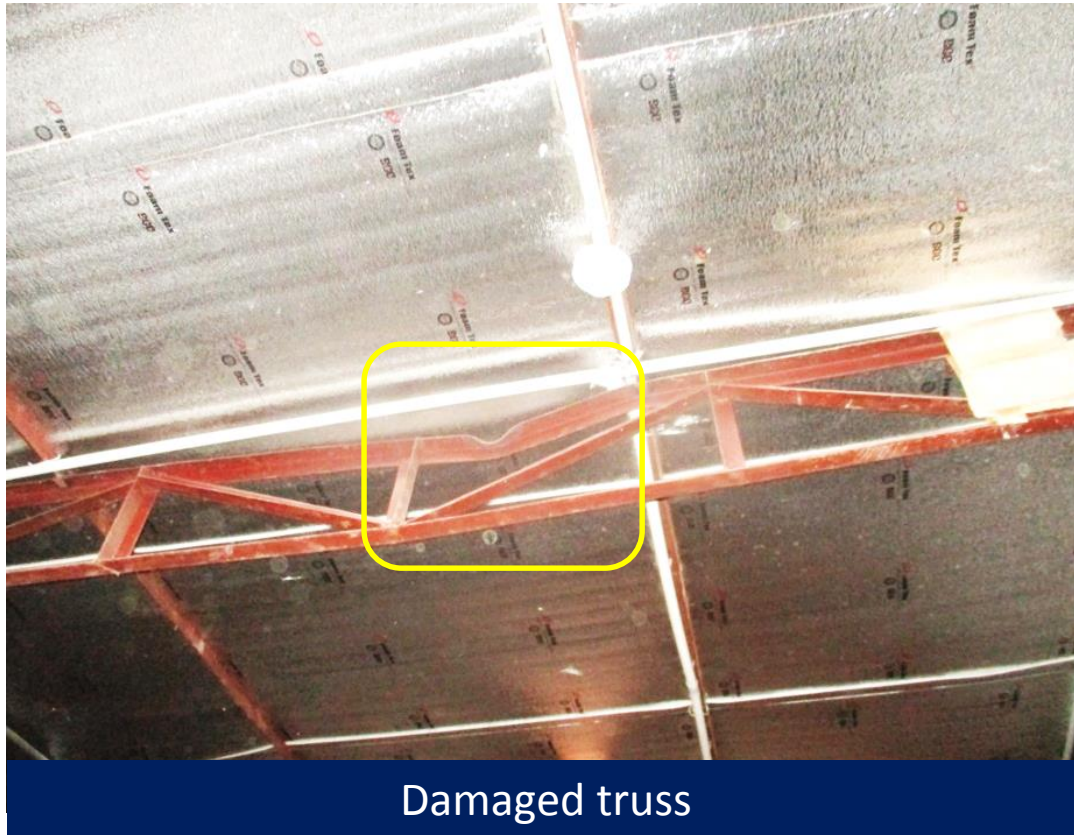
Architectural drawings are not prepared for all utility structures. Also mismatch found in provided structural drawings for generator, sub-station and boiler buildings. Number of rebar in column for generator & sub-station building do not match with column schedule. And grid dimensions are not matched for boiler building.

Observations: Utility structures (Building: 3, 4, & 5)



Damaged truss on wastage go-down

Observations: Utility structures (Building: 5)



Damaged truss

A damaged truss was found at wastage go-down above pump room. Factory engineer is required to repair the damaged member and check the adequacy of the roof truss.

Observations: Utility structures (Building: 5)



Heavy water tank above boiler room

Observations: Utility structures (Building: 3)



5000 ltr. water tank above boiler building

A 5000 ltr. Water tank was found above boiler building. Factory engineer is required to check the slab and column capacity for applied water tank's load.

Observations: Utility structures (Building: 3)



Problems Observed

Building-1

Item 1: Column and Footing to be stressed above normal design limits.

Item 2: Columns susceptible to vehicle impact.

Building-2

Item 3: Column and Footing to be stressed above normal design limits.

Item 4: Discrepancies between Structural drawings and site observations.

Utility Structures(Building- 3, 4 & 5):

Item 5: Lack of architectural drawings and mismatch in structural drawings.

Item 6: Damaged truss on wastage go-down.

Item-7: Heavy water tank above boiler room.



Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	(Building-1) Column and Footing to be stressed above normal design limits	Factory Engineer to review design, loads, columns and footings stresses.	6-weeks
2	(Building-1) Column and Footing to be stressed above normal design limits	Verify in-situ concrete strength and aggregate type by taken min. 4 nos. 100mm dia. core samples from ground floor columns.	6-weeks
3	(Building-1) Column and Footing to be stressed above normal design limits	The Detailed Engineering Assessment to be completed.	6-weeks
4	(Building-1) Column and Footing to be stressed above normal design limits	Produce and actively manage a loading plan for all floor plates within the factory, giving consideration to floor, column and foundation capacity.	6-weeks
5	(Building-1) Column and Footing to be stressed above normal design limits	Complete implementation of any remedial works deemed necessary by the DEA.	6-months
6	(Building-1) Column and Footing to be stressed above normal design limits	Continue to implement loading 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
7	(Building-1) Columns susceptible to vehicle impact	Install a barrier to prevent vehicle impact in columns.	6-weeks
8	(Building-2) Column and Footing to be stressed above normal design limits	Factory Engineer to review design, loads, columns and footings stresses.	6-weeks
9	(Building-2) Column and Footing to be stressed above normal design limits	Verify in-situ concrete strength and aggregate type by taken min. 4 nos. 100mm dia. core samples from ground floor columns.	6-weeks
10	(Building-2) Column and Footing to be stressed above normal design limits	The Detailed Engineering Assessment to be completed.	6-weeks
11	(Building-2) Column and Footing to be stressed above normal design limits	Produce and actively manage a loading plan for all floor plates within the factory, giving consideration to floor, column and foundation capacity.	6-weeks
12	(Building-2) Column and Footing to be stressed above normal design limits	Complete implementation of any remedial works deemed necessary by the DEA.	6-months
13	(Building-2) Column and Footing to be stressed above normal design limits	Continue to implement loading plan.	6-months



Item No.	Observation	Recommended Action Plan	Recommended Timeline
14	(Building-2) Discrepancies between provided drawings and on site condition	Building Engineer to survey as-built structure and prepare accurate as-built survey information for the building.	6-weeks
15	(Building: 3, 4, & 5) Lack of architectural drawings and mismatch in structural drawings	Prepare an “as constructed” drawings which reflect the actual site dimensions with complete structural information.	6-weeks
16	(Building: 5) Damaged truss on wastage go-down	Factory engineer is required to repair the damaged member and check the adequacy of the roof truss.	6-weeks
17	(Building: 3) Heavy water tank above boiler room	Factory engineer is required to check the slab and column capacity for applied water tank’s load.	6-weeks