

# MAAA APPARELS Ltd.

Plot # 1187, 1214-15, Gacha Maddhapara, Gazipur Sadar  
(23.936233, 90.376661)

30<sup>th</sup> August 2016





# Observations

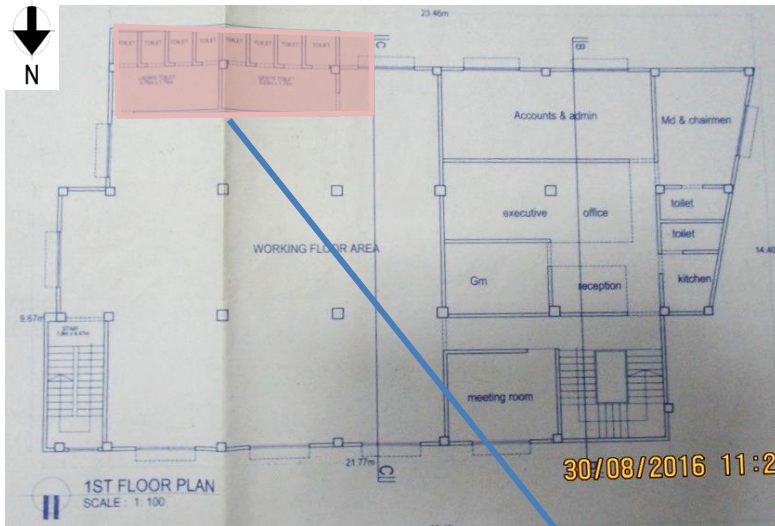


# High Stress Column

**Observation : Building-1**



Cursory calculations indicate that the working stresses to the Ground Floor and First floor columns are at a high level. Building Engineer to review design, loads and columns stresses.



Column sizes in provided schedule are bigger than on-site condition.

Toilet partition wall and build-up observed at south-east cantilever .

OF COLUMN	C1	C2
UP TO GB	13'x18"	15'x15"
GB TO 1ST FLOOR	6-Ø16mm CLEAR COVER = 3"	6-Ø20mm CLEAR COVER = 3"
2ND TO TOP FLOOR	6-Ø16mm CLEAR COVER = 1.5"	8-Ø20mm CLEAR COVER = 1.5"



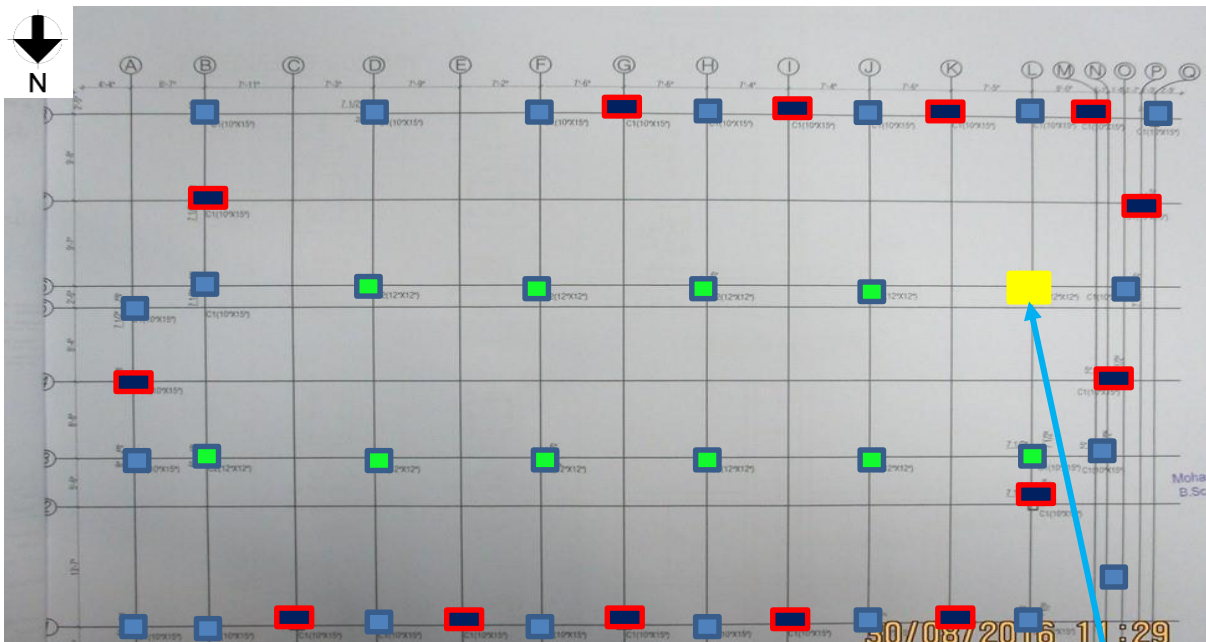
The date of construction of the 4-storied building is 2006-2007. The reinforcement quantities recorded at Ground Floor level using the Ferro scanner coincided with the values provided in the Column Schedule. Brick aggregate was observed on-site. No loading plan was provided for the building.

## Observation : Building-1



# Discrepancies between Structural drawings and site observations

**Observation : Building-1**



**SCHEDULE OF COLUMN**

9/02/80/08

OF COLUMN	C1	C2
	13'x18"	15'x15"
UP TO GB		
	6-Ø16mm CLEAR COVER = 3" Ø10mm @ 4/7" c/c	8-Ø20mm CLEAR COVER = 3" Ø10mm @ 4/7" c/c
	10'x15"	12'x12"
GB TO 1ST FLOOR		
	6-Ø16mm CLEAR COVER = 1.5" Ø10mm @ 4/7" c/c	8-Ø20mm CLEAR COVER = 1.5" Ø10mm @ 4/7" c/c
	10'x15"	12'x12"
2ND TO TOP FLOOR		
	6-Ø16mm CLEAR COVER = 1.5" Ø10mm @ 4/7" c/c	8-Ø20mm CLEAR COVER = 1.5" Ø10mm @ 4/7" c/c

Column layout plan



External column



Brick column

This column is not shown in column schedule. On site measurement the column size was 10x10 inch and 4 nos. of rebar observed by Ferro scanner.

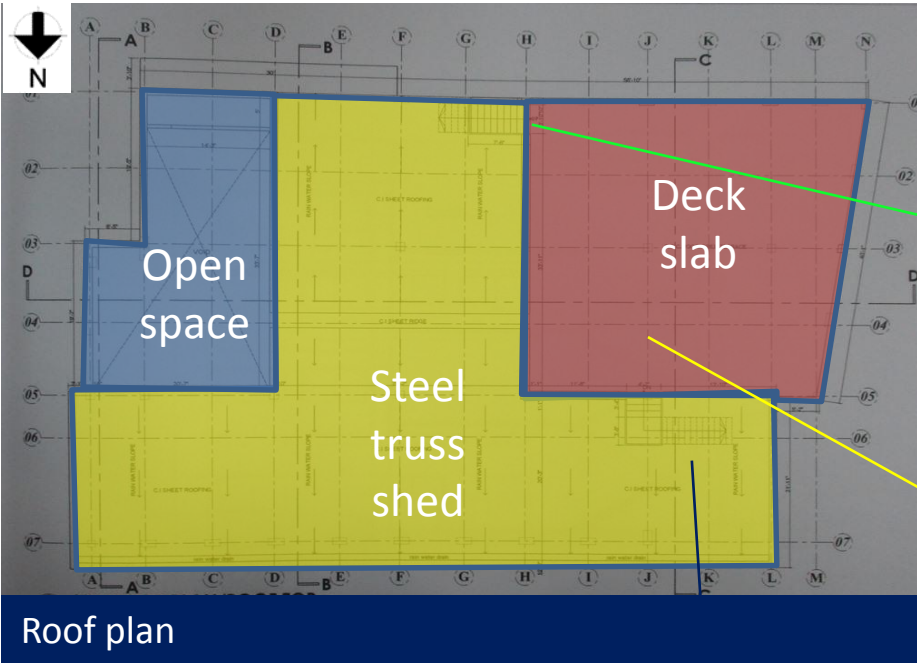
External columns are measured 10x10 inch but in column schedule it is shown as 10x15 inch. Some brick columns are found which is marked as red colour on column layout plan.

# Observation : Building-1



**No structural drawings of roof shed, steel deck and steel stair were found**

**Observation : Building-1**



Steel stair at south poorly connected with I beam of deck slab



Steel stair poorly connected with partition wall and floor.



Connection with column is not clear. No details drawings was found for connection.

# Observation : Building-1



# Apparently non-engineered roof shed and steel stair

**Observation : Building-1**



Apparently non engineered steel shed at roof. Steel truss rest on RC column. No drawing was found during inspection.



## Observation : Building-1



# Discrepancies between Structural drawings and site observations

**Observation : Building-2**



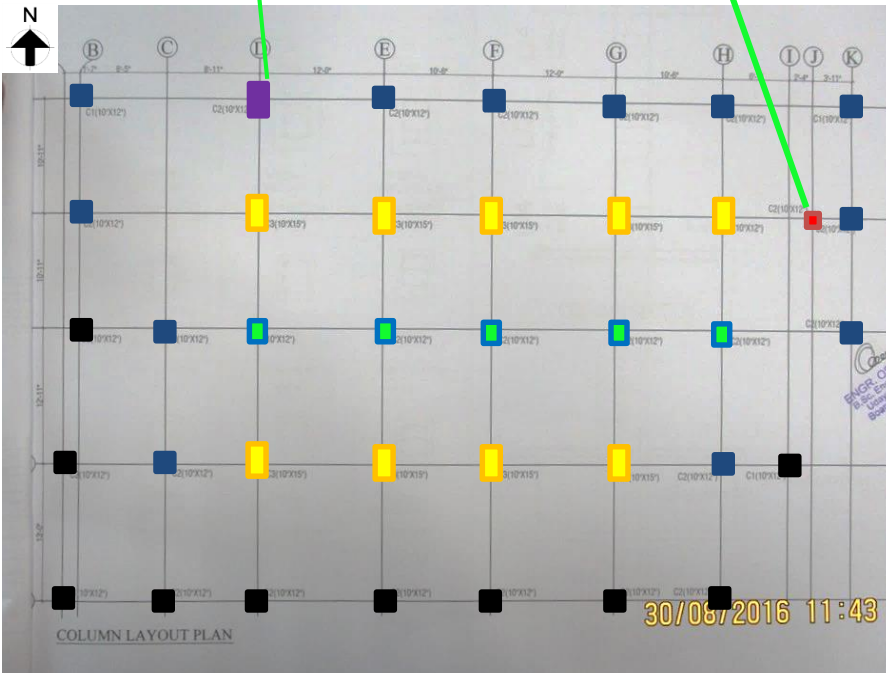
10x15 in size



Brick column

Column sizes are not matched with column schedule. One external column was found 10x15 inch shown in purple. On site measurement black marked columns were found 10x10 inch which is not shown in column schedule.

One brick column was found at GF & 1<sup>st</sup> floor marked as red in column layout plan which does exist at upper floor.



Column Layout Plan

NO OF COLUMN	C1	C2	C2
UP TO GB	13"x15"  6-Ø20mm CLEAR COVER = 3" Ø10mm @ 4"/7°c/c	13"x15"  6-Ø20mm CLEAR COVER = 3" Ø10mm @ 4"/7°c/c	13"x18"  10-Ø20mm CLEAR COVER = 3" Ø10mm @ 4"/7°c/c
GB TO 1ST FLOOR	10"x12"  6-Ø20mm CLEAR COVER = 1.5" Ø10mm @ 5"/7°c/c	10"x12"  6-Ø20mm CLEAR COVER = 1.5" Ø10mm @ 4"/7°c/c	10"x15"  10-Ø20mm CLEAR COVER = 1.5" Ø10mm @ 4"/7°c/c
2ND TO TOP FLOOR	10"x12"  6-Ø20mm CLEAR COVER = 1.5" Ø10mm @ 5"/7°c/c	10"x12"  6-Ø20mm CLEAR COVER = 1.5" Ø10mm @ 4"/7°c/c	10"x15"  10-Ø20mm CLEAR COVER = 1.5" Ø10mm @ 4"/7°c/c

Column Schedule

## Observation : Building-2



# Apparently non-engineered steel roof and steel stair

**Observation : Building-2**



Steel truss are connected with brick column and periphery wall.



Apparently non-engineered steel stair poorly connected with north façade

## Observation : Building-2



**No drawings was found for both sheds**

**Observation : Shed-1 & 2**



Shed-1



Drawings were not found during inspection. Factory engineer required to be prepared the as-built drawings.



Shed-2



## Observation : Shed 1 & 2



# Stability of sheds against lateral load

**Observation : Shed 1 & 2**



Steel truss are poorly connected with column. No roof bracing was observed in both shed. Factory engineer required to check the connection and overall stability of both sheds.



Shed-1



Steel pipe to truss connection for shed-2



## Observation : Shed 1 & 2



# Problems Observed

## Building-1

Item 1: High Stress Column

Item 2: Discrepancies between Structural drawings and site observations

Item 3: No structural drawings of roof shed, steel deck and steel stair were found

Item 4: Apparently non-engineered roof shed and steel stair

## Building-2

Item 5: Discrepancies between Structural drawings and site observations

Item 6: Apparently non-engineered steel roof and steel stair

## Shed 1 & 2

Item 7: No drawings was found for both sheds

Item 8: Stability of sheds against lateral load



Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	High Stress Column	Limit Live Load to 2.0kN/m <sup>2</sup> on all floors immediately.	<b>Immediate - Now</b>
2	High Stress Column	Verify in-situ concrete strength and aggregate type by taken min. 4 nos. 100mm dia. core samples from columns.	<b>6-weeks</b>
3	High Stress Column	The Detailed Engineering Assessment to be completed.	<b>6-weeks</b>
4	High Stress Column	Produce and actively manage a loading plan for all floor plates within the factory, giving consideration to floor capacity and column capacity.	<b>6-weeks</b>
5	High Stress Column	Complete implementation of any remedial works deemed necessary by the DEA.	<b>6-months</b>
6	High Stress Column	Continue to implement loading plan.	<b>6-months</b>
7	Discrepancies between Structural drawings and site observations	Building Engineer to survey as-built structure and prepare accurate as-built survey information, including all columns, beams and slabs as part of DEA.	<b>6-weeks</b>
8	No structural drawings of roof shed, steel deck and steel stair were found	Building Engineer to survey as-built structure and prepare accurate as-built drawings as part of DEA.	<b>6-weeks</b>



# 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
9	Apparently non-engineered roof shed and steel stair	A Detailed Engineering Assessment to be conducted in order to determine the adequacy of steel stair & rooftop truss arrangement.	6-weeks
10	Apparently non-engineered roof shed and steel stair	Engage a qualified structural engineer to confirm satisfactory structural performance of the steel shed under wind loading as part of DEA.	6-weeks
11	Apparently non-engineered roof shed and steel stair	Carry out any remedial measures recommended by above mentioned detailed engineering assessment	6-months
12	Discrepancies between Structural drawings and site observations	Building Engineer to survey as-built structure and prepare accurate as-built drawing including all columns, beams and slabs as part of engineering assessment.	6-weeks
13	Discrepancies between Structural drawings and site observations	Verify in-situ concrete strength and aggregate type by taken min. 4 nos. 100mm dia. core samples from columns.	6-weeks
14	Discrepancies between Structural drawings and site observations	Produce and actively manage a loading plan for all floor plates within the factory, giving consideration to floor capacity and column capacity.	6-weeks
15	Discrepancies between Structural drawings and site observations	Continue to implement loading plan.	6-months
16	Discrepancies between Structural drawings and site observations	Complete implementation of any remedial works deemed necessary from out come of engineering assessment.	6-months



Item No.	Observation	Recommended Action Plan	Recommended Timeline
17	Apparently non-engineered steel roof and steel stair	Engage a qualified structural engineer to confirm satisfactory structural performance of the steel shed under wind loading.	6-weeks
18	Apparently non-engineered steel roof and steel stair	Carry out any remedial measures recommended in assessment report.	6-months
19	No drawings was found for both sheds	Building Engineer to survey as-built structure and prepare accurate as-built drawings.	6-weeks
20	Stability of sheds against lateral load	Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading.	6-weeks
21	Stability of sheds against lateral load	Carry out any remedial measures recommended in assessment report.	6-months