

YP Ashulia Ltd.

Jamgora Bottola (Moyna Market), Gorat Bagbari Road, Gazirchat Aliya Madrasha,
Ashulia, Dhaka-1349
(23.943494, 90.297852)
7 March 2024



1. Building Information

Building-1 (Main Factory Building): A seven-storied (G+6) reinforced concrete (RC) building

Building-2 (Compressor Building): A Seven-storied (G+6) reinforced concrete building.

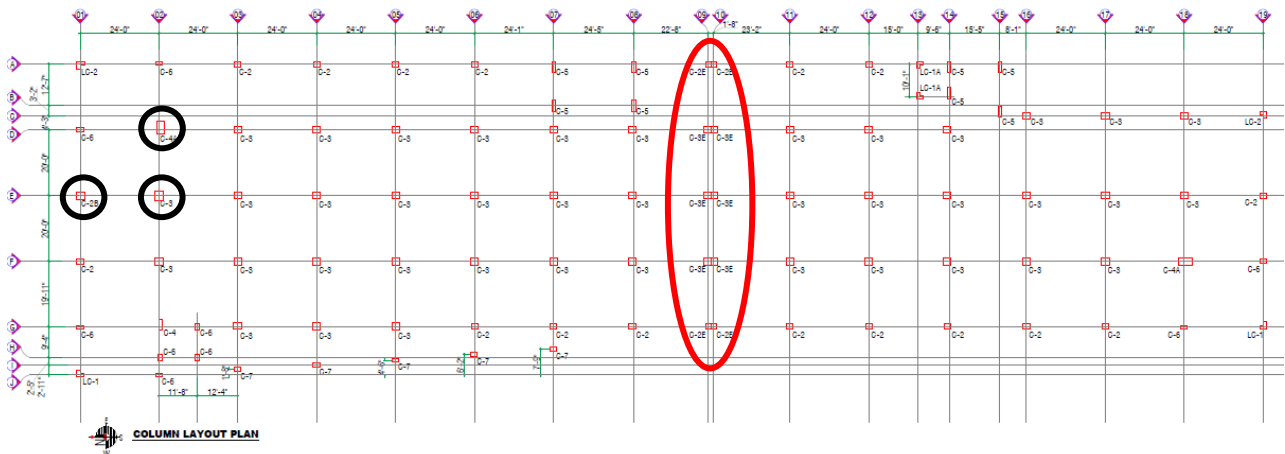
Building-3 (Office Building): A two storied (B+G+1) reinforced concrete building.

Building-4 (Generator Building): A single-storied RC building.

Building-5 (Jhute store): A single-storied reinforced concrete (RC) building with steel roof shed.

2. Observations

Observation-1: Inconsistencies in the design report and floor load plan. (Building-1)



Industrial Building: YP Ashulia Limited

DEA REPORT

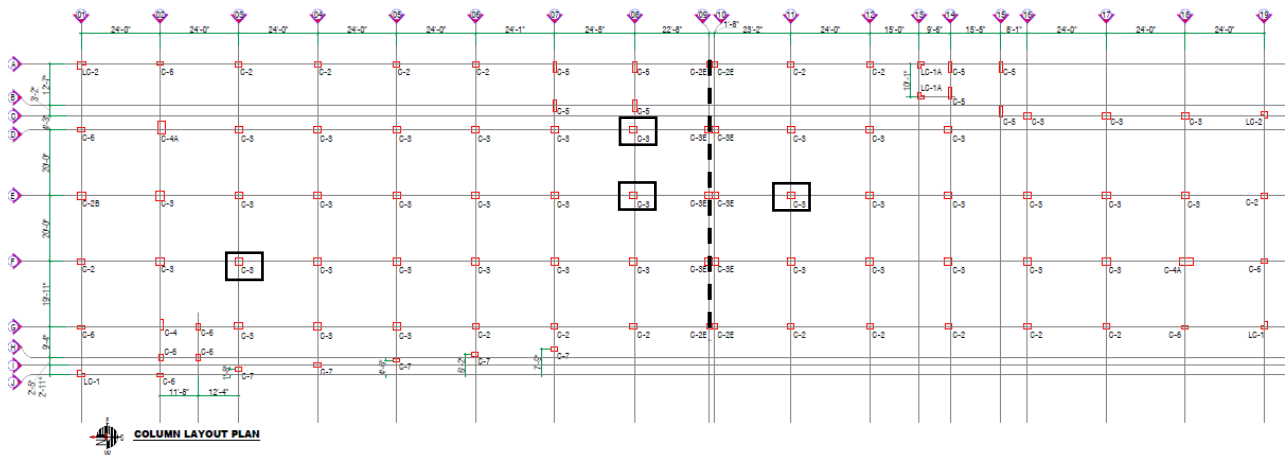
7 CONCLUSION /FINDINGS

According to BNBC loading condition-

- All foundation found adequate in size for bearing capacity.
- All foundation is found inadequate in thickness for punching shear capacity.
- 1 RCC column is found inadequate.
- 1 grade beam is found inadequate in reinforcement requirement.
- All of the floor beam are found adequate in reinforcement requirement.
- Soft Story exists in Ground Floor and 1st Floor in both directions.
- Torsional Irregularity exists in upto 3rd floor, only in Y-direction.
- The separation gap between slabs is not adequate.

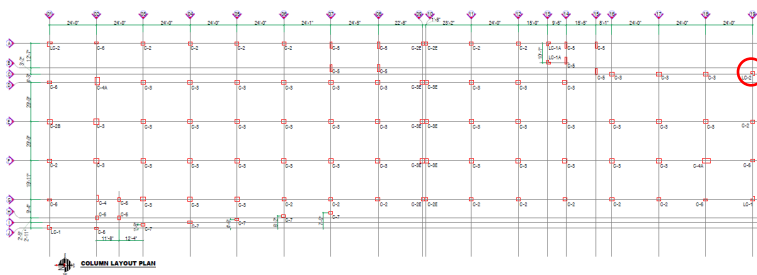
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Observation-2: Lack of material test report. (Building-1)



Description: There is an expansion joint in the middle of the building. Three concrete cores from columns are taken from one part and only one number from the other. The building engineer is required to take a minimum of four concrete cores from each part of the building and confirm the material design strength.

Observation-3: Mismatch in as-built drawings. (Building-1).



Description: During the inspection, an L-24x12 column was found in the marked location where the drawing showed an L-30x12 column. The ground-level retrofitted columns were not shown in the provided as-built column schedule. Also, the details of the steel canopy was missing in the drawing.

The building engineer is required to survey the structure and prepare accurate as-built drawings accordingly.

Observation-4: Lack of anchorage on storage racks and water tank (Building-1).



Description: Storage racks and rooftop water tanks at several locations were found unbraced. The building engineer is required to brace/anchor all the non-structural elements, including the water tank & storage rack.

Observation-5: Trolley and vehicle impact (Building-1)



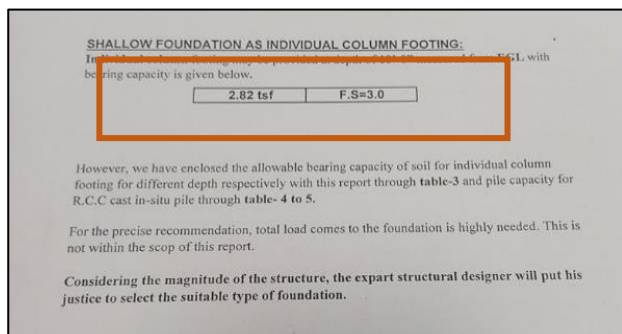
Description: Signs of trolley impact on columns and walls were found on several floors of the building. Also, the ground floor column at the loading-unloading zone is susceptible to vehicle impact. The factory is required to provide the necessary column & wall guards to protect against possible trolley impact and provide separate barriers surrounding the columns to avoid vehicle impact on them.

Observation-6: Loose materials in construction joint (Building-1).



Description: Construction joint was filled with loose materials. Building engineer is required to fill the joint with fireproof compressible materials as per engineers' suggestion.

Observation-7: Inconsistencies in the design report and soil test report. (Building-2)



Recommended footing capacity is 2.82 tsf (5.64ksf) at 3.05 m depth from EGL.

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No design check for structural wall and overturning effect was found in design report.

Description: Foundation check of Building-2 was performed considering 7.56ksf instead of 5.64 ksf. Also, no design check was given for the shear wall in the design report. Building engineer is required to revise the design report with an overturning effect check as per Sec. 2.5.7.8 BNBC-2020 in addition to the above-mentioned issues and submit the revised design documents to the RSC for review.

Table 3.1.1: Bearing capacity check

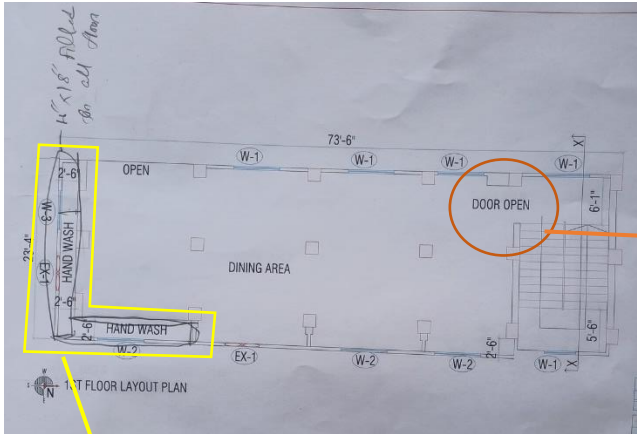
Joint Label	Foundation Type	Provided Foundation Size	Bearing Capacity	Ultimate Load bearing Capacity	Reaction (FDN)	Available FoS (For Existing Foundation)	Remarks (Minimum FoS=2)
		sft	ksf	kip	kip		
3	F3	90.3	7.56	1365.03	512.359	2.66	OK
4	F3	90.3	7.56	1365.03	451.874	3.02	OK
5	F2	64.0	7.56	968.00	412.885	2.34	OK
6	F2	64.0	7.56	968.00	421.585	2.30	OK
7	F2	64.0	7.56	968.00	411.271	2.35	OK
207	F2	64.0	7.56	968.00	339.237	2.85	OK
208	F2	64.0	7.56	968.00	347.518	2.79	OK
209	F2	64.0	7.56	968.00	348.015	2.78	OK
210	F3	90.3	7.56	1365.03	442.877	3.08	OK
211	F1	25.0	7.56	378.13	49.617	7.62	OK
225	F2	64.0	7.56	968.00	284.203	3.41	OK
226	F2	64.0	7.56	968.00	278.558	3.48	OK
227	F2	64.0	7.56	968.00	276.655	3.50	OK
228	F3	90.3	7.56	1365.03	352.519	3.87	OK
229	F3	90.3	7.56	1365.03	356.249	3.83	OK
10					172.463		
206					301.112		
223					135.708		
224					333.687		
258	CF1	299.3	7.56	4526.16	386.052	3.41	OK

Bearing capacity checked was performed considering 7.56ksf where footing depth is 2.1m from EGL.



Shear wall frame.

Observation 8: Mismatch in as-built drawings. (Building – 2).



Additional 250mm wall for fire door.



30" height 125mm wall and 18" height built-up along washing area.

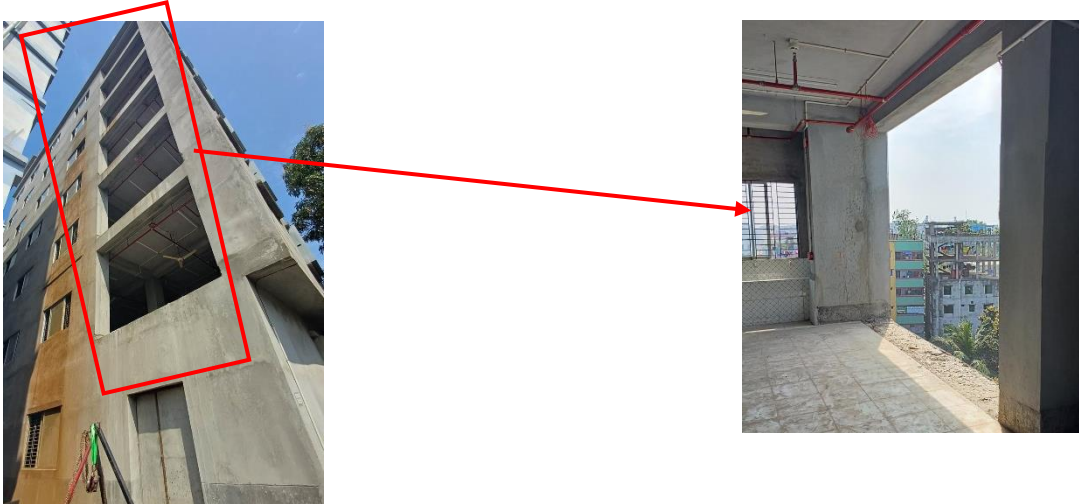
Description: During the inspection, a mismatch was found in the as-built drawing and as-built condition. Undocumented wall and built up was observed on the 1st to 6th floors which have been marked above. The building engineer is required to survey the structures and update the as-built drawings.

Observation 9: Lack of anchorage on roof water tank (Building –2).



Description: Roof water tanks were found unbraced. The building engineer is required to brace/anchor all the non-structural elements, including the water tank.

Observation-10: Falling Hazard (Building-02).



Description: A falling hazard was observed on the 1st floor to the 6th floor, at the South-East corner of the building. The building engineer is required to protect against falling hazards appropriately.

Observation-11: Inconsistencies in the design report and concrete materials observed. (Building-3)

2.3 MATERIAL PROPERTY	
The following material properties has been used for the structural design:	
❖ Yield strength of Rebar, $f_y =$	60000 lb/in ²
❖ Compressive strength of concrete (Column), $f_c' =$	3500 lb/in ²
❖ Young's modulus of concrete, $E_c =$	57,000√ f_c'
❖ Compressive strength of concrete (Beam & Slab), $f_c' =$	3000 lb/in ²
❖ Young's modulus of concrete, $E_c =$	57000√ f_c'

Design report used column concrete mechanical properties (young's modulus) for "Stone chips aggregates".



In ground floor column, brick aggregates was observed.

Description: Material properties mentioned in the design report and test report does not match with on-site observation. Brick aggregate was found instead of stone aggregate in the ground floor column. Also, no test report was found for the ground floor column. Building engineer is required to verify the in-situ concrete strength and incorporate it in the design report.

BRTC No. : 1102-46873 /21-22/CE; Dt: 17/11/2021							
Sent by : SYR INDUSTRIAL PARK, Jangra Ashulia Dhaka							
Ref. No. : Letter, Dt: 17/11/2021							
Project : SYR INDUSTRIAL PARK, Jangra Ashulia Dhaka							
Sample : Concrete Cylinder	(Mix proportion (as quoted): Not mentioned, Aggregate Type: Stone chips)						
Location : Reservoir Water Tank	(Admixture Added (as per letter) : Not Mentioned)						
Test : Compressive Strength Test of Concrete Cylinder (ASTM C39)							
Date of Test : 20/11/2021							
TEST REPORT							
Sl. No.	Date of Casting as per the letter	Specimen Designation/ Frog Mark	Specimen Area (sq. in)	Maximum Load (lb)	Crushing Strength (psi)	Average Crushing Strength (psi)	Mode of Failure
1	20/10/2021	SYR	12.92	64,704	5,008	5008 psi	Combined *
2	(31 days test)	SYR	12.42	63,369	5,101	(34.7 MPa)	Combined *
3		SYR	12.67	63,369	5,001	(354 kg/cm ²)	Combined *

Note: Samples were received in unsealed condition.

Countersigned by: 
Dr. A. B. M. Badruzzaman
Professor
Department of Civil Engineering
BUET, Dhaka-1000, Bangladesh

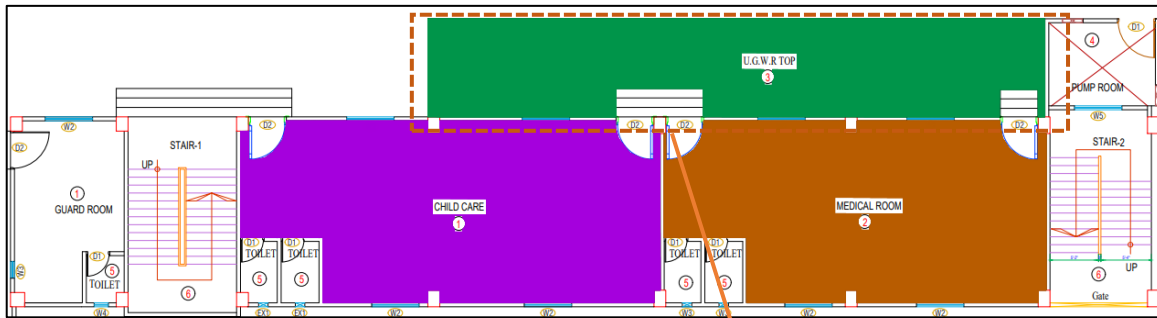
Test Performed by: 
Dr. Md. Mafizur Rahman
Professor
Department of Civil Engineering
BUET, Dhaka-1000, Bangladesh

Important Notice: Samples as supplied to us have been tested in our laboratory. BRTC does not have any responsibility as to the representative character of the samples required to be tested. It is recommended that samples are sent in a secure and sealed cover/container under signature of the competent authority. In order to avoid fraudulent fabrication of test results, it is recommended that all test reports are collected by duly authorized person, and not by the Contractor/Supplier.

Page 1 of 2

In material test report from water reservoir and floor slab, stone chips is mentioned. However, no test report was found from ground floor column.

Observation-12: Lack of load Management. (Building-3)



Produced load plan considered 60 psf (3kPa) live load for marked area which is exposed to large vehicle movement.

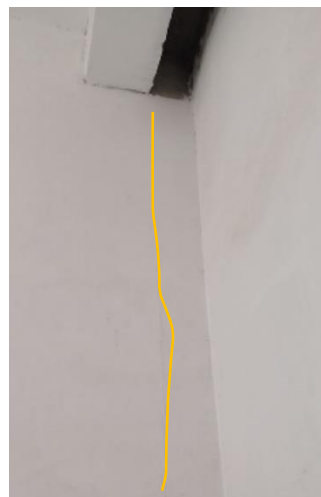


No live load plan was found posted on each floor of Building-3.



Description: The top slab of the underground water reservoir was found exposed to large vehicle movement where a 3kPa load was considered in the load plan. Also, the load plan was not found posted on any floors. The building engineer is required to post the load plan on each floor and provide necessary barriers in the exposed area to prevent large vehicle movement.

Observation-13: Crack in the Brick wall (Building-3).



Description: During the inspection, cracks were observed in the brick wall along the column-to-wall joint in stair. The building engineer is required to repair the wall crack with a suitable method.

Observation-14: Crack in the Brick wall (Building-4).



Description: During the inspection, cracks were observed in the brick wall along the lintel level. The building engineer is required to investigate the presence of a lintel in the wall and repair the crack with suitable methods.

Observation-15: Trolley impact on column (Building-4)



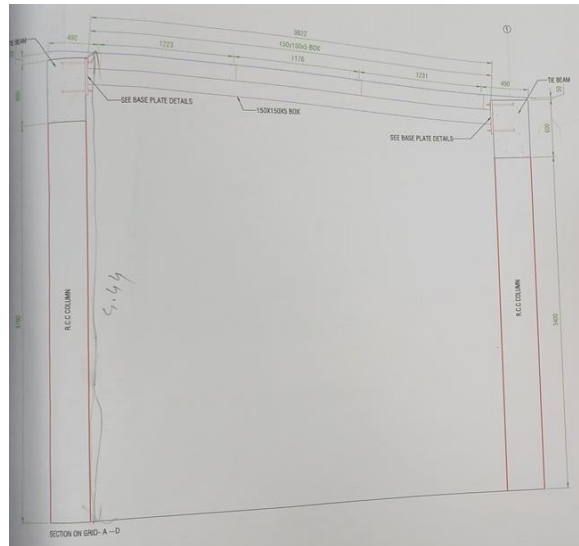
Description: A sign of trolley impact on the column was found. The factory is required to provide the necessary column guard to protect against possible trolley impact.

Observation-16: Exposed rebar. (Building-4).



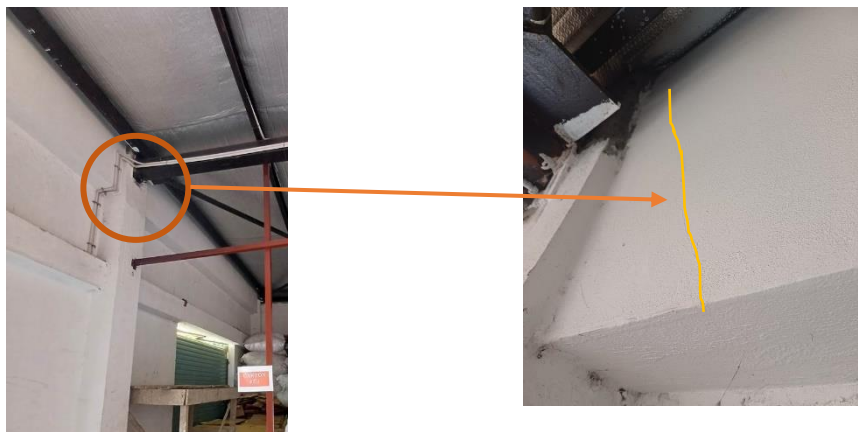
Description: During the inspection, exposed rebar was found at the roof level of the building. The factory is required to provide an anti-corrosive coating to the exposed rebar to protect it from corrosion.

Observation-17: Mismatch in as built drawings (Building-5).



Description: During the inspection, the top height was observed at 4.44m instead of 4.8m. The building engineer is required to survey the structures and update the as-built drawings.

Observation-18: Hairline Crack in the Beam (Building-5).



Description: During the inspection, hairline cracks were observed in the RC beam at both sides of multiple column-beam joints. The building engineer is required to investigate the extent of the crack and repair the crack as per the investigation report.

3. Action Plan

Observation	Action Plan	Timeline
Inconsistencies in the design report and floor load plan. (Building-1)	Update the floor loading plan as per BNBC requirements for all floor plates within the factory, considering floor, column, and foundation capacity.	within 6 weeks
	Revise the structural analysis, design report, and retrofitting scheme of the structure.	within 6 weeks
	Carry out the suggested remedial works if required.	within 6 months
Lack of material test report. (Building-1)	Verify in-situ material strength by taking a minimum 4-100mm dia. concrete core from each part of the building.	within 6 weeks
Mismatch in as-built drawings. (Building-1).	The building engineer is required to survey the structure and prepare accurate as-built drawings accordingly.	within 6 weeks
Lack of anchorage on storage racks and water tank (Building-1).	The building engineer is required to brace/anchor all the non-structural elements, including the water tank & storage rack.	within 6 months
Trolley and vehicle impact (Building-1)	The factory is required to provide the necessary column & wall guards to protect against possible trolley impact and provide separate barriers surrounding the columns to avoid vehicle impact on them.	within 6 weeks
Loose materials in construction joint (Building-1).	Building engineer is required to fill the joint with fireproof compressible materials as per engineers' suggestion.	within 6 weeks
Inconsistencies in the design report and soil test report (Building-2)	The building engineer is required to revise the design report and submit the revised design documents to the RSC for review.	within 6 weeks
	Carry out the suggested remedial works if required.	within 6 months
Mismatch in as-built drawings (Building – 2).	The building engineer is required to survey the structure and prepare accurate as-built drawings accordingly.	within 6 weeks
Lack of anchorage on roof water tank (Building –2).	The building engineer is required to brace/anchor all the non-structural elements including the water tank	within 6 months
Falling Hazard (Building-02).	The building engineer is required to protect against falling hazards appropriately.	within 6 weeks
Inconsistencies in the design report and concrete materials observed (Building-3).	Verify in-situ material strength by taking a minimum 4-100mm dia. core from the lower tier of the building.	within 6 weeks
	The building engineer is required to review the design, loads, and column stresses based on in-situ material strength.	within 6 weeks
	Carry out suggested remedial works if required.	within 6 months
Lack of load Management (Building-3).	Building engineer is required to post the load plan on each floor and provide necessary barriers in the exposed area to prevent large vehicle movement.	within 6 weeks
Crack in the Brick wall (Building-3).	The building engineer is required to repair the wall crack with a suitable method.	within 6 weeks

Crack in the Brick wall (Building-4).	The building engineer is required to investigate the presence of a lintel in the wall and repair the crack with suitable methods.	within 6 weeks
Trolley impact on column (Building-4).	The factory is required to provide the necessary column guard to protect against possible trolley impact.	within 6 weeks
Exposed rebar (Building 4).	The factory is required to provide an anti-corrosive coating to the exposed rebar to protect it from corrosion.	within 6 months
Mismatch in as-built drawings (Building-5).	The building engineer is required to survey the structures and update the as-built drawings.	within 6 weeks
Hairline Crack in the Beam (Building-5).	The building engineer is required to investigate the extent of the crack and repair the crack as per the investigation report.	within 6 weeks