

Crosswear Industries Limited

Ashu/Shilpa-16, Ward-01, Kathgara, Zirabo, Ashulia, Dhaka-1341, Bangladesh
(23.916381 N, 90.294261 E)

20 February 2022



Building Information:

Main Production Building (Building No-1): Seven storied (G+6) building.

Utility Building (Building No-2): Single storied building.

Observations

Foundation stress exceeds the normal design limit

Water intrusion into the roof slab



Sign of water ponding on roof slab



Inactive water outlet, 50 mm above roof level



Sign of water intrusion into the roof slab

Damage due to water intrusion was observed in the several locations of the roof slabs. The building engineer is required to identify the location of water intrusion and suggest remedial measures accordingly. Provide water proofing layer on the roof slab with adequate slope. Develop proper water drainage system on the roof.

7 **Observation: Main Production Building**

Crack in brick walls and beam edge



Crack in brick wall on stair landing



Crack in cantilever beam edge



Crack in brick wall on cantilever area

Crack in brick walls were observed in several locations especially in the cantilever areas. Also, crack in beam edge observed in the 1st floor cantilever beam. The building engineer is required to investigate the crack extent, reason of cracks and prepare an investigation report with proper remedial actions.

Hole in floor slab



Slab holes due to pipping were observed in several locations of slab. Also, corrosion in rebar was observed. The factory is required to remove the corrosion and fill the holes as per building engineer's suggestion.

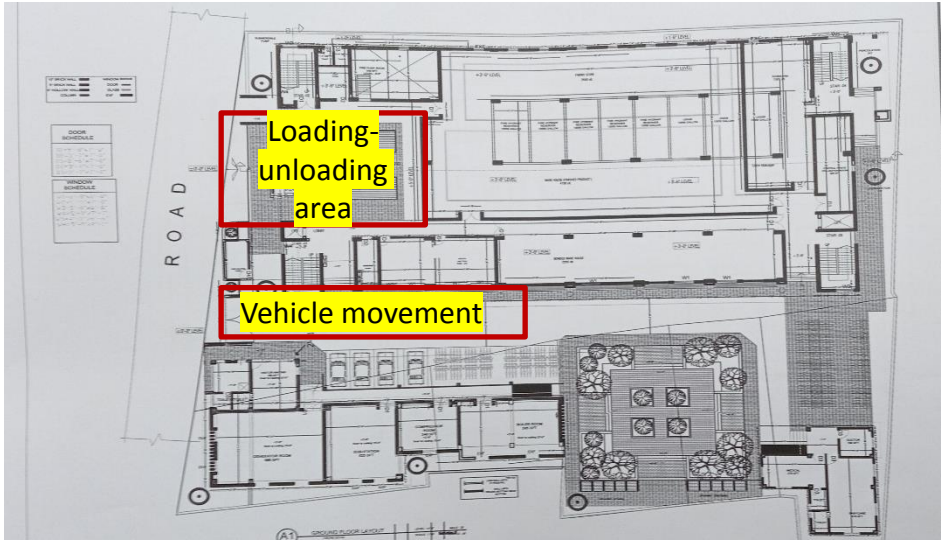
**Columns & beams are susceptible
to vehicle impact**



Ground floor column at loading-unloading zone is susceptible to vehicle impact



1st floor beam- susceptible to vehicle impact



Ground floor plan

Falling hazard & construction debris on the roof



Incomplete parapet wall and construction debris



Hanging steel shutter

Falling hazard was observed on the roof due to incomplete parapet wall and hanging steel shutter. The factory is required to provide protection barrier at roof edges. Remove the hanging steel shutter and construction debris from the roof.

Undocumented RO treatment plant at roof



RO shed on the roof

Undocumented RO water treatment plant has been found on roof. The building engineer is required to survey the RO shed and produce as-built documents.

Absence of design report



Utility Building

As per BNBC, every building or structure designed shall have its design documents prepared in accordance with the provision of Section 1.9.1. The design document shall include a design report, and a set of structural drawings, which shall be prepared in compliance with section 1.9.1.1 and section 1.9.1.2 of part-6, BNBC.

However, design report and floor loading plan was not available during inspection. The building engineer is required to prepare a design report in compliance with BNBC.

Discrepancies between drawings and as-built condition

Water intrusion into the roof slab and wall

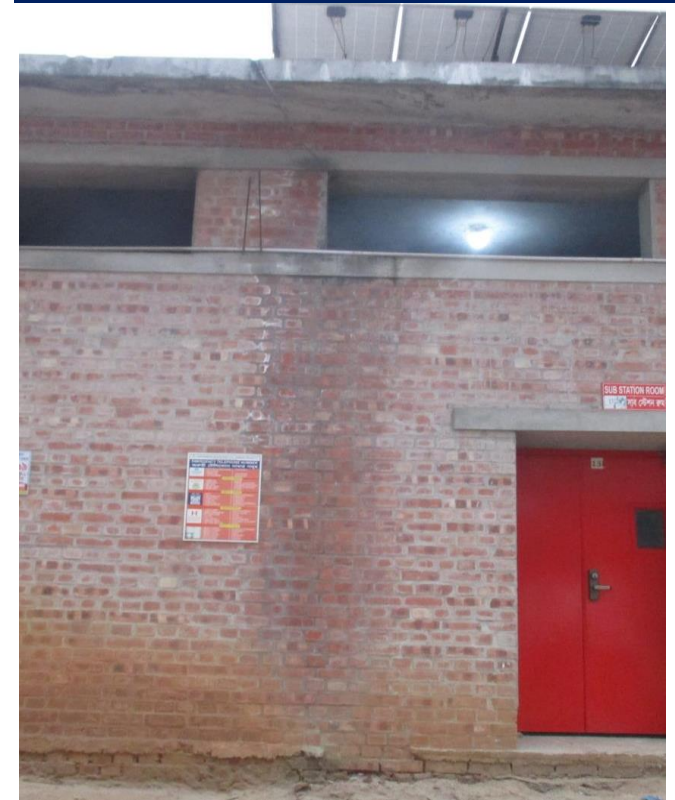


Water intrusion into the slab

Damage due to water intrusion was observed in the roof slab and brick wall. The building engineer is required to identify the location of water intrusions and suggest remedial measures accordingly. Provide water proofing layer on the roof slab with adequate slope. Develop proper water drainage system on the roof.



No water proofing layer on the roof



Water intrusion into the brick wall

Lack of lateral stability of generator chimney



Tall generator chimney

The building engineer is required to check the stability of the chimney and suggest adequate bearing and lateral support system accordingly.

Non-engineered temporary wastage shed



Undocumented temporary wastage shed made by bamboo frame.

The temporary wastage shed is undocumented and non-engineered. The factory is required to demolish the bamboo shed or replace with engineered structure.

As-built documents of gate structure



Gate structure is structurally connected with utility building at south and adjacent security room at north.



The structural connection details were not available in the drawings. The building engineer is required to produce detail of structural connections and incorporate in the as-built documents.

Problems Observed

Main Production Building:

- 1: Foundation stress exceeds the normal design limit.
- 2: Water intrusion into the roof slab.
3. Crack in brick walls and beam edge.
4. Hole in floor slab.
5. Columns & beams are susceptible to vehicle/trolley impact.
6. Falling hazard & construction debris on the roof.
7. Undocumented RO treatment plant at roof.

Utility Building:

8. Absence of design report.
9. Discrepancies between drawings and as-built condition.
10. Water intrusion into the roof slab and wall.
11. Lack of lateral stability of generator chimney.

Temporary Wastage Shed:

12. Non-engineered temporary wastage shed.

Gate Structure:

13. As-built documents of gate structure.

Priority Actions

Item No.	Observation	Recommended Action Plan	Recommended Timeline
01	Foundation stress exceeds the normal design limit. (Main Production Building)	As part of Detail Engineering Assessment (DEA), the building engineer is required to review the design load, foundation stresses and suggest proper remedial actions.	6-weeks
02	Foundation stress exceeds the normal design limit. (Main Production Building)	Produce and actively manage a loading plan for all floor plates within the factory considering foundation capacity.	6-weeks
03	Foundation stress exceeds the normal design limit. (Main Production Building)	Carry out the suggested remedial works.	6-months
04	Foundation stress exceeds the normal design limit. (Main Production Building)	Continue to implement final floor live load plan.	6-months
05	Water intrusion into the roof slab. (Main Production Building)	The building engineer is required to identify the location of water intrusion and suggest remedial measures accordingly.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
06	Water intrusion into the roof slab. (Main Production Building)	Carry out suggested remedial works.	6-weeks
07	Water intrusion into the roof slab. (Main Production Building)	Provide water proofing layer on the roof slab with adequate slope.	6-months
08	Water intrusion into the roof slab. (Main Production Building)	Develop proper water drainage system on the roof.	6-months
09	Crack in brick walls and beam edge. (Main Production Building)	Engage structural consultant to investigate the reason & extend of cracking, prepare an investigation report with proper remedial actions.	6-weeks
10	Crack in brick walls and beam edge. (Main Production Building)	Carry out suggested remedial works.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
11	Crack in brick walls and beam edge. (Main Production Building)	Continue to monitor the cracks and keep records.	6-months
12	Hole in floor slab. (Main Production Building)	The factory is required to remove the corrosion of rebar and fill the holes as per building engineer's suggestion.	6-weeks
13	Columns & beams are susceptible to vehicle/trolley impact. (Main Production Building)	Building engineer is required to provide safety barrier to avoid possible vehicle/trolley impact on the column and beam.	6-weeks
14	Falling hazard & construction debris on the roof. (Main Production Building)	Remove the hanging steel shutter and construction debris from the roof.	6-weeks
15	Falling hazard & construction debris on the roof. (Main Production Building)	The factory is required to provide protection barrier at roof edges.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
16	Undocumented RO treatment plant at roof. (Main Production Building)	The building engineer is required to survey the RO shed and produce as-built documents.	6-weeks
17	Absence of design report. (Utility Building)	Building engineer to prepare the design document for the structure, in compliance with section 1.9.1, part-6 of BNBC.	6-weeks
18	Absence of design report. (Utility Building)	Carry out the remedial works if required.	6-months
19	Discrepancies between drawings and as-built condition. (Utility Building)	Survey the whole structure and prepare accurate as-built drawings with structural connection details in compliance with BNBC.	6-weeks
20	Water intrusion into the roof slab and wall. (Utility Building)	The building engineer is required to identify the location of water intrusion and suggest remedial measures accordingly.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
21	Water intrusion into the roof slab and wall. (Utility Building)	Carry out suggested remedial works.	6-weeks
22	Water intrusion into the roof slab and wall. (Utility Building)	Provide water proofing layer on the roof slab with adequate slope.	6-months
23	Water intrusion into the roof slab and wall. (Utility Building)	Develop proper water drainage system on the roof.	6-months
24	Lack of lateral stability of generator chimney. (Utility Building)	The building engineer is required to check the stability system of the chimney and suggest proper bearing and lateral support accordingly.	6-weeks
25	Lack of lateral stability of generator chimney. (Utility Building)	Carry out remedial works if required.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
26	Non-engineered temporary wastage shed. (Temporary Wastage Shed)	The factory is required to demolish the temporary wastage storage bamboo shed or replace with engineered structure.	6-weeks
27	As-built documents of gate structure. (Gate Structure)	The building engineer is required to produce detail of structural connections and incorporate in the as-built documents.	6-weeks

Survey Limitations and Assumptions

This report is for the private and confidential use of RSC for whom it was prepared together with their professional advisors as appropriate. It should not be reproduced in whole or in part or relied upon by third parties for any use without the express written permission of RSC.

This report can be used in discussion with the supplier or factory owner as a means to rectify or address any observations made. The report is not comprehensive and is limited to what could be observed during a visual inspection of the building.

This Report is not intended to be treated as a generalised inspection and does not cover the deterioration of structural members through dampness, fungal or insect attack, nor does it deal with problems and defects of a non-structural nature. Other non structural aspects of the building such as fire safety have not been assessed in this survey.

Except as otherwise noted, drains and other services were not viewed or tested during our inspection and are therefore similarly excluded from this Report. We have not inspected any parts of the structure which are covered, unexposed or inaccessible and we are therefore unable to report that any such part of the property is free from defect.

External inspection of the façade walls has generally been carried out from ground level only by visual sighting. No opening up works were carried out (except as noted) and we rely on the Architects and Engineers drawings provided to us for our views on concealed parts of the structure and in particular foundations. Strengths of materials and components are untested and we recommend that the factory owners Building Engineer carries out in situ testing over and above those suggested to satisfy themselves with the material strengths and component details.

Recommendations, where given, are for the purpose of providing indicative advice only, are not exhaustive, relate solely to identifying key and obvious structural defects as identified in this presentation, and do not take the form of or constitute a specification for works. We take no responsibility for the works as constructed. This report does not interfere with the factory owners Building Engineers responsibility for the structural performance of this building, The Building Engineer remains fully responsible for the structural adequacy of the building.

This report does not comment in detail on the future seismic performance of the building and only highlights the fact that the building may experience significant damage or collapse in a seismic event along with many others in the Dhaka region.

The observations in this report are based on the Engineering Judgement of the lead surveyor/engineer at the time of the survey. We assume in making these observations that no covering up of faults defects, filling or plastering over cracking or significant repair work has been carried out by the building owner. Any future alteration or additional work by the building owner will void this report.