

Cotton Club (BD) Ltd. (Extension)

Jarun (South), Kashimpur, Gazipur, Bangladesh.

(23.99095N, 90.32162E)

19 & 31 October 2021



Building Information:

Building-2: Two storey (G+1)

Building-4 : Single storey

Building-6: Two storey (G+1)

Building-7: Single storey

Building-8: Two storey (G+1)

Building-9: Five storey (G+4)

Building-10: Single storey

Building-11: Single storey (G+M)

Building-12: Single storey.

Building-14: Single storey (G+M)

Observations

Potential to collapse & falling hazard

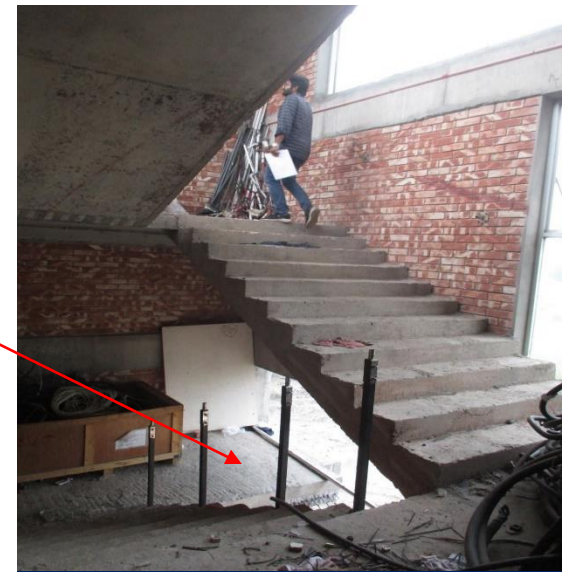
Observation: Building-11 & Building-14



Building-14, Because of soil excavation, soil under the shallow foundation of the steel stair has been moved away and the steel stair is now overhanging, supported by some steel props that have the potential to collapse at any time



Building-14, foundation exposed due soil excavation. Ground bearing slab at EGL level was demolished. RC stair slabs below mezz. floor partially demolished.



Building-14, upper floors' RC slab still lacks a railing and safety briary, potentially posing a fall hazard.



Building-11, foundation exposed due soil excavation



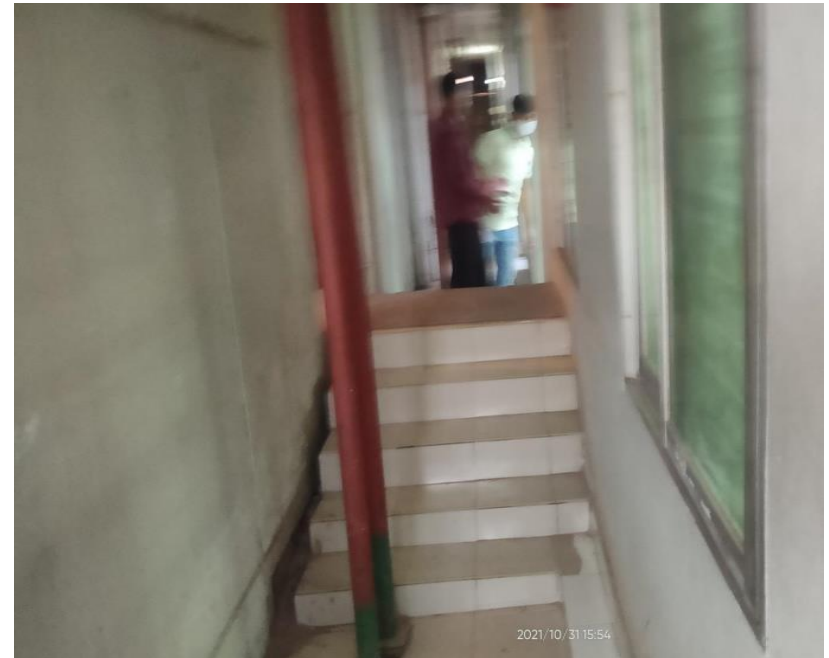
Soil excavation for the construction of a new building was found adjacent to Building-11 and Building-14. Because of that excavation, the soil under the shallow foundation of the steel stair adjacent to Building-14 has been moved away and the steel stair is now overhanging, supported by some steel props that have the potential to collapse at any time. The ground-bearing slab at EGL level, and one landing of the RC stair of Building-14 that connects to the mezzanine floor was found demolished. The upper floors' RC slab still lacks a railing and safety briary, potentially posing a fall hazard. The factory need to take following immediate actions.

1. The operation of Building-14 and the construction of a new building must be ceased immediately. Ensure that the steel stair is properly cordoned off to restrict access.
2. A retaining wall must be constructed immediately. Backfilling the moved soil beneath the stairwell and buildings must be completed after the retaining wall is constructed. The design and construction of the retaining wall must comply with the structural requirements of the BNBC 2020 provisions.
3. Stop all excavation work for the construction of the new building immediately. All existing and adjoining structures must be protected from any damage due to construction operations.
4. Factory to ensure that the contractors are following H&S measures and takes all precautions to safeguard all persons that can be affected by the under-construction Building/site works.
5. Local consultant and/or H&S Engineer to provide advice and verification of the above actions.

Built-up on cantilever slab

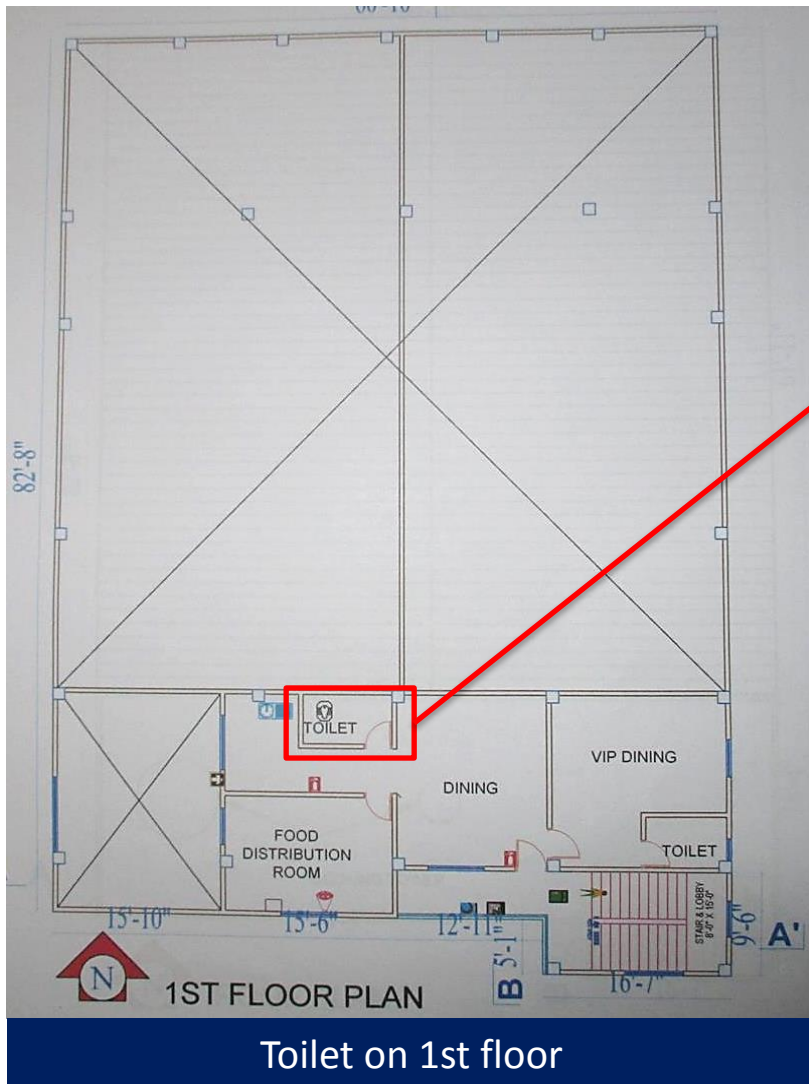


600 mm floor build-up on 1.5 m cantilever slab
not shown in drawing.



Factory engineer is required to survey the whole structure and update as-built drawings as per actual site condition and check the cantilever slab adequacy.

Built-up on toilet zone



300 mm floor build-up was observed in toilet.

Factory engineer is required to survey the structure and update as-built drawings as per actual site condition.

Discrepancy in as-built drawings



150 mm roof slab

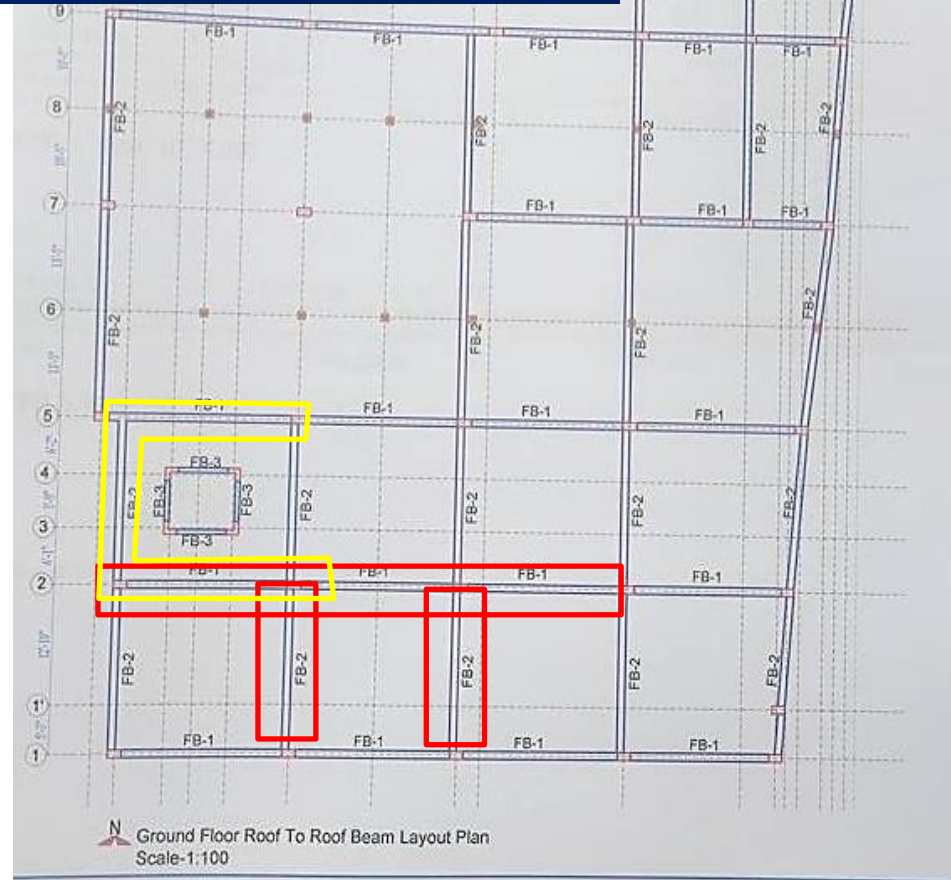
Floor beam was missing on 1st floor roof (red marked) and stair top room (yellow marked). Also, slab thickness was measured 150 mm instead of 125 mm. The building to survey the structure and update the as-built structural drawings accordingly.



Beam missing on roof



Beam missing on 1st floor roof



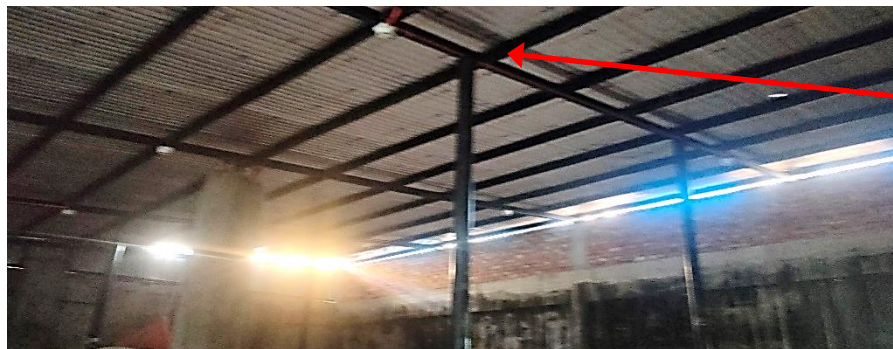
Typical beam layout plan

Observation: Building-8 (Chemical & Dice Store)

Lack of structural integrity



1st floor: Steel rafter on steel pipe & RC column

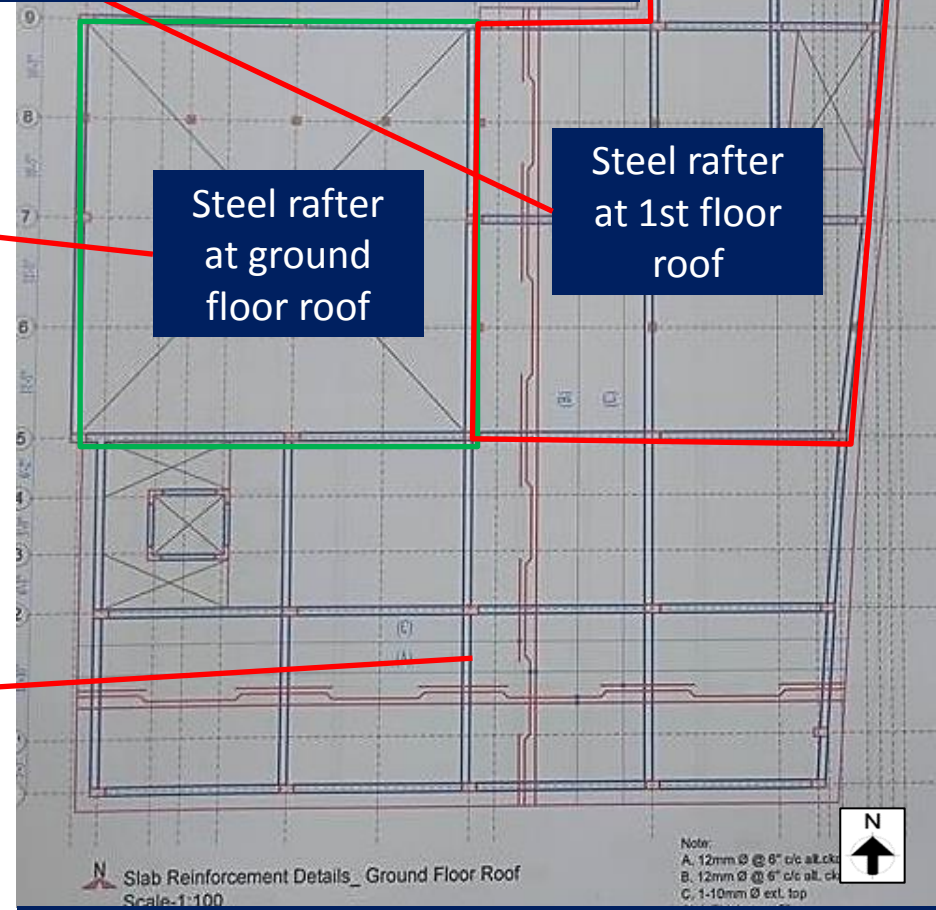


Ground floor: Steel rafter on steel pipe



Ground & 1st floor: RC beam-column frame

The building is irregular in shape and structural arrangement. There are different structural systems in same floor level. The building engineer to verify the lateral load path and check structural integrity.



1st floor slab outline and rebar detail

Observation: Building-8 (Chemical & Dice Store)

Geotechnical investigation report not available



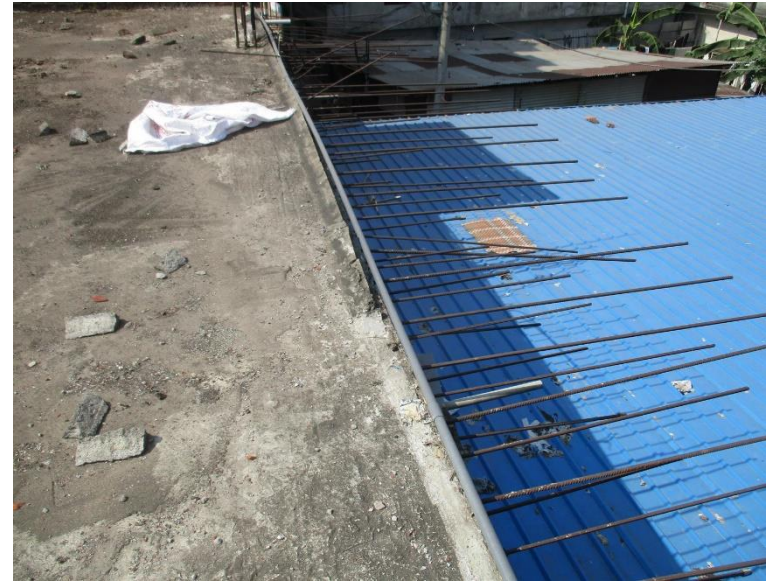
Geotechnical investigation report not available for Building- 8

The building engineer to carry out a geotechnical investigation to the close vicinity of existing building. Check the foundation adequacy and incorporate necessary calculation in the Engineering Assessment (EA) report.

Falling hazard and exposed rebar



No parapet/barrier on roof



Exposed rebar on roof and stair zone

The factory is required to provide parapet/barrier on roof and stair zone to prevent possible falling hazard. Remove rusting and apply rust proof coating to the exposed rebars to protect from further corrosion.

Observation: Building-8 (Chemical & Dice Store)

Corrosion of rebar and concrete spalling



Corrosion of slab rebar

Corrosion of slab rebar and spalling of concrete was observed in the stair zone roof slab. The building engineer to investigate the reason & extend to of corrosion & concrete spalling and prepare an investigation report with suitable remedial measure.



Spalling of concrete

Water ponding on roof



Water ponding and vegetation on roof

The factory is required to remove vegetation & debris from roof. Apply water proofing layer on the roof slab with adequate slope to protect water infiltration into the slab.

Crack on brick wall



Crack on brick wall was observed in ground floor

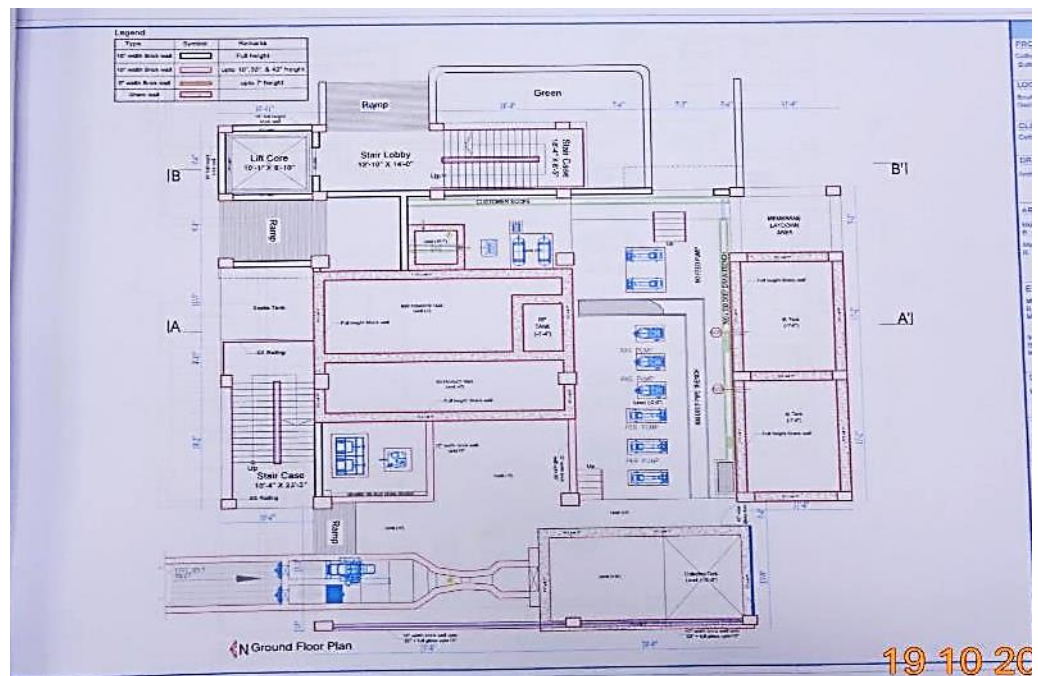
The building engineer to investigate the reason & extend to of crack and prepare an investigation report with suitable remedial measure.

Absence of design report



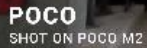
B-9 (RO building)

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 was not available during inspection. The building engineer is required to prepare a design report in compliance with BNBC.



Drawings

Discrepancies between drawings & as-built condition.



⚡ NTIE BEAM LAYOUT (Level from 1st floor : 10'-8")

The building engineer is required to survey the structural components and produce accurate structural drawings.

Connection with adjacent aeration tank



The aeration tank is connected to the middle of Building-9 column

The building engineer is required to check the lateral support to the building columns, consider the effect/support condition in structural analysis and suggest necessary actions accordingly.

Improve roof drainage system.

Observation: Building-9 (RO Building)



Stagnant water observed on roof

Develop proper drainage system on the roof with adequate slope or apply water proofing layer on the roof to resist water ingress into the slab.

Lack of lateral stability

Observation: Building-10 (Storage Shed)

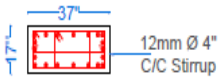


Absence of bracing and lateral load transfer media (compression strut) on roof

The building has no bracing system and lateral load transfer media. The building engineer is required to check the lateral stability of the structure and suggest proper remedial actions accordingly.

Discrepancy in as-built drawing

Observation: Building-11 (Dyeing & Dyeing Finishing Shed)

		Below GL	Above GL	
C2	15" X 35"	 12mm Ø 4" C/C Stirrup 20-20mm Ø	 12mm Ø 4" C/C Stirrup 20-20mm Ø	 10mm Ø @ 5", 7" & 5" C/C Stirrup 8-20mm Ø

C2 column: Different size in column schedule.
15"x 35" (375 mm x 1175 mm) and 17" x 37" (425 mm x 1225 mm)



C2 column measured (above GL) 375mm instead of 425mm



Bracing missing at toilet zone



Half cross-bracing instead full



Typical cross-bracing

Vertical bracing location did not matched with as-built drawings. Some bracings found onsite which were not shown in drawing in grid i-H, K-L, A-B any many others locations. Some bracings were missing on-site as per drawings location. Some cross bracings were found in half length of column where full length was shown in drawings. The building engineer to prepare as-built drawings.

Design report was not available

Observation: Building-11 (Dyeing& Dyeing Finishing Shed)



Design review of jack beam is required



Design review steel stair is required



Design review required for mezzanine

Design report was not available for the Building-11. 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, the building engineer is required to prepare a design report in compliance with BNBC.

Gap between connection plates and bolt missing



Gap between steel joints



Bolts missing



Bolts missing

Gap between connection plates were observed in several steel members connections. Also, bolt was missing in some locations. Factory engineer in required to survey the whole building, re-install missing bolt and apply remedial actions for connections.

Lack of lateral stability

Observation: Building-12 (Fabric Store & Sample Dyeing)



Absence of bracing and lateral load transfer media (compression strut) on roof

The building has no bracing system and lateral load transfer media. The building engineer is required to check the lateral stability of the structure and suggest proper remedial actions accordingly.

Design report was not available



Building-14



Long column design is required

Design report was not available for the Building-14. 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, the building engineer is required to prepare a design report in compliance with BNBC.

Observation: Building-14 (Utility Building)

Exposed pile and shallow foundation



Due to excavation, soil from shallow foundation was moved away and 2.7 m pile was exposed. The factory engineer is required to provide the retaining wall to support loose soil, suggest compaction methodology of backfilling soil and re-check the foundation capacity accordingly.

Corroded & exposed rebar



Exposed rebar on roof



Rebar corrosion

Remove rusting and apply rust proof coating to the exposed rebars to protect from further corrosion.

Water ponding on roof



Water ponding on roof

Develop drainage system on roof with adequate slope to protect water infiltration into the slab.

Test Carried out



B-8: Exposed rebar on roof



B-8: Brick aggregate on column



B-9: Ferro scanning



B-9: Stone aggregate on column and floor





B-14: Exposed rebar on roof



B-14: Stone aggregate on column and slab



B-11: Stone aggregate on foundation

Problems Observed

Building-11 & Building-12:

ITEM 01: Potential to collapse and falling hazard

Building-2:

ITEM 02: Built-up on cantilever slab

Building-6 (Dining building):

ITEM 03: Built-up in toilet

Building 8:

Item 04: Discrepancy in as-built drawing.

Item 05: Lack of structural integrity.

Item 06: Geotechnical investigation report not available.

Item 07: Falling hazard and exposed rebar.

Item 08: Corrosion of rebar and concrete spalling.

Item 09: Water ponding on roof.

Item 10: Crack on brick wall.

Building-9 (RO Building):

Item 11: Absence of design report.

Item 12: Discrepancies between drawings & as-built condition.

Item 13: Connection with adjacent aeration tank.

Item 14: Improve roof drainage system.

Problems Observed

Building 10:

Item 15: Lack of lateral stability.

Building 11:

Item 16: Discrepancy in as-built drawing.

Item 17: Design report not available.

Item 18: Gap between connection plates and missing bolts.

Building 12:

Item 19: Lack of lateral stability.

Building 14:

Item 20: Design report not available.

Item 21: Corroded & exposed rebar.

Item 22: Water ponding on roof.

Priority and Actions

Item No.	Observation	Recommended Action Plan	Recommended Timeline
01	Potential to collapse and falling hazard. (Building-14)	The operation of Building-14 and the construction of a new building must be ceased immediately. Ensure that the steel stair is properly cordoned off to restrict access.	Immediate
02	Potential to collapse and falling hazard. (Building-14)	A retaining wall must be constructed immediately. Backfilling the moved soil beneath the stairwell and buildings must be completed after the retaining wall is constructed. The design and construction of the retaining wall must comply with the structural requirements of the BNBC 2020 provisions.	Immediate
03	Potential to collapse and falling hazard. (Building-14)	Stop all excavation work for the construction of the new building immediately. All existing and adjoining structures must be protected from any damage due to construction operations.	Immediate

Item No.	Observation	Recommended Action Plan	Recommended Timeline
04	Potential to collapse and falling hazard. (Building-14)	Factory to ensure that the contractors are following H&S measures and takes all precautions to safeguard all persons that can be affected by the under-construction Building/site works.	Immediate
05	Potential to collapse and falling hazard. (Building-14)	Local consultant and/or H&S Engineer to provide advice and verification of the above actions.	Immediate
06	Potential to collapse and falling hazard. (Building-14)	Check the design of steel stair and exposed foundations.	6-weeks
07	Potential to collapse and falling hazard. (Building-14)	Carry out necessary remedial actions where required.	6-months
08	Potential to collapse and falling hazard. (Building-14)	Continue to implement floor loading plan.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
09	Built-up on cantilever slab. (Building-2)	The building engineer is required to survey the structure and produce accurate as-built drawings.	6-weeks
10	Built-up on cantilever slab. (Building-2)	Check the cantilever slab adequacy and produce floor live loading plan for the building considering the floor, column & foundations capacity.	6-weeks
11	Built-up on cantilever slab. (Building-2)	Carry out remedial works if required.	6-months
12	Built-up on cantilever slab. (Building-2)	Implement the floor loading plan (posting, signage and maintaining).	6-months
13	Built-up in toilet. (Building-6)	The building engineer is required to survey the structure and produce accurate as-built drawings.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
14	Discrepancy in as-built drawing. (Building-8)	The building engineer is required to survey the structural components and produce accurate as-built structural details.	6-weeks
15	Lack of structural integrity. (Building-8)	As part of Engineering Assessment (EA), the building engineer to verify the lateral load path and check structural integrity of the structure.	6-weeks
16	Lack of structural integrity. (Building-8)	Carry out remedial works as per the recommendation of EA.	6-months
17	Geotechnical investigation report not available. (Building-8)	The building engineer to carry out a geotechnical investigation to the close vicinity of existing building.	6-weeks
18	Geotechnical investigation report not available. (Building-8)	Check the foundation adequacy and incorporate necessary calculation in the Engineering Assessment (EA) report.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
19	Geotechnical investigation report not available. (Building-8)	Carry out remedial works as per the recommendation of EA.	6-months
20	Falling hazard and exposed rebar. (Building-8)	The factory is required to provide parapet/barrier on roof and stair zone to prevent possible falling hazard.	6-weeks
21	Falling hazard and exposed rebar. (Building-8)	Remove rusting and apply rust proof coating to the exposed rebars to protect from further corrosion.	6-weeks
22	Corrosion of rebar and concrete spalling. (Building-8)	The building engineer to investigate the reason & extend to of corrosion & spalling of concrete and prepare an investigation report with suitable remedial measure.	6-weeks
23	Corrosion of rebar and concrete spalling. (Building-8)	Carry out remedial works as per investigation report.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
24	Water ponding on roof. (Building-8)	The factory is required to remove vegetation & debris from roof.	6-weeks
25	Water ponding on roof. (Building-8)	Apply water proofing layer on the roof slab with adequate slope to prevent water infiltration into the slab.	6-months
26	Crack on brick wall. (Building-8)	The building engineer to investigate the reason & extend to of crack and prepare an investigation report with suitable remedial measure.	6-weeks
27	Crack on brick wall. (Building-8)	Carry out remedial works as per investigation report.	6-months
28	Absence of design report (Building-9)	Prepare a set of design documents including Engineering Assessment (EA) report as per BNBC (part-6, section 1.9.1).	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
29	Absence of design report (Building-9)	The building engineer to review the design of all structural members as a part of Engineering Assessment.	6-weeks
30	Absence of design report (Building-9)	Carry out remedial works as per EA recommendation (if any).	6-months
31	Discrepancies between drawings & as-built condition. (Building-9)	The building engineer is required to survey the structural components and produce accurate as-built structural details.	6-weeks
32	Connection with adjacent aeration tank. (Building-9)	The building engineer is required to check the lateral connections, consider in structural analysis and suggest necessary actions accordingly.	6-weeks
33	Connection with adjacent aeration tank. (Building-9)	Carry out remedial works if required.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
34	Improve roof drainage system. (Building-9)	Improve roof drainage system with adequate slope to prevent water ponding on the roof slab.	6-months
35	Lack of lateral stability. (Building-10)	As part of EA, building engineer is required to check the lateral stability of the structure and suggest proper remedial actions accordingly.	6-weeks
36	Lack of lateral stability. (Building-10)	Carry out remedial works as per EA report.	6-months
37	Discrepancy in as-built drawing. (Building-11)	The building engineer is required to survey the structure and produce accurate as-built drawings with structural details.	6-weeks
38	Design report not available. (Building-11)	Prepare a set of design documents including Engineering Assessment (EA) report as per BNBC (part-6, section 1.9.1).	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
39	Design report not available. (Building-11)	The building engineer to review the design of all structural members as a part of Engineering Assessment.	6-weeks
40	Design report not available. (Building-11)	Carry out remedial works (if required).	6-months
41	Gap between connection plates and missing bolts. (Building-11)	Building engineer is required to check all the joint and fill the gap between connection plates with suitable materials.	6-weeks
42	Gap between connection plates and missing bolts. (Building-11)	Install missing bolt where required.	6-weeks
43	Lack of lateral stability. (Building-12)	As part of EA, building engineer is required to check the lateral stability of the structure and suggest proper remedial actions accordingly.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
44	Lack of lateral stability. (Building-12)	Carry out remedial works as per EA report.	6-months
45	Design report not available. (Building-14)	Prepare a set of design documents including Engineering Assessment (EA) report as per BNBC (part-6, section 1.9.1).	6-weeks
46	Design report not available. (Building-14)	The building engineer to review the design of all structural members as a part of Engineering Assessment.	6-weeks
47	Design report not available. (Building-14)	Carry out remedial works (if required).	6-months
48	Corroded & exposed rebar. (Building-14)	Remove rusting and apply rust proof coating to the exposed rebars to protect from further corrosion.	6-weeks
49	Water ponding on roof. (Building-14)	Improve roof drainage system with adequate slope to prevent water ponding on the roof slab.	6-months