

Azim & Son (Pvt) Ltd Unit 2 (Extension)

Gacha Road; Fakir Market; Gazipur
(23.936126, 90.377798)

7th February 2022



Building Information

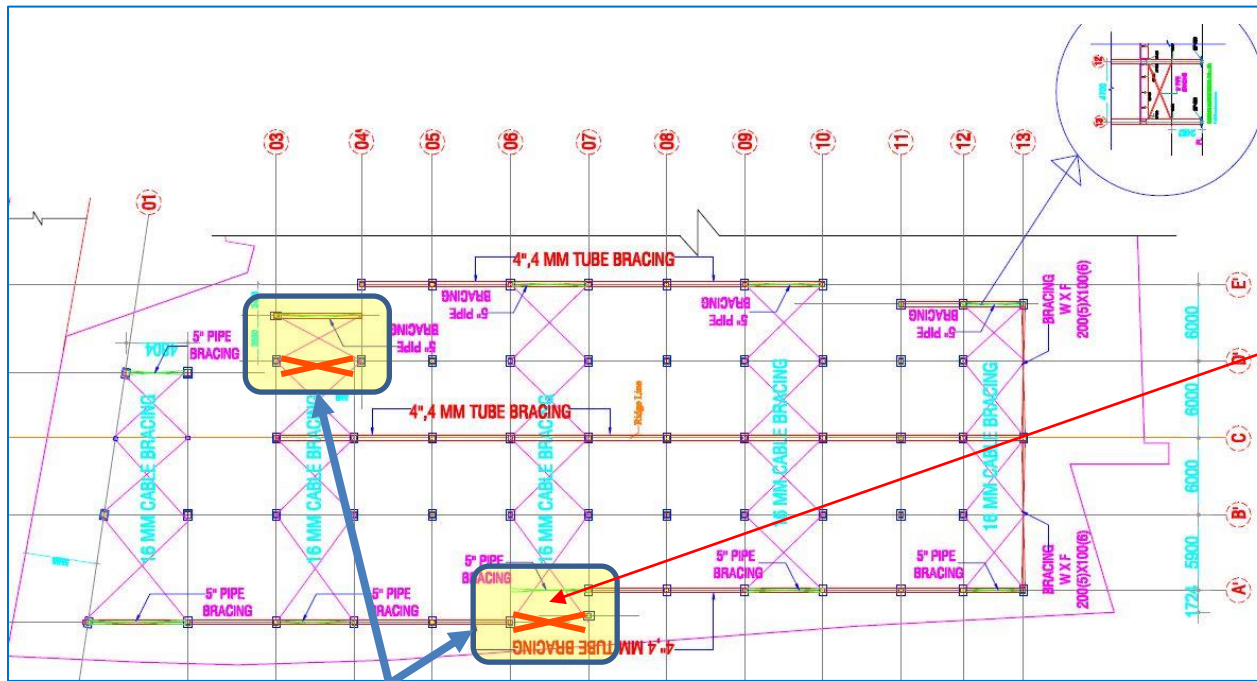
Building-2: Two storied (G+1) Building.

Building-5: Seven storied (G+6) Building.

Building-6: Two storied (G+1) Building.

Observations

Lack of information and discrepancies in as-built drawings.



Vertical Bracing location mismatches

Connection details of column splice and vertical bracings of end grid were not found in the as-built drawings. Locations of vertical bracings were found different in between grid 3-4 & 6-7.



Vertical bracing



Connection of vertical bracing



Column Splice

Observation: Building-2

Absence of design documents



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, part-6 of BNBC. At the time of inspection, only as-built drawing and geotechnical report were available, but no design report & load plan were available which are required to be prepared in compliance with section 1.9.1.1 (part-6, BNBC).

Significant connection gap

Significant gaps observed in rafter connection at several locations. Building engineer is required to carry out suitable remedial works.



Gap observed in rafter connections

Loose cable bracing

Some of the horizontal cable bracings were found loose. The factory is required to tight the bracings for transferring the lateral loads properly.



Loose cable bracing at roof



Loose cable bracing

Corrosion in steel member

Corrosion in steel member was observed in several locations. The building engineer to suggest proper remedial measure accordingly.



Corrosion in Base Plate



Corrosion in Column



Corrosion in column

Observation: Building-2

Connection bridge between Building- 2 and 3

Connecting bridges were found between Building-2 and 3 at two different locations. No drawings were found for these bridge on site. The connecting bridge is a separate structure with independent foundation system. There is no visible stability system and load path is complex in connecting bridge-1. The factory engineer is required to check the lateral stability of the structure and prepare as-built drawings.



Connection Bridge 1



Connection Bridge 2

Design report needs to be revised



Load plan for 3rd to 6th floor.

Factory Building is being used for store purpose at 3rd & 4th floor. The 5th & 6th floor is currently vacant but proposed for store purpose.

Table 2: Typical Loading of Building considered for analysis

Floor	Type of Loading	Specified Load (Q _c) in kg/m2(psf) for industrial building.
Ground floor		
1 st floor	Live Load	105 psf (5 kpa)
2 nd floor	Live Load	105 psf (5 kpa)
3 rd floor	Live Load	105 psf (5 kpa)psf)
4 th floor	Live Load	105 psf (5 kpa)
5 th floor	Live Load	63 psf (3 kpa)
6 th floor	Live Load	63 psf (3 kpa)
Roof	Live Load	32 psf(2 kpa)
Stair case	Live Load	84 psf (4 kpa)

Live load consideration in Design report

As per BNBC, 6 kPa is required to consider as floor loading for the light storage facilities. During inspection, load plan was found posted considering 5 kPa at 3rd & 4th floor and 3kpa for 5th & 6th floor.

INDUSTRIAL, STORAGE & HAZARDOUS (Occupancy - G, H & J)	Workshop, factory, warehouse	1 Light workroom without storage	3.0	2.7
		2 Machinery hall & circulation area	4.0	4.5
		3 Factory, workshop etc.	5.0	4.5
		4 Manufacturing : light	6.0	4.5 ⁽⁵⁾
		heavy	12.0	9.0 ⁽⁵⁾
		ice	15.0	9.0
		5 Printing plant :		
		Press room	7.0	11.0 ⁽⁵⁾
		Composing and linotype room	5.0	9.0 ⁽⁵⁾
		Paper storage room	12.0	9.0 ⁽⁵⁾
		6 Motor room, fan room etc. including the weight of machinery	7.5	4.5
		7 Cold storage, grain storage	15.0	9.0 ⁽⁵⁾
		8 Storage warehouses : light	6.0	4.5 ⁽⁵⁾
		heavy	12.0	9.0
		9 Foundries	20.0	12.0

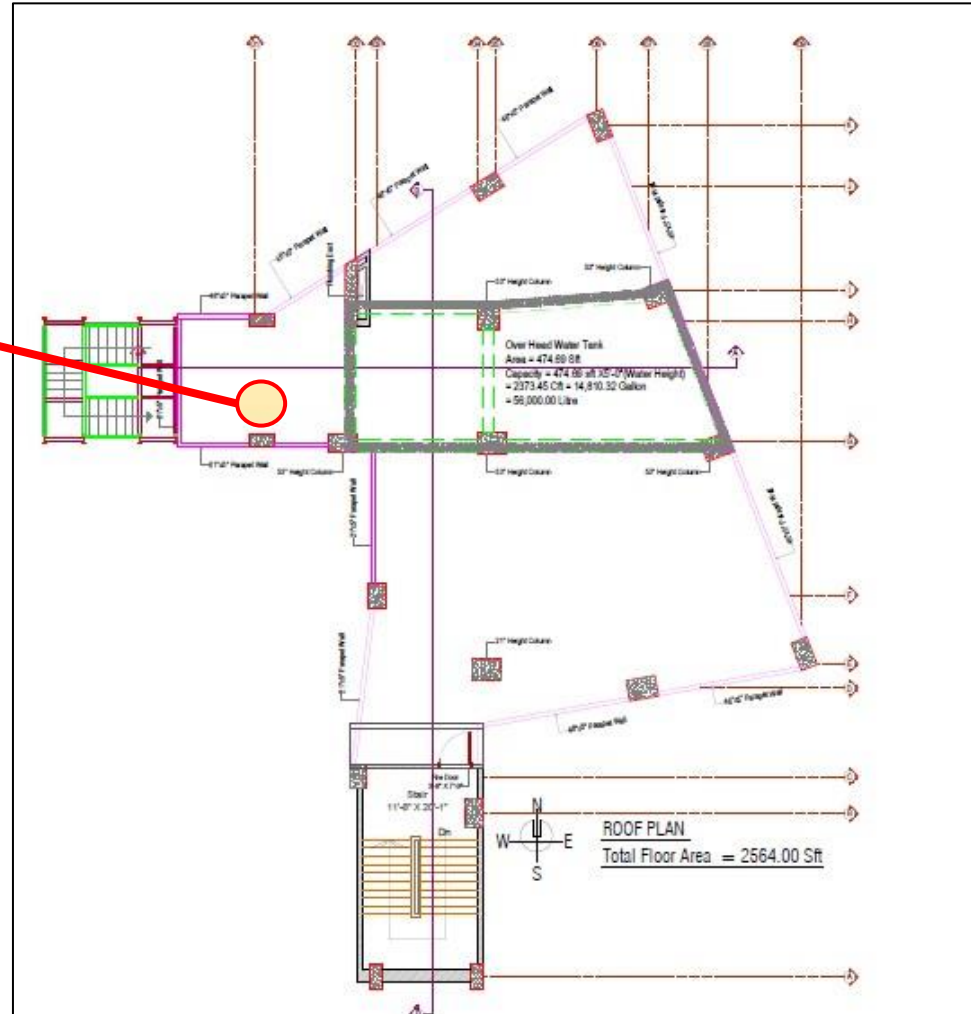
Live load Table- BNBC 2006

During inspection live load plan was not found as per requirement of BNBC. Factory engineer is required to revise the design report in compliance with BNBC chapter-2.



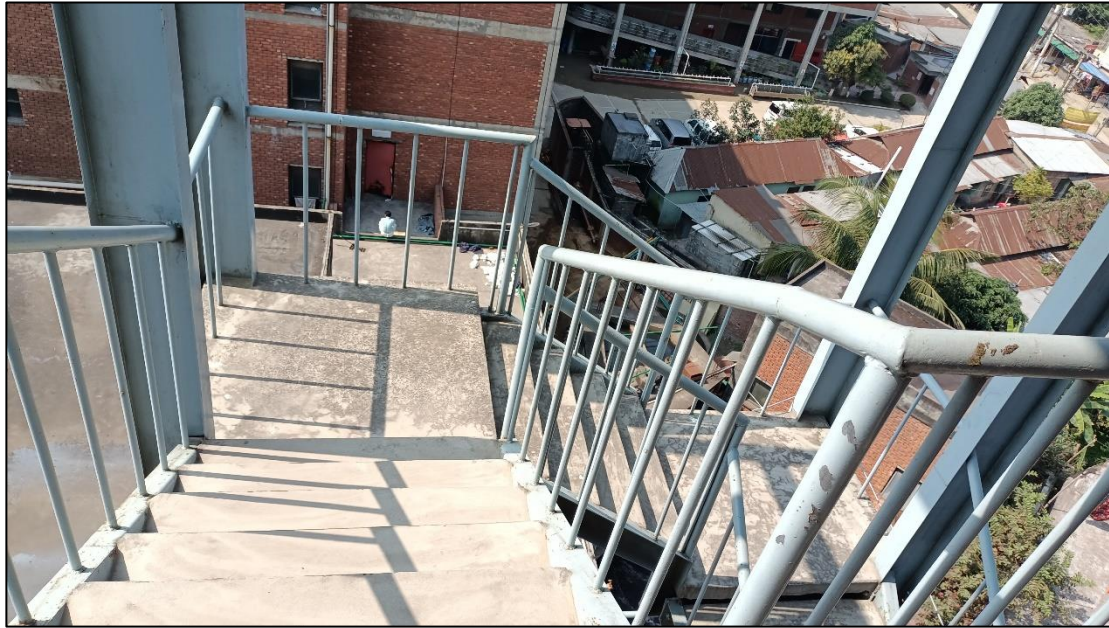
Undocumented 2000L water tank

An undocumented plastic water tank was found at roof. Factory engineer is required to survey the whole structure and update the as-built drawing. The loading from the plastic water tank is required to be considered during an adequacy check of slab.



Roof Layout plan

Lack of as-built drawing



A steel stair was found at west side of the building. No structural details are available for the steel stair.

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. During the inspection, the as built drawings & design report was not found. However, the building engineer is required to prepare as-built drawing and design report for the structure in compliance with section 1.9.1 (part-6, BNBC).

Corrosion in steel member



Corrosion in steel member of steel stair

Corrosion in steel member of steel stair was observed in several locations. The building engineer to suggest proper remedial measure accordingly.

Trolly impact on Column



RC Column damaged due to impact of trolley

RC Column was found damaged due to the impact with trolley. Factory engineer is required to investigate the damage and suggest a remedial action as well as provide suggestion to prevent such damages in future. Factory is required to follow the suggestion of the engineer for remedial actions.

Exposed re-bar found



Exposed rebar of floors



Exposed reinforcement was found extended from slab & beam. All exposed reinforcement is to be protected from corrosion which may cause degradation of the concrete. Factory engineer is required to take necessary measures to prevent the corrosion in exposed rebar.

Absence of design documents

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, part-6 of BNBC. At the time of inspection, only as-built drawing and geotechnical report were available, but no design report & load plan were available which are required to be prepared in compliance with section 1.9.1.1 (part-6, BNBC).

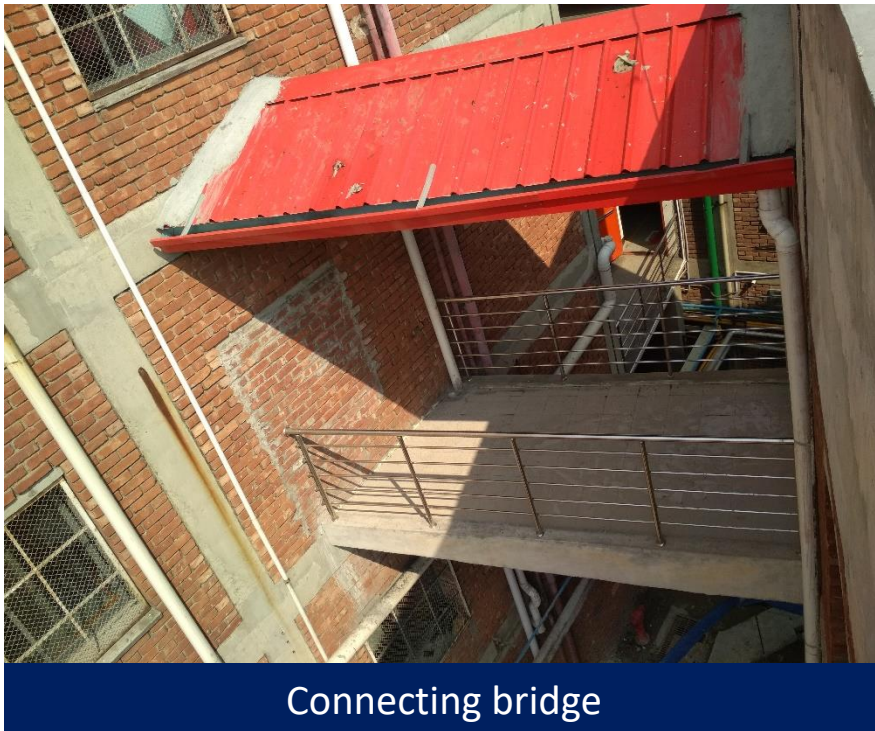


No design report was available for Building-6

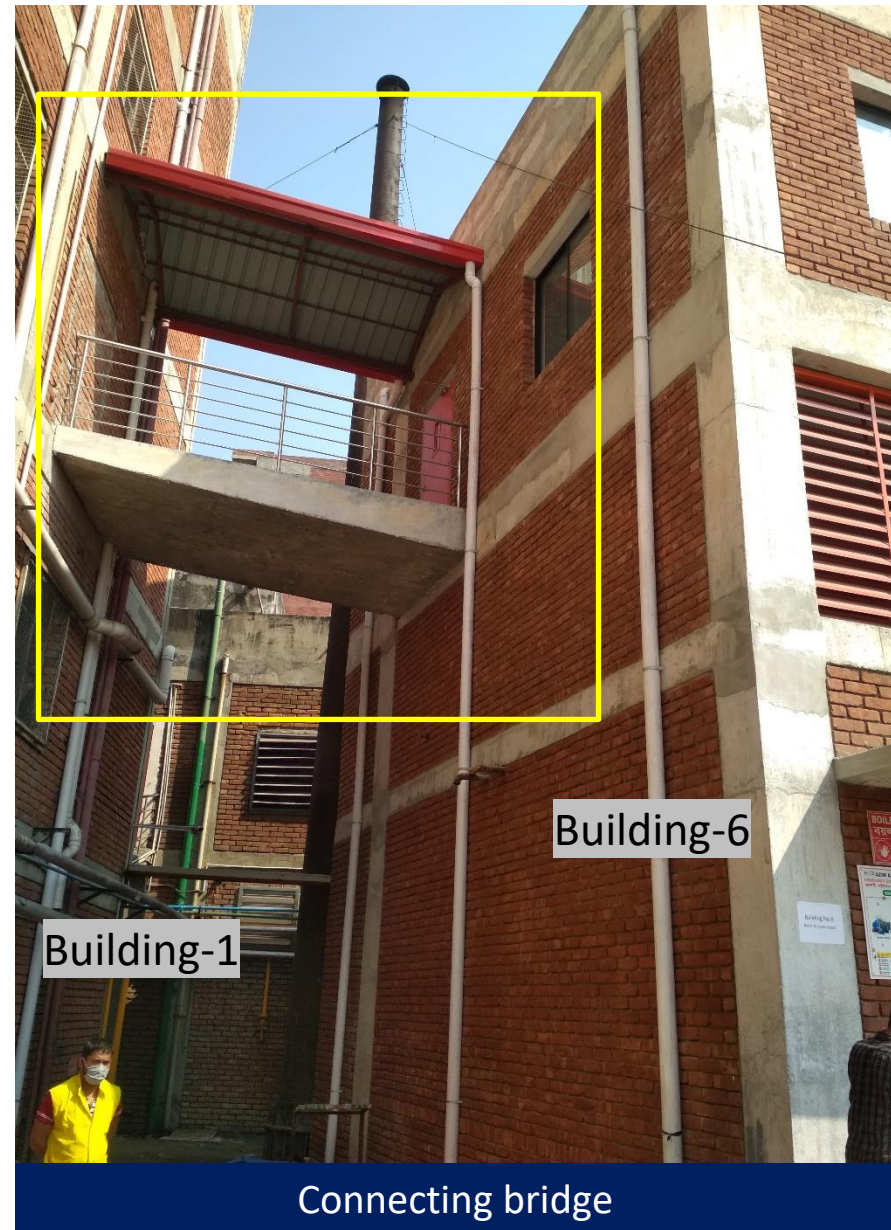
Observation: Building-6

Large cantilever (connecting bridge)

At first floor of building-6 almost 4 m cantilever connection bridge was observed. The building engineer is required to check adequacy & deflection of the cantilever slab.



Connecting bridge



Connecting bridge

Problems Observed

Building-2:

- Item 01: Lack of information and discrepancies in as-built drawings.
- Item 02: Absence of design documents.
- Item 03: Significant connection gap.
- Item 04: Loose cable bracing.
- Item 05: Corrosion in steel member.
- Item 06: Connection bridge between Building- 2 and 3.

Building-5:

- Item 07: Design report needs to be revised.
- Item 08: Lack of as-built drawing.
- Item 09: Corrosion in steel member.
- Item 10: Trolly impact on Column.
- Item 11: Exposed re-bar found.

Building-6:

- Item 12: Absence of design documents.
- Item 13: Large cantilever (connecting bridge).

Priority Actions

Item No.	Observation	Recommended Action Plan	Recommended Timeline
01	Lack of information and discrepancies in as-built drawings. (Building-2)	Building Engineer is to survey the whole structure and update as-built drawings representing accurate site condition.	6-weeks
02	Absence of design documents. (Building-2)	Factory engineer is required to prepare the design documents including a design report, and a set of structural drawings in compliance with section 1.9.1.1 and section 1.9.1.2, part-6 of BNBC and submit it to RSC for review.	6-weeks
03	Absence of design documents. (Building-2)	Produce and actively manage a set of floor loading plan within the factory building considering foundation, column and floor capacity.	6-weeks
04	Absence of design documents. (Building-2)	Carry out remedial works (if any) after review by RSC	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
05	Absence of design documents. (Building-2)	Implement floor load plan.	6-months
06	Significant connection gap. (Building-2)	Factory is required to repair the gap in connections with a suitable method suggested by the factory engineer.	6-weeks
07	Loose cable bracing. (Building-2)	The building engineer to check the bracing and tighten it properly.	6-weeks
08	Corrosion in steel member. (Building-2)	The building engineer to remove the corrosion and apply suitable corrosion resistance coating.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
09	Connection bridge between Building- 2 and 3.	Factory engineer is required to prepare as-built drawings.	6-weeks
10	Connection bridge between Building- 2 and 3.	Factory engineer is required to check the lateral stability of the structure.	6-weeks
11	Connection bridge between Building- 2 and 3.	Carry out remedial works if required.	6-months
12	Design report needs to be revised (Building-5)	Factory engineer to prepare the Engineering Assessment (EA) including a design report, and a set of structural drawings in compliance with section 1.9.1.1 and section 1.9.1.2, part-6 of BNBC.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
13	Design report needs to be revised (Building-5)	Produce and actively manage a loading plan for all floor plates within the factory, considering floor, column and foundation capacity.	6-weeks
14	Design report needs to be revised (Building-5)	Continue to implement loading plan.	6-months
15	Lack of as-built drawing (Steel Stair-Building-5)	Building engineer to prepare the structural drawings in compliance with section 1.9.1.2 as per BNBC.	6-weeks
16	Lack of as-built drawing (Steel Stair-Building-5)	Building engineer is required to check the lateral stability of the steel stair.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
17	Lack of as-built drawing (Steel Stair-Building-5)	Building engineer to prepare the design documents including a design report, and a set of structural drawings in compliance with section 1.9.1.1 and section 1.9.1.2, part-6 of BNBC.	6-weeks
18	Corrosion in steel member. (Steel Stair-Building-5)	The building engineer to remove the corrosion and apply suitable corrosion resistance coating.	6-weeks
19	Trolly impact on Column (Building-5)	Factory engineer is required to investigate the damage and suggest a remedial action as well as protection system to prevent such damages in future.	6-weeks
20	Trolly impact on Column (Building-5)	Carry out remedial works as per recommendation.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
21	Exposed re-bar found (Building-5)	All exposed reinforcement is to be protected from corrosion which may cause degradation of the concrete.	6-weeks
22	Absence of design documents. (Building-6)	Factory engineer is required to prepare the design documents including a design report, and a set of structural drawings in compliance with section 1.9.1.1 and section 1.9.1.2, part-6 of BNBC and submit it to RSC for review.	6-weeks
23	Absence of design documents. (Building-6)	Produce and actively manage a set of floor loading plan within the factory building considering foundation, column and floor capacity.	6-weeks
24	Absence of design documents. (Building-6)	Carry out remedial works (if any) after review by RSC	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
25	Absence of design documents. (Building-6)	Implement floor load plan.	6-months
26	Large cantilever (connecting bridge). (Building-6)	Building engineer is required to check the adequacy & deflection limit of the cantilever slab.	6-weeks
27	Large cantilever (connecting bridge). (Building-6)	Implement any remediation work if required.	6-months