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Identified Priority 1 Concerns

- Building #1 Cooling Tower support appears inadequate.

1st Priority 1 Concern

Cooling towers are located on the corner of Building #1.

Our concerns are related to the following points:

- The support structure (a propped slab) is not shown on the provided structural drawings so there was no way to assess the load carrying capacity of the slab.
- The slab is approximately 6m high and supports two large air conditioning outdoor cooler units.

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Identified Priority 2 Concerns

- Building #1 – Mezzanine between the ground floor and the 1st floor. No documents available.

- Buildings #1 & #2 – Floor loading should be controlled.

- Building #1 - No documents were provided for the dining structure on the roof

- Knitting, Generator, Chemical storage and waste storage sheds are poorly constructed and no drawings were available.

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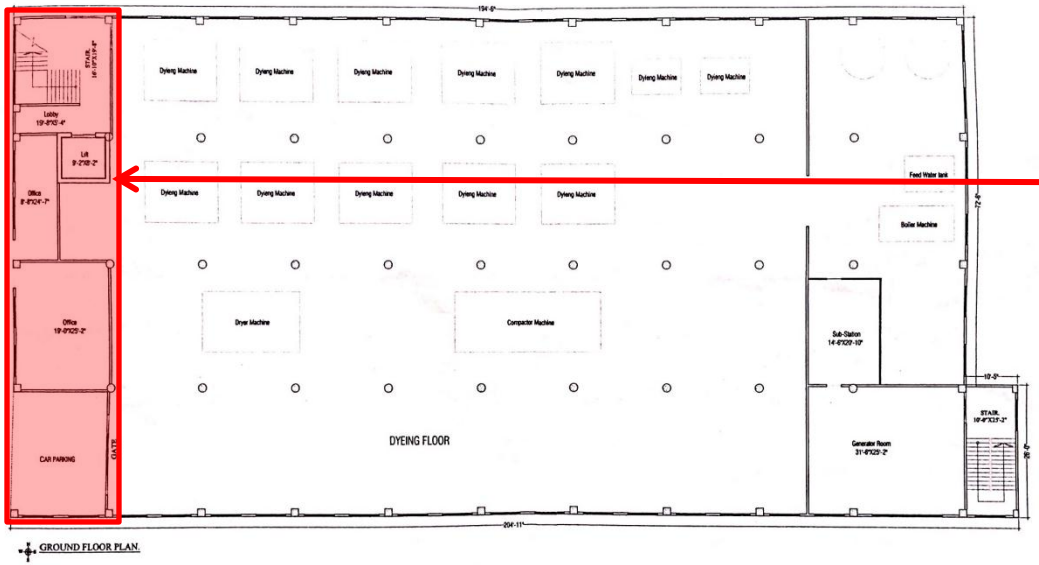
1st Priority 2 Concern

Building #1 has a mezzanine between the ground floor and the 1st floor. It is located along the front face of the building. The ground floor plan does not show the mezzanine or indicate its structural design.



GROUND FLOOR PLAN

Mezzanine

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2nd Priority 2 Concern

Uncontrolled loading in Building #1. In Building #2; the first floor is used mainly for chemical storage. Most of the floor was loaded with more than 2.0kPa. There were no loading plans available and no method of monitoring the live load on each floor.

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3rd Priority 2 Concern

No documents were provided for the Dining space on the top of the building. From a visual observation we note a lack of any lateral stability support; no bracing or compression/tie beams were provided between columns. The brick walls were not aligned with the columns so cannot therefore be considered to provided any form of lateral restraint.

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Knitting shed

Generator shed

4th Priority 2 Concern

The knitting, generator, waste storage and chemical storage sheds are also poorly built.

Our concerns noted during the survey are as follows:

- Trusses were supported by a brick lintels.
- Steel members not properly restrained or tie down against uplift wind forces.
- Improvised truss support details.
- Weak bamboo and timber supporting members.

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4th Priority 2 Concern Continue.

Chemical storage shed

Waste storage shed

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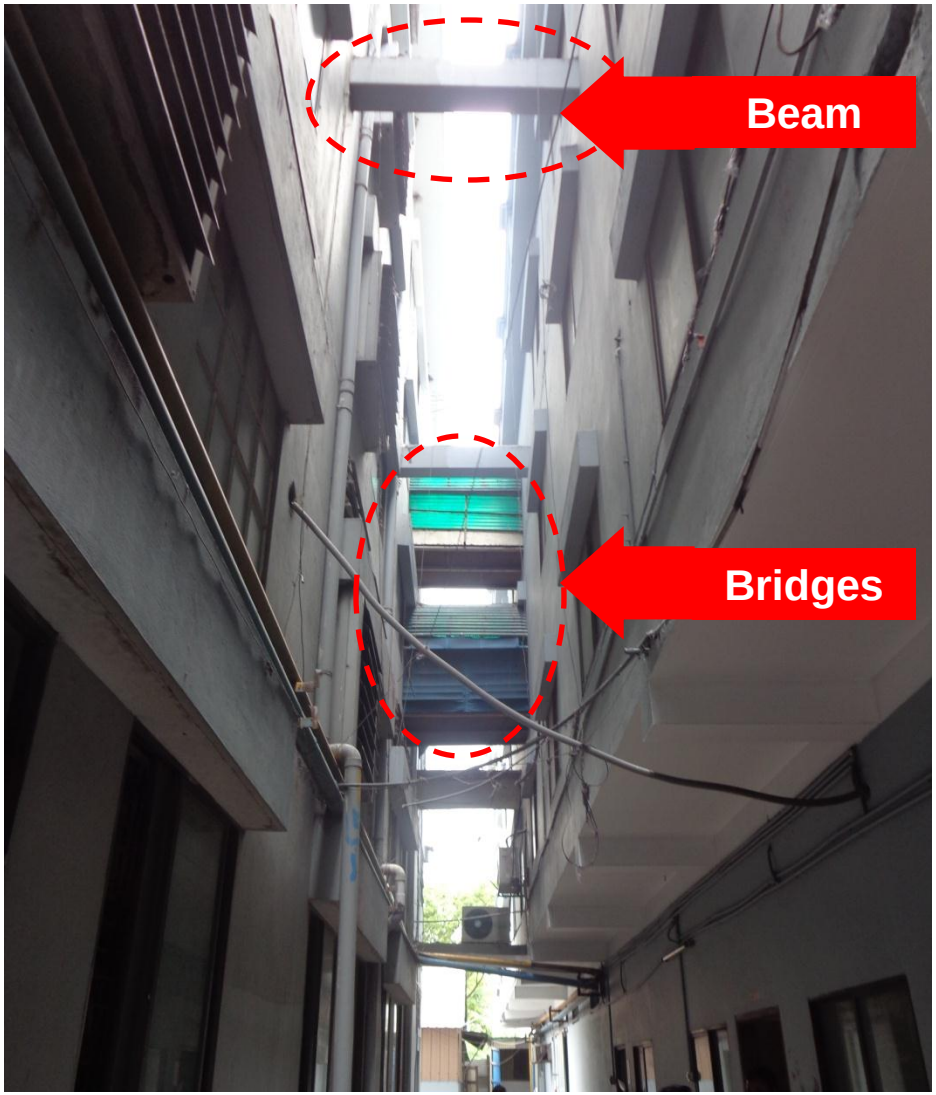
Identified Priority 3 Concerns

- Buildings #1 & #2 - Improvised Foot bridge and connecting beams between the two buildings.



1st Priority 3 Concern

We found several improvised beams and two footbridges between Building #1 and Building #2. These are not mentioned in the documents. The original Design Engineer confirmed that these beams and bridges were not present on the original construction drawings. Their positions, reinforcement details, actual sizes and joint details are unknown, these need to be assessed and verified.

Overall Stability System

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1st and 2nd floor levels

3rd floor frame

We believe that the intent of the original structural design was to use the main grid line beams to provide some form of lateral stability via moment frame action although no ductile detailing is provided on structural drawings.

However, in Building #1, there are beams in one direction at 1st and 2nd floor levels; in the short directions only.

We require that these items be investigated in a Detailed Engineering Assessment.

Building Extents – Building #1

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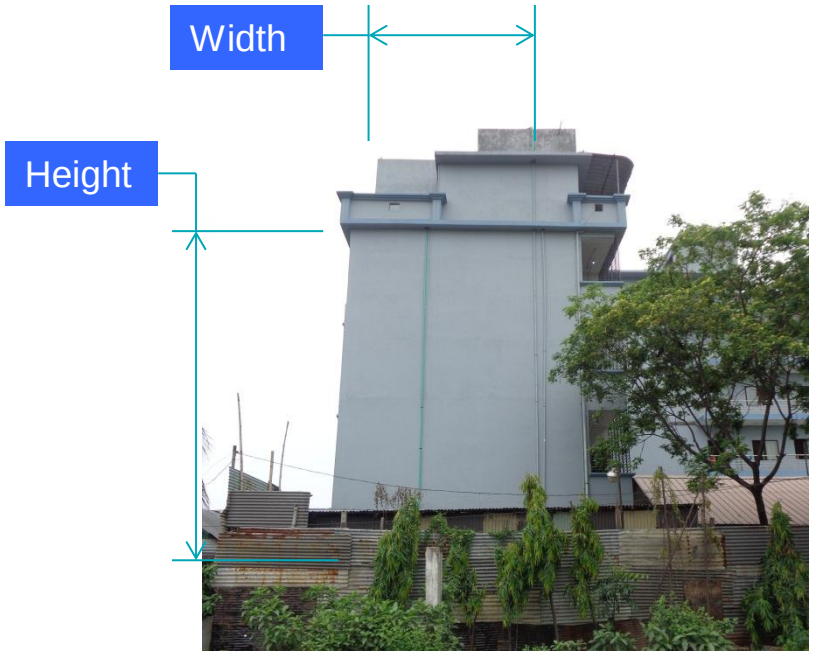

We believe that the intent of the original structural design was to use the main grid line beams to provide some form of lateral stability via moment frame action.

However, for Building #2, the width of the building compared to the height gives us cause for concern and we require the lateral support system to be investigated as part of a Detailed Engineering Assessment.

The two buildings are connected with tie beams. These are not shown on any structural drawings. Each building must be independently stable and these beams can not be used to transfer lateral load from one building to the other given they were not in the original design.

Tie beams

We require that these items be investigated in an Engineering Assessment

Building Extents – Building #2

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Water Ingress at Roof Level

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No waterproofing membrane was visible on the roof of either building. This means that any cracks in the surface finishes on the roof will allow water to seep into the concrete slab beneath the finishes, and cause long-term soaking of the slab. The same applies to the water tanks at roof level.
To resolve this situation, a water proofing membrane should be applied on all the surface of the roof and the water tank.

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Priority Actions

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Problems Observed Summary

ITEM 1: Priority 1 - None of the buildings contains any obvious stability system.

ITEM 2: Priority 1− Building #1 Cooling Tower support structure appears inadequate.

ITEM 3: Priority 2 − Building #1 – Mezzanine between and the ground floor and first floor no design documents were provided.

ITEM 4: Priority 2 − Buildings #1 & #2 floor loading should be controlled.

ITEM 5: Priority 2 − Building #1, No documents were provided for the dining room on the roof.

ITEM 6: **Priority 2** − Knitting, Generator, Chemical storage and waste storage sheds are poorly constructed.

ITEM 7: **Priority 3** - Buildings #1 & #2 - Improvised footbridge and connecting beams between the two buildings.

ITEM 8: Priority 3 – Building #1 & #2 do not have any waterproofing membrane applied to the roof.

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Priority 1 - None of the buildings contains any obvious stability system.	Carry out an Engineering Assessment on the building to verify that it is stable under lateral loading.	6-weeks
2	Priority 1 - None of the buildings contains any obvious stability system.	Carry out all recommendations of the Engineering Assessment.	6-months
3	Priority 1 - Building #1 Cooling Tower support structure appears inadequate.	The Factory Engineer is to carry out an Engineering Assessment on the RC cooling tower support structure, checking foundations, columns, beams and slab.	6-weeks
4	Priority 1 - Building #1 Cooling Tower support structure appears inadequate.	If deemed necessary by the Factory Engineer, carry out any remedial works recommended.	6-months
5	Priority 2 - Building #1 – Mezzanine between and the ground floor and first floor no design documents were provided.	The Factory Engineer is to carry out a full Engineering Assessment of the mezzanine and produce as-built drawings.	6-weeks
6	Priority 2 - Building #1 – Mezzanine between and the ground floor and first floor no design documents were provided.	If deemed necessary by the Factory Engineer, carry out any remedial works recommended. Produce as-built drawings according to the assessment.	6-months
7	Priority 2 - Buildings #1 & #2 floor loading should be controlled.	Reduce all floor loading to below 2.0kPa.	Immediate - Now
8	Priority 2 - Buildings #1 & #2 floor loading should be controlled.	Produce and maintain floor loading plans accordingly for each building and all floors.	6-weeks
9	Priority 2 - Buildings #1 & #2 floor loading should be controlled.	Maintain and enforce all loading plans.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
10	Priority 2 - Building #1, No documents were provided for the dining room on the roof.	The factory Engineer is to full survey and produce as-built drawings for the roof top structures.	6-weeks
11	Priority 2 - Building #1, No documents were provided for the dining room on the roof.	The Factory Engineer is to provide details to reinforce and stabilise the structural elements.	6-months
12	Priority 2 - Knitting, Generator, Chemical storage and waste storage sheds are poorly constructed.	The Factory Engineer is to carry out an assessment of all of the sheds. Their roofs, walls and columns.	6-weeks
13	Priority 2 - Knitting, Generator, Chemical storage and waste storage sheds are poorly constructed.	If deemed necessary by the Factory Engineer, carry out any remedial works recommended. Produce as-built drawings reflecting the site conditions.	6-months
14	Priority 3 - Buildings #1 & #2 - Improvised footbridge and connecting beams between the two buildings.	The Factory Engineer is to carry out an Engineering Assessment of the foot bridge	6-weeks
15	Priority 3 - Buildings #1 & #2 - Improvised footbridge and connecting beams between the two buildings.	If deemed necessary by the Factory Engineer, carry out any remedial works recommended.	6-months
16	Priority 3 - Building #1 & #2 do not have any waterproofing membrane applied to the roof.	Cover the concrete roof with a suitable waterproofing membrane, e.g. waterproof screed.	6-months