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Identified Priority 1 Concerns

- Uncontrolled heavy storage loading in Building 1, Building 2, Building 3 and Building 4.
- Uncontrolled heavy storage loading on cantilevered slabs in Building 1, Building 2, Building 3 and Building 4.
- Bolts missing at the connection between Shed 1 and the existing buildings.



Building 1



Building 2



Building 4

Uncontrolled heavy storage loading was found on the mezzanine, 1st floor, 3rd floor and 5th floor of Building 1 and 1st floor and 2nd floor of Building 2, Building 3 and Building 4. Loading in these area should be reduced to 2.0 kPa and we require that this concern be investigated in a Detailed Engineering Assessment. Loading plans should be clearly displayed in these areas.



Building 1

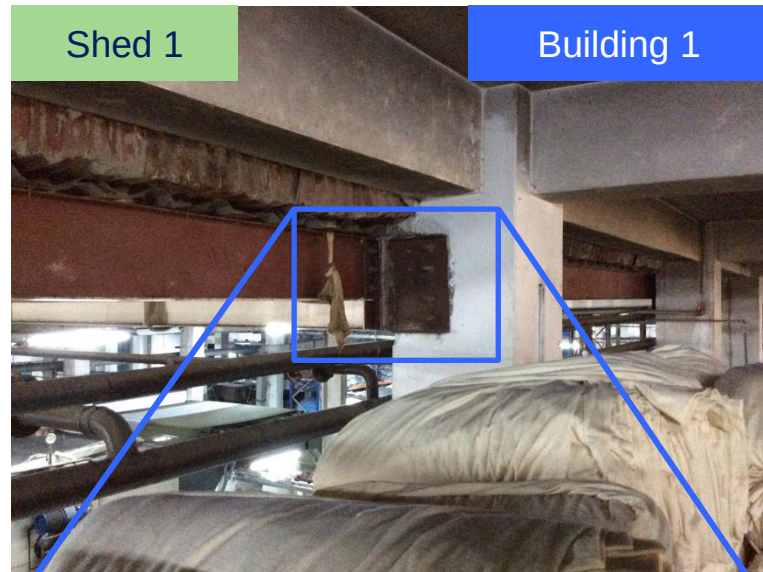


Building 2

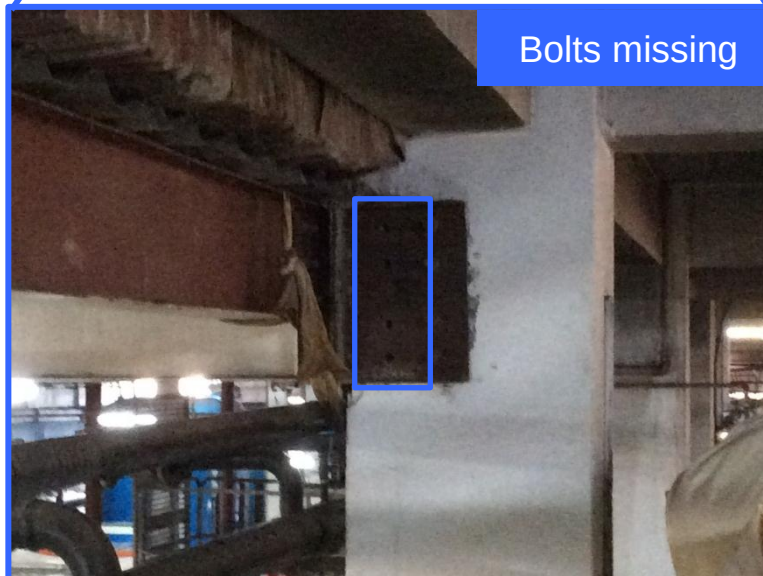


Building 4

Uncontrolled heavy storage loading was found on the 3rd floor and 4th floor cantilevered slabs in Building 1 and 1st floor and 2nd floor of Building 2, Building 3 and Building 4. The loading was also leaning on the brick walls. These lack lateral load resistance. The loading in these areas should be removed and we require that this is investigated in the Detailed Engineering Assessment.



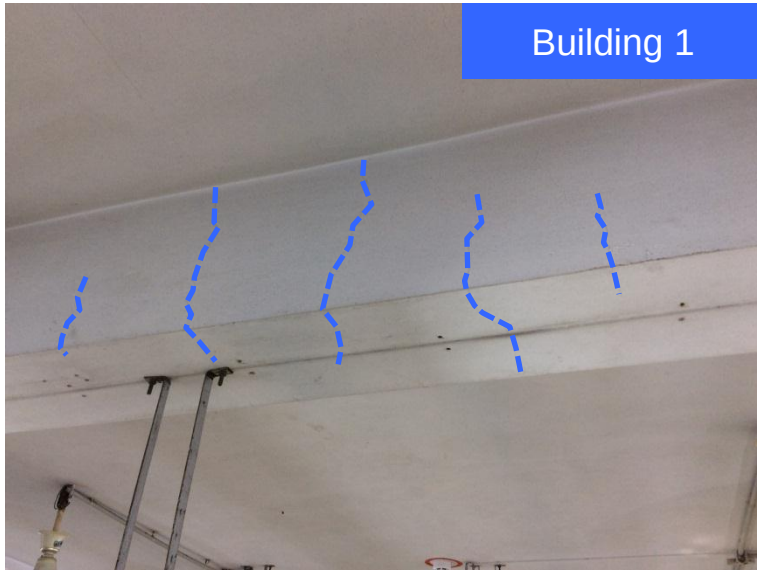
There are bolts missing at the connections between Shed 1 and the existing buildings. These items need to be checked and rectified.



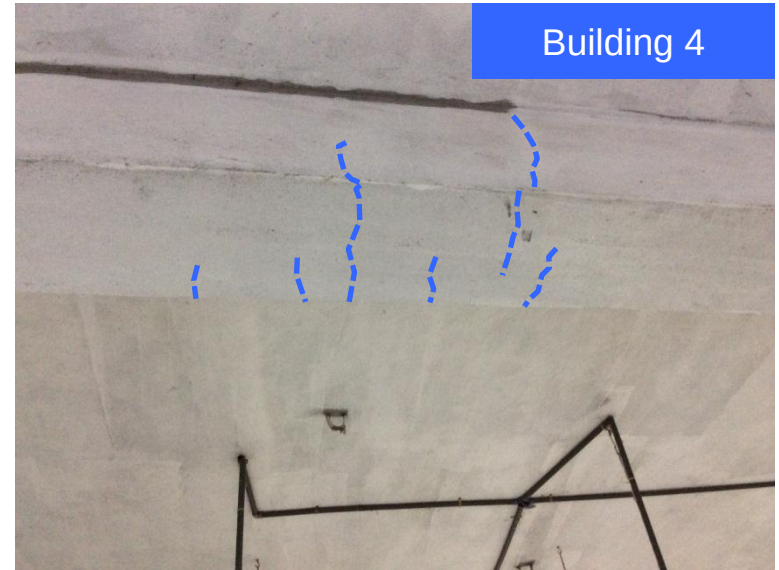
Identified Priority 2 Concerns

- Cracks on beams in Building 1, Building 2, Building 3 and Building 4 and cracks on slab soffits of Building 1.
- Inadequacies between the drawings and the actual as-built conditions for Building 1.
 - Capacity check of slab supporting machines and water tanks in Building 1 and Auxiliary 1.
- Stability and capacity of mezzanine, steel staircase and lift of Building 1.
 - Inclined columns in Building 1 and inclined trusses in Shed 1.
 - Movement joint to be properly established between Building 2, Building 3 and Building 4.

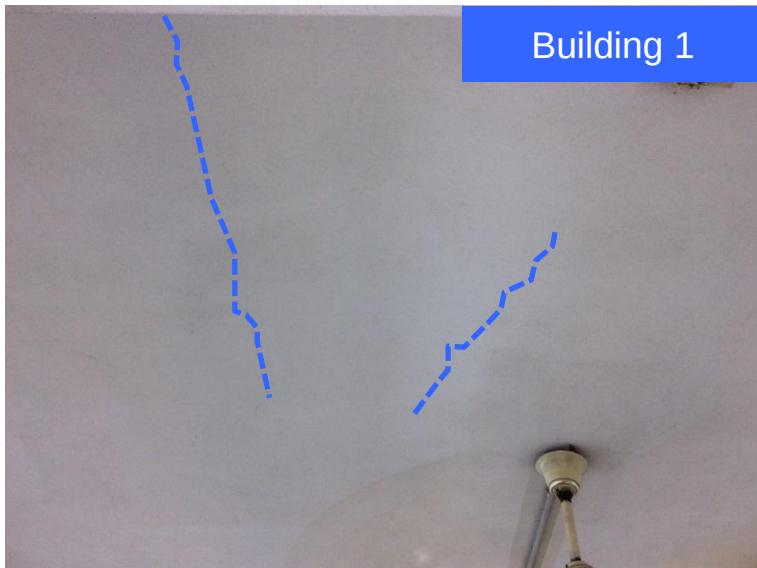
Building 1



Building 4

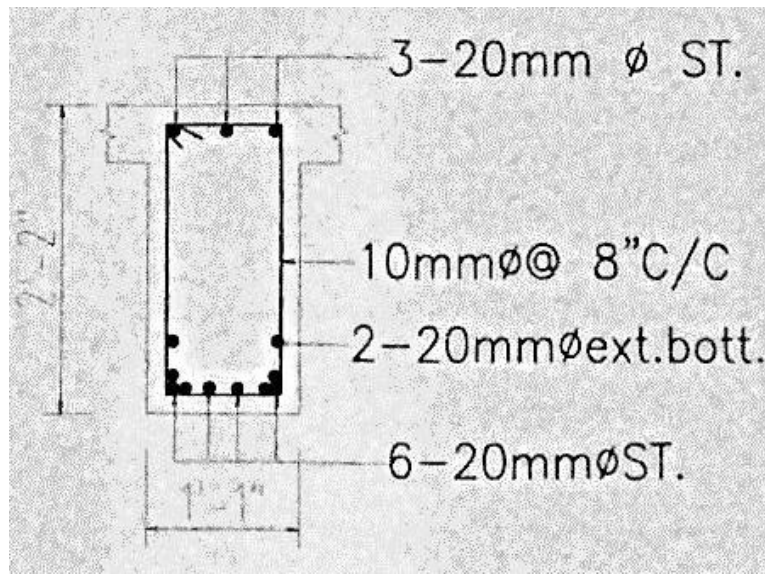


Building 1

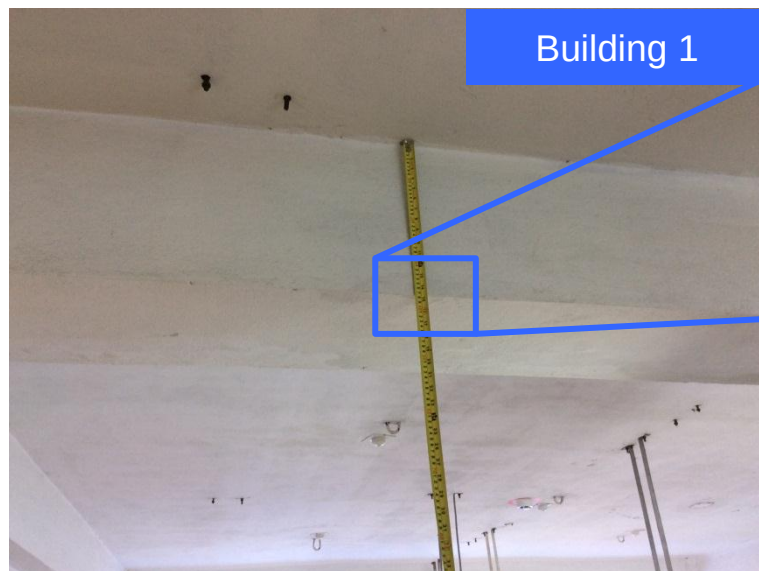


Cracks on 2nd floor, 3rd floor, 4th floor and 5th floor beams of Building 1. Cracks on 1st floor and 2nd floor beams of Building 2, Building 3 and Building 4. And cracks on 3rd floor and 4th floor slab soffits of Building 1.

The cause of cracks should be investigated by appropriate methods, rectified and then the beams repaired.



The depth of beam FB-2 measured in situ is 14" excluding slab thickness. This is smaller than those specified on the structural drawings (19" excluded slab thickness).



The structural drawings of Building 1 need to be revised.



Building 1



Building 4



Building 1

Concerns with the slab supporting knitting machines (1st floor) and water tanks (6th floor) of Building 1 and cooling tower (roof slab) of Auxiliary Building 1. A capacity check of these slabs and all related elements needs to be carried out.

Building 1



Building 1



Building 1



Concerns with stability and capacity of the mezzanine floor, a steel staircase and lift of Building 1.

These should be investigated and strengthened if deemed necessary.

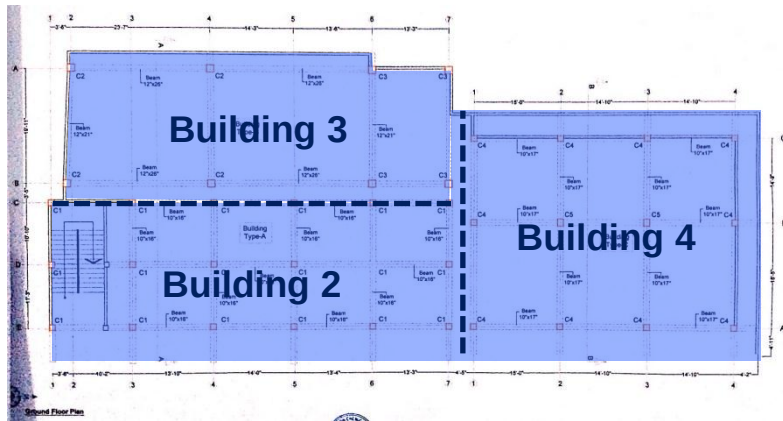


There are inclined columns on the 6th floor of Building 1.



There are inclined roof trusses noted in Shed 1.

Stability for these items and related elements need to be checked.



Building 2, Building 3 and Building 4 were connected together. We were informed that there are movement joints between these buildings.



However, the joints were covered with mortar and/or finishes on the floors. The movement joint should be established properly where shown.

----- Movement Joint

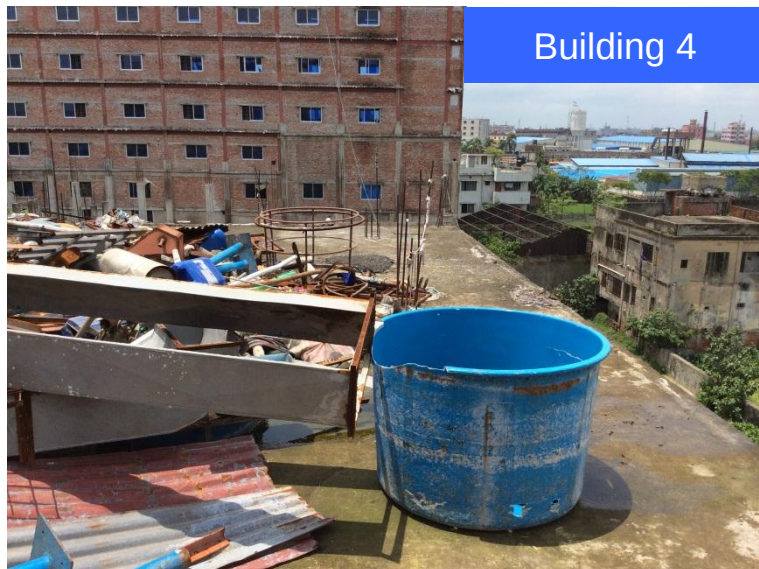
Identified Priority 3 Concerns

- No parapet wall or guardrail is present at top level at Building 2 and Building 4.
- Reinforcement and structural steel left exposed at Building 1, Building 2, Building 3 and Building 4.
- No fireproofing material for structural steel elements (if required).



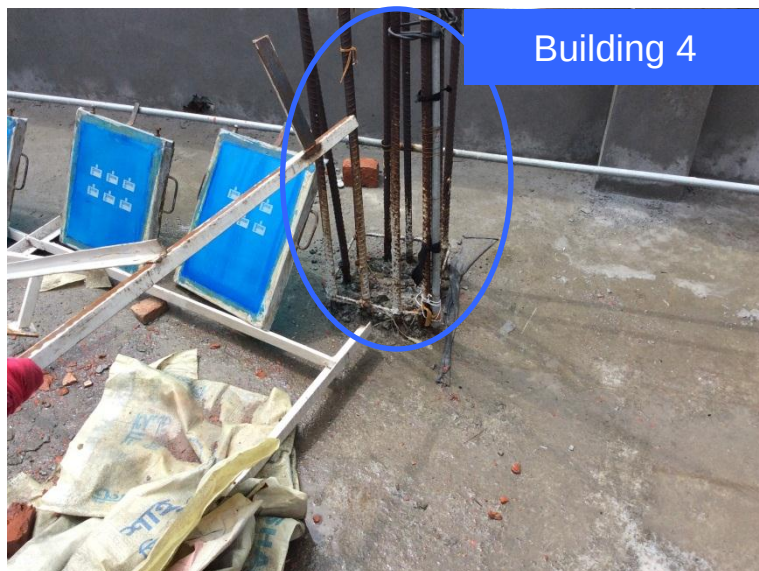
Building 2

There is no parapet wall around the perimeter of top level of Building 2 and Building 4.

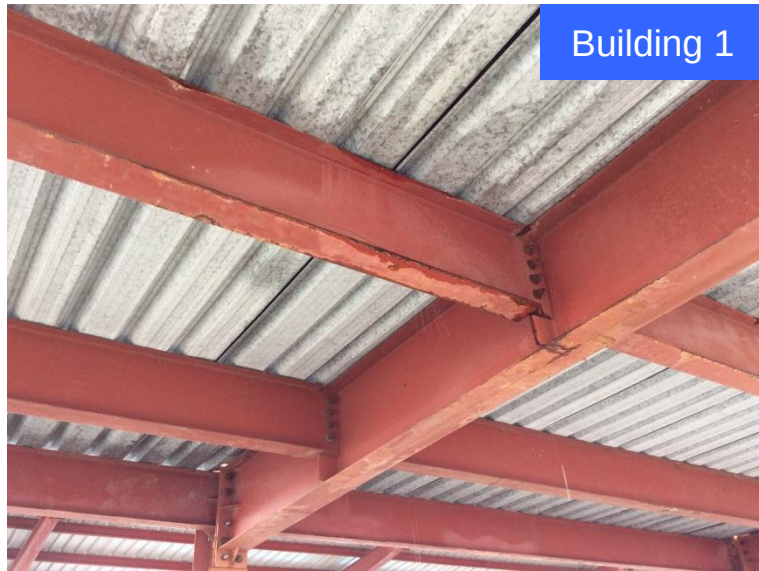


Building 4

Whilst not a structural issue, this is a significant health and safety risk and should be rectified.



Reinforcement is left exposed on Building 1, Building 2, Building 3 and Building 4. And structural steel elements are also left exposed on Building 1.



No fireproofing material was noted on any structural steel elements (if required).

Overall Stability System

Building 1



The lateral loading resistance for Building 1, proposed 8 storeys, Building 2, 4 storeys, Building 3, 4 storeys and Building 4, part 3 part 4 storeys are provided by moment frame action without any shear walls and the façade brickwork walls lack moment capacity due to their poor connections with the surrounding columns and beams.

The lateral loading resistance for Shed 1 is provided by moment frame action in one direction but is without bracing in the other. Stability and capacity must be checked especially at the connections. Stability under wind uplift needs to be checked in particular.

We require that the stability of these buildings to be investigated as part of a Detailed Engineering Assessment.

Shed 1



Water Ingress

Building 1



Building 4



Building 1



Water distress was noted on slabs, beams and walls in Building 1, Building 2, Building 3 and Building 4. Water ponding was also found at the top level.

Priority Actions

Problems Observed Summary

- | | | |
|---------|--------------|--|
| ITEM 1: | (Priority 1) | Uncontrolled heavy storage loading in Building 1, Building 2, Building 3 and Building 4. |
| ITEM 2: | (Priority 1) | Uncontrolled heavy storage loading on cantilevered slabs in Building 1, Building 2, Building 3 and Building 4. |
| ITEM 3: | (Priority 1) | Bolts missing at the connection between Shed 1 and the existing buildings. |
| ITEM 4: | (Priority 2) | Cracks on beams of Building 1, Building 2, Building 3 and Building 4 and cracks on slab soffits of Building 1. |
| ITEM 5: | (Priority 2) | Inadequacies between the drawings and the actual as-built conditions of Building 1. |
| ITEM 6: | (Priority 2) | Capacity check of slab supporting machines and water tanks in Building 1 and Auxiliary 1. |
| ITEM 7: | (Priority 2) | Stability and capacity of mezzanine, steel staircase and lift of Building 1. |
| ITEM 8: | (Priority 2) | Inclined columns in Building 1 and inclined trusses in Shed 1. |

Problems Observed Summary (continued)

- ITEM 9: (Priority 2) Movement joint to be properly established between Building 2, Building 3 and Building 4.
- ITEM 10: (Priority 2) Overall stability system.
- ITEM 11: (Priority 3) Distress due to water ingress in Building 1, Building 2, Building 3 and Building 4.
- ITEM 12: (Priority 3) No parapet wall or guardrail present at the top level of Building 2 and Building 4.
- ITEM 13: (Priority 3) Reinforcement and structural steel left exposed on Building 1, Building 2, Building 3 and Building 4.
- ITEM 14: (Priority 3) No fireproofing material for structural steel elements (if required).

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Priority 1 - Uncontrolled heavy storage loading in Building 1, Building 2, Building 3 and Building 4.	Reduce stacking height to ensure total load does not exceed 2.0 kPa. A Detailed Engineering Assessment is required to review the design and loads. Factory Engineer to state the maximum weight that is allowed per square meter. Suggest that state the value on notice boards in these areas. (Loading Plans).	Immediate – Now
2	Priority 1 - Uncontrolled heavy storage loading in Building 1, Building 2, Building 3 and Building 4.	Adopt some sort of signage/staff guidance to ensure that the maximum weight of storage is not exceeded. (Loading Plans).	6-weeks
3	Priority 1 - Uncontrolled heavy storage loading in Building 1, Building 2, Building 3 and Building 4.	Maintain standards of quality control to ensure that storage procedures are correctly followed so that overloading problems do not arise in the future. Maintain and implement Loading Plans.	6-months
4	Priority 1 - Uncontrolled heavy storage loading on cantilevered slabs in Building 1, Building 2, Building 3 and Building 4.	Remove heavy storage loading in the area identified above. A Detailed Engineering Assessment is required to review the design and loads. Factory Engineer to state the maximum weight that is allowed per square meter. Suggest that state the value on notice boards in these areas. (Loading Plans).	Immediate – Now
5	Priority 1 - Uncontrolled heavy storage loading on cantilevered slabs in Building 1, Building 2, Building 3 and Building 4.	Adopt some sort of signage/staff guidance to ensure that the maximum weight of storage is not exceeded. (Loading Plans).	6-weeks
6	Priority 1 - Uncontrolled heavy storage loading on cantilevered slabs in Building 1, Building 2, Building 3 and Building 4.	Maintain standards of quality control to ensure that storage procedures are correctly followed so that overloading problems do not arise in the future. Maintain and implement Loading Plans.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
7	Priority 1 - Bolts missing at the connection between Shed 1 and the existing buildings.	Factory Engineer to check these items in the area identified above and rectify with a suitable methods.	6-weeks
8	Priority 2 - Cracks on beams of Building 1, Building 2, Building 3 and Building 4 and cracks on slab soffits of Building 1.	The Factory Engineer to investigate the cause of cracks by appropriate methods. The cause of the cracks is to be cured. The distress found is to be suitably repaired.	6-weeks
9	Priority 2 - Inadequacies between the drawings and the actual as-built conditions of Building 1.	Factory Engineer to survey the actual conditions and revise the drawings. Any results of the DEA which affect the structure should be taken on board and also represented on the as-built drawings.	6-weeks
10	Priority 2 - Inadequacies between the drawings and the actual as-built conditions of Building 1.	Continue to implement load plan.	6-months
11	Priority 2 - Capacity check of slab supporting machines and water tanks in Building 1 and Auxiliary 1.	Factory Engineer to review design, loads and related elements in area identified above to confirm capacity for these items. Or The items in the area identified above should be removed. Or The slabs and/or related elements should be strengthened.	6-weeks
12	Priority 2 - Stability and capacity of mezzanine, steel staircase and lift of Building 1.	Factory Engineer to review design, loads and related elements in area identified above to confirm capacity and stability for these items. Or These items should be strengthened.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
13	Priority 2 - Inclined columns in Building 1 and inclined trusses in Shed 1.	Factory Engineer to review design, loads and related elements in area identified above to confirm stability of these items. Or These items should be rectified with a suitable methods.	6-weeks
14	Priority 2 - Movement joint to be properly established between Building 2, Building 3 and Building 4.	The Factory Engineer should investigate to prove the capacity of the building in its existing state, a further building approval should be gained for the building as it exists, as altered since the original approval. Alternatively, the extension building should be separated by a non-structural joint and allowed to act as a fully structurally independent structure.	6-weeks
15	Priority 2 - Movement joint to be properly established between Building 2, Building 3 and Building 4.	Do not construct any further buildings connected to the existing building without thorough structural design and full building approval.	6-months
16	Priority 2 - Overall stability system.	A Detailed Engineering Assessment of the overall building to be carried out and in particular, stability and foundation aspects should be investigated in detail.	6-weeks
17	Priority 2 - Overall stability system.	Carry out all of the recommendations of the DEA.	6-months
18	Priority 3 - Distress due to water ingress in Building 1, Building 2, Building 3 and Building 4.	Factory Engineer to inspect water damaged structures and repair with a suitable methods. Waterproofing on the roof slab is to be applied. Moreover the roof slab drainage system should be investigated and improved.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
19	Priority 3 - No parapet wall or guardrail present at the top level of Building 2 and Building 4.	A suitable perimeter parapet wall or guardrail should be constructed along the building perimeter.	6-months
20	Priority 3 - Reinforcement and structural steel left exposed on Building 1, Building 2, Building 3 and Building 4.	For both durability and serviceability, rust proof paint or any appropriate methods is recommended.	6-months
21	Priority 3 - No fireproofing material for structural steel elements (if required).	Fireproofing material for structural steel element is recommended as suggested in BNBC Codes. Maintain standard of quality control and protection of the fire protection.	6-months