

Elite Garments Ind. Ltd.

Bade Kalmeswer, Board Bazar, Gazipur, Bangladesh
(23.954199, 90.380240)

5th April 2014
8th April 2015



Observations Made

Building 5 - Steel Portal Frame



Main span varies from 12.5m at the back of the shed up to 14.5m at the front. Beam section appears inadequate to support this span and is in danger of buckling under high wind loads.

Building Engineer to assess structure to show that it is adequate.

Building 5 – Portal Frame



Portal section does not appear adequate to resist and lateral forces.



No bracing provided in the roof or in the elevation sections to resist lateral forces.
Building Engineer to make recommendations once assessment is complete.

Building 5 – Portal Frame

High Stress in Columns – Building 1 & 3



Building 1

Cursory calculations indicate that the column working stress in Building 1 & Building 3 is at a high level.

A Building Engineer should review the Design Loads, Design Stresses in the internal columns in Building 1 & Building 3



Building 3

High Stress in Columns

Steel Roof Sections in Buildings 2, 3, 4



Steel roof over Building 2

Steel Roof support connections in Building 2 could not be inspected due to drop ceiling in place. These should be design checked by Building Engineer.



Steel Roof Sections – Building 2



Steel roof over Phase I section of Building 3

Steel Roof connections in Building 3 appear inadequate to resist high wind loading and should be checked by a Building Engineer.



Steel Roof Sections – Building 3



Steel roof over storage section of Building 3A. Section sizes appear inadequate to support roof and should be checked by a Building Engineer.



Storage Area – Building 3A

Steel Roof Sections – Building 3



Steel roof over 4 storey section of Building 4.

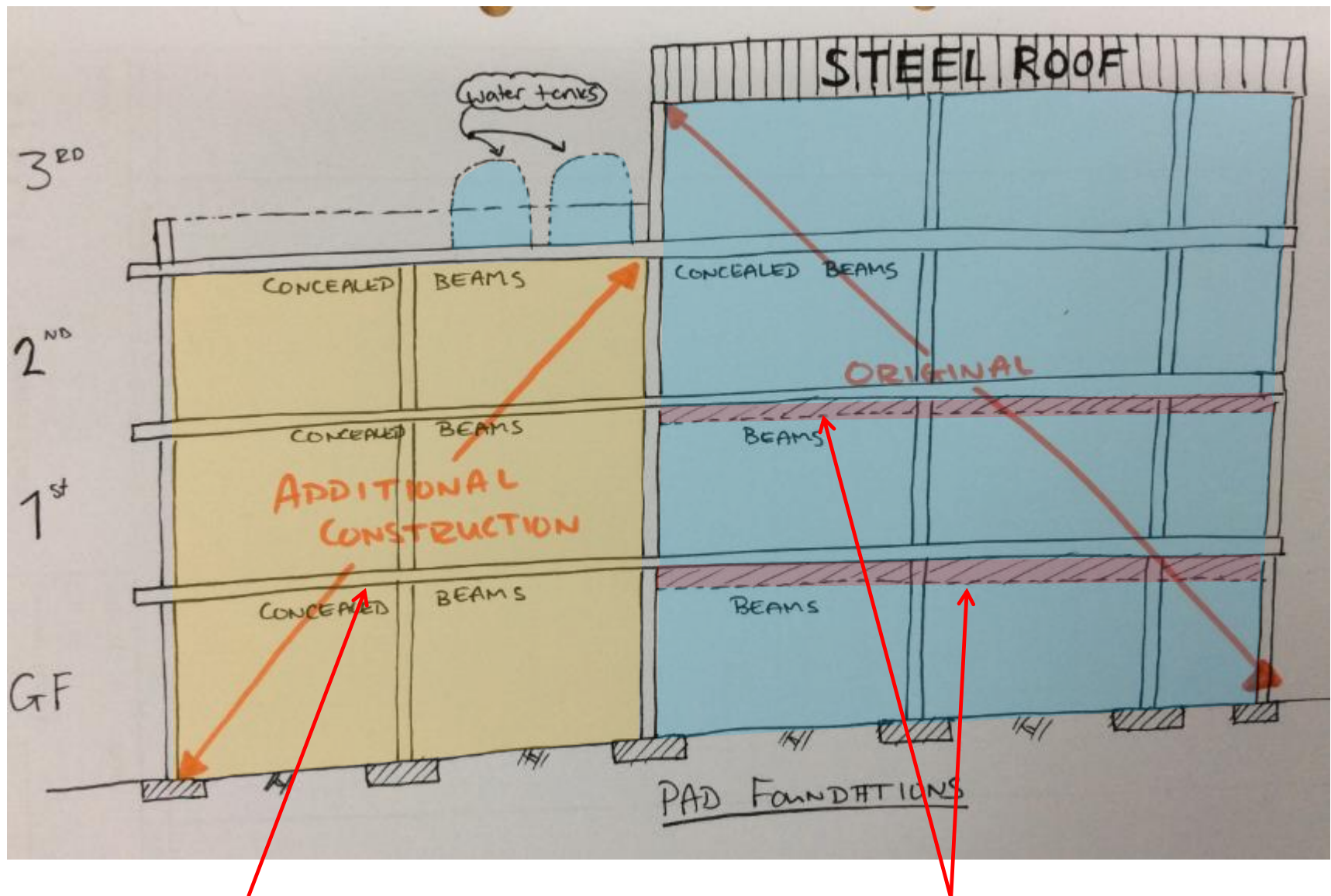
Central Truss Section does not sit directly onto column below.



Steel Roof connections in Building 4 appear inadequate to resist high wind loading and should be checked by a Building Engineer.

Steel Roof Sections – Building 4

Lateral Stability of Building 4



Concealed beams detailed within slab at all other levels

Moment Frame System with beams and slabs on 1st and 2nd Floors in one section of building.

Lateral Stability of Building 4



Concealed Beams – All other areas

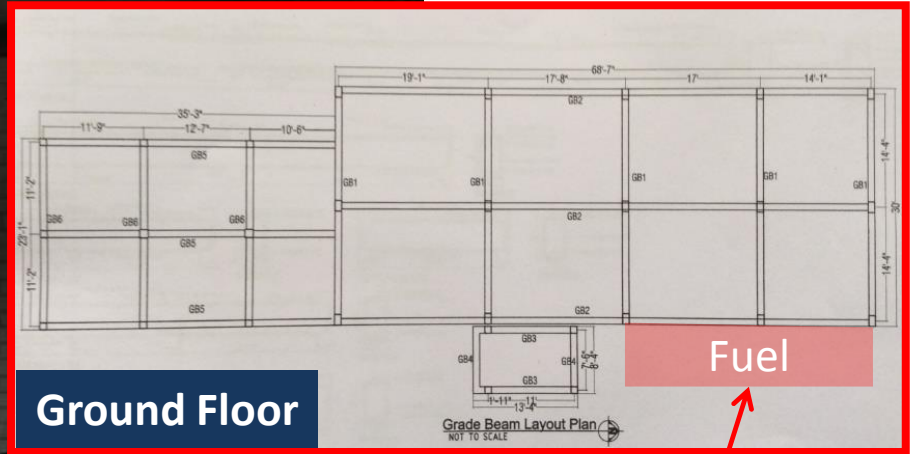
With the new portion of the Building Constructed, and no apparent beams on some levels, that Lateral stability system of Building 4 should be checked by a Building Engineer.



Beams and Slab on underside of 1st and 2nd Floors

Lateral Stability of Building 4

Storage of Fuel at Building 4



Location of Fuel storage outside of Building 4

Fuel storage at ground floor of Building 4 – Danger of fire removing a critical column

Cracking in Beams

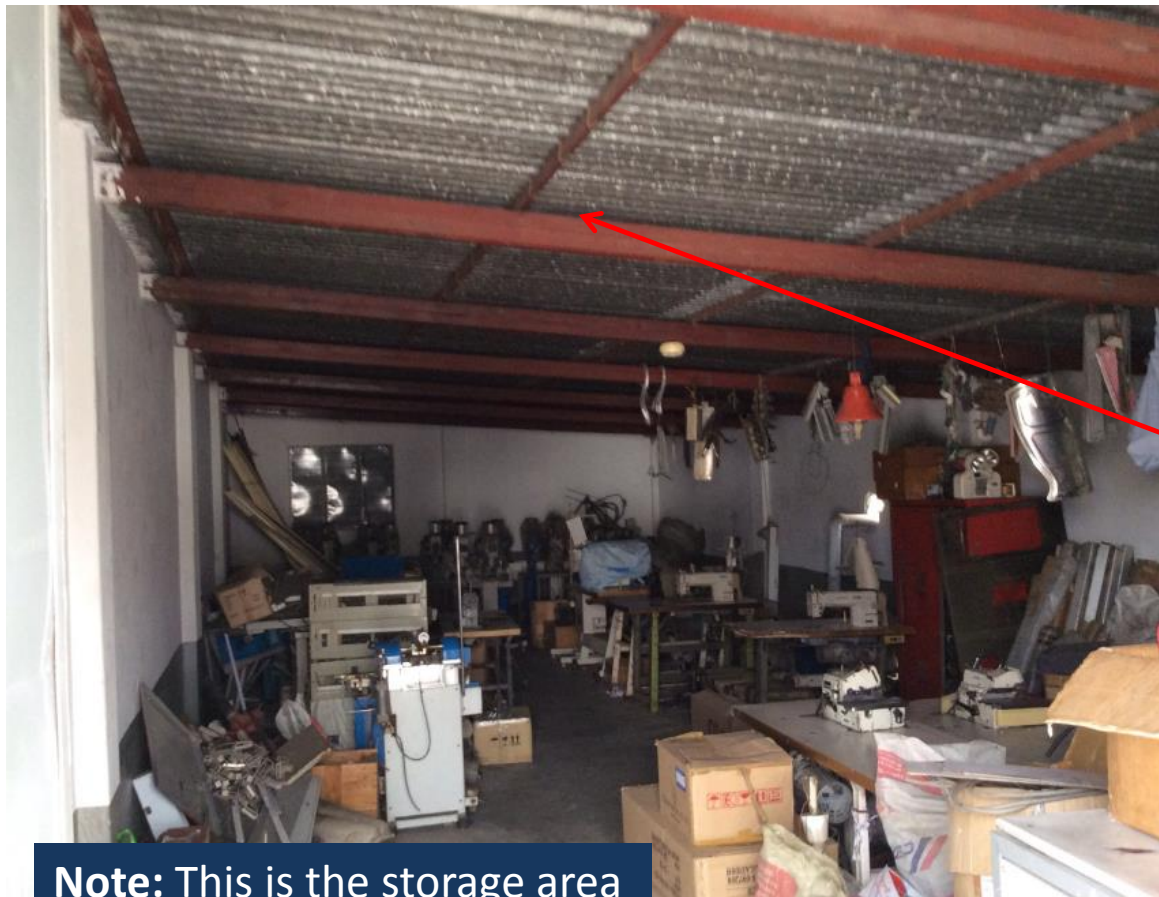
Slender Columns Supporting Steel Stairs



Steel sections supporting the steel stairs adjacent to Building 1 and Building 2 appear to be slender and should be checked by a Building Engineer.

Slender Columns Supporting Steel Stairs

Timber Beams on Roof of Building 1



Note: This is the storage area

Timber beams supporting the roof for the Women's Prayer Room have high deflections ($\sim 100\text{mm}$) and are in danger of collapse.. The timber beams are undersized and have deflected by an estimated 100mm. The connections to the walls are inadequate to resist likely uplift forces.

Roof should be replaced with adequate designed structure.

Timber Beams

Priority Actions

Problems Observed

1. Building 5 - Steel Portal Frame
2. High Stress in Columns – Building 1 and Building 3
3. Steel Roof Sections in Buildings 2, 3, 4
4. Lateral Stability of Building 4
5. Storage of Fuel at Building 4
6. Slender Columns Supporting Steel Stairs
7. Timber Beams on Roof of Building 1

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Building 5 - Structural design and stability System for the steel framed portal structure	Building Engineer to check all section sizes and connections in Building 5, as well as perform a stability analysis.	6-weeks
2	Building 5 - Structural design and stability System for the steel framed portal structure	Install temporary support & bracing as required by building engineer ensure building is safe for occupation	6-weeks
3	Building 5 - Structural design and stability System for the steel framed portal structure	Implement any Building Engineer's recommendations once assessment is complete.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
4	Internal Columns in Buildings 1 & 3 are highly stressed and should be checked by a Building Engineer.	Factory Engineer to review design, loads and columns stresses in area identified above.	6-weeks
5	Internal Columns in Buildings 1 & 3 are highly stressed and should be checked by a Building Engineer.	Verify in-situ concrete stresses either by cores or existing cylinder strength data for the internal columns in Buildings 1 & 3.	6-weeks
6	Internal Columns in Buildings 1 & 3 are highly stressed and should be checked by a Building Engineer.	Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
7	Check design of steel roofs and connections for Buildings 2, 3 and 4.	Building Engineer to check the design of steel roof trusses and steel to column connection details for likely uplift forces due to wind loading.	6-weeks
8	Check design of steel roofs and connections for Buildings 2, 3 and 4.	Implement any recommendations made by the Building Engineer for the steel roofs.	6-months
9	Building 4 – Lateral Stability System	Building Engineer to assess the stability of Building 4. Apparently constructed as one building, the building appears to consist of two different structural systems; beam and slab in one section (with beams strips within the slab depth at one level) and flat slab in the other.	6-weeks
10	Building 4 – Lateral Stability System	Implement any Building Engineer's recommendations once assessment is complete.	6-months
11	Building 4 – Lateral Stability System	Continue to implement load plan.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
12	Building 4 – Factory to move the location of the fuel storage away from any critical structure based on Building Engineer's recommendations.	Building Engineer to propose new location of fuel storage away from critical structural elements.	6-weeks
13	Building 4 – Factory to move the location of the fuel storage away from any critical structure based on Building Engineer's recommendations.	Fuel to be moved from current location within 6 weeks of receiving this report.	6-weeks
14	Building 4 – Factory to move the location of the fuel storage away from any critical structure based on Building Engineer's recommendations.	Ensure safe storage of fuel.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
15	Building 2 - Slender column to external steel staircase	The external lightweight steel staircase between Buildings 1 and 2 is supported on what appears to be slender columns. This in turn is supported as a point load on the external slab adjacent to Building 2.	6-weeks
16	Building 2 - Slender column to external steel staircase	Building Engineer to Check design of supporting columns and slab.	6-weeks
17	Building 2 - Slender column to external steel staircase	Implement any recommendations made by Building Engineer.	6-months
18	Building 2 - Slender column to external steel staircase	Continue to implement load plan.	6-months
19	Building 1 - Timber Beams to Prayer Area at Roof Level	The roof structure should be replaced with a suitable engineered structure.	6-months

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Building N7

8th April 2015

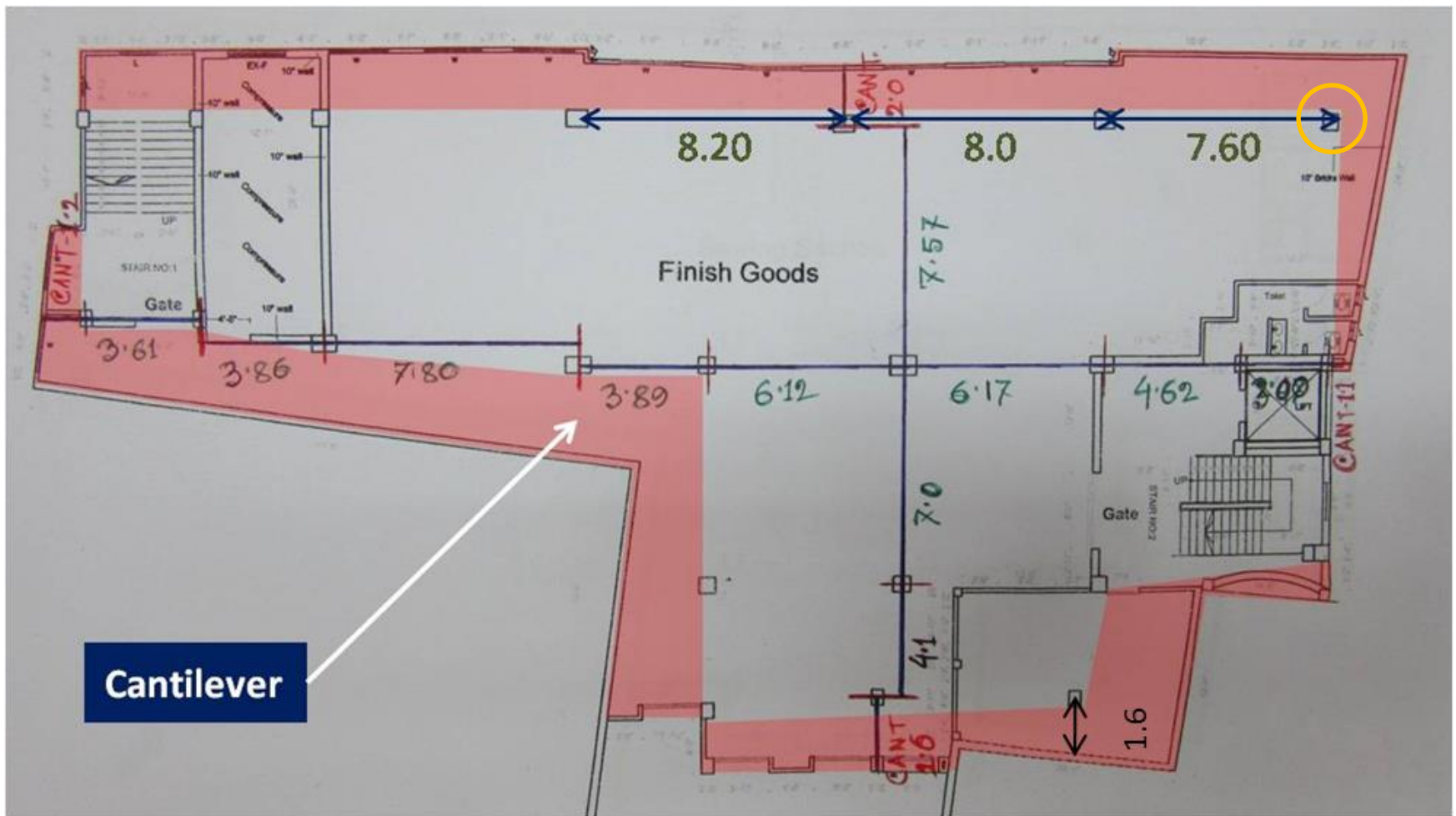
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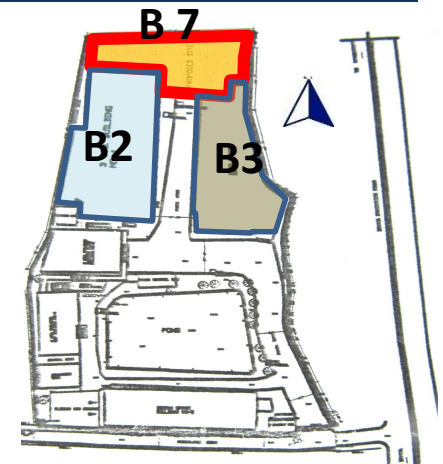
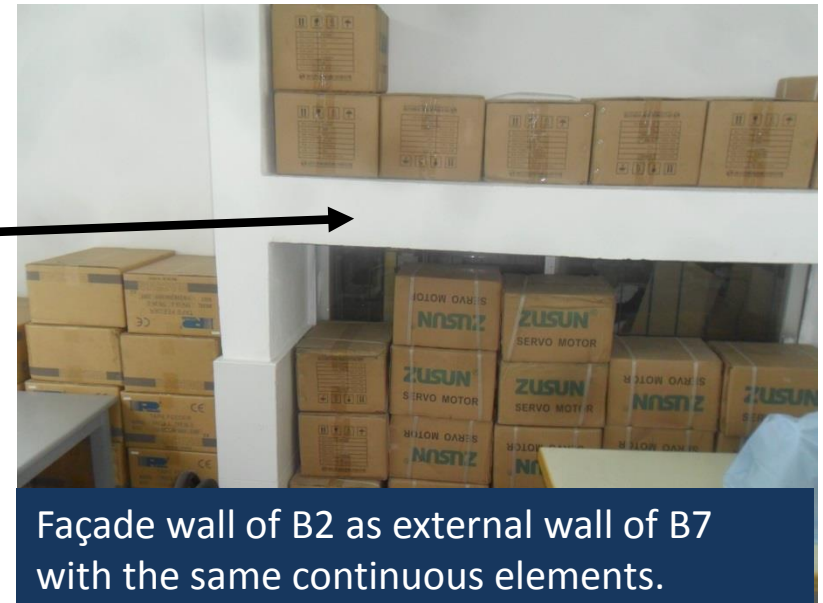
Observations

Apparently high stressed column



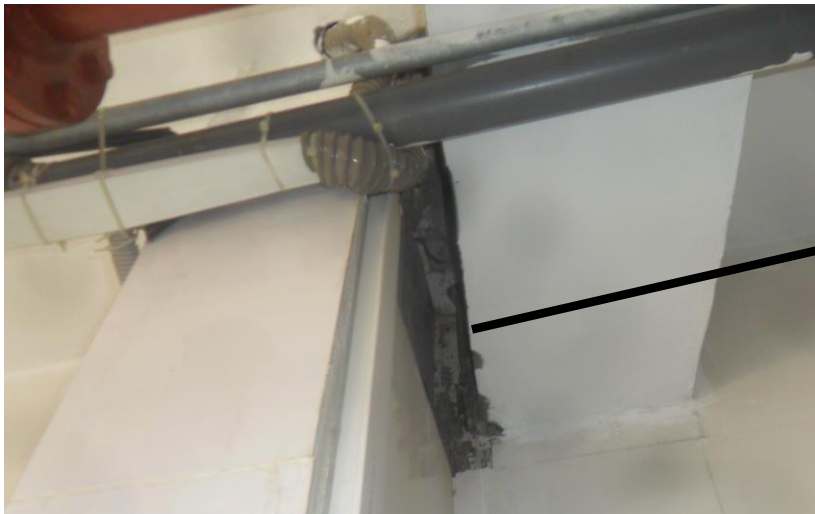
Cursory result shows high stress in the highlighted column due to heavy load coming from toilet present on different floors and water tank on roof top.

Apparently poor construction joints between buildings

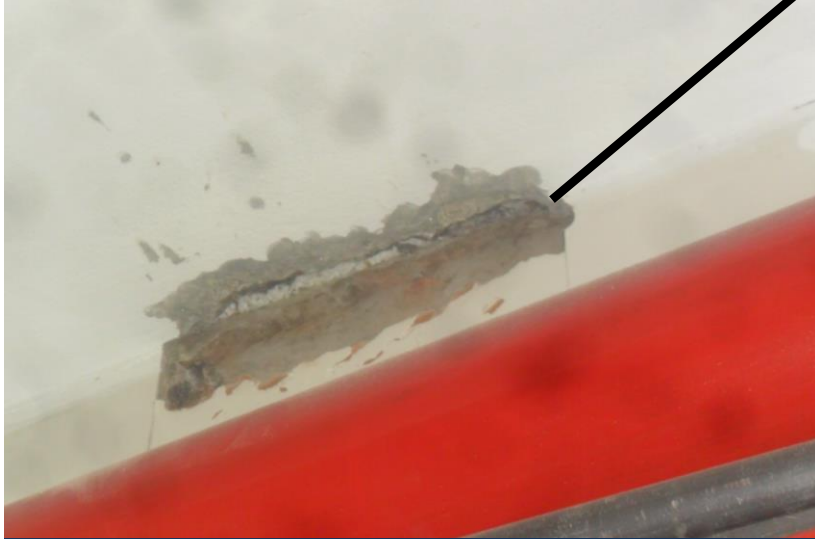


The construction joints between B7 and B1 and B3 is not apparent. In some places there are small construction joints and in other places the structural elements look connected. The façade walls of B1 and B3 are used as a common wall with B7.

Observation

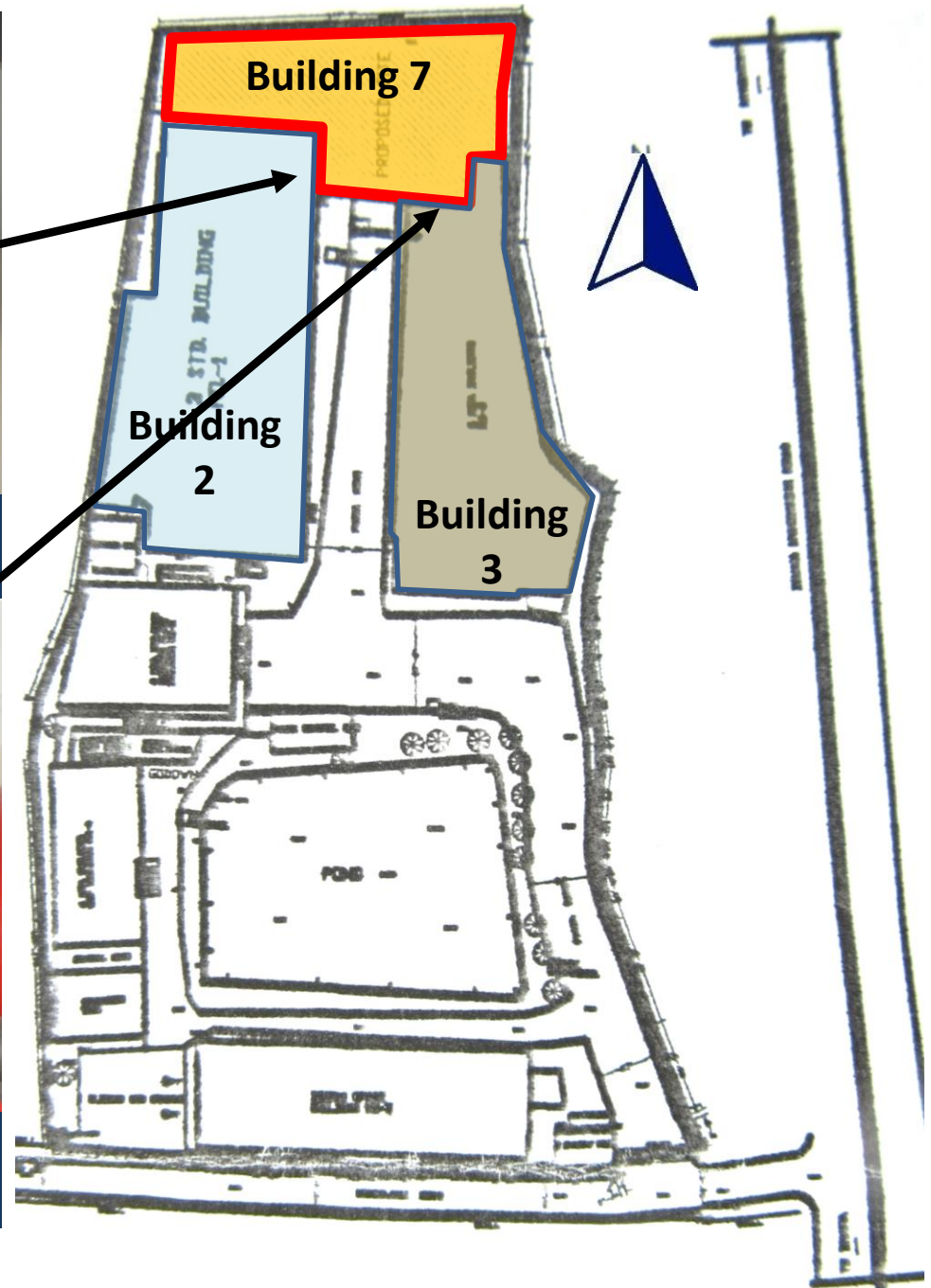


Construction joints are not clearly observed between inspected building and building - 2

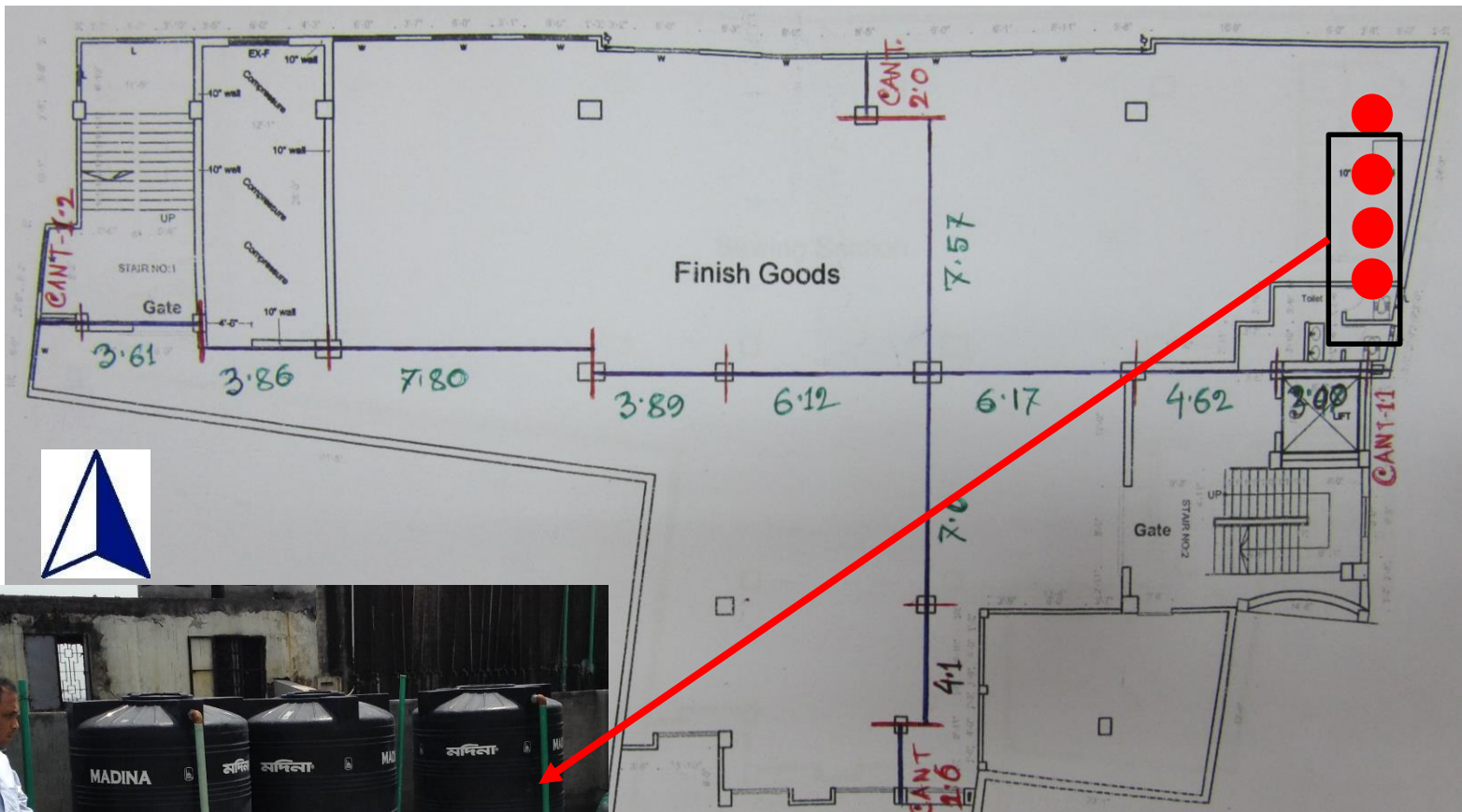


Construction joints observed between inspected building and building - 3

Observation



Apparently heavy loaded areas



Apparently high loading in the toilet area

Observation



Heavy loading observed on 1st floor

Observation

Falling Hazard



Lack of handrails on the 7th floor.

Observation

Priority Actions

Problems Observed

1. Apparently high stress level column
2. Apparently poor construction joints between buildings
3. Apparently heavy loaded areas
4. Falling hazard

Item No.	Observation	Recommended Action Plan	Recommended Timeline
20	Apparently high stress level column	No further construction and extension is permitted after the storey currently being built until the confirmation of the Building engineer on the current loads.	6-weeks
21	Apparently high stress level column	Building Engineer to review design, loads and column stresses in the edge toilet columns attracting loads from cantilevers and toilets.	6-weeks
22	Apparently high stress level column	Verify in-situ concrete stresses by 100mm dia. cores from min. 4 no. columns at ground floor level.	6-weeks
23	Apparently high stress level column	Precise the reinforcement in the column (size and quantity).	6-weeks
24	Apparently high stress level column	Produce and actively manage a loading plan for all floor plates within the Building, giving consideration to floor capacity and column capacity.	6-weeks
25	Apparently poor construction joints between buildings	The Building Engineer to investigate the construction joint between the buildings. Code adequacy to be ensured and eventual alterations to be defined.	6-months
26	Apparently poor construction joints between buildings	Make any structural alterations as advised by Factory Engineer.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
27	Apparently heavy loaded areas	Building Engineer to check and verify the design capacity of the structural elements supporting the water tanks.	6-weeks
28	Apparently heavy loaded areas	Building Engineer to design a loading plan for the building including the temporary water tank.	6-weeks
29	Apparently heavy loaded areas	The location of the future water tanks to be confirmed.	6-weeks
30	Apparently heavy loaded areas	If necessary Building Engineer to take appropriate action by reducing or removing water tanks loads where required and/or spread the load of the roof water tanks over a bigger and more appropriate area as required.	6-months
31	Apparently heavy loaded areas	Building Engineer to continue to implement loading plan.	6-months
32	Falling hazard	Secure constructed area around the staircases to exclude any possible falling hazard.	6-weeks