

Babylon Casualwear Ltd

Aboni Fashions Ltd

Suravee Garments Ltd

Plot-23,24, Tetulzhora, Hemayetpur, Savar, Dhaka
(23.792784N, 90.254587E)
29 March 2014

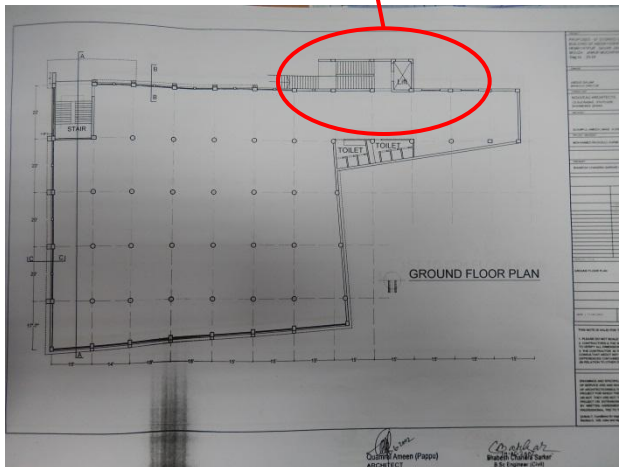
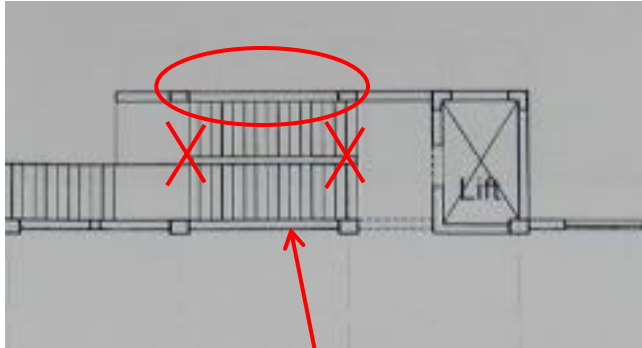


Observations

Potentially Highly-stressed columns

Aboni 7-storey Building (Unit 1)

Drawings below indicate column at external wall of stairs.
X indicate external column location



Typical Column Layout

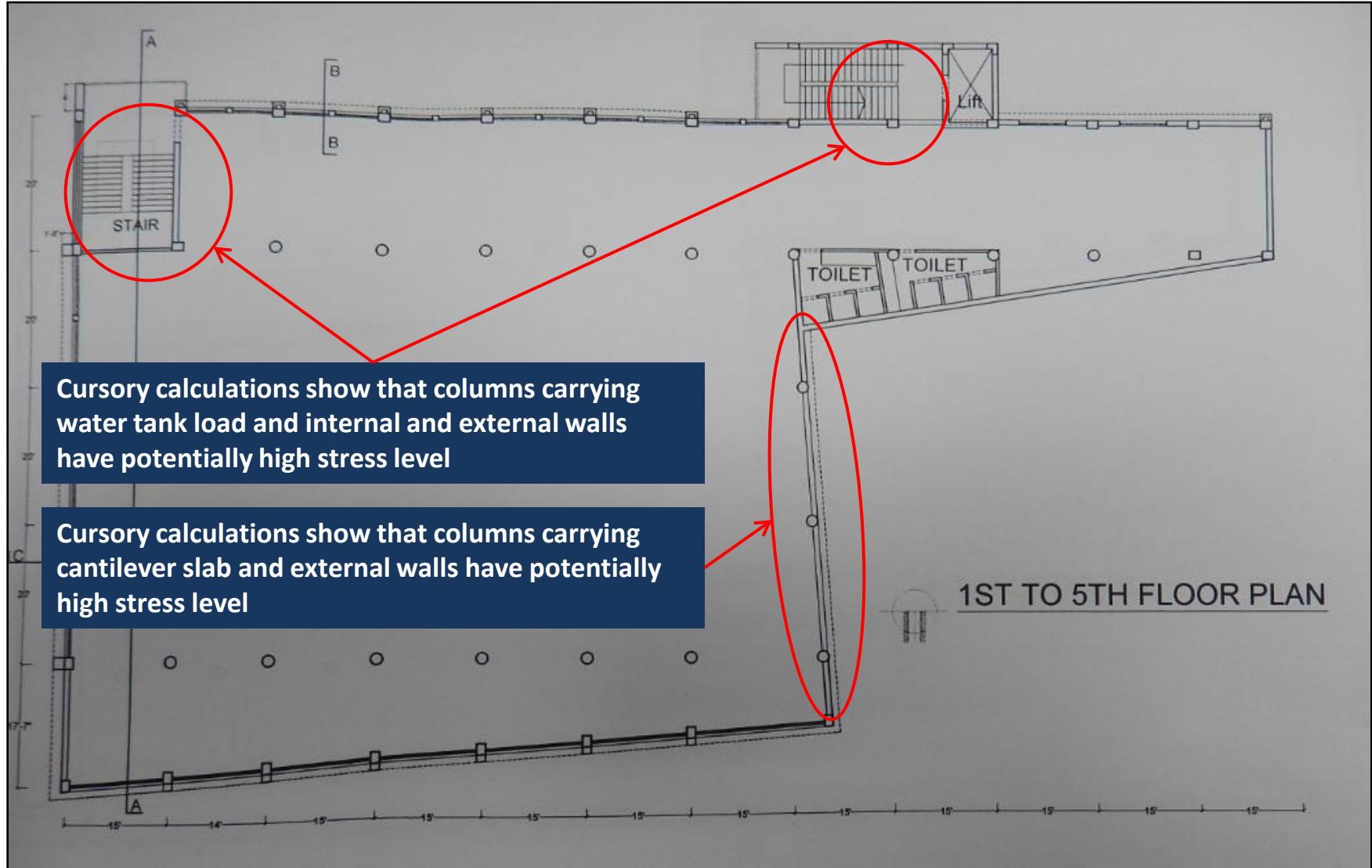
Cursory review of the stairwell column layout has changed to a cantilever carrying 7 storey loads

Building Engineer to check that columns have been designed to accommodate applied loads.



Photo taken of stairwell column as built

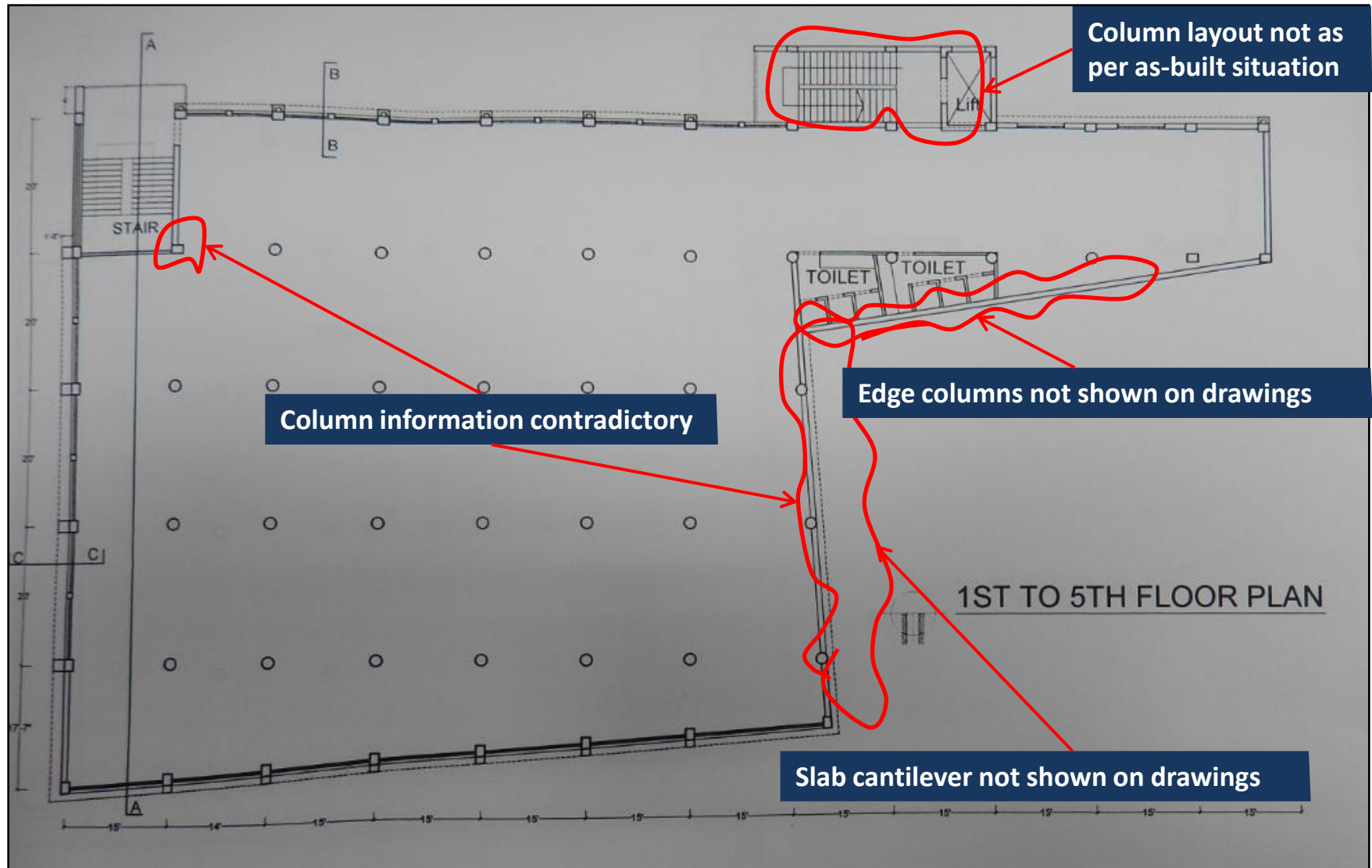
Aboni 7-storey Building (Unit 1)



Discrepancies between Drawings and Observations

Aboni 7-storey Building (Unit 1)

Drawing indicates a non-exhaustive list of discrepancies encountered



Horizontal Extension

(Discrepancies between Drawings and Observations)

Suravee (Unit 3)



Horizontal extension to the ground floor of 3 storey building, comprising brick masonry walls with a lightweight steel trussed roof. No evidence of horizontal bracing.

No structural or design documentation provided for extension. Subject to uplifting forces.

Evidence of localised cracking at column caps.



Areas highlighted show extents of new undocumented buildings

Check on additions required



Suravee (Unit 3)

Evidence of localised cracking at column caps.

Check on additions required

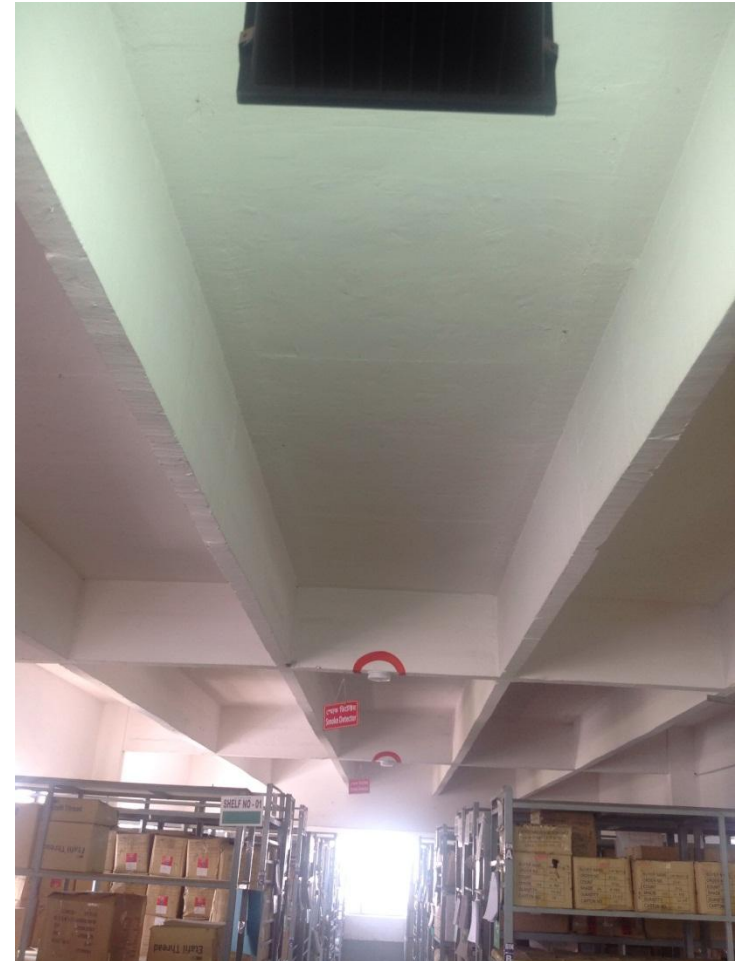
Roof & Level 1 (Unit 1) slab & columns

(Discrepancies between Drawings and Observations)

Aboni 7-storey Building (Unit 1)



Roof level of 7 storey building has utilised pan slab & T columns in lieu of 2 way slab and circular columns. Particular focus on the transition (bottom left photo).



Aboni 7-storey Building (Unit 1)

Level 1 slab of 7storey building has utilised a one-way slab in lieu of two-way slab in one section. Drawings do not indicate a one-way slab



Cracking in beam adjacent to water tank – Unit 2

Babylon 3-storey Building (Unit 2)

Vertical crack in column in proximity of water tank in Unit 2. Note tank sitting on slab without plinth.

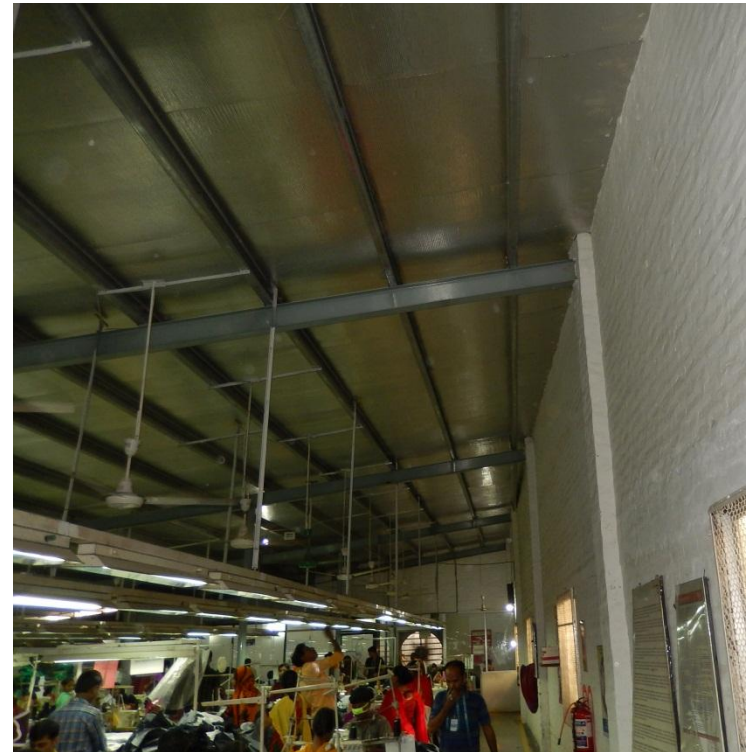


Missing Lateral Stability members in Shed Buildings

Suravee (Unit 3) and all other Sheds



Within shed buildings, no lateral bracing/stability was noted during our reviews



Priority Actions

Problems Observed

1. Potentially highly-stressed columns in the external stairwell and other areas of Unit 1
2. Undocumented Horizontal Extensions (Unit 3)
3. Localised cracking in column caps within new shed buildings (Unit 3)
4. Different design of Unit 1 roof slab and supporting structure
5. Crack in beam in close proximity to water tank – Unit 2
6. Lack of lateral stability in the shed buildings

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Cursory calculations indicate that the working stress of columns are at a high level in the external stairwell and other areas of Unit 1	Maintain current use of the floors and do not change use or increase occupation, either of which could increase loading.	Immediate - Now
2	Cursory calculations indicate that the working stress of columns are at a high level in the external stairwell and other areas of Unit 1	Factory Engineer to review design, loads and columns stresses in all columns	Immediate - Now
3	Cursory calculations indicate that the working stress of columns are at a high level in the external stairwell and other areas of Unit 1	Verify insitu concrete stresses either by 100mm diameter cores or existing cylinder strength data for cores from min. 4 columns	Immediate - Now
4	Cursory calculations indicate that the working stress of columns are at a high level in the external stairwell and other areas of Unit 1	A Detail Engineering Assessment of Unit 1 to be commenced, see attached Scope.	Immediate - Now
5	Cursory calculations indicate that the working stress of columns are at a high level in the external stairwell and other areas of Unit 1	Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity	6-weeks
6	Cursory calculations indicate that the working stress of columns are at a high level in the external stairwell and other areas of Unit 1	Detail Engineering Assessment to be completed	6-weeks
7	Cursory calculations indicate that the working stress of columns are at a high level in the external stairwell and other areas of Unit 1	Continue to implement load plan	6-months

Detail Engineering Assessment

This Schedule develops a minimum level of information, Analysis and testing expected as part of a Detail Engineering Assessment.

The Building(s) have been visually assessed and it is deemed necessary that a detailed engineering assessment be carried out by a competent Engineering Team employed by the factory Owner.

This Request should be read in conjunction with the BUET developed Tripartite Guideline document for Assessment of Structural Integrity of Existing RMG Factory Buildings in Bangladesh (Tripartite Document), the latest version of this document should be referenced. This document also gives guidance on required competency of Engineering Team.

We expect that the following will be carried out:

1. Development of Full Engineering As-Built Drawings showing Structure, loading, elements, dimensions , levels, foundations and framing on Plan, Section and Elevational drawings .
2. The Engineering team are to carry out supporting calculations with a model based design check to assess the safety and serviceability of the building against loading as set out in BNBC-2006, Lower rate provisions can be applied in accordance with the Tripartite Guidelines following international engineering practice, justification for these lower rate provisions must be made.
3. A geotechnical Report describing ground conditions and commenting on foundation systems used/proposed.
4. A report on Engineering tests carried out to justify material strengths and reinforcement content in all key elements studied.
5. Detailed load plans shall be prepared for each level showing current and potential future loading with all key equipment items shown with associated loads.
6. The Engineering team will prepare an assessment report that covers the following:
 - As-Built drawings including
 - Plans at each level calling up and dimensioning all structural components
 - Cross sectional drawings showing structural beams, slabs, floor to floor heights, roof build-ups and Basic design information of the structure
 - Highlight any variation between As-built compared to the designed structure
 - Results of testing for strength and materials
 - Results of geotechnical assessment and testing/investigation
 - Details of loading, inputs and results of computer modelling
 - Commentary on adequacy/inadequacy of elements of the structure
 - Schedule of any required retrofitting required for safety or performance of Structure

Any proposals for Retrofitting to follow guidance developed in the Tripartite Document

Item No.	Observation	Recommended Action Plan	Recommended Timeline
8	Engineering Assessment of undocumented horizontal extension (Unit 3)	The Building Engineer to check the load plans and confirm whether the main building structure is capable of safely supporting the additional loading on the structure from the floor extension	6-weeks
9	Engineering Assessment of undocumented horizontal extension (Unit 3)	Building Engineer to provide detailed calculations for the Unit 2/3 structures and the associated light steel roof. These should confirm their ability to withstand all wind loading pressure, suctions and uplift forces	6-months
10	Engineering Assessment of undocumented horizontal extension (Unit 3)	Building engineer to check, collect information and produce accurate and complete as-built documentation	6-months
11	Cracking in column caps within sheds (Unit 3)	Extent of loading to be assessed on the brick columns and review of the current vertical cracking. The capacity of columns to be assessed to confirm that the structure is designed to carry these loads	6-weeks
12	Cracking in column caps within sheds (Unit 3)	Produce detailed engineering drawings and calculations for the Unit 2/3 structures ensuring design meets the anticipated loadings	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
13	Different design to the Unit 1 roof slab	Column and slab capacity to be assessed for existing loadings as part of Detail Engineering Assessment (see Item 1).	6-weeks
14	Different design to the Unit 1 roof slab	Provide accurate as-built documentation as part of Detail Engineering Assessment	6-months
15	Crack in beam adjacent to water tank location – Unit 2	Building Engineer to assess whether the building structure can carry the additional point load and submit relevant design document	6-weeks
16	Crack in beam adjacent to water tank location – Unit 2	Building engineer to assess the crack in the beam.	6-months
17	Crack in beam adjacent to water tank location – Unit 2	Carry out remedial work if required.	6-months
18	Lateral stability of single storey industrial buildings, and 2-storey steel frame building (Shed 1)	Building Engineer to assess whether building has an appropriate lateral stability system and submit relevant design document	6-weeks
19	Lateral stability of single storey industrial buildings, and 2-storey steel frame building (Shed 1)	Carry out remedial work if required.	6-months
20	Lateral stability of single storey industrial buildings, and 2-storey steel frame building (Shed 1)	Building engineer to assess single storey utility building and confirm its ability to withstand all wind loading pressure, suctions and uplift forces	6-months