

Fakir Apparels Ltd. (9485)

G16/17-A, BSCIC I/A, Enayetnagar, Fatullah, Narayangonj.

(+23.622252N, 90.480949E)

30.AUGUST.2014



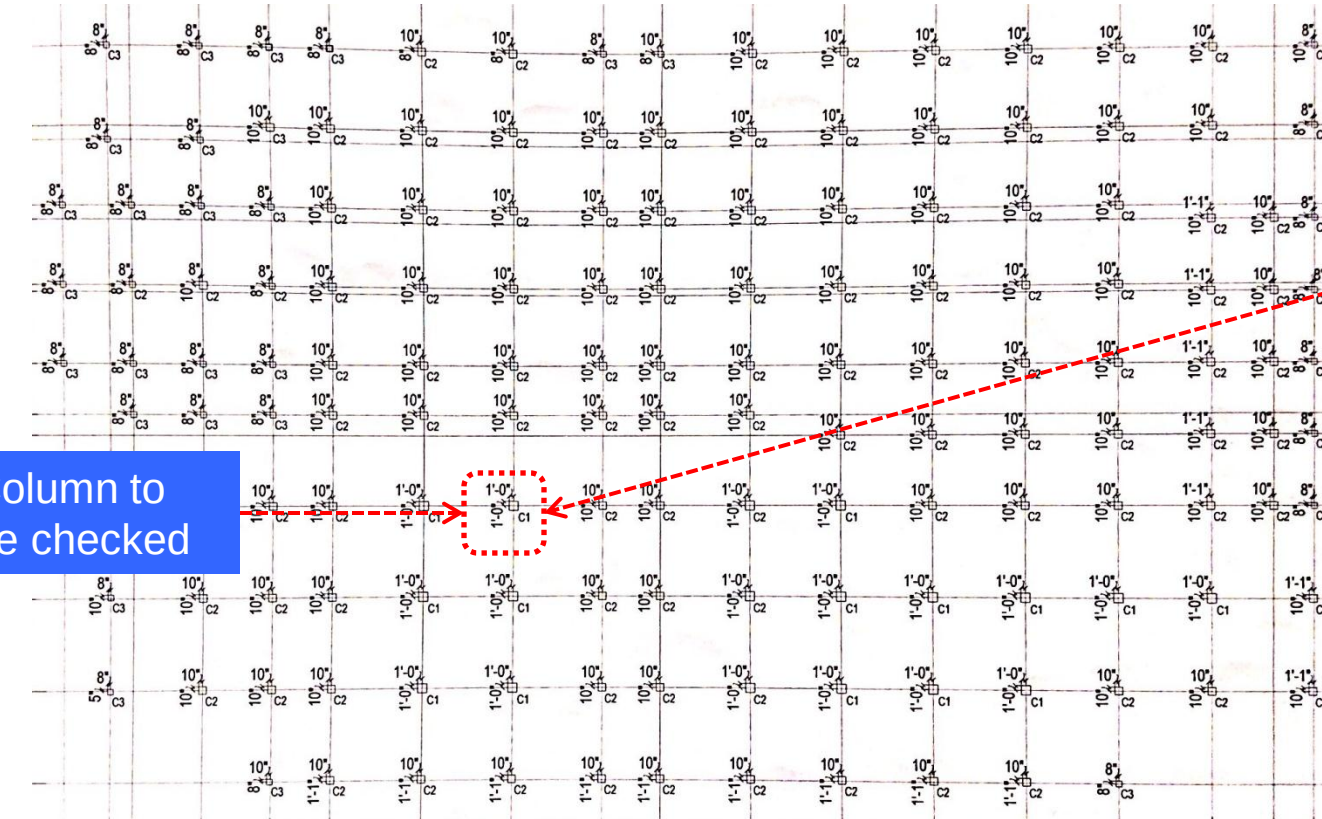
Identified Priority 1 Concerns

1st Priority 1 Concern

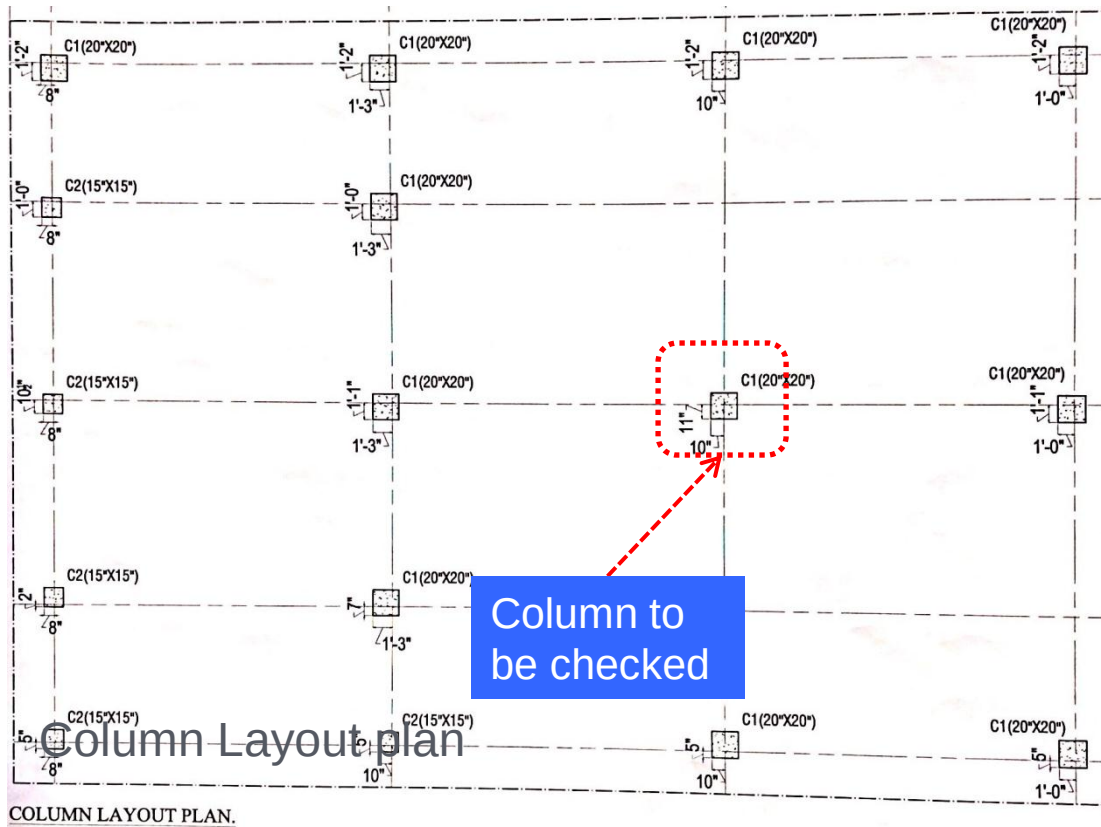
Building 5

The as built column size has been found to be smaller than specified on the structural drawings. The Factory's Engineer suggested a column C3 was used rather than C1

Column to be checked



The loading needs to be maintained under 2.0kPa. As per our calculation, the column has a very low FOS if the applied live load is 5.0kPa as per the information on the structural drawings.



COLUMN SCHEDULE		
S.L No.	BELOW GB.	GF- 1ST FLOOR
C1		

Column C1 was found to be bigger than what was shown on the structural drawings.

The number of bars is also fewer than what was shown in the structural drawings.

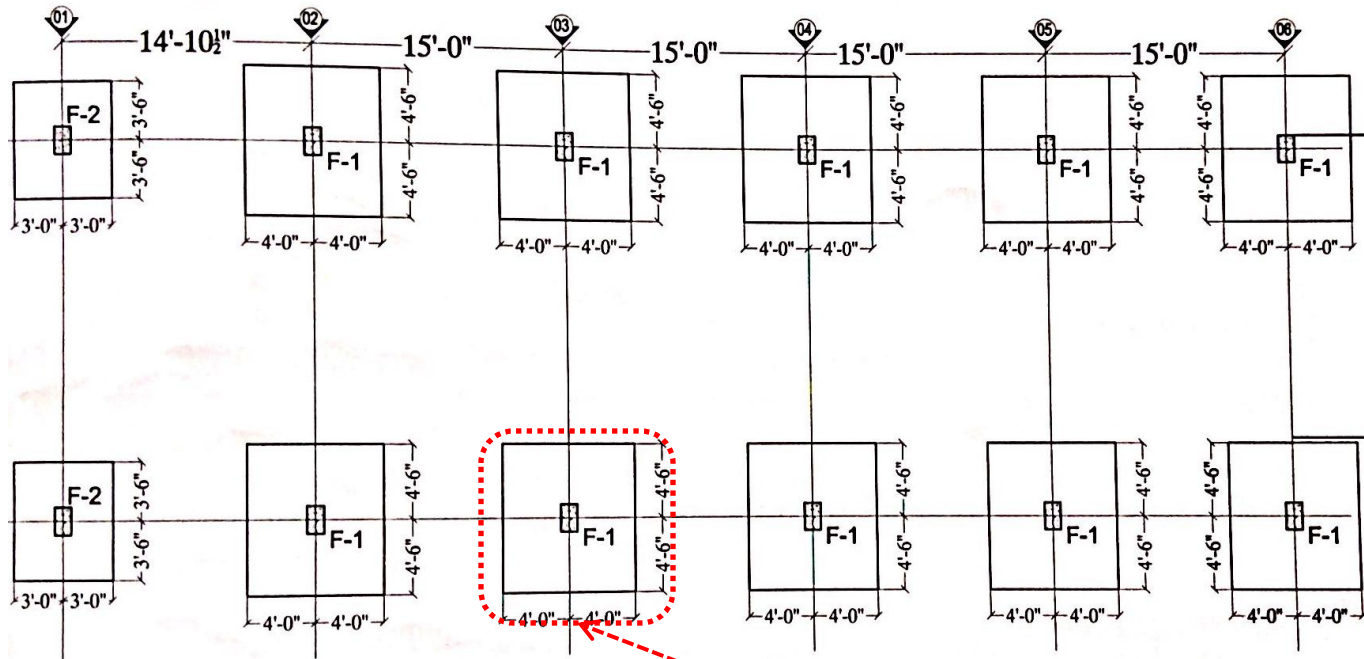
The as-built drawings of this building needs to be updated and re-produced.

The loading needs to be maintained under 2.0kPa. As per our calculation, the column has a very low FOS if the applied live load is 5.0kPa as per information on the structural drawings.

Building Extents

3rd Priority 1 Concern

Building 8



A Structural Engineer needs to review and check the foundation design of this building. The footings appear to be under designed compared with soil capacities.

Footing and Column Layout plan

Footing to be checked

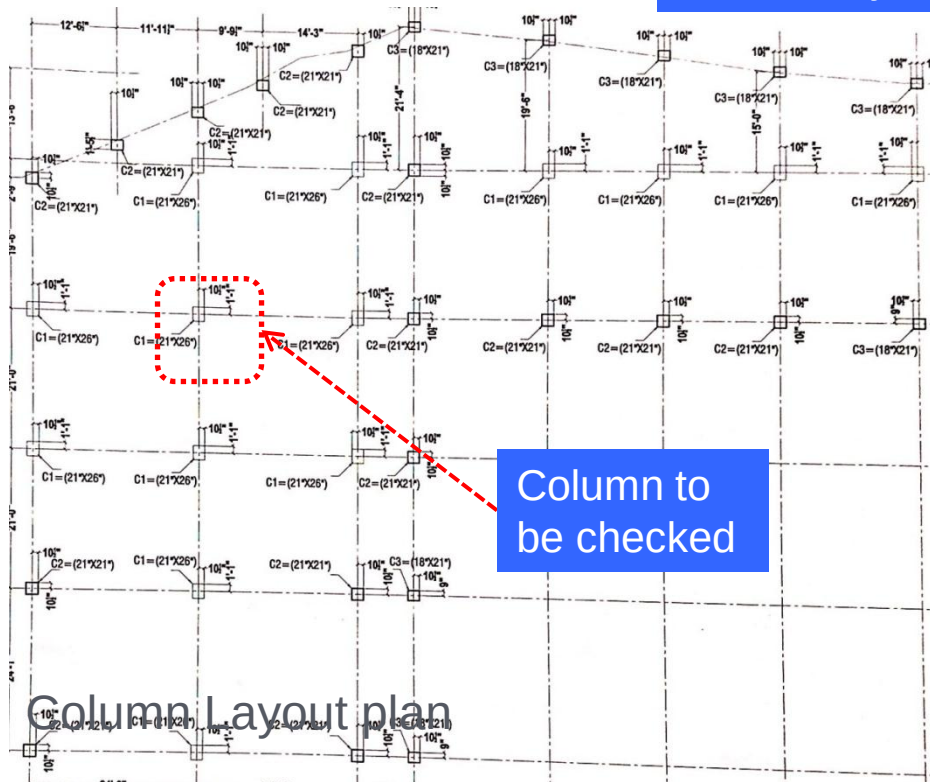
Single pad footings were used. The soil capacity is around 30-60 kPa.

A typical column load is 457kN. The soil stress under footing is 68kPa which is higher than allowable soil capacity. Thus this foundation needs to be reviewed and checked in more detail.

Building Extents

4th Priority 1 Concern

Building 6



COLUMN SCHEDULE

S.L No.	GROUND FLOOR	1ST-TOP FLOOR
C1	21"x26" Shear connector 10 mmØ @ 8"c/c 16-20mmØ.	15"x20" 12-20mmØ.
C2	21"x21" Shear connector 10 mmØ @ 8"c/c 16-20mmØ.	15"x15" 12-20mmØ.
C3	21"x18" Shear connector 10 mmØ @ 8"c/c 16-20mmØ.	15"x12" 8-20mmØ.

Column after strengthening.

Based on the load rundown analysis of column C1 at 1st floor, the column has been found to possess a low factor of safety with regard to its load carrying capacity, thus gaining a YELLOW warning. We require further investigation and checks to be carried out as noted at the priority actions.

Building Extents

Identified Priority 3 Concerns

1st Priority 3 Concern

The factory's Structural Engineer is to produce Loading Plans for each floor of each building.

Based on our calculations, a guide to the allowable live load for each building is as listed in the summarised table below.

Building 4, 7, 12 and 16 can use a live load 5.0kPa . However, a Structural Engineer needs to review and check the beam and slab system to confirm this applied load.

Allowable Live Load	2.0 kPa	3.0 kPa	5.0 kPa
Building No.	B2	B1	B4
	B5	B3	B7
	B9	B8	B12
	B6	B10	B16
		B11	

2nd Priority 3 Concern



The steel columns of all shed buildings need to be provided with tie beams in the longitudinal direction.

Typical examples from Buildings 22 & 26.

3rd Priority 3 Concern



The steel trusses need to be longitudinally braced together to combine the whole building and to increase its overall stability.



A Structural Engineer needs to review the design and check the stability of the trusses under lateral and uplift wind loads.

4th Priority 3 Concern



None of the steel structures have not been protected with fire proofing.

The fire proofing needs to be applied with minimum of 1 to 2 hours of resistance based on the BNBC codes.





The strengthening works for the columns should be extended to underside of the first floor slab above rather than stopping at a lower level.

S.L No.	GROUND FLOOR
C1	Share connector 3" 1'-3" 3" 3" 21"x21" 8-20mmØ.
C2	Share connector 3" 1'-8" 3" 3" 21"x26" 12-20mmØ.
C3	Share connector 3" 1'-8" 3" 3" 21"x26" 16-20mmØ. 18-20

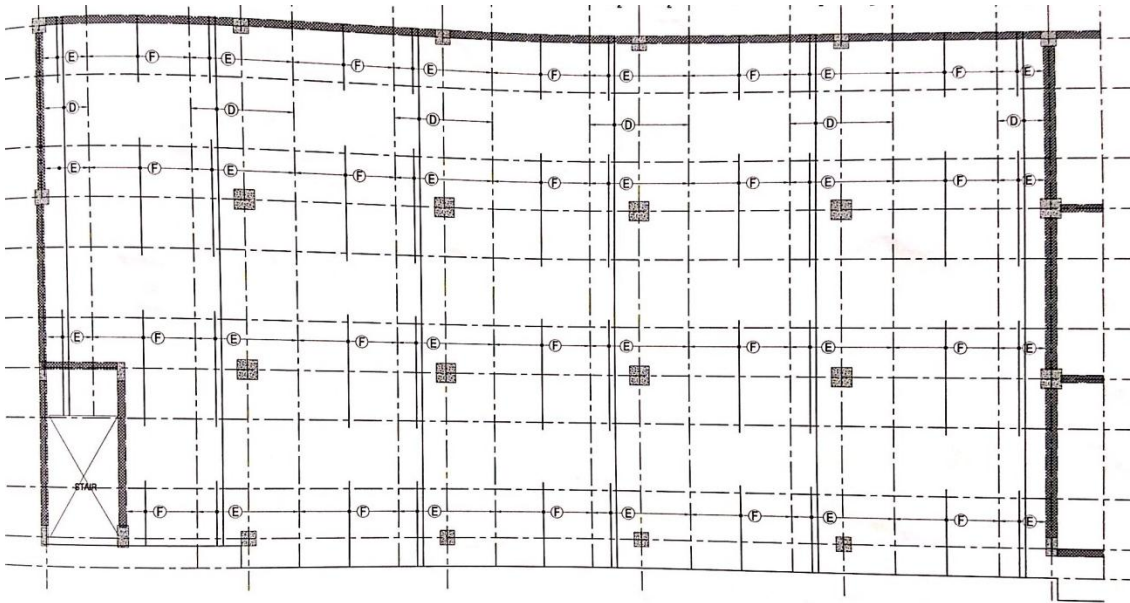
6th Priority 3 Concern



The as-built drawings of the structural steel buildings need to be produced.

Overall Stability System

Buildings 1 & 3



Typical framing floor plan



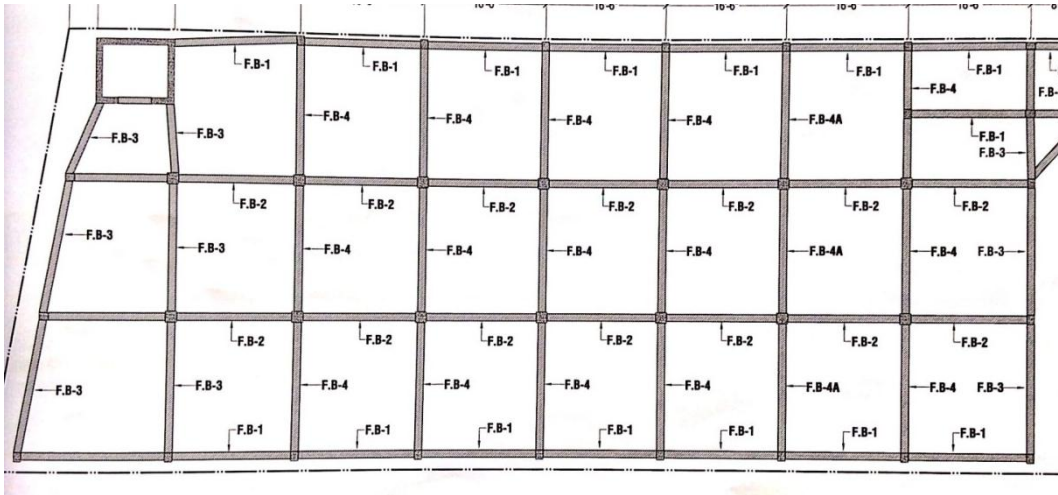
The overall structural arrangement does not appear to have any rational form of lateral stability system to resist the wind or earthquake loads. A lateral load analysis is required to be carried out.

A Structural Engineer needs to check the deflections and storey drift under lateral wind and seismic loads.

The increase in shear stresses to the flat slabs, due to lateral loads, also needs to be assessed.

We require that this item is investigated as part of an Engineering Assessment.

Buildings 2, 4, 5,
6, 7, 8, 9, 10 & 11.



Typical framing floor plan



R.C Beam and column frame
with a 2-way solid slab.
Stability provided by moment
frame action only.

This type of structural framing
is appropriate for buildings
lower than 10 storeys high
and with large plan areas only.

We require that this is
investigated as part of an
Engineering Assessment



We require that this item is investigated as part of an Engineering Assessment

The structure of the floors is made up of steel beams supporting a 1-way spanning composite slab.

Moment frames in the transverse and longitudinal directions provide some stability. The building has also been provided with cross bracing systems in both directions which also provide stability. A Structural Engineer needs to review and check the structural system under lateral wind and seismic loads to verify how the building actually operates under these loads.

We also require the Structural Engineer reviews and checks lateral deflections and story drift under wind and seismic loads.

Priority Actions

Problems Observed Summary

- ITEM 1: (1st Priority 1) The factory's Structural Engineer should review the design, loads and columns stresses of Building 5 in the areas identified previously.**
- ITEM 2: (2nd Priority 1). The factory's Structural Engineer should review the design, loads and columns stresses of Building 9 in the areas identified previously.**
- ITEM 3: (3rd Priority 1). A Structural Engineer needs to review and check for the foundations of building 8.**
- ITEM 4: (4th Priority 1). A Structural Engineer needs to review the design, loads and columns stresses of Building 6 as identified previously**
- ITEM 5: (1st Priority 3) A Structural Engineer needs to produce Loading Plans for each floor of each building.**
- ITEM 6: (2nd Priority 3) The steel columns of all steel buildings need to be provided with eaves tie beams in the longitudinal direction.**

Problems Observed Summary

- ITEM 7: (3rd Priority 3)** The steel trusses of all shed buildings need to be longitudinally braced to combine all trusses together and to increase the overall stability of the building as a whole.
- ITEM 8: (4th Priority 3)** None of the steel structures have been protected with fire proofing.
- ITEM 9: (5th Priority 3)** The strengthening works to the column of building 4 should be extended up to the underside of the slab above.
- ITEM 10: (6th Priority 3)** The as-built drawings of all steel structures need to be produced.
- ITEM 11: (7th Priority 3)** The factory's Structural Engineer needs to check the overall lateral stability systems of the buildings as listed.

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	1st Priority 1 - The factory's Structural Engineer should review the design, loads and columns stresses of Building 5 in the areas identified previously.	A Structural Engineer is to review the design, the loads and columns stresses. Verify in-situ concrete stresses either by 100mm dia. cores or existing cylinder strength data for [the identified columns] or [100mm dia. cores from 4 columns].	6-weeks
2	1st Priority 1 - The factory's Structural Engineer should review the design, loads and columns stresses of Building 5 in the areas identified previously.	Produce and actively manage Loading Plans for all floor plates for all buildings.	6-months
3	2nd Priority 1 - The factory's Structural Engineer should review the design, loads and columns stresses of Building 9 in the areas identified previously.	A Structural Engineer is to review the design, the loads and columns stresses. Verify in-situ concrete stresses either by 100mm dia. cores or existing cylinder strength data for [the identified columns] or [100mm dia. cores from 4 columns].	6-weeks
4	2nd Priority 1 - The factory's Structural Engineer should review the design, loads and columns stresses of Building 9 in the areas identified previously.	Produce and actively manage Loading Plans for all floor plates for all buildings.	6-months
5	3rd Priority 1 - A Structural Engineer needs to review and check for the foundations of building 8.	Factory engineer needs to review and check for the footing of this building. The footing seems to be under design comparison with the soil capacity. Soil capacity also needs to be reviewed and verified again. Plate loading test should be carried out to verify the soil capacity.	6-weeks
6	3rd Priority 1 - A Structural Engineer needs to review and check for the foundations of building 8.	Based on the results above, consider whether or not strengthening work need to be taken.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
7	4th Priority 1 - A Structural Engineer needs to review the design, loads and columns stresses of Building 6 as identified previously	A Structural Engineer is to review the design, the loads and columns stresses. Verify in-situ concrete stresses either by 100mm dia. cores or existing cylinder strength data for [the identified columns] or [100mm dia. cores from 4 columns]	6-weeks
8	4th Priority 1 - A Structural Engineer needs to review the design, loads and columns stresses of Building 6 as identified previously	Produce and actively manage Loading Plans for all floor plates for all buildings.	6-months
9	1st Priority 3 - A Structural Engineer needs to produce Loading Plans for each floor of each building.	Produce Loading Plans for each floor of each building.	6-weeks
10	1st Priority 3 - A Structural Engineer needs to produce Loading Plans for each floor of each building.	Maintain and enforce all Loading Plans.	6-months
11	2nd Priority 3 - The steel columns of all steel buildings need to be provided with eaves tie beams in the longitudinal direction.	The detailed design for the steel building needs be fully reviewed; particularly the stability under wind and seismic loads.	6-weeks
12	2nd Priority 3 - The steel columns of all steel buildings need to be provided with eaves tie beams in the longitudinal direction.	Insert eaves tie beams between each column.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
13	3rd Priority 3 - The steel trusses of all shed buildings need to be longitudinally braced to combine all trusses together and to increase the overall stability of the building as a whole.	The detailed design for the shed building with trussed roof rafters needs to be reviewed to check the structural stability under wind loads.	6-weeks
14	3rd Priority 3 - The steel trusses of all shed buildings need to be longitudinally braced to combine all trusses together and to increase the overall stability of the building as a whole.	Provide a complete truss bracing system in the longitudinal direction.	6-months
15	4th Priority 3 - None of the steel structures have been protected with fire proofing.	Fire proofing needs to be applied with a minimum of 1 to 2 hours of resistance based on the BNBC codes.	6-months
16	5th Priority 3 - The strengthening works to the column of building 4 should be extended up to the underside of the slab above.	Extend the strengthening works for columns of building 4 up to the underside of the first floor slab above.	6-months
17	6th Priority 3 - The as-built drawings of all steel structures need to be produced.	A Structural Engineer should survey the actual conditions and produce the missing drawings as early as possible.	6-weeks
18	7th Priority 3 - The factory's Structural Engineer needs to check the overall lateral stability systems of the buildings as listed.	A Structural Engineer should check the overall structural systems under lateral wind and seismic loads of the buildings as listed.	6-weeks
19	7th Priority 3 - The factory's Structural Engineer needs to check the overall lateral stability systems of the buildings as listed.	Based on the analysis results, consider any strengthening or modification work necessary. Carry out that work fully.	6-months