

Purbasha Composite Tex Ltd

Jamirdia (Square Masterbari), Bhaluka, Mymensingh
(24.305554, 90.393209)
21st March 2022

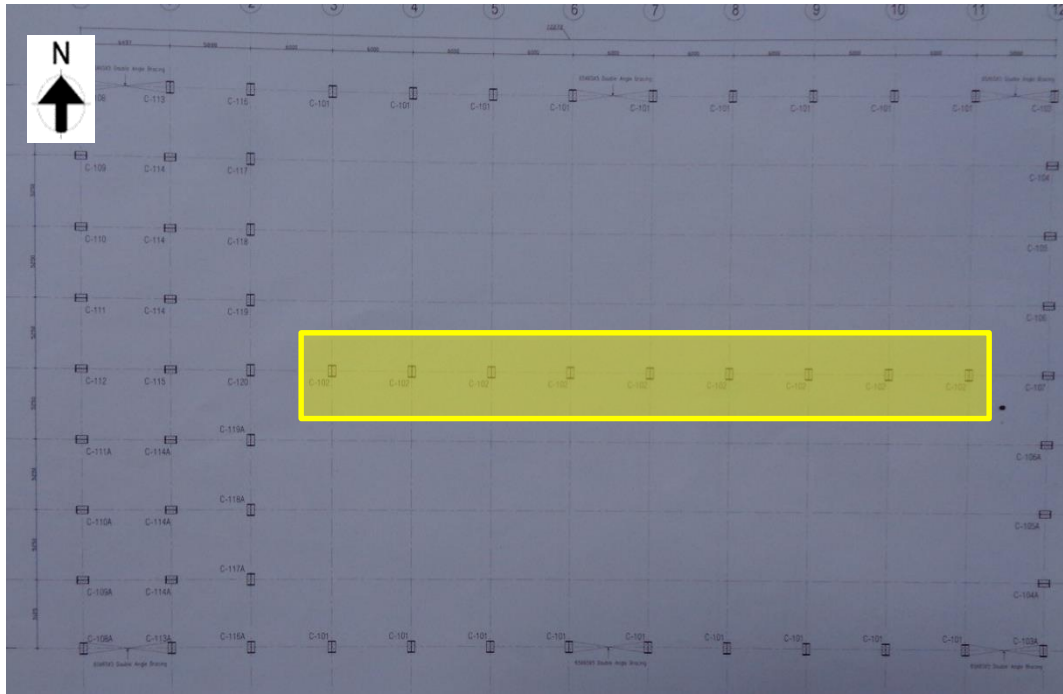


Building Information

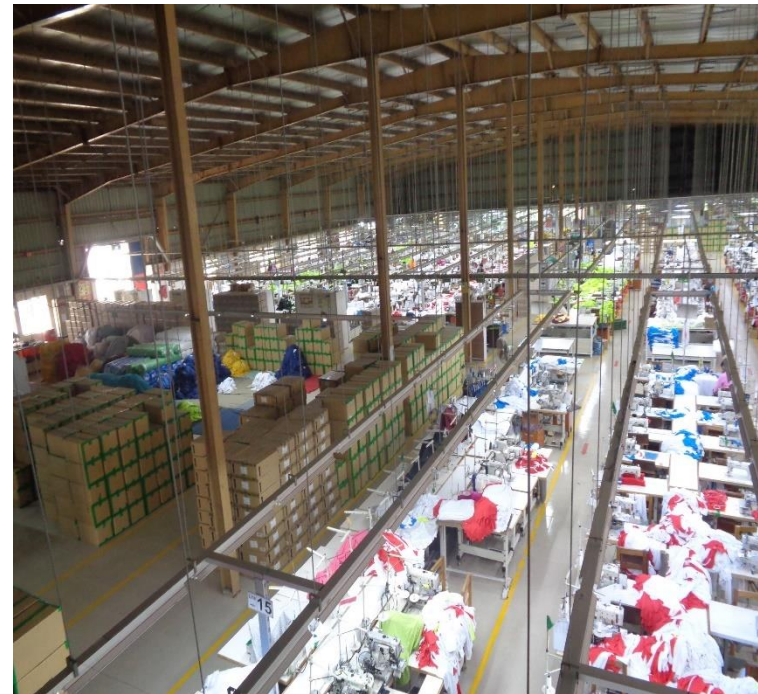
1. Shed-1 (Factory Building) (single storied shed with a mezzanine floor) (steel structure)
2. Shed-2 (Compliance Building) (single storied shed) (steel structure)
3. Utility Building (single storied) (reinforced concrete structure)
4. Security Building (two storied) (reinforced concrete structure)

Observations

Stress in column exceeds normal design limit



Stressed columns in layout



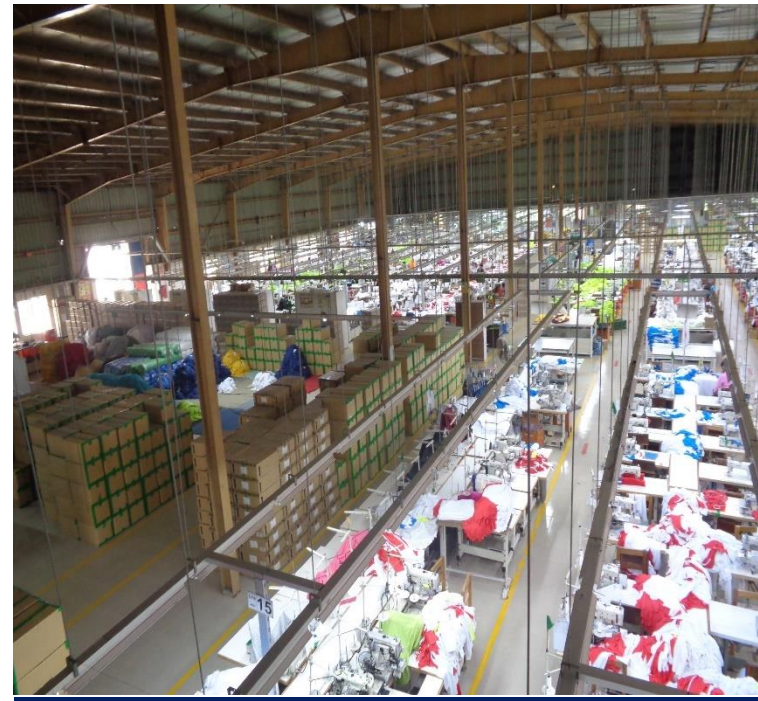
Typical stressed columns along ridge

Cursory calculation indicates that stress in column exceeds the normal design limit (yellow marked) due to large tributary area considering the roof live load (1 kPa) and strength of steel 345 MPa from the available MS plate test report. Building engineer is required to review the design, loads and column stresses for the marked columns.

Apparently incomplete lateral stability system



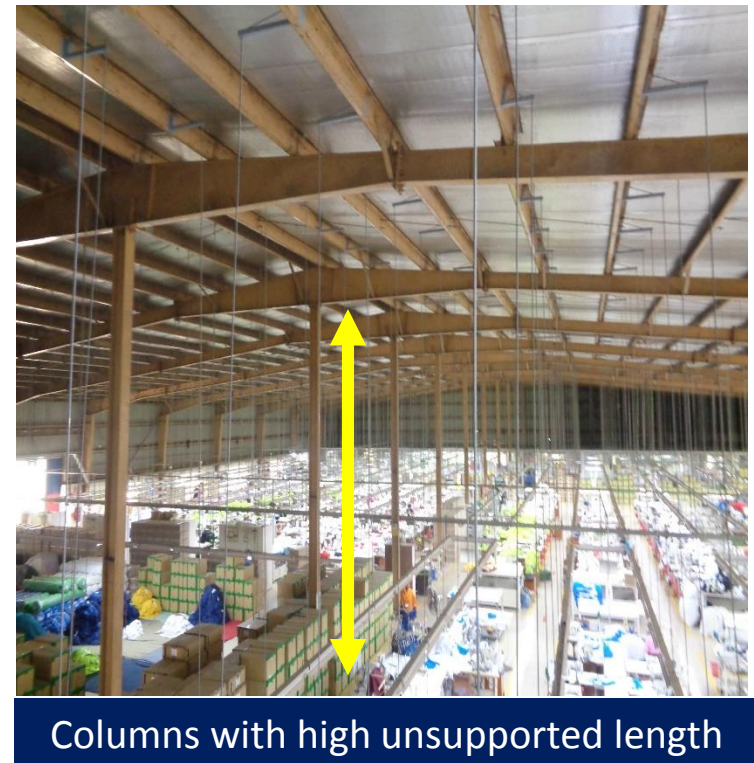
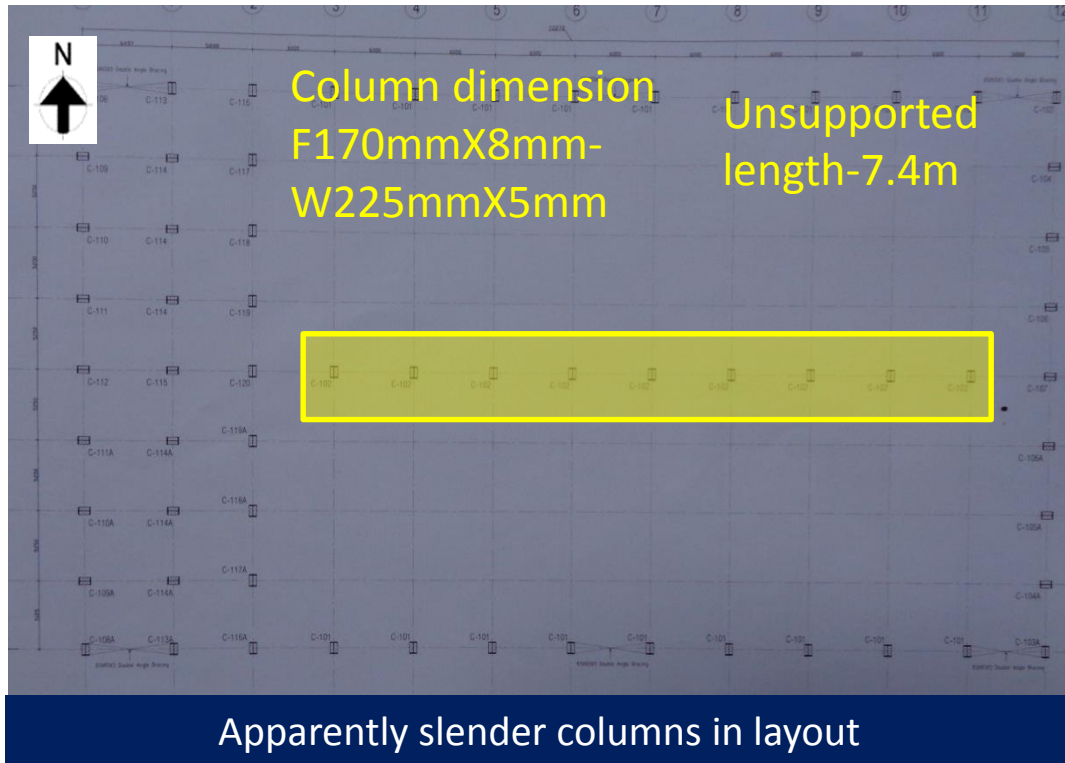
Roof & wall bracing provided



No load transfer media provided

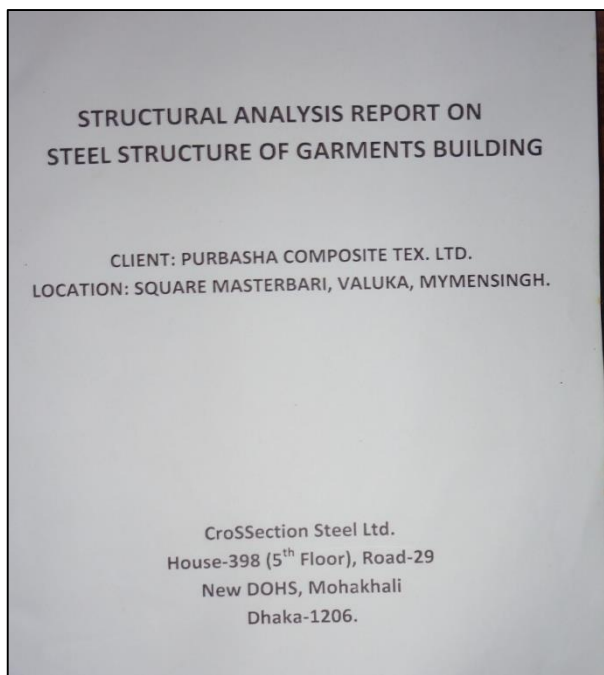
Roof and wall bracing provided at some location, but no-load transfer media provided from frame to frame to transfer the lateral load therefore lateral stability system of the shed is apparently incomplete. Also, the wall bracing seems to be inadequate if considered as both tension-compression Building engineer is required to check the lateral stability of the structure.

Columns appear to be slender

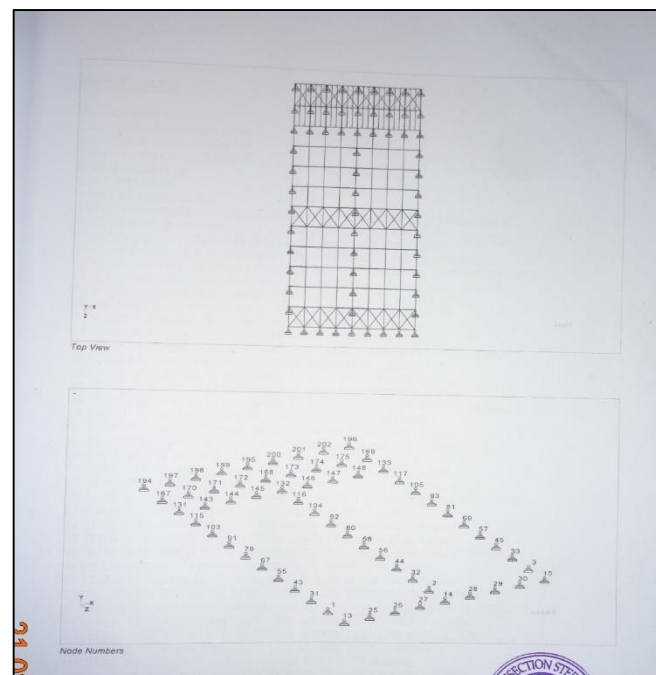


Cursory calculation shows that slenderness in highlighted columns exceeds normal design limit due to long unsupported length. Factory engineer is required to carryout adequacy check of the highlighted column considering slenderness effect.

**Prepared structural analysis report to be updated
and reviewed**



Prepared “Structural Analysis Report”



“Structural Analysis Report” based on FEA model

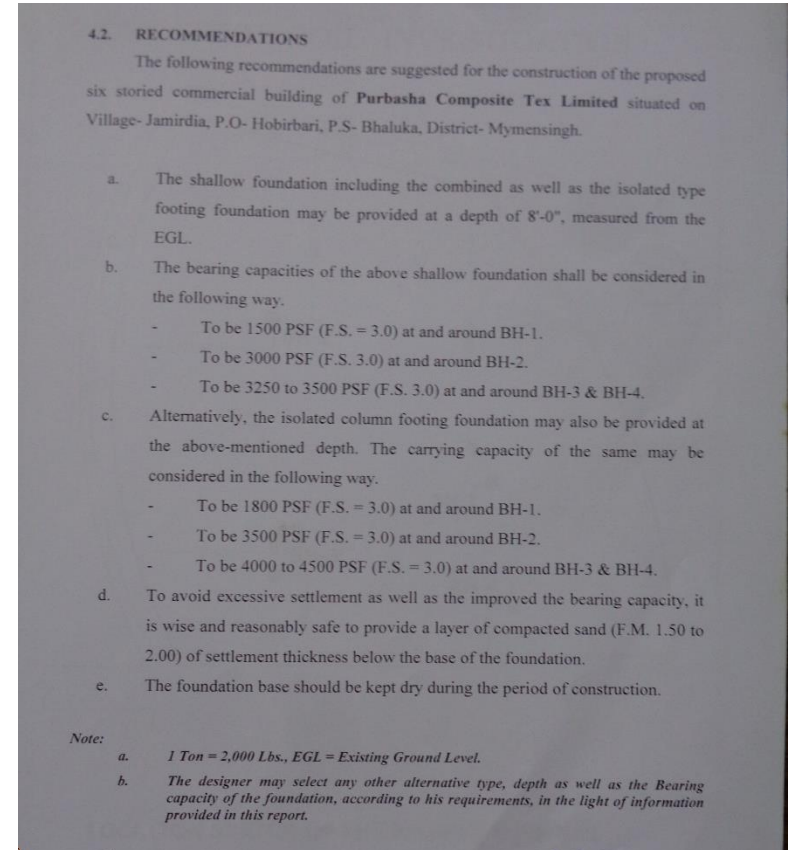
A “Structural Analysis Report” was available based on software-based analysis for this structure. However, no software model was available to review the analysis report. Also, there is not foundation capacity check is included in this report.

As per BNBC, every building or structure designed shall have its design documents prepared in accordance with the provision of Section 1.9.1. The design document shall include a design report, and a set of structural drawings, which shall be prepared in compliance with section 1.9.1.1 and section 1.9.1.2 as per BNBC. Building engineer is required to produce a full set of analysis report as per section 1.9.1 including adequacy check of all type steel members, pedestal column, Grade beam & foundation and submit along with the software model for further review.

Lack of foundation drawings



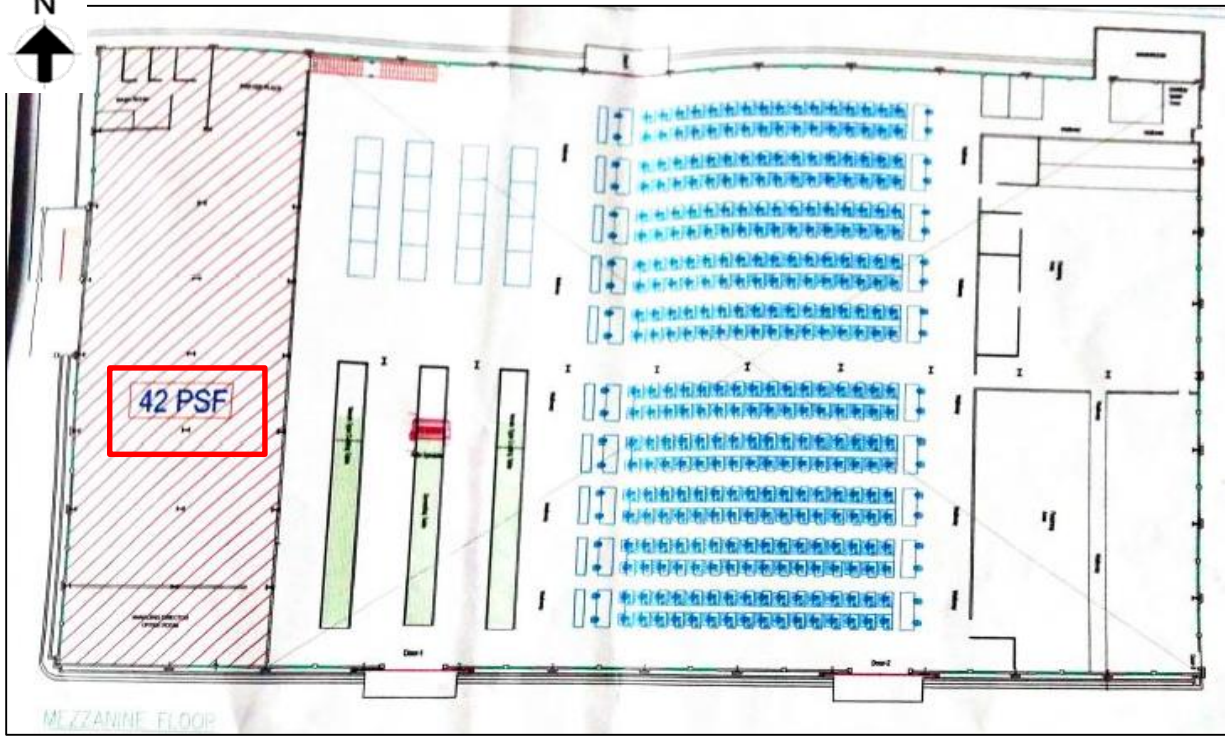
Inside view of the shed



Geotechnical investigation report

A geotechnical investigation report was available based on 4 borehole data which recommend isolated footing foundation for this structure. However, no foundation drawing was available to review the foundation capacity. Building engineer is required to produce structural drawing for the foundation and check the foundation capacity accordingly.

Prepared load plan to be revised



Live load plan-Mezzanine floor -2 kPa

Live load on Mezzanine floor is considered as 2 kPa in prepared load plan. As per BNBC- Part 6, live load for light storage and prayer areas is required to be considered minimum 6 kPa and 3 kPa respectively. However, the building engineer is required to revise the load plan as per BNBC requirement and check the design accordingly.



Prayer area on Mezzanine floor



Storage on Mezzanine floor

STRIAL, STORAGE & HAZARDOUS (Occupancy - G, H & J)	Workshop, factory, warehouse	1 Light workroom without storage	3.0	2.7
		2 Machinery hall & circulation area	4.0	4.5
		3 Factory, workshop etc.	5.0	4.5
		4 Manufacturing : light	6.0	4.5
		heavy	12.0	9.0 ⁽⁵⁾
		ice	15.0	9.0 ⁽⁵⁾
5 Printing plant :	Press room	7.0	11.0 ⁽⁵⁾	
	Composing and linotype room	5.0	9.0 ⁽⁵⁾	
	Paper storage room	12.0	9.0 ⁽⁵⁾	
	6 Motor room, fan room etc. including the weight of machinery	7.5	4.5	

Live load table (BNBC part-6)

Discrepancy in as-built drawing

COLUMN NO.	bf	tf	D	tw
C-101	200	08	250	05
C-102	175	08	225	05
C-103	175	08	250	05
C-103A	175	08	250	05
C-104	175	06	225	05
C-104A	175	06	225	05
C-105	175	06	225	05
C-105A	175	06	225	05
C-106	175	06	225	05
C-106A	175	06	225	05
C-107	175	06	225	05
C-108	175	08	250	05
C-108A	175	08	250	05
C-109	175	06	225	05
C-109A	175	06	225	05
C-110	175	06	225	05

Dimension of flange shown as 175mm for C102



Flange measured as 170mm

Dimension of flange shown as 175mm for C102 but measured as 170mm. Due to the change, the FOS of the columns significantly changed. Building engineer is required to resurvey the whole structure and update the as-built drawing as per onsite condition for all steel members.

Lack of as-built drawing of adjacent toilet blocks



Toilet block at north-east corner



Toilet block at east side

Two single storied toilet block were observed adjacent to Shed-1 but no as-built drawing was available for those block. Building engineer is required to produce as-built drawing for both toilet blocks.

Apparently inadequate connections at toilet block



Toilet block at north-east corner

Connections of steel at toilet block at north-east corner was appeared to be inadequate. Building engineer is required to check the connection adequacy for uplift forces.

Non-structural elements found unbraced/not anchored



Storage rack found within the building without braced/anchored

Factory is required to brace/anchor all non structural elements.

Absence of design documents and as-built drawing

Observations: RC Stair at Shed-1 (Factory Building)



Independent RC Stair at Shed-1 (Factory Building)

As per BNBC, every building or structure designed shall have its design documents prepared in accordance with the provision of Section 1.9.1. The design document shall include a design report, and a set of structural drawings, which shall be prepared in compliance with section 1.9.1.1 and section 1.9.1.2 as per BNBC. At the time of inspection, no as-built drawing or design report was available which are required to be prepared in compliance with section 1.9.1.1 and section 1.9.1.2 (part-6, BNBC).

Absence of design documents and as-built drawing

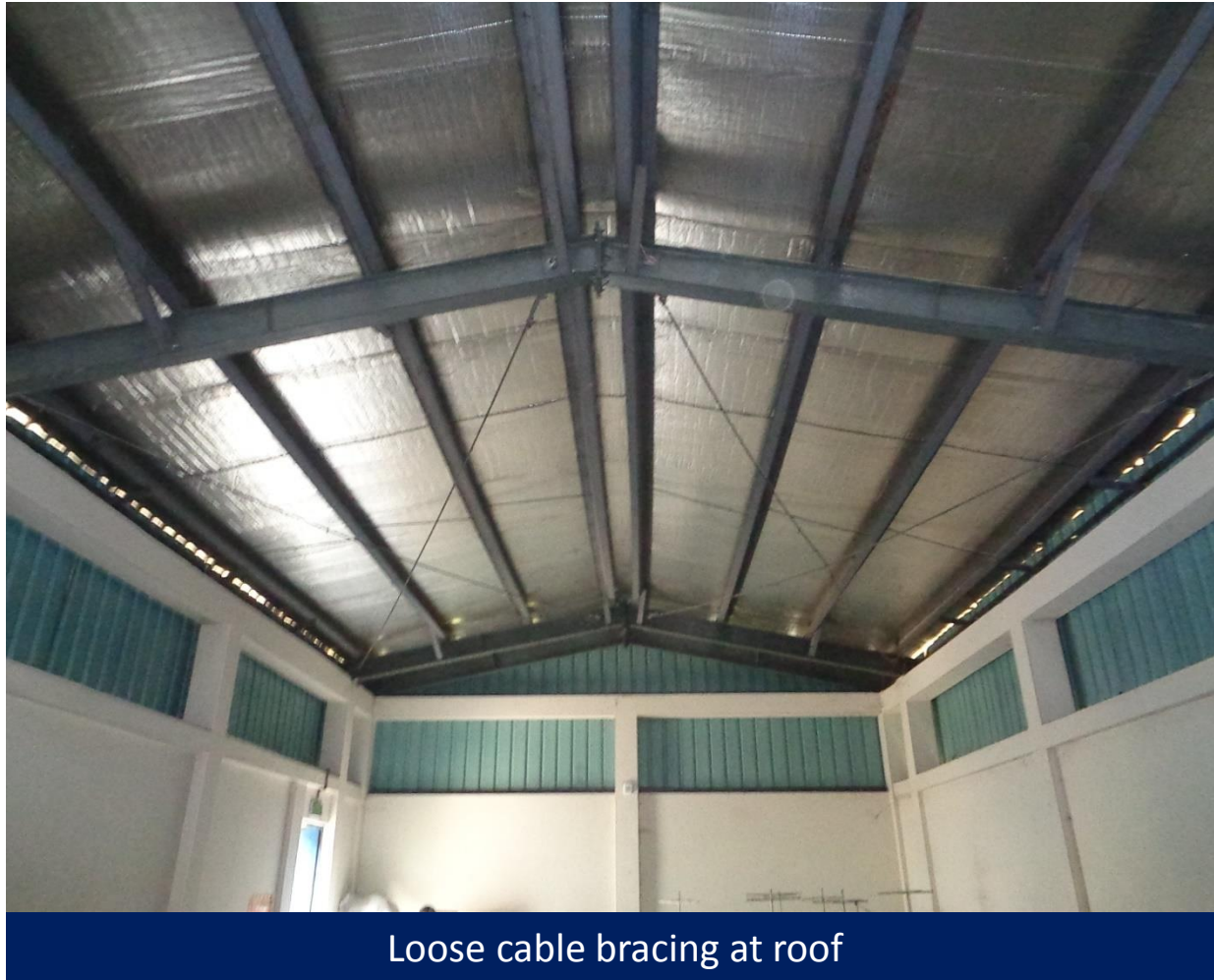
Observations: Shed-2 (Compliance Building)



Shed-2 (Compliance Building)

As per BNBC, every building or structure designed shall have its design documents prepared in accordance with the provision of Section 1.9.1. The design document shall include a design report, and a set of structural drawings, which shall be prepared in compliance with section 1.9.1.1 and section 1.9.1.2 as per BNBC. At the time of inspection, no as-built drawing or design report was available which are required to be prepared in compliance with section 1.9.1.1 and section 1.9.1.2 (part-6, BNBC).

Loose cable bracing



Loose cable bracing at roof

Some of the roof cable bracings were found loose. The factory is required to tight the bracings for transferring the lateral loads properly.

Significant connection gap



Significant gap in connection

Significant gap was observed in connection at several locations. Factory is required to repair the connection gap with a suitable method suggested by the factory engineer.

Absence of design documents and as-built drawing

Observations: Utility Building & Security Building



Utility Building

As per BNBC, every building or structure designed shall have its design documents prepared in accordance with the provision of Section 1.9.1. The design document shall include a design report, and a set of structural drawings, which shall be prepared in compliance with section 1.9.1.1 and section 1.9.1.2 as per BNBC. At the time of inspection, no as-built drawing or design report was available which are required to be prepared in compliance with section 1.9.1.1 and section 1.9.1.2 (part-6, BNBC).



Security Building

As per BNBC, every building or structure designed shall have its design documents prepared in accordance with the provision of Section 1.9.1. The design document shall include a design report, and a set of structural drawings, which shall be prepared in compliance with section 1.9.1.1 and section 1.9.1.2 as per BNBC. At the time of inspection, no as-built drawing or design report was available which are required to be prepared in compliance with section 1.9.1.1 and section 1.9.1.2 (part-6, BNBC).

Tests Carried Out



Shed-2: Brick aggregate



Shed-2: Ferro scanning



Utility Building: Brick aggregate



Security Building: Brick aggregate

Tests Carried Out:

Problems Observed

Shed-1 (Factory Building):

- Item-1: Stress in column exceeds normal design limit.
- Item-2: Apparently incomplete lateral stability system.
- Item-3: Columns appear to be slender.
- Item-4: Prepared structural analysis report to be updated and reviewed.
- Item-5: Lack of foundation drawings.
- Item-6: Prepared load plan to be revised.
- Item-7: Discrepancy in as-built drawing.
- Item-8: Lack of as-built drawing of adjacent toilet blocks.
- Item-9: Apparently inadequate connections at toilet block.
- Item-10: Non-structural elements found unbraced/not anchored.
- Item-11: Absence of design documents and as-built drawing for RC Stair.

Shed-2 (Compliance Building):

- Item-12: Absence of design documents and as-built drawing.
- Item-13: Loose cable bracing.
- Item-14: Significant connection gap.

Utility Building

- Item-15: Absence of design documents and as-built drawing.

Security Building,

- Item-16: Absence of design documents and as-built drawing.

Priority Actions

Item No.	Observation	Recommended Action Plan	Recommended Timeline
01	Stress in column exceeds normal design limit. (Shed-1: Factory Building)	Factory engineer is required to review the design, loads and column stresses for the marked columns.	6-weeks
02	Stress in column exceeds normal design limit. (Shed-1: Factory Building)	Carry out remedial works as per EA recommendations.	6-months
03	Apparently incomplete lateral stability system (Shed-1: Factory Building)	Factory engineer is required to check the lateral stability of the structure.	6-weeks
04	Apparently incomplete lateral stability system (Shed-1: Factory Building)	Carry out remedial works as per EA recommendations.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
05	Columns appear to be slender (Shed-1: Factory Building)	Factory engineer is required to carryout adequacy check of the highlighted column considering slenderness effect.	6-weeks
06	Columns appear to be slender (Shed-1: Factory Building)	Carry out remedial works as per EA recommendations.	6-months
07	Prepared structural analysis report to be updated and reviewed (Shed-1: Factory Building)	Factory engineer is required to produce a full set of analysis report including the foundation adequacy and submit along with the software model for further review.	6-weeks
08	Prepared structural analysis report to be updated and reviewed (Shed-1: Factory Building)	Carry out remedial works as per EA recommendations.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
09	Lack of foundation drawings (Shed-1: Factory Building)	Factory engineer is required to produce structural drawing for the foundation.	6-weeks
10	Lack of foundation drawings (Shed-1: Factory Building)	Check the foundation capacity accordingly.	6-weeks
11	Lack of foundation drawings (Shed-1: Factory Building)	Carry out remedial works as per EA recommendations.	6-months
12	Prepared load plan to be revised (Shed-1: Factory Building)	Building engineer is required to check the occupancy of the building and revise the load plan following occupancy type & BNBC minimum floor live load requirements.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
13	Prepared load plan to be revised (Shed-1: Factory Building)	Check the design of the building accordingly.	6-weeks
14	Prepared load plan to be revised (Shed-1: Factory Building)	Implement floor live load plan.	6-months
15	Discrepancy in as-built drawing (Shed-1: Factory Building)	Factory engineer is required to update the as-built drawing.	6-weeks
16	Lack of as-built drawing of adjacent toilet blocks (Shed-1: Factory Building)	Factory engineer is required to produce as-built drawing for both toilet blocks.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
17	Apparently inadequate connections at toilet block (Shed-1: Factory Building)	Factory engineer is required to check the connection adequacy for uplift forces.	6-weeks
18	Apparently inadequate connections at toilet block (Shed-1: Factory Building)	Implement remediation work where required.	6-months
19	Non-structural elements found unbraced/not anchored (Shed-1: Factory Building)	Factory is required to brace/anchor all non-structural elements.	6-months
20	Absence of design documents and as-built drawing (RC Stair at Shed-1)	Factory engineer is required to prepare the design report and as-built drawing in compliance with section 1.9.1.1 and section 1.9.1.2 (part-6, BNBC).	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
21	Absence of design documents and as-built drawing (RC Stair at Shed-1)	Implement remediation work if required.	6-months
22	Absence of design documents and as-built drawing (Shed-2: Compliance Building)	Factory engineer is required to prepare the design report and as-built drawing in compliance with section 1.9.1.1 and section 1.9.1.2 (part-6, BNBC).	6-weeks
23	Absence of design documents and as-built drawing (Shed-2: Compliance Building)	Implement remediation work if required.	6-months
24	Loose cable bracing (Shed-2: Compliance Building)	The factory is required to tight the bracings for transferring the lateral loads properly.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
25	Significant connection gap (Shed-2: Compliance Building)	Factory is required to repair the connection gap with a suitable method suggested by the factory engineer.	6-weeks
26	Absence of design documents and as-built drawing (Utility Building)	Factory engineer is required to prepare the design report and as-built drawing in compliance with section 1.9.1.1 and section 1.9.1.2 (part-6, BNBC).	6-weeks
27	Absence of design documents and as-built drawing (Utility Building)	Implement remediation work if required.	6-months
28	Absence of design documents and as-built drawing (Security Building)	Factory engineer is required to prepare the design report and as-built drawing in compliance with section 1.9.1.1 and section 1.9.1.2 (part-6, BNBC).	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
29	Absence of design documents and as-built drawing (Security Building)	Implement remediation work if required.	6-months

Survey Limitations and Assumptions

This report is for the private and confidential use of Accord for whom it was prepared together with their professional advisors as appropriate. It should not be reproduced in whole or in part or relied upon by third parties for any use without the express written permission of RSC.

This report can be used in discussion with the supplier or factory owner as a means to rectify or address any observations made. The report is not comprehensive and is limited to what could be observed during a visual inspection of the building.

This Report is not intended to be treated as a generalised inspection and does not cover the deterioration of structural members through dampness, fungal or insect attack, nor does it deal with problems and defects of a non-structural nature. Other non structural aspects of the building such as fire safety have not been assessed in this survey.

Except as otherwise noted, drains and other services were not viewed or tested during our inspection and are therefore similarly excluded from this Report. We have not inspected any parts of the structure which are covered, unexposed or inaccessible and we are therefore unable to report that any such part of the property is free from defect.

External inspection of the façade walls has generally been carried out from ground level only by visual sighting. No opening up works were carried out (except as noted) and we rely on the Architects and Engineers drawings provided to us for our views on concealed parts of the structure and in particular foundations. Strengths of materials and components are untested and we recommend that the factory owners Building Engineer carries out in situ testing over and above those suggested to satisfy themselves with the material strengths and component details.

Recommendations, where given, are for the purpose of providing indicative advice only, are not exhaustive, relate solely to identifying key and obvious structural defects as identified in this presentation, and do not take the form of or constitute a specification for works. We take no responsibility for the works as constructed. This report does not interfere with the factory owners Building Engineers responsibility for the structural performance of this building, The Building Engineer remains fully responsible for the structural adequacy of the building.

This report does not comment in detail on the future seismic performance of the building and only highlights the fact that the building may experience significant damage or collapse in a seismic event along with many others in the Dhaka region.

The observations in this report are based on the Engineering Judgement of the lead surveyor/engineer at the time of the survey. We assume in making these observations that no covering up of faults defects, filling or plastering over cracking or significant repair work has been carried out by the building owner. Any future alteration or additional work by the building owner will void this report.