

TED Bernhardt Textile Industry Ltd.

Gazipura, Ershadnagar, Tongi, Gazipur-1704, Bangladesh

Geographic Coordinates: 23.926346N, 90.392165E

7 September 2023



Building Information:

Building-1 (Main Building): Eight (G+7) storied building.

Building-2 (Generator, Security and Substation Shed): Single storey shed.

Building-3 (Childcare, Medical & Fire Control Building): Single storey building.

Building-4 (Boiler Shed): Single storey shed.

Building-5 (Wastage Shed): Single storey shed.

Building-6 (Fire Pump Room): Single storied underground structure.

Observations

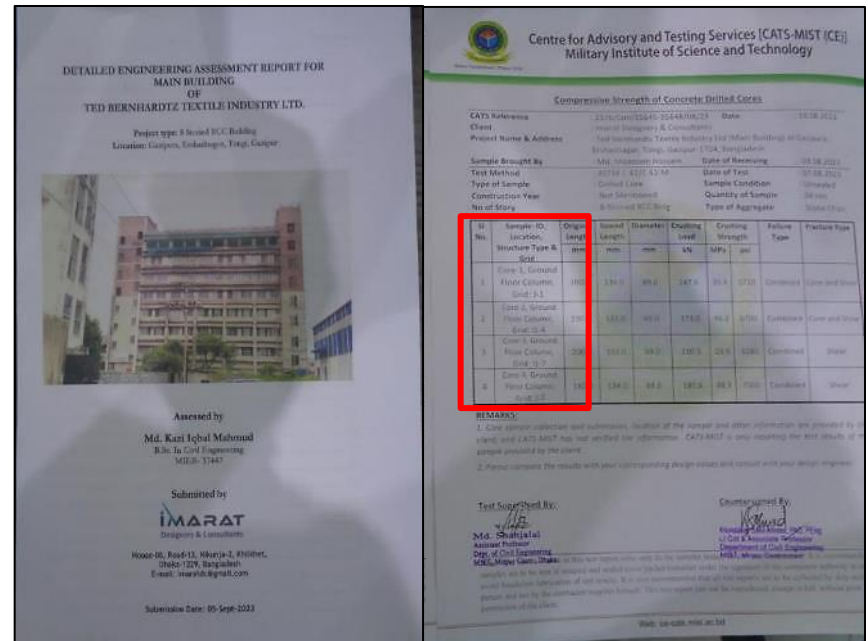
**Design report to be revised for in-situ
material strength**



The 8 storied building was constructed in two phases. 1st phase construction period was February 2014 to March 2018 and completed till 5 storied. 2nd phase construction period was March 2020 to October 2021 and completed rest of three storied.

The factory of safety of allowable pile capacity was not clearly mentioned in the DEA report which to be incorporated.

The building engineer is required to revise the DEA as per in-situ material strength.



DEA report & core test report

4 set of concrete test reports for ground column were available (1st phase). The building was constructed in two phases. As per BNBC, frequency of testing for the concrete core doesn't satisfy. So, the building engineer is required to take concrete cores from the 2nd phase construction to confirm in-situ material strength.

Observation: Building-1 (Main Building)



Cable tray and several utility service pipes are supported on steel box beam.

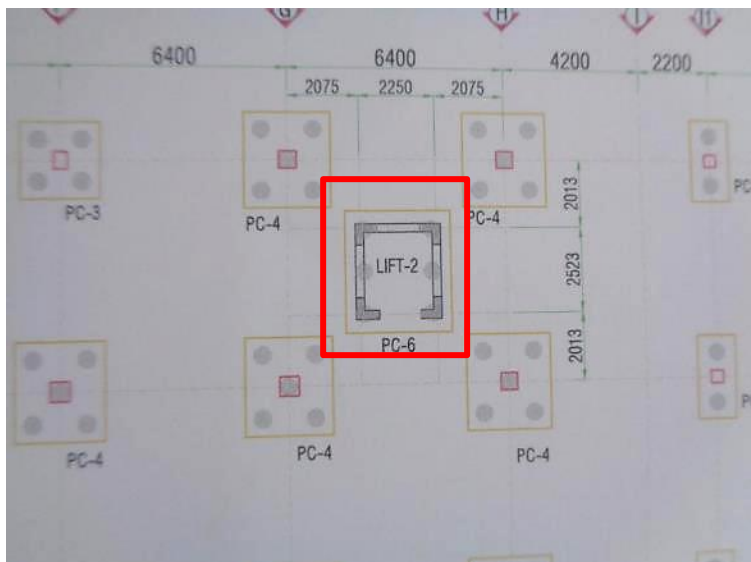


End connection of steel box

Adequacy of steel box member and its end connection did not include in the DEA report. The building engineer is required to incorporate the steel member & connection adequacy check in the DEA report.

Observation: Building-1 (Main Building)

Discrepancies in as-built drawings

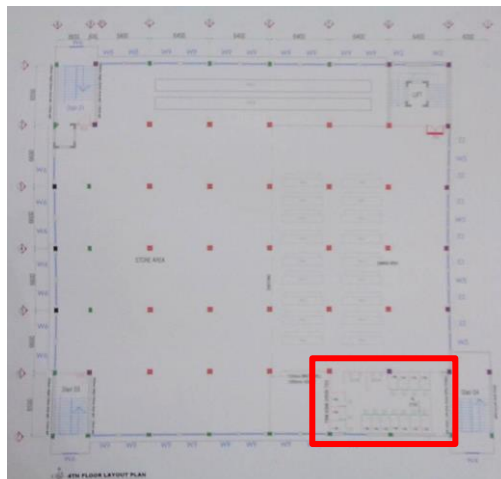


Drawing: L-shape column in lift core



Onsite: Shear wall in lift core

As-built drawings doesn't match with as-built condition. The building engineer is required to survey the structures and prepare accurate as-built drawings.



Drawing: 6 toilets



Onsite: 7 toilets



Exposed rebar at roof



Exposed rebar on roof

Exposed rebar observed on roof which is prone to corrosion. The factory is required to provide anti-corrosive coating on the exposed rebar.

Observation: Building-1 (Main Building)

Water ponding on roof



Water ponding on the roof

The factory is required to improve roof drainage system with adequate slope and provide sufficient water outlets to drain out water.

Observation: Building-1 (Main Building)

Lack of anchorage of non-structural elements



Water tank on the roof has no lateral brace

The factory is required to provide lateral bracing for water tanks to resist seismic forces.

Lack of design documents for lateral stability

Observation: Building-2 (Generator, Security and Substation)



Absence of load transfer media along transverse direction of rafter and absence of horizontal bracing at roof

Lack of lateral stability system (bracing & compression strut) was observed in the structure. Also, the column and rafter size seems to be inadequate. The building engineer is required carryout Engineering Assessment (EA) to check the lateral stability of the structure and suggest proper remedial actions accordingly. Submit the EA documents to the RSC for review.

Observation: Building-2 (Generator, Security and Substation)

Lack of design report

Observation: Building-3 (Childcare, Medical & Fire Control Building)



Building-3

As per BNBC, every building or structure designed shall have its design documents prepared in accordance with the provision of Section 1.9.1, part-6 of BNBC. 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.

During inspection design report was not found which is required to be prepared in compliance with section 1.9.1.1 (part-6, BNBC).

Observation: Building-3 (Childcare, Medical & Fire Control Building)

Crack in brick wall and ground floor

Observation: Building-3 (Childcare, Medical & Fire Control Building)



Crack in brick walls & floors

The building engineer is required to investigate the reason of crack and prepare an investigation report with proper remedial methodology.



Observation: Building-3 (Childcare, Medical & Fire Control Building)

Exposed rebar on roof

Observation: Building-3 (Childcare, Medical & Fire Control Building)

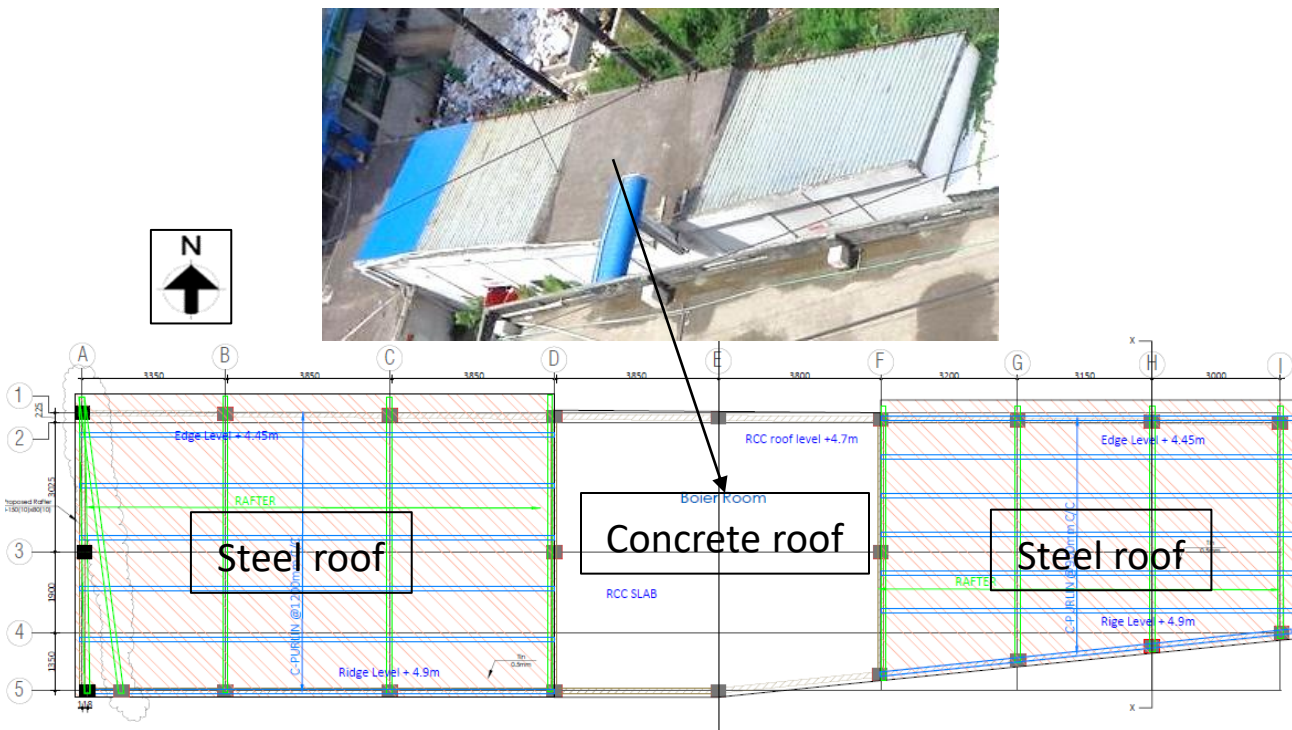


Exposed rebar on roof

Exposed rebar observed on roof which is prone to corrosion. The factory is required to provide anti-corrosive coating on the exposed rebar or remove the rebars & seal the exposed areas.

Observation: Building-3 (Childcare, Medical & Fire Control Building)

Lateral stability system to be verified



Roof layout: Combination of concrete & steel frames

The rafter size and connection seems to be inadequate. And there is combination of concrete & steel frames. So, the building engineer is required carryout Engineering Assessment (EA) to verify the lateral stability of the structure and suggest proper remedial actions accordingly. Submit the EA documents to the RSC for review.

Observation: Building-4 (Boiler Shed)



Apparently inadequate member & connection



Single panel RC frame

Apparently inadequate connection and lateral stability system



Peripheral brick walls



Apparently inadequate rafter



Non-engineered connection

The building engineer is required carryout Engineering Assessment (EA) to check the lateral stability & connection of the structure and suggest proper remedial actions accordingly. Submit the EA documents to the RSC for review.

**Lack of design documents for ground floor
loading-unloading zone & steel roofing**



Lightweight steel shed above staircase



Roof of fire pump room used for loading unloading zone

Building engineer is required to check the adequacy of steel roofing for lateral forces and top slab of fire pump for heavy vehicle loads.

Falling hazard risk in raised platform and stair



Falling hazards

The factory is required to provide adequate barrier to avoid possible falling hazards.

Test Carried out

Exposed rebar identified at roof and aggregate type was mentioned in the available concrete core test report and verified on floor slab punch.



Exposed rebar on roof

Compressive Strength of Concrete Drilled Cores						
2376/Com/25645-15648/08/23		Date		10.08.2023		
Insistat Designers & Consultants						
Textile Research & Textile Industry Ltd (Main Building) at Gazipura, Dhaka, Bangladesh. Tongi, Gazipur-1704, Bangladesh						
Mr. Masrur Hossain		Date of Receiving		03.08.2023		
ASTM C 42/C 42-M		Date of Test		07.08.2023		
Drilled Core		Sample Condition		Unsealed		
Not Mentioned		Quantity of Sample		04 nos		
6-Sided RCC Bldg		Type of Aggregate		Stone Chips		
Core No.	Diameter (mm)	Crushing Load (kN)	Crushing Strength (MPa)	Crushing Strength (psi)	Failure Type	Fracture Type
01	68.0	147.6	39.4	5710	Combined	Cone and Shear
02	69.0	173.0	46.2	6700	Combined	Cone and Shear
03	68.0	110.5	29.5	4280	Combined	Shear
04	68.0	180.6	48.3	7000	Combined	Shear

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04	68.0	180.6	48.3	7000	Combined	Cone and Shear



Stone chips aggregate in Main Building as per test report and floor slab punch.

Problems Observed

Building-1 (Main Building):

- Item 01: Design report to be revised for in-situ material strength.
- Item 02: Discrepancies in as-built drawings.
- Item 03: Exposed rebar at roof.
- Item 04: Water ponding on roof.
- Item 05: Lack of anchorage of non-structural elements.

Building-2 (Generator, Security and Substation Shed):

- Item 06: Lack of design documents for lateral stability.

Building-3 (Childcare, Medical & Fire Control Building):

- Item 07: Lack of design report.
- Item 08: Crack in brick wall and ground floor.
- Item 09: Exposed rebar on roof.

Problems Observed (Continued)

Building-4 (Boiler Shed):

Item 10: Lateral stability system to be verified.

Building-5 (Wastage Shed):

Item 11: Apparently inadequate connection and lateral stability system.

Building-6 (Fire Pump Room):

Item 12: Lack of design documents for ground floor loading-unloading zone & steel roofing.

Item 13: Falling hazard risk in raised platform and stair.

Priority Actions

Item No.	Observation	Recommended Action Plan	Recommended Timeline
01	Design report to be revised for in-situ material strength. Building-1 (Main Building)	The building engineer is required to revise the design report based on in-situ material strength.	6-weeks
02	Design report to be revised for in-situ material strength. Building-1 (Main Building)	Take concrete cores from the 2nd phase construction to confirm in-situ concrete strength.	6-weeks
03	Design report to be revised for in-situ material strength. Building-1 (Main Building)	Incorporate the steel member & connection adequacy check in the design report.	6-weeks
04	Design report to be revised for in-situ material strength. Building-1 (Main Building)	Determine the ultimate pile capacity from sub-soil properties and revise the foundation adequacy check accordingly.	6-weeks
05	Design report to be revised for in-situ material strength. Building-1 (Main Building)	Carry out suggested remedial work.	6-months
06	Design report to be revised for in-situ material strength. Building-1 (Main Building)	Continue to implement floor live load plan.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
07	Discrepancies in as-built drawings. Building-1 (Main Building)	The building engineer is required to survey the structure and produce accurate as-built drawings.	6-weeks
08	Exposed rebar at roof. Building-1 (Main Building)	The factory is required to provide anti-corrosive coating on the exposed rebar.	6-months
09	Water ponding on roof. Building-1 (Main Building)	The factory is required to improve roof drainage system with adequate slope and provide sufficient water outlets to drain out water.	6-months
10	Lack of anchorage of non-structural elements. Building-1 (Main Building)	The factory is required to provide lateral bracing for water tanks to resist seismic forces.	6-months
11	Lack of design documents for lateral stability. Building-2 (Generator, Security and Substation Shed)	The building engineer is required carryout Engineering Assessment (EA) to check the lateral stability of the structure and suggest proper remedial actions accordingly.	6-weeks
12	Lack of design documents for lateral stability. Building-2 (Generator, Security and Substation Shed)	Carry out suggested remedial works.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
13	Lack of design report. Building-3 (Childcare, Medical & Fire Control Building)	The building engineer is required to prepare design documents in compliance with section 1.9.1.1 (part-6, BNBC).	6-weeks
14	Lack of design report. Building-3 (Childcare, Medical & Fire Control Building)	Carry out suggested remedial works if required.	6-months
15	Crack in brick wall and ground floor. Building-3 (Childcare, Medical & Fire Control Building)	The building engineer is required to investigate the reason of crack and prepare an investigation report with proper remedial methodology.	6-weeks
16	Crack in brick wall and ground floor. Building-3 (Childcare, Medical & Fire Control Building)	Carry out suggested remedial works.	6-months
17	Exposed rebar on roof. Building-3 (Childcare, Medical & Fire Control Building)	The factory is required to provide anti-corrosive coating on the exposed rebar or remove the exposed rebars.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
18	Lateral stability system to be verified. Building-4 (Boiler Shed)	The building engineer is required carryout Engineering Assessment (EA) to verify the lateral stability of the structure and suggest proper remedial actions accordingly.	6-weeks
19	Lateral stability system to be verified. Building-4 (Boiler Shed)	Carry out suggested remedial works.	6-months
20	Apparently inadequate connection and lateral stability system. Building-5 (Wastage Shed)	The building engineer is required carryout Engineering Assessment (EA) to check the lateral stability & connection of the structure and suggest proper remedial actions accordingly.	6-weeks
21	Apparently inadequate connection and lateral stability system. Building-5 (Wastage Shed)	Carry out suggested remedial works.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
22	Lack of design documents for ground floor loading-unloading zone & steel roofing. Building-6 (Fire Pump Room)	Building engineer is required to check the adequacy of steel roofing for lateral forces and top slab of fire pump for heavy vehicle loads.	6-weeks
23	Lack of design documents for ground floor loading-unloading zone & steel roofing. Building-6 (Fire Pump Room)	Carry out suggested remedial works if required.	6-months
24	Falling hazard in raised platform and stair. Building-6 (Fire Pump Room)	The factory is required to provide adequate barrier to avoid possible falling hazards.	6-weeks