Sisal Composite Limited (Relocated)

Purbohati, Natunpara, Hemayetpur, Savar, Dhaka, Bangladesh.

(23.78580N, 90.26657E)

8 November 2023

RSC RMG SUSTAINABILITY COUNCIL

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1. Building Information

Main Building: Six (G+5) storied reinforced concrete (RC) building.

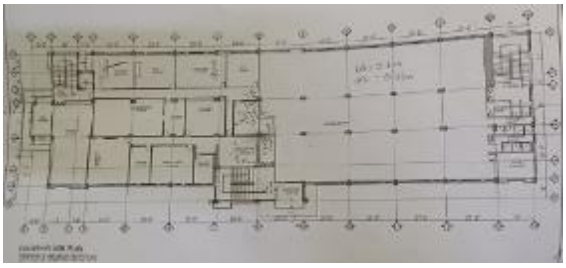
Utility Building: Two (B+G+1) storied RC building with a basement.

Doctor & Daycare Shed: Single storied shed.

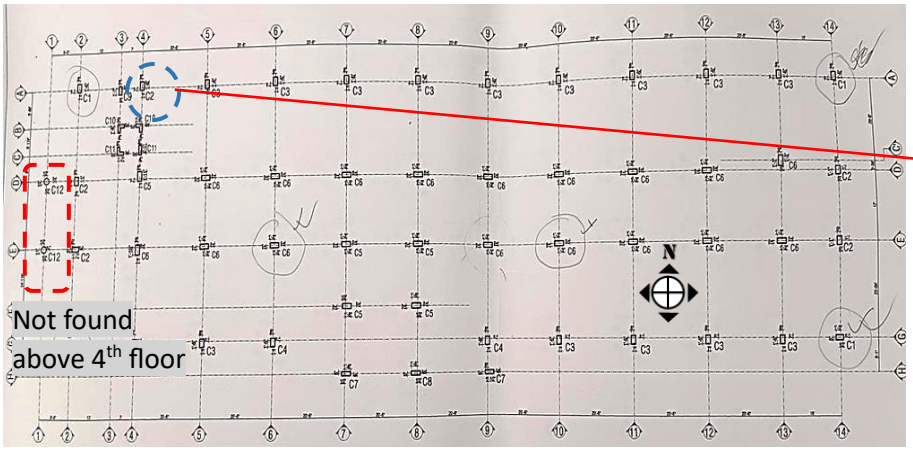
Security Shed: Single storied steel shed.

2. Observations:

Observation-1: Mismatch in as-built drawing. (Main Building)



Floor buildup, false ceiling and partition wall height missing in architectural drawing



Column orientation mismatch

Description: Toilet floor buildup, false ceiling and partition wall height not mentioned in the architectural drawing. Column orientation mismatch found at GL-4A. Also, marked C12 column not found above 4th floor. Building engineer is required to update the as built drawings.

Observation-2: Frequency of testing for beam & slab doesn't comply with BNBC requirement. (Main Building)

Core test result of concrete column

4.3 Material specification:

4.3.1 Structural Steel:

This Building do not have steel structure.

4.3.1 Concrete:

Concrete compressive strength, f'c = 4788psi (For column, Pile Cap) [From core test report]

Concrete compressive strength, f'c = 3500psi (For beam, slab) [though same material been used for construction, after that less strength been considered]

Coarse aggregate: Stone chips

4.3.3 Steel Reinforcement:

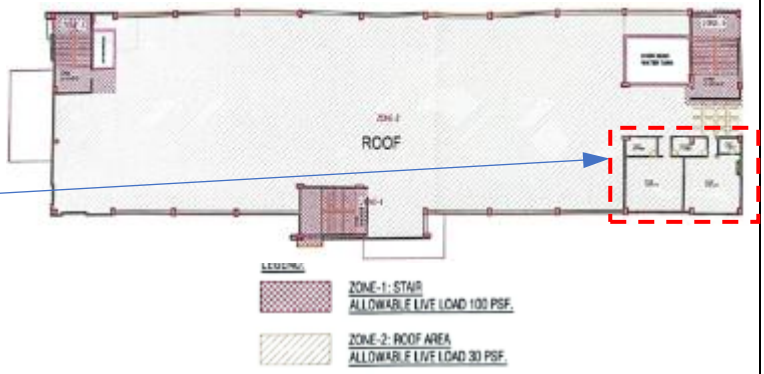
Yield strength of steel, fy = 60,000 psi

Material strength consideration from design report

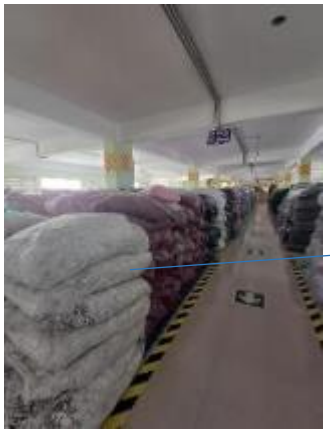
Description: As per the design report, concrete strength of beam and slab was considered 3500 psi (24.13 MPa). Only 6 sets of cylinder test reports were available on-site for floor beam & slab which doesn't meet the BNBC requirement. To confirm the design strength, the building engineer is required to verify the strength of concrete by taking adequate core samples from beam and slab.

Observation-3: Load plan doesn't comply with BNBC requirement. (Main Building)

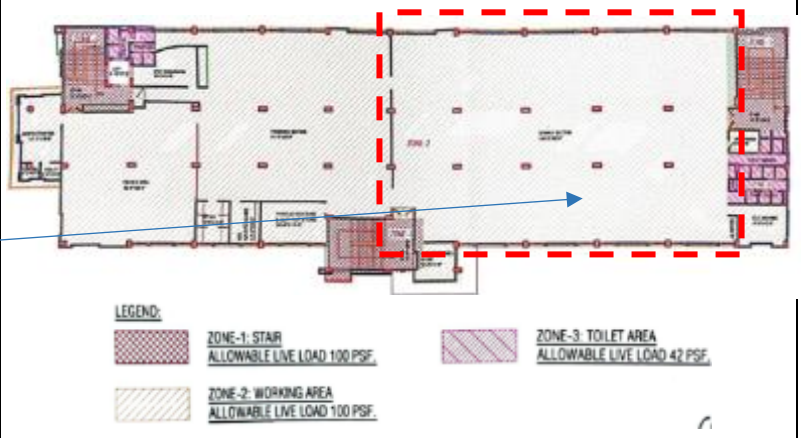
Fabric store



Load plan of storeroom at roof (1.5kPa)



Finished Fabric store



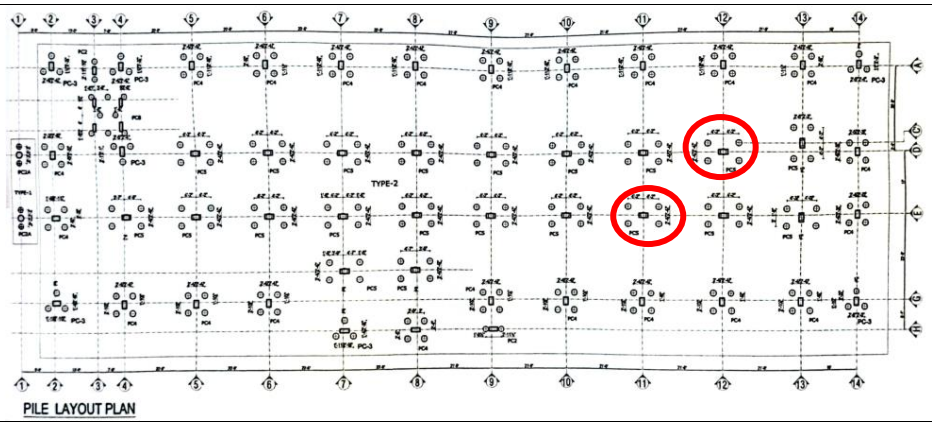
Load plan of finished fabric store at 3rd floor (4.8 kPa)

Description: According to BNBC 2006, a minimum of 6 kPa live load required to be considered for light storage. In the load plan and design report, 1.5 kPa & 4.8 kPa live load is considered for storage at roof and 3rd floor respectively. The building engineer is required to revise the load plan for storage area based on the BNBC live load requirement, update the design report accordingly.

Observation-4: Lack of anchorage of nonstructural elements. (Main Building)

Description: Storage rack found within the building without braced/anchored All non-structural elements including storage racks in the building shall be adequately anchored or braced to resist earthquake forces.

Observation-5: High stress in foundation. (Main Building)

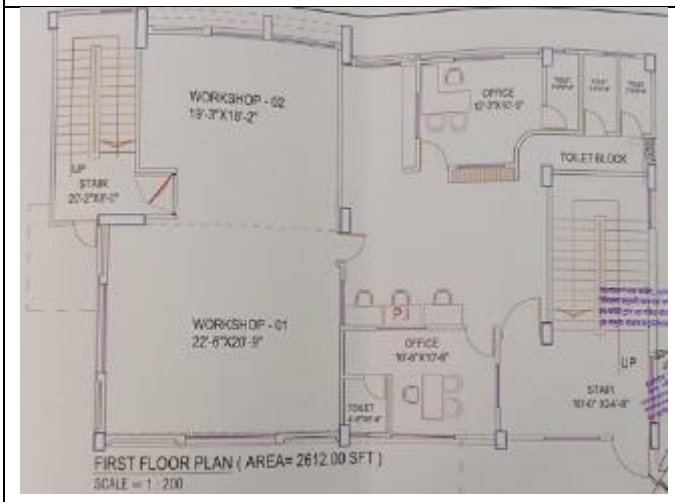


Pile layout plan

Source of loading

Description: Cursory calculation indicates that the marked pile foundations are marginally overstressed based on 5kPa typical floor live load, 6kPa storage live load and observed water load considering allowable pile capacity 58 ton (FoS-2.5) based on soil test report (Table-1). Building engineer is required to carry out Detailed Engineering Assessment (DEA) based on in-situ material strength, minimum floor live loads as per BNBC and submit to RSC for review.

Observation-6: Mismatches in as-built drawings. (Utility Building)

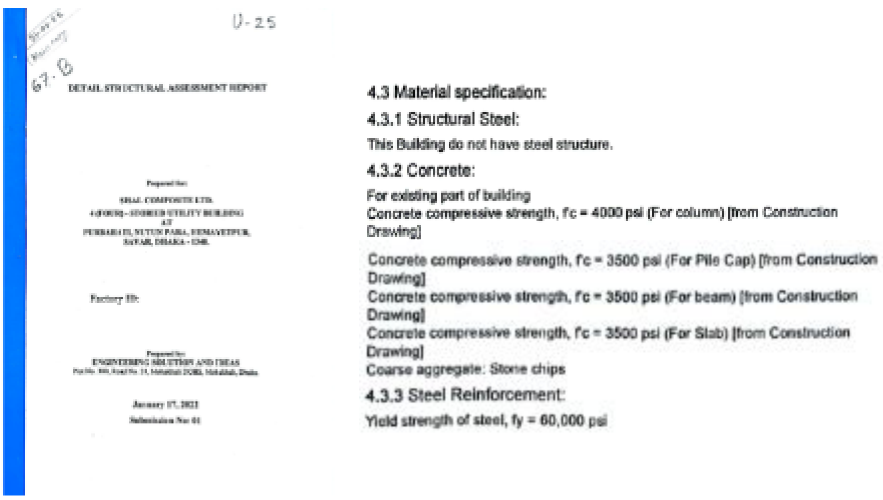


Description: Floor Buildup, false ceiling and partition wall height missing in as-built drawing. Building engineer is required to prepare accurate as-built drawing.

Observation-7: Frequency of testing doesn’t comply with BNBC requirement. (Utility Building)


Department of Civil Engineering
Concrete Laboratory
TEST REPORT

Cylinder test report


DETAIL STRUCTURAL ASSESSMENT REPORT

4.3 Material specification:

4.3.1 Structural Steel:

This Building do not have steel structure.

4.3.2 Concrete:

For existing part of building
Concrete compressive strength, f'c = 4000 psi (For column) [from Construction Drawing]
Concrete compressive strength, f'c = 3500 psi (For Pile Cap) [from Construction Drawing]
Concrete compressive strength, f'c = 3500 psi (For beam) [from Construction Drawing]
Concrete compressive strength, f'c = 3500 psi (For Slab) [from Construction Drawing]
Coarse aggregate: Stone chips

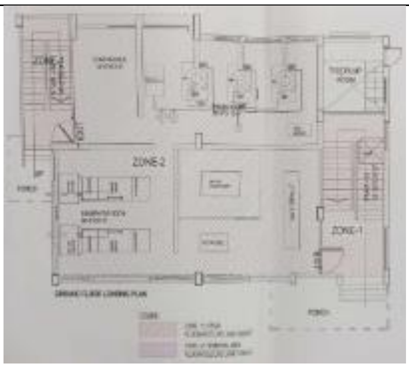
4.3.3 Steel Reinforcement:

Yield strength of steel, fy = 60,000 psi

Material strength consideration in design report

Description: As per the design report, concrete strength of column and beam was considered 4000 psi and 3500 psi respectively. To confirm the design strength, the number of cylinders taken are not adequate as per the frequency test criteria of BNBC (Section 5.12). The building engineer is required to verify the mentioned design strength of concrete by taking adequate core samples.

Observation-8: Incomplete live load plan. (Utility Building)



Load plan of ground floor suspended slab (machine weight missing)

Boiler and generator on suspended floor slab

Description: Machine weight of boiler, generator, compressor, and transformer not mentioned in the load plan. The building engineer is required to update the load plan of the ground floor mentioning machine weights. The factory is required to post the accepted load plan, mark the area, and maintain the floor loading.

Observation-9: Possible falling hazard. (Utility Building)

Possible falling hazard

Description: The building engineer is required to provide barrier for open area to prevent falling hazard at roof.

Observation-10: Apparently non-engineered steel stair at fire pump room. (Utility Building)

Apparently non-engineered steel stair

Description: Apparently inadequate steel member & lack of anchorage were observed for the steel stair at fire pump room. Building engineer is required to check the adequacy of members and connections of the stair.

Observation-11: Lack of anchorage of nonstructural elements. (Utility Building)

Lack of anchorage of plastic water tank at roof

Description: The plastic water tank was not laterally braced. All non-structural elements including plastic water tanks in the building shall be adequately anchored or braced to resist earthquake forces.

Observation-12: Non-engineered shed. (Doctor & Daycare Shed)

Bamboo rafter with tin roof supported by brick wall

Description: Non-engineered roof observed for the shed. The building engineer is required to replace the non-engineered shed with an engineered shed.

Observation-13: Lack of anchorage for uplift forces. (Security Shed)

Lightweight steel roof supported by periphery brick wall

Description: Anchorage was not found between roof & brick walls. The building engineer is required to provide necessary anchorage for the roof to resist uplift forces.

3. Action Plan:

SL	Observation	Action Plan	Timeline
1	Mismatch in as-built drawing. (Main Building)	Building engineer is required to update the as built drawings.	within 6 weeks
2	Frequency of testing for beam & slab doesn't comply with BNBC requirement. (Main Building)	The building engineer is required to verify the strength of concrete by taking adequate core samples from beam and slab. After verification of material strength, the building engineer is required to revise the design documents.	within 6 weeks
3	Frequency of testing for beam & slab doesn't comply with BNBC requirement. (Main Building)	Carry out remedial works if required.	within 6 months
4	Load plan doesn't comply with BNBC requirement. (Main Building)	The building engineer is required to revise the load plan for storage area based on the BNBC live load requirement, update the design report accordingly.	within 6 weeks
5	Load plan doesn't comply with BNBC requirement. (Main Building)	Factory is required to carry out remedial works if required and implement the final floor loading.	within 6 months
6	Lack of anchorage of nonstructural elements. (Main Building)	All non-structural elements including storage racks in the building shall be adequately anchored or braced to resist earthquake forces.	within 6 months
7	High stress in foundation. (Main Building)	Building engineer is required to carry out Detailed Engineering Assessment (DEA) based on in-situ material strength, minimum floor live loads as per BNBC and submit to RSC for review.	within 6 weeks
8	High stress in foundation. (Main Building)	Carry out remedial works if required.	within 6 months
9	Mismatches in as-built drawings. (Utility Building)	Building engineer is required to prepare accurate as-built drawing.	within 6 weeks
10	Frequency of testing doesn't comply with BNBC requirement. (Utility Building)	The building engineer is required to verify the mentioned design strength of concrete by taking adequate core samples. After verification of material strength, the building engineer is required to revise the design documents.	within 6 weeks

11	Frequency of testing doesn't comply with BNBC requirement. (Utility Building)	Carry out remedial works if required.	within 6 months
12	Incomplete live load plan. (Utility Building)	The building engineer is required to update the load plan mentioning machine weights of boiler, compressor, generator and transformer.	within 6 weeks
13	Incomplete live load plan. (Utility Building)	Factory is required to implement the floor loading.	within 6 months
14	Possible falling hazard. (Utility Building)	The building engineer is required to provide barrier for open area to prevent falling hazard at roof.	within 6 weeks
15	Apparently non-engineered steel stair at fire pump room. (Utility Building)	Building engineer is required to check the adequacy of members and connections of the stair.	within 6 weeks
16	Apparently non-engineered steel stair at fire pump room. (Utility Building)	Carry out remedial works if required.	within 6 months
17	Lack of anchorage of nonstructural elements. (Utility Building)	All non-structural elements including plastic water tanks in the building shall be adequately anchored or braced to resist earthquake forces.	within 6 months
18	Non-engineered shed. (Doctor & Daycare Shed)	The building engineer is required to replace the non-engineered shed with an engineered shed.	within 6 months
19	Lack of anchorage for uplift forces. (Security Shed)	The building engineer is required to provide necessary anchorage for the roof to resist uplift forces.	within 6 weeks
20	Lack of anchorage for uplift forces. (Security Shed)	Carry out remedial works if required.	within 6 months