Nkk Knitwear Ltd. (Extension)

KUTUBAIL, FATULLAH, NARAYANGANJ, DHAKA, Bangladesh
(23.642571, 90.487552)
5 November 2024

RSC RMG SUSTAINABILITY COUNCIL

Level 5, Shanta Forum, 187, 188/B,
Bir Uttam Mir Shawkat Sarak, Tejgaon,
Dhaka- 1208, Bangladesh
PABX : +880 2 41081863-6
www.rsc-bd.org

1. Building information

Building-3 (New Production Building) is an eight-storied (B+G+7) RC building with an underground fire pump room and water reservoir.

2. Observations:

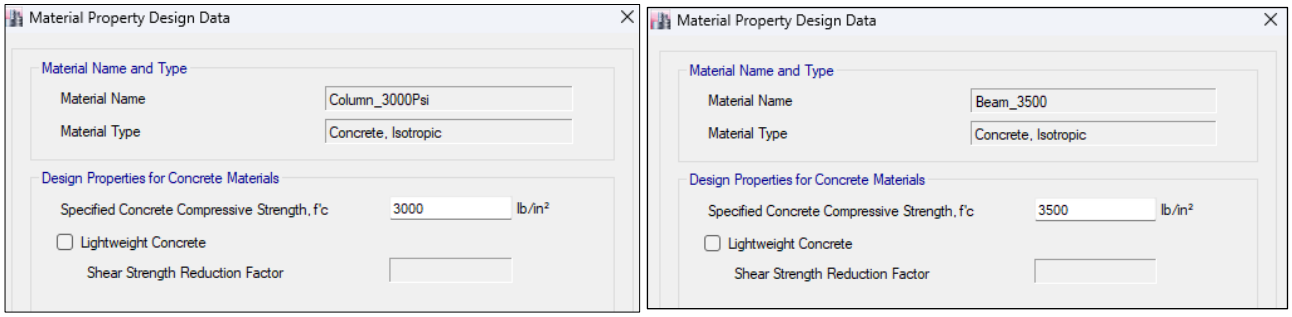
Observation 1: Inconsistencies in design documents. (Building-3)

5.1 Construction Material Properties

The Client provided the evidence of construction material properties during the verification of existing building with respect to the given construction drawings (architectural and structural drawings). Total twenty-four sets of cylinder test reports were found conducted by BRTC, BUET within the construction period. The summary of construction material properties for the building is mentioned in *Table 5.1* from the given structural drawing and material test reports.

Construction material and strength	Concrete compressive strength, $f_c' = 3000\ psi$ for column (Stone aggregates), and $f_c' = 3500\ psi$ for slab (stone aggregates), beam, GB, OHWR and stair as per the construction drawing; yield strength of steel deformed bar, $f_y = 72500\ psi$ as per the provided material test reports by the Client.

Material strength consideration in the design report



Material strength consideration in FEA model for column, beam and slab

In the design report, it is mentioned that twenty-four sets of cylinder test reports were available, but during the inspection, a total 8 sets of cylinder test reports: two sets from columns, five sets from slab and one set from pile cap were available which does not satisfy the frequency of cylinder tests as per BNBC.

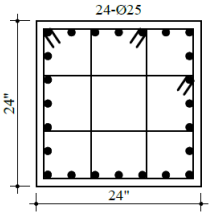
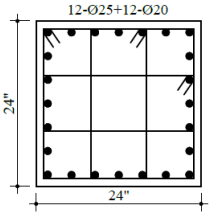
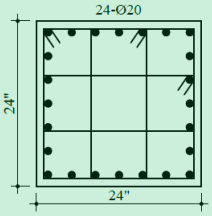
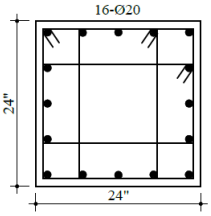
The deviation from the requirement is that the building engineer is required to take concrete core samples from RC members to verify the in situ concrete strength.

Also, the tensile strength has been considered 500 MPa, but no test report is available.

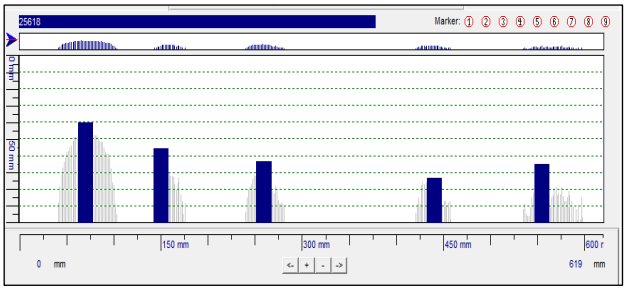
The building engineer is required to revise the design documents based on the in-situ material strength and capacity of structural members.

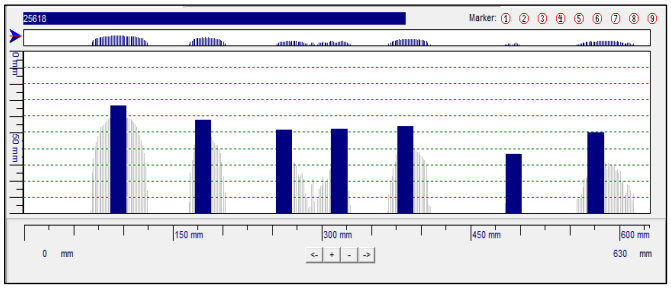
Observation 2: Mismatch in the provided drawing. (Building-3)

COLUMN REINFORCEMENT SCHEDULE:

COLUMN ID	CONCRETE CYLINDER STRENGTH, f 'c = 4000 PSI , MIXING RATIO = 1:1¼:2½			
	UPTO 2ND SLAB	2ND TO 4TH SLAB	4TH TO 6TH SLAB	ABOVE 6TH SLAB
C1 26"×26" BELOW G.L				

Column schedule in as-built drawing





A total of 20 nos of rebars were found from the ferro-scan

Description: During inspection, the number of rebars was found mismatched for the C1 column at grid B/2 on the 4th floor. In the as-built drawing, the total number of rebar has been provided 24 nos (7X7). But, from the ferro-scanning, total 20 nos (5X7) of the re-bar was found.
Building engineer is required to survey the whole structure and prepare accurate as-built drawings.

Observation-3: Lack of load plan and load management program. (Building-3)

Load plan of suspended ground floor slab

Description: During the inspection, jhut storage was found on the ground floor suspended slab over the underground water reservoir. Also, the storage is uncontrolled. Load limit marking has not been provided in the storage area.
The building engineer is required to produce load plan for the ground floor suspended slab and provide load limit marking at the storage area.

Observation-4: Lack of Building permit from the local authority (Building-3)

Description: The factory building did not have a permit from any local authority. Factory is required to avail the permit drawing for the building from the local authority.

Observation-5: Exposed re-bar at the roof. (Building-3)

Description: Exposed re-bar was found at stair top. The building engineer is required to provide anti-corrosive coating in rebar to prevent corrosion.

3. Action Plan:

Serial No	Observation	Action Plan	Timeline
1	Inconsistencies in design documents. (Building-3)	Building engineer is required to revise the design document and submit it to RSC for further review.	within 6 weeks
2	Inconsistencies in design documents. (Building-3)	Provide the adequate number of existing cylinder strength data test reports otherwise verify in-situ concrete strength from column, beam and slab by taking at least 4 cores from each	within 6 weeks
3	Inconsistencies in design documents. (Building-3)	Carry out remedial work if required.	within 6 months
4	Mismatch in the provided drawing. (Building-3)	The building engineer is required to survey the whole structure and prepare accurate as-built drawings.	within 6 weeks
5	Lack of load plan and load management program. (Building-3)	The building engineer is required to produce and actively manage the floor loading plan. Also, provide load limit marking at the storage area.	within 6 weeks
6	Lack of load plan and load management program. (Building-3)	Implement the floor load management plan.	within 6 months
7	Lack of Building permit from the local authority (Building-3)	Factory is required to avail of the permit drawing for the building from the local authority.	within 6 months
8	Exposed re-bar at the roof. (Building-3)	The building engineer is required to provide anti-corrosive coating in the rebar to prevent corrosion.	within 6 months