

Nafa Apparels Ltd. (Extension)

Hizalhati, Baroipara, Kaliakoir, Gazipur.

(24.027024, 90.239682)

20 August 2023



Building Information

1. **New 06 Storied RCC Building:** This structure is a six storied reinforced concrete (RC) building with a steel roof shed.
2. **Ancillary Buildings:** Boiler Room, Fire Pump-Sub-station Room and Diesel Room, these all-ancillary structures are single storied reinforced concrete (RC) building.

Observations

**Load plan & material strength test not
comply with BNBC requirements**

Table 5.4: Information of Construction Material Properties for Analysis

Building	Material Description	Unit Weight (pcf)	Compressive or Yield Strength (psi)		Modulus of Elasticity (psi)
6-storied RMG Factory Building	Concrete having Stone aggregates with steel bar	150	For column	4000	3,604,996.5
			For beam	4000	3,604,996.5
			For floor slab	4000	3,604,996.5
	Steel deformed bar	490	For column	72500	29,000,000
			For beam	72500	29,000,000
			For floor slab	72500	29,000,000
	Steel plate	490	For steel section	36000	29,000,000
	Brick masonry wall	120	For partition	N/A	N/A
Note 1: Compressive strength is for concrete and yield strength is for steel deformed bar					
Note 2: The floor finish is considered as 25 psf.					

5.5.2 Live Load

Live load is the load superimposed by the use or occupancy of the building not including the environmental loads such as wind load, rain load, earthquake load or dead load. The live loads used for the structural design of floors, roof and the supporting members shall be the greatest applied loads arising from the intended use or occupancy of the building. Or from the stacking of materials and the use of equipment and propping during construction but shall not be less than the minimum design live loads set out by the provisions of this section. The assigned live loads are considered for the building as per the occupancies mentioned in BNBC 2006.

Table 5.5: Typically Assigned Live Loads on Floors

Building Name	Occupancy	Assigned Live Load (kNm ⁻²)
6-storied RMG Factory Building	• Stair	5
	• Working area	5
	• Worker Dining area	3
	• Open to Sky	1.5

Provided design report

Currently, the first floor of the building is being allotted for finished cartoon store. As per BNBC, the minimum floor live load for light storage is 6 kN/m² (125 psf). But the storage (first floor) area of the building is designed for 5 kN/m² live loads. Moreover, the factory has provided some concrete cylinder test report from column, but which are not comply with the frequency of BNBC requirement.

The building engineer is required to revise the storage live load limit and related design documents based on BNBC requirement.



Storage on first floor

4.5		1 Light workroom without storage	3.0	2.7
		2 Machinery hall & circulation area	4.0	4.5
1.8		3 Factory, workshop etc.	5.0	4.5
		4 Manufacturing : light	6.0	4.5 ⁽⁵⁾
		heavy	12.0	9.0 ⁽⁵⁾
		ice	15.0	9.0 ⁽⁵⁾
2.7		5 Printing plant :		
4.5		Press room	7.0	11.0
		Composing and linotype room	5.0	9.0 ⁽⁵⁾
		Paper storage room	12.0	9.0 ⁽⁵⁾
2.7		6 Motor room, fan room etc. including the weight of machinery	7.5	4.5
4.5		7 Cold storage, grain storage	15.0	9.0 ⁽⁵⁾
4.5		8 Storage warehouses : light	6.0	4.5 ⁽⁵⁾
		heavy	12.0	9.0
4.5		9 Foundries	20.0	12.0
7.0				

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CONCRETE LABORATORY

BRTC No. : 110199804/19-20/CE; Dt: 11/11/2019
Sent by : Palmit group
Ref. No. : Letter, Dt: 11/11/2019
Project : NAFA Apparels Ltd-01 (New 8 storied Building) at Hishadi Bara para Kalakolr Gazipur.
Sample : Cylinder [Mix proportion (as quoted) : -, Aggregate Type: Stone chips]
Location : 3rd Floor Column
Test : Compressive Strength (ASTM C39)
Date of Test : 13/11/2019

TEST REPORT

SL No.	Date of Casting as per the Letter	Specimen Designation/ Frog Mark	Specimen Area (sq. in)	Maximum Load (lb)	Crushing Strength (psi)	Average Crushing Strength	Mode of Failure
1	10/11/2019		12.42	75,061	6,430	4380 psi	Combined *
2	10/11/2019		12.57	81,565	6,480	445.6 MPa	Combined *
3			12.67	84,699	7,007	(475 kg/cm ²)	Combined *

Note: Samples were received in unsoaked condition.

* Combined = Mortar and Aggregate failure.

Countersigned by:

Dr. Md. Abdul Jalil
Professor
Department of Civil Engineering
BUET, Dhaka-1000, Bangladesh



Test Performed by:

Dr. Md. Mafizur Rahman
Professor
Department of Civil Engineering
BUET, Dhaka-1000, Bangladesh

Important Notes: Samples as supplied to us have been tested in our laboratory. BRTC does not have any responsibility as to the representative character of the samples supplied to us tested. It is recommended that samples are sent in a secure and sealed container/bag/container under signature of the competent authority, in order to avoid fraudulent fabrication of test results. It is recommended that all test reports are collected by duly authorized person, and not by the Contractor/Supplier.

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Concrete cylinder available onsite but the frequency of testing not meet as per BNBC 5.12.2. Building engineer is required to verify the insitu material strength by taking 100 mm core from lower tier columns.

Beam susceptible to vehicle impact

Beams adjacent of driveway of loading unloading area is susceptible to vehicle impact. The factory engineer is required to take necessary measures to prevent the vehicle impact.



Beams adjacent of driveway of loading unloading

Incomplete stability system

Only horizontal cable bracing were found on site. But other load transfer media compression strut were not observed along perpendicular direction of portal frame. Therefore, lateral stability system of the shed is apparently incomplete. Building engineer is required to check the lateral stability of the structure.



No-compression strut

Loose cable bracing

Loose cable bracings were found. Building engineer is required to carry out suitable remedial works and tighten the loose bracing where necessary.



Loose cable bracing



Loose cable bracing

Test Carried Out



Rebar Scan



Stone chips in column

Problems Observed

New 06 Storied RCC Building & Roof Shed:

Item 01: Load plan & design report not comply with BNBC requirements.

Item 02: Beam susceptible to vehicle impact.

Item 03: Incomplete stability system.

Item 04: Loose cable bracing.

Priority Actions

Item No.	Observation	Recommended Action Plan	Recommended Timeline
01	Load plan & design report not comply with BNBC requirements. (New 06 Storied RCC Building)	Building engineer is required to revise the storage live load limit and related design documents based on BNBC requirement.	6-weeks
02	Load plan & design report not comply with BNBC requirements. (New 06 Storied RCC Building)	Revise and actively manage a set of floor loading plan by following BNBC.	6-weeks
03	Load plan & design report not comply with BNBC requirements. (New 06 Storied RCC Building)	Building engineer is required to verify the insitu material strength by taking 100 mm core from lower tier columns by following BNBC.	6-weeks
04	Load plan & design report not comply with BNBC requirements. (New 06 Storied RCC Building)	Implement the recommendations of design report.	6-months
05	Load plan & design report not comply with BNBC requirements. (New 06 Storied RCC Building)	Implement floor load plan.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
06	Beam susceptible to vehicle impact. (New 06 Storied RCC Building)	Building engineer is required to take necessary action to prevent the vehicle impact in the beams.	6-weeks
07	Incomplete stability system. (Roof Shed)	Building engineer is required to check the lateral stability of the structure.	6-weeks
08	Incomplete stability system. (Roof Shed)	Implement remediation work if required.	6-months
09	Loose cable bracing. (Roof Shed)	Tighten the loose bracing where necessary.	6-weeks