

Metro Knitting & Dyeing Mills Ltd (Factory-02) New Building

Charabag, Ashulia, Savar, Dhaka- 1341
(23.883822, 90.310283)
4th October 2021



Building Information

1. Building-3 (Green Project) -(B+G+8)

Observations

Lack of details in Design Report

Observation: Building-3 (Green Project)

3.2.3 Wind Loads

The calculation of wind loads confirms to Sub-clause 2.4, Chapter 2, Part 6 of BNBC 2006. The following equation will be used to calculate sustained wind pressure of the buildings.

$$q_z = C_e C_i C_z V_b^2$$

Where,

Exposure Category: A

q_z = Sustained wind pressure at height z , kN/m²

C_e = Velocity to Pressure conversion coefficient = 47.2×10^{-6}

C_i = 1.0 (Structural importance coefficient given in Table 6. 2. 9 of BNBC, Type III, Special occupancy structure)

C_z = Combined height and exposure coefficient given in Table 6. 2. 10 of BNBC

V_b = 210 km/hr. (Basic wind speed in Dhaka, given in Table 6. 2. 8 of BNBC)

The design wind pressure P_z for a structure or an element of a structure at any height, z above mean ground level shall be determined from the relation:

$$P_z = C_g C_p q_z$$

Where,

P_z = design wind pressure at height z , kN/m²

C_g = Gust coefficient which shall be G_z , G_h , or G as set forth in Sec 2.4.6.6 of BNBC.

C_p = Pressure coefficient for structure or components as set forth Sec 2.4.6.7 of BNBC

q_z = sustained wind pressure as defined above

Method 1 (Surface Area Method) in Section 2.4.6.4, Part 6 of BNBC is adopted for the calculation of design wind loads.

3.2.4 Seismic Load

The calculation of earthquake loads confirms to Sub-clause 2.5, Chapter 2 and Part 6 of BNBC.

The total design base shear is calculated from the following equation.

$$V = (ZIC/R) \times W$$

Where,

Z = 0.15 (Seismic zone coefficient given in Fig. 6.2.22 of BNBC for Zone 2)

I = 1.0 (Structural importance coefficient given in Table 6. 2. 23 in BNBC, Type III, Special occupancy structure)

R = 8 (Response modification coefficient for Intermediate Moment Resisting Frame given in Table 6.2.24 of BNBC) [IMRF] (Justification in article 3.2.4.1)

W = Total seismic load

C = Numerical coefficient given by the following relation

$$C = 1.25S / T^{2/3}$$

Where,

S = site coefficient for soil characteristics as provided in Table 6.2.25 of BNBC.

$$= 1.2$$

T = Fundamental period of vibration in seconds, of the structure for the direction under consideration as determined by the provisions of the Section 2.5.6.2.

Loading parameters in the design report

For wind and seismic loads, only specifications & considerations are provided in design report. No detail calculations for wind and seismic loads were available in the design report. Factory engineer is required to incorporate detail calculations for all lateral loads in the design Report in compliance with the BNBC (section 1.9.1 of part-6).

Observation: Building-3 (Green Project)

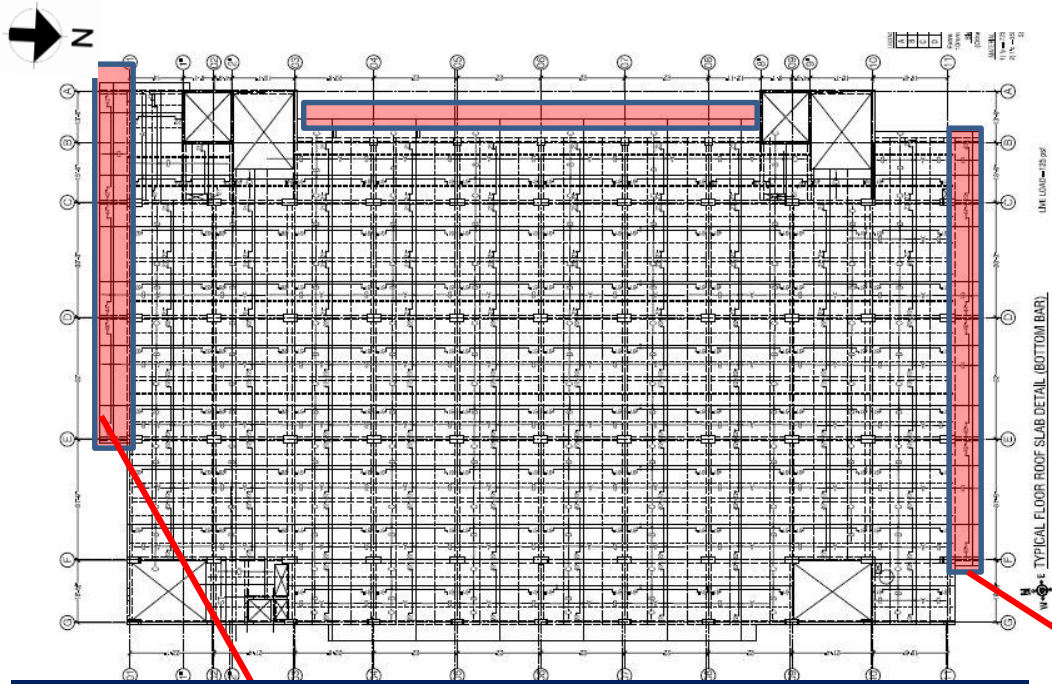
Missing information in as-built drawing

Observation: Building-3 (Green Project)



Beam & slab detail were not shown in as-built drawing for any of the staircases

Beam & slab detail were not shown in as-built drawing for any of the staircases. Factory engineer is required to update the as-built drawing showing details of all the structural elements.



Cantilever dimension was not shown in as-built drawing. Factory engineer is required to update the as-built drawing showing dimension of all the structural elements.

Cantilever dimension was not shown in as-built drawing



Cantilever at south side



Cantilever north side

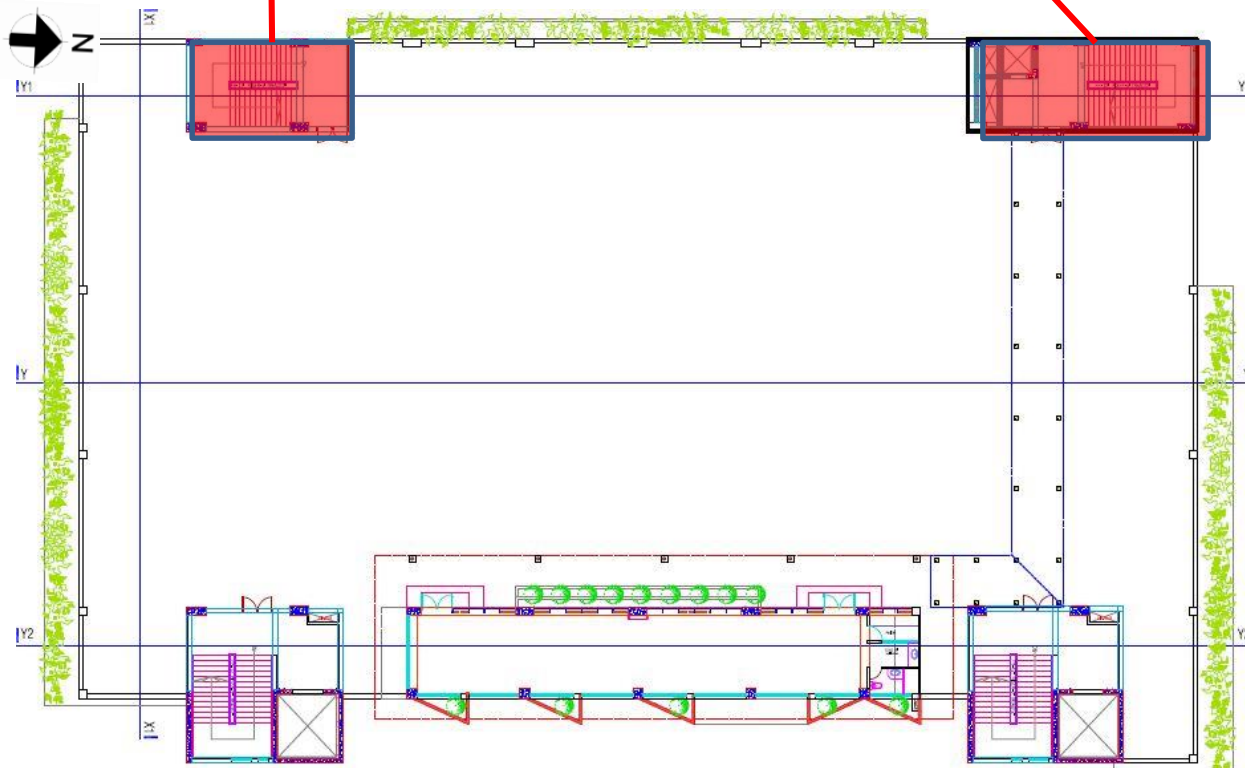
Observation: Building-3 (Green Project)



RC water tank



RC water tank



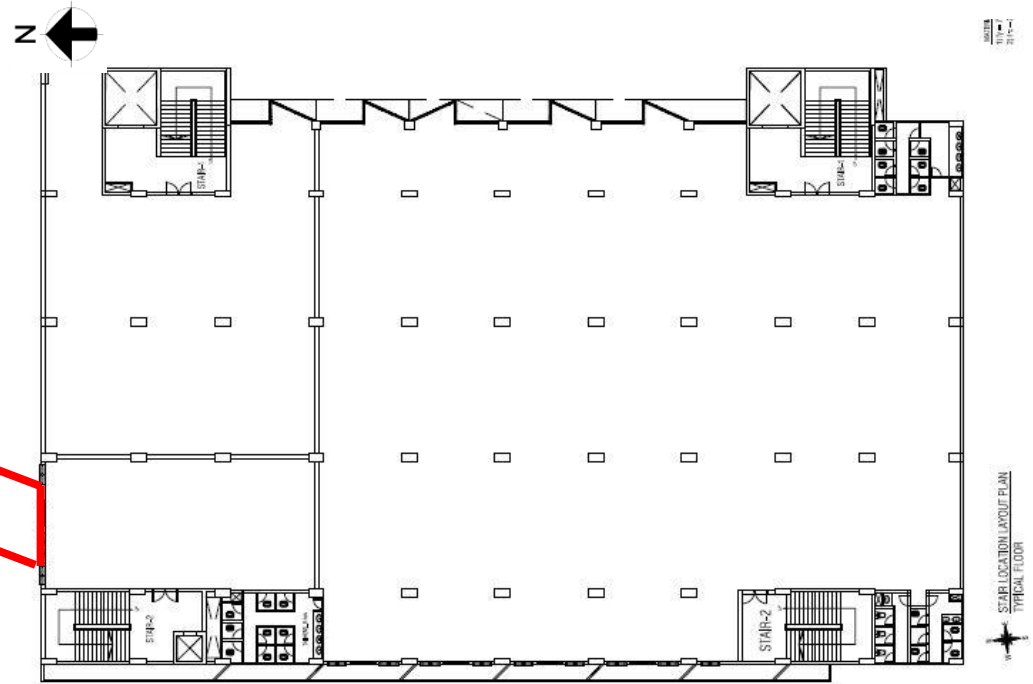
Roof layout

Over water tank location was not shown in archliberal drawing. Factory engineer is required to update the as-built drawing showing the water tanks.

Observation: Building-3 (Green Project)



Extension at north side



Extension at north side was not shown in archliberal drawing. Factory engineer is required to update the as-built drawing showing the extension.

Observation: Building-3 (Green Project)

Possible vehicle impact

Observation: Building-3 (Green Project)



Columns prone to possible vehicle impact

Some columns were found exposed which are prone to possible vehicle impact. Factory is required to provide barrier around all the exposed columns to protect the columns from possible vehicle.

Exposed reinforcement left at roof level

Observation: Building-3 (Green Project)



Exposed reinforcement left at roof level

Exposed reinforcement is left at roof level & staircase which was prone to corrosion. Factory is required to provide rust proof paint on exposed reinforcement to protect from corrosion.

Observation: Building-3 (Green Project)

Problems Observed

Building-3 (Green Project)

Item 01: Lack of details in Design Report

Item 02: Missing information in as-built drawing

Item 03: Possible vehicle impact

Item 04: Exposed reinforcement left at roof level

Priority Action

Item No.	Observation	Recommended Action Plan	Recommended Timeline
01	Lack of details in Design Report(Building-3 (Green Project))	Factory engineer is required to update the design report in compliance with the section 1.9.1 of BNBC part-6. .	6-weeks
02	Lack of details in Design Report(Building-3 (Green Project))	Implement remediation as outcome of design Report (where required).	6-months
03	Missing information in as-built drawing (Building-3 (Green Project))	Factory engineer is required to survey the structure and update as-built (architectural & structural) drawings.	6-weeks
04	Possible vehicle impact (Building-3 (Green Project))	Factory is required to provide barrier around all the exposed columns to protect the columns from possible vehicle.	6-weeks
05	Exposed reinforcement left at roof level (Building-3 (Green Project))	Factory is required to provide rust proof paint on exposed reinforcement to protect from corrosion.	6-weeks