

Designtex Knitwear Ltd (New Building)

Beraiderchala, Sreepur, Gazipur.
(24.193070, 90.416069)
10th June & 25th Aug 2021

Category
Green



Buildings Information

1. Warehouse Building (G+4)
2. Waste Disposal Building (single storied)
3. Connecting Bridge (single storied)
4. Coal Shed (single storied)
5. Car & Cycle Shed (single storied)

Observations

Prepared Design Report to be updated

D. Earthquake/ Seismic Load:

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

Dynamic Response Method (Section 2.5.7, Part 6, BNBC) is adopted to calculate seismic lateral forces.

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

$$V = \frac{ZICW}{R}$$

Where,

$Z = 0.15$ (Seismic zone coefficient given in Fig. 6.2.10 of BNBC)

$I = 1.0$ (Structural importance coefficient given in Table 6.2.23 in BNBC)

$R = 8$ (Response modification coefficient for special moment resisting frame given in Table 6.2.24 of BNBC)

$W =$ Total seismic dead load in kN.

$C =$ Numerical coefficient given by the following relation

$$C = \frac{1.25S}{T^{1/3}}$$

Where,

$S = 1.5$ Site coefficient for soil characteristics as provided in Table 6.2.25 of BNBC.

$T =$ 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, Part 6 of BNBC.

$C_s =$ Velocity to Pressure conversion coefficient $= 47.2 \cdot 10^{-6}$

$C_1 = 1.0$ (Structural importance coefficient given in Table 6.2.9 of BNBC)

$C_2 =$ Combined height and exposure coefficient given in Table 6.2.10 of BNBC

$V_b = 215 \text{ km/hr.}$ (Basic wind speed at Gazipur area, given in Table 6.2.8 of BNBC)

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

$$P_z = C_g C_p Q_z$$

Where, $P_z =$ Design wind pressure at height z , kN/m^2

$C_g =$ Gust coefficient which shall be $G_{z, \text{on}}$ 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.

E. Load Combination:

R.C Structural members will be designed to have strength not less than that required resisting the most unfavorable effect of the combinations of the factored loads shown below.

1. $1.4D$
2. $1.4D + 1.7L$
3. $1.05D + 1.275L + 1.275W$
4. $1.05D + 1.275L + 1.4025E$

(Ref. BNBC, Part 6, sec. 2.7.5)

However for foundation design (e.g., number of piles) following load combination shall be considered.

1. $D + L$
2. $D + L + (W \text{ or } E)$

(Ref. BNBC, Part 6, sec. 3.7)

Where,

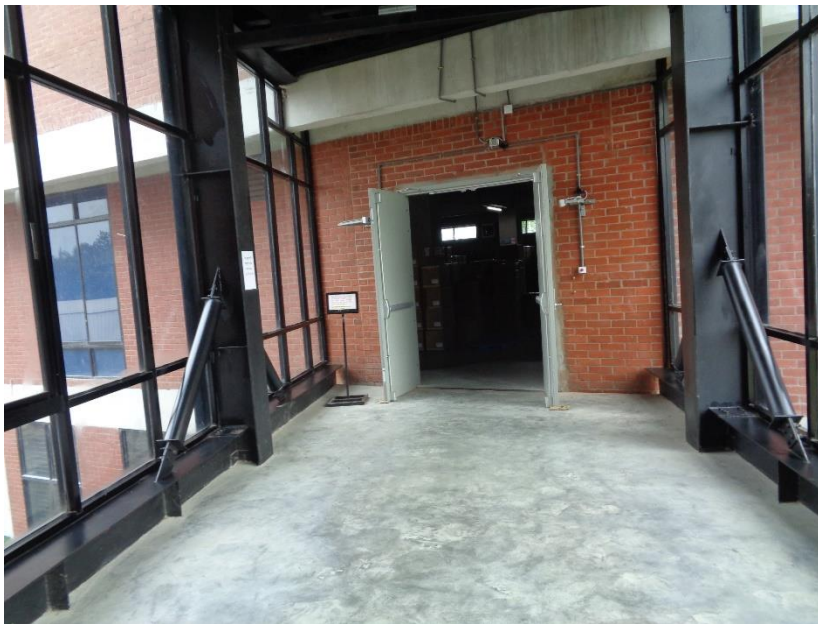
$D =$ Dead Load
 $L =$ Live Load
 $W =$ Wind Load
 $E =$ Earthquake Load

Loading parameter for lateral load

Load combinations

A Design Report is prepared including design parameters for wind and seismic loads. All the load combinations from BNBC part-6 are not considered in Design Report. Also, stability checks are not included in this report. Factory engineer is required to include all load combinations, stability check for all structural members and update the Design Report in compliance with the BNBC (section 1.9.1 of part-6).

Live load plan to be produced



Connecting Bridge-1st floor (Passage)



Connecting Bridge-2nd floor (Passage)

2.4) LOAD APPLIED ON STRUCTURE

2.4.1) Dead Load:

Self-weight of structure.

2.4.2) Live Load:

Live load on roof=20 psf

Live load on floor=105 psf

Live load consideration

Live load is considered as 5 KPa for this structure but no-load plan was provided. All the floors are being used as passage. Factory is required to produce live load plan as per load consideration.

Priority Actions

Problems Observed

Warehouse Building:

Item 01: Prepared Design Report to be updated

Connecting Bridge:

Item 02: Load plan to be produced

Item No.	Observation	Recommended Action Plan	Recommended Timeline
01	Prepared Design Report to be updated (Warehouse Building)	Factory engineer is required to update the Design Report in compliance with the section 1.9.1 of BNBC part-6.	6-weeks
02	Prepared Design Report to be updated (Warehouse Building)	Implement remediation as outcome of Design Report (if required).	6-months
03	Load plan to be produced (Connecting Bridge)	Factory is required to produce floor live load plan as per design documents.	6-weeks
04	Load plan to be produced (Connecting Bridge)	Implement the floor load plan.	6-months