

Comfit Composite Knit Ltd (Extensions 2)

Gorai, Mirzapur, Tangail
(24.163342, 90.419976)
8 May 2023 & 30 May 2023

Category
Green



Building Information

1. **ETP Extension Building:** The structure is a two storied reinforced concrete structure.
2. **Banana Leaf Building:** The structure is a four storied (G+3) reinforced concrete structure.
3. **Utility Building-2:** The structure is a two storied (G+1+Mezz) reinforced concrete structure.
4. **Eco Ville Building:** The structure is a seven storied (G+6) reinforced concrete structure.

Observations

Design report needs to be updated.

Strength of Existing Beams:

The flexural reinforcement of beams required for BNBC 2006 recommended load is shown in Annexure-9. It can be seen that the steel area required for the proposed loads is less than the amount of steel provided at different location. Thus the strength of beams is sufficient for BNBC 2006 specified load.

Strength of Existing Slabs:

The slab thickness is 200mm. The bending moment contour of the floor slabs are shown in Annexure-10. From analysis, it is found that the floor slab is safe for proposed live load. A summary of slab strength is shown in Table 3. It is found that the flexural strength of the floor slab is also sufficient for BNBC 2006 recommended load.

Deflection and Serviceability

BNBC 2006 recommended serviceability limits are checked for this building. The results are summarized in Table-4.

Comment regarding the adequacy of beams in the Design Report

In design report, no analysis output for beam adequacy check has been provided for all types of beams. Building engineer is required to update the design report based on software analysis output for beam as per BNBC. Provide action plan if the required reinforcement is less than the provided reinforcement.

Crack on brick wall



Crack was observed on brick wall at several locations

Factory engineer is required to repair the cracked surface with a suitable method.

Water ponding on roof slab



Water ponding on roof slab

Water ponding was observed on roof slab. Factory is required to improve drainage system on roof slab.

**Consideration of occupancy category doesn't comply
with BNBC**

below Bangladesh shows that Bangladesh does fall in the moderate to high seismic risk zone. Statistical evidence from past major and minor earthquake incidents shows that a major earthquake has been overdue in recent times on a geological scale. Therefore, it is necessary to prepare against any possible earthquake hazard. It should be kept in mind that the objective of earthquake resistance building design is not to make a strong building that can resist any damage due to an earthquake. Instead, the earthquake-resistant design aims at minimizing the possible damage and casualty to an acceptable level.

Regarding the earthquake-resistant structural design, the specific design code must be followed. For the analysis and design checking of this building, the *Equivalent Static Force Method* of BNBC (2020) is followed. The main considerations for the calculation of earthquake load are given below.

- ❖ Zone co-efficient, $Z = 0.28$ (zone III. As Per BNBC 2020)
- ❖ Structure importance co-efficient, $I = 1.0$ (Occupancy II, Table 6.2.17, BNBC 2020)
- ❖ Response modification co-efficient, $R = 8.0$ (SMRF, Table 6.2.19, BNBC-2020)
- ❖ System overstrength factor, $\Omega_0 = 3.0$
- ❖ Deflection Amplification Factor, $C_d = 5.5$
- ❖ Site class = SD (Suggested in Table 6.2.13, BNBC-2020)

Occupancy category is considered as II in Design Report



COMFIT COMPOSITE KNIT LTD.

Goraj, Mirzapur, Tangail-1941

BUILDING DESCRIPTION (RSC ID- 24544)

1. ECO VILLE Building (7-storied)

Ground Floor (Setup: 165 & Strength: 160)	: Dyeing section, Batch, Office Room.
Mezzanine floor (Setup: 24 & Strength: 18)	: Lab Testing Office, Batch processing area
1st Floor (Setup: 150 & Strength: 144)	: Finishing (Dyeing), Office Room
2nd Floor (Setup: 0 & Strength: 0)	: Fabric Godown
3rd Floor (Setup: 0 & Strength: 0)	: Cutting, Office Room, CAD
4th Floor (Setup: 231 & Strength: 25)	: Sewing, Finishing, Office Room
5th Floor- 6th Floor (Setup: 0 & Strength: 0)	: Sewing, Finishing, Office Room (work ongoing)
Rooftop (Setup: 300 & Strength: 294)	: Solar Plant installation (work ongoing)

Number of employee/worker > 300

Occupancy category is considered as II in Design Report whereas Number of employee/worker is greater than 300. However, as per BNBC any structure containing greater than 300 people should be considered as occupancy category III. Building engineer is required to update the design report as per BNBC.

Concrete cylinder test not done as per BNBC

R.C.C. Constructing Material Properties

Note for Pile Cap:

$f'c = f'c = 4.0$ ksi, $f'cr = 5.25$ ksi

$f_y = 415$ Mpa (60 Ksi) must be confirmed $\frac{R_m}{R_{eh}} = 1.25$

Cement: Portland Composite Cement

Sand: Sylhet sand; F.M.=2.2 (minimum)

Aggregate: $\frac{3}{4}$ " downgraded stone chips as coarse aggregate.

Clear cover for foundation = 3"

Note for Column:

$f'c = f'c = 4.75$ ksi, $f'cr = 6.0$ ksi

$f_y = 415$ Mpa (60 Ksi) must be confirmed $\frac{R_m}{R_{eh}} = 1.25$

Cement: Portland Composite Cement

Sand: Sylhet sand; F.M.=2.2 (minimum)

Aggregate: $\frac{3}{4}$ " downgraded stone chips as coarse aggregate

Clear cover:

Below P.L. 2.5";

Above P.L. 1.5"

Note for Grade Beam:

$f'c = f'c = 4.75$ ksi, $f'cr = 6.0$ ksi

$f_y = 415$ Mpa (60 Ksi) must be confirmed $\frac{R_m}{R_{eh}} = 1.25$

Cement: Portland Composite Cement

Sand: Sylhet sand; F.M.=2.2 (minimum)

Aggregate: $\frac{3}{4}$ " downgraded stone chips as coarse aggregate

Clear cover:

Below P.L. 2.5"

Note for Floor Beam:

$f'c = f'c = 4.75$ ksi, $f'cr = 6.0$ ksi

$f_y = 415$ Mpa (60 Ksi) must be confirmed $\frac{R_m}{R_{eh}} = 1.25$

Cement: Portland Composite Cement

Sand: Sylhet sand; F.M.=2.2 (minimum)

Aggregate: $\frac{3}{4}$ " downgraded stone chips as coarse aggregate

Clear cover: 1.5"

Note for Floor Slab & Stair:

$f'c = f'c = 4.75$ ksi, $f'cr = 6.0$ ksi

$f_y = 415$ Mpa (60 Ksi) must be confirmed $\frac{R_m}{R_{eh}} = 1.25$

Cement: Portland Composite Cement

Sand: Sylhet sand; F.M.=2.2 (minimum)

Aggregate: $\frac{3}{4}$ " downgraded stone chips as coarse aggregate

Clear cover: 0.75"

Design strength mention in as-built drawing

Design strength of pile cap is mentioned as 27.58 MPa which is different from the strength of columns (32.75). However, no cylinder test report was available for pile cap which doesn't comply with the frequency as per BNBC. Building engineer is required to ensure the in situ concrete strength as per BNBC.

Concrete cylinder test not done as per BNBC



Dhaka University of Engineering & Technology, Gazipur

Department of Civil Engineering Consultancy Research and Testing Services (CRTS)

Tel: +88-02-49274008, PABX: +88-02-49274034-53/Ext. 2011, E-mail: chairman_crts@duet.ac.bd, Web: <http://www.crts-civil-duet.com>

Memo No. : CRTS/CE/84/65 Date : 06 September 2018
 Ref. No. : CCKL/Slab/A-B/3-4/Grid/04.08.18 Date : 06 September 2018
 Sent by : Engr. Amal Krishna Sarker, GM (Maintenance & Engineering), COMFIT
 COMPOSITE KNIT LTD., Gorai, Mirzapur, Tangail.
 Name of Site : 3-storied Utility building of CCKL
 Type of Specimen : Concrete Cylinder (4" x 8") made with Stone Chips.
 Sample Location : CCKL/Slab/A-B/3-4/
 Date of Casting : 04 August 2018 (as mentioned)
 Date of Testing : 10 September 2018
 Mix Ratio : Not mentioned
 Test Standard : Compressive Strength [ASTM C39]
 Samples Received : 06 September 2018 (Unsealed condition)

Report on Compressive Strength Test of Concrete Cylinder

Sample Identification Mark	Age of Specimen	Area of Specimen	Crushing Load	Crushing Strength		Average Compressive Strength		Mode of Failure
	Days	mm ²	kN	MPa	psi	MPa	psi	
1	37	7590.5	320.00	42.16	6114	44.02	6384	Combined
2		7590.5	340.00	44.79	6497			Combined
3		7850.0	354.00	45.10	6540			Combined

Countersigned By :

Amal
13.09.18
Chairman
CRTS, Department of Civil Engineering
DUET, Gazipur.

Note : 1 MPa = 145.035 psi



Test Performed By :

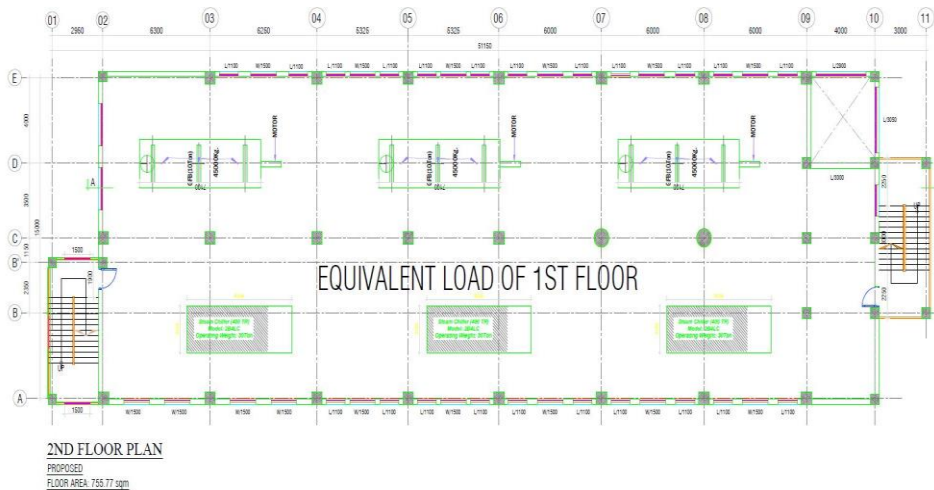
Rokshana Pervin
12.09.18
(Rokshana Pervin)
Assistant Professor
Department of Civil Engineering
DUET, Gazipur.

3 sets of concrete cylinder test reports were available for slab which doesn't comply with the frequency as per BNBC. Building engineer is required to ensure the in situ concrete strength by taking concrete core.

Available concrete cylinder test report (3 sets) for slab

Live load not mentioned in load plan

Discrepancy in as-built drawing



Water tanks are not shown in existing roof layout

Proposed second floor is being used as existing roof and water tanks with other elements are not shown in layout. Building engineer is required to update the existing roof layout and load plan.

Crack on brick wall



Crack was observed on brick wall at several locations

Factory engineer is required to identify the reason of crack and repair the cracked surface with a suitable method.

Dampness on roof slab



Dampness on roof slab

Dampness and vegetation were observed on roof slab. Factory is required to improve drainage system on roof slab.

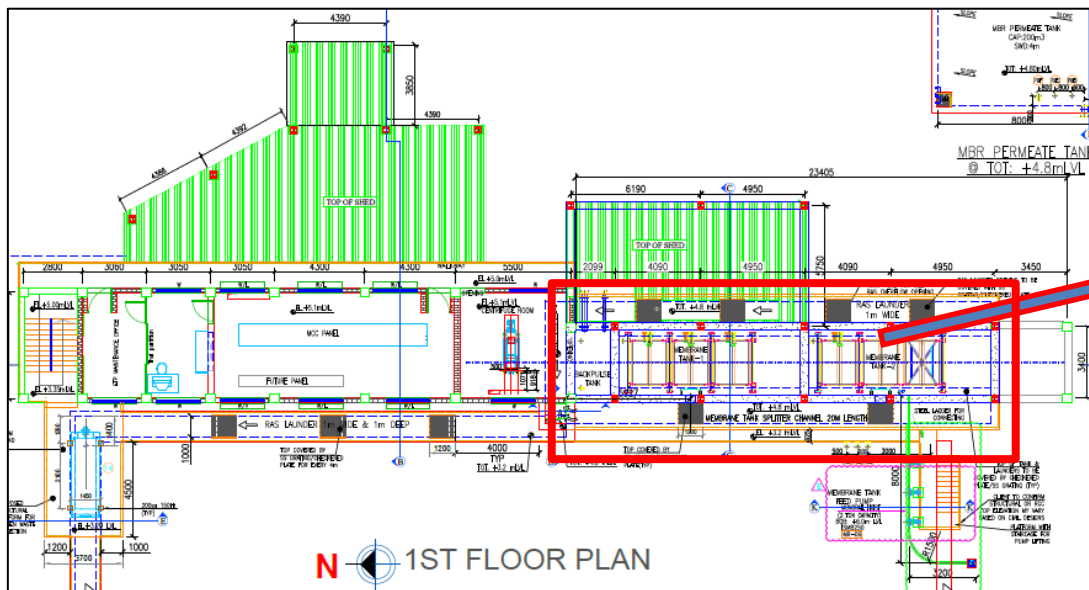
Gap in connection



Gap was observed in connection between RC and steel member

Gap was observed in connection of steel member. Building engineer is required to repair the gaps with a suitable method.

Falling Hazard at 1st floor level in ETP Extension Building



No restricted boundary on the 1st floor slab level.

In some portion of 1st floor area wooden board is installed instead of any engineered slab system to carry enough human live load at a time. Factory is required to restrict access to hazardous area to avoid possible falling hazard.

Problems Observed

Banana Leaf Building:

Item 01: Design report needs to be updated.

Item 02: Crack on brick wall

Item 03: Water ponding on roof slab

Eco Ville Building:

Item 04: Consideration of occupancy category doesn't comply with BNBC

Utility Building-2:

Item 05: Concrete cylinder test is not done as per BNBC

Item 06: Live load not mentioned in load plan

Item 07: Discrepancy in as-built drawing

Item 08: Crack on brick wall

Item 09: Dampness on roof slab

Item 10: Gap in connection

ETP Extension Building:

Item 11: Falling Hazard at 1st floor level

Item No.	Observation	Recommended Action Plan	Recommended Timeline
01	Design report needs to be updated (Banana Leaf Building)	Building engineer is required to update the design report based on software analysis output for beam as per BNBC.	6-weeks
02	Design report needs to be updated (Banana Leaf Building)	Provide action plan if the required reinforcement is less than the provided reinforcement.	6-weeks
03	Design report needs to be updated (Banana Leaf Building)	Carry out remedial works if required.	6-months
04	Crack on brick wall (Banana Leaf Building)	Building engineer is required to check the reason of crack and repair the cracked surface with a suitable method.	6-weeks
05	Water ponding on roof slab (Banana Leaf Building)	Factory is required to improve the roof drainage system with adequate slope and water outlets.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
06	Consideration of occupancy category doesn't comply with BNBC (Eco Ville Building)	Building engineer is required to update the design report as per BNBC occupancy category.	6-weeks
07	Concrete cylinder test not done as per BNBC (Eco Ville Building)	Building engineer is required to verify the in situ concrete strength by taking concrete core and revise the design report if it less then the design strength.	6-weeks
08	Concrete cylinder test not done as per BNBC (Eco Ville Building)	Carry out remedial works if required.	6-months
09	Concrete cylinder test not done as per BNBC (Utility Building-2)	Building engineer is required to verify the in situ concrete strength by taking concrete core and revise the design report if it less then the design strength.	6-weeks
10	Concrete cylinder test not done as per BNBC (Utility Building-2)	Carry out remedial works if required.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
11	Live load not mentioned in load plan. (Utility Building-2)	Building engineer is required to update the live load plan and check the design accordingly.	6-weeks
12	Live load not mentioned in load plan. (Utility Building-2)	Implement floor live load plan.	6-months
13	Discrepancy in as-built drawing. (Utility Building-2)	Building engineer is required to update the existing roof layout and load plan drawings.	6-weeks
14	Crack on brick wall (Utility Building-2)	Factory engineer is required to identify the reason of crack and repair the cracked surface with a suitable method.	6-weeks
15	Dampness on roof slab (Utility Building-2)	Factory is required to improve the roof drainage system.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
16	Gap between RC and Steel member connection (Utility Building-2)	Factory engineer is required to repair the gaps with a suitable method.	6-weeks
17	Falling Hazard at 1st floor level (ETP Extension Building)	Factory is required to restrict access to hazardous area to avoid possible falling hazard.	6-weeks