

# Knittex Industries Limited (Extension)

Plot: 247-252, Baimile, Konabari, Gazipur

(24.006303, 90.333814)

1 January 2025



## 1. Building Information

1. **Building (02 & 03):** Seven-storied (G+6) reinforced concrete (RC) building.
2. **Building 06:** Single-storied RC building with one basement.

## 2. Observation

Observation 1: Lack of load plan and lack of information in the design report (Building 02 & 03).																																																																									
<p style="text-align: center;">STRUCTURAL EVALUATION OF 7 STORIED GARMENTS BUILDING AT 247-252 BAIPAILE, KONABARI, GAZIPUR, BANGLADESH</p> <p style="text-align: center;">CLIENT: KNITTEX INDUSTRIES LTD LTD. AT 247-252 BAIPAILE, KONABARI, GAZIPUR, BANGLADESH</p> <p style="text-align: center;">JULY -2018</p> <p style="text-align: center;">CONSULTANT: PROJECT CONSULTANT &amp; CONSTRUCTION (PCC) CHA-75/2 PROGOTTI SARANI RIDGE DALE 4<sup>TH</sup> FLOOR UTTAR BADDA, DHAKA. PHONE-9884347, 8831462, FAX-880-2-9897930 EMAIL: khanataurrahman@yahoo.com</p>	<p><b>5.2 Design Review of Foundations</b></p> <p>The foundation depth is considered 2.68m below from the existing ground level. Below the foundation level 450mm depth of soil is replaced with mixture of compacted sand, khoa and 5% cement as foundation treatment works. From soil report, below the soil treatment level, the allowable bearing capacity is 143.65 kN/m<sup>2</sup> considering bore hole no BH-1, BH-2 &amp; BH-3 with factor of safety 3.00. Footing design calculation is presented in Table 5.1.</p> <p>Table 5.1: Column Load &amp; Footing Size</p> <table border="1"> <thead> <tr> <th>Foot-ing type</th> <th>Col<sup>m</sup> Load (kN)</th> <th>Required Footing Area (m<sup>2</sup>)</th> <th>Provided Footing Area (m<sup>2</sup>)</th> <th>Require Depth (mm)</th> <th>Provided Depth (mm)</th> <th>Provided Reinforcement Long/Short</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>F1</td> <td>4564</td> <td>31.77</td> <td>6.10x5.18 = 31.60</td> <td>900</td> <td>1000</td> <td>20mmφ@87°c/c 20mmφ@100°c</td> <td>ok</td> </tr> <tr> <td>F2</td> <td>2960</td> <td>20.61</td> <td>5.49x3.96 = 21.72</td> <td>675</td> <td>900</td> <td>20mmφ@100°c/c 20mmφ@112°c/c</td> <td>ok</td> </tr> <tr> <td>F3</td> <td>1802</td> <td>12.54</td> <td>4.57x3.35 = 15.31</td> <td>575</td> <td>750</td> <td>20mmφ@112°c/c 20mmφ@125°c/c</td> <td>ok</td> </tr> <tr> <td>F4</td> <td>3450</td> <td>24.02</td> <td>6.10x4.27 = 26.02</td> <td>700</td> <td>900</td> <td>20mmφ@87°c/c 20mmφ@100°c</td> <td>ok</td> </tr> <tr> <td>F5</td> <td>1724</td> <td>12.00</td> <td>4.26x2.895 = 12.35</td> <td>600</td> <td>675</td> <td>20mmφ@112°c/c 20mmφ@125°c/c</td> <td>ok</td> </tr> <tr> <td>CF1</td> <td>8616</td> <td>59.98</td> <td>9.14x6.70 = 61.24</td> <td>750</td> <td>750</td> <td>25mmφ@125°c/c bott. (L) 25mmφ@125°c/c bott. (S) 20mmφ@125°c/c top (L) 20mmφ@125°c/c top (S)</td> <td>ok</td> </tr> <tr> <td>CF2</td> <td>3993</td> <td>27.80</td> <td>6.55x4.72 = 30.92</td> <td>750</td> <td>750</td> <td>20mmφ@125°c/c bott. (L) 20mmφ@125°c/c bott. (S) 25mmφ@1137°c/c top (L) 16mmφ@150°c/c top (S)</td> <td>ok</td> </tr> <tr> <td>CF3</td> <td>4686</td> <td>32.62</td> <td>9.14x3.66 = 33.46</td> <td>950</td> <td>950</td> <td>20mmφ@112°c/c bott. (L) 20mmφ@112°c/c bott. (S) 25mmφ@100°c/c top (L) 16mmφ@150°c/c top (S) 20mmφ@125°c/c bott. (L)</td> <td>ok</td> </tr> </tbody> </table>	Foot-ing type	Col <sup>m</sup> Load (kN)	Required Footing Area (m <sup>2</sup> )	Provided Footing Area (m <sup>2</sup> )	Require Depth (mm)	Provided Depth (mm)	Provided Reinforcement Long/Short	Remarks	F1	4564	31.77	6.10x5.18 = 31.60	900	1000	20mmφ@87°c/c 20mmφ@100°c	ok	F2	2960	20.61	5.49x3.96 = 21.72	675	900	20mmφ@100°c/c 20mmφ@112°c/c	ok	F3	1802	12.54	4.57x3.35 = 15.31	575	750	20mmφ@112°c/c 20mmφ@125°c/c	ok	F4	3450	24.02	6.10x4.27 = 26.02	700	900	20mmφ@87°c/c 20mmφ@100°c	ok	F5	1724	12.00	4.26x2.895 = 12.35	600	675	20mmφ@112°c/c 20mmφ@125°c/c	ok	CF1	8616	59.98	9.14x6.70 = 61.24	750	750	25mmφ@125°c/c bott. (L) 25mmφ@125°c/c bott. (S) 20mmφ@125°c/c top (L) 20mmφ@125°c/c top (S)	ok	CF2	3993	27.80	6.55x4.72 = 30.92	750	750	20mmφ@125°c/c bott. (L) 20mmφ@125°c/c bott. (S) 25mmφ@1137°c/c top (L) 16mmφ@150°c/c top (S)	ok	CF3	4686	32.62	9.14x3.66 = 33.46	950	950	20mmφ@112°c/c bott. (L) 20mmφ@112°c/c bott. (S) 25mmφ@100°c/c top (L) 16mmφ@150°c/c top (S) 20mmφ@125°c/c bott. (L)	ok
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**Description:** The framing system is considered IMRF, but no related calculation or rebar scan image is provided to justify it. A foundation adequacy check is not provided for lateral loading, and the factor of safety (FoS) is not provided grid-wise. The allowable soil bearing capacity is considered 143.65 KN/m<sup>2</sup> without any calculation. Besides, the required and provided size of the foundation is marginally close. All serviceability checks are not provided as per BNBC. Also, no load plan was available. The building engineer is required to produce a load plan and update the design report as per 1.9.1 BNBC.

**Observation 2: Lack of cylinder test report on the ground floor (Building 02 & 03).**

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<p style="text-align: center;"><b>TEST REPORT</b></p> <table border="1"> <thead> <tr> <th>Sl. No.</th> <th>Date of Casting as per the letter</th> <th>Specimen Designation/ Frog Mark</th> <th>Specimen Area</th> <th>Maximum Load</th> <th>Crushing Strength</th> <th>Average Crushing Strength</th> <th>Mode of Failure</th> </tr> <tr> <th></th> <th></th> <th></th> <th>(sq. ft)</th> <th>(kN)</th> <th>(MPa)</th> <th>(MPa)</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>22/10/2018</td> <td>Knitex Ind. Bldg Building 02 1st Floor (Gd) No-L-05</td> <td>12.42</td> <td>97,853</td> <td>7.879</td> <td>14.0 MPa</td> <td>Combined*</td> </tr> <tr> <td>2</td> <td>01/13 days test</td> <td>Knitex Ind. Bldg Building 02 1st Floor (Gd) No-L-05</td> <td>12.55</td> <td>91,083</td> <td>7.258</td> <td>(5.1 MPa)</td> <td>Combined*</td> </tr> <tr> <td>3</td> <td></td> <td>Knitex Ind. Bldg Building 02 1st Floor (Gd) No-L-05</td> <td>12.67</td> <td>89,065</td> <td>7.100</td> <td>(5.2 MPa)</td> <td>Combined*</td> </tr> </tbody> </table> <p>Note: Samples were received in unsealed condition. * Combined = Mortar and Aggregate Failure</p> <p>Courtesy report by: Prof. Dr. Heba Mohammed Ahsan, Test in Charge, Department of Civil Engineering, BUET, Dhaka-1000, Bangladesh.</p> <p>Test Performed by: Tawar Bahkhyr Zahid, Assistant Professor, Department of Civil Engineering, BUET, Dhaka-1000, Bangladesh.</p> <p>Date of Test: 24/08/2024</p>		Sl. No.	Date of Casting as per the letter	Specimen Designation/ Frog Mark	Specimen Area	Maximum Load	Crushing Strength	Average Crushing Strength	Mode of Failure				(sq. ft)	(kN)	(MPa)	(MPa)		1	22/10/2018	Knitex Ind. Bldg Building 02 1st Floor (Gd) No-L-05	12.42	97,853	7.879	14.0 MPa	Combined*	2	01/13 days test	Knitex Ind. Bldg Building 02 1st Floor (Gd) No-L-05	12.55	91,083	7.258	(5.1 MPa)	Combined*	3		Knitex Ind. Bldg Building 02 1st Floor (Gd) No-L-05	12.67	89,065	7.100	(5.2 MPa)	Combined*
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**Description:** The cylinder test report was available for columns only from the 1<sup>st</sup>, 3<sup>rd</sup> and 5<sup>th</sup> floors but no test report was available from the ground floor which doesn't meet the requirement of frequency test of BNBC. The building engineer is required to verify in-situ concrete strength by taking 4 cores (minimum) from the ground floor column.



**Observation-5:** Nonstructural elements found not anchored/braced (Building 02 & 03).



**Description:** Nonstructural elements (storage racks) were found not anchored/braced. The building engineer is required to anchor/brace all nonstructural elements within the factory.

**Observation 6:** Lack of design report (Connecting bridge).



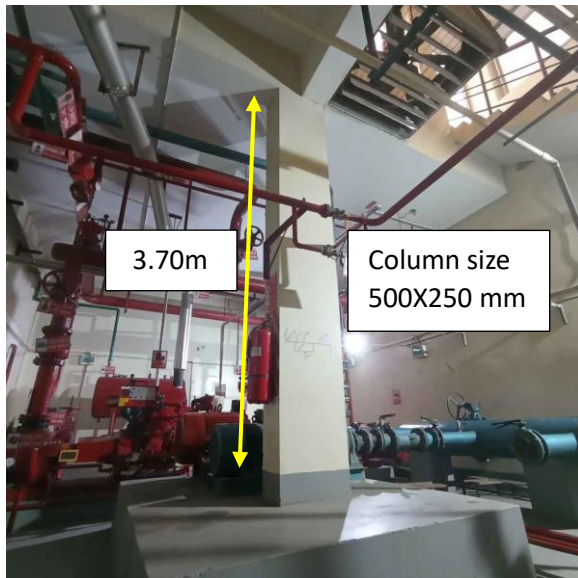
**Description:** As per BNBC, every building or structure designed shall have its design documents prepared by the provision of Section 1.9.1. The design document shall include a design report, and a set of structural drawings, which shall be prepared in compliance with section 1.9.1.1 and section 1.9.1.2 as per BNBC. At the time of inspection, the design report was not available, which is required to be prepared in compliance with section 1.9.1.1 (part 6, BNBC).

**Observation 7:** Corrosion on steel members (Connecting bridge).



**Description:** Corrosion was observed on steel members at the connecting bridge. The building engineer is required to provide rust-proof paint on steel members.

**Observation 8:** The column appears to be slender (Building 6).



**Description:** The column appears to be slender due to high unsupported length. The building engineer is required to check the column for slenderness ratio and incorporate it in the design report.

### 3. Action Plan

Item No.	Observation	Action Plan	Timeline
1.	Lack of load plan and lack of information in the design report (Building 02 & 03).	The building engineer is required to update the design report and submit it to RSC for review.	within 6 weeks
2.		The building engineer is required to provide soil-bearing capacity calculation and check the foundation adequacy.	within 6 weeks
3.		The building engineer is required to prepare a floor load plan.	within 6 weeks
4.		Implement remediation work if required.	within 6 months
5.	Lack of cylinder test report on the ground floor (Building 02 & 03).	The building engineer is required to verify in-situ concrete strength by taking 4 cores (minimum) from the ground floor column.	within 6 weeks
6.	Missing information in the as-built drawing (Building 02 & 03).	The building engineer is required to update the as-built drawing.	within 6 weeks
7.	Dampness and crack on roof slab and beam (Building 02 & 03).	The building engineer is required to prepare an investigation report for the dampness and crack on the roof slab. Repair the dampness and crack as per the investigation report.	within 6 weeks
8.		Also, repair the crack on the beam using a suitable method.	within 6 weeks
9.	Nonstructural elements found not anchored/braced (Building 02 & 03).	The building engineer is required to anchor/brace all nonstructural elements within the factory.	within 6 months

10.		The building engineer is required to prepare a design report in compliance with section 1.9.1.1 (part 6, BNBC).	within 6 weeks
11.	Lack of design report (Connecting bridge).	Implement remediation work if required.	within 6 months
12.	Corrosion on steel members (Connecting bridge).	The building engineer is required to provide rust-proof paint on steel members.	within 6 weeks
13.		The building engineer is required to check the column for slenderness ratio and incorporate it in the design report.	within 6 weeks
14.	The column appears to be slender (Building 6).	Implement remediation work if required.	within 6 months