

Cortex Apparels Ltd

Holding # 160/1, Madhabpur, Ward-01,
Kashimpur Metro, Gazipur-1349, Bangladesh
(24.007779N, 90.262224E)

26 November 2023



1. Building Information

Main Production Building: Partial Five-storied (G+3+partial storey) RC building.

Admin Building: Three-storied RCC (G+2) and proposed for four-storied (G+3) RC building.

Warehouse Building: Single-storied RC building with a mezzanine at ground floor and proposed for six-storied (G+5) RCC building.

Utility Building: A single-story RC beam-column frame with RC wall. There is a underground fire pump room.

Wastage shed: A single-storied shed. The building is being used for wastage Godown.

Gate house: A single storied RC beam-column frame building with two way spanning slab.

2. Observations

Observation-1: Columns appear to exceed Euler force. (Main Production Building).

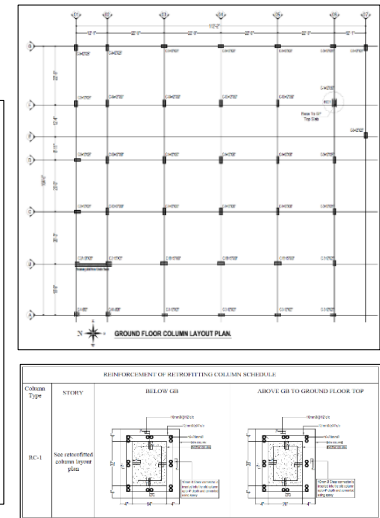


DEA Report On 4-Storeyed Production Building for Coretex Apparels Ltd.

TE	C3	0.59	Safe
1F	C3	0.47	Safe
2F	C1A	0.66	Safe
3F	C1A	0.58	Safe
4F	C1C	0.74	Safe
5F	C1C	0.63	Safe
6F	C1	0.75	Not OK
1G	C3	0.46	Safe
2G	C3	0.74	Safe
3G	C3	0.58	Safe
4G	C3	0.62	Safe
5G	C3	0.66	Safe
6G	C3	0.78	Safe
7G	C3	0.65	Safe

From the above table it is clear that one column is Overstressed. This column needs to be retrofitted. All other columns are safe and sound.

The figure of Column P-M-M ratio @ grid wise is given below:



From left- Ground floor Column, O/S of column shown in DEA report & proposed retrofitting details of column

Description: Ground floor columns are 4.31 m in length and 300X750 mm in size. The length/width=14.36 indicate that the columns are critical for slenderness effect. Factory has proposed the retrofitting for a column at grid- F/6. The building engineer is required to check and address this issue in the design report of all the required columns.

Observation-2: Inconsistency in DEA documents and as-built drawing. (Main Production Building).

Centre for Advisory and Testing Services [CATS-MIST (CE)]
Military Institute of Science and Technology

Compressive Strength of Concrete Drilled Cores

CATS Reference : 00486/Con/34573/05/2023 Date : 30.05.2023
Client : Design Solution Center
Project Name & Address : Coretex Apparels Ltd (Product on Building) at Holding: 156/1, Madhapur, Ward: 01, Kachimpur Metro, Gurgaon, Haryana

Sample Brought By : Design Solution Center Date of Receiving : 22.05.2023
Test Method : ASTM C 47/C 42-M Date of Test : 30.05.2023
Type of Sample : Drilled Core Sample Condition : Unsealed
Construction Year : Not Mentioned Quantity of Sample : 01 nos
No of Story : 4 (four) Storeyed Type of Aggregate : Stone Chips

Sl. No.	Sample ID, Location, Structure Type & Grid	Original Length (mm)	Sawed Length (mm)	Diameter (mm)	Crushing Load (kN)	Crushing Strength (MPa)	Failure Type	Fracture Type
1	Core 1, 1st floor, 1st floor, 1st floor	150.0	133.0	67.0	49.9	16.9	2450	Combined

1. Core sample collection and submission, location of the sample and other information are provided by the client, and CATS-MIST has not verified the information. CATS-MIST is only reporting the test results of the sample provided by the client.

2. Please compare the results with your corresponding design values and consult with your design engineer.

Test Supervised By: Gazi Md. Hossain, Lecturer, Dept. of Engineering, MIST, Vapour Canal, Dhaka

Countersigned By: Khondaker Sami Ahmed, PhD, PEng, Lt Col & Associate Professor, Department of Civil Engineering, MIST, Vapour Canal, Dhaka

Note: The results shown in this report are only valid for the samples tested, unless otherwise stated. It is recommended that samples are to be tested in pairs and the average value should be used for design purposes. It is also recommended that all test reports are to be reviewed by duly authorized personnel prior to the submission of the report. This report cannot be reproduced, except in full, without prior written permission of the client.

Web: cats-mist.ac.bd

Core test reports having 2450 psi strength.

DEA Report On 4-Storeyed Production Building for Coretex Apparels Ltd.

Core Length, L	Core Dia, D	L/D	core strength, psi	Damage Factor, Fd	diameter Correction factor, Fdc	Damage corrected core strength, psi	Diameter Corrected core strength, X, psi	summation	total no of sample
5.24	2.64	1.98	6630	1.06	1.04	7077.8	7316.00		
5.24	2.64	1.98	6030	1.06	1.04	6391.5	6663.01		
5.24	2.64	1.97	7030	1.06	1.04	7451.5	7756.33		
5.24	2.64	1.99	6540	1.06	1.04	6832.4	7116.70	28940.03	4

mean, X	(X-X) ²	sum of (X-X) ²	standard deviation, SD	SD (Rounded)	coefficient of variance, V	modification factor, K	specified concrete strength, f _{cs}	rounded, f _{cs}
7326.01	6388.5							
7326.01	338724.3							
7326.01	217193.3							
7326.01	371.3	617267.7	453.60	454	0.063	1.28	6946.7	6047

ii) COLUMN AND FOUNDATION:
Concrete compressive strength, f_c' = 3652 psi (Stone Chips)

Core Length, L	Core Dia, D	L/D	core strength, psi	Damage Factor, Fd	diameter Correction factor, Fdc	Damage corrected core strength, psi	Diameter Corrected core strength, X, psi	summation	total no of sample
5.236	2.6378	1.98499	3680	1.06	1.040566	3890.5	4060.21		
5.236	2.6378	1.98499	4830	1.06	1.040566	5119.8	5329.03		
5.19685	2.6378	1.97015	5230	1.06	1.040566	5443.8	5770.35	15169.59	3

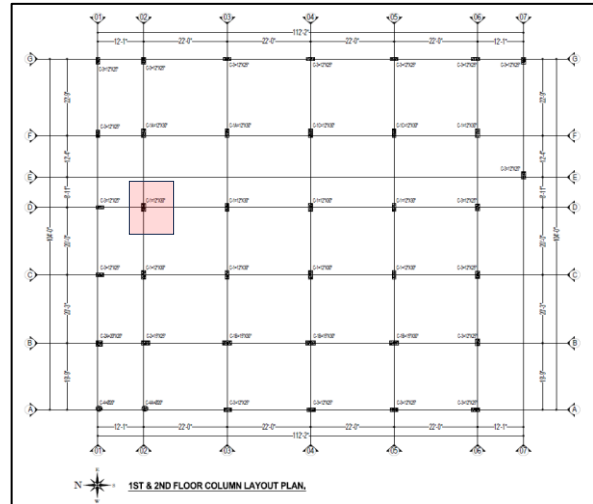
mean, X	(X-X) ²	sum of (X-X) ²	standard deviation, SD	SD (Rounded)	coefficient of variance, V	modification factor, K	specified concrete strength, f _{cs}	rounded, f _{cs}
5063.3963	966032.8							
5063.3963	76081.91							
5063.3963	514313.7	1576417.125	887.81111	888	0.17569298	1.47	3651.65	3652

7 | Page

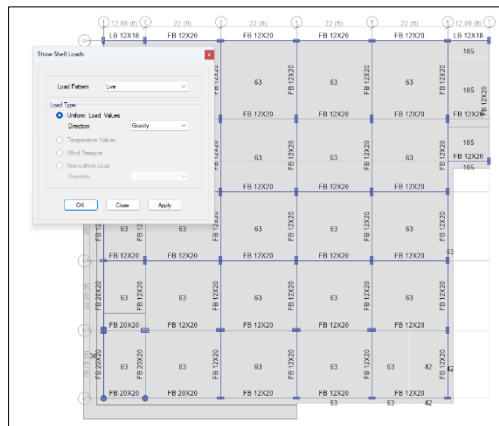
Core strengths considered in the report

COLUMN SCHEDULE			
	● Large dia bar	○ Smaller dia bar	
	Below G.L.	GROUND TO 1ST FLOOR	2ND TO 3RD FLOOR
C-3K			
C-5	×	×	
C-6			

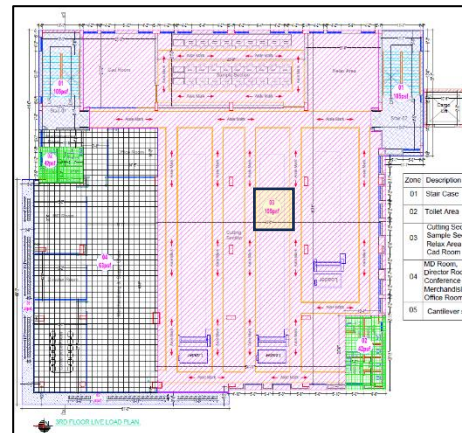
Column details for the C5 & C6



Column details of C-1D shown in Layout



63 psf has been assigned in FEA model



105 psf has been shown load plan

Description: Concrete core sample has been taken as part of the Detail Engineering Assessment (DEA). During inspection, total eight numbers of core test was found but in DEA report seven core test report has been incorporated to determine the equivalent concrete strength. The core test report having crushing strength 2450 psi (16.9 MPa) has not been considered.

In column layout plan, Column ID-C1D has been shown at grid-D/2. But no details of the column have been provided in the column schedule. The size and shape of the C5 & C6 column do not match between as-built drawing and site condition.

The load assignment in FEA model does not match between FEA model and provided load plan.

Observation-3: Non-structural elements not anchored or braced (Main Production Building)



Description: Racks on different floors are not adequately anchored or braced to resist lateral (earthquake) forces. Building engineer is required to adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC.

Observation-4: Column susceptible to vehicle impact (Main Production Building)



Description: Circular columns of the front area are susceptible to vehicle impact. The Building engineer is required to take necessary measures to prevent the vehicle impact by providing the barrier around the columns.

Observation-5: Discrepancies in as built drawings (Admin Building).



Column size measurement for C7 Column

Re-bar number confirmed at roof

Description: During inspection, numerous mismatches were found in the column between onsite condition and as-built drawing. The size of the columns- C3A, C6A and C7 do not match with as-built drawing. Also the number of the re-bar for the columns C2, C4 and C5A mismatches with as-built drawings.

Observation-6: Lack of edge protection (Admin Building).



Description: During the inspection, Edge protection (Parapet wall/Railing) was not observed on the 2nd floor and stairs. Building is required to provide edge protection to avoid falling hazards.

Observation-7: Exposed re-bar at roof (Admin Building).



Description: Exposed reinforcement was found on rooftop columns. Building engineer is required to take necessary measures to prevent corrosion in exposed rebar.

Observation-8: Discrepancies in as-built drawings (Warehouse Building).



Re-bar numbers confirmed at roof

Description: During the inspection, the number of the re-bar for columns and C2 and C4 do not match with as-built drawing and actual site condition.

Observation-9: Lack of edge protection (Warehouse Building).



Description: During the inspection, Edge protection (Parapet wall/Railing) was not observed on the stairs. Building is required to provide edge protection to avoid falling hazards.

Observation-10: Exposed re-bar at roof (Warehouse Building).



Description: Exposed reinforcement was found on rooftop columns. Building engineer is required to take necessary measures to prevent corrosion in exposed rebar.

Observation-11: Lack of design report (Utility Building).



Interior of the utility building



RC wall of the utility Building

Description: As per BNBC, every building or structure designed shall have its design documents prepared following the provision of Section 1.9.1. During inspection, the design report and as built structural drawing was not available on site.

The building engineer is required to prepare a set of design documents including as built drawings, live load plan at roof and a design report based on in-situ material strength and software-based analysis which shall be prepared in compliance with section 1.9.1, part-6 of BNBC.

Observation-12: Non-engineered structure (Wastage Shed).



Description: Lack of lateral stability system (strut and bracing), apparent inadequate members and non-engineered connection was observed. The building engineer is required to check the member, connection & stability system of the structure and suggest proper alternatives accordingly.

Observation-13: Lack of design report (Gate House).



Description: As per BNBC, every building or structure designed shall have its design documents prepared in accordance with the provision of Section 1.9.1. During inspection, the design report and as built structural drawing was not available on site.

The building engineer is required to prepare a set of design documents including as built drawings, live load plan at roof and a design report based on in-situ material strength and software-based analysis which shall be prepared in compliance with section 1.9.1, part-6 of BNBC.

3. Action Plan

Observation	Action Plan	Timeline
Columns appear to exceed Euler force. (Main Production Building).	The building engineer is required to update the DEA documents.	within 6 weeks
	Carry out suggested remedial works if required.	within 6 months
Inconsistency in DEA documents. (Main Production Building).	The building engineer is required to survey the full structure and produce accurate as-built drawings.	within 6 weeks
	Incorporate all the concrete core test report.	within 6 weeks
	The building engineer is required to review the DEA documents based on in-situ material strength & software-based analysis and submit the documents to RSC for review.	within 6 weeks
	Produce and manage the load plan as per BNBC.	within 6 weeks
	Implement the floor loading plan	within 6 months
Non-structural elements not anchored or braced (Main Production Building)	Building engineer is required to adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC.	within 6 weeks
Column susceptible to vehicle impact (Main Production Building)	The factory engineer is required to take necessary measures to prevent the vehicle impact by providing barrier around the columns.	within 6 months
Discrepancies in as built drawings. (Admin Building)	The building engineer is required to survey the full structure and produce accurate as-built drawings.	within 6 weeks
	The building engineer is required to revise the design documents based on actual site condition.	within 6 months
Lack of edge protection (Admin Building).	Building is required to provide edge protection on the roof and stair to avoid falling hazard.	within 6 weeks
Exposed re-bar at roof. (Admin Building).	All exposed reinforcement is to be protected from corrosion which may cause degradation of the concrete.	within 6 weeks
Discrepancies in as built drawings. (Warehouse Building)	The building engineer is required to survey the full structure and produce accurate as-built drawings.	within 6 weeks
	The building engineer is required to revise the design documents based on actual site condition.	within 6 months

Lack of edge protection (Warehouse Building).	Building is required to provide edge protection on the roof and stair to avoid falling hazard.	within 6 weeks
Exposed re-bar at roof. (Warehouse Building).	All exposed reinforcement is to be protected from corrosion which may cause degradation of the concrete.	within 6 weeks
Lack of Design Report. (Utility Building)	The building engineer is required to prepare a set of design documents including as built drawings and a design report as per BNBC	within 6 weeks
	Carry out remedial works if required.	within 6 months
Non-engineered shed. (Wastage Shed)	The building engineer is required to check the member, connection & stability system of the roof shed and suggest proper alternatives accordingly.	within 6 weeks
	Carry out suggested remedial works.	within 6 months
Lack of Design Report. (Gate House)	The building engineer is required to prepare a set of design documents including as built drawings and a design report as per BNBC	within 6 weeks
	Carry out remedial works if required.	within 6 months