

AKH ECO APPARELS LTD.

- Extended Buildings

495, Balitha, Shahbelishwer, Dhamrai, Dhaka-1800

(23.9166 N, 90.1136 E)

07 September 2021



Buildings Information

1. Building-03 (Warehouse) (G+3)
2. Building-09 (Dinning & Store) (G+3)
3. Shed-11 (Wastage Management Area, Left over Goods, Vehicle Spare parts store)
(Single Storied)

Observations

Design report needs to be revised

1.3 Material Specifications

This chapter provides property information for materials, frame sections, shell sections, and links.

1.3.1 Materials

Table 1.1 - Material Properties - Summary

Name	Type	E lb/in ²	ν	Unit Weight lb/ft ³	Design Strengths
4000Psi	Concrete	3604996.5	0.2	150	$F_c=4000$ lb/in ² $F_y=45100$ lb/in ² $F_u=57000$ lb/in ²
A416Gr270	Tendon	28500000	0.2	490	$F_y=60000$ lb/in ² $F_u=90000$ lb/in ²
A615Gr60	Rebar	29000000	0.3	490	$F_y=60000$ lb/in ² $F_u=90000$ lb/in ²

Table 1.2 - Material Properties - Concrete

Name	E lb/in ²	ν	α 1/F	G lb/in ²	Unit Weight lb/ft ³	Unit Mass lb-in ³ /in ³	F_c lb/in ²	Lightweight ?
4000Psi	3604996.5	0.2	5.5E-06	1507081.88	150	4.662	4000	No

Table 1.3 - Material Properties - Rebar

Name	E lb/in ²	α 1/F	Unit Weight lb/ft ³	Unit Mass lb-in ³ /in ³	F_y lb/in ²	F_u lb/in ²
A615Gr60	29000000	5.5E-06	490	15.23	60000	90000

Table 1.4 - Material Properties - Tendon

Name	E lb/in ²	α 1/F	Unit Weight lb/ft ³	Unit Mass lb-in ³ /in ³	F_y lb/in ²	F_u lb/in ²
A416Gr270	28500000	5.5E-06	490	15.23	245100	270000

DESIGN REPORT

PROJECT NAME: 5- STORIED STORAGE BUILDING OF AKH ECO APPARELS LTD.

LOCATION: 495- BALITHA SHAH-BELUSHWER, DHAMRAI, DHAKA.

OWNER: MD. SHAMSUL ALAM, MANAGING DIRECTOR, AKH ECO APPARELS LTD.

PREPARED BY -

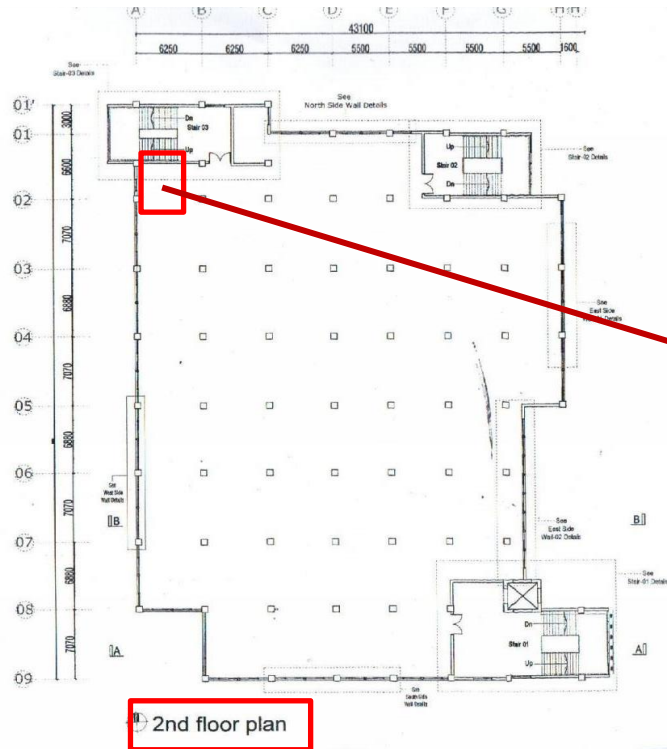
ENGR. MD. NAZRUL ALAM
ENGR. TAIJUR RAHMAN
&
ENGR. MRIDUL HASAN, PEng.

Material specification in FEM model from the Design Report

Design Report

A design report has been provided which was prepared using a FEM based analysis model. However, the model has not been provided for review. In addition, the details calculation of concrete strength evaluation not provided in the design report. Also, concrete strength in cylinder test reports did not meet the equivalent criteria of BNBC 5.6 and 5.12. Building engineer is required to update the design report in compliance BNBC-2006, Part 6, Section 1.9.1.1. And, submit along with software-based analysis model for review.

Mismatch between architectural and as-built condition



Architectural plan of second floor



This toilet zone with built-up (200 mm) in north-east corner is not shown in architectural drawing.

Non-engineered shed over staircase



Non-engineered shed over staircases



Apparently inadequate member & poor connection details

Water ponding due to poor roof drainage system



Water ponding observed on roof. Poor roof drainage system observed. Building engineer is required to improve the roof drainage system.

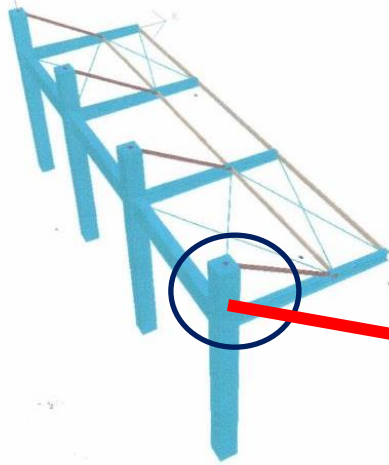
Possible vehicle impact on column



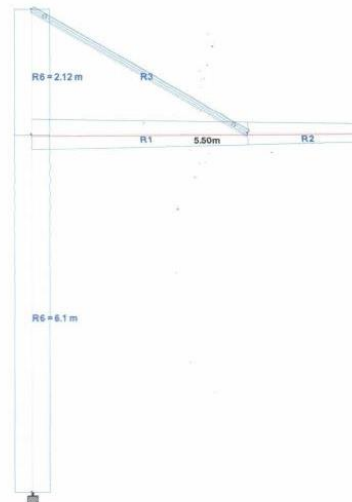
Loading-Unloading bay columns not protected from traffic collision prone to damage. Provide vehicle impact protection to the susceptible column.

Irregular load path of the Canopy

Canopy For (A.K.H GROUP)



3D



Typical Section



Connection between steel rafter and the brick façade wall.

Two end beams are shown connect to column in the design report but, they were connected to brick wall in as-built condition. Hence, the load path is not regular. Building engineer is required to check the adequacy of the connection of canopy.

**Adequacy of foundation & RC member
not addressed in design report**

DESIGN CALCULATION

FOR
BBS-19(04) -881

PROJECT: 4 STORIED FINISHED GOODS WAREHOUSE
CLIENT: AKH ECO APPARELS LTD.
LOCATION: HEMAYETPUR, SAVAR, BANGLADESH

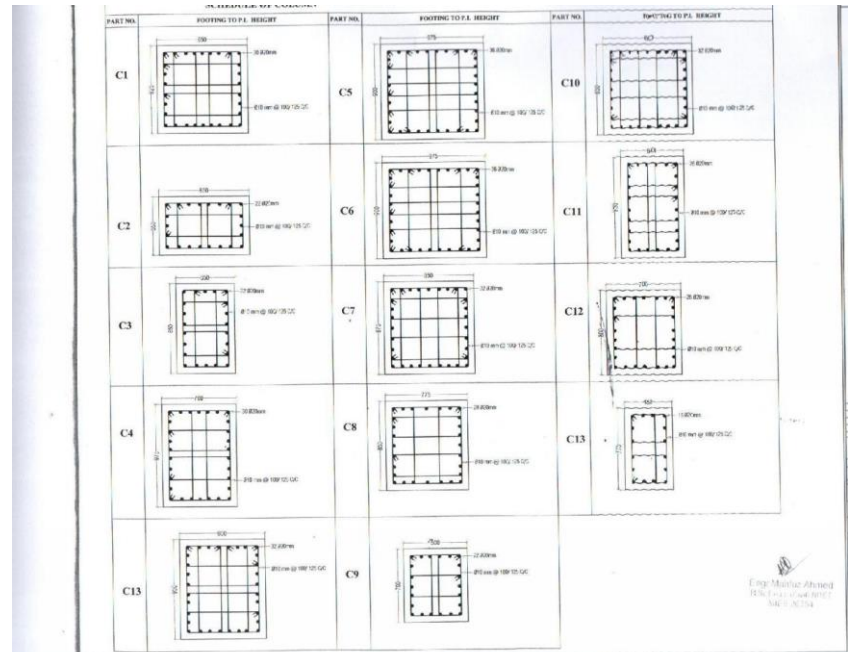
DATE: 07.12.2019

SUBMITTED BY:

BANGLADESH BUILDING SYSTEMS LTD.

CONFIGUR BEPARY TOWER, GA/64, 3RD FLOOR,
PROGOTI SHARANI MIDDLE BADDA, DHAKA-1212
E-mail: info@bbspeb.com

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Adequacy of foundation & RC member not address in design report. Building engineer is required to prepare design report in compliance with section 1.9.1.1 (part 6 BNBC).

Corrosion in steel member



Corrosion observed at several location in the dinning area. Building engineer is required remove the rust from the steel member and apply rust proofing to the steel member.

Lack of lateral stability system



Load transfer media/compression strut not provided in long direction. Therefore, no obvious lateral stability system in long direction. Building engineer is required to check the lateral stability system of the shed.

Sagging of roof bracing



Sagging observed in roof bracing. Building engineer is required to tighten the roof bracing.

Problems Observed

Building-03 (Warehouse)

- Item-1: Design report needs to be revised.
- Item-2: Mismatch between architectural and as-built condition.
- Item-3: Non-engineered shed over staircase.
- Item-4: Water ponding due to poor roof drainage system.
- Item-5: Possible vehicle impact on column.
- Item-6: Irregular load path of the Canopy

Building-09 (Dinning & Store)

- Item-7: Adequacy of foundation & RC member not address in design report.
- Item-8: Corrosion in steel member.

Shed-11 (Wastage Management Area, Left over Goods, Vehicle Spare parts store)

- Item-09: Lack of lateral stability system
- Item-10: Sagging of roof bracing

Priority Actions

Item No.	Observation	Recommended Action Plan	Recommended Timeline
01	Design report needs to be revised (Building- 03)	Building engineer is required to update the design report in compliance BNBC-2006, Part 6, Section 1.9.1.1 which is required to be submitted along with software-based analysis model for review.	6-weeks
02	Design report needs to be revised (Building- 03)	Carryout remedial works if required.	6-months
03	Mismatch between architectural and as-built condition (Building- 03)	Building engineer is required to update the architectural drawing.	6-weeks
04	Non-engineered shed over staircase (Building 3)	Building engineer is required to check the connection adequacy of the roof member for lateral load.	6-weeks
05	Non-engineered shed over staircase (Building 3)	Carryout remedial works if required.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
06	Water ponding due to poor roof drainage system (Building 3)	Building engineer is required to improve the roof drainage system.	6-months
07	Possible vehicle impact on column (Building -03)	Provide vehicle impact protection to the susceptible column.	6-weeks
08	Irregular load path of the Canopy (Building- 03)	Building engineer is required to check the adequacy of the connection of canopy.	6-weeks
09	Irregular load path of the Canopy (Building- 03)	Carryout remedial works if required.	6-months
10	Adequacy of foundation & RC member not address in design report (Building- 09)	Building engineer is required to address the adequacy of foundation & RC member in design report which is required to prepared in compliance with section 1.9.1.1 (BNBC-2006, Part 6).	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
11	Adequacy of foundation & RC member not address in design report (Building- 09)	Carryout remedial works if required.	6-months
12	Corrosion in steel member (Building- 09)	Building engineer is required remove the rust from the steel member and apply rust proofing to the steel member.	6-months
13	Lack of lateral stability system (Shed- 11)	Building engineer is required to check the lateral stability of the shed.	6-weeks
14	Lack of lateral stability system (Shed- 11)	Carryout remedial works if required.	6-months
15	Sagging of roof bracing (Shed- 11)	Building engineer is required to tighten the roof bracing.	6-weeks