

Bando Eco Apparels Ltd.

Plot # 188/2, Block- GA, Chanpur, Amin Bazar, Savar, Dhaka 1348, Bangladesh

(23.790602, 90.315780)

21st November 2017





Observations



Discrepancies between provided drawings and on site condition



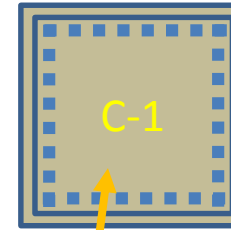
COLUMN SCHEDULE (f'c=5,000 psi, fy=70000 psi)

Type	Size	Reinforcement Detail	1st Floor & 1st Deck	2nd Floor & 2nd Deck	3rd Floor & 3rd Deck
C1	30" x 30"	32-25mm	30" x 30"	30" x 30"	30" x 30"
C2	30" x 30"	28-25mm	30" x 30"	30" x 30"	30" x 30"
C3	30" x 30"	28-25mm	30" x 30"	30" x 30"	30" x 30"

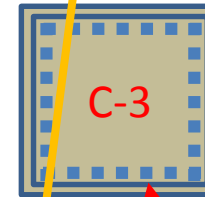
Column Schedule

Reinforcement detected by Ferro Scanning internal and external columns in Production Building (Building-1) appears to be different than shown in the structural drawings. Building engineer to verify number and diameter of rebars at least at two sides by removing plaster and concrete cover at typical columns before commencing future construction.

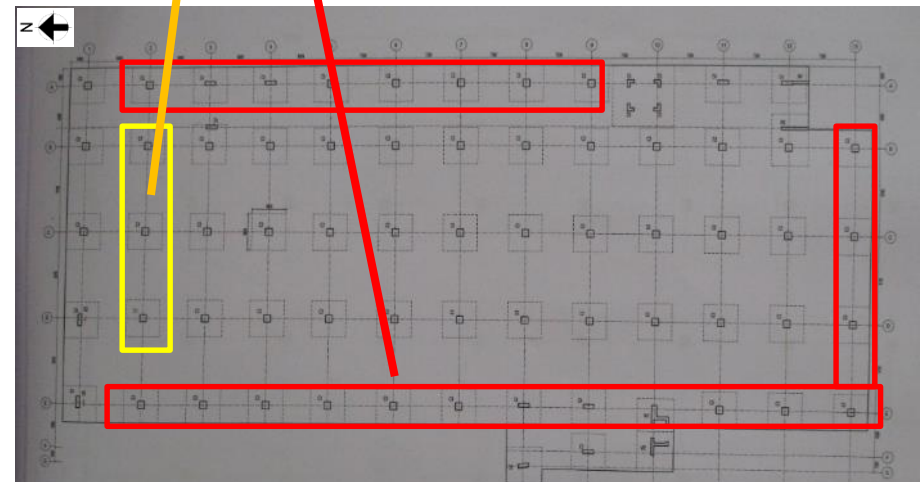
Observed by ferro scan at Ground Floor



28 rebars
(8 rebars on each face)



24 rebars
(7 rebars on each face)

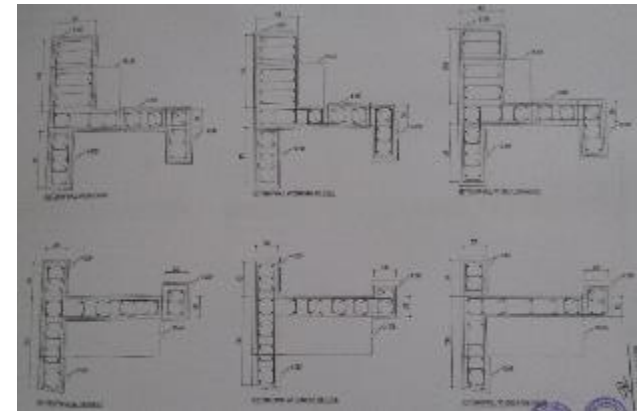


Column layout plan

Observations: Production building



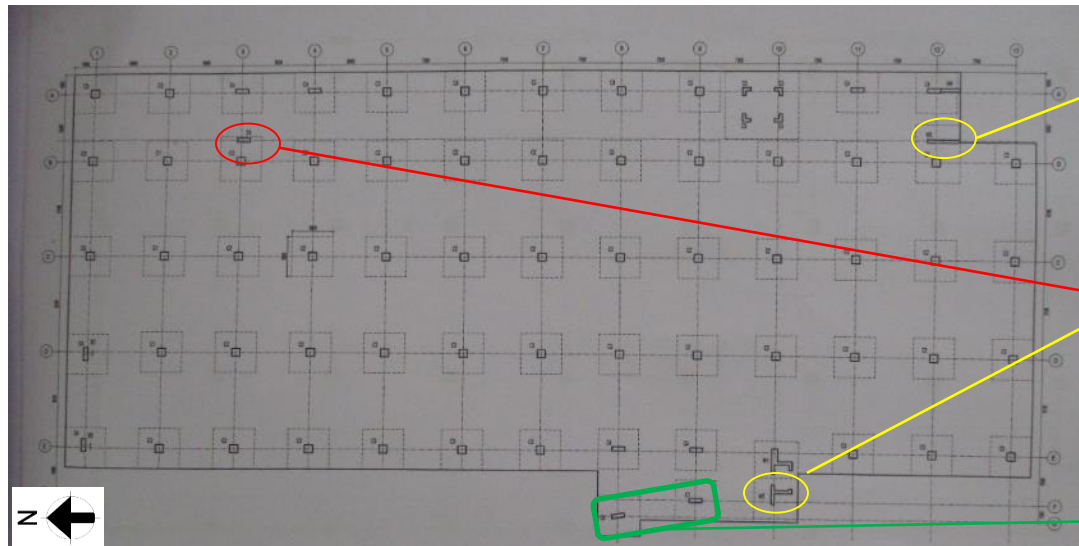
No details were found in column schedule for C6 & C7 type column. Size & number of rebar of shear wall didn't match with provided drawings. On grid-3 an extra column was found. No foundation system is shown on drawings for the additional column. So the load path and foundation system of the extra column is required to be investigated by the factory engineer.



Details of shear wall



Shear wall



Column layout plan



C-6 & 7 Column



Extra Column



Prepared design report to be verified

5 kpa floor loading

2 kpa floor loading

Floor load plan of Building-1

Factory engineer has prepared design report for Building-1 (B+7) considering maximum 6 kpa allowable floor live load. Compressive strength (f'_c) of column concrete considered 5000 psi in FEM model but no concrete cylinder test report for column was shown. Factory engineer to be verified in-situ concrete strength for columns and revise the design report following BNBC provision. Factory is required to maintain the floor live load maximum 3kpa until completion of revised design report.

During inspection over loading was not observed and FoS calculation for internal column was found satisfactory considering 3 kpa allowable floor live loading.

For 250mm brick wall considered 4.8 kN/m^2 and for 125mm partition wall considered 2.4 kN/m^2 . This load multiply by the wall height & input as a line load on beam where brick wall as shown in architectural plan.

6.2 Live Load (L):
This load is the weight of movable objects like machines, furniture, and human. Analysis has been carried out base on following values.

Floor	Design Live Load
Ground floor	6.0 kN/m^2
1 st floor to 6 th floor	6.0 kN/m^2
Roof	5.0 kN/m^2
Stair case	5.0 kN/m^2

6.3 Wind Load (W):
This calculation presents the automatically generated lateral wind loads for load pattern WindX according to UBC 94, as calculated by ETABS.

Exposure: A (according to BNBC-2006)
Enclosure type: Enclosed
Importance factor = 1.0
Building length, $L = 86.75\text{ m}$
Building width, $B = 36.70\text{ m}$
Building height, $h = 35.70\text{ m}$
Overall pressure coefficient, $C_{p, wind} = 1.133$
Overall pressure coefficient, $C_{p, lee} = 1.439$

Wind speed = 210 km/hr
Exposure: A (according to BNBC-2006)
Enclosure type: Enclosed
Importance factor = 1.0
Building length, $L = 86.75\text{ m}$
Building width, $B = 36.70\text{ m}$
Building height, $h = 35.70\text{ m}$
Overall pressure coefficient, $C_{p, wind} = 1.133$
Overall pressure coefficient, $C_{p, lee} = 1.439$

This calculation presents the automatically generated lateral wind loads for load pattern WindX according to UBC 94, as calculated by ETABS.

Exposure Parameters
Exposure From = Diaphragms
Exposure Type = Exposure B
Wind Direction = 0 degrees
Basic Wind Speed, $V = 130\text{ mph}$

Windward Coefficient, $C_{q, wind}$ [UBC Table 16-H] $C_{q, wind} = 1.1334$
Leeward Coefficient, $C_{q, lee}$ [UBC Table 16-H] $C_{q, lee} = 0$

Top Story = Penthouse
Bottom Story = Basement Floor
Include Parapet = No
Factors and Coefficients
Importance Factor, I_s [UBC Table 16-K] $I_s = 1$

Lateral Loading
Wind Stagnation Pressure, q_s [UBC Table 16-F] $q_s = 0.00256V^2 \geq 10\text{ psf}$ $q_s = 43.264$
Design Wind Pressure, P [UBC Eq. 18-1] $P = (C_{e, wind} C_{q, wind} + C_{e, lee} C_{q, lee}) q_s / I_s$

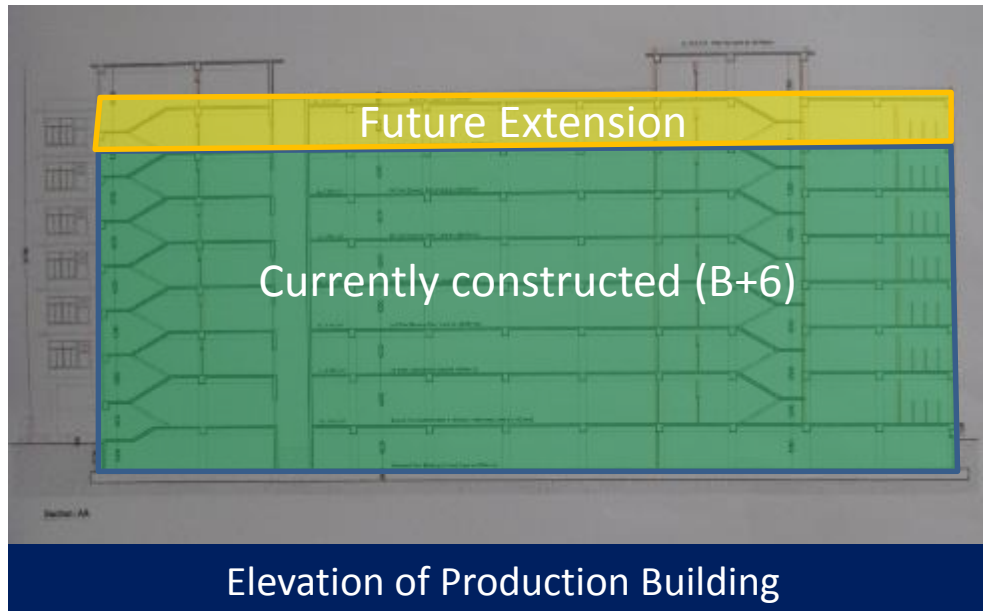
Md. Nazmul Alam
BSc Engg. (Civil), BUET
FEB, P-4180



Future extension to be carried out



As building columns are extended on roof. There is a probability to extend the building vertically up to 8 storied (B+7) as per proposed drawings. Factory engineer is required to carry out a Detail Engineering Assessment considering BNBC provision prior to any extension work.

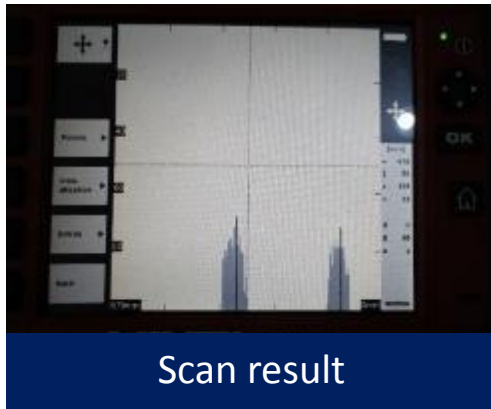




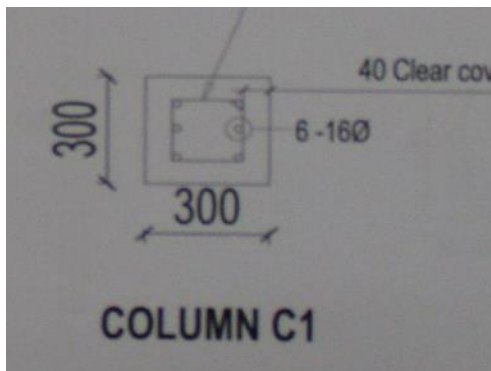
Mismatch in drawings



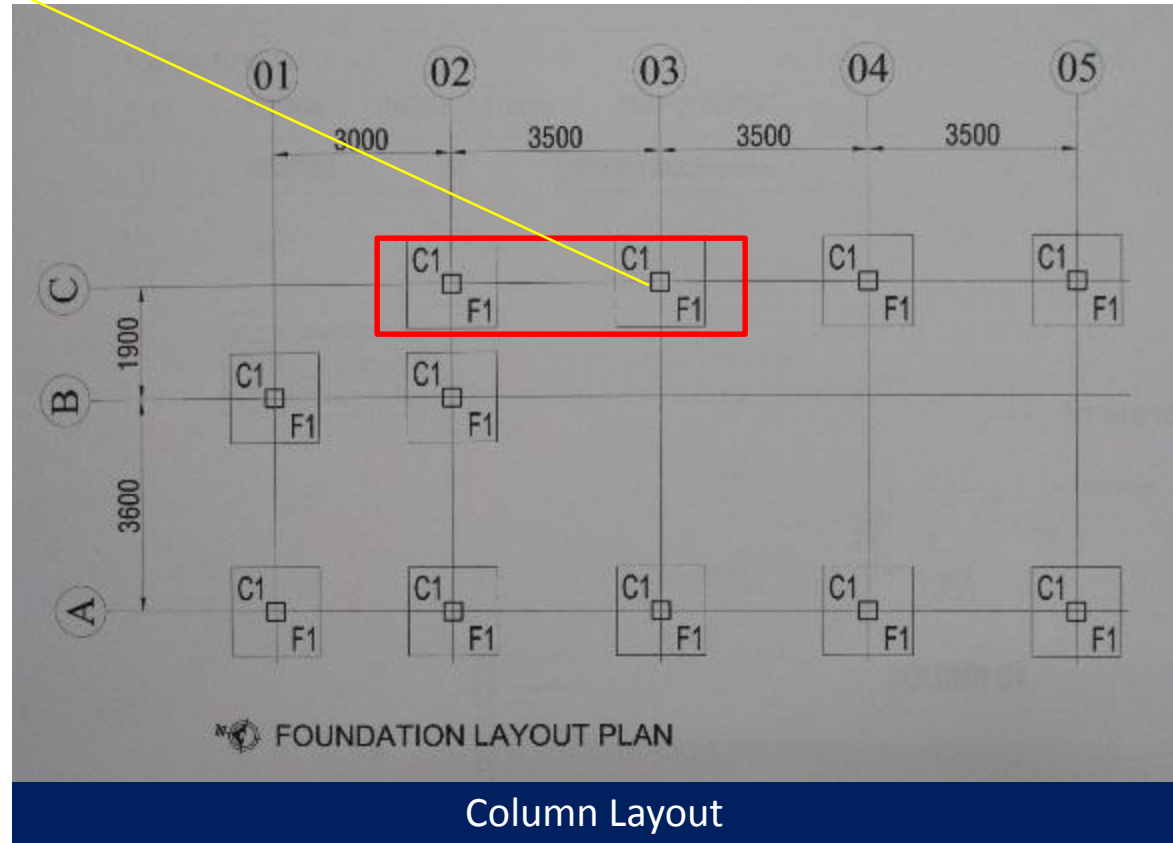
Tested column



Scan result



Number of rebar at corner column didn't matched with as-built condition. 6 number of rebar were shown in column schedule whereas 4 rebar were found by ferro scanning.



Column Layout



Problems Observed

Production Building:

Item-1: Discrepancies between provided drawings and on site condition

Item-2: Prepared design report to be verified.

Item-3: Future extension to be carried out.

Health & Child care:

Item-4: Mismatch in drawings.



Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	(Production building) Discrepancies between provided drawings and on site condition	Building engineer to verify number and diameter of rebar on at least two sides by removing plaster and concrete cover of columns.	6-weeks
2	(Production building) Discrepancies between provided drawings and on site condition	Building Engineer to survey as-built structure and prepare accurate as-built survey information for the building.	6-weeks
3	(Production building) Discrepancies between provided drawings and on site condition	Building Engineer is required to investigate the foundation system of the additional columns. Also load path of the additional columns are required to verify.	6-weeks
4	(Production building) Prepared design report to be verified	Verify in-situ concrete strength for columns	6-weeks
5	(Production building) Prepared design report to be verified	Complete the review of design report with Accord.	6-weeks
6	(Production building) Future extension to be carried out	In case of extension, factory engineer to be carried out further analysis and update design report following BNBC requirement.	6-weeks
7	(Health & Child care) Mismatch in drawings	Prepare update as-built documentation confirming rebar details for Health & Child care.	6-weeks