

P.N. Composite Limited (Extension)

Ambabh, Konabari, Gazipur
(24.020049, 90.321249)
11th & 17th October 2021



Building Information

New Dyeing Building (G+3)

New Knitting Building (G+5)

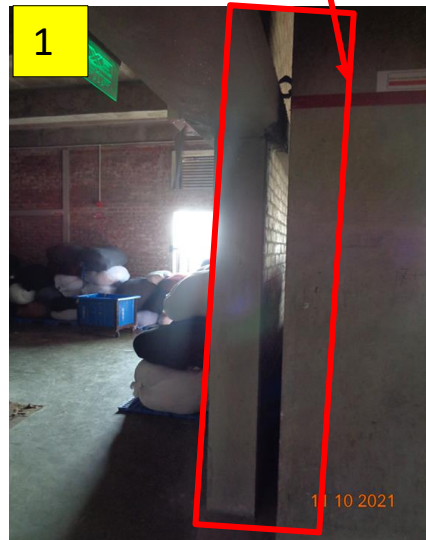
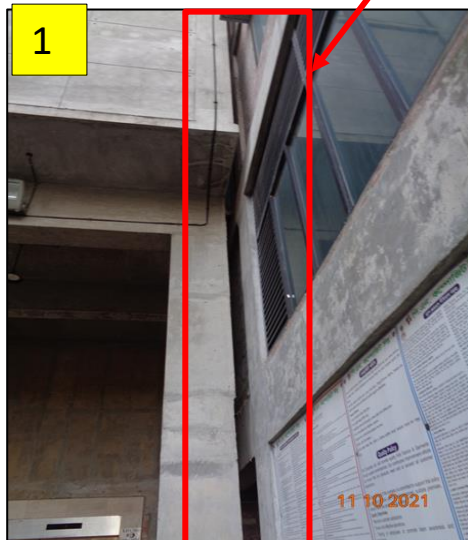
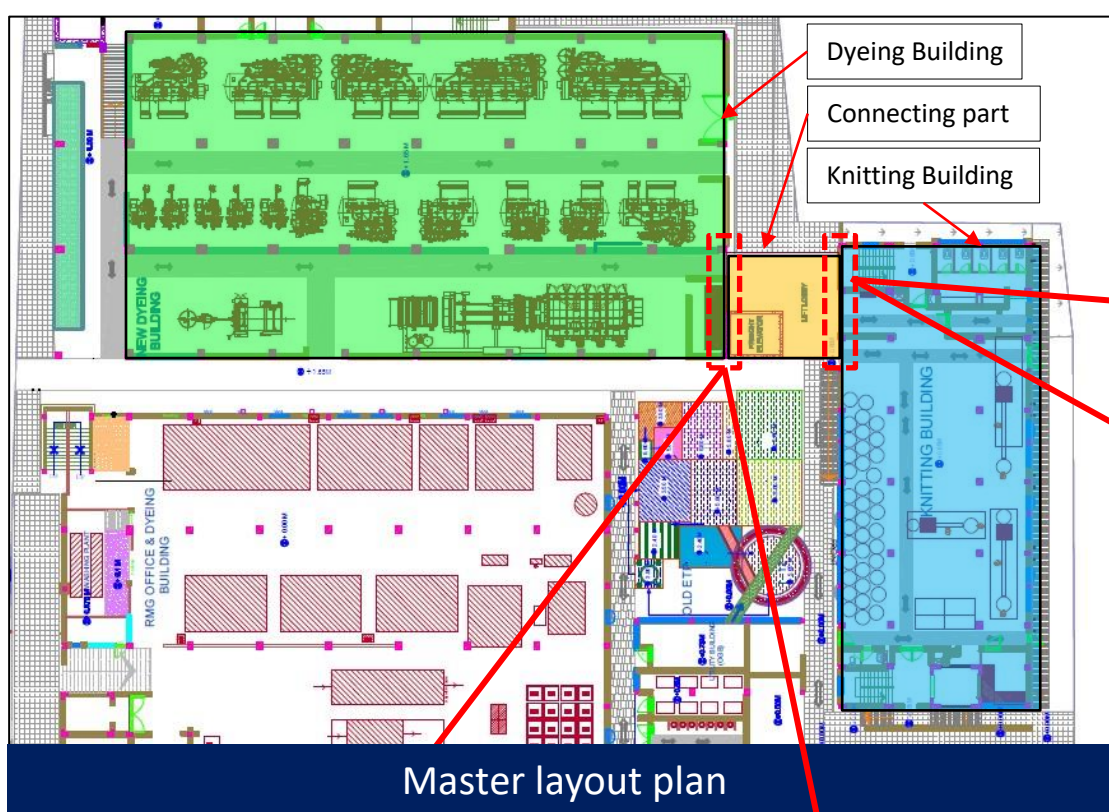
Connecting Part (G+4)

Chemical Dispensing Unit (G+1)

New Boiler & Fire Pump (G)

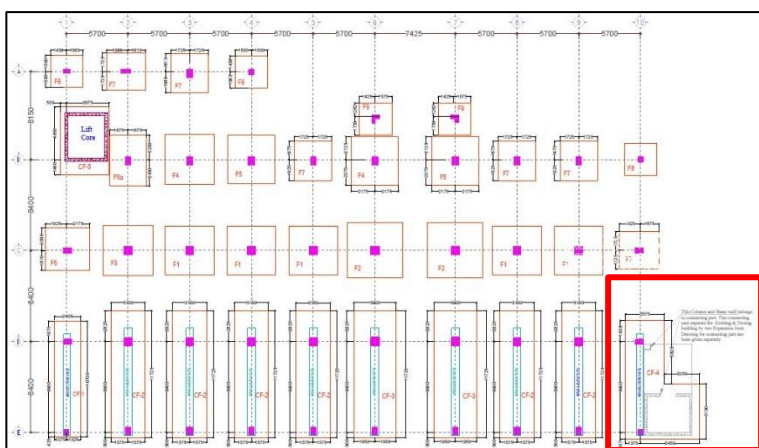
Observations

Design report needs to be revised for New Dyeing Building, Connecting part & Knitting Building.

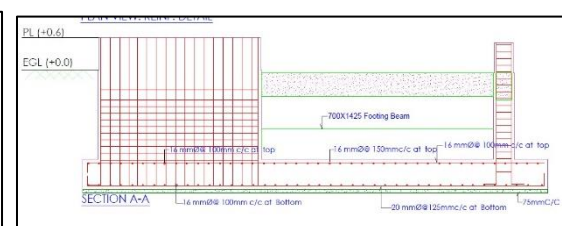
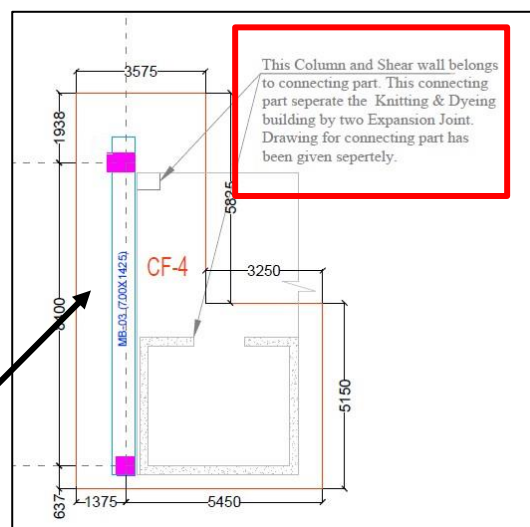


Expansion joints was found among the structures.

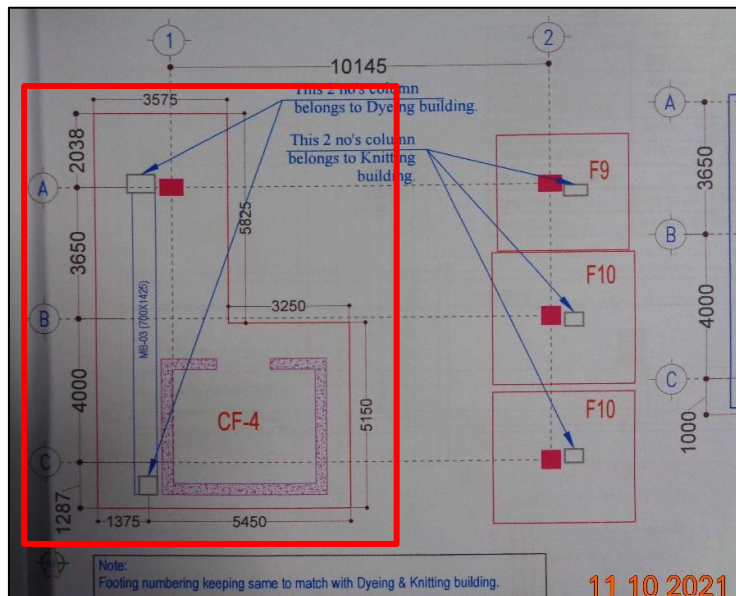
1. Expansion joint between connection part and Dyeing building.
2. Expansion joint between Connection part and knitting Building.



Foundation layout plan –Dyeing Building



Depth of footing from EGL not shown in the section details of footing. So, this is not clear whether the foundations are overlapping or shearing same footing



Foundation layout plan for the Connecting part

The combined footing named “CF4” denoted for both structure but load value found different in adequacy check table.

Table 4.1.4a: Footing review summary

ETABS Column No	Footing No.	Total Load, Kip	Existing Footing Area, sft	Required footing Area, sft	FOS	Observation
C1+Lift Foundation	CF4	1800	602	310.345	4.85	OK
C2	F9	635	124.4444	109.483	2.84	OK
C3	F10	528	154.1111	91.034	4.23	OK
C4	F10	614	154.1111	105.862	3.64	OK

Foundation adequacy check for connecting part

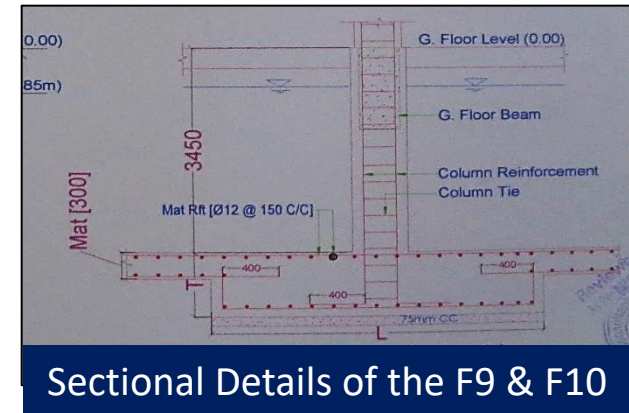
Column No (ETABS)	Footing No.	Total Axial Load, Kip	Existing Footing Area, sft	Required footing Area, sft	FOS	Observation
C46						
C47						
C48	CF4	527.71	314.26	90.93	8.64	OK
C49						
C50						
C52						

Foundation adequacy check for Dyeing Building

Table 4.1.5a: Footing review summary

Column No	Footing No.	Total Axial Load, Kip	Existing Mat Area, sft	Mat Capacity (Mat Area X Bearing Capacity)	FOS
All Column Grid 1 to 9 & A to B	Mat Foundation	17774.88	5868	34034.400	14.500

In the foundation adequacy table, capacity of MAT foundation has been shown.



Sectional Details of the F9 & F10

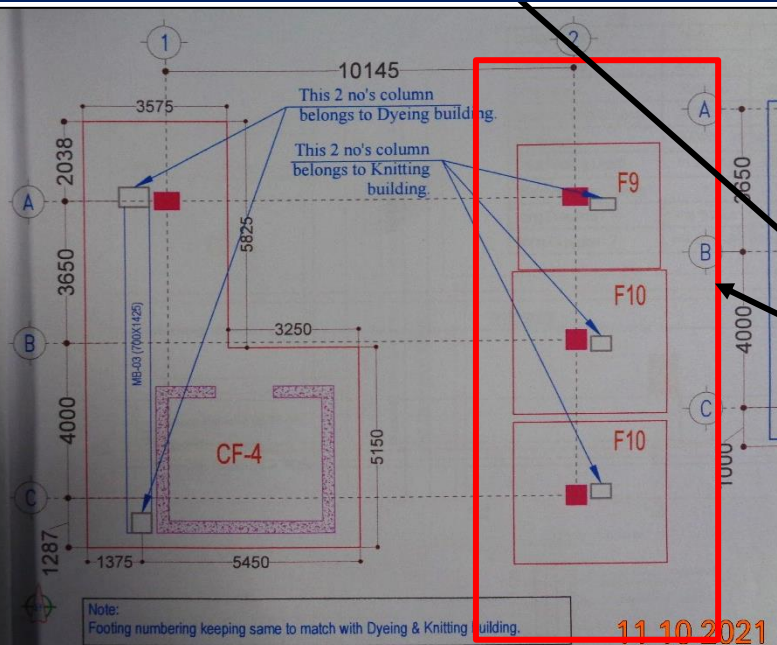
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C3	F10	528	154.1111	91.034	4.23	OK
C4	F10	614	154.1111	105.862	3.64	OK

Foundation adequacy check for connecting part

This is not clear whether the foundations of connecting part & knitting building are overlapping or shearing same footing.

Footing layout plan for the knitting building



Foundation layout plan -Connecting part

JULY
2020

P.N COMPOSITE LTD.
Building Name: Knitting Building
Wings Name: North Wing
Address: Karmabi, Gazipur
(24.0201N, 90.03227E)

DESIGN REPORT STRUCTURAL



Cover page of Detail
Engineering Assessment
(DEA) report

4.1.4 Foundation Review:

Foundation type is mat foundation as per provided structural design for North Wing (shown in Miscellaneous, Appendix IV).

In available design & drawing, foundation thickness is variable 24" to 32" and depth is 10ft from EGL to footing top for North Wing.

North Wing: As per soil test report (year 2015) in Appendix IV: Miscellaneous:

Soil Type at foundation depth: Light Brown medium dense silty fine sand	Ref: Soil Test Report in drain condition
Soil bearing capacity at foundation depth: 2.9tsf	Ref: Soil Test Report, F.S=2.5, Table No. 03, Considering boring no.1, 2, 3 & 4 desired depth with minimum bearing capacity. (Appendix IV: Miscellaneous)

Footing analysis & design value is shown in the below Table 4.1.5 based on Live load as a uniformly distributed load in all floor of existing building (BNBC 2006 Standard).

In DEA report, soil bearing capacity was mentioned 2.9 tsf (FS=2.5). But during inspection, no soil test report was found on-site for this structure.

2.2 Material Properties:

2.2.1 Concrete Strength

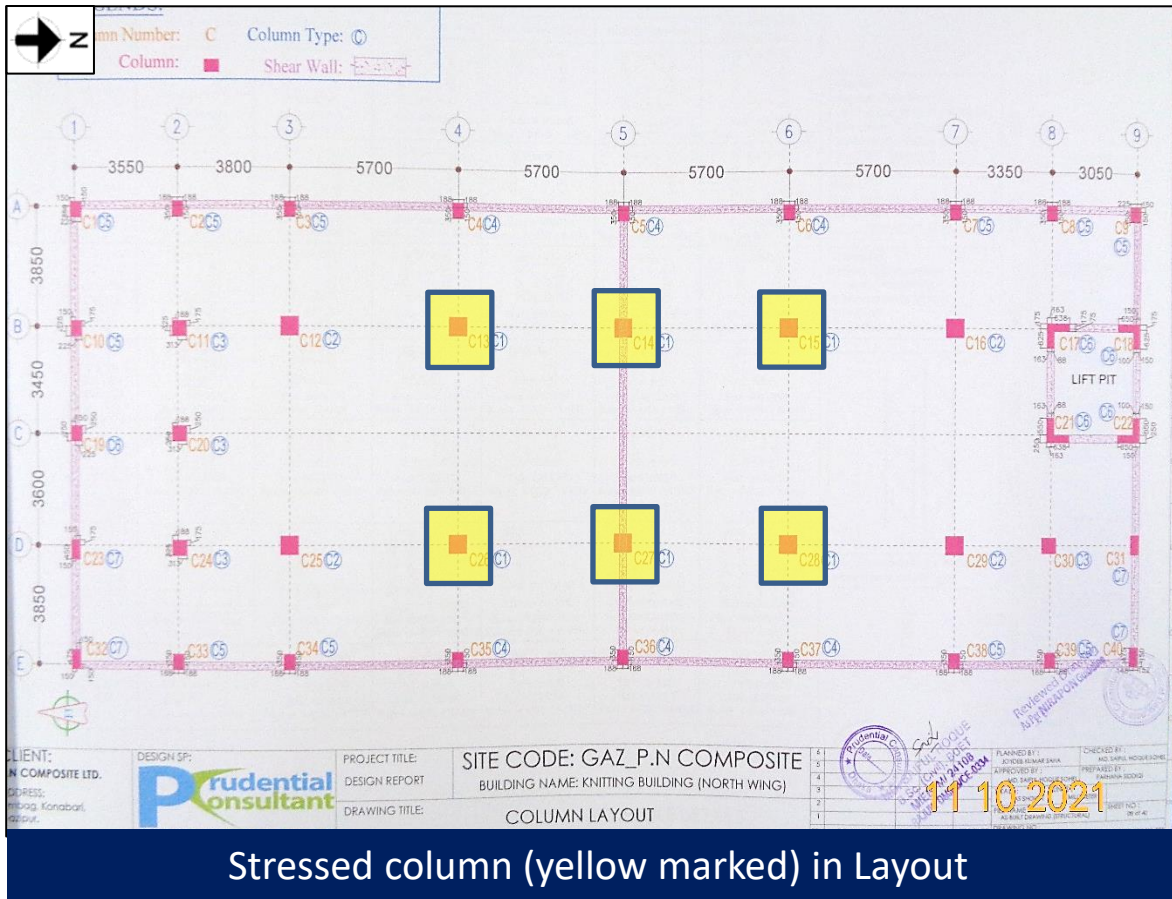
Concrete Strength has been considered as per Design Drawing and values are follows:

Item	Aggregate Type	Concrete Strength, f _c
All Element (Foundation, Column, Shear Wall, Beam & Slab)	Stone Chips	3500 psi (24.137Mpa)

In DEA, concrete strength was mentioned 3500 psi (24.13 MPa). But during inspection, no concrete (cylinder) test report was available.

Factory engineer is required to update the design documents in compliance with section 1.9.1 (part-6, BNBC).

Column to be stressed above normal design limit



Stressed column (yellow marked) in Layout



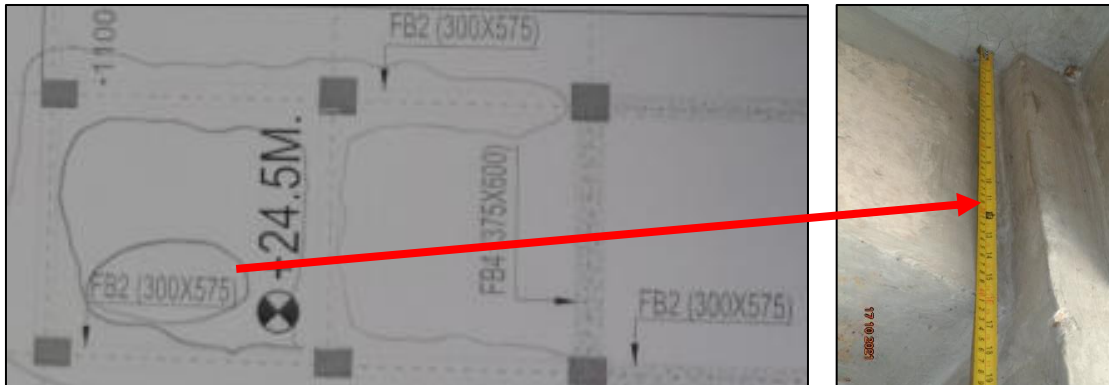
1st floor loading



Floor load plan 10 kPa

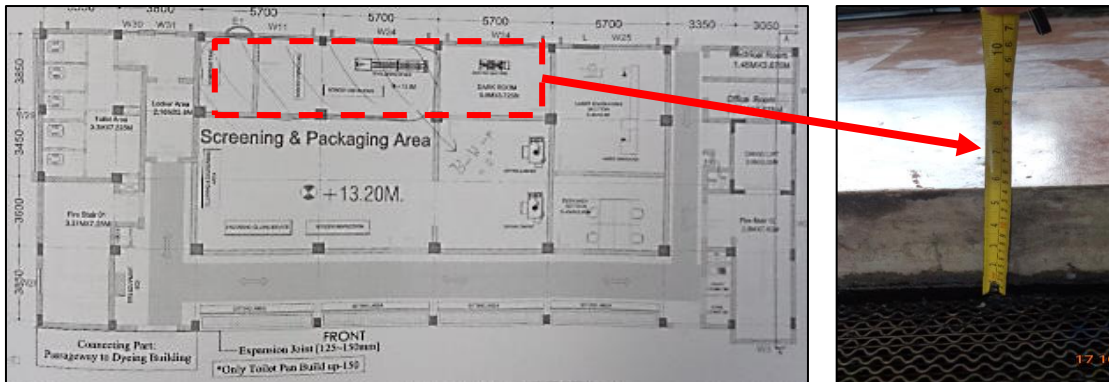
Cursory calculation indicates that the working stress of ground floor column slightly exceeds the normal design limit considering the prepared live load 10 KPa on typical floor, 10 kPa on roof top and minimum concrete strength (16.3 MPa) based on aggregate type. Factory is required to verify the in-situ concrete strength of the building and review design, load & column stress for the area identified above

Discrepancies in as-built drawing



In as-built drawing roof beam was mentioned as 300 mm X 575 mm. Slab thickness in this portion was found 150 mm. But during inspection down stand (d/s) of the roof beam was found 400 mm instead of 425 mm.

Factory engineer is required to update the as-built drawing as per site condition in compliance with section 1.9.1.2 (part-6, BNBC).



During inspection, 50mm build-up was found at 4th floor in screen & packing area. But in as-built drawing no build-up information was mentioned.

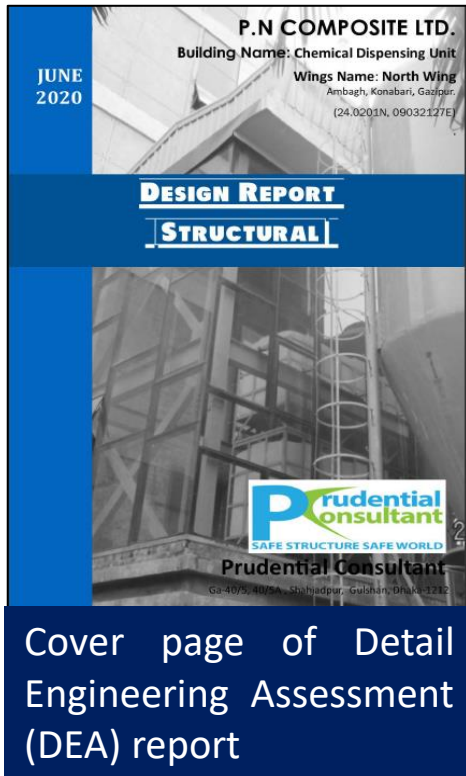
Exposed rebar at roof level



Exposed rebar at roof

Exposed reinforcement was found at roof which is susceptible to corrosion that may be the cause of deterioration for concrete. Factory engineer is required to take necessary measures to prevent the corrosion in exposed rebar.

Design report needs to be revised



Type of Foundation	: Foundation type is Mat & Isolated Footing	Ref.: Designed St. Drawing
Type of soil	: Light Brown medium dense silty fine sand	Ref.: Soil test report from factory. (April-2015)
Bearing Capacity of Soil	: 2.556tsf	Ref.: Soil test report from factory. (April-2015) F.O.S=2.5
Depth of foundation	: 2000mm	

In DEA soil bearing capacity was mentioned 2.556 tsf (FS=2.5). But at the time of inspection no soil test report was found on-site for this structure.

For Reinforced Concrete Section

Item	Aggregate Type	Concrete Strength, f_c
Foundation, Column, Beam & Slab	Stone chips	4000 psi (20.70 MPa)

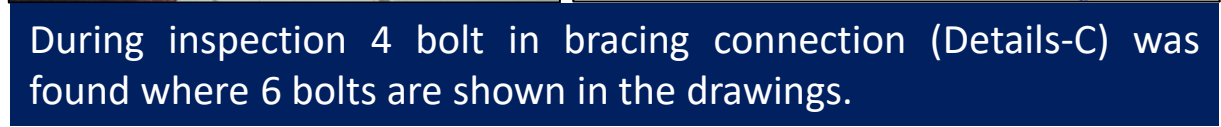
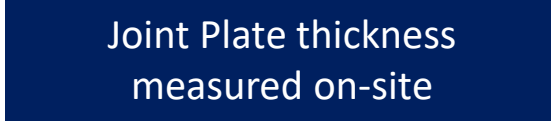
In DEA, concrete strength was mentioned 4000 psi (27.58 MPa). But during inspection no cylinder test report was available on-site.

Factory engineer is required to update the design documents in compliance with section 1.9.1 (part-6, BNBC).

Discrepancies in as-built drawing



Factory engineer is required to survey the structure and prepare accurate as-built drawings.



Connection gap at several locations



Connection gap was found in rafter-column connection

Connection gaps were observed at column rafter joint at several locations. Factory engineer is required to identify the locations and carry out suitable remedial works.

Corrosion in steel member



Corrosion was found in steel column

Corrosion was observed in column at several location. Factory engineer is required to identify the locations and carry out suitable remedial works to protect degradation of the concrete.

Problems Observed

New Dyeing Building, Connecting part & Knitting Building:

Item 01: Design report needs to be revised for New Dyeing Building, Connecting part & New Knitting Building.

New Knitting Building:

Item 02: Column to be stressed above normal design limit

Item 03: Discrepancies in as-built drawing.

Item 04: Exposed rebar at roof level.

Chemical Dispensing Unit:

Item 05: Design report needs to be revised.

Item 06: Discrepancies in as-built drawing.

Item 07: Connection gap at several locations.

Item 08: Corrosion in steel member.

Priority Actions

Item No.	Observation	Recommended Action Plan	Recommended Timeline
01	Design report needs to be revised for New Dyeing Building, Connecting part & New Knitting Building	Factory engineer to verify the foundation system and update as-built structural drawings showing each foundation depth from EGL.	6-weeks
02	Design report needs to be revised for New Dyeing Building, Connecting part & New Knitting Building	Check the foundation adequacy for shared/combined footings considering total imposed loads from adjacent building on it.	6-weeks
03	Design report needs to be revised for New Dyeing Building, Connecting part & New Knitting Building	Factory engineer is required to update the design documents (in compliance with section 1.9.1 of part-6, BNBC).	6-weeks
04	Design report needs to be revised for New Dyeing Building, Connecting part & New Knitting Building	Implement remediation if required.	6-months
05	Column to be stressed above normal design limit	Verify in-situ concrete strength either by existing cylinder strength data or taking minimum 4 number of 100mm diameter cores from the lower tier of the building.	6-weeks
06	Column to be stressed above normal design limit	Factory is required to review design, load & column stress for the area identified above.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
07	Column to be stressed above normal design limit	Update & actively manage the loading plan for all floor plates within the factory considering floor capacity and column capacity.	6-months
08	Column to be stressed above normal design limit	Implement load plan (by posting, height marking & maintaining loadings).	6-months
09	Discrepancies in as-built drawing	Factory engineer is required to update the as-built drawing as per site condition in compliance with section 1.9.1.2 (part-6, BNBC).	6-months
10	Exposed rebar at roof level	Factory engineer is required to identify the locations and all exposed reinforcement is to be protected from corrosion.	6-months
11	Design report needs to be revised	Factory engineer is required to update the design documents in compliance with section 1.9.1 (part-6, BNBC).	6-weeks
12	Design report needs to be revised	Implement remediation if required.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
13	Discrepancies in as-built drawing	Factory engineer is required to survey the structure and prepare accurate as-built drawings with structural details.	6-weeks
14	Connection gap at several locations	Identify the locations and carryout suitable repair works where necessary.	6-weeks
15	Corrosion in steel member	Factory engineer is required to identify the locations and apply corrosion resistance coating to the steel member.	6-weeks