Motex Fashion

802/1, Jajor, National University, Gazipur-1704
23.966722, 90.405533
5 September 2021

RSC RMG SUSTAINABILITY COUNCIL

Buildings Information

Building-1 (Main Building)
Shed-1 (Washing and Sewing)
Shed-2 (Boiler & Winding)
Shed-3 (Warehouse)
Generator shed
Jacquard shed

Observations

Design report to be revised

Observations: Main Building

6.2 Live Load

Live load was assigned in accordance with requirement of Code. In Etabs model Live Load was assigned with Shell Uniform Load Set. The Load sets are as below.

Table 4 Shell Uniform Load Set

Name	Addi-Dead	Dead	FL. Finish	Live	Live Rdc.	Part. Wall	Roof Live
Industrial			25	84		15	
Corridor-Landing			25	100		30	
Roof			25				31
Stair Flight	40		25	100			
Storage	40		25	84		15	

Storage live load 84 psf (4 kN/m2) in design report

Storage at 3rd floor

As per BNBC, the minimum floor live load for light storage is 6 kN/m2 (125 psf). The storage in this building is designed for 4 kN/m2 live loads.
The building engineer is required to revise the storage live load limit based on BNBC requirement and update the load plan and design report accordingly.

Observations: Main Building

8.2 Foundation performance

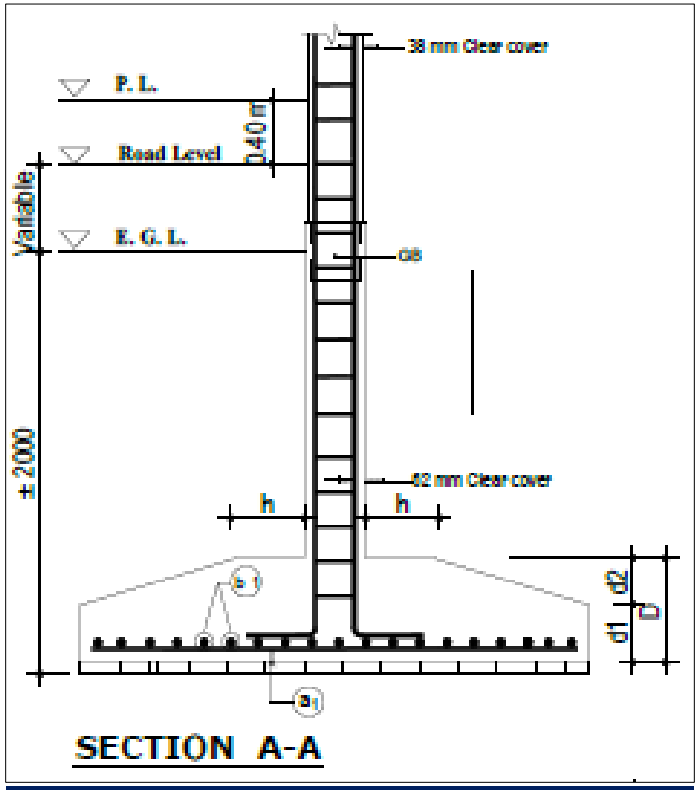
Geotechnical investigations show that the site has an average value of 10 spt at a depth of 10 feet. The structure is designed to be supported by isolated spread foundation. The calculation for foundation size is as bellow.

Table 14 Foundation Size Calculation

Grid	Etabs C ID	Load	Footing No	Length mm	Width mm	Bearing Stress, ksf
A1	C1	171.06	F3	2400	2400	2.67
B1	C4	175.87	F2	2100	2100	3.59
C1	C7	226.77	F3	2400	2400	3.54
D1	C8	296.87	F4	2700	2700	3.67

Footing depth considered in design report 10 feet (3m).

Report: Soil bearing capacity 1.80 tsf at 8 feet (2.4m) depth



Footing depth about 2m (6.56 feet)

5.0 CONCLUSION AND RECOMMENDATION:

CONCLUTION:

The Overall investigation results of the site defines that Shallow & Pile foundation is suitable for the best economic and structurally safe of the Project.

RECOMMENDATION:

This Report is prepared on the basis of SPT & Sample collected from field for the construction of Proposed 06 (Six) Storied Commercial Building At Mouza- Jajhor, J.L No.- 10, Dag No. S.A-382, R.S- 534, Khatian No. S.A- 186, R.S- 142, P.S- Gazipur Sadar, Dist.- Gazipur, Bangladesh.

Shallow Foundation:

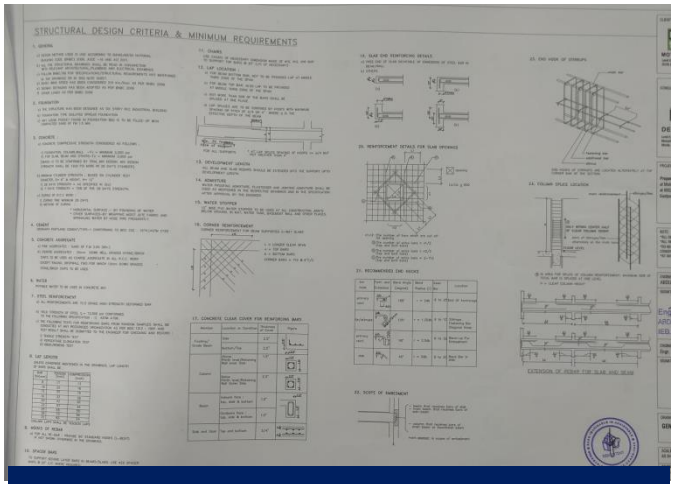
The average bearing capacity of the shallow foundation including isolated column footing may be considered in the following way:

To be considered **1.80 Tsf (F.S=2.5)** at the depth of **8'-0"** measured form E.G.L particularly at and around the test point for BH- 1, 2, 3, 4, 5, 6, 7, 8 only. (table no.3)

As per drawing, isolated footing is provided in 6.56 feet depth. Geotechnical report recommend bearing capacity for 8 feet depth. In the design report, SPT calculated for 10 feet depth and calculated soil bearing stress accordingly. Revise the footing bearing stress calculation as per actual foundation depth.

Observations: Main Building

Insufficient material test reports



Structural drawings

Table 1 Design Strength of Structural Materials

Concrete		
Slab & Beam	: 3000	Psi
Other than Slab & Beam	: 3250	Psi
Steel		
Reinforcing steel	: 72500	Psi

Concrete design strength in Design report

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Department of Civil Engineering
Consultancy Research and Testing Services (CRTS)
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Memo No. : CRTS/CE/74/46 (3) Date : 10 September 2017
Ref. No. : Letter Date : 10 September 2017
Sent by : এ. বি. এম. আবুল্লাহ মূলধুল, এ্যাডমিন এন্ড একাউন্টস ম্যানেজার, মোটেক্স ফ্যাশন
Name of Project : মোটেক্স ফ্যাশন, কাওরা, জয়দেবপুর, গাজীপুর
Type of Specimen : Concrete Cylinder (6"× 12") made with Brick Chips
Sample Location : Roof
Date of Casting : 25 July 2017 (as mentioned)
Date of Testing : 11 September 2017
Mix Ratio : I: 1.5: 3 (as mentioned)
Test Standard : Compressive Strength [ASTM C39]
Samples Received : On 10 September 2017 (Sealed condition)

Report on Compressive Strength Test of Concrete Cylinder

Sample Identification Mark	Age of Specimen	Area of Specimen	Crushing Load	Crushing Strength		Average Compressive Strength		Mode of Failure
	Days	mm^2	kN	MPa	psi	MPa	psi	
1	48	18200.3	249.46	13.71	1987.9	15.03	2180	Combined
2		18859.6	292.59	15.51	2250.0			Combined
3		18778.6	298.20	15.88	2303.1			Combined

Countersigned By :
Chairman
CRTS, Department of Civil Engineering
DUET, Gazipur.

Test Performed By :
12/09/2017
(Md. Monowar Hossain)
Assistant Professor
Department of Civil Engineering
DUET, Gazipur

Note : 1 MPa = 145.035 psi

Cylinder test report: Slab, f'c= 2180 psi

No cylinder test report was available for column. 2 set concrete cylinder sample were taken from two different floor slab. As per test report for one slab, concrete strength (2180 psi) is well below the design strength (3000 psi) mentioned in the design report and structural drawings. Also, rebar strength considered 72,500 psi without any test report.

The building engineer is required to verify in-site concrete strength for column and floor slab by taking minimum 4 number of concrete cores form lower tier of existing column and slabs. Based on in-site concrete strength revise the design, loads and capacity of each structural members.

Observations: Main Building

Uncontrolled loading on 3rd floor.

Observations: Main Building

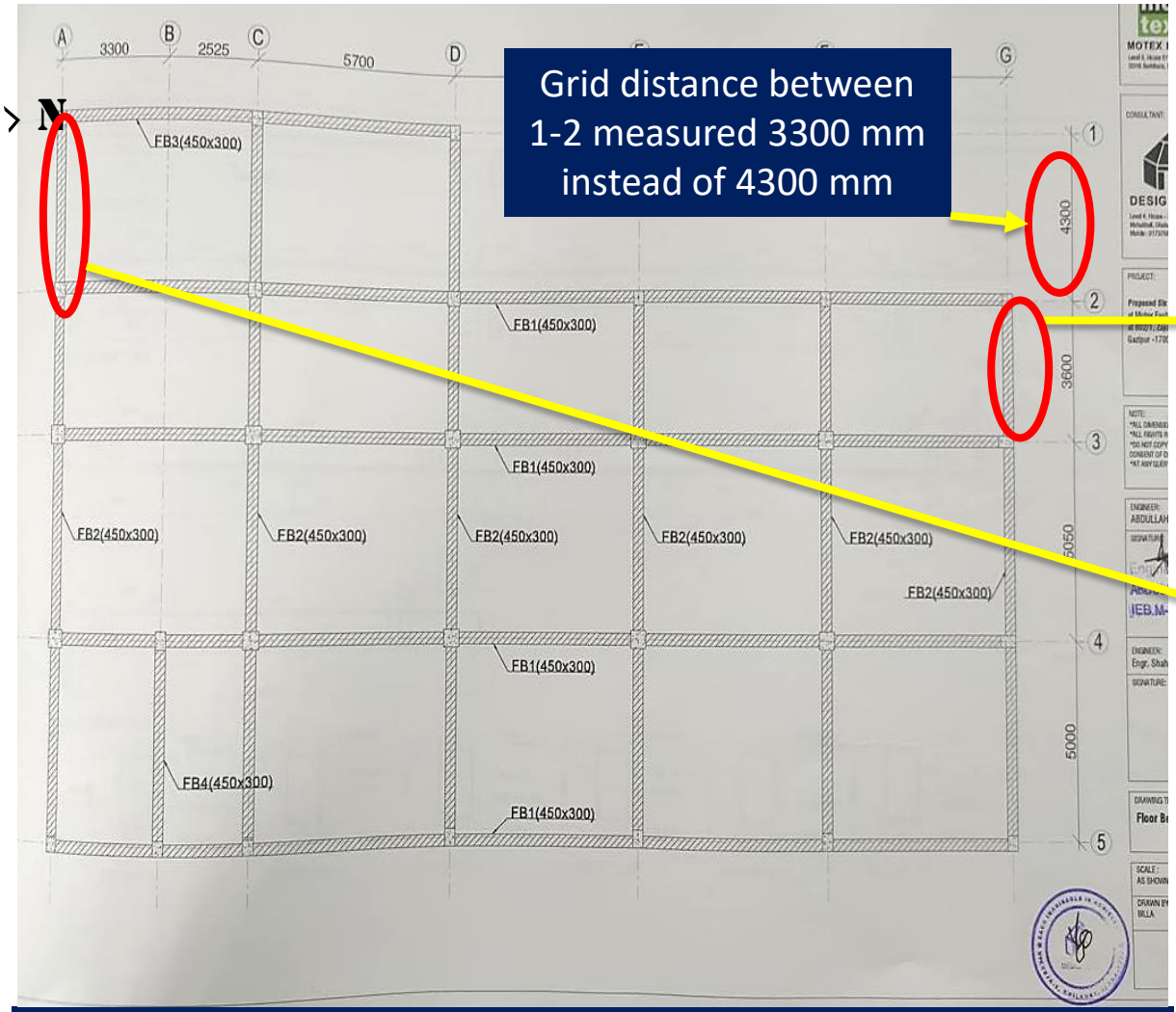
Loading in storage area of 3rd floor.

4 to 5 kPa loading was found in storage area (3rd floor). Also, load management program was not observed. Produce and actively manage a loading plan for all floor plates considering the foundation and column capacity.

Observations: Main Building

Discrepancies in as-built drawing

Observations: Main Building

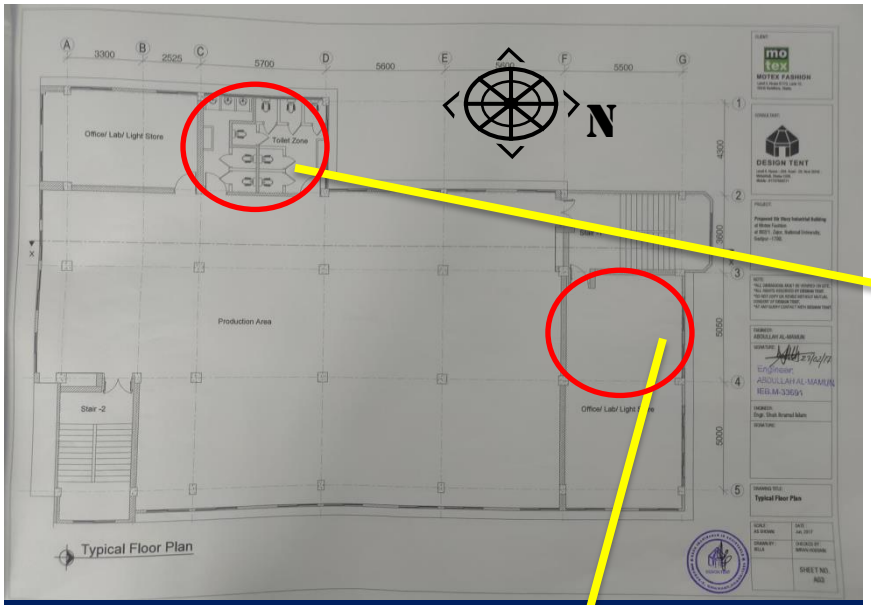


Grid distance between 1-2 measured 3300 mm instead of 4300 mm

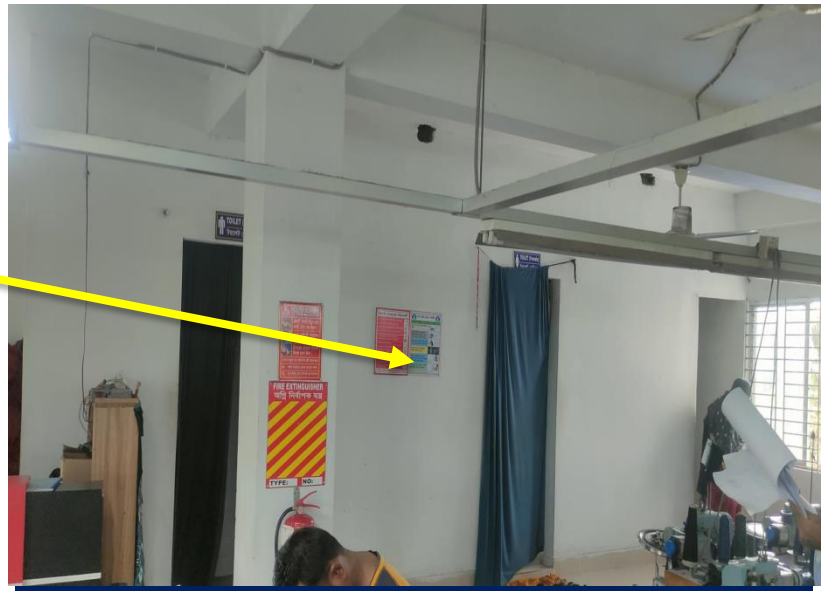
Some stair beams were missing on-site but shown in the provided drawings. Grid distance between 1 and 2 was measured 3300mm instead of 4300mm. Update as-built drawings as per actual as-built condition.

Floor Roof Beam Layout Plan(marked beams are missing)

Observations: Main Building



Typical floor layout plan.



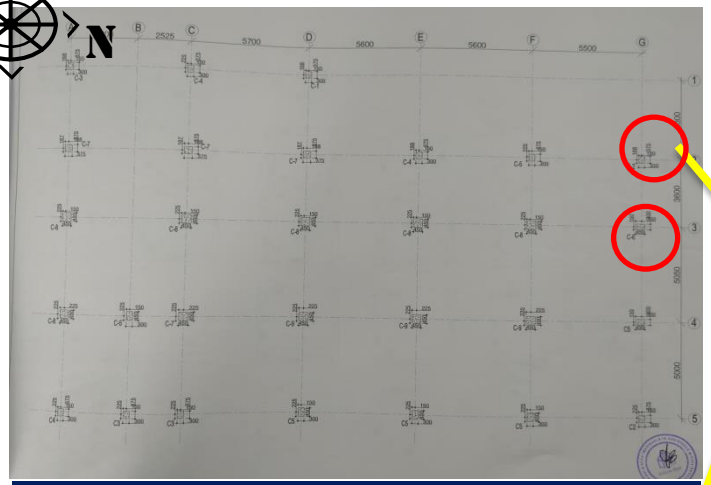
Toilet block

Toilet block and 250mm toilet built-up not shown in drawing.

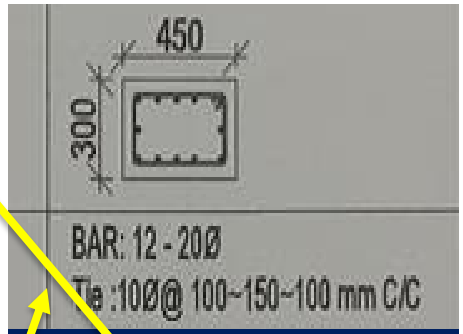
Toilet layout did not match with as-built drawings. Toilet build up was not shown in drawings.

200 mm Toilet built-up.

Observations: Main Building

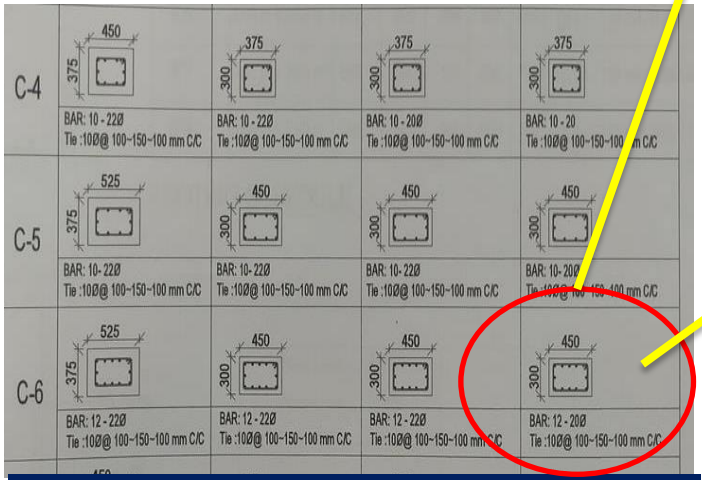


Column layout plan.



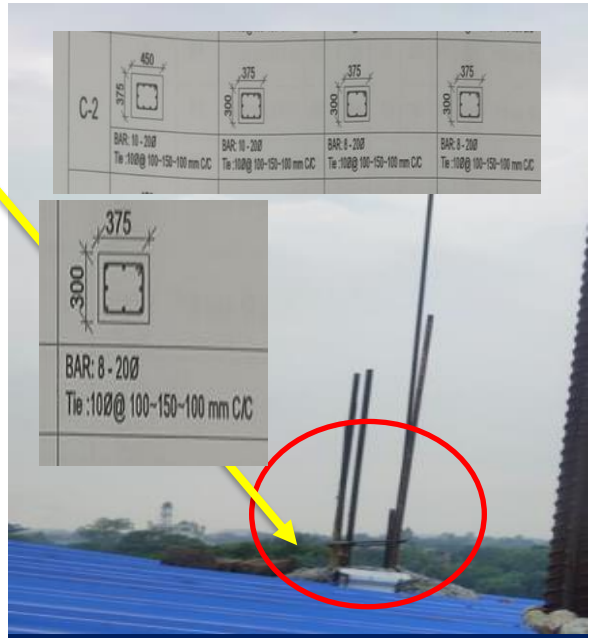
C6 column: 12 numbers of 20mm Rebar shown in drawing.

C6 Column: 8 numbers of 20mm & 2 number 16mm of Rebar counted.



Column schedule

C6 column: Rebar diameter 16mm



C2 type column rebar orientation did not match with drawing.

Observations: Main Building

Exposed rebar & Falling hazard on the roof.

Observations: Main Building

Exposed rebar on roof.

Provide rust proof coating on rebar to prevent from corrosion. And complete parapet wall on the roof.

Corroded rebar

Incomplete parapet wall on the roof

Observations: Main Building

Undocumented plastic water tanks on the roof

Observations: Main Building

3x2000 liter plastic water tanks on the roof

Observations: Main Building

Water stagnant and drainage system on roof

Observations: Main Building

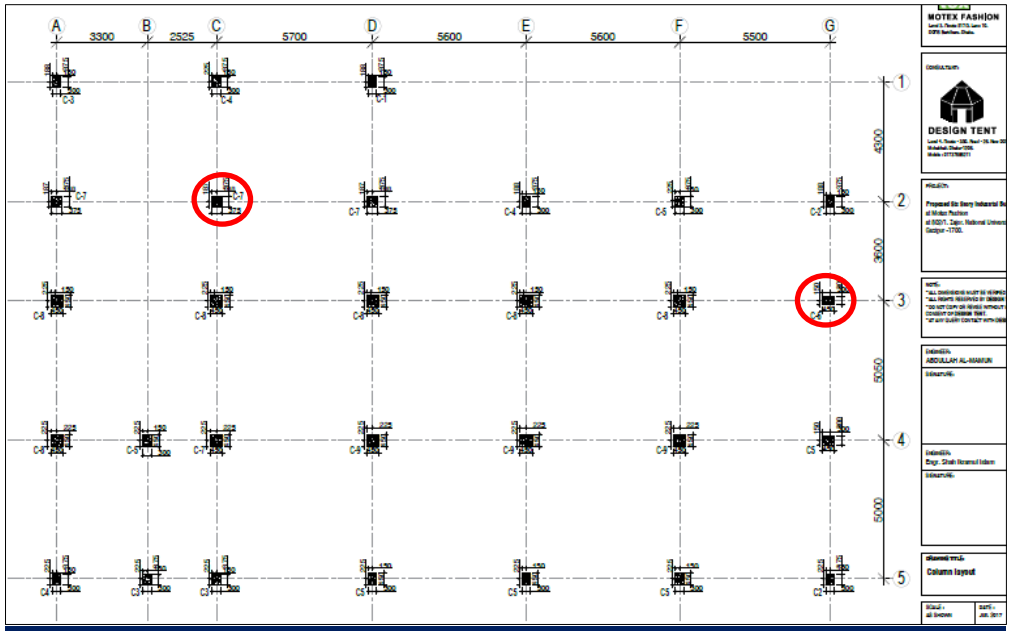
Stagnant water on the roof

Develop proper drainage system with adequate slope on roof.

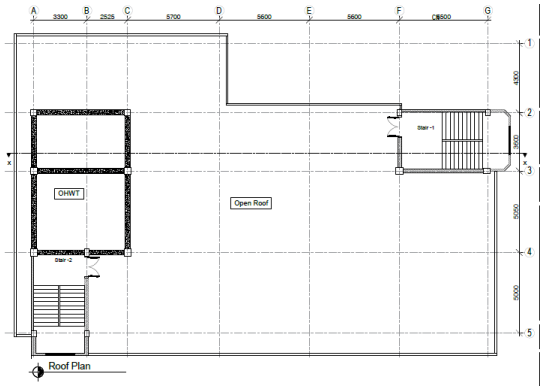
Observations: Main Building

Column and Footing to be over-stressed for proposed 6 storey Building

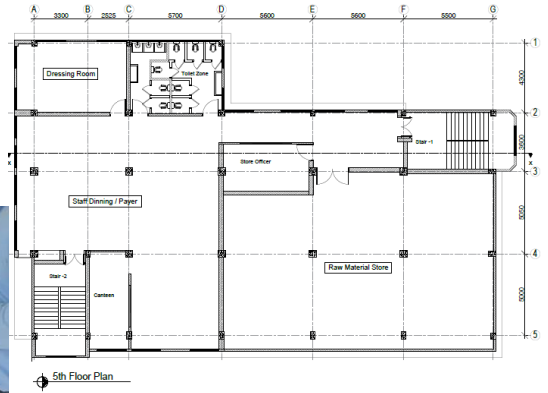
Observations: Main Building



Column & footing at grid C-2 and G-3



Proposed Roof with OHWT



Proposed floor with storage & toilet zone

Extension work on 4th floor

Toilet zone with raise & ceiling

Vertical extension work of this building is going on. Cursory calculation indicates that for proposed 6 storied building the stress in column and footing will be exceeded normal design limit. The calculation is carried out based on minimum concrete strength and proposed floor live load of design report.

Observations: Main Building

Undocumented non engineered sheds

Observations: All Sheds

Problems Observed

Building-1 (Main Building):

Item 1: Prepared design report to be revised.
Item 2: Insufficient material test reports.
Item 3: Uncontrolled loading on 3rd floor.
Item 4: Discrepancies in as-built drawing.
Item 5: Exposed rebar & Falling hazard on the roof.
Item 6: Undocumented plastic water tanks on the roof.
Item 7: Water stagnant and drainage system on roof.
Item 8: Column and Footing to be over-stressed for proposed 6 storey Building

All Sheds (Shed-1,Shed-2, Shed-3, Generator Shed, Jacquard Shed):

Item 9: Undocumented non engineered sheds.

Priority Actions

Problems Observed

Building-1 (Main Building):

Item 1: Prepared design report to be revised.

Item 2: Insufficient material test reports.

Item 3: Uncontrolled loading on 3rd floor.

Item 4: Discrepancies in as-built drawing.

Item 5: Exposed rebar & Falling hazard on the roof.

Item 6: Undocumented plastic water tanks on the roof.

Item 7: Water stagnant and drainage system on roof.

Item 8: Column and Footing to be over-stressed for proposed 6 storey Building.

All Sheds (Shed-1,Shed-2, Shed-3, Generator Shed, Jacquard Shed):

Item 9: Undocumented non engineered sheds.

Item No.	Observation	Recommended Action Plan	Recommended Timeline
01	Prepared design report to be revised. (Building-1: Main Building)	Review the design, loads, columns stresses and prepare a set of design documents including floor live load plan in accordance with BNBC, Section 1.9.1.	6-weeks
02	Prepared design report to be revised. (Building-1: Main Building)	Carry out remedial works if required.	6-months
03	Prepared design report to be revised. (Building-1: Main Building)	Implement floor load management program.	6-months
04	Insufficient material test reports. (Main Building)	Building engineer to take minimum 4 number concrete core of 100 mm diameter from lower tier of the columns.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
05	Insufficient material test reports. (Main Building)	Review the design, loads and stress of the structural members.	6-weeks
06	Insufficient material test reports. (Main Building)	Carry out remedial works if required.	6-months
07	Uncontrolled loading on 3rd floor (Building-1, Main Building)	Maintain floor live loading within 3 kPa in storage area.	6-weeks
08	Uncontrolled loading on 3rd floor (Building-1, Main Building)	Produce and actively manage a floor loading plan for each floor considering foundation & column capacity.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
09	Uncontrolled loading on 3rd floor (Building-1, Main Building)	Implement floor load management program.	6-months
10	Discrepancies in as-built drawings. (Main Building)	Survey the structure and prepare accurate as-built (architectural and structural) drawings in compliance with section 1.9.1.2 as per BNBC.	6-weeks
11	**E**xposed rebar & Falling hazard on the roof. (Main Building).	Provide rust proof coating on the exposed rebar to prevent from corrosion.	6-weeks
12	Exposed rebar & Falling hazard on the roof. (Main Building).	Complete the parapet wall on the roof to prevent falling hazard.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
13	Undocumented plastic water tanks on the roof. (Main Building)	Prepare a floor loading plan considering the plastic water tanks and re-arrange the tanks accordingly.	6-weeks
14	Water stagnant and drainage system on roof. (Main Building)	Develop proper drainage system on the roof with adequate slope.	6-weeks
15	Column and Footing to be over-stressed for proposed 6 storey Building. (Main Building)	Before commencing any extension works the factory is required to carryout Detailed Engineering Assessment (DEA) and required remedial works arise from DEA.	6-weeks
16	Column and Footing to be over-stressed for proposed 6 storey Building. (Main Building)	Carry out necessary remedial works before starting any extension.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
17	Undocumented non engineered sheds. All Sheds (Shed-1,2,3, Generator & Jacquard)	As part of Engineering Assessment EA) building engineer is required to check the connections and stability system of the sheds and suggest proper remedial actions.	6-weeks
18	Undocumented non engineered sheds. All Sheds (Shed-1,2,3, Generator & Jacquard)	Carry out remedial works suggested by the building engineer, otherwise demolish the sheds.	6-months