

Orient Allure Lingerie Ltd. & LZ Textiles Ltd. (Extension Building)

Dewallia Bari, Konabari, Gazipur, Dhaka
(24.011924, 90.309907)

10 October 2021

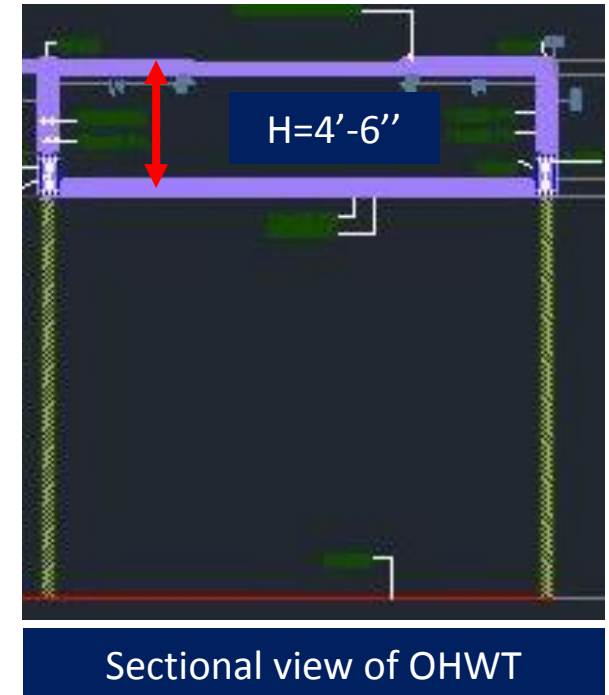


Buildings Information

1. Building-3 (Office Building) (G+4) reinforced concrete (RC) building.
2. Building-2 (Dining Building) (G+5) reinforced concrete (RC) building.

Observations

Mismatch in structural drawings



RC OHWT height was provided 4'-6" (1.37m) in drawing but it was found 5'-4" (1.62m) onsite. Factory engineer is required to revise the structural drawing as per onsite condition. And check the design accordingly.

Discrepancies between drawings and as-built condition (Connecting Bridge)



Mismatch in rafter size at top



Welded connection



Connecting bridge

Rafter size was found 50 mm less than the provided drawing in connection bridge. Also, all the connections with columns were found welded whereas in drawing, all joints were showed bolt connections. Factory engineer is required to revise the drawing as per onsite condition.

7 Observation: Connecting Bridge

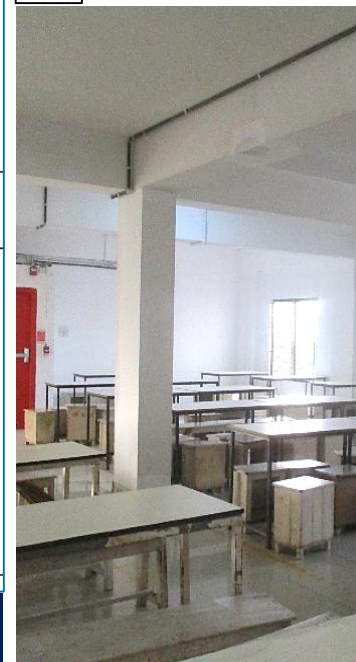
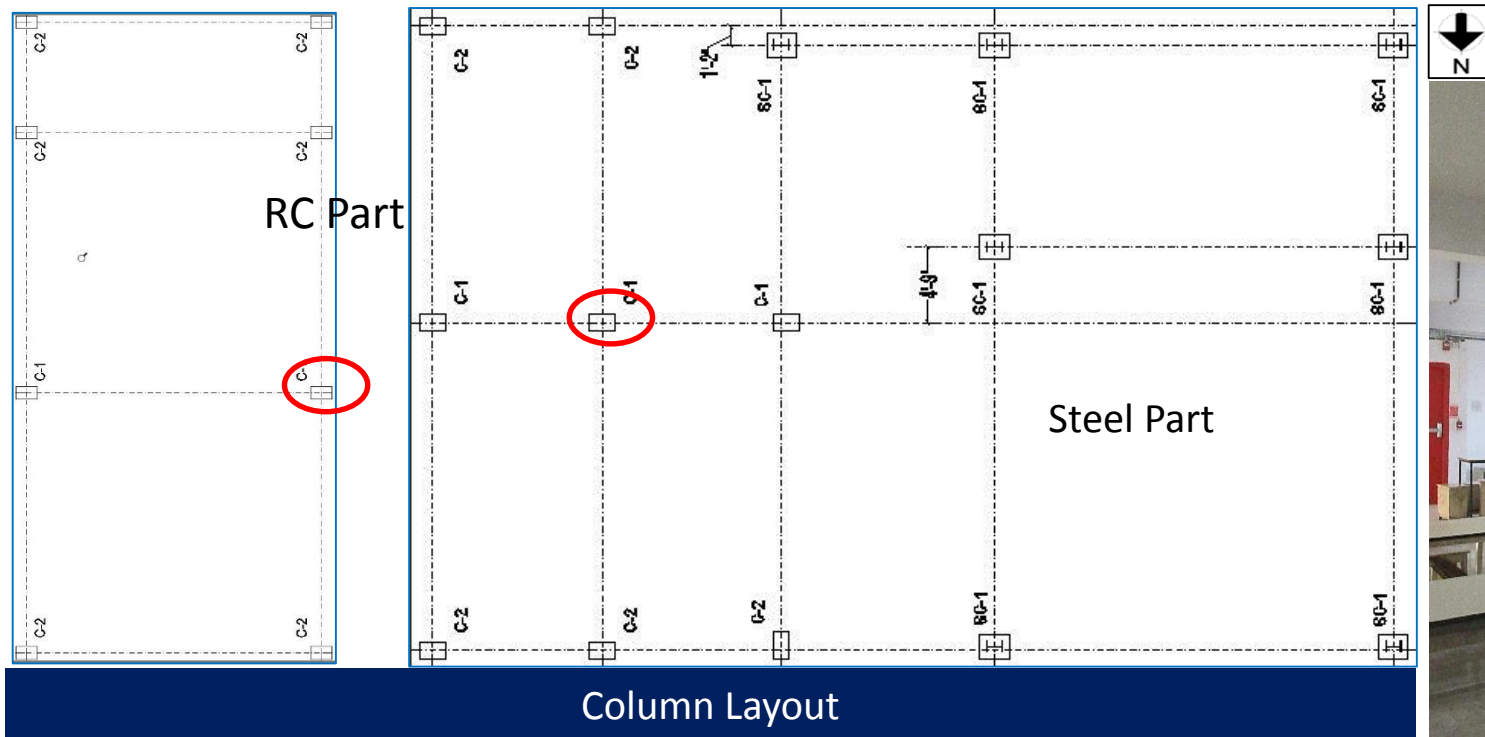
Column susceptible to vehicle impact



Column susceptible to vehicle impact

Some of the columns were found adjacent of driveway of parking & loading unloading platform. These column are susceptible to vehicle impact. The factory engineer is required to take necessary measures to prevent the vehicle impact by providing the barrier around the columns.

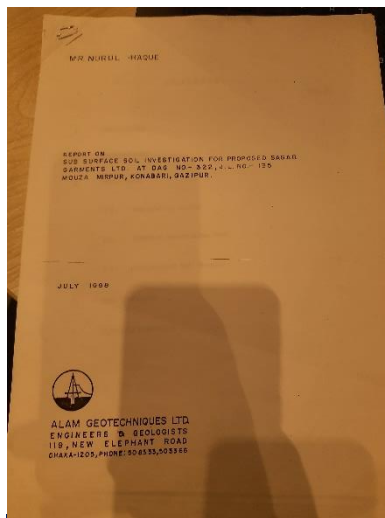
Column stress exceeds normal design limit



Cursory calculation indicate that the working stress of the marked columns exceed the normal design limit considering 3 kPa live load on typical floor, 1.5 KPa live load on roof and 16.37 MPa concrete strength. As part of Engineering Assessment (EA), factory engineer is required to verify the in-situ concrete strength, check the column capacity and suggest proper remedial actions accordingly.

Geotechnical investigation report missing

Observation : Building-2 (Dining Building)

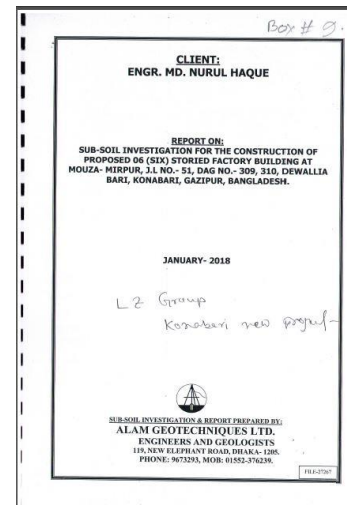


15. PROPOSED FOUNDATION :

From the field and laboratory test results it is concluded that the cohesive deposit encountered at the surface is suitable to support spread footing foundation placed at shallow depth. The allowable bearing capacities of soil at a depth of 2.0 meter below ground level may be taken to be 1.76 Kg/cm^2 for square footing and 1.32 Kg/cm^2 for continuous footing. The above bearing capacities have been calculated from a conservative value of shearing strength of soil by using the formula suggested by Prof. K. Terzaghi and a safety factor of 3.

Result of old geotechnical investigation report

An old geotechnical investigation (soil test) report was available dated (1998). As per bore hole layout of that investigation report, it doesn't cover the area of Building-2. A set of design report of Building-2 was available. In the provided design report, result of a new geotechnical investigation report was used which was not available during inspection. Factory engineer is required to collect the original geotechnical report of this building from concern lab/firm, otherwise conduct further geotechnical investigation in close vicinity of the building and check the foundation adequacy accordingly.



5.0 CONCLUSION AND RECOMMENDATION:

CONCLUSION:

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) Storey Factory Building At Mouza- Mirpur, J.L No.- 51, Dag No.- 309, 310, Dewallia Bari, Konabari, 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 **1.83 Tsf (F.S=2.5)** at the depth of **7'-6"** measured from E.G.L particularly at and around the test point for BH- 1, 8, 7 only. (table no.3)

To be considered **1.99 Tsf (F.S=2.5)** at the depth of **7'-6"** measured from E.G.L particularly at and around the test point for BH- 2, 4 only. (table no.3)

To be considered **1.97 Tsf (F.S=2.5)** at the depth of **7'-6"** measured from E.G.L particularly at and around the test point for BH- 3 only. (table no.3)

To be considered **2.15 Tsf (F.S=2.5)** at the depth of **7'-6"** measured from E.G.L particularly at and around the test point for BH- 5, 6 only. (table no.3)

Result of new geotechnical investigation report

Drainage system at roof



During inspection, signs of water ponding were observed on the roof. Factory engineer is required to improve drainage system to avoid stagnant water ingress into the slab.

Problems Observed

Building-3 (Office Building):

Item 01: Mismatch in structural drawings.

Item 02: Discrepancies between drawings and as-built condition
(Connecting Bridge)

Item 03: Column susceptible to vehicle impact.

Building-2 (Dining Building):

Item 04: Column stress exceeds normal design limit

Item 05: Original Geotechnical Investigation report missing

Item 06: Drainage system at roof

Priority Actions

Item No.	Observation	Recommended Action Plan	Recommended Timeline
01	Mismatch in structural drawings. Building-3 (Office Building)	Factory engineer to survey the structure and produce accurate as-built drawings.	6-weeks
02	Mismatch in structural drawings. Building-3 (Office Building)	Check the design for extra loadings of overhead water tank and update the report accordingly.	6-weeks
03	Discrepancies between drawings and as-built condition. (Connecting Bridge)	Factory engineer to survey the structure and produce accurate as-built drawings with connection details.	6-weeks
04	Column susceptible to vehicle impact. Building-3 (Office Building)	The factory engineer is required to provide proper barrier around the columns to protect from possible vehicle impact.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
05	Column stress exceeds normal design limit. Building-2 (Dining Building)	As part of Engineering Assessment (EA), factory engineer is required to verify the in-situ concrete strength, check the column capacity and suggest proper remedial actions accordingly.	6-weeks
06	Column stress exceeds normal design limit. Building-2 (Dining Building)	Produce and actively manage a loading plan for all floor plates considering floor, column and foundation capacity.	6-weeks
07	Column stress exceeds normal design limit. Building-2 (Dining Building)	The factory engineer is required to prepare a set of design documents for all structures as per BNBC part-6, section 1.9.1	6-weeks
08	Column stress exceeds normal design limit. Building-2 (Dining Building)	Carry out remedial works if suggested in the EA report. Continue to implement the load management plan.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
09	Column stress exceeds normal design limit. Building-2 (Dining Building)	Continue to implement the load management plan.	6-months
10	Geotechnical investigation report missing. Building-2 (Dining Building)	Factory is required to collect original geotechnical report from concern lab/firm, otherwise conduct further geotechnical investigation of soil in close vicinity of the building.	6-weeks
11	Geotechnical investigation report missing. Building-2 (Dining Building)	Geotechnical engineer to calculate ultimate bearing capacity of soil from test data and check the foundation adequacy accordingly.	6-weeks
12	Geotechnical investigation report missing. Building-2 (Dining Building)	Carry out remedial works if necessary.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
13	Drainage system at roof. Building-2 (Dining Building)	Develop drainage system on the roof with adequate slope to protect the roof slab from water ingress.	6-months