Bea-Con Knit Wear Limited (Factory-2) (Extension)

South Salna, Salna Bazar, Gazipur.

(24.0345633493, 90.393227555)

3 December 2023

RMG SUSTAINABILITY COUNCIL

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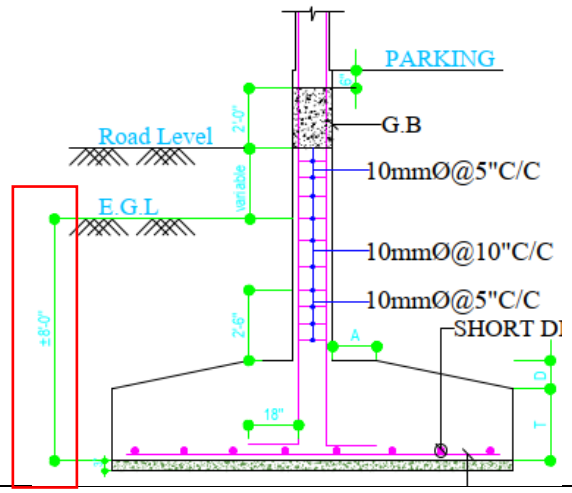
1. Building Information

- Utility building is a three-storied reinforced concrete (RC) building.

2. Observations

Observation 1: Footing is stressed above the normal design limit. (Utility Building)



5.1 Foundation Design

In general foundation for all building has been designed based on superstructur loading, bearing capacity/pile capacity, allowable settlement, and equipmer settlement tolerances.

The foundation design will consider the following:

- Soil bearing and earth pressures
- Allowable settlements
- Equipment, structure, and environmental loads

Types of foundation has been decided on the basis of sub-soil investigation repor type of the structure, construction methodology, condition of the site surrounding are etc.

Soil Test was done by "STANDARD SOIL & FOUNDATION." dated January 2018 (Appendix)

Foundation Type: Footing Foundation

According to Soil test report the foundation Capacity= 2.2 ksf

11.0 CONCLUSION AND RECOMMENDATION

The sub-soil investigation for the construction of proposed **Factory** Building at **SOUTH SALNA, SALNA BAZAR, MONTRIPARA ROAD, GAZIPUR SADAR, GAZIPUR, BANGLADESH.** The sub-soil investigation for the consists of **04 (FOUR)** nos. exploratory boring up to the maximum depth **41** feet from the existing ground level.

The field and laboratory test results of sub-soil investigation up to the maximum depth **41**feet at **BH-1, BH-2, BH-3 & BH-4** are shown in the bore hole chart and test result sheet enclosed here with. The S.P.T. value, bearing capacity, skin-friction and end bearing capacity supplied in the page no. 10 & 11.

On the basis of information available from this geotechnical, it may conclude that shallow footing (Open foundation) will be suitable and economy. This type of footing may be placed **13'-0"** from the existing ground level. The average bearing capacity of soil at **13'-0"** is **1.30** tsf.(F.s.-3.0).

10.0 BEARING CAPACITY OF SUB-SOIL

Bearing capacity of the Shallow Foundation from the Field and Laboratory tests (F.s.=3.0)

Bore Hole No.	Depth in Ft	Field SPT(N)	Corrected SPT(Nc)	Cohesion Tsf	Bearing capacity(Tsf)	
					Continuous footing	For circular or Square footing
BH-1	5	2	2	0.13	0.25	0.33
	8	5	5	0.31	0.63	0.81
	10	2	2	0.13	0.25	0.33
	13	8	8	0.50	1.00	1.30
	15	11	11	0.69	1.38	1.79
	20	15	15	0.94	1.88	2.44
BH-2	5	1	1	0.06	0.13	0.16
	8	5	5	0.31	0.63	0.81
	10	7	7	0.44	0.88	1.14
	13	9	9	0.56	1.13	1.46
	15	12	12	0.75	1.50	1.95
	20	14	14	0.88	1.75	2.28
BH-3	5	2	2	0.13	0.25	0.33
	8	4	4	0.25	0.50	0.65
	10	6	6	0.38	0.75	0.98
	13	8	8	0.50	1.00	1.30
	15	10	10	0.63	1.25	1.63
	20	12	12	0.75	1.50	1.95
BH-4	5	1	1	0.06	0.13	0.16
	8	3	3	0.19	0.38	0.49
	10	8	8	0.50	1.00	1.30
	13	9	9	0.56	1.13	1.46
	15	13	13	0.81	1.63	2.11
	20	14	14	0.88	1.75	2.28

4.2 Material specification:

4.2.1 Structural Steel:

This Building do not have steel structure.

4.2.2 Concrete:

Considered,
Concrete compressive strength, f'c = 4000 psi (For Footing)
Concrete compressive strength, f'c = 4000 psi (For column)

Concrete compressive strength, f'c = 3500 psi (For beam)
Concrete compressive strength, f'c = 3500 psi (For Slab)
Coarse aggregate: Stone chips

4.2.3 Steel Reinforcement:

Yield strength of steel, fy = 60,000 psi

4.2.4 Soil condition:

The foundation has been designed according to Soil test report.

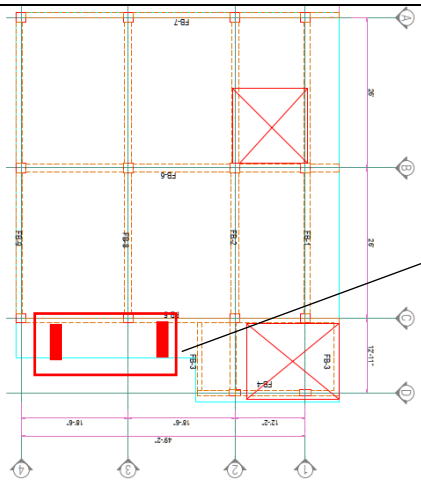
Description: Cursory calculation indicates that footing appears to be stressed above normal design limits considering the soil bearing capacity (1.38 ksf) at 8 feet depth (as per drawing) from E.G.L and footing sizes in the drawing.

Also, the punching stress of footing was found marginally above the normal design limit considering the prepared live load plan of 12 kPa and minimum concrete strength based on aggregate type.

The number of concrete cylinder test reports found on site doesn't comply with the frequency of testing requirements as per BNBC (Part VI, Chapter 5, 5.12.2), but in the DEA report, design strength 4000 psi considered for column and footing, 3500 psi considered for beam and slab.

The building engineer is required to review the adequacy of the footing and confirm the material strength of the foundation. Also, review the design live load of 12 kPa for the building.

Observation-2: Mismatch in as-built drawing. (Utility Building)



Description: During the inspection, a mismatch was found in the beam layout. Marked cantilever beams were not shown in the as-built drawing. Also, on the roof floor, there are 3 nos plastic water tanks and a boiler chimney anchored with RC column and beam which was not mentioned in the as-built architectural drawing. The building engineer is required to survey the full structure and update the as-built drawing and design report accordingly.

3. Action Plan

Sl No.	Observation	Action Plan	Timeline
1.	Footing is stressed above the normal design limit. (Utility Building)	The building engineer is required to review the adequacy of the footing and confirm the material strength of the foundation. Also, review the design live load of 12 kPa for the building.	within 6 weeks
2.	Footing is stressed above the normal design limit. (Utility Building)	Produce and actively manage a loading plan for all floor plates within the factory Building considering floor, column, and foundation capacity.	within 6 weeks
3.	Footing is stressed above the normal design limit. (Utility Building)	Carry out suggested remedial works if required.	within 6 months
4.	Footing is stressed above the normal design limit. (Utility Building)	Implement floor loading plan.	within 6 months
5.	Mismatch in the as-built drawing. (Utility Building)	The building engineer is required to survey the full structure and update the as-built drawing and design report accordingly.	within 6 weeks
6.	Mismatch in the as-built drawing. (Utility Building)	Carry out suggested remedial works if required.	within 6 months