Vertex Innovative Apparels Ltd. (10524)

Forkan Tower, 360/A, Bitak Bazar, Sagorika, Pahartoli Thana, Chittagong

15.MARCH.2014

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Identified Priority 1 Concerns

Low Column Safety Factors

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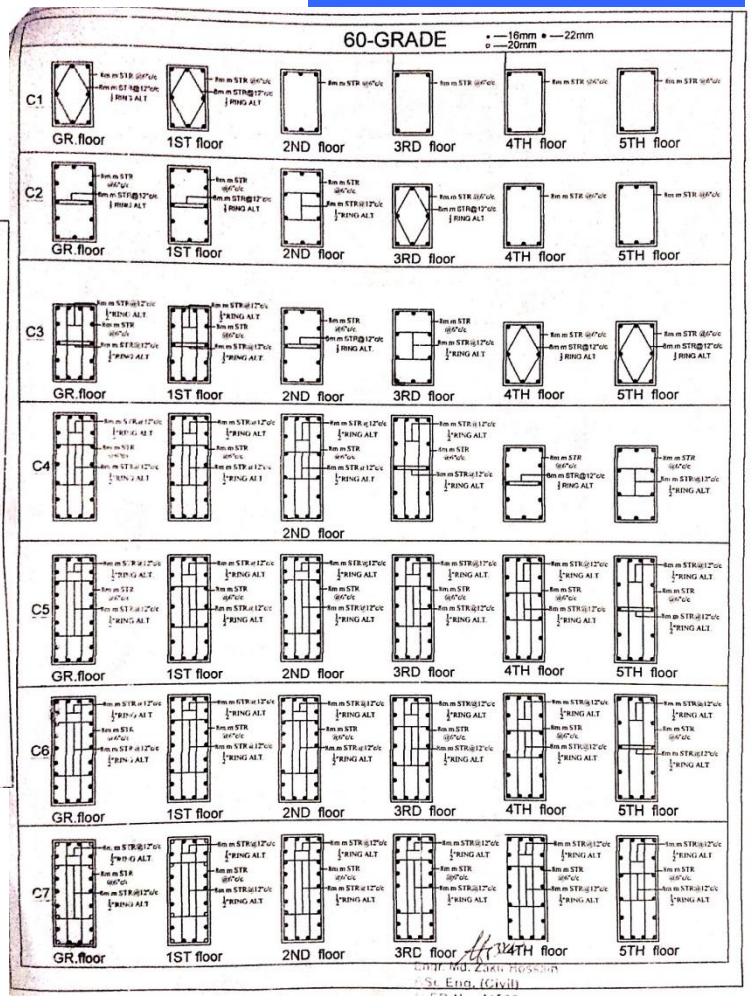
Priority 1 Concern

COLUMN SCHEDULE.

N0	SIZE	REINFORCEMENT (60 GRADE)					
		GR. FLOOR	1ST.FLOOR	2ND.FLOOR	3RD.FLOOR	4TH.FLOOR	5TH.FLOOR
C1	12"X12"	8-16mm	8-16mm	6-16mm	4-16mm	4-16mm	4-16mm
C2	12"X15"	12- 16 mm	12- 16 mm	10- 16 mm	8-16mm	6-16mm	6-16mm
C3	12"X15"	14- 16 mm	14- 16 mm	12- 16 mm	10-16mm	8-16mm	8-16mm
C4	12"X20"	18- 16 mm	18- 16 mm	16- 16 mm	14- 16 mm	12- 16 mm	10- 16 mm
C5	12"X24"	22- 16 mm	22- 16 mm	20- 16 mm	18- 16 mm	16- 16 mm	14- 16 mm
C6	12"X30"	22- 16 mm	22- 16 mm	20- 16 mm	18- 16 mm	16- 16 mm	14- 16 mm
C7	12"X30"	8-20 m.m+ 14-16mm	8-20 m.m+ 14-16mm	22- 16 mm	20- 16 mm	18- 16 mm	16- 16 mm



Column load run-downs indicate lower than desirable column safety factors.

Low Column Safety Factors

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Identified Priority 2 Concerns

Soil Capacity/Footing Design & Incomplete Structural Drawings

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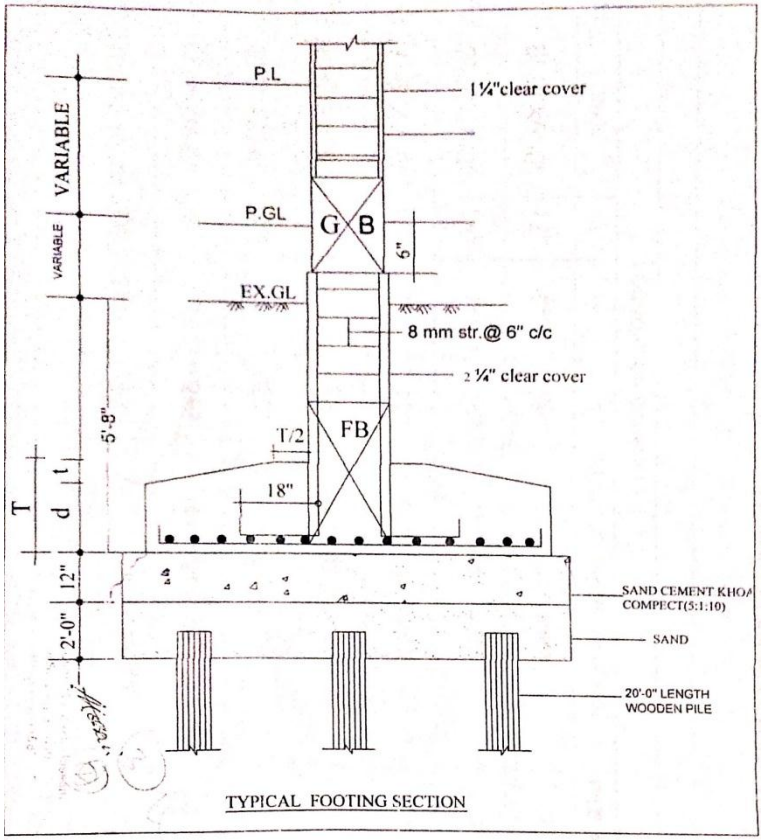
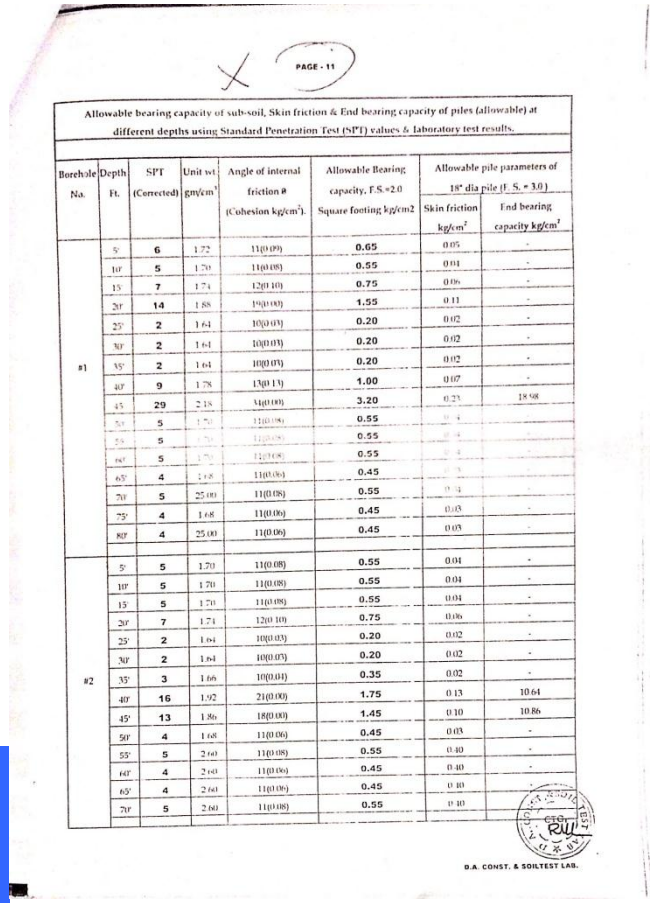
Priority 2 Concern



TYPICAL FOOTING SECTION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Allowable bearing capacity of sub-soil, Skin friction & End bearing capacity of piles (allowable) at different depths using Standard Penetration Test (SPT) values & laboratory test results.

Borehole No.	Depth Ft.	SPT (Corrected)	Unit wt. gm/cm³	Angle of internal friction ϕ (Cohesion kg/cm²).	Allowable Bearing capacity, F.S.=2.0 Square footing kg/cm2	Allowable pile parameters of 18" dia pile (F. S. = 3.0) Skin friction kg/cm²	End bearing capacity kg/cm²
#1	5'	6	1.72	11(0.09)	0.65	0.05	-
	10'	5	1.70	11(0.08)	0.55	0.04	-
	15'	7	1.74	12(0.10)	0.75	0.06	-
	20'	14	1.88	19(0.00)	1.55	0.11	-
	25'	2	1.64	10(0.03)	0.20	0.02	-
	30'	2	1.64	10(0.03)	0.20	0.02	-
	35'	2	1.64	10(0.03)	0.20	0.02	-
	40'	9	1.78	13(0.13)	1.00	0.07	-
	45	29	2.18	34(0.00)	3.20	0.23	18.98
	50'	5	1.70	11(0.08)	0.55	0.04	-
	55	5	1.70	11(0.08)	0.55	0.04	-
	60'	5	1.70	11(0.08)	0.55	0.04	-
	65'	4	1.68	11(0.06)	0.45	0.03	-
	70'	5	25.00	11(0.08)	0.55	0.04	-
	75'	4	1.68	11(0.06)	0.45	0.03	-
	80'	4	25.00	11(0.06)	0.45	0.03	-
#2	5'	5	1.70	11(0.08)	0.55	0.04	-
	10'	5	1.70	11(0.08)	0.55	0.04	-
	15'	5	1.70	11(0.08)	0.55	0.04	-
	20'	7	1.74	12(0.10)	0.75	0.06	-
	25'	2	1.64	10(0.03)	0.20	0.02	-
	30'	2	1.64	10(0.03)	0.20	0.02	-
	35'	3	1.66	10(0.04)	0.35	0.02	-
	40'	16	1.92	21(0.00)	1.75	0.13	10.64
	45'	13	1.86	18(0.00)	1.45	0.10	10.86
	50'	4	1.68	11(0.06)	0.45	0.03	-
	55'	5	2.60	11(0.08)	0.55	0.40	-
	60'	4	2.60	11(0.06)	0.45	0.40	-
	65'	4	2.60	11(0.06)	0.45	0.40	-
	70'	5	2.60	11(0.08)	0.55	0.40	-

D.A. CONST. & SOILTEST LAB.

Foundations are built in a manner other than that recommended by the geotechnical report. General foundation capacity checks were performed. Based upon Geotechnical findings, the soil bearing capacity does not appear adequate to support the foundation shown on the structural drawings.

Soil Capacity/Footing Design

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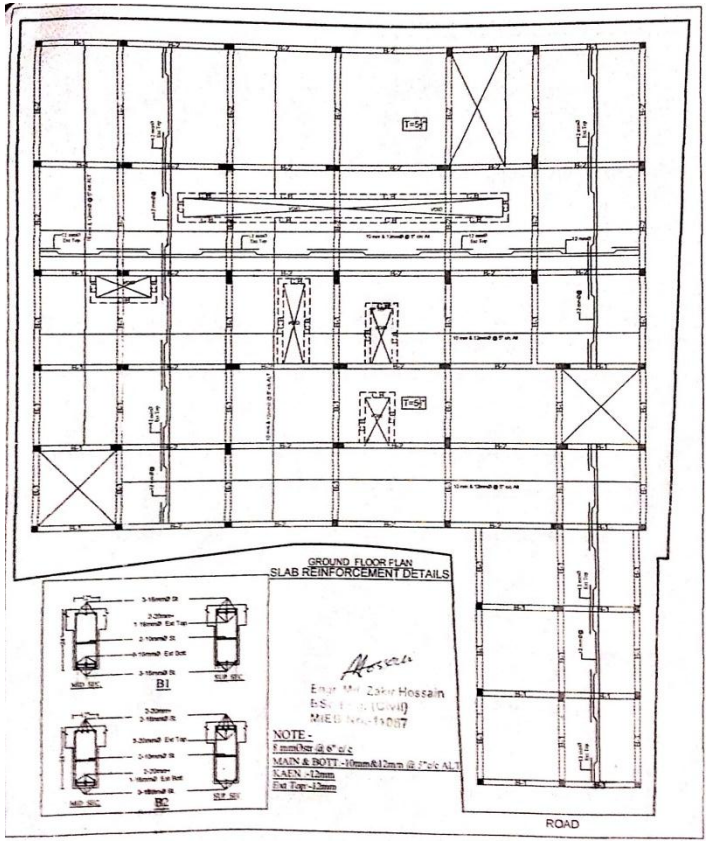
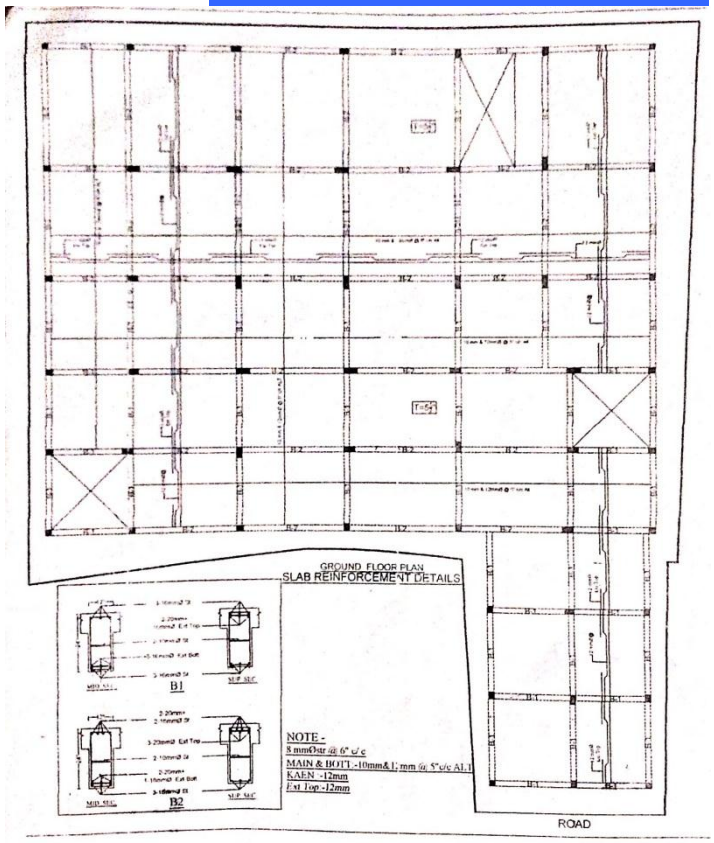
Priority 2 Concern





Structural drawings are incomplete. Typical slab reinforcing and roof slab reinforcing plans are missing. Two differing ground floor slab plans are presented. Plans are generally of very poor quality.

Incomplete Structural Drawings

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Identified Priority 3 Concerns

(None)

Priority Actions

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Problems Observed Summary

ITEM 1: (Priority 1) Column load run-downs indicate a low column safety factor for the completed building. It is notable that the building is currently under construction at the 5th floor slab level.

ITEM 2: (Priority 2) It was noted that the foundations shown on structural drawings do not match the recommendations made by the Geotechnical repot. After examination of Geotechnical findings and various foundation checks based upon the foundations indicated by the structural drawings. It is doubtful that the soil bearing capacity is adequate to support the loads applied to the footings presented. Notably, bamboo piles were used beneath pad footings. However, they commence approximately 2 feet beneath the underside of footing and only extend to a depth of 28'-8" below grade where soil is of very poor capacity.

ITEM 3: (Priority 2) Structural drawings were found to be inconsistent and of low quality. It is questionable how the full structure has been built while lacking clear concise structural drawings. As an example, there is no typical floor slab reinforcing plan provided. However, the structure is currently under construction at the 5th storey level.

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Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Column load run-downs indicate a low column safety factor for the completed building. It is notable that the building is currently under construction at the 5th floor slab level.	Do not continue construction past the 5th floor slab level. It is recommended that the 5th floor slab be used as the roof level.	Immediate – Now
2	Column load run-downs indicate a low column safety factor for the completed building. It is notable that the building is currently under construction at the 5th floor slab level.	Factory engineer to review design, loads and column stresses.	6-weeks
3	Column load run-downs indicate a low column safety factor for the completed building. It is notable that the building is currently under construction at the 5th floor slab level.	Produce and actively manage a loading plan for all floor plates giving consideration to slab and column capacity.	6-months
4	It was noted that the foundations shown on structural drawings do not match the recommendations made by the Geotechnical repot. After examination of Geotechnical findings and various foundation checks based upon the foundations indicated by the structural drawings. It is doubtful that the soil bearing capacity is adequate to support the loads applied to the footings presented. Notably, bamboo piles were used beneath pad footings. However, they commence approximately 2 feet beneath the underside of footing and only extend to a depth of 28'-8" below grade where soil is of very poor capacity.	A Detailed Engineering Assessment to be conducted in order to determine the adequacy of the as-built foundation for existing soil properties.	6-weeks
5	It was noted that the foundations shown on structural drawings do not match the recommendations made by the Geotechnical repot. After examination of Geotechnical findings and various foundation checks based upon the foundations indicated by the structural drawings. It is doubtful that the soil bearing capacity is adequate to support the loads applied to the footings presented. Notably, bamboo piles were used beneath pad footings. However, they commence approximately 2 feet beneath the underside of footing and only extend to a depth of 28'-8" below grade where soil is of very poor capacity.	Carry out any remedial measures recommended by above mentioned detailed engineering assessment.	6-months
6	Structural drawings were found to be inconsistent and of low quality. It is questionable how the full structure has been built while lacking clear concise structural drawings. As an example, there is no typical floor slab reinforcing plan provided. However, the structure is currently under construction at the 5th storey level.	A Detailed Engineering Assessment to be carried out in order to adequately formulate structural plans and assess the suitability of as-built structural elements.	6-weeks
7	Structural drawings were found to be inconsistent and of low quality. It is questionable how the full structure has been built while lacking clear concise structural drawings. As an example, there is no typical floor slab reinforcing plan provided. However, the structure is currently under construction at the 5th storey level.	Address findings and recommendations of the above mentioned detailed engineering assessment.	6-months