

Executive Greentex Limited

Mulaid Telihati Gilarchala, Sreepur, Gazipur.

(24.237972 , 90.399840)

9th and 23rd February 2021

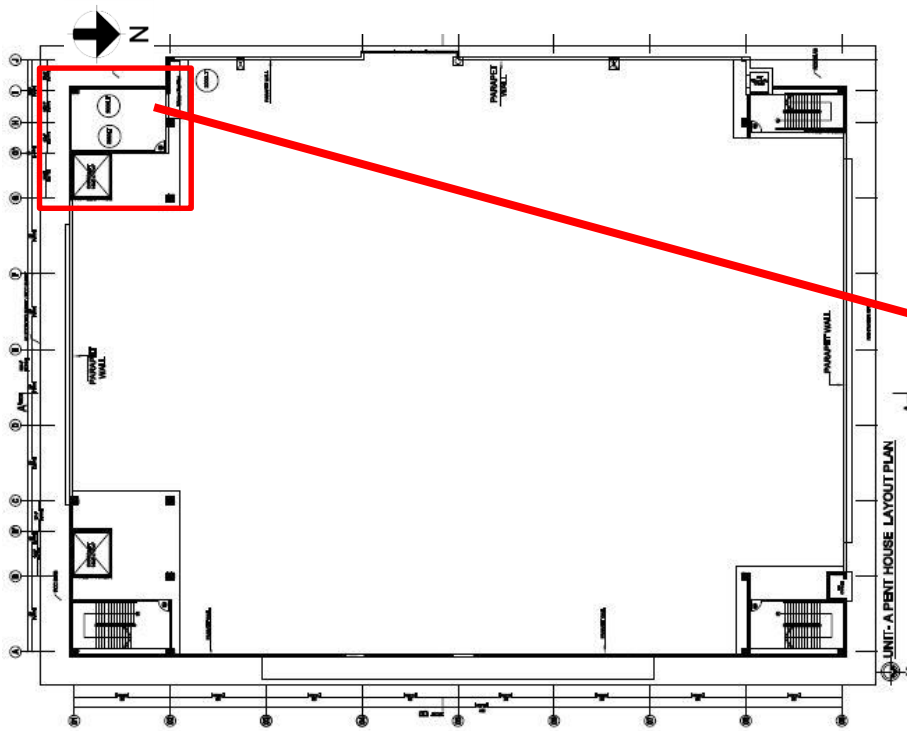


Building Information

1. Main Building (G+5)
2. Utility Building (G+Mz+1)
3. Security and waste keeping Building
4. Boiler Building

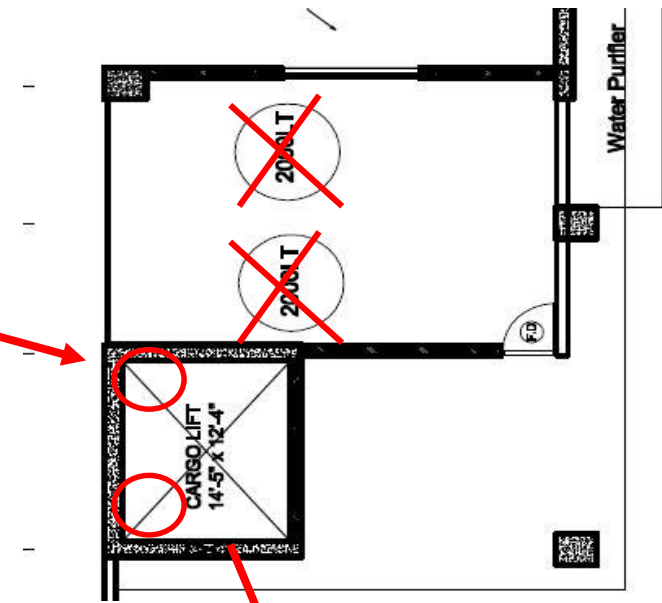
Observations

Discrepancy in as-built drawing with on-site condition



Roof layout

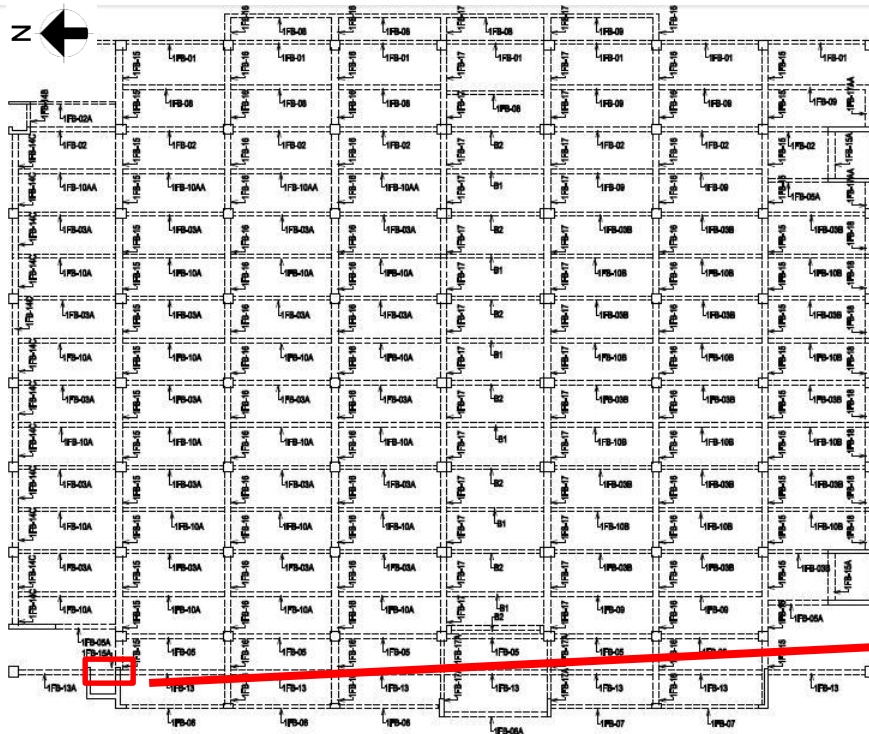
Position of plastic water tank didn't match with roof layout. Two plastic water tank each of 5000 liter were found resting on lift machine room but shown in drawing on staircase. Factory engineer is required to survey the whole structure and update the as-built drawing as per on-site condition in accordance with section 1.9.1.2 (BNBC Part-6) . Also, check the adequacy of the slab of the lift machine room.



Water tank position didn't match



2 Water tanks (capacity-5000 liter) are rested on lift room



Beam layout

At roof level (north -west stair) shear wall constructed over beam but doesn't continue at lower level. Factory engineer is required to survey the whole structure and update the as-built drawing as per on-site condition in accordance with section 1.9.1.2 (BNBC Part-6).



Scenario as per site condition



Typical beam layout

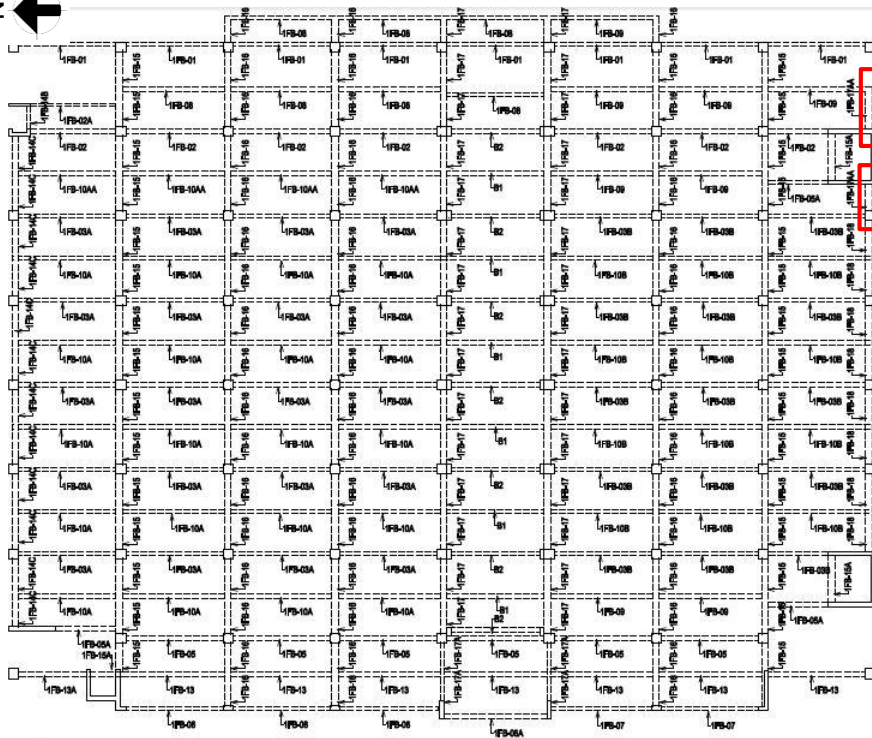
At conveyor area extra beam (375mm W X 525mm d/s) was found at First to top floor but not shown in provided drawing. Also, at upper floor the beam layout of that area was found different with as-built condition. Factory engineer is required to survey the whole structure and update the as-built drawing as per on-site condition in accordance with section 1.9.1.2 (BNBC Part-6).



Width of the beam measured 375mm W



Depth of the beam measured 525mm d/s

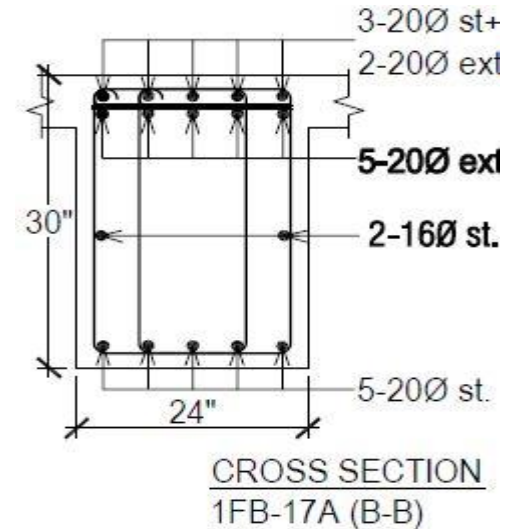


Typical beam layout

Width of the highlighted beam was found 375mm instead of 600 mm. Factory engineer is required to survey the whole structure and update the as-built drawing as per on-site condition in accordance with section 1.9.1.2 (BNBC Part-6).

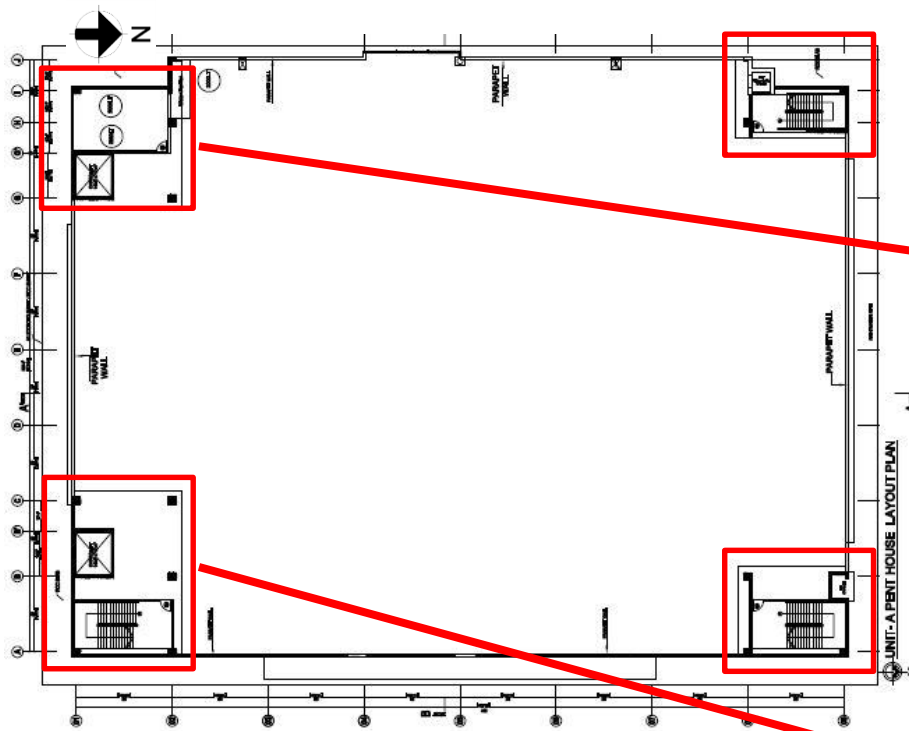


Width of the beam measured 375mm W



Depth of the beam shown 600 mm

Missing information of structural members



Roof layout

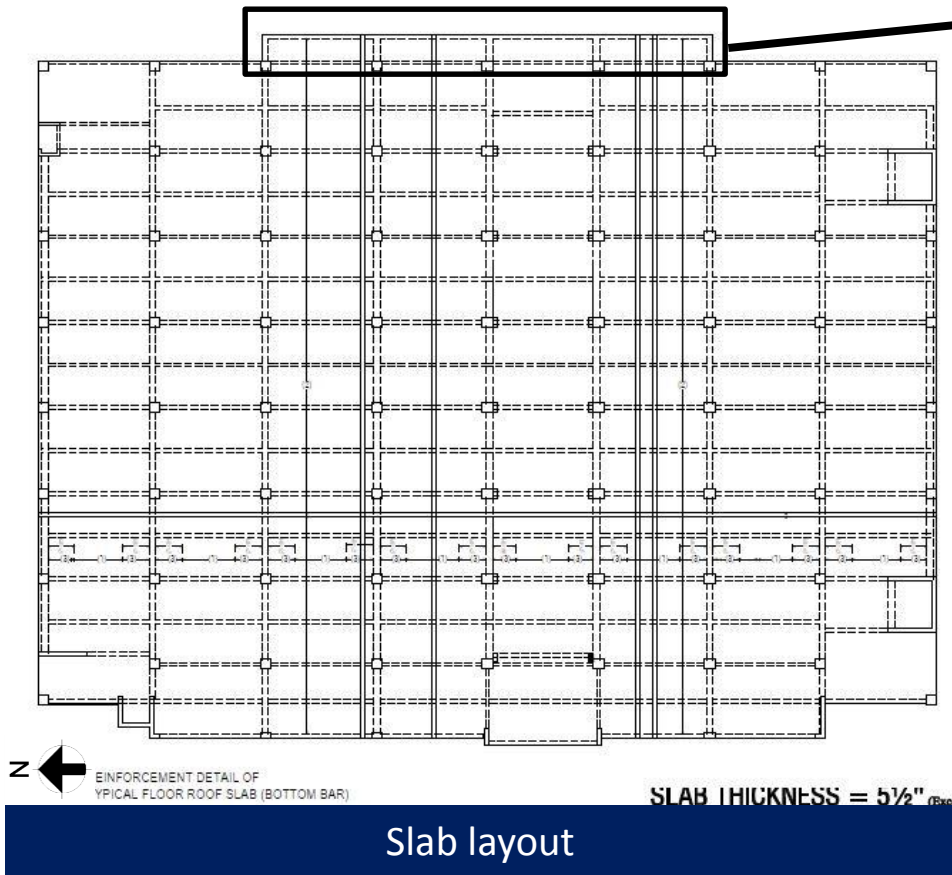
No detail of beam/slab was shown in provided drawing for the staircase and lift machine room at roof level. Factory engineer is required to survey the whole structure and update the as-built drawing as per on-site condition in accordance with section 1.9.1.2 (BNBC Part-6) . Also, update the Design report in accordance with 1.9.1.1 (BNBC Part-6).



Stair room at south west side



Stair and lift area at south east corner



Dimension of cantilever was measured 2.28m

Dimension of cantilever at highlighted locations was not shown in provided drawing. Dimension of cantilever was measured 2.28m. Factory engineer is required to survey the whole structure and update the as-built drawing as per on-site condition in accordance with section 1.9.1.2 (BNBC Part-6). Also, update the Design report in accordance with 1.9.1.1 (BNBC Part-6).

Inconsistencies in the design report

As per BNBC every building or structure designed shall have its design documents prepared in accordance with the provision of Section 1.9.1. The design document shall include a design report, and a set of structural drawings, which shall be prepared in compliance with section 1.9.1.1 and section 1.9.1.2 as per BNBC.



Main Building

A Design Report was provided for the Main Building at the time of inspection which is prepared based on software analysis. Slab adequacy check was not provided in the design report. Also, wind speed was considered 210 Km/h instead of 215km/h for the specified area. Moreover, response modification coefficient $R=9$ has been considered in design report. No calculation has been provided regarding IMRF in the design report.

Wind Loads:

Wind Variables		
Name	Symbol	Value
Basic Speed	210 km/hr	See structural model.
Important Factor	1.0	
Exposure Category	A	

Seismic Loads and input Data :

Wind Variables		
Name	Symbol	Value
Zone Factor	Z	0.15
Important Factor	I	1.0
Structural System	IMRF	
Response Modification Co-efficient.	R	9.0

Load Combinations

- 1 : $1.4D.L + 1.7 L.L$
- 2 : $1.05 D + 1.28 L + 1.28W$ (Considering both direction.)
- 3 : $1.05 D + 1.28 L + 1.40E$ (Considering both direction.)

Design report

Protection against vehicle impact appears to be fragile



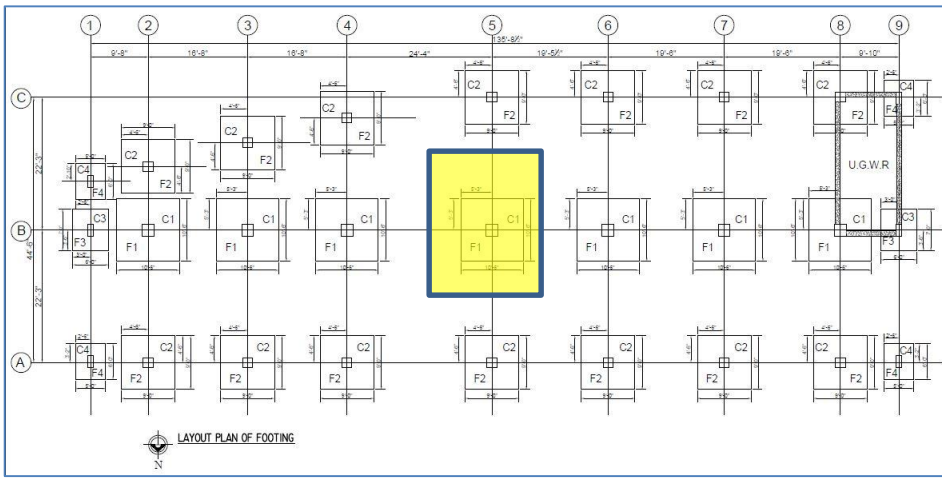
Barrier provided with thin member



Barrier provided with thin member

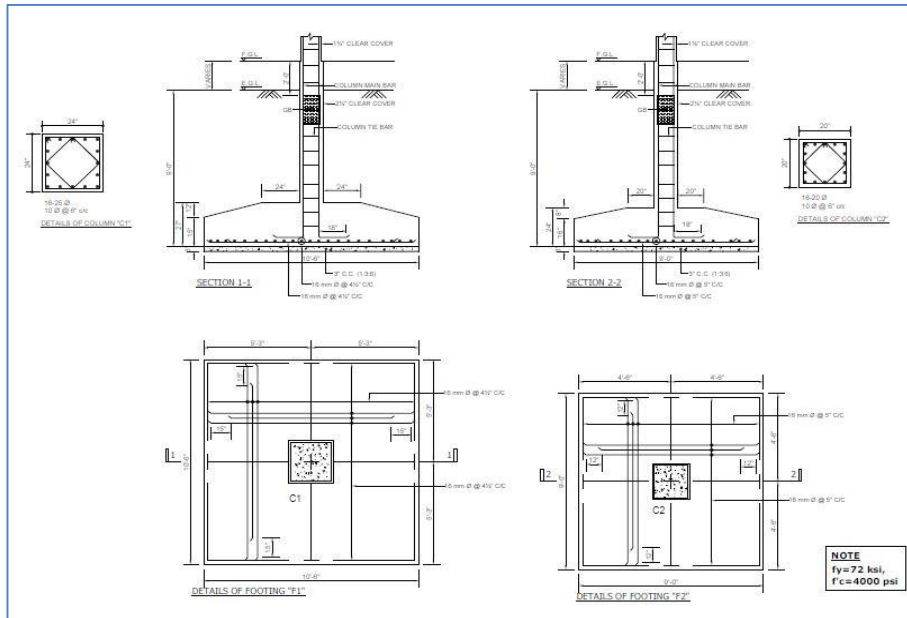
Barrier provided for some columns to prevent the vehicle impact, but the members installed as barrier appears to be thin and fragile. Factory is required to provide the barrier to prevent vehicle impact with proper engineering calculation against possible vehicle load.

Stress in foundation exceeds normal design limit as per provided load plan



Footing Layout Plan.

Cursory calculation indicates that stress in foundation exceeds normal design limit in the highlighted area considering the prepared live load plan (11.9 KPa for typical floor and roof). Factory engineer is required to review the adequacy of footings and comply with BNBC as a part of Engineering Assessment (EA). Also, maintain live load below 5 KPa at all floor areas including roof until the Engineering Assessment (EA) is finalized.



FOOTING ID	DWG grid ID	Column Size		Factored (kip)	Footing (isolated Foundation)				Bearing Capacity of Soil				Foundation Area Check			Foundation Depth Check			
		Width (a) inch	Length (b) inch		Width (B) ft.	Length (L) ft.	Thickness (T) inch	Eff. Depth (d) inch	Ultimate B.C (kip/sft)	Reduction Factor	Allow. B.C (kip/sft)	Develop B.C (kip/sft)	Area Required (SFT)	Area Provided (SFT)	Status	Effective Force for Punching (kip)	Punching Capacity (Kip)	Puch Cap. / Eff. Force	Status
F-04	A/01	15	27	146	5.00	6.00	18.00	15.00	8.00	0.5	4.00	4.87	36.50	30.00	NOT OK	103.42	464.48	0.22	OK
F-02	A/02	23	23	301	9.00	9.00	24.00	21.00	8.00	0.5	4.00	3.72	75.25	81.00	OK	251.04	794.77	0.32	OK
F-02	A/08	23	23	301	9.00	9.00	24.00	21.00	8.00	0.5	4.00	3.72	75.25	81.00	OK	251.04	794.77	0.32	OK
F-04	A/09	15	27	192	5.00	6.00	18.00	15.00	8.00	0.5	4.00	6.40	48.00	30.00	NOT OK	136.00	464.48	0.29	OK
F-03	B/01	15	27	145	6.00	7.00	20.00	17.00	8.00	0.5	4.00	3.45	36.25	42.00	OK	111.24	555.65	0.20	OK
F-01	B/02	27	27	365	10.50	10.50	27.00	24.00	8.00	0.5	4.00	3.31	91.25	110.25	OK	305.20	1,052.81	0.29	OK
F-01	B/08	27	27	627	10.50	10.50	27.00	24.00	8.00	0.5	4.00	5.69	156.75	110.25	NOT OK	524.28	1,052.81	0.50	OK
F-03	B/09	15	27	295	6.00	7.00	20.00	17.00	8.00	0.5	4.00	7.02	73.75	42.00	NOT OK	226.32	555.65	0.41	OK
F-04	B-C/01	15	27	107	5.00	6.00	18.00	15.00	8.00	0.5	4.00	3.57	26.75	30.00	OK	75.79	464.48	0.16	OK
F-02	B-C/02	23	23	181	9.00	9.00	24.00	21.00	8.00	0.5	4.00	2.23	45.25	81.00	OK	150.96	794.77	0.19	OK
F-02	C/08	23	23	327	9.00	9.00	24.00	21.00	8.00	0.5	4.00	4.04	81.75	81.00	NOT OK	272.72	794.77	0.34	OK
F-04	C/09	15	27	185	5.00	6.00	18.00	15.00	8.00	0.5	4.00	6.17	46.25	30.00	NOT OK	131.04	464.48	0.28	OK
F-01	B/05	27	27	733	10.50	10.50	27.00	24.00	8.00	0.5	4.00	6.65	183.25	110.25	NOT OK	612.91	1,052.81	0.58	OK

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Marked footings are shown as overstress in existing Design Report

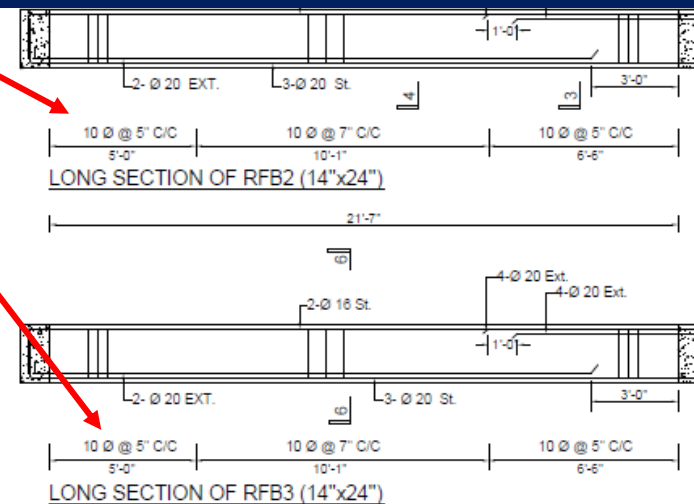
In existing Design Report, some footings are demonstrated as overstressed considering live load as 11.9 kPa but no remediation plan is proposed for those overstressed footings. Factory engineer is required to propose remediation plan as a part of the Engineering Assessment (EA) and implement accordingly.

Discrepancy in as-built drawing with on-site condition

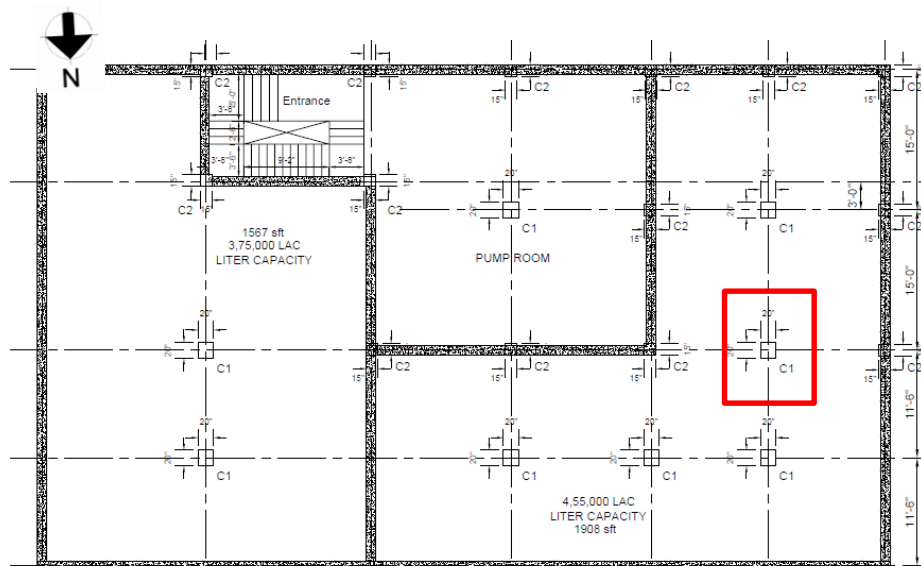


Roof beam layout

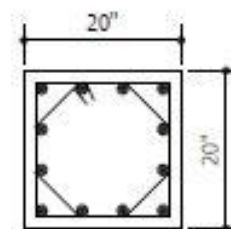
Dimension of same beam is shown differently in beam layout and beam section. For example, width of RFB-2 shown in layout but in section dimension shown for the same beam as 350mm. However, dimension of all beams was found as per section of the beam. Factory engineer is required to survey the whole structure and update the as-built drawing as per on-site condition in accordance with section 1.9.1.2 (BNBC Part-6).



Discrepancy in as-built drawing with on-site condition



Column layout



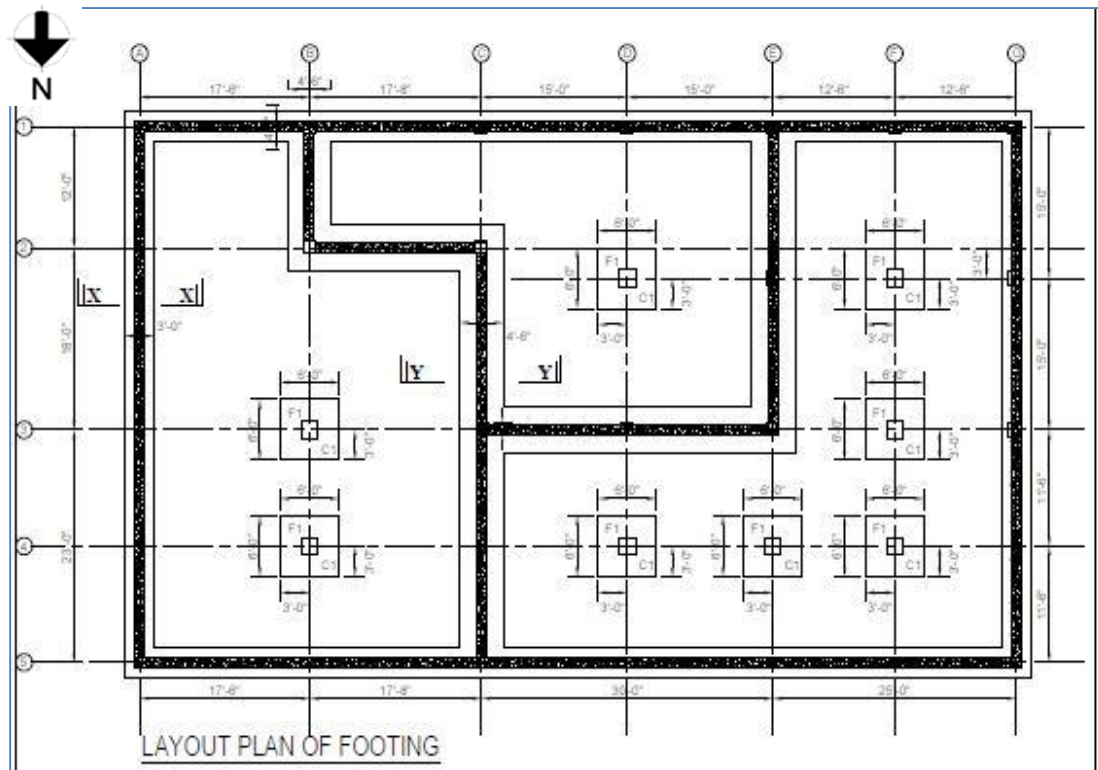
12-20 Ø
10mm Ø @ 5" C/C
DETAILS OF COLUMN C1
CLEAR COVER = 3"

Dimension shown 500mmX500

Column layout is not produced separately for Ground floor. Dimension column C-1 at grid F-3 was found 375mmX375mm instead of 500mmX500mm (shown in provided drawing). Factory engineer is required to survey the whole structure and update the as-built drawing as per on-site condition in accordance with section 1.9.1.2 (BNBC Part-6). Also, review column the stress in accordance with 1.9.1.1 (BNBC Part-6).

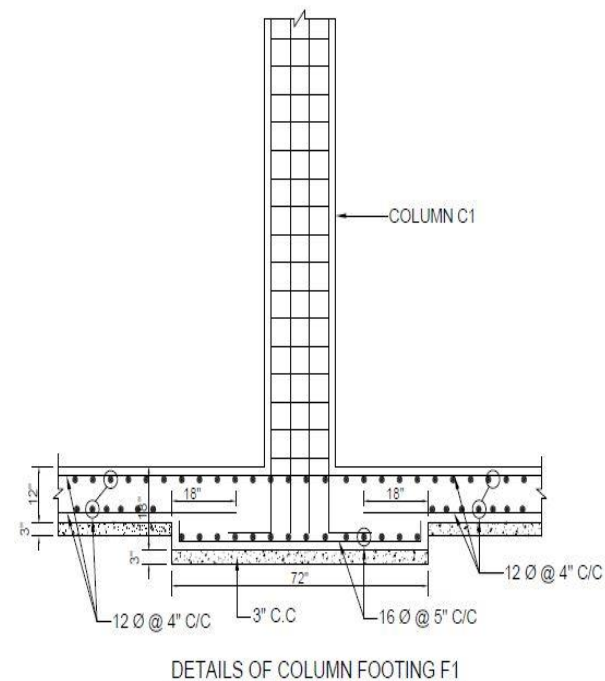


Dimension found 375mmX375mm



Foundation layout (Isolated footing)

Foundation depth from Existing Ground Level (EGL) not shown in provided drawing. Factory engineer is required to survey the whole structure and update the as-built drawing as per on-site condition in accordance with section 1.9.1.2 (BNBC Part-6).



Foundation depth is not mentioned in drawing

Absence of design documents

As per BNBC, every building or structure designed shall have its design documents prepared in accordance with the provision of Section 1.9.1. The design document shall include a design report, and a set of structural drawings, which shall be prepared in compliance with section 1.9.1.1 and section 1.9.1.2 as per BNBC. At the time of inspection, only as-built drawing, load plan and geotechnical report were available, but no design report was available which is required to be prepared in compliance with section 1.9.1.1 (part-6, BNBC).



No design report was available for Boiler Building

Problems Observed

Main Building:

Item 01: Discrepancy in as-built drawing with on-site condition.

Item 02: Missing information of structural members.

Item 03: Inconsistencies in the design report.

Item 04: Protection against vehicle impact appears to be fragile.

Utility Building:

Item 05: Stress in foundation exceeds normal design limit as per provided load plan.

Item 06: Discrepancy in as-built drawing with on-site condition.

Boiler Building:

Item 07: Discrepancy in as-built drawing with on-site condition.

Item 08: Absence of design documents.

Priority Action

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Discrepancy in as-built drawing with on-site condition (Main Building)	Factory engineer is required to survey the whole structure and update the as-built drawing as per on-site condition in accordance with section 1.9.1.2 (BNBC Part-6) .	6-weeks
2	Discrepancy in as-built drawing with on-site condition (Main Building)	Implement remediation work deemed necessary.	6-months
3	Missing information of structural members (Main Building)	Factory engineer is required to survey the whole structure and update the as-built drawing as per on-site condition in accordance with section 1.9.1.2 (BNBC Part-6) .	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
4	Inconsistencies in the design report (Main Building)	Building engineer is required to check the Design Report as per BNBC and incorporate proper loading assignment.	6-weeks
5	Inconsistencies in the design report (Main Building)	Building engineer is required to provide slab adequacy check for 4.7 kPa live load.	6-weeks
6	Inconsistencies in the design report (Main Building)	Complete implementation of any remedial works deemed necessary by the design report.	6 months
7	Protection against vehicle impact appears to be inadequate (Main Building)	Factory is required to provide the barrier to prevent vehicle impact with proper engineering calculation against possible vehicle load.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
8	Stress in foundation exceeds normal design limit as per provided load plan (Utility Building)	Factory engineer is required to review the adequacy of footings and comply with BNBC as a part of Engineering Assessment (EA).	6-weeks
9	Stress in foundation exceeds normal design limit as per provided load plan (Utility Building)	Maintain live load below 5 KPa at all floor areas including roof until the Engineering Assessment (EA) is finalized.	6-weeks
10	Stress in foundation exceeds normal design limit as per provided load plan (Utility Building)	Produce and actively manage a loading plan for all floor plates within the factory considering the foundation capacity.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
11	Stress in foundation exceeds normal design limit as per provided load plan (Utility Building)	Complete implementation of remedial works deemed necessary by the EA.	6-months
12	Stress in foundation exceeds normal design limit as per provided load plan (Utility Building)	Continue to implement loading plan.	6-months
13	Discrepancy in as-built drawing with on-site condition (Utility Building)	Factory engineer is required to survey the whole structure and update the as-built drawing as per on-site condition in accordance with section 1.9.1.2 (BNBC Part-6)	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
14	Discrepancy in as-built drawing with on-site condition (Boiler Building)	Factory engineer is required to survey the whole structure and update the as-built drawing as per on-site condition in accordance with section 1.9.1.2 (BNBC Part-6)	6-weeks
15	Discrepancy in as-built drawing with on-site condition (Boiler Building)	Implement remediation work deemed necessary.	6-months
16	Absence of design documents (Boiler Building)	Factory engineer is required to prepare the design documents including a design report, and a set of structural drawings in compliance with section 1.9.1.1 and section 1.9.1.2 as per BNBC part 6 and submit to RSC for review.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
17	Absence of design documents (Boiler Building)	Carry out remedial works (if any) after review by RSC.	within 6-months