Denitex Ltd (Extension)

9/1 & 10/2 Hazi Younus Ali Sarak, Karnapara, Savar, Dhaka.

(23.823346,90.255950)

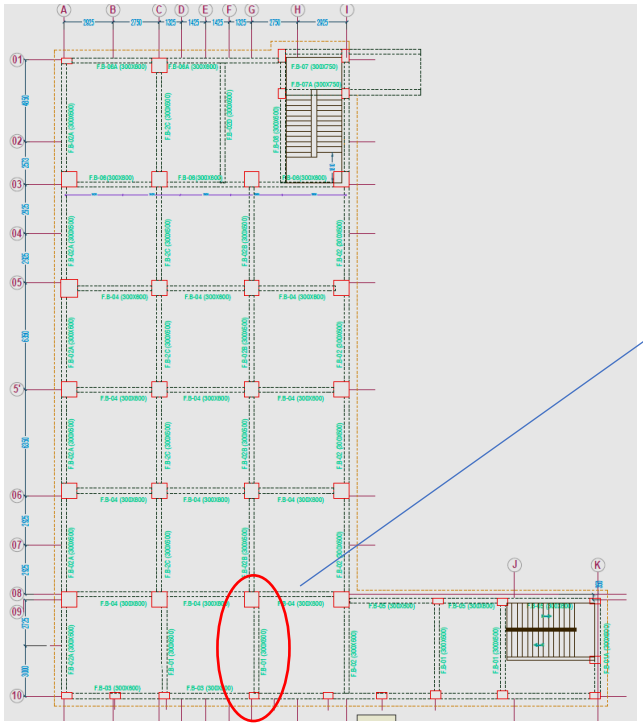
27 January 2025

1. Building Information

1. **ETP Building:** This is a three-storied (G+M+2) reinforced concrete (RC) building with a mezzanine floor and ETP at ground level.
2. **Boiler Building:** The structure is a two-storied (G+1) reinforced concrete (RC) building.

2. Observation

Observation-1: Mismatches in as-built drawings. (ETP Building)



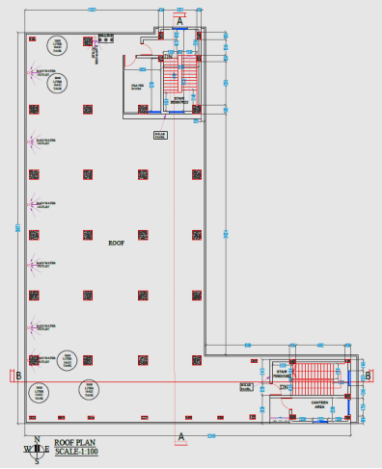
Beam layout

Beam is not aligned with the column line

Description: At the first-floor level beam was found not aligned with the column grid.

Description: Toilet block details and built-up were not provided in architectural drawings. Building engineer is required to survey the structure and prepare the as-built drawing.

Observation-2: Inconsistencies in design report. (ETP Building)



2.5.5.3 Building irregularity

Buildings with irregularity in plan or elevation suffer much more damage in earthquakes than buildings with regular configuration. A building may be considered as irregular, if at least one of the conditions given below are applicable:

2.5.5.3.1 Plan irregularity: Following are the different types of irregularities that may exist in the plan of a building.

(i) Torsion irregularity

To be considered for rigid floor diaphragms, when the maximum storey drift (Δ_{max}) as shown in Figure 6.2.27(a), computed including accidental torsion, at one end of the structure is more than 1.2 times the average $\left(\Delta_{avg}=\frac{\Delta_{max}+\Delta_{min}}{2}\right)$ of the storey drifts at the two ends of the structure. If $\Delta_{max} > 1.4\Delta_{avg}$ then the irregularity is termed as extreme torsional irregularity.

(ii) Re-entrant corners

Both projections of the structure beyond a re-entrant comer [Figure 6.2.27(b)] are greater than 15 percent of its plan dimension in the given direction.

BNBC 2020 Part VI Chapter 2

Description: The building is irregular in plan. Re-entrant corners are present in both directions as per BNBC (section 2.5.5.3). The building engineer is required to consider the plan irregularity and revise the design documents.

Description: A large cantilever corridor (3.8 m) from ETP to Boiler building. No deflection check is provided for the cantilever in the design report. The building engineer is required to check the deflection and incorporate it in the design report.

Design Parameter	Value	Reference	Notes
Seismic Zone Coefficient, Z	0.2	BNBC 2020 Part 6 **Table 6.2.14**	Location: Savar
Importance Factor, I	1.25	BNBC 2020 Part 6 **Table 6.2.17**	Occupancy Category-III
Response Reduction Factor, R	5	BNBC 2020 Part 6 **Table 6.2.19**	System C
System Overstrength Factor, Ω_o	3	BNBC 2020 Part 6 **Table 6.2.19**	System C
Deflection Amplification Factor, C_d	4.5	BNBC 2020 Part 6 **Table 6.2.19**	System C
Coefficient to estimate approximate period, C_t	0.0466	BNBC 2020 Part 6 **Table 6.2.20**	Concrete Moment Resisting Frame
Coefficient to estimate approximate period, m	0.9	BNBC 2020 Part 6 **Table 6.2.20**	Concrete Moment Resisting Frame

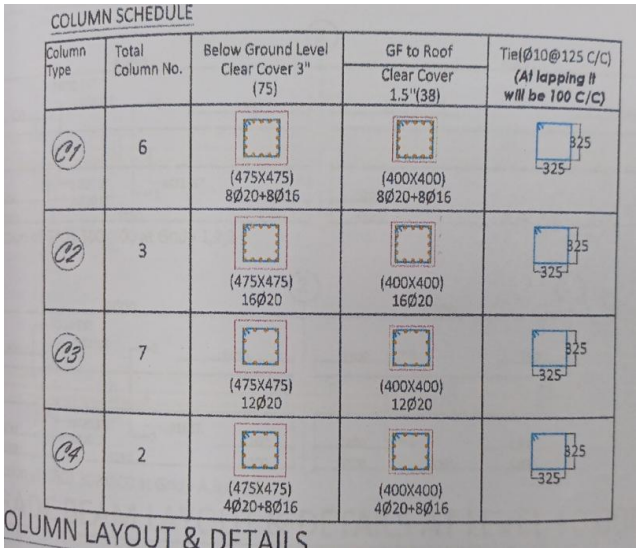
Description: Response modification co-efficient, R-value considered as 5 for IMRF, but detailed calculation/justification is not provided (both beam & column) for the consideration.

Observation-3: Lack of design documents. (Boiler Building)

Description: As per BNBC, every building or structure designed shall have its design documents prepared following 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, design documents (design report, load plan) were not available which are required to be prepared in compliance with section 1.9.1 (part-6, BNBC).

Observation-4: Mismatches in as-built drawings. (Boiler Building)


COLUMN SCHEDULE

Column Type	Total Column No.	Below Ground Level Clear Cover 3" (75)	GF to Roof Clear Cover 1.5"(38)	Tie(Ø10@125 C/C) (At lapping it will be 100 C/C)
C1	6	(475X475) 8Ø20+8Ø16	(400X400) 8Ø20+8Ø16	325 / 325
C2	3	(475X475) 16Ø20	(400X400) 16Ø20	325 / 325
C3	7	(475X475) 12Ø20	(400X400) 12Ø20	325 / 325
C4	2	(475X475) 4Ø20+8Ø16	(400X400) 4Ø20+8Ø16	325 / 325

OLUMN LAYOUT & DETAILS

Unbraced racks on the floor

Description: Rebar at C-2 type column not matched with drawings. The number of rebars found was 12 instead of 16. The building engineer is required to confirm the amount of rebar in the column and update the drawing.

Observation-5: Standing water and dampness on the roof. (Boiler Building)

Description: Standing water and dampness were observed on the roof. Building engineer is required to improve the drainage system on the roof and repair the dampness with a suitable method.

3. Action Plan:

Item No	Observation	Action Plan	Timeline
1	Mismatches in as-built drawings. (ETP Building)	Building engineer is required to survey the structure and prepare the as-built drawing.	within 6 weeks
2		Revise the design report based on the corrected as-built drawing.	within 6 weeks
3	Inconsistencies in design report. (ETP Building)	The building engineer is required to address the inconsistencies in the design report and submit revised design documents to RSC to complete the review. Incorporate all types of adequacies checks in the design report.	within 6 weeks
4		Carry out suggested remedial works if required.	within 6 months
5	Lack of design documents. (Boiler Building)	The building engineer is required to prepare design documents (including design reports, and load plans) in compliance with section 1.9.1 (part-6, BNBC) and submit them to RSC.	within 6 weeks
6		Implement remediation work if required.	within 6 months
7	Mismatches in as-built drawings. (Boiler Building)	Building engineer is required to confirm the amount of rebar in the column and update the drawing.	within 6 weeks
8	Standing water and dampness on the roof. (Boiler Building)	Building engineer is required to improve the drainage system on the roof and repair the dampness with a suitable method.	within 6 weeks