Vertex Wear Limited (Extension)

Vorari, Fulbaria, Hemayetpur, Savar

(23.8007927, 90.2526403)

17 December 2023

RMG SUSTAINABILITY COUNCIL

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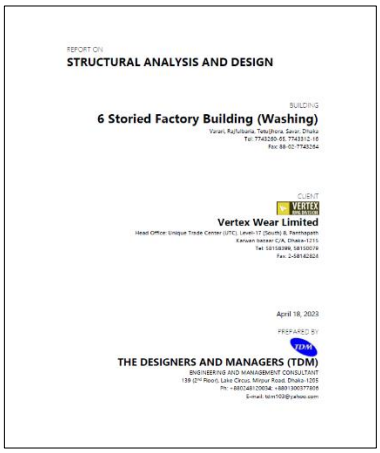
1. Building Information

Washing Building: The structure is a six storied (G+M+5) Reinforced Concrete (RC) building.
ETP Building: The structure is a six storied (G+M+5) RC building.
Utility Building: The structure is a three storied (G+2) RC building.
Gate House & Childcare Building: The structure is a two storied (G+1) RC building.
Workshop Building: The structure is a two storied RC building with an underground pump room.
Sub-Station: The structure is a single storied RC building.
Warehouse shed: The structure is a single storied (G+M) Steel shed with multiple mezzanine floors.
Wastage shed: The structure is a single storied Steel shed.

2. Observation

Observation-1: Design documents need to be submitted to RSC for detail review against lateral loadings. (Washing Building)


REPORT ON
STRUCTURAL ANALYSIS AND DESIGN

BUILDING
6 Storied Factory Building (Washing)

CLIENT
Vertex Wear Limited

April 18, 2023

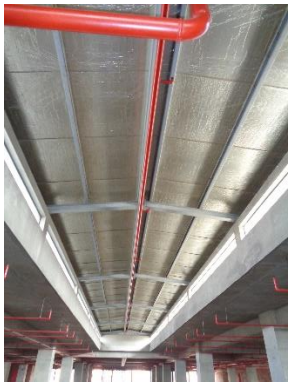
PREPARED BY
THE DESIGNERS AND MANAGERS (TDM)

4 MATERIALS PROPERTY

4.1 Concrete Strength Parameter

Table 4.1: Concrete Strength Parameter

Structural Element	Compressive Strength (Specified), f'c (psi)	Modulus of Elasticity Ec (psi) = 57000 * $\sqrt{f'c}$
Foundation	4500	3,823,676
Column	4500	3,823,676
Beam	4000	3,604,996
Slab	4000	3,604,996
Wall	4000	3,604,996



Steel roof shed

The foundation of ETP bridge and Washing buling is very near

Description: In the design report, design concrete strength has been considered 4500psi for the column. During inspection only one set of the cylinder test report found for the column which do not satisfy the frequency for test as per BNBC. The building engineer is required take adequate number of concrete cores to justify the design strength.

A steel roof shed area was found but in design documents, no information has been provided for the steel roof shed. The building engineer is required to include the adequacy of the steel shed against the lateral loading in the design report.

The foundation of the washing building and the foundation of bridge of ETP building are very near to each other. In design documents, no information has been provided regarding the foundation details that how the pile caps are placed and sharing loading.

The building engineer is required to revise the design documents based on in-situ material strength and lateral loadings based on actual site condition.

Observation-2: Design documents need to be submitted to RSC for detail review against lateral loadings. (ETP Building)

REPORT ON:
STRUCTURAL ANALYSIS AND DESIGN

BUILDING
6 Storied Factory Building (ETP)

CLIENT
Vertex Wear Limited

April 18, 2023

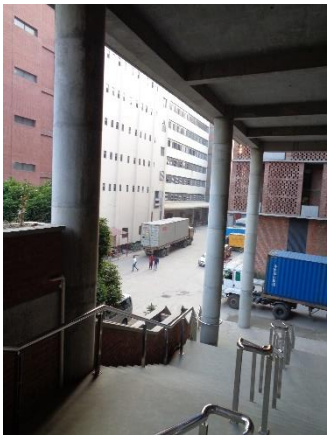
PREPARED BY
THE DESIGNERS AND MANAGERS (TDM)

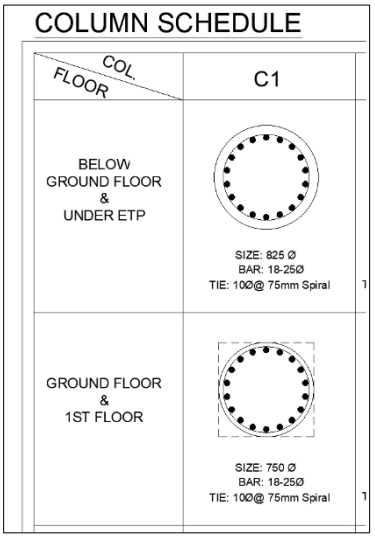
4 MATERIALS PROPERTY

4.1 Concrete Strength Parameter

Table 4.1: Concrete Strength Parameter

Structural Element	Compressive Strength (Specified), f'c (psi)	Modulus of Elasticity Ec (psi) = 57000 * $\sqrt{f'c}$
Pile	3500	3,372,165
Foundation	4500	3,823,676
Column	4500	3,823,676
Beam	4000	3,604,996
Slab	4000	3,604,996
Wall	4000	3,604,996





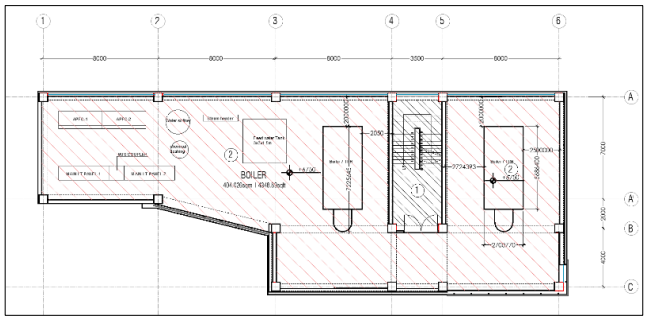
Circular

Description: In the design report, design concrete strength has been considered 4500psi for the column. During inspection only two sets of the cylinder test report were available for the column where one set was found without average value. The number of cylinder test reports do not satisfy the frequency of test as per BNBC. Building engineer is required to verify the in situ concrete strength.

The circular columns' clear height found 11.37m and the diameter of the circular column is 750mm. the columns seems to be slender that needs to be addressed in design report.

Building engineer is required to revise the design documents based on in-situ material strength and lateral loadings based on actual site condition.

Observation-3: Design documents need to be submitted to RSC for detail review against lateral loadings. (Utility Building).



REPORT ON
STRUCTURAL ANALYSIS AND DESIGN

BUILDING
3 Storied Factory Building (Utility)

CLIENT
Vertex Wear Limited

April 18, 2023

PREPARED BY
THE DESIGNERS AND MANAGERS (TDM)

4 MATERIALS PROPERTY

4.1 Concrete Strength Parameter

Table 4.1: Concrete Strength Parameter

Structural Element	Compressive Strength (Specified), f'c (psi)	Modulus of Elasticity Ec (psi) = 57000 * $\sqrt{f'c}$
Foundation	4500	3,823,676
Column	4500	3,823,676
Beam	4000	3,604,996
Slab	4000	3,604,996
Wall	4000	3,604,996

Description: In the provided load plan the weight of the machine has not been mentioned. Building engineer is required to revise the load plan showing actual loading from machine.
In design report, design concrete strength has been considered 4500psi for the column and foundation, 4000psi for beam slab and wall. During inspection only three sets from column, sets from foundations and three sets from slab was available. Building engineer is required to justify whether the available cylinder test report fulfils the requirement for frequency of test as per BNBC or not. Otherwise verify the in situ concrete strength.
Building engineer is required to revise the design documents based on in-situ material strength and lateral loadings based on actual site condition.

Observation-4: Design documents need to be submitted to RSC for detail review against lateral loadings. (Workshop Building)

REPORT ON
STRUCTURAL ANALYSIS AND DESIGN

BUILDING
3 Storied Factory Building (Workshop)

CLIENT
Vertex Wear Limited

PREPARED BY
THE DESIGNERS AND MANAGERS (TDM)

4 MATERIALS PROPERTY

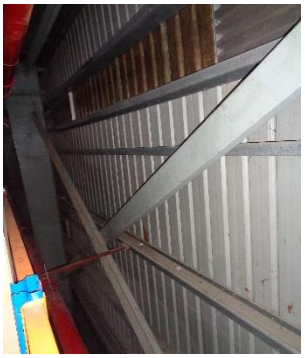
4.1 Concrete Strength Parameter

Table 4.1: Concrete Strength Parameter

Structural Element	Compressive Strength (Specified), f'c (psi)	Modulus of Elasticity Ec (psi) = 57000 * $\sqrt{f'c}$
Foundation	4500	3,823,676
Column	4500	3,823,676
Beam	4000	3,604,996
Slab	4000	3,604,996
Wall	4000	3,604,996

Description: In the design report, design concrete strength has been considered 4500psi for the column and foundation, 4000psi for beam slab and wall. During inspection, only one set of the cylinder test report was available for the slab. The number of cylinder test reports do not satisfy the frequency of test as per BNBC. The building engineer is required to take adequate number of concrete cylinder cores to justify the design strength.
The number of re-bars for the C1 column found mismatch in at 1st floor.
Building engineer is required to revise the design documents based on in-situ material strength and lateral loadings based on actual site condition.

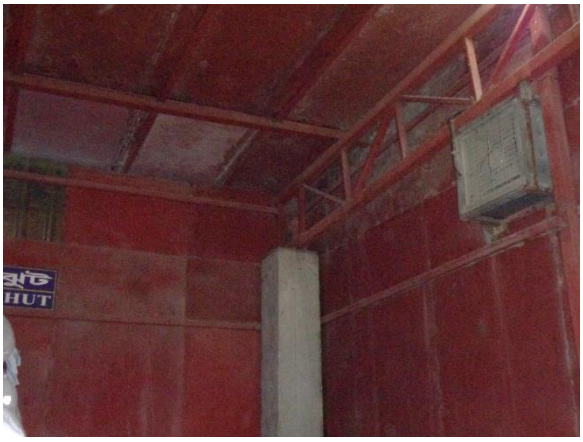
Observation-5: Lack of full sets of design documents. (Warehouse Shed)


Description: The sub-beam of the mezzanine found cantilever with pin connection. In drawing, some columns have been shown regular shape but at site, those columns found tapered shape. Some of vertical bracing was found made of C-channel seems to be inadequate. The lateral load transfer media is not continuous. The building engineer is required to prepare design report addressing all these issues.

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. Factory engineer is required prepare the design documents including architectural drawing and design report based on FEA model in compliance with section 1.9.1 (part-6, BNBC).

Observation-6: Lack of full sets of design documents. (Wastage Shed)




Description: During inspection, only as-built architectural and structural drawing was found available for the wastage shed. 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. Factory engineer is required prepare the design documents including architectural drawing and design report based on FEA model in compliance with section 1.9.1 (part-6, BNBC).

3. Action Plan

Observation	Action Plan	Timeline
Design documents need to be submitted to RSC for detail review against lateral loadings. (Washing Building)	Building engineers is required to revise the Engineering Assessment (EA) based on design/in-situ material strength. Sumit EA to RSC for further review.	within 6 weeks
	Carry out remedial work if required.	within 6 months
Design documents need to be submitted to RSC for detail review against lateral loadings. (ETP Building)	Building engineers is required to revise the Engineering Assessment (EA) based on design/in-situ material strength. Sumit EA to RSC for further review.	within 6 weeks
	Carry out remedial work if required.	within 6 months
Design documents need to be submitted to RSC for detail review against lateral loadings. (Utility Building)	Building engineers is required to revise the Engineering Assessment (EA) based on design/in-situ material strength. Sumit EA to RSC for further review.	within 6 weeks
	Carry out remedial work if required.	within 6 months
Design documents need to be submitted to RSC for detail review against lateral loadings. (Workshop Building)	Building engineers is required to revise the Engineering Assessment (EA) based on design/in-situ material strength. Sumit EA to RSC for further review.	within 6 weeks
	Carry out remedial work if required.	within 6 months
Lack of full sets of design documents. (Warehouse Shed)	Building engineer to prepare the design document 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.	within 6 months
	Carry out remedial work if required.	within 6 months
Lack of full sets of design documents. (Wastage Shed)	Building engineer to prepare the design document 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.	within 6 months
	Carry out remedial work if required.	within 6 months