

STANDARD GROUP LIMITED

Plot No.-10300, Building -1 and building -2(4,5,6) Floor, Beraiderchala,
Post-Gilaberaid.; Sreepur PS; Gazipur-1740; Bangladesh.

(24.191890453, 90.4120348)

13 November 2023



1. Building Information

Main Production Building: Six storied RC building.

Washing Building: Six storied RC building.

Chemical Building: Four storied RC building.

Utility Building: Four storied RC building.

Fire-Pump Room: Single storied RC building.

Guard Room: Single storied RC building.

RMS Room: Single storied RC building.

Belt Press M/C Shed: Single storied steel shed.

ETP Building: Single storied RC building.

Parking Shed: Single storied steel shed.

2. Observations

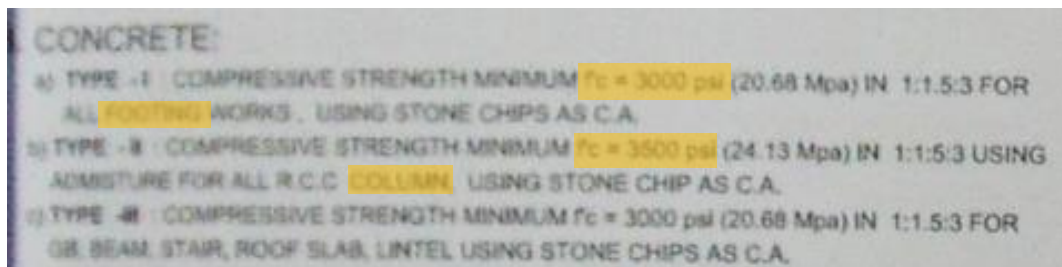
Observation-1: Inconsistency in compressive strength of concrete (Main Production Building).

1.5. Material:

1.5.1. Concrete:

- Compressive strength of concrete using 3/4" downgraded stone chips is $f'_c = 4000$ psi (27.5 Mpa) for Footing & Column as specified in the drawings.
- Compressive strength of concrete (1:1.5:3) using 3/4" downgraded stone chips is $f'_c = 3000$ psi (20.7 Mpa) for Grade Beam, Floor Beam, Stair, Floor Slab, OHWT Slab etc. as specified in drawing.

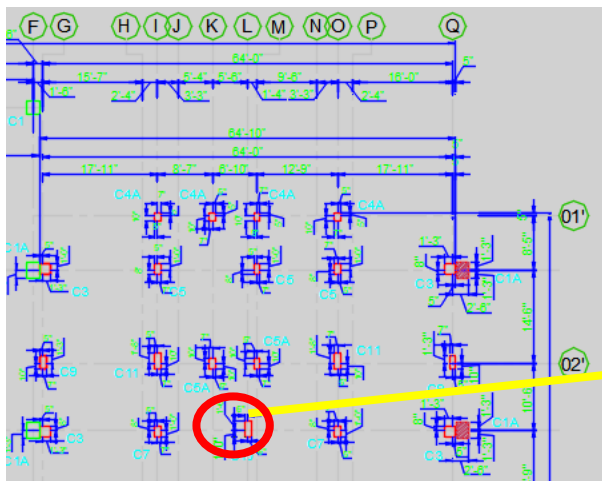
Snapshot taken from design report



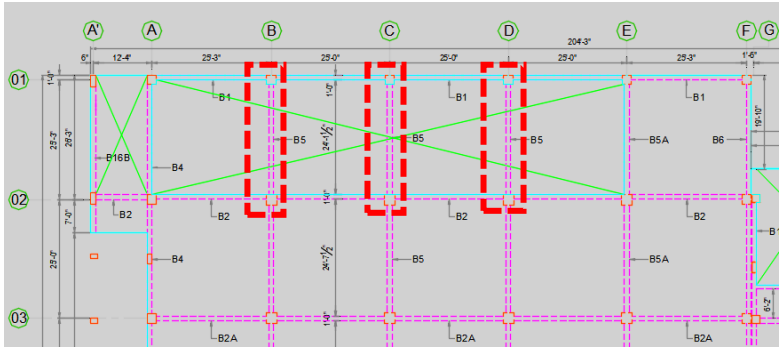
Snapshot taken from construction drawing

Description: In design report, compressive strength of concrete has been considered as 4000 psi for footing and column but in construction drawing 3000 psi and 3500 psi were mentioned for footing and column respectively. In addition, the available test results are insufficient to meet the evaluation and acceptance criteria of BNBC. The building engineer is required to evaluate concrete strength as per BNBC, revise design report accordingly and submit to RSC for review.

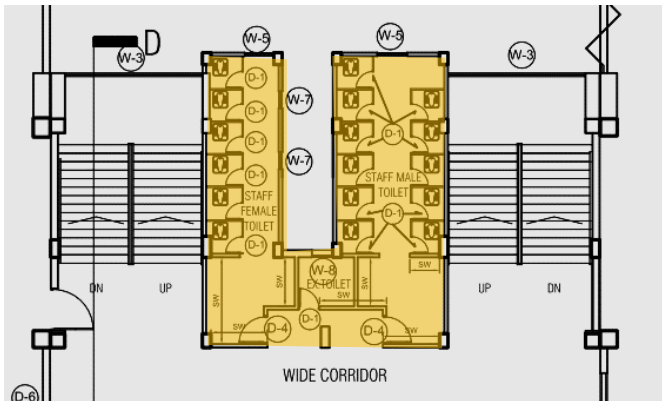
Observation-2: Discrepancies in as built drawings (Main Production Building).



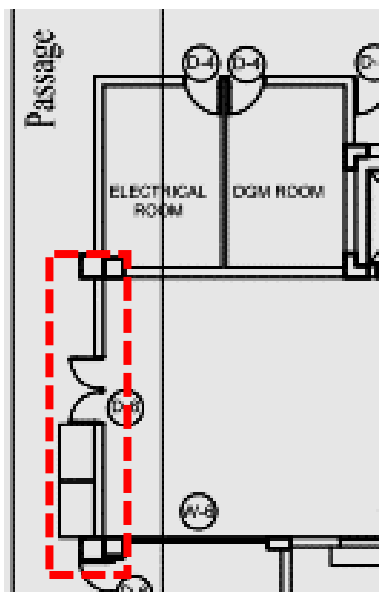
Mismatch in column orientation at grid L-3 (both block A & B)



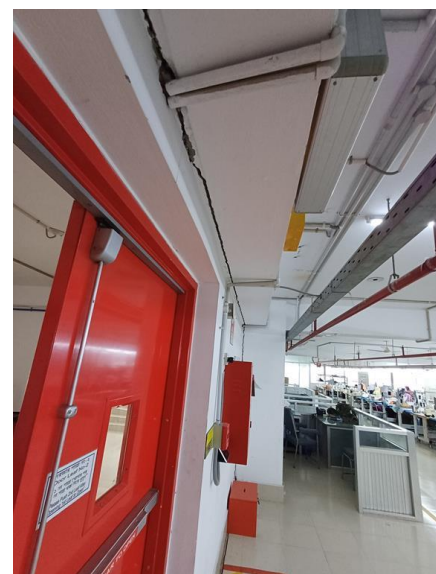
Steel beams instead of RCC beam were found at marked location of roof level (Block A).



150 mm buildup at toilet area not mentioned in drawing.



West ←



→ West

Partition wall was observed at east side of expansion joint instead of west side (Block B).

Description: During inspection, some mismatches (column orientation, steel beam instead of RCC beam at roof level, 150 mm buildup at toilet area, partition wall layout etc.) were found between onsite condition and as-built drawing. The building engineer is required to survey the full structure, update as-built drawings as per site condition and incorporate in assessment.

Observation-3: Horizontal crack on brick wall-beam joint face (Main Production Building).



Description: Horizontal cracks were observed in brick wall-beam joint face at several locations. Factory is required to identify the reason of crack, take necessary remedial measure to repair the wall accordingly.

Observation-4: Lack of calculation of material strength in design report. (Washing & Chemical Building).

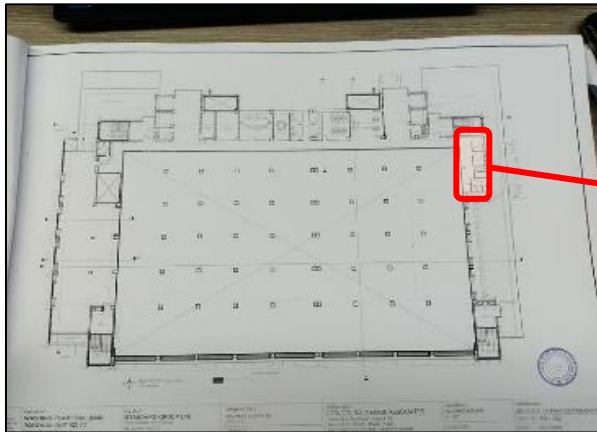
1.5 Material: 1.5.1 Concrete: - Compressive strength of concrete using 3/4" downgraded stone chips is $f'_c = 4500$ psi (31 Mpa) for Footing & Column as specified in the drawings. - Compressive strength of concrete (1:1.5:3) using 3/4" downgraded stone chips is $f'_c = 3500$ psi (24.14 Mpa) for Grade Beam, Floor Beam, Stair, Floor Slab, OHWT Slab etc. as specified in drawing. 1.5.2 Sand: - Filling Sand (F.M = 0.8) - Local Sand (F.M = 1.2) - Sylhet Sand (F.M = 2.5) 1.5.3 Cement: Ordinary Portland cement Structural Design Associates Ltd.	5.12.2 Frequency of Testing 5.12.2.1 Samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, nor less than once for each 60 m³ of concrete, nor less than once for each 250 m² surface area for slabs or walls. 5.12.2.2 On a given project, if the total volume of concrete is such that frequency of testing required by Sec 5.12.2.1 above would provide less than three strength tests for a given class of concrete, tests shall be made from at least three randomly selected batches or from each batch if three or fewer batches are used. 5.12.2.3 When the total quantity of a given class of concrete is less than 20 m³, strength tests are not required when evidence of satisfactory strength is submitted to and approved by the Engineer. 5.12.2.4 A strength test shall be the average of the strengths of at least two 150 mm by 300 mm cylinders or at least three 100 mm by 200 mm cylinders made from the same sample of concrete and tested at 28 days or at test age designated for determination of f'_c.
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Description: A set of design reports was available for washing & chemical building. In the design report, the concrete strength has been considered of 4500 psi on cylinder test reports. The building engineer is required to verify the frequency of testing requirements as per BNBC (Part VI, Chapter 5, 5.12.2) and update the analysis & design report if required.

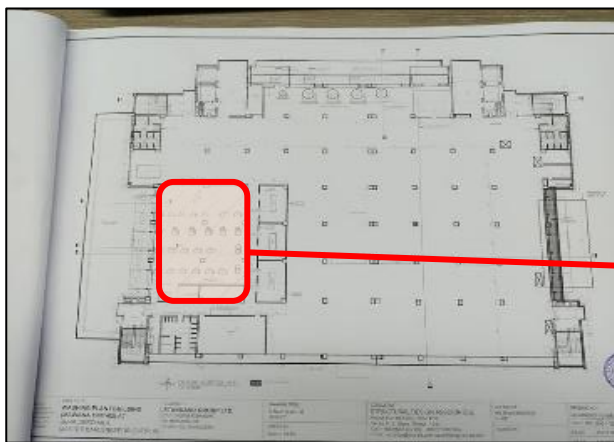
Observation-5: Discrepancy in as-built drawing (Washing Building).



Description: A monorail crane was found in the ground floor column. But in as-built drawing it was not mentioned.



Description: Toilet layout at North-East corner was not matched with as-built drawing.



Description: 200 mm build-up was found on the 1st floor. But in as-built drawing 125 mm built was mentioned.

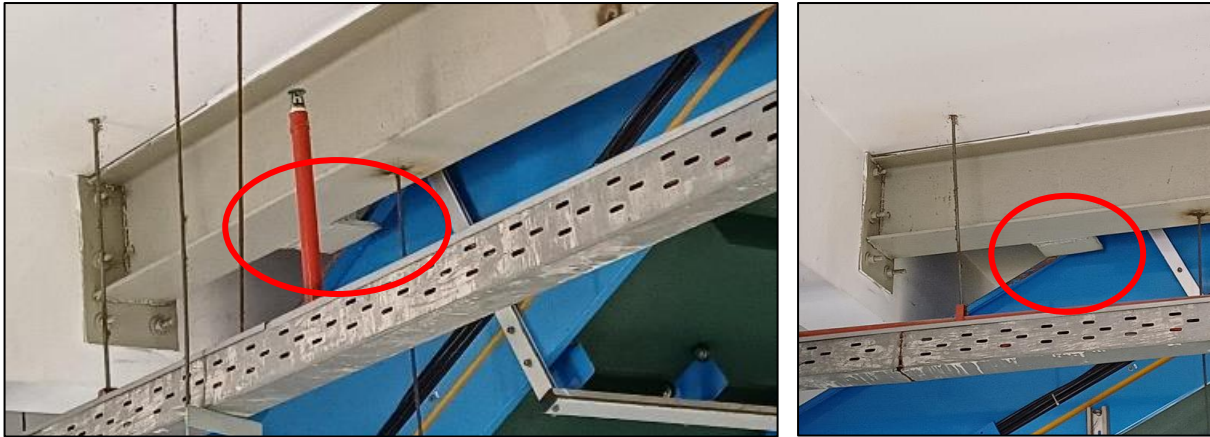


SCHEDULE OF COLUMN REINFORCEMENTS			
NAME OF COLUMN	UP TO F.G.L	F.G.L TO 2ND FLOOR	3RD FLOOR TO ABOVE
C10			
C10A			

REINFORCEMENT DETAILS OF BEAM WALLS (UP TO F.L.)
REINFORCEMENT DETAILS OF BEAM WALLS (F.L. TO ABOVE)

Description: 5 nos. circular column was found only on the 5th floor. But in as-built drawing circular column was mentioned from base to roof.

Observation-6: Discontinued bottom flange of I-beam at 1st floor (Washing Building).



Description: During inspection, discontinued bottom flange of I-beam was found at 1st floor conveyor belt area. Building engineer is required to check the adequacy of steel I-beam to comply with BNBC.

Observation7: Cracks in brick wall (Washing Building).



Description: Some cracks were found in the brick wall. Building engineer is required to investigate the reason of cracks and repair with suitable method.

Observation-8: Falling hazards (Washing Building).



Description: During inspection, no railing or parapet wall was found at 5th floor north portion (front side). Building engineer is required to provide railing to mitigate falling hazard.

Observation-9: Column susceptible to vehicle impact (Washing Building).



Description: Some columns on the ground floor were found susceptible to vehicle impact. Building engineer is required to provide barriers around the column to prevent vehicle impact.

Observation-10: Falling hazards (Chemical Building).



Description: Ground floor north side ceiling is found to be damaged. Building engineer is required to take proper action to mitigate falling hazard.

Observation-11: Column and beam susceptible to vehicle impact (Chemical Building).



Description: Some columns and beams on the ground floor were found susceptible to vehicle impact. Building engineer is required to provide barriers around the column and beam to prevent vehicle impact.

Observation-12: Absence of concrete compressive strength test result (Utility Building).

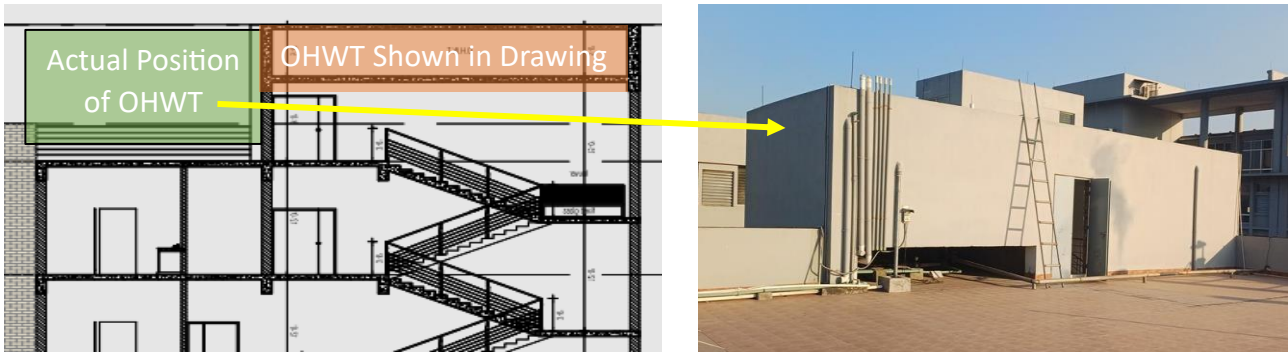
1.5 Material:

1.5.1 Concrete:

- -Compressive strength of concrete using 3/4" downgraded stone chips is $f'_c = 3500$ psi (24 Mpa) for Footing & Column as specified in the drawings.
- Compressive strength of concrete (1:1.5:3) using 3/4" downgraded stone chips is $f'_c = 3000$ psi (21 Mpa) for Grade Beam, Floor Beam, Stair, Floor Slab, OHWT Slab etc. as specified in drawing.

Description: In design report, compressive strength of concrete was considered as 3500 psi for column & footing and 3000 psi for beam, slab etc. But no concrete compressive strength test result was available onsite. The building engineer is required to verify in-situ material strength, produce design report accordingly and submit to RSC for review.

Observation-13: Discrepancies in as built drawings (Utility Building).



Location mismatch of Overhead Water Tank

Description: During inspection, OHWT was found at different location as shown in picture. The building engineer is required to survey the full structure, update as-built drawings as per site condition and incorporate in assessment.

Observation-14: Horizontal crack on brick wall (Utility Building).



Description: Horizontal cracks were observed on brick wall at several locations. Factory is required to identify the reason of crack, take necessary remedial measure to repair the wall accordingly.

Observation-15: Spalling of concrete (Utility Building).



Description: During inspection, spalling of concrete was observed at beam, column and slab of 1st floor. Factory is required to identify the reason and take necessary remedial measure to repair the damaged portion accordingly.

Observation-16: Inconsistency in design report (Belt Press M/C Shed).

1.7. Load Combinations:

For Preliminary assessment of R.C. & Steel structural members will be assessed as per NTPA guideline. The combinations of the factored loads as per NTPA are shown below.

NTPA1:	$1.2 D + 1.6 L$
NTPA2:	$1.05 D + 1.25 L + 1.0 EQ_x$
NTPA3:	$1.05 D + 1.25 L - 1.0 EQ_x$
NTPA4:	$1.05 D + 1.25 L + 1.0 EQ_y$
NTPA5:	$1.05 D + 1.25 L - 1.0 EQ_y$
NTPA6:	$1.05 D + 1.25 L + 1.0 W_x$
NTPA7:	$1.05 D + 1.25 L - 1.0 W_x$
NTPA8:	$1.05 D + 1.25 L + 1.0 W_y$
NTPA9:	$1.05 D + 1.25 L - 1.0 W_y$
NTPA10:	$1.2 D + 0.5 L$
NTPA11:	$1.2 D + 0.5 L + 1.3 W_x$
NTPA12:	$1.2 D + 0.5 L - 1.3 W_x$
NTPA13:	$1.2 D + 0.5 L + 1.3 W_y$
NTPA14:	$1.2 D + 0.5 L - 1.3 W_y$
NTPA15:	$1.2 D + 1.5 E_x$
NTPA16:	$1.2 D - 1.5 E_x$
NTPA17:	$1.2 D + 1.5 E_y$
NTPA18:	$1.2 D - 1.5 E_y$

Description: Design report was prepared using other than BNBC load combination. The building engineer is required to revise design report in accordance with the provision of Section 1.9.1, BNBC and submit to RSC for review.

Observation-17: Non-engineered structure (Parking Shed).



Description: Lack of lateral stability system (strut and bracing), apparent inadequate members and non-engineered connection was observed. The building engineer is required to check the member, connection & stability system of the structure and suggest proper alternatives accordingly.

3. Action Plan

Observation	Action Plan	Timeline
Inconsistency in compressive strength of concrete (Main Production Building).	Verify in situ concrete strength (100mm dia. cores from 4 columns) from lower tier of the building.	within 6 weeks
	The building engineer is required to revise the design report for the concrete strength and submit it to RSC for review.	within 6 weeks
	Carry out suggested remedial works if required.	within 6 months
Discrepancies in as built drawings (Main Production Building).	The building engineer is required to survey the full structure and produce accurate as-built drawings.	within 6 weeks
Horizontal crack on brick wall-beam joint face (Main Production Building).	The building engineer is required to identify the reason of crack, take necessary remedial measure to repair the wall accordingly.	within 6 weeks
Lack of calculation of material strength in design report (Washing & Chemical Building).	Verify in situ concrete strength (100mm dia. cores from 4 columns) from lower tier of the building.	within 6 weeks
	The building engineer is required to revise the design report for the concrete strength and submit it to RSC for review.	within 6 weeks
	Carry out suggested remedial works if required.	within 6 weeks
Discrepancy in as-built drawing (Washing Building).	The building engineer is required to update the as-built drawing as per actual site condition.	within 6 weeks
Discontinued bottom flange of I-beam at 1st floor (Washing Building).	The building engineer is required to check the adequacy of steel I-beam in compliance with BNBC.	within 6 weeks
Cracks in brick wall (Washing Building).	The building engineer is required to investigate the reason of cracks and repair with suitable method.	within 6 weeks
Falling hazards (Washing Building).	The building engineer is required to provide railing to mitigate falling hazard.	within 6 months
Column susceptible to vehicle impact (Washing Building).	The building engineer is required to provide barriers around the column to avoid vehicle impact.	within 6 months
Falling hazards (Chemical Building).	The building engineer is required to take proper action to mitigate falling hazard.	within 6 months
Column and beam susceptible to vehicle impact (Chemical Building).	The building engineer is required to provide barriers around the column and beam to avoid vehicle impact.	within 6 months
Absence of concrete compressive strength test result (Utility Building).	Verify in situ concrete strength (100mm dia. cores from 4 columns) from lower tier of the building.	within 6 weeks
	The building engineer is required to revise the design report for the concrete strength and submit it to RSC for review.	within 6 weeks
	Carry out suggested remedial works if required.	within 6 months

Discrepancies in as built drawings (Utility Building).	The building engineer is required to survey the full structure and produce accurate as-built drawings.	within 6 weeks
Horizontal crack on brick wall (Utility Building).	The building engineer is required to identify the reason of crack, take necessary remedial measure to repair the wall accordingly.	within 6 weeks
Spalling of concrete (Utility Building).	The building engineer is required to identify the reason and take necessary remedial measure to repair the damaged portion accordingly.	within 6 weeks
Inconsistency in design report (Belt Press M/C Shed).	The building engineer is required to revise design report in accordance with the provision of Section 1.9.1, BNBC and submit to RSC for review.	within 6 weeks
	Carry out remedial works if required.	within 6 months
Non-engineered structure (Parking Shed).	The building engineer is required to check the member, connection & stability system of the structure and suggest proper alternatives accordingly.	within 6 weeks
	Carry out remedial works if required.	within 6 months