

Nasa Hitech Style Limited

Madhokhola, Sreepur, Gazipur

(24.176313 N, 90.437430 E)

22 May 2022



Building Information:

Factory Building: Two storied (G+1) building.

Office Building: Four storied (G+3) building.

Facility Building: Three storied (B+G+2) building with semi basement.

Utility Building: Single storied building.

Observations

Lack of material test report

Observation: Factory Building

EXECUTIVE SUMMARY

The Factory Building of **Nasa Hi-tech Style Ltd** is a 2-storied building located at Shreepur, Gazipur.

The authority of **Nasa Hi-tech Style Ltd** has engaged **Composite Consultant** for performing Design Report along with checking architectural and structural drawings of the building.

For Engineering Assessment one of the key inputs is the concrete strength. We have used the concrete compressive strength **3,997 Psi** for Columns, **3,997 Psi** Beams. Stone Chips is considered as coarse aggregate. Rebar yield strength is considered as **72,500 Psi**. Strength of structural steel was considered **50 Ksi**.

Considering **BNBC referred loads & load combinations**, we have analysed the structure & found that all the foundations are adequate in bearing capacity and punching capacity. All the RCC columns are adequate. All the Structural members are also adequate. All the provided grade beams are adequate. All the steel members are also adequate. The structure is adequate in deflection requirements.

The building can continue its operation by maintaining the allowable load layout plan

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Factory engineer considered the rebar strength as 72.5 ksi (500 MPa) and MS plate strength 50 ksi (348 Mpa) in the design report. But material test reports of rebar & MS plate were not available on-site.

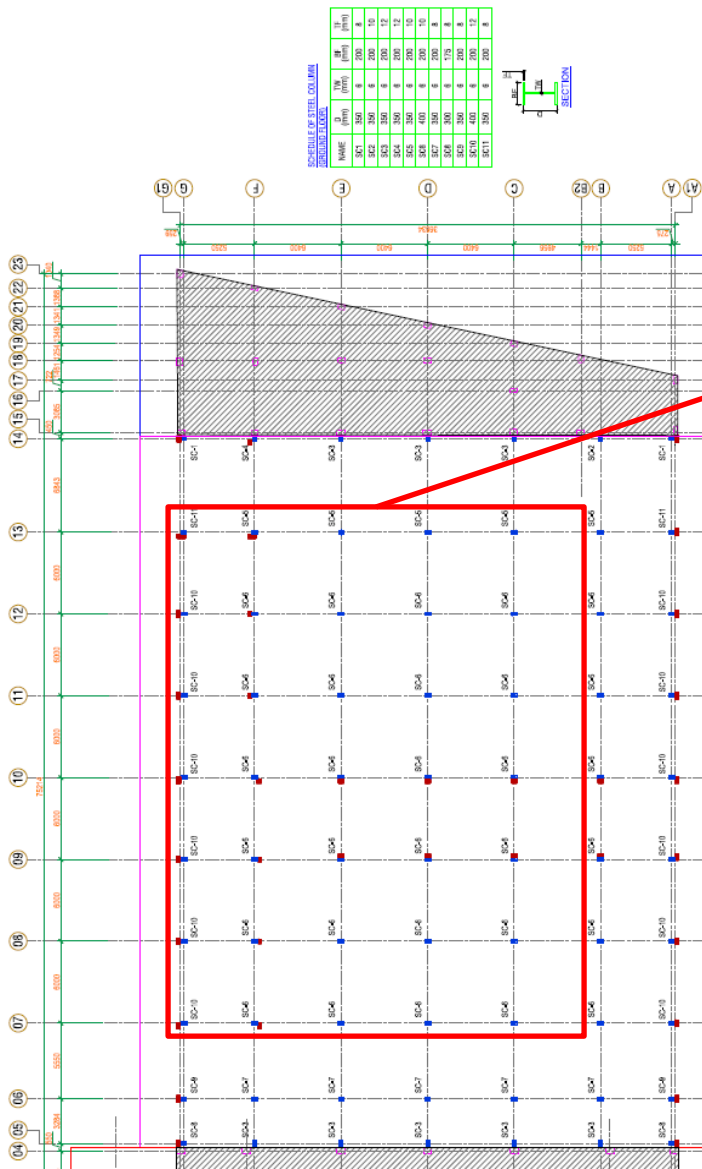
The factory is required to verify in-situ material strength for rebar and MS plate to confirm the design strength. Otherwise, revise the design report considering minimum material strength for rebar and MS plate.

Observation: Factory Building

Discrepancy between as-built drawing and on-site condition

Observation: Factory Building

12 mm flange thickness
measured on-site



12mm flange
thickness found
instead of 10 mm
for SC2, SC5 & SC6
column. Factory
engineer is
required to survey
the structure &
prepare accurate
as- built drawings
with structural
details.

**SCHEDULE OF STEEL COLUMN
(GROUND FLOOR)**

NAME	D (mm)	TW (mm)	BF (mm)	TF (mm)
SC1	350	6	200	8
SC2	350	6	200	10
SC3	350	6	200	12
SC4	350	6	200	12
SC5	350	6	200	10
SC6	400	6	200	10
SC7	350	6	200	8
SC8	300	6	175	8
SC9	350	6	200	8
SC10	400	6	200	12
SC11	350	6	200	8

Column Schedule

Observation: Factory Building

Corrosion in the steel column



Corrosion observed in the steel column due to presence of water source nearby

Factory is required to remove the water source near by the steel members, take necessary actions to remove the corrosion & apply suitable corrosion resistance coating on the steel columns.

Significant connection gap



Significant connection gap observed in steel beam-column joint. Factory engineer is required to check the connections & suggest the proper repair methodology accordingly.

Undocumented telecommunication mast on the staircase



South Elevation of Office Building



Telecommunication mast on the staircase.

Telecommunication mast on the O.H.W.T of the office building but it was not considered in the as-built drawing. Factory engineer is required to update the drawing according to the site condition.

Possibility of vehicle impact on column

Observation: Office Building



Ground Floor Column at Parking

No column guard provided to protect the ground floor column from the vehicle impact. Factory engineer is required to install column guard around the column to avoid the vehicle impact.

Standing water on the roof

Observation: Facility Building



Standing water on the roof



RC Column and wall in the staircase observed in damped condition due to the standing water.

Standing water on roof observed due to improper drainage system. Adjacent RC column and brick wall become damped. Factory engineer is required to provide adequate slope to wash out the storm water & investigate the intensity of the damage of the column and to take proper remedial actions.

Storage racks found without bracing/anchored



Storage racks on the ground floor were not adequately anchored or braced to resist earthquake forces.



Factory Engineer is required to anchored/braced the storage rack and all kinds of non-structural elements.

Storage rack not anchored or braced

Test Carried Out



Steel Member Measurement



Concrete core observed at the column of Utility Building



Concrete core observed at the column of Office Building



Rebar Scanning to verify rebar

Centre for Advisory and Testing Services [CATS-MIST (CE)]
Military Institute of Science and Technology

Majur Cantonment, Dhaka-1216

Compressive Strength of Concrete Drilled Cores

CATS Reference	: 2376/Con/29507-510/05/2022	Date	: 18.05.2022
Client	: NASA Hi-Tech Style Ltd		
Project Name & Address	: NASA Hi-Tech Style Ltd (Factory Building) at Shreepur, Gazipur		
Sample Brought By	: Md. Mustafizur Rahman	Date of Receiving	: 17.05.2022
Test Method	: ASTM C 42/C 42-M	Date of Test	: 18.05.2022
Type of Sample	: Drilled Core	Sample Condition	: Unsealed
Location of Sample	: Ground Floor Column, Grid: A-14, A-5, G-6 & G-14		
Construction Year	: Not Mentioned	Quantity of Sample	: 04 nos
No of Story	: 02-Storey	Type of Aggregate	: Stone Chips

Sl No.	Sample Identification Mark	Original Length mm	Sawed Length mm	Diameter mm	Crushing Load kN	Crushing Strength MPa	Crushing Strength psi	Failure Type	Fracture Type
1	C-1	182.0	135.0	69.0	152.1	40.7	5900	Combined	Cone and Shear
2	C-2	155.0	134.0	69.0	124.9	33.4	4840	Combined	Shear
3	C-3	170.0	136.0	69.0	92.2	24.7	3580	Combined	Shear
4	C-4	175.0	134.0	69.0	202.9	54.3	7820	Combined	Cone

REMARKS:
1. All information displayed above other than the test results are provided by the client.

Concrete (column) core test report of Factory Building



Concrete core observed at the column of Facility Building

Problems Observed

Factory Building:

Item 01: Lack of material test report.

Item 02: Discrepancy between as-built drawing and on-site condition.

Item 03: Corrosion in the steel column.

Item 04: Significant Connection Gap.

Office Building:

Item 05: Undocumented telecommunication mast on the staircase.

Item 06: Possibility of vehicle impact on column.

Facility Building:

Item 07: Standing water on the roof.

Factory Building & Facility Building:

Item 08: Storage racks found without bracing/anchored.

Priority Actions

Item No.	Observation	Recommended Action Plan	Recommended Timeline
01	Lack of material test report. (Factory Building)	Factory engineer is required to verify in-situ material strength for rebar and MS plate to confirm the design strength. Otherwise, revise the design report considering minimum material strength for rebar and MS plate.	6-weeks
02	Discrepancy between as-built drawing and on-site condition. (Factory Building)	Factory engineer is required to survey the structure & prepare accurate as- built drawings with structural details.	6-weeks
03	Corrosion in the steel column. (Factory Building)	Factory is required to remove the water source near by the steel members, take necessary actions to remove the corrosion & apply suitable corrosion resistance coating on the steel columns.	6-weeks
04	Significant Connection Gap. (Factory Building)	Factory engineer is required to check the connections, suggest the proper repair methodology accordingly.	6-weeks
05	Significant Connection Gap. (Factory Building)	Carry out repair works as per the suggestion of factory engineer.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
06	Undocumented telecommunication mast on the staircase. (Office Building)	Factory engineer is required to update the drawing according to the site condition.	6-weeks
07	Possibility of vehicle impact on column. (Office Building)	Factory engineer is required to install column guard around the column to avoid the vehicle impact.	6-weeks
08	Standing water on the roof. (Facility Building)	Factory is required to provide adequate slope to drain out the storm water.	6-weeks
09	Standing water on the roof. (Facility Building)	Factory engineer is required to investigate the intensity of the damaged of the column and to take proper remedial actions.	6-weeks
10	Storage racks found without bracing/anchored. (Factory Building & Facility Building)	Factory engineer is required to anchored or braced the storage rack and all kinds of non-structural elements.	6-weeks