

Auko-Tex Limited (Extended building)

South Panishail zerani bazar, BKSP, Gazipur, Dhaka

(23.990550, 90.260122)

14 January 2024



1. Building Information

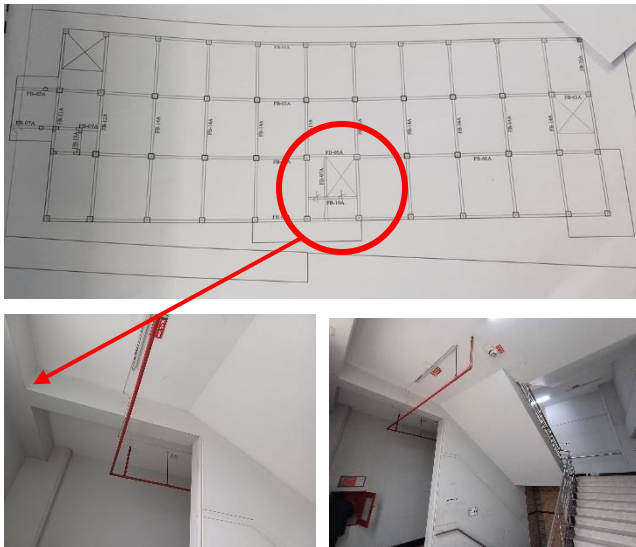
Knitting and Store Building: Knitting and Store building is a six (B+G+5) storied RC building with a basement.

Officers Resting Room: Officers Resting Room is a four (B+G+3) storied RC building with a underground water reservoir.

Security Post & Sub-station Building: Security Post & Sub-Station Building is a two (G+1) storied RC building (security post) with masonry part (sub-station).

2. Observation

Observation-1: Mismatches in as-built drawings. (Knitting and Store Building)



Beam Layout



Steel stair on roof

Description: Beam layout didn't fully match with the drawings. Mismatches are shown in red on the layout. Also, first floor layout was found different with the drawings. Moreover, no drawings were available for the roof steel stair.

Observation-2: Inconsistencies between design report and floor loading & material test report. (Knitting and Store Building)

Live load:

- Ground, 1st, 5th & Helipad Floor live load=125psf
- 2nd, 3rd, 4th & roof Floor live load=42 psf
- Stair live load=80 psf
- Roof live load - 42 psf



Roof floor loading

4.0) MATERIAL SPECIFICATIONS:

- Equivalent Compressive Strength of concrete, f'_c
 - Column (3500 psi) Stone chips for Cylinder Test
 - Beam (3500 psi) Stone chips for Cylinder Test
 - Slab (3500 psi) Stone chips for Cylinder Test



Test report

Description: In the provided design report concrete compression strength considered 3500 psi for column. But no cylinder test report was available from ground floor column in this regard, which does not meet the frequency of testing of BNBC. Thus, ground columns are observed marginally overstressed from cursory calculation considering minimum concrete strength. Also, the live load plan (42 psf) for roof storage (below the helipad) does not comply with BNBC. The building engineer is required to revise the design report incorporating BNBC live load requirements and in-situ material strength.

Observation-3: Cracks found on the slab soffit. (Knitting and Store Building)



Cracks on slab soffit



Cracks on slab soffit

Description: Crack found under the slab soffit at 3rd floor. Building engineer is required to investigate the reason and extent of the crack and repair the crack as per investigation report.

Observation-4: Non-structural elements not anchored or braced. (Knitting and Store Building)



Unbraced racks on floor



Unbraced racks on floor

Description: Some racks on floors are not anchored or braced to resist lateral (earthquake) forces. The factory is required to anchor/brace all non-structural elements adequately to resist earthquake forces.

Observation-5: Discrepancies in as-built drawings. (Officers Resting Room)



Beam Layout



Steel stairs

Description: Roof and 3rd floor layout didn't fully match with as built drawings. Additional room beside of stair on roof not shown in the drawings. Also, the number of partition walls on 3rd floor were found different with as-built drawings. Moreover, no as built drawings were available for steel stair.

Observation-6: Inadequate number of material testing for building column. (Officers Resting Room)

4.0) MATERIAL SPECIFICATIONS:

1) Equivalent Compressive Strength of concrete, f_{cc}

- Column (4000 psi) Stone chips for Core Test
- Beam (4000 psi) Stone chips for Core Test
- Slab (2045 psi) Brick chips

2) Yield Strength of reinforcement, f_y

- Steel (60000 psi), NTPA Art 5

NTPA Art 5: Reinforcing steel -415 MPa (60ksi) for construction from and after 2004 and 275MPa (40ksi)

Design report

TEST REPORT

Sl. No.	Date of Casting as per the Letter	Specimen Designation	Specimen Area (sq. in)	Specimen Length (in)	Crushing Strength (psi)	Average Crushing Strength	Mode of Failure
1	15/12/2018	---	12.42	67.808	4,000	4000 psi	Compressed *
2	16/12/2018	---	12.42	68.786	6,810	(71.9 MPa)	Compressed *
3	---	---	12.67	68.534	6,415	(224 kg/cm ²)	Compressed *

Note: Samples were received in untested condition. * Compressed - Mortar and Aggregate failure.

Countersigned by:

Dr. Abu Sirajique
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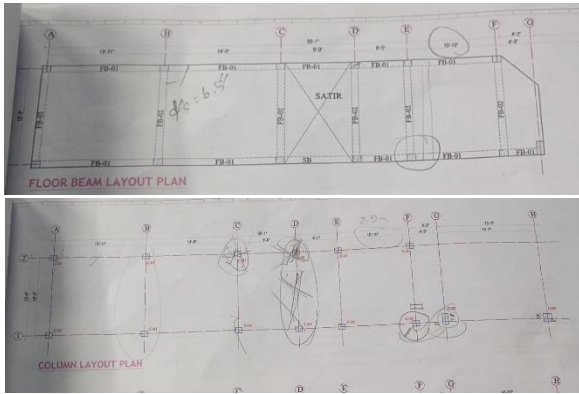
Test Performed by:

Rubaiya Ruman
Lecturer
Department of Civil Engineering
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Test report

Description: In the provided design report concrete compression strength considered 4000 psi for column. But cylinder test report was available from ground floor column only, which does not meet the frequency of testing of BNBC. Thus, ground columns are observed marginally overstressed from cursory calculation considering minimum concrete strength. The building engineer is required to revise the concrete strength in the design report by performing core test.

Observation-7: Discrepancies in as-built drawings. (Security Post & Sub-Station Building)



Beam Layout



Steel stair, floor Beam and Sub-station Room

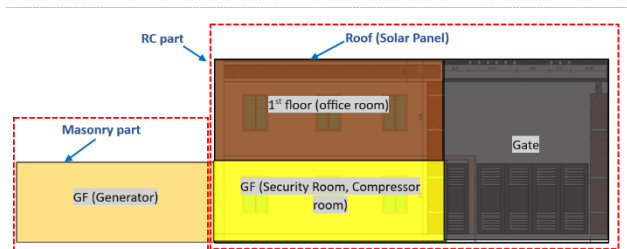


Description: Column and beam layouts were not fully matched with as built drawings. Also, the column of sub-station room was found brick masonry instead of RCC. Moreover, no as built drawings were available for steel stair.

Observation-8: Lack of design report. (Security Post & Sub-Station Building)



Building



Sectional details

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, part 6 of BNBC.

Observation-9: Cracks observed at steel stair and RCC slab connection. (Security Post & Sub-Station Building)



Building



Sectional details

Description: Cracks found in the junction of the steel stair and RC slab connection on 1st floor. Building engineer is required to investigate the reason and extent of the crack and repair the crack as per investigation report.

3. Action Plan:

Observation	Action Plan	Timeline
Mismatches in as-built drawings (Knitting and Store Building)	Building engineer is required to prepare the as-built drawings with complete structural details.	within 6 weeks
Inconsistencies between design report and floor loading & material test report. (Knitting and Store Building)	The building engineer is required to revise the design report incorporating BNBC live load requirements and verifying in-situ concrete strength by taking concrete cores from lower tier columns of the building.	within 6 weeks
Inconsistencies between design report and floor loading & material test report. (Knitting and Store Building)	Implement remediation work if required.	within 6 months
Inconsistencies between design report and floor loading & material test report. (Knitting and Store Building)	Implement the accepted floor load plan.	within 6 months
Cracks found on the slab soffit. (Knitting and Store Building)	Building engineer is required to investigate the reason and extent of the crack and repair the crack as per investigation report.	within 6 weeks
Non-structural elements not anchored or braced. (Knitting and Store Building)	The factory is required to anchor/brace all non-structural elements adequately to resist earthquake forces.	within 6 weeks
Discrepancies in as-built drawings. (Officers Resting Room)	Building engineer is required to prepare the as-built drawings with complete structural & architectural details.	within 6 weeks
Inadequate number of material testing for building column. (Officers Resting Room)	Building engineer to update the design documents based on verifying in-situ concrete strength (by taking concrete cores from lower tier columns) in compliance with BNBC.	within 6 weeks
Inadequate number of material testing for building column. (Officers Resting Room)	Implement remediation work if required.	within 6 months
Discrepancies in as-built drawings. (Security Post & Sub-Station Building)	Building engineers are required to survey the whole structure and prepare accurate as-built drawings.	within 6 weeks
Lack of design report. (Security Post & Sub-Station Building)	Building 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, part-6 of BNBC and submit it to RSC for review.	within 6 weeks

Lack of design report. (Security Post & Sub-Station Building)	Carry out remedial works (if any) after review by RSC.	within 6 months
Cracks observed at steel stair and RCC slab connection. (Security Post & Sub-Station Building)	Building engineer is required to investigate the reason and extent of the crack and repair the crack as per investigation report.	within 6 weeks