

Fancy Fashion Sweaters Ltd. (Extension)

1153-54, Shahid Siddique Road, Khaikur, Board Bazar, Gazipur.

Geographic Coordinates: 23.942381, 90.388961

4 June 2023



Building Information:

Building-2 (Service Building): Six (G+5) storied building.

Jacquard Shed: Single storied shed.

Observations

Lack of design report

2. MATERIAL SPECIFICATION:

2.1 CONCRETE

a) TYPE: ALL CONCRETE COMPRESSIVE STRENGTH CONSIDERED AS FOLLOWS:

- 1) $f'_c = 25 \text{ MPa}$ (3600 psi) at 28 DAYS CYLINDER STRENGTH USING STONE CHIPS (TO BE DETERMINED BY TRIAL MIX DESIGN) FOR COLUMN & FOUNDATION.
 - 2) $f'_c = 25 \text{ MPa}$ (3600 psi) at 28 DAYS CYLINDER STRENGTH USING STONE CHIPS (TO BE DETERMINED BY TRIAL MIX DESIGN) (FOR BEAM, SLAB, STAIR, R.C.C WALL, U.G.W.R & O.H.W.T.)
 - 3) $f'_c = 21 \text{ MPa}$ (3000 psi) at 28 DAYS CYLINDER STRENGTH USING STONE CHIPS NOMINAL MIX RATIO = 1:1½:3. (TO BE DETERMINED BY TRIAL MIX DESIGN) (FOR R.C.C PILE)
 - 4) $f'_c = 18 \text{ MPa}$ (2500 psi) AT 28 DAYS CYLINDER STRENGTH USING BRICK CHIPS MIX RATIO 1:2:4 (FOR LINTEL FALSE SLAB, BOUNDARY WALL, PARAPET, DROP WALL.)
- b) MINIMUM CYLINDER STRENGTH BASED ON CYLINDER TEST OF DIAMETER $D = 100$ or 150 mm & HEIGHT 200 or 300 mm
- I) 28 DAYS STRENGTH AS SPECIFIED IN 2.1(a)
 - II) 7 DAYS STRENGTH = 70% OF THE 28 DAYS STRENGTH.
- c) CURING OF R.C.C WORK:
- I) CURING TIME MINIMUM 28 DAYS
 - II) METHOD OF CURING:
 - * HORIZONTAL SURFACE - BY PONDING OF WATER
 - * OTHER SURFACES-BY WRAPPING MOIST JUTE FABRIC AND SPRINKLING WATER BY HOSE PIPE FREQUENTLY.
 - * USE CONCRETE ADMIXTURE FOR U.G.W.R, O.H.W.T. & PHEREPHERIAL RETAINING WALL.

Construction drawing: Concrete design strength 3500 psi for column

3 set of concrete test reports for column were available. As per BNBC, frequency of testing for the concrete cylinder doesn't satisfy. Also, one of the test result was well below the design strength. So, the building engineer is required to take concrete core from the existing building to confirm in-situ material strength. Prepare a complete set of design report based on as-built drawing and in-situ material strength of the structure.

Coarse Aggregate (Stone chips)		Stone chips		Stone chips		
Average Strength	Failure Type	Average Strength	Failure Type	Average Strength	Failure Type	Failure Type
MPa	psi	MPa	psi	MPa	psi	Failure Type
27.4	3977.4	21.0	3051.9	30.1	4366.6	Mortar
						Mortar
						Mortar

Test report: Concrete crushing strength 3051 psi for column

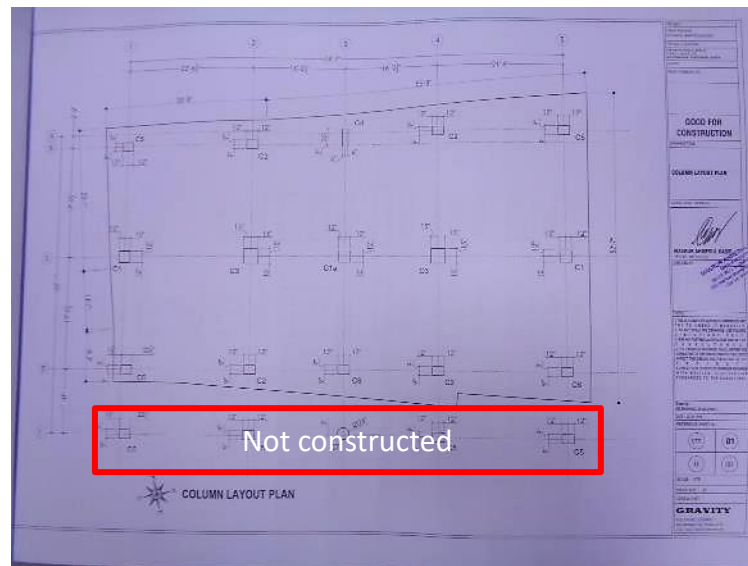
Observation: Building-2 (Service Building)

Incomplete as-built structural drawings

Observation: Building-2 (Service Building)



Ground floor plan



Column layout



Building-2 east elevation

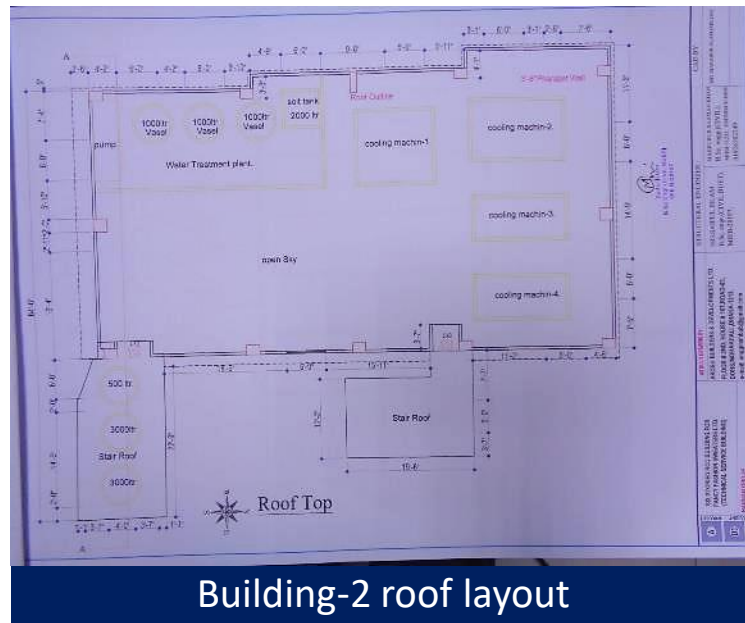


Ground floor roof beam layout

As-built drawings doesn't match with as-built condition. The building engineer is required to survey the structures and prepare accurate as-built drawings. Submit the drawing to the RSC for review.

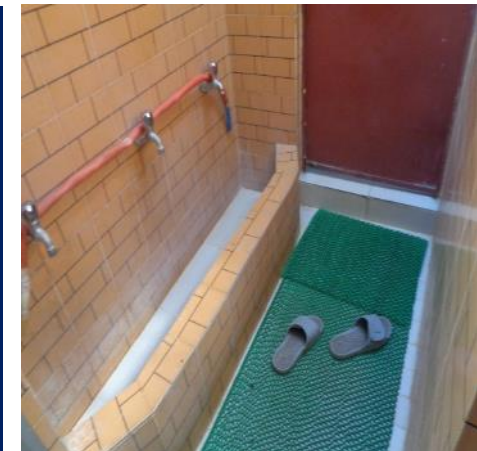


Floor built-ups and water tanks on the roof



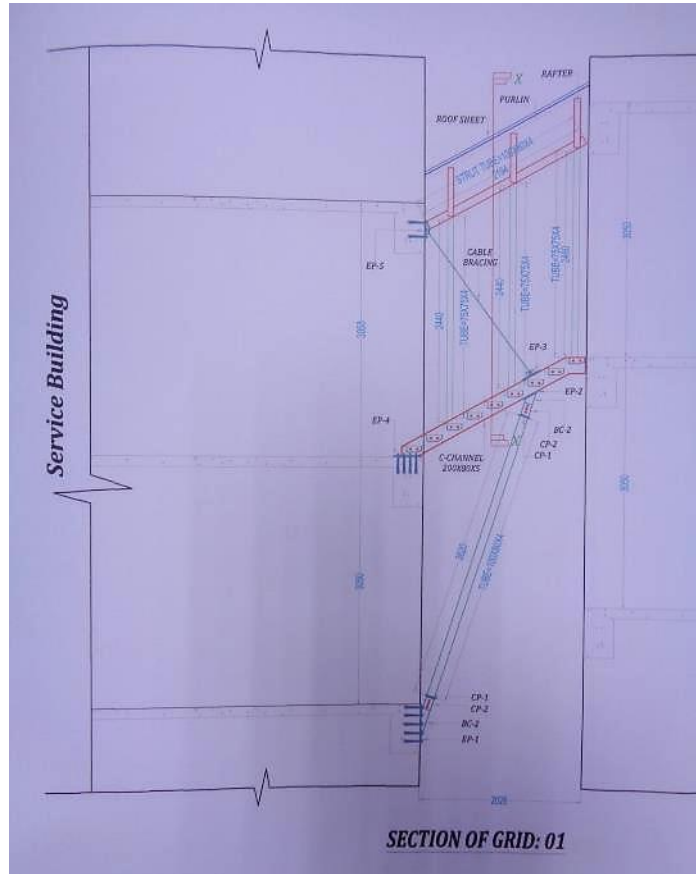
Building-2 roof layout

Two plastic water tanks and floor raises are not shown in the as-built drawings. The building engineer is required to survey the structures and prepare accurate as-built drawings.



Floor built-ups of toilet zone not shown in drawing.

Absence of adequacy check of steel connecting bridge



Steel connecting bridge between Building-1 and Building-2

Only a set of drawing was available for the connecting bridge. The building engineer is required to check the adequacy of the steel connecting bridge and suggest necessary remedial actions if required.

Observation: Building-2 (Service Building)

Stability of metal curved roof decking system



Metal curved roof decking system: No lateral support perpendicular to the deck rib

There is no framing along perpendicular direction of deck rib of steel curved roof. Therefore, the lateral stability of the steel decking roof is questionable. Also, there was no concrete test report onsite to confirm the design strength. So, the building engineer is required to check the lateral stability of the roof system and prepare a complete set of design report for the structure based on in-situ material strength.

e) DEPTH OF FOUNDATION AS PER STRUCTURAL DRAWING.

3. CONCRETE :

e) TYPE : CONCRETE COMPRESSIVE STRENGTH CONSIDERED AS FOLLOWS :

- 1) Column, beam=3000 psi.
- 2) SLAB, PILE CAP AND OTHERS CONCRETE
 $f_c=3000$ psi WHICH ARE TO BE CONFORMED BY Mixed ratio=1:1.5:3

b) MINIMUM CYLINDER STRENGTH : BASED ON CYLINDER TEST OF
 DIAMETER D = 150mm & HEIGHT = 300mm
 i) 28 DAYS STRENGTH = 20.7 Mpa
 ii) 7 DAYS STRENGTH = 14.5 Mpa

c) CURING OF R.C.C WORK :

- i) CURING TIME MINIMUM 22 DAYS
- ii) METHOD OF CURING :
 - * HORIZONTAL SURFACE -- BY PONDING OF WATER
 - * OTHER SURFACES--BY WRAPPING MOIST JUTE FABRIC AND SPRINKLING WATER BY HOSE PIPE FREQUENTLY.

Construction drawing: Concrete strength
3000 psi

Observation: Building-2 (Service Building)

Incomplete as-built drawings



RC portion adjacent to the shed



Roof extension on north

The RC portion, steel roof extension at north and individual truss-column framings are not shown in the drawing. The building engineer is required to survey the structure and produce a complete set of as-built drawing with necessary connection details.



Individual truss-column frame for MEP

Water ponding on the RC valley gutter



Water ponding on the concrete valley gutters of roof

Building engineer is required to provide adequate slope and outlet for the drainage system.

Problems Observed

Building-2 (Service Building):

Item 01: Lack of design report.

Item 02: Incomplete as-built structural drawings.

Item 03: Absence of adequacy check of steel connecting bridge.

Jacquard Shed:

Item 04: Stability of curved roof decking system.

Item 05: Incomplete as-built drawings.

Item 06: Water ponding on the RC valley gutter.

Priority Actions

Item No.	Observation	Recommended Action Plan	Recommended Timeline
01	Lack of design report. Building-2 (Service Building)	The building engineer is required to prepare design report based on in-situ material strength and suggest necessary remedial actions.	6-weeks
02	Lack of design report. Building-2 (Service Building)	Carry out suggested remedial work.	6-months
03	Incomplete as-built structural drawings. Building-2 (Service Building)	The building engineer is required to survey the structure and produce accurate as-built architectural & structural drawings.	6-weeks
04	Absence of adequacy check of steel connecting bridge. Building-2 (Service Building)	The building engineer is required to check the adequacy of the steel connecting bridge and suggest necessary remedial actions.	6-weeks
05	Absence of adequacy check of steel connecting bridge. Building-2 (Service Building)	Carry out suggested remedial works.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
06	Stability of curved roof decking system. (Jacquard Shed)	The building engineer is required to check the lateral stability of the roof system and prepare a complete set of design report for the structure based on in-situ material strength.	6-weeks
07	Stability of curved roof decking system. (Jacquard Shed)	Suggest necessary remedial work where required.	6-weeks
08	Stability of curved roof decking system. (Jacquard Shed)	Carry out suggested remedial works if required.	6-months
09	Incomplete as-built drawings. (Jacquard Shed)	The building engineer is required to survey the structure and produce a complete set of as-built drawing with necessary connection details.	6-weeks
10	Water ponding on the RC valley gutter. (Jacquard Shed)	Building engineer is required to provide adequate slope and outlet for the drainage system.	6-months