

Echotex Ltd

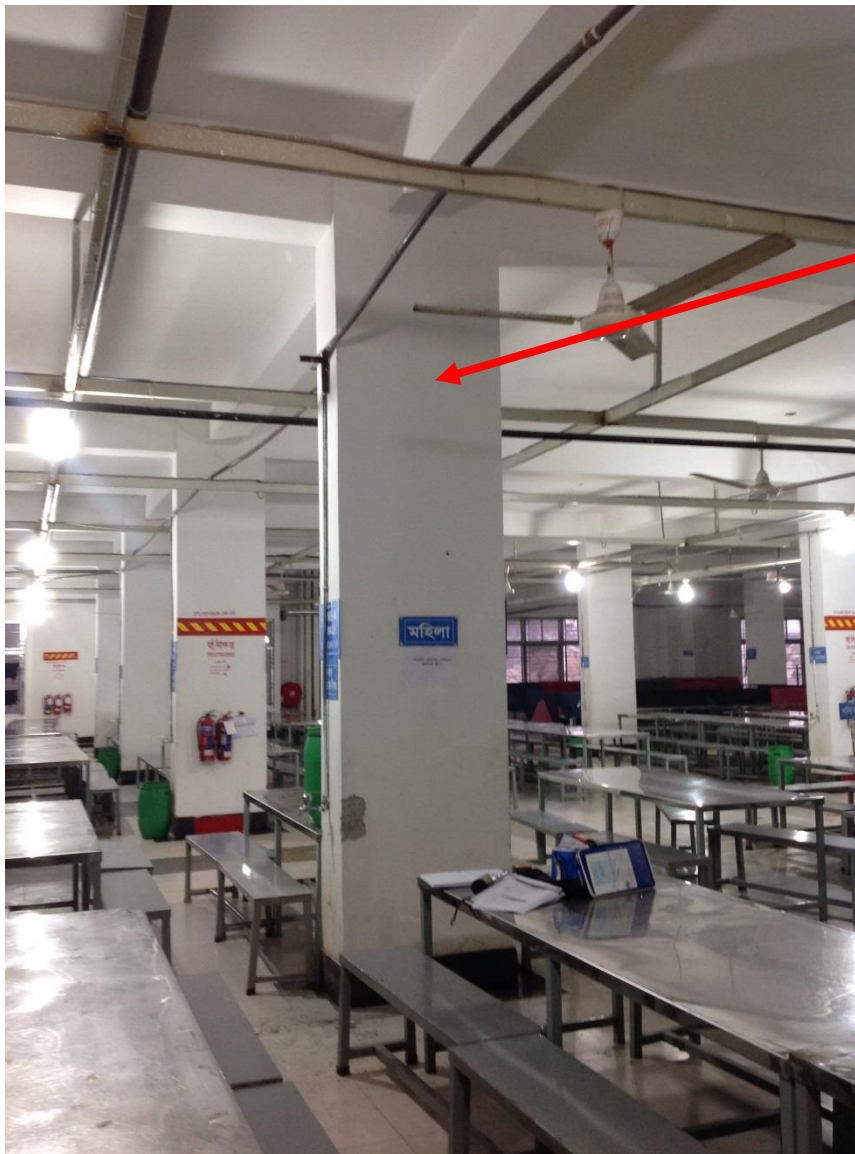
Chandra, Mouchak, Shafipur, Gazipur, Dhaka
(+24.03892N, 90.2586 E)

6 February 2014



Building Observations Garment Factory

**Columns appear to be stressed in excess of
normal design limits**



Cursory calculations indicate that column size appears to be smaller than required by code for the applied dead and live load, assuming typical concrete strength

Building Engineer to perform detailed calculations and concrete tests to prove column size and (if required) :

- Reduce loads by preparation of allowable floor loading plans
- Carry out strengthening works

Columns appear to be stressed in excess of normal design limits

Structural adequacy of concrete roof and columns to support water tanks on plinths and roof weatherproofing build-up



Average 125mm roof finishes build-up

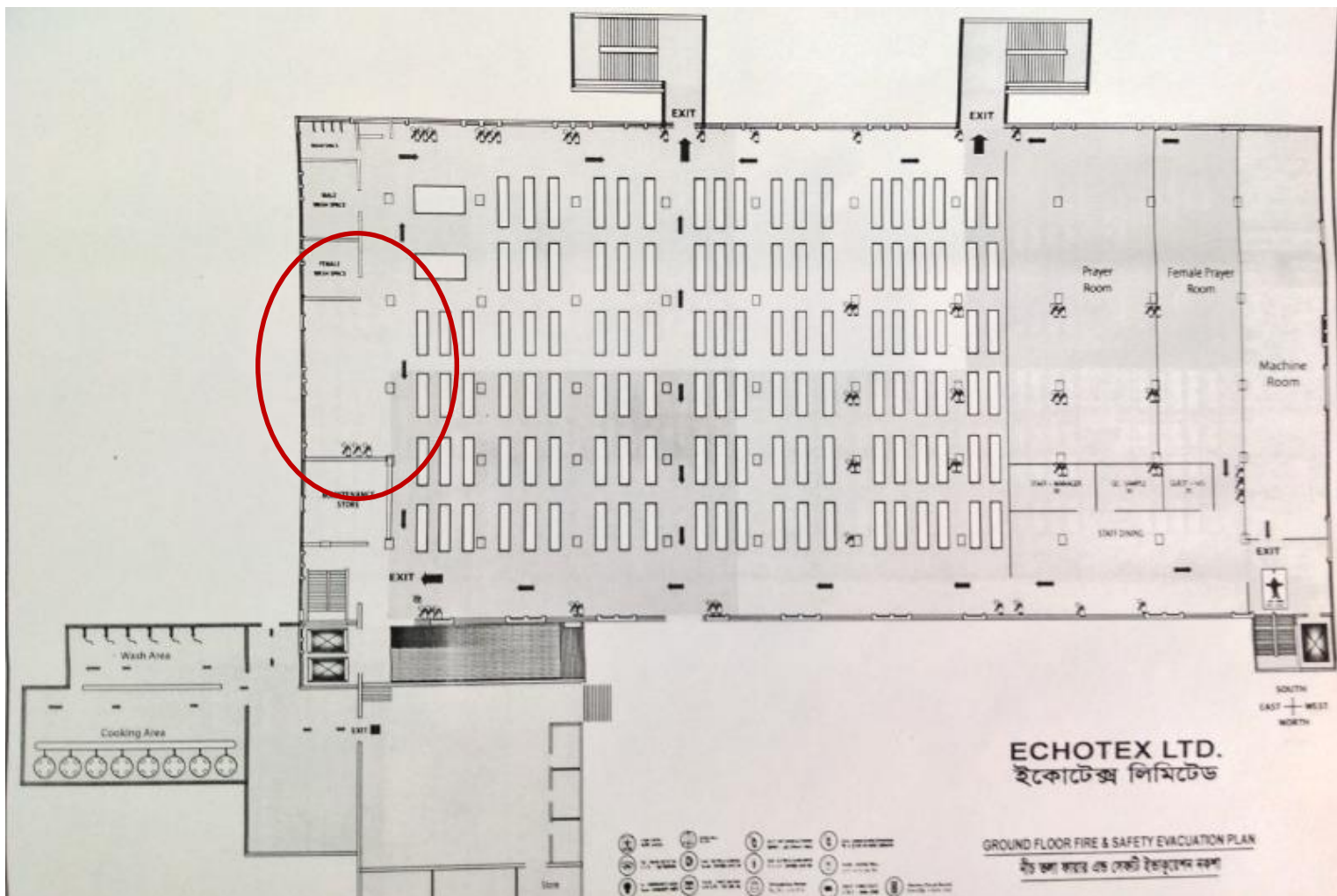


12 x 5000 Lt water tanks on 400 mm. high plinths

Engineer to check that roof beams/slab and support columns have been designed to accommodate roof build-up and water tank/plinth loads.

Roof Loads

Detailed structural drawings for the area at the east end of the Factory Building did not show the correct as-constructed layout



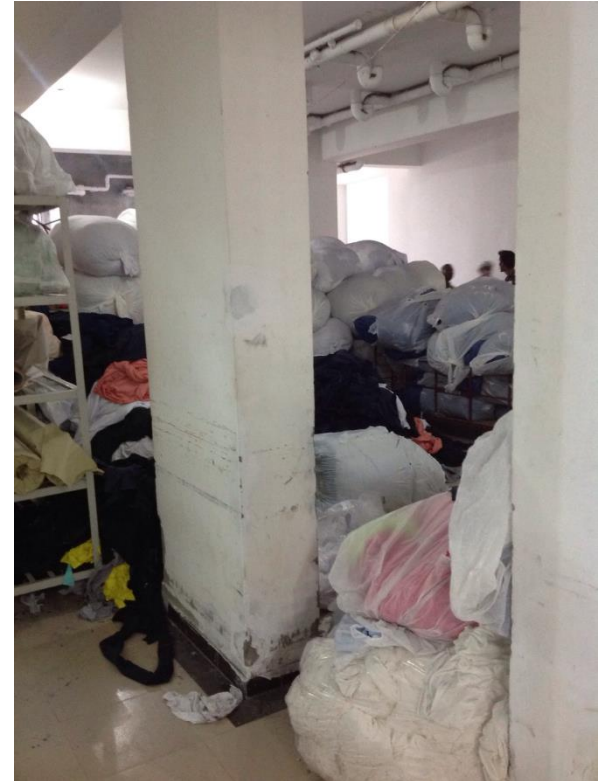
We were provided with a separate set of drawings for this area at the end of the survey. The main drawings should be updated to include these.

Drawing Discrepancy

Load management of storage loads



Eight Floor



Third Floor

**Some level of Storage loads were observed on each floor.
Plan and height restrictions to be introduced to prevent future overloading.**

Floor Storage loads

Cracking to brickwork walls



Ninth floor Annex – diagonal crack. Building Engineer to determine cause and monitor crack width



Northeast Staircase between Roof and 9th floor (plaster 'repair' visible).

At upper levels, significant cracking was observed at the interface of the concrete structure and brick infill. Building Engineer should review.

Brick Wall Cracking

Building Observations – following cursory walk
Printing Building
Utility Building
Knitting & Dyeing Building

Printing Building

- **no apparent lateral bracing system is provided to the steel roof and frame.**
- **the structural drawings provided did not relate to this building.**



The structural drawings provided did not relate to the Printing Building.

Building Engineer to prepare a set of as-built drawings.

No apparent lateral bracing system is provided to the roof or steel frame.
Building Engineer to review

Printing Building

Utility Building – upper floor extension at north west is of light steelwork construction.



Lightweight steel roof to upper floor extension to north west of Utility Building

Roof truss is supported on adjacent brick wall and on column by tack weld connection

Building Engineer to review the lightweight steel structure and prepare engineering design calculations to verify the structure for code specified imposed live and wind loads



Utility Building

Knitting & Dyeing Building – Horizontal bracing is provided in the plane of the steel roof structure, however no vertical bracing system is evident.



Knitting & Dyeing Building

Priority Actions

Problems Observed – Factory Building

ITEM 1; Columns, within the Factory Building appear to be stressed in excess of normal design limits

ITEM 2; Structural adequacy of concrete roof and columns to support water tanks on plinths and roof weatherproofing build-up

ITEM 3; Detailed structural drawings for the area at the east end of the Factory Building did not show the correct as-constructed layout

ITEM 4; Load management of storage loads

ITEM 5; Cracking to brickwork walls

Problems Observed – During Cursory Walk of; Printing Building/Utility Building/Knitting & Dyeing Building

ITEM 6; Printing Building - no apparent lateral bracing system is provided to the steel roof and frame and the structural drawings provided did not relate to this building.

ITEM 7; Utility Building – upper floor extension at north west is of light steelwork construction.

ITEM 8; Knitting & Dyeing Building – Horizontal bracing is provided in the plane of the steel roof structure, however no vertical bracing system is evident.

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Verify the structural adequacy of building columns at all levels based on as built dimensions and material properties	Factory Engineer to review design, loads and columns stresses in area identified above.	6-weeks
2	Verify the structural adequacy of building columns at all levels based on as built dimensions and material properties	Verify insitu concrete strength either by cores or existing cylinder strength data for 4 building columns.	6-weeks
3	Verify the structural adequacy of building columns at all levels based on as built dimensions and material properties	Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.	6-months
4	Structural adequacy of concrete roof and columns to support water tanks on plinths and roof weatherproofing build-up	Building Engineer to carry out design calculations to verify that roof beam/slab and columns have sufficient capacity to support fully filled water tanks, concrete plinths and roof finishes build-up	6-weeks
5	Detailed structural drawings for the area at the east end of the Factory Building did not show the correct as-constructed layout	Building Engineer to survey column/beam locations at the east end of the building and compare with structural drawings. Updated drawing to be prepared showing the correct as constructed layout.	6-weeks
6	Detailed structural drawings for the area at the east end of the Factory Building did not show the correct as-constructed layout	Engineer to review the design calculations and confirm that the design (or an updated design if required) corresponds with the as-built structure.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
7	Detailed structural drawings for the area at the east end of the Factory Building did not show the correct as-constructed layout	Layout and structural drawings to be updated	6-months
8	Load management of storage loads	Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.	6-weeks
9	Cracking to brickwork walls	Building Engineer to review cracking on an on-going basis and propose further remedial works , if required.	6-months
10	Printing Building - no apparent lateral bracing system is provided to the steel roof and frame and the structural drawings provided did not relate to this building	Building Engineer to review requirement for building bracing system	6-months
11	Printing Building - no apparent lateral bracing system is provided to the steel roof and frame and the structural drawings provided did not relate to this building	Building Engineer to prepare as- constructed structural drawings.	6-months
12	Utility Building – upper floor extension at north west is of light steelwork construction	Building Engineer to review structural adequacy of the roof steelwork and connections between roof steel and columns within the upper floor extension to the Utility Building.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
13	Knitting & Dyeing Building – Horizontal bracing is provided in the plane of the steel roof structure, however no vertical bracing system is evident.	Building Engineer to review possible requirement for lateral vertical bracing to the Knitting & Dyeing building structural frame.	6-months