

Esprit Apparel Ltd (Parkzone) Padma Satel Arab Fashions Ltd. P & K Fashion Ltd. Luna Fashion Ltd.

Luna Complex, Joybangla road, Borobari, Gazipur, Dhaka

(23.93645, 90.39146)

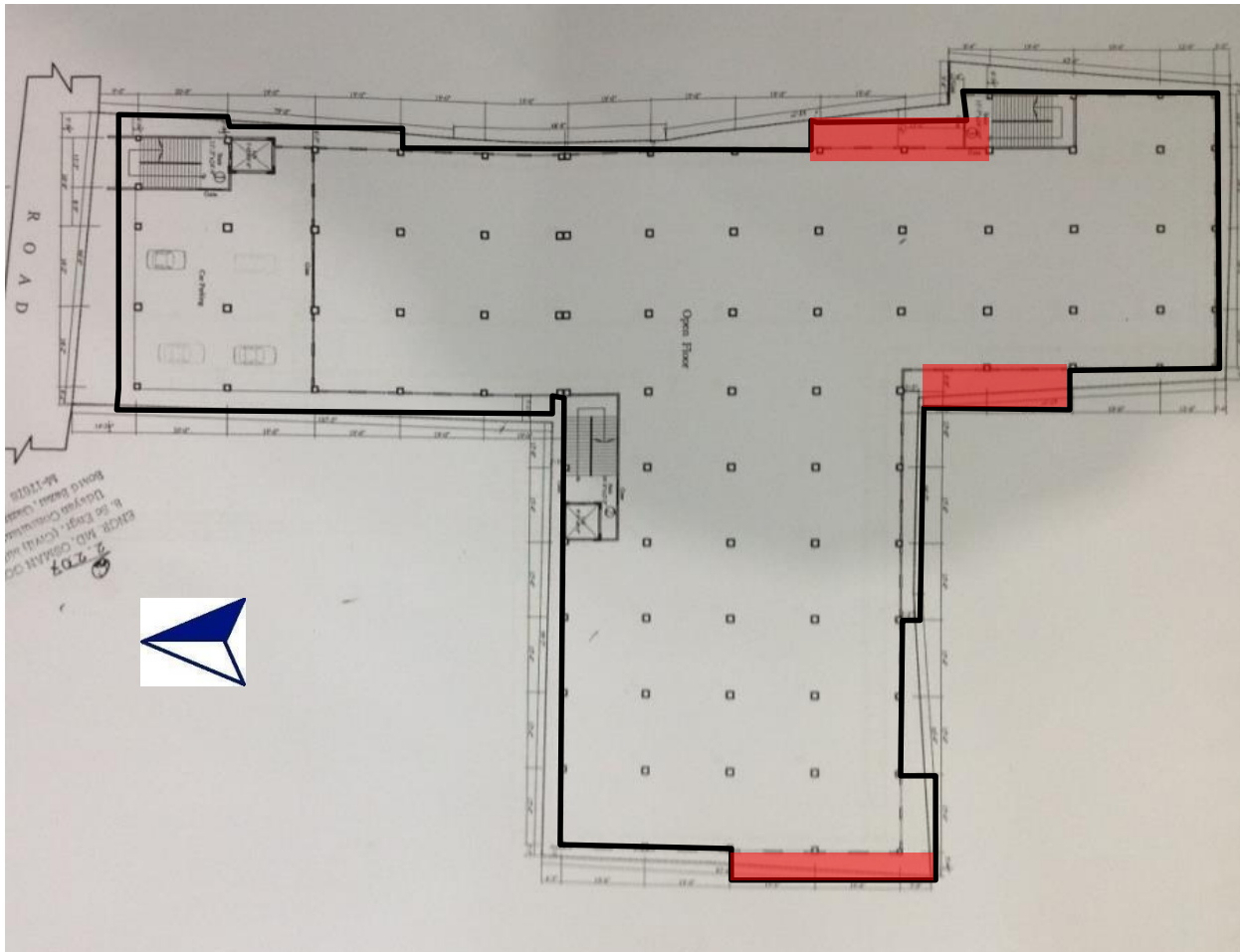
29th June 2014



Observations

Cursory calculations indicate column stresses are high

Cursory calculations indicate that stresses are high in all columns. In particular, columns supporting cantilevers with toilet blocks are very highly stressed.



Typical floor layout

Toilet blocks supported by cantilever slabs



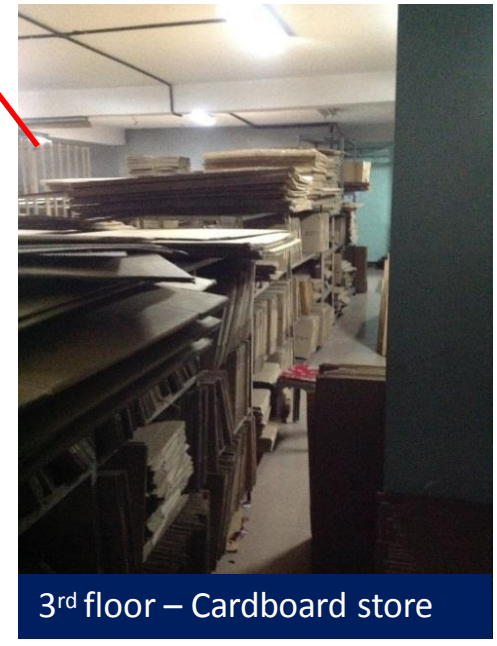
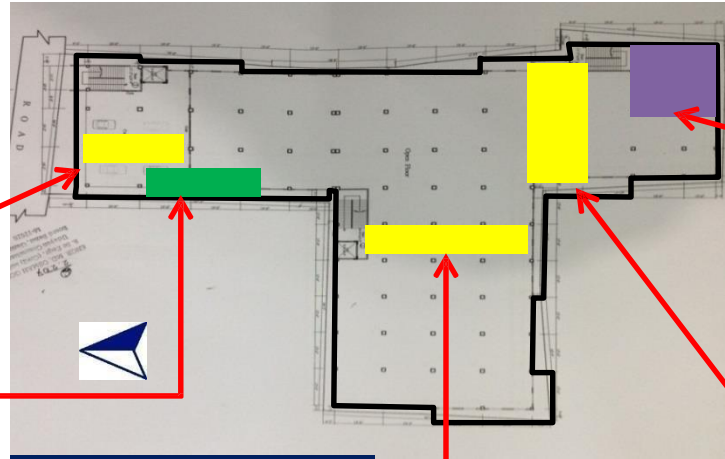
Typical toilet block

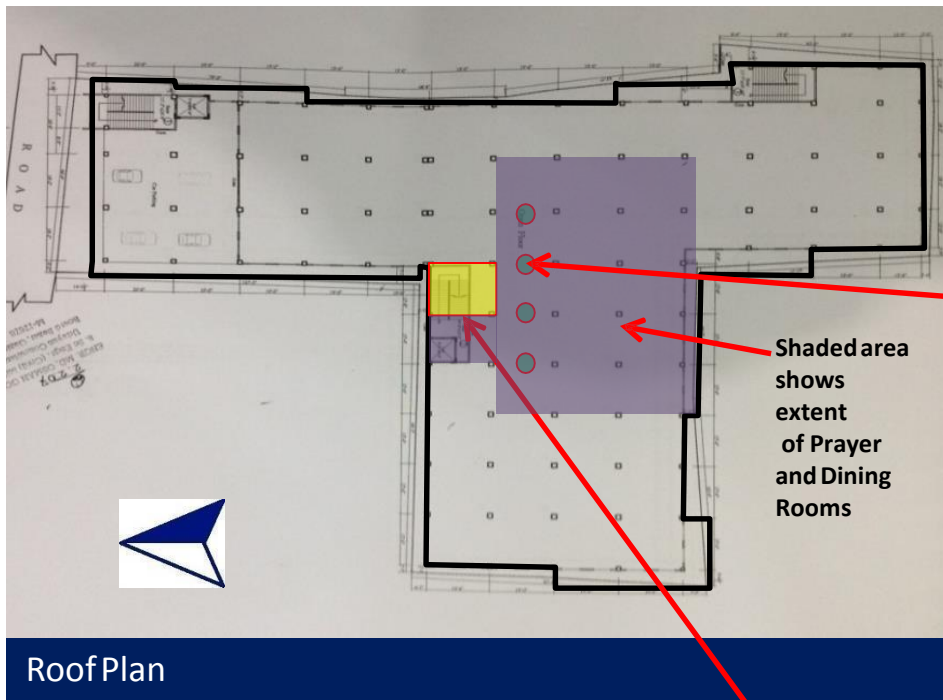


Brick aggregate

Localized areas of high loading

Areas of high loading on structure including cantilevers. No load management plan available for the building.





4 no. plastic water tanks

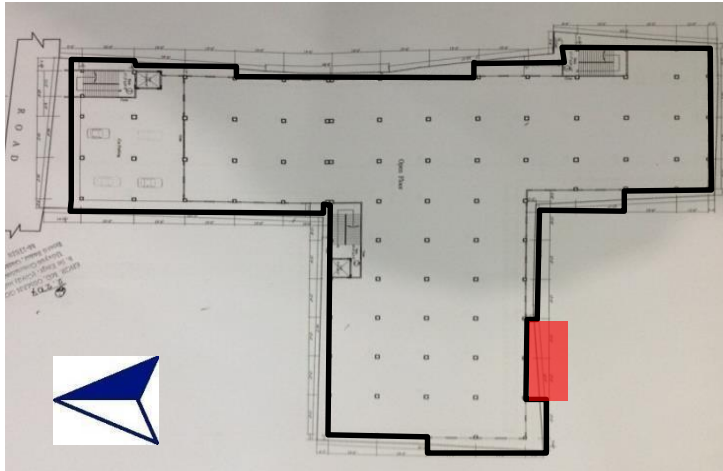


Concrete water tank

Apparently non-engineered steel fire escape stairs

The steel fire escape stairs appears to be non-engineered. The main issues observed are:

- Overall stability under vertical and horizontal loads does not appear to have been achieved
- Bearing of stair to concrete landing appears inadequate
- Section sizes appear to be slender
- Corrosion of the structure has lead to holes in the tube sections



Typical Floor Plan



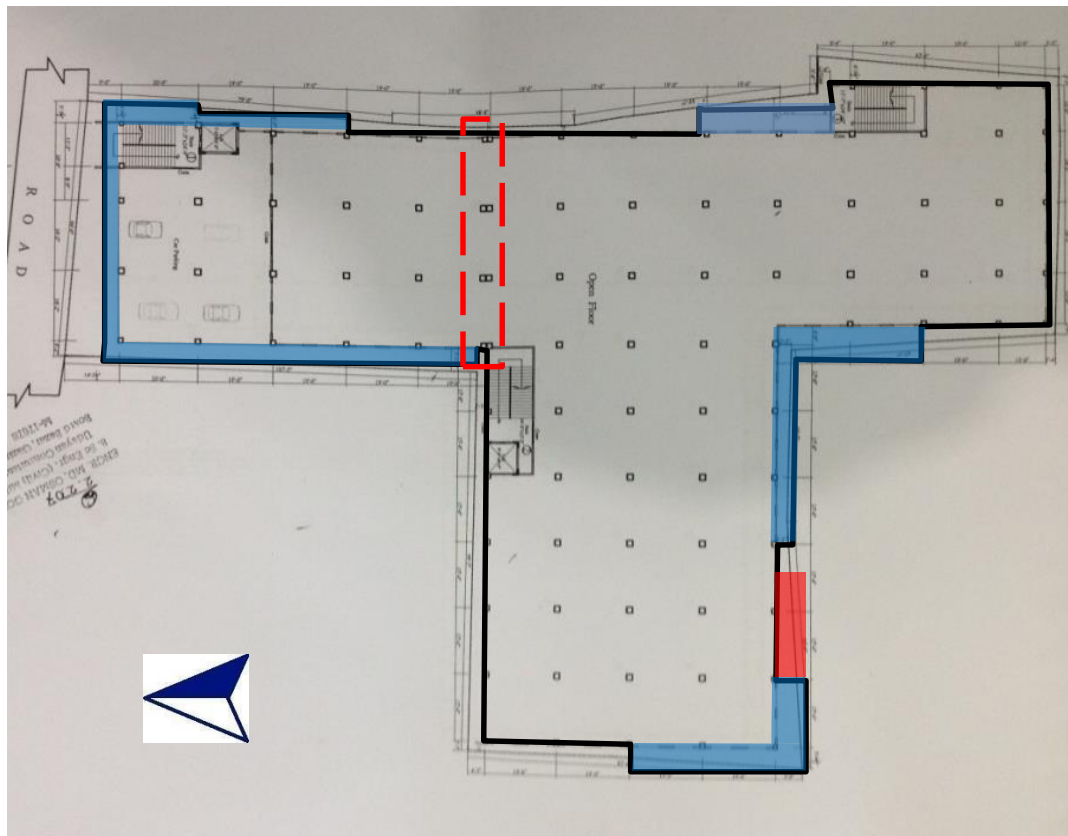
Bearing detail



EW Building stair elevation

Steel stair Location

Inconsistencies between structural drawings and as built construction



Typical floor Layout

- Double columns shown on drawings, single column built
- Cantilevers not on structural drawings
- Undocumented steel escape stairs
- Observed floor plate layout



Steel escape stairs and cantilever structure to the south of E-W Building



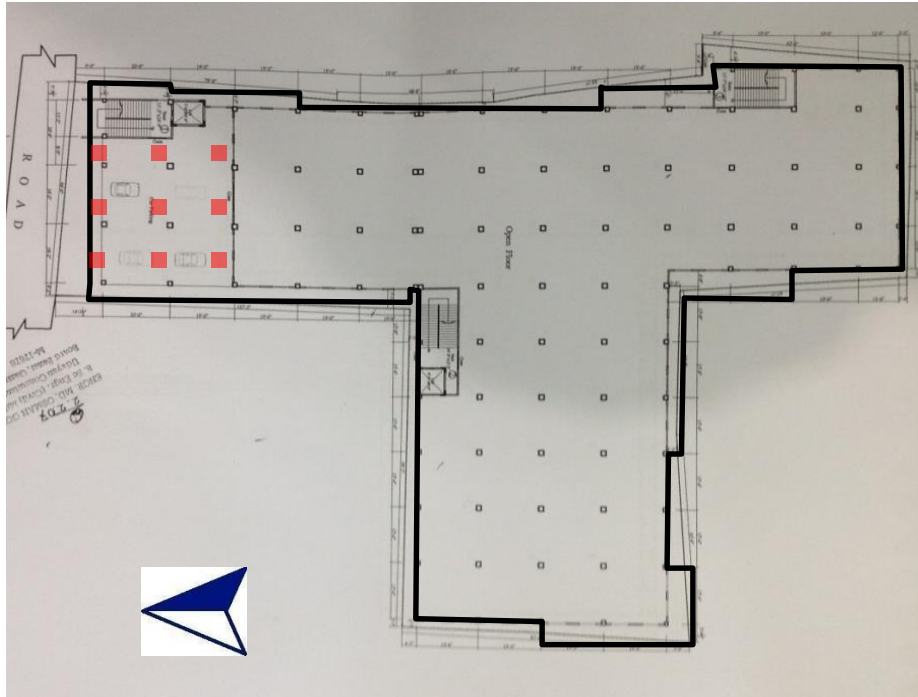
Cantilever structure to North of N-S Building



Cantilever structure to the Southwest of the N-S Building

Column protection at ground floor delivery area

The ground floor columns in the parking/delivery area were partially surrounded by a metal angle frame. These frames appeared light and may provide little protection to the column if struck by a vehicle.



Typical floor Layout

Ground floor columns with steel angle protections



Angle steel frames at columns

Priority Actions

Problems Observed

ITEM 1: Cursory calculations indicate column stresses are high

ITEM 2: No floor load management plan

ITEM 3: Apparently non-engineered steel fire escape stairs

ITEM 4: Inconsistencies between structural drawings and as built construction

ITEM 5: Column protection at ground floor delivery area

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Cursory calculations indicate column stresses are high	Factory Engineer to review design, loads and column stresses for all columns.	Immediate - Now
2	Cursory calculations indicate column stresses are high	Verify insitu concrete strength using min. 4 no. 100mm dia. Cores taken from the ground floor columns (or existing cylinder strength data if available for 4 column locations).	Immediate - Now
3	Cursory calculations indicate column stresses are high	Verify existing reinforcement (steel grade, bar diameter and spacing) in columns.	Immediate - Now
4	Cursory calculations indicate column stresses are high	A Detailed Engineering Assessment of factory to be commenced, see attached scope	Immediate - Now
5	Cursory calculations indicate column stresses are high	Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity. This should include a safe level to which any water tanks can be filled.	6-weeks
6	Cursory calculations indicate column stresses are high	Detailed Engineering Assessment to be completed.	6-weeks
7	Cursory calculations indicate column stresses are high	Continue to implement load plan	6-months

Detail Engineering Assessment

This Schedule develops a minimum level of information, Analysis and testing expected as part of a Detail Engineering Assessment.

The Building(s) have been visually assessed and it is deemed necessary that a detailed engineering assessment be carried out by a competent Engineering Team employed by the factory Owner.

This Request should be read in conjunction with the BUET developed Tripartite Guideline document for Assessment of Structural Integrity of Existing RMG Factory Buildings in Bangladesh (Tripartite Document), the latest version of this document should be referenced. This document also gives guidance on required competency of Engineering Team.

We expect that the following will be carried out:

1. Development of Full Engineering As-Built Drawings showing Structure, loading, elements, dimensions, levels, foundations and framing on Plan, Section and Elevational drawings.
2. The Engineering team are to carry out supporting calculations with a model based design check to assess the safety and serviceability of the building against loading as set out in BNBC-2006. Lower rate provisions can be applied in accordance with the Tripartite Guidelines following international engineering practice, justification for these lower rate provisions must be made.
3. A geotechnical report describing ground conditions and commenting on foundation systems used/proposed.
4. A report on Engineering tests carried out to justify material strengths and reinforcement content in all key elements studied.
5. Detailed load plans shall be prepared for each level showing current and potential future loading with all key equipment items shown with associated loads.
6. The Engineering team will prepare an assessment report that covers the following:
 - As-Built drawings including
 - Plans at each level calling up and dimensioning all structural components
 - Cross sectional drawings showing structural beams, slabs, floor to floor heights, roof build-ups and Basic design information of the structure
 - Highlight any variation between As-built compared to the designed structure
 - Results of testing for strength and materials
 - Results of geotechnical assessment and testing/investigation
 - Details of loading, inputs and results of computer modelling
 - Commentary on adequacy/inadequacy of elements of the structure
 - Schedule of any required retrofitting required for safety or performance of Structure

Any proposals for Retrofitting to follow guidance developed in the Tripartite Document.

Item No.	Observation	Recommended Action Plan	Recommended Timeline
8	No floor load management plan	Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity (refer to Item 1).	6-weeks
9	No floor load management plan	Continue to implement load management plan.	6-months
10	Apparently non-engineered steel fire escape stairs on southern elevation of the EW building	Building engineer to review capacity of steel stair giving consideration to overall stability, section sizes used, stair bearing details and quality of fabrication	6-weeks
11	Apparently non-engineered steel fire escape stairs on southern elevation of the EW building	Building engineer to propose an necessary alterations/strengthening works	6-weeks
12	Apparently non-engineered steel fire escape stairs on southern elevation of the EW building	Ensure any necessary remedial works as advised by the Building Engineer are undertaken.	6-months
13	Inconsistencies between structural drawings and as built construction	Building engineer to survey building and prepare As-Built drawings as part of the Detail Engineering Assessment (refer to Item 1).	6-weeks
14	Inconsistencies between structural drawings and as built construction	Building engineer to identify “as built” cantilever slab and supporting column reinforcement and confirm adequacy of the structural sections.	6-weeks
15	Column protection at ground floor delivery area	Building engineer to review capacity of column protection to vehicular impact and propose strengthening works if required	6-weeks