

## Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

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Name of the Factory	: <b>COMPTEx TEXTILES LTD.</b>
Address of the Factory	: Vulta, Rupgonj, Narayanganj, Dhaka 1460, Bangladesh
Dhaka Present Status of the Factory	: <b>Under Operation</b>
Structural assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Structural Inspection	: 15 April, 2014
Fire & Electrical assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Fire & Electrical Inspection	: 10 March, 2014

**Basic Information:** The present garment factory is a commercial building with beam-column frame system. The following general information was noted:

i.	Building Usage Type	: Garment factory
ii.	Structural System	: RC flat slab
iii.	Floor System	: Beam slab
iv.	Floor Area	: Floor area of 4 storied building 32m X 25.4m = 812 sqm
v.	No. of Stories	: 4 storied
vi.	Construction Year	: 1996
vii.	Foundation Type	: Piled foundation
viii.	Design Drawings	: Available (Approved by the Local Government Engineering Division, dated December, 2004)
ix.	Soil investigation Report	: Available (Dated December, 2000 and April, 2004)
x.	Construction Materials	: Stone chips, Brick Chips
xi.	Generator	: In a separate building

**Recommendations for Corrective Action:** The recommendations of corrective action for both Structural and Fire & Electrical Safety are as follows:

### **The recommendations for Structural Safety corrective actions are:**

#### Immediate (Now):

1. Factory Engineer to review design, loads and column stresses in all columns.
2. Verify insitu concrete strength either by 100mm diameter cores or existing cylinder strength data for cores from 4 columns. Verify grade of steel reinforcement used.
3. A Detail Engineering Assessment of Building 1 to be commenced, see attached Scope.

#### Mid Term (Within 6 Weeks):

1. Detail Engineering Assessment to be completed.
2. Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.
3. Produce and actively manage a loading plan for all floor plates and the roof within the factory giving consideration to floor capacity and column capacity. (Refer to Item 1).
4. Building Engineer to review design, loads and column stresses in area identified above.
5. Verify insitu concrete strength either by 100mm diameter cores or existing cylinder strength data for cores from 4 columns.
6. Commence survey of as constructed building.

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## Long Term (Within 6 Months):

1. Continue to implement load plan.
2. Continue to implement load plan (refer to Item 1).
3. Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.
4. Building Engineer to complete survey as constructed building. Updated drawings to be prepared showing the correct as constructed layout.
5. Prepare/update calculations showing the structural adequacy of the building structure taking into account the factory design imposed loading and the as built structure.
6. Prepare controlled loading plans for all floors designating allowable storage density and where storage may be placed.

## **The recommendations for Fire Safety corrective actions are:**

### Immediate (Within 1 month):

1. Remove locking features from all egress doors / gates. If locks are required for security reasons, utilize special door locking features complying with NFPA 101.
2. Replace all gates / sliding doors along the means of egress with side-hinged, swinging egress doors. If locks are required for security reasons, utilize special door locking features complying with NFPA 101.
3. Remove all storage from exit stairs and egress paths.

### Short Term (Within 3 Months):

1. Provide minimum 1.5-hr fire rated doors and seal all unprotected openings to separate the exit stairs from work areas and other building spaces on all floor levels. Ensure that the fire doors are self-closing and positive latching and that they are provided with fire exit (panic) hardware where serving production floors. If fire doors are required to be held open for functional reasons, provide automatic closing devices tied to the fire alarm system.
2. Seal all penetrations and openings in exit stair enclosure walls to maintain the fire separation.
3. Provide a minimum 2-hr fire-rated shaft to separate the utility risers from each floor level. Seal all penetrations and openings in floor/ceiling assemblies to maintain the fire separation.
4. Provide dedicated storage rooms separated by minimum 1-hr fire-rated construction. Where separate storage rooms may not be feasible, provide defined storage areas and limit the storage arrangement as follows:
  - Maximum height of 2.4m and maximum area of 23m<sup>2</sup>
  - If sprinkler protected: maximum height of 3.66m and maximum area of 93m<sup>2</sup>.Separate areas of unenclosed combustible storage by a minimum clear distance of 3m.
5. Reconfigure the egress arrangement to reduce the maximum common path of travel to not more than 30 m.
6. Inspect, test and maintain the fire alarm system, and keep written records on-site, in accordance with NFPA 72.

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Mid Term (within 6 Months):

1. Modify exit arrangement or provide additional exit(s).
2. Replace the single-station smoke alarms with automatic smoke detectors tied into the fire alarm system. Configure the fire alarm system to initiate occupant notification upon activation of any two smoke detectors in addition to the manual fire alarm stations.

Long Term (More than 6 months):

1. Replace the fire alarm system with a new, listed addressable fire alarm system in accordance with NFPA 72.

### **The recommendations for Electrical Safety corrective actions are:**

Immediate (Within 1 month):

1. Unnecessarily lengthy wirings in flexible PVC conduit in the panels must be trimmed off and dressed well.
2. Bucholtz relay trip and alarm switch must be incorporated in the transformer protection systems.
3. Control panel must be cleaned as part of regular maintenance and all openings in panel must be closed.
4. Phase barriers between different phases must be installed to avoid arc flashing.
5. Provide the rubber mats in front of all the panels with proper size and grade.
6. Leakage must be checked during maintenance and repair as necessary.
7. Phase barriers between different phases must be installed to avoid arc flashing.
8. Wiring inside panel must be arranged and firmly fixed.
9. Every panel doors (metallic) must be bonded with earth connections.

Short Term (Within 3 Months):

1. Extend the air gap between the electrical panel and steam pipe line.
2. HT cable terminating to the transformer bushing must be supported on firmly fixed riser to reduce stress at the termination.
3. Extend the air gap between the electrical BBT and steam pipe line.
4. All panels in operation must be fixed with foundation bolts.
5. All machine(s) in operation must be fixed with foundation bolts.
6. Cables must be supported on tray or riser.
7. Relocate/reposition the panels to create sufficient working space around it.
8. Transformer may be separated from panels by constructing barrier walls.

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9. Sufficient working space must be provided surrounding power transformer.
10. Transformer must be separated from panels by constructing barrier walls.
11. Cables must be supported on cable trays and riser or must be laid in trench.

Mid Term (Within 6 months): NA

Long Term (More than 6 months):NA