

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

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Name of the Factory	: Tex-Heart Garments Ltd.
Address of the Factory	: Hatabo, Birabo, Rupgonj, Narayanganj, Bangladesh.
Present Status of the Factory	: Under operation.
Structural Assessment Conducted by	: VEC
Date of Structural Inspection	: 02 May, 2015
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 02 May, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 02 May, 2015
BGMEA Membership No.	: 5779

### **BASIC INFORMATION:**

The factory building is a three storied RCC building with beam and column system and flat slab system. The following information was noted:

i. Building Usage Type	: Garment Factory.
ii. Structural System	: RCC beam column frame system (GF only) and Flat Plate (1stand 2nd floor)
iii. Floor System	: RCC Beam slab and Flate Plate System.
iv. Floor Area	: 31000 sft
v. No. of Stories	: 3 stories
vi. Construction Year	: 2012
vii. Foundation Type	: Unknown
viii. Design Drawings	: Not Available
ix. Soil Investigation Report	: Not Available
x. Construction Materials	: Brick aggregate.
xi. Generator	: Ground Floor.

### **RECOMMENDATIONS FOR CORRECTIVE ACTION:**

The recommendations of corrective action for both Structural and Fire & Electrical Safety comprises in Short Term, Mid Term and Long Term basis.

The recommendations for **Structural Safety** corrective action are:

Short Term (Immediate)	: N/A
Mid Term (6-weeks)	: N/A
Long Term (6-months)	: 1. Develop set of as-built drawings showing structure details, loading, dimensions, levels, foundations and framing on Plan, Section and Elevation drawings. 2. Continue to monitor for corrosion on an on-going basis. 3. Protection coating should be applied on the exposed rebar to protect them from corrosion

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The recommendations for **Fire & Electrical Safety** corrective action are:

**(A): Recommendations for Fire Safety Corrective Actions:**

<p>Immediate</p> <p><i>(the factory should not continue to be occupied until these non-conformities have been rectified):</i></p>	<p>N/A</p>
<p>Short Term</p> <p><i>(Actions that must be incorporated into a Fire Safety Management Plan immediately (1 ~ 2 weeks) and should be a regular activity</i></p>	<p>Fire drill shall be conducted quarterly (4 times a year) under the Fire Safety Plan. A record of such drills shall be kept in writing for at least 3 years for the inspection of fire brigade whenever called for.</p> <p>All the firefighting equipment need to be tested with proper documents.</p> <p>Ensure minimum width of aisles as follows:          (a) Seats on both sides of the aisle 1 m          (b) Seats on one side of the aisle 0.9 m          Total width needs to comply with table 2.19.</p> <p>Combustibles are to be managed with good housekeeping. Storage facilities with no air-conditioning duct shall be minimum 2.9m and when used as a storage facility there shall be a minimum clearance of one third the floor height from the ceiling to the top of the storage stack.</p> <p>Ensure adequate exit signs in all floors so that it is visible from all positions</p>
<p>Mid Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 weeks)</i></p>	<p>Needs to have as built drawing with floor machine layout showing means of escape with proper dimension</p> <p>Factory needs to have valid fire license covering the full occupied area.</p> <p>Factory safety Manager/Director needs to arrange fire safety training for the workers of the factory from proper authority time to time.</p> <p>All the exit doors need to be install side swinging so that unlockable doors can be opened easily in the direction of evacuation without the use of a key          Provide handrail on both sides of stairways.</p> <p>Emergency back-up power needs to be connected for (a) exit sign, (b) fire alarm and detection system, (c) emergency lighting, (d) automatic fire detection and alarms systems.</p> <p>Factory need to be arranged a Standby generator with</p>

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	required backup power
<p>Long Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 months)</i></p>	<p>Factory needs to have a proper pre-plan for fire service &amp; civil department.</p> <p>Storage area need to be protected with 2 hours rated construction &amp; 1.5 hours rated opening or doors.</p> <p>Boiler: Factory need to protect the boiler room from the factory access route at ground floor of the building by 4 hours rated construction with 2 hours fire rated door/opening.</p> <p>The entire exits connecting to the staircases(2 numbers staircase) need to be protected with fire and smoke resistant enclosures and opening (2 hour rated enclosure and 1.5 hour rated door)and provide a protected route from all though the stairway to the final exits.</p> <p>Factory need to install centralized and automatic fire detection &amp; alarm system on all occupied floors, including other tenanted floors of the building as per NTPA Guideline.</p> <p>The factory need to install manually operated electrical fire alarm system and automatic fire alarm system with single or multiple call boxes on all occupied floors, including other tenanted floors of the building.</p> <p>Factory needs to install control panel for detection and alarm system at required location.</p> <p>Install proper standpipe system having at least 75mm dia of standpipe. First aid hose system (38 mm nominal) shall be provided (Ref. Fire Service Standard # 9) in addition to Fire Aid Fire Fighting Appliances in existing high rise NTPA (20 m) buildings. In addition 50mm or larger hose connection facility shall be provided.</p> <p>Install 1 riser per 1000 m<sup>2</sup> of floor area &amp; 38 mm dia of hoses with variable nozzle need to be installed.</p> <p>Install standard standpipe and hose system as well as fire pump system to ensure required hose pressure at the highest and most remote part of the building.</p> <p>Factory needs to be installed with Siamese connection for to the standpipe system located outside the building and accessible to the fire department connection.</p>

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	<p>Factory needs to have dedicated fire pump with backup power system &amp; sufficient capacity for achieve required pressure in the remote place of the factory.</p> <p>Factory need to have sufficient water storage capacity to get adequate pressure to feed fire-fighting equipment and at least 1900ltr x 75min=142500 liters water storage tank.</p>
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### **(B): Recommendations for Electrical Safety Corrective Actions:**

<p>Immediate</p> <p><i>(the factory should not continue to be occupied until these non-conformities have been rectified):</i></p>	<p>N/A</p>
<p>Short Term</p> <p><i>(Actions that must be incorporated into a Fire Safety Management Plan immediately (a week) and should be a regular activity</i></p>	<p>Ensure all distribution boards (including panel door) are earthed properly.</p> <p>Ensure cables are properly terminated at its point of termination using appropriate size and type of lug.</p> <p>Clean interior components from dust and debris and seal all openings within the enclosure to prevent dust and debris from entering.</p> <p>Provide provision for inspection of all earthing system and ensure inspection is being completed and documented.</p>
<p>Mid Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 weeks)</i></p>	<p>Ensure graded rubber mats are provided in front of all distribution boards.</p> <p>Install switchboards in proper way or proper place to ensure safe installation.</p> <p>Provide dedicated &amp; adequate size of earthing with proper identification.</p> <p>Rewire to ensure single cable at busbar and/or circuit breaker terminal to avoid loose connection, overloading and separate controlling of each circuit/branch circuit.</p> <p>Replace wooden base with metal clad construction for mounting the switch controls.</p> <p>Ensure cable joints are made in respect of conductivity,</p>

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	<p>insulation and mechanical strength.</p> <p>Ensure overcurrent protection device (circuit breaker/fuse) for each circuit/branch circuit.</p> <p>Connect all metal in the building to the building earthing system.</p>
<p>Long Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 months)</i></p>	<p>Develop an electrical layout diagram and an as-built single line diagram detailing key components and capacity of the electrical system.</p> <p>Establish a periodical Insulation and earth Resistance Measurement</p> <p>Program and record the related testing data.</p> <p>Inspect electrical switchgear and panel boards on an annual basis.</p> <p>Ensure overhead service connections are led via roof poles or service masts made of GI pipe having a bend at the top and installed on the outer wall.</p> <p>Ensure distribution boards have no opening and all live internal components are concealed properly.</p> <p>Provide dedicated &amp; adequate size of neutral with proper identification for each circuit.</p> <p>Ensure each distribution board is provided with a circuit list and means of identification is obtained as per list.</p> <p>Provide adequate covers on cable channels.</p> <p>Ensure surface/exposed wiring are run either horizontally or vertically with proper mechanical support.</p> <p>Provide proper cable terminator/conductor for stranded conductors.</p> <p>Provide an emergency power generator with adequate capacity for the building.</p> <p>Install separate distribution boards for lighting and power</p>

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	circuits.  Install lightning protection system on the building.
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