

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

Name of the Factory	: Tex-Tech Garments Ltd.
Address of the Factory	: Kunia, Gacha (Joy Bangla Road), Gazipur, Bangladesh.
Present Status of the Factory	: Under Operation.
Structural Assessment Conducted by	: TUV
Date of Structural Inspection	: 30 <sup>th</sup> July 2015.
Fire Assessment Conducted by	: TUV
Date of Fire Inspection	: 30 <sup>th</sup> July 2015.
Electrical Assessment Conducted by	: TUV
Date of Electrical Inspection	: 30 <sup>th</sup> July 2015.
BGMEA Membership No.	: 4067
BKMEA Membership No.	: 892

### **BASIC INFORMATION:**

The assessed factory building is a 4 storied RCC building with beam column frame structure. The following information was noted:

- i. Building Usage Type : Garment factory.
- ii. Structural System : RCC beam column frame system.
- iii. Floor System : Two way Beam Slab.
- iv. Floor Area : The typical plinth area is 1188 sft. and total production floor is 4752sft.
- v. No. of Stories : 4 Storey.
- vi. Construction Year : 2008
- vii. Foundation Type : Shallow Foundation.
- viii. Design Drawings : Available (Approval for 4-Storey Garments building on 7th April, 2008 from Gazipur LGED).
- ix. Soil Investigation Report : Available.
- x. Construction Materials : Brick aggregate (Identified by removing Plaster).
- xi. Generator : None.

### **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) : None.

Mid Term (6-weeks) : None.

Long Term (6-months) :

- Exposed rebar needs to be covered by lean graded concrete as per direction of building engineer.

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

**(A): Recommendations for Fire Safety corrective actions:**

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<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>	<ul style="list-style-type: none"> <li>• The minimum clear width of the pathway should be 0.9 meter</li> <li>• Provide aisle marking with arrow guiding and exit signage on all Evacuation pathways or provided with overhead signage fixed at ceiling level. <ul style="list-style-type: none"> <li>- Illuminated exit sign should be posted above the exit door,</li> <li>- It should be clearly visible at all time,</li> <li>- Provide directional signs wherever necessary.</li> <li>- All exit doors should be clearly marked for easy identification.</li> <li>-Signage should be uniform.</li> </ul> </li> <li>• Factory management should be checked alarm call points, alarm &amp; detection system periodically and maintained the record properly.</li> <li>• Provide additional firefighting equipment like sand &amp; water buckets near exit or easily accessible area for first phase firefighting.</li> <li>• Fire drill should be conducted quarterly (4 times a year) in existing buildings as detailed under the Fire Safety Plan &amp; should kept record properly.</li> </ul>
<p>Mid Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 weeks)</i></p>	<ul style="list-style-type: none"> <li>• Prepare proper plan and design for one more exit in a way not to exceed the maximum travel distance.</li> <li>• Replace all existing exit doors on evacuation routes, exit doors with side hinged type door, which swing outward and in the direction of travel. Swinging of the door should not constrict the width of the corridor / passage below 0.9 meter.</li> <li>• Remove all locking device from all egress door. All exit doors should be open-able from the side they serve without the use of a key.</li> <li>• Provide handrails on both side of each stairway with height of 0.9m measured from the nose of stair to the</li> </ul>

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	<p>top of the handrail.</p> <ul style="list-style-type: none"> <li>• Doors in stair should be outward opening, side-swing, self-closing, non-lockable 1.5 hours fire rated doors in all stair way encloses.</li> <li>• Provide 2 hour fire rated construction at unprotected opening window, which is adjacent to external staircase.</li> <li>• The egress paths should be illuminated with emergency lighting with power back-up supply &amp; illumination should be a minimum of 10 lux for all corridors &amp; exit doors. Aisles should be provided with a minimum 2 lux.</li> <li>• The stairway should be illuminated with emergency lighting with power back-up supply &amp; illumination should be a minimum of 10 lux for stairway.</li> <li>• Produce design and plan for automatic detection system with automatic fire alarm.</li> <li>• Install Manual activation call point at all exit routes</li> <li>• Automatic alarm systems must be provided throughout the factory; the alarm must be automatically triggered on detection of a fire.</li> <li>• Prepare proper design and plan for dedicated fire pump with alternate backup power supply.</li> <li>• Prepare plan and design for dedicated water storage tank for firefighting operation as per RMG guideline.</li> <li>• Power backup supply should be provided for fire alarm system.</li> <li>• Cover all units / floors in a valid fire license.</li> </ul>
<p>Long Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 months)</i></p>	<ul style="list-style-type: none"> <li>• Implement the plan and design for one more exit in opposite direction of existing exit.</li> <li>• Install automatic detection system with automatic fire alarm.</li> <li>• Install dedicated fire pump with alternate backup power supply.</li> <li>• Provide sufficient number of hose pipe with respect to area and travel distance as per RMG guideline.</li> <li>• Provide dedicated storage tank for firefighting operation.</li> </ul>

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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>N/A</p>
<p>Mid Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 weeks)</i></p>	<ul style="list-style-type: none"> <li>• Provide graded rubber mats of adequate size in front of all distribution panels.</li> <li>• 1. Exit signs should be illuminated either by lamps external to the sign or by lamps contained within the sign.</li> <li>• 2. The source of illumination should be providing not less than 50 lux.</li> <li>• Individual Fuse protection should be provided to every 15A socket.</li> <li>• Provide cable connections with properly soldered / welded lugs at DBs. Ensure that all the electrical connections are properly secured with lug.</li> <li>• Select conductors and MCCB/MCB with adequate sizing without exceeding permissible current carrying capacity for insulation.</li> <li>• Avoid looping and bunch of cable at MCCB/MCB or bus bar terminal, use individual circuit and over current device for every incoming and outgoing circuit at the distribution boards.</li> <li>• Provide circuit diagram /circuit list with proper current ratings and fuse size, marking for DBs identifying end use load, voltage, number of phases.</li> <li>• Provide cable joints of porcelain / PVC connectors with PIB tape wound around before placing the cable in the box.</li> <li>• Seal the cable penetrations through walls adequately with fire resistive elements.</li> </ul>

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	<ul style="list-style-type: none"> <li>• Provide separate earthing connection to electrical equipments. Ensure that earth potential provided for all parts of equipment / installation (other than live parts) and that continuous earth connection is provided back to the main intake supply earth.</li> <li>• Provide adequate earthing to body and doors to DBs. Ensure that all electrical panels provided with proper and separate earth potential.</li> </ul>
<p>Long Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 months)</i></p>	<ul style="list-style-type: none"> <li>• 1. Provide updated SLD matching the existing installation at the factory.</li> <li>2. SLD to indicate exact positions of all points of switch boxes and other outlets.</li> <li>3. SLD to be approved by the engineer-in-charge.</li> <li>• 1. Provide updated Electrical layout drawing prepared after proper locations of all outlets for lamps, fans, fixed and transportable appliances, motors etc.</li> <li>2. Drawings to indicate exact positions of all points of switch boxes and other outlets to match existing installation.</li> <li>3. As built drawing to be approved by the engineer-in-charge.</li> <li>• 1. Design to have proper segregation of different end used loads.</li> <li>2. Wiring design to have separate and distinct sub-circuits for power and heating system.</li> <li>3. All DBs to be placed conveniently.</li> <li>4. Wiring to be neat, tidy and located near ceiling.</li> <li>• Provide calibrated Ammeter &amp; Voltmeter at distribution board.</li> <li>• Review capacity of standby generator on basis of loads for essential lighting. Replace generator with larger capacity or install second generator if review indicates existing unit is too small.</li> <li>• Provide proper height of panel board (&lt; 2m from floor level), easy and accessible location.</li> <li>• 1. Wooden switchboards &amp; panel boards should be</li> </ul>

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	<p>replaced by non-flammable materials.</p> <p>2. Prefer switchboards made of non-flammable materials.</p> <ul style="list-style-type: none"><li>• Each circuit should have a separate neutral (use of common neutral for more than one circuit shall not be permitted).</li><li>• Seal the cable entry-exit points of (DB's with non-flammable materials. In addition:<ol style="list-style-type: none"><li>1. Ensure that DB panels / Switchgears to be vermin / damp proof.</li><li>2. Ensure all unused holes / openings in DBs to be blocked properly.</li></ol></li><li>• <ol style="list-style-type: none"><li>1. Provide the ECC to meet minimum cross-sectional area as per table 4.5.</li><li>2. Ensure that connections between conductors / equipment provided to durable electrical continuity and adequate mechanical strength and protection.</li><li>3. The continuous earth connection is provided back to the main intake supply earth.</li></ol></li><li>• Provide adequate protection against lightning depending on the probability of a strike and acceptable risk levels at roof top of building.</li></ul>
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