

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

---

Name of the Factory	: Tex Knit International.
Address of the Factory	: Plot # B-446,447 Kamarjuri, Board Bazar, Gazipur
Present Status of the Factory	: Under operation.
Structural Assessment Conducted by	:
Date of Structural Inspection	:
Fire Assessment Conducted by	: TUV
Date of Fire Inspection	: 16 November, 2015
Electrical Assessment Conducted by	: TUV
Date of Electrical Inspection	: 16 November, 2015
BGMEA Membership No.	: 4104

### **BASIC INFORMATION:**

The surveyed building was total five story RCC structure including a PEB profile shed covering the major portion of top floor (4th floor) which is supported by RCC columns. The following information was noted:

- i. Building Usage Type :
- ii. Structural System :
- iii. Floor System :
- iv. Floor Area :
- v. No. of Stories :
- vi. Construction Year :
- vii. Foundation Type :
- viii. Design Drawings :
- ix. Soil Investigation Report :
- x. Construction Materials :
- xi. Generator :

### **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) | : |
| Mid Term (6-weeks)     | : |
| Long Term (6-months)   | : |

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

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>	<ul style="list-style-type: none"> <li>• Provide aisle marking with arrow guiding and exit signage on all Evacuation pathways             <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> </ul> </li>   <li>• Provide fire extinguisher at 4th floor and to keep the record for re filling &amp; properly tagged.</li>   <li>• Provide additional firefighting equipment like sand &amp; water buckets near exit or easily accessible area for first phase fire fighting.</li>   <li>• Combustible materials should keep away from electrical source and all the lighting in storage area must have protecting covers and wiring must be in conduits</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>• 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 top of the handrail.</li>   <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 (Also require fire rated door at the floor occupied by other tenants).</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</li> </ul>

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

	<p>with power back-up supply &amp; illumination should be a minimum of 10 lux for stairway.</p> <ul style="list-style-type: none"> <li>• Produce design and plan for automatic detection system with automatic fire alarm.(Also needs to cover the floors occupied by other tenants)</li> <li>• Install Manual activation call point at all exit routes</li> <li>• An 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> </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>• Install automatic detection system with automatic fire alarm.(Also needs to cover the floors occupied by other tenants)</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> </ul>

### **(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>	<ul style="list-style-type: none"> <li>• Provide circuit breaker (MCCB) at MDB panel. Ensure that MDB panels shall have overload, short circuit protections and isolations in the circuits.</li> </ul>
<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>	<ul style="list-style-type: none"> <li>• All strands cables at exposed ends should be properly soldered / crimped and insulated.</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>• All unwanted materials should be removed from transformer &amp; Generator room.</li> <li>• Provide rubber mats of adequate size in front of all distribution panels.</li> <li>• Install smoke/heat detection and provide firefighting</li> </ul>

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

---

	<p>equipment in the substation and generator room.</p> <ul style="list-style-type: none"><li>• Provide and maintain clear and legible identifications numbers &amp; names on all incoming and outgoing circuits of HT panel.</li><li>• Adequate number of caution boards should be kept in the substation room.</li><li>• 1. Exit signs should be illuminated either by lamps external to the sign or by lamps contained within the sign. 2. The source of illumination should be providing not less than 50 lux.</li><li>• Individual Fuse protection should be provided to every 15 socket.</li><li>• 1. All stranded conductors <math>&gt; 6\text{mm}^2</math> to be provided with cable sockets. 2. All stranded conductors <math>&lt; 6\text{ mm}^2</math>, at exposed end should be soldered / crimped.</li><li>• The electrical panels to be of metal case and should be marked with “Danger 415 Volts” and identified with proper phase marking and danger signage.</li><li>• Provide cable connections with properly soldered / welded lugs at (MDB/DB)'s. Ensure that all the electrical connections are properly secured with lugs and glands.</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 and 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>
--	--

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

	<ul style="list-style-type: none"> <li>• Provide proper separate earthing/grounding to generator. Ensure that generator body frame to have two separate and distinct connections to the earth / ground.</li> <li>• Provide separate earthing connection to electrical equipment. 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>• Make suitable arrangements to prevent storm water to enter substation room.</li> <li>• Area of substation to meet requirements of Table 4.3 of RMG Guideline; the area should be 40 m<sup>2</sup>, or relocate the substation room.</li> <li>• Maintain the minimum height of 3.6 m for the substation room. Increase the height or relocate it.</li> <li>• Modify Area of generator room to meet requirements of Table 4.4, RMG Guideline; the area should be 80m<sup>2</sup> for 250kW and 150kW (Generator room-1 ),and 95 m<sup>2</sup> for 850 kW (Generator room-2)or relocate the generator room.</li> <li>• Provide and maintain proper clearance in all sides of generator for ease of maintenance.</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> </ul>

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

---

	<ul style="list-style-type: none"><li>• Provide calibrated Ammeter &amp; Voltmeter at Main distribution boards (MDB).</li> <li>• Relocate the MDBs with easy access. Ensure that all MDBs should have easy accessibility.</li> <li>• Review capacity of standby generator on basis of loads for essential lighting / AC / Equipment / Services. Replace generator with larger capacity or install second generator if review indicates existing unit is too small.</li> <li>• 1. Remove all the inflammable materials from surrounding of electrical circuitry. 2. Ensure that all electric circuitry clean of inflammable materials. 3. Conduct periodic maintenance and maintain the records.</li> <li>• Each circuit should have a separate neutral (use of common neutral for more than one circuit shall not be permitted).</li> <li>• Provide the wiring in PVC conduits or in metallic GI pipes. Ensure that all electrical wiring should be covered in proper conduit pipes.</li> <li>• Seal the cable entry-exit points of (DB)'s with non-flammable materials. In addition: 1. Ensure that DB panels to be vermin / damp proof. 2. Ensure all unused holes / openings in DBs to be blocked properly.</li> <li>• 1. Provide the ECC to meet minimum cross-sectional area as per table 4.5. 2. Ensure that connections between conductors / equipment provided to durable electrical continuity and adequate mechanical strength and protection. 3. The continuous earth connection is provided back to the main intake supply earth.</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>
--	---