

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

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Name of the Factory	: RUBAIYA KNITWEAR LTD.
Address of the Factory	: Demra Rampura Road, Staff Quarter, Demra, Dhaka
Present Status of the Factory	: Under operation.
Structural Assessment Conducted by	: ACCORD
Date of Structural Inspection	:
Fire Assessment Conducted by	: TUV
Date of Fire Inspection	: 19 October, 2015
Electrical Assessment Conducted by	: TUV
Date of Electrical Inspection	: 19 October, 2015
BKMEA Membership No.	: 1063

### **BASIC INFORMATION:**

The assessed factory building was a 3-Storeyed RCC building (2-Storey with vertical extend). The following information was noted:

- i. Building Usage Type :
- ii. Structural System :
- iii. Floor System :
- iv. Floor Area :
- v. No. of Stories : 3 story
- 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:

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|------------------------|---|
| Short Term (Immediate) | : |
| Mid Term (6-weeks)     | : |
| Long Term (6-months)   | : |

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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>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Remove all temporary items from all escape routes, aisles and passageway.</li> <li><input type="checkbox"/> Provide aisle marking with arrow guiding and exit signage on all Evacuation pathways or provided with overhead signage fixed at ceiling level.</li> <li>- Illuminated exit sign should be posted above the exit door,</li> <li>- It should be clearly visible at all time.</li> <li>-Signage should be uniform.</li> <li><input type="checkbox"/> Factory management should be checked alarm call points, alarm &amp; detection system periodically and maintained the record properly.</li> <li><input type="checkbox"/> Provide adequate number of fire extinguisher at all floors.</li> <li><input type="checkbox"/> Provide additional firefighting equipment like sand &amp; water buckets near exit or easily accessible area for first phase fire fighting.</li> <li><input type="checkbox"/> Combustible materials should keep away from electrical source</li> <li><input type="checkbox"/> 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><input type="checkbox"/> 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><input type="checkbox"/> 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><input type="checkbox"/> Prepare proper plan &amp; design for another staircase. - Minimum clear width should be 0.9 meter.</li> <li><input type="checkbox"/> 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><input type="checkbox"/> Doors in stair should be outward opening, side-swing, self closing, non-lockable 0.75 hours fire rated doors in all stair way encloses.(Also require fire rated door at the floor</li> </ul>

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	<p>occupied by other tenants)</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated door at 1st floor boiler room, which located at the adjacent to production area.</li> <li><input type="checkbox"/> 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><input type="checkbox"/> 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><input type="checkbox"/> Produce design and plan for automatic detection system with automatic fire alarm.</li> <li><input type="checkbox"/> Install Manual activation call point at all exit routes</li> <li><input type="checkbox"/> Automatic alarm systems must be provided throughout the factory; the alarm must be automatically triggered on detection of a fire.</li> <li><input type="checkbox"/> Prepare proper design and plan for dedicated fire pump with alternate backup power supply.</li> <li><input type="checkbox"/> Visual alarm should be placed at the generator room.</li> <li><input type="checkbox"/> Obtain fire license / permit from issuing authority</li> <li><input type="checkbox"/> Obtain building approval from issuing authority</li> <li><input type="checkbox"/> Cover all units / floors in a valid fire license</li> <li><input type="checkbox"/> Obtain the boiler license from the proper issuing authority.</li> <li><input type="checkbox"/> Obtain the boiler operator license from the proper issuing authority.</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><input type="checkbox"/> Install another staircase as per plan and design.</li> <li>- Minimum clear width should be 0.9 meter.</li> <li><input type="checkbox"/> Provide 4 hours fire rated barriers with 2 hours fire rated door at 1st floor boiler room, which located at the adjacent to production area.</li> <li><input type="checkbox"/> Install automatic detection system with automatic fire alarm.</li> <li><input type="checkbox"/> Install dedicated fire pump with alternate backup power supply.</li> <li><input type="checkbox"/> Provide sufficient number of hose pipe with respect to area and travel distance as per RMG guideline.</li> <li><input type="checkbox"/> Stand pipe supplying first aid hose should have minimum pressure of 200 KPa.</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>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Over current protection devices (Circuit breakers) should be installed at all distribution panels.</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><input type="checkbox"/> Re-locate oil / fuel tanks away from control panels in generator room.</li> <li><input type="checkbox"/> Relocate the open type switchboards in dry / ventilated areas, away from batteries / chemical fumes</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><input type="checkbox"/> All unwanted materials should be removed from transformer / Generator room.</li> <li><input type="checkbox"/> Provide rubber mats of adequate size in front of all distribution panels.</li> <li><input type="checkbox"/> Install smoke detection and provide firefighting equipment in the substation and generator room.</li> <li><input type="checkbox"/> 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><input type="checkbox"/> 1. All stranded conductors &gt; 6mm<sup>2</sup> to be provided with cable sockets.</li> <li>2. All stranded conductors &lt; 6 mm<sup>2</sup>, at exposed end should be soldered / crimped.</li> <li><input type="checkbox"/> 1. Remove all the inflammable materials from surrounding of electrical circuitry at MDBs/SDBs.</li> <li>2. Ensure that all electric circuitry clean of inflammable materials.</li> <li>3. Conduct periodic maintenance and maintain the records.</li> <li><input type="checkbox"/> Provide suitable &amp; non-flammable protected supports and shades for hanged light fittings/fixtures.</li> <li><input type="checkbox"/> 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><input type="checkbox"/> Provide cable connections with properly soldered / welded lugs at (LT/MDB/DB/SDB)'s.</li> <li>Ensure that all the electrical connections are properly secured with lugs and glands.</li> <li><input type="checkbox"/> Select conductors and MCCB/MCB with adequate sizing without exceeding permissible current carrying capacity for</li> </ul>

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	<p>insulation.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> 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><input type="checkbox"/> 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><input type="checkbox"/> Provide cable joints of porcelain / PVC connectors with PIB tape wound around before placing the cable in the box.</li> <li><input type="checkbox"/> Seal the opening of wall at wiring passing through wall/roof/floor partitions. Ensure that all cable penetrations through walls should be adequately sealed with fire resistive elements.</li> <li><input type="checkbox"/> 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><input type="checkbox"/> 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><input type="checkbox"/> Provide adequate earthing to body and doors to all MDBs / 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><input type="checkbox"/> 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><input type="checkbox"/> 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><input type="checkbox"/> Modify Area of generator room to meet requirements of Table 4.4, RMG Guideline; the area should be 30m<sup>2</sup>, or relocate the generator room.</li> <li><input type="checkbox"/> 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> </ul>

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	<p>4. Wiring to be neat, tidy and located near ceiling.</p> <ul style="list-style-type: none"><li><input type="checkbox"/> Provide calibrated Ammeters / Voltmeters at distribution boards (LT/MDBs).</li><li><input type="checkbox"/> 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></ul> <p>1. Wooden switchboards / panel boards should be replaced by non-flammable materials.</p> <p>2. Prefer switchboards made of non-flammable materials.</p> <ul style="list-style-type: none"><li><input type="checkbox"/> Each circuit should have a separate neutral (use of common neutral for more than one circuit shall not be permitted).</li><li><input type="checkbox"/> 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><input type="checkbox"/> Seal the cable entry-exit points of (LT/MDB/DB/SDB)'s with non-flammable materials. In addition:</li></ul> <p>1. Ensure that HT / LT panels / Switchgears to be vermin / damp proof.</p> <p>2. Ensure all unused holes / openings in DBs to be blocked properly.</p> <ul style="list-style-type: none"><li><input type="checkbox"/> 1. Provide the ECC to meet minimum cross-sectional area as per table 4.5.</li><li>2. Ensure that connections between conductors / equipments 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></ul> <ul style="list-style-type: none"><li><input type="checkbox"/> 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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