

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

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Name of the Factory	: TAURI KNITWEARS LTD.
Address of the Factory	: 30, Zirabo, Ashulia, Depz Road, Savar, Dhaka
Present Status of the Factory	: Under operation.
Structural Assessment Conducted by	: VEC
Date of Structural Inspection	: 1 June, 2015
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 1 June, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 1 June, 2015
BKMEA Membership No.	: 1951

### **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:

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|-------------------------------|--|
| i. Building Usage Type        | : Garment Factory.   |
| ii. Structural System         | : Non - engineered steel shed.   |
| iii. Floor System             | : N/A.   |
| iv. Floor Area                | : 11000 sq. ft   |
| v. No. of Stories             | : Single   |
| vi. Construction Year         | : 2008-2009  |
| vii. Foundation Type          | : Unknown  |
| viii. Design Drawings         | : Available – machine layout plane without dimension. Not Available – approval drawing, architectural design drawing, structural design drawing and material test report |
| ix. Soil Investigation Report | : Not Available  |
| x. Construction Materials     | : RCC column, Circular steel column, truss, pre-fabricated shed.   |
| xi. Generator                 | : Not Available.   |

### **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)     | : 1. Building engineer to confirm requirement for lateral bracing in long direction   |
| Long Term (6-months)   | : 1. Install bracings if required.<br>2. Building engineer should have to check the design and then develop full set of as-built structural drawings & report |

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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>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<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>• Fire manager/Director need to have safety training from proper authority &amp; worker of the factory should as far as possible be trained for use fire extinguisher.</li> <li>• 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.</li> <li>• All the firefighting equipment's need to test with proper documents.</li> <li>• Factory needs to have marked aisles in all working floor according to 0.9m for one side seat and 1.0m for both side seat.</li> <li>• Lights in storage area needed to be installed with protective covers and conduits.</li> <li>• Ensure adequate exit signs in all floors so that it is visible from all positions.</li> <li>• Combustibles are to be managed with good housekeeping. Storage facilities with no air-conditioning duct shall be minimum 2.9 m 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</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>• Factory needs to have as built drawing with proper dimensions showing all the means of escape.</li> <li>• All the exit doors need to be replaced by side swinging so that un-lockable doors can be opened easily in the direction of evacuation without the use of a key.</li> <li>• Illuminated emergency light needs to be covered in floor, exits and aisles. The intensity of illumination by means of escape lighting needs to be equal or more than 10 lux. The aisles need to be illuminated with escape lighting to a level of not less than 2.5 lux at floor level.</li> <li>• Emergency back-up power needs to be connected for critical fire safety system and not less than 30 minutes in case of failure of power supply.</li> </ul>
<p>Long Term</p> <p><i>(The remedial works indicated must be</i></p>	<ul style="list-style-type: none"> <li>• Factory needs to have a proper pre-plan for fire service and civil defense.</li> <li>• Factory need to create an another exit which is need to</li> </ul>

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<p><i>carried out within a period of 6 months)</i></p>	<p>comply the travel distance that is if the occupant load within 50 person so travel distance will be the 23 m.</p> <ul style="list-style-type: none"> <li>• Factory need to construct an another exit for discharge as per RMG Guideline which shall be satisfy for one exit 23 m travel distance and two exit for 60m travel distance.</li> <li>• Final exit route needs to be fire protected from the fabric store by 2 hours rated construction and 1.5 hours rated opening or doors till to reach safe refuse area.</li> <li>• Storage area need to be protected from the generator room with 4 hours rated construction and 2 hours rated opening or doors as per RMG Guide line.</li> <li>• Generator room need to be protected with 4 hour rated construction and 2 hours rated opening or doors.</li> <li>• 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.</li> <li>• 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.</li> <li>• Factory needs to install control panel for centralized automatic smoke detection &amp; fire alarm system according to NTPA Guideline</li> <li>• Factory need to install proper standpipe system having at least 75 mm diameter of riser.</li> <li>• Factory needs to install 1 riser per 1000 m2 of floor area and 38 mm diameter of fabric hoses with variable nozzle.</li> <li>• Factory need to ensure the minimum pressure for standpipes supplying a 50mm or larger hose shall be at least 300 Kpa. For standpipe supplying first aid hose (38mm nominal) may have a minimum pressure of 200 Kpa.</li> <li>• Factory needs to be installed with Siamese connection for to the standpipe system located outside the building and accessible to the fire department connection.</li> <li>• 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.</li> <li>• 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.</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>• N/A</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>• Provide two separate and distinct connections of earthing for each generator.</li> <li>• Ensure all distribution boards (including panel door) are earthed properly using appropriate type and size of cables and the earthing cables have continuity up to main earth /earthing pit.</li> <li>• Remove all unused cables from distribution boards and make sure all necessary cables are properly terminated at its point of termination using appropriate size and type of lug.</li> <li>• Ensure overcurrent protection device (circuit breaker/fuse) for each circuit/branch circuit.</li> <li>• Use nonflammable shades/base for light fittings. Avoid using Celluloid shade under any circumstance.</li> <li>• Clean interior components from dust and debris and seal all openings within the enclosure to prevent dust and debris from entering.</li> <li>• Install earthing pit for the factory with adequate provision for inspection of the earthing system and ensure inspection is being completed and documented</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>• Install appropriate number and type of safety signage and fire-fighting equipment at generator room, and graded rubber mats are provided in front of all distribution boards.</li> <li>• Provide Instruction board for first aid and artificial respiration in the generator room.</li> <li>• Ensure in the generator room, all working place, exit light and escape light have adequate illumination level as per standard.</li> <li>• Ensure distribution boards have a minimum clearance of 1 m (39 in) in front.</li> <li>• Install circuit breaker in proper way and proper place to ensure safe installation.</li> <li>• Provide dedicated and adequate size of earthing with proper identification for each circuit and ensure continuous earth path is back to main shed intake.</li> <li>• Rewire to avoid the use of multiple cables from</li> </ul>

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	<p>incoming and outgoing side of MCB's/MCCB's.</p> <ul style="list-style-type: none"> <li>• Replace wooden bases and use metal enclosure for mounting the circuit breakers.</li> <li>• Ensure all electrical wiring/cables are sized according to capacity of circuit breakers.</li> <li>• Provide adequate support or mechanical guards for electrical equipment and wiring where necessary.</li> <li>• Ensure cable joints are made in respect of conductivity, insulation and mechanical strength.</li> <li>• Seal the openings remaining after wiring system passes through the elements of building construction according to the degree of fire resistance.</li> <li>• Ensure Lighting fixtures/lights are supported from the structure properly</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>• Develop an electrical layout diagram and an as-built single line diagram detailing key components and capacity of the electrical system.</li> <li>• Establish a periodical Insulation and earth Resistance Measurement Program and record the related testing data.</li> <li>• Inspect electrical panel boards on an annual basis to ensure that the equipment is in good working condition.</li> <li>• Ensure overhead service connections to the building are led via adequate size and type of service masts and goose neck bend at the top of the shed.</li> <li>• Ensure the generator room has adequate fire separation from the production area.</li> <li>• Ensure appropriate generator room size in order to properly access the generator to perform routine maintenance activities.</li> <li>• Ensure all live internal components are concealed properly.</li> <li>• Provide dedicated &amp; adequate size of neutral with proper identification for each circuit.</li> <li>• Ensure each distribution board is provided with a circuit list and means of identification is provided as per list.</li> <li>• Provide proper cable terminator/connector for stranded conductors at its point of termination.</li> <li>• Install separate distribution boards for lighting and</li> </ul>

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	<p>power circuits.</p> <ul style="list-style-type: none"><li>• Install lightning protection system on the building</li></ul>
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