

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Tongi Sweater Garden Ltd.
Address of the Factory	: 119, Kakil Sataish Road, Sataish, Tongi, Gazipur.
Present Status of the Factory	: Under Operation
Structural Assessment Conducted by	: TÜV SÜD Bangladesh (Pvt.) Ltd.
Date of Structural Inspection	: 2015-09-12
Fire Assessment Conducted by	: TÜV SÜD Bangladesh (Pvt.) Ltd.
Date of Fire Inspection	: 2015-09-12
Electrical Assessment Conducted by	: TÜV SÜD Bangladesh (Pvt.) Ltd.
Date of Electrical Inspection	: 2015-09-12
BGMEA Membership No.	: 5217

BASIC INFORMATION:

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| i. Building Usage Type | : Garment Factory |
| ii. Structural System | : R.C.C Building |
| iii. Floor System | : Beam-slab floor system. |
| iv. Floor Area | : Total operating floor area = 5102 sft (Approx.) |
| v. No. of Stories | : GF+1 (2 storey RCC building), No Basement |
| vi. Construction Year | : The RCC building and shed was constructed in two phases, GF was built in 2010 and 1st floor was built in 2014. |
| vii. Foundation Type | : Not confirmed |
| viii. Design Drawings | : Not available |
| ix. Soil Investigation Report | : Not available |
| x. construction Materials | : Brick Aggregated. |
| xi. Generator | : East side at the adjacent shed of the building. |

RECOMMENDATIONS FOR CORRECTIVE ACTION: No Critical or high risk observations were found during the day of audit in the factory. During the assessment, some non-conformity was found for which long-term corrective actions have been recommended. There is no need to suspend operation in the factory.

Short Term (Immediate)	: N/A
Mid Term (6-weeks)	: N/A
Long Term (6-months)	: 1. As built structural drawings to be prepared for 2 storey building. As part of this process building engineer will be required to make a number of checks on the as-built construction 2. Water proofing and proper roof drainage system need to be implemented as directed by the guidance of building engineer. 3. Exposed rebar need to be covered by lean graded concrete as directed by building engineer.

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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"> • Remove all temporary items from all escape routes, aisles and passageway. • Direct route of access to required exits should be provided through stairway which is maintained free of obstructions. • Provide aisle marking with arrow guiding and exit signage on all Evacuation pathways. <ul style="list-style-type: none"> - Illuminated exit sign should be posted above the exit door, - It should be clearly visible at all time, - Provide directional signs wherever necessary. - Signage should be uniform • Factory management should be checked alarm call points system periodically and maintained the record properly. • Provide adequate number of fire extinguisher at all floors and to keep the record for re filling & properly tagged. • The first aid hose and standpipe performance should be checked periodically and properly tagged. • Fire drill should be conducted quarterly (4 times a year) in existing buildings as detailed under the Fire Safety Plan & should kept record properly.
<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"> • Replace all existing exit doors on evacuation routes, exit doors with side hinged type door, which swing outward and in the direction of travel. • 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. • 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. • Prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated doors at ground floor generator room, which located at the east side near to final exit. • The egress paths should be illuminated with emergency lighting with power back-up supply & illumination should be a minimum of 10 lux

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	<p>for all corridors & exit doors. Aisles should be provided with a minimum 2 lux.</p> <ul style="list-style-type: none"> • The stairway should be illuminated with emergency lighting with power back-up supply & illumination should be a minimum of 10 lux for stairway. • Produce design and plan for automatic detection system with automatic fire alarm. • Install Manual activation call point at all exit routes • Prepare proper design and plan for dedicated fire pump with alternate backup power supply. • Replace existing 1 inch hose pipe with 1.5 inch hose pipe to meet the requirement of RMG guideline. • Prepare plan and design for dedicated water storage tank for firefighting operation as per RMG guideline. • Power backup supply should be provided for fire alarm system. • Visual alarm should be placed at the generator room. • Obtain fire license / permit with mentioned area of premises from issuing authority.
<p>Long Term (The remedial works indicated must be carried out within a period of 6 months)</p>	<ul style="list-style-type: none"> • Provide 4 hours fire rated barriers with 2 hours fire rated doors at ground floor generator room, which located at the east side near to final exit. • Install automatic detection system with automatic fire alarm. • Install dedicated fire pump with alternate backup power supply. • Stand pipe supplying first aid hose should have minimum pressure of 200 KPa. • Provide dedicated storage tank for firefighting operation.

(B): Recommendations for Electrical Safety corrective actions:

<p>Immediate <i>(the factory should not continue to be occupied until these non-conformities have been rectified):</i></p>	<p>N/A</p>
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<p>Short Term (<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"> • All strands cables at exposed ends should be properly soldered / crimped and insulated. • Provide proper separate earthing/grounding to generator. Ensure that generator body frame to have two separate and distinct connections to the earth / ground.
<p>Mid Term (<i>The remedial works indicated must be carried out within a period of 6 weeks</i>)</p>	<ul style="list-style-type: none"> • Provide rubber mats of adequate size in front of distribution panel MDB/DBs. • Install heat detector and provide firefighting (Fire extinguisher and smoke detector) equipment in the generator room. • 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. • Individual Fuse protection should be provided to every 15/20 A socket. • 1. All stranded conductors > 6mm² to be provided with cable sockets. 2. All stranded conductors < 6 mm², at exposed end should be soldered / crimped. • 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. • Provide cable connections with properly soldered / welded lugs at (MDB/DBs). Ensure that all the electrical connections are properly secured with lugs. • Select conductors and MCCB/MCB with adequate sizing without exceeding permissible current carrying capacity for insulation. • 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. • Provide circuit diagram /circuit list with proper current ratings and fuse size, marking for MDB/DBs identifying end use load, voltage, number of phases. • Provide cable joints of porcelain / PVC connectors with PIB tape wound around before placing the cable in the box. • Provide separate earthing connection to electrical equipments.

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	<p>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.</p> <ul style="list-style-type: none"> • Provide adequate earthing to body and doors to MDB/DBs. Ensure that all electrical panels provided with proper and separate earth potential.
<p>Long Term <i>(The remedial works indicated must be carried out within a period of 6 months)</i></p>	<ul style="list-style-type: none"> • 1. Provide updated SLD matching the existing installation at the factory. 2. SLD to indicate exact positions of all points of switch boxes and other outlets. 3. SLD to be approved by the engineer-in-charge. • 1. Provide updated Electrical layout drawing prepared after proper locations of all outlets for lamps, fans, fixed and transportable appliances, motors etc. 2. Drawings to indicate exact positions of all points of switch boxes and other outlets to match existing installation. 3. As built drawing to be approved by the engineer-in-charge. • Provide 4 hour fire rated walls all around the generator room on ground level. • Modify Area of generator room to meet requirements of Table 4.4, RMG Guideline; the area should be 30 m², or relocate the generator room. • Provide and maintain proper clearance in all sides of generator for ease of maintenance. • 1. Design to have proper segregation of different end used loads. 2. Wiring design to have separate and distinct sub-circuits for power and heating system. 3. All DBs to be placed conveniently. 4. Wiring to be neat, tidy and located near ceiling. • Provide calibrated Ammeters at distribution boards (MDB). • 1. Ensure that all electric circuitry clean of inflammable materials. 3. Conduct periodic maintenance and maintain the records. • Each circuit should have a separate neutral (use of common neutral for more than one circuit shall not be permitted). • Provide the wiring in PVC conduits or in metallic GI pipes. Ensure that all electrical wiring should be covered in proper conduit pipes.

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	<ul style="list-style-type: none">• Seal the cable entry-exit points of (MDB) with non-flammable materials. In addition: 1. Ensure all unused holes / openings in MDB to be blocked properly. • 1. Provide the ECC to meet minimum cross-sectional area as per table 4.5. 2. Ensure that connections between conductors / equipment's 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. • Provide adequate protection against lightning depending on the probability of a strike and acceptable risk levels at roof top of building.
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