

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: CHOWDHURY KNITWEAR LIMITED
Address of the Factory	: BSCIC Industrial Area, Shibpur, Narshindi, Bangladesh.
Present Status of the Factory	: Under Operation
Structural Assessment Conducted by	: TÜV SÜD Bangladesh (Pvt.) Ltd.
Date of Structural Inspection	: 2015-09-10
Fire Assessment Conducted by	: TÜV SÜD Bangladesh (Pvt.) Ltd.
Date of Fire Inspection	: 2015-09-10
Electrical Assessment Conducted by	: TÜV SÜD Bangladesh (Pvt.) Ltd.
Date of Electrical Inspection	: 2015-09-10
BKMEA Membership No.	: 150

BASIC INFORMATION:

i. Building Usage Type	: Knitting Factory
ii. Structural System	: Prefabricated Steel Structure
iii. Floor System	: Not Applicable
iv. Floor Area	: The typical plinth area is 30258 sft. and total production floor is 30258 sft.
v. No. of Stories	: GF (Single Storey), No Basement
vi. Construction Year	: 2003
vii. Foundation Type	: Unknown
viii. Design Drawings	: Not available.
ix. Soil Investigation Report	: Not available.
x. construction Materials	: Brick Aggregate in RCC Columns
xi. Generator	: East side of the dyeing shed.

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 mid-term and long term corrective actions are recommended.

Short Term (Immediate)	: N/A
Mid Term (6-weeks)	: 1. As built architectural and engineering drawings to be prepared for entire building and submitted for approval by appropriate authorities. As part of this process the building engineer will be required to make a number of checks on the structural design.
Long Term (6-months)	: 1. The stability system of the structure needs to be checked by building engineer considering lack of lateral stability system with slender columns. Lateral system is required to ensure the stability of the structure. 2. The connection of steel structure needs to be checked by building engineer and the bracing system and sag rods are required to ensure the stability of the roof structure.

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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. • 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"> - Illuminated exit sign should be posted above the exit door, - It should be clearly visible at all time, - Provide directional signs wherever necessary. - All exit doors should be clearly marked for easy identification. - Signage should be uniform. • Provide additional firefighting equipment like sand & water buckets near exit or easily accessible area for first phase firefighting. • Combustible materials should keep away from electrical appliances and all the lighting in storage area must have protecting covers and wiring must be in conduits. • 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. Swinging of the door should not constrict the width of the corridor / passage below 0.9 meter. • 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. • Prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated doors at ground floor boiler room, which located at the adjacent to east side exit. • The egress paths should be illuminated with emergency lighting with power back-up supply & illumination should be a minimum of 10 lux for all corridors & exit doors. Aisles should be provided with a minimum 2 lux. • Produce design and plan for automatic detection system with automatic fire alarm. • Prepare proper design and plan for dedicated fire pump with alternate backup power supply.

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	<ul style="list-style-type: none"> • Prepare plan and design for dedicated water storage tank for firefighting operation as per RMG guideline. • Obtain fire license / permit from issuing authority -Cover all units / floors in a valid fire license • Obtain building approval from issuing authority
<p>Long Term</p> <p>(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 boiler room, which located at the adjacent to east side exit. • Install automatic detection system with automatic fire alarm. • Install dedicated fire pump with alternate backup power supply. • Provide sufficient number of hose pipe with respect to area and travel distance as per RMG guideline. • Provide dedicated storage tank for firefighting operation

(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"> • Over current protection device (MCB/MCCB) was not installed for outgoing circuit at Main distribution board.
<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"> • Re-locate oil tanks away from control panels in generator room. • 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. • 1. Disconnect the loads from cable of signs of overloading / abnormal temperature found. 2. Make necessary repairs to avoid further accidents.

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<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">• 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. • All unwanted materials should be removed from Generator room. • Provide rubber mats of adequate size in front of all distribution panels. • Install smoke detection in the generator room. • Provide and maintain clear and legible identifications numbers & names on all incoming and outgoing circuits of LT & HT panel. • Adequate number of caution boards should be kept in the substation room. • Exit signs should be illuminated either by lamps external to the sign or by lamps contained within the sign. • Individual Fuse protection should be provided to every 15A 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. • 1. Remove all the inflammable materials from surrounding of electrical circuitry at DBs.• 2. Ensure that all electric circuitry clean of inflammable materials.• 3. Conduct periodic maintenance and maintain the records. • 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 proper clearance of 0.8 - 1.0 m in front of distribution panel. • Provide cable connections with properly soldered / welded lugs at (MDBs). Ensure that all the electrical connections are properly secured with lug.
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	<ul style="list-style-type: none"> • Select conductors and MCCB with adequate sizing without exceeding permissible current carrying capacity for insulation. • Avoid bunch of cable at MCCB, 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 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 proper separate earthing/grounding to transformer. Ensure that transformer body frame to have two separate and distinct connections to the earth / ground. • 1. Provide sufficient and separate earthing for LT & HT panels in substation room 2. Provide adequate number of earth electrodes. • 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. • Provide adequate earthing to body and doors to all DB /. Ensure that all electrical panels provided with proper and separate earth potential.
<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"> • Provide adequate clearance in all sides of main HT , LT panel boards & transformer for easy maintenance. • Provide adequate cable trenches with non-flammable covers at substation areas. • Relocate substation set in generator building adjacent to generator room. • 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 Ammeter & Voltmeter at LT Panel. • Relocate the MDB with easy access. Ensure that all MDB should have easy accessibility. • Review capacity of standby generator on basis of loads for essential

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	<p>lighting. Replace generator with larger capacity or install second generator if review indicates existing unit is too small.</p> <ul style="list-style-type: none">• 1. Wooden switchboards should be replaced by non-flammable materials. 2. Prefer switchboards made of non-flammable materials.• Each circuit should have a separate neutral (use of common neutral for more than one circuit shall not be permitted).• Seal the cable entry-exit points of (DB)'s with non-flammable materials. In addition: 1. Ensure that DB panels / Switchgears to be vermin / damp proof. 2. Ensure all unused holes / openings in DBs 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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