Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Tweed Sweaters Ltd.
Address of the Factory	: H.R. Bhaban, Kadda Bazar, Gazipur
Present Status of the Factory	: Under Operation
Structural Assessment Conducted by	: BUET
Date of Structural Inspection	: 2014-06-05
Fire Assessment Conducted by	: VERITAS Engineering & Consultant.
Date of Fire Inspection	: 2015-04-25
Electrical Assessment Conducted by	: VERITAS Engineering & Consultant.
Date of Electrical Inspection	: 2015-04-25
BGMEA Membership No.	: 4674

BASIC INFORMATION:

The following information was noted:

i. Building Usage Type	: Garment Factory
ii. Structural System	: RCC Beam column up to 2nd floor and flat slab at 3rd floor building.
iii. Floor System	: Beam slab & flat slab.
iv. Floor Area	: Approximately 8000 sft.
v. No. of Stories	: Existing four Storied.
vi. Construction Year	: 2007-2008.
vii. Foundation Type	: Individual column footing.
viii. Design Drawings	: Available(partial).
ix. Soil Investigation Report	: Not available.
x. construction Materials	: Brick chips.
xi. Generator	: The generator room is located at the ground floor.

RECOMMENDATIONS FOR CORRECTIVE ACTION:

Short Term (Immediate)	: 1.Take action to mitigate dampness of roof slab immediately. 2.The intensity of loading at any location of floor should be maintained within 40 psf (2 kN/sqm)
Mid Term (6-weeks)	: 1.Prepare and submit a loading plan within two months. 2. The factory owner should arrange displaying the arranged load plan for each floor on the wall in a visible location and shall adhere to it.
Long Term (6-months)	: N/A

The recommendations for **Fire & Electrical Safety** corrective action are:

(A): Recommendations for Fire Safety corrective actions:

Immediate (*the factory should not continue to be occupied until these non-conformities have been rectified*):	• Remove all unused cables from panel boards and make sure all necessary cables are properly terminated at its point of termination using appropriate size and type of lug.
Short Term (*Actions that must be incorporated into a Fire Safety Management Plan immediately (1 ~ 2 weeks) and should be a regular activity*	• Provide two separate and distinct connections of earthing for each generator. • Ensure all panel boards (including panel door) are earthed properly. • Ensure overcurrent protection device (circuit breaker/fuse) for each circuit/branch circuit. • Ensure proper earthing connections at all electrical equipment. • Clean interior components from dust and debris and seal all openings within the enclosure to prevent dust and debris from entering. • Provide provision for inspection of all earthing system and ensure inspection is being completed and documented.
Mid Term (*The remedial works indicated must be carried out within a period of 6 weeks)*	• Fix appropriate safety signage at generator room and provide graded rubber mats in front of all panel boards. • Provide Instruction board for first aid and artificial respiration in the generator rooms. • Provide dedicated & adequate size of earthing with proper identification for each circuit and ensure continuous earth path is back to main building intake. • Rewire to avoid the use of multiple cables from incoming and outgoing side of MCB's/MCCB's and busbar. • Ensure all electrical cables are sized according to capacity of circuit breakers. • Ensure cable joints are made in respect of conductivity, insulation and mechanical strength. • Provide emergency power connection for life safety loads (fire alarm, fire pump, emergency lighting, exit signage, etc.) temporarily within 6 weeks and find out a permanent solution within 6 months. • Connect all metal in the building to the building earthing system.

Long Term (The remedial works indicated must be carried out within a period of 6 months)	• Develop an electrical layout diagram and an as-built single line diagram detailing key components and capacity of the electrical system. • Establish a periodical Insulation and earth Resistance Measurement Program and record the related testing data. • Inspect electrical panel boards on an annual basis to ensure that the equipment is in good working condition. • Ensure the generator rooms have adequate fire separation from the production area. • Provide adequate means of ventilation for the generator room based on the installed equipment considering fire barriers. • Ensure panel boards have no opening and all live internal components are concealed properly. • Provide dedicated & adequate size of neutral with proper identification for each circuit. • Ensure each panel board is provided with a circuit list and means of identification is provided as per list. • Provide adequate and noncombustible covers on cable channels. • Provide proper cable terminator/connector for stranded conductors at its point of termination. • Install separate distribution boards for lighting and power circuits. • Install lightning protection system on the building.

(B): Recommendations for Electrical Safety corrective actions:

Immediate (*the factory should*	N /A

not continue to be occupied until these non-conformities have been rectified):	
Short Term (*Actions that must be incorporated into a Fire Safety Management Plan immediately (a week) and should be a regular activity)*	• Provide proper separate earthing/grounding to generator. Ensure that generator body frame to have two separate and distinct connections to the earth / ground.
Mid Term (*The remedial works indicated must be carried out within a period of 6 weeks)*	• All unwanted materials should be removed from Generator room. • Provide rubber mats of adequate size in front of all distribution panels. • Install smoke detection and provide firefighting equipment in the generator room. • Provide supports for main service line complete with adequate insulation. • 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 (DB)'s. 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 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 DBs identifying end use load, voltage, number of phases. • 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 DBs. Ensure that all electrical panels provided with proper and separate earth potential.

Long Term (*The remedial works indicated must be carried out within a period of 6 months)*	• 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 & 1.5 hour fire rated door the generator room on ground level. • Relocate the generator room or provide 4 hour fire rated walls & 1.5 hour fire rated door the generator room on ground level. • Modify Area of generator room to meet requirements of Table 4.4, RMG Guideline; the area should be 26 m2 or relocate the generator room. • Provide and maintain proper clearance in all sides of generator for ease of maintenance. • 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. • 1. Wooden switchboards / panel boards should be replaced by non-flammable materials. 2. Prefer switchboards made of non-flammable materials. • 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 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.