

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Valmont Sweaters Ltd.
Address of the Factory	: 505 Eiad Ali Complex, Bot Tola Road, North Khaikur, Board Bazar, Gazipur
Present Status of the Factory	: Under Operation.
Structural Assessment Conducted by	: TUV
Date of Structural Inspection	: 25 th February, 2015
Fire Assessment Conducted by	: TUV
Date of Fire Inspection	: 25 th February, 2015
Electrical Assessment Conducted by	: TUV
Date of Electrical Inspection	: 25 th February, 2015
BGMEA Membership No.	: 4559

BASIC INFORMATION:

The assessed factory was a Six Storey RCC Factory building with RCC beam column frame structure. The following information was noted:

- i. Building Usage Type : Garment Factory
- ii. Structural System : R.C.C. Beam Column Frame.
- iii. Floor System : R.C.C. Beam Slab.
- iv. Floor Area : The typical plinth area is 14,000 sq. ft. and total area is 84,000 sq. ft.
- v. No. of Stories : 6 Storey (No Basement).
- vi. Construction Year : 2008
- vii. Foundation Type : Footing Foundation (As per structural drawing).
- viii. Design Drawings : Available (Signed by Gazipur Upazilla Parishad on 11 February, 2011)
- ix. Soil Investigation Report : Available.
- x. Construction Materials : Brick Aggregated .(Identified by removing Plaster)
- xi. Generator : In an ancillary shed.

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:

Short Term (Immediate) : None

Mid Term (6-weeks) :

- i. Factory Engineer to review design, loads and columns stresses in area identified above columns A1 & A5.
- ii. Verify in-situ concrete stresses either by 100mm dia. cores or existing cylinder strength data for the A1 & A5 columns or 100mm dia. cores from 4 columns.

Long Term (6-months) :

- i. Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

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"> • Provide aisle marking with arrow guiding and exit signage on all Evacuation pathways or provided with overhead signage fixed at ceiling level. - 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. • Factory management should checked alarm call points, alarm & detection system periodically and maintained the record properly. • The first aid hose and standpipe performance should be checked periodically and properly tagged.
<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. • 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. • <input type="checkbox"/> Doors in stair should be outward opening, side-swing, self closing, non-lockable 1.5 hours fire rated doors in all stair way encloses. • <input type="checkbox"/> Seal all openings in slab with fire resistant materials having 2 hours fire rating. • <input type="checkbox"/> The egress paths should be illuminated with emergency lighting with power back-up supply &

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>illumination should be a minimum of 10 lux 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 • An automatic alarm system must be provided throughout the factory; the alarm must be automatically triggered on detection of a fire. • Provide adequate nos. of smoke detectors to cover the whole factory building. • Prepare proper design and plan for dedicated fire pump with alternate backup power supply. • 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. • Cover all units / floors in a valid fire license • Update the boiler license from the proper issuing authority. • Obtain the boiler operator license from the proper issuing authority.
<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"> • 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. • 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</p> <p><i>(the factory should not continue to be occupied until these non-conformities</i></p>	<ul style="list-style-type: none"> • Over current protection devices (Circuit breakers) should be installed at all distribution panels.
---	--

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

<p><i>have been rectified):</i></p>	
<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"> • Re-locate fuel tanks away from control panels in generator room. • All strands cables at exposed ends should be properly soldered / crimped and insulated. • Relocate switchboards away from washing area (> 2.5 m) .
<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. • Provide and maintain clear and legible identifications numbers & names on all incoming and outgoing circuits of LT panel. • Adequate number of caution boards should be kept in the substation 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. • 1. All stranded conductors > 6mm² to be provided with cable sockets.

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>2. All stranded conductors < 6 mm², at exposed end should be soldered / crimped.</p> <ul style="list-style-type: none">• 1. Wiring design should have separate and distinct sub-circuits for power and heat source.• 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 all distribution panels/switchboards.• Provide cable connections with properly soldered / welded lugs at (LT/MDB/DB/SDB)'s. Ensure that all the electrical connections are properly secured with lugs and glands.• 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 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.• Seal the cable penetrations through walls adequately with fire resistive elements.• 1. Replace all flexible cables/wires with fixed wiring; avoid use of flexible wires/cords for fixed machines.2. Flexible cords may only be used for the connections of portable equipments.• Provide proper separate earthing/grounding to generator. Ensure that generator body frame to have two separate and distinct connections to the earth / ground.• Provide adequate earthing to body and doors to all MDBs / DBs. Ensure that all electrical panels provided
--	--

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	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"> • Make suitable arrangements to prevent storm water to enter substation rooms. • Provide adequate cable trenches with non-flammable covers at substation areas. • Modify Area of generator room to meet requirements of Table 4.4, RMG Guideline; the area should be 40m², 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. <li style="padding-left: 20px;">2. Wiring design to have separate and distinct sub-circuits for power and heating system. <li style="padding-left: 20px;">3. Wiring to be neat, tidy and located near ceiling. • Provide calibrated Ammeters / Voltmeters at distribution boards (MDB). • 1. Ensure that all electric circuitry clean of inflammable materials. 2. Conduct periodic maintenance and maintain the records. • Provide and maintain easy access and proper height of panel boards (< 2m from floor level). • Power cables/ telecommunication cables should be laid separately. • 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. • Seal the cable entry-exit points of (LT/MDB/DB/SDB)'s with non-flammable materials. In addition: 1. Ensure that LT panel / 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

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>area as per table 4.5.</p> <ol style="list-style-type: none">2. Ensure that connections between conductors / equipments 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. <ul style="list-style-type: none">• Provide adequate protection against lightning depending on the probability of a strike and acceptable risk levels at roof top of building.
--	---