

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Sleek Knit Garments Ltd.
Address of the Factory	: Plot # 11, Avenue-3, Hazi Road, Rupnagar, Mirpur, Dhaka
Present Status of the Factory	: Under Operation
Structural Assessment Conducted by	: BUET
Date of Structural Inspection	: 2014-01-19
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.	: 3293

BASIC INFORMATION: The present garment factory is a six storied industrial building with beam columns frame structure. The following general information was noted:

i. Building Usage Type	: Garment factory
ii. Structural System	: RCC column frame with flat plate
iii. Floor System	: Flat plate
iv. Floor Area	: 311.66 sqm/floor (according to drawing)
v. No. of Stories	: 6 storied + one basement.
vi. Construction Year	: Building was built in one phase (2000-2002) from reported.
vii. Foundation Type	: Mat foundation.
viii. Design Drawings	: Available.
ix. Soil Investigation Report	: Available
x. construction Materials	: Stone chips.
xi. Generator	: Ground floor.

RECOMMENDATIONS FOR CORRECTIVE ACTION: Corrective action for structure are,

Short Term (Immediate)	: N/A
Mid Term (6-weeks)	: The part tin shed and walls on the roof should be removed within 6 weeks with care.
Long Term (6-months)	: N/A

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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"> • Ensure adequate numbers of fire drills under the Fire Safety Plan. • All the firefighting equipment need to be tested with proper documents. • Factory needs to have sufficient number & width (0.9m) of marked aisles at all floors. • Factory needs to have sufficient number & width (0.9m) of marked aisles at all floors. • Need to be sealing all slabs. • Combustibles are to be managed with good housekeeping. • Storage facilities with no air-conditioning duct shall be minimum 2.9m 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. • Ensure adequate illuminated emergency lighting in floors, exit • Ensure adequate exit signs in all floors so that it is visible from all positions.
<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"> • Factory safety Manager/Director needs to arrange fire safety training for the workers of the factory from proper authority time to time. • All the exit doors need to be install side swinging so that unlockable doors can be opened easily in the direction of evacuation without the use of a key. • Both of the stairs have handrail on both sides. • Ensure adequate illuminated emergency lighting with backup power in all floors, exit & stair • Factory safety Manager/Director needs to arrange fire safety training for the workers of the factory from proper authority time to time.
<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"> • Factory needs to have a proper pre-plan for fire department. • Factory needs to maintain minimum width of exit 0.9 m and height 2m. • Factory needs to ensure fire protected route from stair-1 to final exit -1 safely outside of the building.

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	<ul style="list-style-type: none">• Storage area needs to be protected with 2 hour rated construction & 1.5 hour rated opening or doors.• Generator and boiler room needs to be fire separated with 4 hours fire rated enclosure and 2 hours rated opening having direct access from outside.• All the exits connecting to the staircase-1 & 2 need to be protected with fire and smoke resistant enclosures and opening (1.5 hours rated enclosure and 1 hour rated door) and provide a protected route from all through the stairway to the final exits.• Need to be protected of vertical shaft lift core.• Each bay shall be considered as separate compartment and detectors shall be installed considering each bay an independent compartment.• Automatic fire detection (AFD) and alarm system needs to be installed in all types of buildings.• Factory needs to install control panel for detection and alarm system at required location.• Need to be install communication system of all floors• Install proper standpipe system having at least 100mm dia of standpipe. First aid hose system (38 mm nominal) shall be provided (Ref. Fire Service Standard # 9) in addition to Fire Aid Fire Fighting Appliances in existing high rise NTPA (20 m) buildings. In addition 50mm or larger hose connection facility shall be provided.• Factory needs to install 1 riser per 1000 m2 of floor area and 38 mm dia of hoses with variable nozzle.• Factory needs to install standard standpipe, hose and fire pump system to ensure required hose pressure.• Factory needs to install Siamese connection after installation of stand pipe system, hose system and fire pump.• Factory needs to install dedicated fire pump with sufficient capacity and backup power.• Factory needs to have sufficient water storage capacity to get adequate pressure to feed fire-fighting equipment.
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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"> • Find out cause of burning sign and insulation damage and take proper action including replacing cable or equipment where necessary. • Ensure all electrical wiring/cable properly terminated at its point of termination using appropriate size and type of lug where necessary. • Find out the cause (improper cable/over current selection, over loading, improper lug, improper cable joints, rusted connection, insulation damage, multiple cables at single point,) of overheating (> ambient+ 400C) and take proper action.
<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"> • Ensure all distribution 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.
<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"> • Install appropriate number and type of safety signage and fire-fighting equipment at substation and generator room. Also ensure graded rubber mats are provided in front of all distribution boards. • Provide Instruction board for first aid and artificial respiration in the substation room and generator room. • Ensure in the substations room have adequate illumination level as per standard. • Fill the transformer breather's oil cup with fresh Oil. • Provide two separate and distinct connections of earthing for each generator. • Ensure distribution boards have a minimum clearance of 1 m (39 in) in front. • Provide dedicated & adequate size of earthing with proper identification for each circuit and ensure continuous earth path is back to main building intake.

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	<ul style="list-style-type: none"> • Rewire to ensure single cable at busbar and circuit breaker terminal to avoid loose connection, overloading and separate controlling of each circuit/branch circuit. • Ensure all electrical wiring/cables are sized according to capacity of circuit breakers. • Ensure cable joints are made in respect of conductivity, insulation and mechanical strength. • Connect all metal in the building to the building earthing system. • Ensure Lighting fixtures are supported from the structure properly. • Find out the cause (improper cable/over current selection, over loading, improper lug, improper cable joints, rusted connection, insulation damage, multiple cables at single point,) of overheating { ambient+(200C-400C) } and take proper action..
<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"> • 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 switchgear and panel boards on an annual basis. • Ensure substation room has minimum height & area as per NTPA Table-4.3 respectively. • Ensure the substation room has adequate fire separation from the production area/main building. • Provide adequate means of ventilation for the substation room. • Ensure all high tension cables are laid following standard cable laying techniques. • Ensure the generator room has adequate fire separation from the production area/main building. • Provide adequate means of ventilation for the generator room. • Ensure appropriate generator room size in order to properly access the generator to perform routine maintenance activities. • Ensure distribution boards have no opening and all live internal components are concealed properly. • Ensure distribution boards are installed in compliant locations in

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	<p>terms of height, access and surrounding weather.</p> <ul style="list-style-type: none">• Provide dedicated & adequate size of neutral with proper identification for each circuit.• Ensure each distribution board is provided with a circuit list and means of identification is obtained as per list.• Provide adequate support or mechanical guards for electrical equipment and wiring where necessary.• Provide adequate covers on cable trenches/channel.• Ensure surface/exposed wiring are run either horizontally and vertically with proper mechanical support and avoid wiring at an angle or hanging way with improper support.• Provide proper cable terminator/conductor for stranded conductors.• Install separate distribution boards for lighting and power circuits.• Provide individual fuse with suitable discrimination with backup fuse or miniature MCB for each 15/20A socket outlet.• Install lightning protection system on the building.
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