

## Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

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Name of the Factory	: Texolline Apparels Ltd.
Address of the Factory	: B-26, Shagorica Road, BSCIC I/A, Chittagong.
Present Status of the Factory	: Under Operation
Structural Assessment Conducted by	: VERITAS Engineering & Consultant
Date of Structural Inspection	: 2015-08-24
Fire Assessment Conducted by	: VERITAS Engineering & Consultant
Date of Fire Inspection	: 2015-08-24
Electrical Assessment Conducted by	: VERITAS Engineering & Consultant
Date of Electrical Inspection	: 2015-08-24
BGMEA Membership No.	: 4498

**BASIC INFORMATION:** The following general information was noted:

i. Building Usage Type	: Garment factory
ii. Structural System	: RCC frame system.
iii. Floor System	: RCC Beam slab.
iv. Floor Area	: 43680 sft (all floor).
v. No. of Stories	: 3 storied.
vi. Construction Year	: 2006 to 2007.
vii. Foundation Type	: Isolated foundation.
viii. Design Drawings	: Available: - Approval plan, Full set of structural, As built machine Layout plan, soil test report. Not available: - Full set of architectural drawing, floor load plan And material test report.
ix. Soil investigation Report	: Available
x. construction Materials	: Brick.
xi. Generator	: Ground Floor.

**RECOMMENDATIONS FOR CORRECTIVE ACTION:** Corrective action for structure are,

Short Term (Immediate)	: N/A
Mid Term (6-weeks)	: 1. Factory Engineer to review design, loads and columns stresses in area identified above.  2. Building Engineer to survey as constructed building and prepare constructed layout accordingly.
Long Term (6-months)	: 1. Verify in situ concrete stresses either by 100mm dia. cores or existing cylinder strength data for [the identified columns] or [100mm dia. cores from 4 columns].  2. Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.  3. Continue to implement load plan

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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"> <li>• Factory needs to ensure (a) minimum of 2.3 m<sup>2</sup> of space per occupant; (b) Reduce the occupants from the 2nd floor of the building or shift occupants from 2nd floor of the building to another floors.</li> <li>• Lights in storage area needed to be installed with protective covers and conduits.</li> <li>• Combustibles are to be managed with good housekeeping. Storage facilities with no air-conditioning duct shall be minimum 2.9 m 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.</li> <li>• All required means of exit or exit access in buildings or areas requiring more than one exit shall be signposted. The signs shall be clearly visible at all times, where necessary supplemented by directional signs.</li> </ul>
<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"> <li>• Factory needs to prepare as built drawing with floor machine layout showing means of escape with proper dimension.</li> <li>• Fire manager/Director need to have safety training from proper authority &amp; worker of the factory should as far as possible be trained for use fire extinguisher.</li> <li>• All the exit doors need to be replaced by side swinging so that un-lockable doors can be opened easily in the direction of evacuation without the use of a key.</li> <li>• Factory needs to provide handrail on both sides of all the stairways.</li> <li>• Factory needs to be installed with adequate illuminated emergency lighting in floors, exits &amp; stairs. (Escape route).</li> <li>• Emergency back-up power needs to be connected for critical fire safety system and not less than 30 minutes in case of failure of power supply.</li> </ul>
<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"> <li>• Factory needs to have a proper pre-plan for fire department.</li> <li>• Factory needs to ensure minimum width of stair either 0.9 m or 8 mm per occupant, the largest one of those. Otherwise provide another stair.</li> <li>• Final exit route-2(Stair-2 route) need to be protected (1 hour rated construction with 0.75 hours rated door) at each floor level entrance</li> </ul>

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	<p>and need to be protected from generator at ground floor by 4 hours rated construction with 2 hours rated door/opening, also need to have a protected escape route till to reach safe refuse area.</p> <ul style="list-style-type: none"><li>• Child care room is needed to be separated from other occupancies with 3 hours fire rated construction with 3 hours fire rated door.</li><li>• Storage area need to be protected with 2 hours rated construction and 1.5 hours rated opening or doors.</li><li>• Generator: Generator room need to be protected with 4 hours rated construction &amp; 2 hours rated opening / door from stair-2 as well as from the final exit route-2 located at ground floor.</li><li>• Boiler: Boiler room need to be protected with 4 hours rated construction &amp; 2 hours rated opening / door from the working floor (Sewing section) at 2nd floor of the building.</li><li>• All the exits connecting to the staircase-1 and staircase-2 need to be protected with fire and smoke resistant enclosures and opening (1 hour rated enclosure and 0.75 hour rated door) and provide a protected route from all through the stairway to the final exits.</li><li>• Factory need to install centralized and automatic fire detection &amp; alarm system on all occupied floors, including other tenanted floors of the building as per NTPA Guideline.</li><li>• The factory need to install manually operated electrical fire alarm system and automatic fire alarm system with single or multiple call boxes on all occupied floors, including other tenanted floors of the building.</li><li>• Factory needs to install control panel for centralized automatic smoke detection &amp; fire alarm system according to NTPA Guideline.</li><li>• Factory needs to install proper standpipe system with having at least 75 mm dia of riser.</li><li>• Factory needs to install separate standpipes in each exit stairway with minimum 38 mm diameter of hose with variable nozzle.</li><li>• Factory need to install standard standpipe, hose and fire pump system to ensure required hose pressure as per NTPA Guideline.</li><li>• Factory needs to be installed with Siamese connection for to the standpipe system located outside the building and accessible to the fire department connection.</li><li>• Factory needs to have dedicated fire pump with backup power system &amp; sufficient capacity for achieve required pressure in the remote place</li></ul>
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	<p>of the factory.</p> <ul style="list-style-type: none"> <li>• Factory need to have sufficient water storage capacity to get adequate pressure to feed fire-fighting equipment and at least 1900ltr x 75min=142500 liters water storage tank.</li> </ul>
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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"> <li>• 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 (&gt; ambient+ 400C) and take proper action.</li> </ul>
<p>Short Term (Actions that must be incorporated into a Fire Safety Management Plan immediately (a week) and should be a regular activity)</p>	<ul style="list-style-type: none"> <li>• Discharge the generator exhaust to the exterior of the building in a safe location.</li> <li>• Provide two separate and distinct connections of earthing for each generator.</li> <li>• Ensure all distribution boards (including panel door) are earthed properly.</li> <li>• Ensure overcurrent protection device (circuit breaker/fuse) for each circuit/branch circuit.</li> <li>• Clean interior components from dust and debris and seal all openings within the enclosure to prevent dust and debris from entering.</li> <li>• Provide provision for inspection of all earthing system and ensure inspection is being completed and documented.</li> </ul>
<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"> <li>• Install appropriate type of safety signage at generator room. Also ensure graded rubber mats are provided in front of all distribution boards.</li> <li>• Provide Instruction board for first aid and artificial respiration in the generator room.</li> <li>• Provide dedicated &amp; adequate size of earthing with proper identification for each circuit and ensure continuous earth path is back to main building intake.</li> </ul>

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	<ul style="list-style-type: none"> <li>• Rewire to avoid the use of multiple cables from incoming and outgoing side of MCB's/MCCB's.</li> <li>• Ensure all electrical cables are sized according to capacity of circuit breakers.</li> <li>• Provide mechanical guards for electrical sewing machine.</li> <li>• Ensure cable joints are made in respect of conductivity, insulation and mechanical strength.</li> <li>• Connect all metal in the building to the building earthing system.</li> <li>• 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.</li> </ul>
<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"> <li>• Develop an electrical layout diagram and an as-built single line diagram detailing key components and capacity of the electrical system.</li> <li>• Establish a periodical Insulation and earth Resistance Measurement Program and record the related testing data.</li> <li>• Inspect electrical panel boards on an annual basis.</li> <li>• Ensure overhead service connections to the building are led via adequate size and type of service masts.</li> <li>• Ensure the generator room has adequate fire separation from the production area.</li> <li>• Provide adequate means of ventilation for the generator room based on the installed equipment considering fire barriers.</li> <li>• Ensure appropriate generator room size in order to properly access the generator to perform routine maintenance activities.</li> <li>• Ensure distribution boards have no opening and all live internal components are concealed properly.</li> <li>• Provide dedicated &amp; adequate size of neutral with proper identification for each circuit.</li> <li>• Ensure each distribution board is provided with a circuit list and means of identification is provided as per list.</li> <li>• Provide adequate covers on cable channel.</li> <li>• Provide proper cable terminator/connector for stranded conductors at</li> </ul>

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	<p>its point of termination.</p> <ul style="list-style-type: none"><li>• Install separate distribution boards for lighting and power circuits.</li><li>• Install lightning protection system on the building.</li></ul>
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