

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

---

Name of the Factory	: BISHAL KNIT WEAR LTD
Address of the Factory	: 74/75 BSCIC HOSIERY I/E, SHASANGAON, FATULLAH, NARAYANGANJ.
Present Status of the Factory	: Under Operation
Structural Assessment Conducted by	: ACCORD
Date of Structural Inspection	: 2014-04-08
Fire Assessment Conducted by	: VERITAS Engineering & Consultant
Date of Fire Inspection	: 2015-07-28
Electrical Assessment Conducted by	: VERITAS Engineering & Consultant
Date of Electrical Inspection	: 2015-07-28
BKMEA Membership No.	: 900

**BASIC INFORMATION:** The present garments factory is a single storied non-engineered shed supported on RCC column. The following general information was noted:

i. Building Usage Type	: Garment factory
ii. Structural System	: RCC building.
iii. Floor System	: cantilevered slabs and On the mezzanine floor.
iv. Floor Area	: Total occupied area=2696 m <sup>2</sup> , Ground Floor =1488 sqm, 3rd Floor=372 sqm, 5 <sup>th</sup> Floor=744sqm Roof Floor=92 sqm
v. No. of Stories	: 04occupied floors out of 06 floors
vi. Construction Year	: Not mentioned.
vii. Foundation Type	: Constructed separately with pad footings and pile footings Respectively;
viii. Design Drawings	: Available.
ix. Soil Investigation Report	: Not mentioned.
x. construction Materials	: Not mentioned.
xi. Generator	: Not mentioned.

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

Short Term (Immediate)	: 1. Remove storage loading in this area immediately.  2. Reduced immediately in height to no more than 4 bags(considering a single bag to have a total weight of approx.50kg).
Mid Term (6-weeks)	: 1. The Detailed Engineering Assessment of this area to be carried out.  2. Any repairs and/or strengthening required should be carried out under the control of a Structural Engineer.  3. Adopt some sort of signage/staff guidance to ensure that the maximum height of storage is not exceeded.

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

---

4. Develop and maintain a loading plan.
5. A Detailed Engineering Assessment of this area to be carried out.
6. The distress found is recommended to be repaired. Repair by simply re-rendering is not suitable.
7. The Factory Building's Structural Engineer should carry out a Detailed Engineering Assessment to prove the capacity of the building in its existing state, a further building approval should be gained for the building as it exists, as altered since the original approval. Alternatively, the extension building should be separated by a non-structural joint and allowed to act as a fully structurally independent structure.
8. Fireproofing material for structural steel element is recommended based on Bangladeshi regulations.
9. Request that the Detailed Engineering Assessment of the overall building to be carried out and in particular, stability and foundation aspects should be investigated in detail.

### Long Term (6-months)

- : 1. Maintain standards of quality control to ensure that loading plan is correctly followed so that problems do not arise in the future. Develop and maintain a loading plan.
2. Maintain standards of quality control to ensure that storage procedures are correctly followed so that overloading problems do not arise in the future.
  3. Maintain loading plan.
  4. Maintain standards of quality control to ensure that loading plan is correctly followed so that problems do not arise in the future.
  5. Do not construct any further buildings connected to the existing factory, without thorough structural design and full building approval.
  6. Maintain standard of quality control.

## 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"> <li>• Factory need to have proper testing plan &amp; record of fire safety equipment.</li> <li>• Lights in storage area is 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 need to be minimum 2.9 m and when used as a storage facility there needs to have 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>• Factory needs to have valid fire license with coverage of full occupied area.</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>• Fire department pre-plan needs to be developed.</li> <li>• Factory need to be protected final exit-02 with generator room at ground floor by 4hours rated construction with 2 hours rated door/opening, also need to have a protected escape route till to reach safe refuse area.</li> <li>• Storage area need to be protected with 2 hours rated construction &amp; 1.5 hours rated opening or doors.</li> </ul>

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

	<ul style="list-style-type: none"><li>• Boiler &amp; Generator room needs to be fire separated with 4 hours' fire rated enclosure and 2 hour rated opening having direct access from outside.</li><li>• All the exits connecting to the staircase-1 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 though the stairway to the final exits.</li><li>• All the stairs need to be protected with a 4 hours fire resistant and smoke proof lobby (4 hours rated enclosure and 2 hour rated door) at each floor entrance and provide the protected route from all though 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 need to install proper standpipe system having at least 75 mm diameter of riser.</li><li>• Factory need to be installed by 1 riser per 1000 sqm of floor area with at least 38 mm dia of hoses.</li><li>• Factory need to ensure the minimum pressure for standpipes supplying a 50mm or larger hose shall be at least 300 Kpa. For standpipe supplying first aid hose (38mm nominal) may have a minimum pressure of 200 Kpa.</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 of the factory.</li><li>• Factory need to have sufficient water storage capacity to get adequate pressure to feed fire-fighting equipment and at least <math>1900 \times 75 = 142500</math> liters water storage tank.</li></ul>
--	---

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

### (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>• Remove all unused cables from distribution boards and make sure all necessary cables are properly terminated at its point of termination using appropriate size and type of lug.</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 (&gt; ambient+ 400C) and take proper action.</li> </ul>
<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"> <li>• Ensure panel door of panel boards 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>• Ensure graded rubber mats are provided in front of all panel boards.</li> <li>• Provide Instruction board for first aid and artificial respiration in the generator room.</li> <li>• Provide two separate and distinct connections of earthing for each generator.</li> <li>• Provide dedicated &amp; adequate size of earthing with proper identification for each circuit from the earth bus-bar of distribution boards and ensure continuous earth path is back to main building intake.</li> <li>• Rewire to ensure each incoming supply to an MCB has a dedicated supply from bus-bar.</li> <li>• Avoid the use of multiple cables on outgoing side of MCB's.</li> <li>• Ensure all electrical cables are sized according to capacity of circuit breakers.</li> <li>• Avoid flexible cables for fixed wiring unless contained in an enclosure affording mechanical protection.</li> <li>• Ensure cable joints are made in respect of conductivity, insulation</li> </ul>

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

	<p>and mechanical strength.</p> <ul style="list-style-type: none"> <li>• Ensure discrimination is achieved between circuit breakers used for protection of main circuit and the sub-circuits derived therefrom.</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 the generator room has adequate fire separation from main building.</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 panel boards have no opening and all live internal components are concealed properly.</li> <li>• Install MCCB in proper way to ensure safe installation.</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 support or mechanical guards for electrical equipment and wiring where necessary.</li> <li>• Provide proper cable terminator/connector for stranded conductors at its point of termination.</li> <li>• Install separate distribution boards for lighting and power circuits.</li> <li>• Provide individual fuse with suitable discrimination with backup fuse or miniature MCB for each 15/20A socket outlet.</li> </ul>

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

---

	<ul style="list-style-type: none"><li>• Install lightning protection system on the building.</li></ul>
--	--