

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

---

Name of the Factory	: A. K. KNITWEAR LTD.
Address of the Factory	: East Masdair, Bakery More, Narayangong
Present Status of the Factory	: Under Operation
Structural Assessment Conducted by	: VERITAS Engineering & Consultant
Date of Structural Inspection	: 2015-10-28
Fire Assessment Conducted by	: VERITAS Engineering & Consultant
Date of Fire Inspection	: 2015-10-28
Electrical Assessment Conducted by	: VERITAS Engineering & Consultant
Date of Electrical Inspection	: 2015-10-28
BKMEA Membership No.	: 489

**BASIC INFORMATION: The factory building is brick structure with non engineered shed. The following general information was noted.**

i. Building Usage Type	: Garment factory
ii. Structural System	: Brick column with non engineered shed.
iii. Floor System	: One story shed.
iv. Floor Area	: 1814 sq. ft
v. No. of Stories	: Single storey
vi. Construction Year	: 2009
vii. Foundation Type	: Unknown
viii. Design Drawings	: Not Available: Approval plan, structural design drawing, architectural design drawing, machine layout plan, material test report and soil test report.
ix. Soil Investigation Report	: Available.
x. construction Materials	: Brick chips.
xi. Generator	: Not found.

### **RECOMMENDATIONS FOR CORRECTIVE ACTION:**

Short Term (Immediate)	: N/A
Mid Term (6-weeks)	: 1. Building Engineer to assess the need to provide additional steel bracing elements with the original n element or similar also review the adequacy of the steel roof structure to ensure that it is designed to resist code specified live and wind loads.
Long Term (6-months)	: 1. Building Engineer to confirm that bracing replacement has been carried out if required.  2. Structural engineer to prepare full set of structural drawing, as built drawing and prepare calculations showing the structural adequacy of the whole shed taking into account the factory design

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

imposed loading and the as built structure and take approval from concern authority.

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>• Fire drill shall be conducted quarterly (4 times a year) under the Fire Safety Plan. A record of such drills shall be kept in writing for at least 3 years for the inspection of fire brigade whenever called for.</li> <li>• Factory need to have proper testing plan &amp; record of fire safety equipment.</li> <li>• Factory needs to have sufficient number and width (0.9 m) of marked aisles at all occupied floors.</li> <li>• All required means of exit or exit access in building 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 for the full occupied area.</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>• 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 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</li> </ul>

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

	<p>building.</p> <ul style="list-style-type: none"> <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 diameter of riser.</li> <li>• Install 1 riser per 1000 m<sup>2</sup> of floor area &amp; Install adequate number of hose in floor area and the minimum hose diameter is 38 mm, or 1.5" preferably fabric hose with variable nozzle to be used in both of the stairways covering the floor area.</li> <li>• Factory need to ensure the minimum pressure for standpipes supplying a 50 mm or larger hose shall be at least 300 Kpa. For standpipe supplying first aid hose (38 mm 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 needs 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>
--	---

### ***(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>• Ensure there is no break in the neutral wire in the form of fuse unit throughout the wiring installation.</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>
---	---

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

<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>• Install earthing system for the factory and ensure proper earthing connections at all electrical equipment.</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>• Install earthing pit for the factory with adequate provision for inspection of the earthing system and ensure inspection is being completed and documented.</li> </ul>
<p>Mid Term  (<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 distribution boards.</li> <li>• Ensure distribution boards are installed in compliant locations in terms of height and access.</li> <li>• Provide dedicated &amp; adequate size of earthing with proper identification for each circuit from the earth busbar of distribution boards and ensure continuous earth path is back to main building intake.</li> <li>• Install circuit breakers and fuses using metal enclosure to ensure safe operation.</li> <li>• Ensure all electrical cables are sized according to capacity of circuit breakers.</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> </ul>
<p>Long Term  (<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>• Replace distribution boards with metal enclosed body.</li> <li>• Provide dedicated &amp; adequate size of neutral with proper identification for each applicable circuit.</li> <li>• Ensure each distribution board is provided with a circuit list and</li> </ul>

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

---

	<p>means of identification is provided as per list.</p> <ul style="list-style-type: none"><li>• Provide proper cable terminator/connector for stranded conductors at its point of termination.</li><li>• Provide an emergency power generator with adequate capacity for the building.</li><li>• Install separate distribution boards for lighting and power circuits.</li><li>• Install lightning protection system on the building.</li></ul>
--	---