

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

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Name of the Factory	: ZIHAN KNIT COMPOSITE LTD.
Address of the Factory	: D-136, Modern Plaza, Talbag, Thana Stand, Savar, Dhaka.
Present Status of the Factory	: Under operation.
Structural Assessment Conducted by	: Accord
Date of Structural Inspection	:
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 21 June, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 21 June, 2015
BKMEA Membership No.	: 1936

### **BASIC INFORMATION:**

There is one number of 4 storied reinforced concrete building and a basement is situated in the factory premises. The following information was noted:

- i. Building Usage Type :
- ii. Structural System :
- iii. Floor System :
- iv. Floor Area :
- v. No. of Stories :
- vi. Construction Year :
- vii. Foundation Type :
- viii. Design Drawings :
- ix. Soil Investigation Report :
- x. Construction Materials :
- xi. Generator :

### **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:

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|------------------------|---|
| Short Term (Immediate) | : |
| Mid Term (6-weeks)     | : |
| Long Term (6-months)   | : |

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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>	<p>Lights in storage area needed to be installed with protective covers and conduits.</p> <p>Factory needs to ensure adequate numbers of exit signs which need to be visible from any positions and comply with the following conditions: (a) The color and design of lettering, arrows and other symbols on exit signs needs to be in high contrast with their background; (b) Words on the signs needs to be at least 150 mm with a stroke of not less 20 mm; (c) The source of illumination, contrast, intensity and luminance needs to be at least 50 lux, 0.5, 5.0 foot-candles and 0.2 cd/m<sup>2</sup> respectively.</p> <p>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.</p>
<p>Mid Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 weeks)</i></p>	<p>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.</p> <p>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.</p> <p>Factory needs to provide handrail on both sides of all the stairways.</p> <p>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.</p>
<p>Long Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 months)</i></p>	<p>Fire department pre-plan needs to be developed.</p> <p>Factory needs to ensure minimum width of stair either 0.9 m or 8 mm per occupant, the largest one of those.</p> <p>Final exit route-1&amp;2(Stair-1&amp;2 route) need to be protected by 2 hours rated construction with 1.5 hours fire rated door/opening at each floor level entrance including ground floor and need to have the protected escape route till to</p>

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	<p>reach safe refuse area.</p> <p>Storage area need to be protected with 2 hours rated construction and 1.5 hours rated opening or doors.</p> <p>Generator room needs to be fire separated with 4 hours fire rated enclosure and 2 hour rated opening having direct access from outside. Boiler room is to have a 4 hour fire resistance construction.</p> <p>All the stairs need to be protected with fire and smoke resistant enclosures and opening (2 hours rated enclosure and 1.5 hour rated door) and provide the protected route from all though the stairway to the final exits.</p> <p>Basement staircase needs to be encased and placed near the outer edge of the basement with materials of 4 hours fire resistance. The stair needs to be separated from the basement in such a way that smoke from a fire in the basement not enters the ground and upper floors.</p> <p>Communication with the basement in case of emergency needs to be maintained through a lobby provided with a fire resisting self-closing door of 2 hours fire resistance.</p> <p>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.</p> <p>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.</p> <p>Factory needs to install control panel for centralized automatic smoke detection &amp; fire alarm system according to NTPA Guideline</p> <p>Factory needs to install proper standpipe system with having at least 100 mm dia of riser.</p> <p>Factory needs to install separate standpipes in each exit stairway with minimum 38 mm diameter of hose with variable nozzle.</p> <p>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</p>
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	<p>nominal) may have a minimum pressure of 200 Kpa.</p> <p>Factory needs to be installed Siamese connection for to the standpipe system located outside the building and accessible to the fire department connection.</p> <p>Factory needs to install dedicated fire pump with sufficient capacity and backup power.</p> <p>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.</p>
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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>	N/A
<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>	<p>Ensure all panel boards (including panel door) are earthed properly.</p> <p>Ensure overcurrent protection device (circuit breaker) for each circuit or branch circuit.</p> <p>Clean interior components from dust and seal all openings within the enclosure to prevent dust and debris from entering.</p> <p>Ensure inspection of all earthing system is being completed and documented.</p>
<p>Mid Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 weeks)</i></p>	<p>Ensure graded and adequate size rubber mats are provided in front of all panel boards.</p> <p>Provide Instruction board for first aid and artificial respiration in the generator room.</p> <p>Provide two separate and distinct connections of earthing for the generator.</p> <p>Ensure distribution board has a minimum clearance of 1 m (39 in) in front.</p> <p>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</p>

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	<p>main building intake.</p> <p>Rewire to ensure each incoming supply to an MCB has a dedicated supply from busbar.</p> <p>Avoid the use of multiple cables on outgoing side of MCB's and busbar.</p> <p>Replace wooden base with metal clad construction for mounting socket and circuit breaker.</p> <p>Consult with a qualified electrical engineer and ensure all electrical cables are sized according to capacity of circuit breakers.</p> <p>Ensure cable joints are made in respect of conductivity, insulation and mechanical strength Connect all metal in the building to the building earthing system.</p> <p>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+( 20°C-40°C)} and take proper action.</p>
<p>Long Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 months)</i></p>	<p>Develop an electrical layout drawing and an as-built single line diagram detailing key components and capacity of the electrical system.</p> <p>Establish a periodical Insulation and earth Resistance Measurement Program and record the related testing data.</p> <p>Inspect electrical panel boards on an annual basis. Ensure overhead service connections to the building are led via adequate size and type of service masts.</p> <p>Ensure the generator room has adequate fire separation from the production area building.</p> <p>Ensure appropriate generator room size in order to properly access the generator to perform routine maintenance activities.</p> <p>Ensure panel boards have no opening and all live internal components are concealed properly.</p> <p>Provide proper identification of neutral cables with for each circuit.</p> <p>Ensure each distribution board is provided with a circuit list and</p>

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	<p>means of identification is provided as per list.</p> <p>Use noncombustible material to make channel and provide adequate covers on cable channel.</p> <p>Provide proper cable terminator/connector for stranded conductors at its point of termination.</p> <p>Install separate distribution boards for lighting and power circuits.</p> <p>Install lightning protection system on the building.</p>
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