

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: BRINE KNIT COMPOSITE LTD.
Address of the Factory	: Gazircht, Unique,Alia madrasha Road, Ashulia Savar,Dhaka,Bangladesh
Present Status of the Factory	: Under operation.
Structural Assessment Conducted by	: VEC
Date of Structural Inspection	: 14 May, 2015
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 14 May, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 14 May, 2015
BKMEA Membership No.	: 1437

BASIC INFORMATION:

The factory building is a three storied RCC building with beam and column system and flat slab system. The following information was noted:

i. Building Usage Type	: Garment Factory.
ii. Structural System	: RCC beam column system.
iii. Floor System	: RCC Beam slab.
iv. Floor Area	: 70,250 sft
v. No. of Stories	: 7 storied
vi. Construction Year	: 2007-2008
vii. Foundation Type	: Isolated Footing Foundation
viii. Design Drawings	: Available: Structural design drawing, soil test report. Not Available: Approval plan, architectural design drawing, as built machine layout plan, materials test report and floor load plan
ix. Soil Investigation Report	: Available
x. Construction Materials	: Brick aggregate.
xi. Generator	: Ground Floor.

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:

Short Term (Immediate)	: None
Mid Term (6-weeks)	: 1. Factory Engineer to review design loads and column stresses in the areas identified above. 2. Verify in situ concrete stresses either by cores (100mm diameter) or existing cylinder strength data for all the columns or cores from a minimum of 4 non-critical columns. Building Engineer to verify the structural integrity as per as built dimensions.

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Long Term (6-months) : 1. Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.

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>Ensure adequate numbers of fire drills under the Fire Safety Plan.</p> <p>Ensure minimum width of aisles as follows: (a) Seats on both sides of the aisle 1 m (b) Seats on one side of the aisle 0.9 m Total width needs to comply with table 4.2 (a).</p> <p>Lights in storage area need to be installed with protective covers and conduits.</p> <p>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.</p> <p>Factory needs to be installed with adequate illuminated emergency lighting in floors, exits & stairs.(Escape route). Ensure adequate exit signs in all floors so that it is visible from all positions</p>
<p>Mid Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 weeks)</i></p>	<p>Factory needs to have as built drawing with proper dimensions showing all the means of escape.</p> <p>Fire manager/Director need to have safety training from proper authority & worker of the factory should as far as possible be trained for use fire extinguisher. All the firefighting equipment need to be tested with proper documents.</p> <p>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.</p> <p>Provide handrail on both sides of stairways. Factory need to Emergency backup power for critical fire safety system (signage, fire alarm & detection system, emergency lighting, AFD and Alarm systems etc.)</p>

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<p>Long Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 months)</i></p>	<p>Factory needs to have a proper pre-plan for fire department. The south-west escape routes need to protect from ground floor area to provide protected paths of travel (2 hour fire rated construction with 1.5 hour fire rated opening) till to reach safe refuse area.</p> <p>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 hour rated opening having direct access from outside.</p> <p>Stairs need to be protected with 2 hour fire rated and smoke resistant lobby and enclosure, also having 1.5 hour rated opening or door and provide a protected route from all through the stairway to the final exits.</p> <p>Factory needs to provide 3 hour rated construction between office and finishing section.</p> <p>Install fire lift with backup power including have 1hr fire rated & auto closing fire door in 2 hr fire rated lift core with backup power & having minimum capacity of 545 kgs.</p> <p>Factory need to install centralized and automatic fire detection & 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 detection and alarm system at required location.</p> <p>Factory need to install 100 mm diameter of standpipe system in the building.</p> <p>Factory needs to install 1 riser per 1000 m2 of floor area and 38 mm dia of hoses 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 and standpipe supplying first aid hose (38mm nominal) may have a minimum pressure of 200 kPa.</p> <p>Factory needs to be installed with Siamese connection for to the standpipe system located outside the building and</p>
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	<p>accessible to the fire department connection.</p> <p>Factory needs to have dedicated fire pump with backup power system & sufficient capacity for achieve required pressure in the remote place of the factory.</p> <p>Factory needs 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.</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>	<p>Find out cause of insulation damage and take proper action including replacing cable or equipment where necessary.</p>
<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 distribution boards (including panel door) are earthed properly.</p> <p>Ensure wiring systems are selected and erected so that no damage is caused by the ingress of water.</p> <p>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.</p> <p>Ensure overcurrent protection device (circuit breaker/fuse) for each circuit/branch circuit.</p> <p>Clean interior components from dust and debris and seal all openings within the enclosure to prevent dust and debris from entering.</p> <p>Provide provision for inspection of all earthing system and ensure inspection 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>Install appropriate number and type of safety signage and fire-fighting equipment at generator room. Also ensure graded 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>

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	<p>Ensure distribution boards are installed in compliant locations in terms of height and access.</p> <p>Provide dedicated & adequate size of earthing with proper identification for each circuit and ensure continuous earth path is back to main building intake Rewire to avoid the use of multiple cables from incoming and outgoing side of MCB's/MCCB's. Ensure all electrical cables are sized according to capacity of circuit breakers.</p> <p>Provide adequate support or mechanical guards for rotating parts of electrical equipment where necessary.</p> <p>Provide adequate and noncombustible covers on cable channels. Avoid flexible cables for fixed wiring unless contained in an enclosure affording mechanical protection.</p> <p>Ensure cable joints are made in respect of conductivity, insulation and mechanical strength.</p> <p>Connect all metal in the building to the building earthing system.</p> <p>Ensure lighting fixtures are supported from the structure properly</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 diagram 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 to ensure that the equipment is in good working condition.</p> <p>Ensure the generator room has adequate fire separation from the production area.</p> <p>Provide adequate means of ventilation for the substation room based on the installed equipment considering fire barriers.</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</p>

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	<p>components are concealed properly.</p> <p>Install circuit breakers in proper way or proper place to ensure safe installation.</p> <p>Provide dedicated & adequate size of neutral with proper identification for each circuit.</p> <p>Ensure each panel board is provided with a circuit list and means of identification is provided as per list.</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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