

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

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Name of the Factory	: UNION FASHION (Building_02)
Address of the Factory	: 439/1, Godnyle Road, Narayananj
Present Status of the Factory	: Under operation.
Structural Assessment Conducted by	: VEC
Date of Structural Inspection	: 17 June, 2015
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 17 June, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 17 June, 2015
BKMEA Membership No.	: 1368

### **BASIC INFORMATION:**

In the factory premises there are two buildings, one storied pre-fabricated steel structure building and another one storied non engineered shed. The following information was noted:

i. Building Usage Type	: Garment Factory.
ii. Structural System	: Non engineered shed.
iii. Floor System	: Profile sheet roof.
iv. Floor Area	: 6000 sft
v. No. of Stories	: Single Storied
vi. Construction Year	: 2009
vii. Foundation Type	: Unknown
viii. Design Drawings	: Available document: Approval plan, machine layout plan. Not Available: Structural drawing, architectural drawing, soil test report, Floor load plan, Material test report
ix. Soil Investigation Report	: Not Available
x. Construction Materials	: Steel angle bar, brick.
xi. Generator	: N/A.

### **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. Verify the lateral stability of the shed and confirm the requirement of any bracing in the long direction.
Long Term (6-months)	: 1. Install vertical bracing if required. 2. Structural engineer to prepare full set of structural drawing, as built drawing and prepare/update calculations showing the structural adequacy of the floor system taking into account the factory design imposed loading and the as built structure.

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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>Factory need to have proper testing plan &amp; record of fire safety equipment.</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 2.9 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>Ensure illuminated exit signs in 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>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 be installed with adequate illuminated emergency lighting in floors, exits &amp; stairs.(Escape route)</p>
<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 service &amp; civil department.</p> <p>Child care need to be fire separated from the sample section with 3 hours rated encloser / wall with 3 hour rated door or need to direct access to the road with safe location from production building.</p> <p>Storage area need to be protected with 2 hours rated construction &amp; 1.5 hours rated opening or doors.</p> <p>Factory needs to be installed with centralized automatic detection system with proper sitting arrangement according to NTPA guideline.</p> <p>The factory need to install manually operated electrical fire</p>

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	<p>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 be installed with control panel for centralized automatic smoke detection &amp; fire alarm system according to NTPA Guideline.</p> <p>Factory needs to install with proper standpipe system having at least 75 mm diameter of standpipe.</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 accessible to the fire department connection.</p> <p>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.</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 burning sign 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 are earthed properly using appropriate type and size of cables and the earthing cables have continuity up to main earth /earthing pit.</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>Clean interior components from dust and debris and seal all openings within the enclosure to prevent dust and debris from entering.</p>

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	<p>Provide provision for inspection of all earthing system and ensure inspection is being completed and documented.</p>
<p>Mid Term <i>(The remedial works indicated must be carried out within a period of 6 weeks)</i></p>	<p>Provide Instruction board for first aid and artificial respiration in the generator room.</p> <p>Ensure graded rubber mats are provided in front of all distribution boards.</p> <p>Install circuit breaker in a proper place to ensure safe installation.</p> <p>Provide dedicated &amp; adequate size of earthing with proper identification for each circuit and ensure continuous earth path is back to main factory intake.</p> <p>Rewire to avoid the use of multiple cables from incoming and outgoing side of MCB's/MCCB's and busbar.</p> <p>Replace wooden bases with metal clad construction for mounting the switch controls.</p> <p>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.</p> <p>Seal the openings remaining after wiring system passes through the elements of building construction according to the degree of fire resistance.</p> <p>Provide emergency power connection for life safety loads (exit signage) temporarily within 6 weeks and find out a permanent solution within 6 months.</p> <p>Connect all metal in the sheds to the factory 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>

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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>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 panel boards on an annual basis to ensure that the equipment is in good working condition.</p> <p>Ensure distribution boards have no opening and all live internal components are concealed properly.</p> <p>Provide dedicated &amp; adequate size of neutral with proper identification for each circuit.</p> <p>Ensure each distribution board is provided with a circuit list and means of identification is provided as per list.</p> <p>Provide adequate support or mechanical guards for electrical equipment and wiring where necessary.</p> <p>Provide adequate and noncombustible covers on cable channel.</p> <p>Ensure surface/exposed wiring run either horizontally or vertically with proper mechanical support and avoid wiring at an angle or hanging way with improper support.</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 factory.</p>
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