

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Rmw Fashionwear Ltd.
Address of the Factory	: Binairchara, Duptara, Araihasar, Narayanganj, Dhaka, Bangladesh
Present Status of the Factory	: Under operation.
Structural Assessment Conducted by	: VEC
Date of Structural Inspection	: 18 April, 2015
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 18 April, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 18 April, 2015
BGMEA Membership No.	: 5225

BASIC INFORMATION:

The present garment factory is Pre Engineered building shed truss-column steel frame and the other one is RCC beam slab system. The following information was noted:

i. Building Usage Type	: Garment Factory.
ii. Structural System	: Pre Engineered building shed (truss-column steel frame) and R.C.C. beam slab..
iii. Floor System	: Roof truss (for PEB shed) and two way beam slab (for RCC building).
iv. Floor Area	: 5500 sq. ft, among which only 690 sq. ft is RCC building, rest of the part is PEB shed.
v. No. of Stories	: One storied PEB Shed and two storied RCC building
vi. Construction Year	: Building was constructed in two phases (In 2002 & 2013).
vii. Foundation Type	: Isolated footing.
viii. Design Drawings	: Available: As built structural design drawing documents (mismatched with existing structure), architectural drawing without sign and seal. Not Available: Approval drawing, machine layout plan. material test report
ix. Soil Investigation Report	: Not 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)	: N/A
Mid Term (6-weeks)	: 1. Prepare calculations showing the structural adequacy of the building structure taking into account the factory design, imposed loading and the as built structure.
Long Term (6-months)	: 1. Install horizontal bracing at the roof system if required. 2. All of the documents to be kept at site for review.

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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>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.</p> <p>Factory need to have proper testing plan & record of fire safety equipment.</p> <p>Lights in storage area needed to be installed with protective covers and conduits.</p>
<p>Mid Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 weeks)</i></p>	<p>Needs to have as built drawing with floor machine layout showing means of escape with proper dimension.</p> <p>Factory Manager/Director needs to arrange fire safety training for the workers of the factory from proper authority time to time.</p> <p>All the exit doors need to be replaced by side swinging so that un-lockable fire rated 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.</p> <p>Factory needs to be installed with adequate illuminated emergency lighting in floors, exits and stair. (Escape route).</p> <p>Factory need to have emergency backup power for critical fire safety system with sufficient capacity & arrangement according to NTPA Guideline</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>Final exit route-1 (west-south stair-1) need to protect from the generator room located at ground floor by 4 hours rated construction with 2 hours rated doors, also need to be separated from ground floor area to provide protected paths of travel (2 hours fire rated construction with 1.5 hours fire rated opening) till to reach safe refuse area.</p> <p>Storage area need to be protected with 2 hours rated construction & 1.5 hours rated opening or doors.</p> <p>Generator:</p>

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	<p>Factory need to protect the generator room from the working area & (stair-1)Final exit route-1 located at ground floor of the building by 4 hours rated construction with 2 hours fire rated door/opening</p> <p>The entire exits connecting to the staircases(01numbers staircase) need to be protected with fire and smoke resistant enclosures and opening (2 hour rated enclosure and 1.5 hour rated door)and provide a protected route from all though the stairway to the final exits.</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 centralized and automatic fire detection and alarm system at required location.</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 have to the minimum pressure for standpipes supplying a 50mm or larger hose shall be at least 300 kPa ecr 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 stand pipe system located outside the building and accessible to the sire 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. Factory needs to have sufficient water storage capacity to get adequate pressure to feed fire-fighting equipment and at least 1900liter 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 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+ 40°C) and take proper action</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>Discharge the generator exhaust to the exterior of the building in a safe location.</p> <p>Ensure all panel doors are earthed properly.</p> <p>Ensure proper earthing connections at all electrical equipment. 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> <p>Provide dedicated & 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.</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. Replace wooden base 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>Use noncombustible material to make cable channels and provide adequate covers on cable channels.</p> <p>Ensure cable joints are made in respect of conductivity, insulation and mechanical</p>

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	<p>strength.</p> <p>Connect all metal in the building to the building earthing system.</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 switchgear and panel boards on an annual basis.</p> <p>Ensure the generator room has adequate fire separation from the production area.</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 dedicated & adequate size of neutral with proper identification for each applicable 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 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>