

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: RMT TEXTILE MILLS LTD.
Address of the Factory	: Maona, Sreepur, Gazipur Bangladesh
Present Status of the Factory	: Under operation.
Structural Assessment Conducted by	: VEC
Date of Structural Inspection	: 5 July, 2015
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 5 July, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 5 July, 2015
BKMEA Membership No.	: 1923

BASIC INFORMATION:

The present garment factory is a factory building with steel beam column, rafter, purlin and pre-fabricated steel structure. The following information was noted:

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| i. Building Usage Type | : Garment Factory. |
| ii. Structural System | : Steel beam column, rafter, purlin and pre-fabricated steel structure. |
| iii. Floor System | : Steel beam column, rafter, purlin and pre-fabricated steel structure with .5mm profile sheet. |
| iv. Floor Area | : Floor area is (GF=120000 x 1) = 120000 sft for main factory building. |
| v. No. of Stories | : Single storied pre-fabricated shed. |
| vi. Construction Year | : 2011 to 2012. |
| vii. Foundation Type | : Individual Footing |
| viii. Design Drawings | : Not Available |
| ix. Soil Investigation Report | : Available |
| x. Construction Materials | : Brick aggregate. |
| xi. Generator | : Ground floor in separated shed. |

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) | : N/A |
| Mid Term (6-weeks) | : N/A |
| Long Term (6-months) | : 1. 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. Develop set of as-built drawings showing structure details, loading, dimensions, levels, Foundations and framing on Plan, Section and Elevation drawings.
2. Building engineer to confirm requirement for lateral bracing in |

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long direction

3. Fit lateral bracing if required

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 conduct fire drill quarterly (4 times a year) under the fire safety plan and needs to kept the written record of such drills 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>Factory needs to have marked aisles in all working floor according to 0.9m for one side seat and 1.0m for both side seat.</p> <p>Factory need to build minimum 2 stair with proper width of 3 storied building.</p> <p>The minimum fire resistance rating of the walls separating the smoke proof enclosure by providing lobby or ventilated vestibule from the area of incidence needs to be 4 hours with no openings other than those required for fire doors for exit. The fire rating of the fire doors for exit needs 2 hours.</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>Factory needs to prepare as built drawing with floor machine layout showing means of escape with proper dimension.</p> <p>All the exit doors need to be replaced by side swinging so that unlockable doors can be opened easily in the direction of evacuation without the use of a key.</p> <p>Fire manager/Director need to have safety training from proper</p>

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	<p>authority & worker of the factory should as far as possible be trained for use fire extinguisher.</p> <p>Factory needs to be installed with adequate illuminated emergency lighting in floors, exits & stairs.(Escape route).</p> <p>Stairways serving as means of escape shall have continuous guards and handrails on both sides.</p> <p>All required means of exit or exit access in buildings 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.</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 need to build minimum 2 stair with proper width of 3 storied building.</p> <p>Final exit route-1 of 3 storied building (Stair-1 route) need to be protected (2 hours rated construction with 1.5 hours rated door) at each floor level entrance including ground floor need to have a protected escape route till to reach safe refuse area. Storage area need to be protected with 2 hours rated construction & 1.5 hours rated opening or doors.</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>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 automatic fire detection and alarm system in the command station at the entrance lobby of the factory premises.</p>

(B): Recommendations for Electrical Safety Corrective Actions:

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<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. Remove all unused cables from distribution board and make sure all necessary cables are properly terminated at its point of termination using appropriate size and type of lug.</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 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>Post appropriate type of safety signage at substation and generator room and ensure graded rubber mats are at required location.</p> <p>Provide Instruction board for first aid and artificial respiration in the substation room and generator room.</p> <p>Fill the transformer breather with fresh silica gel and oil cup with fresh oil.</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.</p> <p>Rewire to ensure each incoming supply to an MCB has a dedicated supply from busbar. Avoid the use of multiple cables on outgoing side of MCB's.</p> <p>Ensure cable joints are made in respect of conductivity, insulation and mechanical strength.</p> <p>Connect all metal in the shed to the main earthing system. 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 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.</p> <p>Ensure distribution boards have no opening and all live internal</p>

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	<p>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 shed.</p>
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