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| Name of the Factory | : | Sonali Fabrics & Textiles Mills (Pvt.) Ltd. Sweater Unit. |
| Address of the Factory | : | Choto Godairchar, Madhabdi-1604, Narshingdi. |
| Present Status of the Factory | : | Under operation. |
| Structural Assessment Conducted by | : | VEC |
| Date of Structural Inspection | : | 05-October-2015 |
| Fire Assessment Conducted by | : | VEC |
| Date of Fire Inspection | : | 05-October-2015 |
| Electrical Assessment Conducted by | : | VEC |
| Date of Electrical Inspection | : | 05-October-2015 |
| BGMEA Membership No. | : | 6063 |

## BASIC INFORMATION:

The present garment factory building is a six storied RCC dual system (both beam column frame and flat plate system) structure. The following information was noted:

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| i. | Building Usage Type | : | Garment Factory. |
| ii. | Structural System | : | RCC dual system. |
| iii. | Floor System | : | RCC beam slab system and RCC flat plate system. |
| iv. | Floor Area | : | Floor area is (6250 sft x 6 ) = 37500 sft for main factory |
| v. | No. of Stories | : | 6- storied |
| vi. | Construction Year | : | 2012 to 2013. |
| vii. | Foundation Type | : | Isolated Column Footing. |
| viii. | Design Drawings | : | Available document: Approval plan, Partial Structural design drawing (without elevation, column layout and beam layout), soil test report, Not available: Architectural drawing, floor load plan, material test report and machine layout plan have not been found. |
| ix. | Soil Investigation Report | : | Available |
| x. | Construction Materials | : | Brick aggregate. |
| xi. | Generator | : | In a separate 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) | : | 1. Area of overstressed column should not be used for storage.<br>2. A Detail Engineering Assessment of Factory to be commenced. |
| Mid Term (6-weeks) | : | 1. Detail Engineering Assessment to be completed.<br>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 |
| Long Term (6-months) | : | 1. Continue to implement load plan. |

The recommendations for **Fire & Electrical Safety** corrective action are:

***(A): Recommendations for Fire Safety Corrective Actions:***

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| Immediate<br><br>(*the factory should not continue to be occupied until these non-conformities have been rectified*): | N/A |
| Short Term<br><br>(*Actions that must be incorporated into a Fire Safety Management Plan immediately (1 ~ 2 weeks) and should be a regular activity* | All the firefighting equipment need to be tested with proper documents.<br><br>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. |
| Mid Term<br><br>(*The remedial works indicated must be carried out within a period of 6 weeks)* | Factory needs to prepare as built drawing with floor machine layout showing means of escape with proper dimension.<br><br>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.<br><br>Factory needs to provide handrail on both sides of all the stairways.<br><br>Factory needs to be installed with adequate illuminated emergency lighting in floors, exits & stairs.)Escape route(.<br><br>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. |
| Long Term<br><br>(*The remedial works indicated must be carried out within a period of 6 months)* | Fire department pre-plan needs to be developed.<br><br>Final exit route-1 need to be protected (2 hours rated construction with 1.5 hours rated door) at each floor level entrance and need to be protected from working floor at ground floor by 2 hours rated construction with 1.5 hours rated door/opening, also need to have a protected escape route till to reach safe refuse area.<br><br>Final exit route-2 need to be protected (2 hours rated construction with 1.5 hours rated door) at each floor level entrance and need to be protected from working floor at ground floor by 2 hours rated construction with 1.5 hours rated door/opening, also need to have a protected escape route till to reach safe refuse area.<br><br>Child care room is needed to be separated from other |

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| | occupancies with 3 hours fire rated construction with 3 hours fire rated door.<br><br>Sub-station room need to be protected by 4 hours rated construction with 2 hours rated opening / door from stair-1 as well as from the final exit route-1 located at ground floor.<br><br>All the stairs need to be protected with fire and smoke resistant enclosures and opening (2 hours rated enclosure and 1.5 hours rated door)and provide a protected route from all though the stairway to the final exits.<br><br>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.<br><br>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.<br><br>Factory needs to install control panel for centralized automatic smoke detection & fire alarm system according to NTPA Guideline.<br><br>Factory needs to install proper standpipe system with having at least 100 mm dia of riser.<br><br>Install 1 riser per 1000 m2 of floor area & Install adequate number of hose in floor area and the minimum hose diameter is 38 mm, or 1.5" preferably fabric hose with variable nozzle to be used in both of the stairways covering the floor area.<br><br>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 nominal) may have a minimum pressure of 200 Kpa.<br><br>Factory needs to be installed with Siamese connection for to the standpipe system located outside the building and accessible to the fire department connection.<br><br>Install dedicated fire pump with backup power system & sufficient capacity for achieve required pressure in the remote place of the factory. |

***(B): Recommendations for Electrical Safety Corrective Actions:***

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| Immediate<br><br>(*the factory should not continue to be occupied until these non-conformities have been rectified*): | N/A |
| Short Term<br><br>(*Actions that must be incorporated into a Fire Safety Management Plan immediately (a week) and should be a regular activity* | Ensure all distribution boards (including panel door) are earthed properly.<br><br>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.<br><br>Ensure overcurrent protection device (circuit breaker/fuse) for each circuit/branch circuit.<br><br>Clean interior components from dust and debris and seal all openings within the enclosure to prevent dust and debris from entering.<br><br>Ensure inspection is being completed and documented. |
| Mid Term<br><br>(*The remedial works indicated must be carried out within a period of 6 weeks)* | Ensure graded rubber mats are provided in front of the distribution board.<br><br>Provide Instruction boards for first aid and artificial respiration in the substation room.<br>Fill the transformer oil cup with fresh Oil.<br><br>Provide dedicated & adequate size of earthing with proper identification for each circuit<br>from the earth bus-bar of distribution boards and ensure continuous earth path is back<br>to main building intake.<br><br>Rewire to ensure each incoming supply to an MCB has a dedicated supply from busbar.<br><br>Avoid the use of multiple cables on outgoing side of MCB's.<br>Ensure all electrical cables are sized according to capacity of circuit breakers.<br><br>Provide adequate support and mechanical guards for wiring where necessary.<br><br>Ensure cable joints are made in respect of conductivity, insulation and mechanical strength.<br><br>Connect all metal in the building to the building earthing system. |

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| | Ensure Lighting fixtures are supported from the structure properly.<br><br>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+( 20ºC-40ºC)} and take proper action. |
| Long Term<br><br>(*The remedial works indicated must be carried out within a period of 6 months)* | Develop an electrical layout diagram and an as-built single line diagram detailing key components and capacity of the electrical system.<br><br>Establish a periodical Insulation and earth Resistance Measurement Program and record the related testing data.<br><br>Inspect electrical switchgear and panel boards on an annual basis.<br><br>Ensure all high tension cables are laid following standard cable laying techniques.<br><br>Ensure distribution boards have no opening and all live internal components are concealed properly.<br><br>Provide dedicated & adequate size of neutral with proper identification for each circuit.<br><br>Ensure each distribution board is provided with a circuit list and means of identification is provided as per list.<br><br>Provide proper cable terminator/connector for stranded conductors at its point of termination.<br><br>Install separate distribution boards for lighting and power circuits.<br><br>Install lightning protection system on the building confirming its requirements and adequacy. |