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| Name of the Factory | : | WINNER APPARELS. |
| Address of the Factory | : | 32/21, Ishakha Road, Killarpol, Narayanganj. |
| Present Status of the Factory | : | Under operation. |
| Structural Assessment Conducted by | : | |
| Date of Structural Inspection | : | |
| Fire Assessment Conducted by | : | VEC |
| Date of Fire Inspection | : | 26 July, 2015 |
| Electrical Assessment Conducted by | : | VEC |
| Date of Electrical Inspection | : | 26 July, 2015 |
| BKMEA Membership No. | : | 1365 |

**BASIC INFORMATION:**

The factory consists of one number of 6 storied reinforce concrete building. The following information was noted:

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| i. | Building Usage Type | : |
| ii. | Structural System | : |
| iii. | Floor System | : |
| iv. | Floor Area | : |
| v. | No. of Stories | : |
| vi. | Construction Year | : |
| vii. | Foundation Type | : |
| viii. | Design Drawings | : |
| ix. | Soil Investigation Report | : |
| x. | Construction Materials | : |
| xi. | Generator | : |

**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) | : |
| Mid Term (6-weeks) | : |
| Long Term (6-months) | : |

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* | 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.<br><br>Factory need to have proper testing plan & record of fire safety equipment.<br><br>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.<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>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.<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>Factory needs to have emergency backup power for critical fire safety system with sufficient capacity & arrangement according to NTPA Guideline. |
| 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(stair-1 route) and final exit route-2(stair-2 route) need to be protected (2 hours rated construction with |

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| | 1.5 hours rated door) at each floor level entrance including ground floor and need to be protected from the working floor and storage area at ground floor by 2 hours rated construction with 1.5 hours rated door/opening, also need to have the protected escape route till to reach safe refuse area.<br><br>**Boiler:**<br>Boiler room need to be protected with 4 hours rated construction with 2 hours rated opening / door from finishing section at 5th floor of the building.<br><br>**Generator:**<br>Generator room need to be protected by 4 hours rated construction with 2 hours rated opening / door from embroidery section 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 hour 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>Factory need to 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>Factory needs to have dedicated fire pump with backup power system & sufficient capacity for achieve required pressure in the remote place of the factory. |

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| | 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. |

***(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*): | Isolate all unused cables first and then remove from distribution boards. If necessary make sure cables are properly terminated at its point of termination using appropriate size and type of lug. |
| 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 distribution boards (including panel door) are earthed properly using appropriate type and size of cables and the earthing cables have continuity up to main earth /earthing pit.<br><br>Ensure proper earthing connections at all electrical equipment Provide provision for inspection of all earthing system and 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 mat is in front of the distribution board. Provide dedicated & adequate size of earthing with proper identification for each circuit and ensure continuous earth path is back to main building intake.<br><br>Rewire to ensure each incoming supply to an MCB has a dedicated supply from bus bar. Avoid the use of multiple cables on outgoing side of MCB's/MCCB's.<br><br>Consult with a qualified electrical engineer and ensure all electrical cables are sized according to capacity of circuit breakers.<br><br>Ensure cable joints are made through porcelain/PVC connectors with PIB tape wound around joint in respect of conductivity, insulation and mechanical strength.<br><br>Connect all metal in the building to the building earthing/grounding system such as metal rebar in concrete, metal frame of building, or metal water pipe etc. |
| Long Term<br><br>(*The remedial works indicated must be carried out within a period of 6 months)* | Have a qualified electrical engineer to 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. Also ensure that insulation resistance of power cable and earth pit |

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| | resistance are ">=5 MΩ"and "<=1Ω" respectively.<br><br>Inspect electrical panel board on an annual basis to ensure that the equipment is in good working condition.<br><br>Ensure overhead service connections to a building lead via roof poles or service masts made of GI pipe at least 38 mm in diameter having a bend at the top and installed on the outer wall. Consult with a qualified electrical engineer before completing work.<br><br>Replace distribution board with metal enclosed body.<br><br>Ensure distribution board has 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 indicating current rating of circuit and size of fuse element/ breaker. Also ensure the means of identification (separate color coding, marking tape, tagging, or other approved means) of cable is provided as per circuit list.<br><br>Provide adequate support or mechanical guards for electrical equipment.<br><br>Provide adequate covers on channel.<br><br>Solder together all strands at the exposed ends or are crimped using suitable sleeve or ferrules for stranded conductors having a nominal cross-sectional area less than 6mm$^2$.<br><br>Provide an emergency power generator with adequate capacity for the factory.<br><br>Install separate distribution board for lighting and power circuits.<br><br>Consult with an expert electrical engineer to review requirements, calculate risk index, prepare drawing etc. to make sure the building is secured against lightning.<br><br>Also ensure following as per NTPA based on the building size.<br>iii) Air termination network vertical/horizontal conductors are appropriately spaced. |

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| | iv) Appropriate numbers of down conductors are installed.<br>iii) Resistance of earth conductor within limit (<=10Ω). |