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| Name of the Factory | : | TEXTEC UND MEHR LTD. |
| Address of the Factory | : | Malitha Industrial Zone, Post Office Road, Lalpur, Fatullah, 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 | : | |
| Electrical Assessment Conducted by | : | VEC |
| Date of Electrical Inspection | : | |
| BKMEA Membership No. | : | 1814 |

**BASIC INFORMATION:**

The factory building is a 06-storied reinforced concrete building where only 5th floor is used by the assessed factory independently.. 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 | : | 06-storied |
| 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* | 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.<br><br>Factory need to have proper testing plan & record of fire safety equipment.<br><br>Lights in storage area need to be installed with protective covers and conduits.<br><br>Combustibles are to be managed with good housekeeping. Storage facilities with no air-conditioning duct need to be at least 2.9 m and when used as a storage facility there needs to have a minimum clearance of one third the floor height from the ceiling to the top of the storage stack.<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>Factory needs to have valid fire license for the full occupied area.<br><br>Factory manager or director needs to arrange fire safety training for the workers of the factory from proper authority time to time. Factory need to arrange in house fire training within short term (1-2 weeks).<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. |

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| | 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-2 & 3 (stair-2 & 3 route) need to be protected (2 hours rated construction with 1.5 hours rated door) at each floor level entrance including ground floor and need to be protected from the generator at ground floor by 4 hours rated construction with 2 hours rated door/opening, also need to have the protected escape route till to reach safe refuse area.<br><br>Storage area need to be protected with 2 hours rated construction and 1.5 hours rated opening or doors. Generator: Generator 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>Boiler: Boiler room need to be protected with 4 hours rated construction with 2 hours rated opening / door from stair-1 and generator room at ground floor of the building.<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 the 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 diameter of riser. |

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| | Factory need to be installed by 1 riser per 1000 sqm of floor area with at least 38 mm diameter of hoses.<br><br>Factory need to ensure the minimum pressure for standpipes supplying a 50 mm or larger hose shall be at least 300 Kpa. For standpipe supplying first aid hose (38 mm 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 install dedicated fire pump with sufficient capacity and backup power.<br><br>Factory needs to have sufficient water storage capacity to get adequate pressure to feed fire-fighting equipment and at least 1900×75 = 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*): | 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 Panel 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>Isolate the panel from the electrical service and clean interior components from dust and debris. Seal all openings within the enclosure to prevent dust and debris from entering.<br><br>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)* | Install appropriate type of safety signage at substation and generator room. Also ensure graded rubber mats are in front of all distribution boards.<br>Provide Instruction board for first aid and artificial respiration in the substation room and generator room.<br><br>Ensure in the substations room and generator room, all working place, exit light and escape light have adequate illumination level as per standard.<br><br>Fill the transformer breather with fresh Silica gel and oil cup |

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| | with fresh Oil.<br><br>Provide two separate and distinct connections of earthing for each generator.<br><br>Install circuit breaker in proper way to ensure safe installation. 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 busbar. Avoid the use of multiple cables on outgoing side of MCB's.<br><br>Consult with a qualified electrical engineer and ensure all electrical wiring/cables are sized according to capacity of circuit breakers.<br><br>Avoid flexible cables for fixed wiring unless contained in an enclosure affording mechanical protection.<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>Wiring system passes through elements of building construction such as floors, walls, roofs, ceilings, partitions or cavity barriers, the openings remaining after passage of the wiring system have to seal according to the degree of fire resistance prescribed for the respective element of building construction before penetration.<br><br>Connect all metal in the building to the building earthing/grounding system such as cable channel, boiler, metal rebar in concrete, metal frame of building, or metal water pipe etc.<br><br>Make sure cables are not overloaded ,properly terminated using proper lug, joints are made proper way, no rusted throughout the connection, proper cable bending, no insulation damage, single cable at single point etc. to avoid temperature rise. If necessary consult with a qualified engineer and replace cable or equipment. |
| 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 |

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| | ensure that insulation resistance of power cable and earth pit resistance are ">=5 MΩ"and "<=1Ω" respectively.<br>Inspect electrical switchgear and panel boards on an annual basis to ensure that the equipment is in good working condition.<br><br>Ensure allhigh tension cables are laid following standard cable laying techniques.<br><br>Ensure the generator room has adequate fire separation from adjacent production area.<br><br>Provide adequate means of ventilation for the generator room based on the installed equipment and ensure that ventilation does not impact on fire barriers, e.g. fire dampers<br><br>Ensure appropriate generator room size in order to properly access the generator to perform routine maintenance activities.<br><br>Ensure distribution boards have no opening and all live internal components are concealed properly.<br><br>Ensure distribution boards are installed in compliant locations in terms of height, access and surrounding weather.<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 covers on cable channel.<br><br>Provide cable sockets for stranded conductors having a nominal cross sectional area 6mm². or greater or 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 6mm².<br><br>Install separate distribution boards 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. |

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| | Also ensure following as per NTPA based on the building size.<br>i) Air termination network vertical/horizontal conductors are appropriately spaced<br>ii) Appropriate numbers of down conductors are installed<br>iii) Resistance of earth conductor within limit (<=10Ω). |