

## Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

---

|                                    |   |
|------------------------------------|---|
| Name of the Factory                | : T.H. Fashions   |
| Address of the Factory             | : 45,Free School Street, Sonargaon Road, Hatirpool, Dhaka |
| Present Status of the Factory      | : Under operation.  |
| Structural Assessment Conducted by | : VEC   |
| Date of Structural Inspection      | : 10 May, 2015  |
| Fire Assessment Conducted by       | : VEC   |
| Date of Fire Inspection            | : 10 may, 2015  |
| Electrical Assessment Conducted by | : VEC   |
| Date of Electrical Inspection      | : 10 may, 2015  |
| BGMEA Membership No.               | : 1622  |

### **BASIC INFORMATION:**

The factory building is a three storied RCC building with beam and column system and flat slab system. The following information was noted:

|                               |   |
|-------------------------------|---|
| i. Building Usage Type        | : Garment Factory.  |
| ii. Structural System         | : RCC beam column system.   |
| iii. Floor System             | : RCC Beam slab.  |
| iv. Floor Area                | : 32500sft (Factory area)   |
| v. No. of Stories             | : 07 storied  |
| vi. Construction Year         | : 1991-1992   |
| vii. Foundation Type          | : Isolated foundation   |
| viii. Design Drawings         | : Not available-full set of architectural, As Build drawing of machine layout plan and floor load plan has not been found.<br>Available- Approval drawing, structural drawing, Soil test reports. |
| ix. Soil Investigation Report | : Available   |
| x. Construction Materials     | : Brick aggregate.  |
| xi. Generator                 | : Separate structure.   |

### **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) | : 1. Remove all live loads form that column tributary area.  |
| Mid Term (6-weeks)     | : 1. Engage qualified engineer for maintenance by correcting the identified issues.<br>2. Remedial action to be undertaken to prevent the seepage of water from pipes and other sources. |
| Long Term (6-months)   | : 1. Continue to monitor for cracking on an on-going basis   |

## Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

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>All the firefighting equipment need to be tested with proper documents.</p> <p>Factory needs to have sufficient number &amp; width (0.9m) of marked aisles at all floors.</p> <p>Factory needs to have sufficient total width of marked aisles (5 mm per occupant) at all working floor of the building.</p> <p>Lights in storage area need to be installed with protective covers and conduits.</p> <p>Combustibles are to be managed with good housekeeping. Storage facilities with no air-conditioning duct shall be minimum 2.9m 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>(a) Illuminated emergency light needs to be covered in floor, exits and aisles. (b) The intensity of illumination by means of escape lighting needs to be equal or more than 10 lux. The aisles need to be illuminated with escape lighting to a level of not less than 2.5 lux at floor level</p> <p>Factory need to ensure adequate number of fire exits signs that are visible from any position and comply with the following condition:<br/>         (a) The color and design of lettering, arrows and other symbols on exit signs shall be in high contrast with their background. (b) The source of illumination, contrast, intensity and luminance needs to be at least 50 lux, 0.5, 5.0 foot-candles and 0.2 cd/ m<sup>2</sup> respectively.</p> <p>Install adequate number (one number per 550 m<sup>2</sup> area of floor) of portable fire extinguishers in all floors</p> |

## Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

|   |  |
|---|--|
| <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 have as built drawing with proper dimensions showing all the means of escape.</p> <p>Factory needs to have valid fire license covering the full factory area</p> <p>Factory safety 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 unlockable doors can be opened easily in the direction of evacuation without the use of a key.</p> <p>Factory needs to maintain minimum width of exit 0.9 m and height 2m.</p> <p>Provide handrail on both sides of stairways.</p>   |
| <p>Long Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 months)</i></p> | <p>Factory needs to have a proper pre-plan for fire department. Child care needs r to be at ground floor directly to the final exit.</p> <p>Separation walls need to be 3hrs fire rated with same rated opening with finishing section.</p> <p>Storage area needs to be protected with 2 hours rated construction &amp; 1.5 hours rated opening or doors.</p> <p>Generator room needs to be fire separated with hours fire rated enclosure and hours rated opening.</p> <p>Boiler room shall be situated on the periphery of the factory building and shall have a 4 hours fire resistance wall &amp; hours rated opening.</p> <p>All the exits connecting to the staircases 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 &amp; 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 detection and alarm</p> |

## Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

|  |   |
|--|---|
|  | <p>system at required location Install proper standpipe system having at least mm dia of standpipe.</p> <p>First aid hose system (38 mm nominal) needs to be provided (Ref. Fire Service Standard # 9) in addition to Fire Aid Fire Fighting Appliances in existing high rise NTPA (20 m) buildings. In addition 50 mm or larger hose connection facility needs to be provided.</p> <p>Install 1 riser per 1000 m<sup>2</sup> of floor area and 38 mm diameter of hoses with variable nozzle need to be installed.</p> <p>Install standard standpipe and hose system as well as dedicated fire pump system to ensure required hose pressure at the highest and most remote part of the building.</p> <p>Factory needs to install Siamese connection after installation of stand pipe system, hose system and fire pump.</p> <p>Install dedicated fire pump with backup power system &amp; sufficient capacity for achieve required pressure in the remote place of the factory.</p> <p>Factory needs to have sufficient water storage capacity to get adequate pressure to feed fire-fighting equipment and at least 0011liter x 57min= 005711liters water storage tank</p> |
|--|---|

### ***(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 (&gt; 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>Ensure panel door of distribution boards are earthed properly. 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 fire-fighting equipment at generator room.</p> <p>Provide Instruction board for first aid and artificial respiration in the generator room.</p> <p>Ensure the generator room has adequate illumination level as per</p> |

## Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

|   |  |
|---|--|
|   | <p>standard.</p> <p>Provide two separate and distinct connections of earthing for each generator.</p> <p>Provide dedicated &amp; adequate size of earthing with proper identification for each circuit from the earth busbar of distribution boards and ensure continuous earth path is back to main building intake.</p> <p>Rewire to avoid the use of multiple cables from incoming and outgoing side of MCB's/MCCB's.</p> <p>Replace wooden box with metal clad construction for mounting the switch control.</p> <p>Ensure all electrical cables are sized according to capacity of circuit breakers.</p> <p>Ensure cable joints are made in respect of conductivity, insulation and mechanical strength.</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+( 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 the generator room has adequate fire separation from the main building.</p> <p>Provide adequate means of ventilation for the generator room based on the installed equipment considering fire barriers.</p> <p>Ensure appropriate generator room size in order to properly access the generator to perform routine maintenance activities.</p> <p>Provide dedicated &amp; adequate size of neutral with proper identification for each applicable circuit.</p>   |

## Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

---

|  |  |
|--|--|
|  | <p>Ensure each distribution board is provided with a circuit list and means of identification is provided as per list.</p> <p>Provide mechanical guards for electrical equipment where necessary.</p> <p>Use noncombustible material to make cable channels and provide adequate covers on cable channels.</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>Provide individual fuse with suitable discrimination with backup fuse or miniature MCB for each 15/20A socket outlet.</p> <p>Install lightning protection system on the building.</p> |
|--|--|