

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

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| Name of the Factory | : ALIF TEXTILE |
| Address of the Factory | : Moushumi Super Market (2nd & 3rd floor), Kutubail, Sibumarket, Fatulla, Narayanganj. |
| Present status of the factory | : Under Operation. |
| Structural Assessment Conducted by | : VERITAS Engineering & Consultant |
| Date of Structural Inspection | : 2015-07-12 |
| Fire Assessment Conducted by | : VERITAS Engineering & Consultant |
| Date of Fire Inspection | : 2015-07-12 |
| Electrical Assessment Conducted by | : VERITAS Engineering & Consultant |
| Date of Electrical Inspection | : 2015-07-12 |
| BKMEA Membership No. | : 1765 |

BASIC INFORMATION: The present garment factory is a five storied commercial building with beam column frame structure. The following general information was noted:

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| i. Building Usage Type | : Garment Factory. |
| ii. Structural System | : RCC Beam Slab Frame. |
| iii. Floor System | : RCC Beam Slab. |
| iv. Floor Area | : Floor area is 5000 sft (Total) |
| v. No. of Stories | : 5 stories |
| vi. Construction Year | : 2005 as per verbal information by factory representative. |
| vii. Foundation Type | : Isolated Column footing. |
| viii. Design Drawings | : Available- Structural design drawing (without column layout plan and column schedule), soil test report. Not available- approval drawing, architectural design drawing, material test report, floor load plan. |
| ix. Soil Investigation Report | : Available. |
| x. construction Materials | : Brick chips. |
| xi. Generator | : Ground Floor. |

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) | : 1. Factory Engineer to review design loads and column stresses in the areas identified above. 2. Verify in situ concrete stresses either by cores (100mm diameter) or existing cylinder strength data for all the columns or cores from a minimum of 4 non-critical columns. |

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Long Term (6-months)

: 1. Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.

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

(A): Recommendations for Fire 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>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> | <ul style="list-style-type: none"> • Factory need to have proper testing plan & record of fire safety equipment. • 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>Mid Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 weeks)</i></p> | <ul style="list-style-type: none"> • Factory needs to have as built drawing with floor machine layout showing means of escape with proper dimension. • 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. • 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. • Factory need to provide handrail on both sides of each stairways. • Factory needs to be installed with adequate illuminated emergency lighting in floors, exits & stairs.(Escape route). • 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. |

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| <p>Long Term</p> <p>(The remedial works indicated must be carried out within a period of 6 months)</p> | <ul style="list-style-type: none"> • Factory needs to have a proper pre-plan for fire department. • Factory need to be protected by providing 2 hour rated enclosure with 1.5 hour rated fire doors from stair-1 to final exit -1 for safely outside of the building. Also need to be protected by providing 4 hour rated enclosure with 2 hour rated fire doors from stair-2 to final exit-2 of building. • Generator & boiler room needs to be fire separated with 4 hours fire rated enclosure and 2 hour rated opening having direct access from outside. • All the exits connecting to the staircase-1 and staircase-2 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 through the stairway to the final exits. • 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. • 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. • Factory needs to be installed with control panel for centralized automatic smoke detection & fire alarm system according to NTPA Guideline. • Install proper standpipe system having at least 75 mm diameter of standpipe. • Factory need to ensure the minimum pressure for standpipes supplying a 50mm or larger hose shall be at least 300 kPa and standpipe supplying first aid hose (38mm nominal) may have a minimum pressure of 200 kPa. • Factory needs to be installed with Siamese connection for to the standpipe system located outside the building and accessible to the fire department connection. • Factory needs to have dedicated fire pump with backup power system & sufficient capacity for achieve required pressure in the remote place of the factory. • 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. |
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(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> | <ul style="list-style-type: none"> • 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+40C) and take proper action. |
| <p>Short Term (Actions that must be incorporated into a Fire Safety Management Plan immediately (a week) and should be a regular activity)</p> | <ul style="list-style-type: none"> • Provide two separate and distinct connections of earthing for each generator. • Ensure all panel boards (including panel door) are earthed properly. • Provide provision for inspection of all earthing system and ensure inspection is being completed and documented. |
| <p>Mid Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 weeks)</i></p> | <ul style="list-style-type: none"> • Install appropriate number and type of safety signage and fire-fighting equipment at generator room. • Provide Instruction board for first aid and artificial respiration in the generator room. • Provide dedicated & adequate size of earthing with proper identification for each circuit and ensure continuous earth path is back to main building intake. • Replace wooden base with metal clad construction for mounting meter board. • Ensure all electrical cables are sized according to capacity of circuit breakers. • Provide emergency power connection for life safety loads (emergency lighting, exit signage, etc.) temporarily within 6 weeks and find out a permanent solution within 6 months. • Connect all metal in the building to the building 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 { |

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| | <p>ambient+(20C-40C)} and take proper action.</p> |
| <p>Long Term <i>(The remedial works indicated must be carried out within a period of 6 months)</i></p> | <ul style="list-style-type: none"> • Develop an electrical layout diagram and an as-built single line diagram detailing key components and capacity of the electrical system. • Establish a periodical Insulation and earth Resistance Measurement Program and record the related testing data. • Inspect electrical panel boards on an annual basis. • Ensure overhead service connections to the building are led via adequate size and type of service masts. • Ensure the generator room has adequate fire separation from the main building. • Ensure distribution boards have no opening and all live internal components are concealed properly. • Provide dedicated & adequate size of neutral with proper identification for each circuit. • Ensure each distribution board is provided with a circuit list and means of identification is provided as per list. • Use noncombustible material to make channel and provide adequate covers on cable channel. • Install separate distribution boards for lighting and power circuits. • Install lightning protection system on the building. |