

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Aftabunnesa Textiles Ltd.
Address of the Factory	: Moghal Nagar, Wazkuruni Road, Matuail (South) Demra, Jatrabari, Dhaka-1362, Bangladesh.
Present Status of the Factory	: Under Operation.
Structural Assessment Conducted by	: VEC
Date of Structural Inspection	: 19 th April, 2015
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 19 th April, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 19 th April, 2015
BGMEA Membership No.	: 4944

BASIC INFORMATION:

The building is a single storied CI (corrugated iron) shed over truss roofing system. Both RCC and Brick columns of 10”x10” are used as a vertical load caring primary member (Column) and truss with single angle bar are used in roof frame. The following general information was noted:

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| i. Building Usage Type | : Garment factory. |
| ii. Structural System | : CI (corrugated iron) shed with truss roofing system. |
| iii. Floor System | : Roof truss and shed system. |
| iv. Floor Area | : Total working area of shed = 11800 sft. |
| v. No. of Stories | : Single Storied. |
| vi. Construction Year | : 2001. |
| vii. Foundation Type | : Unknown. |
| viii. Design Drawings | : Unavailable. |
| ix. Soil Investigation Report | : Unavailable. |
| x. Construction Materials | : Brick aggregate. |
| xi. Generator | : At ground floor (At 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) | : None. |
| Mid Term (6-weeks) | : <ul style="list-style-type: none">• Design should be checked by the Building Engineer to verify the lateral stability of the shed and confirm the requirement of any bracing between two horizontal truss members of the shed. |
| Long Term (6-months) | : <ul style="list-style-type: none">• Install horizontal bracing at the roof system if required.• Develop approval drawing, as built structural drawing and soil test report from concern authority. |

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>	<ul style="list-style-type: none"> • None.
<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"> • 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. • Factory needs to have sufficient number and width (0.9 m) of marked aisles in the factory. • All the firefighting equipment's need to test with proper documents. • Lights in storage area needed to be installed with protective covers and conduits. • Combustibles are to be managed with good housekeeping. Storage facilities with no air-conditioning duct shall be minimum 2.9 m 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. • (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/m² respectively
<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"> • Needs to have □As Built Drawing□ with proper dimensions showing means of escape. • Factory manager or director needs to arrange fire safety training for the workers of the factory from proper authority time to time. • 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. • Illuminated emergency light needs to be covered in floor, exits and aisles. 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. • Emergency back-up power needs to be connected for (a) exit sign, (b) fire alarm and detection system, (c)

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	<p>emergency lighting, (d) automatic fire detection and alarms systems.</p>
<p>Long Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 months)</i></p>	<ul style="list-style-type: none"> • Factory needs to have a proper pre-plan for fire department. • Factory needs to protect the final exit route-1 by 2 hours fire rated construction with 1.5 hours fire rated doors or opening from the lift core and stair of the sister concerns building till to reach safe refuse area. • Storage areas need to be protected with 2 hour rated construction and 1.5 hour rated opening or doors. • Generator room needs to be fire separated with 4 hours fire rated enclosure and 2 hours rated opening. • 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 install control panel for centralized automatic smoke detection & fire alarm system according to NTPA Guideline • Install proper standpipe system having at least 100 mm dia of standpipe. First aid hose system (38 mm nominal) shall be provided. In addition 50 mm or larger hose connection facility shall be provided. • Factory needs to install 1 riser per 1000 m² of floor area and 38 mm dia of hoses with variable nozzle. • 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 install dedicated fire pump with

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	<p>sufficient capacity and backup power.</p> <ul style="list-style-type: none"> • Factory needs to have sufficient water storage capacity to get adequate pressure to feed fire-fighting equipment.
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(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>	<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 ($> \text{ambient} + 40^{\circ}\text{C}$) and take proper action.
<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>	<ul style="list-style-type: none"> • Ensure all distribution boards (including panel door) are earthed properly. • 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. • Ensure overcurrent protection device (circuit breaker/fuse) for each circuit/branch circuit. • Clean interior components from dust and debris and seal all openings within the enclosure to prevent dust and debris from entering. • Ensure inspection for earthing system 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"> • Ensure graded rubber mats are provided in front of all distribution boards. • Provide Instruction board for first aid and artificial respiration in the substation room and generator room. • Provide two separate and distinct connections of earthing for each generator. • Install circuit breaker in proper way or proper place to ensure safe installation. • Provide dedicated & adequate size of earthing with proper identification for each circuit from the earth bus-bar of distribution boards and ensure continuous earth path is back to main building intake. • Rewire to ensure each incoming supply to an MCB has a dedicated supply from bus-bar. Avoid the use of

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	<p>multiple cables on outgoing side of MCB's.</p> <ul style="list-style-type: none"> • Ensure all electrical cables are sized according to capacity of circuit breakers. • Ensure cable joints are made in respect of conductivity, insulation and mechanical strength. • 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 { ambient+(20⁰C-40⁰C)} and take proper action.
<p>Long Term</p> <p><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 switchgear and panel boards on an annual basis. • Ensure the substation room has adequate fire separation from the production area. • Ensure all high tension cables are laid following standard cable laying techniques. • Ensure the generator room has adequate fire separation from the main building. • Provide adequate means of ventilation for the generator room based on the installed equipment considering fire barriers. • 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. • Provide mechanical guards for electrical equipment

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	<p>where necessary.</p> <ul style="list-style-type: none">• Provide adequate covers on cable channels.• Provide proper cable terminator/connector for stranded conductors at its point of termination.• Install separate distribution boards for lighting and power circuits.• Install lightning protection system on the building.
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