

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: A4B Wears Ltd.
Address of the Factory	: 123, Dewanhat, Chittagong, Bangladesh
Present Status of the Factory	: Not in Operation.
Structural Assessment Conducted by	: VEC
Date of Structural Inspection	: 9 August, 2015
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 9 August, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 9 August, 2015
BGMEA Membership No.	: 4333

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 : 12,000 square feet
- v. No. of Stories : 4 stories
- vi. Construction Year : 1965 (from factory representative)
- vii. Foundation Type : Could not be verified, foundation drawing and soil test report were not available.
- viii. Design Drawings : Not Available: approval plan, structural design drawing, architectural design drawing, machine layout plan, soil test report, material test report and floor load plan.
- ix. Soil Investigation Report : Not Available
- x. Construction Materials : Brick aggregate.
- 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:

- Short Term (Immediate) : 1. A Detail Engineering Assessment of Factory to be commenced
- Mid Term (6-weeks) : 1. Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.
2. Detail Engineering Assessment to be completed.
- Long Term (6-months) : 1. Continue to implement load plan.

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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>	<ul style="list-style-type: none"> • N/A
<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 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. • Factory need to have proper testing plan & record of fire safety equipment. • 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. • 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 prepare as built drawing with floor machine layout showing means of escape with proper dimension. • Fire license needs to be updated for full occupied area. • 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. • Pro Factory needs to provide handrail on both sides of all the 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
<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"> • Fire department pre-plan needs to be developed. • Factory needs to protected the storage area by 2 hours fire rated construction with 1.5 hours fire rated door/opening from the sewing section of 3rd floor of the building.

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	<ul style="list-style-type: none"> • Boiler room needs to be protected with 4 hours rated construction with 2 hours rated opening / door from iron section at 3rd floor of the building. • 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. • 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 • Factory need to install proper standpipe system having at least 75 mm diameter of riser. • Factory need to be installed by 1 riser per 1000 sqm of floor area with at least 38 mm dia of hoses • 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. • 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 need to have sufficient water storage capacity to get adequate pressure to feed fire-fighting equipment and at least $1900 \times 75 = 142500$ liters water storage tank.
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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"> • Ensure there is no break in the neutral wire in the form of a fuse unit throughout the wiring installation. • 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.
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<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"> • Provide two separate and distinct connections of earthing for each generator. • Ensure all distribution boards (including panel door) are earthed properly. • Clean interior components from dust and debris and seal all openings within the enclosure to prevent dust and debris from entering. • Install earthing pit for the factory with adequate provision for inspection of the 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"> • Ensure graded rubber mats are provided in front of all panel boards. • Provide Instruction board for first aid and artificial respiration in the generator room. • Ensure in the generator room has adequate illumination level as per standard. • Provide dedicated & adequate size of earthing with proper identification for each circuit • 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 busbar. Avoid the use of multiple cables on outgoing side of MCB's. • Replace wooden base with metal clad construction for mounting fuses. • Ensure all electrical cables are sized according to capacity of circuit breakers • Provide adequate support or mechanical guards for electrical equipment and wiring where necessary. • Ensure cable joints are made in respect of conductivity, insulation and mechanical strength. • Connect all metal in the building to the building earthing system.
<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 panel boards on an annual basis. • Ensure the generator room has adequate fire separation from the production area.

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	<ul style="list-style-type: none">• Provide adequate means of ventilation for the generator room based on the installed equipment considering fire barriers.• Ensure panel boards have no opening and all live internal components are concealed properly.• Provide dedicated & adequate size of neutral with proper identification for each applicable circuit.• Ensure each distribution board is provided with a circuit list and means of identification is provided as per list.• Provide proper cable terminator/connector for stranded conductors at its point of termination.• Install separate distribution board for lighting and power circuits.• Install lightning protection system on the building.
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