

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: ALIENS TEXWEAR LTD.
Address of the Factory	: SURA BARI, KASHIMPUR, GAZIPUR
Present Status of the Factory	: Under operation.
Structural Assessment Conducted by	: VEC
Date of Structural Inspection	: 16 June, 2015
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 16 June, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 16 June, 2015
BKMEA Membership No.	: 1580

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 : Non-engineered truss corrugated iron roof structure.
- iii. Floor System : N/A.
- iv. Floor Area : 6900sft
- v. No. of Stories : Single
- vi. Construction Year : 2008
- vii. Foundation Type : Unknown
- viii. Design Drawings : Not Available
- ix. Soil Investigation Report : Not Available
- x. Construction Materials : Truss corrugated iron, steel column, RCC column (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) | : | |
| Mid Term (6-weeks) | : | 1. Building Engineer to review the adequacy of the steel structure. Design should be checked by the Building Engineer to verify the lateral stability of the shed and confirm the requirement of any bracing in the long direction. |
| Long Term (6-months) | : | 1. Engage a qualified structural engineer to prepare as built structural drawing with engineer approval and manage a corrected approval 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 hept the writtenrecord of such drills for at least 3 years for the inspection of fire brigade whenever called for. • Factory needs to have proper testing plan & record for fire safety equipment. • Factory needs to have marked aisles in all working floor according to 0.9m for one side seat and 1.0m for both side seat. • 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 have as built drawing with floor machine layout showing means of escape with proper dimension. • Factory needs to have valid fire license covering the 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. • Factory needs to be installed with adequate illuminated emergency lighting in floor .)route s, exits & stairs.)Escape • 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</i></p>	<ul style="list-style-type: none"> • Fire department pre-plan needs to be developed. • Factory needs to ensure another more exit maintaining

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<p><i>carried out within a period of 6 months)</i></p>	<p>minimum width 0.90 m and height 2.0 m.</p> <ul style="list-style-type: none"> • Factory needs to ensure one more exit within the limit of allowable travel distance. • Final exit route-1 needs to be fire protected from knitting section window and office room by 2 hours rated construction & 1.5 hours fire rated doors/opening and needs to be fire protected from generator room by 4 hours rated construction with 2 hours fire rated doors/opening and needs to have the protected escape route till to reach safe refuse area. • Storage area need to be protected with 2 hours rated construction and 1.5 hours rated opening or doors • Generator room needs to be fire separated from knitting section with 4 hours fire rated enclosure and 2 hour rated opening having direct access from outside. • 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 needs to install proper standpipe system with having at least 75 mm dia of riser. • 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"> • N/A
<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 panel are earthed properly using appropriate type and size of cables and the earthing cables have continuity up to main earth /earthing pit. • 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. • Ensure proper earthing connections at all electrical equipment. • Clean interior components from dust and debris and seal all openings within the enclosure to prevent dust and debris from entering. • 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"> • Ensure appropriate type of safety signage at generator room and graded rubber mats in front of all panel boards. • 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. • Rewire to avoid the use of multiple cables on incoming and outgoing side of MCB's/MCCB's and Replace wooden base and boxes with metal clad construction for the MCCB and energy meter. • 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. • Provide emergency power connection for life safety loads temporarily within 6 weeks and find out a permanent solution within 6 months. • Ensure discrimination is achieved between circuit

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	<p>breakers used for protection of main circuit and the sub-circuits derived therefrom.</p> <ul style="list-style-type: none"> • Connect all metal in the building to the building earthing/grounding 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 electrical panel boards on an annual basis to ensure that the equipment is in good working condition. • Ensure the generator room has adequate fire separation from the production area/main building. • Provide adequate means of ventilation for the generator room based on the installed equipment and ensure that ventilation does not impact on fire barriers. • Ensure panel boards have no opening and all live internal components are concealed properly. • Install switchboards and MCCB in proper way to ensure safe installation. • 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 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.