

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Wintex Garments Ltd.
Address of the Factory	: 91 Sher-e-Bangla Road, Rayer Bazar, Dhaka-1209. Bangladesh
Present Status of the Factory	: Under Operation
Structural Assessment Conducted by	: VEC
Date of Structural Inspection	: 5 th February, 2015.
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 5th February, 2015.
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 5th February, 2015.
BGMEA Membership No.	: 1632

BASIC INFORMATION:

The assessed factory is a 5-storey R.C.C. factory building with RCC beam column frame structure and have a single storied Non-Engineered shed covering 70% of 5th floor roof top. The following information was noted:

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| i. Building Usage Type | : Garment Factory. |
| ii. Structural System | : R.C.C. beam column frame system. |
| iii. Floor System | : R.C.C. beam slab. |
| iv. Floor Area | : 22553 sft (Approximately) |
| v. No. of Stories | : 5 storied +one story Pre-Engineering Shed. |
| vi. Construction Year | : Building was built in one phases. (1993-1995). |
| vii. Foundation Type | : Pile foundation. |
| viii. Design Drawings | : Approval structural and as built machine layout drawing was available. |
| ix. Soil Investigation Report | : Available. |
| x. Construction Materials | : Brick Aggregate. (Identified by removing Plaster) |
| xi. Generator | : At ground floor of the building. |

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) | : | i. Areas over stress should not to be used for storage.
ii. A Detail Engineering Assessment of Factory to be commenced. |
| Mid Term (6-weeks) | : | i. Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.
ii. Building engineer to verify and produce calculations that columns and slab has sufficient capacity to support Non- Engineered shed.
iii. Detail Engineering Assessment to be completed. |

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Long Term (6-months) :
i. Continue to implement load plan.

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>	<ul style="list-style-type: none"> • Factory needs to have proper testing plan & record for fire safety equipment. • 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.
<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. • The entire exit doors (rolling shutter and open type door) 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. • 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). • Factory need to have emergency backup power for critical fire safety system with sufficient capacity & arrangement according to NTPA Guideline.
<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. • Final exit route-1(Stair-1 route) need to be protected (2 hours rated construction with 1.5 hours rated door) at each floor level entrance including ground floor and need to be protected with generator at ground floor by 4 hours rated construction with 2 hours rated door/opening, also need to have the protected escape route till to reach safe refuse area.

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	<ul style="list-style-type: none"> • Childcare needs to be separated from other occupancies (cutting section and office) with 3 hours rated construction and 3 hours rated opening or door. • Storage area need to be protected with 2 hours rated construction & 1.5 hours rated opening or doors. Generator room need to be protected by 4 hours rated construction with 2 hours rated opening / door from stair-1 as well as from the final exit route-1 located at ground floor. Boiler room need to be protected by 4 hours rated construction with 2 hours rated opening / door from finishing section located at 5th floor. • 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 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 be installed with 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. • 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 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:

Immediate	<ul style="list-style-type: none"> • Find out cause (improper cable selection, improper protective device selection, improper termination,
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<p><i>(the factory should not continue to be occupied until these non-conformities have been rectified):</i></p>	<p>rusted connection) of burning sign and take proper action including replacing cable or equipment where necessary.</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+ 400C) 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. • 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. • 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 substation and generator room. Also ensure graded rubber mats are provided in front of all distribution boards. • Provide two separate and distinct connections of earthing for the generator. • Ensure distribution boards are installed in compliant locations in terms of height. • Ensure distribution boards have a minimum clearance of 1 m (39 in) in front. • Provide dedicated & 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. • 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. • Ensure cable joints are made in respect of conductivity, insulation and mechanical strength. • Connect all metal in the building to the building earthing system.

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	<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+(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. • Ensure the generator room has adequate fire separation from the production area. • 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. • Install panel board in proper place to ensure secure operation. • 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 cable channel. • Install separate distribution boards for lighting and power circuits.