Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Sintex Fashion Ltd
Address of the Factory	: 140 DHOUR,Ashulia,Uttara,Dhaka
Present status of the factory	: Under Operation
Structural Assessment Conducted by	: BUET
Date of Structural Inspection	: 2014-12-04.
Fire Assessment Conducted by	: VERITAS Engineering & Consultant
Date of Fire Inspection	: 2015-05-21
Electrical Assessment Conducted by	: VERITAS Engineering & Consultant
Date of Electrical Inspection	: 2015-05-21
BGMEA Membership No.	: 5841.

BASIC INFORMATION: The present garment factory is a RCC beam-column frame structural system. After the visual observation following general information are noted:

i. Building Usage Type	: Garments Factory.
ii. Structural System	: RCC beam-column frame system.
iii. Floor System	: Edge supported RC solid floor slab system on RC beam.
iv. Floor Area	: GF-1390sqm,1F,2F-1670sqm(app)
v. No. of Stories	: Three story constructed but design for ten story as per drawing.
vi. Construction Year	: 2006-2007.
vii. Foundation Type	: Individual Footing of different sizes.
viii. Design Drawings	: Available.
ix. Soil Investigation Report	: Available.
x. construction Materials	: Reinforced Concrete(A few test results on concrete cylinder tests Available),Brick chips in foundation & slab& stone chips in Beam& column.
xi. Generator	: Outside 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:

Short Term (Immediate)	: 1.Approved load plan should be displayed immediately at visible location for showing to all & then strictly followed.
Mid Term (6-weeks)	: N/A
Long Term (6-months)	: N/A

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

(A): Recommendations for Fire Safety corrective actions:

Immediate (the factory should not continue to be occupied until these non-conformities have been rectified):	N/A
Short Term (Actions that must be incorporated into a Fire Safety Management Plan immediately (1 ~ 2 weeks) and should be a regular activity	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. All the firefighting equipment's need to test with proper documents. Factory needs to have sufficient number & width (0.9m) of marked aisles at 2nd floor and ground floor of the building. Factory needs to have sufficient total width of marked aisles (5 mm per occupant) of the factory. 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 2.9m 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. 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. Factory needs to ensure adequate numbers of exit signs which need to be visible from any positions and comply with the following conditions: (a) The color and design of lettering, arrows and other symbols on exit signs needs to be in high contrast with their background; (b) Words on the signs needs to be at least 150 mm with a stroke of not less 20mm; (c) 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.
Mid Term (The remedial works indicated must be carried out within a period of 6 weeks)	Factory Manager/Director needs to arrange fire safety training for the workers of the factory from proper authority time to time. Provide handrail on both sides of stairways of all stairs. 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.

Long Term (The remedial works indicated must be carried out within a period of 6 months)	Fire department pre-plan needs to be developed. Factory need to provide protected paths(2 hours fire rated construction with 1.5 hours fire rated opening) of travel from the stair entrance at each floor level(2 hours rated enclosure with 1.5 hours rated opening/doors) till to reach safe refuse area Childcare needs to be at ground floor and direct exit to the outside safe location. Separation walls need to be 3hrs fire rated with same rated opening. Storage area need to be protected with 2 hours rated construction & 1.5 hours rated opening or doors. Generator room needs to be fire separated with 4 hours fire rated enclosure with 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 with shall be equipped with manually operated electrical fire alarm system and automatic fire alarm system. Manually operated electrical alarm system shall be installed in a building with single or multiple call boxes located on each floor. Factory needs to install control panel for centralized automatic fire detection and alarm system in the command station at the entrance lobby of the factory premises. Install 1 riser per 1000 m2 of floor area and 38 mm diameter of hoses with variable nozzle need to be installed. Install standard standpipe and hose system as well as fire pump system to ensure required hose pressure at the highest and most remote part of the building. 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 X 75 =142500 liters water storage tank.

(A): Recommendations for Fire Safety corrective actions:

Immediate (*the factory should not continue to be occupied until these non-conformities have been rectified*):	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.

Short Term (*Actions that must be incorporated into a Fire Safety Management Plan immediately (1 ~ 2 weeks) and should be a regular activity*	Discharge the generator exhaust to the exterior of the building in a safe location. Ensure panel door of distribution boards are earthed properly. 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.
Mid Term (*The remedial works indicated must be carried out within a period of 6 weeks)*	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. Fill the transformer breather with fresh silica gel and oil cup with fresh oil. Provide two separate and distinct connections of earthing for each generator. 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 avoid the use of multiple cables from incoming and outgoing side of MCB's/MCCB's. 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 adequate covers on cable trench. Connect all metal in the building to the building earthing system.
Long Term (The remedial works indicated must be carried out within a period of 6 months)	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 the substation room has adequate fire separation from the main building. Provide adequate means of ventilation for the substation room based on the installed equipment considering fire barriers. 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 and ensure that ventilation does not impact on fire barriers, e.g. fire dampers.

	Ensure appropriate generator room size in order to properly access the generator to perform routine maintenance activities. 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 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 boards for lighting and power circuits. Install lightning protection system on the building.