Name of the Factory	:	Az Apparels.
Address of the Factory	:	385, Katasur, Mohammadpur, Dhaka
Present Status of the Factory	:	Under operation.
Structural Assessment Conducted by	:	VEC
Date of Structural Inspection	:	28 July, 2015
Fire Assessment Conducted by	:	VEC
Date of Fire Inspection	:	28 July, 2015
Electrical Assessment Conducted by	:	VEC
Date of Electrical Inspection	:	28 July, 2015
BGMEA Membership No.	:	5645

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	:	Floor area is (4250sft x 6) = 25500sft + 380 sft (6th floor) = 25880 sft total
v.	No. of Stories	:	6- Storied
vi.	Construction Year	:	1983 (Approx.)
vii.	Foundation Type	:	Unknown
viii.	Design Drawings	:	Available document: Approval plan, Not available: Structural design drawing, architectural drawing, machine layout plan, floor load plan and material test report has not been found.
ix.	Soil Investigation Report	:	Available
x.	Construction Materials	:	Brick aggregate.
xi.	Generator	:	Outside 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:

Short Term (Immediate)	:	1. Evacuate all floors immediately. 2. Detail Engineering Assessment to be commenced
Mid Term (6-weeks)	:	1. Detail Engineering Assessment to be completed. 2. Building Engineer to carry out design checks on additional structure and have to make as built required drawing.
Long Term (6-months)	:	1. Continue to implement the DEA reports recommendation. 2. Prepare controlled loading plans for all floors designating where how much storage can be placed and cannot be placed.

3. Continue to implement load plan.

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. • Factory need to have proper testing plan & record of fire safety equipment. • Lights in storage area need to be installed with protective covers and conduits. • Combustibles are to be managed with good housekeeping. Storage facilities with no air-conditioning duct need to be at least 2.9 m and when used as a storage facility there needs to have 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.
Mid Term (*The remedial works indicated must be carried out within a period of 6 weeks)*	• Factory needs to prepare as built drawing with floor machine layout showing means of escape with proper dimension. • 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 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
Long Term (*The remedial works indicated must be*	• Fire department pre-plan needs to be developed. • Factory needs to maintain minimum width of exit 0.9

carried out within a period of 6 months)	m and height 2 m. • 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 from the 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. • Storage area need to be protected with 2 hours rated construction and 1.5 hours rated opening or doors. • Generator: 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: Boiler room need to be protected with 4 hours rated construction with 2 hours rated opening / door from stair-1 and generator room at ground 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 theprotected 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 needs to install proper standpipe system with having at least 75 mm diameter of riser. • Factory need to ensure the minimum pressure for standpipes supplying a 50 mm or larger hose shall be at least 300 Kpa. For standpipe supplying first aid hose (38 mm 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 1900×75 = 142500 liters water storage tank

(B): Recommendations for Electrical 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 (a week) and should be a regular activity*	• 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 over current protection device (circuit breaker/fuse) for each circuit/branch circuit. • Ensure proper earthing connections at all electrical equipment. • Use nonflammable shades for light fittings. Avoid using Celluloid shade under any circumstance. • 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 type of safety signage at generator room. Also ensure graded rubber mats are provided in front of all distribution boards. • Provide Instruction board for first aid and artificial respiration in the generator room. • Ensure distribution boards have a minimum clearance of 1 m (39 in) in front. • Install circuit breaker in proper way and proper place to ensure safe installation. • 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. • Seal the openings remaining after wiring system passes through the elements of building construction according to the degree of fire resistance. • 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+(20℃-40℃)} and take proper action
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 underground cables for electrical distribution in the premises are encased in GI or PVC pipes and laid in earth trenches of sufficient depth as per mentioned standard. • 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. • Replace all wooden bases with metal clad construction and ensure circuit breakers, switchboards and distribution boards are having metal enclosure. • Ensure distribution boards have no opening and all live internal components are concealed properly. • Ensure distribution boards are installed in compliant locations in terms of height and access. • 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 where necessary. • Use noncombustible material to make channel and

	provide adequate covers on cable channel. • 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.