Name of the Factory	:	Azmery Garments Ltd.
Address of the Factory	:	79/8/2, Gate # 4 (Bibir Bagicha) North Jatrabari, Dhaka, Bangladesh.
Present Status of the Factory	:	Under Operation.
Structural Assessment Conducted by	:	VEC
Date of Structural Inspection	:	15th February, 2015
Fire Assessment Conducted by	:	VEC
Date of Fire Inspection	:	15th February, 2015
Electrical Assessment Conducted by	:	VEC
Date of Electrical Inspection	:	15th February, 2015
BGMEA Membership No.	:	5580.

BASIC INFORMATION:

The assessed factory building was a 10 Storey RCC building including one basement. The structural system of the building is RCC beam column frame and beam slab floor system in ground floor only and rest of the floor is RCC flat plate system. 7th, 8th and basement floor is occupied by Azmery Garments Ltd. and rest of the floors is occupied by several factories. The following general information were noted:

i.	Building Usage Type	:	Garment Factory.
ii.	Structural System	:	RCC beam column frame and flat plate system.
iii.	Floor System	:	RCC beam slab floor and flat plate floor system.
iv.	Floor Area	:	Total floor area is 32,605 sft.
v.	No. of Stories	:	9 Storey + a basement floor.
vi.	Construction Year	:	2000-2012 (Two phases).
vii.	Foundation Type	:	Pile foundation.
viii.	Design Drawings	:	Available.
ix.	Soil Investigation Report	:	Available.
x.	Construction Materials	:	Brick aggregate.
xi.	Generator	:	At 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) :

- Detail Engineering Assessment of Factory to be commenced.

Mid Term (6-weeks) :

- Detail Engineering Assessment to be completed.

Long Term (6-months) :

- Continue to implement load plan.
- Continue to monitor for cracks on an ongoing basis.

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*):	• Factory need to remove from means of escape i.e. exit access, exit, and exit discharge needs to be free or unobstructed.
Short Term (*Actions that must be incorporated into a Fire Safety Management Plan immediately (1 ~ 2 weeks) and should be a regular activity*	• Factory need 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. • 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 license needs to be renewed for 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 provide handrail on both sides of all the stairways. • Unprotected opening in rated walls of cutting section shall be enclosed by a 4 hours rated walls from the generator room. • Illuminated emergency light needs to be covered in all floors, exits, staircases and aisles of all the factory buildings or sheds. 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. • Emergency back-up power needs to be connected for critical fire safety system and not less than 60 minutes

	in case of failure of power supply. • Install suitable public address system having communication to all floors as well as facilities to receive messages from all floors.
Long Term (*The remedial works indicated must be carried out within a period of 6 months)*	• Factory needs to have a proper pre-plan for fire service & civil department. • Factory need to have the minimum width of exit door at least 0.9 m and height 2.00m. • Factory need to have the minimum width of stair at least 0.9m • Final exit-1 needs to provide protected by 4 hour fire rated enclose construction and 2 hour fire rated opening or door at ground floor level entrance, also need to have this protected route till to reach safe refuse area or outside of the building. • Boiler room and Generator room needs to be fire separated from the working floor by 4 hour fire rated enclosure and 2 hrs rated opening having direct access from outside of the building. • All the exits connecting to the staircase-1,2 need to be protected with fire and smoke resistant enclosures with lobby for 4 hours rated enclosure and 2 hour rated door and provide a protected route from all though the stairway to the final exits. • Lift core need to be separated with working floor with 2 hours rated walls and 1 hours rated opening or install a fire lift. • Factory need to constructed fire separated lobby with 4 hours rated wall and 2 hours rated fire door and smokeproof lobby near to exit leading to staircase. • Factory need to have 4 hours rated fire separated & smoke protected lobby & 2 hours rated fire door at basement area to be maintained. • 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 fire detection and alarm system in the command station at the entrance lobby of the factory premises. • Factory needs to install proper standpipe system with having at least 100 mm dia of riser. • Install 1 riser per 1000 m2 of floor area & Install adequate number of hose in floor area and the minimum hose diameter is 38 mm, or 1.5" preferably fabric hose with variable nozzle to be used in both of the stairways covering the floor area. • 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. • Install dedicated fire pump with backup power system & sufficient capacity for achieve required pressure in the remote place of the factory. Required for adequate pressure of hose • Factory need 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. • Factory needs to establish command station on the entrance lobby and equipped with detailed floor plans along with clearly demarcated locations of fire detection and fighting devices and through the panel board able to detect fire alarm from any floor. It needs to be manned with properly trained personnel having responsibility of maintenance and operating firefighting facilities within the building.

(B): Recommendations for Electrical Safety corrective actions:

Immediate	• Remove all unused cables from distribution boards and make sure all necessary cables are properly terminated

(*the factory should not continue to be occupied until these non-conformities have been rectified*):	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 (a week) and should be a regular activity*	• Provide two separate and distinct connections of earthing for each generator. • Ensure all distribution boards (including panel door) are earthed properly. • Ensure overcurrent protection device (circuit breaker/fuse) for each circuit/branch circuit. • Use nonflammable base 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)*	• Ensure the generator room has adequate illumination as per standard. • 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 bus bar 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. • Replace wooden base with metal clad construction for mounting the lighting boards and switch controls. • Ensure all electrical cables are sized according to capacity of circuit breakers. • Provide adequate support or mechanical guards for wiring where necessary. • Ensure cable joints are made in respect of conductivity, insulation and mechanical strength. • 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+(20^0C-40^0C)} 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 switch board and panel boards on an annual basis ensure that the equipment is in good working condition. • Ensure the generator room has adequate fire separation from the production area. • Ensure appropriate generator room size in order to properly access the generator to perform routine maintenance activities. • Replace wooden distribution boards with metal enclosed body. • 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. • Ensure each distribution board is provided with a circuit list and means of identification is provided as per list. • Use non-combustible material to make channel and provide adequate covers on cable channel. • Provide proper cable terminator/connector for stranded conductors at its point of termination. • Run cable in a designated route with mechanical protection and fire sealing of floor slab and wall penetrations. • Provide stand by power supply by a self-contained generator set/a generator to operate lift without disruption. • Install separate distribution boards for lighting and power circuits.

	• Install lightning protection system on the building.