Name of the Factory	:	Welltouch Apparels Ltd.
Address of the Factory	:	234/1, Kochukhet, Vasantek, Mirpur, Dhaka-1206.
Present Status of the Factory	:	Under Operation.
Structural Assessment Conducted by	:	VEC
Date of Structural Inspection	:	19th March, 2015
Fire Assessment Conducted by	:	VEC
Date of Fire Inspection	:	19th March, 2015
Electrical Assessment Conducted by	:	VEC
Date of Electrical Inspection	:	19th March, 2015
BGMEA Membership No.	:	5743

BASIC INFORMATION:

The assessed factory is a Six Storey RCC Factory building with RCC beam column frame structure and RCC floor slab. Additional RCC storey and non-engineered shed have been found, which covers 30% of roof area. The following information was noted:

i.	Building Usage Type	:	Garment Factory
ii.	Structural System	:	RCC beam column frame.
iii.	Floor System	:	RCC beam slab.
iv.	Floor Area	:	Floor area is 17,000 sft. of Welltouch Apparels Ltd. (Total floor area is 40, 500 sft.)
v.	No. of Stories	:	6 stories+ additional storey, non-engineered shed.
vi.	Construction Year	:	1994-1995 (Building was built in one phase).
vii.	Foundation Type	:	Footing Foundation (As per structural drawing).
viii.	Design Drawings	:	Available.
ix.	Soil Investigation Report	:	Available.
x.	Construction Materials	:	Stone Aggregated .(Identified by removing Plaster)
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:

Short Term (Immediate) : None

Mid Term (6-weeks) :

- Factory Engineer to review design, loads and columns stresses in the area of overstress.
- Building engineer to assess the building structure with regard to lateral wind and seismic resistance.

Long Term (6-months) :

- Prepare controlled loading plans for all floors designating where storage can be placed and cannot be placed.

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. • 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. • Factory needs to reduce the workers from 3rd floor or needs to redistribute excess workers to 2nd floor and others. • Lights in storage area needed to be installed with protective covers and conduits. • Factory needs to equip the kitchen with fire extinguisher and only fixed temperature type detector. • 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. • 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 unlockable 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 provide adequate illuminated emergency lighting system in all floor. • Factory need to have emergency backup power for critical fire safety system with sufficient capacity & arrangement according to NTPA Guideline.
Long Term (*The remedial works indicated must be carried out within a period of 6 months)*	• Fire department pre-plan needs to be developed. • Final exit route-1 (Stair-1 route) need to be protected 2 hours rated door construction at each floor level entrance including ground floor and need to protected with go-down of market place at ground floor by 2 hours rated construction with 1.5 hours rated door/opening, also need to be protect escape route till to reach safe refuse area. Final exit route-2 (Stair-2 route) need to be protected (2 hours rated construction with 1.5 hours rated door) at each floor level entrance and need to be protected from shop of market place at ground floor by 2 hours rated construction with 1.5 hours rated door/opening, also need to have a protected escape route till to reach safe refuse area. • Storage area (sub store and bonded ware house with cutting and finishing section) need to be protected with 2 hours rated construction & 1.5 hours rated opening or doors. • Boiler: Boiler room need to be protected with 4 hours rated construction with 2 hours rated opening / door from sewing section at 4th floor of the building. Generator: Generator room need to be protected by 4 hours rated construction with 2 hours rated opening / door from adjacent building located at ground floor. • All the stairs (stair-1 and 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 the 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. • 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 need to install proper standpipe system with having at least 100mm 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 inch 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. • The 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 1900ltr x 75min=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*):	• 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+ 40C) and take proper action.
Short Term (*Actions that must be incorporated into a Fire Safety Management Plan immediately (a week) and should be a regular activity*	• Discharge the generator exhaust to the exterior of the building in a safe location. • 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)*	• Provide Instruction board for first aid and artificial respiration in generator room. • Ensure in the generator room has adequate illumination level as per standard. • Fix appropriate number and type of safety signage at generator room and provide graded rubber mats in front of all panel boards. • Provide two separate and distinct connections of earthing for each generator. • Provide dedicated & adequate size of earthing with proper identification for each circuit and ensure continuous earth path is back to main building intake. • Replace wooden boxes and panels with metal clad construction for mounting the lighting boards. • Ensure all electrical cables are sized according to capacity of circuit breakers. • Provide adequate support or mechanical guards for electrical equipment where necessary. • Ensure cable joints are made in respect of conductivity, insulation and mechanical strength. • Provide existing emergency power connection for life safety loads temporarily within 6 weeks and find out a permanent solution within 6 months. • 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+(20C-40C)} and take proper action.
Long Term (*The remedial works indicated must be carried out within a period of 6 months)*	• 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 main building. • Ensure panel boards have no opening and all live internal components are concealed properly. • Install switchboards 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 adequate and non-combustible covers on cable channels. • 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.