Name of the Factory	: BHULTA COMPOSITE LTD.
Address of the Factory	: Bhulta, Rupgonj, Narayanganj, Bangladesh.
Present Status of the Factory	: Under Operation.
Structural Assessment Conducted by	: VEC
Date of Structural Inspection	: 30th June, 2015
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 30th June, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 30th June, 2015
BKMEA Membership No.	: 1991

BASIC INFORMATION:

The present garment factory is a single storied roof truss shed supported on RCC column. The following general information was noted for production building:

i.	Building Usage Type	: Garment Factory.
ii.	Structural System	: Roof truss steel shed supported on RCC column.
iii.	Floor System	: Roof truss system.
iv.	Floor Area	: Total floor area is 11,766 sft.
v.	No. of Stories	: Single-Storey.
vi.	Construction Year	: 2013-2014
vii.	Foundation Type	: Isolated footing foundation.
viii.	Design Drawings	: Available document: Approval drawing, machine layout plan without dimension. Not available- Full set of structural design drawing and soil test report.
ix.	Soil Investigation Report	: Unavailable.
x.	Construction Materials	: Brick Aggregate (In column), steel truss.
xi.	Generator	: Housed in a separated structure.

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) :

- Structural engineer to prepare full set of structural drawing, as built drawing and prepare calculations showing the structural adequacy of the floor system taking into account the as built structure.

Long Term (6-months) :

- Develop set of as-built drawings showing structure details, loading, dimensions, levels, foundations and framing on Plan, Section and Elevation drawings.

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*):	• None.
Short Term (*Actions that must be incorporated into a Fire Safety Management Plan immediately (1 ~ 2 weeks) and should be a regular activity*	• Factory needs to conduct fire drill quarterly (4 times a year) under the fire safety plan and needs to kept the written record of such drills 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. • 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 2.9 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. • 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 be installed with adequate illuminated emergency lighting in floors, exits & stairs.(Escape route). • Factory needs 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. • Storage area need to be protected with 2 hours rated construction and 1.5 hours rated opening or doors. • Boiler room need to be protected from iron section by 4 hours rated construction with 2 hours rated doors/opening till to reach safe refuse area. • 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 dia of riser. • Install 1 riser per 1000 sqm 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. • 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*):	• None.
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 shed in a safe location. • Provide two separate and distinct connections of earthing for the generator. • Ensure all distribution boards (including panel door) are earthed properly. • Ensure all electrical cable properly terminated at its point of termination. • Ensure overcurrent protection device (circuit breaker/fuse) for each circuit/branch circuit. • Ensure proper earthing connections at all electrical equipment. • 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)*	• Post safety signage and install appropriate number and type of fire-fighting equipment in generator room and 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 all panel boards have a minimum clearance of 1 m (39 in) in front. • Provide dedicated & adequate size of earthing with proper identification for each circuit.

	• Rewire to ensure each incoming supply to an MCB/MCCB has a dedicated supply from bus-bar. Avoid the use of multiple cables on outgoing side of MCB's/MCCB's. • Ensure all electrical cables are sized according to capacity of circuit breakers. • Provide adequate support or mechanical guards for electrical equipment and wiring where necessary. • Avoid flexible cables for fixed wiring unless contained in an enclosure affording mechanical protection • Ensure cable joints are made in respect of conductivity, insulation and mechanical strength. • 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 overhead service connections to the building are led via adequate size and type of service masts. • 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 all panel boards have no opening and all live internal components are concealed properly. • Install circuit breaker 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 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.