Name of the Factory	: C. S. B. KNIT FASHION
Address of the Factory	: B-172, Bscic I/A, Shasongaon, Fatullah, Narayanganj
Present Status of the Factory	: Under operation.
Structural Assessment Conducted by	: VEC
Date of Structural Inspection	: 7 October, 2015
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 7 October, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 7 October, 2015
BKMEA Membership No.	: 1785

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 frame/ Flat plate system.
iii.	Floor System	: RCC Beam slab & Flat plate.
iv.	Floor Area	: 10,000 sft
v.	No. of Stories	: 6 storied
vi.	Construction Year	: 1997-98
vii.	Foundation Type	: Isolated footing foundation
viii.	Design Drawings	: Available- Approval drawing. Not available- Structural design drawing (without slab detailing), soil test report, as built structural & architectural drawing, machine layout plan, architectural design drawing, material test report, floor load plan.
ix.	Soil Investigation Report	: Not Available
x.	Construction Materials	: Brick aggregate.
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)	: N/A
Mid Term (6-weeks)	: 1. Factory Engineer to review design loads and column stresses in the areas identified above. Verify in situ concrete stresses either by cores (100mm diameter) or existing cylinder strength data for all the columns or cores from a minimum of 4 non-critical columns
Long Term (6-months)	: 1. Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity. 2. 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*):	Factory needs to ensure unobstructed means of escape i.e. aisles, exits, stairs to discharge safely from the upper floors to outside of the building during evacuation and in an emergency or unwanted situation as well.
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 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. 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 updated for 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. Factory needs to be installed with adequate illuminated emergency lighting in floors, exits & stairs.(Escape route)

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 department. Factory needs to have sufficient total width of exits i.e. 0.90 m per exit at each floor of this factory or any existing RMG industrial buildings. Factory needs to have two stair cases and ensure that total width of stair either 0.9 m per stair for any existing or any type RMG industrial buildings. Generator room needs to be fire separated with 4 hours fire rated enclosure and 2 hour rated opening having direct access from outside. Boiler room needs to be fire separated with 4 hours fire rated enclosure and 2 hour rated opening having direct access from outside. All the exits connecting to the staircase-1 need to be protected with 2 hours fire rated constructions and 1.5 hour rated doors. 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. Install proper standpipe system having at least 100 mm diameter of standpipe. 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 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*):	Ensure there is no break in the neutral wire in the form of a fuse unit throughout the wiring installation. 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+ 40ºC) 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*	Provide two separate and distinct connections of earthing for the generator. Ensure all panel 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 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. Install earthing pit for the factory with adequate provision for inspection of the earthing system
Mid Term (*The remedial works indicated must be carried out within a period of 6 weeks)*	Ensure appropriate number and type of safety signage at generator room and graded rubber mats are required location. Provide Instruction board for first aid and artificial respiration in the generator room. Ensure changeover switch have a minimum clearance of 1 m (39 in) in front. Install MCCB and Socket in proper way to ensure safe installation. Provide dedicated & adequate size of earthing with proper identification for each circuit and ensure continuous earth path is back to main building intake.

	Rewire to ensure each incoming supply to an MCB has a dedicated supply from busbar. Avoid the use of multiple cables on outgoing side of MCB's Replace wooden boxes and base with metal clad construction for mounting circuit breakers and sockets. 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. Provide emergency power connection for existing life safety loads. Connect all metal in the building to the building grounding system. Ensure Lighting fixtures are supported from the structure properly. 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+(20ºC-40ºC)} 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 the generator room has adequate fire separation from the production building. Provide adequate means of ventilation for the generator room based on the installed equipment considering fire barriers. Ensure appropriate generator room size in order to properly access the generator to perform routine maintenance activities. Replace all MCCB boards with metal enclosed body. Ensure changeover switches 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 panel board is provided with a circuit list and means of identification is provided as per list. Provide adequate support or mechanical guards for electrical equipment and wiring where necessary. Use noncombustible material to make channel and provide adequate covers on cable channel. Ensure exposed wiring is run either horizontally or vertically with proper mechanical support. Provide proper cable terminator/connector for stranded conductors at its point of termination. Install separate distribution boards for lighting and power circuits. Provide individual fuse or miniature MCB for each 15/20A socket outlet. Install lightning protection system on the building