

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: B.S. KNITWEAR
Address of the Factory	: Plot-B-61, Bscic I/A, Fatullah, Narayanganj, Bangladesh.
Present Status of the Factory	: Under Operation.
Structural Assessment Conducted by	: VEC
Date of Structural Inspection	: 28 th Jun, 2015
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 28 th Jun, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 28 th Jun, 2015
BKMEA Membership No.	: 756

BASIC INFORMATION:

The assessed factory building is a six storied RCC Beam-Column frame structure. The building is owned by factory owner and B.S. KNITWEAR occupies ground floor, 4th floor and 5th floor of the building. The following general information were noted:

i. Building Usage Type	: Garment Factory.
ii. Structural System	: RCC beam column frame structure.
iii. Floor System	: RCC beam slab floor system.
iv. Floor Area	: Total floor area is 10,200 sft.
v. No. of Stories	: 6 Storey.
vi. Construction Year	: 2001-2002
vii. Foundation Type	: Unknown.
viii. Design Drawings	: Not available- Approval drawing, structural and architectural drawing, as build machine layout plan, material test report, soil test report, floor load plan has not been found.
ix. Soil Investigation Report	: Unavailable.
x. Construction Materials	: Brick aggregate in column.
xi. Generator	: None.

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)	:	<ul style="list-style-type: none">• A qualified structural Engineer to be reviewed design, loads and columns stresses in the area identified above.• A Detail Engineering Assessment of Factory to be commenced.
Mid Term (6-weeks)	:	<ul style="list-style-type: none">• Detail Engineering Assessment to be completed.• Building Engineer to survey and prepare as-built drawings for additional structure as part of DEA.
Long Term (6-months)	:	

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- A qualified structural engineer should be involved for maintenance by correcting the identified Issues and continue to implement load plan.

The recommendations for **Fire & Electrical Safety** corrective action are:

(A): Recommendations for Fire Safety corrective actions:

<p>Immediate</p> <p><i>(the factory should not continue to be occupied until these non-conformities have been rectified):</i></p>	<ul style="list-style-type: none"> • None.
<p>Short Term</p> <p><i>(Actions that must be incorporated into a Fire Safety Management Plan immediately (1 ~ 2 weeks) and should be a regular activity</i></p>	<ul style="list-style-type: none"> • 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. • 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. • Factory needs to establish adequate number and types of portable fire extinguishers as per NTPA Guideline.
<p>Mid Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 weeks)</i></p>	<ul style="list-style-type: none"> • Factory needs to be installed with adequate illuminated emergency lighting in floors, exits & stairs. (Escape route). • Factory needs to have valid fire license mentioning the full occupied area of the factory. • 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

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	<p>route).</p> <ul style="list-style-type: none"> • 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.
<p>Long Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 months)</i></p>	<ul style="list-style-type: none"> • Fire department pre-plan needs to be developed. • Factory need to establish at least 2 number of exit or provide 4mm per occupant as per NTPA guideline. • Factory need to provide minimum two number of exit with minimum width 0.90 m and height 2.0 m • Factory needs to keep the travel distance within 60 m according to NTPA guideline. • Factory needs to ensure total width of stair (individual stair minimum width 0.90m or 4mm per persons) shown in discharge capacity calculation as per NTPA guideline. • 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 have the protected route till to reach safe refuse area. • All the staircase need to be protected with fire and smoke resistant enclosures and opening (2 hours rated enclosure and 1.5 hours rated door) and provide a 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. • 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 100 mm dia of riser. • Factory need to be installed by 1riser per 1000sqm of floor area with at least 73mm dia of hoses. • 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.

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	<ul style="list-style-type: none"> • 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 1900ltr x 75min=142500 liters water storage tank.
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(B): Recommendations for Electrical Safety corrective actions:

<p>Immediate</p> <p><i>(the factory should not continue to be occupied until these non-conformities have been rectified):</i></p>	<ul style="list-style-type: none"> • None.
<p>Short Term</p> <p><i>(Actions that must be incorporated into a Fire Safety Management Plan immediately (a week) and should be a regular activity</i></p>	<ul style="list-style-type: none"> • 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 and ensure inspection is being completed and documented.
<p>Mid Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 weeks)</i></p>	<ul style="list-style-type: none"> • Ensure graded rubber mats are provided in front of all distribution boards. • Ensure distribution board is installed in compliant location in terms of height. • Ensure distribution boards have a minimum clearance of 1 m (39 in) in front. • 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 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 base with metal clad construction for mounting circuit breaker.

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	<ul style="list-style-type: none">• Provide mechanical guards for electrical equipment where necessary.• Ensure cable joints are made in respect of conductivity, insulation and mechanical strength.• Connect all metal in the building to the building earthing system.
<p>Long Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 months)</i></p>	<ul style="list-style-type: none">• 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.• Replace distribution boards with metal enclosed body.• 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 channels.• Provide proper cable terminator/connector for stranded conductors at its point of termination.• Provide an emergency power generator with adequate capacity for the building.• Install separate distribution boards for lighting and power circuits.• Install lightning protection system on the building.