Name of the Factory	: SHORNA TEXTILE & GARMENTS LTD
Address of the Factory	: Plot # B-57, Bscic I/E, Shasangaon, Fatullah,Narayanganj
Present Status of the Factory	: Under operation.
Structural Assessment Conducted by	: TUV
Date of Structural Inspection	: 13th May, 2015
Fire Assessment Conducted by	: TUV
Date of Fire Inspection	: 13th May, 2015
Electrical Assessment Conducted by	: TUV
Date of Electrical Inspection	: 13th May, 2015
BKMEA Membership No.	: 1393

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 Slab Frame.
iii.	Floor System	: RCC Beam slab.
iv.	Floor Area	: Plinth Area = 1750 sft (Approx.), Total operating floor area = 12,250 sft (Approx.)
v.	No. of Stories	: GF + 5 Floors (6 Storey), No Basement
vi.	Construction Year	: 2003
vii.	Foundation Type	: Cast-In-Situ RCC Pile foundation
viii.	Design Drawings	: Available (approval from BSCIC Narayanganj on 15th May, 2006.)
ix.	Soil Investigation Report	: Available
x.	Construction Materials	: Brick aggregate.
xi.	Generator	: South of the building side.

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)	: N/A
Long Term (6-months)	: 1. As built engineering drawing to be prepared and submitted for approval by appropriate authority. As part of this process building engineer will be required to make a number of checks on the structural design.

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*	• The minimum clear width of the pathway should be 0.9 meter • Provide aisle marking with arrow guiding and exit signage on all Evacuation pathways or provided with overhead signage fixed at ceiling level. - Exit sign should be posted above the exit door, - It should be clearly visible at all time, - Provide directional signs wherever necessary. • Provide back-up power supply with IPS or battery for emergency lighting • Factory management should be checked alarm call points, alarm & detection system periodically and maintained the record properly. • Provide fire extinguisher at all floor and to keep the record for re filling & properly tagged. • Place the extinguisher near the path of exit travel & easily accessible • The first aid hose and standpipe performance should be checked periodically and properly tagged. • Fire drill should be conducted quarterly (4 times a year) in existing buildings as detailed under the Fire Safety Plan & should kept record properly
Mid Term (*The remedial works indicated must be carried out within a period of 6 weeks)*	• Replace all existing exit doors on evacuation routes, exit doors with side hinged type door, which swing outward and in the direction of travel. Swinging of the door should not constrict the width of the corridor / passage below 0.9 meter. • Remove all locking device from all egress door. All exit doors should be open-able from the side they serve without the use of a key. • Exit door should have minimum clear width 0.9 meter. • Prepare proper plan & design for another staircase. - Minimum clear width should be 0.9 meter. • Provide handrails on both side of each stairway with height of 0.9m measured from the nose of stair to the top of the handrail. • Provide stair ways so that - - stair treads should be of nominal uniformity and minimum tread depth should be 215 mm and a maximum riser height should be 215 mm. • Doors in stair should be outward opening, side-swing, self closing, non-lockable 1.5 hours fire rated doors in all stair way

	encloses. • Prepare proper plan and design for fire rated barrier for 2 hour fire rating separated corridor at ground floor. Or 4 hrs fire rated barrier with 2 hrs fire rated door at generator room. • Prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated doors at ground floor generator room, which located at the adjacent to final exit. • Prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated doors at 3rd floor boiler, which located at the adjacent to production area. • The egress paths should be illuminated with emergency lighting with power back-up supply & illumination should be a minimum of 10 lux for all corridors & exit doors. Aisles should be provided with a minimum 2 lux. • The stairway should be illuminated with emergency lighting with power back-up supply & illumination should be a minimum of 10 lux for stairway. • Produce design and plan for automatic detection system with automatic fire alarm. • Provide adequate nos. of smoke detectors to cover the whole factory building. • Prepare proper design and plan for dedicated fire pump with alternate backup power supply. • Prepare plan and design for dedicated water storage tank for firefighting operation. • Visual alarm should be placed at the generator room. • Cover all units / floors in a valid fire license
Long Term (*The remedial works indicated must be carried out within a period of 6 months)*	• Install staircase as per plan and design. - Minimum clear width should be 0.9 meter. • All stairway to have direct access to any designated refuge area which requires 2 hour fire rated construction at ground floor for fire separated corridor. Or 4 hrs fire rated barrier with 2 hrs fire rated door at generator room. • Provide 4 hours fire rated barriers with 2 hours fire rated doors at ground floor generator room, which located at the adjacent to Final exit. • Proper plan & design 2 hours fire rated wall with 1.5 hours fire rated doors at storage for separation from other operational area. • provide permanent storage area with 2 hours fire rated wall and 1.5 hours fire rated door • Provide 4 hours fire rated barriers with 2 hours fire rated doors at 3rd floor boiler, which located at the adjacent to

	production area. • Install automatic detection system with automatic fire alarm. • Install dedicated fire pump with alternate backup power supply. • Stand pipe supplying first aid hose should have minimum pressure of 200 KPa. • Provide dedicated storage tank for firefighting operation

(B): Recommendations for Electrical 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 (a week) and should be a regular activity*	• Re-locate oil / fuel tanks away from control panels in generator room. • All strands cables at exposed ends should be properly soldered / crimped and insulated. • 1. Remove all the inflammable materials from surrounding of electrical circuitry at MDBs/SDBs. 2. Ensure that all electric circuitry clean of inflammable materials. 3. Conduct periodic maintenance and maintain the records. • Provide cable joints of porcelain / PVC connectors with PIB tape wound around before placing the cable in the box. • Provide proper separate earthing/grounding to generator. Ensure that generator body frame to have two separate and distinct connections to the earth / ground.
Mid Term (*The remedial works indicated must be carried out within a period of 6 weeks)*	• Provide adequate ventilation arrangements for indoor substation. • All unwanted materials should be removed from transformer / Generator room. • Provide rubber mats in front of all distribution panels. • Install smoke detection and provide firefighting equipment in the substation and generator room. • Individual Fuse protection should be provided to every 15/20 A socket. • The electrical panels to be of metal case and should be marked with “Danger 415 Volts” and identified with proper phase marking and danger signage.

	• Provide cable connections with properly soldered / welded lugs at (MDB/DB)'s. Ensure that all the electrical connections are properly secured with lugs and glands. • Select conductors and MCCB/MCB with adequate sizing without exceeding permissible current carrying capacity for insulation. • Avoid bunch of cable at MCCB/MCB or bus bar terminal, use individual circuit and over current device for every incoming and outgoing circuit at the distribution boards. • Provide circuit diagram /circuit list with proper current ratings and fuse size, marking for DBs identifying end use, voltage, no. of phases. • Seal the cable penetrations though walls adequately with fire resistive elements. • Provide adequate earthing to body and doors to all MDBs / DBs. Ensure that all electrical panels provided with proper and separate earth potential.
Long Term (*The remedial works indicated must be carried out within a period of 6 months)*	• 1. Provide updated SLD matching the existing installation at the factory. 2. SLD to indicate exact positions of all points of switch boxes and other outlets. 3. SLD to be approved by the engineer-in-charge. • 1. Provide updated Electrical layout drawing prepared after proper locations of all outlets for lamps, fans, fixed and transportable appliances, motors etc. 2. Drawings to indicate exact positions of all points of switch boxes and other outlets to match existing installation. 3. As built drawing to be approved by the engineer-in-charge. • Make suitable arrangements to prevent storm water to enter Generator rooms. • Provide 4 hour fire rated walls all around the transformer / generator room on ground level. • Modify Area of generator rooms to meet requirements of Table 4.4, RMG Guideline, the area should be 38 m2 & 42m2 • Provide and maintain proper clearance in all sides of generator for ease of maintenance. • 1. Design to have proper segregation of different end used loads. 2. Wiring design to have separate and distinct sub-circuits for power and heating system. 3. All DBs to be placed conveniently. 4. Wiring to be neat, tidy and located near ceiling. • Provide calibrated Ammeters / Voltmeters at distribution boards (LT/MDBs). • For buildings > 20m high, provide at least one vertical shaft of 200 x 400 mm for every 1500 sq.m. floor area. • Energy meters should be installed at convenient height (At least 1.5 m above ground) with proper protection.

	• Each circuit should have a separate neutral (use of common neutral for more than one circuit shall not be permitted). • Seal the cable entry-exit points of (MDB/DB)'s with non-flammable materials. In addition: 1. Ensure that MDB / DB panels / Switchgears to be vermin / damp proof. 2. Ensure all unused holes / openings in DBs to be blocked properly. • 1. Provide the ECC to meet minimum cross-sectional area as per table 4.5. 2. Ensure that connections between conductors / equipments provided to durable electrical continuity and adequate mechanical strength and protection. 3. The continuous earth connection is provided back to the main intake supply earth. • Provide adequate protection against lightning depending on the probability of a strike and acceptable risk levels.