Name of the Factory	:	TRUST FABRICS & KNITTING (PVT.) LTD.
Address of the Factory	:	146, Bagan Bari, Haturia Chala, Kaliyakoir, Gazipur.
Present Status of the Factory	:	Under Operation.
Structural Assessment Conducted by	:	TUV
Date of Structural Inspection	:	1st March, 2015
Fire Assessment Conducted by	:	TUV
Date of Fire Inspection	:	1st March, 2015`
Electrical Assessment Conducted by	:	TUV
Date of Electrical Inspection	:	1st March, 2015
BKMEA Membership No.	:	1809

BASIC INFORMATION:

The assessed factory building is a 3 storey RCC building & 8 nos. (Ancillary) single storey sheds. Structural system of the building is beam column frame and beam slab floor system for 1st floor to 2nd floor & flat slab frame with flat plate floor system for ground floor. The following information was noted:

i.	Building Usage Type	:	Garment Factory
ii.	Structural System	:	RCC beam column frame system for 1st and 2nd floor and RCC flat slab frame for ground floor.
iii.	Floor System	:	RCC beam slab for 1st and 2nd floor & flat plate floor for ground floor.
iv.	Floor Area	:	One 3 storey building (Typical plinth area 8299 sft & total area 24897 sft.). Apart from it a packaging area with wastage go down (single storied shed) plinth area 692 sft & a yarn store 2224.5 sft. Other sheds (6 ancillary buildings) single story shed areas are approx. 5397 sft.
v.	No. of Stories	:	3 storey. No basement floor.
vi.	Construction Year	:	2009.
vii.	Foundation Type	:	Shallow Foundation
viii.	Design Drawings	:	Available (Approval document was available at the factory from L.G.E.D., Kaliyakoir, Gazipur. on 7th August, 2013 for 4 storied Industrial building).
ix.	Soil Investigation Report	:	Available.
x.	Construction Materials	:	Brick Aggregated (Identified by removing Plaster).
xi.	Generator	:	Situated at the west side of the factory building in a separate shed.

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) : None.

Long Term (6-months) :

- Building engineer to verify the design of stability system. Carry out any remedial actions as directed by the Building Engineer regarding lateral stability system.
- Building engineer to review the design and take the corrective action if required regarding unapproved structural members.
- Exposed reinforcement need to be covered by lean graded concrete following the guidance of Building Engineer.

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*	• Periodically check alarm call points, alarm & detection system – Maintain the record properly. • The hose pipe performance should be checked periodically and properly tagged.
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. • 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. • Doors in stair should be outward opening, side-swing, self-closing, non-lockable fire rated 0.75 hours doors in all stair way encloses. • Provide 1 hour fire rated construction at unprotected opening window, which is adjacent to external staircase. • prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated doors at ground floor

	generator room • 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. • Design and plan to provide automatic detection system with automatic fire alarm. • An automatic alarm systems must be provided throughout the factory; the alarm must be automatically triggered on detection of a fire. Design and plan to install dedicated fire pump with alternate backup power supply. • Replace existing 1 inch hose pipe replace with 1.5 inch hose pipe to meet the requirement of RMG guideline. • Plan and design to provide dedicated water storage tank for firefighting operation • Power backup supply should be provided for fire alarm system. • Cover all units / floors in a valid fire license • Obtain the boiler license from the proper issuing authority.
Long Term (*The remedial works indicated must be carried out within a period of 6 months)*	• Provide fire 4 hours rated barriers with 2 hours fire rated doors at ground floor generator room. • Install automatic detection system with automatic fire alarm. • Install dedicated fire pump with alternate backup power supply. • 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*	• All strands cables at exposed ends should be properly soldered / crimped and insulated. • 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)*	• 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. • Refill the silica gel. Ensure that accessories of transformers like breathers, vent pipe, buchholz relay, and silica gel must be in order at substation. • Provide rubber mats of adequate size in front of all distribution panels. • Install smoke detection and provide firefighting equipment in the substation and generator room. • Provide and maintain clear and legible identifications numbers & names on all incoming and outgoing circuits of HT / LT panels. • Adequate number of caution boards should be kept in the substation/ transformer room. • 1. Exit signs should be illuminated either by lamps external to the sign or by lamps contained within the sign. 2. The source of illumination should be providing not less than 50 lux. • 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. • 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 (LT/MDB/DB/SDB)'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 looping and 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 load, voltage, number of phases. • 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 transformer. Ensure that transformer body frame to have two separate and distinct connections to the earth / ground. • Provide separate earthing connection to electrical equipments. Ensure that earth potential provided for all parts of equipment / installation (other than live parts) and that continuous earth connection is provided back to the main intake supply earth. • 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. • Make suitable arrangements to prevent storm water to enter substation / transformer / switch rooms. • Provide adequate clearance in all sides of main HT/LT panel boards/transformer for easy maintenance. • Area of substation / transformer to meet requirements of Table 4.3 of RMG Guideline; the area should be 45m2, or relocate the substation/ transformer room. • Provide adequate ventilation arrangements for indoor substation. • Provide adequate cable trenches with non-flammable covers at substation areas. • Modify Area of generator room to meet requirements of Table 4.4, RMG Guideline; the area should be 60m2, or relocate the generator room. • Provide and maintain proper clearance in all sides of generator for ease of maintenance. • Energy meters should be installed at convenient height (At least 1.5 m above ground) with proper protection. • Provide the wiring in PVC conduits or in metallic GI pipes. Ensure that all electrical wiring should be covered in proper conduit pipes. • Seal the cable entry-exit points of (LT/MDB/DB/SDB)'s with non-flammable materials. In addition: 1. Ensure that HT / LT 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 at roof top of building.