Name of the Factory	:	Tsim'S Company Bangladesh Ltd.
Address of the Factory	:	Plot-29, Road-4, Sector-5, CEPZ, Chittagong, Bangladesh.
Present Status of the Factory	:	Under Operation.
Structural Assessment Conducted by	:	TUV
Date of Structural Inspection	:	20th April 2015
Fire Assessment Conducted by	:	TUV
Date of Fire Inspection	:	20th April 2015
Electrical Assessment Conducted by	:	TUV
Date of Electrical Inspection	:	20th April 2015
BGMEA Membership No.	:	2793.

BASIC INFORMATION:

The assessed factory building is a 5 storey RCC building and a 3 storey RCC building. 5 storey RCC building is designated as Building1 and 3 storey RCC building is designated as Building 2. Top floor of Building1 was rafter steel shed supported in R.C.C column and 2nd floor of building 2 was steel column and steel rafter shed. Structural system of both building is beam column frame and beam slab floor system. The following information was noted:

i.	Building Usage Type	:	Garment Factory
ii.	Structural System	:	RCC beam column frame system for both building.
iii.	Floor System	:	RCC beam slab for both building.
iv.	Floor Area	:	The typical plinth area is 16740 sft. and total production floor is 67020 sft.
v.	No. of Stories	:	5 storey (Building1) and 3 storey (Building2).
vi.	Construction Year	:	2012 (Building1) and 2000 (Building 2).
vii.	Foundation Type	:	Deep Foundation (Building1). Shallow Foundation (Building2).
viii.	Design Drawings	:	Available (Building 1 has approval for 5 storey industrial building from BEPZA on 17th January 2012. And Building 2 has approval for 3 storey industrial building from BEPZA on 9th March 2010).
ix.	Soil Investigation Report	:	Available.(For both)
x.	Construction Materials	:	Brick aggregate (Identified by removing Plaster).
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) : None.

Mid Term (6-weeks) : None.

Long Term (6-months) :

- Sections of plaster finish walls to be removed to investigate if cracks penetrated through the member. Remedial actions need to be taken as directed by the Building Engineer.
- 2. The connection of steel structure and the lateral stability system needs to be checked and Carry out any remedial actions as directed by the 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*	• Rearrange the evacuation pathway to ensure the minimum width. • - 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. - All exit doors should be clearly marked for easy identification. • Factory management should be checked alarm call points, alarm & detection system periodically and maintained the record properly. • Provide additional fire extinguisher at all floor and to keep the record for re filling & 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 1.5 hours fire rated doors in all stair way encloses. • Produce proper design and plan for 2 hours fire rated construction with 1.5 hours fire rated door at fabric storage area for separation from other operational area. • Provide 2 hours fire rated doors at ground floor substation which is adjacent to the stair exit-1. Or, Provide a fire separated corridor which is protected by 2 hour wall and 1.5 hour fire rated door & directly to outside. • Prepare proper plan and design for 2 hour fire rated corridor at 2nd floor Stair 2 & Stair 3. • Prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated doors at 2nd floor where mini boiler is located adjacent to pressing section. • 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. • 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)*	• Provide 2 hours fire rated construction with 1.5 hours fire rated door at fabric storage area for separation from other operational area. • Within 6 months, Provide 4 hours fire rated barriers with 2 hours fire rated doors at 2nd floor where mini boiler is located adjacent to pressing section. • Provide 2 hour fire separated corridor to Stair-1 & Stair-3 at 2nd floor. • 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*):	• Over current protection devices (Circuit breakers) should be installed at LT panel.
Short Term (*Actions that must be incorporated into a Fire Safety Management Plan immediately (a week) and should be a regular activity*	• Do repair of oil leakages at transformer room. Ensure that there should not any oil leakage in the oil type transformer. • All strands cables at exposed ends should be properly soldered / crimped and insulated. • Provide weather proof casing for switchboards exposed to weather (located outside the building).
Mid Term (*The remedial works indicated must be carried out within a period of 6 weeks)*	• 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. • Refill the silica gel. Ensure that accessories of transformers like breathers, vent pipe, bushels relay, and silica gel must be in order at substation. • 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. • Individual Fuse protection should be provided to every 15/20 A socket. • 1. All stranded conductors > 6mm2 to be provided with cable sockets. 2. All stranded conductors < 6 mm2, at exposed end should be soldered / crimped. • 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/DB)s. Ensure that all the electrical connections are properly secured with lugs and glands. • 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. • Seal the cable penetrations through walls adequately with fire resistive elements. • 1. Provide sufficient and separate earthing for HT / LT panels in substation/transformer room 2. Provide adequate number of earth electrodes. • 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)*	• Provide adequate clearance in all sides of main HT/LT panel boards/transformer for easy maintenance. • Provide 4 hour fire rated walls with 2 hours fire rated door all around the transformer / generator room on ground level. • 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). • 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). • 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 / equipment 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.