Name of the Factory	: Csf Garments (Pvt) Ltd.
Address of the Factory	: Deluxe House 3, (3rd – 5th Floor), 209/227 Kulgaon, Baluchara, Chittagong, Bangladesh.
Present Status of the Factory	: Under Operation.
Structural Assessment Conducted by	: TUV
Date of Structural Inspection	: 27th February, 2015
Fire Assessment Conducted by	: TUV
Date of Fire Inspection	: 27th February, 2015
Electrical Assessment Conducted by	: TUV
Date of Electrical Inspection	: 27th February, 2015
BGMEA Membership No.	: 5718

BASIC INFORMATION:

The factory building is a 6-Storey RCC building in the factory premises. There is a RCC slab having steel shed partially on the northern and southern side of the 5th floor of the building, which was constructed in 2011.The factory operates in the building on the 3rd -5th floors of the building. There are two other factories residing on the ground floor – 2nd floors: Stitch Apparels Ltd. and Bayezid Dress's (Pvt.) Ltd. Csf Garments (Pvt) Ltd. operates in the building on a rental basis. The following general information were noted:

i.	Building Usage Type	: Garment Factory.
ii.	Structural System	: RCC beam column frame system.
iii.	Floor System	: RCC beam slab floor system.
iv.	Floor Area	: The typical plinth area is 7500 sq. ft. and total production floor is 45000 sq. ft.
v.	No. of Stories	: 6 Storey (Including partial shed on 5th floor).
vi.	Construction Year	: 1st Phase: Construction started in 2007. 2nd Phase: Construction started in 2011.
vii.	Foundation Type	: Cast-in-situ foundation.
viii.	Design Drawings	: Available (approval for a 6-storied RCC building from Chittagong Development Authority (CDA) on 23rdJuly, 2006 for residential use.)
ix.	Soil Investigation Report	: Available.
x.	Construction Materials	: Stone aggregate. (Identified by removing plaster)
xi.	Generator	: Southern side of 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) : None.

Mid Term (6-weeks) :

- Factory Engineer to review design, loads and columns stresses in area identified above.
- Verify in situ concrete stresses either by 100mm dia. cores or existing cylinder strength data for G7 column.

Long Term (6-months) :

- Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.

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*):	• None.
Short Term (*Actions that must be incorporated into a Fire Safety Management Plan immediately (1 ~ 2 weeks) and should be a regular activity*	• Remove all temporary items from all escape routes, aisles and passageway. • Provide aisle marking with arrow guiding and exit signage on all Evacuation pathways or provided with overhead signage fixed at ceiling level. - Illuminated 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. -Signage should be uniform. • Factory management should check alarm call points, alarm & detection system periodically and maintained the record properly. • Combustible materials should keep away from electrical appliances and all the lighting in storage area must have protecting covers and wiring must be in conduits.
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 2 hours fire rated doors in all stair way encloses.(Also require fire rated door at the floor occupied by other tenants) • Prepare design for installation of fire rating smoke proof enclosure. 2 hours fire rating doors for exit should not be less than that of 4 hours fire resistance rating of the walls of the smoke proof enclosure.(Also require fire rated entry lobby at the floor occupied by other tenants) • 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 evacuation route. • Provide 1.5 hours fire rated door at finished goods storage area for separation for other operational area. • Prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated doors at 3rd floor boiler room, 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. • Produce design and plan for automatic detection system with addressable fire alarm.(Also needs to cover the floors occupied by other tenants) • 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. • Replace existing 1 inch hose pipe replace with 1.5 inch hose pipe to meet the requirement of RMG guideline. • Prepare plan and design for dedicated water storage tank for firefighting operation. • Prepare proper design and plan for fire lifts equipped with approved intercommunication (including two way voice communications) with the fire command station

	or control room on the ground floor lobby of the building. • Complete full design and plan for providing fire command station equipped with detailed floor plans along with clearly demarcated locations of fire detection and fighting devices and through the panel board able to detect fire alarm from any floor. • Implement to a single fire safety management system with approvals from all tenants in the factory building. • Obtain the boiler license from the proper issuing authority. • Obtain the boiler operator license from the proper issuing authority.
Long Term (*The remedial works indicated must be carried out within a period of 6 months)*	• Install smoke proof enclosure at emergency stairways to separate from the area of incidence.(Also require fire rated entry lobby at the floor occupied by other tenants) • Provide 4 hours fire rated barriers with 2 hours fire rated doors at ground floor generator room, which located at the adjacent to evacuation route. • Provide 4 hours fire rated barriers with 2 hours fire rated doors at 3rd floor boiler room, which located at the adjacent to production area. • Install automatic detection system with addressable fire alarm.(Also needs to cover the floors occupied by other tenants) • Install dedicated fire pump with alternate backup power supply. • Provide sufficient number of hose pipe with respect to area and travel distance as per RMG guideline. • Stand pipe supplying first aid hose should have minimum pressure of 200 KPa. • Provide dedicated storage tank for firefighting operation • Install fire lifts equipped with approved intercommunication (including two way voice communications) with the fire command station or control room on the ground floor lobby of the building.

	• Provide fire command station equipped with detailed floor plans along with clearly demarcated locations of fire detection and fighting devices and through the panel board able to detect fire alarm from any floor.

(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 all distribution panels.
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.
Mid Term (*The remedial works indicated must be carried out within a period of 6 weeks)*	• All unwanted materials should be removed from Generator room. • Provide rubber mats of adequate size in front of all distribution panels. • Install smoke/heat detection and provide firefighting equipment in the substation and generator room. • 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. Overhead service connections should be covered and meet the requirements mentioned in RMG Guidelines. 2. Provide supports for main service line complete with adequate insulation. • Provide cable connections with properly soldered / welded lugs at 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 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. • Seal the cable penetrations through walls adequately with fire resistive elements. • Provide proper separate earthing/grounding to generator. Ensure that generator body frame to have two separate and distinct connections to the earth / ground. • Provide adequate earthing to body and doors to all 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. • Modify Area of generator room to meet requirements of Table 4.4, RMG Guideline; the area should be 30 m2, or relocate the generator room. • 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. • Seal the cable entry-exit points of (DB/SDB)'s with non-flammable materials. In addition: 1. 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.