

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Top Star Fashions Ltd.
Address of the Factory	: N/224, Nazma Ahmed Complex, Dewanhat, Chittagong, Bangladesh.
Present Status of the Factory	: Under Operation.
Structural Assessment Conducted by	: TUV
Date of Structural Inspection	: 26 th February, 2015.
Fire Assessment Conducted by	: TUV
Date of Fire Inspection	: 26 th February, 2015.
Electrical Assessment Conducted by	: TUV
Date of Electrical Inspection	: 26 th February, 2015.
BGMEA Membership No.	: 4940

BASIC INFORMATION:

The assessed factory building is an under construction 6 storey RCC building. On the day of assessment it was found that the 5th floor and 50% of the roof floor was under construction, and the remaining 50% of the roof floor had a temporary shed being used for canteen and material storage. Structural system of the 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.
iii. Floor System	: RCC beam slab.
iv. Floor Area	: The typical plinth area is approx. 4,447 sq. ft. and total functioning floor area of Top Star Fashions Ltd. is approx. 20,012 sft.
v. No. of Stories	: 6 storey. No basement floor.
vi. Construction Year	: Phase 1: Ground to 4th Floors. Construction started in 2008. Phase 2: 5th–6th Floors (Continuing). Construction started in January 2015.
vii. Foundation Type	: Pile foundation (As per structural drawing).
viii. Design Drawings	: Available (Signed for 5-Storey Commercial Building on 19th April, 2008 and Signed for 6-Storey Commercial Building on 15th January, 2015)
ix. Soil Investigation Report	: Available.
x. Construction Materials	: Stone Aggregated (Identified by removing Plaster).
xi. Generator	: Ground floor of building. Area of Generator Room is Approx. 300 sft.

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">• Factory Engineer to review design, loads and columns stresses in all columns.• Verify in-situ concrete stresses by 100mm dia. core for F1 column of the factory building.

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- A Detail Engineering Assessment of Factory to be commenced, see attached scope.

Mid Term (6-weeks)

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

Long Term (6-months)

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- Continue to implement loading plan.
- As-built architectural and structural drawings of the building to be prepared and submitted for approval by appropriate authority. As part of this process the building engineer will be required to make a number of checks on the inconsistencies between the structural design and the as-built construction.

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>	N/A
<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"> • Rearrange the evacuation pathway to ensure the minimum width.
<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"> • 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

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	<p>all stair way encloses.(Also require fire rated door at the floor occupied by other tenants)</p> <ul style="list-style-type: none"> • Prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated doors at ground floor generator room at ground floor and boiler room in 2nd floor, which located at the adjacent to production area. • The stairway should be illuminated with emergency lighting with power back-up supply & illumination should be a minimum of 10 lux for stairway. • 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. • Cover all units / floors in a valid fire license • 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.
<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"> • Prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated doors at ground floor generator room at ground floor and boiler room in 2nd floor, which located at the adjacent to production area. • Install automatic detection system with automatic fire alarm and control panel.(Also needs to cover the floors occupied by other tenants) • Install dedicated fire pump with alternate backup power supply. • Provide dedicated storage tank for firefighting operation.

(B): Recommendations for Electrical Safety corrective actions:

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<p>Immediate</p> <p><i>(the factory should not continue to be occupied until these non-conformities have been rectified):</i></p>	<p>N/A</p>
<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>	<p>N/A</p>
<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"> • 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. • All unwanted materials should be removed from transformer / Generator room. • 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 cable connections with properly soldered / welded lugs at MDB's. Ensure that all the electrical connections are properly secured with lugs. • Select conductors and MCCB/MCB with adequate sizing without exceeding permissible current carrying capacity for insulation. • Avoid bunch of cable at MCCB/MCB and bus bar terminal, use individual circuit and over current device for every incoming and outgoing circuit at the distribution boards.

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	<ul style="list-style-type: none"> • 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. • Provide proper separate earthing/grounding to generator. Ensure that generator body frame to have two separate and distinct connections to the earth / ground. • Provide separate earthing connection to electrical equipment's. 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.
<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"> • Substation should be on lowest floor level, with easy access for maintenance. • Provide 4 hour fire rated walls all around the transformer / generator room on ground level. • Relocate generator set in substation building / adjacent to substation room. • 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. • 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

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	<p>covered in proper conduit pipes.</p> <ul style="list-style-type: none">• Seal the cable entry-exit points of MDB's with non-flammable materials. In addition:<ol style="list-style-type: none">1. Ensure that distribution boards / Switchgears to be vermin / damp proof.2. Ensure all unused holes / openings in DBs to be blocked properly.• <ol style="list-style-type: none">1. Provide the ECC to meet minimum cross-sectional area as per table 4.5.2. Ensure that connections between conductors / equipment are 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.
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