

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: A.S. Garments & Textiles Ltd.
Address of the Factory	: Nebula Tower, Ashulia EPZ Road, Unique Bus Stand Gazirchat, Ashulia, Savar Dhaka.
Present Status of the Factory	: Under Operation
Structural Assessment Conducted by	: VERITAS Engineering & Consultant.
Date of Structural Inspection	: 2015-06-18
Fire Assessment Conducted by	: TÜV SÜD Bangladesh (Pvt.) Ltd.
Date of Fire Inspection	: 2015-08-11
Electrical Assessment Conducted by	: TÜV SÜD Bangladesh (Pvt.) Ltd.
Date of Electrical Inspection	: 2015-08-11
BGMEA Membership No.	: 3138

BASIC INFORMATION: The present garment factory is a 6 storied industrial building with beam-column frame system.

The following information was noted:

i. Building Usage Type	: Garment factory
ii. Structural System	: RCC beam column frame.
iii. Floor System	: Beam slab system.
iv. Floor Area	: Floor area 6000 sft per floor.
v. No. of Stories	: 6 stories
vi. Construction Year	: N/A (factory representative not informed us)
vii. Foundation Type	: Isolated Footing
viii. Design Drawings	: Available: structural drawing (partially available), approval plan, Architectural drawing, and machine layout plan. Not available: floor load plan, and material test report
ix. Soil Investigation Report	: Not available.
x. Construction Materials	: Brick chips (on field).
xi. Generator	: Ground floor (separate).

RECOMMENDATIONS FOR CORRECTIVE ACTION:

The recommendations for **Structural Safety** corrective action are:

Short Term (Immediate)	: N/A
Mid Term (6-weeks)	: 1. Factory Engineer to review design, loads and columns stresses in the area identified above. 2. Verify in-situ concrete stresses either by 100mm dia. cores or existing cylinder strength data for [the identified columns] or [100mm dia. cores from 4 columns]. 3. Over loading should be removed and it should not exceed 2 KN/m ² .
Long Term (6-months)	: 1. Produce and actively manage a loading plan for all floors within the factory giving consideration to floor capacity and column capacity.

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

2. Continue to monitor for cracking on an ongoing basis.
3. Proper slope at roof slab should be maintained for water drainages.

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>	<p>N/A</p>
<p>Short Term (Actions that must be incorporated into a Fire Safety Management Plan immediately (1 ~ 2 weeks) and should be a regular activity)</p>	<ul style="list-style-type: none"> • The minimum clear width of the pathway should be 0.9 meter. • 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. <ul style="list-style-type: none"> - 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 • Provide fire extinguisher at 1st floor & 2nd floor and to keep the record for re filling & properly tagged. • The first aid hose and standpipe performance should be checked periodically and properly tagged. • Combustible materials should keep away from electrical appliances and all the lighting in 2nd floor (finishing section) must have protecting covers and wiring must be in conduits. • Fire drill should be conducted quarterly (4 times a year) in existing buildings as detailed under the Fire Safety Plan & should kept record properly.
<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.

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<ul style="list-style-type: none"> • Exit door should have minimum clear width 0.9 meter. • Prepare proper plan & design for 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. • Doors in stair should be outward opening, side-swing, self-closing, non-lockable 1.5 hours fire rated doors in all stair way encloses. (Also require fire rated doors at the floor occupied by other tenants) • Exit door should have minimum clear width 0.9 meter. • Prepare proper plan and design for fire rated barrier for 2 hour fire rating separated corridor with 1.5 hrs fire rated door at ground floor. • 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 evacuation route of stair-2. • Prepare proper plan and design for 2 hrs fire rated barrier with 1.5 hrs fire rated door for storage area. • Prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated door at 2nd floor boiler, which located at the adjacent to rest of the operational areas. • 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 and control panel.(Also needs to cover the floors occupied by other tenants) • 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 as per RMG guideline. • Visual alarm should be placed at the generator room. • Implement to a single fire safety management system with approvals from all tenants in the factory building.
<p>Long Term (The remedial works indicated must be carried out within a period of 6 months)</p>	<ul style="list-style-type: none"> • Install staircase as per plan and design. - Minimum clear width should be 0.9 meter. • All stairway to have direct access to outside of the factory building, which requires 2 hour fire rated construction with 1.5 hrs fire rated door at ground floor for fire separated corridor. • Provide 4 hours fire rated barriers with 2 hours fire rated doors at ground floor generator room, which located at the adjacent to final

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>evacuation route of stair-2.</p> <ul style="list-style-type: none"> • Provide 2 hrs fire rated barrier with 1.5 hrs fire rated door for storage area. • Provide 4 hours fire rated barriers with 2 hours fire rated door at 2nd floor boiler, which located at the adjacent to rest of the operational areas. • 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. • 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:

<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 (a week) and should be a regular activity</i></p>	N/A
<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"> • Provide rubber mats of adequate size in front of all distribution panels. • Install heat detection and provide firefighting equipment in the generator 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. • 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.

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<ul style="list-style-type: none"> • Provide cable connections with properly soldered / welded glands at battery terminal, Busbar & MCCB/MCB.. Ensure that all the electrical connections are properly secured with 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 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. • 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 DBs. Ensure that the facility's 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"> • 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 20m², or relocate the generator room. • Provide and maintain proper clearance in all sides of generator for ease of maintenance. • Review capacity of standby generator on basis of loads for essential lighting / AC / Equipment / Services. Replace generator with larger capacity or install second generator if review indicates existing unit is too small. • Seal the cable entry-exit points of DB's with non-flammable materials. In addition: Ensure all unused holes / openings in DBs to be blocked properly

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<ul 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's 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.
--	---