

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Star Mahin Fashion Ltd.
Address of the Factory	: Mawna Bazar Road, Mawna Chowrasta, Sreepur, Gazipur, Bangladesh
Present Status of the Factory	: Under operation.
Structural Assessment Conducted by	: TUV
Date of Structural Inspection	: 20 th March, 2015
Fire Assessment Conducted by	: TUV
Date of Fire Inspection	: 20 th March, 2015
Electrical Assessment Conducted by	: TUV
Date of Electrical Inspection	: 20 th March, 2015
BGMEA Membership No.	: 5919

BASIC INFORMATION:

The factory building is a three storied RCC building with beam and column system and flat slab system. The following information was noted:

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| i. Building Usage Type | : Garment Factory. |
| ii. Structural System | : R.C.C Beam-Column Frame Structure. |
| iii. Floor System | : RCC Beam slab. |
| iv. Floor Area | : Single storey building 3630 sft & adjacent shed 2174 sft |
| v. No. of Stories | : Single storey |
| vi. Construction Year | : 2013 |
| vii. Foundation Type | : Shallow foundation |
| viii. Design Drawings | : Not available |
| ix. Soil Investigation Report | : Available |
| x. Construction Materials | : Brick aggregate. |
| xi. Generator | : Situated at the North west of the factory building in a separate ancillary tin shed area consisting 177.5 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:

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| Short Term (Immediate) | : N/A |
| Mid Term (6-weeks) | : 1. As-built architectural and structural drawings 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 structural design as described in the following recommendation. |
| Long Term (6-months) | : 1. Building engineer to verify the design of lateral stability system.
2. Sections of plaster finish of wall to be removed to investigate if cracks penetrate the building wall.
3. Water proofing system need to be implemented as directed by the guidance of building engineer. |

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

4. The connections of steel structure and requirement of cross bracing needs to be checked by building engineer. The bracing system is required to ensure the stability of the structure.

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</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"> • Provide aisle marking with arrow guiding and exit signage on all Evacuation routes 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 • Provide fire extinguisher at ground floor and to keep the record for re fill • Provide additional firefighting equipment like sand & water buckets near area for first phase firefighting. • Fire drill should be conducted quarterly (4 times a year) in existing building 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. • Exit door should have minimum clear width 0.9 meter. • Exit door should have minimum clear width 0.9 meter. • Prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated door at ground floor boiler room, which located at the adjacent to ironing section. • 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 automatic fire alarm.

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<ul style="list-style-type: none"> • 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. • Obtain fire license / permit from issuing authority • Obtain building approval from 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"> • Provide 4 hours fire rated barriers with 2 hours fire rated door at ground floor boiler room, which located at the adjacent to ironing section. • Install automatic detection system with automatic fire alarm. • 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. • 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>	<ul style="list-style-type: none"> • 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.
<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 Generator room. • Provide rubber mats of adequate size in front of distribution

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>panel.</p> <ul style="list-style-type: none"> • Install smoke 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. • Individual Fuse protection should be provided to every 15 socket. • 1. Remove all the inflammable materials from surrounding of electrical circuitry at switchboards. 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. • Avoid Looping, bunch of cable at MCB terminal, use individual circuit and over current device for every incoming and outgoing circuit at the distribution board. • 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 separate earthing connection to electrical equipment. 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 MDBs 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"> • Make suitable arrangements to prevent storm water to enter generator room. • Modify Area of generator room to meet requirements of Table 4.4, RMG Guideline; the area should be 18 m², or relocate the generator room. • Provide and maintain proper clearance in all sides of generator for ease of maintenance. • Provide calibrated Ammeter & Voltmeter at distribution board (DB). • Energy meters should be installed at proper protection. • Review capacity of standby generator on basis of loads for essential lighting. Replace generator with larger capacity or install second generator if review indicates existing unit is too small.

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<ul style="list-style-type: none">• 1. Wooden switchboards / panel boards should be replaced by non-flammable materials. 2. Prefer switchboards made of non-flammable materials.• 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 (DB) with non-flammable materials. In addition: 1. Ensure that DB panel 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.
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