

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: BADON FASHION LTD.
Address of the Factory	: Plot- #A-22 & 23 BSCIC I/E, Kanchpur, Sonargaon, Narayanganj
Present Status of the Factory	: Under operation.
Structural Assessment Conducted by	: TUV
Date of Structural Inspection	: 16 June, 2015
Fire Assessment Conducted by	: TUV
Date of Fire Inspection	: 16 June, 2015
Electrical Assessment Conducted by	: TUV
Date of Electrical Inspection	: 16 June, 2015
BKMEA Membership No.	: 517

BASIC INFORMATION:

The assessed factory premises have a 4-Storey RCC building and two nos. single storey shed building. The following information was noted:

- i. Building Usage Type : Knitwear's Factory.
- ii. Structural System : R.C.C beam-slab and R.C.C flat-slab structure.
- iii. Floor System : Beam-slab and flat-slab floor system..
- iv. Floor Area : The typical plinth area of 4 storied RCC building is 6500 sft. Total operational area is 17,500 sft.
- v. No. of Stories : 4 Storied
- vi. Construction Year : Construction started in 2006 and finished at 2008.
- vii. Foundation Type : Shallow foundation as per structural drawings
- viii. Design Drawings : Available (Approval for a 5-Storey factory building from BSCIC, Narayanganj, on 22nd July, 2006.
- ix. Soil Investigation Report : Available
- x. Construction Materials : Brick aggregate.
- xi. Generator : The generator room is located outside of the factory building at the north-west zone of the 4 storied factory building.

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) | : N/A |
| Long Term (6-months) | : 1. The connection of tin shed structure needs to be checked by building engineer and the bracing system is required to ensure the stability of the structure. |

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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>None</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"> <input type="checkbox"/> The minimum clear width of the pathway should be 0.9 meter <input type="checkbox"/> Rearrange the evacuation pathway to ensure the minimum width. <input type="checkbox"/> Remove all temporary items from all escape routes, aisles and passageway. <input type="checkbox"/> 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. <input type="checkbox"/> Factory management should checked alarm call points, alarm & detection system periodically and maintained the record properly. <input type="checkbox"/> The first aid hose and standpipe performance should be checked periodically and properly tagged. <input type="checkbox"/> Provide additional firefighting equipment like sand & water buckets near exit or easily accessible area for first phase firefighting. <input type="checkbox"/> Combustible materials should keep away from electrical sources and all the lighting in Building-1 (GF-Finishing area, fabric store and 2nd floor-cutting area) and Knitting Shed must have protecting covers and wiring must be in conduits. <input type="checkbox"/> 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"> <input type="checkbox"/> Prepare proper plan and design for one more exit in a way not to exceed the maximum travel distance or If the factory design to equip with an automated fire alarm, portable fire-fighting system and appropriate standpipe and hose system through the entire building the length of travel should not be exceed 60 meter. <input type="checkbox"/> Replace all existing exit doors on evacuation routes, exit

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	<p>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.</p> <ul style="list-style-type: none"><input type="checkbox"/> 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.<input type="checkbox"/> Prepare proper plan & design for another staircase. <p>- Minimum clear width should be 0.9 meter.</p> <ul style="list-style-type: none"><input type="checkbox"/> 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.<input type="checkbox"/> Doors in stair should be outward opening, side-swing, self closing, non-lockable 1.5 hours fire rated doors in all stair way encloses.<input type="checkbox"/> Prepare proper plan and design for 2 hour fire rated barrier to cover openings window at ground floor passageway.<input type="checkbox"/> Prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated doors at ground floor of building-1 generator room, which located at the adjacent to stair- 1 final evacuation route.<input type="checkbox"/> Provide 1.5 hrs fire rated door for storage area.<input type="checkbox"/> Prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated door at Ground floor of building-1 gas boiler, which located at the adjacent to rest of the operational areas.<input type="checkbox"/> 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.<input type="checkbox"/> Produce design and plan for automatic detection system with automatic fire alarm.<input type="checkbox"/> Install Manual activation call point at all exit routes<input type="checkbox"/> Automatic alarm systems must be provided throughout the factory; the alarm must be automatically triggered on detection of a fire.<input type="checkbox"/> Provide adequate nos. of smoke detectors to cover the whole factory building.<input type="checkbox"/> Prepare proper design and plan for dedicated fire pump with alternate backup power supply.<input type="checkbox"/> Replace existing 1 inch hose pipe replace with 1.5 inch hose pipe to meet the requirement of RMG guideline.<input type="checkbox"/> Prepare plan and design for dedicated water storage tank for firefighting operation as per RMG guideline.
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	<input type="checkbox"/> Power backup supply should be provided for fire alarm system. <input type="checkbox"/> Visual alarm should be placed at the generator room. <input type="checkbox"/> 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>	<input type="checkbox"/> Implement the plan and design for one more exit or implement with an automated fire alarm, portable fire-fighting system and appropriate standpipe and hose system through the entire building. <input type="checkbox"/> Install another staircase as per plan and design. - Minimum clear width should be 0.9 meter. <input type="checkbox"/> All stairway to have direct access to outside of the factory building, which requires 2 hour fire rated barrier to cover openings window at ground floor passageway. <input type="checkbox"/> Provide 4 hours fire rated barriers with 2 hours fire rated doors at ground floor of building-1 generator room, which located at the adjacent to stair-1 final evacuation route. <input type="checkbox"/> Provide 4 hours fire rated barriers with 2 hours fire rated door at Ground floor of building- 1 gas boiler, which located at the adjacent to rest of the operational areas <input type="checkbox"/> Install automatic detection system with automatic fire alarm. <input type="checkbox"/> Install dedicated fire pump with alternate backup power supply <input type="checkbox"/> Provide sufficient number of hose pipe with respect to area and travel distance as per RMG guideline. <input type="checkbox"/> Stand pipe supplying first aid hose should have minimum pressure of 200 KPa. <input type="checkbox"/> 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>	None
<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>	None
<p>Mid Term</p>	<input type="checkbox"/> Provide electrical graded rubber mats of adequate size in front

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<p><i>(The remedial works indicated must be carried out within a period of 6 weeks)</i></p>	<p>of all distribution panels.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Install smoke/heat detection and provide firefighting equipment in the generator room. <input type="checkbox"/> 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. <input type="checkbox"/> Individual Fuse protection should be provided to every 15/20 A socket. <input type="checkbox"/> 1. Remove all the inflammable materials from surrounding of electrical circuitry at DBs. <input type="checkbox"/> 2. Ensure that all electric circuitry clean of inflammable materials. 3. Conduct periodic maintenance and maintain the records. <input type="checkbox"/> 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. <input type="checkbox"/> 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. <input type="checkbox"/> Provide proper clearance of 0.8 - 1.0 m in front of distribution panels. <input type="checkbox"/> Provide circuit diagram /circuit list with proper current ratings and fuse size, marking for DBs identifying end use load, voltage, number of phases. <input type="checkbox"/> Provide proper separate earthing/grounding to generator. Ensure that generator body frame to have two separate and distinct connections to the earth / ground. <input type="checkbox"/> Provide adequate earthing to body and doors to all 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"> <input type="checkbox"/> 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. <input type="checkbox"/> 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

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	<p>boxes and other outlets to match existing installation.</p> <p>3. As built drawing to be approved by the engineer-in-charge.</p> <ul style="list-style-type: none"><input type="checkbox"/> Provide fire rated door at the generator room on ground level.<input type="checkbox"/> Provide and maintain easy access to the panel boards.<input type="checkbox"/> Seal the cable entry-exit points of (DB)'s with non-flammable materials. In addition:<ol style="list-style-type: none">1. Ensure that DB panels / Switchgears to be vermin / damp proof.2. Ensure all unused holes / openings in DBs to be blocked properly.<input type="checkbox"/> 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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