

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: DESIGN ATTIRES LTD.
Address of the Factory	: 179, Cheachor, Ramarbag, Fatullah, Narayanganj
Present Status of the Factory	: Under operation.
Structural Assessment Conducted by	: TUV
Date of Structural Inspection	: 11 June, 2015
Fire Assessment Conducted by	: TUV
Date of Fire Inspection	: 11 June, 2015
Electrical Assessment Conducted by	: TUV
Date of Electrical Inspection	: 11 June, 2015
BKMEA Membership No.	: 640

BASIC INFORMATION:

The assessed factory building is 2-storey pre-fabricated steel structure. Ground floor consists of one mezzanine floor supported by 10” brick wall. The following information was noted:

- i. Building Usage Type : Knit Garment Factory.
- ii. Structural System : Pre-fabricated steel structure.
- iii. Floor System : I-section steel beam column with RCC Slab.
- iv. Floor Area : Ground floor = 3512.88 sft , Entire building = 7025.76 sft (Approx.)
- v. No. of Stories : GF+ 1 floor (No Basement)
- vi. Construction Year : 2013
- vii. Foundation Type : Cast In situ piles
- viii. Design Drawings : Available but not approved
- ix. Soil Investigation Report : Available
- x. Construction Materials : Brick aggregate.
- xi. Generator : The generator room was located at the ground floor on the building plinth at the south side.

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 engineering drawings to be prepared and submitted for approval by appropriate authorities. 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 recommendations. |
| Long Term (6-months) | : N/A |

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

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"/> Remove all temporary items from all escape routes, aisles and passageway. <input type="checkbox"/> Illuminated exit sign should be posted above the exit door, <ul style="list-style-type: none"> - 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"/> 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 fire fighting. <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"/> 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. <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"/> 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"/> 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 southern side final exit passageway. <input type="checkbox"/> Produce proper plan and design for another exit door at mezzanine floor 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

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>should not be exceed 60 meter.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Prepare proper plan and design for 2 hrs fire rated barrier with 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 electric 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"/> The stairway should be illuminated with emergency lighting with power back-up supply & illumination should be a minimum of 10 lux for stairway. <input type="checkbox"/> Produce design and plan for automatic detection system with automatic fire alarm. <input type="checkbox"/> Prepare proper design and plan for dedicated fire pump with alternate backup power supply. <input type="checkbox"/> Prepare plan and design for dedicated water storage tank for firefighting operation as per RMG guideline. <input type="checkbox"/> Obtain building approval from issuing authority <input type="checkbox"/> Obtain the boiler license from the proper issuing authority. <input type="checkbox"/> Obtain the boiler operator 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"> <input type="checkbox"/> Provide 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 southern side final exit passageway. <input type="checkbox"/> Execute the another exit door at mezzanine floor 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"/> Provide 2 hrs fire rated barrier with 1.5 hrs fire rated door for storage area. <input type="checkbox"/> Provide 4 hours fire rated barriers with 2 hours fire rated door at Ground floor electric 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"/> Stand pipe supplying first aid hose should have minimum pressure of 200 KPa.

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<input type="checkbox"/> Provide dedicated storage tank for firefighting operation
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(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>	<p>None</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>None</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"> <input type="checkbox"/> Provide adequate illumination for generator. <input type="checkbox"/> All unwanted materials should be removed from Generator room. <input type="checkbox"/> Provide electric graded rubber mats of adequate size in front of all distribution panels. <input type="checkbox"/> Install 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. <input type="checkbox"/> 2. The source of illumination should be providing not less than 50 lux. <input type="checkbox"/> Provide supports for main service line complete with adequate insulation. <input type="checkbox"/> Select conductors and MCB with adequate sizing without exceeding permissible current carrying capacity for insulation. <input type="checkbox"/> 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. <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 cable joints of porcelain / PVC connectors with PIB tape wound around before placing the cable in the box. <input type="checkbox"/> Seal the cable penetrations through walls adequately with fire resistive elements. <input type="checkbox"/> Provide proper separate earthing/grounding to generator. Ensure that generator body frame to have two separate and

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>distinct connections to the earth / ground.</p> <ul style="list-style-type: none"> <input type="checkbox"/> 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"> <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. <ul style="list-style-type: none"> <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 boxes and other outlets to match existing installation. 3. As built drawing to be approved by the engineer-in-charge. <ul style="list-style-type: none"> <input type="checkbox"/> Provide 4 hour fire rated walls all around the generator room on ground level. <input type="checkbox"/> Modify Area of generator room to meet requirements of Table 4.4, RMG Guideline; the area should be 24m², or relocate the generator room. <input type="checkbox"/> Provide and maintain proper clearance in all sides of generator for ease of maintenance. <input type="checkbox"/> 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. <input type="checkbox"/> 1. Ensure that all electric circuitry clean of inflammable materials. 2. Conduct periodic maintenance and maintain the records. <input type="checkbox"/> Each circuit should have a separate neutral (use of common neutral for more than one circuit shall not be permitted). <input type="checkbox"/> Provide the wiring in PVC conduits or in metallic GI pipes. Ensure that all electrical wiring should be covered in proper conduit pipes. <input type="checkbox"/> Seal the cable entry-exit points of DBs with non-flammable materials. In addition: <ul 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"/> 1. Provide the ECC to meet minimum cross-sectional area as

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>per table 4.5.</p> <ol style="list-style-type: none">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. <p><input type="checkbox"/> Provide adequate protection against lightning depending on the probability of a strike and acceptable risk levels at roof top of building.</p>
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