

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Yakub Garments Ltd.
Address of the Factory	: Natun Bazar, Rampur, Haliashahar Road Chiitagong.
Present Status of the Factory	: Under Operation
Structural Assessment Conducted by	: TUV
Date of Structural Inspection	: 19th April, 2015
Fire Assessment Conducted by	: TUV
Date of Fire Inspection	: 19th April, 2015
Electrical Assessment Conducted by	: TUV
Date of Electrical Inspection	: 19th April, 2015
BGMEA Membership No.	: 360

BASIC INFORMATION:

The assessed factory is a 1 -storey RCC factory building with beam and column structural frame system. The following information was noted:

- i. Building Usage Type : Sweater Factory.
- ii. Structural System : R.C.C. Beam Column Frame.
- iii. Floor System : Beam Slab.
- iv. Floor Area : The plinth area is 15,000 Sq.ft. and operational area of single storied building is 22,000 Sq.ft.
- v. No. of Stories : Single storey + Partially Tin Shed on 1st floor.
- vi. Construction Year : 1984.
- vii. Foundation Type : Shallow foundation was considered as per as build structural drawings.
- viii. Design Drawings : Available (The building has approval for four storied building from Chittagong Development Authority (CDA) on 14th November, 1984 for Residential use. As built Structural drawings were available on the date of assessment).
- ix. Soil Investigation Report : Available.
- x. Construction Materials : Brick Aggregate
- xi. Generator : South-east corner side of ground floor.

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) : None.

Mid Term (6-weeks) : None.

Long Term (6-months) :

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1. The connection of steel structure needs to be checked by building engineer and factory management need to carry out any remedial actions as directed by the Building Engineer.

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"> <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"/> Direct route of access to required exits should be provided through stairway which is maintained free of obstructions. <input type="checkbox"/> Factory management should check 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.
<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 4 nos. 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 <input type="checkbox"/> Provide 1.5 hours fire rated door at ground floor fabric store for separation for other operational area. <input type="checkbox"/> Prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated doors at ground floor boiler,

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	<p>which located at the adjacent to ironing section</p> <ul style="list-style-type: none"> <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"/> Install adequate manual activation call point at all exit routes. <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. <input type="checkbox"/> Visual fire alarm should be place at Generator room. <input type="checkbox"/> Obtain fire license with covered area 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"> <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 <input type="checkbox"/> Provide 4 hours fire rated barriers with 2 hours fire rated doors at ground floor boiler, which located at the adjacent to ironing section <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"/> 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</i></p>	<p style="text-align: center;">N/A</p>
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<i>have been rectified):</i>	
<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><input type="checkbox"/> All strands cables at exposed ends should be properly soldered / crimped and insulated.</p>
<p>Mid Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 weeks)</i></p>	<p><input type="checkbox"/> Provide suitable & non-flammable protected supports and shades for hanged light fittings/fixtures.</p> <p><input type="checkbox"/> Provide supports for main service line complete with adequate insulation.</p> <p><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.</p> <p><input type="checkbox"/> Provide cable connections with properly soldered / welded lugs at MDB/DB/SDBs. Ensure that all the electrical connections are properly secured with lugs.</p> <p><input type="checkbox"/> Select conductors and MCCB/MCB with adequate sizing without exceeding permissible current carrying capacity for insulation.</p> <p><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.</p> <p><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.</p> <p><input type="checkbox"/> Provide cable joints of porcelain / PVC connectors with PIB tape wound around before placing the cable in the box.</p> <p><input type="checkbox"/> Seal the cable penetrations through walls adequately with fire resistive elements.</p> <p><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.</p> <p><input type="checkbox"/> 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.</p> <p><input type="checkbox"/> Provide adequate earthing to body and doors to all MDBs</p>

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	/ 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>	<p><input type="checkbox"/></p> <ol 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. <p><input type="checkbox"/></p> <ol style="list-style-type: none"> 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. <p><input type="checkbox"/> Provide adequate ventilation arrangements for indoor substation.</p> <p><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.</p> <p><input type="checkbox"/> Each circuit should have a separate neutral (use of common neutral for more than one circuit shall not be permitted).</p> <p><input type="checkbox"/> Seal the cable entry-exit points of MDB/DB/SDBs with non-flammable materials. In addition: 1. Ensure that MDB / SDB panels / Switchgears to be vermin / damp proof. 2. Ensure all unused holes / openings in DBs to be blocked properly.</p> <p><input type="checkbox"/></p> <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 / equipments provided to durable electrical continuity and adequate mechanical strength and protection.

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	<p>3. The continuous earth connection is provided back to the main intake supply earth.</p> <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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