

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: ZONAIID KNIT WEAR LTD.
Address of the Factory	: West Isdair, Fatullah, Narayanganj, Bangladesh.
Present Status of the Factory	: Under Operation
Structural Assessment Conducted by	: TÜV SÜD Bangladesh (Pvt.) Ltd.
Date of Structural Inspection	: 2015-06-23
Fire Assessment Conducted by	: TÜV SÜD Bangladesh (Pvt.) Ltd.
Date of Fire Inspection	: 2015-06-23
Electrical Assessment Conducted by	: TÜV SÜD Bangladesh (Pvt.) Ltd.
Date of Electrical Inspection	: 2015-06-23
BKMEA Membership No.	: 1551

BASIC INFORMATION:

i. Building Usage Type	: Garments Factory.
ii. Structural System	: R.C.C Building.
iii. Floor System	: Flat Slab Floor System at 1st and 2nd floors 2-Way beam-slab system at ground, 3rd and 4th floors.
iv. Floor Area	: The typical plinth area is 14,000 sft. and total production floor of the factory is 14,000sft
v. No. of Stories	: 5-Storey.
vi. Construction Year	: Construction started in 2008.
vii. Foundation Type	: Pile Foundation.
viii. Design Drawings	: Available (Approval from RAJUK on 23rd July 2007 for 6 storey Industrial Building)
ix. Soil Investigation Report	: Available
x. construction Materials	: Brick Aggregated
xi. Generator	: North-West side at ground floor in same building.

RECOMMENDATIONS FOR CORRECTIVE ACTION: No critical or high risk observations have been found on the day of assessment at the factory which can hamper the regular operations. During the assessment, a non - conformity was found for which long term corrective action has been recommended.

Short Term (Immediate) : N/A

Mid Term (6-weeks) : N/A

Long Term (6-months) : 1. Factory Engineer to review design, loads, stresses and stability for slab system. Factory management to carry out any remedial actions as directed by the Building Engineer for inadequate lateral stability system.

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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>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"> • The minimum clear width of the pathway should be 0.9 meter • 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. • Factory management should be checked alarm call points, alarm & detection system periodically and maintained the record properly. • The first aid hose and standpipe performance should be checked periodically and properly tagged. • 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. • 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. • Prepare proper plan and design for doors in stair should be outward opening, side-swing, self-closing, non-lockable 1.5 hours fire rated doors with enclose - 2 hrs fire rated wall in all stair way encloses including ground floor. Also require fire rated door at the floor occupied by other tenants. • Prepare proper plan and design for 4 hours fire rated barriers with 2

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	<p>hours fire rated doors at ground floor generator, sub-station and boiler room, which located near stair exit-2</p> <ul style="list-style-type: none"> • Provide 1.5 hrs fire rated door for storage area located at ground floor in front of staircase. • Prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated door at 1st floor boiler room, which located at the adjacent to finishing section • The stairway should be illuminated with emergency lighting with power back-up supply & illumination should be a minimum of 10 lux for stairway. • Within 6 weeks, Produce design and plan for automatic detection system with automatic fire alarm (Also needs to cover the floors occupied by other tenants) • Provide adequate nos. of smoke detectors to cover the whole factory building. • 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. • Implement to a single fire safety management system with approvals from all tenants in the factory building. • Obtain the boiler license from the proper issuing authority. • Obtain the boiler operator license from the proper issuing authority.
<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 doors in stair should be outward opening, side-swing, self-closing, non-lockable 1.5 hours fire rated doors with enclose - 2 hrs fire rated wall in all stair way encloses including ground floor. Also require fire rated door at the floor occupied by other tenants. • Provide 4 hours fire rated barriers with 2 hours fire rated doors at ground floor generator, sub-station and boiler room, which located near stair exit-2 • Provide 4 hours fire rated barriers with 2 hours fire rated door at 1st floor boiler room, which located at the adjacent to finishing section • Install automatic detection system with automatic fire alarm.(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.

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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>N/A</p>
<p>Short Term <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.
<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. • Provide rubber mats of adequate size in front of all distribution panels. • Install smoke detection and provide firefighting equipment in the substation and generator room. • Provide and maintain clear and legible identifications numbers & names on all incoming and outgoing circuits of LT panels. • 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.

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	<ul style="list-style-type: none"> • Provide cable connections with properly soldered / welded lugs at SDB. Ensure that all the electrical connections are properly secured with lugs and glands. • Select conductors and MCCB/MCB with adequate sizing without exceeding permissible current carrying capacity for insulation. • Avoid 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 circuit diagram /circuit list with proper current ratings and fuse size, marking for DBs identifying end use load, voltage, number of phases. • Seal the cable penetrations through walls adequately with fire resistive elements. • Provide proper separate earthing/grounding to transformer. Ensure that transformer body frame to have two separate and distinct connections to the earth / ground. • Provide proper separate earthing/grounding to generator. Ensure that generator body frame to have two separate and distinct connections to the earth / ground. • 1. Provide sufficient and separate earthing for LT panels in substation / transformer room. 2. Provide adequate number of earth electrodes. • 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 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"> • Provide 4 hour fire rated walls all around the transformer / generator room on ground level. • Seal the cable entry-exit points of (LT/MDB/DB/SDB)s with non-flammable materials. In addition: <ul style="list-style-type: none"> • 1. Ensure that LT panels / Switchgears 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.

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	<p>2. Ensure that connections between conductors / equipment's provided to durable electrical continuity and adequate mechanical strength and protection.</p> <p>3. The continuous earth connection is provided back to the main intake supply earth.</p> <ul style="list-style-type: none">• 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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