

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: UNITED FASHION WEAR LTD.
Address of the Factory	: 32/31 Isha Khan Road, Killarpool, Narayanganj.
Present Status of the Factory	: Under Operation.
Structural Assessment Conducted by	: TUV
Date of Structural Inspection	: 17 th April, 2015
Fire Assessment Conducted by	: TUV
Date of Fire Inspection	: 17 th April, 2015
Electrical Assessment Conducted by	: TUV
Date of Electrical Inspection	: 17 th April, 2015
BKMEA Membership No.	: 1929

BASIC INFORMATION:

The assessed factory building is a 6-Storey RCC building with a semi-storey on the roof. The frame system of the building floors is beam-slab system at the 1st, 5th and roof floor levels and flat slab system at the remaining floors, in where the semi-floor is an angle-framed shed. The following information was noted:

- i. Building Usage Type : Garment Factory
- ii. Structural System : RCC Beam Slab Frame- GF, 5th to 6th Floor
Flat Slab – 1st to 4th Floor.
- iii. Floor System : RCC Beam Slab- GF, 5th and roof floor.
Flat slab- 1st to 4th Floor.
- iv. Floor Area : The typical plinth area is 3061 sft. and total production floor is 21430 sft.
- v. No. of Stories : 6 – Storey + Semi-Storey.
- vi. Construction Year : 2007
- vii. Foundation Type : Pile Foundation (As per structural drawing).
- viii. Design Drawings : Available (approval for a 6-Storey+ Semi-Storey residential building from Narayanganj Municipality on 8th August, 2007)
- ix. Soil Investigation Report : Available.
- x. Construction Materials : Stone aggregate (Identified by removing Plaster).
- xi. Generator : South side of the building at 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) :

- Sections of plaster finish to brick wall to be removed to investigate if dampness penetrates into the building wall. Investigation needed to determine the source of the damp and way to prevent it re-

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occurring. Carry out any remedial actions as directed by the Building Engineer for dampness in wall.

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"> • Rearrange the evacuation pathway to ensure the minimum width. • Remove all temporary items from all escape routes, aisles and passageway. • Direct route of access to required exits should be provided through stairway which is maintained free of obstructions. • 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. • Provide additional firefighting equipment like sand & water buckets near exit or easily accessible area for first phase firefighting. • Combustible materials should keep away from electrical appliances and all the lighting in storage area must have protecting covers and wiring must be in conduits. • Fire drill should be conducted quarterly (4 times a year)

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	<p>in existing buildings as detailed under the Fire Safety Plan & should kept record properly.</p>
<p>Mid Term <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. • Doors in stair should be outward opening, side-swing, self-closing, non-lockable 1.5 hours fire rated doors in all stair way encloses. (Also require fire rated door at the floor occupied by other tenants) • Prepare proper plan and design for fire rated barrier for 4 hour fire rating separated corridor at ground floor. • Or prepare proper plan and design for additional stair that land directly to outside. • 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 Stair-1 east side. • Provide 1.5 hours fire rated door at 1st floor, store room for separation for other operational area. • Prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated doors at 3rd floor, finishing 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. • The stairway should be illuminated with emergency lighting with power back-up supply & illumination should be a minimum of 10 lux for stairway. • Produce design and plan for automatic detection system with automatic fire alarm. (Also needs to cover the

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	<p>floors occupied by other tenants)</p> <ul style="list-style-type: none"> • Install Manual activation call point at all exit routes • 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. • Visual alarm should be placed at the generator room. • Implement to a single fire safety management system with approvals from all tenants in the factory building.
<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"> • All stairway to have direct access to outside of the factory building, which requires 4 hour fire rated separation to generator and stairway. <p>Or prepare additional stair that land directly to outside.</p> <ul style="list-style-type: none"> • Provide 4 hours fire rated barriers with 2 hours fire rated doors at ground floor generator room, which located at the adjacent to Stair-1 east side. • Provide 4 hours fire rated barriers with 2 hours fire rated doors at 3rd floor, 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. • 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. • Relocate switchboards away from gas stoves / sinks / washing area / laundry (> 2.5 m).

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	<ul style="list-style-type: none"> • Provide proper separate earthing/grounding to generator. Ensure that generator body frame to have two separate and distinct connections to the earth / ground. • 1. Disconnect the loads from cable of signs of overloading / abnormal temperature found. • 2. Make necessary repairs to avoid further accidents.
<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"> • All unwanted materials should be removed from the Generator room. • 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. • Individual Fuse protection should be provided to every 15/20 A socket. • Provide suitable & non-flammable protected supports and shades for hanged light fittings/fixtures. • Provide supports for main service line complete with adequate insulation. • Provide proper clearance of 0.8 - 1.0 m in front of all distribution panels/switchboards. • Provide cable connections with properly soldered / welded lugs at DBs. Ensure that all the electrical connections are properly secured with lugs. • 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. • Provide cable joints of porcelain / PVC connectors with PIB tape wound around before placing the cable in the box.

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	<ul style="list-style-type: none"> • Seal the opening of wall at wiring passing through wall/roof/floor partitions. Ensure that all cable penetrations through walls should be adequately sealed with fire resistive elements. • 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 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"> • 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 adequate ventilation arrangements for indoor substation. • Provide 4 hour fire rated walls all around the transformer / generator room on ground level. • Relocate generator set in a suitable location. • Modify Area of generator room to meet requirements of Table 4.4, RMG Guideline; the area should be 24m², or relocate the generator room. • Provide and maintain proper clearance in all sides of generator for ease of maintenance. • 1. Design to have proper segregation of different end used loads.

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	<p>2. Wiring design to have separate and distinct sub-circuits for power and heating system.</p> <p>3. All DBs to be placed conveniently. 4. Wiring to be neat, tidy and located near ceiling.</p> <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).• Seal the cable entry-exit points of DBs with non-flammable materials. In addition 1. Ensure that DB 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 4.5.2. 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.• 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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