

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: UNITED APPARELS
Address of the Factory	: 231/5 B.B Road Narayanganj, Dhaka.
Present Status of the Factory	: Under Operation
Structural Assessment Conducted by	: TÜV SÜD Bangladesh (Pvt.) Ltd.
Date of Structural Inspection	: 2015-02-28
Fire Assessment Conducted by	: TÜV SÜD Bangladesh (Pvt.) Ltd.
Date of Fire Inspection	: 2015-02-28
Electrical Assessment Conducted by	: TÜV SÜD Bangladesh (Pvt.) Ltd.
Date of Electrical Inspection	: 2015-02-28
BKMEA Membership No.	: 17

BASIC INFORMATION:

i. Building Usage Type	: Knit Garments factory & commercial purpose.
ii. Structural System	: RCC beam column frame and flat plate.
iii. Floor System	: Beam slab and flat slab.
iv. Floor Area	: Ground-4751.175 sft, typical-5460.15 sft
v. No. of Stories	: 7-storey.
vi. Construction Year	: 1st phase 1998 and 2nd phase 2002-2003.
vii. Foundation Type	: Pile foundation as per structural drawing.
viii. Design Drawings	: Available (The building has approval up to nine storey from RAJUK on 5th February, 1997 as commercial building)
ix. Soil Investigation Report	: Available
x. construction Materials	: Stone chips.
xi. Generator	: Ground floor.

RECOMMENDATIONS FOR CORRECTIVE ACTION: Specific column was found to be moderately stressed due to small section of column in two side cantilever area. Moreover, during structural assessment, some non-conformity was found for which mid-term and long term corrective actions are recommended.

Short Term (Immediate)	: N/A
Mid Term (6-weeks)	: 1. Factory Engineer to review design, loads and columns stresses in area identified above G7 column. 2. Verify insitu concrete stresses either by 100mm dia. cores or existing cylinder strength data for the identified columns (G7) or 100mm dia. cores from 4 columns.
Long Term (6-months)	: 1. Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity. 2. Building engineer to verify the design of stability system. Lateral system is required to ensure the stability of the structure.

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>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 • Remove all temporary items from all escape routes, aisles and passageway. • 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. -Signage should be uniform • Factory management should check alarm call points, alarm & detection system periodically and maintained the record properly. • The hose pipe 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 wooden and collapsible 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. • Doors in stair should be outward opening, side-swing, self-closing,

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>non-lockable 2 hours fire rated doors in all stair way encloses.(Also require fire rated door at the floor occupied by other tenants)</p> <ul style="list-style-type: none">• Prepare design for installation of fire rating smoke proof enclosure. 2 hours fire rating doors for exit should not be less than that of 4 hours fire resistance rating of the walls of the smoke proof enclosure.(Also require fire rated door at the floor occupied by other tenants)• Prepare proper plan and design for fire rated barrier for 2 hour fire rating separated corridor with 1.5 hrs fire rated door at ground floor.• 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 south stair case.• Prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated doors at 4th floor boiler room, which located at the adjacent to production area and temporary store.• 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 and control panel.(Also needs to cover the floors occupied by other tenants)• An automatic alarm systems must be provided throughout the factory; the alarm must be automatically triggered on detection of a fire.• 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.• Prepare proper design and plan for fire lifts equipped with approved intercommunication (including two way voice communications) with the fire command station or control room on the ground floor lobby of the building.• Complete full design and plan for providing fire command station equipped with detailed floor plans along with clearly demarcated locations of fire detection and fighting devices and through the panel board able to detect fire alarm from any floor.• Visual alarm should be placed at the generator room and boiler room.• Cover all units / floors in a valid fire license• Implement to a single fire safety management system with approvals
--	---

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	from all tenants in the factory building.
<p>Long Term</p> <p>(The remedial works indicated must be carried out within a period of 6 months)</p>	<ul style="list-style-type: none"> • Install smoke proof enclosure at emergency stairways to separate from the area of incidence.(Also require fire rated door at the floor occupied by other tenants) • All stairway to have direct access to any designated refuge area which requires 2 hour fire rated construction with 1.5 hrs fire rated door at ground floor for fire separated corridor. • Provide 4 hours fire rated barriers with 2 hours fire rated doors at ground floor generator room, which located at the adjacent to south stair case. • Provide 4 hours fire rated barriers with 2 hours fire rated doors at 4th floor boiler room, which located at the adjacent to production area and temporary store. • Install automatic detection system with automatic fire alarm and control panel.(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 • Install fire lifts equipped with approved intercommunication (including two way voice communications) with the fire command station or control room on the ground floor lobby of the building. • Provide fire command station equipped with detailed floor plans along with clearly demarcated locations of fire detection and fighting devices and through the panel board able to detect fire alarm from any floor.

(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>	<ul style="list-style-type: none"> • Over current protection devices (Circuit breakers) should be installed at all distribution panels.
---	--

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

<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 <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 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. • 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. • 1. All stranded conductors > 6mm² to be provided with cable sockets. 2. All stranded conductors < 6 mm², at exposed end should be soldered / crimped. • Provide suitable & non-flammable protected supports and shades for hanged light fittings/fixtures. • 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. • Provide cable connections with properly soldered / welded lugs at (MDB/DB/SDB)'s. 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 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. • 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.

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<ul style="list-style-type: none"> • Seal the cable penetrations through walls adequately with fire resistive elements. • Provide proper separate earthing/grounding to generator. Ensure that generator body frame to have two separate and distinct connections to the earth / ground. • 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 4 hour fire rated walls with 2 hour fire rated door at the generator room. • Modify Area of generator room to meet requirements of Table 4.4, RMG Guideline; the area should be 38m², or relocate the generator room. • Provide and maintain proper clearance in all sides of generator for ease of maintenance. • For buildings > 20m high, provide at least one vertical shaft of 200 x 400 mm for every 1500 sqm. Floor area. • 1. Ensure that all electric circuitry clean of inflammable materials. • 2. Conduct periodic maintenance and maintain the records. • Provide and maintain easy access and proper height of switchboard / panel boards (< 2m from floor level). • 1. Prefer switchboards made of non-flammable materials. • Power cables/ telecommunication cables should be laid separately. • Each circuit should have a separate neutral (use of common neutral for more than one circuit shall not be permitted). • Provide the wiring in PVC conduits or in metallic GI pipes. Ensure

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>that all electrical wiring should be covered in proper conduit pipes.</p> <ul style="list-style-type: none">• Seal the cable entry-exit points of (MDB/DB/SDB)'s with non-flammable materials. In addition:<ol style="list-style-type: none">1. Ensure that (MDB/DB/SDB) panels / Switchgears to be vermin / damp proof.2. Ensure all unused holes / openings in DBs to be blocked properly.• <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 / equipment's 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.
--	---