

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: CARE KNIT ATTIRES.
Address of the Factory	: 55/1, S M Maleh Road, Tanbazar, Narayanganj, Bangladesh
Present Status of the Factory	: Under operation.
Structural Assessment Conducted by	:
Date of Structural Inspection	:
Fire Assessment Conducted by	: TUV
Date of Fire Inspection	: 31 May, 2015
Electrical Assessment Conducted by	: TUV
Date of Electrical Inspection	: 31 May, 2015
BKMEA Membership No.	: 1297

BASIC INFORMATION:

The factory building was 10 storey RCC building with a basement. The following information was noted:

- i. Building Usage Type : Garment Factory.
- ii. Structural System :
- iii. Floor System :
- iv. Floor Area :
- v. No. of Stories : 10 storey RCC building with a basement
- vi. Construction Year :
- vii. Foundation Type :
- viii. Design Drawings : Approval from RAJUK on 24th March, 1999 for 9 (Ten) storied building
- ix. Soil Investigation Report :
- x. Construction Materials :
- xi. Generator :

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) | : |
| Mid Term (6-weeks) | : |
| Long Term (6-months) | : |

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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>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"/> Rearrange the evacuation pathway to ensure the minimum width. <input type="checkbox"/> Remove all temporary items from all escape routes, aisles and passageway. <input type="checkbox"/> Provide aisle marking with arrow guiding. <input type="checkbox"/> Factory management should check alarm call points, alarm & detection system periodically and maintained the record properly. <input type="checkbox"/> Provide 18 nos. fire extinguishers for 902.45 meter area and keep the record for re filling & properly tagged. <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. <input type="checkbox"/> Combustible materials should keep away from electrical sources. <input type="checkbox"/> Fire drill should be conducted quarterly (4 times a year) in existing buildings participate all floors 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"/> Doors in stair should be outward opening, side-swing, self closing, non-lockable 2 hours fire rated doors with 4 hours fire rated wall in all stair way to enclose at all floor with

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	<p>others tenants</p> <ul style="list-style-type: none"> <input type="checkbox"/> Prepare design for installation of fire rating smoke proof enclosure(at all floors with other tenants floor). 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 fire rated entry lobby. <input type="checkbox"/> Prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated door at fifth floor boiler room, which located at the adjacent to production area. <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 at all floor. (Also needs to cover the floors occupied by other tenants) <input type="checkbox"/> Install Manual activation call point at all exit routes <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"/> 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. <input type="checkbox"/> 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. <input type="checkbox"/> A suitable public address system should be provided for communicating to all floors as well as facilities to receive messages from all floors. <input type="checkbox"/> Power backup supply should be provided for fire alarm system. <input type="checkbox"/> Visual alarm should be placed at the generator room. <input type="checkbox"/> 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"> <input type="checkbox"/> Install smoke proof fire rated entry lobby at emergency stairways to separate from the area of incidence.(Also require fire rated entry lobby at the floor occupied by other tenants) <input type="checkbox"/> Provide 4 hours fire rated barriers with 2 hours fire rated door at fifth floor boiler room, which located at the adjacent to production area. <input type="checkbox"/> Install automatic detection system with automatic fire alarm at all floor. (Also needs to cover the floors occupied by other

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	<p>tenants)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Install dedicated fire pump with alternate backup power supply. <input type="checkbox"/> Provide dedicated storage tank for firefighting operation <input type="checkbox"/> 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. <input type="checkbox"/> 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.
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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>	<ul style="list-style-type: none"> <input type="checkbox"/> Over current protection devices (Circuit breakers) should be installed at Main distribution panel.
<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"> <input type="checkbox"/> All strands cables at exposed ends should be properly soldered / crimped and insulated. If unused, the cables should be made safe and removed.
<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"/> 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. <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. <input type="checkbox"/> Provide rubber mats of adequate size in front of distribution panels. <input type="checkbox"/> 1. Rating of change over switch should be 1.25 times rating of main incoming circuit breaker 2. Select appropriate type of change over switch as per RMG

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	<p>Guidelines.</p> <ul style="list-style-type: none"> <input type="checkbox"/> 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. <input type="checkbox"/> 1. Remove all the inflammable materials from surrounding of electrical circuitry. 2. Ensure that all electric circuitry clean of inflammable materials. 3. Conduct periodic maintenance and maintain the records. <input type="checkbox"/> Provide supports for main service line complete with adequate insulation. <input type="checkbox"/> Provide cable connections with properly soldered / welded lugs at MDB. Ensure that all the electrical connections are properly secured with lugs. <input type="checkbox"/> Select conductors and MCCB/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"/> 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. <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"/> Provide calibrated Ammeters & Voltmeters at Main distribution board (MDB). <input type="checkbox"/> Provide and maintain easy access and proper height of panel boards (< 2m from floor level). <input type="checkbox"/> 1. Wooden Panel boards should be replaced by non-flammable materials. 2. Prefer switchboards made of non-flammable materials. <input type="checkbox"/> Each circuit should have a separate neutral (use of common neutral for more than one circuit shall not be permitted).

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	<ul style="list-style-type: none"><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 MDB with non-flammable materials. In addition:<ol 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"/> <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 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.<input type="checkbox"/> 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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