

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

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| Name of the Factory | : Banabeathee Fashionwear Ltd. |
| Address of the Factory | : 10, H.S.S Road Chittagong, Bangladesh, Bangladesh. |
| Present Status of the Factory | : Under Operation. |
| Structural Assessment Conducted by | : TUV |
| Date of Structural Inspection | : 25 th March, 2015 |
| Fire Assessment Conducted by | : TUV |
| Date of Fire Inspection | : 25 th March, 2015 |
| Electrical Assessment Conducted by | : TUV |
| Date of Electrical Inspection | : 25 th March, 2015 |
| BGMEA Membership No. | : 2328 |

BASIC INFORMATION:

The surveyed building was one 7 storey RCC building with vertical extended tin shed on roof top of this building which covers 65% of total plinth level. The structural system of the building is beam column frame and beam slab floor system. Banabeathee Fashionwear Ltd. operates 1st to top floor of this buildings as rental basis. The following general information was noted:

- i. Building Usage Type : Garment Factory.
- ii. Structural System : RCC beam column frame system.
- iii. Floor System : RCC beam slab floor system.
- iv. Floor Area : The typical plinth area is 3600 sft. and total production floor is 14400 sft.
- v. No. of Stories : 7 Storey
- vi. Construction Year : 1982.
- vii. Foundation Type : Shallow foundation.
- viii. Design Drawings : Available (approval 7 storey commercial building from Chittagong Development Authority on 6th July, 1978)
- ix. Soil Investigation Report : Unavailable.
- x. Construction Materials : Brick aggregate in column.
- xi. Generator : Ground floor at southern side of main building.

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 walls to be removed to investigate if cracks penetrate the building structure. Investigation needed to determine why cracks occurring and carry out any remedial actions as directed by the Building.
- Plaster should be removed to investigate the condition of corrosion of the slab steel. Investigation needed why it is occurring and Carry out any remedial actions as directed by the Building Engineer.

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The recommendations for **Fire & Electrical Safety** corrective action are:

(A): Recommendations for Fire Safety corrective actions:

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| <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. • Direct route of access to required exits should be provided through stairway which are 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. -Signage should be uniform. • Factory management should be checked alarm call points, alarm & detection system periodically and maintained the record properly. • Provide fire extinguisher at 1st & 2nd floor and to keep the record for re filling & properly tagged. • The first aid hose and standpipe performance should be checked periodically and properly tagged. • 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. |
| <p>Mid Term</p> <p><i>(The remedial works indicated must be</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 |

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| <p><i>carried out within a period of 6 weeks)</i></p> | <p>door should not constrict the width of the corridor / passage below 0.9 meter.</p> <ul style="list-style-type: none">• 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.• Exit door should have minimum clear width 0.9 meter.• 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 2 hours fire rated doors in all stair way encloses.(Also require fire rated door at the floor occupied by other tenants)• 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 fire rated entry lobby.(Also require fire rated entry lobby 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.• Provide 2 hours fire rated doors at ground floor generator room, which located at the adjacent to egress route.• Prepare proper plan and design for 2 hrs fire rated barrier with 1.5 hrs fire rated door for storage area.• Prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated door at 6th floor boiler room, which located at the adjacent to operational area.• 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 addressable 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 as per RMG guideline. • 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. • A suitable public address system should be provided for communicating to all floors as well as facilities to receive messages from all floors. • Power backup supply should be provided for fire alarm system. • Update fire license / permit from issuing authority • Implement to a single fire safety management system with approvals from all tenants in the factory building. • Update the boiler license from the proper issuing authority. • Obtain the boiler operator license from the proper 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"> • 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) • All stairway to have direct access to outside of the factory building, which requires 2 hour fire rated construction with 1.5 hrs fire rated door at ground floor |

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| | <p>for fire separated corridor.</p> <ul style="list-style-type: none"> • Provide 2 hrs fire rated barrier with 1.5 hrs fire rated door for storage area. • Provide 4 hours fire rated barriers with 2 hours fire rated door at 6th floor boiler room, which located at the adjacent to operational area. • Install automatic detection system with addressable 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 • 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. |
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(B): Recommendations for Electrical Safety corrective actions:

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| <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"> • None. |
| <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. |
| <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 |

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| | <p>boxes and other outlets.</p> <p>3. SLD to be approved by the engineer-in-charge.</p> <ul 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. <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 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.• 1. Remove all the inflammable materials from surrounding of electrical circuitry at MDB.2. Ensure that all electric circuitry clean of inflammable materials.3. Conduct periodic maintenance and maintain the records.• 1. Overhead service connections should be covered and meet the requirements mentioned in RMG Guidelines.2. Provide supports for main service line complete with adequate insulation.• The electrical panels to be of metal case and should be |
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| | <p>marked with “Danger 415 Volts” and identified with proper phase marking and danger signage.</p> <ul style="list-style-type: none"> • Provide proper clearance of 0.8 - 1.0 m in front of distribution panels. • 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. • 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 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 door & walls of the generator room on ground level. • Provide calibrated Ammeters & Voltmeters at distribution boards (MDBs). • For buildings > 20m high, provide at least one vertical shaft of 200 x 400 mm for every 1500 sq.m. floor area. • Review capacity of standby generator on basis of loads for essential lighting. Replace generator with larger capacity or install second generator if review indicates existing unit is too small. • 1. Wooden switchboards & panel boards should be replaced by non-flammable materials. • 2. Prefer switchboards made of non-flammable materials. • Power & Antenna cables should be laid separately. • Seal the cable entry-exit points of (DB)'s with non-flammable materials. In addition: <ol style="list-style-type: none"> 1. Ensure that DB panels / Switchgears to be vermin / |

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| | <p>damp proof.</p> <p>2. Ensure all unused holes / openings in DBs to be blocked properly.</p> <ul style="list-style-type: none">• 1. Provide the ECC to meet minimum cross-sectional area as per table 4.5. <p>2. Ensure that connections between conductors / equipment 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> |
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