

## **Summary of Preliminary Assessment on Structural, Fire and Electrical Safety**

---

Name of the Factory	: Nemsan Fashion Management Ltd.
Address of the Factory	: D.T. Road, Banur Bazar, Sitakunda, Chittagong.
Present Status of the Factory	: Not Under operation.
Structural Assessment Conducted by	: TUV
Date of Structural Inspection	: 28 <sup>th</sup> July, 2015
Fire Assessment Conducted by	: TUV
Date of Fire Inspection	: 28th July, 2015
Electrical Assessment Conducted by	: TUV
Date of Electrical Inspection	: 28th July, 2015
BGMEA Membership No.	: 3710

### **BASIC INFORMATION:**

The factory building is a three storied RCC building with beam and column system and flat slab system. The following information was noted:

- i. Building Usage Type : Garment Factory.
- ii. Structural System : R.C.C Beam-Column Frame.
- iii. Floor System : Beam slab.
- iv. Floor Area : Operational floor area of the factory is approx. 33000 sft..
- v. No. of Stories : Ground Floor + 2 Floors
- vi. Construction Year : 1993
- vii. Foundation Type : Not Identified
- viii. Design Drawings : Not Available
- ix. Soil Investigation Report : Not Available
- x. Construction Materials : Brick Aggregated.
- xi. Generator : Located inside the 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) | : N/A   |
| Mid Term (6-weeks)     | : 1. As built architectural & engineering drawing to be prepared and submitted for approval by appropriate authority. As part of this process building engineer will be required to make a number of checks on the as built construction. |
| Long Term (6-months)   | : 1. The connections of steel structure and requirement of cross bracing needs to be checked by building engineer. The bracing 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"> <li>• The minimum clear width of the pathway should be 0.9 meter</li> <li>• Provide aisle marking with arrow guiding and exit signage on all Evacuation pathways or provided with overhead signage fixed at ceiling level.</li> <li>- Illuminated exit sign should be posted above the exit door,</li> <li>- It should be clearly visible at all time,</li> <li>- Provide directional signs wherever necessary.</li> <li>- All exit doors should be clearly marked for easy identification.</li> <li>-Signage should be uniform</li> <li>• Factory management should check alarm call points, alarm &amp; detection system periodically and maintained the record properly.</li> <li>• Provide required number of fire extinguisher at all floors and to keep the record for re filling &amp; properly tagged.</li> <li>• The first aid hose and standpipe performance should be checked periodically and properly tagged.</li> <li>• Provide additional firefighting equipment like sand &amp; water buckets near exit or easily accessible area for first phase firefighting.</li> <li>• Fire drill should be conducted quarterly (4 times a year) in existing buildings as detailed under the Fire Safety Plan &amp; should kept record properly.</li> </ul>
<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"> <li>• 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.</li> <li>• 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.</li> <li>• Prepare proper plan &amp; design for staircase. - Minimum clear width should be 0.9 meter.</li> <li>• 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.</li> <li>• Doors in stair should be outward opening, side-swing, self</li> </ul>

## Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>closing, non-lockable 0.75 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"> <li>• Exit door should have minimum clear width 0.9 meter.</li> <li>• Prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated doors at ground floor substation, which located at the adjacent to stair exit 01.</li> <li>• Prepare proper plan and design for 2 hrs fire rated barrier with 1.5 hrs fire rated door for storage area.</li> <li>• 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.</li> <li>• The egress paths should be illuminated with emergency lighting with power back-up supply &amp; illumination should be a minimum of 10 lux for all corridors &amp; exit doors. Aisles should be provided with a minimum 2 lux.</li> <li>• The stairway should be illuminated with emergency lighting with power back-up supply &amp; illumination should be a minimum of 10 lux for stairway.</li> <li>• 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)</li> <li>• Install Manual activation call point at all exit routes</li> <li>• An automatic alarm systems must be provided throughout the factory; the alarm must be automatically triggered on detection of a fire.</li> <li>• Prepare proper design and plan for dedicated fire pump with alternate backup power supply.</li> <li>• Prepare plan and design for dedicated water storage tank for firefighting operation asper RMG guideline.</li> <li>• Power backup supply should be provided for fire alarm system.</li> <li>• Obtain update fire license / permit from issuing authority</li> <li>• Obtain building approval from issuing authority</li> <li>• Implement to a single fire safety management system with approvals from all tenants in the factory building.</li> </ul>
<p>Long Term <i>(The remedial works indicated must be carried out within a period of 6 months)</i></p>	<ul style="list-style-type: none"> <li>• Install staircase as per plan and design. - Minimum clear width should be 0.9 meter.</li> <li>• Provide 4 hours fire rated barriers with 2 hours fire rated doors at ground floor substation, which located at the adjacent to stair exit 01.</li> <li>• Provide 4 hours fire rated barriers with 2 hours fire rated door at 1st floor boiler room, which located at the adjacent to</li> </ul>

## Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>finishing section.</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Install automatic detection system with automatic fire alarm and control panel and control panel.(Also needs to cover the floors occupied by other tenants)</li> <li>• Install dedicated fire pump with alternate backup power supply.</li> <li>• Provide sufficient number of hose pipe with respect to area and travel distance as per RMG guideline.</li> <li>• Stand pipe supplying first aid hose should have minimum pressure of 200 KPa.</li> <li>• Provide dedicated storage tank for firefighting operation</li> </ul>
--	--

### **(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"> <li>• Over current protection devices (Circuit breakers) should be installed at all distribution panels.</li> </ul>
<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"> <li>• All strands cables at exposed ends should be properly soldered / crimped and insulated.</li> </ul>
<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"> <li>• Provide rubber mats of adequate size in front of all distribution panels.</li> <li>• Install smoke detection and provide firefighting equipment in the substation room.</li> <li>• Provide and maintain clear and legible identifications numbers &amp; names on all incoming and outgoing circuits of HT / LT panels.</li> <li>• Adequate number of caution boards should be kept in the substation/ transformer room.</li> <li>• 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.</li> <li>• Individual Fuse protection should be provided to every 15/20 A socket.</li> <li>• The electrical panels to be of metal case and should be</li> </ul>

## Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>marked with “Danger 415 Volts” and identified with proper phase marking and danger signage.</p> <ul style="list-style-type: none"> <li>• Provide cable connections with properly soldered / welded lugs at (DB)'s. Ensure that all the electrical connections are properly secured with lugs and glands.</li> <li>• Select conductors and MCCB/MCB with adequate sizing without exceeding permissible current carrying capacity for insulation.</li> <li>• 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.</li> <li>• Provide circuit diagram /circuit list with proper current ratings and fuse size, marking for DBs identifying end use load, voltage, number of phases.</li> <li>• Provide cable joints of porcelain / PVC connectors with PIB tape wound around before placing the cable in the box.</li> <li>• 1. Provide sufficient and separate earthing for HT / LT panels in substation/transformer room 2. Provide adequate number of earth electrodes.</li> <li>• Provide separate earthing connection to electrical equipments. 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.</li> <li>• Provide adequate earthing to body and doors to all LT / DBs. Ensure that all electrical panels provided with proper and separate earth potential.</li> </ul>
<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"> <li>• 1. Provide updated SLD matching the existing installation at the factory.</li> <li>2. SLD to indicate exact positions of all points of switch boxes and other outlets.</li> <li>3. SLD to be approved by the engineer-in-charge.</li> <li>• 1. Provide updated Electrical layout drawing prepared after proper locations of all outlets for lamps, fans, fixed and transportable appliances, motors etc.</li> <li>2. Drawings to indicate exact positions of all points of switch boxes and other outlets to match existing installation.</li> <li>3. As built drawing to be approved by the engineer-in-charge.</li> <li>• Make suitable arrangements to prevent storm water to enter substation / transformer / switch rooms.</li> </ul>

## Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

---

	<ul style="list-style-type: none"><li>• Area of substation / transformer to meet requirements of Table 4.3 of RMG Guideline; the area should be 45 m<sup>2</sup>, or relocate the substation/ transformer room.</li><li>• Provide adequate cable trenches with non-flammable covers at substation areas.</li><li>• 1. Design to have proper segregation of different end used loads.</li><li>2. Wiring design to have separate and distinct sub-circuits for power and heating system.</li><li>3. All DBs to be placed conveniently.</li><li>4. Wiring to be neat, tidy and located near ceiling.</li><li>• Review capacity of standby generator on basis of loads for essential lighting / AC / Equipment / Services. Replace generator with larger capacity or install second generator if review indicates existing unit is too small.</li><li>• 1. Wooden panel box should be replaced by non-flammable materials.</li><li>• Each circuit should have a separate neutral (use of common neutral for more than one circuit shall not be permitted).</li><li>• Provide the wiring in PVC conduits or in metallic GI pipes. Ensure that all electrical wiring should be covered in proper conduit pipes.</li><li>• Seal the cable entry-exit points of DB's with non-flammable materials. In addition:<ol style="list-style-type: none"><li>1. Ensure that HT / LT panels / Switchgears to be vermin / damp proof.</li><li>2. Ensure all unused holes / openings in DBs to be blocked properly.</li></ol></li><li>• 1. Provide the ECC to meet minimum cross-sectional area as per table 4.5.</li><li>2. Ensure that connections between conductors / equipments provided to durable electrical continuity and adequate mechanical strength and protection.</li><li>3. The continuous earth connection is provided back to the main intake supply earth.</li><li>• Provide adequate protection against lightning depending on the probability of a strike and acceptable risk levels at roof top of building.</li></ul>
--	--