

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

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| Name of the Factory | : Sinha Dyeing & Finishing Ltd. |
| Address of the Factory | : Kanchpur, Sonargaon, Narayanganj, Bangladesh. |
| Present Status of the Factory | : Under Operation |
| Structural assessment conducted by | : Alliance |
| Date of Structural Inspection | : 11-December-13 |
| Fire & Electrical assessment conducted by | : Alliance |
| Date of Fire & Electrical Inspection | : 27-January-14 |

BASIC INFORMATION:

The present garment factory comprises of one Main Building and six Ancillary Buildings. The following general information was noted:

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| i. | Building Usage Type | : Garments Factory |
| ii. | Structural System | : Frame structure with grade beams, foundation RC spread footing, R.C.C column |
| iii. | Floor System | : 1.2" thickness Deck in roof as main building is one storied |
| iv. | Floor Area | : 121,830 sft |
| v. | No. of Stories | : One story |
| vi. | Construction Year | : 1996 |
| vii. | Foundation Type | : RC spread footing |
| viii. | Design Drawings | : Available |
| ix. | Soil investigation Report | : Unavailable |
| x. | Construction Materials | : Steel with RC materials |
| xi. | Generator | : Unknown |

RECOMMENDATIONS FOR CORRECTIVE ACTION:

The recommendations of corrective action for Structural, Fire and Electrical Safety comprises of Short Term, Mid Term and Long Term basis are as follows:

The recommendations for Structural Safety corrective actions are:

Immediate : NA

Short Term: (3 Weeks) :

- i. Develop a program to ensure that all live loads for which a floor or roof has been designed for will not be exceeded. The designated Load Manager shall oversee this program and ensure it is enforced.
- ii. Designate a representative as the Factory Load Manager. The Factory Owner shall ensure that at least one individual, the Factory Load Manager who is located onsite full time at the factory, is trained in calculating operational load characteristics of the specific factory. The Factory Load Manager shall serve as an ongoing resource to RMG vendors and be responsible to ensure that the factory operational loads do not at any time exceed the factory floor loading limits as described on the Floor Loading Plans.
- iii. Provide Geotechnical report as necessary

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Mid Term (6 Weeks)

- i. Channel section shall be improved by providing additional plate for converting it as box section. Storm surge loading analysis need to be provided if necessary.
- ii. A qualified structural engineer shall be engaged to prepare credible as-built documents based on the requirements of Part 8 Section 8.19 of the Alliance Standard.
- iii. Load plans must be prepared by a qualified engineer and posted clearly on each floor and as necessary to distribute floor loads to comply with the floor loading plans as per Alliance Standard Part 8 Section 8.20.5.3.
- iv. Provide signage or the appropriate markings at all areas used for storage to indicate the acceptable loading limits detailed in the Load Plan.
- v. A qualified structural engineer shall be engaged to develop Floor Loading Plans as per the requirements of Part 8 Section 8.20.5.3.

Long Term (6 Months)

- i. Certificate of Occupancy shall be obtained from appropriate authority

The recommendations for Electrical Safety corrective actions are:

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| Immediate (3 to 6 Days) | Provide light fixtures with protective covers installed in storage areas or in any area where the Inspector of the Factories Rules (1.5.3.5) Part 53 disallows these fixtures. |
| Short Term (3 Weeks) | |
| Mid Term (6 Weeks) | <p>Provide identification for all boxes and enclosures (including transfer switches, generators, and power panels) for emergency circuits permanently marked so they will be readily identified as a component of an emergency circuit or system.</p> <p>The required marking can be by color code, the words “emergency system,” or any other method that identifies the box or enclosure as a component of the emergency system.</p> <p>Provide shielding/insulation for the cables and wiring exposed to external sources.</p> <p>Provide identifying color code for all cables. For phase conductors use red, yellow, and blue. For Neutral conductors use black. For grounding cable use green dotted yellow.</p> <p>Provide electrical insulation mats in front of substation, switchboards, and distribution boards.</p> <p>Provide capacity information labels (Maximum current rating, no of circuit breakers etc.) for switchboards and distribution boards.</p> <p>Install signs posted in Bengali and English, indicating this prohibition at all entrances to the prohibited areas.</p> |

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| <p>Long Term (6 Months)</p> | <p>Provide earthing/grounding system for all metal in the building.</p> <p>Consult with a qualified Electrical Engineer and ensure electrical cables are sized according to capacity of circuit breakers.</p> <p>Provide emergency power for life safety loads.</p> <p>Separate the multiple cables either using proper size of circuit breakers or connecting separately on bus bars as per requirements.</p> <p>Develop and implement an electrical safety program. Include key topics such as lock out tag out procedures, personal protective equipment requirements, etc. Maintain documentation of this program.</p> <p>Provide earthing of equipment at required locations and connect to required number of electrodes. Refer to the BNBG for required number of electrodes.</p> <p>Provide a readily accessible single point of disconnect for each main electrical service feed.</p> <p>Complete and document thermographic scans at least every three years. Thermographic scans should be completed in accordance with the Standard for Infrared Inspection of Electrical Systems & Rotating Equipment and NFPA70B or a comparable standard.</p> <p>Ensure switchboards and/or distribution boards provided with physical means to prevent the installation of more over current devices than that number for which the panel board was designed, rated, and listed following NFPA 70 section 408.54.</p> <p>Provide dedicated neutral for each circuit.</p> <p>Join cables through porcelain/PVC connectors with PIB tape wound around joint.</p> <p>Ensure electrical connections at equipment, fixtures, etc are properly secured. If flexible metallic hose is used for wiring to motors and other equipment, the wiring shall be enclosed to the full lengths and the hose secured properly.</p> <p>Provide grounding (earthing) for switchboards and distribution boards as per BNBC section 2.8.1</p> <p>Develop an Insulation Resistance Measurement Program that ensures deterioration of insulation resistance will be identified quickly. Testing should be in compliance with InterNational Electrical Testing Association (NETA). All transformers, switchgears etc. shall be subject to an insulation resistance measurement test to ground after installation but before any wiring is connected. Insulation</p> |
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| | <p>tests shall be made between open contacts of circuit breakers, switches etc. and between each phase and earth.</p> <p>Ensure all electrical wiring/cable is properly terminated at its point of termination.</p> <p>Establish a routine maintenance and testing program for the emergency generator. Maintain documentation of program.</p> <p>Develop a routine maintenance and operational testing program for the UPS and maintain documentation of program.</p> <p>Install phase separators between terminal connections at the noted locations.</p> <p>Complete an oil analysis on applicable transformers at appropriate intervals based on voltage and power. Maintain documentation of this analysis.</p> |
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The recommendations for Fire Safety corrective actions are:

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| Immediate (3 to 6 Days) | |
| Short Term (3 Weeks) | Remove all hasps, locks, slide bolts, or other locking devices from the means of egress. |
| Mid Term (6 Weeks) | Post the occupant load for all assembly and production floor areas in a conspicuous space near the main exit or exit access doorway for the space in accordance with Alliance Standard Section 6.4.4. |
| Long Term (6 Months) | <p>Provide automatic fire detection alarm system throughout the factory in accordance with NFPA 72; including pull station / break glass switches at each means of egress and periodic location as required.</p> <p>Install signage at required locations and on required equipment. Signage must comply with NFPA 14.</p> <p>Provide automatic fire detection alarm system throughout the factory in accordance with NFPA 72; including pull station / break glass switches at each means of egress and periodic location as required.</p> |