

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

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| Name of the Factory | : Sweater Cottage Ltd. |
| Address of the Factory | : Bada Kalmasher. K.B. Bazar, Gazipur-1704, Bangladesh. |
| Present Status of the Factory | : Under Operation |
| Structural assessment conducted by | : Alliance |
| Date of Structural Inspection | : 12-June-14 |
| Electrical assessment conducted by | : Alliance |
| Date of Electrical Inspection | : 12-June-14 |
| BGMEA Membership No | : 4205 |

BASIC INFORMATION:

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

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| i. | Building Usage Type | : Garments Factory |
| ii. | Structural System | : One Way Steel Moment Resisting Frame at mezzanine portion, Steel roof system on RCC columns at single story structure. |
| iii. | Floor System | : Steel roof system |
| iv. | Floor Area | : 45,000 sft |
| v. | No. of Stories | : Approx. 60% one story & other two stories |
| vi. | Construction Year | : 2004 |
| vii. | Foundation Type | : Unknown |
| viii. | Design Drawings | : Partially Available |
| ix. | Soil investigation Report | : Unavailable |
| x. | Construction Materials | : Steel materials with RC materials |
| xi. | Generator | : Ground floor in ancillary building |

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. Further destructive core testing report required for ground floor column, beam and slab under the guidance of qualified structural engineer to establish the compressive strength of concrete for evaluating the structural capacity of existing structural elements.
- ii. 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.
- iii. 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

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do not at any time exceed the factory floor loading limits as described on the Floor Loading Plans.

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Mid Term (6 Weeks)

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- i. Have a qualified structural engineer complete further analysis of the structure and develop a remediation plan if required.
 - ii. Have a qualified structural engineer prepare credible as-built documents based on the requirements of Part 8 Section 8.19 of the Alliance Standard.
 - iii. Engage a qualified structural engineer to develop the required documents to confirm the structural integrity of the buildings. Documents must comply with Alliance Standard Part 8 Section 8.19 and 8.20
 - iv. Have a qualified structural engineer complete an analytical evaluation of the structural impact of the addition. Moreover, Vertical extension of that portion is required to analyze for the impact of the expansion to the entire structure concern about the adequacy of foundation and column
 - v. Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading.
 - vi. Complete further testing on areas of deterioration and have a qualified structural engineer develop a remediation plan.
 - vii. Develop engineered plans to brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard. Install anchor and braces as shown on approved plans.
 - viii. Engage a qualified structural engineer to confirm and document that provisions have been made to accommodate concentrated loads. If provisions have not been made, have a qualified structural engineer develop a remediation plan.
 - ix. Have a qualified structural engineer confirm that capacity to support the load is available. Load Plans complying with Alliance Standard Part 8 Section 8.20.4.3 should also be developed.
 - x. Engage a qualified structural engineer to prepare as built structural drawing by confirming the actual number of re-bar.
 - xi. Provide signage or the appropriate markings at all areas used for storage to indicate the acceptable loading limits detailed in the Load Plan.
 - xii. Have a qualified structural engineer develop Floor Loading Plans per the requirements of Part 8 Section 8.20.5.3
 - xiii. Have a qualified structural engineer prepare load plans including the information required in Section 8.20 of the Alliance Standard.

Long Term (6 Months)

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- i. Provide Certificates of Occupancy for review.

The recommendations for Electrical Safety corrective actions are:

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| Immediate (3 to 6 Days) | Remove all dirt, debris, lint, water, oil, and improperly stored materials from the substation room. |
| Short Term (3 Weeks) | |
| Mid Term (6 Weeks) | Ensure distribution boards are metal enclosed with a dead front construction. Cover should be provided on cable trenches. Generator room need to proper fire rated. All boxes and enclosures (including transfer switches, generators, and power panels) for emergency circuits should |

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| | <p>be 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. Clear identification/markings must be available at LT, MDB and DB MCB/MCCB. Clear and permanent identification marks are required to be painted in all distribution boards, switchboards, sub main boards and switches as necessary. Provide capacity information labels (Maximum current rating, no of circuit breakers etc.) for Switchboards and distribution boards.</p> <p>Provide generator frame earthing (grounding) at two separate points.</p> <p>Install security measures to ensure access to the substation is restricted.</p> <p>Provide adequate supports for electrical wiring and conduit.</p> <p>Provide means of ventilation for the substation room.</p> <p>Consult a qualified electrical engineer to determine the required ventilation rates based on the installed equipment.</p> <p>Provide covers or blanks to conceal all live internal components of switchboards and/or distribution boards.</p> <p>Ensure meters and other electrical devices installed on the main electrical equipment are operational.</p> <p>Attached Require equipment and safety signage.</p> |
| Long Term (6 Months) | <p>Have a qualified electrical engineer develop an as-built single line diagram detailing key components and capacity of the electrical system.</p> <p>Provide earthing of equipment at required locations and connect to required number of electrodes. Refer to the BNBC for required number of electrodes.</p> <p>Have a qualified electrical engineer design a lightning protection system according to the BNBC requirements.</p> <p>Have a licensed electrician install the designed system.</p> <p>Provide earthing/grounding system for All metal in the building.</p> <p>Circuit should be drawn from breaker.</p> <p>Consult with a qualified Electrical Engineer and ensure electrical cables are sized according to capacity of circuit breakers.</p> <p>Need to separate the multiple cables either using proper size of circuit breakers or connecting separately on bus bars as per requirements.</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 tests shall be made between open contacts of circuit breakers, switches etc. and between each phase and earth.</p> <p>Complete thermographic scans at least on a three year cycle. Thermographic scans should be completed in accordance with the Standard for Infrared Inspection of Electrical Systems & Rotating Equipment and NFPA70B or</p> |

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| | <p>a comparable standard.</p> <p>Dedicated neutral should be provided for each load.</p> <p>Provide grounding (earthing) for Switchboards and distribution boards as per BNBC section 2.8.1.</p> <p>Ensure all electrical wiring/cable properly terminated at its point of termination.</p> <p>Complete an oil analysis on applicable transformers at appropriate intervals based on voltage and power.</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>Install phase separators between terminal connections at the noted locations.</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) | Locking arrangement at the doors should be removed as per Alliance Standard. |
| Mid Term (6 Weeks) | <p>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.</p> <p>Develop a testing and maintenance program that ensures the emergency power for exit signs is tested at least once per year. If battery operated signs are used, these lights are tested on a monthly basis. Functional testing of battery powered signs is provided for a minimum 90 min once per year.</p> <p>A hot work permit system program shall be enacted for all RMG facilities in accordance with NFPA 51B.</p> |
| Long Term (6 Months) | <p>Provide fire-resistive rated construction barriers for exit enclosures in accordance with Alliance Standard Sections 4.5. Consult a qualified fire protection engineer to design the required rated construction barrier.</p> <p>Install a standpipe system at required locations designed by a qualified fire protection engineer. Standpipe system must comply with the requirements of NFPA 14.</p> <p>Install initiating devices and notification appliances as required by the Alliance Standard and NFPA 72. This includes electrical supervision of all valves controlling fire protection systems (sprinklers, fire pumps, water supplies,</p> |

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| | <p>etc.). Connect devices to an automatic fire alarm and detection system for the facility. All fire alarm installations shall be submitted for review by the Alliance prior to commencement of installation.</p> <p>Install an automatic fire alarm and detection system for the facility. System shall comply with the Alliance Standard and NFPA 72. Consult a qualified fire protection engineer and/or authorized fire alarm company to design and install the system.</p> |
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