

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

Name of the Factory	: Bengal Plastics Ltd. Unit-3
Address of the Factory	: Zerabo, Savar,Dhaka, Bangladesh
Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 20-June-14
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 20-June-14 and 28-June-14

### **BASIC INFORMATION:**

There is one building in the factory premises. The following general information was noted:

- i. Building Usage Type : Plastic Factory.
- ii. Structural System : PEB structure.
- iii. Floor System : Roof is steel shed.
- iv. Floor Area : 66,220 sft
- v. No. of Stories : A. Main shed (Hanger shed): Single story prefabricated shed  
B. Store shed (Warehouse ):Single story prefabricated shed.
- vi. Construction Year :  
A. Main shed: 2000-2002;  
B. Store shed: 2000-2002;  
C. Utility building: 2002
- vii. Foundation Type : Unknown
- viii. Design Drawings : Available.
- ix. Soil investigation Report : Available
- x. Construction Materials : Steel .
- xi. Generator : Ground floor (Separate 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. 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 load limits as described on the Floor Load Plans.

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- Mid Term (6 Weeks) :
- i. Complete further testing on areas of deterioration and have a qualified structural engineer develop a remediation plan.
  - ii. Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard.
  - iii. Have a qualified structural engineer prepare credible as-built documents based on the requirements of Part 8 Section 8.19 of the Alliance Standard.
- Long Term (6 Months) :
- i. Provide Certificates of Occupancy for review.

### The recommendations for Electrical Safety corrective actions are:

<p>Immediate (3 to 6 Days)</p>	<p>Find out the cause of overheating, overloading, or signs of burning and take proper action.</p> <p>Remove all combustible materials within the substation room. The lights shall be installed on either wall or non combustible material.</p>
<p>Short Term (3 Weeks)</p>	<p>Develop and implement an electrical safety program. Include key topics such as lock-out/tag-out procedures, personal protective equipment requirements, etc. Keep records of completed training available on site.</p> <p>All boxes and enclosures (including transfer switches, generators, and power panels) for emergency circuits shall be permanently marked so they will be readily identified as a component of an emergency circuit or system. 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 a capacity information label which contains the current carrying capacity and size of main cable, rated capacity of circuit breaker and the bus bar (with dimension). Display panel schedule on panel door (inner side) printed on a sheet made of non combustible material.</p>
<p>Mid Term (6 Weeks)</p>	<p>Provide earthing equipment at required locations and connect to required number of electrodes. Refer to the BNBC for required number of electrodes. In case of LT Switchgear-1 provide required earthing connection with required bus bar installed inside the panel.</p> <p>Provide circuit breaker for all connected load according to the respective service cable. The rating of the circuit breaker shall not exceed the rated capacity of the cable.</p> <p>Check all of the panels to find the over-rated circuit breakers (both MCCB and MCB), and then replace the circuit breakers with appropriate circuit breakers considering the</p>

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	<p>respected cable size.</p> <p>Remove the extra cable from the terminal of the MCB and connected from the bus bar through an appropriate circuit breaker.</p>
Long Term (6 Months)	<p>Have a qualified electrical engineer design a lightning protection system according to the BNBC requirements. Have a licensed electrician install the designed system.</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 &amp; Rotating Equipment and NFPA70B or a comparable standard.</p> <p>Develop an Insulation Resistance Measurement Program that ensures deterioration of insulation resistance will be identified quickly. Testing should be in compliance with Inter National 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>

### The recommendations for Fire Safety corrective actions are:

Immediate (3 to 6 Days)	N/A
Short Term (3 Weeks)	<p>Remove all locking devices from all egress doors and means of egress components in accordance with Alliance Standard Section 6.8. If locks are required for security reasons, utilize special door locking features complying with NFPA 101.</p>
Mid Term (6 Weeks)	<p>Conduct fire drills on a quarterly basis as outlined in BNBC Part 4 Appendix A for all garment facilities. Fire drills shall be conducted under the direction of a Fire Safety Director. All other requirements for fire drills shall be conducted in accordance with BNBC Part 4 Appendix A.</p> <p>Implement training programs and document in accordance with the Alliance Safety Training Curriculum.</p> <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 in accordance with Alliance Standard Section 6.4.4.</p> <p>Develop a testing and maintenance program that ensures the emergency power for all egress lighting is verified at least once per year. If battery operated lights are used, these</p>

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	<p>lights shall be tested on a monthly basis. Functional testing of battery powered lights shall be provided for a minimum 90 min once per year.</p> <p>Develop a testing and maintenance program that ensures the emergency power for exit signs is verified at least once per year. If battery-operated signs are used, these signs shall be tested on a monthly basis. Functional testing of battery powered signs shall be provided for a minimum 90 min once per year.</p> <p>Collect all applicable permits and licenses and kept up to date including BERC license from BERC.</p> <p>Complete Fire Department pre-planning activities with the local Fire Service and Civil Defence in accordance with Alliance Standard Section 13.1.1(2).</p> <p>Apply to appropriate authority in an expeditious manner for issuance of the Certificates of Occupancy for each building and ancillary structure according to building use.</p>
Long Term (6 Months)	<p>Replace non-compliant doors and frames in the means of egress with side-swinging doors. Replacement doors shall be a minimum width of 0.8 m (32 in), and are listed, approved, self-closing, fire rated door assemblies (door and frame) with latching panic hardware.</p> <p>Route exits directly to the exterior or provide an Egress Court in accordance with Alliance Standard Section 6.17.2 for non-compliant arrangements. Consult a qualified fire protection engineer to design and/or approve the required egress court.</p> <p>Provide training and certification for the required number of people (25% of total workers) in fire fighting, first aid, and rescue training by an appropriate authority in accordance with the Alliance Safety Training Curriculum.</p> <p>Install initiating devices and notification appliances as required by the Alliance Standard and NFPA 72. Connect devices to an automatic fire alarm and detection system for the facility. All fire alarm installations or modifications shall be submitted for review by the Alliance prior to commencement of installation.</p> <p>Provide fire-resistive rated construction barriers between hazard types in accordance with Alliance Standard Sections 3.4 and 4.5. Consult a qualified fire protection engineer to design the required rated construction barrier.</p> <p>Establish an inspection, testing, and maintenance program for all fire extinguishers and prepare proper documentation. Program must comply with NFPA 10.</p> <p>Provide a uniform slope/ramp for the walking surface. Slope should not exceed 1 in 20 in the direction of travel. Any changes in elevation (protrusions or lips) must not</p>

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	<p>exceed 1/4 in.</p> <p>Provide continuously illuminated exit signs at all required exits and along egress paths, especially where path has a change of direction. Exit signs may be illuminated either by lamps exterior to the sign or contained within the sign. The source of illumination shall provide not less than 50 lux at the illuminated surface with a contrast of not less than 0.5. Approved self-luminous signs which provide evenly illuminated letters having a minimum luminance of 0.2 cd/m<sup>2</sup> may also be used.</p> <p>Develop a hot work permit program. The program must comply with the requirements of NFPA 51B.</p> <p>Establish written corporate and plant policies on housekeeping to ensure scheduled cleaning for floor, wall, ceiling, supply and return air ventilation systems. Promptly reschedule skipped cleanings. Provide a documented line of authority for authorizing a cleaning delay and rescheduling.</p>
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