

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

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Name of the Factory	: Sinha Designers Ltd
Address of the Factory	: Kanchpur, Sonargaon, Narayanganj, Dhaka.
Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 10-Dec-2010
Fire & Electrical assessment conducted by:	Alliance
Date of Fire & Electrical Inspection	: 10-Dec-2010
BGMEA Membership No	: 4345

### **BASIC INFORMATION:**

The present garment factory is a seven story factory building with beam-column frame system. The following general information was noted:

i.	Building Usage Type	: Factory Building.
ii.	Structural System	: RCC frame structure.
iii.	Floor System	: Flat Plate slab
iv.	Floor Area	: 400,000 sft.
v.	No. of Stories	: (G+11).
vi.	Construction Year	: 2007
vii.	Foundation Type	: Pile Foundation
viii.	Design Drawings	: Available
ix.	Soil Investigation Report	: Available
x.	Construction Materials	: Reinforced Concrete
xi.	Generator	: Main building (Ground floor)

### **RECOMMENDATIONS FOR CORRECTIVE ACTION:**

The recommendations of corrective action for both Structural, Fire and Electrical Safety comprises in Short Term, Mid Term and Long Term basis.

#### **The recommendations for Structural Safety corrective actions are:**

Immediate : NA

Short Term (3 Weeks) : 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.

Mid Term (6 Weeks):

- i. Engage a qualified structural engineer to confirm satisfactory structural performance of the structure.
- ii. 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
- iii. Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard.

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Long Term :

- i. Provide Certificates of Occupancy for review.

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

Immediate (3 to 6 Days)	Find out the cause of overheating, overloading or signs of burning and take proper action.
Short Term (3 Weeks)	<p>Develop and implement an electrical safety program. Include key topics such as lock out tag out procedures, personal protective equipment requirements, etc. Reference NFPA 70e for example program requirements.</p> <p>Ensure proper identification of emergency power switchboards, distribution boards, and circuits.</p> <p>Ensure light fixtures without protective covers are not installed in storage areas or in any area where the Inspector of the Factories Rules (1.5.3.5) Part 53 disallows these fixtures.</p> <p>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</p> <p>Switchboards and distribution boards must have capacity information labels. Location: ALL LT, MDB, DB, SDBs.</p>
Mid Term (6 Weeks)	<p>Have a qualified electrical engineer develop an as-built single line diagram detailing key components and capacity of the electrical system.</p> <p>Remove multi looping of wiring/cables at all distribution boards and switchboards.</p>
Long Term (6 Months)	<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 &amp; Rotating Equipment and NFPA70B or a comparable standard.</p>

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

Immediate	NA
Short Term (3 Weeks)	Locking arrangement at the doors should be removed as per Alliance Standard.
Mid Term (6 Weeks)	<p>Install an automatic sprinkler system throughout the building designed by a qualified fire protection engineer. In accordance with NFPA 13.</p> <p>Install Class III standpipe system at required locations designed by a qualified fire protection engineer. Standpipe system must comply with the requirements of NFPA 14.4 nos.4 inch dia. MS riser pipe should be installed.</p> <p>Training programs need to be implemented and documented in accordance with the Alliance Safety Training Curriculum.</p> <p>Provide Fire Department (Siamese) connections in accordance with Alliance Standard Section 5.5.4. Connections shall match the Fire Service and Civil Defence hose thread standard.</p> <p>Create a Fire Safety Director position and fill the position with an individual that has had sufficient training to be able to carry the required duties.</p> <p>Complete fire department pre-planning activities with the local Fire Service and Civil Defense.</p> <p>Install signage at required locations and on required equipment. Signage must comply with NFPA 14.</p> <p>Install signage adjacent to each stair door indicating the stair name and the floor level at the noted locations in both English and Bengali.</p>
Long Term (6 Months)	<p>Provide fire-resistive rated opening protection and walls for the lifts in accordance with Alliance Standard Sections 4.6. Consult a qualified fire protection engineer to design the required opening, walls or penetration systems.</p> <p>Replace with side-hinged swinging type door with the necessary fire resistance rating including door hardware relating the specific position requirements. Position the door so it shall open in the direction of egress without obstructing other paths of egress.</p> <p>Provide fire-resistive rated penetration protection for rated walls and assemblies in accordance with Alliance Standard Sections 4.6 and 4.7. Consult a qualified fire protection engineer to design the required penetration systems.</p> <p>Provide 1.5hr rated fire doors for openings in a 2hr rated enclosure. Fire door shall be of the side hinged, swinging, self-closing type and shall swing in the direction of egress.</p>

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	<p>Install a dedicated fire pump for the facility in accordance with NFPA 20 to supply the demands of the connected fire protection systems along with a stored source of water sufficient to meet the demands in accordance with NFPA 22. Fire pump installation is to be tested for final acceptance in presence of Alliance and a final inspection of the installation shall be conducted by the Alliance prior to final acceptance of the installation by the Alliance as per clause 5.5.5. Acceptance testing of the installation shall be in accordance with NFPA 20, 22, and 25 testing requirements. Documentation of all testing shall be submitted to the Alliance for review prior to final acceptance by the Alliance.</p> <p>Install a new automatic fire alarm and detection system. Once installed, arrange for direct connection of the fire alarm and detection system to a central station monitoring service or the Fire Service and Civil Defence as per Alliance Standard Part 5 Section 5.7.5 Monitoring. Until that time that a central station monitoring service or direct connection to the Fire Service and Civil Defence can be set up, a person trained to contact the Fire Service and Civil Defence in the event of fire alarm activation shall be provided. An annunciator shall be located in a constantly attended location (such as a fire control room) to alert this person.</p> <p>Provide handrails on both sides of each stairway. Intermediate handrails shall be provided when the stair width exceeds 2.2 m (87 in.)</p> <p>"Additional Extinguisher required. Portable fire extinguishers shall be installed throughout all new and existing facilities in accordance with BNBC Part 4 Section 4.10 and NFPA 10.1.1.1."</p> <p>Establish an inspection, testing, and maintenance program for all fire extinguishers. Program must comply with the requirements of NFPA 10.</p> <p>The occupant loads shall be posted for every production floor in a conspicuous space near the main exit or exit access doorway for the space.</p> <p>Produce, establish and enforce a written policy and procedure for housekeeping to ensure scheduled cleaning of all floors, walls, ceilings, air ventilation systems and other building components. Ensure the timely removal of defective, waste and rubbish materials is included. As a general rule the maximum tolerable deposit thickness for loose fluffy lint is 13 mm (½ in.) over a maximum of 46.5 m<sup>2</sup> (500 ft<sup>2</sup>). Limit dense deposits to 6 mm (¼ in.) and oil saturated deposits to 3.2 mm (⅛ in.).</p> <p>A hot work permit system program shall be enacted for all RMG facilities in accordance with NFPA 51B.</p> <p>Establish an inspection, maintenance, and testing program for the standpipe and hose system. Program must comply with the requirements of NFPA 25.</p>
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