

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

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Name of the Factory	: Sinha Denim Wear Ltd.
Address of the Factory	: WG Building-4, Kanchpur, Sonargaon, Narayangonj, Bangladesh.
Present Status of the Factory	: <b>Under Operation</b>
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 10-December-13
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 10-December-13

### **BASIC INFORMATION:**

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

i.	Building Usage Type	: Garments Factory
ii.	Structural System	: Frame structure with grade beams and flat plate slab
iii.	Floor System	: Flat plate slab
iv.	Floor Area	: 400,000 sft
v.	No. of Stories	: 12 story – Main building
vi.	Construction Year	: 2007
vii.	Foundation Type	: Pile foundation
viii.	Design Drawings	: Available
ix.	Soil investigation Report	: Available
x.	Construction Materials	: Reinforced Concrete for RCC building
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.

Mid Term (6 Weeks) :

- i. Provide additional interior grade beams in both direction so that all inadequacy can be solved.
- ii. Engage a qualified structural engineer to complete further analysis of the structure and develop a remediation plan as required.
- iii. 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.
- iv. 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.

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- v. Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading.
- vi. 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.
- vii. Provide signage or the appropriate markings at all areas used for storage to indicate the acceptable loading limits detailed in the Load Plan.
- viii. A qualified structural engineer shall be engaged to develop Floor Loading Plans as per alliance standard Part 8 Section 8.10.

Long Term (6 Months) :

- i. Provide Certificates of Occupancy for review.

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

Immediate (3 to 6 Days)	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.
Short Term (3 Weeks)	
Mid Term (6 Weeks)	<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>Need to maintain color code for all cables. For phase conductors use red , yellow and blue, for neutral conductors use black and for grounding cables use green dotted yellow.</p> <p>Provide capacity information labels (Maximum current rating, no of circuit breakers etc.) for switchboards and distribution boards</p> <p>Properly secure electrical connections at equipment, fixtures, etc.</p> <p>Light fixtures without protective covers (otherwise known as naked lights) shall not be allowed in storage areas or in any area where the Inspector of the Factories Rules (1.6.3.7) Part 53 disallows these fixtures. Install signs posted in Bengali and English, indicating this prohibition at all entrances to these areas.</p> <p>Ensure meters and other electrical devices installed on the main electrical equipment are operational.</p>

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Long Term (6 Months)	<p>Need to have a readily accessible single point of disconnect for each main electrical service feed.</p> <p>Consult with a qualified Electrical Engineer and ensure electrical cables are sized according to capacity of circuit breakers.</p> <p>Provide earthing/grounding system for all metal in the building.</p> <p>Need to separate the multiple cables by either using proper size of circuit breakers or connecting separately on bus bars as per requirements</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>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>Provide a dedicated neutral for every circuit.</p> <p>Ensure all electrical wiring/cable properly terminated at its point of termination. Cables shall be connected to terminals only by soldered or welded lugs, unless the terminal are of such form that it is possible to securely clamp them without cutting away the cable strands</p> <p>Ensure switchboards and/or distribution boards are 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>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>Provide grounding (earthing) for distribution boards as per BNBC section 2.8.1. Where the panel board is used with nonmetallic raceway or cable or where separate grounding conductors are provided, a terminal bar for the grounding conductors shall be secured inside the cabinet. The terminal bar shall be bonded to the cabinet and panel board frame, if of metal; otherwise it shall be connected to the grounding conductor that is run with the conductors feeding the panel board.</p> <p>Need to joint cable through porcelain/PVC connectors with PIB tape wound around joint.</p> <p>Install phase separators between terminal connections at the noted locations.</p>
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	Complete an oil analysis on applicable transformers at appropriate intervals based on voltage and power.
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### The recommendations for Fire Safety corrective actions are:

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)	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.
Long Term (6 Months)	<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>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>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>Install an automatic sprinkler system throughout the building designed by a qualified fire protection engineer. In accordance with NFPA 13.</p> <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</p>

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	<p>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>
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