

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

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Name of the Factory	: <b>Babylon Washing Ltd.</b>
Address of the Factory	: 169-17, Tetuljhora Union, Hemayetpur, Savar, Dhaka, Bangladesh.
Present Status of the Factory	: <b>Under Operation</b>
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 3-Dec-13
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 2-Dec-13

### **BASIC INFORMATION:**

There is only a single storied shed in the factory. The following general information was noted:

i.	Building Usage Type	: Garments Factory
ii.	Structural System	: Steel frame structure with grade beams
iii.	Floor System	: Steel shed
iv.	Floor Area	: 22,000 sft
v.	No. of Stories	: Single storey shed
vi.	Construction Year	: 2003
vii.	Foundation Type	: Unknown
viii.	Design Drawings	: Available.
ix.	Soil investigation Report	: Available.
x.	Construction Materials	: Steel structure
xi.	Generator	: Ground Level

### **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. The ratio shall be decreased by providing brackets in four faces of each columns. Engage a qualified contractor to conduct the remediation activities.
- ii. Assign a qualified structural engineer confirm that capacity to support the load is available.
- iii. Produce, establish and enforce a written policy and procedure to ensure that the live loads, as detailed in the load plans for each floor, are not exceeded.
- iv. "Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading."

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

- v. 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.
- vi. 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.
- vii. Have a qualified structural engineer complete further analysis of the structure and develop a remediation plan if required.
- viii. The building is one storied and FOS is also satisfactory. So no action shall be taken.
- ix. Load plans need to be prepared for each floor, detailing the maximum operational load for specific high load areas on the floor and the entire floor. These load plans should be posted throughout the assembly and production floors, at a conspicuous space near the specific high load areas and in the general floor areas.
- x. 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
- xi. Provide the load plans, signage, plus highlight these areas by physical marking; using different contrasting colours or materials so they are easy to differentiate between the storage areas, the normal working sections and the means of egress pathways.

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)	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.
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.</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>Properly secure electrical connections at equipment, fixtures, etc.</p> <p>Provide covers or blanks to conceal all live internal components of switchboards and/or distribution boards.</p> <p>Provide grounding (earthing) for distribution boards as per</p>

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

	<p>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>Provide capacity information labels (Maximum current rating, no of circuit breakers etc.) for switchboards and distribution boards. A panel board shall be 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. For the purposes of this section, a 2-pole circuit breaker or fusible switch shall be considered for two over current devices; a 3-pole circuit breaker or fusible switch shall be considered for three over current devices.</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>Electrical switchgear and panel boards must be inspected on an annual basis to ensure that the equipment is installed in accordance with the listed ratings.</p>
<p>Long Term (6 Months)</p>	<p>Have a qualified electrical engineer develop as-built electrical drawings providing detailed key components of the electrical system.</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 on site.</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>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>Have a qualified electrical engineer design a lightning protection system according to the BNBC requirements. Have a licensed electrician install the designed system. A complete lightning protection system shall consist of air termination network, down conductors and earth termination.</p> <p>Provide earthing/grounding system for all metal in the building.</p> <p>Need to separate the multiple and looping cables either using proper size of circuit breakers or connecting</p>

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

	<p>separately on bus bars as per requirements.</p> <p>Provide protective devices (circuit breakers) for all circuits drawn for loads.</p>
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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)	<p>Establish an inspection, testing, and maintenance program for the fire pump. Program must comply with NFPA 25.</p> <p>Occupant load signage should be posted for every assembly and production floor, at a conspicuous space near the main exit or exit access doorway for the space.</p>
Long Term (6 Months)	<p>As per occupancy type in the factory required more smoke detectors that should be installed as per Alliance standard. The fire alarm and smoke detectors should be monitored by central monitoring system.</p> <p>install signage at required locations and on required equipment. Signage must comply with NFPA 14.</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>