

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

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Name of the Factory	: <b>Ayesha Clothing Company Ltd. - Printing Unit</b>
Address of the Factory	: Bangobondhu Road, Tongabari Ashulia, Savar, Dhaka. Ashulia, Savar Dhaka Bangladesh
Present Status of the Factory	: <b>Under Operation</b>
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 1-Novober-15
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 1-Novober-15

### **BASIC INFORMATION:**

There are 06 Main buildings in the factory premises out of which 01 is main production building. The following general information was noted:

- i. Building Usage Type : Garments Factory.
- ii. Structural System : Frame work of the building is composed of steel deck slab, structural steel beams and structural steel columns are supported by RC footings
- iii. Floor System : Factory building-3 storied; Store-1 story; Utility -1 story; ETP-3 story;
- iv. Floor Area : 1,57,585 Sft
- v. No. of Stories : Factory building-3 storied; Store-1 story; Utility -1 story; ETP-3 story;
- vi. Construction Year : 2013~2014
- vii. Foundation Type : isolated column footing
- viii. Design Drawings : Available.
- ix. Soil investigation Report : Available
- x. Construction Materials : RCC stone chips.
- xi. Generator : Ground floor

### **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. Under guidance from a qualified structural engineer arrange Detail Engineering Assessment of the structure within 6 weeks.

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- ii. 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.
- 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 document compliance with the seismic and wind requirements stated in the 2006 BNBC.
- 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. Load plan shall be posted on all levels of all buildings according with Section 8.20 of the Alliance Standard.
- viii. Provide signage or the appropriate markings at all areas used for storage to indicate the acceptable loading limits detailed in the Load Plan.

Long Term (6 Months)

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- i. Under guidance from a qualified structural engineer arrange Detail Engineering Assessment of the structure within 6 weeks. Permanent safety measure should be taken as per DEA report.
  - ii. Provide Certificates of Occupancy for review.

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

Immediate (3 to 6 Days)	Remove all combustible materials within the substation room.
Short Term (3 Weeks)	<p>Switchboards and/or distribution boards should have capacity information labels e.g current carrying capacity of bus bar, rating of main incoming breaker , size of panel and permitted no. of CB, maximum permitted load connection capacity, etc.</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>
Mid Term (6 Weeks)	<p>Multiple connection /looping should be removed and connection should provide individually from bus bar.</p> <p>Install phase separators between terminal connections at the noted locations.</p> <p>Cables should be connected by proper size of lugs.</p> <p>Provide electrical insulation mats in front of distribution boards, Substation room and other electrical panels.</p> <p>Provide clear identification markings (MDB, All SDBs, Change Over System).</p> <p>Over heating equipment should be checked and if not possible to control over heating then need to replace by sound one.</p> <p>Have a qualified electrical engineer develop an as-built single line diagram detailing key components and capacity of the electrical system.</p>

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Long Term (6 Months)	<p>The size of cable should be minimum one size greater than the cable which current carrying capacity matches with the rating of the circuit breaker. Considering some factors, the cable current carrying capacity may be 1.45 times greater than the breaker's rating.</p> <p>Consult with a qualified engineer to have details design and drawing of lightning protection system and ensure the air termination network vertical and horizontal conductors are appropriately spaced.</p>
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### The recommendations for Fire Safety corrective actions are:

Immediate	NA
Short Term (3 Weeks)	
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 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 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>Approval of the plan and design documents of the Notification and Initiation devices for fire alarm system shall be obtained from the competent authority. Alliance Standards Part 5 Section 5.7.4</p> <p>Provide a uniform slope/ramp for the walking surface in accordance with Alliance Standard Section 6.3.4. Slope should not exceed 1 in 20 in the direction of travel. Any changes in elevation (protrusions or lips) must not exceed 1/4 in.</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> <p>Create a Fire Safety Director position and fill the position with an individual that has sufficient training to be able to carry out the required duties in accordance with Alliance Standard Section 13.1.</p> <p>Install signage adjacent to each stair door indicating the stair name and the floor level in both English and Bengali.</p>
Long Term (6 Months)	<p>Provide fire-resistive rated construction barriers for shafts in accordance with Alliance Standard Section 4.5.7. Consult a qualified fire protection engineer to design the required rated construction barrier.</p> <p>Install automatic fire sprinkler systems throughout the facility in</p>

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	<p>accordance with Alliance Standard Section 5.3. Manufacturing areas and storage less than 12 feet high is classified Ordinary Hazard (Group 2). Sprinkler systems should be designed to deliver 0.20 gpm/ft<sup>2</sup> over the most remote 1,500 SF. 250 gpm hose allowance. 90 minute water supply duration. All sprinkler installations shall be submitted for review by the Alliance prior to commencement of installation.</p> <p>The fire doors shall be kept closed at all the time as per Standard. Alternatively, the fire doors shall be provided with magnetic hold open devices that hold the doors open until a fire alarm signal is activated. Upon activation, the magnet shall release and the door shall close automatically. Also drop down door seals shall be provided for the doors. To make the fire doors operable more correctly and effectively, necessary remedial measures shall be taken as per provision of NFPA-101 and NFPA-80.</p> <p>Provide a fire-resistive rated assembly between the exterior exit stairs (and 10 ft beyond the ends of the stairs) and the building to achieve the required separation. Enclose any openings (windows, etc.) with required fire rated construction within that 10 ft wall section. The rated assembly should be designed and/or approved by a qualified fire protection engineer.</p> <p>Revise the door arrangement for stair no. 2 and stair no. 5 so that the doors do not swing out over the stairs for compliance with Alliance Standard Section 6.8.5.</p> <p>Provide a new ramp with a running slope not greater than 1 in 12 (8 percent) in accordance with Alliance Standard Section 6.10. If needed, provided handrails on both sides of the ramp.</p> <p>Implement training programs and document in accordance with the Alliance Safety Training Curriculum.</p> <p>Develop an inspection and testing program for fire doors. Fire doors shall be tested on a quarterly basis to ensure that they are properly closing and latching. They shall also be checked for the proper label and verification that the door has not been damaged in any way. Alliance Standards Part 13 Section 13.9.2 Doors Tested.</p> <p>The pattern of guards shall be such that a sphere 8" in diameter can not pass through the opening. Alliance Standards Part 6 Section 6.12.</p> <p>Provide continuously illuminated exit signs per Alliance Standard Section 6.11. Signs shall be placed at all required exits and along egress paths, especially where there is a change in direction for the path of travel</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>Establish an inspection, testing, and maintenance program for the standpipe system. Program must comply with NFPA 25.</p>
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