

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

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Name of the Factory	: Vanguard Garments (Washing Division) Ltd
Address of the Factory	: 98, Arif Chamber, Agrabad, Chittagong..
Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 15-June-14
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 08-June-14
BGMEA Membership No	: 331

### **BASIC INFORMATION:**

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

- |       |                           |   |
|-------|---------------------------|---|
| i.    | Building Usage Type       | : Garments Factory.   |
| ii.   | Structural System         | : RCC moment resisting frame structure with steel shed at roof. |
| iii.  | Floor System              | : Beam- slab.   |
| iv.   | Floor Area                | : 11186sft  |
| v.    | No. of Stories            | : Single storied.   |
| vi.   | Construction Year         | : 1985  |
| vii.  | Foundation Type           | : Spread footing  |
| viii. | Design Drawings           | : Not Available.  |
| ix.   | Soil investigation Report | : Available   |
| x.    | Construction Materials    | : RCC brick 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. Before conducting any addition of floors of the building, conduct destructive core testing to validate in-situ concrete compressive strength of structural elements. No addition is allowed before conducting the core test. 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

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

do not at any time exceed the factory floor load limits as described on the Floor Load Plans.

Mid Term (6 Weeks)

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- i. Have a qualified structural engineer provide further analysis and investigation of the structural deficiencies. The structural engineer shall also provide remediation documents if required..
- ii. Engage a qualified structural engineer to develop the required documents to confirm the structural integrity of the buildings. Documents must comply with the Alliance Standard Part 8 Sections 8.19 and 8.20
- iii. Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.
- iv. Have a qualified structural engineer develop Floor Loading Plans per the requirements of Part 8 Section 8.20.5.3.
- v. Have a qualified structural engineer provide further testing and analysis of cracking in columns and provide a remediation plan to correct noted issues.
- vi. 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. Apply for issuance of the Certificates of Occupancy and pursue the matter to obtain the same.

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

Immediate (3 to 6 Days)	Remove all dirt, debris, lint, water, oil, and improperly stored materials from the substation room.
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>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>
Mid Term (6 Weeks)	<p>Consult with a qualified electrical engineer and ensure electrical wiring/cables are sized according to the capacity of the circuit breakers.</p> <p>Ensure proper ventilation for the generator room.</p> <p>Have a qualified electrical engineer develop an as-built single line diagram detailing key components and capacity of the electrical system.</p> <p>Ensure an overcurrent protection device (circuit breaker) for</p>

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

	<p>each and every load.</p> <p>Install switchboards and/or distribution boards in compliant locations so that operation is not hampered due to limited access.</p> <p>Ensure switchboards and/or panel boards are not installed above gas stoves or sinks or within 2.5 m of any washing unit in washing rooms or laundries.</p> <p>Establish a periodic inspection program to ensure the electrical systems are free from damage, debris, dirt, lint, etc. Maintain records concerning inspections and follow up actions.</p> <p>Ensure the means of identification are obtained by separate color codings, marking tape, tagging, or other approved means.</p> <p>Connect all metal in the building to the building earthing/grounding system, such as metal rebar in concrete, the metal frame of the building, or metal water pipes, according to BNBC.</p>
Long Term (6 Months)	<p>Consult with a professional electrical engineer to verify that the appropriate number of down conductors are installed according to BNBC based on the building size, and prepare a drawing for down conductors to make sure your system is secured against lightning.</p> <p>Inspect electrical switchgear and panel boards on an annual basis to ensure that the equipment is in good working condition.</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 NFPA 70B or a comparable standard.</p>

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

Immediate (3 to 6 Days)	N/A
Short Term (3 Weeks)	<p>Remove existing gates and doors in the means of egress including all locking devices. Install doors with approved panic hardware that cannot be locked in the direction of egress under any conditions.</p> <p>“No-Smoking” sign should be posted both in English and Bengali.</p>
Mid Term (6 Weeks)	<p>Impart training in accordance with the Alliance Safety Training Curriculum and keep records with proper documentation.</p> <p>Post the occupant load for every assembly and production floor in a facility in a conspicuous space near the main exit or exit access doorway for the space.</p>

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

	<p>Verify emergency power for egress lights at least once per year. If battery operated lights are used, test them monthly. Perform annual functional testing of battery powered lights for at least 30 minutes. Ref. 10.12.2.3.</p> <p>Develop a testing and maintenance program that ensures the emergency power for exit signs is tested at least once per year. If battery operated signs are used, these signs are tested on a monthly basis. Functional testing of battery powered signs is provided for a minimum of 90 minutes, once per year.</p> <p>Develop an emergency evacuation plan which includes the duties and responsibilities of various people/groups, interfacing between groups and the fire brigade, headcount and identification of trapped victims, physically disabled people and their rescue, etc.</p> <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 requirements.</p> <p>Arrange for direct connection of the fire alarm system to a central monitoring station or Fire Service and Civil Defense as per the Alliance Standard. Until such time that monitoring can be set up, arrange a monitoring system using the factory's own central detection system and personnel. A person shall be assigned to contact the fire department in the event of fire alarm activation. An annunciator shall be located in a constantly attended location (such as a fire control room) to alert this person.</p> <p>Install signage adjacent to each stairway door indicating the stairway name and the floor level at the noted locations.</p> <p>Complete fire department pre-planning activities with the local Fire Service and Civil Defense.</p> <p>Apply to Chittagong Development Authority (CDA) for the issuance of an occupancy certificate and expedite the matter.</p>
Long Term (6 Months)	<p>Replace the door from the existing position and move towards the inside of the floor so that door does not swing out over the stairway.</p> <p>Replace all collapsible doors, sliding doors, roll-down gates, and shutters in means of egress with side-hinged, swinging-type doors of a proper width and rating.</p> <p>Doors through rated walls shall be approved fire rated doors that are listed, permanently labeled, automatic-closing, in</p>

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

	<p>compatible fire rated frames with latching hardware. Install listed firestop systems at every penetration through fire rated walls and floors.</p> <p>Provide an emergency power source, either by battery backup or by connecting to the emergency power system, for compliantly illuminating exit signs.</p> <p>Provide handrails on both sides of the noted stairway.</p> <p>Install appropriate means of illumination at the noted locations. Egress paths shall be illuminated at all times the building is occupied. Illumination shall be a minimum of 10 lux for all corridors, exit doors, and stairways. Aisles shall be provided with a minimum 2.5 lux.</p> <p>Fire extinguishers are to be inspected, tested, and maintained in accordance with NFPA requirements.</p> <p>Repave the walking surface to make the slope of the surface 1 in 2 and keep the change in elevation to less than 1/2 inch.</p> <p>Provide fire-resistive rated construction barriers between hazard types following Table 4.4.1 of Alliance Standard. Consult a qualified fire protection engineer to design the required rated construction barrier. Close the opening if it is not required.</p> <p>Select fire extinguishers based on potential fire class and hazards following NFPA requirements. Timber, bamboo, coal, paints, and similar combustible materials shall be kept separated from each other. A minimum of two dry chemical powder (DCP) type fire extinguishers shall be provided at both open and covered locations where combustible and flammable materials are stored. In a store of inflammable and/or fire-sensitive materials, a 5 kg dry powder fire extinguisher conforming to accepted standards shall be kept at an easily accessible position.</p> <p>Develop a hot-work permit program. The program must comply with NFPA requirements. In general, this program should address the process of request and approval by authorities, necessary checks prior to approval, standby fire watch and fire fighting equipment, sounding of alarm procedures, duration and expiry of permit and reapproval procedures, etc.</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. As a general rule the maximum tolerable deposit thickness for loose fluffy lint is 13 mm (1/2 in.) over a maximum of 46.5 m<sup>2</sup> (500 ft<sup>2</sup>). Limit dense deposits to 6 mm (1/4 in.) and oil saturated deposits to 3.2 mm (1/8 in.).</p> <p>Make sure all required exit signs are illuminated continuously at all times. Exit signs may be illuminated either by lamps external to the sign or by lamps contained within the sign. The source of illumination shall provide not less than 50 lux at the illuminated surface with a contrast of</p>
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## Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

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	<p>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>Create a Fire Safety Director position and fill the position with an individual that has had sufficient training to be able to carry out the required duties.</p> <p>The duties of the Fire Safety Director shall include the following:</p> <ol style="list-style-type: none"><li>(1) Establish internal and external rally points and communicate them to all employees in the building.</li><li>(2) Fire department pre-planning.</li><li>(3) Conduct safety inspections as outlined in Alliance Standard.</li><li>(4) Ensure all testing of fire protection equipment is conducted in accordance with Alliance Standard.</li></ol>
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