

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Alliance Knit Composite Ltd.
Address of the Factory	: PukurPar, Zirabo, Ashulia, Savar, Bangladesh
Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 19 Jul 2014
Fire & Electrical assessment conducted by:	Alliance
Date of Fire & Electrical Inspection	: 19 Jul 2014

BASIC INFORMATION:

The present garment factory is a three storied building with concrete beam and slab system. The following general information was noted:

i.	Building Usage Type	: Garments Factory.
ii.	Structural System	: RCC Beam Column Frame system
iii.	Floor System	: Beam slab.
iv.	Floor Area	: 138,214 sft.
v.	No. of Stories	: 3 storied RCC
vi.	Construction Year	: 2008
vii.	Foundation Type	: Known
viii.	Design Drawings	: Available
ix.	Soil investigation Report	: Available
x.	Construction Materials	: Reinforced Concrete (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)	: 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 and document that provisions have been made to accommodate concentrated loads. If provisions have not been made, have a qualified structural engineer develop a remediation plan.
	ii. Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard.
	iii. Have a qualified structural engineer prepare credible as-built documents based on the requirements of Part 8 Section 8.19 of the Alliance Standard.

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- 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 prepare load plans including the information required in Section 8.20 of the Alliance Standard and have it posted in all required location.
- vi. Have a qualified structural engineer prepare a load plan for each floor and have the floors marked for designating storage area as per the developed load plan
- vii. Provide Certificates of Occupancy for review.

Long Term (6 months) : NA.

The recommendations for Fire Safety corrective actions are:

Immediate (3 to 6 Days)	Remove all combustibles stored underneath the cutting tables at the noted locations as soon as possible.
Short Term (3 Weeks)	Remove all locking devices from all egress doors and means of egress components in accordance with Alliance Standard Section 6.8. If locks are required for security reasons, utilize special door locking features complying with NFPA 101.
Mid Term (6 Weeks)	<p>Arrange for direct connection of the fire alarm system to a central monitoring station or Fire Service and Civil Defense. Until that time that monitoring can be set up, arrange a monitoring system using 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>Post emergency egress maps or fire evacuation maps at the entrance to each exit stair or main point of egress.</p> <p>Develop an emergency evacuation plan which includes duties and responsibilities of various people/groups, interfacing between groups and fire brigade, headcount and identification of trapped victims, physically disabled people and their rescue, etc. and all components required by the Alliance Standards and communicate the plan to all employees. The evacuation plan shall include provisions to assist physically disabled persons. A list of all employees with physical disabilities shall be kept by the Fire Service Director.</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 lights 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 a testing and maintenance program that ensures the operation of all exit lights is verified at least once per year. If battery-operated lights are used, these lights shall be</p>

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	<p>tested on a monthly basis. Functional testing of battery powered lights shall be provided for a minimum of 90 minutes once per year.</p> <p>Impart training in accordance with Alliance Safety Training Curriculum and keep record with proper documentation.</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.</p> <p>Post the occupant loads for every assembly and production floor in a conspicuous space near the main exit or exit access doorway for the space.</p> <p>Install signage at each floor entrance from the stair to the floor indicating the stair name and the floor level in English and Bengali.</p> <p>Apply for an electricity license issuing board for electrician license and collect the acid license from Department of Explosives (DC office). Also apply to BERC to add the additional capacity to the license.</p> <p>Complete and document fire department pre-planning activities with the local Fire Service and Civil Defense.</p> <p>Apply to RAJUK for issuance of occupancy certificate and pursue the matter to expedite.</p>
<p>Long Term (6 Months)</p>	<p>Replace all non-compliant doors and frames in the means of egress with doors that are listed, approved, automatic-closing, side-swinging, fire rated doors in compatible fire rated frames with latching panic hardware. Fit outward opening, side-swinging, self-closing, non-lockable fire doors of required rating as per Alliance Standard 4.6.</p> <p>Close all openings across the span of the stair and 10 feet on each side from the ground level to roof or 10 ft above the topmost landing.</p> <p>Exit enclosures shall have a minimum fire-resistance rating of 2 hr when connecting four stories or more and a minimum fire-resistance rating of 1 hr when connecting three stories or less. Fit outward opening, side-swinging, self-closing, non-lockable fire doors of 1.5 hr or 1 hr rating in all stairwell enclosures according to Alliance Standard section 4.6. Consult a qualified fire protection engineer to design the required rated construction barriers.</p> <p>Install standpipe system at required locations. Standpipe system must comply with NFPA 14.</p> <p>Provide opening protectives at all windows and other openings on all fire rated walls throughout the entire premises according to Alliance Standard sections 3.4, 4.5 and 4.6. Close these openings if they are not required.</p> <p>Divert the exit passageway to the exit discharge. Or, extend the rated passageway through production area up to discharge.</p>

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	<p>Train and certify at least 25 percent of workers in fire fighting, first aid and rescue training by the proper authority.</p> <p>Provide rated exit passageway i.e. protected path of egress from the exit enclosure to the public way. The rating of the exit passageway is to be equal to the fire rating requirement of the exit that is being served and shall not be less than 1 hr fire-resistance rated.</p> <p>Pull stations at egress points, smoke detectors in air handling equipment, and visual and audible devices must be spaced appropriately based on occupancy type in accordance with NFPA 72.</p> <p>Have a qualified engineer review the pump capacity and ensure hydraulic calculation is done which can be supported by this pump. Also, identify all other performance data and ensure conformity to NFPA 14, 20, 22 and 25 standards. Also, install a water storage tank in accordance with NFPA 22.</p> <p>Provide fire department connection as required by Alliance standard. Fire Department outlet connections shall be provided to allow Fire Department pumper vehicles to draw water from ground-level or underground water storage tanks. Connections shall match the Fire Service and Civil Defense hose thread standard.</p> <p>Fire extinguishers are to be inspected, tested, and maintained in accordance with NFPA 10 Chapter 7.</p> <p>Provide fire-resistant rated construction barriers between hazard types in accordance with Alliance Standard Sections 3.4 and 4.5. Consult a qualified fire protection engineer to design the required rated construction barrier.</p> <p>Provide handrails on both side of each stairway. Provide handrails at a height between the range of 865 mm (34 in) and 965 mm (38 in).</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 (½ in.) over a maximum of 46.5 m² (500 ft²). Limit dense deposits to 6 mm (¼ in.) and oil saturated deposits to 3.2 mm (⅛ in.).</p> <p>Create a Fire Safety Director position and fill the position with an individual that has had sufficient training 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">(1) Establish internal and external rally points and communicate to all employees in the building.(2) Fire department pre-planning.(3) Conduct safety inspections as outlined in Alliance standard 13.9.
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	<p>(4) Ensure all testing of fire protection equipment is conducted in accordance with Alliance standard 13.10.</p> <p>Develop a hot-work permit program. The program must comply with the requirements of NFPA 51B. In general, this program should address process of request and approval from authorities, necessary checks prior to approval, standby fire watch and fire fighting equipment, sounding of alarm procedure, duration and expiry of permit, re-approval procedure, etc.</p>
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The recommendations for Electrical Safety corrective actions are:

Immediate (3 to 6 Days)	<p>Find out the cause of overheating, overloading, or signs of burning and take proper action indicating replacing of cable or equipment if necessary.</p> <p>Remove all combustible materials within the substation room.</p>
Short Term (3 Weeks)	<p>Provide two separate points earthing (grounding) provided for generator.</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.</p> <p>Ensure meters installed on the main electrical equipment are operational.</p>
Mid Term (6 Weeks)	<p>Ensure proper ventilation for generator room.</p> <p>Provide clearance of at least 1 m (39 in) in front of distribution boards.</p> <p>Ensure distribution boards are metal enclosed with a dead front construction.</p> <p>Consult with a qualified Electrical Engineer and ensure electrical cables are sized according to capacity of circuit breakers.</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>Remove multi looping of wiring and cables at circuit breakers within distribution boards.</p> <p>Provide capacity information labels on distribution boards and ensure 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.</p> <p>Provide electrical graded insulation mats in front of</p>

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	distribution boards.
Long Term (6 Months)	Consult with a qualified electrical engineer to prepare the lighting protection system layout diagram and ensure the required numbers and appropriate spacing of vertical and horizontal conductors.