

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

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Name of the Factory	: <b>Birds A&amp;Z Ltd.</b>
Address of the Factory	: 113, Baipail, Ashulia, Savar, Dhaka, Bangladesh.
Present Status of the Factory	: <b>Under Operation</b>
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 19-May-14
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 4-May-14
BGMEA Membership No	: 3179

### **BASIC INFORMATION:**

There are 3 buildings in the factory premises. The following general information was noted:

i.	Building Usage Type	: Garments Factory
ii.	Structural System	: RCC frame structure with in filled masonry
iii.	Floor System	: RCC Structure with beam and column
iv.	Floor Area	: 186592 SF
v.	No. of Stories	: 1) Six story main building-1: 6 (Grade + 5) 2) Six story main building-2 with one basement and one mezzanine floor: 6 (Basement + Grade + 5) 3) Single story tin shed: 1 (Grade)
vi.	Construction Year	: 1) Six story main building-1: 2000, 2) Six story main building-2 with one basement and one mezzanine floor: (Ground floor to 3rd floor: Finished in 2008, 4th and 5th floor: Construction ongoing), 3) Single story tin shed: 2008.
vii.	Foundation Type	: Building one-Isolated Footing Building two- Mat Foundation
viii.	Design Drawings	: Available.
ix.	Soil investigation Report	: Available.
x.	Construction Materials	: Reinforced Concrete
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.
- 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

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

Mid Term (6 Weeks) :

- i. "Engage a qualified structural engineer and carry out detail engineering assessment (DEA) for Main building-1 to identify what remedial action is appropriate, which may include retrofitting.
- ii. Further analytical evaluation is needed for Main building-2 for its revised [8 (eight) story with one basement] condition, as opposed to its original approved [6 (six) story with one basement] condition."
- 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.
- iv. Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard.
- v. "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."
- vi. Have a qualified structural engineer document compliance with the seismic and wind requirements stated in the 2006 BNBC.
- vii. Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading.
- viii. Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.
- ix. The management should ensure that construction practices and safety requirements are being adhered to as per BNBC 2006, Part 7 and Alliance Standard section 9.
- x. "Have a qualified structural engineer develop Floor Loading Plans per the requirements of Part 8 Section 8.20.5.3"
- xi. "Have a qualified structural engineer prepare load plans including the information required in Section 8.20 of the Alliance Standard."
- xii. Provide signage or the appropriate markings at all areas used for storage to indicate the acceptable loading limits detailed in the Load Plan.
- xiii. Remove all the blockage from expansion joints.

Long Term (6 Months) :

- i. Provide Certificates of Occupancy for review.
- ii. Retrofitting as per DEA

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

Immediate (3 to 6 Days)	Find out the cause of overheating, overloading, or signs of burning and take proper action considering the replacement of conductors or equipment.
Short Term (3 Weeks)	
Mid Term (6 Weeks)	Ensure the generator room properly rated and physically

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	<p>separated from the remainder of the building.</p> <p>Ensure proper ventilation for generator room.</p> <p>Provide adequate cover on cable trenches.</p> <p>Ensure switchboards and distribution boards are metal enclosed with a dead front construction.</p> <p>Provide clearance of at least 1 m (39 in) in front of switchboards and/or distribution boards.</p> <p>Ensure proper identification of emergency power switchboards, distribution boards, and circuits.</p> <p>Provide capacity information labels (Maximum current rating, no of circuit breakers etc.) for switchboards and/or distribution boards.</p>
<p>Long Term (6 Months)</p>	<p>Install lightning protection system on the building.</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 earthing of equipment at required locations and connect to required number of electrodes. Refer to the BNBC for required number of electrodes.</p> <p>Provide readily accessible single point of disconnect for each main electrical service feed.</p> <p>Consult with a qualified Electrical Engineer and ensure electrical wiring/cables are sized according to capacity of circuit breakers.</p> <p>Install switchboards and distribution boards in compliant locations so that operation is not hindered due to limited access.</p> <p>Connect all metal in the building to the building earthing/grounding system such as metal rebar in concrete, metal frame of building, or metal water pipe.</p> <p>Ensure switchboards and 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>Ensure the means of identification is obtained by separate color coding, marking tape, tagging, or other approved means.</p> <p>Provide covers or blanks to conceal all live internal components of switchboards and distribution boards.</p>

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### 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.
Short Term (3 Weeks)	Remove all hasps, locks, slide bolts, or other locking devices at the noted locations. Doors may be locked where the latch and lock are disengaged with one motion where the occupant load does not exceed 49 persons. Turning a door handle and disengaging a lock is considered two motions. Doors may be provided with locking hardware from the ingress side provided that a panic bar is installed on any door with an occupant load exceeding 49 persons. The re-entry provisions of section 6.8.3 must be met.
Mid Term (6 Weeks)	<p>Develop an emergency evacuation plan which includes 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 90 minutes once per year.</p> <p>Apply to BERC for waiver certificate.</p>
Long Term (6 Months)	<p>Provide 1.5 hour fire protective opening assemblies in 2 hour rated exit enclosures. Exits connecting four or more stories shall be enclosed with a minimum 2-hour fire-resistance rating. Exits shall be enclosed with the same fire-resistance rating as the floor penetrated but will not need to exceed 2 hour.</p> <p>Provide an automatic fire alarm and detection system per NFPA 72 and arrange for direct connection of the system to a central station monitoring service or the Fire Service and Civil Defense. Until that time that a central station monitoring service or direct connection to the Fire Service and Civil Defense can be set up, a person shall be assigned to contact the fire department in the event of fire alarm</p>

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	<p>activation. An annunciator shall be located in a constantly attended location (such as a fire control room) to alert this person.</p> <p>Install a standpipe system at required locations designed by a qualified fire protection engineer. The system is to be compliant with the requirements of NFPA 14.</p> <p>Install an automatic sprinkler system throughout the building designed by a qualified fire protection engineer. The hydraulic design of the sprinkler system must be pre-approved by CoE of Alliance. All installation and design requirements outlined in BNBC Part 4 Chapter 4 shall be replaced by the requirements of NFPA 13. Pipe schedules shall not be used to size pipe. All systems shall be hydraulically calculated to meet the required NFPA 13 design requirements. Installation of new automatic sprinkler systems shall be required to provide shop drawings and hydraulic calculations as outlined in NFPA 13. The test and performance report of the installed system has to be submitted to Alliance for review. Final inspection and testing shall be witnessed by the Alliance.</p> <p>Provide 2 hour fire-resistive rated construction barriers at exit enclosures. Fit outward opening, side-swinging, self-closing, non-lockable fire doors of 1.5 hour rating in all stairwell enclosures. Consult a qualified fire protection engineer to design the required rated construction barriers.</p> <p>Install dedicated fire pump following the requirements of NFPA 20. Also, install a water storage tank 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 shall be conducted by the Alliance prior to final acceptance. Acceptance testing of the installation shall be in accordance with NFPA 20, 22, and 24 testing requirements. Documentation of all testing shall be submitted to the Alliance for review prior to final acceptance.</p>
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