

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

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Name of the Factory	: <b>Badgetex Apparels Ltd.</b>
Address of the Factory	: Plot No: P/6-A Mohora Nexus I/A, Chittagong, Bangladesh.
Present Status of the Factory	: <b>Under Operation</b>
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 17-May-14
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 14-April-14
BGMEA Membership No	: 5134
BKMEA Membership No	: 1570

### **BASIC INFORMATION:**

There is one four story RCC main production building with shed on roof: 4 (Grade + 3 + Rooftop Shed) and one single storey generator shed in the building. The following general information was noted:

i.	Building Usage Type	: Garments Factory
ii.	Structural System	: Intermediate moment resisting frame
iii.	Floor System	: Monolithic slab beam system
iv.	Floor Area	: 54333 sft
v.	No. of Stories	: Four Storied main production building and single shed
vi.	Construction Year	: 1) Four story RCC main production building with shed on roof: 1st Phase: 1999-2001 (Ground floor to 1st floor), 2nd Phase: 2009-2011 (2nd floor to 3rd floor), 2) Single story generator tin shed: 2011.
vii.	Foundation Type	: Isolated column footing
viii.	Design Drawings	: Available.
ix.	Soil investigation Report	: Available.
x.	Construction Materials	: RCC & Steel
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.
- ii. Designate a representative as the Factory Load Manager. The Factory Owner shall ensure that at least one individual; the Factory Load Manager is located onsite full time at the factory and is trained in calculating the operational load characteristics of the specific factory. The Factory Load Manager shall serve as an ongoing resource to

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RMG vendors and shall ensure that the factory operational loads do not ever exceed the factory floor loading limits as described on the Floor Loading Plans.

Mid Term (6 Weeks)

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- i. Have Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading.
- 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 Standards Part 8 Section 8.19 and 8.20.
- 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. Under guidance from a qualified structural engineer, address all of the areas of needed maintenance by correcting the identified issues.
- v. Have a qualified structural engineer complete further analysis of the structure and develop a remediation plan if required.
- vi. Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard.
- vii. "Complete further testing on areas of deterioration and have a qualified structural engineer develop a remediation plan.
- viii. "
- ix. Have a qualified structural engineer develop floor loading plans under the requirements of the Alliance Standards Part 8 Section 8.20.5.3
- x. Have a qualified structural engineer prepare load plans including the information required in Section 8.20 of the Alliance Standards and have it posted in all required locations.
- xi. Have a qualified structural engineer prepare a load plan for each floor, and have the floors marked so that the storage area is designated as required by the developed load plan
- xii. Under the guidance of a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.

Long Term (6 Months)

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- i. Provide a protective coating at the structural elements that are constructed with MCAC and that exposed to rainfall or other sources of water. Have protective coating approved by the Alliance or a qualified structural engineer. Alternatively, provide a 2% slope on the exposed surface to prevent the accumulation of water.
- ii. Provide Certificates of Occupancy for review.

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

Immediate (3 to 6 Days)	Survey all storage areas to identify all light fixtures without protective covers. Ensure light fixtures without protective covers are not installed in storage areas or in any area where
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	<p>the Inspector of the Factories Rules (1.5.3.5) Part 53 disallows these fixtures. Provide protective covers for all light fixtures in storage areas.</p> <p>Consult with a qualified electrical engineer to determine the cause of the overheating and identify the required remediation work based on the qualified electrical engineer's findings.</p> <p>Remove all dirt, debris, and lint from the substation room.</p>
Short Term (3 Weeks)	
Mid Term (6 Weeks)	<p>Ensure the substation room is properly rated. Consult a qualified fire protection engineer to determine required rating and remediation work.</p> <p>Ensure the generator room is provided with the required fire rating. Consult a qualified fire protection engineer to determine required rating and remediation work.</p> <p>Ensure that generator exhaust is discharged to the exterior of the building in a safe location.</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> <p>Provide additional insulation for wiring exposed to external heat sources. Consult a qualified electrical engineer in order to determine the appropriate insulation or means of protection based on the application and heat source.</p> <p>Provide adequate ventilation for the substation room. Consult a qualified electrical engineer to determine the required ventilation rates based on the installed equipment.</p> <p>Consult with a qualified electrical engineer in order to determine capacity of each distribution board. Provide capacity information labels (Maximum current rating, no of circuit breakers etc.) for Switchboards and/or distribution boards.</p> <p>Ensure all 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 the NFPA 70 section 408.54.</p>
Long Term (6 Months)	<p>Survey all electrical cables/wiring for all instances where electrical cables/wiring is not sized properly. Consult with a qualified electrical engineer and ensure electrical wiring/cables are sized according to capacity of the respective circuit breaker and the loads the circuits serve.</p> <p>Survey the entire building to identify all locations of non compliance. Connect all metal in the building to the building earthing/grounding system, such as metal rebar in</p>

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	<p>concrete, metal frame of building, or metal water pipe. Consult a qualified electrical engineer to ensure remediation work is completed properly.</p> <p>Consult with an expert electrical engineer and prepare drawing for lightning protection system including risk index and make sure the system is secured against lightning.</p> <p>Survey all circuits to identify any additional locations of non compliance. Consult with a qualified electrical engineer in order to determine the appropriate sized over current protection device required for the respective circuit. Ensure an over current protection device (circuit breaker) is incorporated for each and every load.</p> <p>Survey all distribution boards and provide dead front construction at all locations. Consult a qualified electrical engineer to provide listing of suitable non flammable materials to be utilized as part of the dead front construction.</p> <p>Ensure the generator room is large enough to allow for access to the generator so that personnel can perform routine maintenance activities.</p> <p>Inspect the electrical switchgear and panel boards on an annual basis to ensure that the equipment is in good working condition.</p> <p>Complete thermographic scans on at least a three year cycle. Thermographic scans should be completed in accordance with the Standard for Infrared Inspection of Electrical Systems &amp; Rotating Equipment and the NFPA 70B or a comparable standard.</p> <p>Perform a test to prove whether transformer contains harmful substance (such as PCBs) or not. If found any harmful substance take necessary action to ensure healthy environment.</p>
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### The recommendations for Fire Safety corrective actions are:

Immediate (3 to 6 Days)	Remove all of the combustibles that were stored underneath the cutting tables at the noted locations. Establish and enforce a housekeeping policy to keep these areas clear of storage.
Short Term (3 Weeks)	Provide 1.5 hour fire protective opening assemblies in 2 hour rated exit enclosures. Remove all hasps, locks, slide bolts, and 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

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	<p>disengaging a lock is considered two motions.</p>
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 in accordance with Section 13.3.</p> <p>Occupant loads must be posted for every assembly and production floor in a conspicuous space near the main point of egress.</p> <p>Develop a testing and maintenance program that ensures the operation of all exit signs is verified at least once per year. If battery-operated signs are used, these lights shall be tested on a monthly basis. Functional testing of battery powered signs shall be provided for a minimum of 90 minutes once per year.</p> <p>Fire drills are to be conducted on a quarterly basis as outlined in the BNBC Part 4 Appendix A for all garment facilities. Fire drills shall be conducted under the direction of a Fire Safety Director. All other aspects of the fire drills shall be conducted in accordance with the BNBC Part 4 Appendix A.</p> <p>Apply to the Bidyut Pradan board for the issuance of an electrician license.</p>
Long Term (6 Months)	<p>Provide outward opening, side-swinging, self-closing, non-lockable fire doors with 1.5 hour ratings in all stairwell enclosures. Consult a qualified fire protection engineer to design the required rated construction barriers.</p> <p>An automatic evacuation alarm shall be provided upon the initiation of any of the following: a manual alarm box, a water flow alarm, or two or more automatic smoke or fire detection devices. Notification shall be provided throughout the building for total evacuation. Existing partial evacuation systems shall be replaced. Manual fire alarms shall be provided throughout all new and existing occupancies B (2 or more storied building), F (3 or more storied building), G1, H, and K unless located in buildings with other occupancies requiring automatic fire alarm systems.</p> <p>Install the required identification signs at the noted locations. The signage must comply with the NFPA 14 Chapter 6.</p>

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	<p>Installed a pump dedicated to fire fighting or fire protection following the requirements of the NFPA 20. The fire pump installation is to be tested for final acceptance in the presence of the Alliance, and a final inspection of the installation shall be conducted by the Alliance prior to final acceptance of the installation. Acceptance testing of the installation shall be in accordance with the NFPA 20, 22, and 24 testing requirements. Documentation of all testing shall be submitted to the Alliance for review prior to the final acceptance by the Alliance. This pump is to be connected to an alternative power source like generator, and the generator is to be connected with an ATS (auto starter).</p>
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