

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

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| Name of the Factory                       | : <b>Claxton Apparels &amp; Textiles Ltd.</b>      |
| Address of the Factory                    | : Tarabo, Rupgonj, Narayangonj, Dhaka, Bangladesh. |
| Present Status of the Factory             | : <b>Under Operation</b>                           |
| Structural assessment conducted by        | : Alliance   |
| Date of Structural Inspection             | : 01-Jul-14  |
| Fire & Electrical assessment conducted by | : Alliance   |
| Date of Fire & Electrical Inspection      | : 05-Jul-14  |
| BGMEA Membership No                       | : 2240   |

### **BASIC INFORMATION:**

There are 13 nos. of buildings in the factory premises out of which one is main production building and twelve are ancillary buildings. The buildings are named as: 1) Four story composite main production building (Part-1 is RCC structure and Part-2 is steel structure), 2) Single story CI shed for generator, 3) Single story shed for accessories store, 4) Single story shed for store officer residence and wastage store, 5) Single story shed for chemical and wastage store, 6) Single story shed for wastage store, 7) Single story shed for doctor's room and laboratory, 8) Single story shed for bonded ware house, 9) Single story shed for dining, child care and security post, 10) Single story shed for waiting room, 11) Single story shed for security dormitory, 12) Single story shed for prayer room, 13) Single story shed for carton store. The following general information was noted:

- i. Building Usage Type : Garments Factory
- ii. Structural System : Part-1 is monolithic RCC frame structure with a steel shed at roof and Part-2 is PEB steel frame structure.
- iii. Floor System : Beam column floor & steel building
- iv. Floor Area : 70989 sft
- v. No. of Stories grade:  
: 1) Composite main production building: Stories above grade: 4,below grade: 0,2) CI shed for generator: Stories above grade: 1,below grade: 0,3) Shed for accessories store: Stories above grade: 1,below grade: 0,4) Shed for store officer residence and wastage store: Stories above grade: 1,below grade: 0,5) Shed for chemical and wastage store: Stories above grade: 1,below grade: 0,6) Shed for wastage store: Stories above grade:1,below grade: 0,7) Shed for doctor's room and laboratory: Stories above grade: 1,below grade:0,8) Shed for bonded ware house: Stories above grade: 1,below grade: 0,9) Shed for dining, child care and security post: Stories above grade: 1,below grade: 0,10) Shed for waiting room: Stories above grade: 1,below grade: 0,11) Shed for security dormitory: Stories above grade: 1,below grade:0,12) Shed for prayer room: Stories above grade: 1,below grade: 0,13) Shed for carton store: Stories above grade: 1,below grade: 0.
- vi. Construction Year : 1) Four story composite main production building: RCC part Finished in December-1994 and steel part was finished in 2012; 2) Single story CI shed for generator: Finished in 2002, 3) Single story shed for accessories store: Finished in 2002, 4) Single story shed for store officer residence and wastage store: Finished in 2000, 5) Single story shed for chemical and wastage store: Finished in 2000, 6) Single story shed for wastage store: Finished in 2000, 7) Single story shed for doctor's room and laboratory: Finished in

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- 2000, 8) Single story shed for bonded ware house: Finished in 2000, 9) Single story shed for dining, child care and security post: Finished in 2002, 10) Single story shed for waiting room: Finished in 2008, 11) Single story shed for security dormitory: Finished in 2008, 12) Single story shed for prayer room: Finished in 2012, 13) Single story shed for carton store Finished in 2008.
- vii. Foundation Type : Unknown
  - viii. Design Drawings : Available.
  - ix. Soil investigation Report : Available.
  - x. Construction Materials : Reinforced Concrete & 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 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 do not at any time exceed the factory floor load limits as described on the Floor Load Plans.

Mid Term (6 Weeks) :

- i. Under guidance from a qualified structural engineer arrange Detail Engineering Assessment of the structure. This assessment should be conducted within 6 weeks and should include destructive core testing to validate the in-situ concrete compressive strength of structural elements.
- ii. Have a qualified structural engineer provide further testing and analysis of cracking in walls to ensure cracking does not affect structural performance.
- iii. As part of the detailed assessment outlined elsewhere, destructive core testing should be conducted to validate the in-situ concrete compressive strength of structural elements.
- iv. 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.
- v. Have a qualified structural engineer complete an analytical evaluation of the structural impact of the addition.
- vi. Engage a qualified structural engineer to confirm and document that provisions have been made to accommodate concentrated loads. If

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- provisions have not been made, have a qualified structural engineer develop a remediation plan.
- vii. Have a qualified structural engineer document compliance with the seismic and wind requirements stated in the 2006 BNBC.
  - viii. Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading.
  - ix. Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard.
  - x. Construction Practices and Safety requirements of Section 9 must be followed
  - xi. Have a qualified structural engineer prepare credible as-built documents based on the requirements of Part 8 Section 8.19 of the Alliance Standard.
  - xii. Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.
  - xiii. Have a qualified structural engineer develop Floor Loading Plans per the requirements of Part 8 Section 8.20.5.3.
  - xiv. Have a qualified structural engineer prepare load plans including the information required in Section 8.20 of the Alliance Standard and post the floor load plans on each floor.
  - xv. Provide signage or the appropriate markings at all areas used for storage to indicate the acceptable loading limits detailed in the Load Plan.
  - xvi. The condition should be evaluated by a structural engineer to determine whether an expansion joint is required and determine an appropriate remediation scheme.

### Long Term (6 Months)

- i. Apply for issuance of Certificate of Occupancy and pursue the matter to obtain the same.
- ii. Retrofitting as per DEA recommendation.
- iii. Provide a protective coating at the structural elements constructed with MCAC exposed to rainfall or other sources of water. Have protective coating approved by the Alliance or a qualified structural engineer.

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

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| Immediate (3 to 6 Days) | <p>Ensure the generator room clean and free of dirt, debris and improperly stored materials.</p> <p>Find out cause of overheating and take proper action including replacing cable or equipment where necessary.</p>   |
| Short Term (3 Weeks)    | As per BNBC section 2.11.5.4 ensure clear and permanent identification marks are painted in all distribution boards, switchboards, sub main boards and switches.   |
| Mid Term (6 Weeks)      | <p>Ensure switchboards and distribution boards are metal enclosed with a dead front construction.</p> <p>Ensure the generator room properly rated and physically separated from the remainder of the building.</p> <p>Ensure proper ventilation for generator room.</p> <p>All boxes and enclosures (including transfer switches, generators, and power panels) for emergency circuits shall</p> |

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|                             | <p>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>Ensure switchboards and distribution boards 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>Long Term (6 Months)</p> | <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>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>Connect all metal in the building to the building earthing system such as metal rebar in concrete, metal frame of building or metal water pipe.</p> <p>Have a qualified electrical engineer design a lightning protection system according to the BNBC requirements. Have a licensed electrician install the designed system.</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>Install switchboards and distribution boards in compliant locations so that operation is not hampered due to limited access.</p> <p>Ensure switchboards and panel boards are not installed above gas stoves or sinks or within 2.5m of any washing unit in washing rooms or laundries.</p> <p>Consult with a qualified Electrical Engineer and ensure electrical wiring, cables are sized according to capacity of circuit breakers.</p> <p>Ensure the means of identification is obtained by separate color coding, marking tape, tagging or other approved means.</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 NFPA70B or a comparable standard.</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</p> |

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

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| Immediate (3 to 6 Days) |  |
| Short Term (3 Weeks)    | Remove all hasps, locks, slide bolts, or other locking devices at the noted locations. Provide one more non-lockable side hinged outward swinging emergency exit door.   |
| Mid Term (6 Weeks)      | <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 to be tested on a monthly basis. Functional testing of battery powered signs must provided for a minimum 90 min once per year.</p> <p>Apply to Biddyut Paridaptor for electrician license. Get BERC license from BERC and up to date trade license from Tarabo Pouroshova, Rupgonj, Narayangonj.</p> <p>Remove existing aisle marking and draw new marking fulfilling the minimum aisle width requirement.</p> <p>Develop an emergency evacuation plan which includes duties and responsibilities of various people or groups, interfacing between groups and fire brigade, headcount and identification of trapped victims, physically disabled people and their rescue, etc.</p>   |
| Long Term (6 Months)    | <p>Cover the boiler room opening in exit passageway with opening protectives or seal the opening. Construct required rated walls for the open exit passageway as per clause 6.15.</p> <p>Install a class III standpipe system at required locations designed by a qualified fire protection engineer. The system is to be compliant with the requirements of NFPA 14. The hydraulic calculations should be reviewed by Alliance and review to be completed prior to start of work. All standpipe system installations shall be submitted for review by the Alliance for review prior to commencement of installation according to 5.4.3.2</p> <p>Provide generator room with 2 hour fire separation and 1.5 hour opening protection. Keep the in-process goods in a maximum area of 250 sft with a height of 8 ft, and separated from adjacent area by 10 ft or provide 1 hour protective barrier for storage.</p> |

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|  | <p>Install a pump dedicated for fire fighting or fire protection following the requirements of NFPA 20 as mentioned in Alliance Standard Section 5.5.1. 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 of the installation by the Alliance as per clause 5.5.5. 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 by the Alliance.</p> |
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