

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: BSA Apparels Ltd.
Address of the Factory	: Plot#D 9-12, Block#B, Fouzdarhat I/, Chittagong, Bangladesh.
Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 27-May-14
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 25-May-14
BGMEA Membership No	: 4722

BASIC INFORMATION:

There are 3 buildings in the factory premises out of which one is main production building and two are ancillary buildings. The buildings are named as: 1) Twelve story RCC main production building, 2) Single story compressor and dining building, 3) Single story security building. The following general information was noted:

i.	Building Usage Type	: Garments Factory
ii.	Structural System	: Moment Resisting Frame with monolithic beam slab
iii.	Floor System	: Roof is beam supported slab system.
iv.	Floor Area	: 110987 SF
v.	No. of Stories	: 1) Twelve story RCC main production building: Stories above grade: 12 (including mezzanine floor), Stories below grade: 0, Occupied levels: 12, 2) Single story compressor and dining building: Stories above grade: 1, Stories below grade: 0, Occupied levels: 1, 3) Single story security building: Stories above grade: 1, Stories below grade: 0, Occupied levels: 1.
vi.	Construction Year	: Construction started after 2006 and ended in the year of 2008.
vii.	Foundation Type	: Pile 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.

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- 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)

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- i. 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.
- ii. Engage a qualified structural engineer to confirm and document that provisions have been made to accommodate these water tanks. If provisions have not been made, have a qualified structural engineer develop a remediation plan.
- iii. Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard.
- iv. Have a qualified Structural Engineer prepare the design report.
- v. Have a qualified structural engineer develop Floor Loading Plans per the requirements of Part 8 Section 8.20.5.3.
- 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.

Long Term (6 Months)

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- i. 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. Or provide 2% slope on the exposed surface to prevent accumulation of water.
- ii. Provide Certificates of Occupancy for review.

The recommendations for Electrical Safety corrective actions are:

Immediate (3 to 6 Days)	Ensure switchboards and/or distribution boards free of dirt and debris
Short Term (3 Weeks)	
Mid Term (6 Weeks)	<p>Ensure generator exhaust discharged to the exterior of the building in a safe location.</p> <p>Ensure the generator room is properly fire rated and is physically separated from the remainder of the building.</p> <p>Ensure proper identification of emergency power switchboards, distribution boards, and circuits.</p> <p>Ensure switchboards and distribution boards are metal enclosed with a dead front construction.</p> <p>Provide capacity information labels (Maximum current</p>

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	<p>rating, no of circuit breakers etc.) for Switchboards and/or distribution boards.</p> <p>Provide additional light fixtures to increase illumination levels provided in the BNBC.</p> <p>Provide mechanical guards for electrical equipment where necessary an ensure they are in proper condition.</p> <p>Provide grounding (earthing) for Switchboards and/or distribution boards as per BNBC section 2.8.1.</p> <p>Provide adequate supports for electrical wiring and conduit.</p>
<p>Long Term (6 Months)</p>	<p>Provide emergency power connection for life safety loads (fire alarm, fire pump, elevators, emergency lighting, exit signage, etc.).</p> <p>Connect all metal in the building to the building earthing or grounding system such as metal rebar in concrete, metal frame of building, or metal water pipe.</p> <p>Provide adequate fire rating/ protection for substation room.</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>The overhead service connection shall be led into buildings via roof poles or service masts made of GI pipe having a goose neck bend at the top and installed on the outer wall. Consult a qualified electrical engineer before completing work.</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/cables at circuit breakers within switchboards and distribution boards.</p> <p>Consult with a qualified electrical engineer to ensure electrical wiring/cables are sized according to capacity of circuit breakers.</p> <p>Lead power, telecommunication, and antenna cables separately to the main point of service. Power, telecommunication, and antenna cables must have separate entrance.</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 & Rotating Equipment and NFPA70B or a comparable standard.</p> <p>Inspect electrical switch gear and panel boards on an annual basis to ensure that the equipment is in good working condition.</p> <p>Consult with your transformer manufacturing company and ensure transformer does not contain any harmful substances</p>

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	by having test results.
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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 reentry provisions of section 6.8.3 must be met.
Mid Term (6 Weeks)	<p>Apply to BSCIC for approval.</p> <p>Fire drills are to be conducted 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 with checklist and plan. All other requirements for fire drills shall be conducted in accordance with BNBC Part 4 Appendix A.</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>Remove existing aisles marking and draw new marking fulfilling the minimum aisle width requirement. Relocate the machines accordingly if necessary.</p> <p>Workers are aware of the evacuation procedure upon commencing of the alarm. However, no procedure defining evacuation process was available.</p>

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<p>Long Term (6 Months)</p>	<p>Provide fire-resistive rated construction barriers between hazard types following Table 4.4.1 of Alliance Standard or Table 4.1.1 from BNBC Part 4. Consult a qualified fire protection engineer to design the required rated construction barrier.</p> <p>Provide an automatic fire alarm and detection system per the Alliance Standard. Visual and audible devices must be spaced appropriately based on occupancy type in accordance with NFPA 72.</p> <p>Install a class I 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.</p> <p>Install an automatic sprinkler system throughout the building designed by a qualified fire protection engineer. The hydraulic design of the sprinkler system has to 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 Alliance.</p> <p>Provide fire-resistive rated construction barriers between hazard types following Table 4.4.1 of Alliance Standard or Table 4.1.1 from BNBC Part 4. Consult a qualified fire protection engineer to design the required rated construction barrier.</p> <p>Modify current pump arrangement to meet current needs of system or install a pump dedicated for fire fighting or fire protection following the requirements of NFPA 20. 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. Acceptance testing of the installation shall be in accordance with NFPA 20, 22, and 24 testing requirements. Documentation of all testing shall</p>
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