

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

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Name of the Factory	: <b>DS Fashion Ltd</b>
Address of the Factory	: Manun Nagar, Gazipur Gazipur Dhaka Bangladesh
Present Status of the Factory	: <b>Under Operation</b>
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 05 Jun 2014
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	:

### **BASIC INFORMATION:**

There are Five buildings in the factory premises and they are one Main Building and four Ancillary Buildings. The following general information was noted:

i.	Building Usage Type	: Garments Factory.
ii.	Structural System	: RCC column supported trussed roof system structure
iii.	Floor System	: Trussed roof system
iv.	Floor Area	: 31132.9 sft
v.	No. of Stories	: Single storied.
vi.	Construction Year	: 2008
vii.	Foundation Type	: Isolated column footing
viii.	Design Drawings	: Available.
ix.	Soil investigation Report	: Available
x.	Construction Materials	: Reinforced Concrete and steel
xi.	Generator	: Single storied shed

### **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) : NA

Mid Term (6 Weeks) :

- 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. Have a qualified structural engineer document compliance with the seismic and wind requirements stated in the 2006 BNBC.
- iii. Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading.
- iv. Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard.
- v. Have a qualified structural engineer complete further analysis of the structure and develop a remediation plan if required.
- vi. 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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- vii. Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.
- viii. Under guidance from a qualified structural engineer, arrange a geotechnical investigation in the close vicinity of the structure and make the report available for review.
- ix. Have a qualified structural engineer provide further analysis of the identified cracks to determine the appropriate course of corrective action.
- x. Repair the exterior façade system to prevent water intrusion.

Long Term (6 Months) :

- i. Retrofitting is recommended as per assessment
- ii. Provide Certificates of Occupancy for review.

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

Immediate (3 to 6 Days)	<p>Find out the cause of the overheating and take proper action, including replacing cable or equipment where necessary.</p> <p>Remove all combustible materials within the room.</p>
Short Term (3 Weeks)	<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>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 actions.</p> <p>Switchboards and/or distribution boards should have capacity information labels e.g current carrying capacity of bus bar, rating of main incoming breaker, size of panel and permitted no. of CB, maximum permitted load connection capacity, etc.</p> <p>Install phase separators between terminal connections at the noted locations.</p>
Mid Term (6 Weeks)	<p>Need to remove looping of wiring/cables at circuit breakers.</p> <p>Provide protective cable guards for all cable runs from MDB to LT panels.</p> <p>Provide cable sockets for stranded conductors having a nominal cross-sectional area 6mm<sup>2</sup> or greater.</p> <p>Have a qualified electrical engineer develop an as-built single line diagram detailing key components and capacity of the electrical system.</p>

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Long Term (6 Months)	Develop an Insulation Resistance Measurement Program that ensures deterioration of insulation resistance will be identified quickly. Testing should be in compliance with InterNational Electrical Testing Association (NETA). All transformers, switchgears etc. shall be subject to an insulation resistance measurement test to ground after installation but before any wiring is connected. Insulation tests shall be made between open contacts of circuit breakers, switches etc. and between each phase and earth.
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### The recommendations for Fire Safety corrective actions are:

Immediate (3 to 6 Days)	N/A.
Short Term (3 Weeks)	<p>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.</p> <p>Post the occupant load for every assembly and production floor in a facility in a conspicuous space near the main exit or exit access doorway for the space.</p>
Mid Term (6 Weeks)	<p>Provide an automatic fire alarm and detection system per NFPA 72 as required by the Alliance Standard and arrange for direct connection of the system to a central station monitoring service or the Fire Service and Civil Defense. Until such time as 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 activation. An annunciator shall be located in a constantly attended location (such as a fire control room) to alert this person.</p> <p>Develop an emergency evacuation plan which includes the duties and responsibilities of various people/groups, interfacing between groups and the fire brigade, headcount and identification of trapped victims, physically disabled people and their rescue, etc., including 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 signs include emergency lighting is verified at least once per year. If battery-operated signs are used, these lights shall be tested on a monthly basis.</p>

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	<p>Functional testing of battery powered signs shall be provided for a minimum of 90 minutes, once per year.</p> <p>Apply to Bidyut Paridaptor for an electrician license. Apply to Gazipur City Corporation or proper authority for approval of the unapproved buildings.</p> <p>Apply to Gazipur City Corporation or proper authority for the issuance of an occupancy certificate and expedite the matter.</p> <p>Complete fire department pre-planning activities with the local Fire Service and Civil Defense.</p> <p>Install required identification signs. Signage must comply with NFPA 14 Chapter 6.</p>
<p>Long Term (6 Months)</p>	<p>Increase door widths to 0.8 m or greater by demolishing walls adjacent to the door. If this door is not required to satisfy the requirement of total exit width (based on occupant load) and maximum travel distance, eliminate this door.</p> <p>Replace all collapsible doors, sliding doors, roll-down gates, and shutters in means of egress with side-hinged, swinging-type doors of proper width.</p> <p>Train and certify at least 39 workers more (25 percent of total 258 nos occupant) in fire fighting, first aid and rescue by the proper authority.</p> <p>Install fire rated doors and windows or fill in unprotected openings with fire resistive rated assemblies.</p> <p>Provide an automatic fire alarm and detection system per the Alliance Standard. Pull stations at egress points, smoke detectors in air handling equipment, visual and audible devices must be spaced appropriately based on occupancy type in accordance with NFPA 72.</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>Fire department (Siamese) inlet connection and outlet connection (pillar hydrant) 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>

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	<p>Create a Fire Safety Director position and fill the position with an individual that has had sufficient training to be able to carry out the required duties. The duties of the Fire Safety Director shall include the following: (1) Establish internal and external rally points and communicate them to all employees in the building. (2) Fire department pre-planning. (3) Conduct safety inspections as outlined in Alliance Standard 13.9. (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 the process of request and approval by authorities, necessary checks prior to approval, standby fire watch and firefighting equipment, sounding of alarm procedures, duration and expiry of permit and re-approval procedures, etc.</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 m<sup>2</sup> (500 ft<sup>2</sup>). Limit dense deposits to 6 mm (¼ in.) and oil saturated deposits to 3.2 mm (⅛ in.).</p> <p>Establish an inspection, maintenance, and testing program for the standpipe and hose system. Program must comply with the requirements of NFPA 25 Chapter 6 Table 6.1.1.2.</p>
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