

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Jan Fabric
Address of the Factory	: Raj Hotel Market (2nd Floor) 154, Kazi Nazrul Islam Road, Chittagong, Bangladesh.
Present Status of the Factory	: Closed.
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 08 April 2014.
Fire & Electrical assessment conducted by:	Alliance
Date of Fire & Electrical Inspection	: 08 April 2014.

BASIC INFORMATION:

The present garment factory is a commercial building with beam-column frame system. The following general information was noted:

i.	Building Usage Type	: Mixed Use Building
ii.	Structural System	: RC frame (beam-column framing)
iii.	Floor System	: RC Beam supported slabs
iv.	Floor Area	: Total floor area 129,294 sft (Including 3-Buildings).
v.	No. of Stories	: All are 6 storied.
vi.	Construction Year	: 1980-1983.
vii.	Foundation Type	: Unknown.
viii.	Design Drawings	: Not available
ix.	Soil investigation Report	: Not available.
x.	Construction Materials	: Brick aggregate with 40 grade rebar.
xi.	Generator	: Ground floor, outside the building in a tin shade room.

RECOMMENDATIONS FOR CORRECTIVE ACTION:

The recommendations of corrective action for both Structural, Fire and Electrical Safety comprises in Short Term, Mid Term and Long Term basis.

The recommendations for Structural Safety corrective actions are:

Immediate (3 to 6 Days):

- i. Proper 'Propping' at a spacing of maximum 3' (feet) to be done all through up to 3rd floor for all columns along the beam line C & D.
- ii. 3rd to 5th (top Floor) must not be in operation or must not be further loaded until the recommendations of DEA are carried out.

Short Term (3 Weeks):

- i. Operations in the 2nd floor may continue after propping (as mentioned in ser-1). However the live load during the operations shall not exceed 1 KN/m² (20 psf) and no storage load should be allowed.
- ii. 3" dia cores (at least 3 numbers) have to be taken from columns of the top floor and be tested within 10 days (from the date of the Review Committee/Panel's findings).

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Mid Term (6 Weeks) : DEA has to be completed.

Long Term (6 Months) : Necessary remediation after completion of DEA.

The recommendations for Fire Safety corrective actions are:

<p>Immediate (3 to 6 days)</p>	<p>Remove all stored materials in the stairwells at the noted locations.</p> <p>Means of egress must be full free and clear from impediments, obstructions, and stored materials immediately.</p>
<p>Short Term (3 Weeks)</p>	<p>Remove all hasps, locks, slide bolts, or other locking devices at the noted locations.</p> <p>Remove all combustibles stored underneath the cutting tables at the noted locations.</p>
<p>Mid Term (6 Weeks)</p>	<p>Occupancy certificate (mention occupancy type) for each building.</p> <p>Make aisles marking with proper direction and provide minimum clear width of 36 inch. Keep aisles free of obstruction.</p> <p>Training programs need to be implemented and documented in accordance with the Alliance Safety Training Curriculum.</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 min once per year.</p> <p>Conduct fire drills on a quarterly basis as outlined in BNBC Part 4 Appendix A for all garment facilities with record keeping .These fire drills need to be conducted under the direction of a Fire Safety Director.</p> <p>Post occupant loads for every assembly and production floor in a conspicuous space near the main exit or exit access doorway for the space.</p> <p>Stair designation signs are provided at each floor entrance from the stair to the floor in English and Bengali. Signs indicate the name of the stair and the floor level. Signs are posted adjacent to the door.</p> <p>Complete and document fire department pre-planning activities with the local Fire Service and Civil Defense.</p>
<p>Long Term (6 Months)</p>	<p>Provide fire-resistive rated construction barriers at exit enclosures. Exits connecting three or fewer stories shall be enclosed with a minimum 1-hr fire resistance rating.</p>

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	<p>Install Pull stations at egress points, smoke detectors in air handling equipment, visual and audible devices spaced appropriately based on occupancy type in the factory main building and ancillary shed building. Reference NFPA 72.</p> <p>Install fire extinguishers for the Fabric store. Also install fire extinguishers at appropriate locations and heights based on hazard type per BNBC Part 4 and NFPA 10. Extinguishers shall be placed so that maximum travel distance to the nearest unit shall not exceed 30 m (100 ft.).</p> <p>Set up a Fire alarm and detection system central station monitoring service or direct connection to the Fire Service and Civil Defense. Assign a person at the facility to contact the fire department in the event of fire alarm activation.</p> <p>Provide side-hinged swinging type doors for all means of egress.</p> <p>Provide fire-resistive rated construction barriers between hazard types. Minimum 1-hr fire-rated wall and door for boiler room and minimum 1-hr fire rated door for fabrics store room.</p> <p>Establish an inspection, testing, and maintenance program for all fire extinguishers in accordance with NFPA 10.</p> <p>Install appropriate means of illumination at the noted locations. The source of illumination shall provide not less than 50 lux at the illuminated surface with a contrast of not less than 0.5 lux. Approved self-luminous signs, which provide evenly illuminated letters having a minimum luminance of 0.2 cd/m², may also be used.</p> <p>Provide an emergency power source for illuminated exit signs, either by battery back-up or by connecting to the emergency power system.</p> <p>Install continuous illuminated exit sign at all exit points. The source of illumination shall provide not less than 50 lux at the illuminated surface with a contrast of not less than 0.5 lux. Approved self-luminous signs which provide evenly illuminated letters having a minimum luminance of 0.2 cd/sq.-m may also be used.</p> <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.</p> <p>Installation of an automatic sprinkler system throughout the building.</p> <p>Develop a hot work permit program. The program must comply with the requirements of NFPA 51B</p> <p>Providing handrails on the other side of each stairway.</p>
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	<p>Separation of boiler rooms from the production floors with properly rated fire doors & protection of penetrations</p> <p>Need required number of people (trained and certified) in firefighting, first aid, and rescue training by the appropriate authority accordance with the Alliance Safety Training Curriculum.</p> <p>Install required fire rated door assemblies at all exits. Provide required fire-resistive rated opening protection (Door, Window, Hatch Cover etc.) at openings and penetrations through fire rated walls and/or assemblies. Consult a qualified fire protection engineer to design the required rated opening protection.</p> <p>Installation of an electrically driven fire pump to replace the non-compliant fire pump</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 m² (500 ft²). Limit dense deposits to 6 mm (¼ in.) and oil saturated deposits to 3.2 mm (⅛ in.)</p>
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The recommendations for Electrical Safety corrective actions are:

Immediate (3 to 6 Days)	Clean the generator room and keep it free of dirt, debris, and improperly stored materials.
Short Term (3 Weeks)	<p>Clean all the channels and provide covers of non-combustible materials on cable channels. Also establish a routine cleaning and maintenance program for all electrical panels and cable channels.</p> <p>Provide identification for emergency power switchboards and distribution boards.</p> <p>Light fixtures without protective covers (otherwise known as naked lights) shall not be allowed in storage areas or in any area where the Inspector of the Factories Rules (1.6.3.7) Part 53 disallows these fixtures. Install signs posted in Bengali and English, indicating this prohibition at all entrances to these areas.</p> <p>Develop and implement an electrical safety program. Include key topes such as lock out tag out procedures, personal protective equipment requirements, etc. Reference NFPA 70e for example program requirements.</p>
Mid Term (6 Weeks)	Provide a capacity information label which contains the current carrying capacity and size of main cable, rated capacity of circuit breaker and the busbar (with dimension). Display panel schedules posted on panels' door (inner side). Relocate the Distribution Board to a safe place where rain

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	<p>water may not enter.</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>Provide separate earthing arrangement with required earth installation (earth pit) for each facility and connect every electrical panel and equipment to required number of earth electrodes. Refer to the BNBC for required number of electrodes.</p> <p>Relocate the Distribution Board to a safe place where rain water may not enter.</p> <p>Consult a qualified electrical engineer to determine the ventilation requirements for the generator room.</p>
Long Term (6 Months)	<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>Provide 2 hour fire rated separation for generator room with fire rated door as per the regulation Alliance Standards Part 10 Section 3.4.2.1.3.</p> <p>Check all the cable and circuit breaker for finding the higher rated circuit breakers or lower rated cable. The rated current of a protective device (MCB, MCCB, fuse) must not exceed the current carrying capacity of any conductor in the circuit.</p>