

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: A & A Trousers LTD
Address of the Factory	: Haribaritek, Pubail College Gate, Pubail, Gazipur, Dhaka Bangladesh
Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 04 Jul-2014
Fire & Electrical assessment conducted by:	Alliance
Date of Fire & Electrical Inspection	: 04 Jul-2014

BASIC INFORMATION:

The present garment factory comprises of two buildings: one 3-storied building and one single storied shed. The following general information was noted:

i. Building Usage Type	: Garments Factory.
ii. Structural System	: Building-1 is 3-storied. 1 st floor of the building is monolithic RCC moment resisting frame with slabs, beams and columns. Other two floors are concrete slab over metal deck with steel beams and concrete columns. Foundation system is isolated spread footings. Building-2 is a single storied steel frame "shed" constructed with concrete columns and steel roof trusses.
iii. Floor System	: First floor is beam slab and second and 3 rd floor is concrete slab on steel deck in building-1. Steel roof truss system is used in building-2.
iv. Floor Area	: 124,200 sft.
v. No. of Stories	: 3 storied RCC + one shed
vi. Construction Year	: 2006-2008
vii. Foundation Type	: Unknown
viii. Design Drawings	: Not Available
ix. Soil investigation Report	: Available
x. Construction Materials	: RCC, steel beam and truss
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)	: 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.
Mid Term (6 Weeks)	:
	i. Complete further testing on areas of deterioration in order to understand the level of corrosion and potential weakening of the

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- members and have a qualified structural engineer to develop a remediation plan.
- ii. Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading. This should be completed for all buildings.
 - iii. Have a qualified structural engineer document compliance with the seismic and wind requirements stated in the 2006 BNBC. This should be completed for all buildings.
 - 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. This should be completed for all buildings.
 - v. Have a qualified structural engineer prepare credible as-built documents for unavailable parts of design documents based on the requirements of Part 8 Section 8.19 of the Alliance Standard including a design report. Note that in addition to other items, these documents should include a full set of as-built structural and architectural drawings with the signature and credentials of the structural engineer and architect (per 2006 BNBC requirements).
 - vi. Have a qualified structural engineer complete further analysis of the structure and develop a remediation plan if required. This should be completed for all buildings.
 - vii. Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.
 - viii. Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard.
 - ix. Have the exterior façade repaired to ensure prevention of dampness.
 - x. Provide signage or the appropriate markings at all areas used for storage to indicate the acceptable loading limits detailed in the Load Plan.
 - xi. Have a qualified structural engineer prepare load plans including the information required in Section 8.20 of the Alliance Standard. Floor load plans should be visibly posted on all levels of the building.
 - xii. Have a qualified structural engineer develop Floor Load Plans per the requirements of Part 8 Section 8.20.5.3.
 - xiii. Engage a qualified structural engineer to confirm and document that provisions have been made to accommodate water tanks on roof. If provisions have not been made, have a qualified structural engineer develop a remediation plan.
 - xiv. Provide Certificates of Occupancy for review.

Long Term (6 months) : NA

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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 as soon as possible.
Short Term (3 Weeks)	Remove all locking devices from all egress doors and means of egress components in accordance with Alliance Standard Section 6.8. If locks are required for security reasons, utilize special door locking features complying with NFPA 101.
Mid Term (6 Weeks)	<p>Impart training in accordance with Alliance Safety Training Curriculum and keep records with proper documentation.</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>Develop a testing and maintenance program that ensures the operation of all exit lights is verified at least once per year. If battery-operated lights are used, these lights shall be tested on a monthly basis. Functional testing of battery powered lights shall be provided for a minimum 90 min once per year.</p> <p>Post the occupant load for every assembly and production floor in a conspicuous space near the main exit or exit access doorway for the space.</p> <p>Arrange for direct connection of the fire alarm system to a central monitoring station or Fire Service and Civil Defense. Until that time that monitoring can be set up, arrange a monitoring system using factory's central detection system and personnel. A person shall be assigned to contact the fire department in the event of fire alarm activation.</p> <p>Complete fire department pre-planning activities with the local Fire Service and Civil Defense.</p> <p>Apply to PWD for issuance of occupancy certificates and pursue the matter's expedition.</p> <p>Obtain or renew all the licenses and permits required from the proper issuing authority.</p> <p>Install signage adjacent to each stair door indicating the stair name and the floor level at the noted locations in both English and Bengali.</p>
Long Term (6 Months)	<p>Install outward opening, side-swinging, self-closing, non-lockable fire doors of 1 hr rating in all stairwell enclosures.</p> <p>Install an automatic sprinkler system throughout the building designed by a qualified fire protection engineer comply with NFPA 13. Suggested deadline for start design within 31-Oct-14, complete design within 23-Jan-14 and</p>

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	<p>begin construction within 17-Apr-15.</p> <p>Seal the penetrations with proper fire-resistant sealants in all fire resistance rated walls. Seal openings that are not required with fire resistant construction barriers.</p> <p>Install outward opening, side-swinging, self-closing, non-lockable fire doors of required fire ratings.</p> <p>Replace all non-compliant doors and frames in the means of egress with doors that are listed, approved, automatic-closing, side-swinging, fire rated doors in compatible fire rated frames with latching panic hardware.</p> <p>Install dedicated fire pump 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 be submitted to the Alliance for review prior to final acceptance.</p> <p>Train at least 25% of workers in fire fighting, first aid and rescue by the proper authority.</p> <p>Provide fire-resistant rated construction barriers between floors. Consult a qualified fire protection engineer to design the rated construction barriers.</p> <p>Provide fire-resistive rated construction barrier according to Table 4.1.1 from BNBC Part 4. Consult a qualified fire protection engineer to design the required rated construction barrier.</p> <p>Install fire department connections where required and in compliance with the Standard. Fire department outlet connections 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 as demanded in Alliance Standard Part 13 Section 13.10.3.</p> <p>Provide handrails on both side of each stairway. Provide handrails mounted between the range 865 mm (34 in.) and 965 mm (38 in.).</p>
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	<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> <p>Develop a hot-work permit program. The program must comply with the requirements of NFPA 51B</p>
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The recommendations for Electrical Safety corrective actions are:

<p>Immediate (3 to 6 Days)</p>	<p>Disconnect the panel from the electrical service and clean interior components of all dust and debris. Seal all openings within the enclosure to prevent dust and debris from entering.</p> <p>Find out the cause of overheating and take proper action including replacing cable or equipment where necessary.</p>
<p>Short Term (3 Weeks)</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>Ensure light fixtures without protective covers are not installed in storage areas or in any area where the Inspector of the Factories Rules disallows these fixtures.</p> <p>Provide two separate points earthing (grounding) provided for generator.</p> <p>Ensure electrical connections at equipment, fixtures, etc. are properly secured.</p> <p>Ensure cable joints through porcelain/PVC connectors with PIB tape wound around joint.</p>
<p>Mid Term (6 Weeks)</p>	<p>Ensure distribution boards are metal enclosed with a dead front construction.</p> <p>Provide dedicated neutral for each circuit.</p> <p>Remove multi looping and bunch of cables at circuit breakers within distribution boards.</p> <p>Ensure 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.</p>

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	<p>Lead Led telecommunication or antenna cables separately to the main point of service. Power and telecommunications cables must have separate entrance.</p> <p>Provide electrical insulation mats in front of distribution boards. Service cable should be installed in covered trench as it is dangerous to be laid on the floor.</p> <p>Provide clearance of at least 1 m (39 in) in front of distribution boards.</p> <p>Have a qualified electrical engineer develop an as-built single line diagram detailing key components and capacity of the electrical system.</p>
Long Term (6 Months)	<p>Consult with an expert engineer to have design and drawing of lightening protection system and ensure your building is secured.</p>