

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Vintage Print & Arrow Labels.
Address of the Factory	: 33/1, Darail, Shataish Tongi, Gazipur, Dhaka
Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 26-Apr-14
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 27-Apr-14 & 26-Apr-14

BASIC INFORMATION:

There are 4 buildings in the factory premises out of which one is main production building. The following general information was noted:

- i. Building Usage Type : Garments Factory.
- ii. Structural System : prefabricated steel structure.
- iii. Floor System : None.
- iv. Floor Area : 4,900 sft
- v. No. of Stories : Single storied.
- vi. Construction Year : 2008-2011
- vii. Foundation Type : Isolated footing
- viii. Design Drawings : Available.
- ix. Soil investigation Report : Available
- x. Construction Materials : MS steel.
- 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.
- 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 for further testing and analysis of distress, settlement, shifting, or cracking in columns or walls and provide a remediation plan to correct noted issues.
- ii. Conduct ferro-scanning in the required location for preparing as-built structural drawing to confirm the reinforcement
- iii. Engage a qualified structural engineer to confirm and document that provisions have been made to accommodate concentrated loads. If provisions have not been made, have a qualified structural engineer develop a remediation plan.
- iv. Engage a qualified structural engineer to develop the required documents to confirm the structural integrity of the buildings. Documents must comply with the Alliance Standard Part 8 Sections 8.19 and 8.20
- v. Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading.
- vi. Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard.
- vii. Have a qualified structural engineer develop Floor Loading Plans per the requirements of Part 8 Section 8.20.5.3.
- viii. 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 all buildings.
- ix. Provide signage or the appropriate markings at all areas used for storage to indicate the acceptable loading limits detailed in the Load Plan.
- x. Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.
- xi. Engage a qualified structural engineer for further analysis of the identified cracks to determine the appropriate course of corrective action.

Long Term (6 Months)

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- i. Provide a protective coating to all structural elements that are constructed with MCAC and exposed to rainfall or other sources of water. Have the protective coating approved by the Alliance or a qualified structural engineer. In the alternative, provide a 2% slope on the exposed surfaces to prevent accumulation of water.
 - ii. Apply for issuance of the Certificates of Occupancy and pursue the matter to obtain the same.

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The recommendations for Electrical Safety corrective actions are:

Immediate	N/A
Short Term (3 Weeks)	<p>Develop and implement an electrical safety training program. Include key topics such as lock out tag out procedures, personal protective equipment requirements, etc. Keep records of completed training on site.</p> <p>Remove the table in front of the distribution board so there is a minimum of 1 m clearance in front of it.</p> <p>Provide electrical insulation mats in front of distribution boards.</p> <p>Provide firefighting equipment (preferably ABC type) inside generator room.</p> <p>Install phase separators between terminal connections. Verify phase separators are installed at all remaining locations.</p>
Mid Term (6 Weeks)	<p>Have an Electrical Engineer prepare as-built electrical drawings of all electrical installations according to existing electrical system.</p> <p>Provide earthing connection to all exposed-conductive parts (metal) related to/in close proximity to electrical equipment/installation and utility service such as metallic water/gas/steam pipes etc. such that all the metals remain at a substantially same potential of building earthing system.</p> <p>Keep the load balanced across all three phases and avoid overloading. Terminate all cables at circuit breakers tightly using lugs of proper size (punched by proper lug puncher and crimping tool).</p> <p>Cables must be terminated to MCCB/ bus bar using lugs according to respective cable size. Use appropriate crimping tool or lug puncher (hydraulic preferably) for punching the lugs/cable sockets.</p> <p>Provide permanent identification marking mentioning name of panels or write the panel name on a durable material sheet posted on panel door.</p> <p>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.</p>
Long Term (6 Months)	<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>

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The recommendations for Fire Safety corrective actions are:

Immediate	N/A
Short Term (3 Weeks)	Keep the doors lock free in the direction of egress under any conditions. All hasps, locks, slide bolts and other locking devices shall be removed where available.
Mid Term (6 Weeks)	<p>Install automatic fire detection and alarm system throughout the factory per NFPA 72. Until that time a central station monitoring service or direct connection to the Fire Service and Civil Defense can be set up; a person needs to be assigned to contact the fire department in the event of fire alarm activation. An annunciator needs to be located in a constantly attended location to alert this person. Trouble or alarm notifications shall be indicated on the fire alarm control panel.</p> <p>Develop an emergency evacuation plan which includes all components required by the Alliance Standards and communicate the plan to all employees.</p> <p>Post up to date emergency egress maps at the entrance to each exit or main point of egress.</p> <p>Occupant load shall be posted for every assembly and production floors at a conspicuous space near the main exit or exit access doorway for the space.</p> <p>Complete fire department pre-planning activities with the local Fire Service and Civil Defense.</p> <p>All applicable permits and license shall be kept up to date including BEREC waiver certificates for generator.</p> <p>"Obtain an occupancy certificate for each building and ancillary structures from the approving authority."</p>
Long Term (6 Months)	<p>Replace all non-compliant doors and frames in the means of egress with sides swinging opening in the direction of egress type doors in accordance with Alliance Standard.</p> <p>Provide training for the required number of people (25 % of total workers as per Fire Service and Civil Defense) certified in firefighting, first-aid, and rescue training by Bangladesh Fire Service and Civil Defense.</p> <p>"Provide fire-resistive rated opening and penetration protection for rated walls and assemblies in accordance with Alliance Standard. Consult a qualified fire protection engineer to design the required opening protective or penetration systems"</p> <p>Modify or install the standpipe system to meet the requirements of BNBC 2006, Part 4 Chapter 4 Equipment and In-built Facilities with a minimum pressure of 29 psi/200 kPa/2 Bar at the hydraulically most remote hose connection. Number of hose connection in a floor shall comply with the requirement of BNBC 2006.</p> <p>Install new dedicated fire pump in accordance with BNBC 2006 Part 4 Chapter 4 Section 4.2.6 Fire pump to supply the</p>

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	<p>water demands for the fire protection systems along with a stored source of water. Once new fire pump is installed, establish an inspection, testing, and maintenance program for the fire pump. Program shall comply with the requirements of BNBC 2006 Part 4 Chapter 4 Section 4.2.7 Inspection, testing and maintenance. The system shall be maintained for safe operating conditions and tested at least once per year.</p> <p>Consult a qualified fire protection engineer to design the pull stations at egress points, centralized and addressable smoke detectors all through the building, visual and audible devices spaced appropriately based on occupancy type. Reference NFPA 72.</p> <p>Provide fire-resistive rated construction barriers between hazard types in accordance with Alliance Standard. Rooms used for housing generator, oil filled transformer, shall be separated from the surrounding occupancy with a minimum 2-hour fire rated construction barrier (floor, wall, roof) with 1.5-hour fire rated opening protection (doors, windows, etc.). Consult a qualified fire protection engineer to design the required rated construction barrier with opening protection.</p> <p>Provide fire department connections to allow fire department pumper vehicles to pump water into the standpipe system and another to draft water from ground-level or underground water storage tanks with identification mark in accordance with BNBC 2006 Part 4 Chapter 4 Section 4.2.3.13. The Siamese connection shall be easily accessible to the fire engine.</p> <p>Install handrails on the both side of the stairs and intermediate handrail when the width of the stair exceed 2.20 m. A minimum height of 865 mm (34 in.) and a maximum height of 965 mm (38 in.) as measured from the leading edge of the tread need to be maintained when installing new handrails. The spacing between vertical members will not exceed 200 mm (8 inch) up to a height of 865 mm (34 inch).</p> <p>Install Illuminated exit signs with backup power and continuous graphics at entrances to exits and along the path of egress anywhere the continuation of egress is not obvious or there is a change in the direction of the path of travel.</p> <p>"Establish an inspection, testing, and maintenance program for all fire extinguishers. Program needs to comply with the requirements of NFPA 10 Chapter 7."</p> <p>Establish an inspection, testing and maintenance program for the standpipe and hose system. Program shall comply with the requirements of BNBC 2006, Part 4 Chapter 4 Section 4.2.7 Inspection, testing and maintenance. The system shall be maintained for safe operating conditions and tested at least once per year.</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</p>
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	reschedule skipped cleanings. Provide a documented line of authority for authorizing a cleaning delay and rescheduling."
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