

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Tusuka Fashions Limited
Address of the Factory	: Plot #10, Block # B, Mill Gate, Tongi Industrial Area, Gazipur, Dhaka, Bangladesh
Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 5-Dec-13
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 30-Jan-14
BGMEA Membership No	: 3376

BASIC INFORMATION:

There is 02 main production building in the factory premises and 2 are ancillary buildings. The buildings are named as: Building 1: 2 storied Partially 4 storied RC building, Building 2: 1-storied steel shed. The following general information was noted:

- i. Building Usage Type : Garment Factory.
- ii. Structural System : One RC building and one steel shed building (moment resisting frames with RC spread footings).
- iii. Floor System : RCC beam column and steel frame system
- iv. Floor Area : 46500 SF.
- v. No. of Stories : Building 1: 2 storied Partially 4 storied RC building.
Building 2: 1-storied steel shed.
- vi. Construction Year : 2000
- vii. Foundation Type : RC spread footings
- viii. Design Drawings : Available.
- ix. Soil investigation Report : Available.
- x. Construction Materials : Reinforced Concrete and steel frame.
- 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 : N/A

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

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vendors and be responsible to ensure that the factory operational loads do not at any time exceed the factory floor loading limits as described on the Floor Loading Plans.

Mid Term (6 Weeks)

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- i. A qualified structural engineer shall checked those 5 columns.
- ii. Obtain the concrete compressive strength via destructive core testing at representative column locations and reassess FoS calculations. Also, per section 3.D.10 of the Assessment Protocols.
- iii. A qualified structural engineer assesses the durability aspects as suggested in Alliance Standard Part 7 Section 7.2 and takes appropriate remedial measures. This assessment should include destructive core sample testing of concrete compressive strength.
- iv. Water tanks and racks shall be adequately anchored and braced to resist earthquake force as per BNBC and Alliance Standard.
- v. A qualified structural engineer shall be engaged 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
- vi. 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.
- vii. "Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading and storm surge loading. This should be reflected in the design report."
- viii. A qualified structural engineer shall be engaged to prepare credible as-built documents based on the requirements of Part 8 Section 8.19 of the Alliance Standard.
- ix. A qualified structural engineer develop Floor Loading Plans per the requirements of Part 8 Section 8.20.5.3.
- x. 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 at each level of the building.
- xi. Provide signage or the appropriate marking at all areas used for storage to indicate the acceptable loading limits detailed in the load plan.

Long Term (6 Months)

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- i. Obtain an occupancy certificate for each building structures from the approving government authority.
- ii. Depending on the findings of the Detail Engineering Assessment, permanent remedial measures should be conducted for the safety of the building.

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The recommendations for Electrical Safety corrective actions are:

Immediate (3 to 6 Days)	<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>Find out the cause of overheating, overloading, or signs of burning and take proper action. Consider replacement of equipment immediately if necessary.</p>
Short Term (3 Weeks)	<p>Ensure proper identification of emergency power switchboards, distribution boards, and circuits</p> <p>.Provide two separate points of earthing (grounding) by distinct connections for each generator.</p>
Mid Term (6 Weeks)	<p>Provide capacity information labels (Maximum current rating, no of circuit breakers etc.) for switchboards and/or distribution boards.</p> <p>Consult with a qualified Electrical Engineer and ensure electrical cables are sized according to capacity of circuit breakers.</p> <p>Separate the multiple cables either using proper size of circuit breakers or connecting separately on bus bars as per requirements.</p> <p>Recommend engaging a licensed electrician or electrical contracting firm to rectify all non-conforming and unsafe electrical works throughout the entire complex.</p> <p>Ensure all electrical wiring/cable is properly terminated at its point of termination.</p>
Long Term (6 Months)	<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>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> <p>Complete thermo graphic scans at least on a three year cycle.</p>

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	<p>Thermo graphic 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>Establish an inspection testing, and maintenance program for the Uninterruptable Power Supply (UPS) and associated components. The program must based on the following:</p> <ol style="list-style-type: none"> (1) Manufacturer's recommendations (2) Manufacturer's instruction manuals (3) Minimum Requirements of NFPA 111 Chapter 8 (4) Minimum Requirements of NFPA 70B Chapter 28
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The recommendations for Fire Safety corrective actions are:

Immediate (3 to 6 Days)	NA
Short Term (3 Weeks)	Smoking shall be prohibited in any garment factory building, separate storage building, or any building or area where the Inspector of the Factories Rules (1.6.3.7) Part 53 requires that smoking be prohibited. If an Owner creates a designated smoking area outside the buildings, information on the location of these designated areas shall be posted on the signs required in 13.5.2.
Mid Term (6 Weeks)	<p>Install new automatic fire detection alarm system throughout the factory in accordance with NFPA 72. Until that time a central station monitoring service or direct connection to the Fire Service and Civil Defence 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.</p> <p>Training programs need to be implemented and documented in accordance with the Alliance Safety Training Curriculum.</p> <p>Occupant load signage should be posted for every assembly and production floor, 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 Defence.</p> <p>Install signage at required locations and on required equipment. Signage must comply with NFPA 14.</p> <p>Post stair designation signs at each floor entrance at all stairs in English and Bengali. Signs shall indicate the name of the stairway, the floor level, where the exit discharges to and what floor it originates on. Signs shall be posted adjacent to the door in each floor landing.</p>

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Long Term (6 Months)	<p>In existing construction, stairs shall have a minimum width of 0.9 m (35 in.).</p> <p>Replace non-compliant doors and frames in the means of egress with side-swinging doors. Replacement doors shall be a minimum width of 0.8 m (32 in), and are listed, approved, self-closing, fire rated doors assemblies (door and frame) with latching panic hardware.</p> <p>Install fire-resistive sealant products to provide the required degree of protection for rated walls and assemblies in accordance with the standard.</p> <p>Consult an experienced fire protection specialist to aid in the site specific design requirements for the installation of a standpipe system to meet NFPA 14. Ensure this plan is approved by an engineer; install, test and commission all necessary components of the system and keep records.</p> <p>Provide fire-resistive rated construction barriers and associated opening protection for exit enclosures in accordance with Alliance Standard Section 6.3.1.2. . Consult a qualified fire protection engineer to design the required rated construction barriers</p> <p>Install a dedicated fire pump for the facility in accordance with NFPA 20. Also, to supply the demands of the connected fire protection systems along with a stored source of water sufficient to meet the demands in accordance with NFPA 22. 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 by the Alliance as per clause 5.5.5. Acceptance testing of the installation shall be in accordance with NFPA 20, 22, and 25 testing requirements. Documentation of all testing shall be submitted to the Alliance for review prior to final acceptance by the Alliance.</p> <p>Install initiating devices and notification appliances as required by the Alliance Standard and NFPA 72. Devices should be part of an automatic fire alarm and detection system for the facility. All fire alarm installations shall be submitted for review by the Alliance prior to commencement of installation</p> <p>Provide Fire Department (Siamese) connections in accordance with Alliance Standard Section 5.5.4. Connections shall match the Fire Service and Civil Defence hose thread standard.</p> <p>Install an additional handrail to each stairway where only one is currently installed as per the height and distance requirements set out in the standard.</p> <p>Produce, establish and enforce a written policy and procedure for housekeeping to ensure scheduled cleaning of all floors, walls, ceilings, air ventilation systems and other building components. Ensure the timely removal of defective, waste and rubbish materials is included. As a general rule the maximum tolerable deposit thickness for</p>
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	<p>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>Create a Fire Safety Director position and fill the position with an individual that has had sufficient training to be able to carry the required duties.</p> <p>Establish an inspection, maintenance, and testing program for the standpipe and hose system. Program must comply with the requirements of NFPA 25.</p> <p>Establish an inspection, testing, and maintenance program for the fire pump. Program must comply with NFPA 25.</p>
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