

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Delta Fashions Ltd.
Address of the Factory	: Fleet Club Shopping Complex, Stand Road, Double Mooring
Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 20-Mar-2014
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 20-Mar-2014
BGMEA Membership No	: 2255

BASIC INFORMATION:

The present garment factory comprises of one main building and two ancillary buildings. The following general information was noted:

i.	Building Usage Type	: Garments Factory
ii.	Structural System	: Reinforced Concrete Frame
iii.	Floor System	: Beam supported slab
iv.	Floor Area	: 81,472 SF
v.	No. of Stories	: Main Production Building - Ground + 6 elevated floors + Roof + Partial Steel Roofing
vi.	Construction Year	: 1994
vii.	Foundation Type	: Unknown
viii.	Design Drawings	: Available but not fully credible.
ix.	Soil investigation Report	: Unknown.
x.	Construction Materials	: Reinforced Concrete for RCC portion.
xi.	Generator	: Unknown.

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 loading limits as described on the Floor Loading Plans.

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Mid Term (6 Weeks)

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- i. Have under guidance from a qualified structural engineer, arrange a detailed engineering assessment of the structure, including destructive materials testing.
 - ii. Have a qualified structural engineer prepare credible as-built documents based on the requirements of Part 8 Section 8.19 of the Alliance Standard.
 - iii. Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading as per BNBC and alliance standard.
 - iv. Have a qualified structural engineer confirm that capacity to support the load is available. Load Plans complying with Alliance Standard Part 8 Section 8.20.4.3 should also be developed.
 - v. 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
 - vi. "Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard for Fire and Structural Integrity section 8.18."
 - vii. Under guidance from a qualified structural engineer arrange geotechnical investigation at close vicinity of the structure and make the report available for review.
 - viii. Provide signage or the appropriate markings at all areas used for storage to indicate the acceptable loading limits detailed in the Load Plan.
 - ix. Have a qualified structural engineer prepare load plans including the information required in Section 8.20.5.3 of the Alliance Standard and posted in each floor desalinated areas as per standard.
 - x. Have a qualified structural engineer develop Floor Loading Plans per the requirements of Alliance Standard Part 8 Section 8.20.5.3
 - xi. to RMG 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."

Long Term (6 Months)

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- i. "Provide Certificates of Occupancy for review."

The recommendations for Electrical Safety corrective actions are:

<p>Immediate (3 to 6 Days)</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>Find out the causes of overheating and take proper action</p>
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	including replacing cable or equipment where necessary.
Short Term (3 Weeks)	<p>Provide additional light fixtures to increase illumination levels provided in the BNBC.</p> <p>Required equipment and safety signage should be posted within the room.</p>
Mid Term (6 Weeks)	<p>Consult with a qualified electrical engineer and ensure electrical wiring/cables are sized according to capacity of circuit breakers.</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 dedicated neutral for each circuit.</p> <p>Consult with an expert fire protection engineer and make sure the generator room is fire rated as per Alliance standard section 3.4.2.1.3 & 3.4.2.1.4</p> <p>Ensure overcurrent protection device (circuit breaker) for each and every loads.</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> <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>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>Provide cable shaft for the whole building. Wiring and cables are arranged in shaft for ease of inspection and maintenance.</p>

The recommendations for Fire Safety corrective actions are:

Immediate (3 to 6 Days)	<p>Remove tripping hazards including thresholds and pipes on the roof. Install 1:12 ramps instead of thresholds. Remove clutter from storage area. Remove all excess storage from office areas.</p>
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Short Term (3 Weeks)	<p>Remove all hasps, locks, sliding gates and doors, tracks, and other non-compliant devices.</p> <p>Limit the number of allowable occupants per floor to 285 on all floors. Alternately, provide automatic sprinkler protection throughout the building to increase the width factor and allow 456 occupants.</p>
Mid Term (6 Weeks)	<p>Install occupant load signs at every floor landing in each stair.</p> <p>Install stair designation signs at every floor landing.</p>
Long Term (6 Months)	<p>Remove all existing gates from egress paths.</p> <p>Install listed, labeled, approved, automatic-closing, side-swinging, fire rated doors in fire rated frames with latching panic hardware. These doors should be a minimum of 39 inches wide with a total opening of at least half the width of the stair. Doors should swing in the direction of egress from the floors into the stair.</p> <p>Remove sliding doors and all associated hardware. Install listed, approved, automatic-closing, side-swinging doors that swing in the direction of egress.</p> <p>Install a listed firestop system at every penetration through a fire wall.</p> <p>Install a Class I standpipe system in the building with fire department valves at the floor landings in each stair. The standpipe will be part of the combined standpipe/sprinkler system supply. Standpipes should be designed to supply 250 gpm at 100 psi at the four most remote fire department valves.</p> <p>Install listed firestop systems at every penetration through floors.</p> <p>Protect all egress stairs with a shaft enclosure including 2-hour fire-rated construction. Install fire rated doors.</p> <p>Install a fire pump that will deliver the greatest calculated requirement of the sprinkler and standpipe systems. Design per NFPA 20 and submit for approval.</p> <p>Design and install fire alarm system per NFPA 72. Install pull stations at each entrance to an exit. Install notification horns and strobes so that all occupants are notified in an alarm. Extend the fire alarm to all areas of the building including tenant spaces.</p> <p>Arrange for direct connection of the fire alarm and detection system to a central station monitoring service or the Fire Service and Civil Defense as per Alliance Standard Part 5 Section 5.7.5 Monitoring. Until that time that 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</p>

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	<p>alert this person.</p> <p>Provide fire-resistive rated construction barriers between hazard types in accordance with Alliance Standard Sections 3.4.2 and 4.5. Consult a qualified fire protection engineer to design the required rated construction barrier.</p> <p>Install handrails on both sides of all stairs. Install handrails at stair discharge steps and ramps.</p> <p>Provide illumination of egress paths at all times the building is occupied. Illumination needs to be a minimum of 10 lux for all corridors, exit doors, and stairways. Illumination for aisles needs to be a minimum of 2.5 lux.</p> <p>Provide continuously illuminated exit signs at all required exits and along egress paths, especially where path has a change of direction.</p>
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