

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Crazy Fashion Ltd.
Address of the Factory	: Civil Engineer's tower, ind. Plot 1, Block-E, Avenue 1, Section-11, Mirpur, Dhaka, Bangladesh
Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 31-May-2014
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 26-May- 14
BGMEA Membership No	: 1560

BASIC INFORMATION:

The present garment factory comprises of 3 buildings in the factory premises out of which one is main building and 2 are ancillary buildings. The buildings are named as: 1) Nineteen story main production building (with single basement), 2) Single story masonry construction with tin roof (Ancillary-01) and 3) Single story masonry construction utility shed with tin roof (Ancillary-02). The following general information was noted:

i. Building Usage Type	: Garments Factory
ii. Structural System	: The building is monolithic RCC flat plate structure.
iii. Floor System	: Flat slab
iv. Floor Area	: Total area of all buildings on the premises: 231,306 sft.
v. No. of Stories	: 1) Nineteen story main production building: Stories above grade: 19 (18 floors and occupied roof), Stories below grade: 1, Occupied levels: 20. 2) Single story masonry construction with tin roof (Ancillary-01): Stories above grade: 1, Stories below grade: 0, Occupied levels: 1. 3) Single story masonry construction utility shed with tin roof (Ancillary-02): Stories above grade: 1, Stories below grade: 0, Occupied levels: 1.
vi. Construction Year	: 1999
vii. Foundation Type	: Mat foundation.
viii. Design Drawings	: Available but not fully credible.
ix. Soil investigation Report	: Unknown.
x. Construction Materials	: Reinforced Concrete for RCC building.
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. 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

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Manager shall serve as an ongoing resource to RMG vendors and be responsible for ensuring 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. Connect Develop a program to ensure that all live loads, for which a floor or roof has been designed, will not be exceeded. The designated Load Manager shall oversee this program and ensure it is enforced.
- ii. Have a qualified structural engineer confirm that capacity to support the load is available. Load Plans, complying with the Alliance Standard Part 8 Section 8.20.4.3, should also be developed.
- iii. Have a qualified structural engineer complete further analysis of the structure and develop a remediation plan if required.
- iv. Have a qualified structural engineer prepare the design report and submit to BV for review.
- 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 the Alliance Standard.
- vii. Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.
- viii. Have a qualified structural engineer develop Floor Loading Plans, per the requirements of Part 8 Section 8.20.5.3.
- ix. Have a qualified structural engineer prepare Load Plans, including the information required in Section 8.20 of the Alliance Standard, and post them accordingly. Floor load plans should be visibly posted on all levels of all buildings.
- x. Provide signage or the appropriate markings 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. Apply for issuance of Certificates of Occupancy and pursue the matter to obtain the same.

The recommendations for Electrical Safety corrective actions are:

Immediate (3 to 6 Days)	Ensure signage indicating the prohibition of light fixtures without protective covers is installed at the required locations.
Short Term (3 Weeks)	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. Provide clearance of at least 1m (39in.) in front of

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	switchboards and distribution boards.
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>Provide dedicated neutral for each circuit.</p> <p>Ensure switchboards and panel boards are not installed above gas stoves or sinks or within 2.5m of any washing unit in washing rooms or laundries.</p> <p>Ensure a means for the proper identification of the wiring is obtained by separate color coding, marking tape, tagging, or other approved means.</p> <p>Ensure cable joints are through porcelain/PVC connectors with PIB tape wound around joint.</p>
Long Term (6 Months)	<p>Provide an earthing/grounding system for all metal in the building.</p> <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>

The recommendations for Fire Safety corrective actions are:

Immediate (3 to 6 Days)	<p>Remove all combustibles stored underneath the cutting tables at the noted locations.</p> <p>Keep means of egress continuously free and clear of all obstructions or impediments for full instant use in the case of fire or other emergency. Remove all locks or other devices installed on a means of egress component that would prevent any occupant from having safe egress from the building or structure.</p>
Short Term (3 Weeks)	<p>Remove all hasps, locks, slide bolts, or other locking devices at the noted locations. Doors may be locked where the latch and lock are disengaged with one motion where the occupant load does not exceed 49 persons. Turning a door handle and disengaging a lock is considered two motions. Doors may be provided with locking hardware from the ingress side provided that a panic bar is installed on any door with an occupant load exceeding 49 persons. Re-entry provisions must be met.</p> <p>Provide childcare direct access to staircase if it remains on 6th floor or shift the childcare to the ground floor and make sure it has a maximum travel distance of 9 m to the exit discharge.</p>

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<p>Mid Term (6 Weeks)</p>	<p>Post the occupant load for every assembly and production floor in a facility in a conspicuous space near the main exit or exit access doorway for the space.</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 signs shall be tested on a monthly basis. Functional testing of battery powered signs shall be provided for a minimum 90 min once per year.</p> <p>Impart training in accordance with Alliance Safety Training Curriculum and keep record with proper documentation.</p> <p>Develop a testing and maintenance program that ensures the operation of all exit signs is verified at least once per year. If battery-operated signs are used, these signs shall be tested on a monthly basis. Functional testing of battery powered signs shall be provided for a minimum 90 min once per year.</p> <p>Arrange for direct connection of the fire alarm system to a central monitoring station or Fire Service and Civil Defense as per the Alliance Standard. Until that time that monitoring can be set up, arrange a monitoring system using factory's own central detection system and personnel. 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 alert this person.</p> <p>Develop an emergency evacuation plan which includes duties and responsibilities of various people/groups, interfacing between groups and fire brigade, headcount and identification of trapped victims, physically disabled people and their rescue, etc. and all components required by the Alliance Standards and communicate the plan to all employees.</p> <p>Obtain or update all the licenses and permits required from the proper issuing authority from the proper issuing authority.</p> <p>Complete fire department pre-planning activities with the local Fire Service and Civil Defense.</p> <p>Install NFPA-compliant identification signs at the noted locations.</p> <p>Install signage adjacent to each stair door indicating the stair name and the floor level at the noted locations.</p>
<p>Long Term (6 Months)</p>	<p>Exit access corridors serving an occupant load exceeding 30 are to be separated by walls with a fire resistance rating of 1 hr unless provided with an automatic sprinkler protection throughout the story or building. Window and glass block assemblies are to be tested for fire rating following NFPA 257 requirements.</p> <p>Remove existing aisle markings and draw new markings to fulfill the minimum aisle width requirement. Relocate the</p>

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	<p>machines accordingly if necessary.</p> <p>Install fire rated doors and windows or fill in unprotected openings with fire resistive rated assemblies.</p> <p>Install an automatic sprinkler system throughout the building designed by a qualified fire protection engineer. The hydraulic design of the sprinkler system must be pre-approved by CoE of the Alliance. All installation and design requirements outlined, in BNBC Part 4 Chapter 4, shall be replaced by the requirements of NFPA 13. Pipe schedules shall not be used to size pipe. All systems shall be hydraulically calculated to meet NFPA 13 design requirements. For installation of the new automatic sprinkler system, shop drawings and hydraulic calculations will be required as per NFPA 13 requirements. The test and performance report of the installed system has to be submitted to the Alliance for review. Final inspection and testing shall be witnessed by the Alliance.</p> <p>Install a NFPA 14-compliant standpipe system at required locations designed by a qualified fire protection engineer. All standpipe system installations and hydraulic calculations shall be submitted for review by the Alliance prior to commencement of installation.</p> <p>Close or fit doors that swing in the direction of egress, side-swinging, self-closing, non-lockable fire doors of 1.5 hour rating in all stairwell enclosures. Close or provide 1.5 hour fire barrier to all the opening of staircase wall facing towards production or storage. Consult a qualified fire protection engineer to design the required rated construction barriers.</p> <p>Train and certify at least 836 workers (25 percent of total workers) in firefighting, first aid and rescue by the proper authority.</p> <p>Either seal the exits at stair-3 and stair-4 as these stairs are not required as per current highest occupant load on a single floor or provide 1.5 hr fire protective opening assemblies in 2 hr rated exit enclosures. Exits connecting four or more stories shall be enclosed with a minimum 2-hr fire-resistance rating.</p> <p>Provide a shaft enclosure of required rating by constructing an enclosure of required thickness and protect openings with fire-rated assemblies.</p> <p>Provide hydraulic calculations for current fire pumps and if these do not meet the needs of the systems then, install a pump dedicated to firefighting or fire protection following the requirements of NFPA 20. Fire pump is to be connected to an alternative power source, such as a diesel generator, and the generator is to be connected with an ATS (auto starter). Fire pump installation is to be tested for final acceptance in presence of the Alliance and a final inspection of the installation shall be conducted by the Alliance prior to final acceptance. Acceptance testing of the installation shall be in accordance with NFPA 20 testing requirements. Documentation of all testing shall be</p>
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	<p>submitted to the Alliance for review prior to final acceptance by the Alliance.</p> <p>Remove aisle markings and mark aisles again so that these are not blocked by any permanent elements like columns. Remove movable items blocking aisles.</p> <p>Provide fire-resistive rated construction barriers between hazard types following Table 4.4.1 of Alliance Standard. Consult a qualified fire protection engineer to design the required rated construction barriers. Rooms used for storage of combustible materials shall be separated from the surrounding occupancies with a minimum 1 hour construction. In-process storage open to the surrounding occupancy is not required to be separated when the floor is provided with an automatic sprinkler. Keep the in-process goods within a maximum area of storage of 250 sft, height 8 ft, and separated from adjacent area by 10 ft.</p> <p>Install illuminated exit signs 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>Provide handrails on both side of each stairway in accordance with Alliance Standard. Provide handrail of height between the range 865 mm (34 in.) and 965 mm (38 in.).</p> <p>Install proper signage for the existing fire department connections where required and in compliance with the Standard.</p> <p>Every door in a stair enclosure serving more than 5 stories shall be provided with re-entry unless it meets the following requirements. Stair doors may be permitted to be locked from the stair (ingress) side that prevents re-entry to the floor provided at least two floors allowing re-entry to access another exit are provided, there are not more than 4 stories intervening between re-entry floors, re-entry is allowed on the top or next to top level, reentry doors are identified as such on the stair side, and locked doors shall be identified as to the nearest re-entry floors. When the discharge floor is determined to be a required re-entry floor using the above requirements, re-entry does not have to be provided back into the building on this level.</p> <p>Develop a NFPA 51B-compliant hot-work permit program. In general, this program should address the process of request and approval of authorities, necessary checks prior to approval, standby fire watch and firefighting equipment, sounding of alarm procedures, duration and expiry of permit and re-approval procedures, etc.</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</p>
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	46.5 m ² (500 ft ²). Limit dense deposits to 6 mm (¼ in.) and oil saturated deposits to 3.2 mm (⅛ in.).
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