

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Tip Top Fashions Ltd
Address of the Factory	: Civil Engineers Tower, Industrial Plot-1, Block -E, Avenue-1, Section-11, Mirpur, Dhaka.
Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 31-May-14
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 26-May-14
BGMEA Membership No	: 1561

BASIC INFORMATION:

There are 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), 3) single story masonry construction utility shed with tin roof (Ancillary-02) The following general information was noted:

i. Building Usage Type	: Garment Factory.
ii. Structural System	: RCC flat plate structure
iii. Floor System	: RCC flat plate structure
iv. Floor Area	: 155,072 sft.
v. No. of Stories	: Main Building: 19 storied RCC building Ancillary Building: 2 PEB
vi. Construction Year	: 1999
vii. Foundation Type	: Mat foundation
viii. Design Drawings	: Available.
ix. Soil investigation Report	: Available.
x. Construction Materials	: Reinforced Concrete
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	:	
		i. The density of operation in the storage of fabric rolls in fifth and third floors exceeds 42 psf and there is no analytical confirmation this load can be supported. Reduce the load.
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.

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- 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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- ii. There is no program in place to ensure that the live loads for which a floor or roof is or has been designed will not be exceeded.
- iii. The structure is a flat plate system, therefore the lateral load system is not apparent and the redundancy is unknown.
- iv. A set of design documents is available on site for review. The design report is required, as per BNBC 2006 Clause 1.9.1.1, but is unavailable.
- v. There is no clear information available on the design document to understand the consideration of storm surge and wind loading, in the design of the building.
- vi. On the 3rd, 5th, 13th, 14th and 16th floors, racks that are not braced for earthquake force are present.
- vii. Some water ponding exists on the roof top due to the lack of maintenance.
- viii. There is no designated representative (Factory Load Manager), who is onsite full time, trained regarding the structural floor capacity, and who serves as an ongoing vendor resource and monitor of operational factory floor loadings.
- ix. There is no Load Plan available to show the actual maximum operational loading that is allowed.
- x. Floor Load Plans are not posted.
- xi. There is no Load Plan. No markings on the floor designate spaces and height for storage of work materials.

Long Term (6 Months)

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- i. Obtain an occupancy certificate for each building and ancillary

The recommendations for Electrical Safety corrective actions are:

Immediate	NA
Short Term (3 Weeks)	<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>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 disallows these fixtures. Install signs posted in Bengali and English, indicating this prohibition at all entrances to these areas.</p>

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Mid Term (6 Weeks)	<p>Relocate/keep the distribution boards where minimum of 1 m (39 in) clearance is available in front of the panels.</p> <p>Provide actual capacity information labels for all distribution boards and don't leave any space available in din rail channel for installing additional over current devices</p> <p>Provide dedicated neutral connection in load circuit. The number of neutral connections in neutral bus bar must be same as the number of single-phase circuit breaker in the distribution board.</p> <p>Install phase separators between terminal connections of MCCB. Verify phase separators are installed at all remaining noted locations.</p>
Long Term (6 Months)	<p>Provide fire rated separation for the substation according to the Alliance Standard.</p> <p>Provide two hour fire rated separation for generator room with fire rated door and fire rated top roof as per the regulation Alliance Standards.</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. According to section 6.8.2.2, 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.</p>
Mid Term (6 Weeks)	<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</p>

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	<p>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>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>Smoking shall be prohibited in any garment factory building, separate storage building, or any building or area where the Inspector of the Factories Rules 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.</p> <p>Install signage adjacent to each stair door indicating the stair name and the floor level at the noted locations.</p>
Long Term (6 Months)	<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 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 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>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-</p>

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	<p>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 fire fighting 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 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>Demolish the lintel and wall above lintel. Construct the same again fulfilling the height requirement.</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>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>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>
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	<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>Train and certify at least 836 workers (25 percent of total workers) in fire fighting, first aid and rescue by the proper authority.</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>Inspect, test and maintain fire extinguishers in accordance with NFPA 10 requirements.</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 fire fighting 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 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>Establish required inspection, maintenance, and testing program for the standpipe and hose system.</p>
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