

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: TUNIC APPARELS LTD
Address of the Factory	: Plot M-4/3, Road 7, Section 7 Mirpur, Dhaka Dhaka Dhaka Bangladesh
Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 21-October-15
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 21-October-15

BASIC INFORMATION:

There are 03 Main buildings in the factory premises out of which 01 is main production building. The following general information was noted:

i.	Building Usage Type	: Garments Factory.
ii.	Structural System	: Main Building: 12 Stories with one basement (B + G + 11).
iii.	Floor System	: Building frame system with flat slab, column and structural wall.
iv.	Floor Area	: 92,600 SF
v.	No. of Stories	: 12 Stories with one basement
vi.	Construction Year	: 1993-97
vii.	Foundation Type	: isolated column footing
viii.	Design Drawings	: Available.
ix.	Soil investigation Report	: Available
x.	Construction Materials	: RCC stone chips.
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. Have a qualified structural engineer document compliance with the seismic and wind requirements stated in the 2006 BNBC.
- ii. Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard.
- iii. Have a qualified structural engineer prepare credible as-built documents based on the requirements of Part 8 Section 8.19 of the Alliance Standard.
- iv. Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.
- v. Repair the exterior façade system to prevent water intrusion.
- vi. 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 the building.
- vii. 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. Submit the previously conducted Bureau Veritas detail engineering assessment (DEA) report to the Alliance for review and approval as a DEA has already been completed from the factory end. Permanent safety measure should be taken as per DEA report.
 - ii. Provide Certificates of Occupancy for review.

The recommendations for Electrical Safety corrective actions are:

Immediate (3 to 6 Days)	Generator room should be kept clean and free from dirt , debris, inflammable materials etc.
Short Term (3 Weeks)	<p>Switchboards and/or distribution boards should have capacity information labels e.g current carrying capacity of bus bar, rating of main incoming breaker , size of panel and permitted no. of CB, maximum permitted load connection capacity, etc.</p> <p>Provide earthing of equipment at required locations and connect to required number of electrodes. Refer to the BNBG for required number of electrodes.</p>
Mid Term (6 Weeks)	<p>Cables should be connected by proper size of lugs.</p> <p>Provide electrical insulation mats in front of distribution boards, Substation room and other electrical panels.</p> <p>Provide clear identification markings (MDB, All SDBs, Change Over System).</p> <p>Have a qualified electrical engineer develop an as-built single line diagram detailing key components and capacity of the electrical system.</p>
Long Term (6 Months)	The size of cable should be minimum one size greater than the cable which current carrying capacity matches with the rating of the circuit breaker. Considering some factors , the cable current carrying capacity may be 1.45 times greater than the breaker's rating.

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The recommendations for Fire Safety corrective actions are:

Immediate	NA
Short Term (3 Weeks)	Remove all combustibles stored underneath the cutting tables in accordance with Alliance Standard Section 13.7.2.
Mid Term (6 Weeks)	<p>Provide an exit passageway in accordance with Alliance Standard Section 6.15. Consult a qualified fire protection engineer to design and/or approve the required exit passageway</p> <p>Develop a testing and maintenance program that ensures the emergency power for all egress lighting is verified at least once per year. If battery-operated lights are used, these lights shall be tested on a monthly basis. Functional testing of battery powered lights shall be provided for a minimum 90 min once per year.</p> <p>Develop a testing and maintenance program that ensures the emergency power for 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>Create a Fire Safety Director position and fill the position with an individual that has sufficient training to be able to carry out the required duties in accordance with Alliance Standard Section 13.1.</p> <p>Complete Fire Department pre-planning activities with the local Fire Service and Civil Defence in accordance with Alliance Standard Section 13.1.1(2)</p> <p>Provide identification signs with permanently marked water proof metal or rigid plastic for the required components of sprinkler system as per NFPA 13.</p> <p>Develop and implement a hot work permit program. The program shall comply with the requirements of NFPA 51B.</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.</p> <p>Install signage adjacent to each stair door indicating the stair name and the floor level in both English and Bengali.</p>
Long Term (6 Months)	<p>Provide training and certification for the required number of people (25% of total workers) in fire fighting, first aid, and rescue training by an appropriate authority in accordance with the Alliance Safety Training Curriculum.</p> <p>Provide fire-resistive rated opening or penetration protection for rated walls and assemblies in accordance with Alliance Standard Sections 4.6 and 4.7. Consult a qualified fire protection engineer to design the required opening or penetration protection systems.</p> <p>Install automatic fire sprinkler systems throughout the facility. Manufacturing areas and storage less than 12 feet high is classified Ordinary Hazard (Group 2). Sprinkler systems should be designed to deliver 0.20 gpm/ft² over the most remote 1500 square feet. 250 gpm hose allowance. 90 minute water supply duration. The owner</p>

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	<p>plans to install rack storage systems in the warehouse. This may include solid shelf storage of Class III or IV commodities up to 20 feet high. Install a system of open racks to eliminate the need for in-rack sprinklers. Install an ESFR sprinkler system designed to deliver 98 gpm at the 12 most remote sprinklers. 250 gpm hose allowance. 60 minute water duration. All sprinkler installations shall be submitted for review by the Alliance prior to commencement of installation.</p> <p>Provide proper fire door certificate in accordance with Alliance Standard. If not in compliance, provide associated opening protection for exit enclosures in accordance with Alliance Standard Sections 4.5, 4.6, and 6.3.1.2. Consult a qualified fire protection engineer to design the required rated opening protection.</p> <p>Modify or install standpipe system at required locations in accordance with Alliance Standard Section 5.4 and NPFA 14. Standpipe system must comply with NFPA 14. The hydraulic calculations should be submitted and reviewed by Alliance prior to start of work. All standpipe system installation activities shall be submitted for reviewed by the Alliance prior to commencement of installation in accordance with Section 5.4.3.2.</p> <p>Provide fire-resistive rated construction barriers between floors in accordance with Alliance Standard Section 4.5. Consult a qualified fire protection engineer to design the rated construction barriers.</p> <p>Install sprinkler system throughout the Main Building. Also, ensure spacing and coverage is compliant with NFPA 13.</p> <p>Evaluate the existing fire pump arrangement and modify or replace the dedicated fire pump for the facility in accordance with NFPA 20 to supply the demands of the connected fire protection systems. Provide a stored source of water sufficient to meet the demands in accordance with NFPA 22. Fire pump installation shall 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. The pump shall be connected to an alternative power source such as a generator. The generator shall be configured with an ATS (auto starter)</p> <p>Install initiating devices and notification appliances as required by the Alliance Standard and NFPA 72. This includes electrical supervision of all valves controlling fire protection systems (sprinklers, fire pumps, water supplies, etc.). Connect devices to the automatic fire alarm and detection system for the facility. All fire alarm installations or modifications shall be documented with shop drawings and submitted for review by the Alliance prior to commencement of installation.</p> <p>Provide fire-resistive rated construction barriers (with associated opening protection) between hazard types in accordance with Alliance Standard Sections 3.4 and 4.5. Consult a qualified fire protection engineer to design the required rated construction barrier.</p> <p>Provide parapets or guards with a minimum height of 1067 mm (42 in.) for all occupiable roof areas in accordance with Alliance</p>
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	<p>Standard Section 6.12.</p> <p>Install initiating devices as required by the Alliance Standard and NFPA 72 for electrical supervision of all valves controlling fire protection systems (sprinklers, fire pumps, water supplies, etc.). Connect devices to an automatic fire alarm and detection system for the facility. All fire alarm installations or modifications shall be documented with shop drawings and submitted for review by the Alliance prior to commencement of installation.</p> <p>Install fire extinguishers at locations and heights based on hazard type per BNBC Part 4 and NFPA 10.</p> <p>Remove or reduce the change of elevation with beveled slope do not exceed 12.7 mm (1/2 in). Also mark with additional signage or floor markings.</p> <p>Provide re-entry to floor levels from the stairwells in accordance with Alliance Standard Section 6.8.3.</p> <p>Install handrails on both sides of the stairs. Mount new handrail at a height consistent with existing height, between 865 mm (34 in.) and 965 mm (38 in.).</p> <p>Establish an inspection, testing, and maintenance program for all fire extinguishers and prepare proper documentation. Program must comply with NFPA 10.</p> <p>Define and mark minimum aisles which shall be maintained free of storage in accordance with NFPA 13 chapter 12, based on the design criteria used for the sprinkler system.</p> <p>Provide proper clearance between storage and sprinkler deflectors in accordance with Alliance Standard Section 5.3.6.1</p> <p>Modify the hangers, bracing, and restraint of sprinkler piping to meet the requirements of NFPA 13 chapter 9. Consult a qualified fire protection engineer to design the proper piping supports.</p> <p>Post the occupant load for all assembly and production floor areas in a conspicuous space near the main exit or exit access doorway for the space in accordance with Alliance Standard Section 6.4.4.</p> <p>Install an approved audible device connected to the automatic sprinkler system for each building. Activation of the waterflow shall activate the fire alarm system.</p> <p>Establish an inspection, testing, and maintenance program for the standpipe system. Program shall comply with NFPA 25. Any newly installed standpipe system shall be evaluated for compliance with the design pressure and flow demands of NFPA 14 or BNBC Section 5.4.3.</p> <p>Follow up with the appropriate authority in an expeditious manner for issuance of the Certificates of Occupancy for each building and ancillary structure according to building use.</p> <p>Establish an inspection, maintenance, and testing program for the fire pump. Program shall comply with NFPA 25.</p>
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