

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: UNI GEARS LIMITED
Address of the Factory	: Badshamiah School Road, Khailkur, Board Bazar, Gazipur, Dhaka, Bangladesh.
Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 30-Apr-2014
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 06-Apr-2014
BGMEA Membership No	: 4613

BASIC INFORMATION:

There are two main buildings and five ancillary buildings. The following general information was noted:

- i. Building Usage Type : Garments Factory
- ii. Structural System : Reinforced concrete slabs, beams and column, with beams spanning between columns and slabs spanning between beams.
- iii. Floor System : RCC
- iv. Floor Area : 177,135 sft
- v. No. of Stories : 08 Storied RCC
- vi. Construction Year : 2013
- vii. Foundation Type : Pile foundations for Building-1 and a Mat foundation for Building-2.
- viii. Design Drawings : Available
- ix. Soil investigation Report : Available
- x. Construction Materials : RCC
- 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 over see 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.

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Mid Term (6 Weeks)

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- i. Engage a qualified structural engineer to develop credible structural documents to confirm the structural integrity of the buildings. Documents must comply with Alliance Standard Part 8 Section 8.19 and 8.2.
 - ii. Have a qualified structural engineer provide further testing and analysis of cracks.
 - iii. Properly brace and anchor all the racks to resist earthquake forces to comply with the BNBC and Alliance Standard.
 - iv. Have a qualified structural engineer develop Floor Loading Plans for all the three buildings as per the requirements of Part 8 Section 8.20.5.3
 - v. Have a qualified structural engineer prepare load plans for all the three buildings including the information required in Section 8.20 of the Alliance Standard.
 - vi. Provide signage or the appropriate markings at all areas used for storage to indicate the acceptable loading limits detailed in the Load Plan.
 - vii. Under guidance from a qualified structural engineer, address all areas of needed maintenance.

Long Term (6 Months)

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- i. Factories should apply for Certificate of Occupancy to proper authority.
 - ii. Remove blockage from expansion joints.

The recommendations for Electrical Safety corrective actions are:

Immediate (3 to 6 Days)	Generator room need to clean and free of dirt, debris, and improperly stored materials.
Short Term (3 Weeks)	<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>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>Review previous assessment report and complete identified action items beginning with highest priority items.</p>
Mid Term (6 Weeks)	<p>Provide means of ventilation for the substation room. Consult a qualified electrical engineer to determine the required ventilation rates based on the installed equipment.</p> <p>Clear & Permanent identification marks should be printed in all DBs, Switchboards, Sub-distribution boards & switches as necessary. BNBC- Part 8 section 2.11.5.4.</p> <p>All cable trenches should be covered by noncombustible materials.</p>

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	Provide electrical insulation mats in front of distribution boards, substation room etc.
Long Term (6 Months)	<p>Bond the ground terminals of the lightning protection system to the building or structure grounding. Alliance standard art. 10.11.4.2.</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>

The recommendations for Fire Safety corrective actions are:

Immediate	NA
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 are considered two motions.</p> <p>Immediately remove all combustibles stored underneath the cutting tables at the noted locations.</p>
Mid Term (6 Weeks)	<p>Select a qualified fire protection engineer to design an automatic sprinkler system to be installed throughout the building. The hydraulic design of the sprinkler system must be pre-approved by CoE of 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 the required NFPA 13 design requirements. Installation of new automatic sprinkler systems shall be required to provide shop drawings and hydraulic calculations as per NFPA 13 requirements. The test and performance report for the installed system must be reviewed by the Alliance. Final inspection and testing shall be witnessed by Alliance. Suggested timeline: Start design-16 Dec 2014, Complete design-1 Feb 2015, Begin construction-15 Mar 2015.</p> <p>Install inlet fire department connections where required and in compliance with the Standard. Fire department outlet connections shall be provided to allow fire department pumper vehicles to draw water from ground-level or underground water storage tanks. Connections shall match the Fire Service and Civil Defense hose thread standard.</p> <p>Fire drills are to be conducted on a quarterly basis under the direction of a Fire Safety Director as outlined in BNBC Part 4 Appendix A for all garment facilities. All other requirements for fire drills shall be conducted in accordance with BNBC requirements.</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</p>

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	<p>monthly basis. Functional testing of battery powered signs 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 tested at least once per year. If battery operated signs are used, these signs must be tested on a monthly basis. Functional testing of battery powered signs must be provided for a minimum 90 min once per year.</p> <p>Post the occupant load for every facility's assembly and production floor in a conspicuous space near the main exit or near the exit access doorway for the space.</p> <p>Obtain an occupancy certificate from LGED.</p>
<p>Long Term (6 Months)</p>	<p>Provide fire-resistive rated assemblies at the required exit access corridors. The rated assembly should be approved and designed by a qualified fire protection engineer. 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 automatic sprinkler protection throughout the story or building. Windows and glass block assemblies are to be tested for fire rating following NFPA 257 requirements.</p> <p>Install a class III standpipe system at required locations designed by a qualified fire protection engineer. The system must be compliant with NFPA 14 requirements. All standpipe system installations and hydraulic calculations shall be reviewed by the Alliance prior to commencement of installation. Testing of the installation shall be conducted in accordance with NFPA 14 acceptance testing requirements. Documentation of all testing shall be submitted for review by the Alliance. Final inspection and testing of the installation shall be witnessed by the Alliance.</p> <p>Provide 1.5 hour rated doors at exit enclosure in main building as per the Alliance Standard.</p> <p>Update current fire pump or install a new fire pump to meet the Alliance standard. Pump design should also account for two additional stories under construction. Install a pump dedicated for firefighting or fire protection following NFPA 20 requirements. 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. Acceptance testing of the installation shall be in accordance with NFPA 25 testing requirements. Documentation of all testing shall be submitted to the Alliance for review prior to final acceptance by the Alliance.</p> <p>Provide 2 hr. fire resistive rated construction barriers at exit enclosures of main building. Fit side-swinging, self-closing, non-lockable fire doors that swing in the direction of egress of 1.5 hr rating in all stairwell enclosures. Consult a qualified fire protection engineer to design the required rated construction barriers.</p> <p>Replace all collapsible, sliding, roll-down gates and shutters in means of egresses with side-hinged swinging type doors of proper width and rating.</p> <p>Impart training in accordance with Alliance Safety Training Curriculum and keep record with proper documentation.</p> <p>Provide fire-resistive rated construction barriers between hazard</p>

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	<p>types following Table 4.4.1 of Alliance Standard. Consult a qualified fire protection engineer to design the required rated construction barrier.</p> <p>Inspect, test, and maintain fire extinguishers in accordance with NFPA 10 requirements.</p> <p>Post emergency egress maps/fire evacuation maps at the entrance to each exit stair or main point of egress.</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 direct monitoring can be set up, arrange a monitoring system using factory's 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 a NFPA 51B-compliant hot-work permit program. In general, this program should address the process of request and approval by authorities, necessary checks prior to approval, standby fire watch and firefighting equipment, sounding of alarm procedure, duration and expiry of permit and re-approval procedure, etc.</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. The duties of the Fire Safety Director shall include the following: (1) Establish internal and external rally points and communicate to all employees in the building. (2) Fire department pre-planning. (3) Conduct safety inspections as outlined in Alliance Standard. (4) Ensure all testing of fire protection equipment is conducted in accordance with Alliance Standard.</p> <p>Install signage adjacent to each stair door indicating the stair name and the floor level at the noted locations.</p> <p>Establish a NFPA 25-compliant inspection, maintenance, and testing program for the standpipe and hose system.</p> <p>Install required identification signs at the noted locations. Signage must comply with NFPA 14 Chapter 6.</p>
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