Name of the Factory	: **Unitex International**
Address of the Factory	: 108 B. Nag Lane, Gosalidanga Agrabad,Chittagong
Present Status of the Factory	: **Under Operation**
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 25 Jul 2014
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 19 Jul 2014 & 25 Jul 2014

BASIC INFORMATION:

The present garment factory is comprises of a 1 Main Building. The following general information was noted:

i.	Building Usage Type	: Garments Factory.
ii.	Structural System	: Main Building: RCC Beam-Column framed structures with RCC slab and roof tin shed.
iii.	Floor System	: Beam slab type in RCC Building
iv.	Floor Area	: 9,890.00 SFT
v.	No. of Stories	: 02 stories RCC building with column with tin shed on roof.
vi.	Construction Year	: 2005-2007
vii.	Foundation Type	: Isolated footing foundation.
viii.	Design Drawings	: Available.
ix.	Soil investigation Report	: Available
x.	Construction Materials	: RCC (brick 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) :

i. Have a qualified structural engineer provide further testing and analysis of distress cracking in columns and provide a remediation plan to correct noted issues.

ii. Have a qualified structural engineer provide further analysis and testing of the noted settlement and crack issues. If required, a remediation plan shall also be provided by the qualified structural engineer.

iii. Assign a qualified structural engineer to prepare credible as-built documents based on the requirements of Part 8 Section 8.19 of the Alliance Standard.

iv. Conduct ferro-scanning to confirm the reinforcement of all structural elements and prepare as-built drawing as per construction.

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. Engage a qualified structural engineer to confirm and document that provisions have been made to accommodate concentrated loads. If provisions have not been made, have a qualified structural engineer develop a remediation plan.

vii. "Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading."

viii. Have a qualified structural engineer complete an analytical evaluation of the structural impact of the addition.

ix. Develop engineered plans to brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard. Install anchor and braces as shown on approved plans.

x. Provide Certificates of Occupancy for review.

xi. Have a qualified structural engineer develop Floor Loading Plans per the requirements of Part 8 Section 8.20.5.3

xii. 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 all buildings.

xiii. 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) :

i. Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.

ii. Provide a protective coating at the structural elements constructed with MCAC exposed to rainfall or other sources of water. Have protective coating approved by the Alliance or a qualified structural engineer

The recommendations for Electrical Safety corrective actions are*:*

Immediate (3 to 6 Days)	Keep area around the generator clean and free of improperly stored materials.
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 protective covers on all light fixtures installed inside storage areas. All boxes and enclosures (including transfer switches, generators, and power panels) for emergency circuits shall be permanently marked so they will be readily identified as a component of an emergency circuit or system.The required marking can be by color code, the words "emergency system," or any other method that identifies the box or enclosure as a component of the emergency system. Provide approved covers made of non-combustible materials throughout the length of cable trays. Provide identification/tagging mentioning the equipment/machines' name (i.e. Sewing machine line-1 or Lighting line-2) and type of conductor (i.e. L1,L2,L3,N,PE)for every cable at its termination point or maintain the color-code at its termination point (providing colored cable-sleeves) for identification of conductor-type (i.e. Red/Yellow/blue for phase cable, Black for neutral cable, Green for earthing cable).(Labeling-cable-tie/Marker-tie can be used for cable identification). Provide separate earthing connection for doors with flexible copper braid.
Mid Term (6 Weeks)	Have a qualified electrical engineer update the as-built diagrams detailing key components and capacity of the electrical system. Check all the cables and circuit breakers and sort out the higher rated circuit breakers. The rated current of a protective device (MCB, MCCB, fuse) must not exceed the current carrying capacity of any conductor in the circuit. Verify existing individual loads do not exceed the cable and/or breaker rating. Verify total existing loads do not exceed the panel rating. Use pin type busbar to avoid multiple cables terminating into same circuit breaker. Provide covers or blanks to conceal all live internal components of switchboards and/or distribution boards. Provided generator frame earthing at two separate points with earthing cables of minimum 35 sqmm. Calculate and display the information of the capacity & panel-schedule of the distribution boards and then provide a physical means to prevent the installation of additional

	circuit breakers.
Long Term (6 Months)	Have a qualified electrical engineer design a lightning protection system according to the BNBC requirements. Have a licensed electrician install the designed system.

The recommendations for Fire Safety corrective actions are:

Immediate (3 to 6 Days)	None
Short Term (3 Weeks)	Doors need to keep lock free in the direction of egress under any conditions. All hasps, locks, slide bolts, and other locking devices shall be removed where installed.
Mid Term (6 Weeks)	Develop and execute an emergency evacuation plan which includes all necessary components required by the Alliance Standards. Provide sufficient communication and training of this plan to all employees. Install automatic fire detection and alarm system throughout the factory in accordance with NFPA 72. Until that time a central station monitoring service or direct connection to the Fire Service and Civil Defense can be set up; a person needs to be assigned to contact the fire department in the event of fire alarm activation. An annunciator needs to be located in a constantly attended location to alert this person. Occupant load signage should be posted for every assembly and production floor, at a conspicuous space near the main exit or exit access doorway for the space. Develop a testing and maintenance program that ensures the operation of all exist signs is verified at least once per year. If battery-operated signs are used, these lights shall be tested on a monthly basis. Functional testing of battery powered signs shall be provided for a minimum 90 min once per year. Develop a testing and maintenance program that ensures the correct operation of all egress lighting, including emergency and illuminated exit signs, is verified at least once per year. If stand alone, battery-operated signs are used, these lights shall be tested on a monthly basis. Functional testing of battery powered lighting shall ensure that full operation is provided for a minimum 90 min, once per year. Training programs need to be implemented and documented in accordance with the Alliance Safety Training curriculum. Post stair designation signs at each floor entrance at all stairs in English and Bengali. Signs shall indicate the name of the stairway, the floor level, where the exit discharges to and what floor it originates on. Signs shall be posted adjacent to the door in each floor landing. Need to complete fire department per-planning activities

	with the local Fire Service and Civil Defense. Apply to appropriate authority in an expeditious manner for issuance of the Certificates of Occupancy for each building and ancillary structure is according to building use. Install required identification signs at the noted locations. Signage must comply with NFPA 14 Chapter 6.
Long Term (6 Months)	Replace non-compliant doors and frames in the means of egress with side swinging doors. Replacement doors shall be a minimum width of 0.8 m (32 in), and are listed, approved, self-closing, fire rated door assemblies (door and frame) with latching panic hardware. Provide required fire resistance rated opening protection (Door, Window,Hatch Cover etc.) at opening and penetration through fire rated walls and/or assemblies or closed the unprotected openings by fire-resistance rated barrier as per requirements. Consult a qualified fire protection engineer to design the required rated opening protection. Provide 1-hour fire-resistance rated construction barriers at exit enclosures with 0.75-hour fire-rated opening protection (Door, window, etc.) for buildings. Fire doors shall be of the side-hinged, swinging type and shall swing in the direction of egress, auto closure and panic bar and without locking arrangement. Consult a qualified fire protection engineer to design the required rated construction barriers with opening protection. Provide training (25% of total workers) for the required number of people certified in firefighting, first aid, and rescue training by fire service and civil defense. 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 an automatic fire alarm and detection system for the facility. All fire alarm installations shall be submitted for review by the Alliance prior to commencement of installation. Provide a 1 hour fire-resistive rated assembly with 0.75 hour opening protection in line with the stair and extend 3.05 m (10 ft.) beyond the ends of the stair between the exterior exit stairs and the building to achieve the required separation. The rated assembly should be approved and/or designed by a qualified fire protection engineer. All roll-down, collapsible, sliding gates and shutters in the means of egress shall be replaced with required fire rated outward opening side hinged swinging self-closing type doors as per Alliance standard section: 6.8. Doors will be free from general locking arrangement. Assign a fire expert for designing the swing doors. Establish a Periodic Programmed Maintenance (PPM) plan for the routine inspection, maintenance and periodic testing

	for the fire extinguishers. This program must incorporate all elements and comply with the requirements of NFPA 10. Provide fire department connections to allow fire department pumper vehicles to pump water into the standpipe system and another to draft water from ground-level or underground water storage tanks with identification mark in accordance with Alliance Standard Part 5 Section 5.5.4. The Siamese connection shall be easily accessible to the fire engine. Rooms used for generator shall be separated from the surrounding occupancy with a minimum 2-hour fire rated construction with 1.5 hour fire rated opening protection. Consult a qualified fire protection engineer to design the required rated construction barrier with opening protection. Install extinguisher at required locations and mounted at the correct height as per BNBC Part 4 Section 4.10 and NFPA 10. Need to install Portable fire extinguishers as per potential fire class and hazards in accordance with NFPA 10 Chapter 5. Provide guards with a minimum height of 1067 mm (42 in.) at all occupied floors. Install handrails on the both side of the stairs and intermediate handrail when the width of the stair exceed 2.20 m. A minimum height of 865 mm (34 in.) and a maximum height of 965 mm (38 in.) as measured from the leading edge of the tread need to be maintained when installing new handrails. The spacing between vertical members will not exceed 200 mm (8 inch) up to a height of 865 mm (34 inch). Establish an inspection, testing and maintenance program for the standpipe and hose system. Program shall comply with the requirements of NFPA 25. The system shall be maintained for safe operating conditions and tested at least once per year. Produce, establish and enforce a written policy and procedure for housekeeping to ensure scheduled cleaning of all floors, walls, ceilings, air ventilation systems and other building components. Ensure the timely removal of defective, waste and rubbish materials is included. 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.).