Name of the Factory	: **Uponti Apparels Ltd.**
Address of the Factory	: Boktair Mension, Hajipara, Atturerdipu, Bayazid Bostami, Chittagong,Bangladesh
Present Status of the Factory	: **Under Operation**
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 26 Nov 2014
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 26 Nov 2014
BKMEA Membership No	: 1954

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	: 5-Storied RCC Frame Structure with Isolated Column Footings and Beam-Slab System.
iii.	Floor System	: Beam slab type in RCC Building
iv.	Floor Area	: 18,515 SF (Approx).
v.	No. of Stories	: 5
vi.	Construction Year	: 2011-2012
vii.	Foundation Type	: Isolated Column Footing.
viii.	Design Drawings	: Not 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. "Engage a qualified structural engineer to provide additional investigation into the areas of distress, separations, or cracking and provide a remediation plan if required."

ii. Under guidance from a qualified structural engineer arrange Detail Engineering Assessment of the structure within 6 weeks. This detailed assessment should include destructive core testing to determine the in-situ concrete compressive strength. Concrete strength shall be assessed by taking at least 4 nos. of 3 inch diameter cores from the area of concern. If cores are to be taken from column, it is advisable to take it from an upper level where the stresses are low.

iii. "Have a qualified structural engineer provide further testing and analysis of distress, settlement, shifting, or cracking in columns or walls and provide a remediation plan to correct noted issues."

iv. "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."

v. "Have a qualified structural engineer document compliance with the seismic and wind requirements stated in the 2006 BNBC."

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

vii. As part of the Detailed Engineering Assessment outlined elsewhere, structural engineer shall use ferro-scanning to document the as-built reinforcing configuration within columns throughout the building.

viii. "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"

ix. "Have a qualified structural engineer complete an analytical evaluation of the structural impact of the additions. "

x. "Have a qualified structural engineer complete further analysis of the structure and develop a remediation plan if required. "

xi. "Have a qualified structural engineer prepare credible as-built documents based on the requirements of Part 8 Section 8.19 of the Alliance Standard. "

xii. "Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard. "

xiii. As part of the Detailed Engineering Assessment outlined elsewhere, conduct destructive core testing to validate the in-situ concrete compressive strength of structural elements.

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

xv. "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. "

xvi. "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

iii. Provide Certificates of Occupancy for review

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. Provide covers made of non-combustible material throughout the length of cable trays. Remove all un-terminated cables from inside panel boards. Provide permanent identification marking mentioning name of panels (i.e. MDB - 2, 1st Floor) on a durable material sheet posted on panels door. 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. Provide light fixtures close to the generator so that adequate illumination is available around it.
Mid Term (6 Weeks)	Have a qualified electrical engineer update the as-built diagrams detailing key components and capacity of the electrical system. Provide a weatherproof enclosure to protect the generator from storm water. Make sure the generator receives adequate ventilation inside the enclosure. Use pin type bus bar to avoid multiple cables terminating into same circuit breaker. Use separate circuit breaker for individual loads. Relocate the Distribution Board to a safe location or provide arrangement so that the open panel door does not

	cause hindrance to toilet access. Provide individual neutral connections same as the respective phase cable size for all single-phase loads. The number of neutral connections in neutral bus bar must be same as the number of single-phase circuit breakers.
Long Term (6 Months)	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. 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.

The recommendations for Fire Safety corrective actions are:

Immediate (3 to 6 Days)	Keep areas beneath cutting tables clear of combustibles as all times.
Short Term (3 Weeks)	Keep the doors lock free in the direction of egress under any conditions. All hasps, locks, slide bolts and other locking devices shall be removed where available.
Mid Term (6 Weeks)	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. 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. Post emergency egress map at the entrance to each exit stair or main point of egress. Develop a testing and maintenance program that ensures the operation of all means of egress lights are 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. 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 lights are tested on a monthly basis. Functional testing of battery powered signs is provided for a minimum 90 min once per

	year. Post the occupant load for every assembly and production floor in a conspicuous space near the main exit or exit access doorway for the space. Conduct fire drill on a quarterly basis as outlined in BNBC Part 4 Appendix A. Training programs need to be implemented and documented in accordance with the Alliance Safety Training Curriculum. Collect all applicable permit and license and kept up to date including waiver certificate from BERC. Provide stair designation signs at each floor entrance from the stairs to the floor in English and Bengali. Signs shall be indicating the name of the stair and the floor level. Signs shall be posted adjacent to the door. 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 the building according to building use.
Long Term (6 Months)	All collapsible, rolling shutters, Steel sliding doors in the means of egress shall to 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. Provide the aisles with the minimum unobstructed clear width of 0.9 m (36 in). Provide required fire rated door in all exits. Fire door shall be of the side-hinged, swinging, self-closing type and shall swing in the direction of egress. New door shall have a minimum clear width of 1.0 m (39 in.). Consult a qualified fire protection engineer to design the fire rated door. Provide certified training by an approved training provider, for the required number of workers necessary for the safe protection of your workers. The training shall cover firefighting, first aid and emergency rescue training including CPR. Additional CPR and advanced first aid training should be considered for electrical staff and those working with, or around dangerous equipment. 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. Install the standpipe system (Class-III) to meet the requirements of Alliance Standard's Section 5.4. Consult a qualified fire protection engineer before installing a new

	system as per NFPA 14. After installing standpipe system, establish an inspection, testing and maintenance program for the standpipe and hose system. Program need to be complying with the requirements of NFPA 25. Also install signage for the standpipe system at required locations and on required components. The signage must comply with the requirements of NFPA 14. Provide 2-hour fire-resistive rated construction barriers at exit enclosures with 1.5-hour fire-rated opening protection (Door, window, etc.). The new fire rated door shall be side-hinging, swinging, with auto closure and without locking arrangement. Consult a qualified fire protection engineer to design the required rated construction barriers with opening protection. Install a dedicated fire pump in accordance with NFPA 20 to supply the demands of water to the connected fire protection systems along with a stored source of water sufficient to meet the demands as per NFPA 22. Also establish an inspection, testing and maintenance program for the fire pump after installing the fire pump and conduct. Program needs to comply with NFPA 25. Trained the worker on proper operation of fire pump. Consult a qualified fire protection engineer to design the pull stations at egress points, centralized and addressable smoke detectors all through the building, visual and audible devices spaced appropriately based on occupancy type. Reference NFPA 72. 01. Generator room shall be separated from the surrounding occupancy with a minimum 2-hours fire rated construction with 1.5-hours fire rated opening protection. 02. Stores shall be separated from the surrounding occupancy with a minimum 1-hours fire rated construction with 0.75-hours fire rated opening protection. Install illuminated exit signs with backup power and continuous graphics 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. Install handrails on the both side of the stairs. 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). Fire extinguishers having a gross weight not exceeding 18.14 kg (40 lb) shall be installed so that the top of the fire extinguisher is not more than 1.53 m (5 ft) above the floor. Fire extinguishers having a gross weight greater than 18.14 kg (40 lb) (except wheeled types) shall be installed so that the top of the fire extinguisher is not more than 1.07 m (3½ ft) above the floor. Establish an inspection, testing and maintenance program for all fire extinguishers. Program must comply with the

	requirements of NFPA 1. Remove the thresholds 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. Provide Fire Department (Siamese) connections in accordance with Alliance Standard Section 5.5.4. Connections shall match the Fire Service and Civil Defense hose thread standard. Consult with a qualified fire protection engineer to design the Fire Department Connections. The factory need to ensure that the both factory management are on the same page with regards to fire safety and the fire protection systems in order to protect the entire building per the Alliance Standard. Provide parapet in every occupied roofs with a minimum height of 1067 mm (42 in.). 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. Provide illumination not less than 50 lux at the illuminated surface with a contrast of not less than 0.5. Approved self-luminous signs which provide evenly illuminated letters having a minimum luminance of 0.2cd/m2 may also be used. Produce and enforce a policy and procedure for the safe execution of all hot work actions in the factory. Provide those required factory workers and contractors with training on the hot work P&P and ensure that all hot work actions follow the 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.