Name of the Factory	: **ABONI KNIT WEAR LTD**
Address of the Factory	: 169-171 Tetulzhora Union, Hemayetpur, Savar, Dhaka, Bangladesh
Present Status of the Factory	: **Under Operation**
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 1-March-14
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 24-May-14
BGMEA membership No	: 3498
BKMEA membership No	: 625

BASIC INFORMATION:

There are 10 buildings in the premises out of which one is main production building and four are ancillary buildings. The following general information was noted:

i.	Building Usage Type	: Garments Factory.
ii.	Structural System	: The building is a RCC frame structure. the nature of foundation is cast in-situ pile foundation.
iii.	Floor System	: Beam supported slab
iv.	Floor Area	: 169468.3 sft.
v.	No. of Stories	: 8 story RCC Main Production Building.
vi.	Construction Year	: 2001~2002
vii.	Foundation Type	: Pile foundation.
viii.	Design Drawings	: Available.
ix.	Soil investigation Report	: Available
x.	Construction Materials	: The building columns are made of stone chips, but beam and slabs are made of 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 : N/A

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 loading limits as described on the Floor Loading Plans.

Mid Term (6 Weeks) :

i. Have a qualified structural engineer complete further analysis of the structure and develop a remediation plan if required.
ii. Have a qualified structural engineer prepare credible as-built documents based on the requirements of Part 8 Section 8.19 of the Alliance Standard.
iii. "Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.
iv. 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. Or provide 2% slope on the exposed surface to prevent accumulation of water.
v. 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.
vi. Complete further testing on areas of deterioration in order to understand the level of corrosion and weakening of the member and have a qualified structural engineer develop a remediation plan.
vii. Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard.
viii. Have a qualified structural engineer develop Floor Loading Plans per the requirements of Part 8 Section 8.20.5.3
ix. Have a qualified structural engineer prepare load plans including the information required in Section 8.20 of the Alliance Standard.
x. Prepare Load Plan as per Alliance Standard. 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. Provide Certificates of Occupancy for review.

The recommendations for Electrical Safety corrective actions are*:*

Immediate (3 to 6 Days)	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.

Short Term (3 Weeks)	Ensure proper identification of emergency power switchboards, distribution boards, and circuits .Provide mechanical guards for electrical equipment where necessary.
Mid Term (6 Weeks)	Provide clearance of at least 1 m (39 in) in front of switchboards and/or distribution boards. Provide capacity information labels (Maximum current rating, no of circuit breakers etc.) for switchboards and/or distribution boards. Install Switchboards and distribution boards in compliant locations so that operation is not hampered due to limited access. Ensure all electrical cable properly terminated at its point of termination. Remove un-terminated wiring cable back to source.
Long Term (6 Months)	Consult with a qualified Electrical Engineer and ensure electrical wiring and cables are sized according to capacity of circuit breakers. Verify existing individual loads do not exceed the cable and/or breaker rating. Verify total existing loads do not exceed the panel rating. 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. 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. Establish an inspection testing, and maintenance program for the Uninterruptable Power Supply (UPS) and associated components. The program must based on the following: (1) Manufacturer's recommendations (2) Manufacturer's instruction manuals (3) Minimum Requirements of NFPA 111 Chapter 8 (4) Minimum Requirements of NFPA 70B Chapter 28

The recommendations for Fire Safety corrective actions are:

Immediate (3 to 6 Days)	Remove all combustibles stored underneath the cutting tables at the noted locations.

Short Term (3 Weeks)	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.
Mid Term (6 Weeks)	Impart training in accordance with Alliance Safety Training Curriculum and keep record with proper documentation. Develop an emergency evacuation plan which includes all components required by the Alliance Standards and communicate the plan to all employees in accordance with Section-13.3. 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. Develop a testing and maintenance program that ensures the operation of all exit lights 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. Install signage adjacent to each stair door indicating the stair name and the floor level at the noted locations as per the Alliance Standard Section 6.9.
Long Term (6 Months)	Install a centralized automatic fire alarm and smoke/heat detection system with control panel following the requirement of NFPA 72 throughout all new and existing buildings and structures. Provide fire-resistive rated assemblies at the required exit access corridors. The rated assembly should be approved and/or designed by a qualified fire protection engineer. Exit access corridors serving an occupant load exceeding 30 are to be separated by walls having a fire resistance rating of 1 hr in accordance with 4.5 unless provided with automatic sprinkler protection throughout the story or building. Window and glass block assemblies are to be of tested fire rating following NFPA 257. Replace all non-compliant doors and frames in the means of egress with doors that are listed, approved, automatic-closing, side-swinging, fire rated doors in compatible fire rated frames with latching panic hardware that open in the direction of egress. Provide 1.5 hr fire protective opening assemblies in 2 hr rated exit enclosures as per the Alliance Standard section 4.6. Train and certify at least 611 people(25% of occupant load) in firefighting, first aid and rescue training by the proper authority. Provide opening protectives at all windows and other

	openings on all the fire rated wall across the entire premises as per section 4.6. If these openings are not required, close these. Protect the penetrations of fire resistive rated assemblies with a listed through penetration fire stop system tested in accordance with ASTM E814. Install standpipe system at required locations. Standpipe system must comply with NFPA 14. Install doors that swing in the direction of egress, side-swinging, self-closing, non-lockable fire doors of 1.5 hr rating in all stairwell enclosures of 2 hr fire-resistive rated construction barriers. Consult a qualified fire protection engineer to design the required rated construction barriers. Install a pump dedicated for firefighting or fire protection following the requirements of NFPA 20. 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 of the installation by the Alliance. Acceptance testing of the installation shall be in accordance with NFPA 20, 22, and 24 testing requirements. Documentation of all testing shall be submitted to the Alliance for review prior to final acceptance. Pull stations at egress points, smoke detectors in air handling equipment, visual and audible devices must be spaced appropriately based on occupancy type in accordance with NFPA 72. Protect the openings of shaft enclosure by providing rated opening protectives according to the Alliance Standard. Construct required rated walls for the open exit passageway. Provide rated exit passage way . i.e Provide separation between stairs and generator room according to Alliance Standard. Arrange for direct connection of the fire alarm system to a central monitoring station or Fire Service and Civil Defense. 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. Provide fire-resistive rated construction barriers between hazard types following Table 4.4.1 of Alliance Standard or Table 4.1.1 from BNBC Part 4. Consult a qualified fire protection engineer to design the required rated construction barrier. Remove gas cylinder from kitchen. Install fire department connections where required and in compliance with the Standard. Fire department (Siamese) inlet connections shall be provided to allow fire department pumper equipment to supplement the fire protection systems. 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. 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 as per section 6.11. 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 as per section 6.11. 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; re-entry 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. Provide handrails on both side of each stairway. Provide intermediate handrail when the stair width exceeds 2.2m (87 inches). Provide handrail of height between the range 865 mm (34 in.) and 965 mm (38 in) as per section 6.9 and 6.12. Fire extinguishers are to be inspected, tested, and maintained in accordance with NFPA 10 Chapter 7. Establish written corporate and plant policies on housekeeping to ensure scheduled cleaning for floors, walls, ceilings, and 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.). Establish an inspection, maintenance, and testing program for the standpipe and hose system. Program must comply with the requirements of NFPA 25 Chapter 6 Table 6.1.1.2. Complete fire department pre-planning activities with the local Fire Service and Civil Defense in accordance with Section 13.1.1(2) Develop a hot-work permit program. The program must comply with the requirements of NFPA 51B.