Name of the Factory	: **B.H.I.S. Apparels Ltd.**
Address of the Factory	: 671 Dutta Para, Hossain Market, Tongi. Gazipur, Dhaka, Bangladesh.
Present Status of the Factory	: **Under Operation**
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 21-May-14
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 21-May-14
BGMEA Membership No	: 2758

BASIC INFORMATION:

There are 2 Main Factory Buildings in the factory. The following general information was noted:

i.	Building Usage Type	: Garments Factory
ii.	Structural System	: Framing system is monolithic RC slab with beams..
iii.	Floor System	: Beam column floor
iv.	Floor Area	: Building #1: 135,800 sft Building #2: 6,850 sft
v.	No. of Stories	: Building #1: 6 stories + partial steel rooftop shade Building #2: 3 stories
vi.	Construction Year	: Building #1: 2008 to 2010 Building #2: 2000 to 2002
vii.	Foundation Type	: Isolated footing
viii.	Design Drawings	: Available.
ix.	Soil investigation Report	: Available.
x.	Construction Materials	: Reinforced Concrete
xi.	Generator	: Ground Level

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 Under guidance from a qualified structural engineer arrange Detail Engineering Assessment of the building portions identified above. This assessment should include destructive core testing to validate the in-situ concrete compressive strength of structural elements and should be conducted within 6 weeks.
ii. Have a qualified structural engineer prepare credible as-built documents based on the requirements of Part 8 Section 8.19 and 8.20 of the Alliance Standard. The documents should address all buildings within the complex.
iii. Have a qualified structural engineer complete an analytical evaluation of the structural impact of the additions.
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 confirm that capacity to support the load is available. Load Plans complying with Alliance Standard Part 8 Section 8.20.4.3 should also be developed.
vi. Have a qualified structural engineer document compliance with the seismic and wind requirements stated in the 2006 BNBC.
vii. Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading.
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 assess the durability aspects as suggested in Alliance Standard Part 7 Section 7.2 and take appropriate remedial measures. This assessment should include destructive core testing to validate the in-situ concrete compressive strength of structural elements constructed with MCAC.
x. "Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard."
xi. Have a qualified structural engineer conduct a stability check of the support conditions for the structural steel frame roof structure at the roof level of Building #1.
xii. Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.
xiii. 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.
xiv. Provide signage or the appropriate markings at all areas used for storage to indicate the acceptable loading limits detailed in the Load Plan.
xv. Have a qualified structural engineer develop Floor Loading Plans per the requirements of Part 8 Section 8.20.5.3.

Long Term (6 Months) :

i. 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.

ii. Provide Certificates of Occupancy for review.
iii. Retrofitting as per DEA recommendation.

The recommendations for Electrical Safety corrective actions are*:*

Immediate (3 to 6 Days)	Remove light fixture without protective covers and installed light fixtures with protective covers in required locations. Check for any loose connection of circuit breaker, if not then replace it .
Short Term (3 Weeks)	
Mid Term (6 Weeks)	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. Install an emergency power generator for emergency loads like fire alarm, fire pump, emergency light, exit signs etc. Clear & Permanent identification marks should be printed in all DBs, Switchboards, Sub-distribution boards & switches as necessary. Earth the frame of generator in two different points(Engine body & alternator body)
Long Term (6 Months)	Have a qualified electrical engineer develop an as-built single line diagram detailing key components and capacity of the electrical system. 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. Replace the oversize circuit breaker by one which current rating will be matched with the current carrying capacity of the respective cables. Have a qualified electrical engineer design a lightning protection system according to the BNBC requirements. Have a licensed electrician install the designed system. Remove multiple connection or looping of wiring/cables observed at circuit breakers within switchboards and/or distribution board. Provide each circuit with a dedicated neutral. 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.

	All the panel boards should have the capacity information labels like it's bus bar rating, no. of CB according to size of Box, incoming CB rating, maximum permitted load etc. Develop an electrical maintenance program that includes inspections and testing of the electrical systems. Reference NFPA 70 for example program requirements. 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. Remove all unterminated cables from the installation.

The recommendations for Fire Safety corrective actions are:

Immediate (3 to 6 Days)	Remove all combustible materials from the underneath the cutting tables.
Short Term (3 Weeks)	Remove all locking devices from all egress doors and means of egress components in accordance with Alliance Standard Section 6.8. If locks are required for security reasons, utilize special door locking features complying with NFPA 101.
Mid Term (6 Weeks)	Mark aisles with proper directional indicators and widen them to a minimum of 36 inches. Keep aisles free of obstructions. Higher occupancy loads will require a greater width to accommodate the increased load. Occupant loads are posted for every assembly and production floor in a conspicuous space near the main point of egress. Develop a testing and maintenance program that ensures the operation of 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.
Long Term (6 Months)	Provide 2-hr fire-resistive rated construction barriers and 1.5-hr fire doors in accordance with Alliance Standard. Also consult with a qualified fire protection engineer to design

	the required rated construction barrier. 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. Modify or install the Standpipe System to meet the requirements of NFPA-14 (install class-I standpipe hose connection provisions and class-II hose connections at all required stair cases on each level). Consult a qualified fire protection engineer before modify or installing a new system. Install a dedicated fire pump for the facility in accordance with NFPA 20 to supply the demands of the connected fire protection systems along with a stored source of water sufficient to meet the demands in accordance with NFPA 22. 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 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 is to be connected to an alternative power source such as a generator. The generator is to be configured with an ATS (auto starter).