Name of the Factory : **Civic Apparels Ltd & Impressive Garments (Pvt)**

Address of the Factory : JR Casero Tower, 46, Mohakhali C/A

Present Status of the Factory : **Under Operation**

Structural assessment conducted by : Alliance

Date of Structural Inspection : 08-May-2014

Fire & Electrical assessment conducted by: Alliance

Date of Fire & Electrical Inspection : 02-May-2014

BASIC INFORMATION:

The present garment factory is a seven storied building with beam-column frame system and Flat Plate at newer portion .The following general information was noted:

i.	Building Usage Type	: Factory Building.
ii.	Structural System	: Moment resisting frame system (RCC beam slab).
iii.	Floor System	: Monolithic beam slab.
iv.	Floor Area	: Total area-107216.00 sft.
v.	No. of Stories	: Seven Stories (G+6).
vi.	Construction Year	: Finished in 2005.
vii.	Foundation Type	: Pile foundation.
viii.	Design Drawings	: Available
ix.	Soil investigation Report	: Available
x.	Construction Materials	: Columns: Stone aggregate with 60 grades rebar. Beams and slabs: Brick aggregate with 60 grade rebar.
xi.	Generator	: Ground floor.

RECOMMENDATIONS FOR CORRECTIVE ACTION:

The recommendations of corrective action for both Structural, Fire and Electrical Safety comprises in Short Term, Mid Term and Long Term basis.

The recommendations for Structural Safety corrective actions are:

Immediate : NA

Short Term (3 Weeks) : A program needs to be developed to ensure that live loads do not exceed the design load. Load Manager will enforce this program.

Mid Term (6 Weeks) :

i. Factory owner should manage the occupancy certificate through proper authorities.
ii. Wind and storm surge loading needs to be clearly mentioned in structural design documents.
iii. Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standards.
iv. Floor load plan should be posted properly.
v. Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.

vi. 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 and BNBC 1.9.1.1.

Long Term (6 Months) : 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 Fire Safety corrective actions are:

Immediate (3 to 6 Days)	There were combustibles stored underneath the cutting table at 1st floor of the factory. Remove all combustible storage materials from underneath the cutting tables at the noted locations. Remove all combustible materials in front of the medical room.
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)	Fire Department pre-planning has not been completed yet. Complete fire department pre-planning activities with the local Fire Service and Civil Defense in accordance with Alliance Standard, Part-13, Section-13.1.1(2). Automatic fire alarm and detection system is available in the factory. But currently there is no monitoring company in Bangladesh. Fire Service and Civil Defense is not also capable of monitoring fire alarm and detection systems of the factories. As per section 5.7.5., until that time that a central station monitoring service or direct connection to the Fire Service and Civil Defense can be set up, 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 to alert this person. Occupant loads were not posted in any assembly and production floor as demanded in Alliance Standard Part 6 Section 6.4.4. Post the occupant load for every assembly and production floor in a facility 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 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.

	Implement training program with proper documentation in accordance with the Alliance Safety Training Curriculum on fire safety. 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 or, since battery backup is used, these lights are required to be tested on a monthly basis. Through the interview, it was noted that the workers are aware of the evacuation procedure upon commencing of the alarm. However, no procedure defining evacuation process was available. Develop an emergency evacuation plan which includes all components required by the Alliance Standards and communicate the plan to all employees in accordance with Alliance Standard, Part-13, Section-13.3. BERC License for 580 KW Diesel Generator found but the license for 120 KW Diesel Generator was not available; Coverage area is not mentioned in the fire license. Apply to BERC for waiver certificate and apply to Fire Service Civil Defense for appropriate fire license that covers the fully occupied area of the factory. Install signage adjacent to each stair door indicating the stair name and the floor level at the noted locations. Install required identification signs at the noted locations. Signage must comply with NFPA 14. No occupancy certificate is available for the existing building in the factory premises. Apply to RAJUK for issuance of occupancy certificate and pursue the matter to expedite.
Long Term (6 Months)	Doors and openings of substation room, finished goods store (at ground floor), doors & openings at the separation of the cutting section and office (1st floor), doors and openings at the separation of the finishing section, prayer room and dining room are not fire protected. Close all windows and other openings on all the fire rated walls across the entire premise and install certified fire rated doors. Provide 1.5 hr. certified fire rated doors at each floor level at north stair enclosure. A Class III standpipe system with adequate water pressure has been installed at the existing building. However, no approved hydraulic design or any approved document for testing of the existing standpipe system was found. Prepare the hydraulic design of the system and get it approved by Alliance expert. 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 as per clause 5.4.3.3. Fire extinguishers are to be inspected, tested, and maintained in accordance with NFPA 10 Chapter 7 as demanded in Alliance Standard Part 13 Section 13.10.3. Establish an inspection, maintenance, and testing program for the standpipe and hose system. Program must comply with the requirements of NFPA 25. Develop a hot work permit program. The program must comply with the requirements of NFPA 51B. According to Alliance Standard 5.5.4 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 and should be clearly identified. The pump is available and dedicated for fire fighting and the hose pressure is approximately 4.5 bar. There is a jockey pump and the pump is connected to an alternative power source. But the factory authority could not show any document related to the installation of fire pump accepted by Alliance. 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 24 testing requirements. Documentation of all testing shall be submitted to the Alliance for review prior to final acceptance by the Alliance. 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. Provide handrails on both side of each stairway. Provide intermediate handrail when the stair width exceeds 2.2m (87 inch). Provide handrail of height between the range 865 mm (34 in.) and 965 mm (38 in.). According to Alliance Standard, Part-13, Section-13.6, 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. 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.).

The recommendations for Electrical Safety corrective actions are*:*

Immediate (3 to 6 Days)	Need to find the causes of overheating and consider replacement of conductors or equipment.
Short Term (3 Weeks)	Ensure proper identification of emergency power switchboards, distribution boards, and circuits. Ensure signage indicating the prohibition of light fixtures without protective covers is installed at required locations. Provide required equipment and safety signage within the room. Provide two separate points earthing (grounding) for generator. 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. Connect all metal in the building to the building earthing/grounding system such as metal rebar in concrete, metal frame of building, or metal water pipe.
Mid Term (6 Weeks)	Ensure distribution boards are metal enclosed with a dead front construction. Provide clearance of at least 1 m (39 in) in front of distribution boards. Provide mechanical guards for electrical equipment where necessary. Install appropriate type and number of firefighting equipment inside the generator room. Ensure proper ventilation for generator room. Provide capacity information labels (maximum current rating, no of circuit breakers etc.) for distribution boards.
Long Term (6 Months)	Install distribution boards in compliant locations so that operation is not hampered due to limited access. Consult with a qualified Electrical Engineer and ensure electrical cables are sized according to capacity of circuit breakers. Provide adequate fire rating, protection for substation room and make it separated from rest of the building. Consult with an expert electrical engineer and prepare drawing for lightning protection including risk index and make sure your system is secured against lightning.