Name of the Factory	: **Western Dress Ltd Unit 2**
Address of the Factory	: 123/1, North Begun Bari Tejgoan I/A, Dhaka
Present Status of the Factory	: **Under Operation**
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 14 May 2014
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 11 May 2014
BGMEA Membership No	: 1179

BASIC INFORMATION:

There is one structure in the premise which is a seven (7) storied storied RCC building. The following general information was noted:

i.	Building Usage Type	: Garments Factory.
ii.	Structural System	: Column beam supported RCC frame structure. Foundation type is pile foundation. External & internal partition is masonry wall.
iii.	Floor System	: Beam slab type in RCC Building
iv.	Floor Area	: Total area of the building in the factory premises: 78000 sft. Floor wise breakdown as follows: 1) Seven story main production building: 78000 sft (Ground Floor: 10500 sft, 1st floor: 10500 sft, 2nd floor: 10500 sft, 3rd floor: 10500 sft, 4th floor: 10500 sft, 5th floor: 10500 sft, 6th floor: 7500 sft, Roof: 7500 sft.)
v.	No. of Stories	: 1)Seven story main production building: Stories above grade: 7, Stories below grade: 0, Occupied levels: 7.
vi.	Construction Year	: Factory personnel informed the date of construction as follows: 1) Seven story main production building: Finished in May-2000.
vii.	Foundation Type	: Pile 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. Under guidance from a qualified structural engineer arrange Detail Engineering Assessment of the structure. This assessment should include destructive core testing to validate the in-situ concrete compressive strength of structural elements.

ii. As part of the detailed assessment outlined elsewhere, conduct destructive core testing to validate the in-situ concrete compressive strength of structural elements.

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

iv. Engage a qualified structural engineer to develop the required documents to confirm the structural integrity of the buildings. The documents must comply with the Alliance Standards Part 8 Section 8.19 and 8.20.

v. Engage a qualified structural engineer to confirm and document that provisions have been made to accommodate these water tanks. If provisions have not been made, have a qualified structural engineer develop a remediation plan.

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

vii. Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and the Alliance Standards.

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 Standards. Floor load plans should be visibly posted on all levels of all buildings

x. Have a qualified structural engineer prepare a load plan for each floor and have floor markings that designate the storage areas laid out in the developed load plan.

xi. "Remove deteriorated expansion joint material and provide new approved material at the expansion joint.

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 that are constructed with MCAC and that are exposed to rainfall or other sources of water. Have the protective coating approved by the Alliance or a qualified structural engineer. Alternatively, provide a 2% slope on the exposed surface to prevent the accumulation of water

iii. Provide Certificates of Occupancy for review

The recommendations for Electrical Safety corrective actions are*:*

Immediate (3 to 6 Days)	Find out the cause of the overheating and take proper action, including replacing cable or equipment where necessary.
Short Term (3 Weeks)	Develop and implement an electrical safety program. Include key topes such as lock out tag out procedures, personal protective equipment requirements, etc. Reference NFPA 70e for example program requirements. 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. Switchboards and/or distribution boards should have capacity information labels e.g current carrying capacity of bus bar, rating of main incoming breaker , size of panel and permitted no. of CB, maximum permitted load connection capacity, etc.
Mid Term (6 Weeks)	Provide cable sockets for stranded conductors having a nominal cross-sectional area 6mm2 or greater. Have a qualified electrical engineer develop an as-built single line diagram detailing key components and capacity of the electrical system. Install phase separators between terminal connections at the noted locations.
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. 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)	Keep means of egress continuously free and clear of all obstructions or impediments to allow full instant use in the case of fire or other emergency. Remove all combustibles stored underneath the cutting

	tables at the noted locations as required by the Alliance Standards.
Short Term (3 Weeks)	Replace all collapsible gates in the means of egress with the side-hinged swinging type fire doors of the proper width and rating. This is required under the Alliance Standards 6.8. Remove all hasps, locks, slide bolts, or other locking devices at the noted locations. 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. Relocate the childcare on ground floor with a maximum travel distance of 9 m (30 ft) or located it on 1st floor where direct access to an exit enclosure is provided as demanded in Alliance standard 3.4.2.1.1.
Mid Term (6 Weeks)	Provide an automatic fire alarm and detection system per NFPA 72 as required by the Alliance Standard and arrange for direct connection of the system to a central station monitoring service or the Fire Service and Civil Defense as per Alliance Standard Part 5 Section 5.7.5 Monitoring. Until that time 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 (such as a fire control room) to alert this person. Impart training in accordance with the Alliance Safety Training Curriculum and keep records with the proper documentation as required by the Alliance Standards. Develop an emergency evacuation plan which includes all of the components required by the Alliance Standards and communicate the plan to all employees. 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 exit signs is verified at least once per year. If battery-operated signs are used, these signs shall be tested on a monthly basis. Functional testing of battery powered signs shall be provided for a minimum of 90 minutes once per year. Install signage adjacent to each stair door indicating the stair name and the floor level at the noted locations in accordance with the Alliance Standards.

	Complete fire department pre-planning activities with the local Fire Service and Civil Defense in accordance with the Alliance Standard. Apply to BERC for license and electricity license issuing board for electrician license. Install required identification signs at the noted locations as per NFPA requirements. Apply to Rajuk for issuance of occupancy certificate and pursue the matter to expedite.
Long Term (6 Months)	Provide fire-resistive rated assemblies at the required exit access corridors. Exit access corridors serving an occupant load exceeding 30 are to be separated by walls having a fire resistance rating of 1 hr. Provide a fire-resistive rated assembly between the exterior exit stairs and the building to achieve the required separation in accordance with the Alliance Standards. The rated assembly should be approved and/or designed by a qualified fire protection engineer. Remove existing aisle markings and draw new markings to fulfill the minimum aisle width requirement. Relocate the machines accordingly if necessary. Provide 1.5 hour fire protective opening assemblies in 2 hour rated exit enclosures as required under the Alliance Standards. Construct the required rated walls and slab for the open exit passageway in accordance with Alliance standard 6.14. Provide a rated exit passageway and a protected path of egress from the exit enclosure to the public way. The rating of the exit passageway is to be equal to fire rating requirement of the exit that is being served and shall not be less than 1 hour fire-resistance rated. Install a NFPA 14-compliant standpipe system designed by a qualified fire protection engineer at the required locations. All standpipe system installations and hydraulic calculations shall be submitted for review by the Alliance prior to commencement of installation. Testing of the installation shall be conducted in accordance with the NFPA 14 acceptance testing requirements. Documentation of all of the testing shall be submitted for review by the Alliance. Final inspection and testing of the installation shall be witnessed by the Alliance as required by the Alliance Standards.

	Install a pump dedicated to fire fighting or fire protection following NFPA requirements. The fire pump installation is to be tested in the presence of the Alliance prior to final acceptance of the installation. Acceptance testing of the installation shall be in accordance with NFPA 25 testing requirements. Documentation of all testing shall be submitted to the Alliance for review prior to final acceptance. This pump is to be connected to alternative power source like a generator, and the generator is to be connected with an ATS (auto starter). Notification and initiation devices should be installed in accordance with NFPA 72. Install fire rated doors and windows or fill in unprotected openings with fire resistive rated assemblies. Provide 2 hour fire-resistive rated construction barriers at the exit enclosures for the steel stairs. Fit outward opening (towards the direction of egress), side-swinging, self-closing, non-lockable fire doors of 1.5 hour rating in all stairwell enclosures. Consult a qualified fire protection engineer to design the required rated construction barriers. Install an automatic fire detection system, portable fire extinguishers, and a standpipe system in accordance with the Alliance Standards then the accepted travel distance will be 60 meters. Otherwise, provide another exit to satisfy maximum travel distance requirement within 45 meters. Provide fire-resistive rated construction barriers between the floors following Table 4.4.1 of the Alliance Standards.Seal the penetrations with proper fire-resistive sealants. Provide fire-resistive rated construction barriers between the hazard types following Table 4.4.1 of the Alliance Standards. Consult with a qualified fire protection engineer to design the required rated construction barriers. Provide a fire department inlet and outlet connection as required in Alliance Standards 5.5.4. 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 signs are to be tested on a monthly basis. Functional testing of the battery powered signs is to be provided for a minimum of 90 minutes once per year. Install illuminated exit signs at the entrances to the 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 in accordance with the Alliance Standards. Select fire extinguishers based on potential fire class and hazards following NFPA 10 Chapter 5. Fire extinguishers are to be inspected, tested, and maintained in accordance with NFPA 10 requirements. Every door in a stair enclosure serving more than 5 stories shall be provided with re-entry doors unless it meets the following requirements. Stair doors may be permitted to be locked from the stair (ingress) side, preventing re-entry to the floor, provided that at least two floors allowing re-entry access at another exit are provided, there are not more than 4 stories intervening between the 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 identify 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 sides of each stairway. Provide an intermediate handrail when the stair width exceeds 2.2m (87 inches). Handrails should have a height between 865 mm (34 in.) and 965 mm (38 in.). Provided parapets or guards for all occupied roofs. The parapets and guards must have a minimum height of 1067 mm (42 in.) as demanded in the Alliance Standards. Develop a NFPA-compliant hot-work permit program. In general, this program should address the process of request and approval of authorities, necessary checks prior to approval, standby fire watch and fire fighting equipment, sounding of alarm procedure, duration and expiry of permit and reapproval procedure, etc. Make sure all required exit signs are illuminated continuously at all times. Exit signs may be illuminated either by lamps external to the sign or by lamps contained within the sign. The source of illumination shall provide 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. 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). Establish an inspection, maintenance, and testing program for the standpipe and hose system.