Name of the Factory	: **ATS Apparels Ltd**
Address of the Factory	: 414, Kochakuri, Telirchala Mouchak, Gazipur
Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Alliance
Date of Fire Inspection	: 31-May-14
Fire & Electrical assessment conducted by	: Alliance
Date of Structural & Electrical Inspection	: 4-Jun-14 & 31-May-14

BASIC INFORMATION:

The following general information was noted:

Building Usage Type	: Garments Factory.
Structural System	: This building is a Moment Resisting Frame.
Floor System	: monolithic concrete beam slab.
Floor Area	: 156405 sft
No. of Stories	: Six story RCC main production building
Construction Year	: 2005
Foundation Type	: spread foundation
Design Drawings	: Not Available
Soil investigation Report	: Available
Construction Materials	: RCC
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. Conduct destructive core testing to validated the in-situ concrete compressive strength of the structural elements.

ii. 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.

Mid Term (6 Weeks) :

i. 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.

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

iii. 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

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

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

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

vii. Have a qualified structural engineer prepare Load Plans including the information required in Section 8.20 of the Alliance Standard and have it posted on all levels of all buildings.

viii. Have a qualified structural engineer prepare a Load Plan for each floor and have the floors marked for designating storage area as per the developed 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. Otherwise, provide 2% slope on the exposed surface to prevent accumulation of water.

iii. Apply for issuance of Certificate of Occupancy and pursue the matter to obtain the same..

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 or comply with section 13.7.2 of Alliance Standard. Smoking shall be prohibited in any garment factory building, separate storage building, or any building or area where the Inspector of the Factories Rules (1.6.3.7) Part 53 requires that smoking be prohibited. If an Owner creates a designated smoking area outside the buildings, information on the location of these designated areas shall be posted on the signs required in 13.5.2.
Short Term (3 Weeks)	Remove all hasps, locks, slide bolts, or other locking devices at the noted locations as per Alliance Standard, section 6.8.2.
Mid Term (6 Weeks)	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. Develop a testing and maintenance program that ensures the emergency power 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. 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. 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. 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 your 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. Install required identification signs at the noted locations. Signage must comply with NFPA 14 Chapter 6. Complete fire department pre-planning activities with the local Fire Service and Civil Defense. Apply to BERC for license to use five generators.

	Install signage adjacent to each stair door indicating the stair name and the floor level at the noted locations. Apply to FSCD for issuance of occupancy certificate and pursue the matter to expedite.
Long Term (6 Months)	Protect the openings or doors of shaft enclosure by providing 1.5 hour rated opening protectives. Provide rated exit passageway i.e. 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 hr fire-resistance rated. Install an automatic sprinkler system throughout the building designed by a qualified fire protection engineer The hydraulic design of the sprinkler system has to be pre-approved by CoE of Alliance. All installation and design requirements outlined in BNBC Part 4 Chapter 4 shall be replaced by the requirements of NFPA 13. Pipe schedules shall not be used to size pipe. All systems shall be hydraulically calculated to meet the required NFPA 13 design requirements. Installation of new automatic sprinkler systems shall be required to provide shop drawings and hydraulic calculations as outlined in NFPA 13. The test and performance report of the installed system has to be submitted to Alliance for review. Final inspection and testing shall be witnessed by Alliance according to clause 5.3. Otherwise, sprinkler system can be avoided if the factory dismantled the prefab shed on roof which is used as female prayer room (thus need to make the roof un-occupied). Install class I standpipe system at required locations designed by a qualified fire protection engineer. The system is to be compliant with the requirements of NFPA 14. The hydraulic calculations should be reviewed by Alliance and review to be completed prior to start of work. All standpipe system installations shall be submitted for review by the Alliance for review prior to commencement of installation according to 5.4.3.2. 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. Exit enclosure shall have a minimum fire-resistance rating of 2 hr when connecting four stories or more and a minimum fire-resistance rating of 1 hr when connecting three stories or less. Fit doors that swing in the direction of egress, side-swinging, self-closing, non-lockable fire doors of 1.5 hr rating at 2 hr rated fire barriers and 1 hr rating at 1 hr rated fire barriers. Consult a qualified fire protection engineer to design the required rated construction barriers. Update the current pump to meet standard or install a pump dedicated for fire fighting or fire protection following the requirements of NFPA 20. Fire pump installation is to be

	tested for final acceptance in presence of the Alliance and a final inspection of the installation shall be conducted by the Alliance prior to final acceptance of the installation. 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. This pump is to be connected to alternative power source like generator. And the generator is to be connected with ATS (auto starter). Get at least 25 percent worker trained and certified in fire fighting, first aid and rescue training by the proper authority. Install fire rated doors and windows or fill in unprotected openings with fire resistive rated assemblies. Remove existing aisle marking and draw new marking fulfilling the minimum aisle width requirement (0.9m). Relocate the machines accordingly if necessary. Remove aisle marking and mark aisles again so that these are not blocked by any permanent element like column. Provide 1 hr fire protective opening assemblies in 1 hr rated exit enclosure. Provide 1.5 hr fire protective opening assemblies in 2 hr rated exit enclosure. 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 following section 6.8. of Alliance Standard. Construct required 2 hr rated walls for the open exit passageway near office side up to roof to enclose the exit passageway in the required fire resistance rated construction. Protect the exit passageway with protective opening assemblies in warehouse side for door and ventilation of warehouse. 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. Provided parapets or guards for all occupied roofs of a minimum height of 1067 mm (42 in). Every door in a stair enclosure serving more than five 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 four stories intervening between re-entry floors, re-entry is allowed on the top or next to top level, reentry 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 sides of each stairway. Provide intermediate handrail when the stair width exceeds 2.2m (87 inch). Provide handrail of height between the range 865mm (34 in.) and 965mm (38 in.). Fire extinguishers are to be inspected, tested, and maintained in accordance with NFPA 10 Chapter 7. Repave the walking surface to make the slope less than or equal to 1 in 20. Try to keep walking surface mostly level. Install fire department connections where required and in compliance with the Standard. 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. Provide fire-resistive rated construction barriers between hazard types in accordance with Alliance Standard Sections 3.4, 4.5 and 4.6. Consult a qualified fire protection engineer to design the required rated construction barrier. For cooking operation it needs to follow Alliance standard 5.10. Establish an inspection, maintenance, and testing program for the standpipe and hose system. Program must comply with the requirements of NFPA 25. Establish an inspection, maintenance and testing program for the fire pump. Program must comply with NFPA 25. Develop a hot work permit program. The program must comply with the requirements of NFPA 51B. In general, this program should address process of request and approval authorities, necessary checks prior approval, standby fire watch and fire fighting equipment, sounding of alarm procedure, duration and expiry of permit and re-approval procedure etc.

The recommendations for Electrical Safety corrective actions are*:*

Immediate (3 to 6 Days)	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. Find out the cause of 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 topics such as lock out tag out procedures, personal protective equipment requirements, etc. Reference NFPA 70e for example program requirements. Ensure light fixtures without protective covers are not

	installed in storage areas or in any area where the Inspector of the Factories Rules disallows these fixtures. Provide two separate points earthing (grounding) provided for generator. Ensure electrical connections at equipment, fixtures, etc. are properly secured. Ensure overcurrent protection device (circuit breaker) for each and every loads. Ensure wiring systems are selected and erected so that no damage is caused by the ingress of water. Ensure cable joints through porcelain/PVC connectors with PIB tape wound around joint.
Mid Term (6 Weeks)	Consult with a qualified electrical engineer to ensure electrical cables are sized according to capacity of circuit breakers. Install distribution boards in compliant locations so that operation is not hampered due to limited access. Ensure distribution boards provided with physical means to prevent the installation of more over current devices than that number for which the panel board was designed, rated, and listed following NFPA 70 section 408.54. Ensure distribution boards provided with physical means to prevent the installation of more over current devices than that number for which the panel board was designed, rated, and listed. Provide electrical insulation mats in front of distribution boards. Service cable should be installed in covered trench as it is dangerous to be laid on the floor.
Long Term (6 Months)	Consult with an expert engineer to have design and drawing of lightening protection system and ensure your building is secured.