Name of the Factory : **ASWAD COMPOSITE MILLS LTD.**

Address of the Factory : Kabirpur, Savar, Dhaka

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

Structural assessment conducted by : Alliance

Date of Structural Inspection : 22 May 2014

Fire & Electrical assessment conducted by: Alliance

Date of Fire Inspection : 8-May-14

Date of Electrical Inspection : 8-May-14

BASIC INFORMATION:

The present garment factory is a Differnt storied RCC & prefabricated steel building. The following general information was noted:

i.	Building Usage Type	: Garments Factory.
ii.	Structural System	: 1) Six story RCC Main Building, 2) Three story prefabricated steel Building, 3) Four story RCC Building,
iii.	Floor System	: Beam Supported slab.
iv.	Floor Area	: 1) Six story RCC Main Building: 203000 sft 2)Three story prefabricated steel Building: 60000 sft 3) Four story RCC Building: 4080 sft
v.	No. of Stories	: 1) Six story RCC Main Building, 2) Three story prefabricated steel Building, 3) Four story RCC Building,
vi.	Construction Year	: 1) Six story RCC Main Building: Finished in2006, 2) Three story prefabricated steel Building: Finished 2006, 3) Four story RCC Building: Finished in 2009
vii.	Foundation Type	: RCC Footings
viii.	Design Drawings	: Not Available
ix.	Soil investigation Report	: Available
x.	Construction Materials	: Reinforced Concrete &. prefabricated steel
xi.	Generator	: Unknown

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. 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.

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. A qualified structural engineer shall be engaged 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 2006

ii. A qualified structural engineer shall be engaged 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.

iii. A qualified structural engineer shall be engaged to prepare documents compliance with the seismic and wind requirements stated in the 2006 BNBC.

iv. A qualified structural engineer shall be engaged to confirm satisfactory structural performance of the buildings under wind loading as detailed in BNBC Part 6 Section 1.5.3.

v. Water tank shall be adequately anchored and braced to resist earthquake force as per BNBC and Alliance Standard.

vi. A qualified structural engineer shall be engaged to prepare credible as-built documents based on the requirements of Part 8 Section 8.19 of the Alliance Standard.

vii. Rust cleaning and re-painting are required with sufficient coating thickness prior to next rainy season.

viii. A qualified structural engineer shall be engaged to develop floor loading plans per the requirements of Part 8 Section 8.20.5.3

ix. A qualified structural engineer shall be engaged to prepare load plans including the information required in Section 8.20 of the Alliance Standard.

x. Areas used for storage of work materials and work products shall be clearly marked to indicate acceptable loading limits.

Long Term (6 Months) :

i. Certificate of Occupancy shall be obtained from the appropriate authority

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

The recommendations for Fire Safety corrective actions are:

Immediate	NA
Short Term (3 Weeks)	Remove all noncompliant doors 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 are considered two motions. Doors may be provided with locking hardware from the ingress side provided that a panic bar is installed on any door with an occupant load exceeding 49 persons.
Mid Term (6 Weeks)	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. 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 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. 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 minutes once per year. Implement training programs and document in accordance with the Alliance Safety Training Curriculum. Develop an emergency evacuation plan which includes all components required by the Alliance Standards and communicate the plan to all employees. The evacuation plan shall include provisions to assist physically disabled persons. A list of all employees with physical disabilities shall be kept by the Fire Service Director.

	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. Install signage adjacent to each stair door indicating the stair name and the floor level in both English and Bengali. Apply to BERC for issuing the license for generators. Install a standpipe system at required locations designed by a qualified fire protection engineer. The system is to be compliant with the requirements of NFPA 14. 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 Defence. Apply to Shimulia Union Parishod in an expeditious manner for issuance of the Certificates of Occupancy for each building and ancillary structure is according to building use.
Long Term (6 Months)	Provide fire-resistive rated opening and penetration protection for rated walls and assemblies in accordance with Alliance Standard Sections 4.6 and 4.7. Consult a qualified fire protection engineer to design the required opening protective and penetration systems. Install a 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. Provide fire-resistive rated construction barriers between floors in accordance with Alliance Standard Section 4.5. Consult a qualified fire protection engineer to design the rated construction barriers. Provide fire-resistive rated construction barriers and associated opening protection for exit enclosures in accordance with Alliance Standard Sections 4.5 and 4.6. Consult a qualified fire protection engineer to design the required rated construction barrier. 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. 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. This pump is to be connected to alternative power source like generator and the generator is to be connected with ATS (auto starter). Replace non-compliant doors and frames in the means of egress with side-swinging doors. Replacement doors shall be a minimum width of 0.8 m (32 in), and are listed, approved, self-closing, fire rated door assemblies (door and frame) with latching panic hardware. Replace non-compliant doors and frames in the means of egress with side-swinging doors. Replacement doors shall be a minimum width of 0.8 m (32 in), and are listed, approved, self-closing, fire rated door assemblies (door and frame) with latching panic hardware. Route exits directly to the exterior or provide an exit passageway in accordance with Alliance Standard Section 6.15 or an Egress Court in accordance with Alliance

	Standard Section 6.17.2 for non-compliant arrangements. Consult a qualified fire protection engineer to design and/or approve the required exit passageway or egress court. Train and certify at least 25 percent of workers in firefighting, first aid and rescue training by the proper authority. Provide re-entry to floor levels from the stairwells in accordance with Alliance Standard Section 6.8.3. Provide fire-resistive rated construction barriers between hazard types in accordance with Alliance Standard Sections 3.4 and 4.5. Consult a qualified fire protection engineer to design the required rated construction barrier. Provide handrails on both sides of each stairway. Provide intermediate handrails when the stair width exceeds 2.2 m (87 inch). Provide a handrail of height between the range 865 mm (34 in.) and 965 mm (38 in.). Develop a hot work permit program. The program must comply with the requirements of NFPA 51B. 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. Install a pump dedicated for firefighting or fire protection following the requirements of NFPA 20. Then establish an inspection, maintenance, and testing program for the fire pump. Program must comply with NFPA 25. Install class III standpipe system at required locations designed by a qualified fire protection engineer. The system is to be compliant with the requirements of NFPA 14. Then

	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.

The recommendations for Electrical Safety corrective actions are*:*

Immediate (3 to 6 Days)	Disconnect the panel from the electrical service and clean interior components of all dust and debris. Seal all openings within the enclosure to prevent dust and debris from entering.
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 capacity information labels (maximum current rating, number of circuit breakers, etc.) for distribution boards in permanently. Ensure signage indicating the prohibition of light fixtures without protective covers is installed at required locations. Post required equipment and safety signage within the substation room. Ensure proper identification of emergency power switchboards, distribution board, and circuits. Ensure cable joints through porcelain/PVC connectors with PIB tape wound around joint.
Mid Term (6 Weeks)	Ensure distribution boards are metal enclosed with a dead front construction. Ensure proper ventilation for generator room. Provide adequate cover on cable trench. Ensure switchboard is not installed above gas stoves or sinks or within 2.5m of any washing unit in washing rooms or laundries. Connect all metal in the building to the building earthing/grounding system such as metal rebar in concrete, metal frame of building and metal water pipe. Provide dedicated neutral for each circuit. Ensure switchboards and 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.

	Provide mechanical guards for electrical equipment where necessary. Provide clearance of at least 1 m (39 in) in front of distribution boards.
Long Term (6 Months)	Ensure the lightning protection earthing connection is bonded to the roof structure grounding. Ensure appropriate size for generator room in order to properly access the generator to perform routine maintenance activities. 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.