

## Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

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Name of the Factory	: ACS Textiles Ltd.
Address of the Factory	: Tetlabo, Rupgonj, Narayangonj, Dhaka, Bangladesh
Present Status of the Factory	: <b>Under Operation</b>
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 02-June-14
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 27-May-14

### **BASIC INFORMATION:**

The present garment factory is comprises of 13 buildings in the factory premises out of which five are main production buildings and eight are ancillary buildings. The following general information was noted:

- i. Building Usage Type : Shared Factory.
- ii. Structural System : Main Building 01: 2 storied steel building.  
Main Building 02: 3 storied steel building  
Main Building 03: Single storied steel building  
Main Building 04: 2 storied steel building.  
Main Building 05: 2 storied steel building.  
Office building: 3 storied RCC office building.  
RCC Accessories Building: 3 storied RCC office building  
RCC staff quarter: 3 storied RCC office building.  
& others are single storied building.
- iii. Floor System : Steel structure & RCC beam column system
- iv. Floor Area : 1119985.00 sft
- v. No. of Stories : 2 storey, 3 storey & single storey building.
- vi. Construction Year : 2005-2012
- vii. Foundation Type : pile footing, isolated footing etc.
- viii. Design Drawings : Available.
- ix. Soil investigation Report : Available
- x. Construction Materials : Reinforced Concrete & Steel
- 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.

Mid Term (6 Weeks)

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- ii. Have a qualified structural engineer provide further analysis and testing of the noted settlement and crack issues. If required, a remediation plan shall also be provided by the qualified structural engineer.
  - iii. Have a qualified structural engineer carry out detailed structural assessment to understand the cause of lack of performance of the structure as well as for identifying appropriate remedial action.
  - iv. Engage a qualified structural engineer and carry out detail engineering assessment (DEA) to identify what remedial action is appropriate, which may include retrofitting. Reduction of load is required before any other remedial action is undertaken based on detailed structural assessment.
  - v. Have a qualified structural engineer provide further testing and analysis of cracking in walls and provide a remediation plan to correct noted issues.
  - vi. 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.
  - vii. Have a qualified structural engineer document compliance with the seismic and wind requirements stated in the 2006 BNBC.
  - viii. Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.
  - ix. 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
  - x. Have a qualified structural engineer to prepare credible as-built documents for required structures based on the requirements of Part 8 Section 8.19 of the Alliance Standard.
  - xi. Have a qualified structural engineer complete an analytical evaluation of the structural impact of the addition.
  - xii. 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.
  - xiii. Complete further testing on areas of deterioration in order to understand the level of corrosion and weakening of the member and have a qualified structural engineer develop a remediation plan.
  - xiv. Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard.
  - xv. Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading.
  - xvi. Engage a qualified structural engineer and carry out structural assessment to identify what remedial action is appropriate, which may include retrofitting. Reduction of load is required

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- before any other remedial action is undertaken based on detailed structural assessment.
- xvii. Have a qualified structural engineer develop Floor Loading Plans per the requirements of Part 8 Section 8.20.5.3
  - xviii. Have a qualified structural engineer prepare load plans including the information required in Section 8.20 of the Alliance Standard and have it posted in all required location. Floor load plans should be prepared & visibly posted on all levels of all buildings,
  - xix. 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. 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. Retrofitting is recommended as per assessment

### The recommendations for Electrical Safety corrective actions are:

Immediate (3 to 6 Days)	<p>Find out the cause of overheating and take proper action.</p> <p>Ensure light fixtures without protective covers are not installed in storage areas or in any area where the Inspector of the Factories Rules (1.5.3.5) Part 53 disallows these fixtures.</p>
Short Term (3 Weeks)	
Mid Term (6 Weeks)	<p>Ensure distribution boards are metal enclosed with a dead front construction.</p> <p>Provide clearance of at least 1 m (39 in) in front of distribution boards.</p> <p>Connect Cable trays and MS stairs to the building earthing system.</p> <p>Provide adequate cover on cable trench.</p> <p>Ensure proper identification of all emergency power distribution boards. It may be color paint or metal sticker permanently affixed with door.</p> <p>Ensure clear and permanent identification marks are painted in all distribution boards, switchboards, sub main boards and switches.</p> <p>Provide capacity information labels (Maximum current rating, no of circuit breakers etc.) for distribution boards.</p> <p>Provide mechanical guards for electrical equipment where necessary.</p>

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	<p>Provide electrical insulation mats in front of switchboards and distribution boards.</p> <p>Ensure signage indicating the prohibition of light fixtures without protective covers is installed at required locations.</p> <p>Ensure distribution boards free of dirt and debris.</p>
<p>Long Term (6 Months)</p>	<p>Ensure that wet type transformer is not leaking and have appropriate oil levels.</p> <p>Ensure switchboards and panel boards are not installed above gas stoves or sinks or within 2.5m of any washing unit in washing rooms or laundries.</p> <p>Ensure over an current protection device (circuit breaker) is installed for each and every load.</p> <p>Consult with a qualified Electrical Engineer and ensure electrical wiring and cables are sized according to capacity of circuit breakers.</p> <p>Remove multi looping of cables at circuit breakers &amp; busbar within switchboards and distribution boards.</p> <p>Ensure wiring systems are selected and erected so that no damage is caused by the ingress of water.</p> <p>Provide adequate fire rating for generator room.</p> <p>Consult with an Expert Electrical Engineer and ensure the system is secured against lightning.</p> <p>Ensure proper rating for distribution boards and provide physical means to prevent the installation of more over current devices than that number for which the panel board is rated.</p> <p>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.</p> <p>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 &amp; Rotating Equipment and NFPA 70B or a comparable standard</p>

**The recommendations for Fire Safety corrective actions are:**

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<p>Immediate (3 to 6 Days)</p>	<p>Remove all combustibles stored underneath the cutting tables at the noted locations. Establish and enforce a housekeeping policy to keep these areas clear of storage.</p>
<p>Short Term (3 Weeks)</p>	<p>Remove existing gates and doors in the means of egress including all locking devices. Install doors with approved panic hardware that cannot be locked in the direction of egress under any conditions.</p>
<p>Mid Term (6 Weeks)</p>	<p>Provide fire-resistive rated assemblies at the required exit access corridors. The rated assembly should be approved and/or designed by a qualified fire protection engineer. Exit access corridors serving an occupant load exceeding 30 are to be separated by walls having a fire resistance rating of 1 hr in accordance with 4.5 unless provided with automatic sprinkler protection throughout the story or building. Window and Glass Block Assemblies are to be tested fire rating following NFPA 257.</p> <p>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 to be tested on a monthly basis. Functional testing of battery powered signs is provided for a minimum 90 minutes once per year.</p>
<p>Long Term (6 Months)</p>	<p>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. Exits connecting three or fewer stories shall be enclosed with a minimum 1-hr fire-resistance rating. Exits connecting four or more stories shall be enclosed with a minimum 2-hr fire-resistance rating. Exits shall be enclosed with the same fire-resistance rating as the floor penetrated but will not need to exceed 2 hr. Provide fire door of required rating to access the corridor.</p> <p>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.</p> <p>Provide fire-resistive rated assemblies at the required exit access corridors. The rated assembly should be approved</p>

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	<p>and/or designed by a qualified fire protection engineer. Exit access corridors serving an occupant load exceeding 30 are to be separated by walls having a fire resistance rating of 1 hr in accordance with 4.5 unless provided with automatic sprinkler protection throughout the story or building. Window and Glass Block Assemblies are to be tested fire rating following NFPA 257.</p> <p>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. 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.</p>
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