

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: ARK Washing
Address of the Factory	: B-10,BSCIC Industrial Area, Tongi, Gazipur,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	: 22 May 2014
Date of Electrical Inspection	: 3-Jul-14

BASIC INFORMATION:

The present garment factory is a Single storied RCC building. The following general information was noted:

i.	Building Usage Type	: Garments Factory.
ii.	Structural System	: Single storied Load bearing Masonry (plate brick) Wall System. The roof is RCC structure..
iii.	Floor System	: RCC slab.
iv.	Floor Area	: Main Building: 10,052 SF.
v.	No. of Stories	: 01
vi.	Construction Year	: 1980
vii.	Foundation Type	: Unknown
viii.	Design Drawings	: Not Available
ix.	Soil investigation Report	: Available
x.	Construction Materials	: Brick wall
xi.	Generator	: Ground

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

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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)

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- i. Have a qualified structural engineer provide further testing and analysis of distress, cracking in walls and provide a remediation plan to correct noted issues.
- ii. 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
- iii. Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading.
- iv. Redistribute floor loads to comply with the Floor Loading Plans.
- v. Have a qualified structural engineer prepare credible as-built documents based on the requirements of Part 8 Section 8.19/8.20 of the Alliance Standard.
- vi. Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.
- vii. Have a qualified structural engineer assess the durability aspects as suggested in Alliance Standard Part 7 Section 7.2 and take appropriate remedial measures. This assessment should include a validation of in-situ concrete comprehensive strengths via destructive core testing.
- viii. Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard section 8.18.
- ix. Have a qualified structural engineer develop Floor Loading Plans per the requirements of Part 8 Section 8.20.5.3.
- x. Have a qualified structural engineer prepare load plans including the information required in Section 8.20 of the Alliance Standard.
- xi. Provide signage or the appropriate markings at all areas used for storage to indicate the acceptable loading limits detailed in the Load Plan.
- xii. Repair the exterior facade system to prevent water intrusion.

Long Term (6 Months)

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- i. Provide Certificates of Occupancy for review
- ii. Necessary remedial measure subjected to core test & further analysis.
- iii. 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.

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The recommendations for Fire Safety corrective actions are:

Immediate (3 to 6 Days)	NA
Short Term (3 Weeks)	Remove all hasps, locks, slide bolts, or other locking devices at the noted locations.
Mid Term (6 Weeks)	<p>Install an automatic fire alarm and detection system for the facility comply with the Alliance Standard and NFPA 72 with trouble or alarm notifications feature. Also consult a qualified fire protection engineer and/or authorized fire alarm company to design and install the system.</p> <p>Training programs need to be implemented and documented in accordance with the Alliance Safety Training Curriculum.</p> <p>Post the occupant load for all assembly and production floor areas in a conspicuous space near the main exit or exit access doorway for the space in accordance with Alliance Standard Section 6.4.4.</p> <p>Develop a testing and maintenance program that ensures the operations 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.</p> <p>Complete fire department pre-planning activities with the local Fire Service and Civil Defence.</p> <p>Apply to appropriate authority in an expeditious manner for issuance of the Certificates of Occupancy for each building and ancillary structure is according to building use.</p>
Long Term (6 Months)	<p>Provide training and certification for the required number of people in fire fighting, first aid, and rescue training by an appropriate authority in accordance with the Alliance Safety Training Curriculum.</p> <p>Provide minimum 1hr fire-resistive rated construction wall and door to protect the unprotected door and openings in accordance with Alliance Standard Sections 4.6. Consult a qualified fire protection engineer to design the required opening protectives.</p> <p>Provide side-hinged swinging type doors in all means of egress (Alliance Standards Part 6 Section 6.8 Doors and Gates).</p> <p>Install initiating devices and notification appliances as required by the Alliance Standard and NFPA 72. Devices should be part of an automatic fire alarm and detection system for the facility. All fire alarm installations shall be</p>

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	<p>submitted for review by the Alliance prior to commencement of installation.</p> <p>Install a new automatic fire alarm and detection system. Once installed, arrange for direct connection of the fire alarm and detection system to a central station monitoring service or the Fire Service and Civil Defence as per Alliance Standard Part 5 Section 5.7.5 Monitoring. Until that time that a central station monitoring service or direct connection to the Fire Service and Civil Defence can be set up, a person trained to contact the Fire Service and Civil Defence in the event of fire alarm activation shall be provided. An annunciator shall be located in a constantly attended location (such as a fire control room) to alert this person.</p> <p>Establish an inspection, testing, and maintenance program for all fire extinguishers. Program must comply with the requirements of NFPA 10.</p> <p>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 separation construction barrier.</p> <p>Fire department (Siamese) inlet connections shall be provided to allow fire department pumper equipment to supplement the fire protection systems. 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 Defence hose thread standard.</p> <p>Provide a uniform slip resistant surface through the entire means of egress.</p> <p>Provided handrails on both sides of each stairway. Intermediate handrails shall be provided when the stair width exceeds 2.2 m (87 in.). Mount handrails at height between 30 in. to 44 in.</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 tested on a monthly basis. Functional testing of battery powered signs is provided for a minimum 90 min once per year.</p> <p>Create a Fire Safety Director position and fill the position with an individual that has had sufficient training to be able to carry out the required duties.</p> <p>Develop a hot work permit program. The program must comply with the requirements of NFPA 51B.</p> <p>Establish written corporate and plant policies on</p>
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	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.
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The recommendations for Electrical Safety corrective actions are:

Immediate	N/A
Short Term (3 Weeks)	<p>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.</p> <p>Put capacity information labels on all panel boards including information like bus bar rating, no. of CB allow according to the size of DB box, incoming CB rating, maximum permitted load etc.</p> <p>Provide two separate points earthing (grounding) provided for generator.</p> <p>Ensure electrical connections at equipment, fixtures, etc. are properly secured.</p> <p>Post a prohibition signage in front of storage or other location where there is a high risk of fire.</p>
Mid Term (6 Weeks)	<p>Install an emergency power supply source in the factory for emergency load like exit sign, fire pump, fire alarm, emergency light etc.</p> <p>Install seismic bracing light fixture which will be properly supported from the structure.</p> <p>Provide dedicated neutral for each circuit.</p> <p>Remove multi looping and bunch of cables at circuit breakers within distribution boards.</p> <p>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.</p> <p>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.</p> <p>Have a qualified electrical engineer develop an as-built single line diagram detailing key components and capacity of the electrical system.</p>
Long Term (6 Months)	<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</p>

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	<p>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 & Rotating Equipment and NFPA70B or a comparable standard.</p> <p>Provide means of ventilation for the substation room. Consult a qualified electrical engineer to determine the required ventilation rates based on the installed equipment.</p>
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