

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: ZEE-3 Washing Ltd.
Address of the Factory	: 62, Katgara, Zirabo, Ashulia, Savar.
Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 13-Apr-14
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 13-Apr-14

BASIC INFORMATION:

There are three sheds in factory premises. These include: 1. One RCC column supported PEB shed; 2. Two ancillary buildings. The following general information was noted:

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| i. | Building Usage Type | : Washing Factory. |
| ii. | Structural System | : PEB roof system |
| iii. | Floor System | : None. |
| iv. | Floor Area | : 18520 sft |
| v. | No. of Stories | : All are single storied |
| vi. | Construction Year | : 2007 |
| vii. | Foundation Type | : Unknown |
| viii. | Design Drawings | : Available. |
| ix. | Soil investigation Report | : Available |
| x. | Construction Materials | : MS 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) : NA

Mid Term (6 Weeks) :

- i. Have a qualified structural engineer provide further testing and analysis of distress, settlement, shifting, or cracking in columns or walls and provide a remediation plan to correct noted issues.
- ii. Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.
- iii. 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.

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- iv. Engage a qualified structural engineer to develop the required documents to confirm the structural integrity of the buildings. Documents must comply with the Alliance Standard Part 8 Sections 8.19 and 8.20
- v. Have a qualified structural engineer document compliance with the seismic and wind requirements stated in the 2006 BNBC.
- vi. Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard.
- vii. Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.
- viii. Have a qualified structural engineer provide further analysis of the identified cracks to determine the appropriate course of corrective action.

Long Term (6 Months)

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- i. Apply for issuance of the Certificates of Occupancy and pursue the matter to obtain the same.

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)	<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>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.</p> <p>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.</p> <p>Install phase separators between terminal connections at the noted locations.</p>
Mid Term (6 Weeks)	<p>Need to remove looping of wiring/cables at circuit breakers.</p> <p>Provide protective cable guards for all cable runs from MDB to LT panels.</p> <p>Provide cable sockets for stranded conductors having a nominal cross-sectional area 6mm² or greater.</p> <p>Have a qualified electrical engineer develop an as-built single line diagram detailing key components and capacity of the electrical system.</p>

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The recommendations for Fire Safety corrective actions are:

Immediate (3 to 6 Days)	N/A
Short Term (3 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.
Mid Term (6 Weeks)	<p>Arrange for direct connection of the fire alarm system as per Alliance Standard Part 5 Section 5.7.5 Monitoring. Until that time that monitoring 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.</p> <p>Develop an emergency evacuation plan which includes duties and responsibilities of various people/groups, interfacing between groups and fire brigade, headcount and identification of trapped victims, physically disabled people and their rescue, etc. and all components required by the Alliance Standards and communicate the plan to all employees.</p> <p>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.</p> <p>Impart training in accordance with Alliance Safety Training Curriculum and keep record with proper documentation.</p> <p>Develop a testing and maintenance program that ensures the operation of all exist signs is verified at least once per year. If battery-operated signs are used, these lights shall be tested on a monthly basis. Functional testing of battery powered signs shall be provided for a minimum 90 min once per year</p> <p>Install a standpipe system at required locations designed by a qualified fire protection engineer.</p> <p>Then install required identification signs at the noted locations. Signage must comply with NFPA 14.</p> <p>Complete fire department pre-planning activities with the local Fire Service and Civil Defense</p> <p>Install signage adjacent to each stair door indicating the stair name and the floor level at the noted locations.</p> <p>Apply to Rajuk/ proper authority for issuance of occupancy certificate and pursue the matter to expedite.</p>
Long Term (6 Months)	Install a centralized automatic fire alarm and smoke/heat detection system with control panel following the requirement of NFPA 72 throughout all new and existing

	<p>buildings and structures.</p> <p>At main building Provide 1.5 hr fire protective opening assemblies in 2 hr rated exit enclosure as required in accordance with section 6.3.1.2.2 and 4.6.</p> <p>Replace all collapsible, sliding, roll-down gates and shutters in means of egresses with side-hinged swinging type doors of proper width and rating.</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>Standalone standpipe systems shall meet the local BNBC requirements with a minimum 450 kPa (65 psi) pressure at the hydraulically most remote hose connection or NFPA 14. This requirement is as per clause 5.4.3.</p> <p>Provide 2 hr fire-resistive rated construction barriers at exit enclosures of main building. Fit outward opening, side-swinging, self-closing, non-lockable fire doors of 1.5 hr rating in all stairwell enclosures. Consult a qualified fire protection engineer to design the required rated construction barriers.</p> <p>Installed a pump dedicated for fire fighting or fire protection following the requirements of NFPA 20 as mentioned in Alliance Standard Section 5.5.1. 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 by the Alliance as per clause 5.5.5. 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 an alternative power source such as a generator provided with ATS (auto transfer switch).</p> <p>Initiating devices shall include either smoke or fire detection devices spaced in accordance with NFPA 72. When complete sprinkler protection is provided throughout a floor with waterflow devices designed to initiate the alarm notification, smoke and fire detection devices can be eliminated throughout that floor as per Alliance Standard</p>
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	<p>Part 5 Section 5.7.3.1.</p> <p>Close all windows and other openings on all the fire rated wall across the entire premise.</p> <p>Remove all hasps, locks, slide bolts, or other locking devices at the noted locations.</p> <p>According to section 6.8.2.2 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.</p> <p>Provide handrails on both side of each stairway. Provide intermediate handrail when the stair width exceeds 2.2m (87 inch). Provide handrail of height between the range 865 mm (34 in.) and 965 mm (38 in.).</p> <p>These different occupancies need 3 hr fire-resistive rated construction barrier according to Alliance Standard Part 4</p> <p>Section 4.5 and BNBC Table 3.2.1 (pg-10352)</p> <p>Provide fire-resistive rated construction barriers between hazard types following Table 4.4.1 of Alliance Standard or Table 4.1.1 from BNBC Part 4. Consult a qualified fire protection engineer to design the required rated construction barrier.</p> <p>Install fire department connections where required and in compliance with the Standard. According to Alliance Standard 5.5.4 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>Install a standpipe system at required locations designed by a qualified fire protection engineer.</p> <p>Every door in a stair enclosure serving more than 5 stories shall be provided with re-entry unless it meets the following requirements.</p> <p>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 4 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</p>
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	<p>requirements, re-entry does not have to be provided back into the building on this level.</p> <p>Fire extinguishers are to be inspected, tested, and maintained in accordance with NFPA 10 Chapter 7 as demanded in Alliance Standard Part 13 Section 13.10.3.</p> <p>Install a standpipe system at required locations designed by a qualified fire protection engineer.</p> <p>Then establish an inspection, maintenance, and testing program for the standpipe and hose system. Program must comply with the requirements of NFPA 25.</p> <p>Installed a pump dedicated for fire fighting or fire protection following the requirements of NFPA 20 as mentioned in Alliance Standard Section 5.5.1. Then establish an inspection, maintenance, and testing program for the fire pump. Program must comply with NFPA 25.</p> <p>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 reapproval procedure etc.</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 the required duties.</p> <p>The duties of the Fire Safety Director shall include the following:</p> <ol style="list-style-type: none">(1) Establish internal and external rally points and communicate to all employees in the building.(2) Fire department pre-planning.(3) Conduct safety inspections as outlined in Alliance standard 13.9.(4) Ensure all testing of fire protection equipment is conducted in accordance with Alliance standard 13.10. <p>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</p>
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	46.5 m ² (500 ft ²). Limit dense deposits to 6 mm (¼ in.) and oil saturated deposits to 3.2 mm (⅛ in.).
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