

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

| | |
|---|---|
| Name of the Factory | : Windy Wet & Dry Process (Unit-2) |
| Address of the Factory | : 936, Vogra Chowdhury Bari, Joydevpur, Gazipur, Dhaka Bangladesh |
| Present Status of the Factory | : Under Operation |
| Structural assessment conducted by | : Alliance |
| Date of Structural Inspection | : 16 May 2015 |
| Fire & Electrical assessment conducted by | : Alliance |
| Date of Fire & Electrical Inspection | : 16 May 2015 |

BASIC INFORMATION:

The present garment factory is comprises of a 2 Main Buildings 2 Ancillary Buildings. The following general information was noted:

| | |
|-------------------------------|---|
| i. Building Usage Type | : Garments Factory. |
| ii. Structural System | : All buildings are 2 storied steel structure with Shallow Foundation (Isolated Column Footings). |
| iii. Floor System | : PEB section in steel structure. |
| iv. Floor Area | : 32,800 SF. |
| v. No. of Stories | : Shed-1: G+M+1; Shed-2: Single story shed, Generator shed: Single story shed; ETP: Single story RCC structure) |
| vi. Construction Year | : 2008-2010 |
| vii. Foundation Type | : Isolated Column Footing |
| viii. Design Drawings | : Not Available. |
| ix. Soil investigation Report | : Available |
| x. Construction Materials | : RCC (Brick chips). |
| 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.
- ii. 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 load limits as described on the Floor Load Plans.

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Mid Term (6 Weeks)

:

- i. Have a qualified structural engineer provide further analysis along with a remediation plan to correct noted issues
- ii. Have a qualified structural engineer prepare credible as-built documents based on the requirements of Part 8 Section 8.19 of the Alliance Standard.
- 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.
- iv. Complete further testing on areas of deterioration and have a qualified structural engineer develop a remediation plan.
- 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. Floor load plans should be visibly posted on all levels of all buildings.
- viii. Provide signage or the appropriate markings at all areas used for storage to indicate the acceptable loading limits detailed in the 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. Repair the exterior façade system to prevent water intrusion.
- iii. Provide Certificates of Occupancy for review.

The recommendations for Electrical Safety corrective actions are:

| | |
|-------------------------|---|
| Immediate (3 to 6 Days) | Remove improperly stored materials from the Generator Room and keep the Generator Room clean. Remove all dirt, debris, lint, water, oil, and improperly stored materials from the substation room. |
| 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 proper identification of emergency power switchboards, distribution boards, and circuits in all facilities in the edifice. 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. |

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

| | |
|----------------------|---|
| | <p>Install phase separators between terminal connections at the noted locations.</p> |
| Mid Term (6 Weeks) | <p>Provide proper support and protection for the cables in Generator Room and Substation using metallic cable tray with cover.</p> <p>Provide cable joints with PVC connectors with PIB tape wound around.</p> <p>Provide earthing connection to all exposed-conductive parts (metal) related to/in close proximity to electrical equipments/installation and utility service such as metallic water/gas/steam pipes etc. such that all the metals remain at a substantially same potential of building earthing system.</p> <p>Remove all obstacles from in front of electrical panels so that there is a minimum of 1 m clearance in front. Install covered cable-tray for laying the cables on the floor in a safer location (instead of installing flexible pipes).</p> <p>Relocate the distribution board to a safe location so that it is not in risk of ingress of water.</p> <p>Use circuit breakers of appropriate size for connecting loads.</p> <p>Check all of the panels to find the over-rated circuit breakers, and then replace the circuit breakers with appropriate circuit breakers considering the cable size.</p> <p>Avoid multi looping by taking separate connection from busbar for individual circuits.</p> <p>Remove the un-terminated cable from busbar or terminate it inside circuit breaker for future use.</p> |
| Long Term (6 Months) | <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 NFPA 70B or a comparable standard.</p> <p>Have a qualified electrical engineer design a lightning protection system according to the BNBC requirements. Have a licensed electrician install the designed system.</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, switch gears 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> |

The recommendations for Fire Safety corrective actions are:

| | |
|-------------------------|------|
| Immediate (3 to 6 Days) | None |
|-------------------------|------|

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

| | |
|----------------------|---|
| Short Term (3 Weeks) | Remove all locking devices from all egress doors and means of egress components in accordance with Alliance Standard Section 6.8. If locks are required for security reasons, utilize special door locking features complying with NFPA 101. |
| Mid Term (6 Weeks) | <p>Install an automatic fire alarm and detection system for the facility. System shall comply with the Alliance Standard and NFPA 72. Consult a qualified fire protection engineer and/or authorized fire alarm company to design and install the system.</p> <p>Implement training programs and document in accordance with the Alliance Safety Training Curriculum.</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 Defense as per Alliance Standard Section 5.7.5. Until that time, a person trained to contact the Fire Service and Civil Defense 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>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 emergency power for 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>Develop a testing and maintenance program that ensures the emergency power for exit signs is verified at least once per year. If battery-operated signs are used, these signs 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>Collect all applicable permit and license and kept up to date including boiler license and waiver certificate from BEREC.</p> <p>Complete Fire Department pre-planning activities with the local Fire Service and Civil Defense in accordance with Alliance Standard Section 13.1.1(2).</p> <p>Install signage adjacent to each stair door indicating the stair name and the floor level in both English and Bengali.</p> <p>Apply to appropriate authority in an expeditious manner for issuance of the Certificates of Occupancy for each building and ancillary structure according to building use.</p> |
| Long Term (6 Months) | <p>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.</p> <p>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</p> |

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

| | |
|--|--|
| | <p>assemblies (door and frame) with latching panic hardware.</p> <p>Route exits directly to the exterior or provide 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 egress court.</p> <p>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 and opening protection.</p> <p>Install initiating devices and notification appliances as required by the Alliance Standard and NFPA 72. Connect devices to an automatic fire alarm and detection system for the facility. All fire alarm installations or modifications shall be submitted for review by the Alliance prior to commencement of installation.</p> <p>Provide a uniform slope/ramp for the walking surface. Slope should not exceed 1 in 20 in the direction of travel. Any changes in elevation (protrusions or lips) must not exceed 1/4 in.</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 construction barrier.</p> <p>Establish an inspection, testing, and maintenance program for all fire extinguishers and prepare proper documentation. Program must comply with NFPA 10.</p> <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.</p> <p>Create a Fire Safety Director position and fill the position with an individual that has sufficient training to be able to carry out the required duties in accordance with Alliance Standard Section 13.1.</p> <p>Develop a hot work permit program. The program must comply with the requirements of NFPA 51B.</p> |
|--|--|