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| Name of the Factory | : **WALTZ FASHIONS LTD.** |
| Address of the Factory | : Badshamia School RD, Khalikur, National University, Gazipur |
| Present Status of the Factory | : **Under Operation** |
| Structural assessment conducted by | : Alliance |
| Date of Structural Inspection | : 20 May 2014 |
| Fire & Electrical assessment conducted by | : Alliance |
| Date of Fire & Electrical Inspection | : 05 May 2014 |
| BGMEA Membership No | : 3879 |

## BASIC INFORMATION:

The present garment factory is comprises of 2 Main Buildings (One belongs to another company) 2 Ancillary Buildings. The following general information was noted:

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| i. | Building Usage Type | : Garments Factory. |
| ii. | Structural System | : RCC frame structural system with infilled masonry walls. Foundation is a pile foundation. The slabs are supported by beams between columns.. |
| iii. | Floor System | : Beam slab type in RCC Building |
| iv. | Floor Area | : 104412.00 sft |
| v. | No. of Stories | : 1) Five Story Waltz Fashions Ltd Main Building: 5 (Basement + Grade + 4) 2) Four Story Rare Fashions Ltd Main Building: 4 (Basement + Grade + 3) |
| vi. | Construction Year | : Factory personnel informed the date of construction as follows: 1) Five Story Waltz Fashions Ltd Main Building: 2004, 2) Four Story Rare Fashions Ltd Main Building: 2010, 3) Single Story Utility Building-1: 2009, 4) Single Story Utility Building-2: 2009. |
| vii. | Foundation Type | : Pile foundation. |
| viii. | Design Drawings | : Available. |
| ix. | Soil investigation Report | : Available |
| x. | Construction Materials | : RCC (brick & Stone 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.

Mid Term (6 Weeks) :

i. 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.

ii. Engage a qualified structural engineer to prepare design report to confirm satisfactory structural performance of the buildings under wind loading.

iii. Have a qualified structural engineer complete an analytical evaluation of the structural impact of the addition.

iv. Engage a qualified structural engineer to develop the design report to confirm the structural integrity of the buildings. Documents must comply with Alliance Standard Part 8 Section 8.19 and 8.20

v. Have a qualified structural engineer prepare a design report based on the requirements of Part 8 Section 8.19 of the Alliance Standard.

vi. Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard.

vii. Have a qualified structural engineer develop Floor Loading Plans as per the requirements of Part 8 Section 8.20.5.3

viii. 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 locations.

ix. Provide signage or the appropriate markings at all areas used for storage to indicate the acceptable loading limits detailed in the Load Plan.

x. Have the full identity of the geotechnical engineer mentioned in the geotechnical report.

xi. "Have a qualified structural engineer provide further analysis of the identified cracks to determine the appropriate course of corrective action.

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 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

iv. Provide Certificates of Occupancy for review

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

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| 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) | Develop and implement an electrical safety program. Include key topes such as lock out tag out procedures, personal protective equipment requirements, etc. Reference NFPA 70e for example program requirements.<br><br>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.<br><br>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. |
| Mid Term (6 Weeks) | Provide cable sockets for stranded conductors having a nominal cross-sectional area 6mm2 or greater.<br><br>Install phase separators between terminal connections at the noted locations. |
| Long Term (6 Months) | Have a qualified electrical engineer design a lightning protection system, according to the BNBC requirements. Have a licensed electrician install the designed system. |

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

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| Immediate (3 to 6 Days) | Keep means of egress continuously free and clear of all obstructions or impediments to full instant use in the case of fire or other emergency. |
| 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.<br><br>Daycare occupancies that are accessory to other occupancies shall be located on the ground floor with a maximum travel distance of 9 m (30 ft). If located on a higher floor, direct access to an exit enclosure shall be provided as per the Alliance Standard. |
| Mid Term (6 Weeks) | 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.<br><br>Arrange for direct connection of the fire alarm system to a central monitoring station or Fire Service and Civil Defense as per the Alliance Standard. Until that time that monitoring can be set up, a person shall be assigned to contact the fire |

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| | 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.<br><br>Fire drills shall be conducted under the direction of a Fire Safety Director. All other requirements for fire drills shall be conducted in accordance with BNBC Part 4 Appendix A.<br><br>Implement training program with proper documentation in accordance with the Alliance Safety Training Curriculum on fire safety.<br><br>Emergency power for means of egress illumination shall be 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 30 min once per year.<br><br>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.<br><br>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 signs are to tested on a monthly basis. Functional testing of battery powered signs is provided for a minimum 90 min once per year.<br><br>Install signage adjacent to each stair door indicating the stair name and the floor level in accordance with Alliance Standard.<br><br>Apply to Biddyut Paridaptor for Electrician license.<br><br>Complete fire department pre-planning activities with the local Fire Service and Civil Defense in accordance with Alliance Standard.<br><br>Install identification signs at the required locations as per NFPA-14.<br><br>Apply to FSCD for issuance of occupancy certificate and expedite the matter. |
| Long Term (6 Months) | Provide 1.5 hr fire protective opening assemblies in 2 hr rated exit enclosures as per Alliance Standards. If those shafts are not needed the seal them with 2 hr rated walls.<br><br>Provide fire rated exit passageway i.e. protected path of egress from the exit enclosure to the public way. The rating of the exit passageway is to be equal to fire rating requirement of the exit that is being served and shall not be less than 1 hr fire-resistance rated.<br><br>Provide fire rated exit passageway i.e. protected path of egress from the exit enclosure to the public way. The rating of the exit passageway is to be equal to fire rating requirement of the exit that is being served and shall not be less than 1 hr fire-resistance rated.<br><br>Install fire rated doors and windows or fill in unprotected |

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| | openings with fire resistive rated assemblies.<br><br>Install a NFPA-14 compliant class-III standpipe system at required locations designed by a qualified fire protection engineer. The hydraulic calculations should be reviewed by the Alliance prior to start of work. All standpipe system installations shall be reviewed by the Alliance prior to commencement of installation. Testing of the installation shall be conducted in accordance with NFPA acceptance testing requirements. Documentation of all testing shall be submitted for review by the Alliance. Final inspection and testing of the installation shall be witnessed by the Alliance.<br><br>Provide 2 hr fire-resistive rated construction barriers at exit enclosures. Provide self-closing, non-lockable, 1.5 hour fire-resistive rated doors that swing in the direction of egress in all stairwell enclosures. Install 1.5 hour fire rated windows or fill in unprotected openings with fire resistive rated assemblies. Consult a qualified fire protection engineer to design the required rated construction barriers.<br><br>Install a pump dedicated for fire fighting or fire protection following NFPA 20 requirements. Fire pump installation is to be tested for final acceptance in presence of the 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 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 such as a generator, and the generator is to be connected with ATS (auto starter).<br><br>Train and certify at least 274 numbers of workers (which is 25 percent of total occupant load of the factory) in fire fighting, first aid and rescue by the proper authority.<br><br>Provide 1.5 hr fire protective opening assemblies in 2 hr rated exit enclosures as per the Alliance Standard.<br><br>Provide fire-resistive rated assemblies at the required exit access corridors. The rated assembly should be approved and designed by a qualified fire protection engineer in accordance with the Alliance Standard.<br><br>Replace all collapsible, sliding, roll-down gates and shutters in means of egress with side-hinged type doors of proper width and rating which swing in the direction of egress in accordance with the Alliance Standard.<br><br>Provide fire-resistive rated construction barriers between hazard types in accordance with the Alliance Standards. Consult a qualified fire protection engineer to design the required rated construction barrier.<br><br>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 Defense hose thread standard. Both the inlet and outlet connection should be clearly visible and should be in reach of fire |

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| | department pumper vehicle.<br><br>Inspect, test, and maintain fire extinguishers in accordance with NFPA 10 requirements.<br><br>Install handrails on both sides of the stairs in accordance with the Alliance Standard.<br><br>Reconstruct the ramp with slope 1 in 12 and provide handrails on both sides of the ramp as per the Alliance Standard.<br><br>Install illuminated exit signs at entrances to exits and along the path of egress anywhere the continuation of egress is not obvious or there is a change in the direction of the path of travel.<br><br>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. The duties of the Fire Safety Director shall include the following: (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. (4) Ensure all testing of fire protection equipment is conducted in accordance with Alliance Standard.<br><br>Make sure all required exit signs are illuminated continuously at all times. Exit signs may be illuminated either by lamps external to the sign or by lamps contained within the sign. The source of illumination shall provide not less than 50 lux at the illuminated surface with a contrast of not less than 0.5. Approved self-luminous signs which provide evenly illuminated letters having a minimum luminance of 0.2cd/m2 may also be used.<br><br>Develop a hot-work permit program in accordance with NFPA 51B requirements.<br><br>Establish an inspection, maintenance, and testing program for the standpipe and hose system. Program must comply with NFPA-25 requirements. |