

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Delta Accessories
Address of the Factory	: 2 Arun (South) Kashimpur, Gazipur Bangladesh
Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 20 Mar 2014
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 20 Mar 2014

BASIC INFORMATION:

The present garment factory is a steel frame RCC slab building. The following general information was noted:

i.	Building Usage Type	: Garments Factory
ii.	Structural System	: Steel Shed
iii.	Floor System	: Steel frame RC slab
iv.	Floor Area	: (Main building) 103160 sft (Total) (Ancillary building) Printing Prefabricated Shed = 22800sft, Raw material Go-down Prefabricated shed-1 = 6400 sft, Raw material Go-down Prefabricated shed-2 = 10000 sft.
v.	No. of Stories	: Building#1 (Level=2, Height=25 ft) Building#2- Printing Prefabricated Shed (Level=1, Height= 15 ft), Building#3- Raw material Go-down Prefabricated shed (Level=1, Height= 15 ft), Building#4- Raw material Go-down Prefabricated shed (Level=1, Height= 15 ft)
vi.	Construction Year	: 2007
vii.	Foundation Type	: Individual Footing
viii.	Design Drawings	: Not available
ix.	Soil investigation Report	: Not available
x.	Construction Materials	: Steel and RC slab
xi.	Generator	: Not available (generator power connection from another factory)

RECOMMENDATIONS FOR CORRECTIVE ACTION:

The recommendations of corrective action for both Structural, Fire and Electrical Safety comprises in Short Term, Mid Term and Long Term basis.

The recommendations for Structural Safety corrective actions are:

Immediate	: NA
Short Term: (3 Weeks)	: Develop a program to ensure that all live loads for which a floor or roof has been designed for will not be exceeded and appoint a factory load manager.

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Mid Term (6 Weeks):

- i. Develop the required documents to confirm the structural integrity of the buildings.
- ii. Prepare credible as-built documents based on the requirements.
- iii. Adequately anchor and brace all non-structural elements to resist earthquake forces.
- iv. Develop Floor Loading Plans per the requirements.
- v. Arrange geotechnical investigation at close vicinity of the structure and make the report available for review.

Long Term : NA

The recommendations for Fire Safety corrective actions are:

<p>Immediate (3 to 6 Days)</p>	<p>Remove combustible materials from the production floor.</p> <p>Provide non-combustible materials at the lighting fixture.</p> <p>Remove all combustibles materials stored underneath the cutting tables at the noted locations as per Alliance Standard Part 13 Section 13.7.2.</p>
<p>Short Term (3 Weeks)</p>	<p>Remove all temporary obstructions from all escape routes, aisles and passageways.</p> <p>Ensure minimum width of corridors, passageways and aisles.</p> <p>Ensure easy access to portable extinguishers and monitor and maintain the same at required interval as per guidelines. Provide proper directional sign and exit sign in Bangla and English as per guidelines.</p> <p>Provide aisles marking with proper direction and with minimum 36 inch width. Keep aisles free of obstruction.</p> <p>Remove all hasps, locks, slide bolts, or other locking devices at the noted locations. If locks are required for security reasons, utilize special door locking features complying with NFPA 101.</p>
<p>Mid Term (6 Weeks)</p>	<p>Produce proper drawing and plans to create horizontal and vertical fire-rated separation for stairways of appropriate specifications, grills, storage and assembly areas, offices, work areas. Also design to ensure proper separation of high risk areas (e.g., generator, boiler, transformer and substation rooms) as per guidelines.</p> <p>Remove all collapsible gates/roller shutters. Produce design drawings to demonstrate how stairways are to be made of adequate dimensions and appropriate specifications and to be converted into fire-rated enclosures equipped with fire-rated side swinging doors of required dimensions opening in the direction of travel at each floor.</p> <p>Develop a testing and maintenance program that ensures the Operations of all exist signs are verified at least once per year. If battery-operated signs are used, these lights shall be</p>

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	<p>tested on a monthly basis. Functional testing of battery powered signs shall be provided for a minimum 90 min once per year.</p> <p>Need to collect Certificates of Occupancy for each building.</p> <p>Training programs need to be implemented and documented in accordance with the Alliance Safety Training Curriculum.</p> <p>Install signage adjacent to each stair door indicating the stair name and the floor level at the noted locations. Stair designation signs are provided at each floor entrance from the stair to the floor in English and Bengali. Signs indicate the name of the stair and the floor level. Signs are posted adjacent to the door.</p> <p>Complete fire department pre-planning activities with the local Fire Service and Civil Defense</p> <p>Provide design to install proper fire detection and alarm system.</p>
<p>Long Term (6 Months)</p>	<p>Install horizontal and vertical fire- rated separation for stairways, grills, storage and assembly areas, offices, work areas.</p> <p>Ensure proper fire separation of high risk areas (e.g, boiler, transformer and substation rooms) as per approved design Install fire rated enclosure and doors at exit to the stairs to prevent smoke and fire propagation as per approved design Provide fire rated enclosure, install self closing fire rated door as per guidelines.</p> <p>Provide fire-resistive rated construction barriers between hazard types. Provide 2 hr. rated fire barrier for generator room and remove all combustible material from the ceiling. 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. Connections shall match the Fire Service and Civil Defense hose thread standard. It will allow fire department pumper vehicles to draw water from ground -level or underground water storage tanks.</p> <p>Fire barrier shall be continuous from outside wall to outside wall, from one fire barrier to another or combination thereof and shall be continuous through all concealed spaces.</p> <p>Install appropriate means of illumination at the noted locations. 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.</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>

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	<p>Install a fire pump system according to NFPA 20 with minimum pressure of 450 kPa (65 psi) at the hydraulically most remote hose connection.</p> <p>Provide pull stations at each egress points, smoke detectors in air handling equipment, visual and audible devices spaced appropriately based on occupancy type. Reference NFPA 72.</p> <p>Arrange sufficient training programs for fire fighting, first aid, and rescue training and make proper documentations and keep evidence for Alliance review. Train-up sufficient number (25 %) of worker for fire fighting and emergency purposes.</p>
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The recommendations for Electrical Safety corrective actions are:

Immediate	NA
Short Term (3 Weeks)	<p>Need to provide earthing connections at all electrical equipment.</p> <p>Connect all metal in the building to the building earthing/grounding system such as metal rebar in concrete, metal frame of building, or metal water pipe.</p> <p>Need to identify all overheating points and replace damaged cables, faulted circuit breakers, check loose connections, etc. and take other necessary steps to rectify problems as early as possible.</p> <p>Multiple connections/looping should be avoided. Each circuit should be connected individually and from separate protective device. In present case looping among breakers needs to be disconnected and connected separately from bus bar.</p> <p>Light fixtures without protective covers (otherwise known as naked lights) shall not be allowed in storage areas or in any area where the Inspector of the Factories Rules (1.6.3.7) Part 53 disallows these fixtures. Install signs posted in Bengali and English, indicating this prohibition at all entrances to these areas.</p>
Mid Term (6 Weeks)	<p>Have a qualified electrical engineer develop as-built electrical drawings providing detailing key components of the electrical system.</p> <p>Cable trenches should be covered by non-flammable material or fill by sand.</p>

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Long Term (6 Months)	Higher rated MCCB/MCB was used with lower rated cable in the distribution boards. This is a violation of section: 2.7.6.3 and 2.7.6.4 of BNBC-2006. As it is difficult to replace wire; it is recommended to replace the oversize breaker by one which can meet /match the existing cable.
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