

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: DAF Accessories.
Address of the Factory	: 173 Vannara, Mouchak, Kaliakoir, Gazipur, Bangladesh
Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 3-June-2014
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 28-May-2014

BASIC INFORMATION:

The present garment factory comprises of 6 buildings in the factory premises out of which two are main production buildings and four are ancillary buildings. The buildings are named as: 1) Three story Hanger building with prefab shed on roof, 2) Single story poly and packaging shed, 3) Single story oil store shed, 4) Single story childcare, kitchen and fire control shed, 5) Single story office shed, 6) Single story generator shed. The following general information was noted:

i.	Building Usage Type	: Garments Factory
ii.	Structural System	: The main factory building is a RCC frame structure. The beams and slab at each floor are monolithic.
iii.	Floor System	: Beam supported slab
iv.	Floor Area	: Total area of all buildings in the factory premises: 58,172 Sft (Including roof square footage).
v.	No. of Stories	: 1) Three story Hanger building with prefab shed on roof: Stories above grade: 4, Stories below grade: 0, 2) Single story poly and packaging shed: Stories above grade: 1, Stories below grade: 0, 3) Single story oil store shed: Stories above grade: 1, Stories below grade: 0, 4) Single story childcare, kitchen and fire control shed: Stories above grade: 1, Stories below grade: 0, 5) Single story office shed: Stories above grade: 1, Stories below grade: 0, 6) Single story generator shed: Stories above grade: 1, Stories below grade: 0.
vi.	Construction Year	: 2002
vii.	Foundation Type	: Unknown
viii.	Design Drawings	: Available but not fully credible.
ix.	Soil investigation Report	: Unknown.
x.	Construction Materials	: Reinforced Concrete for RCC portion.
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

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designated Load Manager shall oversee this program and ensure it is enforced.

Mid Term (6 Weeks)

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- ii. Structural engineer should properly follow the BNBC 1993 or BNBC 2006 to develop the required documents which confirm the structural integrity of the building.
- 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. Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading.
- 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 prepare design report based on the requirements as per BNBC 2006 clause 1.9.1.1. 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 prepare load plans including the information required in Section 8.20 of the Alliance Standard and have it posted in all required location.
- ix. Have a qualified structural engineer prepare a load plan for each floor and have the floors marked for designating storage area as per the developed load plan.
- x. Have a qualified structural engineer develop Floor Loading Plans per the requirements of Part 8 Section 8.20.5.3

Long Term (6 Months)

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- i. 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. Or provide 2% slope on the exposed surface to prevent accumulation of water.
- ii. Provide Certificates of Occupancy for review.

The recommendations for Electrical Safety corrective actions are:

Immediate (3 to 6 Days)	Ensure Signage indicating the prohibition of light fixtures without protective covers is installed at required locations.
Short Term (3 Weeks)	Provide capacity information labels (maximum current rating, no of circuit breakers etc.) for distribution boards. All boxes and enclosures (including transfer switches, generators, and power panels) for emergency circuits shall be permanently marked so they will be readily identified as a component of an emergency circuit or system. The required marking can be by color code, the words

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	<p>“emergency system,” or any other method that identifies the box or enclosure as a component of the emergency system.</p>
Mid Term (6 Weeks)	<p>Consult with a qualified Electrical Engineer and ensure electrical wiring/cables are sized according to capacity of circuit breakers.</p> <p>Remove multi looping or multi looping of wiring/cables at circuit breakers within switchboards and/or distribution boards.</p> <p>Provide dedicated neutral for each circuit.</p>
Long Term (6 Months)	<p>Provide an earthing/grounding system for all metal in the building.</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>

The recommendations for Fire Safety corrective actions are:

Immediate (3 to 6 Days)	N/A
Short Term (3 Weeks)	<p>Remove existing gates and doors in the means of egress including all locking devices. Install doors with approved panic hardware that cannot be locked in the direction of egress under any conditions.</p>
Mid Term (6 Weeks)	<p>Arrange for direct connection of the fire alarm system to a central monitoring station or Fire Service and Civil Defense. Until that time that monitoring can be set up, arrange a monitoring system using factory's own central detection system and personnel. 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 a testing and maintenance program that ensures the emergency power for exit signs is tested at least once per year.</p> <p>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.</p> <p>Implement training program with proper documentation in accordance with the Alliance Safety Training Curriculum on fire safety.</p> <p>Verify emergency power for egress lights at least once per year. If battery operated lights are used, test them monthly. Perform annual functional testing of battery powered lights for at least 30 minutes. Ref. 10.12.2.3.</p>

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	<p>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.</p> <p>Complete fire department pre-planning activities with the local Fire Service and Civil Defense.</p> <p>Apply to FSCD for issuance of occupancy certificate and pursue the matter to expedite.</p> <p>Once a standpipe system is installed at required locations designed by a qualified fire protection engineer, provide signage in compliance with NFPA for the new system.</p> <p>Install signage adjacent to each stair door indicating the stair name and the floor level at the noted locations.</p>
<p>Long Term (6 Months)</p>	<p>Provide a fire-resistive rated assembly between the exterior exit stairs and the building up to 10 ft beyond the end of the stair to achieve the required separation. The rated assembly should be approved by a qualified fire protection engineer.</p> <p>Provide 1 hr fire protective opening assemblies in 1 hr rated exit enclosure.</p> <p>Replace all collapsible doors in means of egresses with side-hinged swinging type doors of proper width and rating.</p> <p>Seal the opening in the wall or provide opening protective assemblies to ensure 1 hour fire resistance of the walls of egress court.</p> <p>Provide opening protective at all windows and other openings on all the fire rated wall across the entire premises. If these openings are not required, close these.</p> <p>Install standpipe system at required locations. Standpipe system must comply with NFPA 14.</p> <p>Fit outward opening, side-swinging, self-closing, non-lockable fire doors of 1 hr rating in all stairwell enclosures. Consult a qualified fire protection engineer to design the required rated construction barriers.</p> <p>Have a qualified engineer review the pump capacity and ensure hydraulic calculation is done which can be supported by this pump. Also, identify all other performance data and ensure conformity to NFPA 14, 20, 22 and 25 standards.</p> <p>Install fire department connections where required and in compliance with the Standard. 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.</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>Develop an emergency evacuation plan which includes</p>

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	<p>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. 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>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.</p> <p>Provide parapets or guards for all occupied roofs of a minimum height of 1067 mm (42 in).</p> <p>Provide handrails on both side of each stairway as per sections 6.9 and 6.12.</p> <p>Install appropriate means of illumination at the noted locations. The means of egress paths shall be illuminated at all times the building is occupied. Illumination shall be a minimum of 10 lux for all corridors, exit doors, and stairways. Aisles shall be provided with a minimum 2.5 lux.</p> <p>Repave the walking surface to make the slope of the 1 in 2 and keep change in elevation less than 1/2 inch.</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.</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. 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>According to Alliance Standard,Part-13,Section-13.6, 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 46.5 m2 (500 ft2). Limit dense deposits to 6 mm (¼ in.) and oil saturated deposits to 3.2 mm (⅛ in.).</p><p>Install a standpipe system at required locations designed by</p>
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	<p>a qualified fire protection engineer and institute an inspection, testing and maintenance program for the system.</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 of authorities, necessary checks prior to approval, standby fire watch and fire fighting equipment, sounding of alarm procedure, duration and expiry of permit and re-approval procedure, etc.</p> <p>Establish an inspection, maintenance, and testing program for the fire pump. Program must comply with NFPA 25.</p>
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