

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: The Need Apparels (PVT.) Ltd.
Address of the Factory	: 154/C Rajakhal Road, East Bakalla, Bakalla, Chittagong, Bangladesh
Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 09 Jun 2014
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 04 Jun 2014
BGMEA Membership No	: 385

BASIC INFORMATION:

The present garment factory is comprises of a 1 Main Building 1 Ancillary Building. The following general information was noted:

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| i. | Building Usage Type | : Garments Factory. |
| ii. | Structural System | : The building is a RCC structure with flat plate system.
Exterior walls are of masonry.. Framing system is almost regular. |
| iii. | Floor System | : RCC structure with flat plate system |
| iv. | Floor Area | : 68,158 SF. |
| v. | No. of Stories | : Single storied Prefab Building,2 Storied Prefab Building,3 Storied RCC Building and others are single storied building. |
| vi. | Construction Year | : Factory personnel informed the date of construction as follows: 1) Five story RCC main production building with occupied level on roof: Started in May- 2001 and finished in December-2002, 2) Two story RCC generator building: No record for date of construction was found |
| vii. | Foundation Type | : Foundation type is pile foundation. |
| viii. | Design Drawings | : Available. |
| ix. | Soil investigation Report | : Available |
| x. | Construction Materials | : RCC (brick chips). |
| xi. | Generator | : Unknown |

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) :

- 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.
- Designate a representative as the Factory Load Manager. The Factory Owner shall ensure that at least one individual, the Factory Load

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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)

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- i. For further future extension: Under guidance of a qualified structural engineer arrange Detail Engineering Assessment of the structure. This assessment should be conducted prior to the proposed expansion (currently 5 levels present) and should include destructive core testing to validate the in-situ concrete compressive strength of structural elements. No extension is allowed before the detailed assessment is performed.
- ii. For further future extension: Under guidance from a qualified structural engineer arrange Detail Engineering Assessment of the structure. This assessment should be conducted prior to the proposed expansion (currently 5 levels present) and should include destructive core testing to validate the in-situ concrete compressive strength of structural elements constructed with MCAC and stone chips. No extension is allowed before the detailed assessment is performed.
- iii. Engage a qualified structural engineer to develop the required documents to confirm the structural integrity of the buildings. Documents must comply with Alliance Standard Part 8 Section 8.19 and 8.20.
- iv. Engage a qualified structural engineer to confirm and document that provisions have been made to accommodate these water tanks. If provisions have not been made, have a qualified structural engineer develop a remediation plan.
- v. "Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading.
- 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 complete further analysis of the structure and develop a remediation plan if required.
- viii. "Have a qualified structural engineer prepare credible as-built documents based on the requirements of Part 8 Section 8.19 of the Alliance Standard.
- ix. "Have a qualified structural engineer develop Floor Loading Plans per the requirements of Part 8 Section 8.20.5.3.
- x. Have a qualified structural engineer prepare load plans including the information required in Section 8.20 of the Alliance Standard and they should be visibly posted on all levels of all buildings.
- xi. "Have a qualified structural engineer prepare a load plan for each floor and provide signage or the appropriate markings at all areas used for storage to indicate the acceptable loading limits detailed in the load plan.
- xii. "Provide the geotechnical report with the identity of the geotechnical engineer. If the report is found to be invalid, under guidance from a

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qualified structural engineer arrange geotechnical investigation at close vicinity of the structure and make the report available for review.

Long Term (6 months) :

- i. Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.
- ii. 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. Otherwise, provide 2% slope on the exposed surface to prevent accumulation of water

The recommendations for Electrical Safety corrective actions are:

Immediate (3 to 6 Days)	
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. Keep records of completed training available on site.</p> <p>Ensure light fixtures without protective covers are not installed in storage areas or in any area where the Inspector of the Factories Rules (1.5.3.5) Part 53 disallows these fixtures.</p>

The recommendations for Fire Safety corrective actions are:

Immediate (3 to 6 Days)	<p>Remove all stored materials in the stairwells.</p> <p>Smoking shall be prohibited in any garment factory building, separate storage building, or any building or area where the Inspector of the Factories Rules requires that smoking be prohibited. If an owner creates a designated smoking area outside the buildings, information on the location of these designated areas shall be posted on the signs.</p>
Short Term (3 Weeks)	<p>Remove all hasps, locks, slide bolts, or other locking devices at the noted locations. 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>

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Mid Term (6 Weeks)	<p>Develop a testing and maintenance program that ensures the operation of all 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 of 90 min once per year.</p> <p>Impart training in accordance with the Alliance Safety Training Curriculum and keep record with proper documentation.</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. 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>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>Conduct fire drills on a quarterly basis as outlined in BNBC Part 4 Appendix A for all garment facilities. 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 requirements.</p> <p>Install required identification signs at the noted locations.</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 in English and Bengali.</p> <p>Apply to Chittagong Development Authority (CDA) for issuance of occupancy certificate and expedite the matter.</p>
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<p>Long Term (6 Months)</p>	<p>Provide 2 hr fire-resistive rated construction barriers at exit enclosures. Fit doors that open in the direction of egress, 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>Install fire rated doors and windows or fill in unprotected openings with fire resistive rated assemblies.</p> <p>Install a NFPA 14-compliant class III standpipe system at required locations designed by a qualified fire protection engineer. All standpipe system installations and hydraulic calculations shall be reviewed by the Alliance prior to commencement of installation. System design should also account for the two additional stories currently under construction.</p> <p>Provide exit discharge directly exterior to the building with protected passageway or Egress courts less than 10 ft in width (as measured from the building and the adjacent property line) shall be provided with walls having a 1 hr fire resistance rated construction for a distance of 10 ft above the ground level of the court as demanded in Alliance 6.17.2. Consult a qualified fire protection engineer to design the required rated construction barrier.</p> <p>Train and certify at least 25 percent of total workers (244 numbers of workers out of 973) in firefighting, first aid and rescue training by the proper authority.</p> <p>Provide 1.5 hr fire protective opening assemblies in 2 hr rated exit enclosures as demanded in alliance standard 4.6. and door shall be compliant with 4.5.4.</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>Egress courts less than 10 ft in width (as measured from the building and the adjacent property line) shall be provided with walls having a 1 hr fire resistance rated construction for a distance of 10 ft above the ground level of the court as demanded in Alliance 6.17.2. Consult a qualified fire protection engineer to design the required rated construction barrier.</p> <p>Need hydraulic calculations to confirm existing fire pump is adequate for fire protection demand. If not, install new fire pump compliant with NFPA-20.</p> <p>Provide fire-resistive rated construction barriers between mixed occupancy according to Alliance standard 3.4.4 and Table 4.4.1. Consult a qualified fire protection engineer to design the required rated construction barrier.</p> <p>Provide fire department (Siamese) inlet connections to allow fire department pumper equipment to supplement the fire protection systems and outlet connections 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>Provided parapets or guards for all occupied roofs with a minimum height of 1067 mm (42 in).</p>
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	<p>Provide an emergency power source, either by battery backup or by connecting to the emergency power system, for compliantly illuminated exit signs.</p> <p>Provide handrails on both sides of each stairway. Provide handrail of height between the range 865 mm (34 in.) and 965 mm (38 in.).</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>Every door in a stair enclosure serving more than 5 stories shall be provided with re-entry unless it meets the following requirements. 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 requirements, re-entry does not have to be provided back into the building on this level.</p> <p>Provide an automatic fire alarm and detection system per NFPA 72 requirements and arrange for direct connection of the system to a central station monitoring service or the Fire Service and Civil Defense. Until that time that a central station monitoring service or direct connection to the Fire Service and Civil Defense 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>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>Inspect, test and maintain fire extinguishers in accordance with NFPA 10 requirements.</p> <p>Establish an inspection, maintenance, and testing program for the standpipe and hose system. Program must comply with NFPA requirements.</p> <p>Develop a NFPA 51B-compliant hot-work permit program. In general, this program should address the 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>Create a Fire Safety Director position and fill the position with an individual that has sufficient training 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.
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	<p>(4) Ensure all testing of fire protection equipment is conducted in accordance with Alliance Standard.</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. 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>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.</p> <p>Establish required inspection, maintenance, and testing program for the fire pump.</p>
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