

## Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

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Name of the Factory	: <b>Creative Shirts Ltd. (Unit- 2)</b>
Address of the Factory	: South Panishail, Kashimpur, Gazipur, DHAKA, Bangladesh.
Present Status of the Factory	: <b>Under Operation</b>
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 27-May-2014
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 21-May-2014
BGMEA Membership No	: 5419

### **BASIC INFORMATION:**

The present garment factory comprises of one main factory building (Two story main production shed). The following general information was noted:

- i. Building Usage Type : Garments Factory.
- ii. Structural System : The building is Braced Steel frame structure with infilled Masonry wall with regular framing.
- iii. Floor System : Unknown.
- iv. Floor Area : Total area of building in the factory premises: 53,082 sft.
- v. No. of Stories : 1) Two story main production shed: Building height (Highest occupied floor level): 4.57 m or 15 ft [Height up to roof 12.80 m or 42 ft], Stories above grade: 2, Stories below grade: 0, Occupied levels: 2.
- vi. Construction Year : Two story main production shed: Finished in August-2007.
- vii. Foundation Type : Isolated footing.
- viii. Design Drawings : Available but not fully credible.
- ix. Soil investigation Report : Available
- x. Construction Materials : Steel members and reinforced concrete
- 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) :

- 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.

Mid Term (6 Weeks) :

- i. Engage a qualified structural engineer to confirm structural performance of the structure.
- ii. Engage a qualified structural engineer to provide additional investigation into the areas of overstress and provide a remediation plan if required.

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- iii. Have a qualified structural engineer provide further testing and analysis of distress, settlement, shifting, or cracking in columns or walls and provide a remediation plan to correct noted issues.
- iv. Have a qualified structural engineer document compliance with the seismic and wind requirements stated in the 2006 BNBC.
- v. Engage a qualified structural engineer to develop the required documents to confirm the structural integrity of the buildings. Documents must comply with the Alliance Standard, Part 8, Section 8.19 and 8.20.
- vi. Have a qualified structural engineer prepare the credible as-built documents and design report based on the requirements of Part 8, Section 8.19 of the Alliance Standard and submit to BV for review.
- vii. Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.
- viii. "Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and the Alliance Standards."
- ix. Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading and storm surge.
- x. Have a qualified structural engineer develop Floor Loading Plans per the requirements of Part 8, Section 8.20.5.3.
- xi. 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. Floor load plans should be visibly posted on all levels of all buildings.
- xii. 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. Apply for issuance of Certificate of Occupancy and pursue the matter to obtain the same.

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

Immediate (3 to 6 Days)	Find out the cause of sign of burning and take proper action.
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. Keep documentation of completed training available on site.  Ensure proper identification of emergency power switchboards, distribution boards, and circuits.
Mid Term (6 Weeks)	Have a qualified electrical engineer develop an as-built single line diagram detailing key components and capacity of the electrical system.  Consult with a qualified electrical engineer and ensure electrical cables are sized according to capacity of circuit breakers. Ensure distribution boards are metal enclosed with a dead front construction.  Provide a dedicated neutral for each circuit.  Provide capacity information labels (maximum current

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	rating, number of circuit breakers, etc.) for distribution boards.
Long Term (6 Months)	<p>Inspect electrical switchgear and panel boards on an annual basis to ensure that the equipment is in good working condition.</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 &amp; Rotating Equipment and NFPA 70B or a comparable standard.</p>

### The recommendations for Fire Safety corrective actions

Immediate (3 to 6 Days)	<p>Remove all stored materials in the stairwells at the noted locations.</p> <p>Means of egress must be full free and clear from impediments, obstructions, and stored materials immediately.</p>
Short Term (3 Weeks)	<p>Remove all hasps, locks, slide bolts, or other locking devices at the noted locations.</p> <p>Remove all combustibles stored underneath the cutting tables at the noted locations.</p>
Mid Term (6 Weeks)	<p>Occupancy certificate (mention occupancy type) for each building.</p> <p>Make aisles marking with proper direction and provide minimum clear width of 36 inch. Keep aisles free of obstruction.</p> <p>Training programs need to be implemented and documented in accordance with the Alliance Safety Training Curriculum.</p> <p>Develop a testing and maintenance program that ensures the operation of all exits signs is verified at least once per year. If battery-operated signs are used, these lights 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>Post occupant loads for every assembly and production floor in a conspicuous space near the main exit or exit access doorway for the space.</p> <p>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 and document fire department pre-planning activities with the local Fire Service and Civil Defense.</p>

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<p>Long Term (6 Months)</p>	<p>Provide fire-resistive rated construction barriers at exit enclosures. Exits connecting three or fewer stories shall be enclosed with a minimum 2-hr fire resistance rating. Install Pull stations at egress points, smoke detectors in equipment, visual and audible devices spaced appropriately based on occupancy type in the factory main building and ancillary shed building. Reference NFPA 72.</p> <p>Install fire extinguishers. Also install fire extinguishers at appropriate locations and heights based on hazard type per BNBC Part 4 and NFPA 10. Extinguishers shall be placed so that maximum travel distance to the nearest unit shall not exceed 30 m (100 ft.).</p> <p>Set up a Fire alarm and detection system central station monitoring service or direct connection to the Fire Service and Civil Defense. Assign a person at the facility to contact the fire department in the event of fire alarm activation.</p> <p>Provide side-hinged swinging type doors for all means of egress.</p> <p>Provide fire-resistive rated construction barriers between hazard types. Minimum 1-hr fire-rated wall and door for boiler room and minimum 1-hr fire rated door for fabrics store room.</p> <p>Establish an inspection, testing, and maintenance program for all fire extinguishers in accordance with NFPA 10.</p> <p>Provide an emergency power source for illuminated exit signs, either by battery back-up or by connecting to the emergency power system.</p> <p>Install continuous illuminated exit sign at all exit points. The source of illumination shall provide not less than 50 lux at the illuminated surface with a contrast of not less than 0.5 lux. Approved self-luminous signs which provide evenly illuminated letters having a minimum luminance of 0.2 cd/sq.-m 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 out the required duties.</p> <p>Installation of an automatic sprinkler system throughout the building.</p> <p>Providing handrails on the other side of each stairway.</p> <p>Separation of boiler rooms from the production floors with properly rated fire doors &amp; protection of penetrations</p> <p>Need required number of people (trained and certified) in firefighting, first aid, and rescue training by the appropriate authority accordance with the Alliance Safety Training Curriculum.</p>
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	<p>Install automatic fire detection and alarm system throughout the factory. 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 to alert this person.</p> <p>Installation of an electrically driven fire pump to replace the non-compliant fire pump</p> <p>Install a standpipe system at required locations designed by a qualified fire protection engineer.</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 m<sup>2</sup> (500 ft<sup>2</sup>). Limit dense deposits to 6 mm (¼ in.) and oil saturated deposits to 3.2 mm (⅛ in.)</p>
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