

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

---

Name of the Factory	: Standard Stitches Ltd – Woven Unit
Address of the Factory	: F.F. Tower, Baimail, Konabari, Gazipur Shadar, Gazipur, Bangladesh.
Present Status of the Factory	: <b>Under Operation</b>
Structural assessment conducted by	: Alliance
Date of Structural & Electrical Inspection	: 03-June-14
Fire & Electrical assessment conducted by	: Alliance
Date of Fire Inspection	: 06-July-14
BGMEA Membership No	: 5663

### **BASIC INFORMATION:**

The present garment factory comprises of one ten story Main Building and three Ancillary Buildings. The following general information was noted:

i.	Building Usage Type	: Garments Factory
ii.	Structural System	: Reinforced concrete slabs between beams
iii.	Floor System	: Beam supported slab
iv.	Floor Area	: 178,000 SF
v.	No. of Stories	: 10 (Basement+Ground+9)
vi.	Construction Year	: 2007-2010
vii.	Foundation Type	: Mat foundation
viii.	Design Drawings	: Available
ix.	Soil investigation Report	: Available
x.	Construction Materials	: Reinforced Concrete for RCC building
xi.	Generator	: Ground floor in ancillary building

### **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 loading limits as described on the Floor Loading Plans.

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

---

Mid Term (6 Weeks)

- :
- i. Under guidance from a qualified structural engineer arrange Detail Engineering Assessment of the structure. This assessment should include destructive core testing to validate the in-situ concrete compressive strength of structural elements.
  - ii. Have a qualified structural engineer prepare credible as-built documents based on the requirements of Part 8 Section 8.19 of the Alliance Standard. This should be completed for all parts of all buildings.
  - iii. Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading. This should be completed for all buildings.
  - iv. Have a qualified structural engineer document compliance with the seismic and wind requirements stated in the 2006 BNBC. This should be completed for all buildings.
  - v. Have a qualified structural engineer confirm that capacity to support the load is available. Load Plans complying with Alliance Standard Part 8 Section 8.20.4.3 should also be developed.
  - vi. 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.
  - vii. 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. This should be completed for all buildings.
  - viii. As part of the detailed engineering assessment detailed elsewhere, have a qualified structural engineer assess the durability aspects as suggested in Alliance Standard Part 7 Section 7.2 and take appropriate remedial measures. This assessment should include destructive core testing to validate the in-situ concrete compressive strength of structural elements.
  - ix. Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard.
  - x. Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.
  - xi. Provide signage or the appropriate markings at all areas used for storage to indicate the acceptable loading limits detailed in the Load Plan.
  - xii. Have a qualified structural engineer prepare load plans including the information required in Section 8.20 of the Alliance Standard. Floor load plans should be visibly posted on all levels of all buildings.
  - xiii. Have a qualified structural engineer develop Floor Loading Plans per the requirements of Part 8 Section 8.20.5.3.

Long Term (6 Months)

- :
- 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.
  - ii. Repair the exterior façade system to prevent water intrusion.
  - iii. Provide Certificates of Occupancy for review.

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

Immediate (3 to 6 Days)	Clean and free the generator room from dirt, debris, and
-------------------------	--

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

	<p>improperly stored materials. Provide a maintenance program to include that penetrator is cleaned and inspected for dirt, debris and improperly stored materials on a regular basis.</p> <p>Find out the cause of overheating and overloading and take proper action.</p>
Short Term (3 Weeks)	<p>Provide wiring systems that are selected and erected so that no damage is caused by the ingress of water. The completed wiring system shall comply with the IP degree of protection relevant to the particular location.</p>
Mid Term (6 Weeks)	<p>Provide proper fire rating for the generator room.</p> <p>Provide adequate clearance around equipment.</p> <p>Provide proper generator frame earthing for all generator frames in accordance with Bangladesh Electricity rules 1937, Clause 57 (2).</p> <p>Provide additional light fixtures to increase illumination levels in substation room in accordance with the BNBC.</p> <p>Ensure the means of identification is obtained by separate color coding, marking tape, tagging, or other approved means.</p> <p>Provide adequate supports for electrical wiring and conduit permanently.</p>
Long Term (6 Months)	<p>Connect all metal in the building to the building earthing system such as metal rebar in concrete, metal frame of building, or metal water pipe.</p> <p>Have a qualified electrical engineer develop as-built electrical drawings providing detailing key components of the electrical system.</p> <p>Replace electrical wiring to circuit breakers with appropriately sized wiring in accordance with BNBC.</p> <p>Develop and implement an electrical safety program and a procedure for documentation. Include key topics such as lock out tag out procedures, personal protective equipment requirements, etc.</p> <p>Provide earthing of all equipment at required locations by appropriate size of earthing cables and connect to required number of earth electrodes. Refer to the BNBG for required number of electrodes.</p> <p>Complete thermographic scans at least on a three year cycle and document. Thermographic scans should be completed in accordance with the Standard for Infrared Inspection of Electrical Systems &amp; Rotating Equipment and NFPA70B or a comparable standard.</p> <p>The lightning protection system ground terminals shall be</p>

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

	<p>bonded to the building or structure grounding electrode system. Alliance standard art. 10.11.4.2</p> <p>Install air termination network vertical and horizontal conductors, spaced appropriately for the building roof areas.</p> <p>Provide a dedicated neutral for each circuit and provide identification and marking for maintenance.</p> <p>Lay in telecommunication and antenna cables separately to the main point of service. Power and telecommunications cables must have separate entrance.</p> <p>Ensure all electrical wiring is properly terminated at its point of termination by soldered or welded lugs.</p> <p>Provide required service shaft arrangement for the ease of cable identification, inspection and maintenance.</p> <p>Provide 6mm<sup>2</sup> stranded conductors or greater with cable sockets and solder all exposed ends of all strand conductor below the 6mm<sup>2</sup> without cable sockets.</p> <p>Provide an appropriately sized room for the generator in order to properly access the generator and keep minimum one meter clearance around the generators to perform routine maintenance activities. The Generator room size should be as described in BNBC 2006 table : 8.2.9.</p> <p>Ensure cable joints are through porcelain/PVC connectors with PIB tape wound around joint.</p>
--	--

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

Immediate (3 to 6 Days)	Remove all combustibles stored underneath the cutting tables in accordance with Alliance Standard Section 13.7.2.
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.
Mid Term (6 Weeks)	<ol style="list-style-type: none"> <li>1. Provide aisles marking with minimum width of 0.9 m (36 in) in the level-10.</li> <li>2. Increase the number of aisles with proper marking in the level-8 at finishing section.</li> </ol> <p>Establish an inspection, testing, and maintenance program for all fire extinguishers. Program must comply with the requirements of NFPA 10.</p>

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

	<p>Develop a testing and maintenance program that ensures the emergency power for egress lighting is tested at least once per year. If battery operated lights are used, these lights are tested on a monthly basis. Functional testing of battery powered lights is provided for a minimum 90 minutes once per year.</p> <p>Collect a license in accordance with the petroleum act for all storage of class-II petroleum.</p>
<p>Long Term (6 Months)</p>	<p>Provide fire-resistive rated opening and penetration protection for rated walls and assemblies in accordance with Alliance Standard Sections 4.6 and 4.7. Consult a qualified fire protection engineer to design the required opening protectives and penetration systems.</p> <p>Install initiating devices and notification appliances as required by the Alliance Standard and NFPA 72. This includes electrical supervision of all valves controlling fire protection systems (sprinklers, fire pumps, water supplies, etc.). Connect devices to an automatic fire alarm and detection system for the facility. All fire alarm installations shall be submitted for review by the Alliance prior to commencement of installation.</p> <p>Install standpipe system at required locations. Standpipe system must comply with NFPA 14. The hydraulic calculations should be submitted and reviewed by Alliance prior to start of work. All standpipe system installation activities shall be submitted for reviewed by the Alliance prior to commencement of installation in accordance with Section 5.4.3.2.</p> <p>Install an automatic sprinkler system throughout the building in accordance with Alliance Standards and NFPA 13. Consult a qualified qualified fire protection engineer for the design and/or review of the sprinkler system. Suggested deadline date: 12 weeks - start design, 24 weeks - design complete, 36 - begin construction.</p> <p>Provide minimum 2 hr fire-resistive rated construction barriers and minimum 1.5 hr fire-resistive rated door (Point: 1-4) to separate the hazard types in accordance with Alliance Standard Sections 3.4 and 4.5. Also consult a qualified fire protection engineer to design the required rated construction barriers. Separate the generator and boiler area (point-5) from each other with minimum 2 hr fire rated construction walls and roofs and provide minimum 1.5 hr fire rated door(s). Also separate the fuel tank with minimum 2 hr fire rated construction walls and roofs and provide minimum 1.5 hr fire rated door.</p>

