Name of the Factory : **Supreme Stitch Ltd**

Address of the Factory : West Shaildube, Kashimpur, Gazipur, Dhaka

Present Status of the Factory : **Under Operation**

Structural assessment conducted by : Alliance

Date of Structural Inspection : 8-May-2014

Fire & Electrical assessment conducted by: Alliance

Date of Fire & Electrical Inspection : 03 May 2014

BASIC INFORMATION:

The present garment factory is a three storied building with beam-column frame system. The following general information was noted:

i.	Building Usage Type	: Garments Factory.
ii.	Structural System	: Monolithic concrete frame structure
iii.	Floor System	: Beam Supported slab
iv.	Floor Area	: 145,658 SF
v.	No. of Stories	: 3 storied building
vi.	Construction Year	: 2008
vii.	Foundation Type	: Isolated column spread footings.
viii.	Design Drawings	: Available
ix.	Soil investigation Report	: Available
x.	Construction Materials	: Reinforced Concrete.
xi.	Generator	: In Ground Floor

RECOMMENDATIONS FOR CORRECTIVE ACTION:

The recommendations of corrective action for 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) :

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.

Mid Term: (6 Weeks) :

i. Engage a qualified structural engineer to provide additional investigation into the areas of beam cracking and provide a remediation plan if required.

ii. As part of the detailed assessment outlined elsewhere, conduct destructive core testing to validate the in-situ concrete compressive strength of structural elements.

iii. Install overhead protection provisions at the perimeter of the building on the Ground Level to mitigate hazards from potential falling construction debris.

iv. Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard.

v. Have the original structural engineer of record prepare a design report according to the requirements of the Alliance Standard and BNBC. Alternatively, a qualified structural engineer must be engaged to conducted a detailed structural analysis to confirm the load-bearing capacity of structural elements within each of the buildings.ave a qualified structural engineer prepare design report.

vi. 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.

vii. 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.

viii. Have a qualified structural engineer document compliance with the seismic and wind requirements stated in the 2006 BNBC.

ix. Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading.

x. Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.

xi. Have a qualified structural engineer develop Floor Loading Plans per the requirements of Part 8 Section 8.20.5.3.

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. Provide signage or the appropriate markings at all areas used for storage to indicate the acceptable loading limits detailed in the Load Plan.

xiv. Provide Certificates of Occupancy for review.

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. Alternatively, provide 2% slope on the exposed surface and drains with downspouts at low points to prevent accumulation of water.

ii. Necessary remediation after assessment.

The recommendations for Fire Safety corrective actions are:

Immediate (3 to 6 Days)	Remove all combustibles stored underneath the cutting tables at the noted locations.
Short Term (3 Weeks)	Remove all hasps, locks, slide bolts, or other locking devices at the noted locations. Smoking shall be prohibited in any garment factory building, separate storage building, or any building or area where the Inspector of the Factories Rules (1.6.3.7) Part 53 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 required in 13.5.2.
Mid Term (6 Weeks)	Arrange for direct connection of the fire alarm system to a central monitoring station or Fire Service and Civil Defense as per Alliance Standard Part 5 Section 5.7.5 Monitoring. Until that time that monitoring can be set up, arrange a monitoring system using 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. Develop a testing and maintenance program that ensures the emergency power for exit signs is tested at least once per year. If battery operated signs are used, these lights are tested on a monthly basis. Functional testing of battery powered signs is provided for a minimum 90 min once per year. 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. Follow the guideline of BNBC. Develop a testing and maintenance program that ensures the operation of all egress lighting is verified at least once per year. If battery-operated lights are used, these lights shall be tested on a monthly basis. Functional testing of battery powered lights shall be provided for a minimum 90 min once per year. Impart training in accordance with Alliance Safety Training Curriculum and keep record with proper documentation. 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. Complete fire department pre-planning activities with the

	local Fire Service and Civil Defense. Install signage adjacent to each stair door indicating the stair name and the floor level in English and Bengali at the noted locations. Apply to PWD for issuance of occupancy certificate and pursue the matter to expedite.
Long Term (6 Months)	Provide required fire rated construction at the stairs and 10 ft beyond the ends of the exterior stairs. Enclose any openings (windows, etc.) with required fire rated construction within those 10 ft wall sections. Replace all non-compliant doors and frames in the means of egress with doors that are listed, approved, automatic-closing, side-swinging, fire rated doors in compatible fire rated frames with latching panic hardware. Provide 1 hr fire protective opening assemblies in 1 hr rated exit enclosure. Provide 1.5 hr fire protective opening assemblies in 2 hr rated exit enclosure. Exits connecting three or fewer stories shall be enclosed with a minimum 1-hr fire-resistance rating. Exits connecting four or more stories shall be enclosed with a minimum 2-hr fire-resistance rating. Exits shall be enclosed with the same fire-resistance rating as the floor penetrated but will not need to exceed 2 hr. Provide 1 hr fire-resistive rated construction barriers at exit enclosures. Fit outward opening, side-swinging, self-closing, non-lockable fire doors of 1 hr rating in all stairwell enclosures. Get at least 25 percent of the workers trained and certified in fire fighting, first aid and rescue training by the proper authority. Seal the opening in the wall or provide opening protective assemblies to ensure 1 hour fire resistance of the walls. Install fire department connections where required and in compliance with the Standard. According to Alliance Standard 5.5.4 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. 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. Provide handrails on both sides of each stairway. Provide handrails of heights between the range 865 mm (34 in.) and 965 mm (38 in.). Fire extinguishers are to be inspected, tested, and maintained in accordance with NFPA 10 Chapter 7 as demanded in Alliance Standard Part 13 Section 13.10.3. Replace glossy tiles from the walking surface along the path of egress (aisles and staircase) with non-slippery homogeneous tiles. Develop a hot work permit program. The program must comply with the requirements of NFPA 51B. 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.

The recommendations for Electrical Safety corrective actions are*:*

Immediate	NA
Short Term (3 Weeks)	Establish a periodic inspection program to ensure the electrical systems are free from damage, debris, dirt, lint, etc. Maintain records concerning inspections and follow up actions. Connect all metals of the building to the building's earthing/grounding system. 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. Ensure proper identification of emergency power switchboards, distribution boards, and circuits. Ensure Signage indicating the prohibition of light fixtures without protective covers is installed at required locations.
Mid Term (6 Weeks)	Ensure distribution boards are metal enclosed with a dead front construction. Lead telecommunication or antenna cables separately to the main point of service. Power and telecommunications cables must have separate entrance. Ensure meters (Ammeter, Voltmeter, PFI Auto Controller,

	etc) on the main electrical equipment are operational. Ensure clear and permanent identification marks are painted in all distribution boards, switchboards, sub main boards and switches. Provide graded and sufficient electrical insulation mats in front of distribution boards. Provide mechanical guards for electrical equipment where necessary. Provide capacity information labels (Maximum current rating, no of circuit breakers etc.) for distribution boards.
Long Term (6 Months)	Ensure the generator room properly rated and physically separated from the remainder of the building. 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. Consult with an expert electrical engineer and make sure your system is secured against lightning. Inspect electrical switchgear and panel boards on an annual basis to ensure that the equipment is in good working condition.