Name of the Factory	:	**SINHA KNITTING LTD.**
Address of the Factory	:	Kanchpur, Sonargaon, Narayangonj,Bangladesh
Dhaka Present Status of the Factory	:	**Under Operation**
Structural assessment conducted by	:	Accord (Full report available at bangladeshaccord.org)
Date of Structural Inspection	:	5 July, 2014
Fire & Electrical assessment conducted by	:	Accord (Full report available at bangladeshaccord.org)
Date of Fire & Electrical Inspection	:	24 June, 2014

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

i.	Building Usage Type	: Garment factory
ii.	Structural System	: R.C Beam and column frame with a 2-way beam slab, RC flat slab
iii.	Floor System	: Beam slab
iv.	Floor Area	: Floor area of building and are 14,500sq-ft. and 4,000sq-ft, of (G+9) and (G+4) stories respectively
v.	No. of Stories	: 10 & 5 storied
vi.	Construction Year	: 2005 & 1998
vii.	Foundation Type	: Unavailable
viii.	Design Drawings	: Available
ix.	Soil investigation Report	: Unavailable
x.	Construction Materials	: Unavailable
xi.	Generator	: Ground floor of Utility building

Recommendations for Corrective Action: The recommendations of corrective action for both Structural and Fire & Electrical Safety are as follows:

The recommendations for Structural Safety corrective actions are:

Immediate (Now):

1. Immediately remove all loads from all floors.
2. Carry out a Detailed Engineering Assessment to confirm actual building structural capacity.

Mid Term (Within 6 Weeks):

1. Implement recommendations from the DEA.
2. Generate loading plan for each floor of the buildings.
3. Carry out a Detailed Engineering Assessment for the lateral stability of buildings and sheds as per BNBC.
4. Carry out an Engineering Assessment to verify the stairway stability and the cause of crack in stairway slabs.

Long Term (Within 6 Months):

1. Clear indication displaying maximum storage height must be carried out in all storey building.
2. Implement recommendations from the DEA.

3. Carry out actions from Engineering Assessment recommendations.
4. Carry out engineering assessment on design connections of bridge between buildings.
5. Update drawings to show bridge.
6. Fireproofing material for structural steel element is recommended as suggested in BNBC Codes.
7. Maintain standard of quality control and protection of the fire protection.
8. Factory Engineer to inspect water damaged structures and repair with a suitable methods.

The recommendations for Fire Safety corrective actions are:

Immediate (Within 1 month):

1. Immediately reduce occupant load to not more than available exit capacity (396). Or Provide additional exits.
2. Remove all storage from exit stairs and egress paths.
3. Replace all gates / sliding doors along the means of egress with side-hinged, swinging egress doors. If locks are required for security reasons, utilize special door locking features complying with NFPA 101.
4. Remove locking features from all egress doors / gates. If locks are required for security reasons, utilize special door locking features complying with NFPA 101.
5. Keep egress paths and stairs clear of storage.
6. Configure the fire alarm system to initiate automatic occupant notification on all floor levels to facilitate whole building evacuation upon any manual fire alarm station activation.
7. Remove manual on/off switches from emergency lighting units to prevent them from being switched off.

Short Term (Within 3 Months):

1. Separate the chemical storage room by a minimum 2-hr fire rated construction. Seal and/or protected all openings to maintain the required fire separations.
2. Separate the boiler and generator room by a minimum 2-hr fire-rated construction. Seal and/or protected all openings to maintain the required fire separations.
3. Provide dedicated storage rooms separated by minimum 1-hr fire-rated construction. Where separate storage rooms may not be feasible, provide defined storage areas and limit the storage arrangement as follows:

   -Maximum height of 2.4m and maximum area of 23m2

   -If sprinkler protected: maximum height of 3.66m and maximum area of 93m2.

   Separate areas of unenclosed combustible storage by a minimum clear distance of 3m.
4. Provide minimum 1.5-hr fire rated doors and seal all unprotected openings to separate the exit stairs from work areas and other building spaces on all floor levels. Ensure that the fire doors are self-closing and positive latching and that they are provided with fire exit (panic) hardware where serving production floors. If fire doors are required to be held open for functional reasons, provide automatic closing devices tied to the fire alarm system.
5. Provide a minimum 2-hr fire rated shaft to separate the utility risers from each floor level.

6. Seal all penetrations and openings in exit stair enclosure walls to maintain the fire separation.
7. Inspect, test and maintain the fire alarm system, and keep written records on-site, in accordance with NFPA 72.
8. Inspect, test and maintain the emergency lighting system in accordance with The ACCORD standard. Keep written records on-site.
9. Move the storage from the base of the stairwell and provide a storage room with a minimum 2-hr fire-rated construction.
10. Provide handrails on at least one side of exit stair.
11. Test the emergency lighting system on each floor and provide additional emergency fixtures to provide adequate illumination along the means of egress. Provide a minimum illumination of 10 lux at the floor level within exit stairs and exit discharge paths and minimum 2.5 lux along exit access aisles.
12. Separate the hazardous materials / flammable liquid storage room by a minimum 2- hr fire-rated construction. Seal and/or protected all openings to maintain the required fire separations.
13. Seal all penetrations and openings in wall assemblies to maintain the fire separation.

Mid Term (within 6 Months):

1. Remove single-station smoke alarms. Provide automatic smoke detection throughout the building, tied into the fire alarm system, in accordance with NFPA 72.
2. Provide automatic smoke detection throughout the building, tied into the fire alarm system, in accordance with NFPA 72.
3. Seal all penetrations and openings to the interior of the building along the discharge path, up to a height of 10 ft., to provide a minimum 1-hr fire separation. Alternatively, provide a second remote discharge path to the public way (only include this if feasible).
4. Modify stair to discharge directly outside.
5. Provide additional exit.

Long Term (More than 6 months):

1. Replace the fire alarm system with a new, listed addressable fire alarm system in accordance with NFPA 72.
2. Provide automatic sprinkler protection throughout the building in accordance with NFPA 13.

The recommendations for Electrical Safety corrective actions are:

Immediate (Within 1 month):

1. Room separator (metal mesh fence) must be connected to earth.
2. Arrange periodic inspection & thermal scan to identify the overloading, loose connection, unbalanced load which may cause the excessive heat-rise and take action accordingly.
3. Connect the bonding wires between panel frame and door.
4. MCB should be inside enclosure.

5. Cables passing through pathway on the floor must be protected by rigid conduit or cable tray.
6. Conduits must be bent using elbows and angle accessories.
7. Motor cable should be connected inside of motor terminal box.
8. Assign a qualified engineer to develop an as built drawing according to the actual installation.
9. Correct Circuit directory should be put/attach inside each panel with one line diagram.

Short Term (Within 3 Months):

1. Periodic inspection and testing of electrical system should be carried out and duly documented.
2. Thermo graphic scanning of the entire electrical system must be performed on tri-annual basis and recorded.
3. Insulation resistant test of all the cables must be performed once every 5 year cycle and recorded.
4. Earth resistant test must be carried out and ensured that the earth resistance is below 1 ohm.
5. Electrical safety training and awareness program for the electrical personal and workers must be initiated and recorded.
6. The factory must have As-built electrical SLD with electrical wiring layout designs and drawings. Any changes in load, protection system, conductors, Generation and supply system must be reflected in the As-built SLD and drawings and updated.
7. Platform (step) is required below panel with rubber mat on top.
8. The panels should be fixed with the foundation plinth (floor) with nuts and bolts.
9. Make sure of ventilation system and thermal insulation of steam header and steam pipe.
10. Floor openings remaining must be sealed according to the degree of fire resistance.
11. The PVC/rigid pipe used for surface wiring must be continuous through-out its length and properly supported (clamped with saddle, at regular interval of 600 mm).The conduit shall run vertically or horizontally, shall never at angle.

Mid Term (Within 6 months): NA

Long Term (More than 6 months): NA