

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

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Name of the Factory	: <b>SPRING TRADE LTD.</b>
Address of the Factory	: Plot # 42, Konapara, Tenguri, Zirani Bazar, B.K.S.P, Savar, Dhaka, Bangladesh
Dhaka Present Status of the Factory	: <b>Under Operation</b>
Structural assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Structural Inspection	: 28 April, 2014
Fire & Electrical assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Fire & Electrical Inspection	: 3 May, 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 solid slab
iii.	Floor System	: Beam slab
iv.	Floor Area	: Floor area of the Spring Trade Ltd. is 19000sq.ft.
v.	No. of Stories	: 6 storied
vi.	Construction Year	: 2007
vii.	Foundation Type	: Unavailable
viii.	Design Drawings	: Available
ix.	Soil investigation Report	: Unavailable
x.	Construction Materials	: Brick aggregated
xi.	Generator	: Ground floor

**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): NA

Mid Term (Within 6 Weeks):

1. Carry out a full Detailed Engineering Assessment of the entire building including any intrusive testing required.
2. Carry out full survey of all structural elements to check the loading capacity of the overall structural system.
3. The Factory Engineer to review design, loads and columns stresses in entire building in accordance with BNBC regulations.
4. Carry out the steps noted in Item 1
5. The Factory Engineer to review design, loads to figure out the reasons of the crack formation.

Long Term (Within 6 Months):

1. Provided loading plan must be strictly maintained.
2. As per result of design check, building engineer to propose the strengthening or repairing works for those beam with cracks accordingly.

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

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3. Consider to remove the old plaster and reapply the new plastering layer.
4. As per the results of structural analysis, the building needs to be revised to accord with BNBC building codes with regard to lateral stability.

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

#### Immediate (Within 1 month):

1. Remove locking features from all egress doors / gates. If locks are required for security reasons, utilize special door locking features complying with NFPA 101.
2. Reduce occupant load to not more than available exit capacity of 400 occupants. In the future provide an additional emergency exit stair at the west side of the floors.

#### Short Term (Within 3 Months):

1. 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.
2. Separate the storage room by a minimum 1-hr fire-rated construction. Seal and/or protected all openings to maintain the required fire separations.
3. Separate the generator and transformer room by a minimum 2-hr fire-rated construction. Seal and/or protected all openings to maintain the required fire separations.
4. Separate the boiler room by a minimum 1-hr fire-rated construction. Seal and/or protected all openings to maintain the required fire separations.
5. 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 23m<sup>2</sup>

-If sprinkler protected: maximum height of 3.66m and maximum area of 93m<sup>2</sup>.

Separate areas of unenclosed combustible storage by a minimum clear distance of 3m.

6. Modify the egress door to swing in the direction of egress travel.
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.

#### Mid Term (within 6 Months):

1. Replace the single-station smoke alarms. Provide automatic smoke detection throughout the building in accordance with NFPA 72.

#### Long Term (More than 6 months):

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

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1. Replace the fire alarm system with a new, listed addressable fire alarm system in accordance with NFPA 72.

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

#### Immediate (Within 1 month):

1. Fill the Breather oil cup with transformer oil up to the required level as instructed by the manufacturer. Consult with transformer servicing company before performing the task. Establish a routine maintenance & inspection program for transformer as well as all other electrical equipment to ensure any future repetition of the occurrence.
2. Connect the Leakage current- collector of the HT cable to the earthing, otherwise, the insulation of the cable may get damaged due to leakage current.
3. Provide phase separators between poles of MCCB made of noncombustible materials preferably use rubber having enough dielectric strength to insulate phases from each other.
4. Provide earth connection for body and doors of all metallic distribution boards using green cables preferably braid so that the metallic door remains at zero potential all the time.
5. Generator body must have two separate and distinct earth connections with minimum 35 sq.mm conductor.
6. Wire joints in panels must be tightly connected using terminals or sockets crimped and insulated. Heat shrink tubes may be used for insulation.
7. Construct a fire rated room for the transformers. Assign a qualified engineer to design a required transformer room according to BNBC, Section-2.6.3. The transformer must be installed with barrier walls between transformer and other panels. The walls must be fire resistant and should have height up to the ceiling. The wall should have the provision for necessary ventilation and fire rated door on required side.

#### Short Term (Within 3 Months):

1. HT cable dropping from HT pole must be protected in steel pipe of required size at least 2m from the ground level to protect the cable from any physical damage. The cable should be supported on covered tray or ladder throughout its length up to the HT panel base-plate (except the part of the cable laid underground at a depth of at least 1 meter).
2. Remove all the multiple connections made at a single point of bus bar and connect individual branch cables to individual points on bus bar using individual lug according to the respective cable size.
3. Cable terminating at generator output terminal box must be supported on riser and protected. Install cable duct to protect the generator output cables and provide covers made of non-combustible material preferably metal to protect the cables' insulation from any physical damage.
4. Disconnect the power source of the cable laid into channel and clean dust and debris of all interior components. Establish a periodic cleaning program and maintain records of the activities. Provide cover made of noncombustible material on the channel for preventing ingress of dust and debris in future.
5. Panel base-plate must be installed. Make circular hole at the base-plate of panels and provide cable gland according to the respective cable size for cable entry and exit so that the cables

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

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are not stressed on the sharp edges of the hole of panels. Provide covers (of noncombustible material) if any additional gap remains after installing cable glands.

Mid Term (Within 6 months): NA

Long Term (More than 6 months): NA