

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: STITCH TONE APPARELS LIMITED.
Address of the Factory	: 18/19, Strand Road, Champa Tower, Mazirghat, Chittagong, Bangladesh
Dhaka Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Structural Inspection	: 20 May, 2014
Fire & Electrical assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Fire & Electrical Inspection	: 26 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	: Unavailable
v.	No. of Stories	: 5 storied
vi.	Construction Year	: 2002
vii.	Foundation Type	: Unavailable
viii.	Design Drawings	: Available
ix.	Soil investigation Report	: Unavailable
x.	Construction Materials	: Unavailable
xi.	Generator	: Ground floor in separate shed on the east side of the 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. Do not increase the loading and follow posted loading plans.
2. A Detail Engineering Assessment of Factory to be commenced.

Mid Term (Within 6 Weeks):

1. Complete the Detailed Engineering Assessment for the load bearing capacity of concrete columns.
2. Verify concrete strength by 100mm dia. Cores.
3. Structural Engineer responsible for design to revise drawings to match existing condition.
4. Detailed Engineering Assessment is required for extension, cantilevered slab, and steel roof.
5. Detailed Engineering Assessment is required for steel detailing of roof and canopy.

Long Term (Within 6 Months):

1. Implement recommendations from DEA.

The recommendations for Fire Safety corrective actions are:

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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. Keep egress paths and stairs clear of storage.
3. Remove all storage from exit stairs and egress paths.

Short Term (Within 3 Months):

1. 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.
2. Provide dedicated storage rooms separated by minimum 1-hr fire-rated construction. Where separate storage rooms are not 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.

3. 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.
4. Provide minimum aisle widths of 36-in.
5. Inspect, test and maintain the fire alarm system, and keep written records on-site, in accordance with NFPA 72.
6. Inspect, test and maintain the emergency lighting system in accordance with The ACCORD standard. Keep written records on-site.
7. 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.

Mid Term (within 6 Months):

1. Modify exit arrangement. OR: Provide additional exit(s).
2. Remove single-station smoke alarms. Provide automatic smoke detection throughout the building in accordance with NFPA 72.

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.

The recommendations for Electrical Safety corrective actions are:

Immediate (Within 1 month):

1. 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

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activities. Provide cover made of noncombustible material on the channel for preventing ingress of dust and debris in future.

2. Cables behind panel must be supported and latched into cable trays or ladders.
3. Transformer breather must be filled up with the oil. During the breathing process, the incoming air may consist of moisture and dirt which should be removed in order to prevent any damage to the insulating property of transformer oil.
4. Earthing connection must be connected to the body in such a way that better earth continuity should be remaining.
5. Cables must be terminated to power contactor providing lugs of required size according to the size of the respective cable.
6. Check the connected load and tighten connections. If required, replace the burn cable.
7. Install separators between different phases of MCCB. Standard separators provided by the MCCB manufacturer must be used.
8. Indicating lamps in panels must connect through fuse or MCBs to bus bar terminal.
9. Bearing grease applied on Change-Over-Switch contacts for mobility must be cleaned. For lubricating, thin layer of contact grease may be used.
10. Transformer earthing connection must be connected to the body in such a way that better earth continuity should be remaining.

Short Term (Within 3 Months):

1. Cables supported in ducts must be arranged and easily separable for maintenance. Cables must be tightly covered to prevent ingress of lint and dust. Clean the cable ducts before rearranging the cables and install with protective covers.
2. 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.
3. Install a vertical cable tray (instead of using flexible pipes) or duct ranging from generator terminal (output) box to cable trench to support the generator output cables.
4. Assign an electrical engineer to determine the capacity of the installation and redesign the wirings of the panel. If the wirings and loads exceed the capacity of the panel, install additional panel. Establish a load management program for avoiding any installation exceeding its capacity in future. Install slotted wiring-duct inside the panel to arrange and latch the haphazard cables.

Mid Term (Within 6 months):

1. Install the cables tray or duct with cover (metallic) for the protection of the cable laid on floor. Ensure the cables are tightly latched inside the ladder/tray and provide covers made of non-combustible material preferably metallic sheet to protect the cables' insulation from any physical damage as well as prevent the ingress of debris, dust and lint.
2. Cables of different voltage levels must be separated in different trays.

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3. Cables/wirings passing through permanent wall must be protected installing pipes and remaining gaps must be sealed with fire resistant materials. Cable tray/raceway shall be installed for the support of the cable throughout its length.
4. Install cable tray with metallic cover to provide mechanical support to cables laid haphazardly on the floor.
5. 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.
6. Cables passing floor or through permanent walls must be protected in steel/PVC pipes and fixed the PVC pipes with clamps at wall.
7. Make circular hole at the base plate and provide cable gland according to the respective cable size for cable entry and exit so that the cables 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.
8. Wires terminating to devices inside panel must be connected firmly and wires approaching devices must be securely fastened to avoid unintentional contact with live parts. Install slotted wiring duct to latch the cable inside the duct.
9. Terminate each cable individually on the bus bar. Multiple cables shall not be terminated on same point of bus bar.
10. Provide earth connection for body and doors of metallic distribution boards using green cables preferably braid so that the metallic door remains at zero potential all the time.
11. Install cable or ladder to support the main service cables from pole mounted distribution transformer to main switch (MCCB).

Long Term (More than 6 months):

1. Safety clearance between the HT overhead line and building must be maintained. Cable raceways outside in open air must have mechanical protection. Install cover (metallic) on the cable tray to ensure the required mechanical protection.
2. Relocate the transformer and 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.
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4. Cables/wirings passing through permanent wall must be protected installing pipes and remaining gaps must be sealed with fire resistant materials. Cable tray/raceway shall be installed for the support of the cable throughout its length.
5. Seal all the penetrations using non appropriate fire rated material and ensure the cable insulation does not get damaged during sealing work.