

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: DICA TEX LTD.
Address of the Factory	: Tenguri, Shimulia, Zirani, Ashulia, Savar, Dhaka, Bangladesh
Dhaka Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Structural Inspection	: 11 June, 2014
Fire & Electrical assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Fire & Electrical Inspection	: 7 July, 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 spanning slab
iii.	Floor System	: Beam slab
iv.	Floor Area	: The total floor area of the building is 43665 sft.
v.	No. of Stories	: 6 storied
vi.	Construction Year	: 2012
vii.	Foundation Type	: Pad foundation
viii.	Design Drawings	: Available (Approved by RAJUK on 3rd October 2009)
ix.	Soil investigation Report	: Available
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. Factory Engineer to review design, loads and columns stresses in all ground floor columns.
2. Verify insitu concrete stresses either by 100mm diameter cores or existing cylinder strength data for cores from min. 4 columns. Factory Engineer to ensure that cores are not taken from highly stressed locations.

Long Term (Within 6 Months):

1. Produce and actively manage a loading plan for all floor plates within the factory, giving consideration to floor capacity and column capacity.
2. Building engineer to review the stair structure and its connections and, if required, prescribe relevant structural improvements to ensure these meet BNBC requirements to allow for crowd loading.
3. Building Engineer to review as-built layout of off-grid columns and beams eccentric on columns and, if required, prescribe relevant structural improvements to ensure these meet BNBC requirements.
4. Manage drainage from roof level and downpipes to avoid structural corrosion due to continuous moisture.

The recommendations for Fire Safety corrective actions are:

Immediate (Within 1 month):

1. Remove locking features from all egress doors and gates. If locks are required for security reasons, utilize special door locking features complying with NFPA 101.
2. Remove all storage from exit stairs and egress paths.
3. Replace all gates and 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 manual on/off switches from emergency lighting and exit signage units to prevent them from being switched off.

Short Term (Within 3 Months):

1. 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.

2. Separate the boiler and generator room by a minimum 2-hr fire-rated construction. Seal and protected all openings to maintain the required fire separations.
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. Seal all penetrations and openings in exit stair enclosure walls to maintain the fire separation.
5. Provide 2-hr continuous stairwell enclosure to exterior ground floor.
6. Remove and relocate the non-serving electric appliances to the exterior of the stairwells.
7. Modify the egress door to swing in the direction of egress travel.
8. Provide a minimum 2-hr fire rated exit corridor between the day-care room and exit stair.
9. Inspect, test and maintain the fire alarm system, and keep written records on-site, in accordance with NFPA 72.
10. 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. Remove single-station smoke alarms. Provide automatic smoke detection throughout the building, tied into the fire alarm system, in accordance with NFPA 72.

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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. OH LV cable must be firmly fixed at both ends and supported on catenary wire clamped at regular interval or the cable tray may be extended throughout the length.
2. Provide acid resistant stand (battery rack) for the batteries and keep sufficient distance around individual battery for maintenance and inspection purpose.
3. Use steel pipe/cable tray to ensure the mechanical protection of the cable laid on floor otherwise cable insulation may damage due to falling object or stepping of occupants onto it. Cables drawn on wall or otherwise shall be supported by cable riser or cable tray.
4. Existing raised cable trenches inside building must be covered with protective covers (concrete slabs or checkered plates).
5. Use cable tray or conduit to pass cables through concrete wall and seal the unused openings by fire rated materials.
6. Phase barriers between different phases supplied by the breaker manufacturer must be installed to avoid arc flashing.
7. Terminate each cable proving individual lug according to the cable size. Multiple cables shall not be terminated on a single point of the bus bar.
8. Cables/wirings passing through permanent wall must be protected and remaining gaps must be sealed with fire resistant materials.
9. Metallic (aluminium) cover should be provided on cable raceway to prevent damage of cable insulation and ingress of dust.
10. Provide acid resistant stand (battery rack) for the batteries and keep sufficient distance around individual battery for maintenance and inspection purpose.
11. Wires close/attached to boiler and generator must be protected from external heat and moisture by using metallic heat resistant conduits. If possible, keep sufficient clearance between heat sources and cable/wires.
12. SLD and schematic drawings of electrical system shall be developed a qualified engineer. SLD shall show be maintained and continuously updated to reflect as built condition.

Short Term (Within 3 Months):

1. All panels must be connected to earth at least at two points for guaranteed earth connection. All metal parts of electrical appliances and devices must be connected to earth. Panel doors and other metal parts used must be connected with earth bond.
2. Provide base plate for the panel. 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.

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3. Existing panel installed near exit may be relocated to prevent obstruction to emergency exits, as required by fire safety regulations. While relocating arrange cables using cable duct and use cable tray to support and protect cables.
4. Evaluated total risk index figure for the factory building premises is 49. Install an appropriate lightning protection system.

Mid Term (Within 6 months): NA

Long Term (More than 6 months): NA