

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: TTS MANUFACTURING LTD.
Address of the Factory	: Dilan Complex, Dhaka Road, Chandana Chowrasta, Gazipur 1702, 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 March, 2014
Fire & Electrical assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Fire & Electrical Inspection	: 5 March, 2014

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

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|-------|---------------------------|---|
| i. | Building Usage Type | : Garment factory |
| ii. | Structural System | : RC flat slab |
| iii. | Floor System | : Beam slab |
| iv. | Floor Area | : Usable space of the ground floor along with premises is 5600 sq. ft. and for other floors of the building the floor area is 13500 sq. ft. |
| v. | No. of Stories | : 7 storied |
| vi. | Construction Year | : 2010 |
| vii. | Foundation Type | : Pad foundation |
| viii. | Design Drawings | : Available (Signed in August, 2007) |
| ix. | Soil investigation Report | : Unavailable |
| x. | Construction Materials | : Unavailable |
| xi. | Generator | : Separate 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): NA

Mid Term (Within 6 Weeks):

1. Factory Engineer to carry out column checks in areas highlighted above (columns under water tanks).
2. Factory Engineer to commence production of controlled loading plans for each level.

Long Term (Within 6 Months):

1. Create controlled loading plans for all floors, designating where storage can be placed.
2. Provide calculations showing the structural adequacy of columns under the water tanks, taking into account the loading plans and all built structure. Provide concrete strength tests.
3. New steel roof structures should be designed and upgraded to support code vertical and wind loads, or they should be vacated and removed.

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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. 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. 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.
5. Remove manual on/off switches from emergency lighting / exit signage units to prevent them from being switched off.

Short Term (Within 3 Months):

1. Separate the boiler and transformer rooms by a minimum 2-hr fire-rated construction. Seal and/or protected all openings to maintain the required fire separations.
2. Provide a minimum 2-hr fire-rated shaft to separate the utility risers from each floor level. Seal all penetrations and openings in floor/ceiling assemblies to maintain the fire separation.
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 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 combustibile storage by a minimum clear distance of 3m.

6. Inspect, test and maintain the fire alarm system, and keep written records on-site, in accordance with NFPA 72.

Mid Term (within 6 Months):

1. Provide additional notification appliances such that the fire alarm system is audible 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.

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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. Wire terminating to devices inside panel must be connected firmly and wires approaching devices must be securely fastened to avoid unintentional contact with live parts.
2. Clean regularly and protect the panel from ingress of lint and dust by closing all sides and doors.
3. Breather oil cup must be filled with transformer oil to required level as instructed by the manufacturer.
4. Panel door(s) must be connected with earth bond connecting frame and door.

Short Term (Within 3 Months):

1. Install separators between different phases of MCCB. Standard separators provided by the MCCB manufacturer must be used.
2. Panel must be connected with dedicated earth and connection of earth strip to the panel frame does not substitute the requirement of earth connection.
3. Additional air terminal may be required and may be checked and redesigned.
4. Panel base plates must be installed, at all time, and cable(s) entering panel must be firmly fixed with cable gland.
5. Replace the weak cable trench with chequered plates or concrete slabs of required strength and rigidity.
6. Flexible PVC conduit wiring must be additionally supported on cable tray and risers.
7. Replace silica gel and must include in routine maintenance to check and maintain.
8. Avoid joints in service cables.
9. Panels located below stairs must be relocated to safe place.

Mid Term (Within 6 months):

1. Remove wires connected across transformer terminals. Connections must be made from the LT panels with control and protective devices.
2. Transformer may be separated from panels by constructing barrier walls.
3. Cable trench should be covered with concrete slab.

Long Term (More than 6 months): NA