

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: AZIM MANNAN GARMENTS LTD
Address of the Factory	: Plot # 12P & 13P, Kalurghat Heavy I/A, 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	: 18 March, 2014
Fire & Electrical assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Fire & Electrical Inspection	: 19 August, 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 frames with a 2-way solid slab
iii.	Floor System	: Beam slab
iv.	Floor Area	: Total floor area of Azim Mannan Garments Ltd is 47000sq.ft
v.	No. of Stories	: 9 & 10 storied
vi.	Construction Year	: 2012
vii.	Foundation Type	: Unavailable
viii.	Design Drawings	: Available
ix.	Soil investigation Report	: Available
x.	Construction Materials	: Unavailable
xi.	Generator	: Ground floor shed

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. Reduce storage loads to those set out by the Structural Safety Certificate issued by Shaheed ullah and New Associates Ltd of July 7th 2012.

Mid Term (Within 6 Weeks):

1. Factory engineer to review design, loads and column stresses.
2. Factory engineer to review design, loads and column stresses in areas identified above.
3. Detailed engineering assessment to be performed upon the foundations of building C.
4. Detailed engineering assessment to be performed upon the slabs of building A.

Long Term (Within 6 Months):

1. Develop a loading plan for all floor plates within all buildings with consideration given to slab and column capacity.
2. Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor slab and column capacity.
3. Implement any recommendations put forth by the above mentioned detailed engineering assessment.

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. Keep egress paths and stairs clear of storage.
3. Remove all storage from exit stairs and egress paths.
4. 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.
5. Provide exit signs above all exits to the exterior and all doors to the exit stairs.
6. Regularly inspect all exit signage and replace/install lights as needed to illuminate signs.
7. Regularly test the emergency lighting system on each floor and replace/repair lights as needed.

Short Term (Within 3 Months):

1. Separate the boiler, 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 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.

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 minimum aisle widths of 36-in.
6. Reconfigure the egress arrangement to reduce the maximum dead-end distance to not more than 30 m.
7. Modify the egress door to swing in the direction of egress travel.
8. Reduce occupant load (615) to not more than available exit capacity (418). Or Provide additional exits.
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.

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

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.

Mid Term (within 6 Months):

1. 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.
2. Provide 2-hr fire-rated exit passageway leading directly outside (vestibules to separate any storage areas).
3. Remove single-station smoke alarms. Provide automatic smoke detection throughout the building, tied into the fire alarm system, 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.
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. Check and find out the reason behind the overheating and take necessary steps.
2. Generator room must be kept dry and free from oil and water.
3. Arrange periodic inspection & thermal scan to identify the overloading, loose connection, unbalanced load which may cause the excessive heat-rise and take action accordingly.
4. Multiple cables connecting at a MCCB terminal must be removed. Individual circuit breaker must be used for each load according to the respective cable-size.
5. Check the earthing connection (for loose connections) and rectify as required.

Short Term (Within 3 Months):

1. Thermo graphic scanning of the entire electrical system must be performed on tri-annual basis and recorded.
2. Insulation resistant test of all the cables must be performed once every 5 year cycle and recorded.
3. Electrical safety training and awareness program for the electrical personal and workers must be initiated and recorded.
4. 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 on required side.
5. Construct cable trench to protect the cables to ensure the mechanical protection of the cable laid on floor otherwise cable insulation may damage due to falling objects or stepping of occupants onto it.

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

6. Install cable tray or riser (up to the panel base plate) to support the cables entering and leaving the panel boards to reduce cable strain on cable termination point.
7. Panel board should be relocated and installed to the permanent wall or on a firmly fixed foundation.
8. Cable tray or conduit must be passed across the wall to support and protect the cables. The openings after the passage of cable tray or conduit (the wiring system) should be sealed with the fire rated materials.
9. Route of power cables and water pipe lines must be separated at minimum 0.9m.
10. Heat deteriorated cable must be replaced from panel as soon as possible.
11. Rotating machines like motors must be firmly fixed to the foundation.
12. Earth bus bar strip must be firmly fixed to the metal enclosure.
13. Use proper sized cable lugs for each single cable and punches them by proper hand puncher or hydraulic puncher to avoid loose connection. Enlarge the earth bus bar size according to the capacity of the panel and make more holes. Use single point (hole) of bus bar to terminate each single cable (lugs).
14. Cables must be supported by covered cable tray/ladder, fixed on wall.
15. Replace rewire fuses (cut out fuse) mounted on the wiring ducts with MCBs installed in protective enclosure.
16. Power cables installed near boiler steam lines must be protected from external heat and moisture (may keeping sufficient clearance between steam pipes and cable/installing adequate thermal-insulation on the steam pipe).
17. Provide cover on cable duct and make a periodical cleaning program.
18. Cable must be arranged and latched properly on the cable tray. Provide cover made of non-combustible material preferably metallic sheet to protect the cables' insulation from physical damage as well as prevent the ingress of debris, dust and lint. Keep 30% free inside cable tray/channels/ducts for proper heat dissipation. Install another duct/tray to accommodate all the cables.

Mid Term (Within 6 months): NA

Long Term (More than 6 months): NA