

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: ALLIANCE GARMENTS LTD.
Address of the Factory	: House No 8 & 10, Road No 3, Section No 7, Mirpur Industrial Estate, Dhaka
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	: 5 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. Beams and 2-way solid slabs typical at each floor
iii.	Floor System	: Beam slab
iv.	Floor Area	: The total floor area of the building is 32,200sqft.
v.	No. of Stories	: 6 storied
vi.	Construction Year	: 1996
vii.	Foundation Type	: Spread foundation
viii.	Design Drawings	: Available (Approved by RAJUK in August 1998)
ix.	Soil investigation Report	: Available (Dated April 1998)
x.	Construction Materials	: Brick chip 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 column stresses in area identified above.
2. Verify insitu concrete strengths (using min. 4 no. 100mm dia. Cores) and existing reinforcement for all columns.
3. Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.
4. Update existing floor loading plans to distinguish between allowable and actual imposed floor loads
5. Extent of roof loading, including concrete and plastic water tanks and water tank support structure, to be surveyed and capacity of roof slab and support system to be assessed to confirm that they are structurally adequate.
6. Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.
7. Sections of plaster finish to soffit of the cracked roof beams to be removed to investigate if cracks penetrate the building structure.

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Long Term (Within 6 Months):

1. Continue to implement load management plan.
2. Implement loading plans on an on-going basis.
3. Building Engineer to carry out design check on beams to confirm that these cracks are non-structural.
4. Building Engineer to inspect internal line of building movement joint and prepare a schedule of areas which require remedial works to prevent risk of falling plasterwork.
5. Carry out making good works per Building Engineer schedule including re-weathering of joint line externally to prevent any rainwater ingress.

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. Replace all gates and roll-up 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.

Short Term (Within 3 Months):

1. Separate the boiler and transformer room by a minimum 1-hr fire-rated construction. Seal and/or protected all openings to maintain the required fire separations.
2. 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.
3. 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.

4. Separate the storage rooms by a minimum 1-hr fire-rated construction. Provide minimum .75-hr fire rated doors and seal all unprotected openings to separate the storage rooms from work areas and other building spaces at the ground floor.
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.

Mid Term (within 6 Months):

1. Modify exit arrangement.

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2. Replace the 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. Install separators between different phases of MCCB. Standard separators provided by the MCCB manufacturer must be used.
2. Terminate each cable individually on the bus bar. Multiple cables shall not be terminated on same point of bus bar.
3. 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.

Short Term (Within 3 Months):

1. The transformer must be installed with barrier walls (instead of grill) between transformer and other panels. The walls must be fire resistant and should have height up to the ceiling or Assign a qualified engineer to design a required transformer room according to BNBC, Section-2.6.3.
2. Provide ladder tray for supporting the cables and seal all the penetrations using appropriate fire rated material and ensure the cable insulation does not get damaged during sealing work.
3. Install the cable tray/ladder/ duct up to the cable entry of the panel in order to support the cables. Ensure the cables are tightly latched with the ladder and provide covers made of non-combustible material preferably metallic sheet to protect the cables' insulation from any physical damage as well as prevent ingress of debris, dust and lint. Provide cable gland for every cable entry and exit hole.
4. Cables terminating at generator output terminal box may be supported on cable trays. Install vertical cable tray, bottom of the generator output terminal box.
5. 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).
6. Cable ducts must be cleaned regularly and covered to prevent ingress of dust and lint.
7. Flexible PVC conduits on walls and column must be additionally protected and supported on trays or risers.
8. Cables in electrical shaft must be securely clamped to the tray/ladder and must be protected.
9. Install cable tray or ladder or metallic conduit to support and protect the cables throughout its length. And install riser at the bottom of the panel.
10. Existing wooden ducts supporting wiring may be replaced with non-combustible ducts, with ample strength and rigidity, supported at regular intervals.

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11. Remove the wooden cable duct and install metallic covered cable duct (BBT) or tray to route and arrange cables safely. Replace the rewirable as a MCB.

Mid Term (Within 6 months):

1. Transformer room may be rearranged or some of the panels may be relocated to increase the room size of the transformer. The room area for the transformer should be 13 sq m according to BNBC 2006, Section-2.6.3. Make sure that the transformer room should be fire rated and separated from other occupancy. Assign an electrical engineer to rearrange the room.
2. Cables must be supported on cable trays and riser. Cables may be laid in cable trench with covers.
3. The cable trench must be tightly covered by using checkered plates to avoid physical damage and also from falling debris, dust and lint.

Long Term (More than 6 months): NA