

## Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

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Name of the Factory	: <b>AMIR SWEATER &amp; APPARELS LTD.</b>
Address of the Factory	: Satter Bhaban, Bogabari Bazar, Baipail, Ashulia, Savar, Dhaka
Dhaka Present Status of the Factory	: <b>Under Operation</b>
Structural assessment conducted by	: Accord (Full report available at <a href="http://bangladeshaccord.org">bangladeshaccord.org</a> )
Date of Structural Inspection	: 2 April, 2014
Fire & Electrical assessment conducted by	: Accord (Full report available at <a href="http://bangladeshaccord.org">bangladeshaccord.org</a> )
Date of Fire & Electrical Inspection	: 27 March, 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	: RC beam slab, RC flat slab
iii.	Floor System	: Beam slab
iv.	Floor Area	: Total area of the factory building is 6218sq.ft.
v.	No. of Stories	: 5 storied
vi.	Construction Year	: 2010
vii.	Foundation Type	: Unavailable
viii.	Design Drawings	: Available (Permit Drawings were signed by the assistant Engineer of the Cantonment Board in September 2010)
ix.	Soil investigation Report	: Unavailable
x.	Construction Materials	: Unavailable
xi.	Generator	: Generator room ground level south side

**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. Factory Engineer to review design, loads and column stresses in factory building.
2. Verify insitu concrete stresses by cores or existing cylinder strengths for ground floor columns or take 100mm dia. Cores from min. 4 no. columns.
3. A Detail Engineering Assessment of factory to be commenced immediately -see attached scope.
4. Detail Engineering Assessment (see Item 1) to include assessment of tank loads on flat slab and slab build-up in toilet areas.
5. As part of Detail Engineering Assessment (see Item 1), evaluate if column at entrance has been designed to withstand vehicular impact loading.
6. All material storage on stairs to be removed immediately, in order to maintain a clear escape route.

#### Mid Term (Within 6 Weeks):

1. Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.
2. Detail Engineering Assessment to be completed

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3. Detail Engineering Assessment to be completed. Tanks to be moved if required.
4. Provide permanent adequate protection to column as required following assessment.
5. Building engineer to review design of roof over stair core, particularly in terms of stability under high wind conditions, and propose remedial measures as necessary.
6. Continue to ensure stairs are kept clear.

### Long Term (Within 6 Months):

1. Produce accurate structural drawings for the building.
2. Implement actions arising from Detail Engineering Assessment.
3. Ensure that protection to column is maintained.
4. Implement remedial works.
5. Continue to ensure stairs are kept clear.

### **The recommendations for Fire Safety corrective actions are:**

#### Immediate (Within 1 month):

1. Remove stock and only have what is needed for a days work.
2. Remove all storage from exit stairs and egress paths.
3. Keep egress paths and stairs clear of storage.
4. Remove locking features from all egress doors / gates. If locks are required for security reasons, utilize special door locking features complying with NFPA 101.
5. 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.

#### Short Term (Within 3 Months):

1. 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.
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 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 23m<sup>2</sup>
  - If sprinkler protected: maximum height of 3.66m and maximum area of 93m<sup>2</sup>.Separate areas of unenclosed combustible storage by a minimum clear distance of 3m.
4. Inspect, test and maintain the fire alarm system, and keep written records on-site, in accordance with NFPA 72.

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5. Replace the single-station smoke alarms with automatic smoke detectors tied into the fire alarm system. Configure the fire alarm system to initiate occupant notification upon activation of any two smoke detectors in addition to the manual fire alarm stations.
6. 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. Provide minimum 1hr fire rated room and seal all unprotected openings to separate from work areas and other building spaces on all floor levels. Ensure that the fire doors are self-closing and fire rated for use.
2. Relocate day-care room to ground floor with maximum travel distance of 9m (30 ft).

### 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. Cable installed outside in open air must have mechanical protection. Install covered (metallic) cable tray to ensure the required mechanical protection. Remove the combustible material (fabrics) hanging on the power cable.
2. All protective devices should be encased in metal casing made of metal sheets minimum 20 SWG thickness.
3. Install separators between different phases of MCCB. Standard separators provided by the MCCB manufacturer must be used.
4. Damaged fittings must be replaced with new one as required. Regular inspection is needed to avoid such circumstances.
5. Disconnect the panel from electric supply and remove all the dust and lint from inside the panel. Establish a routine maintenance program to clean all the electrical panels.

#### Short Term (Within 3 Months):

1. Some of the panels shall be relocated, to other location, to provide adequate and safe working space (1 meter clearance preferably) for ease of its operation.
2. Provide cable gland to circular hole at the base plate of panels 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.
3. Protective devices should be encased in metal casing made of metal sheets minimum 20 SWG thickness.
4. Cables shall be connected to terminals only by soldered/welded lugs according to the size of the respective cables. Proper crimping tools must be used to punch the socket.

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5. Wiring in flexible PVC conduit must be supported (throughout the length and near panel) on tray/riser to prevent stress at the entry point or termination point.
6. Cables/wirings passing through permanent wall must be protected installing rigid 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.

Mid Term (Within 6 months): NA

Long Term (More than 6 months): NA