

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

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Name of the Factory	: CLAMOON GARMENTS LTD
Address of the Factory	: Plot 4, Block I, Road 6, Section 7, Mirpur, 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	: 9 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	: 10 April, 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 and 2-way span solid slabs
iii.	Floor System	: Beam slab
iv.	Floor Area	: Unavailable
v.	No. of Stories	: 6 storied
vi.	Construction Year	: 1995
vii.	Foundation Type	: Unavailable
viii.	Design Drawings	: Available (Approved by RAJUK in October 2005)
ix.	Soil investigation Report	: Available (Dated June, 2013)
x.	Construction Materials	: Brick chips (confirmed in ground floor columns)
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):

1. Prop beams and slabs at each floor level in the highlighted area.
2. Factory Engineer to review design, loads and column stresses in all columns.
3. Verify insitu concrete strength either by 100mm diameter cores or existing cylinder strength data for cores from min. 4 columns. Verify grade of steel reinforcement used.
4. A Detail Engineering Assessment of Factory to be commenced, see attached Scope.

Mid Term (Within 6 Weeks):

1. Detail Engineering Assessment to be completed.
2. Make structural alterations as advised by Engineer and remove props.
3. Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.
4. Building Engineer to survey as-constructed building. Updated drawings to be prepared showing the correct as-constructed layout.
5. Prepare/update calculations showing the structural adequacy of the building structure, taking into account the factory design imposed loading and the as-built structure.

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6. Prepare controlled loading plans for all floors designating storage density and where storage may be placed.
7. Building Engineer to review column load path at 1st/ 2nd floor level on the front elevation as part of Detail Engineering Assessment (see Item 1).

### Long Term (Within 6 Months):

1. Continue to implement load plan.
2. Continue to implement load plan. (Refer to Item 1).
3. Implement actions arising from review of column load path.
4. Building Engineer to carry out design check for crowd loading on external steel stairs and concrete stairs.
5. If required, upgrade stairs to support code loading.

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

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

1. Separate the boiler and generator rooms 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. Separated storage rooms are not permitted to open directly into exit enclosures.
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. Provide minimum aisle widths of 36-in.
5. Provide handrails on at least one side of exit stair.
6. Inspect, test and maintain the fire alarm system, and keep written records on-site, in accordance with NFPA 72.

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7. 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 2-hr fire-rated exit passageway from the stairwell leading directly outside.
2. 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.

### 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. Existing phase separators fabricated from insulating materials may not provide the required insulating properties for the type of MCCB installed.
2. Multiple cable terminating at a terminal in bus bars must be separated.
3. Replace rewire fuses (cut out fuse) mounted on the wiring ducts with MCBs installed in protective enclosure.

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

1. Overhead service cables must be protected in rigid conduit or in covered trays.
2. Overhead cables must be firmly fastened at both ends.
3. Existing panels may be rearranged to provide adequate working space, especially when the panels are open.
4. Cables below panels must be laid in trench and supported in cable trays.
5. Multiple cable connecting at a MCCB terminal must be disconnected. Existing multiple circuits may be distributed through bus bars.
6. Existing panel door earth connection from earth strip may be disconnected from the strip and connected to the panel frame, such that it will not disturb the opening and closing of the panel door.
7. Wires in wiring must be protected and supported throughout its length. Wiring exposed between different wiring system may be prevented by selecting appropriate adapter to connect.
8. Wooden frame for existing panel boards must be replaced by steel panel.

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### Mid Term (Within 6 months):

1. Cable laid or installed on roof must be removed and laid through safe route. Cables must be protected and supported on tray, duct or conduits.
2. Communication cables laid alongside the power cables or electric wiring must be protected and supported in trays to maintain safe clearance from the electrical facilities.
3. Existing power cables installed alongside the steam line must be covered to protect against external heat from the steam lines. Adequate clearance may be provided from the steam lines.
4. Some of the existing panels near generator may be relocated to another room.

### Long Term (More than 6 months): NA