

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

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Name of the Factory	: A.M. DESIGN LTD.
Address of the Factory	: Diakhali, Beron, Jamgara, Ashulia, Bangladesh
Dhaka Present Status of the Factory	: <b>Under Operation</b>
Structural assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Structural Inspection	: 3 May, 2014
Fire & Electrical assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Fire & Electrical Inspection	: 6 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         | : RC moment frame with infill masonry walls             |
| iii.  | Floor System              | : Beam slab   |
| iv.   | Floor Area                | : The total floor area of the building is 80,000 sq.-ft |
| v.    | No. of Stories            | : 4 storied   |
| vi.   | Construction Year         | : 2005-2006   |
| vii.  | Foundation Type           | : Unavailable   |
| viii. | Design Drawings           | : Available (Dated 2006, approved by LGED)              |
| ix.   | Soil investigation Report | : Unavailable   |
| x.    | Construction Materials    | : Stone aggregated                                      |
| xi.   | Generator                 | : Ground floor (utility 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): NA

Mid Term (Within 6 Weeks):

1. Building Engineer to assess capacities of cantilever slabs and develop and implement loading plans for these areas as necessary.
2. Building Engineer to implement loading plans specific for cantilever areas.
3. Building Engineer to confirm one-way spanning slab parallel to GL G (as assumed). If slab is designed/constructed as a cantilever about GL F a verification of the slab design is required.

Long Term (Within 6 Months):

1. Building Engineer to develop loads plans for all buildings, accounting for usage, floor build ups, solid partition walls and areas of concentrated loading. Factory management to implement load plans.
2. Building Engineer to monitor façade cracking due to unstiffened slab edge and restrict floor use with loading plans as defined in item 1.
3. As built structural drawings to be generated/updated for all buildings on factory complex. As built drawings to account for structural framing as observed on site.
4. As built drawings to be revised, as necessary, as future modifications are made to the building. Any strengthening works, as required, to be included on the as built drawings.

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5. Building Engineer to identify areas of structural cracking throughout building.
6. Building Engineer to continue to monitor size, length and location of structural cracking throughout.
7. Prior to future extension commencing, Building Engineer to verify column capacities exceed future design loading, accounting for actual loading throughout existing building. Loading plans to be updated as required.
8. Building Engineer to review the adequacy of non-engineered structures throughout complex. Particular attention should be paid to the stability of these structures and the holding down connection details.

### **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. Reduce occupant load to not more than available exit capacity (575 persons). If possible add new exit stairs in the future to increase capacity.
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. Remove single-station smoke alarms. Provide automatic smoke detection throughout the building, tied into the fire alarm system, in accordance with NFPA 72.
5. 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 room from the working areas and egress routes by a minimum 2-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. Seal all penetrations and openings in exit stair enclosure walls to maintain the fire separation.
4. Provide minimum path widths of 36-in.
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. 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. Alternatively, provide a second remote discharge path to the public way.

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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. Make circular hole at the top plate of panels and provide cable gland according to the respective cable size for cable entry and exit.
2. 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.
3. Install cable tray with metallic cover to provide mechanical support to cables laid haphazardly on the floor.
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. Install graded separators between different phases of MCCB.

Short Term (Within 3 Months):

1. Steel or PVC conduit must be installed for the cable support to prevent damages and stress to the cables.
2. Steel or PVC conduit or cable tray must be installed for the cable support to prevent damages and stress to the cables.
3. Cables passing through permanent walls must be protected in steel pipes and remaining holes around the pipe must be sealed.
4. Remove lint and dust from the cable duct and cover it with noncombustible material; make a periodical cleaning program.
5. Use steel pipe or PVC pipe (not flexible) or cable tray to support the cables.

Mid Term (Within 6 months):      NA

Long Term (More than 6 months): NA