

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

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Name of the Factory	: DEBONAIR LIMITED UNIT-2
Address of the Factory	: Plot 356, Ozarpara, Sharifpur Road, Maleker Bari, Gazipur
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	: 17 May, 2014
Fire & Electrical assessment conducted by	: Accord (Full report available at <a href="http://bangladeshaccord.org">bangladeshaccord.org</a> )
Date of Fire & Electrical Inspection	: 25 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. Beam-Column Frame System
iii.	Floor System	: Beam slab
iv.	Floor Area	: Unavailable
v.	No. of Stories	: 3 storied
vi.	Construction Year	: 2010
vii.	Foundation Type	: Pad foundation
viii.	Design Drawings	: Available (Not signed by an appropriate authority.)
ix.	Soil investigation Report	: Available
x.	Construction Materials	: Brick aggregated
xi.	Generator	: In a separate 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. Factory Engineer to review design, loads and columns stresses in all columns.
2. Verify insitu concrete stresses by taking 100mm diameter cores from a minimum of 4 columns. Verify grade of steel reinforcement used.
3. A Detail Engineering Assessment of Factory to be commenced, see attached Scope.

Mid Term (Within 6 Weeks):

1. Make structural alterations as advised by Engineer.
2. Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.
3. Detail Engineering Assessment to be completed.
4. Building Engineer to review the design of all the buildings on the site with regard to lateral stability. The Building Engineer should either confirm that the cantilever concrete columns are adequate to carry the horizontal loads or advise on an appropriate vertical bracing system. In addition the Building Engineer is to provide guidance on the requirement for horizontal bracing in the plane of the roof.
5. Building Engineer to confirm that the cantilever slabs have been designed to take the floor and façade loads applied, as part of DEA (See Item 1).

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Long Term (Within 6 Months):

1. Continue to implement load plan.
2. Carry out any remedial works as determined by the Building Engineer.

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

Immediate (Within 1 month):

1. Remove locking features from all egress gates. If locks are required for security reasons, utilize special door locking features complying with NFPA 101.
1. 2. Replace all gates 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.
2. Regularly inspect all exit signage and replace/install lights as needed to illuminate signs.
3. Regularly test the emergency lighting system on each floor and replace/repair lights as needed.

Short Term (Within 3 Months):

1. 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.

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. Separate the generator and transformer rooms by a minimum 2-hr fire-rated construction. Seal and/or protected all openings to maintain the required fire separations.
4. Immediately reduce occupant load to not more than available exit capacity. If possible provide additional exits to increase exit capacity.
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 stair to discharge directly outside. Or provide 2-hr fire-rated exit passageway leading directly outside (vestibules to separate any storage areas). Or provide sprinkler protection for discharge floor in accordance with NFPA 13.

Long Term (More than 6 months): NA

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

#### Immediate (Within 1 month):

1. Provide phase separators between terminals of MCCB made of noncombustible material preferably rubber having enough die electric strength to insulate the phases from each other.
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. Panel base must be securely fixed to the foundation, with appropriate fastening devices. Panel base frame may be used on foundation to mount the panel.
4. Fill the Breather oil cup with transformer oil up to the required level as instructed by the manufacturer. Consult with transformer servicing company before performing the task. Establish a routine maintenance & inspection program for transformer as well as all other electrical equipment to ensure any future repetition of the occurrence.
5. Disconnect (shutdown) the transformer from service line and replace the silica gel and establish a routine maintenance program to inspect and maintain related issues of transformer.
6. Provide pin type bus bar for making connection in the tapper box. Ensure the capacity of the pin type bus bar is higher than the connected breakers' total rating.

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

1. Provide covers on the trench made of noncombustible material preferably concrete slab to protect the cables' insulation from physical damage as well as prevent entering debris, dust and lint.
2. Construct a cable trench to terminate the generator output cables and provide covers made of noncombustible material preferably concrete slab to protect the cables' insulation from physical damage as well as prevent entering debris, dust and lint.
3. Install cable tray up to entry of the panel made of noncombustible material preferably metallic sheet to support the cables. Ensure the cables are tightly attached with the ladder and provide covers made of noncombustible material preferably metallic sheet to protect the cables' insulation from physical damage as well as prevent entering debris, dust and lint.
4. Provide cover on the duct made of noncombustible material preferably metallic sheet to protect the cables' insulation from physical damage as well as prevent entering debris, dust and lint. Rearrange the cables routed inside the duct and maintain the same arrange for future wiring if necessary.

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

1. Provide cable ladder made of noncombustible material preferably metal for supporting HT cables and ensure the cables are firmly fixed with the ladder to avoid stress at the termination (transformer bushing).
2. Terminate the HT cable and LT cables separately on a cable tray/ladder and provide covers made of noncombustible material preferably metal to protect the cables' insulation from physical damage as well as prevent entering debris, dust and lint.
3. Install a tray/ladder to support the excess length cables and provide covers made of noncombustible material preferably metal to protect the cables' insulation from physical damage as well as prevent entering debris, dust and lint.

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4. Install tray/ladder to support the cables and provide covers made of noncombustible material preferably metal to protect the cables' insulation from physical damage as well as prevent entering debris, dust and lint.
5. Provide steel pipe of required size to support and protect HT cable from physical damage by moving objects.

Long Term (More than 6 months): NA