

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

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| Name of the Factory | : DIVINE DESIGN LTD |
| Address of the Factory | : 12/13, BSCIC I/A, Kalurghat, Chandgoan, Chittagong, Bangladesh |
| Dhaka Present Status of the Factory | : Under Operation |
| Structural assessment conducted by | : Accord (Full report available at bangladeshaccord.org) |
| Date of Structural Inspection | : 20 April, 2014 |
| Fire & Electrical assessment conducted by | : Accord (Full report available at bangladeshaccord.org) |
| Date of Fire & Electrical Inspection | : 7 May, 2014 |

Basic Information: The present garment factory is a commercial building with beam-column frame system. The following general information was noted:

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| i. | Building Usage Type | : Garment factory |
| ii. | Structural System | : Cantilever slabs on every face of the building, R.C. frame structure with a moment frame action |
| iii. | Floor System | : Beam slab |
| iv. | Floor Area | : The building has 7348.63sqft per floor |
| v. | No. of Stories | : 7 storied |
| vi. | Construction Year | : 2006 |
| vii. | Foundation Type | : Unavailable |
| viii. | Design Drawings | : Available (Signed by Chittagong BSCIC in 2006) |
| ix. | Soil investigation Report | : Available (Dated 2013) |
| x. | Construction Materials | : Brick 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):

1. Only lightweight operations (max. 100kg/m² -1kPa) or access ways / escape routes are permitted in shaded zones at all levels. No storage allowed.
2. Verify insitu concrete stresses by cores (100mm diameter) at min. 4 no. non-critical columns on ground floor.
3. Detail Engineering Assessment to be commenced immediately, see attached scope.
4. Remove storage from cantilever slabs.
5. Provide temporary propping to lintel.
6. As part of Detail Engineering Assessment (refer to Item 1), Building Engineer to commence re-survey of as-built structure and update drawings including a verification of the column sizes, lift shaft, beam-column connection etc.

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. Extent of floor build-up and partition walls and their respective loads onto the slab to be surveyed / identified and compared against the capacity of floor slab which will be assessed as part of Detail Engineering Assessment (Refer to Item 1).
4. As part of Detail Engineering Assessment (refer to Item 1), Building Engineer to commence re-survey of as-built structure and check foundation for the unused lift shaft.
5. Create controlled loading plans for all floors designating where storage can / cannot be placed along cantilevering edges.
6. Provide calculations showing the structural adequacy of the cantilever slab, taking into account the loading plans, facade and all built structure, including additions beyond the original design, as part of Detail Engineering Assessment (refer to Item 1).
7. Provide calculations showing the structural adequacy of the roof, columns underneath to carry the extra loading as part of the Detail Engineering Assessment (refer to Item 1).
8. Restore lintel beam.
9. Provide calculations showing the structural adequacy of the building taking into account the eccentricity of the beam-column connection as part of the Detail Engineering Assessment (refer to Item 1).
10. Complete as-built survey and Detail Engineering Assessment.
11. Produce and actively manage a loading plan for all floors within the Factory giving consideration to floor capacity and column capacity. (Refer to Item 1).

Long Term (Within 6 Months):

1. Reduce dead load / live load or carry out strengthening of floor slab as required.
2. Take actions as required by the results of the Detail Engineering Assessment.
3. Reduce live load or carry out strengthening as required.
4. Remove additional RC structure if required.
5. Continue to implement load plan.

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. Remove all storage from exit stairs and egress paths.
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 manual on/off switches from emergency lighting / exit signage units to prevent them from being switched off.

Short Term (Within 3 Months):

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

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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 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.
4. Seal all penetrations and openings in exit stair enclosure walls to maintain the fire separation.
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): NA

Long Term (More than 6 months):

1. Alter the fire alarm system in accordance with NFPA 72 requirements.

The recommendations for Electrical Safety corrective actions are:

Immediate (Within 1 month):

1. Transformer frame earth must be checked and proper earth must be maintained.
2. Check for loose connections and rectify as required.
3. Clear electrical room(s) from any item necessary for regular operation.
4. The office should not be located in the MDB room.

Short Term (Within 3 Months):

1. Cables on floor may be laid within the cable trench.
2. Overhead cables must be firmly fastened at both ends.
3. The cables must be supported on cable trays and additionally protected. Flexible PVC conduit is not adequate for protection.
4. Transformer room may be rearranged or some of the panels may be relocated.
5. Transformer may be separated from panels by constructing barrier walls.
6. Transformer plinth must be raised above local flood level.
7. Buildings higher than 53 m must be installed with lightning protection system in accordance with the local standards.
8. Cables must be supported in cable trays/riser.
9. Panel base plates must be installed and all cables entering panel must be firmly fixed with cable glands.

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10. MBD should not be located within the maintenance room or it must be barricaded with fire rated wall.
11. The cable exiting and exiting must be supported and protected using cable trays.
12. The cable on the floor must be protected and supported by either cable trench or cable tray.
13. Ducts should be properly covered and cables must be arranged inside the ducts.

Mid Term (Within 6 months):

1. Cable tray may be provided to support the power cable instead of laying on the floor.

Long Term (More than 6 months): NA