

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

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| Name of the Factory                       | : WINTER DRESS LIMITED.                                  |
| Address of the Factory                    | : 1 No. Kalma, Dairy Farm, Savar, Dhaka, 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             | : 30 April, 2014   |
| Fire & Electrical assessment conducted by | : Accord (Full report available at bangladeshaccord.org) |
| Date of Fire & Electrical Inspection      | : 19 August, 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         | : R.C. Beam and column frame with a 2- way solid slab                      |
| iii.  | Floor System              | : Beam slab  |
| iv.   | Floor Area                | : The factory has total floor area of 1, 92,000Sqft                        |
| v.    | No. of Stories            | : 5 storied  |
| vi.   | Construction Year         | : 2013   |
| vii.  | Foundation Type           | : Unavailable  |
| viii. | Design Drawings           | : Available (Permit drawing stamped & signed by local building authority ) |
| ix.   | Soil investigation Report | : Unavailable  |
| x.    | Construction Materials    | : Unavailable  |
| xi.   | Generator                 | : On the 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. Reduce high local storage levels down to the allowable live load of 3.0kPa (60psf).

Mid Term (Within 6 Weeks):

1. Should construction be considered above the 6th Storey, the Factory Engineer is to review design, loads and column stresses.
2. Under no circumstances can construction be continued higher than the original 8 Storeys considered by the structural design.
3. Develop and implement a loading plan for all floor plates within the factory giving consideration to slab, beam and column capacities.

Long Term (Within 6 Months):

1. Conduct representative samples of concrete strength tests during future construction.
2. Actively monitor and enforce the loading plan.

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

Immediate (Within 1 month):

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

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1. Reduce occupant load to not more than available exit capacity (786) or provide additional exits.
2. Remove locking features from all egress gates. If locks are required for security reasons, utilize special door locking features complying with NFPA 101.
3. Keep egress paths and stairs clear of storage.
4. Remove all storage from exit stairs and egress paths.
5. 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.

### 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.
3. Seal all penetrations and openings in exit stair enclosure walls to maintain the fire separation.
4. Separate the transformer room by a minimum 2-hr fire-rated construction. Seal and protect all openings to maintain the required fire separations.
5. 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>

Separate areas of unenclosed combustible storage by a minimum clear distance of 3m.

6. Provide minimum aisle widths of 36-in.
7. Relocate day-care room to ground floor with maximum travel distance of 9m (30 ft).
8. Inspect, test and maintain the fire alarm system, and keep written records on-site, in accordance with NFPA 72.
9. 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.

Long Term (More than 6 months): NA

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

#### Immediate (Within 1 month):

1. Cable tray and ladder outside the building must be covered with metallic sheet to prevent any physical damage to cable insulation.

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

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2. Breather oil cup must be filled with transformer oil to the required level as instructed by the manufacturer.
3. Metallic cover (checkered plate) should be provided on cable trench to prevent the damage of cable insulation/falling of operator into the trench.
4. Placed electrical graded rubber mat/insulating material in front of all kind of electrical panels permanently.
5. Cables connecting to bus bar/MCCB inside panel must be connected firmly with cable lugs according to cable size. Cable terminating to the MCCB must be fixed with proper size nuts and bolt.
6. 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.
7. 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. Install cable gland in the base plate hole for cable entry and exit into the panel and seal all the unused openings to make the panel dust and vermin proof.
8. Seal the penetrations using appropriate fire rated material and the cables are not stressed while in touch of concrete. Provide cable ladder or tray to support and protect the cables.
9. Generator frame should be earthed with two separate and distinct connections to earth with better earth continuity.
10. Large exhaust fans must be connected through control device such that it will not restart automatically when power is restored.
11. Every item of installation shall be arranged so as to facilitate its operation, inspection, maintenance & access. Access of the DB must be kept obstacle free for easy operation & maintenance.
12. Cables connecting to MCCB inside panel must be connected firmly with cable lugs according to cable size. Cable terminating to the MCCB must be fixed with proper size nuts and bolt to avoid loose connection. Multiple terminations should be avoided.
13. Install the cables through rigid pipe (metallic) for the protection of the cable laid on floor. The pipe must be fixed/ clamped with saddle on floor at regular interval.
14. Inspection is needed to identify exact reason for creating high temperature. In case of overloading; select the power cables by calculating the connected load or in case of loose connection; tighten the loose connection.
15. Cables behind panel must be supported and arranged on cable trays or ladder in such a way that these (cables) can be easily identified and perform maintenance.
16. Cables below panel must be supported and arranged on cable trays or ladder till the entry point to the panel in such a way that these (cables) can be easily identified and perform maintenance. Make circular hole at the base plate/top plate of panels and provide cable gland 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.
17. Inspection is needed to identify exact reason for creating high temperature. In case of overloading; select the bus bar by calculating the connected load or in case of loose connection; tighten the loose connection.

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

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18. Every item of installation shall be arranged so as to facilitate its operation, inspection, maintenance & access. Access of the DB must be kept obstacle free for easy operation & maintenance. And the minimum distance between the two electrical panels should of one meter (opening of panel door should not obstruct in working at other panels).
19. Use Steel pipe /covered cable tray for carrying cables laid on the floor drawn from the panel to motor terminal box. Use industrial graded flexible pipe where the steel pipe unable to bend.
20. Provide acid resistant stand for the batteries and keep sufficient distance around individual battery for maintenance and inspection purpose. Protection made of wooden board must be removed and should be made of noncombustible materials.
21. Make circular hole at the base plate/top plate of panels and provide cable gland 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.
22. Arrange periodic inspection & thermal scan to identify the overloading, loose connection, unbalanced load which may cause the excessive heat-rise and take action accordingly. And also please check the size of cable connecting.

### Short Term (Within 3 Months):

1. The factory must have As-built electrical SLD with electrical wiring layout designs and drawings. Any changes in load, protection system, conductors, Generation and supply system must be reflected in the As-built SLD and drawings.
2. Thermo graphic scanning of the entire electrical system must be performed on tri-annual basis and recorded.
3. Insulation resistant test of all the cables must be performed once every 5 year cycle and recorded.
4. Electrical safety training and awareness program for the electrical personal and workers must be initiated and recorded.
5. Make circular hole at the base plate/top plate of panels and provide cable gland 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. 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.

Mid Term (Within 6 months):      NA

Long Term (More than 6 months): NA