

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: DEWAN FASHION WEARS LTD.
Address of the Factory	: Gorat, Navana Village, Ashulia, Savar, Dhaka, Bangladesh
Dhaka Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Structural Inspection	: 22 June, 2014
Fire & Electrical assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Fire & Electrical Inspection	: 14 August, 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	: Reinforced Concrete Beam column moment frame structure
iii. Floor System	: Beam slab
iv. Floor Area	: The each floor area of buildings is 10,267.18sft.
v. No. of Stories	: Single storied
vi. Construction Year	: 2011
vii. Foundation Type	: Unavailable
viii. Design Drawings	: Available
ix. Soil investigation Report	: Available (Dated August 2010)
x. Construction Materials	: Unavailable
xi. Generator	: Separate building

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): NA

Long Term (Within 6 Months):

1. Building engineer to record all cracking throughout building and monitor on an on-going basis.
2. If further cracking occurs Building Engineer to investigate and remediate as appropriate.
3. Building envelope is to be made watertight.
4. Falls to be provided and roof slab to be protected from direct contact with water to protect the reinforcement from corrosion.
5. Building engineer to prepare a set of "as built" drawings for all structures linked to the factory's activities.
6. Permit documentation and drawings also to be prepared.
7. Building engineer to check the capacity of non-engineered lightweight roof structures under horizontal and vertical loading and make any necessary alterations required.

The recommendations for Fire Safety corrective actions are:

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Immediate (Within 1 month):

1. Remove locking features from all egress doors. 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. Provided emergency evacuation plan in accordance with the NFPA standard.
4. Conduct fire drill in accordance with the ACCORD standard.
5. Replace all 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.

Short Term (Within 3 Months):

1. Separate the boiler room by a minimum 2-hr fire-rated construction.
2. Provide dedicated storage rooms separated by minimum 1-hr fire-rated construction. Where separate storage rooms are not feasible, provide defined storage areas and limit the storage arrangement as follows:
 - Maximum height of 2.4m and maximum area of 23m²
 - If sprinkler protected: maximum height of 3.66m and maximum area of 93m²Separate areas of unenclosed combustible storage by a minimum clear distance of 3m.
3. Remove and replace all combustible construction materials inside the building.
4. Provide handrails on at least one side of exit stair.
5. Provide additional means of egress.
6. Inspect, test and maintain the fire alarm system, and keep written records on-site, in accordance with NFPA 72.
7. 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. Remove single-station smoke alarms. Provide automatic smoke detection throughout the building, tied into the fire alarm system, in accordance with NFPA 72.

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. 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.
2. Placed electrical graded rubber mat/insulating material in front of all kind of electrical panels permanently.

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3. Remove lint and dust from the panel and make a periodical cleaning program.
4. Select the protective devices according to the connected cable size to be protected i.e. the rated current of protective devices (ACB, MCCB, MCB) does not exceed the current carrying capacities of the conductors.
5. Substation room must be kept dry and free from oil and water.
6. Relocate the power socket from the wooden boards to a non-combustible material preferably on wall. Avoid installing electrical boards, switch, sockets etc. on combustible materials.
7. Exhaust fan must be connected through control device.
8. Need to install on noncombustible platform.
9. Remove combustible on light set.
10. Electrical devices must be installed on metallic plate with proper enclose instead of wooden board.
11. Combustible materials and wastage stored in generator room must be removed.
12. Generator room must be clean and free from dirt, debris, improperly stored and water.

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. Earth resistance test should be done in five years cycle and recorded.
6. Panels' enclosure including its door should be earthed properly with better earth continuity.
7. Panel top cover plate must be installed to prevent the ingress of lint/dust into the panel. Make circular hole at the top cover plate of panel and provide cable glands according to the respective cable size for cable entry and exit.
8. Provide permanent tags (name plate) on the panel and provide caution & danger sign showing voltage, current rating and capacity presence inside it.
9. Replace with good one or repair them.
10. Terminate each cable individually on the bus bar with proper size of cable lugs. Multiple cables shall not be terminated on same point of bus bar.
11. Multiple cables connecting at a MCCB terminal must be avoided. Bigger size single cable may be used to avoid loose connection.

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12. Cables must be terminated to MCCB providing lugs of required size according to the size of the respective cable.
13. Use single (individual) cables from the bus bar to MCB input or use plug-in bus bar for MCB input to avoid loose connection which may induce unexpected heat.
14. Make circular hole at the top and base plate of panels. Provide cable gland according to the respective cable size for cable entry and exit.
15. Arrange the main incoming cable inside panel by avoiding acute bend and install slotted PVC channel to route and arrange cables inside panel.
16. Earth bus bar should be installed inside all panels with earthing connection as per BNBC.
17. Disconnect the power source of the cable laid into channel and clean dust and debris of all interior components. Establish a periodic cleaning program and maintain records of the activities. Provide cover made of noncombustible material on the channel for preventing ingress of dust and debris in future.
18. The substation should be installed in such a location that where there is no risk of ingress of water. Keep the substation room dry and clean.
19. Provide mechanical guards for electrical equipment.
20. IPS unit should be place on noncombustible frame (steel frame).
21. Need to use ceiling rose for connection.
22. Use industrial graded (heat resistant) pipe for control and power wiring of boiler.
23. Separate the boiler room from working area by constructing fire rated construction.
24. Generator battery must be placed on the battery stand made of noncombustible material (may be steel fabricated).
25. Two separate and distinct earth connections must be provided for generator.
26. Construct a cable trench to terminate the generator output cables and 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.
27. Install additional lights inside generator room and ensure minimum illumination around the room for performing easy and smooth maintenance and inspection.
28. Provide covered cable ladder or perforated cable tray to support cables terminated to/from Changeover switch and distribution panel.
29. Steel or PVC conduit or cable tray must be installed for the cable support to prevent damages and stress to the cables.

Mid Term (Within 6 months): NA

Long Term (More than 6 months):

1. Lightning arrestor must be installed (according to BNBC Part 8, section 2.9.) with proper size air termination network, down conductors and earth termination.