

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

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| Name of the Factory | : SHINEST APPARELS LIMITED |
| Address of the Factory | : Azim Tower, Plot No. 217/1, Beribadh, Mohammadpur, 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 | : 24 May, 2014 |
| Fire & Electrical assessment conducted by | : Accord (Full report available at bangladeshaccord.org) |
| Date of Fire & Electrical Inspection | : 21 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 | : RC flat slab construction |
| iii. | Floor System | : Beam slab |
| iv. | Floor Area | : The factory has floor area) of 9700sqft per floor |
| v. | No. of Stories | : 10 storied |
| vi. | Construction Year | : 2006- 2013 |
| vii. | Foundation Type | : Unavailable |
| viii. | Design Drawings | : Available (Signed by RAJUK in 2002) |
| ix. | Soil investigation Report | : Available (2001) |
| x. | Construction Materials | : Stone aggregated |
| xi. | Generator | : North corner of 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. Release all water from RC water tank on the roof and restrict loads to 1.0kN/m² on the roof, to 1.5kN/m² in 8th to 1st floor and to 2.0kN/m² in ground floor, pending the outcome of the Detail Engineering Assessment.
2. Building Engineer to review design, loads and columns stresses in all columns.
3. Verify insitu concrete stresses either by 100mm diameter cores or existing cylinder strength data for a minimum of 4 columns.
4. A Detail Engineering Assessment of the building to be carried out immediately, see attached scope.
5. As part of the Detail Engineering Assessment (see Item 1), verify in-situ concrete strength of slabs either by 100mm diameter cores (remote from columns) or existing cylinder strength data.
6. Verify existing top reinforcement of slabs.
7. As part of Detail Engineering Assessment (see Item 1), Building engineer to verify the column and flat slab reinforcement as constructed.
8. Building Engineer to survey building.

Mid Term (Within 6 Weeks):

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1. Produce and actively manage a loading plan for all floor plates within the building, giving consideration to floor capacity and column capacity.
2. Detail Engineering Assessment to be completed.
3. Review of design, loads and column stresses in flat slabs to be completed.
4. Output from review to be incorporated in load plan.
5. Drawings and documentation to be updated as required to reflect as-constructed details.
6. Limit storage load as required in accordance with loading plan.

Long Term (Within 6 Months):

1. 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 and gates. If locks are required for security reasons, utilize special door locking features complying with NFPA 101.
2. Remove manual on/off switches from emergency lighting units to prevent them from being switched off.

Short Term (Within 3 Months):

1. Separate the flammable liquid storage room by a minimum 2- hr fire-rated construction.
2. Separate the boiler, generator and transformer room by a minimum 2-hr fire-rated construction. Seal and/or protected all openings to maintain the required fire separations.
3. 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.
4. Provide 2-hr continuous stairwell enclosure to exterior ground level.
5. Seal all penetrations and openings in exit stair enclosure walls to maintain the fire separation.
6. Provide minimum 1.5-hr fire rated doors and 2-hr fire rated constructions to separate the exit stairs from storage floor on the basement. Ensure that the fire doors are self-closing and positive latching. If fire doors are required to be held open for functional reasons, provide automatic closing devices tied to the fire alarm system.
7. Provide a minimum 2-hr fire rated constructions to separate the factories.
8. Provide dedicated storage rooms separated by minimum 1-hr fire-rated construction.
9. Modify the egress door to swing in the direction of egress travel.
10. Inspect, test and maintain the fire alarm system, and keep written records on-site, in accordance with NFPA 72.
11. Inspect, test and maintain the emergency lighting system in accordance with The ACCORD standard. Keep written records on-site.

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Mid Term (within 6 Months):

1. 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.
2. Provide additional notification appliances such that the fire alarm system is audible throughout the building 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.
2. Provide automatic sprinkler protection throughout the building in accordance with NFPA 13.

The recommendations for Electrical Safety corrective actions are:

Immediate (Within 1 month):

1. Breather oil cup must be filled with transformer oil to required level as instructed by the manufacturer.
2. Replace silica gel and must include in routine maintenance to check and maintain.
3. HT cable dropping from HT pole must be protected in steel pipe of required size at least 2m from the ground level to protect from physical damages from moving objects.
4. 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.
5. Disconnect the power source of panel 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.
6. All panels used for distribution of circuits must be provided with earth bar installed inside panel for downstream earth branches.
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.
8. All panels must be grounded (at least at one point) and earth conductor must be sized according to the BNBC requirement (min size 14SWG, 16mm² for main conductor sizes 16-35mm² Main conductor size above 35mm², the earth conductor must be half the main conductor). All downstream earth connection should be terminated in the earth bus bar.
9. Disconnect the power source of panel 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.
10. Generator Battery must be placed on the battery stand made of noncombustible material (steel fabricated, acid proof).
11. Cables must be supported on covered cable trays installed on the floor.

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12. Install a vertical cable tray (instead of using flexible pipes) for the cables kept hanging, to provide mechanical support and protection.
13. Floors in generator room must be kept free from water and oil spillage.
14. Electrical room must be free from materials (that are not required for regular operations) stored inside the room.
15. Provide additional lighting to maintain required illumination level (150 lux) inside transformer room.
16. Transformer plinth must be high enough to reduce the risk of submersion by flood water.
17. Establish a routine cleaning program to keep neat and clean the transformer room. Shut the power of the transformer and clean the exterior of the transformer at scheduled period.

Short Term (Within 3 Months):

1. HT cable may be carried through cable trench instead of buried in concrete slab.
2. Cables passing through permanent walls must be protected in steel pipes and remaining holes around the pipe must be sealed.
3. Existing panel(s) installed near wall may be rearranged to provide accessibility from either/both sides for maintenance.
4. Wire terminating to devices inside panel must be connected firmly and wires approaching devices must be securely fastened inside PVC wiring duct.
5. Additional panels may be installed by redesigning the electrical distribution systems to have sufficient space inside the panel for maintenance work.
6. Wiring looped at MCB terminals may be replaced by installing additional Bus bars to terminate cables of noted MCBs.
7. Install separators between different phases of MCCB. Standard separators provided by the MCCB manufacturer must be used.
8. Every wire terminating must be installed using individual lug/terminal according to respective cable size to avoid loose connection.
9. Cable must be reconnected to the panel through gland fixation in entry plates (bottom or top).
10. Cable terminating at Generator output terminal box must be supported on covered cable tray installed on at safe location. Use industrial graded flexible pipes instead of using normal flexible pipes (if required).
11. PVC conduits may be supported on trays. Bends, corners and tees must be used to navigate corners. Cable trays with proper accessories may be used to support cables.
12. Wire joints in panels must be tightly connected using terminals or sockets crimped and insulated. PIB tape and heat-shrink tubes may be used for insulation.
13. Combustible materials covering power cables must be removed.
14. 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

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activities. Provide cover made of noncombustible material on the channel for preventing ingress of dust and debris in future. Also arrange the cable inside the duct before covering.

15. Cables terminating at distribution boards must be supported in on cable tray supported on wall and protected throughout its length till the panel base or top plate.
16. Cables supported in cable trays must be firmly tied to the tray with cable-tie at regular intervals. The tray shall be installed for the throughout its length. Flexible conduit must not be used for long point wiring (except for special wirings).
17. Existing wiring in flexible PVC conduits fixed to ceiling must be additionally supported in tray or ducts. Flexible conduit must not be used for long point wiring (except for special wirings).
18. Cables supported in tray must be continuous throughout cable length. Flexible conduit must not be used for long point wiring (except for special wirings).
19. Conduit wiring installed overhead must be supported in cable trays or ducts. Flexible conduit must not be used for long point wiring (except for special wirings).
20. Cables passing through permanent walls must be protected with rigid conduits/pipes and supported near entry point. The remaining opening must also be sealed with fire rated material.

Mid Term (Within 6 months):

1. Maintain safe working space (1 meter preferably) surrounding the existing power transformer.
2. Cable tray with cover must be installed at safe distance from the transformer (preferably on side wall).
3. Cables laid on concrete floor must be protected from physical damaging, by providing covered cable trays installed overhead at safe distance.
4. Expand the existing generator room to provide safe working space as per BNBC table 8.2.9 or keep sufficient space (1 meter preferably) around the generator for ease of maintenance.

Long Term (More than 6 months): NA