

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: AROUND STAR SWEATERS LIMITED
Address of the Factory	: Hazi A Azij Super Market (Pvt.) Ltd. Golakandali, P.O. Bhulta, Rupgonj, Narayangonj
Dhaka Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Structural Inspection	: 11 August, 2014
Fire & Electrical assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Fire & Electrical Inspection	: 12 April, 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 and column frame with a 2-way beam slab
iii.	Floor System	: Beam slab
iv.	Floor Area	: Unavailable
v.	No. of Stories	: 5 storied
vi.	Construction Year	: 2004
vii.	Foundation Type	: Unavailable
viii.	Design Drawings	: Available
ix.	Soil investigation Report	: Unavailable
x.	Construction Materials	: Unavailable
xi.	Generator	: Ground floor adjacent to the transformer room

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. Ensure that the slabs are not loaded above 2.0kPa (40psf).
2. Reduce loading in yarn store to 2.0kPa (40psf).
3. Do not construct any further above the 5th floor.
4. Decide if the shed is temporary or permanent.

Mid Term (Within 6 Weeks):

1. Carry out an Engineering Assessment on the columns, taking 100mm core samples where necessary to establish the strength.
2. Carry out an Engineering Assessment to establish the safe working load for each level.
3. Produce loading plans for each level.
4. If shed is permanent apply for permission for the additional storey and carry out Engineering Assessment on building to verify it can support additional loading.
5. If shed is temporary, then formulate a demolition plan for the structure to avoid collapse.
6. Building Engineer to survey the beams, removing plaster, to establish the extent of the cracks in the beams.

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7. Carry out an Engineering Assessment concentrating on the anchor points to establish if the slab and connections are sufficient for the applied loadings.
8. Carry out an Engineering Assessment on the building to verify that it is stable under lateral loading.
9. An Engineering Assessment is to be carried out to determine cause of vibration. We also recommend to use rubber mats under weaving machines.
10. Carry out an Engineering Assessment to determine if the slab is adequate to support the higher dead load of the plinth.
11. Carry out Engineering Assessment on steel roof to determine if any strengthening works are required.

Long Term (Within 6 Months):

1. Carry out any recommendations highlighted in the Engineering Assessment.
2. Ensure loading plans are displayed and actively managed at each level.
3. Demolish shed.
4. If shed is to be demolished the inadequate steel roof highlighted in item 9 will be fixed by virtue of removing the shed and roof.
5. Keep shed and act on item 9 further in the report.
6. Relocate the water tanks closer to columns if the cracks are in the concrete.
7. Carry out actions from the Engineering Assessment.
8. Update structural drawings to show mast.
9. Carry out actions highlighted in the Engineering Assessment, removing or lowering the heights of the plinths if required.
10. Building Engineer to survey the as built condition and update the structural drawings, paying close attention to the column size. Remove plaster as required to measure columns.
11. Cover the concrete roofs with a suitable waterproofing membrane, e.g. waterproof screed.

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. Configure the fire alarm system to initiate automatic occupant notification on all floor levels to facilitate whole building evacuation upon any manual fire alarm station activation.
5. Remove the exit sign and replace with one-sided exit signage facing the correct direction.
6. Provide exit signs above all exits to the exterior and all doors to the exit stairs.

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7. Regularly test the emergency lighting system on each floor and replace/repair lights as needed.

Short Term (Within 3 Months):

1. Separate the hazardous materials / flammable liquid storage area by a minimum 2- hr fire-rated construction. Seal and/or protected all openings to maintain the required fire separations.
2. Separate the boiler, generator and transformer rooms by a minimum 2-hr fire-rated construction. Seal and/or protect all openings to maintain the required fire separations.
3. 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 23m²
 - If sprinkler protected: maximum height of 3.66m and maximum area of 93m².

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

4. 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.
5. Enclose the exit stairs with a minimum 2-hr fire-rated construction.
6. Seal all penetrations and openings in exit stair enclosure walls to maintain the fire separation.
7. Reduce occupant load to not more than available exit capacity.
8. Inspect, test and maintain the fire alarm system, and keep written records on-site, in accordance with NFPA 72.
9. Test the emergency lighting system on each floor and provide additional emergency fixtures to provide adequate illumination along the means of egress. Provide a minimum illumination of 10 lux at the floor level within exit stairs and exit discharge paths and minimum 2.5 lux along exit access aisles.

Mid Term (within 6 Months):

1. Provide additional notification appliances such that the fire alarm system is audible throughout the building in accordance with NFPA 72.
2. Replace the single-station smoke alarms with automatic smoke detectors tied into the fire alarm system. Configure the fire alarm system to initiate occupant notification upon activation of any two smoke detectors in addition to the manual fire alarm stations.

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):

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1. Service line should be supported with rigid tray/clamp at proper intervals or other suitable means (may be a catenary wire).
2. The generator output cable must be supported on a riser up to the terminal box of the generator to prevent any stress on termination point.
3. Multiple cables connecting at a MCCB terminal must be removed. Individual circuit breaker must be used for each load according to the respective cable-size.
4. Check and redesign the requirements to control the circuits. If three phase control is not required, the control devices suitable for the purpose must be selected and replaced (may be single phase circuit breaker used).
5. Terminate each cable individually on the bus bar (providing individual lug according to the cable size). Multiple cables shall not be terminated on same point of bus bar.
6. Cable tray or riser must be provided up to the panel base plate to support the cable at the bottom of the panel.
7. Cables in cable trench should be protected and covered with non-combustible material (preferably checkered plate).
8. Wooden planks or boards used for mounting electrical panels or apparatus must be removed and MCCB must be used to protect the circuit instead of using cut out.
9. Replace rewire fuses (cut out fuse) mounted on the wiring ducts with MCBs installed inside the protective enclosure.
10. MCCB should be installed inside the panel instead of using re wireable fuse.
11. Wire should be spliced with proper connector PVC connector and wrapped by electrical standard tape (preferably PIB tape).

Short Term (Within 3 Months):

1. The PVC conduit must be supported rigidly, clamped using saddle at regular interval. The pipe must be continuous throughout the length of the cable.
2. Cable should be supported and arranged on cable tray/clamp at proper intervals.
3. The cable/flexible pipes (kept the haphazardly near panel) must be the supported on tray or riser. The cable must be arranged and latched properly on the cable tray. Flexible conduit must not be used for long point wiring (except for special wirings).
4. Cable must be supported with rigid frame/tray before terminating at appliances and distribution panel with clamps at proper intervals.
5. Wooden boards or blocks used for supporting devices must be removed and enclosed with an enclosure made of metal sheet of minimum 20 SWG thickness.
6. Make circular hole at the 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.
7. 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.

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8. Cables laid on outside-wall of the building must be supported in cable trays/ladder with metallic protective covers and protected against harsh weather and possible physical damages.
9. Cables passing underground or through permanent walls must be protected in steel/PVC pipes and remaining holes around the pipe must be sealed with fire rated materials.
10. 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.

Mid Term (Within 6 months): NA

Long Term (More than 6 months): NA