

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: 4A YARN DYEING LTD.
Address of the Factory	: Kaichabari, Savar, Dhaka-1340, Bangladesh
Dhaka Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Structural Inspection	: 25 March, 2014
Fire & Electrical assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Fire & Electrical Inspection	: 24 March, 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. flat slabs and perimeter beams with square columns
iii.	Floor System	: Beam slab
iv.	Floor Area	: Unavailable
v.	No. of Stories	: 5 storied
vi.	Construction Year	: 2005
vii.	Foundation Type	: Pad foundation
viii.	Design Drawings	: Available (Permitted by LGED in 2005)
ix.	Soil investigation Report	: Available (Dated 2013)
x.	Construction Materials	: Brick aggregated
xi.	Generator	: Ground floor in a 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):

1. Factory Engineer to review design, loads and columns stresses including any additional loading as documented in the observations chapter.
2. Verify insitu concrete stresses either by 100mm diameter cores or existing cylinder strength data for cores from minimum 4 columns.
3. The Building Engineer should check the load plans and confirm that the main building structure is capable of safely supporting the additional loading on the structure from the roof extension.
4. Flat slab capacity to be assessed for additional loading due to brick partitions, and extent of cracking within slab depth to be investigated.
5. Extent of build-up loading in toilet and wash areas to be surveyed and weight of water tanks on roof to be assessed. The capacity of floor & roof slabs to be assessed to confirm that the structure is designed to carry these loads.

Long Term (Within 6 Months):

1. Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

2. Building Engineer to provide detailed calculations for the temporary rooftop structures and the associated light steel roofs. These should confirm their ability to withstand all wind loading pressure, suctions and uplift forces.
3. Building engineer to check, collect information and produce accurate and complete as-built documentation.
4. Remove partitions if required by design check
5. Repair slab if required following investigation of crack
6. Design check of building required prior to installing any new brick partition walls.
7. Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity. Loading plans to be put on each factory floor.

The recommendations for Fire Safety corrective actions are:

Immediate (Within 1 month):

1. Reduce the occupant load on the 3rd floor immediately. In the future provide adequate egress width by either: - Addition of an exit stair or - Upgrade of the existing North exit stair to provide sufficient combined width for the occupants of 3rd floor.
2. Remove locking features from all egress doors / gates. If locks are required for security reasons, utilize special door locking features complying with NFPA 101.
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 all storage from exit stairs and egress paths.

Short Term (Within 3 Months):

1. Separate the boiler & generator rooms by a minimum 2-hr fire-rated construction. Seal and/or protected all openings to maintain the required fire separations.
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 93m²

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

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. Inspect, test and maintain the fire alarm system, and keep written records on-site, in accordance with NFPA 72.
5. Regularly inspect all exit signage and replace/install lights as needed to illuminate signs.

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Mid Term (within 6 Months):

1. 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):

1. Use rigid PVC pipe (use steel pipe on floor) or cable to support and protect the cables entering and leaving the panel. Support the conduits at regular intervals.
2. Provide earth connection to metallic panel enclosure including its door by using green cables preferably earthing braid so that the metallic door remains at zero potential all the time.
3. Use steel pipe to ensure the mechanical protection of the cables laid on floor otherwise cable insulation may damage due to falling object or stepping of occupants onto it.
4. Use proper sized cable lugs to terminate the cables to bus bar. Punch the lugs by proper hand puncher or hydraulic puncher. Use chromium plated nut, bolt and washer to fix the lugs (cables) to bus bar tightly.
5. Install separators/barriers between different phases of MCCB to avert flashover. Standard separators provided by the MCCB manufacturer must be used.
6. Install the base plate of the panel as well as seal all the unused openings of the panel to make the distribution panel dust and vermin proof.

Short Term (Within 3 Months):

1. Install cable trays supported from the ceiling to provide power from distribution panel to load; or construct cable trench or steel pipe to laid cable in trench or pass through pipe on floor respectively.
2. Generator room floor must be kept free from oil spillage to avoid fire hazard. Establish a routine cleaning program to keep the generator room neat and clean.
3. Provide metallic cover or RC slab on cable to avoid physical damage to the cables from falling objects and to keep the trench free from lint, dust and debris.
4. Extend the cable tray up to the distribution panel and encased the cables inside it. Install base plate of the panel and make hole into it then fit cable glands (required sized) for cable entry and exit to the panel and seal all the unused openings by suitable means to make the panel dust and vermin proof.
5. Arrange the main incoming cable inside panel by avoiding acute bend and install slotted PVC channel to route and arrange cables inside panel.
6. Install base plate of the panel and make hole into it then fit cable gland (required sized) for cable entry and exit to the panel and seal all the unused openings by suitable means to make the panel dust and vermin proof.

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Mid Term (Within 6 months): NA

Long Term (More than 6 months): NA