

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: BIG BOSS CORPORATION LTD.
Address of the Factory	: LutfunTower, Middle Badda, Gulshan,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	: 6 December, 2013
Fire & Electrical assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Fire & Electrical Inspection	: 9 November, 2013

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 spanning solid slab
iii.	Floor System	: Beam slab
iv.	Floor Area	: The estimated floor area for each floor is approximately 11,875 square feet (1,103 square meters)
v.	No. of Stories	: 12 storied
vi.	Construction Year	: 1996
vii.	Foundation Type	: Raft foundation
viii.	Design Drawings	: Available (Stamped and signed in April 1995 by RAJUK)
ix.	Soil investigation Report	: Available (Dated in April 1995)
x.	Construction Materials	: Unavailable
xi.	Generator	: Basement

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 in area identified above.
2. Verify in situ concrete stresses either by cores or existing cylinder strength data for from 4 cores.
3. Building's Engineer to ensure the structure is not loaded beyond capacity. We recommend limit stack height to 1.80m (1.50x1.50m area) and keep 0.60-0.70 m cleared strip around. Limit height to 1.80 m for loose clothing.
4. Building Engineer to create controlled loading plans for all floors.

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.
2. Building Engineer to check that slab has sufficient capacity to support fully filled water tanks. We recommend relocate tanks on columns location.

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3. Manage drainage from above levels and water tanks to downpipes to avoid structural corrosion due to continuous moisture.
4. Building engineer to check, collect information and produce accurate and complete as-built documentation soonest.
5. Engineer to review penetrations made to ensure structural beams / slabs have not been affected.

The recommendations for Fire Safety corrective actions are:

Immediate (Within 1 month):

1. Remove all collapsible gates and door locking features at exit stairs and along the means of egress. If locks are required for security reasons, utilize special door locking features complying with NFPA 101.
2. Remove all storage from exit stair enclosures.
3. 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.

Short Term (Within 3 Months):

1. Provide minimum 1.5-hr fire rated doors and seal all unprotected openings to separate the exit stairs on all floor levels, including floors used by other tenants and the market areas. 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. Seal all penetrations and openings in exit stair enclosure walls to maintain the fire separation.
3. Provide dedicated storage rooms separated by minimum 1½hr fire-rated construction on all production floors where transient storage is required for operations. Where separate storage rooms are not feasible, provide defined storage areas and limit the storage arrangement as follows:

-Maximum height of 2.4 m 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. Separate boiler and generator rooms by minimum 2-hr fire rated construction. Seal and/or protected all openings to maintain the required fire separations.
5. The day-care room is reportedly not be used. If it is needed, relocate the day-care room such that it has direct access into an exit stair.
6. Modify the storage arrangement and provide a second means of egress from the storage area, as needed, to limit the maximum dead-end distance to 50 ft and maximum common path of travel of 75 ft. Provide minimum aisle widths of 28-in.
7. Provide minimum aisle widths of 36-in. for production areas.
8. Inspect, test and maintain the fire alarm system, and keep written records on-site, in accordance with NFPA 72.

Mid Term (within 6 Months):

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1. Modify the exit stair to discharge directly outside at ground level.

Note – there is currently a market located behind the building, which may preclude the ability to modify the stair discharge arrangement. If direct exit discharge is not feasible, fully addressing (stair enclosures) and (sprinkler protection throughout including market areas) would significantly mitigate the condition.

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.
2. Provide automatic sprinkler protection throughout the building, including the market areas on the ground and first floors, in accordance with NFPA 13.

The recommendations for Electrical Safety corrective actions are:

Immediate (Within 1 month):

1. The capacity of the MCCB (100A) installed is too large for the incoming line size used. Selection of cable size and MCCB must be designed as per the requirement.
2. Not more than 2 cables must be terminated at one point. A large size cable can be used to connect from the output of the MCCB to Bus bar from where individual MCBs may be supplied. It can also be done by using MCB terminal shorting loop of proper size.
3. Phase separation between MCCB terminals must be installed to avoid short accidental short circuit.
4. Panels must be connected with separate earth and every metal swing doors must be connected with earth bond.
5. The electrical room in third floor must be moved to another place and all furniture including grinding machines must be removed.
6. Machine room on seventh floor LT panel room must be moved to other places and the space surrounding the panels must remain clear.
7. Storage surrounding the other panel on third floor must be cleared and kept free all times.
8. The wooden ducts used must have removable covers to prevent from dust and damages. Only wires and cables of smaller cross-sectional area may be used as it does not provide bends & elbows.
9. Mid span joints to provide earth for devices/panels must be avoided.
10. Multiple earth conductor termination through a cable lug/ferrule must be avoided.
11. Earth conductor must be continuously looped from main earth (electrode) to the end connection.

Short Term (Within 3 Months):

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1. Cable must be laid and supported on cable trays and raisers and must be fixed firmly with cable glands through gland plate.
2. Cables terminating to & from panel must be dressed to avoid short circuit in side panel and to ease maintenance.
3. Cables terminated to panel must be firmly fixed with cable glands through gland plate.
4. It is dangerous to keep the secondary of CT open. It must either be removed or else shorted to avoid high terminal voltage.
5. For proper electrical connection / bonding, the paints must be removed at the terminal points. Paints within joints may increase contact resistance and may cause heating. The paint is combustible and is not recommended for high current. It may be replaced by heat shrink insulating rubber boots.
6. Cables and wires used in boiler room must be covered/protected from ambient heat from the boiler.
7. Cables terminating at motors, panels and devices must be terminated with proper cable gland. Cables/conduits must be supported on cable trays or raisers.
8. Aluminum channels used for cable trays or the wiring ducts must be used with proper corners, bends and covers.
9. Cables passing through walls, ceiling or floors must be protected from mechanical damages by running through rigid ducts (steel conduits, steel ducts).

Mid Term (Within 6 months):

1. Cables must be run in rigid conduits of proper sizes and must be continuous throughout length. Bends, corners and tees must be used to navigate corners. Cable trays with proper accessories may be used to support cables.

Long Term (More than 6 months): NA