

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: CASSIOPEA GARMENTS LTD
Address of the Factory	: 90, LK Plaza, Dakkin khan Bazar, Dhaka-1230, Bangladesh
Dhaka Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Structural Inspection	: 29 April, 2014
Fire & Electrical assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Fire & Electrical Inspection	: 30 August, 2014 & 31 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	: R.C Beam and column frame with a 2-way solid slab
iii.	Floor System	: Beam slab
iv.	Floor Area	: The total floor area of the factory is 150,262sqft
v.	No. of Stories	: 6 storied
vi.	Construction Year	: 2009
vii.	Foundation Type	: Raft foundation
viii.	Design Drawings	: Available (Do not match the actual site condition)
ix.	Soil investigation Report	: Available
x.	Construction Materials	: Unavailable
xi.	Generator	: 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. Keep storage below 4.8kPa (100psf).
2. Carry out a Detailed Engineering Assessment to verify allowable loading on each floor.
3. Ensure construction does not resume.

Mid Term (Within 6 Weeks):

1. Produce loading plans for each level. Ensure these are displayed and managed at each level.
2. Re-apply for permit based on 8 storeys.
3. Carry out a new Geotechnical Assessment on the foundations at 8'10" depth to verify if they are suitable for the present construction.
4. Re survey the building and produce as-built Structural and Architectural drawings.
5. Re-apply for a Building Permit based on the current construction.
6. Carry out an Engineering Assessment on frame.
7. Extend electrical ducts below soffit of slab.
8. Re-cast underside of slab.

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Long Term (Within 6 Months):

1. Maintain and enforce the loading plans.
2. Await results from a new Geotechnical Assessment to determine how many storeys can be built.
3. If further storeys are to be built these are to be designed by a Structural Engineer, following a Detailed Engineering Assessment of the building.
4. Re apply to RAJUK for any additional storeys.
5. Carry out the recommendations from the Geotechnical Assessment.
6. Carry out a new Geotechnical Assessment on the foundations at 8'10" depth to verify they are suitable for proposed ten storey construction.
7. Conduct any necessary repairs highlighted in the Engineering Assessment.

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. Regularly inspect all exit signage and replace/install lights as needed to illuminate signs.
5. Remove manual on/off switches from emergency lighting units to prevent them from being switched off.

Short Term (Within 3 Months):

1. 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.
2. 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.

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. Seal all penetrations and openings in exit stair enclosure walls to maintain the fire separation.
5. Inspect, test and maintain the fire alarm system, and keep written records on-site, in accordance with NFPA 72.

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6. 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. Check the earthing connection (for loose connections) and rectify as required.
2. Disconnect the panel from the electrical service (switch off the power) and tighten up the terminals. If the heat rise still persists, check the connected load & diversity factor and replace the cable if necessary.
3. Breather oil cup must be filled with transformer oil to required level as instructed by the manufacturer.

Short Term (Within 3 Months):

1. Thermo graphic scanning of the entire electrical system must be performed on tri-annual basis and recorded.
2. Factory must have insulation test report.
3. Install separators between different phases of MCCB. Standard separators provided by the MCCB manufacturer must be used.
4. Construct cable trench to protect the cables to ensure the mechanical protection of the cable laid on floor otherwise cable insulation may damage due to falling object or stepping of occupants onto it.
5. Install cable tray or conduit to pass the HT cable through wall to protect the cable insulation from physical damage and seal the openings of the wall after the passage of cable with fire rated materials. Construct a cable trench in floor or install cable tray inside the room to route and arrange the HT cable avoiding acute bend of cable.
6. Construct a fire rated separate dedicated room for the transformers providing necessary clearance around it. Assign a qualified engineer to design a required transformer room according to BNBC 2006, Section-2.6.3.
7. Large exhaust fans must be connected through control device such that it will not restart automatically when power is restored.
8. Main cables between electrical rooms to factory floors must be supported by using cable ladder tray. And cable tray rigidly fixed on wall. The remaining hole after passage of the cables must be sealed with fire rated materials.

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9. Remove all the multiple connections made at a single point of bus bar and connect individual branch cables to individual points on bus bar using individual lug according to the respective cable size. Terminate each cable providing individual lug according to the cable size. Multiple cables shall not be terminated on a single point of the bus bar.
10. Cable must be arranged and latched properly on the cable tray. Provide cover made of noncombustible material preferably metallic sheet to protect the cables' insulation from physical damage as well as prevent the ingress of debris, dust and lint.
11. Provide cover made of noncombustible material preferably metallic sheet along with cable gland same as the cable size at the cable entry and exit so that it prevents the ingress of lint and dust through entry and exit hole of the panel board.

Mid Term (Within 6 months): NA

Long Term (More than 6 months): NA