

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: AZMERI COMPOSITE KNIT LTD.
Address of the Factory	: 199,Fayedabad, Uttar para, Uttara, 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	: 20 May, 2014
Fire & Electrical assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Fire & Electrical Inspection	: 5 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	: RC flat slab, RC frame structure
iii.	Floor System	: Beam slab
iv.	Floor Area	: The factory has total floor area of 7,133.95 Sqm
v.	No. of Stories	: 5 storied
vi.	Construction Year	: 2003
vii.	Foundation Type	: Pad foundation
viii.	Design Drawings	: Available (As-built drawing)
ix.	Soil investigation Report	: Available (Prepared in June, 2013)
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. Construction work in Building 2 to cease immediately pending the outcome of the assessment / review.
2. Building Engineer to assess the effect of the demolition of RC elements on the remaining structure, including the preparation of calculations.
3. Building Engineer to review all steelwork details to check if the steel frame are capable of carrying the proposed building loads, both vertical and horizontal, including the preparation of calculations.
4. Building Engineer to assess the requirement for providing fire protection to the steel frame.
5. Building Engineer to check the need for pad footings under the steel columns, including the preparation of calculations.

Mid Term (Within 6 Weeks):

1. Carry out any necessary repairs / strengthening works to the RC structure arising from Building Engineer's assessment.
2. Carry out any necessary remedial works to steelwork, including new foundations, arising from Building Engineer's review.
3. Building Engineer to assess by calculation the capacity of the narrow 5-storey structures to withstand lateral loads in accordance with Code values.

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4. Building Engineer to review the design, loads and punching shear stresses of all flat slabs in the building.
5. Verify insitu concrete stresses in the flat slabs either by 100mm diameter cores, or existing cylinder strength data for cores, from min. 4 locations that will not adversely affect the slabs.
6. Produce and actively manage a loading plan for all floor plates within Building 1, giving consideration to floor capacity and column capacity.
7. Building Engineer to survey the as-built structure.
8. There should be no further additions to Building 1 without full design and approval documentation.
9. Building Engineer to confirm if cracks are of a structural nature.
10. Building Engineer to assess by measurement whether the columns are aligned vertically.

Long Term (Within 6 Months):

1. Produce accurate as-built drawings for Building 2.
2. Following results of calculations/cores, any strengthening works required are to be completed.
3. Continue to implement load plan.
4. Produce design calculations and accurate as-built drawings for Building 1.
5. Carry out any structural repairs as deemed necessary.
6. Continue to monitor for cracking.
7. Lightweight roof structure to be analyzed by Building Engineer to ensure adequacy for code vertical and wind loads.
8. Implement any remedial / strengthening works arising from analysis.

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 all storage from exit stairs and egress paths.
3. Replace all gates and 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 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. Seal and/or protected all openings to maintain the required fire separations.
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.

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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 a minimum 2-hr fire rated shaft to separate the utility risers from each floor level.
5. Seal all penetrations and openings in exit stair enclosure walls to maintain the fire separation.
6. Provide handrails on at least one side of exit stair.
7. Inspect, test and maintain the fire alarm system, and keep written records on-site, in accordance with NFPA 72.
8. Inspect, test and maintain the emergency lighting system in accordance with The ACCORD standard. Keep written records on-site.
9. Provide dedicated storage rooms separated by minimum 1-hr fire-rated construction.

Mid Term (within 6 Months): NA

Long Term (More than 6 months):

1. Alter the fire alarm system to meet the requirements in accordance with NFPA 72.

The recommendations for Electrical Safety corrective actions are:

Immediate (Within 1 month):

1. HT cable dropping from 11kV pole must be protected in steel pipe of required size at least 2m from the ground level to protect from physical injury by moving objects.
2. Panel base plates must be installed, at all time, and cable(s) entering panel must be firmly fixed with cable gland.
3. 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.
4. All electrical panels must be grouted with proper foundation with nuts and bolts.
5. Replace silica gel and must include in routine maintenance to check and maintain.
6. Breather oil cup must be filled with transformer oil to required level as instructed by the manufacturer.
7. Cables must be supported by installing cable duct to protect the noted cables and provide covers made of non-combustible material preferably metal to protect the cables' insulation from any physical damage as well as prevent the ingress of debris, dust and lint.
8. Cables terminating at MCCBs must be installed with cable lugs/terminals of required size and rating.
9. Check the unbalance loading, overloading, by measure the running current, calculate the connected load of the respective cables and replace the cable if the load is higher than the capacity of the cable. Establish a load management program to avoid any occurrence in future.

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10. Multiple cables connecting at a MCCB terminal must be disconnected and may be distributed through bus bars. Use cable lugs/sockets to terminate cables into the MCCB poles. Use single cable into single pole of MCCB to avoid loose connection.
11. Cables terminating from secondary terminals must be arranged properly and supported on trays. Existing cables laid on floor may be installed in cable trench or on trays with cover to protect the cables from physical damaging of insulation.
12. Heat resistant conduits may be used to protect wirings.
13. Cables entering/exiting the MDB panel must properly arranged and support in the riser/aluminum channel/duct.
14. Provide cover on the duct made of noncombustible material preferably metallic sheet to protect the cables' insulation from physical damage as well as prevent entering debris, dust and lint. Rearrange the cables routed inside the duct and maintain the same arrange for future wiring if necessary.

Short Term (Within 3 Months):

1. The transformer must be installed with barrier walls (instead of grill) between transformer and other panels. The walls must be fire resistant and should have height up to the ceiling with proper ventilation.
2. Excess cable length may be laid outside building and rest of the cable must be supported on a covered cable trench inside the room.
3. Provide cover on the trench made of noncombustible material preferably concrete slab and ensure the trench is neat & clean.
4. Cables passing through permanent walls must be protected in steel pipes and remaining holes around the pipe must be sealed.
5. Shift the generator and ensure sufficient working clearance around the generator (minimum 1.07 meter preferably). Lay the cable inside cable trench/Install cable duct to protect the generator output cables and provide covers made of non-combustible material preferably metal to protect the cables insulation from any physical damage as well as prevent the ingress of debris, dust and lint.
6. Panels must be readily accessible for operation and maintenance. Keep at least 1 meter clearance around the panel for ease of its operation.
7. Compressor machine mounted on wheel must be anchored or the wheels must be locked to prevent from trolling.
8. Panel must not be crowded with devices and apparatus. Each panel must be installed with devices and apparatus to maintain safety clearances inside panel. 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.
9. Transformer placed on concrete floor must be installed on concrete foundation plinth of sufficient height (raised above min. local flood level).
10. The factory must have As-built electrical SLD with electrical wiring layout designs and drawings. Any changes in load, protection system, conductors, Generation and supply system must be reflected in the As-built SLD and drawings.
11. Thermo graphic scanning of the entire electrical system must be performed on tri-annual basis and recorded.

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12. Electrical safety training and awareness program for the electrical personal and workers must be initiated and recorded.

Mid Term (Within 6 months): NA

Long Term (More than 6 months): NA