

## Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

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Name of the Factory	: COPPER CO. LTD.
Address of the Factory	: FS-SFB-4 (1 <sup>st</sup> Floor), Road No. -02, Chittagong EPZ, South Haliashahar, Chittagong
Dhaka Present Status of the Factory	: <b>Under Operation</b>
Structural assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Structural Inspection	: 22 April, 2014
Fire & Electrical assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Fire & Electrical Inspection	: 10 May, 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 beams and columns with a 2-way solid slab
iii.	Floor System	: Beam slab
iv.	Floor Area	: Unavailable
v.	No. of Stories	: 5 storied
vi.	Construction Year	: 2012
vii.	Foundation Type	: Pile foundation
viii.	Design Drawings	: Unavailable
ix.	Soil investigation Report	: Available (Dated March, 2010)
x.	Construction Materials	: Unavailable
xi.	Generator	: In a separate Single-storied structure

**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. Childcare Centre in the ancillary building should immediately be temporarily relocated until Building Engineer is satisfied that the structure has sufficient residual strength to allow safe occupation.
2. Building Engineer to review design, loads and columns stresses in building.
3. Verify in-situ concrete strengths by taking cores from 4 columns. Prior to coring, the floor beams supported by the column should be propped through all levels to ground floor. The column reinforcement should be exposed to ensure that it will not be damaged during coring. Following propping, the column should be repaired using suitable repair mortar before de-propping.
4. A Detail Engineering Assessment of ancillary building to be commenced, see attached scope. This assessment should pay particular attention to the remedial work required to cracked columns and corrosion of reinforcement.

#### Mid Term (Within 6 Weeks):

1. Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.
2. Detail Engineering Assessment to be completed.
3. Repairs to concrete columns to be completed.

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4. Building Engineer to review design, loads and columns stresses in area identified above.
5. Verify in-situ concrete stresses either by cores or existing cylinder strength data for 4 columns in the area identified.

### Long Term (Within 6 Months):

1. Continue to implement load plan for all floor plates within the factory.
2. As item 1, continue to implement load plan for all floor plates within the factory.
3. Steel structures should be designed and upgraded to support code vertical and wind loads by the Building Engineer, or they should be vacated and removed.
4. Provide protection to columns near loading areas e.g. impact barrier.

### **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. Keep egress paths and stairs clear of storage.
3. Remove all storage from exit stairs and egress paths.
4. 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.
5. 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 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.
2. Provide a minimum 2-hr fire-rated shaft to separate the utility risers and elevator from each floor level. Seal all penetrations and openings in floor and ceiling assemblies to maintain the fire separation.
3. Provide dedicated storage rooms separated by minimum 1-hr fire-rated construction.
4. Modify the egress door to swing in the direction of egress travel.
5. Inspect, test and maintain the fire alarm system, and keep written records on-site, in accordance with NFPA 72.
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. Seal all penetrations and openings to the interior of the building along the discharge path, up to a height of 10 ft., to provide a minimum 1-hr fire separation.

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2. Provide 2-hr fire-rated exit passageway leading directly outside (vestibules to separate any storage areas).
3. Provide additional exit.
4. Remove single-station smoke alarms. Provide automatic smoke detection, tied to the fire alarm system, throughout the building 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. Electrically graded insulating mats of required size must be provided in front of all panels that required to be operated on regular basis.
2. Temporary wirings connected to the bus bars inside panel passing through the front door (door kept open) must be removed.
3. 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.

Short Term (Within 3 Months):

1. Cable must be supported on cable trays on the ceiling. Support cables in cable trays. Cable trench with cover may ease the congestion of cables behind the panel(s).
2. Open unused live cables must be removed if not in use, and be well insulated in use.
3. Every wire terminating must be installed using independent lug/terminal. Existing bus bars may be weakened when bunched wires in a terminal is separated. It is recommended to install separate panel or extend / replace the existing bus bars.
4. Panel base must be securely fixed to the foundation, with appropriate fastening devices. Panel base frame may be used on foundation to mount the panel.

Mid Term (Within 6 months):      NA

Long Term (More than 6 months): NA