

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

Name of the Factory	: Clifton Garments Ltd.
Address of the Factory	: 92, Batali Road, Enayet Bazar, Chittagong, Bangladesh.
Present Status of the Factory	: Under Operation.
Structural Assessment Conducted by	: TUV
Date of Structural Inspection	: 22 <sup>nd</sup> February, 2015
Fire Assessment Conducted by	: TUV
Date of Fire Inspection	: 22 <sup>nd</sup> February, 2015
Electrical Assessment Conducted by	: TUV
Date of Electrical Inspection	: 22 <sup>nd</sup> February, 2015
BGMEA Membership No.	: 395

### **BASIC INFORMATION:**

The assessed building is a 5-storey RCC building. Clifton Garments Ltd. is located on the GF, 1st and 2nd floor of the building and resides on a rental basis. The building has an extension shed at the roof floor of the building utilized as a dining shed. The structural system of the building is beam column frame and beam slab floor system. The following general information was noted:

i. Building Usage Type	: Garment factory.
ii. Structural System	: RCC Beam-Column Frame system.
iii. Floor System	: RCC beam slab floor system.
iv. Floor Area	: Production area is 9,000 sq. ft.(approx.)
v. No. of Stories	: 5 Storey + extension shed on roof top.
vi. Construction Year	: 1980-1982.
vii. Foundation Type	: Spread footing (As per structural drawing)
viii. Design Drawings	: Available (Signed by Authorization Committee of the 1952 Construction Act, on 15th June, 1979).
ix. Soil Investigation Report	: Unavailable.
x. Construction Materials	: Brick aggregate. (Identified by removing plaster)
xi. Generator	: Separate shed approx. 50 yards from factory building.

### **RECOMMENDATIONS FOR CORRECTIVE ACTION:**

The recommendations of corrective action for both Structural and Fire & Electrical Safety comprises in Short Term, Mid Term and Long Term basis.

The recommendations for **Structural Safety** corrective action are:

Short Term (Immediate)	: None.
Mid Term (6-weeks)	: <ul style="list-style-type: none"><li>• Factory Engineer to review design, loads and columns stresses in area identified above.</li><li>• Verify in-situ concrete stresses by 100mm dia. cores for A7 &amp; A9 columns.</li><li>• Building engineer to verify the strength and stability and connection design of the steel shed at roof level and propose remedial action as required.</li></ul>

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- Identified water tank needs to be checked by building engineer to ensure whether the particular span can carry the additional load.
- Long Term (6-months) :
- Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.
  - Continue to implement load plan.
  - Carry out any remedial actions as directed by the Building Engineer regarding non engineered connection.
  - As built drawings of steel shed to be prepared.
  - Carry out any remedial actions as directed by the Building Engineer if required regarding unapproved water tank.
  - Water proofing and proper roof drainage system need to be implemented and fixing of any leaking water tank pipes needs to be performed as directed by the guidance of building engineer.

The recommendations for **Fire & Electrical Safety** corrective action are:

**(A): Recommendations for Fire Safety corrective actions:**

<p>Immediate</p> <p><i>(the factory should not continue to be occupied until these non-conformities have been rectified):</i></p>	<ul style="list-style-type: none"> <li>• None.</li> </ul>
<p>Short Term</p> <p><i>(Actions that must be incorporated into a Fire Safety Management Plan immediately (1 ~ 2 weeks) and should be a regular activity</i></p>	<ul style="list-style-type: none"> <li>• None.</li> </ul>
<p>Mid Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 weeks)</i></p>	<ul style="list-style-type: none"> <li>• Replace all existing exit doors on evacuation routes, exit doors with side hinged type door, which swing outward and in the direction of travel. Swinging of the door should not constrict the width of the corridor / passage below 0.9 meter.</li> <li>• Remove all locking device from all egress door. All exit doors should be open-able from the side they serve without the use of a key.</li> <li>• Prepare proper plan &amp; design for additional exit door at ground floor.             <ul style="list-style-type: none"> <li>- Minimum clear width should be 0.9 meter.</li> </ul> </li> <li>• Prepare proper plan &amp; design for another staircase. - Minimum clear width should be 0.9 meter. Or rearrange the occupant load, it should not be exceed 305 nos. of</li> </ul>

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	<p>occupants.</p> <ul style="list-style-type: none"> <li>• Provide handrails on both side of each stairway with height of 0.9m measured from the nose of stair to the top of the handrail.</li> <li>• Doors in stair should be outward opening, side-swing, self-closing, non-lockable 1.5 hours fire rated doors in all stair way encloses.(Also require fire rated door at the floor occupied by other tenants)</li> <li>• Prepare proper plan and design for fire rated barrier for 2 hour fire rating separated corridor with 1.5 hrs fire rated door at ground floor.</li> <li>• Provide 1.5 hours fire rated door at ground floor store godown for separation for other operational area.</li> <li>• Prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated doors at 1st &amp; 2nd floor substation &amp; boiler room respectively, which located at the adjacent to production floor.</li> <li>• Produce design and plan for automatic detection system with automatic fire alarm and control panel.</li> <li>• Provide adequate nos. of smoke detectors to cover the whole factory building.</li> <li>• Prepare proper design and plan for dedicated fire pump with alternate backup power supply.</li> <li>• Replace existing 1 inch hose pipe replace with 1.5 inch hose pipe to meet the requirement of RMG guideline.</li> <li>• Prepare plan and design for dedicated water storage tank for firefighting operation.</li> <li>• Cover all units / floors in a valid fire license</li> <li>• Implement to a single fire safety management system with approvals from all tenants in the factory building.</li> <li>• Obtain the boiler license from the proper issuing authority.</li> <li>• Obtain the boiler operator license from the proper issuing authority.</li> </ul>
<p>Long Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6</i></p>	<ul style="list-style-type: none"> <li>• Install additional exit door as per plan and design.</li> </ul>

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<p>months)</p>	<ul style="list-style-type: none"> <li>- Minimum clear width should be 0.9 meter.</li> <li>• Install another staircase as per plan and design.</li> <li>- Minimum clear width should be 0.9 meter.</li> <li>• All stairway to have direct access to outside of the factory building, which requires 2 hour fire rated construction with 1.5 hrs fire rated door at ground floor for fire separated corridor.</li> <li>• Provide 4 hours fire rated barriers with 2 hours fire rated doors at 1st &amp; 2nd floor substation &amp; boiler room respectively, which located at the adjacent to production floor.</li> <li>• Install automatic detection system with automatic fire alarm and control panel.</li> <li>• Install dedicated fire pump with alternate backup power supply.</li> <li>• Stand pipe supplying first aid hose should have minimum pressure of 200 KPa.</li> <li>• Provide dedicated storage tank for firefighting operation.</li> </ul>
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### **(B): Recommendations for Electrical Safety corrective actions:**

<p>Immediate</p> <p><i>(the factory should not continue to be occupied until these non-conformities have been rectified):</i></p>	<ul style="list-style-type: none"> <li>• None.</li> </ul>
<p>Short Term</p> <p><i>(Actions that must be incorporated into a Fire Safety Management Plan immediately (a week) and should be a regular activity</i></p>	<ul style="list-style-type: none"> <li>• None.</li> </ul>
<p>Mid Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 weeks)</i></p>	<ul style="list-style-type: none"> <li>• All unwanted materials should be removed from Generator room.</li> <li>• Provide and maintain clear and legible identifications numbers &amp; names on all incoming and outgoing circuits of HT / LT panels.</li> <li>• Seal the cable penetrations through walls adequately with fire resistive elements.</li> </ul>

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	<ul style="list-style-type: none"> <li>• Provide proper separate earthing/grounding to generator. Ensure that generator body frame to have two separate and distinct connections to the earth / ground.</li> <li>• 1. Provide sufficient and separate earthing for HT / LT panels in substation/transformer room</li> <li>• 2. Provide adequate number of earth electrodes.</li> </ul>
<p>Long Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 months)</i></p>	<ul style="list-style-type: none"> <li>• Substation should be on lowest floor level, with easy access for maintenance.</li> <li>• Area of substation / transformer to meet requirements of Table 4.3 of RMG Guideline; the area should be 35 m<sup>2</sup>, or relocate the substation/ transformer room.</li> <li>• Maintain the minimum height of 3.6 m for the substation room. Increase the height or relocate it.</li> <li>• Provide 4 hour fire rated walls all around the transformer / generator room on ground level.</li> <li>• Provide adequate cable trenches with non-flammable covers at substation areas.</li> <li>• Relocate generator set in substation building / adjacent to substation room.</li> <li>• Provide the wiring in PVC conduits or in metallic GI pipes. Ensure that all electrical wiring should be covered in proper conduit pipes.</li> <li>• Provide adequate protection against lightning depending on the probability of a strike and acceptable risk levels at roof top of building.</li> </ul>