

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: CHISTIYA APPARELS LTD
Address of the Factory	: Madina Market (5th Floor), 3049/A, Pathantolly, Choumuhoni, Agrabad, Chittagong, Bangladesh.
Present Status of the Factory	: Under Operation.
Structural Assessment Conducted by	: TUV
Date of Structural Inspection	: 25 th July, 2015
Fire Assessment Conducted by	: TUV
Date of Fire Inspection	: 25 th July, 2015
Electrical Assessment Conducted by	: TUV
Date of Electrical Inspection	: 25 th July, 2015
BKMEA Membership No.	: 1679

BASIC INFORMATION:

The assessed factory building is a 7 - Storey RCC building. The structural system of the building is beam column frame and beam slab floor system. CHISTIYA APPARELS LTD occupied on 5th floor & 6th floor as a rental basis. The following general information was noted:

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| i. Building Usage Type | : Garment Factory |
| ii. Structural System | : RCC Beam-Column Frame. |
| iii. Floor System | : RCC beam slab floor system. |
| iv. Floor Area | : Operational floor area of the factory is approx. 13020 sft. |
| v. No. of Stories | : 7 Storey. |
| vi. Construction Year | : Unknown. |
| vii. Foundation Type | : Unknown. |
| viii. Design Drawings | : Available (Approval for a 7 - storey commercial building on
27th January, 1991 from Chittagong Development Authority) |
| ix. Soil Investigation Report | : Unavailable. |
| x. Construction Materials | : Brick aggregate. (Identified by removing plaster) |
| xi. Generator | : Located on south side at ground floor. |

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) : None.

Long Term (6-months) :

- As- built architectural & engineering drawings to be prepared. As part of this process the building engineer will be required to make a number of checks as-built conditions of the structure.
- The connections of steel structure and requirement of cross bracing needs to be checked by building engineer. The bracing system is required to ensure the stability of the structure.

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

(A): Recommendations for Fire Safety corrective actions:

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<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"> • None.
<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"> • The minimum clear width of the pathway should be 0.9 meter • Direct route of access to required exits should be provided through stairway which is maintained free of obstructions. • Factory management should be checked alarm call points, alarm & detection system periodically and maintained the record properly. • The first aid hose and standpipe performance should be checked periodically and properly tagged. • Fire drill should be conducted quarterly (4 times a year) in existing buildings as detailed under the Fire Safety Plan & should kept record properly.
<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"> • 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. • 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. • 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. • Doors in stair should be outward opening, side-swing, self-closing, non-lockable 2 hours fire rated doors in all stair way encloses.(Also require fire rated door at the floor occupied by other tenants) • Prepare design for installation of fire rating smoke proof enclosure. 2 hours fire rating doors for exit should not be less than that of 4 hours fire resistance rating of the walls of the smoke proof fire rated entry lobby.(Also require fire rated entry lobby at the floor occupied by other tenants) • Prepare proper plan and design for fire rated barrier for 2 hour fire rating separated corridor with 1.5 hrs fire

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	<p>rated door at ground floor.</p> <ul style="list-style-type: none">• Prepare proper plan and design for fire rated entry lobby of 4 hrs fire rated barrier with 2 hrs fire rated door in the stair access from the store at 6th floor. And also Provide 1.5 hrs fire rated door for storage area at 5th floor• Provide 2 hours fire rated door at 6th floor generator room, which located at the adjacent to finishing section• The egress paths should be illuminated with emergency lighting with power back-up supply & illumination should be a minimum of 10 lux for all corridors & exit doors. Aisles should be provided with a minimum 2 lux.• The stairway should be illuminated with emergency lighting with power back-up supply & illumination should be a minimum of 10 lux for stairway.• Produce design and plan for automatic detection system with automatic fire alarm and control panel.(Also needs to cover the floors occupied by other tenants)• Install Manual activation call point at all exit routes• Provide adequate nos. of smoke detectors to cover the whole factory building.• Prepare proper design and plan for dedicated fire pump with alternate backup power supply.• Prepare plan and design for dedicated water storage tank for firefighting operation as per RMG guideline.• Prepare proper design and plan for fire lifts equipped with approved intercommunication (including two way voice communications) with the fire command station or control room on the ground floor lobby of the building.• Complete full design and plan for providing fire command station equipped with detailed floor plans along with clearly demarcated locations of fire detection and fighting devices and through the panel board able to detect fire alarm from any floor.• Power backup supply should be provided for fire alarm system.• Visual alarm should be placed at the generator room.
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	<ul style="list-style-type: none"> Implement to a single fire safety management system with approvals from all tenants in the factory building.
<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"> Install smoke proof fire rated entry lobby at emergency stairways to separate from the area of incidence.(Also require fire rated entry lobby at the floor occupied by other tenants) All stairway to have direct access to any designated refuge area which requires 2 hour fire rated construction with 1.5 hrs fire rated door at ground floor for fire separated corridor. Provide fire rated entry lobby of 4 hrs fire rated barrier with 2 hrs fire rated door in the stair access from the store. Install automatic detection system with automatic fire alarm.(Also needs to cover the floors occupied by other tenants) Install dedicated fire pump with alternate backup power supply. Provide sufficient number of hose pipe with respect to area and travel distance as per RMG guideline. Stand pipe supplying first aid hose should have minimum pressure of 200 KPa. Provide dedicated storage tank for firefighting operation Install fire lifts equipped with approved intercommunication (including two way voice communications) with the fire command station or control room on the ground floor lobby of the building. Provide fire command station equipped with detailed floor plans along with clearly demarcated locations of fire detection and fighting devices and through the panel board able to detect fire alarm from any floor.

(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"> None.
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<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"> • All strands cables at exposed ends should be properly soldered / crimped and insulated.
<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"> • Provide rubber mats of adequate size in front of distribution panel DBs. • Install heat detection and provide firefighting equipment in the generator room. • Provide proper clearance of 0.8 - 1.0 m in front of all DBs/SDBs. • Provide cable connections with properly soldered / welded lugs at (DB)'s. Ensure that all the electrical connections are properly secured with lugs. • Select conductors and MCCB/MCB with adequate sizing without exceeding permissible current carrying capacity for insulation. • Avoid looping and bunch of cable at MCCB/MCB or bus bar terminal, use individual circuit and over current device for every incoming and outgoing circuit at the distribution boards. • Provide circuit diagram /circuit list with proper current ratings and fuse size, marking for DBs identifying end use load, voltage, number of phases. • Provide cable joints of porcelain / PVC connectors with PIB tape wound around before placing the cable in the box. • Provide proper separate earthing/grounding to generator. Ensure that generator body frame to have two separate and distinct connections to the earth / ground. • Provide separate earthing connection to electrical equipment's. Ensure that earth potential provided for all parts of equipment / installation (other than live parts) and that continuous earth connection is provided back to the main intake supply earth. • Provide adequate earthing to body and doors to DBs. Ensure that all electrical panels provided with proper and separate earth potential.

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Long Term

(The remedial works indicated must be carried out within a period of 6 months)

- 1. Provide updated SLD matching the existing installation at the factory.
- 2. SLD to indicate exact positions of all points of switch boxes and other outlets.
- 3. SLD to be approved by the engineer-in-charge.
- 1. Provide updated Electrical layout drawing prepared after proper locations of all outlets for lamps, fans, fixed and transportable appliances, motors etc.
- 2. Drawings to indicate exact positions of all points of switch boxes and other outlets to match existing installation.
- 3. As built drawing to be approved by the engineer-in-charge.
- Relocate generator set in substation building / adjacent to substation room.
- Modify Area of generator room to meet requirements of Table 4.4, RMG Guideline; the area should be 30 m², or relocate the generator room.
- 1. Design to have proper segregation of different end used loads.
- 2. Wiring design to have separate and distinct sub-circuits for power and heating system.
- 3. All DBs to be placed conveniently.
- 4. Wiring to be neat, tidy and located near ceiling.
- Each circuit should have a separate neutral (use of common neutral for more than one circuit shall not be permitted).
- Seal the cable entry-exit points of DBs with non-flammable materials. In addition:
 1. Ensure all unused holes / openings in DBs/SDBs to be blocked properly.
- 1. Provide the ECC to meet minimum cross-sectional area as per table 4.5.
- 2. Ensure that connections between conductors / equipments provided to durable electrical continuity and adequate mechanical strength and protection.

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	<p>3. The continuous earth connection is provided back to the main intake supply earth.</p> <ul style="list-style-type: none">• Provide adequate protection against lightning depending on the probability of a strike and acceptable risk levels at roof top of building.
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