

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: G.R. Apparels Ltd.
Address of the Factory	: 1293 D.T Road, Dhania para, Chittagong, Bangladesh.
Present Status of the Factory	: Shutdown.
Structural Assessment Conducted by	: TUV
Date of Structural Inspection	: 27 th February, 2015.
Fire Assessment Conducted by	: TUV
Date of Fire Inspection	: 27 th February, 2015.
Electrical Assessment Conducted by	: TUV
Date of Electrical Inspection	: 27 th February, 2015.
BGMEA Membership No.	: 1956

BASIC INFORMATION:

The assessed factory building is a 5 Storey RCC building. 1st floor of the building is occupied by the assessed factory and rest floors of the building is occupied by other factories. The structural system of the factory building is RCC beam column frame and beam slab floor system. The following information was noted:

i. Building Usage Type	: Garment Factory.
ii. Structural System	: RCC beam column frame system.
iii. Floor System	: RCC beam slab system.
iv. Floor Area	: First floor area is 6120 sft (G.R. Apparels Ltd), Entire building area is 30600 sft (Approx.)
v. No. of Stories	: 5 Storey.
vi. Construction Year	: 1990.
vii. Foundation Type	: Spread Footing.
viii. Design Drawings	: Available. (Approval for 3 storey RCC structure from Chittagong Development Authority (CDA) on 5th November 1982 for residential use)
ix. Soil Investigation Report	: Unavailable.
x. Construction Materials	: Brick aggregated (Identified by removing Plaster).
xi. Generator	: Situated at east corner of main building in 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 and structural to be prepared and submitted for approval by appropriate authorities. As part of this process the building engineer will be required to make a number of checks on the structural design as described in the following recommendations.

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- Sections of plaster finish to wall-column joint to be removed to investigate if cracks penetrate into the building structure. Investigation needed to determine why cracks occurring.
- Sections of plaster finish to brick wall need to be removed to investigate if dampness penetrates into the building wall. Investigation needed to determine the source of the damp and way to prevent it re-occurring.
- Water proofing and proper roof drainage system need to be implemented 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>	<p>N/A</p>
<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. • Remove all temporary items from all escape routes, aisles and passageway. • Provide aisle marking with arrow guiding and exit signage on all Evacuation pathways or provided with overhead signage fixed at ceiling level. <ul style="list-style-type: none"> - Illuminated exit sign should be posted above the exit door, - It should be clearly visible at all time, - Provide directional signs wherever necessary. - All exit doors should be clearly marked for easy identification. -Signage should be uniform. • Provide additional firefighting equipment like sand & water buckets near exit or easily accessible area for first phase firefighting. • 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 /

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	<p>passage below 0.9 meter.</p> <ul style="list-style-type: none"> • 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. • Prepare proper plan & design for exit door. <ul style="list-style-type: none"> - Minimum clear width should be 0.9 meter. • Prepare proper plan & design for another staircase. <ul style="list-style-type: none"> - Minimum clear width should be 0.9 meter. • 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 1.5 hours fire rated doors in all stair way encloses.(Also require fire rated door at the floor occupied by other tenants) • 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. • 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. • Visual alarm should be placed at the generator room. • 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 exit door as per plan and design. <ul style="list-style-type: none"> - Minimum clear width should be 0.9 meter. • Install another staircase as per plan and design. <ul style="list-style-type: none"> - Minimum clear width should be 0.9 meter. • Install automatic detection system with automatic fire alarm and control panel.(Also needs to cover the floors

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	<p>occupied by other tenants)</p> <ul style="list-style-type: none"> • 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. • Provide dedicated storage tank for firefighting operation.
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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>	<p>None.</p>
<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 all distribution panels. • 1. Exit signs should be illuminated either by lamps external to the sign or by lamps contained within the sign. 2. The source of illumination should be providing not less than 50 lux. • 1. Remove all the inflammable materials from surrounding of electrical circuitry at DBs. 2. Ensure that all electric circuitry clean of inflammable materials. 3. Conduct periodic maintenance and maintain the records. • 1. Overhead service connections should be covered and meet the requirements mentioned in RMG Guidelines. 2. Provide supports for main service line complete with adequate insulation. • The electrical panels to be of metal case and should be marked with “Danger 415 Volts” and identified with

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	<p>proper phase marking and danger signage.</p> <ul style="list-style-type: none"> • Provide proper clearance of 0.8 - 1.0 m in front of all distribution panels/switchboards. • Provide cable connections with properly soldered / welded lugs at DBs. Ensure that all the electrical connections are properly secured with lugs. • 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. • Seal the cable penetrations through walls adequately with fire resistive elements. • Provide adequate earthing to body and doors to all DBs. Ensure that all electrical panels provided with proper and separate earth potential.
<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"> • 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. • Provide 4 hour fire rated walls all around the transformer / generator room on ground level. • Provide and maintain easy access and proper height of

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	<p>switchboard / panel boards (< 2m from floor level).</p> <ul style="list-style-type: none">• 1. Wooden switchboards should be replaced by non-flammable materials.2. Prefer switchboards made of non-flammable materials.• Provide the wiring in PVC conduits or in metallic GI pipes. Ensure that all electrical wiring should be covered in proper conduit pipes.• Seal the cable entry-exit points of DB's with non-flammable materials. In addition:<ol style="list-style-type: none">1. Ensure all unused holes / openings in DBs to be blocked properly.• 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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