

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Calm Denims Ltd.
Address of the Factory	: 289, Ashraf Ali road, Patharghata, Chittagong
Present Status of the Factory	: Under operation.
Structural Assessment Conducted by	: VEC
Date of Structural Inspection	: 2 September, 2015
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 2 September, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 2 September, 2015
BGMEA Membership No.	: 3817

BASIC INFORMATION:

The factory building is a three storied RCC building with beam and column system and flat slab system. The following information was noted:

i. Building Usage Type	: Garment Factory.
ii. Structural System	: RCC beam column system.
iii. Floor System	: RCC Beam slab.
iv. Floor Area	: 52000 sft
v. No. of Stories	: Five storied and 5th floor has been constructed 40% of roof area
vi. Construction Year	: 2006-2007
vii. Foundation Type	: Isolated footing foundation
viii. Design Drawings	: Available: Approval plan, full set of structural design drawing, machine layout plan and architectural design drawing, Not Available: soil test report, floor load plan and test report of materials.
ix. Soil Investigation Report	: Not Available
x. Construction Materials	: Brick aggregate.
xi. Generator	: Separate structure.

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)	: N/A
Mid Term (6-weeks)	: N/A
Long Term (6-months)	: 1. Remedial action to be undertaken to prevent the seepage of water from pipes and other sources. 2. Qualified engineer to prepare soil test report and floor load plan.

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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"> • N/A
<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"> • Fire drill shall be conducted quarterly (4 times a year) under the Fire Safety Plan. A record of such drills shall be kept in writing for at least 3 years for the inspection of fire brigade whenever called for. • All the firefighting equipment's need to test with proper documents. • Lights in storage area needed to be installed with protective covers and conduits. • Combustibles are to be managed with good housekeeping. Storage facilities with no air-conditioning duct shall be minimum 2.9m and when used as a storage facility there shall be a minimum clearance of one third the floor height from the ceiling to the top of the storage stack. • All required means of exit or exit access in buildings or areas requiring more than one exit shall be signposted. The signs shall be clearly visible at all times, where necessary supplemented by directional signs
<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"> • Needs to have as built drawing with floor machine layout showing means of escape with proper dimension. • All the exit doors need to be replaced by side swinging so that un-lockable doors can be opened easily in the direction of evacuation without the use of a key. • Factory needs to provide handrail on both sides of all the stairways. • Factory needs to be installed with adequate illuminated emergency lighting in floors, exits & stairs.(Escape route).
<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"> • Factory needs to have a proper pre-plan for fire service & civil department • Final exit route-3 (Stair-3 route-Only 1st floor to ground floor) need to be protected (2 hours rated construction with 1.5 hours rated door) at each floor level entrance and need to be protected from fabric store at ground floor by 2 hours rated construction with 1.5 hours rated door/opening, also need to have a protected escape route till to reach safe refuse area. • Fabric store and accessories storage area need to be protected with 2 hours rated construction and 1.5 hours

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	<p>rated opening or doors.</p> <ul style="list-style-type: none">• Generator: Generator room need to be constructed with 4 hours rated construction & 2 hours rated opening / door.• Boiler: Boiler room need to be protected with 4 hours rated construction & 2 hours rated opening / door from the working floor (Finishing & Iron section) at 2nd floor of the building.• All the stairs need to be protected with fire and smoke resistant enclosures and opening (2 hours rated enclosure and 1.5 hours rated door)and provide a protected route from all though the stairway to the final exits.• Factory need to install centralized and automatic fire detection & alarm system on all occupied floors, including other tenanted floors of the building as per NTPA Guideline.• The factory need to install manually operated electrical fire alarm system and automatic fire alarm system with single or multiple call boxes on all occupied floors, including other tenanted floors of the building.• Factory needs to install control panel for centralized automatic smoke detection & fire alarm system according to NTPA Guideline.• Factory needs to install proper standpipe system with having at least 75 mm dia of riser.• Factory need to be installed by 1 riser per 1000 sqm of floor area with at least 38 mm dia of fabric hose with variable nozzle.• Install standard standpipe and hose system as well as fire pump system to ensure required hose pressure at the highest and most remote part of the building.• Factory needs to be installed with Siamese connection for to the standpipe system located outside the building and accessible to the fire department connection.• Factory needs to have dedicated fire pump with backup power system & sufficient capacity for achieve required pressure in the remote place of the factory.• Factory need to have sufficient water storage capacity to get adequate pressure to feed fire-fighting equipment and at least 1900 ltr/min x 75 min = 142500 liters water storage tank.
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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"> • N/A
<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"> • Ensure overcurrent protection device (circuit breaker/fuse) for each circuit/branch circuit. • Ensure inspection of all earthing system is being completed and documented
<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"> • Install appropriate type of fire-fighting equipment at generator room. Also ensure graded rubber mat is provided in front of the panel board. • Ensure the substation room has adequate illumination level as per standard. • Fill the transformer breather with fresh Silica gel and oil cup with fresh Oil. • Ensure distribution board is installed in compliant location in terms of height. • Provide dedicated & adequate size of earthing with proper identification for each circuit and ensure continuous earth path is back to main building intake. • Ensure all electrical cables are sized according to capacity of circuit breakers. • Provide adequate support or mechanical guards for electrical equipment and wiring where necessary. • Ensure cable joints are made in respect of conductivity, insulation and mechanical strength. • Ensure discrimination is achieved between circuit breakers used for protection of main circuit and the sub-circuits derived therefrom connect all metal in the building to the building earthing system. • Find out the cause (improper cable/over current selection, over loading, improper lug, improper cable joints, rusted connection, insulation damage, multiple cables at single point,) of overheating { ambient+(20°C-40°C)} and take proper action.
<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"> • Develop an electrical layout diagram and an as-built single line diagram detailing key components and capacity of the electrical system. • Establish a periodical Insulation and earth Resistance Measurement Program and record the related testing data.

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	<ul style="list-style-type: none">• Inspect electrical panel boards on an annual basis.• Ensure substation room has minimum height & area as per NTPA Table- 4.3 respectively.• Ensure the substation room has adequate fire separation from the production area.• Provide adequate means of ventilation for the substation room based on the installed equipment considering fire barriers.• Ensure the generator room has adequate fire separation from the production area.• Provide adequate means of ventilation for the generator room based on the installed equipment considering fire barriers.• Provide dedicated & adequate size of neutral with proper identification for each circuit.• Ensure each distribution board is provided with a circuit list and means of identification is provided as per list.• Provide adequate covers on cable channel.• Provide proper cable terminator/connector for stranded conductors at its point of termination.• Install separate distribution boards for lighting and power circuits.• Install lightning protection system on the building.
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