

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: SOUL APPARELS LTD.
Address of the Factory	: Plot # 88, Gouripur, Ashulia, Savar, Dhaka
Present Status of the Factory	: Under operation.
Structural Assessment Conducted by	: VEC
Date of Structural Inspection	: 04-June-2015
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 04-June-2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 04-June-2015
BKMEA Membership No.	: 1626

BASIC INFORMATION:

The main factory building is a single storied RCC beam column structure. The following information was noted:

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| i. Building Usage Type | : Garment Factory. |
| ii. Structural System | : RCC beam column system. |
| iii. Floor System | : RCC Beam slab. |
| iv. Floor Area | : 2600 sft |
| v. No. of Stories | : Single story. |
| vi. Construction Year | : 2007-2008 |
| vii. Foundation Type | : Unknown |
| viii. Design Drawings | : Not available |
| ix. Soil Investigation Report | : Not available |
| x. Construction Materials | : Brick aggregate. |
| xi. Generator | : In non-engineered shed (ancillary 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:

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| Short Term (Immediate) | : N/A |
| Mid Term (6-weeks) | : N/A |
| Long Term (6-months) | : 1. Provide protective coating to cover the exposed rebar from corrosion.
2. Structural engineer to prepare full set of structural drawing, as built drawing and prepare/update calculations showing the structural adequacy of the floor system taking into account the factory design imposed loading and the as built structure |

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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>	<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>	<p>Factory manager or director needs to arrange fire safety training for the workers of the factory from proper authority time to time.</p> <p>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.</p> <p>All the firefighting equipment's need to test with proper documents.</p> <p>Factory needs to have sufficient number & width (0.9m) of marked aisles at ground floor of the shed.</p> <p>Factory needs to have sufficient total width of marked aisles (5 mm per occupant) of the factory.</p> <p>Relocate the knitting machine so that means of escape remains free and unobstructed.</p> <p>Combustibles are to be managed with good housekeeping. Storage facilities with no air-conditioning duct shall be minimum 2.9 m 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.</p> <p>Factory needs to have sufficient portable fire extinguishers as one number per 500 m² or one number every 100 feet distance</p>
<p>Mid Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 weeks)</i></p>	<p>Factory needs to have as built drawing with proper dimensions showing all the means of escape.</p> <p>Factory needs to have a valid fire license for the full occupied area.</p> <p>Factory needs to have a proper pre-plan for fire department. The exits Which are leading to the final exit needs to be replaced by side swinging fire rated doors so that the final exit remains free from smoke as well as the lockable doors can</p>

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	<p>be opened easily in the direction of evacuation without the use of a key.</p> <p>Illuminated emergency light needs to be covered in floor, exits and aisles. The intensity of illumination by means of escape lighting needs to be equal or more than 10 lux. The aisles need to be illuminated with escape lighting to a level of not less than 2.5 lux at floor level.</p> <p>Factory need to have emergency backup power for critical fire safety system with sufficient capacity & arrangement according to NTPA Guideline</p> <p>(a) The color and design of lettering, arrows and other symbols on exit signs shall be in high contrast with their background. (b) The source of illumination, contrast, intensity and luminance needs to be at least 50 lux, 0.5, 5.0 footcandles and 0.2cd/m² respectively.</p> <p>Factory needs to install manual as well as automatic fire alarm system with control panel for centralized automatic fire detection and alarm system in the command station at the entrance lobby of the factory premises.</p>
<p>Long Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 months)</i></p>	<p>Factory needs to ensure fire protected route from floor to final exit -1 safely outside of the building or generator room need to be fire separated with 2 hours fire rated enclosure and 1.5 hour rated opening or door or replace the generator room 3m away from the exit access.</p> <p>Storage area need to be protected with 2 hours rated construction & 1.5 hours rated opening or doors.</p> <p>Generator room needs to be protected with 2 hours rated construction and 1.5 hours rated opening or doors with the others occupancies.</p> <p>Factory need to install with proper sitting arrangement of detectors shall be considering 900 sft area of each detectors centralized as per NTPA guideline.</p> <p>Factory needs to install control panel for detection and alarm system at required location.</p> <p>Install proper standpipe system having at least 75 mm dia of standpipe. First aid hose system (38 mm nominal) shall be provided. In addition 50 mm or larger hose connection facility shall be provided.</p> <p>Install 1 riser per 1000 m² of floor area and 38 mm diameter</p>

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	<p>of hoses with variable nozzle need to be installed.</p> <p>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.</p> <p>Factory need to installed Siamese connection after installation of stand pipe system, hose system and fire pump.</p> <p>Factory needs to install dedicated fire pump with sufficient capacity & backup power.</p> <p>Factory need to have sufficient water storage capacity to get adequate pressure to feed fire-fighting equipment and at least $1900 \times 75 = 142500$ liters water storage tank.</p>
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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>N/A</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>	<p>Discharge the generator exhaust to the exterior of the building in a safe location.</p> <p>Provide two separate and distinct connections of earthing for the generator.</p> <p>Ensure all distribution boards (including panel door) are earthed properly.</p> <p>Ensure proper earthing connection at electrical equipment (Compressor motor).</p> <p>Clean interior components from dust and debris and seal all openings within the enclosure to prevent dust and debris from entering.</p> <p>Ensure inspection for all earthing system is being completed and documented.</p>
<p>Mid Term</p> <p><i>(The remedial works indicated must be</i></p>	<p>Install appropriate number and type of safety signage at generator room.</p>

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<p><i>carried out within a period of 6 weeks)</i></p>	<p>Also ensure graded rubber mats are provided in front of all distribution boards.</p> <p>Provide Instruction board for first aid and artificial respiration in the generator room.</p> <p>Provide dedicated & adequate size of earthing with proper identification for each circuit.</p> <p>Rewire to ensure each incoming supply to an MCB has a dedicated supply from bus bar. Avoid the use of multiple cables on outgoing side of MCB's</p> <p>Ensure all electrical cables are sized according to capacity of circuit breakers.</p> <p>Avoid flexible cables for fixed wiring unless contained in an enclosure affording mechanical protection</p> <p>Ensure cable joints are made in respect of conductivity, insulation and mechanical strength.</p> <p>Ensure cable joints are made in respect of conductivity, insulation and mechanical strength.</p>
<p>Long Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 months)</i></p>	<p>Develop an electrical layout diagram and an as-built single line diagram detailing key components and capacity of the electrical system.</p> <p>Establish a periodical Insulation and earth Resistance Measurement Program and record the related testing data.</p> <p>Inspect electrical panel boards on an annual basis.</p> <p>Ensure overhead service connections to the building are led via adequate size and type of service masts.</p> <p>Ensure the generator room has adequate fire separation from the production area.</p> <p>Replace panel board with metal enclosed body and all circuit breakers related to distribution board should be installed inside metal enclosure.</p> <p>Ensure distribution boards have no opening and all live internal components are concealed properly.</p> <p>Provide dedicated & adequate size of neutral with proper</p>

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	<p>identification for each circuit.</p> <p>Ensure each distribution board is provided with a circuit list and means of identification is obtained as per list.</p> <p>Provide proper cable terminator/connector for stranded conductors.</p> <p>Install separate distribution boards for lighting and power circuits.</p> <p>Install lightning protection system on the building.</p>
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