

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: DAZZLING TEXTILE INDS. LTD.
Address of the Factory	: 7-no pathantuli, godnail, siddirganj, Narayanganj
Present Status of the Factory	: Under operation.
Structural Assessment Conducted by	: VEC
Date of Structural Inspection	: 27 June, 2015
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 27 June, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 27 June, 2015
BKMEA Membership No.	: 1972

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:

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| i. Building Usage Type | : Garment Factory. |
| ii. Structural System | : R C b e a m column frame structure. |
| iii. Floor System | : RCC Beam slab. |
| iv. Floor Area | : 30,200 sft |
| v. No. of Stories | : G+3 storied but proposed 6 storied |
| vi. Construction Year | : Year of Construction of building is 2009-2011 |
| vii. Foundation Type | : Pile foundation. |
| viii. Design Drawings | : Available-Approval drawing, Structural drawing, Architectural drawing, Soil test report, Machine layout plan, Not available: Floor load plan, Material test report |
| ix. Soil Investigation Report | : Available |
| x. Construction Materials | : All columns stone and beam, slab 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:

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| Short Term (Immediate) | : N/A |
| Mid Term (6-weeks) | : N/A |
| Long Term (6-months) | : 1. Prepare controlled loading plans for all floors designating where storage can be placed and cannot be placed. |

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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"> • Factory needs to conduct fire drill quarterly (4 times a year) under the fire safety plan and needs to kept the written record of such drills 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 need 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 2.9 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. • 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"> • Factory needs to have a proper pre-plan for fire department. • Fire manager/Director need to have safety training from proper authority & worker of the factory should as far as possible be trained for use fire extinguisher. • 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). • Emergency back-up power needs to be connected for critical fire safety system and not less than 30 minutes in case of failure of power supply.
<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"> • Fire department pre-plan needs to be developed. • Final exit route-1&2(Stair-1&2 route) need to be protected (2 hours rated construction with 1.5 hour rated door) at each floor level entrance including ground floor working area and need to have the

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	<p>protected escape route till to reach safe refuse area.</p> <ul style="list-style-type: none">• Storage area need to be protected with 2 hours rated construction and 1.5 hours rated opening or doors.• Boiler room needs to be fire separated with 4 hours fire rated enclosure and 2 hour rated opening or doors.• Both of the stairs need to be protected with fire and smoke resistant enclosures and opening (2 hours rated enclosure and 1.5 hour rated door) and provide the protected route from all though the stairway to the final exits.• Factory needs to provide 2 hours rated construction and 1.5 hours rated opening or doors between cutting section and prayer room at 3rd floor.• 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.• Install 1 riser per 1000 m² of floor area & Install adequate number of hose in floor area and the minimum hose diameter is 38 mm, or 1.5" preferably fabric hose with variable nozzle to be used in both of the stairways covering the floor area.• Factory need to ensure the minimum pressure for standpipes supplying a 50mm or larger hose shall be at least 300 Kpa. For standpipe supplying first aid hose (38mm nominal) may have a minimum pressure of 200 Kpa.• 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 need 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 \times 75 = 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"> 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+ 40°C) and take proper action.
<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 all distribution boards (including panel door) are earthed properly. Provide additional insulation for wiring exposed to external heat sources to protect cable. 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 safety signage at substation and generator room. Also ensure graded rubber mats are provided in front of all distribution boards. Provide Instruction board for first aid and artificial respiration in the substation room and generator room. Fill the transformer breather's oil cup with fresh Oil. Provide two separate and distinct connections of earthing for each generator. Provide dedicated & adequate size of earthing with proper identification for each circuit from the earth busbar of distribution boards and ensure continuous earth path is back to main building intake. Rewire to ensure each incoming supply to an MCB has a dedicated supply from busbar. Avoid the use of multiple cables on outgoing side of MCB's. Ensure all electrical cables are sized according to capacity of circuit breakers. Ensure cable joints are made in respect of conductivity, insulation and mechanical strength. 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.• Provide adequate means of ventilation for the substation room based on the installed equipment considering fire barriers.• Ensure all high tension cables are laid following standard cable laying techniques.• Ensure distribution boards have no opening and all live internal components are concealed properly.• Provide dedicated & adequate size of neutral with proper identification for each applicable 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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