

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Danys Knitwear Ltd.
Address of the Factory	: Vhumihin Road, Surabari, Gazipur Sadar, Gazipur, Bangladesh.
Present Status of the Factory	: Under operation.
Structural Assessment Conducted by	: VEC
Date of Structural Inspection	: 26 February, 2015
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 26 February, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 26 February, 2015
BGMEA Membership No.	: 5724

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	: 27675 sft
v. No. of Stories	: 3 Storied
vi. Construction Year	: Building was constructed in two phases 2013-14 [ground floor, 1st floor, 2nd floor (Grid No. E to I)] 2014-continue [G.F to 1st floor (Grid no. E to B)]
vii. Foundation Type	: Isolated footing foundation
viii. Design Drawings	: Available: Structural drawing, architectural drawing (without seal, sign & IAB no.), soil test report, as built machine layout plan, material test report. Not Available: Floor load plan
ix. Soil Investigation Report	: 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. Engineer to inspect whether waterproofing material is applied or where it can be maintained. For both durability and serviceability, waterproofing on the roof slab is recommended. Moreover the roof slab drainage system should be investigated.

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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 need to have proper testing plan & record of fire safety equipment.</p> <p>Lights in storage area need to be installed with protective covers and fire rated conduit.</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>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> <p>Ensure adequate illuminated emergency lighting in floors, exits & stairs.</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 prepare as built drawing with floor machine layout showing means of escape with proper dimension.</p> <p>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.</p> <p>Factory needs to provide handrail on both sides of all the stairways.</p>
<p>Long Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 months)</i></p>	<p>Fire department pre-plan needs to be developed. Child care room is needed to be separated from other occupancies with 3 hours fire rated construction with 3 hours fire rated door.</p> <p>Storage area need to be protected with 2 hours rated construction and 1.5 hours rated opening or doors.</p> <p>Boiler room need to be protected with 4 hours rated construction and 2 hours rated opening or doors.</p> <p>All the exits connecting to the staircases need to be protected</p>

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	<p>with fire and smoke resistant enclosures and opening (1 hours rated enclosure and 0.75 hour rated door) and provide a protected route from all though the stairway to the final exits.</p> <p>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.</p> <p>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.</p> <p>Factory needs to install control panel for centralized automatic smoke detection & fire alarm system according to NTPA Guideline.</p> <p>Factory needs to install proper standpipe system with having at least 75 mm dia of riser.</p> <p>Factory need to ensure the minimum pressure for standpipes supplying a 50 mm 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.</p> <p>Factory needs to be installed with Siamese connection for to the standpipe system located outside the building and accessible to the fire department connection.</p> <p>Install dedicated fire pump with backup power system & sufficient capacity for achieve required pressure in the remote place of the factory</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>Ensure all distribution boards (including panel door) are earthed properly.</p> <p>Provide additional insulation for wiring exposed to external heat source to protect cable/conduit.</p> <p>Provide provision for inspection of all earthing system and</p>

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	<p>ensure inspection is being completed and documented.</p>
<p>Mid Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 weeks)</i></p>	<p>Ensure graded and sufficient rubber mats are provided in front of all distribution boards.</p> <p>Provide two separate and distinct connections of earthing for each generator.</p> <p>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.</p> <p>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.</p> <p>Ensure all electrical cables are sized according to capacity of circuit breakers.</p> <p>Connect all metal in the building to the building earthing system such as metal rebar in concrete, metal frame of building, or metal water pipe etc.</p> <p>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>
<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. Inspect electrical panel boards on an annual basis.</p> <p>Ensure the generator room has adequate fire separation from the production building.</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 identification for each circuit.</p>

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	<p>Ensure each distribution board is provided with a circuit list and means of identification is provided as per list.</p> <p>Provide proper cable terminator/connector for stranded conductors at its point of termination.</p> <p>Provide individual fuse with suitable discrimination with backup fuse or miniature MCB for each 15/20A socket outlet.</p> <p>Install lightning protection system on the building.</p>
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