

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Rising Knit Textiles Ltd.
Address of the Factory	: Nayadingi, Satoria, Manikgang, Bangladesh.
Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 08-March-14
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 08-March-14
BGMEA Membership No	: 4687
BKMEA Membership No	: 1386

BASIC INFORMATION:

The present garment factory is comprises of one four story Main Production Building and one Generator Building. The following general information was noted:

i.	Building Usage Type	: Garments Factory
ii.	Structural System	: RCC moment resisting frame system structure
iii.	Floor System	: Beam supported slab system
iv.	Floor Area	: 42,771 SF
v.	No. of Stories	: Four storied building (4th floor is under construction)
vi.	Construction Year	: Built in 2007 but 3rd floor was added in 2012 & 4th floor was added in the end of 2013. Some portions of the 4th floor were still under construction at time of inspection.
vii.	Foundation Type	: Unknown
viii.	Design Drawings	: Available.
ix.	Soil investigation Report	: Available.
x.	Construction Materials	: Reinforced Concrete
xi.	Generator	: Ground Floor in Generator Building

RECOMMENDATIONS FOR CORRECTIVE ACTION:

The recommendations of corrective action for Structural, Fire and Electrical Safety comprises of Short Term, Mid Term and Long Term basis are as follows:

The recommendations for Structural Safety corrective actions are:

Immediate : NA

Short Term: (3 Weeks) :

- i. Develop a program to ensure that all live loads for which a floor or roof has been designed for will not be exceeded. The designated Load Manager shall oversee this program and ensure it is enforced.
- ii. Designate a representative as the Factory Load Manager. The Factory Owner shall ensure that at least one individual, the Factory Load Manager who is located onsite full time at the factory, is trained in calculating operational load characteristics of the specific factory. The Factory Load Manager shall serve as an ongoing resource to RMG vendors and be responsible to ensure that the factory operational loads do not at any time exceed the factory floor loading limits as described on the Floor Loading Plans.

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Mid Term (6 Weeks)

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- i. Engage Have a qualified structural engineer provide further analysis and investigation of the structural deficiencies. Structural engineer shall also provide remediation documents if required.
 - ii. Under guidance from a qualified structural engineer arrange Detail Engineering Assessment of the structure within 6 weeks. The assessment should include core testing to assess concrete strength.
 - iii. Engage a qualified structural engineer to provide additional investigation into the areas of distress, separations, or cracking and provide a remediation plan if required.
 - iv. Engage a qualified structural engineer to confirm and document that provisions have been made to accommodate concentrated loads. If provisions have not been made, have a qualified structural engineer develop a remediation plan.
 - v. Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard.
 - vi. Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.
 - vii. Factory Owner must respond to any exception noted in assessment report.
 - viii. Have a qualified structural engineer develop Floor Loading Plans per the requirements of Part 8 Section 8.20.5.3
 - ix. Have a qualified structural engineer to prepare load plans including in section 8.20 of the Alliance standard. Floor load plans shall be visibly posted on all building levels.
 - x. Provide signage or the appropriate markings at all areas used for storage to indicate the acceptable loading limits detailed in the Load Plan.
 - xi. Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.

Long Term (6 Months)

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- i. Provide Certificate of Occupancy for Review.

The recommendations for Electrical Safety corrective actions are:

Immediate (3 to 6 Days)	Provide light fixtures with protective covers inside storage areas.
Short Term (3 Weeks)	
Mid Term (6 Weeks)	<p>All boxes and enclosures (including transfer switches, generators, and power panels) for emergency circuits shall be permanently marked so they will be readily identified as a component of an emergency circuit or system.</p> <p>The required marking can be by color code, the words “emergency system,” or any other method that identifies the box or enclosure as a component of the emergency system.</p> <p>Provide a capacity information label which contains the current carrying capacity and size of main cable, rated capacity of circuit breaker and the busbar (with dimension). Display panel schedules posted on panels door (inner side).</p>

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	<p>Provide identification/tagging mentioning the equipment/machines name (i.e. Sewing machine line-1 or Lighting line-2) and type of conductor (i.e. L1,L2,L3,N,PE) for every cable at its termination point or maintain the color-code at its termination point (providing colored cable-sleeves) for identification of conductor-type (i.e. red/yellow/blue for phase cable, black for neutral cable, green for earthing cable). (Labeling-cable-tie/Marker-tie can be used for cable identification).</p> <p>Provide permanent identification marking mentioning name of panels (i.e. Washing Main SDB, GF/Washing room) on a durable material sheet posted on panels door.</p> <p>Provide covers or blanks to conceal all live internal components of switchboards and/or distribution boards.</p> <p>Install two distinct earth connections of minimum 35 sqmm for generator frame earthing.</p> <p>Provide mechanical guards for electrical equipment and wiring to avoid any accidents.</p> <p>Light fixtures without protective covers (otherwise known as naked lights) shall not be allowed in storage areas or in any area where the Inspector of the Factories Rules (1.6.3.7) Part 53 disallows these fixtures. Install signs posted in Bengali and English, indicating this prohibition at all entrances to these areas.</p> <p>Provide electrical graded rubber mats with the specifications of 650 V-protection and required area (accommodating at least two persons or depending on the panels length).</p>
<p>Long Term (6 Months)</p>	<p>Have a qualified electrical engineer develop an as-built single line diagram detailing key components and capacity of the electrical system.</p> <p>Develop and implement an electrical safety training program. Include key topics such as lock out tag out procedures, personal protective equipment requirements, etc. Keep documentation of completed training available on site.</p> <p>Install an earthing cable inside the LT Panel, Distribution board, Power socket and Machine. Earth all of the metallic parts in the facility.</p> <p>Provide earthing connection to all exposed-conductive parts (metal) related to/in close proximity to electrical equipments/installation and utility service such as metallic water/gas/steam pipes etc. such that all the metals remain at a substantially same potential of building earthing system.</p> <p>After finishing the construction, have a qualified electrical engineer design a lightning protection system according to the BNBC requirements. Have a licensed electrician install</p>

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	<p>the designed system.</p> <p>Check all the cables and circuit breakers for sorting out the higher rated circuit breakers. The rated current of a protective device (MCB, MCCB, and fuse) must not exceed the current carrying capacity of any conductor in the circuit.</p> <p>Branch circuits shall be avoided which need to be separately controlled. Use individual breaker for individual circuit and take connection from bus bar for each circuit breaker.</p> <p>Relocate the distribution board to a safe location so that it is not affected by water from washing machine.</p> <p>Complete thermographic scans at least on a three year cycle. Thermographic scans should be completed in accordance with the Standard for Infrared Inspection of Electrical Systems & Rotating Equipment and NFPA70B or a comparable standard.</p> <p>Develop an Insulation Resistance Measurement Program that ensures deterioration of insulation resistance will be identified quickly. Testing should be in compliance with InterNational Electrical Testing Association (NETA). All transformers, switchgears etc. shall be subject to an insulation resistance measurement test to ground after installation but before any wiring is connected. Insulation tests shall be made between open contacts of circuit breakers, switches etc. and between each phase and earth.</p> <p>Provide individual neutral connections same as the respective phase cable-size for all single-phase loads. The number of neutral connections in neutral bus bar must be same as the number of single-phase circuit breakers.</p> <p>Use PVC connector with PIB tape wound around with a junction box for every cable joint.</p> <p>Install phase separators between terminal connections. Verify phase separators are installed at all remaining locations.</p>
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The recommendations for Fire Safety corrective actions are:

Immediate (3 to 6 Days)	
Short Term (3 Weeks)	Keep the doors lock free in the direction of egress under any conditions. All hasps, locks, slide bolts and other locking devices shall be removed where available.
Mid Term (6 Weeks)	Establish an inspection, testing and maintenance program

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	<p>for the standpipe and hose system. Program need to be complying with the requirements of NFPA 25.</p> <p>Develop an emergency evacuation plan which includes all components required by the Alliance Standards and communicate the plan to all employees.</p> <p>The occupant load shall be posted for every assembly and production floors in a facility in a conspicuous space near the main exit or exit access doorway for the space.</p>
Long Term (6 Months)	<p>Provide required fire rated door in all exits. Fire door shall be of the side-hinged, swinging, self-closing type and shall swing in the direction of egress. New door shall have a minimum clear width of 1.0 m (39 in.). Consult a qualified fire protection engineer to design the fire rated door.</p> <p>Install initiating devices and notification appliances as required by the Alliance Standard and NFPA 72. This includes electrical supervision of all valves controlling fire protection systems (sprinklers, fire pumps, water supplies, etc.). Connect devices to an automatic fire alarm and detection system for the facility. All fire alarm installations shall be submitted for review by the Alliance prior to commencement of installation.</p> <p>Modify or install the standpipe system (class-I and class-II) to meet the requirements of Alliance Standard's Section 5.4. Consult a qualified fire protection engineer before modify or installing a new system as per NFPA 14.</p>