

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Rocky Knitting Mills (Pvt) Ltd.
Address of the Factory	: Dahargoan, Baliapara, Rupgonj, Narayangonj.
Present Status of the Factory	: Under Operation
Structural Assessment Conducted by	: BUET
Date of Structural Inspection	: 2014-02-19
Fire Assessment Conducted by	: VERITAS Engineering & Consultant
Date of Fire Inspection	: 2015-04-22
Electrical Assessment Conducted by	: VERITAS Engineering & Consultant
Date of Electrical Inspection	: 2015-04-22
BGMEA Membership No.	: 3132

BASIC INFORMATION:

i. Building Usage Type	: Garments Factory.
ii. Structural System	: RCC Frame Building.
iii. Floor System	: Edge supported RC slab (no info on slab thickness was Available)
iv. Floor Area	: Not measured
v. No. of Stories	: 5 story + one steel truss shed.
vi. Construction Year	: 1997-2013
vii. Foundation Type	: No information.
viii. Design Drawings	: Available (but, not sufficient)
ix. Soil Investigation Report	: Available but boring at outside of the building.
x. construction Materials	: Reinforced concrete, steel truss.
xi. Generator	: Outside of the building.

RECOMMENDATIONS FOR CORRECTIVE ACTION:

Short Term (Immediate)	: 1. Immediate detail is necessary.
Mid Term (6-weeks)	: 1. No further construction is to be carried out on this building until approval of the DEA is provided.it is necessary within six months.
Long Term (6-months)	: N/A

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

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>	<ul style="list-style-type: none"> • Factory needs to have sufficient number & width (0.9m) of marked aisles at all floor of the Production building. • Factory needs to have sufficient total width of marked aisles (5mm per occupant) at all the production building. • Factory needs to remove all temporary obstruction from aisles for easy movement and safe discharge. • Lights in storage area needed to be installed with protective covers and conduits. • Kitchen area should be fixed with fixed temperature type detectors and portable fire extinguishers as per guideline. • 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 • Ensure illuminated exit signs in floors so that it is visible from all positions.
<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 proper dimensions showing means of escape • Factory need to have a valid fire license with covering full occupied area and clearly mention the coverage area in the license. • Factory need to have proper testing plan & record for fire safety equipment. • All the exit doors of staircase enclosure need to be replaced by side swinging fire rated doors so that the staircase remains free from smoke as well as the lockable doors can be opened easily in the direction of evacuation without the use of a key. • Stairways serving as means of escape shall have continuous guards and handrails on both sides. • Propagation of fire, smoke, gas or fume through the opening of fire resistive floors and walls need to be restricted by sealing such opening with an approved material which needs to have a minimum 2 hours fire resistance rating of the walls. <p>(a) Illuminated emergency light needs to be covered in floor, exits and aisles.</p>

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>(b)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> <ul style="list-style-type: none"> • Factory need to have emergency backup power for critical fire safety system with sufficient capacity & arrangement according to NTPA Guideline
<p>Long Term (The remedial works indicated must be carried out within a period of 6 months)</p>	<ul style="list-style-type: none"> • Factory needs to have a proper pre-plan for fire department • Factory needs to rearrange the floor layout for minimum requirement travel distance 60m or need another more exit for fulfill the minimum requirement • The escape route need to provide protected paths of travel from the stair entrance at each floor level, all the way to the final exit to outside of the building for this storage area and chemical room need to be protected with 2 hours rated construction & 1.5 hours rated opening or doors with the knitting and washing section of ground floor. • Child care should be located at ground floor or should have direct discharge to outside and needs to be separated from dining with 3 hours rated construction and 2 hours rated opening or door. • Storage area need to be protected with 2 hours rated construction & 1.5 hours rated opening or doors with the knitting and washing section of ground floor • Boiler: Boiler and chemical room need to be protected with 2 hours rated construction & 1.5 hours rated opening / door from the working floor (washing section) of ground floor. • Generator: Generator room need to be protected with 2 hours rated construction & 1.5 hours rated opening / door stair-2 and final exit route-2 located at ground floor. • All the stairs need to be protected with fire and smoke resistant enclosures & opening (1.5 hours rated enclosure and 1 hour rated door)and provide a protected route from all though the stairway to the final exits. • Factory need to Install centralized automatic fire and smoke detection system throughout the building to full occupied area according to 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.

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<ul style="list-style-type: none"> • Factory needs to install control panel for detection and alarm system in the command station at the entrance lobby of the factory premises. • Install proper standpipe system having at least 100 mm diameter of standpipe. First aid hose system (38 mm nominal) needs to be provided (Ref. Fire Service Standard # 9) in addition to Fire Aid Fire Fighting Appliances in existing high rise NTPA (20 m) buildings. In addition 50 mm or larger hose connection facility needs to be provided. • Install standard standpipe and hose system as well as dedicated fire pump system to ensure required hose pressure at the highest and most remote part of the building. • Ensure Siamese connection for to the standpipe system located outside the building and accessible to the fire department connection • Install dedicated fire pump with backup power system & sufficient capacity for achieve required pressure in the remote place of the factory.
--	--

(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 of overheating (Temperature differences greater than 40°C from ambient) and take necessary actions.
<p>Short Term <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"> • Provide two separate and distinct connections of earthing for each generator. • Ensure all distribution boards (including panel door) are earthed. • Ensure proper earthing connections at all electrical equipment • Use nonflammable shades for light fittings. • Ensure proper cable termination and remove un-terminated wires. • Ensure overcurrent protection device (circuit breaker/fuse) for each

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>circuit/branch circuit.</p> <ul style="list-style-type: none"> • Clean interior components from dust and debris and seal all openings within the enclosure to prevent dust and debris from entering. • Ensure earthing system is inspected and recorded.
<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"> • 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. • Remove the visual barrier and make sure the transformer breather's cup is not empty. • Provide dedicated & adequate size of earthing with proper identification for each circuit. • Rewire to avoid the use of multiple cables from incoming and outgoing side of MCB's and busbar. • Ensure cables are sized according to the rating of the circuit breaker. • Use noncombustible material to make cable channel. • 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 by adjusting the protective devices of the sub-circuit breakers to operate at lower current setting and shorter time-lag than the main circuit breaker. • 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+(200C-400C) } 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

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>Program and record the related testing data.</p> <ul style="list-style-type: none">• Inspect electrical panel boards on an annual basis to ensure that the equipment is in good working condition.• Ensure the substation room has adequate fire separation from the production building.• Ensure high tension cables which are laid in cable trench having trench cover.• Ensure distribution boards have no openings and all live internal components are concealed properly.• Ensure distribution boards are installed in compliant locations.• Ensure each distribution board is provided with a circuit list and means of identification is obtained as per list.• Provide cable sockets or solder exposed ends of stranded conductors as per requirement.• Install separate distribution boards for lighting and power circuits.• Install lightning protection system on the building.
--	---