

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Azad Rifat Fibers (Pvt) Ltd. (RCC Structure)
Address of the Factory	: Kutubpur, Ramarbagh, Fatullah, Narayanganj, Bangladesh.
Present Status of the Factory	: Under Operation
Structural Assessment Conducted by	: VERITAS Engineering & Consultant
Date of Structural Inspection	: 2015-07-08
Fire Assessment Conducted by	: VERITAS Engineering & Consultant
Date of Fire Inspection	: 2015-07-08
Electrical Assessment Conducted by	: VERITAS Engineering & Consultant
Date of Electrical Inspection	: 2015-07-08
BKMEA Membership No.	: 1305

BASIC INFORMATION: The building is comprised of a three storied RCC beam columns frame structure with one storied pre-fabricated steel structure. The following general information were noted:

i. Building Usage Type	: Garment factory.
ii. Structural System	: RCC beam columns frame structure with prefabricated steel structure.
iii. Floor System	: Beam column frame and pre-fabricated steel structure with RCC floor slab.
iv. Floor Area	: 35,000 sq. ft,
v. No. of Stories	: 3 storied.
vi. Construction Year	: 2005.
vii. Foundation Type	: Pile foundation
viii. Design Drawings	: Available: Approval drawing, Structural drawing, soil test report have been found. Not available: floor load plan, materials test report.
ix. Soil Investigation Report	: Available.
x. construction Materials	: Stone chips (Column), brick chips (Slab & Beam), and Pre-fabricated steel.
xi. Generator	: Ancillary building.

RECOMMENDATIONS FOR CORRECTIVE ACTION: Corrective action for structure are,

Short Term (Immediate)	: N/A
Mid Term (6-weeks)	: 1. An engineering assessment is to be carried out to determine the causes of vibration. Printing machine and other heavy machineries in 1st floor are recommended to relocate at ground floor.

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Long Term (6-months)	<p>: 1. Carry out actions from the engineering assessment and prepare and update floor load plan.</p> <p>2. 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.</p> <p>3. Prepare controlled loading plans for all floors designating where heavy machineries/ storage can be placed and cannot be placed and also conduct materials tests.</p>
----------------------	--

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"> • Lights in storage area needed to be installed with protective covers and conduits. • Kitchen area need to be equipped with fire extinguisher & Only fixed temperature type detector. • 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. • 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 prepare as built drawing with floor machine layout showing means of escape with proper dimension. • 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.

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<ul style="list-style-type: none"> • 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). • Factory needs to have emergency backup power for critical fire safety system with sufficient capacity & arrangement according to NTPA Guideline.
<p>Long Term</p> <p>(The remedial works indicated must be carried out within a period of 6 months)</p>	<ul style="list-style-type: none"> • Fire department pre-plan needs to be developed. • Factory need to be protected final exit -1 with chemical & printing store room at ground floor by 4hours rated construction with 2 hours rated door/opening, also need to have a protected escape route till to reach safe refuse area. • All the stairs need to be protected with a 4 hours fire resistant and smoke proof lobby (4 hours rated enclosure and 2 hour rated door) at 2nd floor entrance. • Storage area need to be protected with 4 hours rated construction & 2 hours rated opening or doors. • Generator room: Generator room need to be protected with 4 hours rated construction & 2 hours rated opening / door from the fabric store room of ground floor of the building. • Chemical store: Factory need to be protected final exit -1 with chemical & printing store room at ground floor by 4hours rated construction with 2 hours rated door/opening, also need to have a protected escape route till to reach safe refuse area. • All the stairs need to be protected with fire and smoke resistant enclosures and opening (1 hours rated enclosure and 0.75 hour rated door) and provide the protected route from all though the stairway to the final exits. • Factory need to install fire lift with backup power including having 1 hour fire rated & auto closing fire door in 2 hours fire rated lift core with backup power & having minimum capacity of 545 kgs. • All the stairs need to be protected with a 4 hours fire resistant and smoke proof lobby (4 hours rated enclosure and 2 hour rated door) at 2nd floor entrance. • Flammable liquids need to be stored in conformity with relevant regulations. Stacks need not be piled so high as to make them unstable under fire fighting conditions and in general they shall not be more than 4.5 m in height. • Factory need to install centralized and automatic fire detection &

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>alarm system on all occupied floors, including other tenanted floors of the building as per NTPA Guideline</p> <ul style="list-style-type: none"> • 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. • Factory needs to install proper standpipe system with having at least 75 mm dia of riser.
--	--

(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+ 400C) and take proper action.
<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"> • Ensure all distribution boards (including panel door) are earthed properly. • Install panel boards in proper way or proper place to ensure safe installation. • Isolate/make safe all unused cables first and then remove from distribution boards. If necessary make sure cables are properly terminated at its point of termination using appropriate size and type of lug. • Ensure over current protection device (circuit breaker/fuse) for each circuit/branch circuit. • Clean interior components from dust and debris and seal all

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>openings within the enclosure to prevent dust and debris from entering.</p> <ul style="list-style-type: none"> • Provide provision for inspection of all earthing system and ensure inspection 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"> • Ensure graded rubber mats are provided in front of all distribution boards. • Provide Instruction board for first aid and artificial respiration in the generator room. • Provide two separate and distinct connections of earthing for each generator. • Ensure switchboards and/or distribution boards have a minimum clearance of 1 m (39 in) in front. • Provide dedicated & adequate size of earthing with proper identification for each circuit 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 bus bar. Avoid the use of multiple cables on outgoing side of MCB's. • Replace wooden bases with metal clad construction for mounting the lighting boards and switch controls. • Consult with a qualified electrical engineer and 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+(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 program and record the related testing data.

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<ul style="list-style-type: none">• Inspect electrical panel boards on an annual basis.• 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 circuit.• Ensure each distribution board is provided with a circuit list and means of identification is provided as per list.• Ensure wiring systems are selected and erected so that no damage is caused by the ingress of water.• 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 and Shed.
--	--