

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: ADITY KNITWEAR LTD. (FOR UD-04-07-12)
Address of the Factory	: Borabo, Mouchak, Kaliakoir, Gazipur.
Present status of the factory	: Under Operation.
Structural Assessment Conducted by	: VERITAS Engineering& Consultant
Date of Structural Inspection	: 2015-06-20
Fire Assessment Conducted by	: VERITAS Engineering& Consultant
Date of Fire Inspection	: 2015-06-20
Electrical Assessment Conducted by	: VERITAS Engineering& Consultant
Date of Electrical Inspection	: 2015-06-20
BKMEA Membership No.	: 1855

BASIC INFORMATION: The present garments factory, there is a single storied non engineered truss shed used as a production and a single storied ancillary non-engineered shed as well. The following general information was noted:

i. Building Usage Type	: Garment factory.
ii. Structural System	: Periphery brick column, RCC column and truss Corrugated non engineered shed.
iii. Floor System	: N/A
iv. Floor Area	: Non engineered shed 4990 sft floor and Ancillary Non-engineered shed 3235 sft.
v. No. of Stories	: Single storied.
vi. Construction Year	: Building was built in one phase. Constructed in year, 2010.
vii. Foundation Type	: Unknown.
viii. Design Drawings	: Not Available – Approval plan, Soil test report, As built Structural drawing, Material test report. Available- Structural drawings do not match with constructed Structure, as built Machine layout plan.
ix. Soil Investigation Report	: Not Available.
x. construction Materials	: MS angle bar, CI sheet, Brick aggregate.
xi. Generator	: Outside of the shed.

RECOMMENDATIONS FOR CORRECTIVE ACTION:

Short Term (Immediate)	: N/A
Mid Term (6-weeks)	: 1. Design should be checked by the Building Engineer to verify the lateral stability of the frame structure and confirm the requirement of any bracing in the long direction
Long Term (6-months)	: 1. Install the horizontal bracing at the shed if required. 2. Building Engineer to survey the constructed building and to be checked truss frame which is competent to prevent wind force or not. If not, to be prepared accurate drawing and built the shed according to the drawing.

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3. Engage a qualified structural engineer to prepare as built structural drawing and to be taken approval of plan of the factory from concern authority.

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"> • Fire drill shall be conducted quarterly (4 times a year) under the Fire Safety Plan. A record of such drills shall be kept in writing for at least 3 years for the inspection of fire brigade whenever called for. • Factory needs to have proper testing plan & record for fire safety equipment • Factory needs to have marked aisles in all working floor according to 0.9m for one side seat and 1.0m for both side seat. • 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 as built drawing with floor machine layout showing means of escape with proper dimension. • Factory need to have a valid fire license with covering full occupied area. • 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 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.

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<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.• Generator and substation room need to be protected from production area by 4 hours rated construction with 2 hours rated doors/opening and should have direct access from the outside.• 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 be installed with 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.• Factory needs to install 1 riser per 1000 m2 of floor area and 38 mm dia of hoses with variable nozzle.• 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 needs 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 cause (improper cable selection, improper termination, rusted connection etc.) of burning sign/insulation damage and take proper action including replacing cable or equipment where necessary.
<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. • Remove all unused cables from distribution boards and make sure all necessary cables are properly terminated at its point of termination using appropriate size and type of lug. • Ensure overcurrent protection device (circuit breaker/fuse) for each circuit/branch circuit. • Clean interior components from dust and debris and seal all openings within the enclosure to prevent dust and debris from entering. • 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"> • Install appropriate number and type of safety signage and fire-fighting equipment at substation and generator room. Also ensure graded rubber mats are provided in front of all distribution boards. • Provide Instruction boards for first aid and artificial respiration in the substation and generator room. • Ensure that wet type transformer has appropriate oil level. • Fill the transformer breather with fresh Silica gel and oil cup with fresh Oil. • Provide two separate and distinct connections of earthing for each generator. • Ensure distribution board has a minimum clearance of 1 m (39 in) in front. • 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.

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	<ul style="list-style-type: none"> • Rewire to ensure each incoming supply to an MCB/MCCB has a dedicated supply from busbar. Avoid the use of multiple cables on outgoing side of MCB's/MCCB's. • Ensure all electrical cables are sized according to capacity of circuit breakers. • Provide mechanical guards for electrical cable where necessary. • Ensure cable joints are made through porcelain/PVC connectors with PIB tape wound around joint in respect of conductivity, insulation and mechanical strength. • Connect all metal in the building to the building earthing system. • Ensure Lighting fixtures are supported from the structure properly.
<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. • Inspect electrical panel boards on an annual basis. • Ensure the substation room has adequate fire separation from the production area. • 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 the generator room has adequate fire separation from the production area. • Ensure appropriate generator room size in order to properly access the generator to perform routine maintenance activities. • 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.

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	<ul style="list-style-type: none">• Ensure surface/exposed wiring are run either horizontally or vertically with proper mechanical support and avoid wiring at an angle or hanging way with improper support.• 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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