

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Ar Style Ltd.
Address of the Factory	: Kajlar Par, Vangha Press, Jatra Bari, Dhaka, Bangladesh.
Present Status of the Factory	: Under Operation.
Structural Assessment Conducted by	: VEC
Date of Structural Inspection	: 19 th April, 2015
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 19 th April, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 19 th April, 2015
BGMEA Membership No.	: 5639.

BASIC INFORMATION:

The assessed factory building was a single storied roof truss corrugated iron shed attached 3 side peripheral 2 storied RCC building with non-engineering shed. The following general information were noted:

- i. Building Usage Type : Garment Factory.
- ii. Structural System : Single storied CI shed (truss-column steel frame) attached RCC beam column frame.
- iii. Floor System : Roof truss (for single storied CI shed) and beam slab.
- iv. Floor Area : Total floor area is 11,000 sft.
- v. No. of Stories : Single storied roof truss corrugated iron shed attached 3 side peripheral 2 storied RCC building with non-engineering shed.
- vi. Construction Year : 2001.
- vii. Foundation Type : Isolated footing foundation.
- viii. Design Drawings : Available: as built architectural drawing, as built structural drawing (Mismatched with columns size and reinforcements)
Not Available: Approval drawing and soil test report have not been found.
- ix. Soil Investigation Report : Unavailable.
- x. Construction Materials : Brick aggregate and steel.
- xi. Generator : Outside of building.

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) | : None. |
| Mid Term (6-weeks) | : <ul style="list-style-type: none">• Engage a qualified structural engineer to prepare structural drawing, as built drawing and manage approval from concern authority and prepare/update calculations showing the structural adequacy of the floor system taking into account the factory design imposed loading and the as built structure. |
| Long Term (6-months) | : |

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

- Building engineer to check, collect information and produce accurate and complete as-built documentation.

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 need to have proper testing plan & record of fire safety equipment. • 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. • Lights in storage area needed to be installed with protective covers and conduits. • 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. • Factory need to be installed with adequate illuminated emergency lighting in floors, exits & stairs. (Escape route).
<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 proper dimensions showing all the means of escape. • All the exit doors need to be installed side swinging so that unlockable doors can be opened easily in the direction of evacuation without the use of a key. • Provide handrail on both sides of stairways. • Factory need to Emergency backup power for critical fire safety system (signage, fire alarm & detection system, emergency lighting, AFD and Alarm systems etc.)
<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"> • Fire department pre-plan needs to be developed. • Factory needs to maintain minimum width of exit 0.9 m and height 2m. • Storage area need to be protected with 2 hours rated

	<p>construction & 1.5 hours rated opening or doors.</p> <ul style="list-style-type: none">• Generator and boiler room needs to be fire separated with 4 hours fire rated enclosure and 2 hours rated opening having direct access from outside.• Stairs need to be protected with 2 hours fire rated and smoke proof enclosure, also having 1.5 hours rated opening or door and provide a protected route from all through the stairway to the final exits.• Factory needs 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 needs 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.• Install automatic fire and smoke detection system throughout the building to cover every portion in that building.• Factory needs to install with proper standpipe system having at least 75 mm dia of standpipe. First aid hose system (38 mm nominal) shall 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 shall be provided.• Factory needs to install 1 riser per 1000 m² of floor area and 38 mm dia of hoses with variable nozzle.• Factory needs to ensure the minimum pressure for standpipes supplying a 50mm or larger hose shall be at least 300 kPa and 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.
--	---

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

(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"> • None.
<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>	<ul style="list-style-type: none"> • Discharge the generator exhaust to the exterior of the building in a safe location. • Provide additional insulation for wiring exposed to external heat sources (Boiler) to protect cable. • Ensure proper earthing connections at all electrical equipment. • 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 generator room. • Provide Instruction board for first aid and artificial respiration in the generator installation room. • Provide two separate and distinct connections of earthing for generator. • Install circuit breaker in proper way and proper place to ensure safe installation. • 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 avoid the use of multiple cables from incoming and outgoing side of MCB's/MCCB's and bus bar. • Replace wooden panels with metal clad construction for mounting the energy meter. • Ensure all electrical cables are sized according to capacity of circuit breakers. • Provide mechanical guards on rotating part of electrical equipment where necessary. • Provide adequate and non-combustible covers on cable channel.

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<ul style="list-style-type: none"> • Ensure cable joints are made in respect of conductivity, insulation and mechanical strength. • Seal the openings remaining after wiring system passes through the elements of building construction according to the degree of fire resistance. • 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+(20°C-40°C)} 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. • Inspect electrical panel boards on an annual basis to ensure that the equipment is in good working condition. • Ensure overhead service connections to the building are led via adequate size and type of service masts. • Ensure the generator is installed in a room with adequate fire separation from the production area. • Ensure panel 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. • Provide proper cable terminator/connector for stranded conductors at its point of termination. • Install separate distribution boards for lighting and power circuits. • Provide individual fuse with suitable discrimination with backup fuse or miniature MCB for each 15/20A socket outlet.

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<ul style="list-style-type: none">• Install lightning protection system on the building.
--	--