

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Amanah Fashion Ltd.
Address of the Factory	: House # 30, HaziMofiz Uddin Member Road, Hajipara, North Badda, Dhaka.
Present Status of the Factory	: Under Operation.
Structural Assessment Conducted by	: VEC
Date of Structural Inspection	: 29 th June, 2015
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 29 th June, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 29 th June, 2015
BGMEA Membership No.	: 5855.

BASIC INFORMATION:

The assessed factory building was a Single storied RCC beam column frame structure. There is a temporary non-engineered shed on the 1st floor which covers about 30% of the floor area. First floor construction work is ongoing. Entire building is used for RMG purpose. Amanah Fashion Ltd. occupies entire building area. The following general information were noted:

- i. Building Usage Type : Garment Factory.
- ii. Structural System : RCC beam column frame system.
- iii. Floor System : RCC beam slab system.
- iv. Floor Area : Total floor area is 9,375 sft.
- v. No. of Stories : Single Storey.
- vi. Construction Year : 2014.
- vii. Foundation Type : Unknown.
- viii. Design Drawings : Available: As built machine layout plan.
Not Available: Approval plan, structural design drawing.
- ix. Soil Investigation Report : Unavailable.
- x. Construction Materials : Brick aggregate.
- xi. Generator : Outside of the 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) : None.

Long Term (6-months) :

- Structural engineer to prepare full set of structural drawing, as built architectural drawing 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.
- Should be taken approval of the factory from concern authority.

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- 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.
- Proper slope should be maintained on roof top.

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>	<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 (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. • All the firefighting equipment's need to test with proper documents. • Factory need to have minimum width of marked aisles at least 0.90m for one sided seat & at least 1.0m for both sided of seats. • Factory needs to have sufficient total width of marked aisles (5mm per occupant) at all the production building. • Lights and wiring in the storage area need 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 ensure adequate number of exit signs so that it is visible from any positions and comply with the followings: <ul style="list-style-type: none"> (a) The color and design of lettering, arrows and other symbols on exit signs shall be in high contrast with their background. (b) The source of illumination, contrast, intensity and luminance needs to be at least 50 lux, 0.5, 5.0 foot-

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	candles and 0.2 cd/m ² respectively.
<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 floor machine layout showing means of escape with proper dimension. • 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 equipment. • 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. • Provide handrail on both sides of stairways. • Ensure adequate illuminated emergency lighting in floors, exits & stairs. • Factory need to have emergency backup power for critical fire safety system with sufficient capacity & arrangement according to NTPA Guideline.
<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"> • Factory needs to have a proper pre-plan for fire department. • Single escape is permitted for 30 persons and less than two story building. But the building is 2-storied reinforced concrete buildings. So minimum two numbers of stair required. This is not complying the RMG guide line. • Final exit-01 needs to be fire separated by 2 hours rated construction and 1.5 hours rated opening from the production area. • Storage area need to be protected with 2 hours rated construction and 1.5 hours rated opening or doors. • Boiler room needs to have a 4 hours fire resistance wall and opening also need to have 2 hours fire rated. • Generator room and substation room needs to be fire separated with 4 hours fire rated enclosure and 2 hour rated opening having direct access from 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

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	<p>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.</p> <ul style="list-style-type: none"> • Factory needs to install control panel for centralized and automatic fire detection and alarm system at required location. • Install proper standpipe system having at least 75 mm diameter 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 diameter of hoses with variable nozzle. • Install standard standpipe and hose system as well as fire pump system to ensure required hose pressure at the highest and most remote part of the building. • 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 1900ltr x 75min=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"> • 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.
<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"> • Provide two separate and distinct connections of earthing for each generator. • Ensure all Panel boards (including panel door) are earthed. • Ensure proper earthing connections at all electrical

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	<p>equipment.</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. • Install earthing pit for the factory with adequate provision for inspection of the 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"> • Fix appropriate type of safety signage at generator room and provide graded rubber mats in front of all distribution/Panel boards. • Provide Instruction board for first aid and artificial respiration in the generator room. • Provide dedicated & adequate size of earthing with proper identification for each circuit from the earth bus bar of distribution boards and ensure continuous earth path is back to main building intake. • Rewire to avoid the use of multiple cables on outgoing/incoming side of MCB's/MCCB's and busbar. • Ensure all electrical cables are sized according to capacity of circuit breakers. • Avoid flexible cables for fixed wiring unless contained in an enclosure affording mechanical protection. • 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.

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	<ul style="list-style-type: none">• Inspect electrical panel boards on an annual basis to ensure the equipment is in good working condition.• Ensure overhead service connections to the building are led via adequate size and type of service masts.• Provide adequate means of ventilation for the generator room based on the installed equipment considering fire barriers.• Ensure distribution boards have no opening and all live internal components are concealed properly.• Install circuit breaker in proper way using metal base/channel and enclosure.• 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 adequate support or mechanical guards for electrical equipment and wiring where necessary.• 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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