

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Al-Tahsin Apparels Ltd.
Address of the Factory	: Chandura, Mouchak, Kaliakoir, Gazipur, Bangladesh.
Present Status of the Factory	: Under Operation.
Structural Assessment Conducted by	: VEC
Date of Structural Inspection	: 6 th April, 2015
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 6 th April, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 6 th April, 2015
BGMEA Membership No.	: 4438.

BASIC INFORMATION:

The assessed factory building was a 3 Storey PEB shed building. The structural system of the building is steel structure with Isolated Footing foundation. The entire building is used for Al-Tahsin Apparels Ltd. RMG industries. The following general information were noted:

i. Building Usage Type	: Garment Factory.
ii. Structural System	: RCC beam column frame with PEB shed system.
iii. Floor System	: Raw steel deck (without slab casting).
iv. Floor Area	: Floor area is 24590 sft for main factory building, 8870 sft for ancillary building-1 and 2700 sft for ancillary building-2.
v. No. of Stories	: 3 Storey.
vi. Construction Year	: 2006-2007.
vii. Foundation Type	: Isolated Footing foundation.
viii. Design Drawings	: Available document: Approval plan. Not available: Architectural drawing, structural drawing (PEB shed), as built machine layout plan, material test report and floor load plan have not been found.
ix. Soil Investigation Report	: Unavailable.
x. Construction Materials	: Brick Aggregated
xi. Generator	: At ground floor.

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">• Detail Engineering Assessment (DEA) should be commenced.
Long Term (6-months)	: <ul style="list-style-type: none">• Continue to implement load plan.• Continue to monitor steel corrosion on an ongoing basis.

The recommendations for **Fire & Electrical Safety** corrective action are:

(A): Recommendations for Fire Safety corrective actions:

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

<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. • Need to have documented fire-fighting equipment. • Ensure illuminated emergency light in floors, exit & stair. • Ensure adequate exit signs in all 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 floor machine layout showing means of escape with proper dimension. • Need to match actual floor area and its validity. • Factory authority should arrange fire safety training. • Factory need to be fitted fire rated doors with self-closing mechanisms, which shall open in the direction of travel and that allowable to easy opening from inside, also having minimum widths according Table 4.2 • Exit width need to minimum 0.9m • Ensure emergency backup power for critical fire safety system in floors, exit & stair.
<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 service & civil department. • Stair-3 minimum clear width need to 0.9m. • 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. • Storage area need to be protected with 2 hour rated construction & 1.5 hour rated opening or doors. • Generator room shall be situated on the periphery of the factory building and shall have a 4 hour fire resistance

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>wall between generator room & sewing section.</p> <p>Entry to generator room shall be through a 2 hours fire resistance composite door.</p> <ul style="list-style-type: none"> • All the stairs need to be protected with fire and smoke resistant enclosures & opening (2 hours rated enclosure and 1.5 hour rated door) and provide a protected route from all though the stairway to the final exits. • Ensure 2 hour fire rated walls and doors between office & sewing section. • Each bay shall be considered as separate compartment and detectors shall be installed considering each bay an independent compartment. • Install automatic fire and smoke detection system throughout the building to cover every portion in the building. • Need to install PA system with both way communication facilities. • Need to Install 100mm dia Standpipe and hose system in the factory building. • Provide the required flow of 1900 liter/min and minimum pressure of 200 kPa for supplying first aid hose (38 mm nominal) OR Hydraulically design the standpipe and hose system to get the required pressure. • Ensure Siamese connection for existing standpipe & hose system. • Install dedicated fire pump with backup power system & sufficient capacity for achieve required pressure in the remote place of the factory. Required for adequate pressure of hose. • Water reservoir need to design of required discharge quantity for fire-fighting. • Factory need to installed fire command station facilities with communication to all floors.
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(B): Recommendations for Electrical Safety corrective actions:

<p>Immediate</p> <p><i>(the factory should not continue to be</i></p>	<ul style="list-style-type: none"> • Find out cause (improper cable selection, improper protective device selection, improper termination, rusted connection) of burning sign damage and take
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Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

<p><i>occupied until these non-conformities have been rectified):</i></p>	<p>proper action including replacing cable where necessary.</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+ 40°C) and take proper action.
<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 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"> • Ensure appropriate number and type of safety signage, fire-fighting equipment and rubber mats at required location. • 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. • 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 base with metal clad construction for mounting circuit breakers. • Ensure all electrical cables are sized according to capacity of circuit breakers. • Ensure cable joints are made in respect of conductivity,

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>insulation and mechanical strength.</p> <ul style="list-style-type: none"> • Ensure discrimination is achieved between circuit breakers used for protection of main circuit and the sub-circuits derived therefrom. • 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. • Inspect electrical panel boards on an annual basis. • Ensure overhead service connections to the building are led via adequate size and type of service masts. • Ensure the generator room has adequate fire separation from the production area. • Provide adequate means of ventilation for the generator room based on the installed equipment considering fire barriers. • 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 obtained as per list. • Provide adequate support or mechanical guards for electrical wiring where necessary. • Provide proper cable terminator/conductor for stranded conductors. • Install separate distribution boards for lighting and

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

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