

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Swiss Schiffli Fashion (Bd) Ltd.
Address of the Factory	: Gakul Nagar, Narayanpur, Raipura, Narsingdi-1630, Bangladesh
Present Status of the Factory	: Under operation.
Structural Assessment Conducted by	: BUET
Date of Structural Inspection	: 14 January, 2014
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 18 April, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 18 April, 2015
BGMEA Membership No.	: 5264

BASIC INFORMATION:

The factory building is a two storied RCC building and a shed. The following information was noted:

- i. Building Usage Type : Garment Factory.
- ii. Structural System : Composite structure for office building and Gable frame for shed.
- iii. Floor System : RCC Beam slab for office building and steel sheet roofing for shed.
- iv. Floor Area : Approximately 3000 sq.ft per floor at office building and 20,000 sq.ft shed area.
- v. No. of Stories : Two storied office building and single storied shed
- vi. Construction Year : 2010
- vii. Foundation Type : Unknown
- viii. Design Drawings : Not Available
- ix. Soil Investigation Report : Not Available
- x. Construction Materials : Steel and RCC.
- xi. Generator : Ground Floor outside the shed.

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:

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| Short Term (Immediate) | : N/A |
| Mid Term (6-weeks) | : N/A |
| Long Term (6-months) | : 1. Detail engineering assessment (DEA) should be carried out to check adequacy of structures.
2. The consultants strongly recommend storing any type of carton boxes, finished products and fabrics in such a manner so that intensity of loading should not exceed 40 psf (2.0 kN/m ²)
3. No further construction is to be carried out on this building until approval the DEA is given. |

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

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>	<p>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.</p> <p>Factory need to have proper testing plan & record of fire safety equipment.</p> <p>Factory needs to have sufficient number & width (0.9m) of marked aisles at all working floor.</p> <p>Lights in storage area needed to be installed with protective covers and conduits.</p> <p>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.</p> <p>(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 footcandles and 0.2 cd/m² respectively.</p>
<p>Mid Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 weeks)</i></p>	<p>Factory needs to have as built drawing with floor machine layout showing means of escape with proper dimension.</p> <p>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.</p> <p>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.</p> <p>Factory needs to maintain minimum width of exit 0.9 m and height 2 m.</p> <p>Factory need to provide handrail on both sides of each</p>

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>stairways.</p> <p>Factory needs to be installed with adequate illuminated emergency lighting in floors, exits & stairs.(Escape route) Factory need to emergency backup power for critical fire safety system (signage, fire alarm & detection system, emergency lighting, AFD and Alarm systems etc.)</p>
<p>Long Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 months)</i></p>	<p>Factory needs to have a proper pre-plan for fire service & civil department.</p> <p>Factory needs to ensure minimum clear width of stair 0.90 m. The final exit –03 need to be protected by 4 hours fire rated construction with 2 hours fire rated doors or openings from the generator room and need to have the protected route till to reach safe refuse area</p> <p>Storage area needs to be protected with 2 hours rated construction & 1.5 hours rated opening or doors.</p> <p>Generator room needs to be fire separated with 4 hours fire rated enclosure and 2 hours rated opening having direct access from outside.</p> <p>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</p> <p>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</p> <p>Factory needs to install control panel for centralized automatic smoke detection & fire alarm system according to NTPA Guideline</p> <p>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.</p> <p>Factory needs to install 1 riser per 1000 m2 of floor area and 38 mm diameter fabric hoses with variable nozzle.</p> <p>Factory need to ensure the minimum pressure for standpipes supplying a 50mm or larger hose shall be at least 300 kPa</p>

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>and standpipe supplying first aid hose (38mm nominal) may have a minimum pressure of 200 kPa.</p> <p>Factory needs to be installed with Siamese connection for to the standpipe system located outside the building and accessible to the fire department connection.</p> <p>Factory needs to have dedicated fire pump with backup power system & sufficient capacity for achieve required pressure in the remote place of the factory.</p> <p>Factory needs 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.</p>
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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>	N/A
<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>	<p>Ensure panel door of distribution boards are earthed properly.</p> <p>Ensure all electrical wiring/cable properly terminated at its point of termination using appropriate size and type of lug where necessary.</p> <p>Ensure overcurrent protection device (circuit breaker/fuse) for each circuit/branch circuit.</p> <p>Ensure proper earthing connections at all electrical equipment. Clean interior components from dust and debris and seal all openings within the enclosure to prevent dust and debris from entering.</p> <p>Provide provision for inspection of all earthing system and ensure inspection is being completed and documented.</p>
<p>Mid Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 weeks)</i></p>	<p>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.</p> <p>Provide Instruction board for first aid and artificial respiration in the substation room and generator room.</p>

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>Ensure substations room, generator room, working place, exit light and escape light have adequate illumination level as per standard.</p> <p>Fill the transformer breather with fresh Silica gel and oil cup with fresh Oil.</p> <p>Provide two separate and distinct connections of earthing for each generator</p> <p>Provide dedicated & adequate size of earthing with proper identification for each circuit.</p> <p>Replace wooden plates with metal clad construction for mounting the lighting boards and switch controls.</p> <p>Rewire to ensure single cable at busbar and/or circuit breaker terminal to avoid loose connection, overloading and separate controlling of each circuit/branch circuit.</p> <p>Ensure all electrical cables are sized according to capacity of circuit breakers.</p> <p>Provide emergency power connection for life safety load (exit signage) Provide adequate support or mechanical guards for electrical equipment and wiring where necessary.</p> <p>Use noncombustible material to make channel and/ or cable trench and provide adequate covers on cable trenches/channel.</p> <p>Ensure cable joints are made in respect of conductivity, insulation and mechanical strength.</p> <p>Connect all metal in the building to the building earthing system.</p> <p>Ensure Lighting fixtures are supported from the structure properly.</p>
<p>Long Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 months)</i></p>	<p>Develop an electrical layout diagram and an as-built single line diagram detailing key components and capacity of the electrical system.</p> <p>Establish a periodical Insulation and earth Resistance Measurement Program and record the related testing data.</p> <p>Inspect electrical switchgear and panel boards on an annual basis.</p>

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>Install security measures to ensure access to the substation is restricted.</p> <p>Ensure all high tension cables are laid following standard cable laying techniques.</p> <p>Ensure the generator room has adequate fire separation from the production area.</p> <p>Provide adequate means of ventilation for the generator room based on the installed equipment and ensure that ventilation does not impact on fire barriers, e.g. fire dampers.</p> <p>Ensure appropriate generator room size in order to properly access the generator to perform routine maintenance activities.</p> <p>Ensure distribution boards have no opening and all live internal components are concealed properly.</p> <p>Ensure distribution boards are installed in compliant locations in terms of height, access and surrounding weather.</p> <p>Ensure each distribution board is provided with a circuit list and means of identification is obtained as per list.</p> <p>Provide proper cable terminator/conductor for stranded conductors.</p> <p>Install lightning protection system on the building.</p>
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