

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Teason Fashion Ltd.
Address of the Factory	: 1142 North Agrabad, Mistripara, Chittagong, Bangladesh
Present Status of the Factory	: Under operation.
Structural Assessment Conducted by	: VEC
Date of Structural Inspection	: 27 October, 2015
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 27 October, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 27 October, 2015
BGMEA Membership No.	: 3446

BASIC INFORMATION:

There are two RCC buildings in the factory premises. Among them building-01 is used for Eden fashions Ltd. and **Teason fashion Ltd.** whereas 3rd floor of Building-02 is used for **Teason fashion Ltd.** The following information was noted:

i. Building Usage Type	: Garment Factory.
ii. Structural System	: RCC beam column system.
iii. Floor System	: RCC Beam slab.
iv. Floor Area	: Floor area is 25,500 sft (total) for main factory building-2
v. No. of Stories	: 5 - Storied
vi. Construction Year	: 2008 - 2010
vii. Foundation Type	: Could not be verified since soil test report and foundation drawing were not available
viii. Design Drawings	: Not Available
ix. Soil Investigation Report	: Not Available
x. Construction Materials	: Brick aggregate.
xi. Generator	: In a separate 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:

Short Term (Immediate)	: N/A
Mid Term (6-weeks)	: 1. Factory Engineer to review design loads and column stresses in the areas identified above. 2. Verify in situ concrete stresses either by cores (100mm diameter) or existing cylinder strength data for all the columns or cores from a minimum of 4 non-critical columns.
Long Term (6-months)	: 1. Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity. 2. Provide protective coating to cover the exposed rebar from

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corrosion.

3. Structural engineer to prepare full set of structural design drawing, as built 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.

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>Factory need to have proper testing plan & record of fire safety equipment.</p> <p>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.</p> <p>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.</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>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>
<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 prepare as built drawing with floor machine layout showing means of escape with proper dimension.</p> <p>Factory need to have valid fire license with mentioning full occupied area by the factory.</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 need to provide handrail on both sides of both the stairways.</p>

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	<p>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</p>
<p>Long Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 months)</i></p>	<p>Fire department pre-plan needs to be developed.</p> <p>Factory needs to maintain minimum width of exit 0.9 m and height 2 m.</p> <p>Final exit route-2 needs to be protected with generator by 4 hours rated construction with 2 hours rated door/opening and also need to have a protected escape route till to reach safe refuse area.</p> <p>Generator room need to be protected by 4 hours rated construction with 2 hours rated opening / door from final exit-3 and assembly point located at ground floor.</p> <p>Storage area need to be protected with 2 hours rated construction & 1.5 hours rated opening or doors.</p> <p>Boiler room need to be protected with 4 hours rated construction with 2 hours rated opening / door from finishing section at 2nd floor of the building and Generator room need to be protected by 4 hours rated construction with 2 hours rated opening / door from final exit-3 as well as assembly point at ground floor.</p> <p>All the stairs (stair-1 and 2) need to be protected with fire and smoke resistant enclosures and opening (1 hour rated enclosure and 0.75 hour rated door) and provide the protected route from all though the stairway to the final exits.</p> <p>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.</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 installproper standpipe system withhaving at</p>

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	<p>least 75mm diameter of riser.</p> <p>Factory needs 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.</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 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.</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>	<p>Remove all unused cables from panel boards and make sure all necessary cables are properly terminated at its point of termination using appropriate size and type of lug.</p>
<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>Discharge the generator exhaust to the exterior of the building in a safe location.</p> <p>Ensure all panel boards (including panel door) are earthed properly.</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>Install earthing pit for the factory with adequate provision for inspection of the 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 boards for first aid and artificial respiration</p>

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	<p>in the generator room.</p> <p>Ensure the generator room has adequate illumination level as per standard.</p> <p>Provide two separate and distinct connections of earthing for each generator.</p> <p>Ensure distribution board has a minimum clearance of 1 m (39 in) in front.</p> <p>Provide dedicated & adequate size of earthing with proper identification for each circuit and ensure continuous earth path is back to main building intake.</p> <p>Rewire to avoid the use of multiple cables from incoming and outgoing side of MCB's/MCCB's.</p> <p>Replace wooden base with metal clad construction for mounting the panels.</p> <p>Ensure all electrical cables are sized according to capacity of circuit breakers.</p> <p>Provide adequate mechanical guards for electrical equipment and wiring where necessary.</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>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>
<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>

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	<p>Inspect electrical panel boards on an annual basis.</p> <p>Ensure overhead service connections to the building are led via adequate size and type of service masts.</p> <p>Ensure the generator room has adequate fire separation from the main building.</p> <p>Provide adequate means of ventilation for the generator room based on the installed equipment considering fire barriers.</p> <p>Ensure appropriate generator room size in order to properly access the generator to perform routine maintenance activities.</p> <p>Ensure panel boards have no opening and all live internal components are concealed properly.</p> <p>Provide dedicated & adequate size of neutral with proper identification for each circuit.</p> <p>Ensure each distribution board is provided with a circuit list and means of identification is provided as per list.</p> <p>Provide adequate covers on cable channel.</p> <p>Provide proper cable terminator/connector for stranded conductors at its point of termination.</p> <p>Install separate distribution boards for lighting and power circuits.</p> <p>Provide individual fuse with suitable discrimination with backup fuse or miniature MCB for each 15A socket outlet.</p> <p>Install lightning protection system on the building.</p>
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