

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Best Ladies Wear Ltd.
Address of the Factory	: 35 Kunia, Boro Bari, National University, Gazipur, Bangladesh.
Present Status of the Factory	: Under Operation.
Structural Assessment Conducted by	: VEC
Date of Structural Inspection	: 29 th January, 2015
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 29 th January, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 29 th January, 2015
BGMEA Membership No.	: 5688

BASIC INFORMATION:

The surveyed building was a 10 storey RCC building. The structural system of the building is beam column frame and beam slab floor system. 5th, 6th, 7th floors are used for Best Ladies Wear Ltd. and 8th floor is used as canteen and finished goods store by both Best Shirts and Best Ladies Wear Ltd. The following general information was noted:

- i. Building Usage Type : Garment Factory.
- ii. Structural System : RCC beam column frame system.
- iii. Floor System : RCC beam slab floor system.
- iv. Floor Area : Total floor area is 47643 sft.
- v. No. of Stories : 10 Storey.
- vi. Construction Year : Building was built in two phases. 1st phase (GF to 5th floor) on 2007 and 2nd phase (up to 9th floor) on 2013.
- vii. Foundation Type : Pile foundation.
- viii. Design Drawings : Available: Structural design drawing, architectural drawing, soil test report, machine layout plan and material test reports.
- ix. Soil Investigation Report : Available.
- x. Construction Materials : Stone aggregate in column.
- xi. Generator : 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) : None.

Long Term (6-months) :

- Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.

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

(A): Recommendations for Fire Safety corrective actions:

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<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 needs to have minimum 0.9m width of aisles for one sided seat and minimum 1.0m for sided seat • Lights in storage area need to be installed with protective covers and fire rated conduit. • Combustibles are to be managed with good housekeeping. Storage facilities with no air-conditioning duct shall be minimum 2.9m 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 and need to reduce or minimize fire hazard, good housekeeping within and outside shall be strictly maintained by the occupants and owner of the building. • 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. • Factory needs to seal the penetration in rated slab by 2 hours fire rated materials both internally and externally.
<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 prepare as built drawing with floor machine layout showing means of escape with proper dimension. • Factory needs to be installed with adequate illuminated emergency lighting in floors, exits & stairs. (Escape route). • Factory need to install sufficient capacities standby generator and connected to supply power for staircase and corridor Lighting, fire lifts, standby fire pump, pressurization fans and blowers, smoke extraction and damper systems in case of failure of normal electricity supply and must having the minimum capacity to serve for 1 hour with the NTPA requirements • Fire license needs to be renewed. • Factory needs to provide handrail on both sides of all the stairways. • Factory needs to provide intermediate handrail on stair-

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	<p>01 (west stair) staircase.</p> <ul style="list-style-type: none"> • Factory needs to install standby generator with required backup power.
<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 need to be developed. • All the lockable exit doors need to be replaced by an opening system so that the doors can be opened easily in the direction of evacuation & all exit access doors shall be of a side-swinging type. • Final exit route of stair-1 need to protected from the generator room & lift by 4 hours rated construction with 2 hours rated door at ground floor level, also need to have a protected route from the each floor exit/entry (with 4 hours rated enclosure and lobby & 2 hours rated door)to till reach safe refuge area. <p>Final exit route of stair-2 need to protect from the storage area & lift by 4 hours rated construction with 2 hours rated door at ground floor level, also need to have a protected route from the each floor exit/entry (with 4 hours rated enclosure and lobby & 2 hours rated door) to till reach safe refuge area.</p> <ul style="list-style-type: none"> • Factory need to protect the entire stair by 4 hours fire separated & smoke proof lobby with 2 hours fire rated door/opening. • Factory need to protect the childcare room from the passage area of the factory by 3 hours fire rated construction and 3 hours fire rated door/opening at the ground floor of the building. • Factory needs to provide 2 hours rated wall & door opening between cutting section & fabric store and 3 hours rated for sewing & prayer room respectively. • Generator room needs to be fire separated with 4hr fire rated enclosure and 2hrs rated opening having direct access from outside. • Boiler room shall be situated on the periphery of the factory building and shall have a 4 hour fire resistance wall. • Factory needs to protect the lift with 2 hours rated enclosure & 1hour rated auto closing fire door. • Factory need to install fire lift with backup power

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	<p>including having 1 hour fire rated & auto closing fire door in 2 hours fire rated lift core with backup power & having minimum capacity of 545 kgs.</p> <ul style="list-style-type: none"> • All the stairs need to be protected with fire and smoke resistant enclosures & opening (4 hours rated enclosure and 2 hour rated door) and provide a protected route from all though the stairway to the final exits • Both of the staircase need to be protected with 2 hours fire & smoke proof lobby from the working floor of the building • Factory needs to establish command station on the entrance lobby and equipped with detailed floor plans along with clearly demarcated locations of fire detection and fighting devices and through the panel board able to detect fire alarm from any floor. It needs to be manned with properly trained personnel having responsibility of maintenance and operating firefighting facilities within the building. • Factory needs 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.
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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"> • 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 ($> \text{ambient} + 40^{\circ}\text{C}$) 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 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"> • Provide two separate and distinct connections of earthing for each generator. • Provide dedicated & adequate size of earthing with proper identification for each circuit. • Rewire to avoid the use of multiple cables from incoming and outgoing side of MCB's.

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	<ul style="list-style-type: none"> • Ensure cable joints are made in respect of conductivity, insulation and mechanical strength. • 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"> • Establish a periodical Insulation and earth Resistance Measurement Program and record the related testing data. • Ensure the substation room has adequate fire separation from the production area. • Ensure the generator room has adequate fire separation from the production area. • 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. • Run cable in a designated route with mechanical protection and fire sealing of floor slab and wall penetrations