

## **Summary of Preliminary Assessment on Structural, Fire and Electrical Safety**

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Name of the Factory	: Uni World Bd Ltd.
Address of the Factory	: 34, M.R. Road Magura-7600, Bangladesh
Present Status of the Factory	: Under operation.
Structural Assessment Conducted by	:
Date of Structural Inspection	:
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 30 July, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 30 July, 2015
BGMEA Membership No.	: 5659

### **BASIC INFORMATION:**

Factory is a 04-storied reinforced concrete building. The following information was noted:

- i. Building Usage Type :
- ii. Structural System :
- iii. Floor System :
- iv. Floor Area :
- v. No. of Stories :
- vi. Construction Year :
- vii. Foundation Type :
- viii. Design Drawings :
- ix. Soil Investigation Report :
- x. Construction Materials :
- xi. Generator :

### **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) | : |
| Mid Term (6-weeks)     | : |
| Long Term (6-months)   | : |

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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 &amp; record of fire safety equipment.</p> <p>Factory needs to have sufficient number and width (0.9 m) of marked aisles at all occupied floors.</p> <p>Lights in storage area need 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 need to be at least 2.9 m and when used as a storage facility there needs to have 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>Fire manager/Director need to have safety training from proper authority &amp; 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 provide handrail on both sides of all the stairways.</p> <p>Provide intermediate handrail in the staircase so that no point on the stair is farther than 1 m from the handrail.</p>

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	<p>Factory needs to be installed with adequate illuminated emergency lighting in floors, exits &amp; stairs. (Escape route).</p> <p>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>Final exit route-1 &amp; 2 (stair-1 &amp; 2 route) need to be protected (2 hours rated construction with 1.5 hours rated door) at each floor level entrance including ground floor and need to be protected from the generator at ground floor by 4 hours rated construction with 2 hours rated door/opening, also need to have the protected escape route till to reach safe refuse area.</p> <p>Storage area need to be protected with 2 hours rated construction and 1.5 hours rated opening or doors.</p> <p>Generator room need to be protected by 4 hours rated construction with 2 hours rated opening / door from stair-1 as well as from the final exit route-1 located at ground floor. Sub-station room need to be protected with 4 hours rated construction with 2 hours rated opening / door from stair-1 and sub-station room at ground floor of the building.</p> <p>All the exits connecting to the staircase-1 need to be protected with fire and smoke resistant enclosures and opening (1.5 hours rated enclosure and 1 hour rated door) and provide a protected route from all though the stairway to the final exits.</p> <p>Factory need to install centralized and automatic fire detection &amp; 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 &amp; fire alarm system according to NTPA Guideline.</p> <p>Factory needs to install proper standpipe system with having at least 75 mm diameter of riser.</p> <p>Factory need to ensure the minimum pressure for standpipes supplying a 50 mm or larger hose shall be at</p>

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	<p>least 300 Kpa. For standpipe supplying first aid hose (38 mm 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 &amp; 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 <math>1900 \times 75 = 142500</math> 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>Discharge the generator exhaust to the exterior of the building in a safe location.</p> <p>Ensure all distribution boards (including panel door) are earthed properly.</p> <p>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> <p>Ensure overcurrent protection device (circuit breaker/fuse) for each circuit/branch circuit.</p> <p>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 type of safety signage 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</p>

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	<p>the substation room and generator room.</p> <p>Ensure in the substations room, all 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>Ensure distribution board is installed in compliant location in terms of access.</p> <p>Provide dedicated &amp; adequate size of earthing with proper identification for each circuit from the earth busbar of distribution boards 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>Ensure all electrical cables are sized according to capacity of circuit breakers.</p> <p>Provide adequate support or mechanical guards for electrical 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>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 panel boards on an annual basis. Ensure substation room has minimum height &amp; area as per NTPA Table-4.3 respectively.</p> <p>Ensure the substation room has adequate fire separation from the main building.</p>

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	<p>Provide adequate means of ventilation for the substation room based on the installed equipment considering fire barriers.</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 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 distribution boards have no opening and all live internal components are concealed properly.</p> <p>Install circuit breaker using metal enclosure to ensure safe installation.</p> <p>Provide dedicated &amp; 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>Install lightning protection system on the building.</p>
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