

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: TULIP DESIGN (PVT) LTD.
Address of the Factory	: 56, S. M. Maleh Road, River View Complex, (7th Floor), Tanbazar, Narayanganj
Present Status of the Factory	: Under operation.
Structural Assessment Conducted by	:
Date of Structural Inspection	:
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 28 July, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 9 July, 2015
BKMEA Membership No.	: 1234

BASIC INFORMATION:

Factory consist one 9-storied reinforced concrete building with basement (9 floor + basements). 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>Factory needs to conduct fire drill quarterly (4 times a year) under the fire safety plan and needs to kept the written record of such drills 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 ensure unobstructed means of escape i.e. aisles, exits, stairs to discharge safely from the upper floors to outside of the building during evacuation and in an emergency or unwanted situation as well.</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>Mid Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 weeks)</i></p>	<p>Needs to have as built drawing with proper dimensions showing means of escape.</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>Factory needs to have valid fire license covering the full occupied area.</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>Propagation of fire, smoke, gas or fume through the opening of fire resistive floors and walls need to be restricted by sealing such opening with an approved material which needs to have a minimum 4 hours fire resistance rating of the walls.</p>

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	<p>Factory needs to be installed with adequate illuminated emergency lighting in floors, exits & stairs.(Escape route).</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>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 need to install suitable public address system having communication to all floors as well as facilities to receive messages from all floors.</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 department.</p> <p>Final exit route-1 & 2(Stair-1 & 2 route) need to be protected by 4 hours rated construction with 2 hours fire rated door/opening at each floor level entrance including ground floor and need to be protected with substation room 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 & 1.5 hours rated opening or doors.</p> <p>Boiler room needs to have a 4 hour fire resistance construction with 2 hours fire rated opening or doors.</p> <p>All the exits connecting to the staircases need to be protected with 4 hours fire rated constructions and 2 hours rated doors.</p> <p>All the stairs need to be protected with a 4 hours fire resistant and smoke proof lobby (4 hours rated enclosure and 2 hour rated door) at each floor entrance and provide the protected route from all though the stairway to the final exits.</p> <p>Factory need to have 4 hours rating for walls (enclosure) and 2 hours for door openings fire separated & smoke proof in the basement area with lobby.</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>Factory needs to install control panel for centralized automatic</p>

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	<p>smoke detection & fire alarm system according to NTPA Guideline</p> <p>Factory needs to install proper standpipe system with having at least 100 mm dia of riser.</p> <p>Factory need to be installed by 1 riser per 1000 sqm of floor area with at least 38 mm dia of hoses Factory need to ensure the minimum pressure for standpipes supplying a 50mm or larger hose shall be at least 300 Kpa.</p> <p>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> <p>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</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>N/A</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>Provide two separate and distinct connections of earthing for the generator.</p> <p>Ensure all panel boards (including panel door) are earthed properly</p> <p>Ensure overcurrent protection device (circuit breaker/fuse) for</p>

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	<p>each circuit/branch circuit.</p> <p>Ensure proper earthing connections at all electrical equipment. Provide provision for inspection of all earthing system.</p>
<p>Mid Term</p> <p><i>(The remedial works indicated must be carried out within a period of 6 weeks)</i></p>	<p>Ensure safety signage and fire-fighting equipment at generator room and graded rubber mats are required location.</p> <p>Provide Instruction board for first aid and artificial respiration in the generator room.</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 and busbar.</p> <p>Replace wooden base with metal clad construction for mounting the circuit breaker.</p> <p>Ensure all electrical cables are sized according to capacity of circuit breaker.</p> <p>Provide adequate mechanical guards for electrical equipment where necessary.</p> <p>Ensure cable joints are made in respect of conductivity, insulation and mechanical strength.</p> <p>Provide emergency power connection for all existing life safety loads.</p> <p>Connect all metals in the building to the building earthing system.</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</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>

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<p><i>months)</i></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.</p> <p>Ensure overhead service connections to the building are led via adequate size and type of service masts.</p> <p>Ensure panel distribution 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 applicable circuit.</p> <p>Ensure each distribution board is provided with a circuit list and means of identifications provided as per list.</p> <p>Use noncombustible material to make channel and 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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