

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Create Design Ltd.
Address of the Factory	: Plot #1169, West Nandipara, Halim Complex, Trimohoni, Road, Khilgaon, Dhaka-1219, Bangladesh.
Present Status of the Factory	: Under Operation.
Structural Assessment Conducted by	: VEC
Date of Structural Inspection	: 14 th May, 2015
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 14 th May, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 14 th May, 2015
BGMEA Membership No.	: 6041

BASIC INFORMATION:

The assessed factory building is a two storied RCC flat plate system structure with RCC column. Ground floor is used for super market and entire 1st floor is occupied by Create Design Ltd. as a readymade garments factory. The following general information was noted:

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| i. Building Usage Type | : Garments factory& shopping complex. |
| ii. Structural System | : RCC column with flat plate system. |
| iii. Floor System | : RCC flat plate slab floor system. |
| iv. Floor Area | : Total floor area is 24141 sft. |
| v. No. of Stories | : 2 Storey. |
| vi. Construction Year | : 2009-2011. |
| vii. Foundation Type | : Isolated column footing foundation. |
| viii. Design Drawings | : Available: Approval plan, partial as built structural drawing
(without colume schedule and mismatch in grid spacing)
Not Available- Architectural drawing, machine layout |
| ix. Soil Investigation Report | : Available. |
| x. Construction Materials | : Brick aggregate. (Identified by removing plaster) |
| xi. Generator | : At 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:

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| Short Term (Immediate) | : None. |
| Mid Term (6-weeks) | : <ul style="list-style-type: none">• Remedial action to be undertaken to prevent the seepage of water from pipes and other sources.• Structural engineer to prepare full set of structural 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. |
| Long Term (6-months) | : |

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- Structural Develop set of as-built drawings showing structure details, loading, dimensions, levels, foundations and framing on Plan, Section and Elevation drawings.

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>	<ul style="list-style-type: none"> • None.
<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"> • 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. • Ensure minimum width of aisles as follows: <ul style="list-style-type: none"> (a) Seats on both sides of the aisle 1 m (b) Seats on one side of the aisle 0.9 m • Factory needs to have sufficient total width of marked aisles (5mm per occupant) at all the production building. • Lights in storage area needed to be installed with protective covers and conduits. • 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. • Factory need to ensure adequate number of exit sign as it is visible from any position and comply with the following condition: <ul style="list-style-type: none"> (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 foot-candles and 0.2 cd/ m² respectively.
<p>Mid Term</p> <p><i>(The remedial works indicated must be</i></p>	<ul style="list-style-type: none"> • Needs to have as built drawing with proper dimensions showing means of escape.

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<p><i>carried out within a period of 6 weeks)</i></p>	<ul style="list-style-type: none"> • 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 equipment. • Factory need to have proper testing plan & record for fire safety equipment. • All the exit doors of staircase enclosure need to be replaced by side swinging fire rated doors so that the staircase remains free from smoke as well as the lockable doors can be opened easily in the direction of evacuation without the use of a key. • Provide handrail on both sides of stairways. • Ensure adequate illuminated emergency lighting in floors, every exit and stair case landing. • 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. • Factory need to install one portable fire extinguisher per 550 sft.
<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"> • Factory needs to have a proper pre-plan for fire department • The north-east escape routes need to protect from ground floor need to provide protected paths of travel (2 hours fire rated construction with 1.5 hours fire rated opening) till to reach safe refuse area. • Storage area need to be protected with 2 hours rated construction & 1.5 hours rated opening or doors. • Boiler room is to have a 2 hour fire resistance construction and 1.5 hour rated opening having direct access from outside. • All the stairs need to be protected with fire and smoke resistant enclosures & 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. • 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. • The factory need to install manually operated electrical

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	<p>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> <ul style="list-style-type: none"> • Factory needs to install control panel for centralized and automatic fire detection and alarm system at required location. • Factory need to install 75mm diameter of standpipe system in the building. • Factory needs to install 1 riser per 1000 m2 of floor area and 38 mm diameter of hoses with variable nozzle. • Factory need to ensure the minimum pressure for standpipes supplying a 50mm or larger hose shall be at least 300 kPa and standpipe supplying first aid hose (38mm nominal) may have a minimum pressure of 200 kPa. • Factory needs to be installed with Siamese connection for to the standpipe system located outside the building and accessible to the fire department connection. • Factory needs to install standby generator for continuation of power supply in case of emergency. • Factory needs to have dedicated fire pump with backup power system & sufficient capacity for achieve required pressure in the remote place of the factory. • Factory needs to have sufficient water storage capacity to get adequate pressure to feed fire-fighting equipment and at least 1900liter x 75min=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"> • Ensure cables are properly terminated at its point of termination using appropriate size and type of lug.
<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"> • Ensure all distribution boards (including panel door) are earthed properly. • Ensure overcurrent protection device (circuit breaker/fuse) for each circuit/branch circuit. • Clean interior components from dust and debris and

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	<p>seal all openings within the enclosure to prevent dust and debris from entering.</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"> • Ensure graded rubber mats are provided in front of all distribution boards. • Provide dedicated & adequate size of earthing with proper identification for each circuit and ensure continuous earth path is back to main building intake • Rewire to ensure each incoming supply to an MCB has a dedicated supply from busbar. Avoid the use of multiple cables on outgoing side of MCB's. • Replace wooden base with metal clad construction for mounting the circuit breaker. • Ensure all electrical cables are sized according to capacity of circuit breakers • Provide emergency power connection for all life safety. • Connect all metal in the building to the building earthing system.
<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"> • Develop an electrical layout diagram and an as-built single line diagram detailing key components and capacity of the electrical system. • Establish a periodical Insulation and earth Resistance Measurement Program and record the related testing data. • Inspect electrical panel boards on an annual basis. • 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 provided as per list. • Provide adequate mechanical guards for electrical equipment and where necessary.

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	<ul style="list-style-type: none">• Provide adequate covers on cable channel.• Provide proper cable terminator/connector for stranded conductors at its point of termination.• Provide an emergency power generator with adequate capacity for the factory.• Install separate distribution boards for lighting and power circuits.• Install lightning protection system on the building.
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