

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: UNIGARDEN INCORPORATE PRINTING SOLUTION
Address of the Factory	: Plot No- B-136/137/138 Bscic B/I Shahongaon Fatullah, Narayanganj, Bangladesh.
Present Status of the Factory	: Under Operation.
Structural Assessment Conducted by	: TUV
Date of Structural Inspection	: 17 th June, 2015
Fire Assessment Conducted by	: TUV
Date of Fire Inspection	: 19 th June, 2015
Electrical Assessment Conducted by	: TUV
Date of Electrical Inspection	: 17 th June, 2015
BKMEA Membership No.	: 1303

BASIC INFORMATION:

The assessed factory have two nos. RCC buildings in factory premise. One is 7 storey and another one is 6 storey RCC building. In this literature, 7 storey buildings are named as building-1 and 6 storey building is named as building-2. Building-1 & Building-2 are used as main production unit and the structural system of both factory building is RCC beam column frame structure and RCC floor slab. The following information was noted:

i. Building Usage Type	: Garment Factory
ii. Structural System	: R.C.C beam column frame structure.
iii. Floor System	: Two way beam slab system.
iv. Floor Area	: The typical plinth area is 4733.77 sft. and total production floor is 28402.54sft
v. No. of Stories	: GF + 6 Floors (7 Storey), No Basement, (Building 1). GF + 5 Floors (6 Storey), No Basement, (Building 2).
vi. Construction Year	: 2006 (Building-1), 2013 (Building-2).
vii. Foundation Type	: Deep Foundation (As per structural drawing).
viii. Design Drawings	: Available.
ix. Soil Investigation Report	: Available.
x. Construction Materials	: Brick aggregate for (Building1), Stone aggregate for (Building-2).(Identified by removing Plaster)
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) :

- As built engineering drawing to be prepared and submitted for approval by appropriate authority. As part of this process building

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engineer will be required to make a number of checks on the structural design.

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>	<ul style="list-style-type: none"> • The minimum clear width of the pathway should be 0.9 meter • Provide aisle marking with arrow guiding • Provide additional firefighting equipment like sand & water buckets near exit or easily accessible area for first phase firefighting.
<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"> • Replace all existing exit doors on evacuation routes, exit doors with side hinged type door, which swing outward and in the direction of travel. Swinging of the door should not constrict the width of the corridor / passage below 0.9 meter. • Remove all locking device from all egress door. All exit doors should be open-able from the side they serve without the use of a key. • Provide handrails on both side of each stairway with height of 0.9m measured from the nose of stair to the top of the handrail. • Doors in stair should be outward opening, side-swing, self-closing, non-lockable 2 hours fire rated doors in all stair way encloses. • Within 6 Weeks, Prepare design for installation of fire rating smoke proof enclosure. 2 hours fire rating doors for exit should not be less than that of 4 hours fire resistance rating of the walls of the smoke proof fire rated entry lobby. • Within 6 Weeks, Prepare proper plan and design for fire rated barrier for 4 hour fire rating separated corridor at ground floor. • Within 6 Weeks, Prepare proper plan and design for 2 hrs fire rated barrier with 1.5 hrs fire rated door for

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	<p>storage area.</p> <ul style="list-style-type: none"> • Provide 2 hours fire rated door at 3rd floor boiler room, which located at the adjacent to finishing section. • The stairway should be illuminated with emergency lighting with power back-up supply & illumination should be a minimum of 10 lux for stairway. • Within 6 Weeks, Prepare plan and design for dedicated water storage tank for firefighting operation as per RMG guideline. • Within 6 Weeks, Prepare proper design and plan for fire lifts equipped with approved intercommunication (including two way voice communications) with the fire command station or control room on the ground floor lobby of the building. • Power backup supply should be provided for fire alarm system. • Visual alarm should be placed at the generator room. • Obtain the boiler license from the proper issuing authority. • Obtain the boiler operator license from the proper issuing authority.
<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"> • Install smoke proof fire rated entry lobby at emergency stairways to separate from the area of incidence. • All stairway to have direct access to outside of the factory building, which requires 4 hour fire rated construction at ground floor for fire separated corridor. • Provide 2 hrs fire rated barrier with 1.5 hrs fire rated door for storage area. • Provide dedicated storage tank for firefighting operation • Install fire lifts equipped with approved intercommunication (including two way voice communications) with the fire command station or control room on the ground floor lobby of the building.

(B): Recommendations for Electrical Safety corrective actions:

<p>Immediate</p> <p><i>(the factory should not continue to be occupied until these non-conformities</i></p>	<ul style="list-style-type: none"> • Over current protection devices (Circuit breakers) should be installed at all distribution panels.
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<i>have been rectified):</i>	
<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"> • Relocate panel boards away from water source /sinks (> 2.5 m).
<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 adequate illumination for substation. • Provide rubber mats of adequate size in front of all distribution panels. • Provide and maintain clear and legible identifications numbers & names on all incoming and outgoing circuits of HT / LT panels. • Adequate number of caution boards should be kept in the substation/ transformer room. • Select conductors and MCCB/MCB with adequate sizing without exceeding permissible current carrying capacity for insulation. • Avoid bunch of cable at MCCB/MCB and bus bar terminal, use individual circuit and over current device for every incoming and outgoing circuit at the distribution boards. • Provide circuit diagram /circuit list with proper current ratings and fuse size, marking for DBs identifying end use load, voltage, number of phases. • Provide cable joints of porcelain / PVC connectors with PIB tape wound around before placing the cable in the box. • Seal the cable penetrations through walls adequately with fire resistive elements. • Provide proper separate earthing/grounding to transformer. Ensure that transformer body frame to have two separate and distinct connections to the earth / ground. • Provide proper separate earthing/grounding to generator. Ensure that generator body frame to have two separate and distinct connections to the earth / ground. • Provide adequate earthing to body and doors to all MDBs / DBs / SDBs. Ensure that all electrical panels

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	provided with proper and separate earth potential.
<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"> • 1. Provide updated SLD matching the existing installation at the factory. 2. SLD to indicate exact positions of all points of switch boxes and other outlets. 3. SLD to be approved by the engineer-in-charge. • Provide adequate ventilation arrangements for indoor substation. • Provide 4 hour fire rated walls all around the generator room on ground level. • 1. Design to have proper segregation of different end used loads. 2. Wiring design to have separate and distinct sub-circuits for power and heating system. 3. All DBs to be placed conveniently. 4. Wiring to be neat, tidy and located near ceiling. • For buildings > 20m high, provide at least one vertical shaft of 200 x 400 mm for every 1500 sq.m. floor area. • Provide and maintain easy access and proper height of switchboard / panel boards (< 2m from floor level). • Each circuit should have a separate neutral (use of common neutral for more than one circuit shall not be permitted). • Provide adequate protection against lightning depending on the probability of a strike and acceptable risk levels at roof top of building.