

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

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| Name of the Factory | : Astras Garments Ltd. |
| Address of the Factory | : 44, New Eskaton Road, Mogbazar, Dhaka. |
| Present Status of the Factory | : Under Operation |
| Structural Assessment Conducted by | : TÜV SÜD Bangladesh (Pvt.) Ltd. |
| Date of Structural Inspection | : 2015-06-21 |
| Fire Assessment Conducted by | : TÜV SÜD Bangladesh (Pvt.) Ltd. |
| Date of Fire Inspection | : 2015-06-21 |
| Electrical Assessment Conducted by | : TÜV SÜD Bangladesh (Pvt.) Ltd. |
| Date of Electrical Inspection | : 2015-06-21 |
| BGMEA Membership No. | : 74 |

BASIC INFORMATION:

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| i. Building Usage Type | : Garment Factory (Rented) |
| ii. Structural System | : RCC beam slab. |
| iii. Floor System | : Beam slab |
| iv. Floor Area | : Total floor area is 1, 12,000 sq. ft. approx. |
| v. No. of Stories | : 7 storied |
| vi. Construction Year | : 1986 to 1988 – phase 1 1990 to 1992 – phase 2 |
| vii. Foundation Type | : Shallow foundation (spread footing) |
| viii. Design Drawings | : Available (Approval for a 7-Sorey commercial building from Rajuk). |
| ix. Soil Investigation Report | : Available |
| x. construction Materials | : Brick aggregate. |
| xi. Generator | : Ground floor. |

RECOMMENDATIONS FOR CORRECTIVE ACTION:

Columns were found in over stressed condition due to over load and inadequate member capacity which may pose risk to operations in the factory. During the assessment, various non-conformities were found for which immediate, mid-term and long term corrective action is recommended.

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| Short Term (Immediate) | : 1. Factory Management to remove any storage loading from Column supporting floors of the building and maintain Maximum live load not greater than 25.0 psf on the adjacent Slab panels of the central column and not greater than 5.0 psf on The adjacent slab panels of the edge column. 2. Factory Engineer to review design, loads and columns Stress for all columns. 3. Verify in-situ concrete stresses either by 100mm dia. Cores From columns at grids D4, B5 and H4. |
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4. A Detail Engineering Assessment of Factory to be Commenced, see attached Scope.

Mid Term (6-weeks) : 1. Produce and actively manage a loading plan for all floor Plates within the factory giving consideration to floor Capacity and column capacity.

2. Detail Engineering Assessment to be completed.

Long Term (6-months) : 1. Continue to implement load plan.

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> | N/A |
| <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> | N/A |
| <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 |

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| | <p>be open-able from the side they serve without the use of a key.</p> <ul style="list-style-type: none"> • Doors in stair should be outward opening, side-swing, self-closing, non-lockable 2 hours fire rated doors & 4 hour fire rated wall in all floor with occupied by other tenants. • 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.(Also require fire rated entry lobby at the floor occupied by other tenants) • Provide 1.5 hours fire rated doors at ground floor fabric store, which located at the adjacent to final evacuation route of both Stair 2. • Prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated door at 1st Floor electric boiler, which located at the adjacent to rest of the operational areas. • Replace existing 1 inch hose pipe with 1.5 inch hose pipe to meet the requirement of RMG guideline. • Prepare plan and design for dedicated water storage tank for firefighting operation as per RMG guideline. • 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. • Complete full design and plan for providing fire command station 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. • Obtain the boiler license from the proper issuing authority. |
| <p>Long Term (The remedial works indicated must be carried out within a period of 6 months)</p> | <ul style="list-style-type: none"> • Install smoke proof fire rated entry lobby at emergency stairways to separate from the area of incidence.(Also require fire rated entry lobby at the floor occupied by other tenants) • Provide 4 hours fire rated barriers with 2 hours fire rated door at 1st Floor electric boiler, which located at the adjacent to rest of the operational areas. • 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. • Provide fire command station 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. |

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(B): Recommendations for Electrical 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 (Actions that must be incorporated into a Fire Safety Management Plan immediately (a week) and should be a regular activity)</p> | <ul style="list-style-type: none"> • All strands cables at exposed ends should be properly soldered / crimped and insulated. |
| <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"> • 1. Provide updated Electrical layout drawing prepared after proper locations of all outlets for lamps, fans, fixed and transportable appliances, motors etc. • 2. Drawings to indicate exact positions of all points of switch boxes and other outlets to match existing installation. • 3. As built drawing to be approved by the engineer-in-charge. • Provide and maintain clear and legible identifications numbers & names on all incoming and outgoing circuits of HT and LT panels. • Individual Fuse protection should be provided to every 15 A socket. • The electrical panels to be of metal case and should be marked with “Danger 415 Volts” and identified with proper phase marking and danger signage. • Provide proper clearance of 0.8 - 1.0 m in front of all distribution panels/switchboards. • Provide circuit diagram /circuit list with proper current ratings and fuse size, marking for DBs identifying end use load, voltage, number of phases. • 1. provide sufficient and separate earthing for HT / LT panels in |

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| | <p>substation/transformer room</p> <p>2. Provide adequate number of earth electrodes.</p> <ul style="list-style-type: none"> • Provide adequate earthing to body and doors to LT. Ensure that all electrical panels 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 clearance in all sides of main HT, LT panel boards and transformer for easy maintenance. • Area of substation to meet requirements of Table 4.3 of RMG Guideline; the area should be 45m², or relocate the substation room. • Provide 4 hour fire rated wall and door all around the Substation and generator room on ground level. • Provide adequate cable trenches with non-flammable covers at substation areas. • Provide calibrated Voltmeters at distribution boards (LT). • Relocate the MDBs with easy access. Ensure that LT should have easy accessibility. • 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). • 1. Wooden switchboards / panel boards should be replaced by non-flammable materials. • 2. Prefer switchboards made of non-flammable materials. • Seal the cable entry-exit points of (LT/MDB/DB/SDB)'s with non-flammable materials. In addition: 1. Ensure that HT / LT panels / Switchgears to be vermin / damp proof. • 2. Ensure all unused holes / openings in DBs to be blocked properly. • 1. Provide the ECC to meet minimum cross-sectional area as per table 4.5. • 2. Ensure that connections between conductors / equipment's |

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| | <p>provided to durable electrical continuity and adequate mechanical strength and protection.</p> <p>3. The continuous earth connection is provided back to the main intake supply earth.</p> <ul style="list-style-type: none">• Provide adequate protection against lightning depending on the probability of a strike and acceptable risk levels at roof top of building. |
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