

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Apex Weaving & Finishing Mills Ltd.
Address of the Factory	: East Chandora,Shafipur,Gazipur,Bangladesh
Present status of the factory	: Under Operation
Structural Assessment Conducted by	: TÜV SÜD Bangladesh (Pvt.) Ltd.
Date of Structural Inspection	: 2015-11-25
Fire Assessment Conducted by	: TÜV SÜD Bangladesh (Pvt.) Ltd.
Date of Fire Inspection	: 2015-11-25
Electrical Assessment Conducted by	: TÜV SÜD Bangladesh (Pvt.) Ltd.
Date of Electrical Inspection	: 2015-11-25
BGMEA Membership No.	: 2624

BASIC INFORMATION:

The present garment factory is a factory building with RCC column and flat plat system structure. The following general information was noted:

- i. Building Usage Type : Not mentioned in the drawing.
- ii. Structural System : RCC column frame system.
- iii. Floor System : Rib Slab.
- iv. Floor Area : Finishing builsing-1: GF-60632 sft,
Entre building- 75488 sft .
Finishing building-2: GF-5799 sft,
Entre building- 17397 sft
Weaving building: GF-99035 sft,
Entre building- 129819 sft
Grey Fabric store building: GF-23318 sft,
Entire building-29786 sft.
- v. No. of Stories : Finishing building-1: GF+2nd floors,
Finishing building-2: GF+2st floors,
Weaving building: GF+1st floor.
Gray Fabric Store Building: GF+2 floors.
- vi. Construction Year : 1995, 2001.
- vii. Foundation Type : Isolated footing (shallow foundation).
- viii. Design Drawings : Available (Approval from 1 no. Khalikor Municipality,
Gazipur, Dhaka on dated 26 June, 2014)

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

- ix. Soil Investigation Report : Available.
- x. construction Materials : Brick Aggregated Column.
- xi. Generator : Generator is located outside the main building at the south-east corner.

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:

Columns were found in highly stressed condition due to extra-large tributary area and large size beam self-weight from upper floors and inadequate member capacity in weaving building which may pose risk to operations in the factory. Immediate, mid-term and long term corrective actions are recommended for this non-conformity. Detailed Engineering Assessment (DEA) is also recommended.

- Short Term (Immediate) : 1. No excessive storage was observed on the floors of overstressed columns but since columns are highly stressed hence not to use those floors for storage purpose as precaution until DEA not performed.
2. Factory Engineer to review design, loads and columns stresses in area identified above.
3. Verify in situ concrete stresses by 100mm dia. cores for central C2, D2, E2, F2 & G2 columns.
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.

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

- Long Term (6-months) : 1. Continue to implement load plan.
2. Building Engineer to check design of column whether is slender design done or not. If not, provide internal tie beam or increase the section of column to mitigate slenderness effect of columns.
3. Building Engineer to check the design of flat slab. Lateral system is required to ensure stability of the structure. 4. Sections of plaster finish to wall and stair concrete to be removed to investigate if dampness penetrates into the building structure Investigation needed to determine why dampness occurring. .

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>	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>	<ul style="list-style-type: none"> • No corrective actions Factory management should be checked alarm call points, alarm & detection system periodically and maintained the record properly. • The first aid hose and standpipe performance should be checked periodically and properly tagged.
<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"> • Prepare proper plan and design for more required exit in a way not to exceed the maximum travel distance 45 meter Or If the factory design to equip with an automated fire alarm, portable fire-fighting system and appropriate standpipe and hose system through the entire building the length of travel should not be exceed 60 meter. • Replace all existing exit doors on evacuation routes, exit doors with side hinged type door, which swing outward and in the

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>direction of travel. Swinging of the door should not constrict the width of the corridor / passage below 0.9 meter.</p> <ul style="list-style-type: none"> • 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. • Prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated doors at ground floor substation of finishing building & thermo oil heater room, which located at the adjacent to final evacuation route. • Prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated door at chemical shed, which located at the adjacent to weaving section. • The egress paths should be illuminated with emergency lighting with power back-up supply & illumination should be a minimum of 10 lux for all corridors & exit doors. Aisles should be provided with a minimum 2 lux. • Prepare proper design and plan for dedicated fire pump with alternate backup power supply. • 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. • Visual alarm should be placed at the generator room.
<p>Long Term (The remedial works indicated must be carried out within a period of 6 months)</p>	<ul style="list-style-type: none"> • Implement the plan and design for more required exit or implement with an automated fire alarm, portable fire-fighting system and appropriate standpipe and hose system through the entire building. • Provide 4 hours fire rated barriers with 2 hours fire rated doors at ground floor substation of finishing building & thermo oil heater room, which located at the adjacent to final evacuation route. • Provide 4 hours fire rated barriers with 2 hours fire rated door at chemical shed, which located at the adjacent to weaving section. • Install dedicated fire pump with alternate backup power supply. • Provide sufficient number of hose pipe at all utility building and travel distance as per RMG guideline. • Stand pipe supplying first aid hose should have minimum pressure of 200 KPa. • Provide dedicated storage tank for firefighting operation

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

(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 (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"> • Individual Fuse protection should be provided to every 15/20 A socket. • 1. Remove all the inflammable materials from surrounding of electrical circuitry at MDBs/SDBs. 2. Ensure that all electric circuitry clean of inflammable materials. 3. Conduct periodic maintenance and maintain the records. Provide cable connections with properly soldered / (LT/MDB/DB/SDB)'s. Ensure that all the electrical connections are properly secured with lugs. • Select conductor permissible current carrying capacity for insulation. • Avoid looping and bunching of circuit and over current device for every incoming and outgoing circuit at the distribution boards. • Provide circuit for DBs identifying end use load, voltage, number of phases. • Provide cable joints of before placing the cable in the box. • Provide proper separate earthing/grounding to generator. body frame to have two separate and distinct connections to the earth / ground. • Provide separate earthing connection to electrical e potential provided for all parts of equipment / installation (other than live parts) and that continuous earth connection is provided back to the main intake supply earth. • Provide adequate earthing to body and doors to all panels provided with proper and separate earth potential.

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

<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">• Substation room and generator room must be separated with 4 hour fire rated walls and door around the generator and substation room.• 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. n to have proper segregation of different end used loads.• Provide calibrated Ammeters / Voltmeters at distribution boards (LT/MDBs).• Each circuit should have a separate neutral (use of common neutral for more than one circuit shall not be permitted).• Seal 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 are provided to durable electrical continuity and adequate mechanical strength and protection. 3. The continuous earth connection is provided back to the main intake supply earth.• Provide adequate protection against and acceptable risk levels at roof top of building.
---	---