

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Thina Sweaters Ltd.
Address of the Factory	: Dagerchala, National University, Joydebpur, Gazipur.
Present Status of the Factory	: Under Operation
Structural Assessment Conducted by	: TÜV SÜD Bangladesh (Pvt.) Ltd.
Date of Structural Inspection	: 2015-10-29
Fire Assessment Conducted by	: TÜV SÜD Bangladesh (Pvt.) Ltd.
Date of Fire Inspection	: 2015-10-29
Electrical Assessment Conducted by	: TÜV SÜD Bangladesh (Pvt.) Ltd.
Date of Electrical Inspection	: 2015-10-29
BGMEA Membership No.	: 3731

BASIC INFORMATION:

i. Building Usage Type	: Knitwear's Factory.
ii. Structural System	: R.C.C Building
iii. Floor System	: Beam-slab floor system.
iv. Floor Area	: The typical plinth area of 7 storied RCC building is 8600 sft. Total operational area is 60,200sft.
v. No. of Stories	: 7-Storey.
vi. Construction Year	: The building was constructed in a single phase, where Construction of all floors in 1st phase was started on 2004 and Completed on 2005
vii. Foundation Type	: According to the approval drawings, Shallow foundation has Been used.
viii. Design Drawings	: Approval available only but as-built drawing (approval for seven Storied from Assistant Engineer of district office, Gazipur, on 30th October, 2002 for Commercial Building use).
ix. Soil Investigation Report	: Available.
x. construction Materials	: Brick Aggregated.
xi. Generator	: The generator room is located at the ground floor of the factory Building.

RECOMMENDATIONS FOR CORRECTIVE ACTION: Column was found in moderately stressed condition due to excessive tributary area, which may pose risk to operations in the factory. During the assessment, other non-conformities were found. Mid-term and long term corrective actions are recommended.

Short Term (Immediate)	: N/A
Mid Term (6-weeks)	: 1. Factory Engineer to review design, loads and columns stresses in area identified above. 2. Verify in-situ concrete stresses either by 100mm dia. cores or existing cylinder strength data for J-6, B-5, B-6, J-7 column or 100mm dia. cores from 4 columns.
Long Term (6-months)	: 1. Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.

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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>	<ul style="list-style-type: none"> • Remove all temporary items from all escape routes, aisles and passageway. • Provide aisle marking with arrow guiding and exit signage on all Evacuation pathways or provided with overhead signage fixed at ceiling level. <ul style="list-style-type: none"> - Illuminated exit sign should be posted above the exit door, - It should be clearly visible at all time, - Provide directional signs wherever necessary. - All exit doors should be clearly marked for easy identification. • 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. • Provide additional firefighting equipment like sand & water buckets near exit or easily accessible area for first phase firefighting. • Fire drill should be conducted quarterly (4 times a year) in existing buildings as detailed under the Fire Safety Plan & should kept record properly.
<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,

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	<p>non-lockable 2 hours fire rated doors in all stair way encloses.</p> <ul style="list-style-type: none"> • 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. • The stairway should be illuminated with emergency lighting with power back-up supply & illumination should be a minimum of 10 lux for stairway. • Install Manual activation call point at all exit routes • Provide adequate nos. of smoke detectors to cover the whole factory building. • Replace existing 1 inch hose pipe with 1.5 inch hose pipe to meet the requirement of RMG guideline. • Visual alarm should be placed at the generator room. • Cover all units / floors in a valid fire license. • Obtain the boiler license from the proper issuing authority. • Obtain the boiler operator license from the proper issuing authority. • 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. • Produce design and plan for automatic detection system with automatic fire alarm and control panel. • Prepare proper design and plan for dedicated fire pump with alternate backup power supply. • 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.
<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. • Install automatic detection system with automatic fire alarm and control panel. • Install dedicated fire pump with alternate backup power supply.

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	<ul style="list-style-type: none"> • Stand pipe supplying first aid hose should have minimum pressure of 200 KPa. • 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:

<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 <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"> • 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"> • Provide rubber mats of adequate size in front of distribution panel MDB/DBs. • Individual Fuse protection should be provided to every 15/20 A socket. • Select conductors and MCCB/MCB with adequate sizing without exceeding permissible current carrying capacity for insulation. • Avoid looping and bunch of cable at MCCB/MCB or bus bar

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	<p>terminal, use individual circuit and over current device for every incoming and outgoing circuit at the distribution boards.</p> <ul style="list-style-type: none"> • Provide circuit diagram /circuit list with proper current ratings and fuse size, marking for MDBs/DBs/SDBs 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. • Provide proper separate earthing/grounding to generator. Ensure that generator body frame to have two separate and distinct connections to the earth / ground. • Provide separate earthing connection to electrical equipment's. Ensure that earth 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 MDB. Ensure that all electrical panels provided with proper and separate earth potential.
<p>Long Term <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. • 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 4 hour fire rated walls all around the generator room on ground level. • Modify Area of generator room to meet requirements of Table 4.4, RMG Guideline; the area should be 40 m², or relocate the generator room. • Provide and maintain proper clearance in all sides of generator for ease of maintenance.

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	<ul style="list-style-type: none">• 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. • Provide calibrated Ammeters at distribution boards (MDB). • For buildings > 20m high, provide at least one vertical shaft of 200 x 400 mm for every 1500 sqm. floor area. • Each circuit should have a separate neutral (use of common neutral for more than one circuit shall not be permitted). • Seal the cable entry-exit points of (MDB) with non-flammable materials. In addition:<ol style="list-style-type: none">1. Ensure all unused holes / openings in MDB to be blocked properly. • <ol style="list-style-type: none">1. Provide the ECC to meet minimum cross-sectional area as per table 4.5.2. Ensure that connections between conductors / equipment's 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 lightning depending on the probability of a strike and acceptable risk levels at roof top of building.
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