

## **Summary of Preliminary Assessment on Structural, Fire and Electrical Safety**

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Name of the Factory	: Aji Apparels Industry Ltd.
Address of the Factory	: 226 Singair Road, Hemayetpur, Savar, Dhaka. Bangladesh.
Present Status of the Factory	: Under Operation.
Structural Assessment Conducted by	: TUV
Date of Structural Inspection	: 16 <sup>th</sup> March, 2015
Fire Assessment Conducted by	: TUV
Date of Fire Inspection	: 16 <sup>th</sup> March, 2015
Electrical Assessment Conducted by	: TUV
Date of Electrical Inspection	: 16 <sup>th</sup> March, 2015
BGMEA Membership No.	: 2181

### **BASIC INFORMATION:**

AJI Apparels Industry Ltd, a sister concern of AJI Group, is situated in a production complex of three adjacent buildings and housed in a 7-storey rectangular building with a semi-basement. The 6th floor of the building is the corporate office of Aji Group, and the 1st and 3rd floors are the operational floors of FRM Fashion House Ltd. Aji Apparels Industry Ltd. solely functions on the 5th floor of the building, and functions on the remaining floors ( Basement, Ground, 2nd and 4th ) combined with FRM Fashion House Ltd. There is a vertical extension of a profile-roofed shed on the 6th floor roof of the building. The following general information was noted:

i. Building Usage Type	: Garment factory.
ii. Structural System	: RCC beam column + flat slab with edge beam system.
iii. Floor System	: Ground floor to 1 <sup>st</sup> floor is Beam-slab system and rest of the floor is flat slab with edge beam.
iv. Floor Area	: The typical plinth area is 8030 sft. (approx.) Approx. 8, 030 sft. is utilized completely for production of AJI Apparels Industry Ltd. and Approx.32,120 sft. is shared for production purposes with AJI Apparels Ltd.
v. No. of Stories	: Basement + 7 Storey + Shed
vi. Construction Year	: 2004-2005.
vii. Foundation Type	: Cast in situ Pile Foundation (As per structural drawing).
viii. Design Drawings	: Available (Signed by Tetuljhora Union Parisad on 25th June, 2009)
ix. Soil Investigation Report	: Available.
x. Construction Materials	: Stone Aggregated in columns, Brick Aggregate in slabs & beams.
xi. Generator	: Ground floor of South-direction Adjacent building.

### **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)	:	
		<ul style="list-style-type: none"><li>• Factory Engineer to review design, loads and columns stresses for all columns.</li></ul>

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- Verify in-situ concrete stresses by 100mm dia. cores from 4 columns.
  - A Detail Engineering Assessment of Factory to be commenced, see attached Scope.
- Mid Term (6-weeks) :
- Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.
  - Detail Engineering Assessment to be completed.
  - Factory Engineer to review design, loads and punching capacity for slabs.
  - The factory management needs to plan for an alternative location to relocate the stacked fabric materials on the 4th floor cantilever.
- Long Term (6-months) :
- Continue to implement load plan.
  - Carry out any remedial actions as directed by the Building Engineer if required regarding punching capacity of slabs.
  - Carry out any remedial actions as directed by the Management regarding remedy of overloading on 4th floor cantilever.

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"> <li>• None.</li> </ul>
<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"> <li>• The minimum clear width of the pathway should be 0.9 meter</li> <li>• Remove all temporary items from all escape routes, aisles and passageway.</li> <li>• Provide arrow guiding overhead signage fixed at ceiling level               <ul style="list-style-type: none"> <li>- Provide directional signs wherever necessary.</li> <li>- It should be clearly visible at all time</li> <li>-Signage should be uniform.</li> </ul> </li> <li>• Combustible materials should keep away from electrical appliances and all the lighting in storage area must have protecting covers and wiring must be in conduits.</li> </ul>

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<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"> <li>• 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.</li> <li>• 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.</li> <li>• 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.</li> <li>• Doors in stair should be outward opening, side-swing, self-closing, non-lockable 2 hours fire rated doors in all stair way encloses.(Also require fire rated door at the floor occupied by other tenants)</li> <li>• Provide smoke and heat vents on the roof / ceiling / wall at godown section.</li> <li>• The egress paths should be illuminated with emergency lighting with power back-up supply &amp; illumination should be a minimum of 10 lux for all corridors &amp; exit doors. Aisles should be provided with a minimum 2 lux.</li> <li>• Prepare proper design and plan for dedicated fire pump with alternate backup power supply.</li> <li>• Replace existing 1 inch hose pipe with 1.5 inch hose pipe to meet the requirement of RMG guideline.</li> <li>• 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.</li> </ul>
<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"> <li>• Install dedicated fire pump with alternate backup power supply.</li> <li>• Stand pipe supplying first aid hose should have minimum pressure of 200 KPa.</li> <li>• 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.</li> </ul>

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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"> <li>• None.</li> </ul>
<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"> <li>• All strands cables at exposed ends should be properly soldered / crimped and insulated.</li> <li>• Relocate switchboards away from gas stoves / sinks / washing area / laundry (&gt; 2.5 m).</li> <li>• 1. Disconnect the loads from cable of signs of overloading / abnormal temperature found.</li> <li>2. Make necessary repairs to avoid further accidents.</li> </ul>
<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"> <li>• 1. Provide updated SLD matching the existing installation at the factory.</li> <li>2. SLD to indicate exact positions of all points of switch boxes and other outlets.</li> <li>3. SLD to be approved by the engineer-in-charge.</li> <li>• 1. Provide updated Electrical layout drawing prepared after proper locations of all outlets for lamps, fans, fixed and transportable appliances, motors etc.</li> <li>2. Drawings to indicate exact positions of all points of switch boxes and other outlets to match existing installation.</li> <li>3. As built drawing to be approved by the engineer-in-charge.</li> <li>• 1. Remove all the inflammable materials from surrounding of electrical circuitry at MDBs/DBs.</li> <li>2. Ensure that all electric circuitry clean of inflammable materials.</li> <li>3. Conduct periodic maintenance and maintain the records.</li> <li>• Provide cable connections with properly soldered / welded lugs at MDB's. Ensure that all the electrical connections are properly secured with lugs.</li> <li>• Avoid looping and 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</li> </ul>

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	<p>distribution boards.</p> <ul style="list-style-type: none"> <li>• Provide cable joints of porcelain / PVC connectors with PIB tape wound around before placing the cable in the box.</li> <li>• Provide proper separate earthing/grounding to generator. Ensure that generator body frame to have two separate and distinct connections to the earth / ground.</li> <li>• 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.</li> <li>• Provide adequate earthing to body and doors to all MDBs / DBs. Ensure that all electrical panels provided with proper and separate earth potential.</li> </ul>
<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"> <li>• Provide adequate cable trenches with non-flammable covers at substation areas.</li> <li>• 1. Design to have proper segregation of different end used loads.</li> <li>2. Wiring design to have separate and distinct sub-circuits for power and heating system.</li> <li>3. All DBs to be placed conveniently.</li> <li>4. Wiring to be neat, tidy and located near ceiling.</li> <li>• Provide calibrated Ammeters / Voltmeters at distribution boards LT's</li> <li>• Relocate the MDBs with easy access. Ensure that all MDBs / SDBs should have easy accessibility.</li> <li>• For buildings &gt; 20m high, provide at least one vertical shaft of 200 x 400 mm for every 1500 sq.m. floor area.</li> <li>• Energy meters should be installed at convenient height (At least 1.5 m above ground) with proper protection.</li> <li>• Provide and maintain easy access and proper height of switchboard / panel boards (&lt; 2m from floor level).</li> <li>• Power cables/ telecommunication cables / antenna cables should be laid separately.</li> </ul>

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	<ul style="list-style-type: none"><li>• Each circuit should have a separate neutral (use of common neutral for more than one circuit shall not be permitted).</li><li>• Provide the wiring in PVC conduits or in metallic GI pipes. Ensure that all electrical wiring should be covered in proper conduit pipes.</li><li>• Seal the cable entry-exit points of MDB/DB's with non-flammable materials. In addition:<ol style="list-style-type: none"><li>1. Ensure that Distribution boards / Switchgears to be vermin / damp proof.</li><li>2. Ensure all unused holes / openings in DBs to be blocked properly.</li></ol></li><li>• <ol style="list-style-type: none"><li>1. Provide the ECC to meet minimum cross-sectional area as per table 4.5.</li><li>2. Ensure that connections between conductors / equipment are provided to durable electrical continuity and adequate mechanical strength and protection.</li><li>3. The continuous earth connection is provided back to the main intake supply earth.</li></ol></li><li>• Provide adequate protection against lightning depending on the probability of a strike and acceptable risk levels at roof top of building.</li></ul>
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