

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Appropriate Apparels Ltd.
Address of the Factory	: Mouchak, Kaliakoir, Gazipur, Bangladesh
Present Status of the Factory	: Under Construction.
Structural Assessment Conducted by	: ACCORD
Date of Structural Inspection	: 7 th March, 2015
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 2 nd July, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 2 nd July, 2015
BGMEA Membership No.	: 5555

BASIC INFORMATION:

The assessed factory building is a 6 storied RCC building having beam column frame and beam slab floor system. From ground floor to 3rd floor of the building is used by another factory named as “Mouchak Knit Composite Ltd.” From 4th floor to 5th floor is used by the assessed factory. The two floors (4th & 5th floors used by the factory) are fully under construction. The following general information were noted:

i. Building Usage Type	: Garment Factory.
ii. Structural System	: RCC beam-column frame system.
iii. Floor System	: RCC beam slab floor system.
iv. Floor Area	: Total production floor will be 31750 sft.(4 th and 5 th floor)
v. No. of Stories	: 6- storied.
vi. Construction Year	: Not identified. (From ACCORDs report)
vii. Foundation Type	: Not identified. (From ACCORDs report).
viii. Design Drawings	: Available but mismatch.
ix. Soil Investigation Report	: Not identified. (From ACCORDs report).
x. Construction Materials	: Not identified. (From ACCORDs report).
xi. Generator	: Not identified. (From ACCORDs report).

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)	:
	<ul style="list-style-type: none">• Factory Engineer to review design, loads and columns stresses in columns supporting toilet, water tank and additional roof top loads.• Verify insitu concrete strengths either by taking 100mm diameter cores from 4 columns at Ground Floor (min) or by using existing cylinder strength data for Ground floor columns if available.• 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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- Building Engineer to confirm design loading of slabs and incorporate it into the loading plan for all floor plates within the Building.
- Seek approval from building authorities for additional roof top construction.

Long Term (6-months)

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- Continue to implement the load management plan.
 - Continue to implement the load management plan.
 - Building Engineer to produce accurate as-built drawings.

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"> • None.
<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"> • Fire drill shall be conducted quarterly (4 times a year) under the Fire Safety Plan. A record of such drills shall be kept in writing for at least 3 years for the inspection of fire brigade whenever called for. • Factory needs to have marked aisles in all working floor according to 0.9m for one side seat and 1.0m for both side seat. • All required means of exit or exit access in buildings or areas requiring more than one exit shall be signposted. The signs shall be clearly visible at all times, where necessary supplemented by directional signs. • Factory need to be installed with adequate number and types of portable fire extinguishers at all floors as per NTPA Guideline.
<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"> • Factory needs to prepare as built drawing with floor machine layout showing means of escape with proper dimension. • Factory need to have valid fire license with mentioning full occupied area by the factory. • Fire manager/Director need to have safety training from proper authority & worker of the factory should as far as possible be trained for use fire extinguisher. • All the firefighting equipment need to be tested with proper documents.

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	<ul style="list-style-type: none"> • All the exit doors need to be replaced by side swinging so that un-lockable doors can be opened easily in the direction of evacuation without the use of a key. • Factory needs to provide handrail on both sides of all the stairways. • Factory needs to be installed with adequate illuminated emergency lighting in floors, exits & stairs.(Escape route). • Factory need to have emergency backup power for critical fire safety system with sufficient capacity & arrangement according to NTPA Guideline. • Factory needs to install standby generator with required backup power.
<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"> • Fire department pre-plan needs to be developed. • Final exit route-1 (stair-1 route) need to be protected (2 hours rated construction with 1.5 hours rated door) at each floor level entrance including ground floor and need to be protected from fabric stores of another factory at ground floor by 4 hours fire rated lobby/construction with 2 hours rated door/opening, also need to have protected escape route till to reach safe refuse area. • All the stairs (stair-1 and 2) need to be protected with fire and smoke resistant enclosures and opening (2 hours rated enclosure and 1.5 hour rated door) and provide the protected route from all though the stairway to the final exits. Also Stair-2 needs to be protected from fabric stores of another factory at ground floor by 4 hours fire rated lobby/construction with 2 hours rated door/opening and provide the protected route from all though the stairway to the final exits. • Stair-1 needs to be protected with fire and smoke resistant enclosures and opening (2 hours rated enclosure and 1.5 hour rated door) and needs to be protected from fabric stores of another factory at ground floor by 4 hours fire rated lobby/construction with 2 hours rated door/opening and provide the protected route from all though the stairway to the final exits. • Factory need to install centralized and automatic fire detection & alarm system on all occupied floors, including other tenanted floors of the building as per NTPA Guideline. • The factory need to install manually operated electrical fire alarm system and automatic fire alarm system with

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	<p>single or multiple call boxes on all occupied floors, including other tenanted floors of the building.</p> <ul style="list-style-type: none"> • Factory needs to install control panel for centralized automatic smoke detection & fire alarm system according to NTPA Guideline. • Factory needs to install proper standpipe system with having at least 100 mm dia of riser. • Install 1 riser per 1000 m² of floor area & Install adequate number of hose in floor area and the minimum hose diameter is 38 mm, or 1.5" preferably fabric hose with variable nozzle to be used in both of the stairways covering the floor area. • Factory need to ensure the minimum pressure for standpipes supplying a 50mm or larger hose shall be at least 300 kPa and standpipe supplying first aid hose (38mm nominal) may have a minimum pressure of 200 kPa. • Factory needs to be installed with Siamese connection for to the standpipe system located outside the building and accessible to the fire department connection. • Factory needs to have dedicated fire pump with backup power system & sufficient capacity for achieve required pressure in the remote place of the factory. • Factory needs to have sufficient water storage capacity to get adequate pressure to feed fire-fighting equipment and at least 1900ltr x 75min=142500 liters water storage tank.
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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"> • None.
<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"> • Ensure inspection of all earthing system is being completed and documented.
<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"> • Install appropriate number and type of safety signage and fire-fighting equipment at substation. • Provide Instruction board for first aid and artificial respiration in the substation room and generator room. • Fill the transformer breather with fresh Silica gel and

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	<p>oil cup with fresh Oil.</p> <ul style="list-style-type: none">• Connect all metal in the building to the building earthing system.
<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">• Establish a periodical Insulation and earth Resistance Measurement Program and record the related testing data.• Ensure the substation room has adequate fire separation from the production area.• Ensure underground cables for electrical distribution in the premises are encased in GI or PVC pipes and laid in earth trenches of sufficient depth as per mentioned standard.• Ensure all high tension cables are laid following standard cable laying techniques.• Install lightning protection system on the building.