

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: ANTHONY YOUNG GARMENTS LTD.
Address of the Factory	: 519, Bhurulia, Joydevpur, Gazipur, Dhaka-1700, Bangladesh.
Present Status of the Factory	: Under Operation.
Structural Assessment Conducted by	: VEC
Date of Structural Inspection	: 30 th January, 2015
Fire Assessment Conducted by	: VEC
Date of Fire Inspection	: 30 th January, 2015
Electrical Assessment Conducted by	: VEC
Date of Electrical Inspection	: 30 th January, 2015
BKMEA Membership No.	: 1844.

BASIC INFORMATION:

The assessed factory building was a 6 -Storey RCC building with partial basement on the south side of the building below the ground level. The structural system of the building is RCC beam column frame and beam slab floor system. The entire building is used for industrial purpose. The following information was noted:

i. Building Usage Type	: Garment Factory.
ii. Structural System	: RCC beam column frame system.
iii. Floor System	: RCC beam slab system.
iv. Floor Area	: Total floor area is 31664 sft.
v. No. of Stories	: 6 storied building with partial basement.
vi. Construction Year	: 2008-2013.
vii. Foundation Type	: Isolated footing foundation.
viii. Design Drawings	: Unavailable.
ix. Soil Investigation Report	: Available.
x. Construction Materials	: Brick aggregate. (Identified by removing plaster)
xi. Generator	: At Ground floor.

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">• Knitting machine to be removed in between grid 1 and 3 in the ground floor.• Detail Engineering Assessment to be commenced.
Mid Term (6-weeks)	:	<ul style="list-style-type: none">• Produce and actively manage a loading plan for all floors within the factory giving consideration to floor capacity and column capacity.
Long Term (6-months)	:	<ul style="list-style-type: none">• As built architectural and structural drawings to be prepared as a part of Detail Engineering Assessment (DEA).

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- Continue to monitor cracking of beam on an ongoing basis.
- Continue to implement load plan corrosion.

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"> • Ensure adequate numbers of fire drills under the fire safety plan. • Lights in storage area need to be installed with protective covers and fire rated conduit. • Storage facilities with no air-conditioning duct shall be minimum 2.9m and when used as a storage facility there shall be a minimum clearance of one-third the floor height from the ceiling to the top of the storage stack.
<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"> • Needs to have as built drawing with floor machine layout showing means of escape with proper dimension. • Fire license needs to be updated for the full occupied area • Factory Manager/Director needs to arrange fire safety training for the authority & workers time to time from proper authority. • Each factory shall have a trained officer who shall be responsible for the proper maintenance and for keeping updated records of all firefighting equipment's. • Ensure adequate illuminated emergency lighting in floors, exits & stairs. • Factory need to have emergency backup power for critical fire safety system with sufficient capacity & arrangement according to NTPA Guideline • Provide handrail on both sides of stairways • Factory needs to provide 2 hours rated wall & door opening between knitting section & bonded ware house • Factory needs to have sufficient water storage capacity

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	to get adequate pressure to feed fire-fighting equipment.
<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 need to be developed. • All the lockable exit doors need to be replaced by an opening system so that the doors can be opened easily in the direction of evacuation & all exit access doors shall be of a side-swinging type. • Final exit route of stair-1 need to protected from the working floors by 2 hours rated construction with 1.5 hours rated door at ground floor level, also need to have a protected route from the each floor exit/entry (with 2 hours rated enclosure & 1.5 hours rated door)to till reach safe refuge area. <p>Final exit route of stair-2 need to protected from the working floor by 2 hours rated construction with 1.5 hours rated door at ground floor level, also need to have a protected route from the each floor exit/entry (with 2 hours rated enclosure & 1.5 hours rated door)to till reach safe refuge area.</p> <ul style="list-style-type: none"> • Ensure slope of ramp not steeper than 1 vertical in 8 horizontal. • Increase the width of the steel stair (south-east) at least 0.9 m • Generator room needs to be fire separated with 4hr fire rated enclosure and 2hrs rated opening having direct access from outside. • Boiler room shall be situated on the periphery of the factory building and shall have a 4 hour fire resistance wall. • Factory need to be protect both of the stair with 2 hours rated enclosure & 1.5 hours rated door/opening in each floors level • Needs to install automatic fire & smoke detection system. • Ensure required number of fire alarm call point. • Install proper standpipe system having at least 100 mm dia of standpipe. • Basement staircase shall be encased and placed near the outer edge of the basement with materials of 2 hours fire resistance Communication with the basement in case of emergency shall be maintained through a lobby provided with a fire resisting self-closing door of 1 hour fire resistance. • Ensure the minimum pressure for standpipes supplying a 50mm or larger hose shall be at least 300 Kpa. For standpipe supplying first aid hose (38 mm nominal)

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	<p>may have a minimum pressure of 200 Kpa.</p> <ul style="list-style-type: none"> • Siamese connection needs to the standpipe or to the delivery pipe of the gravity roof storage tank • Install dedicated fire pump with backup power system & sufficient capacity to achieve required pressure in the remote place of the factory.
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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"> • Find out cause (improper cable selection, improper protective device selection, improper termination, rusted connection, heat source etc.) of burning sign and take proper action including replacing cable or equipment where necessary. • Find out the cause (improper cable/over current selection, over loading, improper lug, improper cable joints, rusted connection, insulation damage, multiple cables at single point,) of overheating (> ambient+ 40°C) and take proper action.
<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 distribution boards (including panel door) are earthed properly. • Ensure all electrical cables are properly terminated at its point of termination.
<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 and generator room. Also ensure graded rubber mats are provided in front of all distribution boards. • Provide Instruction board for first aid and artificial respiration in the substation room and generator room. • Fill the transformer oil cup with fresh Oil. • Provide two separate and distinct connections of earthing for the generator. • Provide dedicated & adequate size of earthing with proper identification for each circuit. • Rewire to <ul style="list-style-type: none"> i) Ensure each incoming supply to an MCB has a dedicated supply from earth busbar. ii) Avoid the use of multiple cables on outgoing side of

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	<p>MCB's.</p> <ul style="list-style-type: none"> • Replace wooden bases with metal clad construction for mounting the lighting boards and switch controls. • Ensure all electrical wiring and cables are sized according to capacity of circuit breakers within distribution boards. • Ensure cable joints are made in respect of conductivity, insulation and mechanical strength. • Ensure overcurrent protection device (circuit breaker/fuse) for each circuit/branch circuit. • Ensure Lighting fixtures are supported from the structure. • Find out the cause (improper cable/over current selection, over loading, improper lug, improper cable joints, rusted connection, insulation damage, multiple cables at single point,) of overheating { ambient+(20°C-40°C)} and take proper action.
<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"> • Develop an electrical layout diagram and an as-built single line diagram detailing key components and capacity of the electrical system. • Establish a periodical Insulation and earth Resistance Measurement Program and record the related testing data. • Inspect electrical switchgear and panel boards on an annual basis. • Ensure the substation room has adequate fire separation from the production area. • Provide adequate means of ventilation for the substation room based on the installed equipment and ensure that ventilation does not impact on fire barriers, e.g. fire dampers. • Ensure all high tension cables are laid following standard cable laying techniques. • Ensure the generator room has adequate fire separation from the production area. • Replace distribution board with metal enclosed body. • Ensure distribution boards have no opening and all live

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	<p>internal components are concealed properly.</p> <ul style="list-style-type: none">• Provide dedicated & adequate size of neutral with proper identification for each circuit.• Ensure each distribution board is provided with a circuit list and means of identification is obtained as per list.• Provide adequate support or mechanical guards for electrical equipment and wiring where necessary.• Provide proper cable terminator/conductor for stranded conductors at its point of termination.• Install separate distribution boards for lighting and power circuits.• Install lightning protection system on the building.
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