

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: ANINDYA APPARELS LTD.
Address of the Factory	: Word No: 07, Chandra, Kaliakoir, GAZIPUR, and Bangladesh.
Present Status of the Factory	: Under Operation
Structural Assessment Conducted by	: VERITAS Engineering & Consultant
Date of Structural Inspection	: 2015-07-07
Fire Assessment Conducted by	: VERITAS Engineering & Consultant
Date of Fire Inspection	: 2015-07-07
Electrical Assessment Conducted by	: VERITAS Engineering & Consultant
Date of Electrical Inspection	: 2015-07-07
BKMEA Membership No.	: 1545

BASIC INFORMATION: Single storied PEB shed which is covered with Profile sheet. RCC tied columns are used as column and single angle bars are used in roofing truss frame. The following general information were noted:

i. Building Usage Type	: Garment factory.
ii. Structural System	: Steel truss on RCC tied column.
iii. Floor System	: Steel truss.
iv. Floor Area	: 14150 sft.
v. No. of Stories	: Single storey.
vi. Construction Year	: 2010
vii. Foundation Type	: Isolated footing
viii. Design Drawings	: Available (Not credible).
ix. Soil Investigation Report	: Not Available.
x. construction Materials	: Brick aggregate
xi. Generator	: Ground floor.

RECOMMENDATIONS FOR CORRECTIVE ACTION: Corrective action for structure are,

Short Term (Immediate)	: N/A
Mid Term (6-weeks)	: 1. Design should be checked by the Building Engineer to verify the structural integrity of the roofing frame against wind force.
Long Term (6-months)	: 1. Necessary corrective measures to be completed if required as per the structural verification recommendation. 2. Building Engineer should prepare full set of as built structural drawing. 3. Install bracing on roofing system if required.

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

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"> • Factory needs to conduct fire drill quarterly (4 times a year) under the fire safety plan and needs to kept the written record of such drills for at least 3 years for the inspection of fire brigade whenever called for. • Factory need to have proper testing plan & record of fire safety equipment. • 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. • Lights in storage area needed to be installed with protective covers and conduits. • Combustibles are to be managed with good housekeeping. 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. • 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. • Potable fire extinguisher needs to be of an approved type and installed as per manufacturer's instruction and placed near the path of exit travel where easily accessible. Portable fire extinguisher needs to be installed in private and public buildings as per specification and requirements of BDS 825:1991 (BDS 825:91).
<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. • 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. • Factory need to have proper testing plan & record for fire safety

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>equipment.</p> <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 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.
<p>Long Term (The remedial works indicated must be carried out within a period of 6 months)</p>	<ul style="list-style-type: none"> • Fire department pre-plan needs to be developed. • The final exit-2 need to be protected from compressor room by 4 hours rated construction with 2 hours rated doors/opening also need to have the protected escape route till to reach safe refuse area. • Storage area need to be protected with 2 hours rated construction and 1.5 hours rated opening or doors. • Generator room and wastage store need to be protected by 4 hours rated construction with 2 hours rated doors/opening till to reach safe refuse area • 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 single or multiple call boxes on all occupied floors, including other tenanted floors of the building. • 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 75 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. For standpipe supplying first aid hose (38mm nominal) may have a minimum pressure of 200 Kpa.

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<ul style="list-style-type: none"> • 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 need to have sufficient water storage capacity to get adequate pressure to feed fire-fighting equipment and at least $1900 \times 75 = 142500$ 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"> • Remove all unused cables from distribution boards and make sure all necessary cables are properly terminated at its point of termination using appropriate size and type of lug.
<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"> • Ensure panel doors of all distribution boards are earthed properly. • Ensure overcurrent protection device (circuit breaker/fuse) for each circuit/branch circuit. • Clean interior components from dust and debris and seal all openings within the enclosure to prevent dust and debris from entering. • Ensure inspection is being completed and documented for all earthing system.
<p>Mid Term</p> <p><i>(The remedial works indicated must be carried out within a</i></p>	<ul style="list-style-type: none"> • Post safety signage and install appropriate number and type of fire-fighting equipment in generator room and ensure graded rubber mats are provided in front of all distribution boards. • Provide Instruction board for first aid and artificial respiration in the generator room. • Ensure in the generator room, all working place, exit light and escape light have adequate illumination level as per standard.

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

<p><i>period of 6 weeks)</i></p>	<ul style="list-style-type: none"> • Provide two separate and distinct connections of earthing for the generator. • Install the circuit breaker in proper way to ensure safe installation. • Provide dedicated & adequate size of earthing with proper identification for each circuit from the earth busbar of distribution boards and ensure continuous earth path is back to main building intake. • Rewire to avoid the use of multiple cables from incoming and outgoing side of MCB's/MCCB's. • Ensure all electrical cables are sized according to capacity of circuit breakers. • Provide adequate support or mechanical guards for electrical equipment and wiring where necessary. • Ensure cable joints are made in respect of conductivity, insulation and mechanical strength. • Connect all metal in the factory to the main earthing system. • Ensure Lighting fixtures are supported from the structure properly and if flexible cords are used to support light fixture then make sure it has enough strength to carry the weight.
<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"> • 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 panel boards on an annual basis. • Ensure overhead service connections to a building are achieved with covered conductor and adequate size and type of service masts. • Ensure panel boards have no opening and all live internal components are concealed properly. • 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 proper cable terminator/conductor for stranded conductors.

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	<ul style="list-style-type: none">• Install separate distribution boards for lighting and power circuits.• Install lightning protection system on the building.
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