Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: URANUS APPAREL (PVT.) LTD.
Address of the Factory	: Jhazor, Gazipur, Dhaka-1704, Bangladesh.
Present Status of the Factory	: Under Operation
Structural Assessment Conducted by	: ACCORD
Date of Structural Inspection	: 2015-03-08
Fire Assessment Conducted by	: VERITAS Engineering & Consultant
Date of Fire Inspection	: 2015-02-18
Electrical Assessment Conducted by	: VERITAS Engineering & Consultant
Date of Electrical Inspection	: 2015-02-18
BGMEA Membership No.	: 455

BASIC INFORMATION:

i.	Building Usage Type	: Garment Factory.
ii.	Structural System	: RCC Beam Slab Frame & prefabricated shed.
iii.	Floor System	: RCC Beam Slab.
iv.	Floor Area	: Total floor area= 3270 sq.m, 1st floor=805 sq.m, 2nd floor= 805 sq.m, 3rd floor= 805 sq.m, 4th floor= 805 sq.m, Single storied pre-Fabricated shed-2=20 sq.m, Single storied Pre-fabricated shed-3=30sq.m
v.	No. of Stories	: 5 stories.
vi.	Construction Year	: Not mentioned in Accord report.
vii.	Foundation Type	: Not mentioned in Accord report.
viii.	Design Drawings	: Available
ix.	Soil Investigation Report	: Not mentioned in Accord report.
x.	construction Materials	: Brick aggregate.
xi.	Generator	: Not mentioned in Accord report

RECOMMENDATIONS FOR CORRECTIVE ACTION:

Short Term (Immediate) : 1. Remove storage loading and construction debris from area indicated above at Roof and 4th Floor and these floors should remain unoccupied until columns have been strengthened. Ensure that imposed loading is 2kPa or less at 1st, 2nd and 3rd floors.

2. Submit the Detail Engineering Assessment performed by DDS, dated 10.12.2014, to Accord with request for approval for compliance with the Accord required standards.

3. Commence strengthening works to columns in accordance with Accord approved procedures.

Mid Term (6-weeks) : 1. Implement the column strengthening as described in the Detail Engineering Assessment by DDS, before any other modifications in the factory take place, and before unoccupied floors are used for production.

2. Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.

3. Verify that slab has sufficient capacity to support fully filled water tank, if not relocate tank to other areas advised by Building Engineer. Avoid placement on the highly stressed central columns and toilet area. If necessary, replace water tank with several smaller water tanks distributed in different appropriate locations.

Long Term (6-months) : 1. Continue to implement load plan.

2. Steel roof structures should be design checked to support code vertical and wind loads by the Building Engineer, and upgraded as directed by the Building Engineer.

The recommendations for **Fire & Electrical Safety** corrective action are:

(A): Recommendations for Fire Safety corrective actions:

Immediate (*the factory should not continue to be occupied until these non-conformities have been rectified*):	N/A
Short Term (*Actions that must be incorporated into a Fire Safety Management Plan immediately (1 ~ 2 weeks) and should be a regular activity*	• 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 proper testing plan & record for 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 2.9 m 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.

Mid Term (*The remedial works indicated must be carried out within a period of 6 weeks)*	• Factory needs to prepare as built drawing with floor machine layout showing means of escape with proper dimension. • Factory needs to have a valid fire license for the full occupied area & needs to be mentioned in the fire license. • The entire exit doors (steel sliding door) 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.
Long Term (The remedial works indicated must be carried out within a period of 6 months)	• Factory needs to have a proper pre-plan for fire department. • 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 with generator at ground floor by 4 hours rated construction with 2 hours rated door/opening, also need to have the protected escape route till to reach safe refuse area. • Childcare needs to be separated from other occupancies (time section) with 3 hours rated construction and 3 hours rated opening or door. • Storage area need to be protected with 2 hours rated construction and 1.5 hours rated opening or doors. • Generator room needs to be fire separated with 4 hours fire rated enclosure and 2 hour rated opening having direct access from outside. • Boiler room needs to be fire separated with 4 hours fire rated enclosure and 2 hour rated opening having direct access from outside.

	• All the stairs (Stair-1&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. • 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 be installed with 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 & 38 mm diameter of hoses with variable nozzle need to be installed. • 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. • 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.

(B): Recommendations for Electrical Safety corrective actions:

Immediate (*the factory should not continue to be occupied until these non-conformities have been rectified*):	N/A
Short Term (*Actions that must be incorporated into a Fire Safety Management Plan immediately (a week) and should be a regular activity)*	• Ensure all distribution boards (including panel door) are earthed properly. • 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. • Ensure overcurrent protection device (circuit breaker/fuse) for each circuit/branch circuit. • Ensure proper earthing connections at all electrical equipment. • Clean interior components from dust and debris and seal all openings within the enclosure to prevent dust and debris from entering • Ensure inspection of all earthing system is being completed and documented.
Mid Term (*The remedial works indicated must be carried out within a period of 6 weeks)*	• Ensure appropriate type of safety signage and graded rubber mats at required location. • Provide Instruction board for first aid and artificial respiration in generator room. • Provide two separate and distinct connections of earthing for each generator. • 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. • Ensure cable joints are made in respect of conductivity, insulation and mechanical strength.

	• Connect all metal in the building to the building earthing system. • 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+(200C-400C)} and take proper action.
Long Term (*The remedial works indicated must be carried out within a period of 6 months)*	• 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 all panel boards on an annual basis. • Ensure distribution boards have no opening and all live internal components are concealed properly. • Provide dedicated & adequate size of neutral with proper identification for each circuit from the neutral busbar of distribution boards and ensure continuous earth path is back to main building intake • Ensure each distribution board is provided with a circuit list and means of identification is provided as per list. • Provide adequate covers on cable channel. • Provide proper cable terminator/connector for stranded conductors at its point of termination. • Provide individual fuse or miniature MCB for each 15/20A socket outlet. • Install lightning protection system on the building.