Name of the Factory	: **Cortz Apparels Ltd.**
Address of the Factory	: Baniarchala, Bager Bazar, Gazipur, Bangladesh.
Present Status of the Factory	: **Under Operation**
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 1-March-2014
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 11-May-2014
BGMEA Membership No	: 4490

BASIC INFORMATION:

The present garment factory comprises of two factory buildings and five ancillary buildings. The following general information was noted:

i.	Building Usage Type	: Garments Factory
ii.	Structural System	: For building 1, The structural floor system consists of concrete fill over metal deck in combination with composite steel beams. The lateral system appears to be beam/column moment frame "bents" in the transverse direction and tension-only steel rod or wire rope braces in the longitudinal direction. Building 2 is a similar steel framed structure. The ancillary buildings are a combination steel framing and cast-in-place reinforced concrete, with perimeter masonry infill walls.
iii.	Floor System	: Steel framed structure with metal deck
iv.	Floor Area	: 83,262 sft
v.	No. of Stories	: Building 1 is a two story building with additional partial plan mezzanines at the north and south ends between the first floor and the roof. Building 2 is a single story building with a mezzanine type-level created from storage racks on the west half of the building.
vi.	Construction Year	: Factory building 1 was completed in 2006. Factory building 2 was completed in 2010
vii.	Foundation Type	: Isolated pad footings.
viii.	Design Drawings	: Complete original structural drawings were not available for all of the buildings (including ancillary buildings) of the complex..
ix.	Soil investigation Report	: Available.
x.	Construction Materials	: Reinforced Concrete for RCC portion and steel member for steel framing.
xi.	Generator	: Ground floor

RECOMMENDATIONS FOR CORRECTIVE ACTION:

The recommendations of corrective action for Structural, Fire and Electrical Safety comprises of Short Term, Mid Term and Long Term basis are as follows:

The recommendations for Structural Safety corrective actions are:

Immediate : NA

Short Term: (3 Weeks) :

Mid Term (6 Weeks) :

i. "Repair and/or replace tension only rod braces as required. Conditions where the rods are sagging, cut, removed, and/or lacking tautness shall be corrected such that the braces comply with the original construction drawings.
ii. The original engineer of record for the building should be consulted if there is any uncertainty regarding the original design and/or construction requirements.
iii. Under guidance from a qualified structural engineer arrange Detail Engineering Assessment of the two storied steel structure (Building 1). This assessment should be conducted within 6 weeks.
iv. The tension-only rod or wire rope bracing used in both horizontal and vertical applications in Building 2 should be repaired and/or replaced as required. Conditions where the braces are sagging, cut, removed, and/or not taut should be corrected such that the braces comply with the original construction drawings. The original engineer of record for the building should be consulted if there is any uncertainty regarding the original design and/or construction requirements.
v. The undocumented mezzanine levels of Building 1 should be removed unless the capacity of the base building structure to safely support the additional loads resulting from the weight of the framing and the live load of the occupied space is analytically verified. The Factory Owner should obtain from the building structural engineer of record evidence that the building as designed and constructed is adequate to resist these loads and obtain from the local jurisdiction a building permit to substantiate the mezzanine construction.
vi. The modifications (widening) to the exterior exit stair on the west side of Building 1 should be removed unless both the capacity of the base building structure to safely support the additional loads applied and the adequacy of the modified framing itself can be confirmed. The Factory Owner should obtain from the building structural engineer of record evidence that the stair as designed and constructed is adequate to resist the added loads, and obtain from the local jurisdiction a building permit to substantiate the construction.
vii. For Building 2, have a qualified structural engineer document compliance with the seismic and wind requirements stated in the 2006 BNBC.
viii. 2006 BNBC Part 6 Section 1.5. Compliance may be waived if the Factory Owner provides satisfactory evidence of a cyclone operations plan that includes full evacuation of the factory in advance of any approaching cyclone"
ix. Have a qualified structural engineer complete further analysis of the structure and develop a remediation plan if required.
x. Structural documents, if available, should be made available for review.
xi. Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard.
xii. Engage a qualified structural engineer to develop the required documents to confirm the structural integrity of the buildings.

Documents must comply with Alliance Standard Part 8 Section 8.19 and 8.20

xiii. Provide signage or the appropriate markings at all areas used for storage to indicate the acceptable loading limits detailed in the Load Plan.

Long Term (6 Months) :

i. Retrofitting as per DEA.

The recommendations for Electrical Safety corrective actions are*:*

Immediate (3 to 6 Days)	Determine the causes of overheating and consider replacement of conductors or equipment.
Short Term (3 Weeks)	Ensure inspection, maintenance, and testing procedures of the IPS and UPS are completed and documented. Install switchboards and/or distribution boards in compliant locations so that operation is not hampered due to limited access. Provide adequate cover on cable trench.
Mid Term (6 Weeks)	Ensure all electrical wiring/cable properly terminated at its point of termination. Ensure clear and permanent identification marks are painted in all distribution boards, switchboards, sub main boards and switches. Provide capacity information labels (Maximum current rating, no of circuit breakers etc.) for Switchboards and/or distribution boards. Ensure cable joints through porcelain/PVC connectors with PIB tape wound around joint.
Long Term (6 Months)	Complete Thermographic scans at least on a three year cycle. Thermographic scans should be completed in accordance with the Standard for Infrared Inspection of Electrical Systems & Rotating Equipment and NFPA70B or a comparable standard. Ensure appropriate size for generator room in order to properly access the generator to perform routine maintenance activities. Establish a periodic inspection program to ensure the electrical systems are free from damage, debris, dirt, lint, etc. Maintain records concerning inspections and follow up actions.

The recommendations for Fire Safety corrective actions are:

Immediate (3 to 6 Days)	Remove all combustibles stored underneath the cutting tables at the noted locations.

Short Term (3 Weeks)	Provide non-lockable, side-hinged, outward-swinging emergency exit doors along the means of egress. Remove all electrical equipment and other foreign equipment from the stairs. Permanently remove all stored material out of the stairs and position firefighting equipment so that it does not create an obstruction.
Mid Term (6 Weeks)	Develop a testing and maintenance program that ensures the emergency power for exit signs is tested at least once per year. If battery operated signs are used, these lights should be tested on a monthly basis. Functional testing of battery powered signs is provided for a minimum of 90 minutes once per year. Post the occupant load for every assembly and production floor in a facility in a conspicuous space near the main exit or exit access doorway for the space. Impart training in accordance with Alliance Safety Training Curriculum and keep record with proper documentation. Conduct fire drills on a quarterly basis as outlined in BNBC Part 4 Appendix A for all garment facilities. Fire drills shall be conducted under the direction of a Fire Safety Director. Complete fire department pre-planning activities with the local Fire Service and Civil Defense. Apply to BERC for 680 KVA power generation waiver certificate. Install signage adjacent to each stair door indicating the stair name and the floor level at the noted locations. Smoking shall be prohibited in any garment factory building, separate storage building, or any building or area of the factory premises. If an owner creates a designated smoking area outside the buildings, information on the location of these designated areas shall be posted on the signs required in 13.5.2.
Long Term (6 Months)	Provide a fire-resistive rated assembly between the exterior exit stairs and the building to achieve the required separation. The rated assembly should be approved and/or designed by a qualified fire protection engineer. At all the non-rated shed the doors along the means of egress should have the mechanism of fire door except but at exit enclosures doors must be fire rated. The rating of the fire doors through the required rated assembly should be as: 1) 2 hr fire barriers protected with 1.5 hr fire protective opening assemblies (2) 1 hr fire barriers protected with ¾ hr fire protective opening assemblies (3) 1 hr exit enclosures and vertical shafts protected with 1 hr fire protective opening assemblies.

	Provide required fire rated doors at the door openings. Install listed fire stop systems at every penetration through fire rated walls and assemblies. Consult a qualified fire protection expert for design and/or approval of design. Provide 1 hr fire rated doors at the exit enclosure. While the production areas afford reasonable width for egress, there are limited cross aisles. Cross aisles are necessary to allow occupants additional paths to reach exits in an emergency. Floor layouts should be redesigned to limit the exit travel distance from any point in a building to the outside to no more than 150 feet. All doors in a means of egress shall be of the side-hinged swinging type. Roll-down and sliding gates and shutters shall not be allowed. 1) Provide 1 hour fire separations with 45 minute fire resistant doors at the spot removing rooms; 2) Extend the fire barrier separating the child care and medical room vertically up to ceiling for a proper fire proofed enclosure. 3) Provide rated fire door at doctor's room and childcare room. 4) Provide fire-resistive rated construction barriers between hazards. Consult a qualified fire protection engineer to design the required rated construction barrier. Kitchen is not permitted with lab and dining together, so kitchen must be moved. Storage room with dining area needs 3 hr separation, otherwise move the storage room. Install illuminated exit signs at entrances to exits and along the path of egress anywhere the continuation of egress is not obvious or there is a change in the direction of the path of travel. Provide handrails on both side of each stairway. Provide intermediate handrail when the stair width exceeds 2.2m (87 inch). Provide handrail of height between the range of 865 mm (34 in.) and 965 mm (38 in.). Repave the walking surface to make the slope less than or equal to 1 in 2. Try to keep walking surface mostly level. Arrange for direct connection of the fire alarm system to a central monitoring station or Fire Service and Civil Defense as per Alliance Standard Part 5 Section 5.7.5 Monitoring. Until that time that monitoring can be set up, a person shall be assigned to contact the fire department in the event of fire alarm activation. An annunciator shall be located in a constantly attended location (such as a fire control room) to alert this person. Develop a hot work permit program. The program must comply with the requirements of NFPA 51B. In general, this program should address process of request and approval authorities, necessary checks prior approval, standby fire watch and firefighting equipment, sounding of alarm

	procedure, duration and expiry of permit and re-approval procedure etc. Create a Fire Safety Director position and fill the position with an individual that has had sufficient training to be able to carry the required duties. The duties of the Fire Safety Director shall include the following: (1) Establish internal and external rally points and communicate to all employees in the building. (2) Fire department pre-planning. (3) Conduct safety inspections as outlined in Alliance standard 13.9. (4) Ensure all testing of fire protection equipment is conducted in accordance with Alliance standard 13.10.