

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Zyta Apparels Ltd
Address of the Factory	: Industrial Plot NO. 4, Milk Vita Road, Section 7, Mirpur, Dhaka, Bangladesh
Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 09 Jul 2014
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 09 Jul 2014

BASIC INFORMATION:

The present garment factory is comprises of a 1 Building. The following general information was noted:

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| i. | Building Usage Type | : Garments Factory. |
| ii. | Structural System | : Monolithic reinforced concrete slab with beams on reinforced concrete columns. |
| iii. | Floor System | : Beam slab type in RCC Building |
| iv. | Floor Area | : 11,000 SF. |
| v. | No. of Stories | : B+G+9+R+SR |
| vi. | Construction Year | : 2002 |
| vii. | Foundation Type | : Unknown |
| viii. | Design Drawings | : Available. |
| ix. | Soil investigation Report | : Not Available |
| x. | Construction Materials | : RCC (Stone chips). |
| 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) :

- i. Develop a program to ensure that all live loads for which a floor or roof has been designed for will not be exceeded. The designated Load Manager shall oversee this program and ensure it is enforced.
- ii. Designate a representative as the Factory Load Manager. The Factory Owner shall ensure that at least one individual, the Factory Load Manager who is located onsite full time at the factory, is trained in calculating operational load characteristics of the specific factory. The Factory Load Manager shall serve as an ongoing resource to RMG vendors and be responsible to ensure that the factory operational loads do not at any time exceed the factory floor load limits as described on the Floor Load Plans.

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Mid Term (6 Weeks)

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- i. Under guidance from a qualified structural engineer arrange Detail Engineering Assessment of the structure. This assessment should be conducted within 6 weeks and should include destructive core testing to validate the in-situ concrete compressive strength of structural elements.
 - ii. Have a qualified structural engineer confirm that capacity to support the load is available. Load Plans complying with Alliance Standard Part 8 Section 8.20.4.3 should also be developed.
 - iii. Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard.
 - iv. Engage a qualified structural engineer to confirm and document that provisions have been made to accommodate concentrated loads. If provisions have not been made, have a qualified structural engineer develop a remediation plan.
 - v. Have a qualified structural engineer prepare credible as-built documents based on the requirements of Part 8 Section 8.19 of the Alliance Standard.
 - vi. Have a qualified structural engineer develop Floor Loading Plans per the requirements of Part 8 Section 8.20.5.3.
 - vii. Have a qualified structural engineer prepare load plans including the information required in Section 8.20 of the Alliance Standard. Floor load plans should be visibly posted on all levels of all buildings.
 - viii. 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)

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- i. Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.
 - ii. Repair the exterior façade system to prevent water intrusion.
 - iii. Provide Certificates of Occupancy for review

The recommendations for Electrical Safety corrective actions are:

Immediate (3 to 6 Days)	Find out the cause of overheating and take proper action.
Short Term (3 Weeks)	<p>All boxes and enclosures (including transfer switches, generators, and power panels) for emergency circuits shall be permanently marked so they will be readily identified as a component of an emergency circuit or system. The required marking can be by color code, the words “emergency system,” or any other method that identifies the box or enclosure as a component of the emergency system.</p> <p>Develop and implement an electrical safety program. Include key topics such as lock out tag out procedures, personal</p>

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	<p>protective equipment requirements, etc. Keep records of completed training available on site.</p> <p>Ensure light fixtures without protective covers are not installed in storage areas or in any area where the Inspector of the Factories Rules (1.5.3.5) Part 53 disallows these fixtures.</p>
Mid Term (6 Weeks)	<p>.Have a qualified Electrical Engineer develop an as-built single line diagram detailing key components and capacity of the electrical system.</p> <p>Consult with a qualified Electrical Engineer and ensure electrical cables are sized according to capacity of circuit breakers.</p> <p>Provide dedicated neutral for each circuit.</p>
Long Term (6 Months)	<p>Complete thermo graphic scans at least on a three year cycle.</p> <p>Thermo graphic scans should be completed in accordance with the Standard for Infrared Inspection of Electrical Systems & Rotating Equipment and NFPA70B or a comparable standard.</p> <p>Have a qualified Electrical Engineer design a lightning protection system according to the BNBC requirements. Have a licensed electrician install the designed system.</p>

The recommendations for Fire Safety corrective actions are:

Immediate (3 to 6 Days)	<p>Relocate obstructions at access to Main Stair on Basement Level. Remove all chemicals and empty containers from the Emergency exit discharge path on the north side of the building.</p> <p>Remove all storage from the exit stairs.</p> <p>Remove all combustibles stored underneath the cutting tables.</p>
Short Term (3 Weeks)	<p>Remove all locking devices from all egress doors and means of egress components.</p>
Mid Term (6 Weeks)	<p>Post the occupant load for all assembly and production floor areas in a conspicuous space near the main exit or exit access doorway for the space.</p> <p>Provide Stair designation signs at each floor entrance from the stair to the floor in English and Bengali. Signs shall indicate the name of the stair and the floor level. Signs shall be posted adjacent to the door.</p>
Long Term (6 Months)	<p>Install initiating devices and notification appliances as required by the Alliance Standard and NFPA 72. Devices should be part of an automatic fire alarm and detection system for the facility.</p> <p>Remove the existing sliding gates that separate the</p>

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	<p>production floors from the stairs and replace them with automatic-closing, side-swinging, fire-rated doors in fire rated frames with latching panic hardware. These doors should be a minimum 39 inches (1 m) wide with a total opening of at least half the existing stair width to maintain the flow of pedestrian traffic. These doors should swing in the direction of egress from the production floor toward the stair. Provide 90-min. fire-rated doors at all other openings into the stair enclosures including the door from the water treatment plant to the Emergency exit stair on the Ground Floor.</p> <p>Either reconfigure the exterior exit stair on the South side of the building to discharge to grade without re-entering the building or properly enclose the ground floor exit stair. Provide a minimum 2-hr. rated ceiling above the exit discharge path along the north side of the building to protect occupants exiting the Emergency stair from the garment factory to the north.</p> <p>Provide automatic sprinkler protection throughout the facility. The installation of sprinkler protection should be conducted in phases. The first phase would be to protect all storage areas.</p> <p>Limit the number of occupants on the Roof level canteen to 292 based on the available width of the stairs. Alternatively, widen the stairs from Floor 9 to the Roof to handle the additional load. Replace the Emergency exit discharge stair (from the Ground Floor to grade) with a 60 in. wide stair to facilitate the capacity that is available from the rest of the 60 in. wide stair above the Ground Floor level. Limit the number of occupants on the sewing floors to 365 until the Emergency exit discharge stair can be widened or automatic sprinkler protection is provided throughout the building.</p> <p>Limit the number of occupants on the Roof level canteen to 292 based on the available width of the stairs. Alternatively, widen the stairs from Floor 9 to the Roof to handle the additional load. Replace the Emergency exit discharge stair (from the Ground Floor to grade) with a 60 in. wide stair to facilitate the capacity that is available from the rest of the 60 in. wide stair above the Ground Floor level. Limit the number of occupants on the sewing floors to 365 until the Emergency exit discharge stair can be widened or automatic sprinkler protection is provided throughout the building.</p> <p>Provide standpipe systems in each stairwell capable of meeting the fire protection demand for hose connections and automatic sprinkler protection. The standpipe should be sized with a minimum 6 in. supply pipe and 3 in. drain pipe. The system should be designed to provide a demand of 750 gpm at 65 psi at the top of the each standpipe riser (500 gpm for the first riser and 250 gpm for the second). Class I standpipe hose connections (65 mm) shall be located in all required stairwells at each floor level including occupiable roofs. This system should be installed as part of the first phase of the overall fire protection system.</p> <p>Provide 2-hour fire resistive rating for all vertical shafts (primarily plumbing and electrical shafts). The protection</p>
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	<p>means can either be at each floor penetration or by the provision of a fire rated shaft enclosure.</p> <p>Remove the existing sliding gates that separate the production floors from the stairs and replace them with automatic-closing, side-swinging, fire-rated doors in fire rated frames with latching panic hardware. These doors should be a minimum 39 inches (1 m) wide with a total opening of at least half the existing stair width to maintain the flow of pedestrian traffic. These doors should swing in the direction of egress from the production floor toward the stair.</p> <p>Protect all openings in rated walls with fire-resistive rated assemblies.</p> <p>Separate all hazard areas including the transformer room, generator, chemical room areas from the remaining portions of the facility with 1-hour fire-rated construction. This includes providing rated fire doors at all openings into these hazard areas. Change the opening from the wastage room so that it opens from the production floor side instead of opening directly into the Emergency exit stair enclosure. Fill in the opening to the stair with fire-rated construction. Fill in the windows on the north side of the Emergency exit stair with 2-hr. rated construction materials to eliminate the exposure from the garment factory to the north.</p> <p>Provide parapets or guards with a minimum height of 1067 mm (42 in.) for all occupiable roof areas.</p> <p>Provide stairs on top of the main ramp from the basement level to properly facilitate egress. Alternately, reroute the egress path to use the Main exit stair with removal of the obstructions from the battery charging area and air compressor.</p> <p>Remove all tripping hazards created by thresholds and gate structures and level the floor at these locations.</p> <p>Provide additional emergency lighting fixtures to provide a minimum lighting level of 2.5 lux for all aisles in production and storage areas.</p> <p>Provide handrails on both sides of each stairway. Mount handrails at a height between 30 in. and 44 in.</p> <p>Develop a hot work permit program. The program must comply with the requirements of NFPA 51B.</p>
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