

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Confidence Industries Ltd.
Address of the Factory	: Plot 102-104, Section-2, Block-A, Road-Dhaka, Bangladesh.
Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 11-July-2013
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 1-March-2014

BASIC INFORMATION:

The present garment factory comprises of one main factory building and one ancillary structure. The following general information was noted:

i.	Building Usage Type	: Garments Factory
ii.	Structural System	: The structure is a cast-in-place reinforced concrete system with a two way slab floor system. The lateral resisting system is a beam/column moment frame system.
iii.	Floor System	: Beam supported two way slab.
iv.	Floor Area	: Unknown
v.	No. of Stories	: 5 stories (G+4+R).
vi.	Construction Year	: 1991
vii.	Foundation Type	: Shallow foundation
viii.	Design Drawings	: Available but only partial structural drawings consisting of two sheets (not numbered) were provided.
ix.	Soil investigation Report	: Available
x.	Construction Materials	: Reinforced Concrete for RCC building
xi.	Generator	: Unknown

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.

Mid Term (6 Weeks) :

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- i. Engage a qualified structural engineer to develop the required documents to confirm the structural integrity of the main factory building and the washing shed. Documents must comply with Alliance Standard Part 8 Section 8.19 and 8.20
- ii. Have a qualified structural engineer complete an analytical evaluation of the structural impact of the addition.
- iii. 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.
- iv. Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading.
- v. Complete further testing on areas of deterioration and have a qualified structural engineer develop a remediation plan.
- vi. Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard.
- vii. Have a qualified structural engineer prepare credible as-built documents for the main building and the washing shed based on the requirements of Part 8 Section 8.19 of the Alliance Standard.
- viii. "Once floor load plans are posted, redistribute floor loads to comply with the Floor Loading Plans."
- ix. "Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues."
- x. to RMG vendors and be responsible to ensure that the factory operational loads do not at any time exceed the factory floor loading limits as described on the Floor Loading Plans."
- xi. Have a qualified structural engineer develop Floor Loading Plans per the requirements of Part 8 Section 8.20.5.3
- xii. Have a qualified structural engineer prepare load plans including the information required in Section 8.20 of the Alliance Standard.
- xiii. Provide signage or the appropriate markings at all areas used for storage to indicate the acceptable loading limits detailed in the Load Plan.
- xiv. Have a qualified structural engineer provide further analysis of the identified cracks to determine the appropriate course of corrective action.
- xv. "Repair the exterior façade system to prevent water intrusion."
- xvi. Obtain from the geotechnical engineer who authored the geotechnical report clarification regarding the acceptability of using a shallow foundation system at the site and an explanation of the contradictions found on page 11 of the report.

Long Term (6 Months) :

- i. "Provide Certificates of Occupancy for review."
- ii. Provide a protective coating at the structural elements constructed with MCAC exposed to rainfall or other sources of water. Have protective coating approved by the Alliance or a qualified structural engineer.

The recommendations for Electrical Safety corrective actions are:

Immediate (3 to 6 Days)	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.
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Short Term (3 Weeks)	Develop and implement an electrical safety program. Include key topics such as lock out tag out procedures, personal protective equipment requirements, etc. Reference NFPA 70e for example program requirements.
Mid Term (6 Weeks)	Consult with a qualified Electrical Engineer and ensure electrical wiring/cables are sized according to capacity of circuit breakers. Remove multi looping or multi looping of wiring/cables at circuit breakers within switchboards and/or distribution boards. Provide dedicated neutral for each circuit.
Long Term (6 Months)	Provide an earthing/grounding system for all metal in the building. 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.

The recommendations for Fire Safety corrective actions are:

Immediate (3 to 6 Days)	Remove all storage from under tables and similar obstructions.
Short Term (3 Weeks)	N/A
Mid Term (6 Weeks)	Develop an emergency evacuation plan in accordance with the Alliance Standard and communicate the plan to all employees. Arrange for direct connection of the fire alarm and detection system to a central station monitoring service or the Fire Service and Civil Defense. Assign a person to contact the fire department in the event of fire alarm activation until this connection is set up. Locate an annunciator to alert this person in a constantly attended location (such as a fire control room). Training programs need to be implemented and documented in accordance with the Alliance Safety Training Curriculum. 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 in accordance with Alliance Standard Section 6.4.4. Install signage adjacent to each stair door indicating the stair name and the floor level in both English and Bengali.
Long Term (6 Months)	Install a landing and full width stairs on both sides of the column. Remove all existing doors and gates in the means of egress.

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	<p>Install side-hinged doors with approved hardware that swing in the direction of egress.</p> <p>Install a rated exit corridor to connect the stairs to and exterior discharge exit from the building.</p> <p>Provide rated exit passageways that extend the stair enclosures to exterior discharge from the building.</p> <p>Install listed fire stop systems at every penetration through fire rated walls and assemblies.</p> <p>Protect all egress stairs with a shaft enclosure including 2-hour fire-rated construction. Install fire doors and listed penetration systems.</p> <p>Install a dedicated fire pump for the facility in accordance with NFPA 20. Also, install a water storage tank in accordance with NFPA 22.</p> <p>Install fire alarm system per NFPA 72. Include pull stations at all entrances to exit stairs, and at ground floor exits. Install strobes and horns for complete notification on all floors. Install smoke detectors that are part of the fire alarm system in locations required by Alliance standards.</p> <p>Install a Class III standpipe system at required locations. Standpipe system must comply with NFPA 14.</p> <p>Provide fire-resistive rated construction barriers between hazard types in accordance with Alliance Standard Sections 3.4.2 and 4.5. Consult a qualified fire protection engineer to design the required rated construction barrier.</p> <p>Provide handrails on both sides of ramp.</p> <p>Remove all combustible materials and finishes from the stairs.</p> <p>Regrade walking surfaces to create a smooth and level egress path.</p> <p>Provide continuously illuminated exit signs. Signs shall be placed at all required exits and along egress paths, especially where there is a change in direction for the path of travel.</p> <p>Provide handrails on both sides of each stairway. Mount handrails at a height between 30 in. and 44 in.</p> <p>Install emergency lighting for all paths of egress. Illumination needs to be a minimum of 10 lux for all corridors, exit doors and stairways. Illumination for aisles needs to be a minimum of 2.5 lux.</p> <p>Develop a hot work permit program. The program must comply with the requirements of NFPA 51B.</p> <p>Create a Fire Safety Director position and fill the position with an individual that has sufficient training to be able to carry out the required duties in accordance with Alliance Standard Section 13.1.</p>
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