

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Arunima Apparels Ltd.
Address of the Factory	: Plot I/10, Block-K, Rupnagar I/A, Section 2, Dhaka, Bangladesh.
Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 01-June-14
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 26-May-14
BGMEA Membership No	: 3190

BASIC INFORMATION:

There is one building on the factory premises, which is the main production building. The building is named: 1) Nine story RCC main production building (As per building approval drawing there are two buildings in the premises, one 4-story RCC building and one 9-story RCC building. But both buildings are merged together by construction joint and each floor has an access from one building to another building and it is known as a single production building). The following general information was noted:

i.	Building Usage Type	: Garments Factory
ii.	Structural System	: RCC Beam-Column frame system
iii.	Floor System	: RCC Structure with beam and column
iv.	Floor Area	: 98067 SF
v.	No. of Stories	: Nine story RCC building
vi.	Construction Year	: 1998
vii.	Foundation Type	: Isolated footing
viii.	Design Drawings	: Available.
ix.	Soil investigation Report	: Available.
x.	Construction Materials	: Reinforced Concrete
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

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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 evaluate the impact of the vertical expansion of the building.
- ii. 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.
- iii. Have a qualified structural engineer confirm that the capacity for the 3rd floor to support the load is available. Load Plans complying with Alliance Standard Part 8 Section 8.20.4.3 should also be developed.
- iv. Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading.
- v. Perform all action items from previous assessment.
- 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 develop Floor Load Plans per the requirements of Part 8, Section 8.20.5.3.
- viii. 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.
- ix. Have a qualified structural engineer prepare a load plan for each floor, and ensure that areas on each floor are marked to designate storage areas as per the load plans.
- x. Organization is to apply for a certificate of occupancy and obtain such as soon as possible from the appropriate authority.

Long Term (6 Months)

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- i. 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. Or provide 2% slope on the exposed surfaces to prevent the accumulation of water.

The recommendations for Electrical Safety corrective actions are:

Immediate (3 to 6 Days)	Provide protective covers for light fixtures installed in storage areas or in any area where required by the Inspector of the Factories Rules (1.5.3.5), Part 53.
Short Term (3 Weeks)	<p>Connect all metal in the building to the building earthing/grounding system, such as metal rebar in concrete, metal frame of building, or metal water pipe.</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 disallows these fixtures.</p> <p>Develop and implement an electrical safety program. Include key topics such as lock out tag out procedures,</p>

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	<p>personal protective equipment requirements, etc.</p> <p>Ensure electrical connections at equipment, fixtures, etc. are properly secured.</p> <p>Ensure cable joints through porcelain/PVC connectors with PIB tape wound around joint.</p>
Mid Term (6 Weeks)	<p>Ensure distribution boards are metal enclosed with a dead front construction.</p> <p>Ensure distribution boards provided with physical means to prevent the installation of more over current devices than that number for which the panel board was designed, rated, and listed.</p> <p>Lead Led telecommunication or antenna cables separately to the main point of service. Power and telecommunications cables must have separate entrance.</p> <p>Ensure switchboards and/or panel boards are not installed above gas stoves or sinks or within 2.5m of any washing unit in washing rooms or laundries.</p> <p>Consult with a qualified electrical engineer and ensure electrical wiring/cables are sized according to capacity of circuit breakers.</p> <p>Ensure underground cables, for electrical distribution, on the premises/compound of the building are encased in GI or PVC pipes and laid in earth trenches of sufficient depth.</p> <p>Have a qualified electrical engineer develop an as-built single line diagram detailing key components and capacity of the electrical system.</p>
Long Term (6 Months)	<p>Consult with an expert engineer to have design and drawing of lightening protection system and ensure your building is secured.</p> <p>Ensure the air termination network vertical and horizontal conductors are appropriately spaced</p> <p>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.</p> <p>Complete an oil test on applicable transformer. If harmful substances are found in report, then replace the existing transformer with a new transformer that is documented to be without harmful substances.</p> <p>Ensure tagging and/or numbering identification on cables.</p> <p>Provide capacity information labels (maximum current rating, number of circuit breakers, etc.) for distribution boards.</p> <p>Ensure switchboards and distribution boards provided with physical means to prevent the installation of more over current devices than that number for which the panel board</p>

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	<p>was designed, rated and listed following NFPA 70 section 408.54.</p> <p>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.</p> <p>Inspect electrical switchgear and panel boards on an annual basis to ensure that the equipment is in good working condition and maintain documentation.</p>
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The recommendations for Fire Safety corrective actions are:

<p>Immediate (3 to 6 Days)</p>	<p>Remove all combustibles stored underneath the cutting tables at the noted locations. Establish and enforce a housekeeping policy to keep these areas clear of storage.</p>
<p>Short Term (3 Weeks)</p>	<p>Remove existing gates and doors in the means of egress including all locking devices. Install doors with approved panic hardware that cannot be locked in the direction of egress under any conditions.</p>
<p>Mid Term (6 Weeks)</p>	<p>Develop an emergency evacuation plan which includes duties and responsibilities of various people/groups, interfacing between groups and fire brigade, headcount and identification of trapped victims, physically disabled people and their rescue, etc., and all components required by the Alliance Standards.</p> <p>Communicate the plan to all employees. The evacuation plan shall include provisions to assist physically disabled persons. A list of all employees with physical disabilities shall be kept by the Fire Service Director.</p> <p>Provide 1.5 hr fire protective opening assemblies in 2 hr rated exit enclosures. Exits connecting four or more stories shall be enclosed with a minimum 2-hr fire-resistance rating. Exits shall be enclosed with the same fire-resistance rating as the floor penetrated, but will not need exceed 2 hr.</p> <p>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 are tested on a monthly basis. Functional testing of battery powered signs is provided for a minimum 90 minutes once per year.</p> <p>Apply to 'Biddiyut License Prodan Board' for renewal of electrician license.</p>

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Long Term (6 Months)	<p>Provide 2 hr fire-resistive rated construction barriers at exit enclosures. Fit outward opening, side-swinging, self-closing, non-lockable fire doors of 1.5 hr rating in all stairwell enclosures. Consult a qualified fire protection engineer to design the required rated construction barriers.</p> <p>Install fire alarm system per NFPA 72. Include listed pull stations at all entrances to exits. Install strobes and horns for complete notification. Area smoke detection is not required because automatic sprinklers shall be installed throughout.</p> <p>Install an automatic sprinkler system throughout the building designed by a qualified fire protection engineer. The hydraulic design of the sprinkler system has to be pre-approved by CoE of Alliance. All installation and design requirements outlined in BNBC Part 4 Chapter 4 shall be replaced by the requirements of NFPA 13. Pipe schedules shall not be used to size pipe. All systems shall be hydraulically calculated to meet the required NFPA 13 design requirements. Installation of new automatic sprinkler systems shall be required to provide shop drawings and hydraulic calculations as outlined in NFPA 13. The test and performance report of the installed system must be submitted to Alliance for review. Final inspection and testing shall be witnessed by Alliance according to clause 5.3</p> <p>Install a pump dedicated for fire fighting or fire protection following the requirements of NFPA 20. Fire pump installation is to be tested for final acceptance in the presence of an Alliance authority, and a final inspection of the installation shall be conducted by the Alliance prior to final acceptance. Acceptance testing of the installation shall be in accordance with NFPA 20, 22, and 24 testing requirements. Documentation of all testing shall be submitted to the Alliance for review prior to final acceptance.</p>