

## Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

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Name of the Factory	: <b>The Rose Dresses Ltd</b>
Address of the Factory	: Jamgara, Diakhali, Yearpur, Asulia, Savar, Bangladesh
Present Status of the Factory	: <b>Under Operation</b>
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 16 Jun 2014
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 15 Jun 2014
BGMEA Membership No	: 4241

### **BASIC INFORMATION:**

The present garment factory is comprises of a 2 Main Buildings 5 Ancillary Buildings. The following general information was noted:

- i. Building Usage Type : Garments Factory.
- ii. Structural System : Main Building 01: The building is seven storied RCC column supported moment resisting frame structure with infilled masonry wall. Foundation type is spread footing and framing is regular. Main Building 02: The building is seven storied steel column supported special moment resisting deck slab steel structure with infilled masonry walls. Foundation type is spread footing and framing is regular. Main Building 03: The building is two storied steel column supported special moment resisting deck slab steel structure with partly infilled masonry and profile sheet. Foundation type is spread footing and framing is regular.
- iii. Floor System : Mixed type
- iv. Floor Area : Total area of all buildings in the factory premises: 396525.00 sft. Building wise breakdown as follows: 1) Seven story main production building-1: 213308.00 sft (Ground floor: 31058.00 sft, 1st floor: 29735.00 sft, 2nd floor: 30503.00 sft, 3rd floor: 30503.00 sft, 4th floor: 30503.00 sft, 5th floor: 30503.00 sft, 6th floor(Occupied): 22806.00 sft, Roof (Unoccupied): 7697.00 sft ), 2) Seven story prefab main production building-2: 136755.00 sft (Ground floor: 21949.00 sft, 1st floor: 21552.00 sft, 2nd floor: 19655.00 sft, 3rd floor: 19655.00 sft, 4th floor: 19655.00 sft, 5th floor: 19655.00 sft, 6th floor: 14634 sft), 3) Two story central prefab warehouse: 41342.00 sft (Ground floor: 20671.00 sft, 1st floor: 20671.00 sft), 4) Two story medical building: 2856.00 sft (Ground floor: 1428.00 sft, 1st floor: 1428.00 sft), 5) Single story staff dining with CI shed: 1610.00 sft. 6) Single story guard room: 100 sft, 7) Single story sub-station shed: 554 sft
- v. No. of Stories : Single storied Prefab Building, 2 Storied Prefab Building, 3 Storied RCC Building and others are single storied building.
- vi. Construction Year : 2004
- vii. Foundation Type : Spread Footing.
- viii. Design Drawings : Available.
- ix. Soil investigation Report : Available
- x. Construction Materials : RCC (brick chips).
- xi. Generator : Unknown

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## **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) :

- i. "Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading.
- ii. Have a qualified structural engineer prepare documentation to evidence compliance with the seismic and wind requirements stated in the 2006 BNBC.
- iii. 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, Sections 8.19 and 8.20.
- iv. Adequately anchor all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard.
- 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. All the incomplete CAP that was suggested in assessment report should be carried out by factory authority immediately.
- vii. Provide signage or the appropriate markings at all areas used for storage to indicate the acceptable loading limits as detailed in the Load Plan for that floor.
- viii. Have a qualified structural engineer develop Floor Loading Plans, per the requirements of Part 8, Section 8.20.5.3. Floor load plans should be visibly posted on all levels of all buildings.
- ix. Have a qualified structural engineer develop Floor Loading Plans, per the requirements of Part 8, Section 8.20.5.3.
- x. Have a qualified structure engineer identify the locations where a expansion joint is needed and then have a remediation plan developed.

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Long Term (6 months) :

- i. Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.
- ii. Provide a protective coating to all the structural elements constructed with MCAC that are exposed to rainfall or other sources of water. Have the protective coating approved by the Alliance or a qualified structural engineer
- iii. Apply for issuance of Certificates of Occupancy, and pursue the matter to obtain the same
- iv. Remove deteriorated expansion joint material, and provide new approved material at each expansion joint

### 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)	Develop and implement an electrical safety program. Include key topics such as lock out tag out procedures, personal protective equipment requirements, etc. Keep records of completed training available on site.  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.
Mid Term (6 Weeks)	Ensure that cable joints are through porcelain/PVC connectors with PIB tape wound around joints.  Provide a dedicated neutral for each circuit.
Long Term (6 Months)	Complete thermo graphic scans at least on a three year cycle.  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.  Have a qualified Electrical Engineer design a lightning protection system according to the BNBC requirements. Have a licensed electrician install the designed system.

### 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 as soon as possible.
Short Term (3 Weeks)	Remove all hasps, locks, slide bolts, or other locking devices from the noted locations.
Mid Term (6 Weeks)	Arrange for the direct connection of the fire alarm system to a central monitoring station or Fire Service and Civil Defense. Until the time that monitoring can be set up, arrange a monitoring system using the factory's own central detection system and personnel. A

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	<p>person shall be assigned to contact the fire department in the event of fire alarm activation.</p> <p>Implement training programs in accordance with the Alliance Safety Training Curriculum, and keep record of the training with proper documentation.</p> <p>Develop an emergency evacuation plan which includes all components required by Alliance Standards, and communicate the plan to all employees as per the requirement.</p> <p>Develop a testing and maintenance program that ensures that the emergency power for exit signs is tested at least once per year. If battery operated signs are used, these signs should be tested on a monthly basis. Functional testing of battery powered signs should be provided for a minimum of 90 minutes once per year.</p> <p>Post the occupant load for every assembly and production floor in a conspicuous space near the main exit or exit access doorway for the space, as per Alliance Standards.</p> <p>Develop a testing and maintenance program that ensures that the operation of all exit signs and egress lights is verified at least once per year. If battery-operated signs are used, these signs should be tested on a monthly basis. Functional testing of battery powered signs should be provided for a minimum of 30 minutes once per year.</p> <p>Conduct fire drills on a quarterly basis as outlined in BNBC Part 4, Appendix A for all garment facilities. Fire drills should be conducted under the direction of a Fire Safety Director. All other requirements for fire drills shall be fulfilled in accordance with BNBC requirements.</p> <p>Complete fire department pre-planning activities with the local Fire Service and Civil Defense in accordance with Alliance Standards.</p> <p>Install signage adjacent to each stair door indicating the stair name and the floor level at the noted locations, in accordance with Alliance Standards.</p> <p>Apply to PWD for the issuance of Certificates of Occupancy and pursue expedition of the process.</p> <p>Apply to BERC for the appropriate 1885 KVA power generation certificate.</p> <p>Install required identification signs at the noted locations as per NFPA 14 requirements.</p>
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<p>Long Term (6 Months)</p>	<p>Exit access corridors serving an occupant load exceeding 30 people are to be separated by walls with a 1 hr fire resistance rating. Or alternatively, remove the storage area.</p> <p>Close all openings across the span of the stairway and 10 feet on each side from the ground level to the roof, or 10 ft above the topmost landing, as per the Alliance Standard. Structures accommodating three stories or less should be provided with 1-hr fire rating. Structures accommodating four stories or more should be provided with a 2-hr fire rating.</p> <p>Install fire rated doors and windows or fill in unprotected openings with fire resistive rated assemblies.</p> <p>Install a NFPA 14-compliant class III standpipe system at required locations designed by a qualified fire protection engineer. All standpipe system installations and hydraulic calculations shall be reviewed by the Alliance prior to commencement of the installation. Testing of the installation shall be conducted in accordance with NFPA 14 acceptance testing requirements. Documentation of all testing shall be submitted for review by the Alliance. Final inspection and testing of the installation shall be witnessed by the Alliance.</p> <p>Provide hydraulic calculations for the the current fire pump. If the current fire pump does not meet the demand,install a fire pump dedicated for fire protection following NFPA 20 requirements. The fire pump installation is to be tested for final acceptance in the presence of an Alliance representative, 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 testing requirements. Documentation of all testing shall be submitted to the Alliance for review prior to final acceptance.</p> <p>This exit access corridor is to be separated by walls with a 1 hr fire resistance rating. Or alternatively, remove the storage area.</p> <p>Replace all collapsible, sliding, roll-down gates and shutters in means of egresses with side-hinged swinging type doors of proper width and rating.</p> <p>Provide fire-resistive rated construction barriers between hazard types following Table 4.4.1 of the Alliance Standard. Consult a qualified fire protection engineer to design the required rated construction barriers.</p> <p>Properly identify the required re-entry doors as per Alliance Standards.</p> <p>Provide handrails on both sides of each stairway. Provide handrails at a height between the range of 865 mm (34 in.) and 965 mm (38 in.), as per the Alliance Standard.</p> <p>According to Alliance Standard 3.6.2.4 nonrated construction shall not be allowed for high- rise buildings. Therefore it is required to reduce the highest occupied floor level of 7 story prefab main production building-2.</p> <p>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, as per</p>
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	<p>Alliance Standards.</p> <p>Fire extinguishers are to be inspected, tested, and maintained in accordance with NFPA 10 requirements.</p> <p>Install an appropriate means of illumination at the noted locations. Illumination shall be a minimum of 10 lux for all corridors, exit doors, and stairways. Aisles shall be provided with a minimum of 2.5 lux.</p> <p>Establish an inspection, maintenance, and testing program for the standpipe and hose system. The program must comply with NFPA 25 requirements.</p> <p>Develop NFPA 51B-compliant hot-work permit program. In general, this program should address the process of request and approval of authorities, the necessary checks prior to approval, the standby fire watch and fire fighting equipment, the sounding of alarm procedures, and the duration and expiry of permit and reapproval procedures, etc.</p> <p>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 these points to all employees in the building. (2) Complete fire department pre-planning. (3) Conduct safety inspections as outlined in Alliance Standard. (4) Ensure that all testing of fire protection equipment is conducted in accordance with Alliance Standard.</p> <p>Establish an inspection, maintenance, and testing program for the fire pump as per NFPA 25 requirements.</p>
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