

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

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Name of the Factory	: <b>Rose Sweaters Ltd (Unit 2)</b>
Address of the Factory	: Vogra, By-pass Bishaw Road, Joydebpur, Gazipur, Dhaka, Bangladesh.
Present Status of the Factory	: <b>Under Operation</b>
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 04 May 2014
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 04 May 2014
BGMEA Membership No	: 4885

### **BASIC INFORMATION:**

The present garment factory is comprises of a 1 Main Buildings 4 Ancillary Buildings. The following general information was noted:

- i. Building Usage Type : Garments Factory.
- ii. Structural System : The building is regular RCC frame structure. The nature of foundation is isolated column footing.
- iii. Floor System : RCC Beam slab type
- iv. Floor Area : 166602 SF.
- v. No. of Stories : Eight story RCC building-1 with basement (Main building), Two story RCC building-2 and others are single storied shed.
- vi. Construction Year : 2008
- vii. Foundation Type : Isolated Spread Footing.
- viii. Design Drawings : Not Available.
- ix. Soil investigation Report : Not Available
- x. Construction Materials : RCC (brick 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.

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

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Mid Term (6 Weeks)

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- i. Engage a qualified structural engineer to provide additional investigation into the areas cracking and provide a remediation plan if required.
- ii. The structural design engineer should prepare the design report and submit to the factory for further review by BV.
- 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 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.
- v. 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.
- vi. Have a qualified structural engineer document compliance with the seismic and wind requirements stated in the 2006 BNBC.
- vii. Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind load and submit a report on same.
- viii. Have a qualified structural engineer to develop Floor Loading Plans as per the requirements of Part 8 Section 8.20.5.3.
- ix. Have a qualified structural engineer prepare load plans including the information required in Section 8.20 of the Alliance Standard.
- x. Provide appropriate markings at all areas used for storage to indicate the acceptable loading limits detailed in the Load Plan.
- xi. MIEB number must be mentioned in the Geotechnical report.

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. After issuing the certificate of occupancy provide it for further review.

**The recommendations for Electrical Safety corrective actions are:**

Immediate	N/A
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## Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

<p>Short Term (3 Weeks)</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> <p>Ensure proper identification of emergency power switchboards, distribution boards and circuits.</p> <p>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.</p> <p>Survey all electrical equipment to identify all areas of noncompliance. Ensure meters and other electrical devices installed on the main electrical equipment are operational.</p> <p>Install phase separators between terminal connections. Verify phase separators are installed at all remaining locations.</p>
<p>Mid Term (6 Weeks)</p>	<p>Ensure overhead service conductors are covered by replacing the existing conductors or by covering the existing conductors with an approved material. Consult a qualified electrical engineer before completing work.</p> <p>Distribution boards are metal enclosed without a dead front construction. Survey all distribution boards and provide dead front construction at all locations.</p> <p>Have a qualified electrical engineer develop/update the as-built electrical diagram of the main distribution circuit and floor level circuits.</p> <p>Survey all distribution boards to identify all locations of multi looping of cables. Consult a qualified electrical engineer to determine appropriate remediation work to remove multi looping of cables. Remove multi looping of cables at circuit breakers within distribution boards.</p> <p>Make sure the lightning protection ground terminals are bonded to the building or structure grounding. Consult a qualified electrical engineer to determine the appropriate remediation work and sizing grounding conductors.</p> <p>Survey all cables to identify all areas of noncompliance. Ensure the means of identification is obtained by separate color coding, marking tape, tagging, or other approved means.</p> <p>Ensure telecommunication or antenna cables are led separately to the main point of service. Power and telecommunications cables must have separate entrance.</p>
<p>Long Term (6 Months)</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 &amp; Rotating Equipment and NFPA70B or a comparable standard.</p> <p>Provide wire/cable shaft for the whole building. Wiring and cables are arranged in shaft for ease of inspection and maintenance.</p>

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

### The recommendations for Fire Safety corrective actions are:

Immediate (3 to 6 Days)	None
Short Term (3 Weeks)	Remove all hasps, locks and slide bolts from exit doors in compliance with the Alliance Standard. Doors may be provided with locking hardware from the ingress side provided that a panic bar is installed on any door with an occupant load exceeding 49 persons.
Mid Term (6 Weeks)	<p>Impart training in accordance with Alliance Safety Training Curriculum and keep records with proper documentation.</p> <p>Develop an emergency evacuation plan which includes all components required by the Alliance Standards and communicate the plan to all employees.</p> <p>Arrange for a direct connection of the fire alarm and detection system to a central station monitoring service or the Fire Service and Civil Defense as per Alliance Standards. Until a central station monitoring service or direct connection to the Fire Service and Civil Defense can be set up, a trained person to contact the Fire Service and Civil Defense in the event of fire alarm activation shall be provided. An annunciator shall be located in a constantly attended location (such as a fire control room) to alert this person.</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, ensure these signs are tested on a monthly basis. Functional testing of battery powered signs shall be provided for a minimum 90 min once per year.</p> <p>Develop a testing and maintenance program that ensures the operation of all emergency lights are verified at least once per year. If battery-operated lights are used, these lights shall be tested on a monthly basis. Functional testing of battery powered lights shall be provided for a minimum of 90 min once per year.</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 Standard.</p> <p>Provide signage in compliance with NFPA 14 for the standpipe system.</p> <p>Complete fire department pre-planning activities with the local Fire Service and Civil Defense in accordance with Alliance Standards.</p> <p>Apply to LGED of Gazipur Sadar for issuance of occupancy certificate and pursue the matter to expedite.</p>
Long Term (6 Months)	Provide fire-resistant rated assemblies at the required exit access corridors designed by a qualified fire protection

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

	<p>engineer in accordance with Alliance Standard.</p> <p>Replace all non-compliant doors and frames in the means of egress with doors that are listed, approved, automatic-closing, side-swinging, fire-rated doors in compatible fire-rated frames with latching panic hardware. These doors are to open in the direction of egress.</p> <p>Provide fire-resistive rated opening and penetration protection for rated walls and assemblies at the abovementioned locations. Consult a qualified fire protection engineer to design the required opening protectives or penetration systems.</p> <p>Provide 1.5 hr rated doors for the stair enclosures with fire-resistive rated construction barriers at exit enclosures. Consult a qualified fire protection engineer to design the required rated construction barriers and opening protectives.</p> <p>Bring current fire pump up to standard or install a new fire pump in accordance NFPA 20.</p> <p>Install Class-III standpipe system at required locations designed by a qualified fire protection engineer. The system must be compliant with the requirements of NFPA 14. The hydraulic calculations must be reviewed by the Alliance.</p> <p>Provide complete automatic fire detection system, portable fire extinguishers, and standpipe system to have the maximum travel distance limit up to 60 m in accordance with Alliance Standard.</p> <p>Provide protected opening of 1.5 hour rating for the shaft enclosure.</p> <p>Remove existing aisle markings and draw new markings to fulfil the minimum aisles width requirement. Relocate the machines accordingly if necessary.</p> <p>Remove aisle marking and mark aisles again as per Alliance Standard.</p> <p>Provide 1.5 hr fire protective opening assemblies in 2 hr rated exit enclosures. Exits connecting three or fewer stories shall be enclosed with a minimum 1-hr fire-resistance rating. Exits connecting four or more stories shall be enclosed with a minimum 2-hr fire-resistance rating or in accordance with Alliance Standard.</p> <p>Provide an additional exit at 7th floor to meet the requirement of Alliance Standard.</p> <p>Every door in a stair enclosure serving more than 5 stories shall be provided with re-entry unless it meets the following requirements:</p> <p>Stair doors may be permitted to be locked from the stair (ingress) side that prevents re-entry to the floor provided at least two floors allowing re-entry to access another exit are provided, there are not more than 4 stories intervening between re-entry floors, re-entry is allowed on the top or next to top level, reentry doors are identified as such on the</p>
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## Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

	<p>stair side, and locked doors shall be identified as to the nearest re-entry floors. When the discharge floor is determined to be a required re-entry floor using the above requirements, re-entry does not have to be provided back into the building on this level.</p> <p>Spot removing room must be 1 hour fire separated with 45 minute fire-resistant doors.</p> <p>Provide fire-resistant rated construction barriers between hazard types in accordance with Alliance Standards throughout the building. Consult with a qualified fire protection engineer to design the required rated construction barrier in accordance with Alliance Standards.</p> <p>The horizontal passageway should be removed. Store materials in proper stacks. Remove all residences from factory premises.</p> <p>According to Alliance Standard Part-5 Section-5.5.4, fire department (Siamese) inlet connections shall be provided to allow fire department pumper equipment to supplement the fire protection systems. Fire department outlet connections shall be provided to allow fire department pumper vehicles to draw water from ground-level or underground water storage tanks. Connections shall match the Fire Service and Civil Defense hose thread standard.</p> <p>Install handrails on both sides of the stair in accordance with Alliance Standard.</p> <p>Reconstruct the ramp with slope 1:12 and provide handrails on both sides of the ramp as per Alliance Standards.</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 Alliance Standard.</p> <p>Provided parapets or guards for all occupied roofs of a minimum height of 1067 mm (42 in.).</p> <p>Install emergency lighting for all paths of egress in accordance with Alliance Standard. Illumination shall be a minimum of 10 lux for all corridors, exit doors, and stairways. Aisles shall be provided with a minimum 2.5 lux.</p> <p>Install fire dampers in air-conditioning ducts as per Alliance Standard.</p> <p>Inspect, test and maintain fire extinguishers in accordance with NFPA 10.</p> <p>Establish an inspection, testing and maintenance program for the fire pump. Program must comply with NFPA 25 requirements.</p> <p>Establish written corporate and plant policies on housekeeping to ensure scheduled cleaning for floor, wall, ceiling, supply and return air ventilation systems. Promptly reschedule skipped cleanings. Provide a documented line of</p>
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## Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

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	<p>authority for authorizing a cleaning delay and rescheduling.</p> <p>Develop a hot-work permit program as per NFPA 51B requirements.</p>
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