

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: Rupa Fabrics Ltd
Address of the Factory	: Kunia, Board Bazar, Gazipur
Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 29-May-14
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 22-May-14

BASIC INFORMATION:

There are 7 buildings in the factory premises out of which 4 are main production buildings. The following general information was noted:

i.	Building Usage Type	: Garments Factory.
ii.	Structural System	: Building 1: RCC flat slab system with edge beam Building 2: RCC moment resisting frame system Building 3: RCC moment resisting frame system Building 4: Special structural system (RCC moment resisting frame at basement and pre-engineered steel frame structure above grade)
iii.	Floor System	: Beam Supported slab.
iv.	Floor Area	: 208,694sft
v.	No. of Stories	: 1. Main Production Building: 11 (Basement+Ground+9), 2. Production Building: 4 (Basement+Ground+2) , 3. Production Building-1: 3 (Basement+Ground+1), 4. Production Building-2: 2 (Basement+Ground)
vi.	Construction Year	: Unknown
vii.	Foundation Type	: Isolated footing
viii.	Design Drawings	: Available.
ix.	Soil investigation Report	: 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

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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. Under guidance of a qualified structural engineer conduct destructive core testing to validate the in-situ concrete compressive strength of the structural elements.
- ii. Engage a qualified structural engineer to develop the required documents to confirm the structural integrity of the buildings. Documents must comply with the Alliance Standard Part 8 Sections 8.19 and 8.20
- iii. Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading.
- iv. Have a qualified structural engineer complete an analytical evaluation of the structural impact of the addition.
- 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. 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 Loading 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. Provide signage or the appropriate markings at all areas used for storage to indicate the acceptable loading limits detailed in the Load Plan.
- x. Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.

Long Term (6 Months)

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- i. Depending on the findings of the Core test, permanent remedial measures should be conducted for the safety of the building.
- ii. Apply for issuance of the Certificates of Occupancy and pursue the matter to obtain the same.

The recommendations for Electrical Safety corrective actions are:

Immediate (3 to 6 Days)	Gas generator room needs to keep clean and not free from dirt, lint, debris.
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. Transformers are needed to properly ground (earthed).

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Mid Term (6 Weeks)	<p>Underground service cables need to lay in conformity with the requirements of concealed wiring.</p> <p>As-built electrical drawings need to physically match.</p> <p>The substation room has required fire rating, protection and physically separated from the remainder of the building.</p> <p>Distribution boards are metal enclosed with dead front construction.</p> <p>Power and telecommunication or antenna cables are needed to separate.</p> <p>Electrical wiring and cables should be properly identified.</p>
Long Term (6 Months)	<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>Have a qualified electrical engineer design a lightning protection system according to the BNBC requirements.</p> <p>Have a licensed electrician install the designed system.</p>

The recommendations for Fire Safety corrective actions are:

Immediate (3 to 6 Days)	Combustibles underneath cutting table.
Short Term (3 Weeks)	During site tour, locking devices were noticed at exit doors.
Mid Term (6 Weeks)	<p>Relevant document complying with the requirements of Alliance Standard Section 10.12.1.4 was not found.</p> <p>No record of developing and communicating any emergency evacuation plan has been found.</p> <p>Alliance safety training curriculum was not found among the documents shown by factory personnel.</p> <p>Available central control panel. Visual Assessment: Fire alarm and detection system monitored centrally.</p> <p>During the site tour, no signage for occupants load was noticed.</p> <p>Floor level mentioned at some floor in English but stair name not mentioned.</p> <p>There was no occupancy certificate for any of the buildings among the documents shown by the factory concerned people.</p>

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	<p>All applicable permits are up to date including Fire License & Boiler License.</p> <p>No document regarding fire department pre-planning has been found among the documents shown by factory personnel.</p> <p>During site on signage was noticed for available standpipe systems.</p>
<p>Long Term (6 Months)</p>	<p>Exit access corridors are not protected., Visual Assessment: The wall separating the corridor was measured for thickness and investigated for unprotected openings.</p> <p>Aisle width at the 6th floor, the 5th floor, the 4th floor, and the 3rd floor, is 0.81m.</p> <p>Doors along the path of egress are not fire doors.</p> <p>Exit door not side-hinged swinging type.</p> <p>Interior exit stairway terminating at non-rated exit passageway.</p> <p>No document regarding fire training has been found among the documents shown by factory personnel.</p> <p>Height of the highest occupied level of the Main Production Building is 32.92 m (108 ft). Since the occupied floor height for this building is greater than 23 m (75 ft) above the finished grade, the entire building needs to be protected by automatic sprinkler system.</p> <p>Height of the highest occupied floor of the Main Production Building is 32.92 m (108 ft). Automatic sprinkler system following NFPA 13 is not provided. Therefore, Class I standpipe system along with sprinkler system needs to be installed throughout the building. Currently, only Class II stand pipe system is installed in the Main Production Building. Four Class II standpipe hose connections (40 mm) are installed on each floor. There is no hydraulic design for the installed system. Hose pressure at the roof was negligible. Hose diameter and water capacity are not sufficient.</p> <p>Handrails are provided only on one side of each stair.</p> <p>No document regarding inspection, maintenance and testing procedure of fire extinguisher was found in the documents shown by the factory personnel.</p> <p>On visual inspection, it was noticed that barriers required between generator and boiler room and chemical room were</p>

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	<p>not provided properly. Spot removing rooms with glass and aluminum partitions are not fire rated.</p> <p>No record of filling the position of fire safety director has been found.</p> <p>No document regarding housekeeping policy has been found among the documents shown by factory personnel.</p> <p>No hot work permit program could be presented by the factory personnel.</p> <p>No document regarding inspection, maintenance and testing procedure of fire pump was found in the documents shown by the factory personnel.</p> <p>No document regarding inspection, maintenance and testing procedure of standpipe and hose system was found among the documents shown by the factory personnel.</p>
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