Name of the Factory	:	Rnsco Sweaters Ltd.
Address of the Factory	:	Plot- 212, Baizid Bostami Road, Nasirabad, Chittagong
Present Status of the Factory	:	Under operation.
Structural Assessment Conducted by	:	ACCORD
Date of Structural Inspection	:	10 June, 2014
Fire Assessment Conducted by	:	TUV
Date of Fire Inspection	:	1 July, 2015
Electrical Assessment Conducted by	:	TUV
Date of Electrical Inspection	:	1 July, 2015
BGMEA Membership No.	:	3769

BASIC INFORMATION:

The factory building is a three storied RCC building with beam and column system and flat slab system. The following information was noted:

i.	Building Usage Type	:	Garment Factory.
ii.	Structural System	:	RCC beam column system.
iii.	Floor System	:	RCC Beam slab.
iv.	Floor Area	:	Not mentioned in the report
v.	No. of Stories	:	4- Storey
vi.	Construction Year	:	GF-1998, 1st Floor- 2000, 2nd to 3rd floor- 2003
vii.	Foundation Type	:	Not mentioned in the report
viii.	Design Drawings	:	Available
ix.	Soil Investigation Report	:	Not mentioned in the report
x.	Construction Materials	:	Brick aggregate.
xi.	Generator	:	Not mentioned in the report.

RECOMMENDATIONS FOR CORRECTIVE ACTION:

The recommendations of corrective action for both Structural and Fire & Electrical Safety comprises in Short Term, Mid Term and Long Term basis.

The recommendations for **Structural Safety** corrective action are:

Short Term (Immediate) :

1. Loadings on each floor are to be reduced and limited as indicated on page 2 of this report (Columns appear to be stressed to levels that require immediate review)

2. Factory Engineer to review design, loads and columns stresses in area identified above.

3. Verify insitu concrete strengths (using min. 4 no. 100mm dia. cores) and existing reinforcement for all columns

4. A Detail Engineering Assessment of Factory to be commenced, see attached Scope

5. As part of Detail Engineering Assessment, Building Engineer to commence re-survey of as-built structure and update drawings, including a verification of the location of stairs, column orientation and cantilevers (Design check required due to discrepancies between 'as-built' drawings and building structure)

6. Handrails to be provided to roof or access to be prohibited to area. (Edge protection to roof slab)

Mid Term (6-weeks) : 1. Produce and actively manage a loading plan for all floor plates within the factory, giving consideration to floor capacity and column capacity. This should include a safe level to which any water tanks can be filled (Columns appear to be stressed to levels that require immediate review)

2. Detail Engineering Assessment to be completed

3. Sections of render to be removed to investigate if cracks penetrate the building structure

4. Building Engineer to carry out design check on floor slab to assess if these cracks are non-structural. (Refer to Item 1 –Detail Engineering Assessment)

5. Complete as-built survey and commence calculations for verification of structure

6. Produce and actively manage a loading plan for all floors within the Building, giving consideration to floor capacity and column capacity. (Refer to Item 1 –Detail Engineering Assessment)

7. Produce and actively manage a loading plan for all floor plates within the Main Building giving consideration to floor capacity and column capacity. (Refer to Item 1 –Detail Engineering Assessment

8. Building engineer to assess the effect of the telecoms mast on the building structure

9. Building engineer to check the capacity of non-engineered lightweight roof structures under horizontal and vertical loading and make any necessary alterations required

Long Term (6-months) : 1. Continue to implement load management plan (Columns appear to be stressed to levels that require immediate review)

2. Building Engineer to monitor location of all cracks and ensure that, where required, remedial works are carried out.

3. Building Engineer to survey as-constructed building and update drawings as required

4. Continue to implement load management plan (Management of storage loads)

5. Implement any required remedial works arising from assessment. (Rooftop telecoms mast)

6. Concrete roof slab to be protected from direct contact with water, and falls to be provided, to protect the reinforcement from corrosion. Construction joints and the intersection between stair core walls and roof slab to be sealed and flashed properly (Water ingress evident in many areas)

The recommendations for **Fire & Electrical Safety** corrective action are:

(A): Recommendations for Fire Safety Corrective Actions:

Immediate (*the factory should not continue to be occupied until these non-conformities have been rectified*):	N/A
Short Term (*Actions that must be incorporated into a Fire Safety Management Plan immediately (1 ~ 2 weeks) and should be a regular activity*	• The minimum clear width of the pathway should be 0.9 meter • Remove all temporary items from all escape routes, aisles and passageway. • Factory management should be checked alarm call points, alarm & detection system periodically and maintained the record properly. • The first aid hose and standpipe performance should be checked periodically and properly tagged. • Provide additional firefighting equipment like sand & water buckets near exit or easily accessible area for first phase fire fighting. • Combustible materials should keep away from electrical source.
Mid Term (*The remedial works indicated must be carried out within a period of 6 weeks)*	• Replace all existing exit doors on evacuation routes, exit doors with side hinged type door, which swing outward and in the direction of travel. Swinging of the door should not constrict the width of the corridor / passage below 0.9 meter. • Remove all locking device from all egress door. All exit doors should be open-able from the side they serve without the use of a key. • Provide handrails on both side of each stairway with height of 0.9m measured from the nose of stair to the top of the handrail. • Doors in stair should be outward opening, side-swing, self closing, non-lockable 1.5 hours fire rated doors in all stair way encloses.(Also require fire rated door at the floor occupied by other tenants) • Prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated doors at ground floor generator room, which located at the adjacent to final exit. • Provide 1.5 hours fire rated door at store room for separation for other operational area. • Prepare proper plan and design for 4 hours fire rated barriers with 2 hours fire rated doors at ground floor generator room, which located at the adjacent to finishing section. • Produce design and plan for automatic detection system with automatic fire alarm.(Also needs to cover the floors occupied by other tenants)

	• Install Manual activation call point at all exit routes • Provide adequate nos. of smoke detectors to cover the whole factory building. • Prepare proper design and plan for dedicated fire pump with alternate backup power supply. • Replace existing 1 inch hose pipe replace with 1.5 inch hose pipe to meet the requirement of RMG guideline. • Prepare plan and design for dedicated water storage tank for firefighting operation as per RMG guideline. • Obtain updated fire license / permit from issuing authority • Implement to a single fire safety management system with approvals from all tenants in the factory building. • Obtain the boiler operator license from the proper issuing authority
Long Term (*The remedial works indicated must be carried out within a period of 6 months)*	• Provide 4 hours fire rated barriers with 2 hours fire rated doors at ground floor generator room, which located at the adjacent to final exit. • Provide 4 hours fire rated barriers with 2 hours fire rated doors at ground floor generator room, which located at the adjacent to finishing section. • Install automatic detection system with automatic fire alarm.(Also needs to cover the floors occupied by other tenants) • Install dedicated fire pump with alternate backup power supply. • Provide dedicated storage tank for firefighting operation

(B): Recommendations for Electrical Safety Corrective Actions:

Immediate (*the factory should not continue to be occupied until these non-conformities have been rectified*):	N/A
Short Term (*Actions that must be incorporated into a Fire Safety Management Plan immediately (a week) and should be a regular activity*	• All strands cables at exposed ends should be properly soldered / crimped and insulated
Mid Term (*The remedial works indicated must be*	• All unwanted materials should be removed from Generator room.

carried out within a period of 6 weeks)	• Provide rubber mats of adequate size in front of all distribution panels. • Install smoke detection and provide firefighting equipment in the generator room. • 1. All stranded conductors > 6mm2 to be provided with cable sockets. 2. All stranded conductors < 6 mm2, at exposed end should be soldered / crimped. • The electrical panels to be of metal case and should be marked with "Danger 415 Volts" and identified with proper phase marking and danger signage. • Provide cable connections with properly soldered / welded lugs at (DB/SDB)'s. Ensure that all the electrical connections are properly secured with lugs. • Avoid bunch of cable at MCCB/MCB or bus bar terminal, use individual circuit and over current device for every incoming and outgoing circuit at the distribution boards. • Provide circuit diagram /circuit list with proper current ratings and fuse size, marking for DBs identifying end use load, voltage, number of phases. • Provide cable joints of porcelain / PVC connectors with PIB tape wound around before placing the cable in the box. • Seal the cable penetrations through walls adequately with fire resistive elements. • Provide adequate earthing to body and doors to all DBs. Ensure that all electrical panels provided with proper and separate earth potential.
Long Term (*The remedial works indicated must be carried out within a period of 6 months)*	• Provide 4 hour fire rated walls and 1.5 hour fire rated door the generator room on ground level. • Modify Area of generator room to meet requirements of Table 4.4, RMG Guideline; the area should be 26m2 & 30m2, or relocate the generator room. • Provide proper height of panel boards (< 2m from floor level). • 1. Provide the ECC to meet minimum cross-sectional area as per table 4.5. 2. Ensure that connections between conductors / equipment provided to durable electrical continuity and adequate mechanical strength and protection. 3. The continuous earth connection is provided back to the main intake supply earth. • Provide adequate protection against lightning depending on the probability of a strike and acceptable risk levels at roof top of building