

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: ROBINTEX BD LTD.
Address of the Factory	: Vulta, Rupganj, Narayangonj, Bangladesh
Dhaka Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Structural Inspection	: 17 May, 2014
Fire & Electrical assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Fire & Electrical Inspection	: 10 March, 2014

Basic Information: The present garment factory is a commercial building with beam-column frame system. The following general information was noted:

i.	Building Usage Type	: Garment factory
ii.	Structural System	: RC beam slab
iii.	Floor System	: Beam slab
iv.	Floor Area	: Floor area of 4 storied building: 32m X 25.4m = 812 sqm
v.	No. of Stories	: 5 storied
vi.	Construction Year	: 2003-2005
vii.	Foundation Type	: Unavailable
viii.	Design Drawings	: Available (Approved by Rupgonj Upazilla Local Authority)
ix.	Soil investigation Report	: Available (Dated September, 2003)
x.	Construction Materials	: Stone aggregated
xi.	Generator	: In a separate building

Recommendations for Corrective Action: The recommendations of corrective action for both Structural and Fire & Electrical Safety are as follows:

The recommendations for Structural Safety corrective actions are:

Immediate (Now):

1. Building Engineer to review design, loads and column stresses in all columns in Building 3.
2. Verify insitu concrete strength either by 100mm diameter cores or existing cylinder strength data for cores from 4 columns. Verify grade of steel reinforcement used.
3. A Detail Engineering Assessment of Building 3 to be commenced, see attached Scope.
4. Sections of plaster finish to slab soffit to be removed to investigate if cracks penetrate the building structure.

Mid Term (Within 6 Weeks):

1. Detail Engineering Assessment for Building 3 to be completed.
2. Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.
3. Building Engineer to obtain loading from equipment on ground floor and verify the adequacy of the floor slab structure.
4. If required, relocate equipment and carry out remedial works to repair cracks on slab soffit.
5. Sections of plaster finish to soffit of 3rd floor slab to be removed to investigate if cracks penetrate the building structure.

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6. Building Engineer to review design, loads and column stresses in area identified above.
7. Verify insitu concrete strengths (using min. 4 no. 100mm dia. Cores) and existing reinforcement for all columns.
8. Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.
9. Produce and actively manage a loading plan for all floor plates of the factory giving consideration to floor capacity and column capacity.
10. Building Engineer to survey building bracing for completeness and to identify areas of corrosion on the steel frame.
11. Building Engineer to issue a schedule of remedial works for bracing reinstatement and corrosion protection.
12. Building Engineer to inspect stairs handrail and issue schedule of works required.
13. Remedial works to be carried out.
14. Building Engineer to survey as constructed building –in particular columns within the basement. Updated drawings to be prepared showing the as constructed layout.

Long Term (Within 6 Months):

1. Continue to implement load plan.
2. Building Engineer to carry out design check on slab to confirm that these cracks are non-structural.
3. Building Engineer to inspect internal line of building movement joint and prepare a schedule of areas where making good works are required to ensure that there is no risk of falling plasterwork.
4. Carry out making good works per Building Engineers schedule.
5. Remedial works to be carried out.
6. The design of the steel roof should be checked by the Building Engineer -specifically the provision of compression flange restraints should be reviewed as they are not all provided in matching locations on each rafter as would be expected.
7. Missing flange restraints to be reinstated.
8. Prepare calculations showing the structural adequacy of the building columns and equipment support columns taking into account the factory design imposed loading and the as built structure.
9. If any additions to the building structure are proposed, the Building Engineer shall provide calculations showing the structural adequacy of all columns taking into account any additions to the existing structure, the loading plans and as built structure, including insitu concrete strength testing.
10. Building Engineer to verify completeness of structural design drawings for the areas highlighted above. Full set of design drawings to be collated for each of these areas.

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The recommendations for Fire Safety corrective actions are:

Immediate (Within 1 month):

1. Remove locking features from all egress doors / gates. If locks are required for security reasons, utilize special door locking features complying with NFPA 101.
2. Keep egress paths and stairs clear of obstacles.
3. Replace all gates / sliding doors along the means of egress with side-hinged, swinging egress doors. If locks are required for security reasons, utilize special door locking features complying with NFPA 101.
4. Remove all storage from exit stairs and egress paths.

Short Term (Within 3 Months):

1. Provide dedicated storage rooms separated by minimum 1-hr fire-rated construction. Where separate storage rooms may not be feasible, provide defined storage areas and limit the storage arrangement as follows:

-Maximum height of 2.4m and maximum area of 23m²

-If sprinkler protected: maximum height of 3.66m and maximum area of 93m².

Separate areas of unenclosed combustible storage by a minimum clear distance of 3m.

2. Provide minimum 1.5-hr fire rated doors and seal all unprotected openings to separate the exit stairs from work areas and other building spaces on all floor levels. Ensure that the fire doors are self-closing and positive latching and that they are provided with fire exit (panic) hardware where serving production floors. If fire doors are required to be held open for functional reasons, provide automatic closing devices tied to the fire alarm system.
3. Seal all penetrations and openings in exit stair enclosure walls to maintain the fire separation.
4. Inspect, test and maintain the fire alarm system, and keep written records on-site, in accordance with NFPA 72.
5. Provide minimum aisle widths of 36-in.
6. Modify the egress door to swing in the direction of egress travel.

Mid Term (within 6 Months):

1. Provide 2-hr fire-rated exit passageway leading directly outside (vestibules to separate any storage areas) or provide sprinkler protection for discharge floor in accordance with NFPA 13.
2. Remove single-station smoke alarms. Provide automatic smoke detection throughout the building, tied into the fire alarm system, in accordance with NFPA 72.

Long Term (More than 6 months):

1. Replace the fire alarm system with a new, listed addressable fire alarm system in accordance with NFPA 72.
2. Provide automatic sprinkler protection throughout the building in accordance with NFPA 13.

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The recommendations for Electrical Safety corrective actions are:

Immediate (Within 1 month):

1. Unnecessarily lengthy wirings in flexible PVC conduit in the panels must be trimmed off and dressed well.
2. Bucholtz relay trip and alarm switch must be incorporated in the transformer protection systems.
3. Control panel must be cleaned as part of regular maintenance and all openings in panel must be closed.
4. Phase barriers between different phases must be installed to avoid arc flashing.
5. Provide the rubber mats in front of all the panels with proper size and grade.
6. Leakage must be checked during maintenance and repaired as necessary.
7. Phase barriers between different phases must be installed to avoid arc flashing.
8. Wiring inside panel must be arranged and firmly fixed.
9. Every panel doors (metallic) must be bonded with earth connections.

Short Term (Within 3 Months):

1. Extend the air gap between the electrical panel and steam pipe line.
2. HT cable terminating to the transformer bushing must be supported on firmly fixed riser to reduce stress at the termination.
3. Extend their air gap between the electrical BBT and steam pipe line.
4. All panels in operation must be fixed with foundation bolts.
5. All machine(s) in operation must be fixed with foundation bolts.
6. Cables must be supported on tray or riser.
7. Relocate/reposition the panels to create sufficient working space around it.
8. Transformer may be separated from panels by constructing barrier walls.
9. Sufficient working space must be provided surrounding power transformer.
10. Transformer must be separated from panels by constructing barrier walls.
11. Cables must be supported on cable trays and riser or must be laid in trench.

Mid Term (Within 6 months): NA

Long Term (More than 6 months): NA