

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: W APPARELS
Address of the Factory	: 295/JA/4, Rayer Bazaar, Dhaka-1209, Bangladesh
Dhaka Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Structural Inspection	: 8 March, 2014
Fire & Electrical assessment conducted by	: Accord (Full report available at bangladeshaccord.org)
Date of Fire & Electrical Inspection	: 23 March, 2014 & 23 April, 2014

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

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| i. | Building Usage Type | : Garment factory |
| ii. | Structural System | : Steel frame with concrete slab on metal deck at Roof level with R.C. Beam and column frame with 2-way spanning solid slabs at other floor levels |
| iii. | Floor System | : Beam slab |
| iv. | Floor Area | : Unavailable |
| v. | No. of Stories | : 5 storied |
| vi. | Construction Year | : 2001-2004 |
| vii. | Foundation Type | : Unavailable |
| viii. | Design Drawings | : Available (Approved by RAJUK in 1994) |
| ix. | Soil investigation Report | : Available (Dated January 2013) |
| x. | Construction Materials | : Brick aggregated |
| xi. | Generator | : Ground floor 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. Detail Engineering Assessment of as built structure to be commenced as per attached scope. Verify insitu concrete strengths (using min. 4 no. 100mm dia. Cores) and existing reinforcement for all columns.
2. 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 columns and floor beams.

Mid Term (Within 6 Weeks):

1. Detail Engineering Assessment to be completed.
2. Produce and actively manage a loading plan for all floors within the building giving consideration to floor capacity and column capacity.
3. Complete as-built survey and Detail Engineering Assessment.
4. Steel roofs to lean-to entrance structure and steel stairs - design should be checked by the Building Engineer to confirm that it includes the provision of a horizontal stability system and, if required, upgraded to support code vertical and wind loads.

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5. Sections of plaster finish to columns and slabs to be removed to investigate if cracks penetrate the building structure.
6. Building Engineer to carry out design check on columns and slabs to confirm that these cracks are non-structural.
7. Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity. (Refer to Item 1)
8. Sections of plaster finish to beams to be removed to investigate if cracks penetrate the building structure.
9. Extent of build-up loading within toilet areas to be surveyed and capacity of floor slab to be assessed to confirm that the floor slab is designed to carry these loads.
10. Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity including floor slab and column capacity.
11. Building Engineer to confirm that brick columns are nonstructural and that they may be removed to avoid providing an alternative support point to the beam above which will not have been allowed for by the building designer.

Long Term (Within 6 Months):

1. Continue to implement load management plan.
2. Completeness of steelwork connections should be checked on site.
3. Building Engineer to prepare Allowable Floor Loading Plans.
4. Building Engineer to carry out design check on beams to confirm that these cracks are non-structural.
5. Following confirmation by the Building Engineer, two plastered brick columns to be removed.

The recommendations for Fire Safety corrective actions are:

Immediate (Within 1 month):

1. Reduce the occupant load on 1st and 3rd floor immediately. In the future, provide adequate egress width by either:
 - Providing an enclosed passageway from the west end of the central stair to an exterior door.
 - Providing an additional stair for egress.
2. Remove locking features from all egress doors / gates. If locks are required for security reasons, utilize special door locking features complying with NFPA 101.
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.
5. Remove manual on/off switches from emergency lighting & exit signage units to prevent them from being switched off.

Short Term (Within 3 Months):

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1. Separate the boiler and transformer room by a minimum 2-hr fire-rated construction. Seal and/or protected all openings to maintain the required fire separations.
2. Provide dedicated storage rooms separated by minimum 1-hr fire-rated construction.
3. 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.
4. Inspect, test and maintain the fire alarm system, and keep written records on-site, in accordance with NFPA 72.

Mid Term (within 6 Months):

1. Provide 2-hr fire-rated exit passageway leading directly outside (vestibules to separate any storage areas).

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.

The recommendations for Electrical Safety corrective actions are:

Immediate (Within 1 month):

1. Disconnect (shutdown) the transformer from service line and replace the silica gel and establish a routine maintenance program to inspect and maintain related issues of transformer.
2. Disconnect (shutdown) the transformer from service line and clean all the dust & debris from the transformer. Establish a routine cleaning program to keep the transformer free from dust.
3. Provide phase separators between terminals of MCCB made of noncombustible material preferably rubber having enough dielectric strength to insulate the phases from each other.
4. Disconnect (switch off) the panel from electrical supply and clean all the dust, debris & lint of all the internal components. Establish a routine cleaning program to keep all the panels free from dust.
5. Provide earth connection for body and doors of metallic distribution boards using green cables preferably braid so that the metallic door remains at zero potential all the time.
6. Provide acid resistant stand for the batteries and keep sufficient distance around individual battery for maintenance and inspection purpose.

Short Term (Within 3 Months):

1. Construct a cable trench to terminate the excessive cables and provide covers on the trench made of noncombustible material preferably concrete slab to protect the cables' insulation from physical damage as well as prevent entering debris, dust and lint.
2. Install a cable ladder to terminate the excessive cables and fasten the cables with the ladder so that the cables get fixed with the ladder firmly. Ensure the cables are free from dust and debris.

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3. Provide cable gland same as the cable size at the cable entry and exit so that the cables are not stressed on the sharp edges of the entry and exit hole of the panel board. Provide covers if any additional gap remains after installing cable glands.
4. Provide cover on the duct made of noncombustible material preferably metallic sheet to protect the cables' insulation from physical damage as well as prevent entering debris, dust and lint. Rearrange the cables routed inside the duct and maintain the same arrange for future wiring if necessary.
5. Disconnect (switch off) the supply of the channel and clean all the dust, debris & lint inside the channel. Establish a routine cleaning program to keep the channel free from dust & lint.
6. Provide cover made of noncombustible material preferably rubber along with cable gland same as the cable size at the cable entry and exit so that it prevents the ingress of lint and dust through entry and exit hole of the panel board.
7. Remove all the multiple cables connected at single terminal of MCCB. Make single connection with proper lugs from MCCB terminal to bus bar and distribute to different loads from bus bar through protective devices.
8. Provide cover made of noncombustible material preferably metallic sheet along with cable gland same as the cable size at the cable entry and exit so that it prevents the ingress of lint and dust through entry and exit hole of the panel board.

Mid Term (Within 6 months):

1. Construct a wall instead of mesh fencing up to sealing separating from the remainder of the substation. Ensure forced ventilation is provided during wall construction and penetrations are sealed using appropriate fire rated noncombustible material.

Long Term (More than 6 months): NA