Name of the Factory	: **DIRD GARMENTS LTD**
Address of the Factory	: Nagarchar, Rajfulbaria, Savar Savar Dhaka Bangladesh
Present Status of the Factory	: **Under Operation**
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 03 Jun 2014
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 29 May 2014

BASIC INFORMATION:

There are six buildings in the factory premises out of which two are main production buildings and four are ancillary buildings. The following general information was noted:

i.	Building Usage Type	: Garments Factory.
ii.	Structural System	: Main building 1: RCC Frame structure system. Main building 2: RCC Frame structure system and roof is tin shed supported by angle truss frame.
iii.	Floor System	: RCC beam column system.
iv.	Floor Area	: 69946sft.
v.	No. of Stories	: 1) Six story RCC main production building 2) Two story RCC production building (Main Building 2), 3) Single story CI Shed-1 4) Single story CI Shed-2, 5) Single story RCC Building-1, 6) Single story RCC Building-2
vi.	Construction Year	: 2000
vii.	Foundation Type	: Main building -1: spread foundation
viii.	Design Drawings	: Available.
ix.	Soil investigation Report	: Available
x.	Construction Materials	: Reinforced Concrete and steel
xi.	Generator	: Unknown

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.

Mid Term (6 Weeks) :

i. Building-1: Under guidance of a qualified structural engineer conduct destructive core testing to validate the in-situ concrete compressive strength of structural elements.
ii. Conduct a detailed structural assessment by a qualified structural engineer and carry out remedial action as necessary.
iii. Redistribute floor loads to comply with the Floor Loading Plans.
iv. Engage a qualified structural engineer to confirm satisfactory structural performance of the building-2 under wind loading.
v. Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard.
vi. Engage a qualified structural engineer to develop the required documents to confirm the structural integrity of building-2. Documents must comply with Alliance Standard Part 8 Section 8.19 and 8.20
vii. 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.
viii. Have a qualified structural engineer confirm that capacity to support the load is available. Load Plans complying with Alliance Standard Part 8 Section 8.20.4.3 should also be developed.
ix. Have a qualified structural engineer prepare credible as-built documents for Building 2 based on the requirements of Part 8 Section 8.19 of the Alliance Standard.
x. Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.
xi. Provide signage or the appropriate markings at all areas used for storage to indicate the acceptable loading limits detailed in the Load Plan.
xii. Under guidance from a qualified structural engineer arrange a geo-technical investigation for the main building-2 at close vicinity of the structure and make the report available for review.

Long Term (6 Months) :

i. Provide a protective coating at the structural elements constructed with MCAC exposed to rainfall or other sources of water. Have protective coating approved by the Alliance or a qualified structural engineer. Implement proper drainage slope.
ii. Retrofitting is recommended as per assessment
iii. Obtain an occupancy certificate for each building and ancillary structures from the approving government authority.

The recommendations for Electrical Safety corrective actions are*:*

Immediate (3 to 6 Days)	Find out the cause of overheating and take proper action

Short Term (3 Weeks)	Develop and implement an electrical safety program. Include key topes such as lock out tag out procedures, personal protective equipment requirements, etc. Reference NFPA 70e for example program requirements. Establish a periodic inspection program to ensure the electrical systems are free from damage, debris, dirt, lint, etc. Maintain records concerning inspections and follow up actions. Switchboards and/or distribution boards should have capacity information labels e.g current carrying capacity of bus bar, rating of main incoming breaker , size of panel and permitted no. of CB, maximum permitted load connection capacity, etc. Review previous assessment thermal report and complete identified action items beginning with highest priority items.
Mid Term (6 Weeks)	Have a qualified electrical engineer develop as-built electrical drawings detailing key components of the electrical system. Provide cable sockets for stranded conductors having a nominal cross-sectional area 6mm2 or greater. Ensure the means of identification is obtained by separate color coding, marking tape, tagging, or other approved means.
Long Term (6 Months)	Develop an Insulation Resistance Measurement Program that ensures deterioration of insulation resistance will be identified quickly. Testing should be in compliance with InterNational Electrical Testing Association (NETA). All transformers, switchgears etc. shall be subject to an insulation resistance measurement test to ground after installation but before any wiring is connected. Insulation tests shall be made between open contacts of circuit breakers, switches etc. and between each phase and earth. Make sure the lightning protection ground terminals are bonded to the building or structure grounding..

The recommendations for Fire Safety corrective actions are:

Immediate (3 to 6 Days)	1. Install standpipe system following the requirements of NFPA 14 and detectors in accordance with NFPA 72 for Dird washing ltd. 2. Dird Washing Ltd must get acid licence from Dhaka DC office.
Short Term (3 Weeks)	Remove all locking devices from all egress doors and means of egress components in accordance with Alliance Standard Section 6.8. If locks are required for security reasons, utilize special door locking features complying

	with NFPA 101. Post the occupant load for every assembly and production floor in a facility in a conspicuous space near the main exit or exit access doorway for the space.
Mid Term (6 Weeks)	Develop an emergency evacuation plan which includes duties and responsibilities of various people/groups, interfacing between groups and fire brigade, headcount and identification of trapped victims, physically disabled people and their rescue, etc. and all components required by the Alliance Standards and communicate the plan to all employees. The evacuation plan shall include provisions to assist physically disabled persons. A list of all employees with physical disabilities shall be kept by the Fire Service Director. Provide an automatic fire alarm and detection system per NFPA 72 and arrange for direct connection of the system to a central station monitoring service or the Fire Service and Civil Defense. Until a central station monitoring service or direct connection to the Fire Service and Civil Defense can be set up, a person shall be assigned to contact the fire department in the event of fire alarm activation. An annunciator shall be located in a constantly attended location (such as a fire control room) to alert this person. Develop a testing and maintenance program that ensures the operation of all means of egress lights is 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 90 minutes once per year. Impart training in accordance with the Alliance Safety Training Curriculum and keep record with proper documentation. Complete and document fire department pre-planning activities with the local Fire Service and Civil Defense. Apply to Rajuk for the issuance of an occupancy certificate and pursue the matter to expedite. Install signage adjacent to each stair door indicating the stair name and the floor level at the noted locations in English and Bengali.
Long Term (6 Months)	Install an automatic fire alarm and detection system for the facility. System shall comply with the Alliance Standard and NFPA 72. Consult a qualified fire protection engineer and/or authorized fire alarm company to design and install the system. 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 a compatible fire rated frames with latching panic hardware. Provide fire-resistive rated construction barriers between

	floors following Section 4.4 and Table 4.4.1 of Alliance Standard or Table at 3.3.1 (page 10383) and Table 4.1.1 (page 10409) from BNBC Part 4. Consult a qualified fire protection engineer to design the rated construction barriers. Install an automatic fire alarm and detection system for the facility. System shall comply with the Alliance Standard and NFPA 72. Consult a qualified fire protection engineer and/or authorized fire alarm company to design and install the system. Automatic fire alarms shall be provided throughout all new and existing occupancies E, G2 and J as per clause 5.7.3. Install a standpipe system at required locations designed by a qualified fire protection engineer. The system is to be compliant with the requirements of NFPA 14. The hydraulic calculations should be reviewed by Alliance and review to be completed prior to start of work. All standpipe system installations shall be submitted for review by the Alliance for review prior to commencement of installation according to 5.4.3.2. System design should also account for the two additional stories currently under construction. Provide fire-resistive rated opening or penetration protection for rated walls and assemblies in accordance with Alliance Standard Sections 4.6 and 4.7. Consult a qualified fire protection engineer to design the required opening protectives or penetration systems. Provide 2 hr fire-resistive rated construction barriers at exit enclosures. Fit side-swinging, self-closing, non-lockable fire doors of 1.5 hr rating in all stairwell enclosures. Consult a qualified fire protection engineer to design the required rated construction barriers. Provide proper aisles marking (clear width minimum 36 in.) and keep aisles free of storage. The path of egress travel along a means of egress shall not be interrupted by any obstruction. The capacity of the means of egress shall not be reduced along the path of travel. Replace non-compliant doors and frames in the means of egress with side-swinging doors. Replacement doors shall be a minimum width of 0.8 m (32 in), and are listed, approved, self-closing, fire rated door assemblies (door and frame) with latching panic hardware. Provide re-entry to floor levels from the stairwells in accordance with Alliance Standard Section 6.8.3.

	Provide handrails on both side of each stairway. Provide intermediate handrails when the stair width exceeds 2.2m (87 inch). Provide handrail of height between the range 865 mm (34 in.) and 965 mm (38 in.). Provide Fire Department (Siamese) connections in accordance with Alliance Standard Section 5.5.4. Connections shall match the Fire Service and Civil Defence hose thread standard. Install a standpipe system at required locations designed by a qualified fire protection engineer. The system is to be compliant with the requirements of NFPA 14. Provide fire-resistive rated construction barriers between hazard types following Table 4.4.1 of Alliance Standard or Table 4.1.1 from BNBC Part 4. Consult a qualified fire protection engineer to design the required rated construction barrier. 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. Develop a hot-work permit program. The program must comply with the requirements of NFPA 51B. In general, this program should address the process of request and approval of authorities, necessary checks prior to approval, standby fire watch and fire fighting equipment, sounding of alarm procedure, duration and expiry of permit and re-approval procedure etc. Install a standpipe system at required locations designed by a qualified fire protection engineer. The system is to be compliant with the requirements of NFPA 14. Install required identification signs at the noted locations. Signage must comply with NFPA 14 Chapter 6. Install a class III standpipe system at the required locations designed by a qualified fire protection engineer. The system is to be compliant with the requirements of NFPA 14. Then establish an inspection, maintenance, and testing program for the standpipe and hose system. The Program must comply with the requirements of NFPA 25 Chapter 6 Table 6.1.1.2. Install a pump dedicated for fire fighting or fire protection following the requirements of NFPA 20. Then establish an inspection, maintenance, and testing program for the fire pump. Program must comply with NFPA 25.

	Establish written corporate policies on housekeeping to ensure scheduled cleaning for floor, wall, ceiling, supply. Promptly reschedule skipped cleanings. Provide a documented line of authority for authorizing a cleaning delay and rescheduling.