INITIAL STRUCTURAL INTEGRITY ASSESSMENT REPORT (SIAR)

Factory Name:	**Shah Makhdum Garments Ltd**
Address:	**72/B, Malibagh Chowdhury Para, Sharifpur Saydana National University, Gazipur Gazipur Dhaka Bangladesh**
Assessor:	**BD Technologies**
Date:	**18 Mar 2014**

Introduction to the Report

The following report contains a site profile and summary of non-conformities identified during an onsite assessment commissioned by the Alliance for Bangladesh Worker Safety (Alliance) and conducted by a third-party Qualified Assessment Firm (QAF). The assessment was conducted against the Alliance for Bangladesh Worker Safety Assessment Protocols (APs) and Fire Safety and Structural Integrity Standard, which is harmonized with the factory assessment guidelines developed by Bangladesh University of Engineering and Technology (BUET) for the Bangladesh National Tripartite Plan of Action (NTPA). The goal of the Alliance process is to provide clear and practical technical requirements by which Bangladeshi Ready Made Garment (RMG) Factories producing for Alliance members may be consistently and fairly evaluated for fire, structural, and electrical safety in a non-duplicative manner. Each assessment will prompt action plans that will be used by RMG factories to systematically and sustainably improve safety conditions for garment workers. Beyond tracking and reporting on action steps taken in a transparent manner, the Alliance organization and its members will seek to further support factory improvements through technical assistance, training, implementation support for functional Worker Committees, and in some cases financial assistance and wage support for workers if factories are closed for remediation.

The contents of the report do not constitute a guarantee of compliance with the applicable laws, the Alliance Standard or the absolute or continued safety against fire, electrical and/or structural integrity issues that may lead to injury or loss of life. The report is designed to provide a non-exhaustive summary of risk issues, based on a limited sampling and duration of time onsite by the named QAF. Neither the QAF nor the Alliance can certify or guarantee the quality, outcome, or effectiveness of actions taken in response to the report.

For more information and report feedback please go to: www.bangladeshworkersafety.org.

GENERAL INFORMATION

General Information	
Factory Name:	Shah Makhdum Garments Ltd
Address:	72/B, Malibagh Chowdhury Para, Sharifpur Saydana National University, Gazipur Gazipur Dhaka Bangladesh
Country:	Bangladesh
Province:	Dhaka
City:	Gazipur
Zip Code:	
Audit Duration:	1 Days 8 Hours
Re-Audit:	Re-Audit After 0 Months
Draft Report Date :	27/3/2014
Final Report Date :	28/3/2014
Are all Action Items From Previous Assessment Completed?:	N/A
Buildings in Complex :	1
Number of Building Levels (Stories) :	Approved as eight storied building but constructed up to level=4, Hight =42 ft.
Approximate Building Area (SF) :	Ground Floor =14,230 sqft, 1st floor =14,230sqft, 2nd Floor =14,230sqft, 3rd Floor =occupable floor area 1330sqft, unoccupable floor area 12900sqft Total=(14230x3+1330+12900) sqft =56,920sqft
Date of Building Construction :	9/12/2011
Date of Last Building Renovation/Addition :	N/A
Is the Building mixed use?:	No
Ancillary Structures in Complex :	One boiler room shed
Number of Ancillary Levels (Stories) :	Boiler room shed (Level=1, Height= 10 ft).
Approximate Ancillary	225 sft

Structures Area (SF) :	
Number of Occupants :	G.F=27, 1st floor=95, 2nd Floor=245, 3rd=0 (3rd Floor use for dining purpose)
Exterior Facade Description :	Burnt clay masonry infill walls. CI (tin) sheet window covering, aluminium framed glass windows and doors.
Structural System Description :	The primary type of structural system of the main building is reinforced concrete and the lateral load-resisting system for the building is concrete frame. There is no discontinuity (in diaphragm, frame or soft story) in lateral load path.The typical floor framing system is monolithic RC slab with beams. The structure is founded on single spread footing.

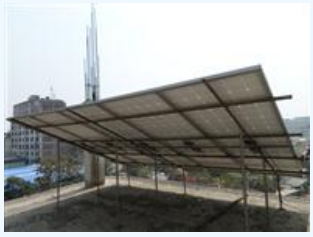
ASSESSMENT FINDINGS

Structural System Design		
Question:	Are credible structural design documents available for review and kept on site?	
Priority Level:	Medium	
Non-Compliance Level:	3	
Description:	The original structural documents, architectural, geotechnical investigation report and some newly prepared certifications are available for review and kept on site. But those structural documents are not credible according to BNBC Part 6 section 1.9.	
Source of Findings:	Document Review: documents provided during visit on 18th March 2014	
Suggested Plan of Action:	Have a qualified structural engineer prepare credible as-built documents based on the requirements of Part 8 Section 8.19/8.20 of the Alliance Standard.	
Suggested Deadline Date:	15 Jun 2014	
Standard:	Alliance Standard Part 8 Section 8.19 Required Structural Documentation for New and Existing Factories	
Question:	Can credible structural documentation indicating general conformance with 2006 BNBC or other comparable applicable international model building code be produced?	
Priority Level:	Medium	
Non-Compliance Level:	3	
Description:	No credible structural documentation indicating general conformance with 2006 BNBC or other comparable applicable international model building code could be produced before the assessment team. The available drawings do not comply with BNBC 2006 part 6 section 1.9.	
Source of Findings:	Document Review: Documents supplied by the Factory Owner.	
Suggested Plan of Action:	Engage a qualified structural engineer to develop the required documents to confirm the structural integrity of the buildings. Documents must comply with Alliance Standard Part 8 Section 8.19 and 8.20.	
Suggested Deadline Date:	15 Jun 2014	
Standard:	Reference Alliance Standards Part 8 Section 8.2 Structural Integrity of Existing Factory Buildings	
Question:	If built after 2006, can documented compliance with the seismic and wind	

	requirements of the 2006 BNBC be provided?	
Priority Level:	Medium	
Non-Compliance Level:	3	
Description:	The available structural documents are not in compliance with the seismic and wind requirements of the 2006 BNBC. Design notes are missing in the structural document. Seismic criteria and wind related requirements are not mentioned in the structural documents.	
Source of Findings:	Document Review: Documents review during visit on 18th March 2014.	
Suggested Plan of Action:	Have a qualified structural engineer document compliance with the seismic and wind requirements stated in the 2006 BNBC.	
Suggested Deadline Date:	15 Jun 2014	
Standard:	Alliance Standards Part 8 Section 8.17 Design for Lateral Loads and 2006 BNBC Part 6 Section 1.5	
Question:	Can documentation be provided that the building is compliant with the requirements for wind loading and storm surge loadings as detailed in BNBC Part 6 Section 1.5.3?	
Priority Level:	Medium	
Non-Compliance Level:	3	
Description:	Wind loading and storm surge loadings requirements as detailed in BNBC Part 6 Section 1.5.3 are not mentioned in the available structural drawings.	
Source of Findings:	Document Review: Documents review during visit on 18th March 2014.	
Suggested Plan of Action:	Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading.	
Suggested Deadline Date:	15 Jun 2014	
Standard:	2006 BNBC Part 6 Section 1.5. Compliance may be waived if the Factory Owner provides satisfactory evidence of a cyclone operations plan that includes full evacuation of the factory in advance of any approaching cyclone"	
Question:	If the structure has been previously expanded, was the structural impact on the entire structure analytically evaluated and confirmed by a qualified structural engineer.	
Priority Level:	Medium	
Non-Compliance Level:	3	
Description:	The structural documents are not credible as per BNBC pert 6 section 1.9. The factory has permission for eight storied building. Additionally at present there are provisions for vertical extension of the building. All provisions do not meet	

	the standard; such as, the beam is partially cast in stair areas so slab-beam monolithic casting is not possible. There is no evidence of involvement of a qualified structural engineer in the building expansion process.	
Source of Findings:	Visual Assessment: visit on 18th March 2014.	
Suggested Plan of Action:	Have a qualified structural engineer complete an analytical evaluation of the structural impact of the addition.	
Suggested Deadline Date:	15 Jun 2014	
Standard:	Reference Alliance Standards Part 8 Section 8.1 Applicability of Building Code.	
Question:	Have provisions been made in floors or decks for a concentrated load (such as heavy equipment, water tanks, stored materials, etc) applied at a location wherever this load acting upon an otherwise unloaded floor would produce stresses greater than those caused by a uniform load?	
Priority Level:	Medium	
Non-Compliance Level:	3	
Description:	No such provisions have been made in floors for a concentrated load (water tank at roof top, stored materials at 1st floor). The structural capacity of the factory to safely support the water tank and stored materials could not be confirmed and documented by a qualified structural engineer.	
Source of Findings:	Visual Assessment: visit on 18th March 2014.	
Suggested Plan of Action:	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.	
Suggested Deadline Date:	15 Jun 2014	
Standard:	Alliance Standard Part 8 Section 8.13 and 8.14	
Question:	Where density of operations, storage of materials, or equipment weights require live load capacity in excess of 2.0 kN/m2 (42 psf), do the design documents confirm that the required load capacity exists? Or has the load capacity been analytically confirmed and certified by an Alliance-qualified structural engineer?	
Priority Level:	Medium	
Non-Compliance Level:	3	
Description:	The live load or occupancy type are not mentioned in the existing so called architectural and structural drawings. The fabric storage in the 1st floor and water tanks in rooftop were evaluated and found exceeding the specified load capacity 2.0 kN/m2 (42psf).	
Source of Findings:	Visual Assessment: Visit on 18th March 2014.	

Suggested Plan of Action:	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.	
Suggested Deadline Date:	15 Jun 2014	
Standard:	Alliance Standards Part 8 Section 8.15 Minimum Floor Design Loads	
Question:	Are Certificates of Occupancy available for review?	
Priority Level:	Low	
Non-Compliance Level:	3	
Description:	No.	
Source of Findings:	Document Review: Document review during factory visit on 18th March 2014.	
Suggested Plan of Action:	Provide Certificates of Occupancy for review.	
Suggested Deadline Date:	15 Jun 2014	
Standard:	Alliance Standard Part 8 Section 8.3 Preliminary Structural Assessment	
Structural System Construction		
Question:	Have all areas of needed maintenance, including areas with efflorescence, dampness, standing water on rooftops, and corrosion been addressed.	  
Priority Level:	Medium	
Non-Compliance Level:	3	
Description:	Corrosion at rooftop exposed columns rebars. Stairwell protection as the construction is not continue. Dampness outside masonry walls.	
Source of Findings:	Visual Assessment: visit on 18th March 2014.	
Suggested Plan of Action:	Under guidance from a qualified structural engineer, address all areas of needed maintenance by correcting the identified issues.	
Suggested Deadline Date:	15 Jun 2014	
Standard:	Alliance Standard Part 8 Section 8.26 Durability and Maintenance	

Question:	Are all non-structural elements suspended from, attached to, or resting atop the structure adequately anchored and braced to resist earthquake forces?	 
Priority Level:	Medium	
Non-Compliance Level:	3	
Description:	Non-structural elements like water tanks at rooftop, storage racks, solar PV at rooftop are not adequately anchored and braced to resist earthquake forces.	
Source of Findings:	Photograph: see photo	
Suggested Plan of Action:	Adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard.	
Suggested Deadline Date:	15 Jun 2014	
Standard:	Alliance Standards Part 8 Section 8.18 Seismic Bracing of Key Non-Structural Elements and 2006 BNBC Part 6	
Question:	If yes, have the structural members constructed with MCAC been investigated by an appropriate program of in-situ testing and representative destructive testing or core samples?	
Priority Level:	Medium	
Non-Compliance Level:	3	
Description:	Non destructive rebound hammer test was done onsite to find concrete strength.	
Source of Findings:	Photograph: photo taken during visit., Visual Assessment: visit on 18th March 2014.	
Suggested Plan of Action:	Have a qualified structural engineer assess the durability aspects as suggested in Alliance Standard Part 7 Section 7.2 including core cutting and testing is suggested to ensure concrete strength and take appropriate remedial measures.But it is important to note that the destructive core testing is only technically required if the circumstances stated in Alliance Standard section 7.2.2.1.1 are met, but that the testing is advised nonetheless.	
Suggested Deadline Date:	15 Jun 2014	
Standard:	Reference Alliance Standards Part 7 Building Materials Section 7.2 Masonry-chip aggregate concrete (MCAC)	

Question:	Is the building free of active signs of water intrusion or ponding due to lack of performance of the façade system?	 
Priority Level:	Low	
Non-Compliance Level:	3	
Description:	No. The outside of the front is without any weather coating. The rooftop masonry are without plaster and sign of water intrusion.	
Source of Findings:	Photograph: see photo, Visual Assessment: visit on 18th March 2014.	
Suggested Plan of Action:	Repair the exterior façade system to prevent water intrusion.	
Suggested Deadline Date:	15 Jun 2014	
Standard:	Alliance Standard Part 8 Section 8.26 Durability and Maintenance	
Structural Safety Programs		
Question:	Are floor loads in compliance with posted plans?	
Priority Level:	Medium	
Non-Compliance Level:	3	
Description:	No floor Loading Plans exist in the factory as mentioned in Alliance Standards Part 8 Structural Design Section 8.10.	
Source of Findings:	Document Review: No floor load plans found in available documents provided during visit.	
Suggested Plan of Action:	Redistribute floor loads to comply with the Floor Loading Plans as per alliance standard.	
Suggested Deadline Date:	15 Jun 2014	
Standard:	Alliance Standard Part 8 Section 8.10 Floor Loading Plans (Load Plans).	
Question:	Is a program in place to ensure that the live loads for which a floor or roof is or has been designed will not be exceeded?	
Priority Level:	Medium	
Non-Compliance Level:	3	
Description:	There is no program in place to ensure that the live loads for which a floor or roof is or has been designed will not be exceeded. It has been found in temporary finished goods storage in 3rd and 4th floor.	
Source of Findings:	Visual Assessment: visit on 18th March 2014.	
Suggested Plan of	Develop a program to ensure that all live loads for which a floor or roof has	

Action:	been designed for will not be exceeded. The designated Load Manager shall oversee this program and ensure it is enforced.	
Suggested Deadline Date:	15 Jun 2014	
Standard:	Alliance Standard Part 13 Section 13.7 and Part 8 Section 8.9.	
Question:	Have Load Plans been prepared for each floor documenting the actual maximum operational loading that is intended and/or allowable on each floor.	
Priority Level:	Low	
Non-Compliance Level:	3	
Description:	Load Plans have not been prepared for each floor documenting the actual maximum operational loading that is intended and/or allowable on each floor.	
Source of Findings:	Visual Assessment: visit on 18th March 2014.	
Suggested Plan of Action:	Have a qualified structural engineer develop Floor Loading Plans per the requirements of Alliance Standard Part 8 Section 8.20.5.3	
Suggested Deadline Date:	15 Jun 2014	
Standard:	Alliance Standard Part 8 Section 8.10 Floor Loading Plans (Load Plans)	
Question:	Are Floor Load Plans posted as required?	
Priority Level:	Low	
Non-Compliance Level:	3	
Description:	No floor load plan posted.	
Source of Findings:	Photograph: see photo	
Suggested Plan of Action:	Have a qualified structural engineer prepare load plans including the information required in Section 8.20.5.3 of the Alliance Standard and posted in each floor desalinated areas as per standard.	
Suggested Deadline Date:	15 Jun 2014	
Standard:	Alliance Standard Part 8 Section 8.20.5.3	
Question:	Are areas used for storage of work materials and work products, clearly marked to indicate the acceptable loading limits as described in the Load Plan for that floor?	
Priority Level:	Low	
Non-Compliance Level:	3	
Description:	Areas used for storage of work materials and work products, are not clearly	

	marked to indicate the acceptable loading limits as described in the Load Plan for that floor.	
Source of Findings:	Visual Assessment: visit on 18th March 2014.	
Suggested Plan of Action:	Provide signage or the appropriate markings at all areas used for storage to indicate the acceptable loading limits detailed in the Load Plan.	
Suggested Deadline Date:	15 Jun 2014	
Standard:	Alliance Standard Part 8 Section 8.11 Floor Load Markings	
Question:	Is a designated representative (Factory Load Manager), who is onsite full time, trained regarding the structural floor capacity, and serves as an ongoing vendor resource and monitor of operational factory floor loadings?	
Priority Level:	Low	
Non-Compliance Level:	3	
Description:	No designated representative (Factory Load Manager), who is onsite full time, trained regarding the structural floor capacity, and serves as an ongoing vendor resource and monitor of operational factory floor loadings available during visit.	
Source of Findings:	Visual Assessment: visit on 18th March 2014	
Suggested Plan of Action:	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 vendors and be responsible to ensure that the factory operational loads do not at any time exceed the factory floor loading limits as described on the Floor Loading Plans.	
Suggested Deadline Date:	15 Jun 2014	
Standard:	Alliance Standards Part 8 Section 8.9 Factory Load Manager	