INITIAL STRUCTURAL INTEGRITY ASSESSMENT REPORT (SIAR)

Factory Name:	**SHAMS STYLING WEARS LTD.**
Address:	**Shams Tower, South Shyampur (Bagh Bari) Hemayetpur, Savar Savar Dhaka Bangladesh**
Assessor:	**Walter P. Moore**
Date:	**29 May 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:	SHAMS STYLING WEARS LTD.
Address:	Shams Tower, South Shyampur (Bagh Bari) Hemayetpur, Savar Savar Dhaka Bangladesh
Country:	Bangladesh
Province:	Dhaka
City:	Savar
Zip Code:	
Audit Duration:	1 Days
Re-Audit:	Re-Audit After 0 Months
Draft Report Date :	May 29, 2014
Final Report Date :	December 20, 2014
Are all Action Items From Previous Assessment Completed?:	No
Buildings in Complex :	2 buildings in complex (main building and generator room)
Number of Building Levels (Stories) :	9 stories (ground level, 8 elevated levels, and roof)
Approximate Building Area (SF) :	175,000 SF
Date of Building Construction :	2006, with vertical expansion in 2014
Date of Last Building Renovation/Addition :	2014
Is the Building mixed use?:	No
Ancillary Structures in Complex :	1 ancillary structure (generator room)
Number of Ancillary Levels (Stories) :	1 level on ground
Approximate Ancillary	Unknown

Structures Area (SF) :	
Number of Occupants :	4000
Exterior Facade Description :	Plastered brick masonry infill walls
Structural System Description :	RCC flat slab, RCC one way slab and beams, piles

ASSESSMENT FINDINGS

Structural System Design		
Question:	Are the available FoS for the columns adequate based on Preliminary calculation?	
Priority Level:	High	
Non-Compliance Level:	3	
Description:	Calculated FoS were as follows: Center: 2.27 Corner: 1.77 Edge: 1.85 For our calculations a concrete compressive strength of 2,370 psi was used based on the Alliance Standard minimum for stone chip aggregate concrete due to the lack of materials testing reports. If a greater compressive strength value can be validated, the FoS results will increase.	
Source of Findings:	Uploaded Document: Stress calculation spreadsheet	
Suggested Plan of Action:	Conduct destructive core testing to validate the in-situ concrete compressive strength for structural elements throughout the building.	
Suggested Deadline Date:	15 Feb 2015	
Standard:	Provide results of preliminary calculations in space provided. a) column capacity; FoS > 1.86 - Safe b) column capacity; FoS 1.5 -1.86 - Needs Evaluation c) Column capacity; FoS 1.25-1.5 - Needs Evaluation d) Column capacity; FoS <1.25 - Unsafe In case of a critically low FoS (<1.25), consider Immediate Escalation Protocol	
Question:	Is a clear and redundant load path to resist lateral loads provided?	
Priority Level:	Medium	
Non-Compliance Level:	3	
Description:	The structural system consists of a flat slab with no apparent shear walls or moment frames. For the vertical addition, there are no details on how the new columns were connected to the original construction. Per conversations with factory personnel they mentioned that the reinforcing steel for the new columns were welded to the reinforcing steel in the slab. There are no details shown on drawings for such condition and there is no indication that the reinforcing steel used is weldable	
Source of Findings:	Document Review: Construction documents reviewed on site, Worker Interviews: Discussion with factory personnel during site visit, Visual Assessment: Site visit on May 29, 2014	
Suggested Plan of Action:	Have a qualified structural engineer complete further analysis of the structure and develop a remediation plan if required.	
Suggested Deadline	15 Feb 2015	

Date:		
Standard:	Alliance Standards Part 8 Section 8.17 Design for Lateral Loads and 8.3.3. 2006 BNBC Part 6 Section 1.5	
Question:	Are credible structural design documents available for review and kept on site?	
Priority Level:	Medium	
Non-Compliance Level:	2	
Description:	Construction documents for original construction and vertical addition were reviewed on site. However, both sets of documents are incomplete and lack design criteria and seals of engineers.	
Source of Findings:	Document Review: Construction documents reviewed on site	
Suggested Plan of Action:	Have a qualified structural engineer prepare credible as-built documents based on the requirements of Part 8 Section 8.19 of the Alliance Standard.	
Suggested Deadline Date:	15 Feb 2015	
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:	2	
Description:	Structural documentation reviewed does not indicate design criteria nor design codes used.	
Source of Findings:	Document Review: Construction documents reviewed on site	
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 Feb 2015	
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:	2	

Description:	Original construction is not required to meet 2006 BNBC criteria, however, vertical addition performed in 2014 has no documented compliance with 2006 BNBC	
Source of Findings:	Document Review: Construction documents reviewed on site	
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 Feb 2015	
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:	2	
Description:	No design criteria was shown in the documents reviewed	
Source of Findings:	Document Review: Construction documents reviewed on site	
Suggested Plan of Action:	Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading.	
Suggested Deadline Date:	15 Feb 2015	
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:	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:	2	
Description:	Finished fabric stacks and cardboard stacks may produce floor overload	
Source of Findings:	Visual Assessment: Site visit on May 29, 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 Feb 2015	

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:	2	
Description:	Finished fabric stacks and cardboard stacks may produce floor overload	
Source of Findings:	Visual Assessment: Site visit on May 29, 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 Feb 2015	
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:	1	
Description:	No Certificates of Occupancy are available	
Source of Findings:	Document Review: Documents reviewed on site	
Suggested Plan of Action:	Provide Certificates of Occupancy for review.	
Suggested Deadline Date:	15 Feb 2015	
Standard:	Alliance Standard Part 8 Section 8.3 Preliminary Structural Assessment	
Structural System Construction		
Question:	Are the performance of key structural elements such as columns, slender columns, flat plates and transfer structures satisfactory?	
Priority Level:	High	
Non-Compliance Level:	3	
Description:	No performance issues were observed. However, for the vertical addition, there are no details on how the new columns were connected to the original construction. Per conversations with factory personnel they mentioned that the reinforcing steel for the new columns were welded to the reinforcing steel in	

	the slab. There are no details shown on drawings for such condition and there is no indication that the reinforcing steel used is weldable	
Source of Findings:	Document Review: Construction documents reviewed on site, Visual Assessment: Site visit on May 29, 2014	
Suggested Plan of Action:	Engage a qualified structural engineer to confirm structural performance of the structure.	
Suggested Deadline Date:	15 Feb 2015	
Standard:	Alliance Standard Part 8 Section 8.3.3	
Question:	Is the structural system free of distress, separations, or cracking that indicates lack of performance or overstress of the lateral load-carrying system?	
Priority Level:	High	
Non-Compliance Level:	3	
Description:	There is no visual evidence of distress on the lateral-load carrying system. However, based on our document review, the connection between the top level columns and the supporting structure does not appear to be adequate for lateral loads.	
Source of Findings:	Document Review: Construction documents reviewed on site, Visual Assessment: Site visit on May 29, 2014	
Suggested Plan of Action:	Engage a qualified structural engineer to provide additional investigation into the areas of distress, separations, or cracking and provide a remediation plan if required.	
Suggested Deadline Date:	15 Feb 2015	
Standard:	Alliance Standard Part 8 Section 8.3.3	
Question:	Is the structure free from any major/progressive distress?	
Priority Level:	High	
Non-Compliance Level:	3	
Description:	There is no visual evidence of major distress. However, from our document review we documented that for the vertical addition, there are no details on how the new columns were connected to the original construction. Per conversations with factory personnel they mentioned that the reinforcing steel for the new columns were welded to the reinforcing steel in the slab. There are no details shown on drawings for such condition and there is no indication that the reinforcing steel used is weldable	
Source of Findings:	Document Review: Construction documents reviewed on site, Visual Assessment: Site visit on May 29, 2014	
Suggested Plan of	Engage a qualified structural engineer to confirm the causes of such distress	

Action:	and suggest appropriate remedial measures.	
Suggested Deadline Date:	15 Feb 2015	
Standard:	Alliance Standards Part 8 Section 8.3.3	
Question:	Are structural steel members free of corrosion, physical damage or other types of deterioration?	 
Priority Level:	Medium	
Non-Compliance Level:	2	
Description:	Structural steel stairs from level 8 to roof level are not adequately anchored at support points	
Source of Findings:	Visual Assessment: Site visit on May 29, 2014	
Suggested Plan of Action:	Engage a qualified structural engineer provide further analysis and develop a remediation plan, if required	
Suggested Deadline Date:	15 Feb 2015	
Standard:	Alliance Standard Part 8 Section 8.26	
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:	1	
Description:	Racks, service lines, and rooftop antenna are not braced	
Source of Findings:	Visual Assessment: Site visit on May 29, 2014	
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 Feb 2015	
Standard:	Alliance Standards Part 8 Section 8.18 Seismic Bracing of Key Non-Structural Elements and 2006 BNBC Part 6	
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:	1	
Description:	Evidence of water intrusion was observed on the 5th floor accessory room	

Source of Findings:	Visual Assessment: Site visit on May 29, 2014	
Suggested Plan of Action:	Repair the exterior facade system to prevent water intrusion.	
Suggested Deadline Date:	15 Feb 2015	
Standard:	Alliance Standard Part 8 Section 8.26 Durability and Maintenance	
Structural Safety Programs		
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:	2	
Description:	No Load Plans have been developed and a Load Manager has not been designated	
Source of Findings:	Visual Assessment: No Load Management noted during visual assessment.	
Suggested Plan of Action:	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.	
Suggested Deadline Date:	15 Feb 2015	
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:	2	
Description:	No Load Plans have been developed	
Source of Findings:	Visual Assessment: No load plans noted during visual assessment	
Suggested Plan of Action:	Have a qualified structural engineer develop Floor Loading Plans per the requirements of Part 8 Section 8.20.5.3	
Suggested Deadline Date:	15 Feb 2015	
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:	2	
Description:	No Load Plans have been developed	
Source of Findings:	Visual Assessment: No load plans noted during visual assessment	
Suggested Plan of Action:	Have a qualified structural engineer prepare load plans including the information required in Section 8.20 of the Alliance Standard. Floor load plans should be visibly posted on all levels of all building.	
Suggested Deadline Date:	15 Feb 2015	
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:	2	
Description:	No Load Plans have been developed	
Source of Findings:	Visual Assessment: No load limit markings.	
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 Feb 2015	
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:	2	
Description:	A Load Manager has not been designated	
Source of Findings:	Visual Assessment: No load manager noted during visual assessment.	
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	15 Feb 2015	

Date:		
Standard:	Alliance Standards Part 8 Section 8.9 Factory Load Manager	