INITIAL STRUCTURAL INTEGRITY ASSESSMENT REPORT (SIAR)

Factory Name:	**SALIM & BROTHERS LTD.**
Address:	**C/8-10 BSCIC Industrial Area, Sagarika Road, Pahartoli, Chittagong Chittagong Chittagong Bangladesh**
Assessor:	**Bureau Veritas**
Date:	**19 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:	SALIM & BROTHERS LTD.
Address:	C/8-10 BSCIC Industrial Area, Sagarika Road, Pahartoli, Chittagong Chittagong Chittagong Bangladesh
Country:	Bangladesh
Province:	Chittagong
City:	Chittagong
Zip Code:	4219
Audit Duration:	1 Days
Re-Audit:	Re-Audit After 0 Months
Draft Report Date :	05-20-2014
Final Report Date :	10-12-2014
Are all Action Items From Previous Assessment Completed?:	N/A
Buildings in Complex :	1 Main Building (Unit-2A and Unit-2B, separated by expansion joint) 1 Ancillary Building
Number of Building Levels (Stories) :	5 (Grade + 4) (Unit-2A) 9 (Grade + 8) (Unit-2B)
Approximate Building Area (SF) :	Total area of all buildings in the factory premises: 190136 sft. Building wise breakdown as follows: 1) Nine Story RCC Main Production Building (Including the areas of both nine story and five story): 189436.00 sft (Ground floor: 22906.00 sft, 1st floor: 22906.00 sft, 2nd floor: 22906.00 sft, 3rd floor: 22906.00 sft, 4th floor: 22906.00 sft, 5th floor: 22906.00 sft, 6th floor: 13000.00 sft, 7th floor: 13000.00 sft, 8th floor: 13000.00 sft Roof: 13000.00 sft). 2) Single story RCC utility building: 700.00 sft.
Date of Building Construction :	2005
Date of Last Building Renovation/Addition :	No renovations or additions have been performed.
Is the Building mixed use?:	No
Ancillary Structures in Complex :	1) Single story RCC utility building.
Number of Ancillary	1 (Grade)

Levels (Stories) :	
Approximate Ancillary Structures Area (SF) :	700.00 sf
Number of Occupants :	2965
Exterior Facade Description :	RCC moment resisting frame structure with infilled masonry. Windows are sliding glass. Main door is metallic sliding type. There is a parapet along the periphery of the building.
Structural System Description :	RCC moment resisting frame structure with infilled masonry. Slabs and beams are poured monolithically. At top of Unit-2A, there is a canteen which is a roof trussed structure. Foundation type is pile foundation for both buildings.

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:	1) Unit-2A: Based on Concrete Compressive Strength: 2045 Psi(Alliance Standard); Rebar Yield Strength: 40 ksi; Live Load: 42 psf 1. FoS of Central Columns:1.30; 2. FoS of Corner Columns:1.97; 3. FoS of Edge Columns:1.51; Result shows that the FoS of the central and edge columns are inadequate based on preliminary calculations. 2) Unit-2B: Based on Concrete Compressive Strength: 2370 Psi(Alliance Standard); Rebar Yield Strength: 60 ksi; Live Load: 42 psf 1. FoS of Central Columns:2.29; 2. FoS of Corner Columns:1.17; 3. FoS of Edge Columns:1.80; Result shows that the FoS of the corner and edge columns are inadequate based on preliminary calculations.	
Source of Findings:	Uploaded Document: FoS calculation spreadsheet	
Suggested Plan of Action:	Under guidance from a qualified structural engineer arrange Detail Engineering Assessment of the structure immediately. Necessary remediation should be completed urgently. No storage shall be allowed in Unit 2B until remediation is complete.	
Suggested Deadline Date:	31 Jul 2014	
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:	Are credible structural design documents available for review and kept on site?	
Priority Level:	Medium	
Non-Compliance Level:	2	
Description:	As-built structural drawings and architectural drawings are available for both units. Structural documents contain the identity of the structural engineer, while architectural documents don't contain the identity of the architect. Soil test report with proper identity of the engineer is available, but the test is valid for unit-2B only. Design reports are not available for either unit.	
Source of Findings:	Document Review: Available document review shows that credible structural design documents are not available for review.	
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:	31 Jul 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:	2	
Description:	Both units (2A & 2B) were designed and constructed before 2006. No building code (i.e BNBC) is mentioned in the available structural documents, and design reports are not unavailable. Credible structural documentation indicating general conformance with 2006 BNBC or other comparable applicable international model building code can not be produced in this case.	
Source of Findings:	Document Review: Design report is unavailable. Other document review shows that no building code (i.e. BNBC) is mentioned in the available structural documents.	
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:	31 Jul 2014	
Standard:	Reference Alliance Standards Part 8 Section 8.2 Structural Integrity of Existing Factory Buildings	
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:	In the available design documents, there is no indication of wind loading and storm surge loadings as detailed in BNBC Part 6 Section 1.5.3.	
Source of Findings:	Document Review: In the available design documents, there is no indication of wind loading and storm surge loadings as detailed in BNBC Part 6 Section 1.5.3.	
Suggested Plan of Action:	Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading.	
Suggested Deadline Date:	31 Jul 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:	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:	At the roof top of unit-2B, there are eight undocumented plastic water tanks (4 with 5000L capacity, 4 with 2000L capacity). Also, there are four telecom towers situated at the roof top of unit-2B. The tanks and telecom towers are acting as concentrated loads on the roof slab.	
Source of Findings:	Document Review: The water tanks and telecom towers do not appear in the available documents., Visual Assessment: 8 plastic water tanks and 4 telecom towers were observed at the roof of Unit-2B.	
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:	31 Jul 2014	
Standard:	Alliance Standard Part 8 Section 8.13 and 8.14	
Question:	Is a Geotechnical Report available for review and kept on site?	
Priority Level:	Low	
Non-Compliance Level:	2	
Description:	Geotechnical report is available only for the 9 storied building (unit-2B) with proper identity of the responsible engineer. No geotechnical report is available for unit-2A.	
Source of Findings:	Document Review: Available document review reveals that, geotechinical report is available for the 9 storied building (unit-2B) with proper identity of the responsible engineer.	
Suggested Plan of Action:	Under guidance of a qualified structural engineer arrange geotechnical investigation at close vicinity of the structure (unit-2A) and provide the report for further review.	
Suggested Deadline Date:	31 Jul 2014	
Standard:	Alliance Standard Part 8 Section 8.2 Structural Integrity of Existing Factory Buildings	

Structural System Construction

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:	1	
Description:	1) Unit-2A: Hairline cracks have been observed in the beams and columns of the ground floor, but these do not appear to indicate lack of performance or overstress of the lateral load-carrying system, but they require further investigation. 2) Unit-2B: Hairline cracks have been observed in the beams at the ground floor and 5th floor, and the columns at the 6th floor. These cracks do not appear to indicate lack of performance or overstress of the lateral load-carrying system, but they require further investigation.	
Source of Findings:	Visual Assessment: Visually, cracks have been observed at columns and beams of different floors of both units, but these do not appear to indicate lack of performance or overstress of the lateral load-carrying system.	
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:	31 Jul 2014	
Standard:	Alliance Standard Part 8 Section 8.3.3	
Question:	Is the structural system free of distress, settlement, shifting, or cracking in columns or walls?	
Priority Level:	High	
Non-Compliance Level:	1	
Description:	Masonry cracks have been found at the 2nd floor of Unit-2A (5 storied building).	
Source of Findings:	Visual Assessment: Visually, masonry cracks have been found in 2nd floor in unit 2A(5 storied building).	
Suggested Plan of Action:	Engage a qualified structural engineer and make a remediation plan.	
Suggested Deadline Date:	31 Jul 2014	
Standard:	Alliance Standard Part 8 Section 8.3.3	

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:	2
Description:	The storage racks at the ground floors of both units are not braced or anchored to resist earthquake forces. In addition, the plastic water tanks at the terrace of unit 2B require anchorage and bracing.
Source of Findings:	Visual Assessment: Visually, the storage racks at the ground floors of both units are not braced or anchored to resist earthquake forces. In addition, the plastic water tanks at the terrace of unit 2B require anchorage and bracing.
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:	11 Sep 2014
Standard:	Alliance Standards Part 8 Section 8.18 Seismic Bracing of Key Non-Structural Elements and 2006 BNBC Part 6

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:	1
Description:	Dampness was observed at the roof top of Unit-2B, which appears to be due to water ponding.
Source of Findings:	Visual Assessment: Visually, dampness was observed at the roof top of Unit-2B, which appears to be due to water ponding.
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:	31 Jul 2014
Standard:	Alliance Standard Part 8 Section 8.26 Durability and Maintenance

Question:	Is expansion joint material free from cracking and other forms of deterioration?
Priority Level:	Low
Non-Compliance Level:	2
Description:	Cracking was observed in the expansion joint's blocking material.
Source of Findings:	Visual Assessment: Visually, cracking was observed in the expansion joint's blocking material.

Suggested Plan of Action:	Remove deteriorated expansion joint material and provide appropriate material at the expansion joint.	
Suggested Deadline Date:	11 Sep 2014	
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:	There is no program for either unit (2A & 2B) that will ensure that the designated load in each floor will not be exceeded.	
Source of Findings:	Document Review: No evidence of the existence of any program to control the live load on the floor as per the floor load plan was found.	
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:	17 Jul 2014	
Standard:	Alliance Standard Part 13 Section 13.7 and Part 8 Section 8.9.	
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:	There is no marking on the floor to designate spaces and height for storage of work materials.	
Source of Findings:	Visual Assessment: Visually, there is no marking on the floor to designate spaces and height for storage of work materials.	
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:	31 Jul 2014	
Standard:	Alliance Standard Part 8 Section 8.11 Floor Load Markings	

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:	The factory has provided Floor Load Plans for each unit, but they are not in accordance with the Alliance Standard.	
Source of Findings:	Document Review: Existing Floor Load Plans are not in accordance with the Alliance Standard.	
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:	31 Jul 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:	2	
Description:	The factory has provided Floor Load Plans for each unit, but they are not in accordance with the Alliance Standard.	
Source of Findings:	Document Review: Existing Floor Load Plans are not in accordance with the Alliance Standard.	
Suggested Plan of Action:	Have a qualified structural engineer prepare load plans including the information required in Section 8.20 of the Alliance Standard and have it posted in all required locations.	
Suggested Deadline Date:	31 Jul 2014	
Standard:	Alliance Standard Part 8 Section 8.20.5.3	