INITIAL STRUCTURAL INTEGRITY ASSESSMENT REPORT (SIAR)

Factory Name:	**Sterling Laundry Ltd.**
Address:	**Dania, Nayarhat, Ashulia, Savar Ashulia, Savar Dhaka Bangladesh**
Assessor:	**Emkay Enterprises LTD**
Date:	**15 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

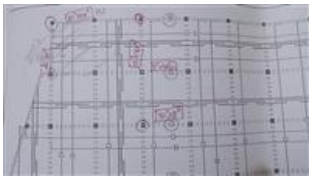
General Information	
Factory Name:	Sterling Laundry Ltd.
Address:	Dania, Nayarhat, Ashulia, Savar Ashulia, Savar Dhaka Bangladesh
Country:	Bangladesh
Province:	Dhaka
City:	Ashulia, Savar
Zip Code:	1350
Audit Duration:	1 Days
Re-Audit:	Re-Audit After 0 Months
Draft Report Date :	10/5/2014
Final Report Date :	06/06/2014
Are all Action Items From Previous Assessment Completed?:	N/A
Buildings in Complex :	Total 4 buildings in the complex
Number of Building Levels (Stories) :	Main building is 7 storied with 1 basement and 1 roof top shed
Approximate Building Area (SF) :	about 213927.40 sft
Date of Building Construction :	The building initially built for 3 storied in 2006-2008 Above this constructed in 2011-2012
Date of Last Building Renovation/Addition :	Roof top shed was constructed in 2012
Is the Building mixed use?:	No
Ancillary Structures in Complex :	The number of Ancillary structures in the complex is 3 1 Utility building 2 other structures (Guard house and ETP)
Number of Ancillary Levels (Stories) :	Utility building is 3 storied with basement and the guard house is 2 storied
Approximate Ancillary	Total area 14,160 sft. Utility Building area 12,000sft and Guard room area 2,160sft.

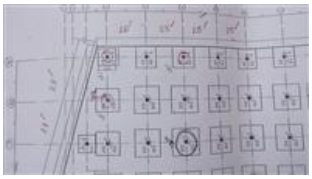
Structures Area (SF) :	
Number of Occupants :	Total occupants 3,689
Exterior Facade Description :	Brick masonry wall, exterior facade is plastered not painted.
Structural System Description :	RCC Column-Beam frame with spread footing.

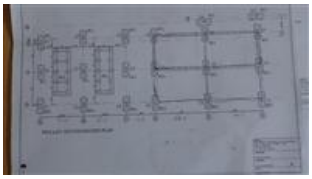
ASSESSMENT FINDINGS

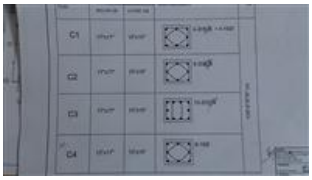
Structural System Design

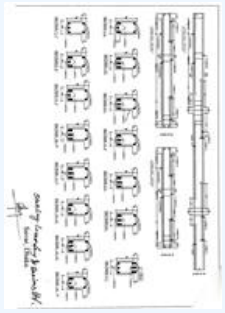
Question:	Are the available FoS for the columns adequate based on Preliminary calculation?
Priority Level:	High
Non-Compliance Level:	1
Description:	FoS of (main building) central column 1.74, corner column 2.09 and edge columns 1.52 and 1.79 found for 42 psf live load. The Factor of safety of the Utility Building central column 3.05, corner column 6.01 and edge column 3.67 has been found for 42 psf live load. The Alliance Guidelines regarding the Factor of safety of columns are given below- 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
Source of Findings:	Photograph: Column layout of main and utility building. Column Schedule of Utility Building, Uploaded Document: Excel sheet of FOS for Axial load (Main Building and Utility Building
Suggested Plan of Action:	Under guidance from a qualified structural engineer assessment of concrete strength to be done by taking at least 4 nos. of 3-4 inch diameter cores from the area of concern
Suggested Deadline Date:	02 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:	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:	Alliance Standards Part 8 Section 8.15 Minimum Floor Design Loads. 4th floor have heavy storage where live load exceeds 42 psf. Special design provided for this 4th floor. In 6th floor the existing load exceeds 42 psf. Live load capacity of each floor has not been mentioned by the Design engineer.	
Source of Findings:	Uploaded Document: 4th floor slab and beam designs	
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:	05 Jul 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:	1	
Description:	No Certificates of Occupancy for review	
Source of Findings:	Document Review: No Certificates of Occupancy found	
Suggested Plan of Action:	Provide Certificates of Occupancy for review	
Suggested Deadline Date:	07 Jul 2014	
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:	1	
Description:	Alliance Standard Part 8 Section 8.3.3 No major cracks found in the key structural elements. The performance of key structural elements such as columns, slender columns, flat plates and transfer structures are satisfactory	

	for main buildings. Soft story and slender column found in Utility Building. Need to do a Detail Engineering Assessment of Utility Building.	
Source of Findings:	Visual Assessment: During assessment it was found	
Suggested Plan of Action:	Engage a qualified structural engineer to confirm structural performance of the structure.	
Suggested Deadline Date:	18 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:	1	
Description:	Alliance Standards Part 8 Section 8.18 Seismic Bracing of Key Non-Structural Elements and 2006 BNBC Part 6 No anchorage or bracing found to resist the earthquake forces	
Source of Findings:	Photograph: Racks with stored materials	
Suggested Plan of Action:	Develop engineered plans to brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard. Install anchor and braces as shown on approved plans.	
Suggested Deadline Date:	08 Jul 2014	
Standard:	Alliance Standards Part 8 Section 8.18 Seismic Bracing of Key Non-Structural Elements and 2006 BNBC Part 6	
Question:	The exterior façade is free of cracking.	
Priority Level:	Low	
Non-Compliance Level:	1	
Description:	In the left side wall at 1st floor level a horizontal crack has been found in the interface of brick wall and slab. The slab in this area is 8' cantilever.	
Source of Findings:	Photograph: Exterior Facade crack at 1st floor level	
Suggested Plan of Action:	Have a qualified structural engineer provide further analysis of the identified cracks to determine the appropriate course of corrective action.	

Suggested Deadline Date:	05 Jul 2014	
Standard:	Alliance Standard Part 8 Section 8.2	
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:	2006 BNBC Part 6 Chapter 1 Section 1.4.6 and Alliance Standard Part 13 Section 13.7 and Part 8 Section 8.9. No program in place to ensure live load.	
Source of Findings:	Visual Assessment: No programs for load allocation 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:	24 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:	2	
Description:	Reference Alliance Standards Part 8 Structural Design Section 8.10 Floor Loading Plans (Load Plans) No load plans found.	
Source of Findings:	Document Review: Floor load plans not found.	
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:	05 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:	No load Plans posted by following the guideline Alliance Standard Part 8 Section 8.20.5.3	

Source of Findings:	Visual Assessment: During the inspection no posted load plans found in the factory	
Suggested Plan of Action:	Have a qualified structural engineer prepare load plans including the information required in Section 8.20 of the Alliance Standard.	
Suggested Deadline Date:	08 Jul 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:	2	
Description:	Reference Alliance Standards Part 8 Structural Design Section 8.11 Floor Load Markings. No load marking found in storage areas	
Source of Findings:	Visual Assessment: During assessment no load plans marking found	
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:	08 Jul 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:	2	
Description:	Alliance Standards Part 8 Section 8.9 Factory Load Manager. No designated representative in the factory for managing floor live load found.	
Source of Findings:	Visual Assessment: No designated representative found in the factory	
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:	24 Jun 2014	

Standard:	Alliance Standards Part 8 Section 8.9 Factory Load Manager	