INITIAL STRUCTURAL INTEGRITY ASSESSMENT REPORT (SIAR)

Factory Name:	**One Composite Mills Ltd**
Address:	**Vill: B.K.Bari, Post: Mirzapur, Gazipur Gazipur Dhaka Bangladesh**
Assessor:	**EIMS**
Date:	**11 Apr 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:	One Composite Mills Ltd
Address:	Vill: B.K.Bari, Post: Mirzapur, Gazipur Gazipur Dhaka Bangladesh
Country:	Bangladesh
Province:	Dhaka
City:	Gazipur
Zip Code:	1703
Audit Duration:	13 Hours
Re-Audit:	Re-Audit After 0 Months
Draft Report Date :	05 May 2014
Final Report Date :	27 May 2014
Are all Action Items From Previous Assessment Completed?:	N/A
Buildings in Complex :	Two
Number of Building Levels (Stories) :	Building#1(Garments Division): 5 storied Building#2(Textile Division): 2 storied
Approximate Building Area (SF) :	155,058 Square feet
Date of Building Construction :	Building#1 (Garments Division: 2002-2005 Building#2(Textile Division):2002-2003
Date of Last Building Renovation/Addition :	No renovation/addition
Is the Building mixed use?:	No
Ancillary Structures in Complex :	Nine(09)
Number of Ancillary Levels (Stories) :	All the ancillary structures are one storied
Approximate Ancillary	31,000 square feet

Structures Area (SF) :	
Number of Occupants :	Building#1(Garments Division): 1624 Building#2(Textile division): 278 Utility area:25 Security Barrack:25
Exterior Facade Description :	Unreinforced brick masonry wall has been used as exterior wall in both of the buildings. In building#1 twenty four (16) windows have been provided in the front side of the building; while in case of building#2 glass has been used in the front side. In the entrance a porch has been provided
Structural System Description :	Building#1: Moment Resisting Frame (Flat slab) Building#2:Building Frame System & Steel Structure (Gable frame)

ASSESSMENT FINDINGS

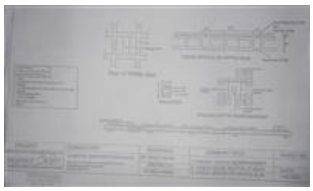
Structural System Design		
Question:	Are the available FoS for the columns adequate based on Preliminary calculation?	
Priority Level:	High	
Non-Compliance Level:	3	
Description:	Building#1(Garments Division): Typical interior column (C14) size is 18 inch diameter (from actual measurement & drawing) and and no. of rebar is 8-25 mm which is same as the design drawings (verified by scanning & also from exposed reinforcements at roof). Contributing area is 400 sft. The FoS = 2.41 Typical edge and interior column reinforcements were also verified from exposed reinforcements at roof which is similar to the design drawings and the sizes were also similar to the design drawings. Typical edge column size: 10”x18” (8-25mm bars); FoS =2.55 Typical corner column size: 10”x15” (8-20mm bars); FoS =2.67 Building#2(Textile Division): In the RCC structure of textile division typical interior column (C7) size is 18 inch diameter from actual measurement & drawing) and no. of rebar is 8-25 mm which is same as the design drawings (verified by scanning). Contributing area is 500 sft. The slenderness ratio is found to be 43, which is greater than 40, therefore the interior slender column are inadequate). Typical edge column size: 10”x20” (10-25mm bars); FoS =5.77 Typical corner column size: 10”x20” (10-25mm bars); FoS =7.96 Alliance standard calculation spreadsheet could not be used here because building #1 has circular column. Concrete compressive strength was considered to be 2400 psi because no in-situ or during-construction test results were available and the strength obtained via UPV testing was very close to the ALLIANCE guideline of 2400 psi for stone chip aggregate concrete.	
Source of Findings:	Document Review: Provided design drawings, Uploaded Document: Excel file for column capacity calculation	
Suggested Plan of Action:	Under guidance from a qualified structural engineer arrange Detail Engineering Assessment of the structure. This assessment should include special attention for the interior columns (type C7) of the Textile Building (Building 2) which were determined to be overly slender during the initial assessment.	
Suggested Deadline Date:	20 Jun 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:	Can credible structural documentation indicating general conformance with 2006 BNBC or other comparable applicable international model building code be produced?	

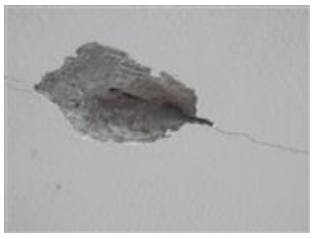
Priority Level:	Medium	
Non-Compliance Level:	3	
Description:	In the design drawing it was not mentioned that which Building code has been used for design of the factory buildings, therefore the answer of this question is "No"	
Source of Findings:	Document Review: Provided Design Documents	
Suggested 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:	20 Jun 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:	3	
Description:	There is no indication in the design drawing that the requirements for wind loading and storm surge loadings as detailed in BNBC Part 6 Section 1.5.3 are considered in designing the buildings.	
Source of Findings:	Document Review: Provided design drawings	
Suggested Plan of Action:	Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading.	
Suggested Deadline Date:	20 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:	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:	All the floors were loaded less than 42 psf. But even considering a 42 psf live load, the capacity of the flat slab in building #1 is inadequate.	

Source of Findings:	Uploaded Document: Excel file of Flat Slab capacity calculation	
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:	20 Jun 2014	
Standard:	Alliance Standards Part 8 Section 8.15 Minimum Floor Design Loads	
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 roof of building#1 6 water tanks were found during inspection.	
Source of Findings:	Visual Assessment: Photograph of water tank at roof of building#1	
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:	20 Jun 2014	
Standard:	Alliance Standard Part 8 Section 8.13 and 8.14	
Question:	Are Certificates of Occupancy available for review?	
Priority Level:	Low	
Non-Compliance Level:	1	
Description:	No occupancy certificate was provided to the team during assessment.	
Source of Findings:	Document Review: Documents reviewed during April 11, 2014 site visit.	
Suggested Plan of Action:	Provide occupancy certificate for review.	
Suggested Deadline Date:	22 Jun 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:	3
Description:	Building#1(Garments Division): Columns: Satisfactory Slender Columns: Not found Flat Plate: Not satisfactory. The provided slab thickness was found to be 7 inch whereas it was 7.5 inch in the design drawing. The slab thickness is found to be inadequate considering punching shear capacity. The top two floor slabs were constructed as waffle slabs using hollow blocks between ribs. Significant cracking was observed in the top three floor slabs (top two waffle slabs, topmost flat slab). The cracks were confirmed to extend through plaster into the concrete by removing plaster at representative locations. UPV testing conducted at cracked locations also indicated the cracks extended into the concrete. As the floor slabs in Building #1 were observed to be relatively lightly loaded, the cracking did not seem to stem from punching shear and therefore does not create a immediate safety concern. The slab cracking should be further investigated however to determine the cause of the cracking and determine an appropriate course of repair. Building#2(Textile Division): Columns:Interior columns of Building#2(Textile division) are not satisfactory as they are found to be slender and the slenderness ratio is very high. The column slenderness should be further investigated to determine an appropriate course of repair. Beams: Satisfactory
Source of Findings:	Document Review: Design drawing of top two floor slab of building#1, Uploaded Document: Excel file of Capacity calculation of One Composite Mills Ltd., Visual Assessment: Photograph of cracks in slab of Building#1 Photograph of hollow blocks used in slab of Building#1
Suggested Plan of Action:	Engage a qualified structural engineer to confirm structural performance of the structure, focusing on the issues outlined in the description section. If required, a remediation plan shall also be provided by the qualified structural engineer.
Suggested Deadline Date:	20 Jun 2014
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:	As Building#1 is a flat plate structure, the slab is a key lateral load carrying system here and significant cracks were found in the slab which indicates lack of performance or overstress of the lateral load-carrying system.
Source of Findings:	Visual Assessment: Photographs of cracks in slab of building#1
Suggested Plan of Action:	Engage a qualified structural engineer to provide additional investigation into the areas of distress or cracking and provide a remediation plan if required.
Suggested Deadline Date:	20 Jun 2014
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:	Potentially progressive cracks were found in the top three floor slabs of building#1 (Garments Division) during our inspection (11th April, 2014).
Source of Findings:	Visual Assessment: Photographs of cracks in slab on building#1
Suggested Plan of Action:	Engage a qualified structural engineer to confirm the causes of such distress and suggest appropriate remedial measures.
Suggested Deadline Date:	20 Jun 2014
Standard:	Alliance Standards Part 8 Section 8.3.3

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:	Water ponding was found at roof of Building#1(Garments Division)
Source of Findings:	Visual Assessment: Photograph of water ponding at roof
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:	20 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:	1	
Description:	Storage racks at ground floor of building#1 needs to be anchored and braced. Water tanks at roof top were unbraced and need to be braced/anchored.	
Source of Findings:	Visual Assessment: i)Photograph of storage rack ii)Photograph of unbraced/un-anchored water tank at roof	
Suggested Plan of Action:	Develop engineered plan 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:	01 Aug 2014	
Standard:	Alliance Standards Part 8 Section 8.18 Seismic Bracing of Key Non-Structural Elements and 2006 BNBC Part 6	
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 such program was found in the factory during inspection	
Source of Findings:	Visual Assessment: Visual Inspection	
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:	20 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:	No load plan was available.	

Source of Findings:	Document Review: No floor load plan was provided	
Suggested Plan of Action:	Have a qualified structural engineer prepare load plans including the information required in Section 8.20 of the Alliance Standard" as well as language that these load plans should be clearly displayed on each building level per Alliance Standards section 8.10.	
Suggested Deadline Date:	20 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:	2	
Description:	No floor load plan was available.	
Source of Findings:	Document Review: No floor load plan was provided to the assessors	
Suggested Plan of Action:	Have a qualified structural engineer prepare load plans including the information required in Section 8.20 of the Alliance Standard" as well as language that these load plans should be clearly displayed on each building level per Alliance Standards section 8.10.	
Suggested Deadline Date:	20 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:	2	
Description:	No marking was found during inspection to indicate the acceptable loading limits as described in the Load Plan for that floor.	
Source of Findings:	Document Review: No load plan is available., Visual Assessment: Photo of No marking of load limit in storage area.	
Suggested Plan of Action:	Prepare floor load plan and provide signage or appropriate markings at all areas used for storage to indicate the acceptable loading limits detailed in the Load Plan.	
Suggested Deadline Date:	20 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:	2	
Description:	No designated representative (Factory Load Manager)was engaged.	
Source of Findings:	Visual Assessment: No Factory Load Manager was found during inspection	
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:	20 Jun 2014	
Standard:	Alliance Standards Part 8 Section 8.9 Factory Load Manager	