INITIAL STRUCTURAL INTEGRITY ASSESSMENT REPORT (SIAR)

Factory Name:	**Centex Textile and Apparels Limited**
Address:	**CB 203/3, Kachukhet Puran Bazar Dhaka Cantonment Dhaka Dhaka Bangladesh**
Assessor:	**Sumerra**
Date:	**30 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:	Centex Textile and Apparels Limited
Address:	CB 203/3, Kachukhet Puran Bazar Dhaka Cantonment Dhaka Dhaka Bangladesh
Country:	Bangladesh
Province:	Dhaka
City:	Dhaka
Zip Code:	1206
Audit Duration:	2 Days
Re-Audit:	Re-Audit After 0 Months
Draft Report Date :	April 18, 2014
Final Report Date :	May 1, 2014
Are all Action Items From Previous Assessment Completed?:	N/A
Buildings in Complex :	Main Building (2 parts A/B)
Number of Building Levels (Stories) :	Part A - 6 Storied with basement and 1 tin shade on roof top Part B - 7 Storied
Approximate Building Area (SF) :	Part A (6 storied with 1 basement) = 5260 sft X 6 + 4800 = 36,360 sft Part B (7 storied) = 10,700 sft X 7 = 74,900 sft Total area =1,11,260 sft
Date of Building Construction :	Part A: 2004 -2005 Extension (Part B): 2011
Date of Last Building Renovation/Addition :	Extension (Part B): 2011
Is the Building mixed use?:	No
Ancillary Structures in Complex :	NA
Number of Ancillary Levels (Stories) :	NA
Approximate Ancillary	NA

Structures Area (SF) :	
Number of Occupants :	1,920
Exterior Facade Description :	Brick facade with typical doors and windows. Good condition.
Structural System Description :	Part A: Monolithic RC flat slab with RC frame Part B: Monolithic RC slab with beams, RC fram

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:	Part A (6 Storied) 42psf Central 1.41 Corner 1.80 Edge 1.74 20psf Central 1.61 Corner 1.96 Edge 1.93 Part B (7 storied) 42psf Central 2.79 Corner 2.67 Edge 2.03 20psf Central 3.18 Corner 2.88 Edge 2.26 Adequate safety margin exists in new building (Part B) but for Part A FoS 1.25 to 1.5 indicates inadequate safety margin.	
Source of Findings:	Uploaded Document: Stress Calc.	
Suggested Plan of Action:	PART A: Engage qualified structural engineer to conduct a detailed engineering assessment (DEA) of building within 6 weeks. DEA should include assessment of the strength of the concrete and quantity of the steel in the columns. Concrete strength shall be assessed by taking at least 4 nos. of 4 inch diameter cores from the area of concern. If cores are to be taken from column, it is advisable to take it from an upper level where the stresses are low (for practical reasons 3 inch cores may be taken from columns). In addition, UPV shall be used to have concrete strength in sufficient number of columns in the lower tiers so that a level of confidence is achieved. The calibrated results of core tests and UPV shall be used to determine a reliable value of concrete strength in columns. The size and diameter of steel rebar in most of the columns of two lowest tiers shall be authentically determined using a Ferro scanner or similar device. In order to confirm the diameter of embedded bars as obtained from Ferro scanner, the Assessor may have to remove the concrete cover in one or two locations.	
Suggested Deadline Date:	26 Sep 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:	3	
Description:	Factory has only a structural drawing which was prepared for submission purpose in Cantonment Board, where required data details are missing. No detailed structural or architectural drawings are available.	

Source of Findings:	Document Review: No detailed structural or architectural drawings are available.	
Suggested Plan of Action:	Have a qualified structural engineer prepare credible as-built documents (As built structural drawing / As built architectural drawing) based on the requirements of Part 8 Section 8.19 of the Alliance Standard. Drawings should indicate all load types (dead, wind, seismic), strength, and code compliance.	
Suggested Deadline Date:	30 May 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:	Factory has only a structural drawing which was prepared for submission purpose in Cantonment Board, where required data details are missing. No detailed structural or architectural drawings are available and therefore general conformance with 2006 BNBC or other comparable applicable international model building code cannot be determined.	
Source of Findings:	Document Review: No detailed structural or architectural drawings are available	
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 (also noted elsewhere)	
Suggested Deadline Date:	30 May 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:	For Part B extension (built in 2011) factory has only a structural drawing which was prepared for submission purpose in Cantonment Board, where required data details are missing. No detailed structural or architectural drawings are available and therefore compliance with the seismic and wind requirements of the 2006 BNBC cannot be determined.	
Source of Findings:	Document Review: No detailed structural or architectural drawings are available	

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:	30 May 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:	Factory has only a structural drawing which was prepared for submission purpose in Cantonment Board, where required data details are missing. No detailed structural or architectural drawings are available and therefore general conformance 2006 BNBC Part 6 Section 1.5 cannot be determined.	
Source of Findings:	Document Review: No detailed structural or architectural drawings are available	
Suggested Plan of Action:	Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading. Compliance may be waived if satisfactory evidence is provided of a cyclone operations plan that includes full evacuation of the factory in advance of any approaching cyclone	
Suggested Deadline Date:	30 May 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:	No credible documentation was provided regarding the assessed impact of the Part B extension (2011). The structural impact on the existing structure (Part A) may have been evaluated but no documentation is available.	
Source of Findings:	Document Review: No credible documentation was provided regarding the assessed impact of the Part B extension (2011)	
Suggested Plan of Action:	As part of other assessments and required drawings mentioned elsewhere, have a qualified structural engineer complete an analytical evaluation of the structural impact of the addition.	

Suggested Deadline Date:	30 May 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 evaluation or provisions have been made for concentrated loads observed in the factory. No load information was available for review in drawings. Concentrated loads were observed in the following areas: Part B - Ground Floor, East - Warehouse for Cutting - Storage of Fabric Goods Part A - Ground Floor, SE (Roof of basement floor) - Generator Room Part A - Basement - Warehouse (All) - Storage of Fabric Goods	
Source of Findings:	Photograph: Photo of Generator	
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:	30 May 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:	No load information was available for review in drawings nor has load capacity been analytically confirmed for the following areas that are expected to require a higher live load capacity: Part B - Ground Floor, East - Warehouse for Cutting - Storage of Fabric Goods Part A - Ground Floor, SE (Roof of basement floor) - Generator Room Part A - Basement - Warehouse (All) - Storage of Fabric Goods	
Source of Findings:	Photograph: Photo of fabric storage	
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 (also mentioned elsewhere).	
Suggested Deadline	30 May 2014	

Date:		
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:		
Description:		
Source of Findings:		
Suggested Plan of Action:	Provide Certificates of Occupancy for review.	
Suggested Deadline Date:		
Standard:	Alliance Standard Part 8 Section 8.3 Preliminary Structural Assessment	
Structural System Construction		
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:	Racking systems in the factory have not been sufficiently anchored to resist earthquake forces in the following locations: Part B - 1st Floor - Accessories Store Part A - Basement (NW) - Temporary mezzanine	
Source of Findings:	Photograph: Photo of Accessories Store and temporary mezzanine	
Suggested Plan of Action:	Develop engineered plans to brace all racking systems and messazine structure to resist earthquake forces to comply with the BNBC and Alliance Standard. Install anchor and braces as shown on approved plans.	
Suggested Deadline Date:	30 May 2014	
Standard:	Alliance Standards Part 8 Section 8.18 Seismic Bracing of Key Non-Structural Elements and 2006 BNBC Part 6	
Question:	Was masonry-chip aggregate concrete (MCAC) used in the construction of the building?	
Priority Level:		
Non-Compliance Level:		
Description:		

Source of Findings:	
Suggested Plan of Action:	Have a qualified structural engineer assess the durability aspects as suggested in Alliance Standard Part 7 Section 7.2 and take appropriate remedial measures.
Suggested Deadline Date:	
Standard:	Reference Alliance Standards Part 7 Building Materials Section 7.2 Masonry-chip aggregate concrete (MCAC)

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:	3
Description:	No program is in place to ensure loads will not be exceeded as per BNBC Part 6 Chapter 1 Section 1.4.6 and Alliance Standard Part 13 Section 13.7 and Part 8 Section 8.9.
Source of Findings:	Worker Interviews: Management confirms no program currently in place.
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:	30 May 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:	No load plans have been prepared as per Alliance Standards Part 8 Structural Design Section 8.10 Floor Loading Plans (Load Plans)
Source of Findings:	Document Review: No load plans available for review.
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:	30 May 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 load plans posted as required per Alliance Standard Part 8 Section 8.20.5.3	
Source of Findings:	Visual Assessment: No load plans observed.	
Suggested Plan of Action:	Have a qualified structural engineer prepare load plans including the information required in Section 8.20 of the Alliance Standard. Load Plans shall be prepared for each floor. These Load Plans shall document the actual maximum operational loading that is intended and/or allowable on each floor.For each section of a floor, live load should be posted in the adjacent column, particularly for the critical sections.	
Suggested Deadline Date:	30 May 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 are not marked with acceptable loading limits as per Alliance Standards Part 8 Structural Design Section 8.11 Floor Load Markings	
Source of Findings:	Visual Assessment: No loading limits observed on storage racks or other concentrated loads.	
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:	30 May 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 load manager has been assigned as per Alliance Standards Part 8 Section 8.9 Factory Load Manager	

Source of Findings:	Worker Interviews: Management confirms no load manager is designated.
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:	30 May 2014
Standard:	Alliance Standards Part 8 Section 8.9 Factory Load Manager