INITIAL STRUCTURAL INTEGRITY ASSESSMENT REPORT (SIAR)

Factory Name:	**TUNIC APPARELS LTD**
Address:	**Plot M-4/3, Road 7, Section 7 Mirpur, Dhaka Dhaka Dhaka Bangladesh**
Assessor:	**Emkay Enterprises LTD**
Date:	**21 Oct 2015**

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:	TUNIC APPARELS LTD
Address:	Plot M-4/3, Road 7, Section 7 Mirpur, Dhaka Dhaka Dhaka Bangladesh
Country:	Bangladesh
Province:	Dhaka
City:	Dhaka
Zip Code:	1217
Audit Duration:	1 Days 0 Hours
Re-Audit:	Re-Audit After 0 Months
Draft Report Date :	30 September 2015
Final Report Date :	11 November 2015
Are all Action Items From Previous Assessment Completed?:	N/A
Buildings in Complex :	There are 3 buildings. One Main Buildings and two Ancillary Buildings.
Number of Building Levels (Stories) :	Main Building: 12 Stories with one basement (B + G + 11).
Approximate Building Area (SF) :	Total: 92,600 SF (Basement: 6,900; G.F: 7,600; 1st to 11th: 7,100 SF Each).
Date of Building Construction :	01. Main Building: 1993-97; 02. Boiler Shed: 2000; 03. Generator Building: 2000.
Date of Last Building Renovation/Addition :	No addition or renovation.
Is the Building mixed use?:	No
Ancillary Structures in Complex :	There are two ancillary structures.
Number of Ancillary Levels (Stories) :	01. Boiler Shed: Single story tin shed; 02. Generator Building: Single story RCC building.
Approximate Ancillary	Total: 381 SF; (Boiler Shed: 107, Generator Building: 274).

Structures Area (SF) :	
Number of Occupants :	Total Occupant: 827 [Basement: 20 (Tunic Apparels Ltd. & O'dell Apparels Ltd.); G.F: 23 (Tunic Apparels Ltd. & O'dell Apparels Ltd.); 1st: 55 (Tunic Apparels Ltd.); 2nd: 20 (O'dell Apparels Ltd.); 3rd: 115 (Tunic Apparels Ltd.); 4th: 195 (Tunic Apparels Ltd.); 5th: 190 (Tunic Apparels Ltd.); 6th: 190 (Tunic Apparels Ltd.); 7th to 10th: Vacant (O'dell Apparels Ltd.); 11th: 19 (Tunic Apparels Ltd. & O'dell Apparels Ltd.)].
Exterior Facade Description :	The exterior facade is infilled masonry wall with plaster finished and painted and windows are frame type.
Structural System Description :	Building frame system with flat slab, column and structural wall.
Issues were not found during the structural integrity assessment that required the Emergency Escalation Protocol (and referral to NTC Review Panel)?:	Yes

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:	FoS calculations were completed assuming an average live load of 42 psf for working area. A 40 ksi reinforcing steel strength was assumed according to design documents. FoS calculations were originally completed assuming a concrete compressive strength of 2,370 psi according to the Alliance Standard guideline for stone chip aggregate concrete. During this assessment however, it was revealed that a detailed engineering assessment (DEA) report by Bureau Veritas has already been completed for this factory. As part of this DEA, selective destructive core testing was completed. As such, we revised our FoS calculations based on these core testing results by modifying the concrete compressive strength to 2,307 psi based on calculations for an average strength based on ACI 562 guidelines. The destructive core testing results and ACI 562 calculations are uploaded for reference. Column FoS results are listed below based on the compressive strength derived from the ACI 562 calculations. Column FoS results: Central column D-6 = 1.56; Central column F-6=1.77; Corner column F-1=2.17; Edge column D-1= 1.70. In the absence of a Detailed Engineering Assessment (DEA), these results would warrant additional investigation as they fall between 1.5 and 1.86. Action is required of the Alliance to decide on a future course of action as a DEA has already been conducted.	
Source of Findings:	Uploaded Document: 1. FoS calculation of Tunic Apparels Ltd. 2. Core test reports-Tunic Apparels Ltd. 3. Equivalent Concrete Core Strength Calculation.	
Suggested Plan of Action:	Submit the previously conducted Bureau Veritas detail engineering assessment (DEA) report to the Alliance for review and approval as a DEA has already been completed from the factory end.	
Suggested Deadline Date:	31 Dec 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:	Are credible structural design documents available for review and kept on site?	
Priority Level:	Medium	
Non-Compliance Level:	2	
Description:	Structural design document available and kept on site. But some column	

	section for upper floor does not match with the provided structural drawing.	
Source of Findings:	Visual Assessment: Structural design document available and kept on site. But some column section for upper floor does not match with the provided structural drawing.	
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 Dec 2015	
Standard:	Alliance Standard Part 8 Section 8.19 Required Structural Documentation for New and Existing Factories	
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:	General conformance with BNBC 2006 wind requirement found in the factory provided detail engineering assessment report but seismic loading criteria was not indicated in design calculation report.	
Source of Findings:	Document Review: General conformance with BNBC 2006 wind requirement found in the factory provided detail engineering assessment report but seismic loading criteria was not indicated in design calculation report.., Photograph: Wind load requirement.	
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:	31 Dec 2015	
Standard:	Alliance Standards Part 8 Section 8.17 Design for Lateral Loads and 2006 BNBC Part 6 Section 1.5	
Question:	Are Certificates of Occupancy available for review?	
Priority Level:	Low	
Non-Compliance Level:	2	
Description:	The factory has not obtained the certificate of occupancy from the authority.	
Source of Findings:	Document Review: The factory has not obtained the certificate of occupancy from the authority.	
Suggested Plan of Action:	Provide Certificates of Occupancy for review.	
Suggested Deadline Date:	31 Dec 2015	

Standard:	Alliance Standard Part 8 Section 8.3 Preliminary Structural Assessment	
Structural System Construction		
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:	2	
Description:	Corrosion found at roof top exposed rebar.	
Source of Findings:	Photograph: Corrosion in exposed rebar, Visual Assessment: Corrosion found at roof top exposed rebar.	
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 Dec 2015	
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:	2	
Description:	Racks in the storage area at basement were not anchored to the resist earthquake forces.	
Source of Findings:	Photograph: Storage rack at basement., Visual Assessment: Racks in the storage area at basement were not anchored to the resist earthquake forces.	
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:	31 Dec 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:	2	
Description:	Though water intrusion or ponding was not found during visual assessment, some wall found unplastered at outside face which can make the wall damp in future.	
Source of Findings:	Photograph: Un-plastered wall picture-1 Un-plastered wall picture-2, Visual Assessment: Though water intrusion or ponding was not found during visual assessment, some wall found unplastered at outside face which can make the wall damp in future.	
Suggested Plan of Action:	Repair the exterior façade system to prevent water intrusion.	
Suggested Deadline Date:	31 Dec 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:	There is no program that will ensure that the designated load in each floor will not be exceeded.
Source of Findings:	Document Review: There is no program that will ensure that the designated load in each floor will not be exceeded.
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:	31 Dec 2015
Standard:	Alliance Standard Part 13 Section 13.7 and Part 8 Section 8.9.
Question:	Are Floor Load Plans posted as required?
Priority Level:	Low
Non-Compliance Level:	2
Description:	Floor load plan is not posted.

Source of Findings:	Visual Assessment: During visual assessment it was found that floor load plan was not posted according to the load plan.	
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 the building.	
Suggested Deadline Date:	31 Dec 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:	Floor load plans were present for review but there was no marking to indicate acceptable loading limits.	
Source of Findings:	Document Review: Floor load plans were present for review but there was no marking to indicate acceptable loading limits., Visual Assessment: Floor load plans were present for review but there was no marking to indicate acceptable loading limits.	
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 Dec 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:	There is no 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 loading.	
Source of Findings:	Document Review: No designated representative Factory Load Manager was found., Visual Assessment: No designated representative Factory Load Manager was found.	
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:	31 Dec 2015	
Standard:	Alliance Standards Part 8 Section 8.9 Factory Load Manager	