

# INITIAL STRUCTURAL INTEGRITY ASSESSMENT REPORT (SIAR)

Factory Name: **Actor Sporting Ltd (Garment Division)**  
Address: **Plot 33-35, Dhaka (EPZ), Savar Savar Dhaka  
Bangladesh**  
Assessor: **Bureau Veritas**  
Date: **06 Jul 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](http://www.bangladeshworkersafety.org).



## GENERAL INFORMATION

General Information	
Factory Name:	Actor Sporting Ltd (Garment Division)
Address:	Plot 33-35, Dhaka (EPZ), Savar Savar Dhaka Bangladesh
Country:	Bangladesh
Province:	Dhaka
City:	Savar
Zip Code:	1349
Audit Duration:	1 Days
Re-Audit:	Re-Audit After 0 Months
Draft Report Date :	July 7, 2014
Final Report Date :	August 14, 2014
Are all Action Items From Previous Assessment Completed?:	N/A
Buildings in Complex :	2 Main Buildings: 1. Main Production Building 2. Store Building
Number of Building Levels (Stories) :	1. Main Production Building: 5 (Ground + 4) 2. Store Building: 4 (Ground + 3 + Occupied Roof)
Approximate Building Area (SF) :	Approximately 155,072 sft.
Date of Building Construction :	1. Main Production Building: Ground to Level 2 in 1995, Levels 3 and 4 in 1996. 2. Store Building: 2003.
Date of Last Building Renovation/Addition :	2013 (Undocumented Steel Frame Roof Structure, Atop Store Building)
Is the Building mixed use?:	No
Ancillary Structures in Complex :	8 Ancillary Structures: 1. Security Building 2. Wastage Jute Godown 3. Dining Shed 4. Generator, Boiler and Compressor shed 5. Child Care Shed 6. Accessories Store Shed 7. Accessories Store (Visor) Shed 8. Diesel Shed
Number of Ancillary Levels (Stories) :	1 (Ground)

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Approximate Ancillary Structures Area (SF) :	Approximately 7,316 sft.
Number of Occupants :	1,751
Exterior Facade Description :	Brick masonry infill between concrete structural frame elements (slabs, beams and columns). Aluminum doors and glass sliding windows.
Structural System Description :	Reinforced concrete moment resisting frame structures (slabs, beams and columns). Pile foundations.
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:	2	
Description:	Column FoS calculations were performed for two concrete compressive strength cases: Alliance Standard minimum for MCAC (2,370 psi) and as determining by nondestructive testing (2,800 psi via UPV testing). Column FoS results for minimum strength (2,370 psi) concrete: For five-story building (considering 47.20 psf (average) live load): Central column - 1.73, Corner column - 2.94, Edge column - 1.88. For four-story building (considering 63.00 psf (average) live load): Corner column - 2.63, Edge column - 1.87, (No central columns in this building). Column FoS results for concrete strength (2,800 psi) from UPV test: For five-story building (considering 47.20 psf (average) live load): Central column - 1.93, Corner column - 3.34, Edge column - 2.13. For four-story building (considering 63.00 psf (average) live load): Corner column - 2.90, Edge column - 2.06, (No central columns in this building). The FoS of central columns for the five story main production building is below the acceptable limit (1.86) using the Alliance Standard minimum for MCAC (2,370 psi). This warrants additional investigation.	
Source of Findings:	Uploaded Document: Column FoS calculation spreadsheet.	
Suggested Plan of Action:	Under guidance from a qualified structural engineer arrange Detail Engineering Assessment of the five-story Main Building structure. This assessment should include destructive core testing to validate the in-situ concrete compressive strength of structural elements.	
Suggested Deadline Date:	30 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:	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:	A structural steel roof frame structure has been added at the roof level of the Store Building to create additional occupancy space. No evidence was available to indicate that this structure had been designed by a structural	



	<p>engineer or that the structural impact of the additional occupancy space had been considered. An overhead concrete water tank has also been added at Level 5 of the Main Production Building. No evidence was available to indicate that this structure had been designed by a structural engineer or that the structural impact of this addition had been considered.</p>	
Source of Findings:	<p>Photograph: Additional occupancy space created by steel frame roof structure, overhead concrete water tank.</p>	
Suggested Plan of Action:	<p>Have a qualified structural engineer complete an analytical evaluation of the structural impact of the additions.</p>	
Suggested Deadline Date:	<p>30 Sep 2014</p>	
Standard:	<p>Reference Alliance Standards Part 8 Section 8.1 Applicability of Building Code.</p>	
Question:	<p>Where density of operations, storage of materials, or equipment weights require live load capacity in excess of 2.0 kN/m<sup>2</sup> (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?</p>	
Priority Level:	<p>Medium</p>	
Non-Compliance Level:	<p>3</p>	
Description:	<p>The following large storage loads were observed in which the live load exceeded 42 psf: -Levels 3 and 4, five-story Main Building -Levels 1, 2 and 3, four-story Store Building No evidence was available to indicate that the structural impact of these increased loads had been considered.</p>	
Source of Findings:	<p>Photograph: Areas of excessive live load.</p>	
Suggested Plan of Action:	<p>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.</p>	
Suggested Deadline Date:	<p>30 Sep 2014</p>	
Standard:	<p>Alliance Standards Part 8 Section 8.15 Minimum Floor Design Loads</p>	
Question:	<p>Are credible structural design documents available for review and kept on site?</p>	
Priority Level:	<p>Medium</p>	
Non-Compliance Level:	<p>2</p>	
Description:	<p>A set of design documents was available for review. However, these documents were incomplete and also did not contain a design report as required by the BNBC and Alliance Standard.</p>	
Source of Findings:	<p>Document Review: Documents reviewed on-site.</p>	



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. This should be completed for all buildings.	
Suggested Deadline Date:	30 Sep 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:	For the two main buildings, no evidence was available to indicate general conformance with the BNBC or other comparable building code.	
Source of Findings:	Document Review: Documents reviewed on-site.	
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:	30 Sep 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:	2	
Description:	For the two main buildings, no evidence was available to indicate compliance with the seismic and wind loading requirements of the BNBC.	
Source of Findings:	Document Review: Documents reviewed on-site.	
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 Sep 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:	2
Description:	For the two main buildings, no evidence was available to indicate compliance with the wind loading requirements of the BNBC.
Source of Findings:	Document Review: Documents reviewed on-site.
Suggested Plan of Action:	Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading.
Suggested Deadline Date:	30 Sep 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:	Are Certificates of Occupancy available for review?
Priority Level:	Low
Non-Compliance Level:	2
Description:	Certificates of Occupancy are not available for review.
Source of Findings:	Document Review: Documents reviewed on-site.
Suggested Plan of Action:	Provide Certificates of Occupancy for review.
Suggested Deadline Date:	30 Sep 2014
Standard:	Alliance Standard Part 8 Section 8.3 Preliminary Structural Assessment
Question:	Is a Geotechnical Report available for review and kept on site?
Priority Level:	Low
Non-Compliance Level:	2
Description:	For main factory building: A geotechnical report is complete and available for review and kept on site. For store building: A geotechnical Report is not available for review and kept on site.
Source of Findings:	Document Review: Documents reviewed on-site.
Suggested Plan of Action:	Under guidance from a qualified structural engineer arrange geotechnical investigation at close vicinity of the structure and make the report available for review. This should be completed for the Store Building.
Suggested Deadline	30 Sep 2014







Date:	
Standard:	Alliance Standard Part 8 Section 8.2 Structural Integrity of Existing Factory Buildings

**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:	Water ponding and dampness were noted at the roof level of the five-story Main Building. Dampness was also noted at masonry walls at Level 3 of the Main Building and within the Store Building.
Source of Findings:	Photograph: Water ponding and wall dampness.
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:	30 Sep 2014



Standard:	Alliance Standard Part 8 Section 8.26 Durability and Maintenance
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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 following elements were observed to not contain adequate anchorage or bracing to resist seismic forces: -Storage racks in five-story Main Building (Levels 1, 2 and 4) -Storage racks in four-story Store Building (Ground Levels and Levels 1, 2 and 3)
Source of Findings:	Photograph: Unbraced storage racks.
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:	30 Sep 2014



Standard:	Alliance Standards Part 8 Section 8.18 Seismic Bracing of Key Non-Structural Elements and 2006 BNBC Part 6
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**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?
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Priority Level:	Medium	
Non-Compliance Level:	2	
Description:	No load management plan is currently in place.	
Source of Findings:	Document Review: No documented load management plan.	
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 Sep 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:	Floor load plans have not been prepared.	
Source of Findings:	Document Review: No documented floor load plans.	
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 Sep 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:	Floor load plans have not been prepared or posted.	
Source of Findings:	Visual Assessment: No posted load plans.	
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 all buildings.	
Suggested Deadline Date:	30 Sep 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:	Storage areas have not been marked to indicate acceptable loading limits.
Source of Findings:	Visual Assessment: No acceptable loading limit markings.
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 Sep 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 Factory Load Manager is currently in place.
Source of Findings:	Document Review: No documented Factory Load Manager.
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 Sep 2014
Standard:	Alliance Standards Part 8 Section 8.9 Factory Load Manager