

INITIAL STRUCTURAL INTEGRITY ASSESSMENT REPORT (SIAR)

Factory Name: **Ayesha Clothing Co. Ltd.**
Address: **Jamgara, Ashulia, Savar. Ashulia, Savar Dhaka
Bangladesh**
Assessor: **Bureau Veritas**
Date: **04 May 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.



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GENERAL INFORMATION

General Information

Factory Name:	Ayesha Clothing Co. Ltd.
Address:	Jamgara, Ashulia, Savar. Ashulia, Savar Dhaka Bangladesh
Country:	Bangladesh
Province:	Dhaka
City:	Ashulia, Savar
Zip Code:	1349
Audit Duration:	1 Days
Re-Audit:	Re-Audit After 0 Months
Draft Report Date :	06-22-2014
Final Report Date :	10-22-2014
Are all Action Items From Previous Assessment Completed?:	N/A
Buildings in Complex :	There are 4 buildings in the factory premises out of which one is main production building (Three seven story building jointed by expansion joint) and three are ancillary buildings. The buildings are named as: 1) Seven story RCC main production building and shed on roof, 2) Single Story utility prefabricated shed, 3) Single Story Washing Shed, 4) Single story under construction ETP.
Number of Building Levels (Stories) :	1) Seven story RCC main production building and shed on roof: Stories above grade: 8, Stories below grade: 0, Occupied levels: 8, 2) Single Story utility prefabricated shed: Stories above grade: 1, Stories below grade: 0, Occupied levels: 1, 3) Single Story Washing Shed: Stories above grade: 1, Stories below grade: 0, Occupied levels: 1.
Approximate Building Area (SF) :	Total area of buildings in the factory premises: 345500.00 sft. (Including roof square footage). Building wise breakdown as follows: 1) Seven story RCC main production building and shed on roof: 336000.00 sft (Ground floor: 42000.00 sft, 1st floor: 42000.00 sft, 2nd floor: 42000.00 sft, 3rd floor: 42000.00 sft, 4th floor: 42000.00 sft, 5th floor: 42000.00 sft, 6th floor: 42000.00 sft, Occupied roof: 8000.00 sft, Unoccupied roof: 34000.00 sft), 2) Single Story utility prefabricated shed: 1500.00 sft, 3) Single Story Washing Shed: 8000.00 sft.
Date of Building Construction :	Factory personnel informed the date of construction as follows: 1) Seven story RCC main production building and shed on roof: Finished in 2005, 2) Single Story utility prefabricated shed: Finished in 2005, 3) Single Story Washing Shed: Started in July-2006 and Finished in December-2007.
Date of Last Building Renovation/Addition :	Factory personnel informed the date of last building renovation as follows: 1) Seven story RCC main production building and shed on roof: Finished in May-2014. 2) Single story under construction ETP: Construction running.



Is the Building mixed use?:	No
Ancillary Structures in Complex :	1) Single Story utility prefabricated shed, 2) Single Story Washing Shed.
Number of Ancillary Levels (Stories) :	1) Single Story utility prefabricated shed: Stories above grade: 1, Stories below grade: 0, Occupied levels: 1, 2) Single Story Washing Shed: Stories above grade: 1, Stories below grade: 0, Occupied levels: 1.
Approximate Ancillary Structures Area (SF) :	1) Single Story utility prefabricated shed: 1500.00 sft, 2) Single Story Washing Shed: 8000.00 sft.
Number of Occupants :	Total number of occupants: 3448. 1) Seven story RCC main production building and shed on roof: 3408 (Ground floor: 345, 1st floor: 217, 2nd floor: 789, 3rd floor: 619, 4th floor: 625, 5th floor: 241, 6th floor: 567, 7th floor: 5), 2) Single Story utility prefabricated shed: 15, 3) Single Story Washing Shed: 25.
Exterior Facade Description :	Building-1: The building is a RCC moment resisting frame system structure with in filled masonry. The nature of foundation of the building is isolated column footing. The windows are glassed sliding type with aluminium frame. The main door is metallic sliding type. Some portion of front side is covered by glass. Building-2: The building is edge beam supported flat slab system structure with in filled masonry. The nature of foundation of the building is isolated column footing with timber pile. The windows are glassed swinging type with cast iron frame. The main door is metallic sliding type. A basket type ladder is anchored at the west side of the building. Some portion of front side is covered by glass. Building-3: The building is a RCC moment resisting frame system structure with in filled masonry. The nature of foundation of the building is isolated column footing. The windows are glassed sliding type with aluminium frame. The main door is metallic sliding type.
Structural System Description :	Building 1 is the RCC moment resisting frame structure; however the building 2 is the edge beam supported flat slab system structure. Building-3 is a RCC moment resisting frame structure, but ground floor occupies a mezzanine floor which is constructed with steel member and not directly connected to the main structure and also top floor of this building is a PEB roofing system shed.



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:	Concrete strength 2370 psi(minimum) for stone chips and 2045 psi (minimum) for brick chips, Steel strength 60000 psi Fos calculation for 3 buildings as below: For building-1: 1)Fos for central column: 3.07, 2)Fos for corner column: 1.97, 3)Fos for edge column : 2.32, For building-2:(Stone chips) 1)Fos for central column: 2.00, 2)Fos for corner column: 2.35, 3)Fos for edge column : 1.72, For building-3:(MCAC) 1)Fos for central column: 2.52, 2)Fos for corner column: 2.97, 3)Fos for edge column : 2.52, Result shows that The edge column of building-2 is overstressed.	
Source of Findings:	Uploaded Document: Uploaded document shows that the edge column of building-2 is over-stressed.	
Suggested Plan of Action:	Under the guidance of a qualified structural engineer, arrange a detailed engineering assessment of the structure as required within 8 weeks. Conduct destructive core testing to validate the in-situ concrete compressive strength of the structural elements of building 2.	
Suggested Deadline Date:	12 Aug 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:	2	
Description:	A set of design documents is available on site for review. However, the design report is not available which is required as per BNBC 2006 clause 1.9.1.1.	
Source of Findings:	Document Review: Document Review reveals that a set of design documents is available on site for review. However, the design report is not available which is required as per BNBC 2006 clause 1.9.1.1.	
Suggested Plan of Action:	Have a qualified Structural Engineer to prepare the design report and provide the full credential of the architect of record on architectural documents..	



Suggested Deadline Date:	12 Aug 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:	Credible structural documents do not indicate general conformance with BNBC 2006.	
Source of Findings:	Document Review: Document Review shows that credible structural documents do not indicate general conformance with BNBC 2006.	
Suggested Plan of Action:	Under guidance from a qualified structural engineer, arrange a geotechnical investigation at close vicinity of the structure and make the report available for review.	
Suggested Deadline Date:	12 Aug 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:	2	
Description:	Documentation cannot be provided that the building is compliant with the requirements for wind loading as detailed in BNBC Part 6 Section 1.5.3.	
Source of Findings:	Document Review: The available documents do not indicate the building is adequately strong against wind and surge loading	
Suggested Plan of Action:	Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading.	
Suggested Deadline Date:	12 Aug 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:	2
Description:	In building -3 a mezzanine floor was previously added at the ground floor, which is not directly connected with the main structure. It is constructed with a steel frame and supported from ground level. The structural impact for this construction on the entire structure has not been analytically evaluated and confirmed by a qualified structural engineer.
Source of Findings:	Visual Assessment: In building -3 a mezzanine floor was previously added at the ground floor, which is not directly connected with main structure. It is constructed with a steel frame and supported from the ground level.
Suggested Plan of Action:	Have a qualified structural engineer complete an analytical evaluation of the structural impact of the addition.
Suggested Deadline Date:	12 Aug 2014
Standard:	Reference Alliance Standards Part 8 Section 8.1 Applicability of Building Code.
Question:	Is a clear and redundant load path to resist lateral loads provided?
Priority Level:	Medium
Non-Compliance Level:	2
Description:	Since there are multiple moment resisting frames for building 1 and 3, the lateral load path is clear and redundancy is available. However, building 2 is the flat slab system structure, so the lateral load path is not clear and redundancy is unavailable. Pounding effect should be checked.
Source of Findings:	Document Review: Structural documents shows that there are multiple momentum resisting frames for building 1 and 3, the lateral load path is clear and redundancy is available. However the building 2 is the flat slab system structure, so the lateral load path is not clear and redundancy is unavailable. , Visual Assessment: From the Visual inspection, there are multiple moment resisting frames for building 1 and 3, the lateral load path is clear and redundancy is available. However the building 2 is the flat slab system structure, so the lateral load path is not clear and redundancy is unavailable.
Suggested Plan of Action:	Have a qualified structural engineer complete further analysis of the structure and develop a remediation plan if required. Pounding effect for different structural system should be checked.
Suggested Deadline Date:	12 Aug 2014
Standard:	Alliance Standards Part 8 Section 8.17 Design for Lateral Loads and 8.3.3. 2006 BNBC Part 6 Section 1.5





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:	No provisions have been made in the floor for a concentrated load (such as heavy equipment, water tank. Stored materials.) In building 1, there are 7 plastic tanks (capacity 17000 lt.) on the roof top & on building 2 there is a RCC water reservoir (28000 lt.) on the roof top beside a staircase & on the top of the staircase is a plastic tank (capacity 3000 lt.) & also 2 plastic tanks (capacity 6000lt) are found.
Source of Findings:	Document Review: From the structural document it is found that the provision for concentrated load such as water tanks has not been made., Visual Assessment: Visually, in building 1 & 2 there are plastic & RCC water tanks found on the rooftop.
Suggested Plan of Action:	Engage a qualified structural engineer to confirm and document that provisions have been made to accommodate these water tanks. If provisions have not been made, have a qualified structural engineer develop a remediation plan.
Suggested Deadline Date:	12 Aug 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:	The factory has not obtained the Certificate of Occupancy from the authority.
Source of Findings:	Document Review: The document review shows that the factory has not obtained the Certificate of Occupancy from the authority.
Suggested Plan of Action:	Apply for issuance of Certificate of Occupancy and pursue the matter to obtain the same.
Suggested Deadline Date:	12 Aug 2014
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:	Dampness has been found at some floor of these three buildings. Standing water also been found on the roof top of the building 2 and 3.
Source of Findings:	Visual Assessment: A visual assessment shows that dampness has been found at some of the floors of these three buildings. Standing water has also been found on the rooftop of the building 2 and 3.
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:	12 Aug 2014
Standard:	Alliance Standard Part 8 Section 8.26 Durability and Maintenance
Question:	If yes, have the structural members constructed with MCAC been investigated by an appropriate program of in-situ testing and representative destructive testing or core samples?
Priority Level:	Medium
Non-Compliance Level:	2
Description:	The structural members constructed with MCAC have not been investigated by an appropriate program of in-situ testing and representative destructive testing or core samples. However, for building 2 which is made of stone chips, the column stress calculated taking into account the strength of concrete from the standard, shows over-stressing.
Source of Findings:	Document Review: Visual inspection and calculation shows that the columns constructed of stone chips are overstressed.
Suggested Plan of Action:	Conduct detailed structural assessment by qualified structural engineer and carry out remedial action as necessary.
Suggested Deadline Date:	12 Aug 2014
Standard:	Reference Alliance Standards Part 7 Building Materials Section 7.2 Masonry-chip aggregate concrete (MCAC)
Question:	Are any structural elements constructed with MCAC exposed to rainfall or other sources of water sealed with a protective coating to prevent water intrusion?
Priority Level:	Medium
Non-Compliance Level:	2





Description:	The roof of the building is of MCAC aggregate, but no protective sealing is available.
Source of Findings:	Visual Assessment: Visual inspection shows that the roof of the building is of MCAC aggregate, but no protective sealing is available.
Suggested Plan of Action:	Provide a protective coating at the structural elements constructed with MCAC exposed to rainfall or other sources of water. Have protective coating approved by the Alliance or a qualified structural engineer. Alternatively provide 2% slope on the exposed surface to prevent accumulation of water.
Suggested Deadline Date:	12 Aug 2014
Standard:	Alliance Standards Part 7 Building Materials Section 7.2 Masonry-chip aggregate concrete (MCAC).
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:	All non-structural elements were found non-braced. Some plastic tanks resting on the roof top and also some racks in different floors are not adequately anchored or braced to resist earthquake forces.
Source of Findings:	Visual Assessment: Some plastic tanks resting on the roof top and some shelves in different floors have been found not adequately anchored or braced to 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:	23 Sep 2014
Standard:	Alliance Standards Part 8 Section 8.18 Seismic Bracing of Key Non-Structural Elements and 2006 BNBC Part 6
Question:	If the building is currently being renovated or expanded, are the Construction Practices and Safety requirements of Section 9 being followed?
Priority Level:	Medium
Non-Compliance Level:	2
Description:	The building is currently being externally renovated, but the safety issues are not maintained properly.
Source of Findings:	Visual Assessment: External renovation work is on going without any safety concern.
Suggested Plan of Action:	Immediate safety issues should be applied. The management should ensure that the construction and safety practices are being adhered to as per BNBC





	2006 and as per section 9 of Alliance Standard.	
Suggested Deadline Date:	12 Aug 2014	
Standard:	Alliance Standard Part 9 Construction Practices and Safety.	
Question:	Are expansion joints provided at appropriate intervals on the exterior façade?	
Priority Level:	Low	
Non-Compliance Level:	2	
Description:	An expansion joint has been provided in between building 2 & 3 in the exterior facade; this expansion joint is blocked.	
Source of Findings:	Document Review: No expansion joint have been found from document review., Visual Assessment: The expansion joint has been found in between building 2 & 3 from a visual observation.	
Suggested Plan of Action:	Joint between building-2 and 3 must be free from blockage.	
Suggested Deadline Date:	23 Sep 2014	
Standard:	Alliance Standard Part 8 Section 8.2 Structural Integrity of Existing Factory Buildings	
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:	Visual Assessment: 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:	29 Jul 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 are available, but not as per standard.	
Source of Findings:	Document Review: Floor load plan is documented; however not as per standard.	
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:	12 Aug 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 are not posted as required.	
Source of Findings:	Visual Assessment: Floor Load Plans are not posted in each panel of the floors as required.	
Suggested Plan of Action:	To have a qualified structural engineer prepare load plans including the information required in Section 8.205.3 of the Alliance Standard & also posting in each panel of all floors.	
Suggested Deadline Date:	12 Aug 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 of work materials and work products are not marked to indicate the acceptable loading limit as well as Floor loads plan is not available in the floor.	
Source of Findings:	Visual Assessment: Visual inspection shows that there is no load plan and no floor load marking in the factory.	
Suggested Plan of Action:	Have a qualified structural engineer prepare a load plan for each floor and have the floors marked for designating storage area as per the developed load	

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	plan.	
Suggested Deadline Date:	12 Aug 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:	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 loadings.	
Source of Findings:	Document Review: There is no evidence of a designated load manager being present in the factory., Visual Assessment: No load Manager was found in the visual 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. 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.	
Suggested Deadline Date:	29 Jul 2014	
Standard:	Alliance Standards Part 8 Section 8.9 Factory Load Manager	