INITIAL STRUCTURAL INTEGRITY ASSESSMENT REPORT (SIAR)

Factory Name:	**JAMUNA DENIM LTD (Washing & Garments Unit)**
Address:	**Jarun, Konabari, Gazipur Gazipur Dhaka Bangladesh**
Assessor:	**Bureau Veritas**
Date:	**18 Jun 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:	JAMUNA DENIM LTD (Washing & Garments Unit)
Address:	Jarun, Konabari, Gazipur Gazipur Dhaka Bangladesh
Country:	Bangladesh
Province:	Dhaka
City:	Gazipur
Zip Code:	1706
Audit Duration:	1 Days
Re-Audit:	Re-Audit After 0 Months
Draft Report Date :	06-27-2014
Final Report Date :	11-01-2014
Are all Action Items From Previous Assessment Completed?:	N/A
Buildings in Complex :	There are 11 buildings in the factory premises out of which three are main production buildings and eight are ancillary buildings. The buildings are named as: 1) Four story RCC main production building (Jamuna Knitting & Dyeing Ltd.), 2) Four story RCC main production building (Jamuna Denim Garments Ltd.), 3) Six story RCC main production building (Jamuna Optimo Jeans Ltd.), 4) Three story RCC Day care building, 5) Single story generator shed, 6) Single story boiler shed, 7) Single story welding shop shed, 8) Single story chemical and yarn store shed, 9) Single story workshop and accessories store shed, 10) Single story dining shed, 11) Single story RCC Finished good and fabric store.
Number of Building Levels (Stories) :	1) Four story RCC main production building (Jamuna Knitting & Dyeing Ltd.): Stories above grade: 4,below grade: 0, 2) Four story RCC main production building (Jamuna Denim Garments Ltd.): Stories above grade: 4, below grade: 0, 3) Six story RCC main production building (Jamuna Optimo Jeans Ltd.):Stories above grade: 6, below grade: 0, 4) Three story RCC Day care building:Stories above grade: 3,below grade: 0,5) Single story generator shed:Stories above grade: 1,below grade: 0,6) Single story boiler shed:Stories above grade: 1,below grade: 0,7) Single story welding shop shed:Stories above grade: 1,below grade: 0,8) Single story chemical and yarn store shed:Stories above grade: 1,below grade: 0,9) Single story workshop and accessories store shed:Stories above grade: 1,below grade: 0,10) Single story dining shed:Stories above grade: 1, below grade: 0,11) Single story RCC Finished good and fabric store:Stories above grade: 1,below grade: 0,
Approximate Building Area (SF) :	Total area of buildings in the factory premises: 683803 sft. Building wise breakdown as follows: 1) Four story RCC main production building (Jamuna Knitting & Dyeing Ltd.): 441740 sft,2) Four story RCC main production building (Jamuna Denim garments ltd): 149955 sft,3) Six story RCC main production building (Jamuna Optimo Jeans Ltd.): 72168 sft,4) Three story RCC Day care building: 6600 sft,5) Single story generator shed: 2529 sft,6) Single story boiler shed: 1442 sft,7) Single story welding shop shed: 603 sft,8) Single story chemical and yarn store shed: 3002 sft,9) Single story workshop and accessories store shed: 1507 sft,10) Single story

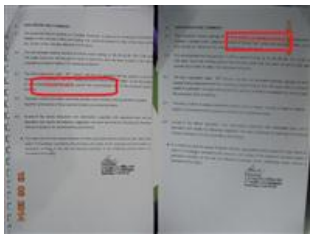
	dining shed: 2000 sft,11) Single story RCC Finished good and fabric store: 2257 sft.
Date of Building Construction :	Factory personnel informed the date of construction as follows: 1) Four story RCC main production building (Jamuna Knitting & Dyeing Ltd.): Finished in 2006, 2) Four story RCC main production building (Jamuna Denim Garments Ltd.): Finished in 1992, 3) Six story RCC main production building (Jamuna Optimo Jeans Ltd.): Finished in 1992, 4) Three story RCC Day care building: Finished in 2008, 5) Single story generator shed: Finished in 2006, 6) Single story boiler shed: Finished in 2008, 7) Single story welding shop shed: Finished in 2009, 8) Single story chemical and yarn store shed: Finished in 2008, 9) Single story workshop and accessories store shed: Finished in 2008, 10) Single story dining shed: Finished in 2008, 11) Single story RCC Finished good and fabric store: Finished in 2010.
Date of Last Building Renovation/Addition :	No record for date of renovation or addition was found from factory personnel.
Is the Building mixed use?:	No
Ancillary Structures in Complex :	1) Three story RCC Day care building, 2) Single story generator shed, 3) Single story boiler shed, 4) Single story welding shop shed, 5) Single story chemical and yarn store shed, 6) Single story workshop and accessories store shed, 7) Single story dining shed, 8) Single story RCC Finished good and fabric store.
Number of Ancillary Levels (Stories) :	1) Three story RCC Day care building: Stories above grade: 3, Stories below grade: 0, Occupied levels: 3, 2) Single story generator shed: Stories above grade: 1, Stories below grade: 0, Occupied levels: 1, 3) Single story boiler shed: Stories above grade: 1, Stories below grade: 0, Occupied levels: 1, 4) Single story welding shop shed: Stories above grade: 1, Stories below grade: 0, Occupied levels: 1, 5) Single story chemical and yarn store shed: Stories above grade: 1, Stories below grade: 0, Occupied levels: 1, 6) Single story workshop and accessories store shed: Stories above grade: 1, Stories below grade: 0, Occupied levels: 1, 7) Single story dining shed: Stories above grade: 1, Stories below grade: 0, Occupied levels: 1, 8) Single story RCC Finished good and fabric store: Stories above grade: 1, Stories below grade: 0, Occupied levels: 1.
Approximate Ancillary Structures Area (SF) :	1) Three story RCC Day care building: 6600 sft (Ground floor: 2200 sft, 1st floor: 2200 sft, 2nd floor: 2200 sft), 2) Single story generator shed: 2529 sft, 3) Single story boiler shed: 1442 sft, 4) Single story welding shop shed: 603 sft, 5) Single story chemical and yarn store shed: 3002 sft, 6) Single story workshop and accessories store shed: 1507 sft, 7) Single story dining shed: 2000 sft, 8) Single story RCC Finished good and fabric store: 2257 sft.
Number of Occupants :	Total number of occupants: 3117. 1) Four story RCC main production building (Jamuna Knitting & Dyeing Ltd.): 1100 (Ground floor: 200, 1st floor: 200, 2nd floor: 700, 3rd floor: 0), 2) Four story RCC main production building (Jamuna Denim Garments Ltd.): 1927 (Ground floor: 427, 1st floor: 500, 2nd floor: 500, 3rd floor: 500), 3) Six story RCC main production building (Jamuna Optimo Jeans Ltd.): 52 (Ground floor: 50, 1st floor: 0, 2nd floor: 0, 3rd floor: 0, 4th floor: 0, 5th floor: 2), 4) Three story RCC Day care building: 10 (Ground floor: 4, 1st floor: 3, 2nd floor: 3), 5) Single story generator shed: 2, 6) Single story boiler shed: 3, 7) Single story welding shop shed: 5, 8) Single story chemical and yarn store shed: 5, 9) Single story workshop and accessories store shed: 5, 10) Single story dining shed: 3, 11) Single story RCC Finished good and fabric store: 5.
Exterior Facade Description :	Jamuna denim ltd and Jamuna knitting & Dyeing Ltd: The façade consists of infill masonry walls in between RCC frames. The exterior face of the masonry walls has plaster and they are painted. The main door of the buildings is metallic and it slides. The windows are made of glass and they slide. Optimo jeans Ltd: The façade consists of infill masonry walls in between RCC frames. The exterior face of the masonry walls has plaster and they are painted. The main door of the buildings is made of wood and it slides. The windows are made of glass and they slide.
Structural System Description :	Only the main buildins are described. 1. Jamuna denim ltd: The structure consists of a 3-story RCC moment-resisting frame in both directions and a one-story steel PEB frame on the roof. The beams and slabs at each floor are monolithic. The foundations consist of isolated footings for the columns. The geometry of the floor plan is irregular. 2. Jamuna knitting & Dyeing Ltd: The first story consists of a RCC moment-resisting frame,

	the second through fifth levels consist of flat slab system, and the sixth floor is a PEB steel structure. The foundations consist of isolated footings for the columns. The geometry of the floor plan is regular. 3. Optimo jeans Ltd: The structure consist of a three-story RCC flat slab system with a one-story PEB steel structure. The foundations consist of isolated footings for the columns. The geometry of the floor plan is regular.

ASSESSMENT FINDINGS

Structural System Design		
Question:	Are credible structural design documents available for review and kept on site?	
Priority Level:	Medium	
Non-Compliance Level:	2	
Description:	There is no credible design documents available on site for review. However, design documents for Jamuna Denim ltd. and Jamuna Knitting & Dyeing Ltd. are partially available. There are no design documents for roof top sheds and Optimo Jeans Ltd. A d	
Source of Findings:	Document Review: Documentation reviewed.	
Suggested Plan of Action:	1) Have a qualified structural engineer prepare credible as-built documents based on the requirements of Part 8 Section 8.19 of the Alliance Standard including the design report and submit to BV for review. 2) Have a qualified architect to prepare a credible architectural as-built drawing for review and post his name and identity on the design documents.	
Suggested Deadline Date:	15 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:	Structural documentation do not conform 2006 BNBC or other comparable applicable international model building code.	
Source of Findings:	Document Review: Documentation reviewed.	
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:	15 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:	There is no clear information available on the design document to understand the consideration of storm surge and wind loading in the design of those buildings.
Source of Findings:	Document Review: Documentation reviewed.
Suggested Plan of Action:	Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading and storm surge.
Suggested Deadline Date:	28 Jul 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:	Is a clear and redundant load path to resist lateral loads provided?
Priority Level:	Medium
Non-Compliance Level:	2
Description:	1. Jamuna Denim Ltd: Since there are multiple moment resisting frames, the lateral load path is clear and redundancy is available. 2. Jamuna Knitting & Dyeing Ltd & Optimo jeans Ltd both buildings structures have (at least in part) flat slab systems an
Source of Findings:	Visual Assessment: Visually confirmed.
Suggested Plan of Action:	Have a qualified structural engineer complete further analysis of the structure and develop a remediation plan if required for both Jamuna knitting & Dyeing Ltd & Optimo jeans Ltd.
Suggested Deadline Date:	28 Jul 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:	OPTIMO JEANS LTD: There is two plastic water tank of each 1000 liter.

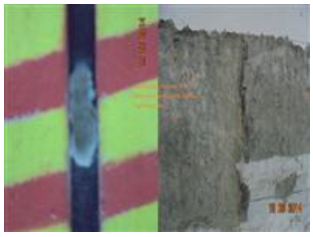
	JAMUNA KNITTING & DYEING LTD: There are four plastic water tanks on top roof of 10000 liter each and three of 1000 liter.There is no evidence that the effects of the tanks were consider	
Source of Findings:	Visual Assessment: Visually confirmed.	
Suggested Plan of Action:	Engage a qualified structural 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:	28 Jul 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:	2	
Description:	JAMUNA DENIM LTD- Finished ready made garments were stacked at the 3rd floor. The estimated load is approximately 50 psf.	
Source of Findings:	Visual Assessment: Visually confirmed.	
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:	12 Jul 2014	
Standard:	Alliance Standards Part 8 Section 8.15 Minimum Floor Design Loads	
Question:	Is a Geotechnical Report available for review and kept on site?	
Priority Level:	Low	
Non-Compliance Level:	2	
Description:	The Geotechnical Report is complete and available for review for Jamuna Denim ltd. and Jamuna Knitting & Dyeing Ltd. However, it is not available for Optimo Jeans Ltd.	
Source of Findings:	Document Review: Documentation reviewed.	
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 of Optimo jeans Ltd. .	
Suggested Deadline	15 Aug 2014	

Date:		
Standard:	Alliance Standard Part 8 Section 8.2 Structural Integrity of Existing Factory Buildings	
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: Documentation reviewed.	
Suggested Plan of Action:	Apply for issuance of Certificate of Occupancy and pursue the matter to obtain the same.	
Suggested Deadline Date:	15 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:	There is no maintenance program for all areas including areas with efflorescence, dampness, standing water on rooftops, and corrosion. Dampness found on 2nd and 3rd floor of JAMUNA DENIM LTD. Hair crack on slab found on 4th floor and dampness on masonry w	
Source of Findings:	Visual Assessment: Visually confirmed.	
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:	28 Jul 2014	
Standard:	Alliance Standard Part 8 Section 8.26 Durability and Maintenance	

Question:	Are structural steel members free of corrosion, physical damage or other types of deterioration?
Priority Level:	Medium
Non-Compliance Level:	2
Description:	Optimo Jeans Ltd.: Corrosion has been observed at truss members and CI sheet of roof top shed. Knitting & Dyeing: Corrosion has been observed at expose rebars of roof top.
Source of Findings:	Visual Assessment: Visually confirmed
Suggested Plan of Action:	Complete further testing on areas of deterioration and have a qualified structural engineer develop a remediation plan.
Suggested Deadline Date:	01 Dec 2014
Standard:	Alliance Standard Part 8 Section 8.26


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:	Jamuna Denim Ltd: There are wooden racks in 1st floor which are not braced for earthquake force. Optimo Jeans Ltd: There are plastic water tanks at roof top which are not braced for earthquake force. Jamuna Knitting & Dyeing Ltd: There are plastic w
Source of Findings:	Visual Assessment: Visually confirmed.
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:	28 Jul 2014
Standard:	Alliance Standards Part 8 Section 8.18 Seismic Bracing of Key Non-Structural Elements and 2006 BNBC Part 6

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:	
Description:	The roof of Optimo Jeans Ltd. and Jamuna Denim Ltd (partially) is made of MCAC but no protective sealing is available.
Source of Findings:	Visual Assessment: Visually confirmed.

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. Or provide 2% slope on the exposed surface to prevent accumulation of water.	
Suggested Deadline Date:	28 Jul 2014	
Standard:	Alliance Standards Part 7 Building Materials Section 7.2 Masonry-chip aggregate concrete (MCAC).	
Question:	Is expansion joint material free from cracking and other forms of deterioration?	
Priority Level:	Low	
Non-Compliance Level:	3	
Description:	Expansion joint materials are free from cracking in Optimo Jeans Ltd. and Jumuna Knitting & Dyeing Ltd. But expansion joint is filled with mortar in Jamuna Denim Ltd. Blocking the joint will make it ineffective.	
Source of Findings:	Visual Assessment: Visually confirmed.	
Suggested Plan of Action:	Remove all the blockages from expansion joints for them to be free for taking up the expansion.	
Suggested Deadline Date:	28 Jul 2014	
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: Documentation reviewed.	
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:	01 Aug 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:	There is no load plan available showing the actual maximum operational loading that is allowable.	
Source of Findings:	Document Review: Documentation reviewed.	
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:	15 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:	3	
Description:	Floor load plan is not prepared and posted.	
Source of Findings:	Visual Assessment: Visually confirmed.	
Suggested Plan of Action:	Have a qualified structural engineer prepare load plans including the information required in Section 8.20 of the Alliance Standard and have it posted in all required location.	
Suggested Deadline Date:	15 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:	3	
Description:	There is no load plan. Also, there is no marking on the floor to designate spaces and height for storage of work materials.	
Source of Findings:	Visual Assessment: Visually confirmed.	
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 plan	
Suggested Deadline Date:	15 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:	3	
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: Documentation reviewed.	
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:	01 Aug 2014	
Standard:	Alliance Standards Part 8 Section 8.9 Factory Load Manager	