

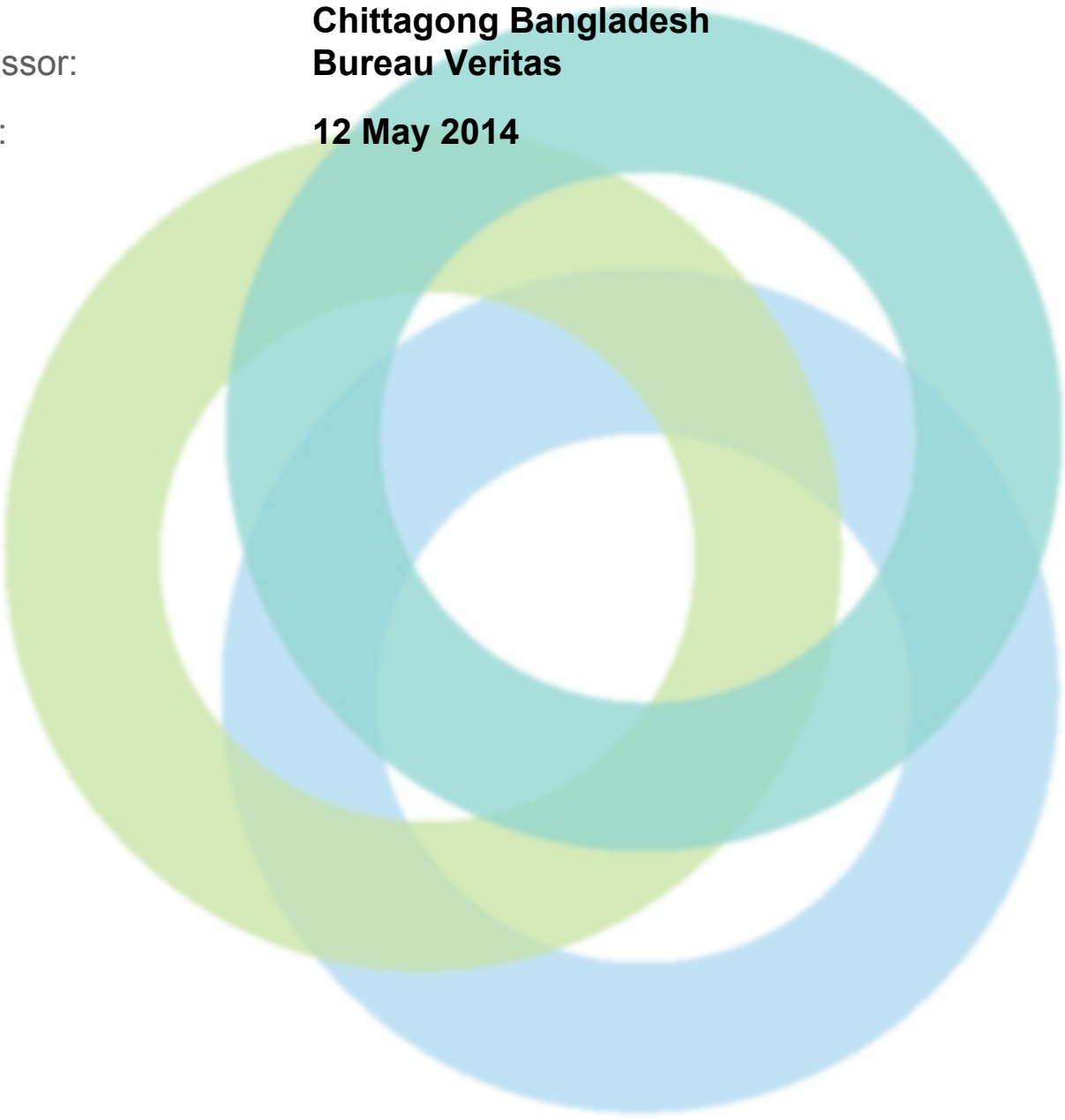
INITIAL STRUCTURAL INTEGRITY ASSESSMENT REPORT (SIAR)

Factory Name: **DENIM PLUS (BD) LTD**

Address: **Plot 3-8, Sector 7, CEPZ, Chittagong Chittagong
Chittagong Bangladesh**

Assessor: **Bureau Veritas**

Date: **12 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.





GENERAL INFORMATION

General Information

Factory Name:	DENIM PLUS (BD) LTD
Address:	Plot 3-8, Sector 7, CEPZ, Chittagong Chittagong Chittagong Bangladesh
Country:	Bangladesh
Province:	Chittagong
City:	Chittagong
Zip Code:	4223
Audit Duration:	1 Days
Re-Audit:	Re-Audit After 0 Months
Draft Report Date :	05-15-2014
Final Report Date :	02-10-2014
Are all Action Items From Previous Assessment Completed?:	N/A
Buildings in Complex :	There are 14 buildings in the premises out of which two are main production buildings & 12 are ancillary buildings. The buildings are named as: 1) Four story RCC main production building, 2) Single story Washing prefab production shed (with one mezzanine floor), 3) Single story RCC Gate house, 4) Single story RCC Driver rest house, 5) Single story prefab wastage store shed, 6) Single story RCC Boiler building-01, 7) Single story RCC Boiler building-02, 8) Single story RCC Compressor building, 9) Single story CI Gas meter shed, 10) Single story CI Hydrant shed, 11) Single story CI Dining & Kitchen shed, 12) Single story RCC Sub-station building, 13) Single story RCC Toilet building, 14) Single story masonry CI Mechanical workshop.
Number of Building Levels (Stories) :	1) Main production building: Four story, 2) Washing shed: Single sory, 3) Gate house: Single sory, 4) Driver rest house: Single sory, 5) Wastage store shed: Single sory, 6) Boiler building-01: Single sory, 7) Boiler building-02: Single sory, 8) Compressor building: Single sory, 9) Gas meter shed: Single sory, 10) Hydrant shed: Single sory, 11) Dining & Kitchen shed: Single sory, 12) Sub-station building: Single sory, 13) Toilet building: Single sory, 14) Mechanical workshop: Single sory.
Approximate Building Area (SF) :	Total Area of all buildings in the factory premises: 101348 + 13940 sft(Roof area)= 115288 sft. Building wise breakdown as follows: 1) Four story RCC main production building: 69700 sft (Ground floor: 13940 sft, 1st floor: 13940 sft, 2nd floor: 13940 sft, 3rd floor: 13940 sft, Roof area: 13940 sft), 2) Single story Washing prefab production shed (with one mezzanine floor): 35192 sft, 3) Single story RCC Gate house: 111 sft, 4) Single story RCC Driver rest house: 224 sft, 5) Single story prefab wastage store shed: 855 sft, 6) Single story RCC Boiler building-01: 858 sft, 7) Single story RCC Boiler building-02: 988 sft, 8) Single story RCC Compressor building: 344 sft, 9) Single story CI Gas meter shed: 60 sft, 10) Single story CI Hydrant shed: 165 sft, 11) Single story CI Dining & Kitchen shed: 5011 sft, 12) Single story RCC Sub-station building: 400 sft, 13) Single story RCC Toilet building: 480 sft, 14) Single story masonry CI Mechanical workshop: 900 sft.



Date of Building Construction :	Factory personnel informed the date of construction as follows: Construction of main production building and washing shed started in August-1997 and finished in November-1998. No information could be obtained for any other building.
Date of Last Building Renovation/Addition :	Construction of ETP building is ongoing.
Is the Building mixed use?:	No
Ancillary Structures in Complex :	1) Single story RCC Gate house, 2) Single story RCC Driver rest house, 3) Single story prefab wastage store shed, 4) Single story RCC Boiler building-01, 5) Single story RCC Boiler building-02, 6) Single story RCC Compressor building, 7) Single story CI Gas meter shed, 8) Single story CI Hydrant shed, 9) Single story CI Dining & Kitchen shed, 10) Single story RCC Sub-station building, 11) Single story RCC Toilet building, 12) Single story masonry CI Mechanical workshop.
Number of Ancillary Levels (Stories) :	1) Single story RCC Gate house: Stories above grade: 1, Stories below grade: 0, Occupied levels: 1, 2) Single story RCC Driver rest house: Stories above grade: 1, Stories below grade: 0, Occupied levels: 1, 3) Single story prefab wastage store shed: Stories above grade: 1, Stories below grade: 0, Occupied levels: 1, 4) Single story RCC Boiler building-01: Stories above grade: 1, Stories below grade: 0, Occupied levels: 1, 5) Single story RCC Boiler building-02: Stories above grade: 1, Stories below grade: 0, Occupied levels: 1, 6) Single story RCC Compressor building: Stories above grade: 1, Stories below grade: 0, Occupied levels: 1, 7) Single story CI Gas meter shed: Stories above grade: 1, Stories below grade: 0, Occupied levels: 1, See the description.....
Approximate Ancillary Structures Area (SF) :	1) Single story RCC Gate house: 111 sft, 2) Single story RCC Driver rest house: 224 sft, 3) Single story prefab wastage store shed: 855 sft, 4) Single story RCC Boiler building-01: 858 sft, 5) Single story RCC Boiler building-02: 988 sft, 6) Single story RCC Compressor building: 344 sft, 7) Single story CI Gas meter shed: 60 sft, 8) Single story CI Hydrant shed: 165 sft, 9) Single story CI Dining & Kitchen shed: 5011 sft, 10) Single story RCC Sub-station building: 400 sft, 11) Single story RCC Toilet building: 480 sft, 12) Single story masonry CI Mechanical workshop: 900 sft.
Number of Occupants :	Total number of occupants: 1212. 1) Four story RCC main production building: 687 (Ground floor: 11, 1st floor: 298, 2nd floor: 295, 3rd floor: 83), 2) Single story Washing prefab production shed (with one mezzanine floor): 479, 3) Single story RCC Gate house: 5, 4) Single story RCC Compressor building: 4, 5) Single story prefab wastage store shed: 1, 6) Single story RCC Boiler building-01: 1, 7) Single story RCC Boiler building-01: 1, 8) Single story RCC Compressor building: 1, 9) Single story CI Gas meter shed: 3, 10) Single story CI Hydrant shed: 1, 11) Single story CI Dining & Kitchen shed: 13, 12) Single story RCC Sub-station building: 1, 13) Single story RCC Toilet building: 1, 14) Single story masonry CI Mechanical workshop: 14.
Exterior Facade Description :	Exterior masonry wall on concrete frame with glass windows and metallic main gate.
Structural System Description :	RCC framed structure system (beams/slabs between columns) with in filled masonry. The foundation is wooden pile foundation.



ASSESSMENT FINDINGS

Structural System Design

Question:	Are the available FoS for the columns adequate based on Preliminary calculation?	
Priority Level:	High	
Non-Compliance Level:		
Description:	During inspection, NDT (UPV Test) was done to measure the concrete compressive strength. Rebar strength has been considered 40 ksi. Column FoS calculation has been done considering both minimum value and NDT value. 1) For NDT Value (3000 psi): Central column: 2.71, Corner column: 3.93 & Edge column: 3.72, 2) For minimum value (2045 psi): Central columns: 2.07, Corner columns: 2.93 & Edge columns: 2.84; For both cases, result of FoS calculation are above the minimum value 1.86;	
Source of Findings:	Uploaded Document: Stress calculation has been uploaded.	
Suggested Plan of Action:	Under guidance from a qualified structural engineer arrange Detail Engineering Assessment of the structure.	
Suggested Deadline Date:		
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:	1	
Description:	Structural design documents are available for review and kept on site except design report.	
Source of Findings:	Document Review: Documentation reviewed.	
Suggested Plan of Action:	Have a qualified structural engineer prepare design report.	
Suggested Deadline Date:	02 Jul 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:	1
Description:	There is no structural documentation indicating general conformance with BNBC 2006 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, Sections 8.19 and 8.20
Suggested Deadline Date:	02 Jul 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:	1
Description:	Documentation can not be provided confirming that the building is in compliance with the requirements for wind loading and storm surge loadings as detailed in BNBC Part 6, Section 1.5.3.
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.
Suggested Deadline Date:	02 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:	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:	1





Description:	No provisions been made in floors or decks for a concentrated load (such as heavy equipment, water tanks, stored materials, etc.).
Source of Findings:	Document Review: Documentation reviewed., Visual Assessment: One overhead water tank has been found during visual assessment.
Suggested Plan of Action:	Remove the water from the overhead water tanks and engage a qualified structural engineer to confirm and document any provisions that have been made to accommodate concentrated loads. Otherwise, remove the water tanks.
Suggested Deadline Date:	02 Jul 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:	Certificates of Occupancy are not available for review.
Source of Findings:	Document Review: Certificates of Occupancy were not found in the documents submitted by factory personnel.
Suggested Plan of Action:	Provide Certificates of Occupancy for review.
Suggested Deadline Date:	18 Jun 2014
Standard:	Alliance Standard Part 8 Section 8.3 Preliminary Structural Assessment

Structural System Construction

Question:	Are structural steel members free of corrosion, physical damage or other types of deterioration?
Priority Level:	Medium
Non-Compliance Level:	3
Description:	Corrosion and physical damage was found on the lower part of a steel column located at the washing plant and the loading and unloading zone.
Source of Findings:	Visual Assessment: Visually confirmed.
Suggested Plan of Action:	Replace all the damaged steel sections with adequate sections under the direction of a qualified structural engineer.
Suggested Deadline Date:	04 Jun 2014
Standard:	Alliance Standard Part 8 Section 8.26





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 is exposed to rainfall and it is not sealed with a protective coating to prevent water intrusion.	
Source of Findings:	Visual Assessment: Visually confirmed.	
Suggested Plan of Action:	A 2% slope of the roof needs to be provided in order to prevent water ponding. Otherwise, the roof needs to be sealed with a protective coating to prevent water intrusion.	
Suggested Deadline Date:	02 Jul 2014	
Standard:	Alliance Standards Part 7 Building Materials Section 7.2 Masonry-chip aggregate concrete (MCAC).	
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:	1	
Description:	Dampness has been found in the toilet area of 2nd floor.	
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:	02 Jul 2014	
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:	1	
Description:	Some racks were found at the store of ground floor without proper anchoring or bracing to resist earthquake forces.	
Source of Findings:	Visual Assessment: Visually confirmed.	
Suggested Plan of	Adequately anchor and brace all non-structural elements to resist earthquake	



Action:	forces.	
Suggested Deadline Date:	04 Jun 2014	
Standard:	Alliance Standards Part 8 Section 8.18 Seismic Bracing of Key Non-Structural Elements and 2006 BNBC Part 6	
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 in place to ensure that the live loads for which a floor or roof is or has been designed will not be exceeded.	
Source of Findings:	Visual Assessment: No program is in place in the factory.	
Suggested Plan of Action:	Develop a program to ensure that all live loads for which a floor or roof is or has been designed will not be exceeded. The designated Load Manager shall oversee this program and ensure it is enforced.	
Suggested Deadline Date:	19 Jun 2014	
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:	No floor load plans are posted as required.	
Source of Findings:	Visual Assessment: Visually confirmed.	
Suggested Plan of Action:	Post load plans as detailed in Section 8.20 of the Alliance Standard.	
Suggested Deadline Date:	02 Jul 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:	Areas used for storage of work materials and work products are not marked to indicate the acceptable loading limit.
Source of Findings:	Visual Assessment: Visually confirmed.
Suggested Plan of Action:	Provide signage or appropriate markings at all areas used for storage of work materials to indicate the acceptable loading limits as detailed in the Load Plans.
Suggested Deadline Date:	02 Jul 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:	A Factory Load Manager or designated representative is not available
Source of Findings:	Document Review: There is no documentation of a human resources file for a Factory Load Manager or designated representative.
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 for ensuring 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:	19 Jun 2014
Standard:	Alliance Standards Part 8 Section 8.9 Factory Load Manager