

# INITIAL STRUCTURAL INTEGRITY ASSESSMENT REPORT (SIAR)

Factory Name: **Ratul Knitwear**  
Address: **CS, SA-41, Zirabo, Ashulia, Savar Ashulia, Savar  
Dhaka Bangladesh**  
Assessor: **EIMS**  
Date: **23 Apr 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

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Factory Name:	Ratul Knitwear
Address:	CS, SA-41, Zirabo, Ashulia, Savar Ashulia, Savar Dhaka Bangladesh
Country:	Bangladesh
Province:	Dhaka
City:	Ashulia, Savar
Zip Code:	
Audit Duration:	1 Days
Re-Audit:	Re-Audit After 0 Months
Draft Report Date :	May 13, 2014
Final Report Date :	May 23, 2014
Are all Action Items From Previous Assessment Completed?:	N/A
Buildings in Complex :	One main building and one ancillary building
Number of Building Levels (Stories) :	main building is 6 stories
Approximate Building Area (SF) :	Total area of the main building is 70,000 sft
Date of Building Construction :	Date of construction of main building was 2010-2012 according to factory personnel
Date of Last Building Renovation/Addition :	N/A
Is the Building mixed use?:	No
Ancillary Structures in Complex :	One ancillary building in complex
Number of Ancillary Levels (Stories) :	Two stories
Approximate Ancillary	Total ancillary building area is 18,180 sft

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Structures Area (SF) :	
Number of Occupants :	Total number of employees is 920 in which 60% are female.
Exterior Facade Description :	Un-reinforced 5 inch Brick masonry wall has been used as exterior wall in the building with glass windows.
Structural System Description :	Steel structure (moment resisting frame with bracing)



## ASSESSMENT FINDINGS

### Structural System Design

Question:	Are the available FoS for the columns adequate based on Preliminary calculation?	
Priority Level:	High	
Non-Compliance Level:	1	
Description:	Factor of safety has been calculated based on 105 psf live load (live load mentioned in structural drawing is 105 psf for 2nd to 5th floor). However, during inspection, we did not find any floor having live load more than 42 psf except 1st floor. We measured 136 psf live load in the storage area of 1st floor and structural drawings shows that designed live load for 1st floor was 146 psf. Moreover, structural engineer designed corner columns as composite column up to 2nd floor. Therefore, factor of safety for edge and corner column will be higher than calculated, as during column capacity checking we assumed column as steel structure only. Factor of safety of edge column is 1.81, which is less than 1.86. So, some doubts about this column's safety.	
Source of Findings:	Uploaded Document: Designed load for the main building, Composite Column, Strength of Column Deed, Column Capacity Calculation	
Suggested Plan of Action:	Some doubts about safety - so under guidance from a qualified structural engineer arrange Detail Engineering Assessment of the structure.	
Suggested Deadline Date:	30 Jun 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:	Is a clear and redundant load path to resist lateral loads provided?	
Priority Level:	Medium	
Non-Compliance Level:	2	
Description:	We have found that bracing from elevation was removed at eight locations. However, they have incorporated bracing already at four location and they are incorporating bracing at remaining four location (according to factory representative).	
Source of Findings:	Photograph: Removed bracing location Incorporated bracing	
Suggested Plan of Action:	Incorporate remaining all missing bracing	



Suggested Deadline Date:	17 Jun 2014
Standard:	Alliance Standards Part 8 Section 8.17 Design for Lateral Loads and 8.3.3. 2006 BNBC Part 6 Section 1.5

**Structural System Construction**

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:	We found un-braced rack in first floor of the main building during inspection. However, racks were already anchored (photograph attached). Review the observed correction by an engineer.
Source of Findings:	Photograph: Photograph of anchored non-structural elements, Visual Assessment: Factory visited on April 23, 2014
Suggested Plan of Action:	Have an engineer review the observed correction.
Suggested Deadline Date:	17 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:	1
Description:	There was no program in place to ensure the live loads for which a floor or roof has been designed. So it is required and it should be marked in all floors including roof.
Source of Findings:	Visual Assessment: Site visited April 23, 2014
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:	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:	1
Description:	No floor load plan was posted on the floors of the building. But, we received existing load for each as documents (attached).
Source of Findings:	Visual Assessment: Site inspected on April 23, 2014
Suggested Plan of Action:	Have a qualified structural engineer prepare load plans including the information required in Section 8.20 of the Alliance Standard.
Suggested Deadline Date:	19 Jun 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:	1
Description:	Storage areas are required to be marked to indicate acceptable loading limits per the load plans.
Source of Findings:	Visual Assessment: Site inspected on April 23, 2014
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:	19 Jun 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:	1
Description:	No factory load manager was onsite full time. So, a factory load manager is required to check whether the loads exceed or not as per floor load plan
Source of Findings:	Visual Assessment: Visual assessment done on April 23, 2014
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

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	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