INITIAL STRUCTURAL INTEGRITY ASSESSMENT REPORT (SIAR)

Factory Name:	**The Finery Ltd**
Address:	**2-D, Darus Salam Road, Mirpur, Section-01, Dhaka Dhaka Dhaka Bangladesh**
Assessor:	**Bureau Veritas**
Date:	**12 Apr 2014**

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ALLIANCE
FOR BANGLADESH WORKER SAFETY

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:	The Finery Ltd
Address:	2-D, Darus Salam Road, Mirpur, Section-01, Dhaka Dhaka Dhaka Bangladesh
Country:	Bangladesh
Province:	Dhaka
City:	Dhaka
Zip Code:	1216
Audit Duration:	1 Days 8 Hours
Re-Audit:	Re-Audit After 0 Months
Draft Report Date :	13-04-2014
Final Report Date :	26-05-2014
Are all Action Items From Previous Assessment Completed?:	N/A
Buildings in Complex :	5 nos. 1. Main building 2. Ancillary 1 3. Ancillary 2 4. Shed 1 5. Shed 2
Number of Building Levels (Stories) :	1. Main building: G+5 2. Ancillary 1: B+G+2 3. Ancillary 2: G+1 4. Shed 1: 1 5. Shed 2: 1
Approximate Building Area (SF) :	i) 1st phase – 1987 [up to 4(four) storied]. ii) 2nd phase – 1998 [expansion of existing 4(four) storied building which was constructed in 1987]. iii) 3rd phase – 2001 [vertical extension of existing 4(four) storied building up to 06(six) storied].
Date of Building Construction :	1987
Date of Last Building Renovation/Addition :	2001
Is the Building mixed use?:	No
Ancillary Structures in Complex :	1. Ancillary 1 2. Ancillary 2 3. Shed 1 4. Shed 2
Number of Ancillary Levels (Stories) :	1. Ancillary 1: B+G+2 2. Ancillary 2: G+1 3. Shed 1: 1 4. Shed 2: 1
Approximate Ancillary Structures Area (SF) :	845 SF
Number of Occupants :	Approximate 1222
Exterior Facade Description :	The main building is RCC framed structure with infilled masonry. The windows are glassed swinging and sliding type with cast iron and aluminum frame. The main door is swinging type metallic.
Structural System Description :	RCC framed structure with infilled masonry.

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:	Based on preliminary calculation, columns are found over stressed. The center column FoS is 1.92 The corner column FoS is 1.82 The edge column FoS is 1.60	
Source of Findings:	Uploaded Document: Calculations show column FoS have "some doubts about safety" according to the Alliance Assessment Protocols (FoS between 1.5 and 1.86).	
Suggested Plan of Action:	Under guidance from a qualified structural engineer arrange Detail Engineering Assessment of the structure. This assessment should include assessment of concrete strength by destructive coring.	
Suggested Deadline Date:	10 Jul 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:	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:	3	
Description:	The structural drawing available is insufficient to establish coverage of relevant codes.	
Source of Findings:	Document Review: Credible structural document is not available in the submitted document.	
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:	12 Jun 2014	
Standard:	Reference Alliance Standards Part 8 Section 8.2 Structural Integrity of Existing Factory Buildings	
Question:	Are credible structural design documents available for review and kept on site?	
Priority Level:	Medium	
Non-Compliance Level:	2	
Description:	The structure is not constructed as per submitted structural document. Also the design report is not available.	

Source of Findings:	Document Review: The constructed structure is not complying with the submitted structural document and the design report is also not available. No. of rebars and bay distance not matching in the main building.	
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.	
Suggested Deadline Date:	12 Jun 2014	
Standard:	Alliance Standard Part 8 Section 8.19 Required Structural Documentation for New and Existing Factories	
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 can not 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.	
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. This should be reflected in the design report.	
Suggested Deadline Date:	12 Jun 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:	There are two sheds and one RCC structure have been constructed on the roof beyond the submitted structural drawing.	
Source of Findings:	Visual Assessment: The result of visual assessment shows that two sheds and one RCC structure constructed beyond the submitted structural drawing without any analytical evaluation of this extension on the entire structure.	
Suggested Plan of Action:	Have a qualified structural engineer complete an analytical evaluation of the structural impact of the extension as well as prepare design report and provide to the factory for further review.	
Suggested Deadline Date:	12 Jun 2014	
Standard:	Reference Alliance Standards Part 8 Section 8.1 Applicability of Building Code.	

Question:	Results of ferro-scanning for confirmation of steel rebar in the columns of the lowest tier were satisfactory.	
Priority Level:	Medium	
Non-Compliance Level:	2	
Description:	Ferro-scanning results for the confirmation of steel rebar in the columns of the lowest tier were not satisfactory.	
Source of Findings:	Visual Assessment: Ferro scanning shows rebars are not matching with structural design.	
Suggested Plan of Action:	Under guidance from a qualified structural engineer arrange Detail Engineering Assessment of the structure. This assessment should include verification of as-built reinforcing configuration within the columns.	
Suggested Deadline Date:	10 Jul 2014	
Standard:	Alliance Standard Part 8 Section 8.3 Preliminary Structural Assessment	
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:	There is no provisions been made in floor for a concentrated load (such as heavy equipment, water tank. Stored materials.)	
Source of Findings:	Document Review: From the structural document it is found that the provision for concentrated load such as water tanks and GSM towers have not been made., Visual Assessment: There are five plastic, one RCC water tanks and 10 GSM towers have been found on the top of the roof.	
Suggested Plan of Action:	Remove the water tanks and GSM towers. If the design report proves that these point loads are accommodated in the design then they can be retained.	
Suggested Deadline Date:	12 Jun 2014	
Standard:	Alliance Standard Part 8 Section 8.13 and 8.14	
Question:	Is a clear and redundant load path to resist lateral loads provided?	
Priority Level:	Medium	
Non-Compliance Level:	1	
Description:	The lateral load path is apparent but further information is required for understanding the redundancy.	
Source of Findings:	Document Review: In absence of the design report the adequacy and redundancy of the lateral load path is not established., Visual Assessment: Visual inspection shows the structure continuous lateral load path.	
Suggested Plan of Action:	Design report is to be prepared and submitted by the design engineer. Have a qualified structural engineer complete further analysis of the structure and develop a remediation plan if required as well as prepare design report and provide to the factory for further review.	
Suggested Deadline Date:	12 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	
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 have not been found in the submitted document.	
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:	Is the structural system free of distress, separations, or cracking that indicates lack of performance or overstress of the lateral load-carrying system?	
Priority Level:	High	
Non-Compliance Level:	3	
Description:	Some cracks have been found in the beams and columns and also some spalling have been found in the roof of the main building.	
Source of Findings:	Visual Assessment: The result of the visual assessment shows that some cracks have been observed in beam and column. Also some spalling has been observed in the roof of the main building.	
Suggested Plan of Action:	Conduct a detailed structural assessment of the entire structure based on NDT and SDT. Carry out required remedial actions based on the findings of this assessment.	
Suggested Deadline Date:	12 Jun 2014	
Standard:	Alliance Standard Part 8 Section 8.3.3	
Question:	Are the performance of key structural elements such as columns, slender columns, flat plates and transfer structures satisfactory?	
Priority Level:	High	
Non-Compliance Level:	2	
Description:	The performance of key structural elements such as columns, slender columns, beams and transfer structures are not satisfactory.	
Source of Findings:	Visual Assessment: There are cracks in some beams which are indicating the lack of performance of the key structural elements.	
Suggested Plan of Action:	To carry out a detailed structural assessment of the entire structure based on NDT and SDT in order to understand the integrity and stability of the building.	
Suggested Deadline Date:	12 Jun 2014	
Standard:	Alliance Standard Part 8 Section 8.3.3	

Question:	Is the structural system free of distress, settlement, shifting, or cracking in columns or walls?	
Priority Level:	High	
Non-Compliance Level:	2	
Description:	There are some cracks in the columns which calls for detailed structural assessment of the building.	
Source of Findings:	Visual Assessment: There are cracks in the beams and columns though they are not of serious nature.	
Suggested Plan of Action:	Execute detailed structural assessment and remedial action thereafter.	
Suggested Deadline Date:	12 Jun 2014	
Standard:	Alliance Standard Part 8 Section 8.3.3	
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:	3	
Description:	1. Some cracks on beam and column have been found. 2. Dampness have been found in almost all floor. 3. Spalling have been found in the roof slab in main building.	
Source of Findings:	Visual Assessment: The hair cracks, spalling and dampness need to be treated.	
Suggested Plan of Action:	A qualified structural engineer should be involved for detailed structural assessment using NDT and SDT.	
Suggested Deadline Date:	12 Jun 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:	They have no in-situ testing and representative destructive testing or core samples.	
Source of Findings:	Document Review: No such program was not documented.	
Suggested Plan of Action:	Have a qualified structural engineer assess the durability aspects as suggested in Alliance Standard Part 7 Section 7.2 and take appropriate remedial measures. This assessment should include confirmation of concrete strength by destructive coring.	
Suggested Deadline Date:	12 Jun 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:	Roof was constructed by MCAC, which is exposed to rainfall. The roof is not sealed with a protective coating to prevent water intrusion.	
Source of Findings:	Visual Assessment: The roof was not sealed with protective coating to prevent water intrusion during visual inspection.	
Suggested Plan of Action:	Provide a protective coating at the structural elements constructed with MCAC exposed to rainfall or positive drainage slope of at least 2% . Have protective coating approved by the Alliance or a qualified structural engineer.	
Suggested Deadline Date:	28 Jun 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:	1	
Description:	Some plastic tanks resting on the roof top are not adequately anchored or braced to resist earthquake forces.	
Source of Findings:	Visual Assessment: Some plastic tanks resting on the roof top 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. If the tanks cannot be structurally accommodated, they should be removed.	
Suggested Deadline Date:	12 Jun 2014	
Standard:	Alliance Standards Part 8 Section 8.18 Seismic Bracing of Key Non-Structural Elements and 2006 BNBC Part 6	
Question:	The exterior façade is free of cracking.	
Priority Level:	Low	
Non-Compliance Level:	1	
Description:	Some spalls and cracks have been observed at exterior facade.	
Source of Findings:	Visual Assessment: Some spalls and cracks have been observed at exterior facade.	
Suggested Plan of Action:	Have a qualified structural engineer provide further analysis of the identified cracks and spalling to determine the appropriate course of corrective action.	
Suggested Deadline Date:	12 Jun 2014	
Standard:	Alliance Standard Part 8 Section 8.2	
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:	The live loads may comply with floor live load from our simple calculation but roof live load is not complying with design live load. There is no program available to manage floor and roof live loads.	
Source of Findings:	Visual Assessment: There are some plastic water tank and GSM towers which are not indicated in the design document. Also the sheds and RCC structure on the roof top have been not documented.	
Suggested Plan of Action:	To 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 over see this program and ensure it is enforced.	
Suggested Deadline Date:	12 Jun 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:	No load Plans been prepared for each floor documenting the actual maximum operational loading that is intended or allowable on each floor.	
Source of Findings:	Document Review: No load plan is documented.	
Suggested Plan of Action:	Have a qualified structural engineer develop Floor Loading Plans as per the requirements of Part 8 Section 8.20.5.3	
Suggested Deadline Date:	12 Jun 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: No load plan is found posted as required.	
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 plan should be posted in each floor.	
Suggested Deadline Date:	12 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:	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: No load plan is avail able in the floor.	
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:	12 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:	2	
Description:	Factory Load manager or designated representative is not available.	
Source of Findings:	Document Review: The HR file of factory load manager or designated representative is not documented., Visual Assessment: Presence of factory load manager or designated representative is not evident.	
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:	12 Jun 2014	
Standard:	Alliance Standards Part 8 Section 8.9 Factory Load Manager	