

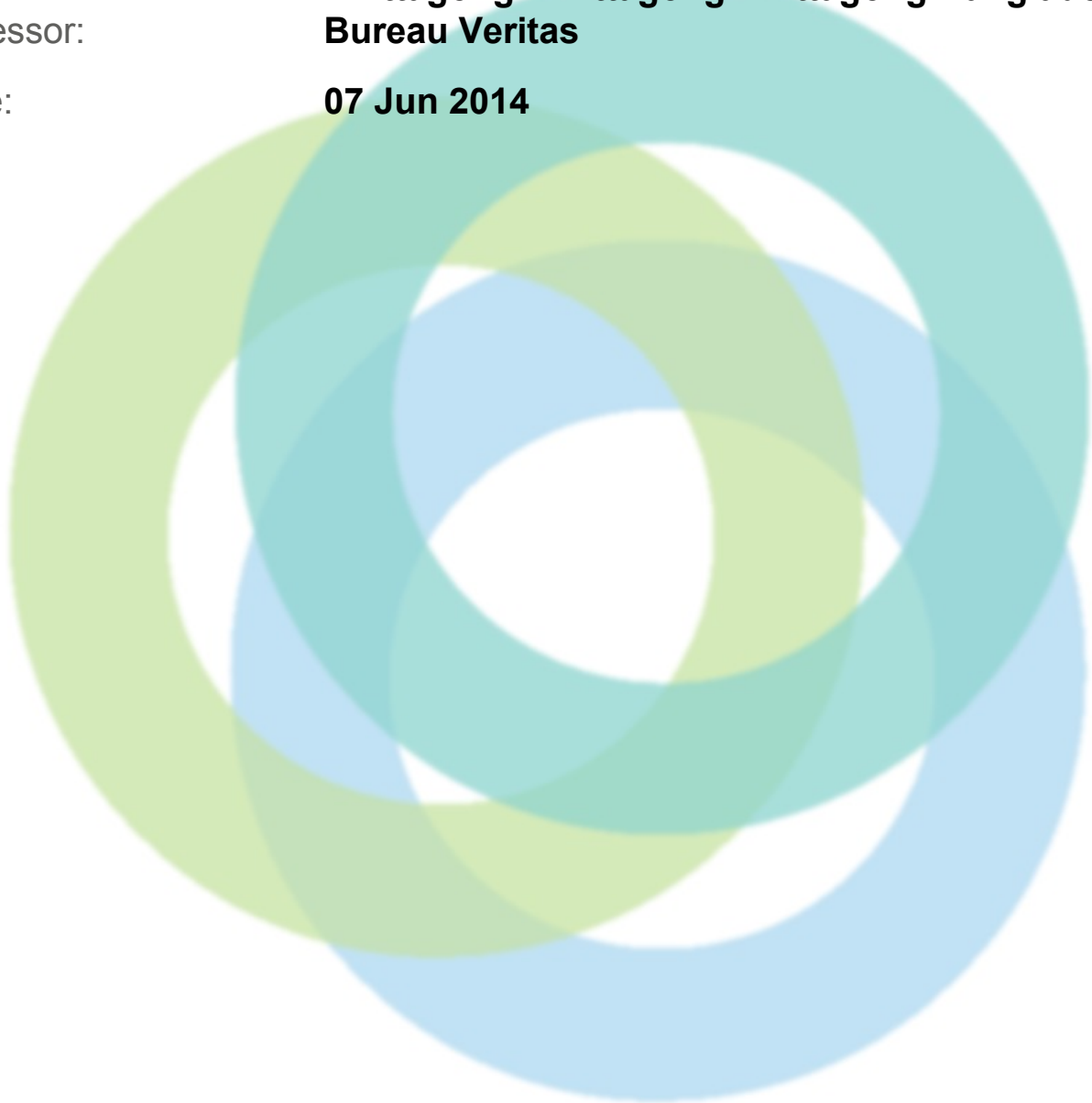
# INITIAL STRUCTURAL INTEGRITY ASSESSMENT REPORT (SIAR)

Factory Name: **Anowara Fashions Ltd**

Address: **Anwara building, BSCIC Industrial Estate, Kalurghat,  
Chittagong. Chittagong Chittagong Bangladesh**

Assessor: **Bureau Veritas**

Date: **07 Jun 2014**



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Assessor: **Bureau Veritas**

Date: **07 Jun 2014**



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## 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

General Information	
Factory Name:	Anowara Fashions Ltd
Address:	Anowara building, BSCIC Industrial Estate, Kalurghat, Chittagong. Chittagong Chittagong Bangladesh
Country:	Bangladesh
Province:	Chittagong
City:	Chittagong
Zip Code:	
Audit Duration:	1 Days
Re-Audit:	Re-Audit After 0 Months
Draft Report Date :	06-11-2014
Final Report Date :	10-21-2014
Are all Action Items From Previous Assessment Completed?:	N/A
Buildings in Complex :	There are four buildings in the factory premises out of which two are main production buildings and two are ancillary buildings. The buildings are named as: 1) Six story RCC Anowara main production building(West portion is a six storied RCC frame structure and east portion is a two storied RCC frame structure with one shed on roof), 2) Six story RCC Legacy main production building, 3) Single story utility shed, 4) Single story RCC security post.
Number of Building Levels (Stories) :	1) Six story RCC Anowara main production building: Stories below grade: 0, Occupied levels: 6, 2) Six story RCC Legacy main production building: Stories below grade: 0, Occupied levels: 6, 3) Single story utility shed: Stories above grade: 1, Stories below grade: 0, Occupied levels: 1, 4) Single story RCC security post: Stories above grade: 1, Stories below grade: 0, Occupied levels: 1.
Approximate Building Area (SF) :	Total area of all buildings in the factory premises: 280301.00 sft. Building wise breakdown as follows: 1) Six story RCC Anowara main production building: 54551.00 sft (Ground floor: 12051.00 sft, 1st floor: 11750.00 sft, 2nd floor: 11750.00 sft, 3rd floor: 5500.00 sft, 4th floor: 5500.00 sft, 5th floor: 4000.00 sft, Roof: 4000.00 sft), 2) Six story RCC Legacy main production building: 225000.00 sft (Ground floor: 39000.00 sft, 1st floor: 39000.00 sft, 2nd floor: 39000.00 sft, 3rd floor: 39000.00 sft, 4th floor: 39000.00 sft, 5th floor: 15000.00 sft, Roof: 15000.00 sft), 3) Single story utility shed: 500.00 sft, 4) Single story RCC security post: 250.00 sft.
Date of Building Construction :	Factory personnel informed the date of construction as follows: 1) Six story RCC Legacy main production building: Started in December-1998 and finished in December-2000, 2) Six story RCC Anowara main production building: Started in June-1997 and finished in December-2001, 3) Single story utility shed: Finished in December-2002, 4) Single story RCC security post: Finished in December-2007.
Date of Last Building Renovation/Addition :	Factory personnel informed the date of renovation as follows: 1) Six story RCC Anowara main production building: No record for date of renovation or addition was found from factory personnel, 2) Six story RCC

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	Legacy main production building: Dinning space and compressor room was built on roof of five storied RCC building in 2011, 3) Single story utility shed: No record for date of renovation or addition was found from factory personnel, 4) Single story RCC security post: No record for date of renovation or addition was found from factory personnel.
Is the Building mixed use?:	No
Ancillary Structures in Complex :	1) Single story utility shed, 2) Single story RCC security post.
Number of Ancillary Levels (Stories) :	1) Single story utility shed: Stories above grade: 1, Stories below grade: 0, Occupied levels: 1, 2) Single story RCC security post: Stories above grade: 1, Stories below grade: 0, Occupied levels: 1.
Approximate Ancillary Structures Area (SF) :	1) Single story utility shed: 500.00 sft, 2) Single story RCC security post: 250.00 sft.
Number of Occupants :	Total number of occupants: 4155. 1) Six story RCC Anowara main production building: 1066 (Ground floor: 180, 1st floor: 310, 2nd floor: 316, 3rd floor: 130, 4th floor:125, 5thfloor: 5), 2) Six story RCC Legacy main production building: 3081 (Ground floor: 30, 1st floor: 450, 2nd floor: 950, 3rd floor: 500, 4th floor: 1150, 5th floor: 1), 3) Single story utility shed: 2, 4) Single story RCC security post: 6.
Exterior Facade Description :	Anowara Fashions ltd - The building is a 6 storied RCC frame structure with infilled masonry wall and 3-storied frame structure (one shed on 2 storied RCC frame structure). Exterior face of the masonry wall is of plaster and paint works. Glass windows in aluminum frame are sliding type. For Legacy Fashions Ltd.:The building is a RCC frame structure with infilled masonry wall. Exterior face of the masonry wall is of plaster and paint works. Glass windows in aluminum frame are sliding type.
Structural System Description :	Anowara Fashions Ltd. - This building is Moment Resisting Frame with monolithic beam slab. Foundation is isolated footing foundation. Regular framing system. For Legacy Fashions Ltd.: This building is a flat plate with edge beam system. Foundation is pile foundation. Irregular framing.





## 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:	Anowara Fashions Ltd.: Credible structural documents are not available for review. Only approved drawings and soil test report are available. There is no Structural Engineer of Record and Architect of Record available for Anowara Fashions Ltd. Legacy Fashions Ltd.: A set of structural document 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. The engineer's name, his signature and the name of the structural firm are available, but his IEB no is not mentioned.	
Source of Findings:	Document Review: Document pertaining to the relevant information unavailable.	
Suggested Plan of Action:	Anowara Fashions Ltd.: Have a qualified structural engineer prepare credible as-built documents based on the requirements of Part 8 Section 8.19 of the Alliance Standard. Legacy Fashions Ltd.: 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:	17 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:	The design document does not clearly demonstrate the conformance with any applicable code.	
Source of Findings:	Document Review: Confirmed by reviewing documents.	
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:	17 Aug 2014	
Standard:	Reference Alliance Standards Part 8 Section 8.2 Structural Integrity of Existing	



	Factory Buildings	
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:	One level has been built on the roof of the building of Legacy Fashions Ltd in 2011. No information on the impact of the new load on the previous structure is available.	
Source of Findings:	Document Review: Document unavailable. , Visual Assessment: Confirmed visually.	
Suggested Plan of Action:	Have a qualified structural engineer complete an analytical evaluation of the structural impact of the addition.	
Suggested Deadline Date:	17 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:	Anowara fashions Ltd.: The structural configuration is moment resisting structure and hence the lateral load path is apparent. There also is redundancy due to the presence of multiple frames in both directions. For Legacy Fashions Ltd.: The structure consists of a flat slab system with edge beam, and therefore the lateral load system is not apparent; further information (design report) is required to understand the redundancy against lateral loads.	
Source of Findings:	Visual Assessment: Confirmed visually.	
Suggested Plan of Action:	Have a qualified structural engineer complete further analysis of the structure and develop a remediation plan if required.	
Suggested Deadline Date:	17 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	

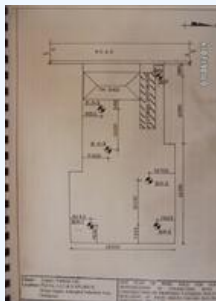


Non-Compliance Level:	2
Description:	Anowara Fashions Ltd.: There are 2 plastic water tanks (capacity 1500 Ltr. and 500 Ltr.) at the top of the roof. There is no analytical information on the provision of these tanks in the design. For Legacy Fashions Ltd.: There is a plastic water tank (1500 Liter capacity) at the top of the roof. There is no analytical information on the provision of these tanks in the design.
Source of Findings:	Visual Assessment: Confirmed visually.
Suggested Plan of Action:	Engage a qualified structural engineer to confirm and document that provisions have been made to accommodate concentrated loads. If provisions have not been made, have a qualified structural engineer develop a remediation plan.
Suggested Deadline Date:	17 Aug 2014
Standard:	Alliance Standard Part 8 Section 8.13 and 8.14
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:	There is no clear information available on the design document to understand the consideration of storm surge and wind load in the design of building.
Source of Findings:	Document Review: Confirmed by reviewing documents.
Suggested Plan of Action:	Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading.
Suggested Deadline Date:	17 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:	Are Certificates of Occupancy available for review?
Priority Level:	Low
Non-Compliance Level:	2
Description:	Both Anowara Fashions Ltd. and Legacy Fashions Ltd. has not obtained the Certificate of Occupancy from the authority.
Source of Findings:	Document Review: Document unavailable.
Suggested Plan of Action:	Provide Certificates of Occupancy for review.
Suggested Deadline	17 Aug 2014





Date:	
Standard:	Alliance Standard Part 8 Section 8.3 Preliminary Structural Assessment
Question:	Is a Geotechnical Report available for review and kept on site?
Priority Level:	Low
Non-Compliance Level:	1
Description:	Anowara Fashions Ltd.: The document review shows that there is a geotechnical report available for review at the site but geotechnical engineer's IEB No. not available. For Legacy Fashions Ltd.: The document review shows that there is a geotechnical report available for review at the site but geotechnical engineer's IEB No. not available.
Source of Findings:	Document Review: Document pertaining to the relevant information unavailable.
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. MIEB number need to be mentioned in the Geotechnical Report.
Suggested Deadline Date:	17 Aug 2014
Standard:	Alliance Standard Part 8 Section 8.2 Structural Integrity of Existing Factory Buildings



**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:	2
Description:	Anowara Fashion: 1st floor: Unbraced racks at office room, 2nd floor: Unbraced racks at office room, 3rd floor: Unbraced racks at storage room, 4th floor: Unbraced racks at storage room, Roof: There are 2 unbraced plastic water tanks (capacity 1500 Ltr. and 500 Ltr.) at the top of the roof. Legacy Fashion: 3rd floor: Unbraced racks, Roof: There is a unbraced plastic water tank (1500 Liter capacity) at the top of the roof. It seems that the water tank has been used for drinking purpose, but it should be braced and anchored.
Source of Findings:	Visual Assessment: Confirmed visually.
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:	17 Aug 2014
Standard:	Alliance Standards Part 8 Section 8.18 Seismic Bracing of Key Non-Structural Elements and 2006 BNBC Part 6



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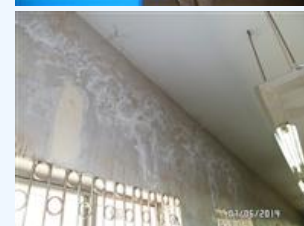
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Question:	Have all areas of needed maintenance, including areas with efflorescence, dampness, standing water on rooftops, and corrosion been addressed.
Priority Level:	Medium
Non-Compliance Level:	1
Description:	Anowara Fashions Ltd.: Dampness has been observed on the walls at almost every floor, especially in bathrooms. Legacy Fashions Ltd.: Dampness has been observed on the walls at almost every floor and standing water has also been observed on the roof top.
Source of Findings:	Document Review: Document unavailable. , Visual Assessment: Confirmed visually.
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:	17 Aug 2014
Standard:	Alliance Standard Part 8 Section 8.26 Durability and Maintenance





<p>Question:</p>	<p>Are any structural elements constructed with MCAC exposed to rainfall or other sources of water sealed with a protective coating to prevent water intrusion?</p>	
<p>Priority Level:</p>	<p>Medium</p>	
<p>Non-Compliance Level:</p>	<p>1</p>	
<p>Description:</p>	<p>Anowara Fashions Ltd.: The roof of the building is of MCAC aggregate but no protective sealing is available.</p>	
<p>Source of Findings:</p>	<p>Visual Assessment: Visual inspection shows that the roof of the building is of MCAC aggregate but no protective sealing is available.</p>	
<p>Suggested Plan of Action:</p>	<p>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. Otherwise, provide 2% slope on the exposed surface to prevent accumulation of water.</p>	
<p>Suggested Deadline Date:</p>	<p>17 Aug 2014</p>	
<p>Standard:</p>	<p>Alliance Standards Part 7 Building Materials Section 7.2 Masonry-chip aggregate concrete (MCAC).</p>	
<p>Question:</p>	<p>The exterior façade is free of cracking.</p>	
<p>Priority Level:</p>	<p>Low</p>	
<p>Non-Compliance Level:</p>	<p>1</p>	
<p>Description:</p>	<p>Anowara Fashions Ltd.: There is no cracking on the exterior façade. There are minor masonry cracks which do not affect the structural performance. For</p>	



	Legacy Fashions Ltd.: Some minor cracks have been found on the exterior facade of top floor(4th floor).	
Source of Findings:	Visual Assessment: Confirmed visually.	
Suggested Plan of Action:	Have a qualified structural engineer provide further analysis of the identified cracks to determine the appropriate course of corrective action.	
Suggested Deadline Date:	17 Aug 2014	
Standard:	Alliance Standard Part 8 Section 8.2	
Question:	Is expansion joint material free from cracking and other forms of deterioration?	
Priority Level:	Low	
Non-Compliance Level:	1	
Description:	Anowara Fashions Ltd: The expansion joint is filled with mortar. Cracks have been observed at this expansion joint material. For Legacy Fashions Ltd.: Expansion joint materials are free from cracking and other forms of deterioration.	
Source of Findings:	Visual Assessment: Confirmed visually.	
Suggested Plan of Action:	Remove all the blockages from expansion joints for them to be free for taking up the expansion. Remove deteriorated expansion joint material and provide new approved material at the expansion joint.	
Suggested Deadline Date:	17 Aug 2014	
Standard:	Alliance Standard Part 8 Section 8.26 Durability and Maintenance	
Question:	Is the building free of active signs of water intrusion or ponding due to lack of performance of the façade system?	
Priority Level:	Low	
Non-Compliance Level:	1	
Description:	Dampness has been observed on the exterior walls of the buildings. Water stains were spotted on interior walls of 1st floor and 2nd floor of legacy fashions ltd.	
Source of Findings:	Visual Assessment: Confirmed visually.	
Suggested Plan of Action:	Repair the exterior façade system to prevent water intrusion.	
Suggested Deadline Date:	17 Aug 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:	3
Description:	There is no program that will ensure that the designated load in each floor will not be exceeded.
Source of Findings:	Document Review: No evidence of the existence of any program to control the live load on the floor as per the floor load plan was found.
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:	17 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 for both of the buildings.
Source of Findings:	Document Review: Document unavailable.
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:	17 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:	There is no load plan available showing the actual maximum operational loading that is allowable for both of the buildings.
Source of Findings:	Visual Assessment: Confirmed visually.
Suggested Plan of	Have a qualified structural engineer prepare the floor load plans including the



Action:	information required in Section 8.20 of the Alliance Standard and the floor load plans should be visibly posted on all levels of all buildings.
Suggested Deadline Date:	17 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: Confirmed visually.
Suggested Plan of Action:	Have a qualified structural engineer prepare a load plan for each floor and 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:	17 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: There is no evidence of a designated load manager being present in the factory.
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:	17 Aug 2014
Standard:	Alliance Standards Part 8 Section 8.9 Factory Load Manager

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