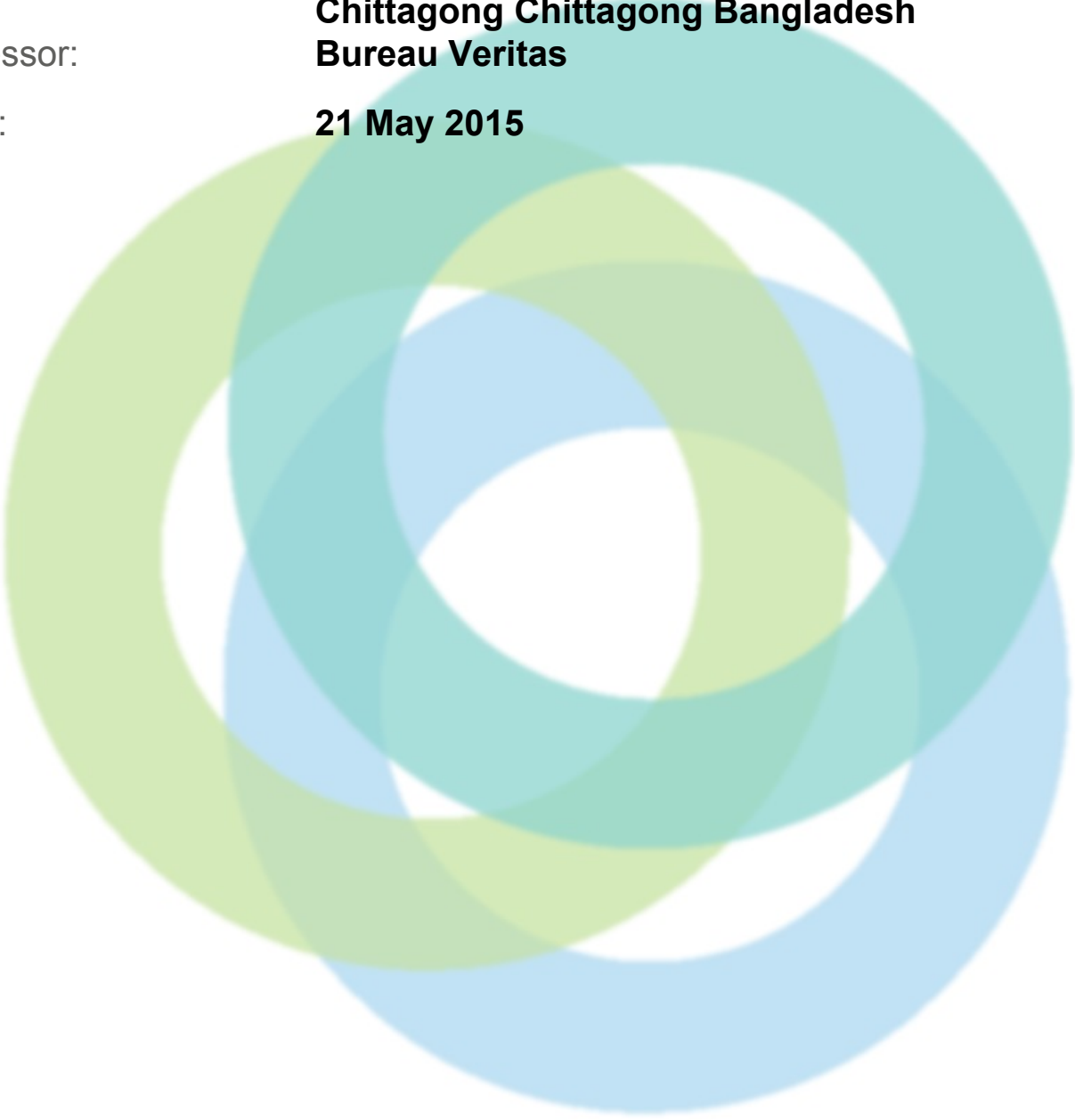


INITIAL STRUCTURAL INTEGRITY ASSESSMENT REPORT (SIAR)

Factory Name: **Karnaphuli Shoes Industries Ltd. (Garments)**
Address: **Anowara, Plot # G1 and G2, Korean EPZ, Chittagong
Chittagong Chittagong Bangladesh**
Assessor: **Bureau Veritas**
Date: **21 May 2015**





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:	Karnaphuli Shoes Industries Ltd. (Garments)
Address:	Anowara, Plot # G1 and G2, Korean EPZ, Chittagong Chittagong Chittagong Bangladesh
Country:	Bangladesh
Province:	Chittagong
City:	Chittagong
Zip Code:	
Audit Duration:	
Re-Audit:	Re-Audit After 0 Months
Draft Report Date :	23-Feb-2015
Final Report Date :	09-Jul-2015
Are all Action Items From Previous Assessment Completed?:	Yes
Buildings in Complex :	There are twelve buildings in the factory premises out of which six are main production buildings and six are ancillary buildings. Each two RCC buildings and one shed are combinedly known as Building-12 as well as Building-13. The buildings are named as: 1) Main production building-12; Three story building (south part), 2) Main production building-12; Single story prefab shed, 3) Main production building-12; Three story building (north part), 4) Main production building-13; Three story building (south part), 5) Main production building-13; Single story prefab shed, 6) Main production building-13; Three story building (north part), 7) Single story security building-1, 8) Single story security building-2, 9) Single story substation building, 10) Single story compressor shed-12, 11) Single story compressor shed-13, 12) Single story pump building.
Number of Building Levels (Stories) :	1) Main production building-12; Three story building (south part): Stories above grade: 3, Stories below grade: 0, 2) Main production building-12; Single story prefab shed: Stories above grade: 1, Stories below grade: 0, 3) Main production building-12; Three story building (north part): Stories above grade: 3, Stories below grade: 0, 4) Main production building-13; Three story building (south part): Stories above grade: 3, Stories below grade: 0, 5) Main production building-13; Single story prefab shed: Stories above grade: 1, Stories below grade: 0, 6) Main production building-13; Three story building (north part): Stories above grade: 3, Stories below grade: 0, 7) Single story security building- 1: Stories above grade: 1, Stories below grade: 0, 8) Single story security building-2: Stories above grade: 1, Stories below grade: 0, 9) Single story substation building: Stories above grade: 1, Stories below grade: 0, 10) Single story compressor shed-12: Stories above grade: 1, Stories below grade: 0, 11) Single story compressor shed-13: Stories above grade: 1, Stories below grade: 0, 12) Single story pump building: Stories above grade: 1, Stories below grade: 0;
Approximate Building Area (SF) :	Total area of all buildings in the factory premises: 295511.00 sft. Building wise breakdown as follows: 1) Main production building-12; Three story building (south part): 37704.00 sft (Ground floor: 9426 sft, 1st floor: 9426 sft, 2nd floor: 9426 sft, Roof: 9426 sft), 2) Main production building-12; Single story prefab shed: 68464 sft, 3) Main production building-12; Three story building (north part): 37704.00 sft (Ground floor: 9426 sft, 1st floor:



	9426 sft, 2nd floor: 9426 sft, Roof: 9426 sft), 4) Main production building-13; Three story building (south part): 37704.00 sft (Ground floor: 9426 sft, 1st floor: 9426 sft, 2nd floor: 9426 sft, Roof: 9426 sft), 5) Main production building-13; Single story prefab shed: 68464 sft, 6) Main production building-13; Three story building (north part): 37704.00 sft (Ground floor: 9426 sft, 1st floor: 9426 sft, 2nd floor: 9426 sft, Roof: 9426 sft), 7) Single story security building-1: 587 sft, 8) Single story security building-2: 587 sft, 9) Single story substation building: 4800 sft, 10) Single story compressor shed-12: 602 sft, 11) Single story compressor shed-13: 602 sft, 12) Single story pump building: 589 sft;
Date of Building Construction :	Factory personnel informed the date of construction as follows: 1) Main production building- 12 & 13; Started in December-2012 and finished in November-2013, 2) Single story security building-1 & 2; Started in December- 2012 and finished in January-2013, 3) Single story substation building, compressor shed 12 & 13, pump building; Started in October-2013 and finished in November-2013,
Date of Last Building Renovation/Addition :	No renovation or addition was done to any of buildings in factory premises.
Is the Building mixed use?:	No
Ancillary Structures in Complex :	1) Single story security building-1, 2) Single story security building-2, 3) Single story substation building, 4) Single story compressor shed-12, 5) Single story compressor shed-13, 6) Single story pump building.
Number of Ancillary Levels (Stories) :	1) Single story security building-1: Stories above grade: 1, Stories below grade: 0, 2) Single story security building-2: Stories above grade: 1, Stories below grade: 0, 3) Single story substation building: Stories above grade: 1, Stories below grade: 0, 4) Single story compressor shed-12: Stories above grade: 1, Stories below grade: 0, 5) Single story compressor shed-13: Stories above grade: 1, Stories below grade: 0, 6) Single story pump building: Stories above grade: 1, Stories below grade: 0;
Approximate Ancillary Structures Area (SF) :	1) Single story security building-1: 587 sft, 2) Single story security building-2: 587 sft, 3) Single story substation building: 4800 sft, 4) Single story compressor shed-12: 602 sft, 5) Single story compressor shed-13: 602 sft, 6) Single story pump building: 589 sft.
Number of Occupants :	Total number of occupants: 4016. 1) Main production building-12; Three story building (south part): 150 (Ground floor: 50, 1st floor: 50, 2nd floor: 50), 2) Main production building-12; Single story prefab shed: 1700, 3) Main production building-12; Three story building (north part): 150 (Ground floor: 50, 1st floor: 50, 2nd floor: 50), 4) Main production building-13; Three story building (south part): 150 (Ground floor: 50, 1st floor: 50, 2nd floor: 50), 5) Main production building-13; Single story prefab shed: 1700, 6) Main production building-13; Three story building (north part): 150 (Ground floor: 50, 1st floor: 50, 2nd floor: 50), 7) Single story security building-1: 5, 8) Single story security building-2: 5, 9) Single story substation building: 3, 10) Single story compressor shed-12: 1, 11) Single story compressor shed-13: 1, 12) Single story pump building: 1.
Exterior Facade Description :	There are four RCC buildings in factory premises and all of them are identical. Perimeter façade of the RCC buildings consists of brick masonry wall. Windows are sliding glass in aluminum frame and main doors are swinging glass in aluminum frame. Roof of the buildings are surrounded by parapet. On the other hand, perimeter facades of PEB production sheds consists of zinc alum profile sheet. Windows are louver type and doors are metallic sliding type.
Structural System Description :	There are four RCC buildings in factory premises and all of them are identical. All the RCC buildings are moment resisting frame structure with monolithic beams and slabs. On the other hand, production sheds are braced steel framed PEB shed. Foundation of all the buildings and sheds are on isolated column footing as per structural drawing.
Issues were not found during the structural integrity assessment that required the Emergency Escalation Protocol (and	Yes

Factory Name: **Karnaphuli Shoes Industries Ltd. (Garments)**
Address: **Anowara, Plot # G1 and G2, Korean EPZ, Chittagong Chittagong Chittagong Bangladesh**

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Date: **21 May 2015**



ALLIANCE
FOR BANGLADESH WORKER SAFETY

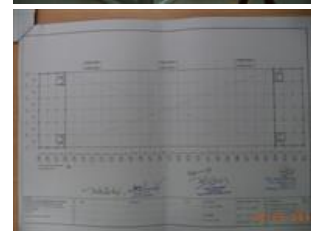
referral to NTC Review
Panel)?:



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:	A set of structural document is available for both the RCC buildings and PEB production sheds. But, identity of the Structural Engineer of Record is not mentioned on structural document of steel sheds. The factory is making room in floors by giving glass partition/interior brick wall, but arrangement of the glass partition/brick wall is not shown in architectural document. Also, an assessment report named "Assessment of Construction Completion & Structural Safety of 3 & Single Storied Buildings" is available on-site and it has claimed that the structures are in safe condition. It should be mentioned that, this assessment report does not meet the requirement of design report.
Source of Findings:	Document Review: Documents reviewed on site.
Suggested Plan of Action:	Have a qualified structural engineer prepare as-built documents with design report based on the requirements of Part 8 Section 8.19 of the Alliance Standard.
Suggested Deadline Date:	
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:	For RCC buildings and sheds: The available design documents do not indicate general conformance with 2006 BNBC or other comparable applicable international model building code.
Source of Findings:	Document Review: Document reviewed onsite.
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:		
Standard:	Reference Alliance Standards Part 8 Section 8.2 Structural Integrity of Existing Factory Buildings	
Question:	If built after 2006, can documented compliance with the seismic and wind requirements of the 2006 BNBC be provided?	
Priority Level:	Medium	
Non-Compliance Level:	2	
Description:	The buildings were constructed after 2006, but no information available on the design documents to understand the consideration of seismic and wind requirements as per 2006 BNBC in the design of the building.	
Source of Findings:	Document Review: Documents reviewed on site.	
Suggested Plan of Action:	Have a qualified structural engineer document compliance with the seismic and wind requirements stated in the 2006 BNBC.	
Suggested Deadline Date:		
Standard:	Alliance Standards Part 8 Section 8.17 Design for Lateral Loads and 2006 BNBC Part 6 Section 1.5	
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:	For RCC buildings and sheds: No information available on the design documents to understand the consideration of wind loading in the design of the building.	
Source of Findings:	Document Review: Documents reviewed on site.	
Suggested Plan of Action:	Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading.	
Suggested Deadline Date:		
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:	2
Description:	Seven plastic water tanks on roof level of substation building were noted. No structural provisions have been made for these water tanks.
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 concentrated loads. If provisions have not been made, have a qualified structural engineer develop a remediation plan.
Suggested Deadline Date:	
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:	2
Description:	Certificate of Occupancy is not available for review.
Source of Findings:	Document Review: Certificate of Occupancy is not available
Suggested Plan of Action:	Apply for issuance of Occupancy Certificate to concerned authority.
Suggested Deadline 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:	There is a set of geotechnical report available for review but the report does not contain the IEB no. of the engineer involved in the geotechnical investigation.
Source of Findings:	Document Review: Geotechnical report reviewed on-site
Suggested Plan of Action:	Provide the IEB membership number of the geotechnical engineer.
Suggested Deadline Date:	
Standard:	Alliance Standard Part 8 Section 8.2 Structural Integrity of Existing Factory





Buildings

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:	1
Description:	There are some shrinkage crack which are not structural but requires proper monitoring. Building-12: North RCC part: -Shrinkage Crack on ceiling at 1st floor. South RCC part: -Shrinkage crack on beam at 1st and 2nd floor. Building-13: North RCC part: -Shrinkage crack on beam at 2nd floor. South RCC part- -Shrinkage crack on beam at 2nd floor.
Source of Findings:	Visual Assessment: Visually confirmed.
Suggested Plan of Action:	Engage a qualified structural engineer to provide additional investigation into the areas of cracking and provide a remediation plan if required.
Suggested Deadline Date:	
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:	1	
Description:	Building-12: North side RCC part: -Column and masonry wall joint crack at 2nd floor. -Masonry crack on wall at 1st floor. South side RCC part: -Masonry crack on wall was found at 2nd floor. Building-13: North side RCC part: -Masonry crack on wall at 1st floor and roof staircase. South side RCC part: -Masonry crack on wall at 1st floor.	
Source of Findings:	Visual Assessment: Visually confirmed.	
Suggested Plan of Action:	Have a qualified structural engineer provide further testing and analysis of cracking in walls and provide a remediation plan to correct noted issues.	
Suggested Deadline Date:		
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:	2
Description:	The following areas need proper maintenance: Building-12: North side RCC part- - Dampness on ceiling of roof top staircase. - Dampness on roof surface. Building-13: North Side RCC part- - Dampness on roof surface. South side RCC part- - Dampness on wall around east side staircase at 1st and 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:	
Standard:	Alliance Standard Part 8 Section 8.26 Durability and Maintenance
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:	Slab of RCC buildings were constructed with MCAC but protective sealing (i.e. lime terrace) is available only on the roof surface of south part buildings. No protective sealing is provided on the roof surface of north part buildings.
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.





Suggested Deadline Date:	
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:	2
Description:	Following non-structural elements need bracing and anchorage: -Storage racks at PEB Shed (Building-12), -Storage racks at MCD storage of PEB shed (Building-13), -Compressor at compressor shed, -Seven plastic water tanks on roof level of substation building.
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:	
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 that will ensure that the designated load in each floor will not be exceeded.
Source of Findings:	Document Review: Documents reviewed on-site.
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:		
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:	For the four RCC buildings no load plans are available. (Note that, no production is going on currently in any of the floors of RCC buildings. But, during inspection storage has been observed on floors of RCC buildings. Also, a printing section has been observed on 2nd floor level of north part-building 13. Due to having storage areas and a printing section floor load plans showing actual maximum loading limit have been demanded. On the other hand, as the PEB sheds are single storied, floor load plans are not required for them).	
Source of Findings:	Document Review: Load Plans unavailable	
Suggested Plan of Action:	Have a qualified structural engineer develop Floor Loading Plans for the multistory structures per the requirements of Part 8 Section 8.20.5.3.	
Suggested Deadline Date:		
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:	For the four RCC buildings no load plans are available.	
Source of Findings:	Visual Assessment: Load Plans unavailable	
Suggested Plan of Action:	Have a qualified structural engineer develop Floor Loading Plans for the multistory structures per the requirements of Part 8 Section 8.20.5.3 Once prepared, post the load plan on each level of the building as required.	
Suggested Deadline Date:		
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:	For the four RCC production buildings no load plans are available documenting the actual maximum operational loading that is intended and/or allowable on each floor. Also, the areas used for storage of work materials and work products, are not clearly marked to indicate the acceptable loading limits as described in the Load Plan for that floor.	
Source of Findings:	Visual Assessment: Visually confirmed.	
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:		
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:	Load Manager is not appointed yet.	
Source of Findings:	Document Review: Documents reviewed on-site.	
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:		
Standard:	Alliance Standards Part 8 Section 8.9 Factory Load Manager	