

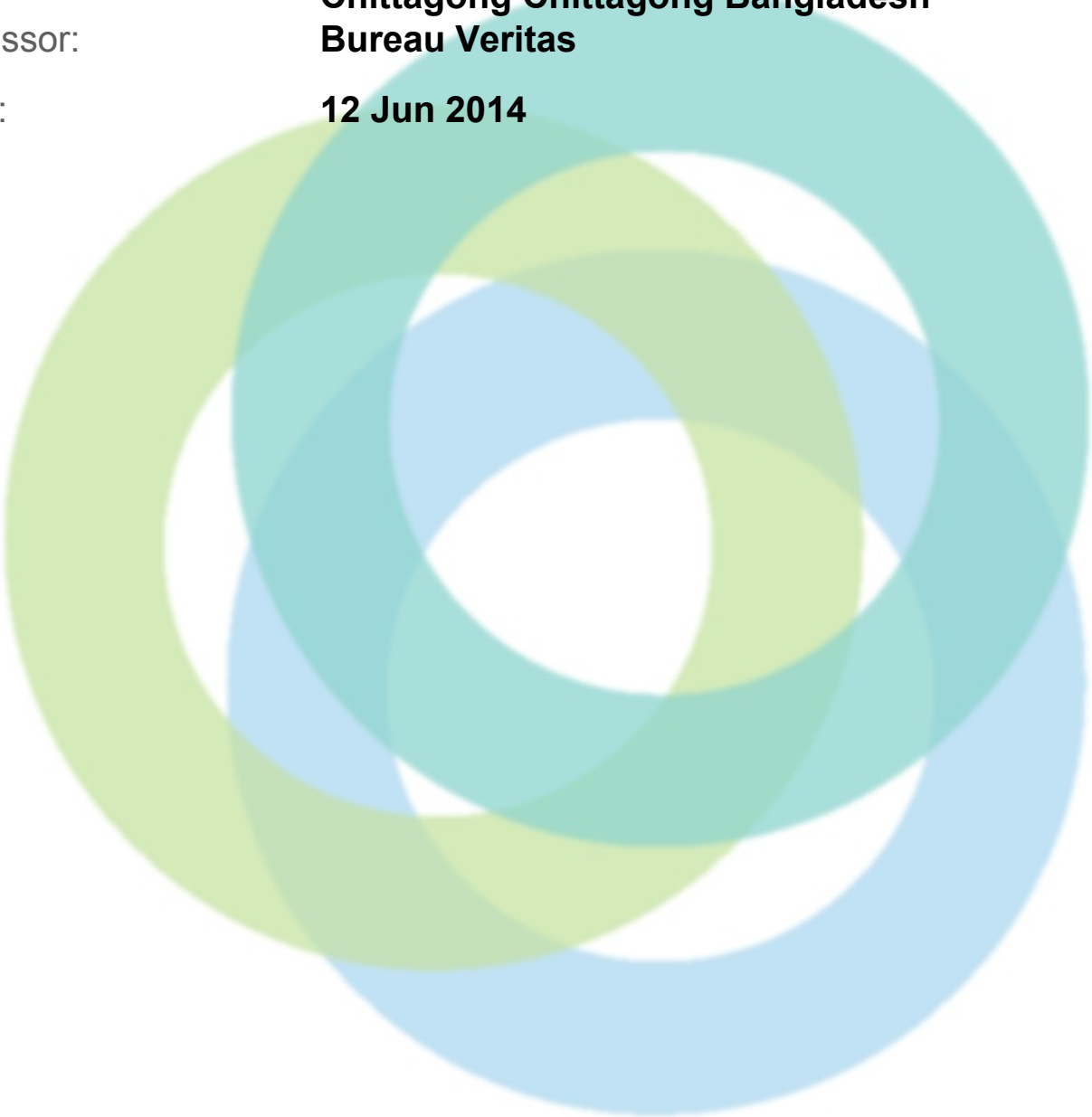
INITIAL STRUCTURAL INTEGRITY ASSESSMENT REPORT (SIAR)

Factory Name: **Sea Tex Limited**

Address: **Plot # 08-09, Sector # 06, CEPZ, Chittagong
Chittagong Chittagong Bangladesh**

Assessor: **Bureau Veritas**

Date: **12 Jun 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:	Sea Tex Limited
Address:	Plot # 08-09, Sector # 06, 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 :	06-17-2014
Final Report Date :	10-28-2014
Are all Action Items From Previous Assessment Completed?:	N/A
Buildings in Complex :	There are 14 buildings in the factory premises out of which four are main production buildings and ten are ancillary buildings. The buildings are named as: 1) Four story RCC production building-1, 2) Five story RCC production building-2, 3) Four story RCC production building-A, 4) Seven story RCC production building-B(A part of roof top is occupied, that is why counted as seven story), 5) Two story RCC boiler building, 6) Two story RCC maintenance building, 7) Single story wastage building, 8) Single story substation building, 9) Single story boiler shed, 10) Single story chemical shed, 11) Single story gas meter shed, 12) Single story pump building, 13) Single story security building, 14) Single story ETP building.
Number of Building Levels (Stories) :	1) Four story RCC production building-1:above grade: 4,below grade: 0,2) Five story RCC production building-2:above grade: 5,below grade: 0,3) Four story RCC production building-A:above grade: 4,below grade: 0,4) Seven story RCC production building-B:above grade: 7 below grade: 0,5) Two story RCC boiler building:above grade: 2below grade: 0,6) Two story RCC maintenance building:above grade: 2below grade: 0,7) Single story wastage building:above grade: 1,below grade: 0,8) Single story substation building:above grade: 1,below grade: 0,9) Single story boiler shed:above grade: 1,below grade: 0,10) Single story chemical shed:above grade: 1, below grade: 0,11) Single story gas meter shed:above grade: 1,below grade: 0,12) Single story RCC pump building:above grade: 1,below grade: 0,13) Single story security building:above grade: 1,below grade: 0,14) Single story ETP building: above grade: 1,below grade: 0,
Approximate Building Area (SF) :	Total areas of all buildings in the factory premises are 317398 sft. Building wise breakdown are as follows: 1) Four story RCC production building-1: 63000 sft 2) Five story RCC production building-2: 84600 sft 3) Four story RCC main production building-A: 32000 sft 4) Seven story RCC production building-B: 127803 sft 5) Two story RCC boiler building: 2298 sft 6) Two story RCC maintenance building: 2520 sft 7) Single story wastage building: 108 sft, 8) Single story substation building: 560 sft, 9) Single story boiler shed: 1283 sft, 10) Single story chemical shed: 283 sft, 11) Single story gas meter shed: 115 sft, 12) Single story pump building: 200 sft, 13) Single story security building: 216 sft, 14) Single story ETP building: 2412 sft.



Date of Building Construction :	Factory personnel informed the date of construction as follows: 1) Four story RCC production building: Finished in 2002, 2) Five story RCC production building: Finished in 2005, 3) Four story RCC production building: Finished in 2007, 4) Seven story RCC production building: Finished in 1999. For rest of the buildings no record for date of construction was found.
Date of Last Building Renovation/Addition :	No record for date of renovation or addition was found from factory personnel.
Is the Building mixed use?:	No
Ancillary Structures in Complex :	1) Two story RCC boiler building, 2) Two story RCC maintenance building, 3) Single story wastage building, 4) Single story substation building, 5) Single story boiler shed, 6) Single story chemical shed, 7) Single story gas meter shed, 8) Single story pump building, 9) Single story security building, 10) Single story ETP building.
Number of Ancillary Levels (Stories) :	1) Two story RCC boiler building: Stories above grade: 2,below grade: 0, 2) Two story RCC maintenance building: Stories above grade: 2,below grade: 0, 3) Single story wastage building: Stories above grade: 1,below grade: 0, 4) Single story substation building: Stories above grade: 1,below grade: 0, 5) Single story boiler shed: Stories above grade: 1,below grade: 0, 6) Single story chemical shed: Stories above grade: 1,below grade: 0, 7) Single story gas meter shed: Stories above grade: 1, below grade: 0, 8) Single story RCC pumps building: Stories above grade: 1,below grade: 0, 9) Single story security building: Stories above grade: 1,below grade: 0, 10) Single story ETP building: Stories above grade: 1,below grade: 0,
Approximate Ancillary Structures Area (SF) :	1) Two story RCC boiler building: 2298 sft (Ground floor: 766 sft, 1st floor: 766 sft, Roof: 766 sft), 2) Two story RCC maintenance building: 2520 sft (Ground floor: 840 sft, 1st floor: 840 sft, Roof: 840 sft), 3) Single story wastage building: 108 sft, 4) Single story substation building: 560 sft, 5) Single story boiler shed: 1283 sft, 6) Single story chemical shed: 283 sft, 7) Single story gas meter shed: 115 sft, 8) Single story pump building: 200 sft, 9) Single story security building: 216 sft, 10) Single story ETP building: 2412 sft.
Number of Occupants :	Total numbers occupants: 1188. 1) Four story RCC production building-1: 350 (Ground floor: 60, 1st floor: 05, 2nd floor: 215, 3rd floor: 70), 2) Five story RCC production building-2: 683 (Ground floor: 20, 1st floor: 200, 2nd floor: 250, 3rd floor: 200, 4th floor: 03), 3) Four story RCC production building-A: 38 (Ground floor: 2, 1st floor: 5, 2nd floor: 1, 3rd floor: 30, 4) Seven story RCC production building-B: 783 (Ground floor: 38, 1st floor: 15, 2nd floor: 80, 3rd floor: 270, 4th floor: 280, 5th floor: 96), 6th floor: 2), 5) Two story RCC boiler building: 3 (Ground floor: 2, 1st floor: 1), 6) Two story RCC maintenance building: 6 (Ground floor: 3, 1st floor: 3), 7) Single story wastage building: 1, 8) Single story substation building: 1, 9) Single story boiler shed: 1, 10) Single story chemical shed: 1, 11) Single story gas meter shed: 0, 12) Single story pump building: 1, 13) Single story security building: 2, 14) Single story ETP building: 0.
Exterior Facade Description :	Building 01: The building is a RCC framed structure with infilled masonry. Windows are glassed sliding type with aluminium frame. Doors are fire rated metal door; Buiilding-02: The building is a RCC framed structure with infilled masonry. Windows are glassed sliding type with aluminium frame. Doors are fire rated metal door; Building-A: The exterior facade of the building is infilled masonry walls which is decorated with ceramic Bricks & aluminium composite cladding. Aluminium frames and glasses are used in windows. Doors are fire proofing metal door; Building B: The exterior facade of the building is infilled masonry walls with aluminium frame and glass. Doors are fire proofing metal door.
Structural System Description :	Building-01: Floor framing: Framing with beams. Foundation system: Pile foundation Structural framing members: Columns and beams. Framing regularity: Regular frames. Building-02: Floor framing:Framing with beams. Foundation system:Pile foundation. Structural framing members:Columns and beams. Framing regularity:Regular frames. Building-A: Floor framing: Framing with beams. Foundation system: Spread footing. Structural framing members: Columns and beams. Framing regularity: Regular frames. Building-B: Floor framing: Framing with beams. Foundation system: Individual footing. Structural framing members: Columns and beams. Framing regularity: Regular frames.

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ALLIANCE
FOR BANGLADESH WORKER SAFETY

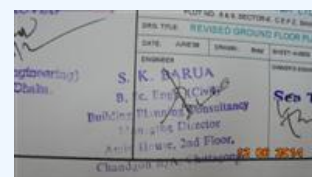


ASSESSMENT FINDINGS

Structural System Design

Question:	Are Certificates of Occupancy available for review?
Priority Level:	Low
Non-Compliance Level:	1
Description:	The factory has not obtained the Certificates of Occupancy from the authority.
Source of Findings:	Document Review: Documents reviewed on site.
Suggested Plan of Action:	Provide Certificates of Occupancy for review.
Suggested Deadline Date:	05 Aug 2014
Standard:	Alliance Standard Part 8 Section 8.3 Preliminary Structural Assessment

Question:	Structural Engineer of Record
Priority Level:	
Non-Compliance Level:	
Description:	S.K.Barua is the Structural Engineer of Record whose signature is available on structural documents. However, IEB membership no. is not mentioned in the structural documents..
Source of Findings:	Document Review: Documents reviewed on site.
Suggested Plan of Action:	
Suggested Deadline Date:	
Standard:	Provide the name and firm of the structural engineer of record.



Question:	Architect of Record
Priority Level:	
Non-Compliance Level:	
Description:	There is no Architect of Record available.
Source of Findings:	Document Review: Documents reviewed onsite.
Suggested Plan of	



Action:		
Suggested Deadline Date:		
Standard:	Provide the name and firm of the architect of record.	
Question:	Are credible structural design documents available for review and kept on site?	
Priority Level:	Medium	
Non-Compliance Level:	2	
Description:	A set of design document is available on site for review. However, these are not credible and the design report is not available which is required as per BNBC 2006 clause 1.9.1.1. Also, the identity of the Architect is not available.	
Source of Findings:	Document Review: Documents reviewed on site.	
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 and prepare the design report and submit it to BV for review.	
Suggested Deadline Date:	05 Aug 2014	
Standard:	Alliance Standard Part 8 Section 8.19 Required Structural Documentation for New and Existing Factories	
Question:	Is a Geotechnical Report available for review and kept on site?	
Priority Level:	Low	
Non-Compliance Level:		
Description:	The Geotechnical Report is complete and available for review.	
Source of Findings:	Document Review: Documents reviewed on site.	
Suggested Plan of Action:		
Suggested Deadline Date:		
Standard:	Alliance Standard Part 8 Section 8.2 Structural Integrity of Existing Factory Buildings	
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	



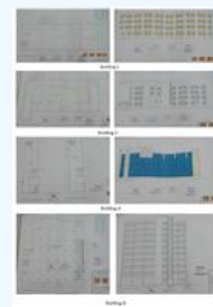
Description:	Building 1, 2 & B were designed and constructed before 2006 and building A was designed and constructed after 2006. There is no indication that the design accommodates the requirement of BNBC 2006 or other international model building code.	
Source of Findings:	Document Review: Documents reviewed on site.	
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:	05 Aug 2014	
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:	Building 1, 2 & B were designed and constructed before 2006 and building A was designed and constructed after 2006. There is no indication that the building has been designed taking into consideration of the seismic and wind loading requirements.	
Source of Findings:	Document Review: Documents reviewed on site.	
Suggested Plan of Action:	Engage a qualified structural engineer and assess the building against seismic and wind load conditions and if there are any deficiency, make the remediation accordingly.	
Suggested Deadline Date:	19 Aug 2014	
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:	There is no clear information available on the design document to understand the consideration of storm surge and wind loading in the design of the buildings.	
Source of Findings:	Document Review: Documents reviewed on site.	
Suggested Plan of	Engage a qualified structural engineer to confirm satisfactory structural	



Action:	performance of the buildings under wind loading.	
Suggested Deadline Date:	05 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:	Has evidence of structural integrity been provided using a Preliminary Structural Assessment?	
Priority Level:	High	
Non-Compliance Level:		
Description:	No preliminary structural assessment has been carried out in these factories to provide evidence of integrity of the buildings.	
Source of Findings:	Document Review: Document review shows that, no preliminary structural assessment has been carried out in these factories to provide evidence of integrity of the buildings.	
Suggested Plan of Action:		
Suggested Deadline Date:		
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:		
Description:	There is no evidence of previous expansion of the structures.	
Source of Findings:	Document Review: Document Review shows that there is no extension of the buildings beyond the original construction., Visual Assessment: Visual Inspection shows that, there is no extension of the buildings beyond the original construction.	
Suggested Plan of Action:		
Suggested Deadline Date:		
Standard:	Reference Alliance Standards Part 8 Section 8.1 Applicability of Building Code.	



Question:	Structural System Type as defined by 2006 BNBC Part 6 Chapter 1 Table 6.1.2.
Priority Level:	
Non-Compliance Level:	
Description:	Building-1, 2, A & B are moment resisting frame structures.
Source of Findings:	Document Review: Document review shows that, building-1, 2, A & B are moment resisting frame structures. , Visual Assessment: Visual inspection shows that, building-1, 2, A & B are moment resisting frame structures.
Suggested Plan of Action:	
Suggested Deadline Date:	
Standard:	2006 BNBC Part 6 Chapter 1 Table 6.1.2
Question:	What is the Structural Configuration?
Priority Level:	
Non-Compliance Level:	
Description:	All the buildings are regular structure.
Source of Findings:	Document Review: Document review reveals that, all the buildings are regular structure., Visual Assessment: Visual inspection shows that, all the buildings are regular structure.
Suggested Plan of Action:	
Suggested Deadline Date:	
Standard:	2006 BNBC Part 6 Chapter 1 Section 1.3.4
Question:	Is a clear and redundant load path to resist lateral loads provided?
Priority Level:	Medium
Non-Compliance Level:	
Description:	For Building-1, 2, A & B: Since there are multiple moment resisting frames, the lateral load path is clear and redundancy is available.
Source of Findings:	Document Review: Documents reviewed on site., Visual Assessment: visual inspection conducted.
Suggested Plan of Action:	





Suggested Deadline Date:		
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 the available FoS for the columns adequate based on Preliminary calculation?	
Priority Level:	High	
Non-Compliance Level:	3	
Description:	FoS of columns noted as below: Building-1, considering minimum strength for MCAC (2045 psi): Central Column:1.77, Corner Column:2.64, Edge Column:1.89. The FoS for central column are below the acceptable limit that is 1.86; Building-2, considering minimum strength for MCAC (2045 psi): Central Column:2.04, Corner Column:2.36, Edge Column:1.82. The FoS for Edge columns are below the acceptable limit that is 1.86; Building-A, considering minimum strength for MCAC (2045 psi): Central Column:1.57, Corner Column:2.44, Edge Column:2.17. The FoS for Central columns are below the acceptable limit that is 1.86; Building-B, (For existing six story), considering minimum strength for Stone CHips (2370 psi): Central Column:2.72, Corner Column:2.56, Edge Column:2.91. The FoS in all columns are within acceptable limit. Building-B, (For proposed ten story), considering minimum strength for Stone CHips (2370 psi): Central Column:1.65, Corner Column:1.55, Edge Column:1.76. The FoS for Central, Corner and Edge columns are below the acceptable limit that is 1.86;	
Source of Findings:	Uploaded Document: Uploaded calculation of FoS	
Suggested Plan of Action:	Building 1,2 & A: Conduct core testing to validate the in-situ concrete compressive strength of structural elements. Building-B: Before any other expansion of the building conduct a Detail Engineering Assessment (DEA) including core testing to validate the in-situ concrete compressive strength of structural elements. No further expansion is allowed before DEA.	
Suggested Deadline Date:	19 Aug 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:	Results of ferro-scanning for confirmation of steel rebar in the columns of the lowest tier were satisfactory.	
Priority Level:	Medium	
Non-Compliance Level:		
Description:	Result of ferro-scanning confirms that the number of rebars are matching with the structural designs for the buildings.	
Source of Findings:	Visual Assessment: Result of ferro-scanning confirms that the number of	



	rebars are matching with the structural designs for the buildings.	
Suggested Plan of Action:		
Suggested Deadline Date:		
Standard:	Alliance Standard Part 8 Section 8.3 Preliminary Structural Assessment	
Question:	What are the full dead and live loads of the floor slabs and decks?	
Priority Level:		
Non-Compliance Level:		
Description:	For building- 1: Slab thickness is measured 6", So dead load is $75 + 25 \text{ (FF)} = 100 \text{ psf}$ and estimated live load is about 42 psf. For building- 2, A & B: Slab thickness is measured 6.5", So dead load is $85 + 25 \text{ (FF)} = 105 \text{ psf}$ and estimated live load is about 42 psf.	
Source of Findings:	Visual Assessment: Slab thickness measured	
Suggested Plan of Action:		
Suggested Deadline Date:		
Standard:	Provide information regarding the dead and live loads of the floor slabs and decks.	
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 a plastic water tank on roof top of building B and 3rd floor of building 2. There is no analytical information on the provision of these tanks in the design.	
Source of Findings:	Document Review: Documents reviewed on site., Visual Assessment: Visual inspection conducted.	
Suggested Plan of Action:	Engage a qualified structural engineer to confirm and document that provisions have been made to accommodate the water tanks. 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:	Where density of operations, storage of materials, or equipment weights require live load capacity in excess of 2.0 kN/m2 (42 psf), do the design documents confirm that the required load capacity exists? Or has the load capacity been analytically confirmed and certified by an Alliance-qualified structural engineer?
Priority Level:	Medium
Non-Compliance Level:	
Description:	The density of operation does not exceed 42 psf for all the buildings.
Source of Findings:	Document Review: The document review shows that the density of operation does not exceed 42 psf. , Visual Assessment: The visual inspection shows that the density of operation does not exceed 42 psf.
Suggested Plan of Action:	
Suggested Deadline Date:	
Standard:	Alliance Standards Part 8 Section 8.15 Minimum Floor Design Loads

Structural System Construction

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:	Dampness and water ponding are found at every building. There is no maintenance program for these areas including areas with efflorescence, dampness, standing water on rooftops, and corrosion.
Source of Findings:	Document Review: Documents reviewed on site., Visual Assessment: Visual inspection conducted.
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:	05 Aug 2014
Standard:	Alliance Standard Part 8 Section 8.26 Durability and Maintenance





Question:	The exterior façade is free of cracking.
Priority Level:	Low
Non-Compliance Level:	
Description:	The exterior façade is free of cracking.
Source of Findings:	Visual Assessment: Visual inspection shows that there is no cracking in the exterior façade.
Suggested Plan of Action:	
Suggested Deadline Date:	
Standard:	Alliance Standard Part 8 Section 8.2
Question:	Are expansion joints provided at appropriate intervals on the exterior façade?
Priority Level:	Low
Non-Compliance Level:	
Description:	Building-1, 2, A & B : No expansion joints have been provided at exterior facade.
Source of Findings:	Document Review: Documents reviewed on site., Visual Assessment: Visual inspection conducted.
Suggested Plan of Action:	
Suggested Deadline Date:	
Standard:	Alliance Standard Part 8 Section 8.2 Structural Integrity of Existing Factory Buildings
Question:	Is expansion joint material free from cracking and other forms of deterioration?
Priority Level:	Low
Non-Compliance Level:	2
Description:	Building-1: There are expansion joints which are filled with mortar. This will make the expansion joints ineffective.
Source of Findings:	Document Review: Documents reviewed on site., Visual Assessment: Visual inspection conducted.
Suggested Plan of Action:	Remove deteriorated expansion joint material and provide new approved material at the expansion joint.
Suggested Deadline	16 Sep 2014





Date:		
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:	There are sign of dampness on the exterior walls of building-B. This needs to be remedied.	
Source of Findings:	Visual Assessment: Visual inspection shows dampness on the exterior walls of building-B.	
Suggested Plan of Action:	Have the exterior façade repaired to ensure prevention of dampness.	
Suggested Deadline Date:	16 Sep 2014	
Standard:	Alliance Standard Part 8 Section 8.26 Durability and Maintenance	
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:		
Description:	The performance of the key structural elements are satisfactory for all the buildings.	
Source of Findings:	Visual Assessment: Visual assessment reveals that, the performance of the key structural elements are satisfactory for all the buildings.	
Suggested Plan of Action:		
Suggested Deadline Date:		
Standard:	Alliance Standard Part 8 Section 8.3.3	
Question:	Is the structural system free of settlement cracking, excessive perimeter separations, and unlevel floors attributable to foundation settlements?	
Priority Level:	High	
Non-Compliance Level:		
Description:	The structural systems are free of settlement, cracking, excessive perimeter separation etc. which show no noticeable settlement has occurred.	



Source of Findings:	Visual Assessment: Visual inspection shows that, the structural systems are free of settlement, cracking, excessive perimeter separation etc. which show no noticeable settlement has occurred.
Suggested Plan of Action:	
Suggested Deadline Date:	
Standard:	Reference Alliance Standards Part 8 Structural Design Section 8.2 Structural Integrity of Existing Factory Buildings
Question:	Is the structural system free of deflections (sagging), rotations (twisting), perceivable vibrations, or other noticeable movements of the structure?
Priority Level:	High
Non-Compliance Level:	
Description:	The structural systems are free of deflections (sagging), rotations (twisting), perceivable vibrations, or other noticeable movements of the structures.
Source of Findings:	Visual Assessment: Visual assessment shows that, the structural systems are free of deflections (sagging), rotations (twisting), perceivable vibrations, or other noticeable movements of the structures.
Suggested Plan of Action:	
Suggested Deadline Date:	
Standard:	Reference Alliance Standards Part 8 Structural Design Section 8.2 Structural Integrity of Existing Factory Buildings
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:	Building-1: Crack has been observed at roof of 1st floor. Building-2: There is a crack in slab at 3rd floor roof. This crack shows from top side & bottom side. Building-A: Crack has been observed in column of 3rd floor and beam & slab of 1st 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:	01 Dec 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:	1	
Description:	Building-1 & 2: Minor masonry cracks have been observed at every floor. Building-A: Crack has been found at column of 3rd floor.	
Source of Findings:	Visual Assessment: Visual assessment conducted	
Suggested Plan of Action:	Have a qualified structural engineer provide further testing and analysis of cracking in columns or walls and provide a remediation plan to correct noted issues.	
Suggested Deadline Date:	01 Dec 2014	
Standard:	Alliance Standard Part 8 Section 8.3.3	
Question:	Have any previous repairs to correct structural deficiencies or to reinforce the existing structure been completed?	
Priority Level:		
Non-Compliance Level:		
Description:	No strengthening or retrofitting has been done on the structural members.	
Source of Findings:	Visual Assessment: Visual inspection supported by document review shows that, No strengthening or retrofitting has been done on the structural members.	
Suggested Plan of Action:		
Suggested Deadline Date:		
Standard:		
Question:	Was masonry-chip aggregate concrete (MCAC) used in the construction of the building?	
Priority Level:		
Non-Compliance Level:		
Description:	Building-1, 2 & A: The frame of these buildings are made of MCAC, Building-B: The frame of the building is made of stone chips.	
Source of Findings:	Visual Assessment: Visual inspection shows that, the frames of building-1, 2 & A are made of MCAC and the frame of building-B is made of stone chips.	



Suggested Plan of Action:		
Suggested Deadline Date:		
Standard:	Reference Alliance Standards Part 7 Building Materials Section 7.2 Masonry-chip aggregate concrete (MCAC)	
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:	3	
Description:	The structural members constructed with MCAC have not been investigated by an appropriate program of in-situ testing and representative destructive testing or core samples. The column stress calculated taking into account the strength of concrete for building-01, 02 & A shows overstress at 2045 psi (MCAC). Also, the column stress calculated taking into account the strength of concrete for building-B (fro proposed 10 storied building)shows overstress at 2370 psi (Stone chips).	
Source of Findings:	Visual Assessment: Visual inspection conducted.	
Suggested Plan of Action:	Building 1,2 & A: As part of the detailed assessment outlined elsewhere, conduct destructive core testing to validate the in-situ concrete compressive strength of structural elements.	
Suggested Deadline Date:	19 Aug 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:	The roof of the building-1,building-2 and building-A are of MCAC aggregate and protective sealing is available. But due to lack of maintenance program, these sealing loose effectiveness. Water ponding is noted on roof top of the buildings.	
Source of Findings:	Visual Assessment: Visual inspection conducted.	
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. Or provide 2% slope on the exposed surface to prevent accumulation of water.	



Suggested Deadline Date:	05 Aug 2014	
Standard:	Alliance Standards Part 7 Building Materials Section 7.2 Masonry-chip aggregate concrete (MCAC).	
Question:	Are structural steel members free of corrosion, physical damage or other types of deterioration?	
Priority Level:	Medium	
Non-Compliance Level:	1	
Description:	Building-1: There is no sign of corrosion in the steel members of the structure, Building-2: Corrosion has been noticed in the steel members of the structure, Building-A & B: Steel members were not used in the structure.	
Source of Findings:	Visual Assessment: Visual inspection conducted.	
Suggested Plan of Action:	Complete further testing on areas of deterioration and have a qualified structural engineer develop a remediation plan.	
Suggested Deadline Date:	31 Aug 2014	
Standard:	Alliance Standard Part 8 Section 8.26	
Question:	For post-tensioned reinforced concrete systems or elements, cored holes have not compromised the post-tensioned strands.	
Priority Level:	High	
Non-Compliance Level:		
Description:	Post-tensioned reinforced concrete systems or elements were not used in the construction of the buildings.	
Source of Findings:	Document Review: Document review reveals that, Post-tensioned reinforced concrete systems or elements were not used in the construction of the buildings., Visual Assessment: Visual inspection reveals that, Post-tensioned reinforced concrete systems or elements were not used in the construction of the buildings.	
Suggested Plan of Action:		
Suggested Deadline Date:		
Standard:	Not Applicable	
Question:	Is the structure free from any major/progressive distress?	
Priority Level:	High	
Non-Compliance Level:		



Description:	There are no signs of progressive distress visible in the structures.
Source of Findings:	Visual Assessment: There are no signs of progressive distress visible in the structures.
Suggested Plan of Action:	
Suggested Deadline Date:	
Standard:	Alliance Standards Part 8 Section 8.3.3
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:	Building 01: There is a dying machine at 3rd floor which is not braced and storage racks on 1st floor. Building 02: There is a steam boiler on 3rd floor and a 2000 liters capacity water tanks on the roof of the building which are not braced. Also racks on the first floor require bracing. Building A: Racks at 2nd floor needs bracing and anchorage. Building B: There are some racks of raw materials at ground floor which are not braced.
Source of Findings:	Visual Assessment: Visual inspection conducted.
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:	16 Aug 2014
Standard:	Alliance Standards Part 8 Section 8.18 Seismic Bracing of Key Non-Structural Elements and 2006 BNBC Part 6
Question:	If the building is currently being renovated or expanded, are the Construction Practices and Safety requirements of Section 9 being followed?
Priority Level:	Medium
Non-Compliance Level:	
Description:	No renovation or expansion work is ongoing.
Source of Findings:	Visual Assessment: From visual inspection, no renovation work is ongoing.
Suggested Plan of Action:	
Suggested Deadline Date:	
Standard:	Alliance Standard Part 9 Construction Practices and Safety.





Structural Safety Programs

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:	Load plans have been prepared for each floor but due to unavailability of structural design report, load plans couldn't be accepted.
Source of Findings:	Document Review: Documents reviewed on site.
Suggested Plan of Action:	Provide supporting credible document to establish the load bearing capacity as mentioned in submitted load plans.
Suggested Deadline Date:	05 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:	Floor load plans are not posted.
Source of Findings:	Visual Assessment: Visual inspection conducted.
Suggested Plan of Action:	Provide supporting credible document to establish the load bearing capacity as mentioned in submitted load plans and have the load plans posted in all required location. Floor load plans should be visibly posted on all levels of all buildings.
Suggested Deadline Date:	05 Aug 2014
Standard:	Alliance Standard Part 8 Section 8.20.5.3
Question:	Are floor loads in compliance with posted plans?
Priority Level:	Medium
Non-Compliance Level:	
Description:	There are no load plans posted to comply with the actual maximum operational loading that is allowable for the buildings.
Source of Findings:	
Suggested Plan of Action:	





Suggested Deadline Date:		
Standard:	Alliance Standard Part 8 Section 8.10 Floor Loading Plans (Load Plans).	
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 marking on the floors to designate spaces and height for storage of work materials.	
Source of Findings:	Visual Assessment: Visual inspection shows that, there is no load marking in the factory.	
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:	05 Aug 2014	
Standard:	Alliance Standard Part 8 Section 8.11 Floor Load Markings	
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 existence of any program to control the live load on the floor as per the floor load plan.	
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:	05 Aug 2014	
Standard:	Alliance Standard Part 13 Section 13.7 and Part 8 Section 8.9.	
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: 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:	05 Aug 2014
Standard:	Alliance Standards Part 8 Section 8.9 Factory Load Manager
Question:	For post-tensioned reinforced concrete systems or elements, is a program in place to ensure post-tensioned strands are located before core drilling begins?
Priority Level:	Medium
Non-Compliance Level:	
Description:	No post-tensioned reinforced concrete systems or elements have been used in these structures.
Source of Findings:	Document Review: Document review reveals that no post-tensioned reinforced concrete systems or elements have been used in these structures., Visual Assessment: Visual inspection shows no post-tensioned reinforced concrete systems or elements have been used in these structures.
Suggested Plan of Action:	
Suggested Deadline Date:	
Standard:	Alliance Standard Part 8 Section 8.26 Durability and Maintenance