# INITIAL STRUCTURAL INTEGRITY ASSESSMENT REPORT (SIAR)

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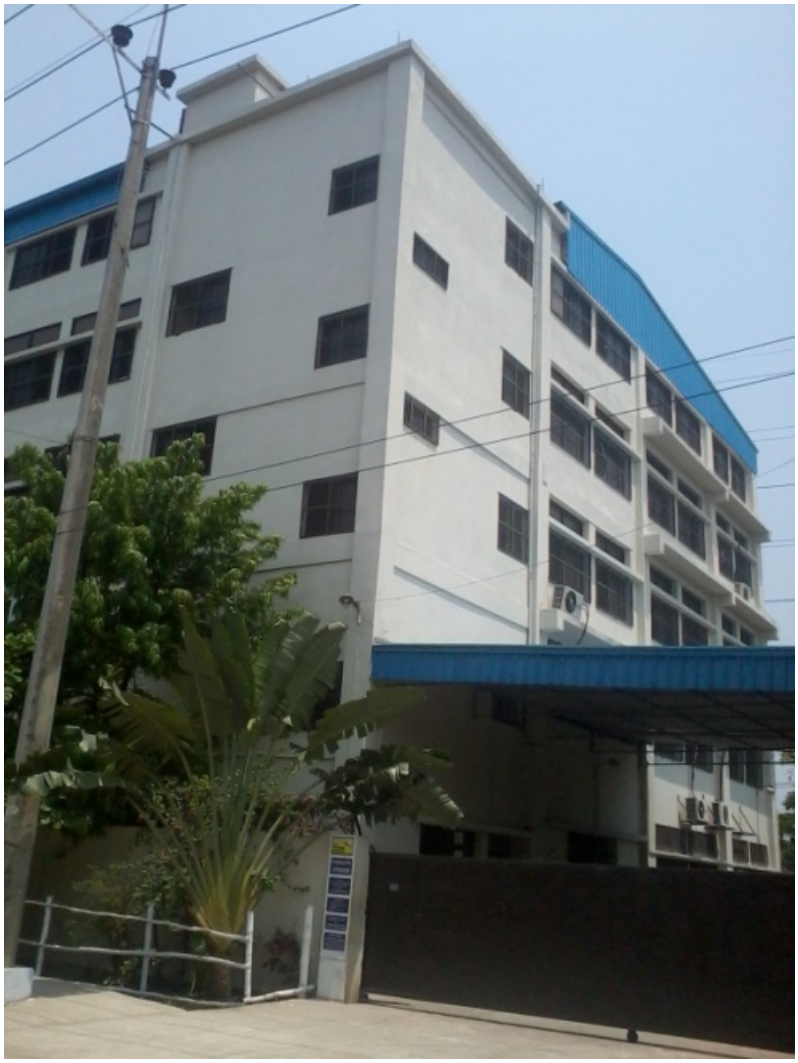
| Factory Name: | **Delmas Apparels (Pvt) Limited** |
| Address: | **Plot No.5,Sector - 2/A CEPZ, Chittagong Chittagong Chittagong Bangladesh** |
| Assessor: | **Sumerra** |
| Date: | **12 Apr 2014** |

## Introduction to the Report

The following report contains a site profile and summary of non-conformities identified during an onsite assessment commissioned by the Alliance for Bangladesh Worker Safety (Alliance) and conducted by a third-party Qualified Assessment Firm (QAF). The assessment was conducted against the Alliance for Bangladesh Worker Safety Assessment Protocols (APs) and Fire Safety and Structural Integrity Standard, which is harmonized with the factory assessment guidelines developed by Bangladesh University of Engineering and Technology (BUET) for the Bangladesh National Tripartite Plan of Action (NTPA). The goal of the Alliance process is to provide clear and practical technical requirements by which Bangladeshi Ready Made Garment (RMG) Factories producing for Alliance members may be consistently and fairly evaluated for fire, structural, and electrical safety in a non-duplicative manner. Each assessment will prompt action plans that will be used by RMG factories to systematically and sustainably improve safety conditions for garment workers. Beyond tracking and reporting on action steps taken in a transparent manner, the Alliance organization and its members will seek to further support factory improvements through technical assistance, training, implementation support for functional Worker Committees, and in some cases financial assistance and wage support for workers if factories are closed for remediation.

The contents of the report do not constitute a guarantee of compliance with the applicable laws, the Alliance Standard or the absolute or continued safety against fire, electrical and/or structural integrity issues that may lead to injury or loss of life. The report is designed to provide a non-exhaustive summary of risk issues, based on a limited sampling and duration of time onsite by the named QAF. Neither the QAF nor the Alliance can certify or guarantee the quality, outcome, or effectiveness of actions taken in response to the report.

For more information and report feedback please go to: www.bangladeshworkersafety.org.



# GENERAL INFORMATION

| General Information | |
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| Factory Name: | Delmas Apparels (Pvt) Limited |
| Address: | Plot No.5,Sector - 2/A CEPZ, Chittagong Chittagong Chittagong Bangladesh |
| Country: | Bangladesh |
| Province: | Chittagong |
| City: | Chittagong |
| Zip Code: | |
| Audit Duration: | 2 Days |
| Re-Audit: | Re-Audit After 0 Months |
| Draft Report Date : | May 30, 2014 |
| Final Report Date : | June 6, 2014 |
| Are all Action Items From Previous Assessment Completed?: | N/A |
| Buildings in Complex : | 1 |
| Number of Building Levels (Stories) : | 4 stories plus pre- fabricated steel structure at rooftop to create 1 additional level. |
| Approximate Building Area (SF) : | 67500 |
| Date of Building Construction : | Building construction began in 2009, first four floors completed in 2010. Last floor (steel shed) added in 2013. |
| Date of Last Building Renovation/Addition : | 1 floor extension was completed in 2013. No vertical extension is present after 5th floor. |
| Is the Building mixed use?: | No |
| Ancillary Structures in Complex : | None |
| Number of Ancillary Levels (Stories) : | N/A |
| Approximate Ancillary | N/A |

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| Structures Area (SF) : | |
| Number of Occupants : | 1100 |
| Exterior Facade Description : | RCC frame structural building with brick masonry in fill. |
| Structural System Description : | Concrete beam & slab system with beam spanning both directions between column. Monolithic RC slab with beams. Foundation & lateral load resisting system are moment resisting concrete frame. Additionally, there is a prefabricated steel frame structure on the fifth floor. |

# ASSESSMENT FINDINGS

| Structural System Design | | |
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| Question: | Are credible structural design documents available for review and kept on site? | |
| Priority Level: | Medium | |
| Non-Compliance Level: | 3 | |
| Description: | Although credible structural drawings are available, a design report is not available to indicate code compliance, loads or other design criteria. | |
| Source of Findings: | Document Review: Documents reviewed on-site. | |
| Suggested Plan of Action: | Have a qualified structural engineer prepare design reports indicating load criteria and load calculations based on the requirements of Part 8 Section 8.19 of the Alliance Standard. | |
| Suggested Deadline Date: | 15 Jul 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: | 3 | |
| Description: | Since a design report is not available, conformance with the 2006 BNBC or other comparable applicable international model building code cannot be ascertained. | |
| Source of Findings: | Document Review: Detailed design report is not available | |
| 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: | 15 Jul 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 | |

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| Non-Compliance Level: | 3 |
| Description: | Since a design report is not available, compliance with the seismic and wind requirements on the BNBC could not be ascertained. |
| Source of Findings: | Document Review: No detailed design report available for review. |
| 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: | 15 Jul 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: | 3 |
| Description: | Since a design report is not available, compliance with wind loading and storm surge loadings as detailed in BNBC Part 6 Section 1.5.3 could not be ascertained. |
| Source of Findings: | Document Review: No detailed design report available |
| Suggested Plan of Action: | Engage a qualified structural engineer to confirm satisfactory structural performance of the buildings under wind loading. 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. |
| Suggested Deadline Date: | 15 Jul 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: | 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: | 3 |
| Description: | The factory authority did not calculate and display live load. A detailed design report was not available to indicate design live loads particularly for finished goods and fabric storage areas in which large floor loads were noted. |

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| Source of Findings: | Document Review: Documents reviewed on-site. | |
| Suggested Plan of Action: | Have a qualified structural engineer confirm that capacity to support the load is available. Load Plans complying with Alliance Standard Part 8 Section 8.20.4.3 should also be developed. | |
| Suggested Deadline Date: | 15 Jul 2014 | |
| Standard: | Alliance Standards Part 8 Section 8.15 Minimum Floor Design Loads | |
| 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: | 1 | |
| Description: | Exposed rebar observed on column in front of main building. This condition indicates a potential planned expansion which is not shown on the available structural documents. A structural steel frame roof structure has been added atop the roof level to create additional occupancy space on the roof. It is uncertain whether the structural impact of this additional occupancy has been considered. | |
| Source of Findings: | Photograph: Photo of exposed rebar. | |
| Suggested Plan of Action: | Have a qualified structural engineer complete an analytical evaluation of the structural impact of the additions. This evaluation should address both any planned expansion in the vicinity of the column in front of the main building that is not shown on the structural documents as well as the structural impact of the additional occupancy created by the steel frame roof structure at the roof level of the main building. Enclose exposed rebar at extra column in front of main building by temporary concrete structure or other appropriate protection (e.g. epoxy coating) immediately to protect from weathering and other degradation. | |
| Suggested Deadline Date: | 15 Jul 2014 | |
| Standard: | Reference Alliance Standards Part 8 Section 8.1 Applicability of Building Code. | |
| Question: | Are Certificates of Occupancy available for review? | |
| Priority Level: | Low | |
| Non-Compliance Level: | 1 | |
| Description: | No Certificate of occupancy available for review. | |
| Source of Findings: | Document Review: Documents reviewed on-site | |
| Suggested Plan of Action: | Provide Certificates of Occupancy for review. | |

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| Suggested Deadline Date: | 15 Jul 2014 |
| Standard: | Alliance Standard Part 8 Section 8.3 Preliminary Structural Assessment |

**Structural System Construction**

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| Question: | Is the structural system free of distress, settlement, shifting, or cracking in columns or walls? |
| Priority Level: | High |
| Non-Compliance Level: | 1 |
| Description: | Cracks were noted at the following locations: -1st floor east wall beside toilet area -2nd floor wall beside the storage area -Outside portion of of east wall -False column at sub station These cracks appeared to be plaster (non-structural) cracks, but the cracking should be investigated further. |
| Source of Findings: | Photograph: Photos of plaster cracks |
| Suggested Plan of Action: | Have a qualified structural engineer provide further testing and analysis of distress, settlement, shifting, or cracking in columns or walls and provide a remediation plan to correct noted issues. |
| Suggested Deadline Date: | 15 Jul 2014 |
| Standard: | Alliance Standard Part 8 Section 8.3.3 |



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| 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: | The water tank at the south side of the roof level is not properly anchored to resist seismic & wind loads. Also there are some rain water drainage spouts (routing water from the roof level to the ground level) that are not properly anchored to the main structure. |
| Source of Findings: | Visual Assessment: Site visit observations. |
| Suggested Plan of Action: | Develop engineered plans to brace all non-structural elements to resist earthquake forces to comply with the BNBC and Alliance Standard. Install anchor and braces as shown on approved plans. |
| Suggested Deadline Date: | 15 Jul 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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| 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: | Efflorescence was noted at the 5th floor, 4th floor beside the toilet area, and the 2nd floor west side wall. | |
| Source of Findings: | Photograph: Photos of water damaged walls | |
| Suggested Plan of Action: | Under guidance from a qualified structural engineer, repair the source of moisture in the toilet areas. Remove damaged plaster and replace. | |
| Suggested Deadline Date: | 15 Jul 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: | 2 | |
| Description: | As noted elsewhere, efflorescence/water staining was noted at the 5th floor, 4th floor beside the toilet area, and the 2nd floor west side wall. It is unclear from the visual assessment if this is due to failure of the facade system or due to internal leaking in mechanical systems or other source. | |
| Source of Findings: | Photograph: Photos of water damaged walls | |
| Suggested Plan of Action: | Under guidance from a qualified structural engineer, identify and repair the source of moisture in the toilet and other areas. | |
| Suggested Deadline Date: | 15 Jul 2014 | |
| Standard: | Alliance Standard Part 8 Section 8.26 Durability and Maintenance | |
| Question: | Was masonry-chip aggregate concrete (MCAC) used in the construction of the building? | |
| Priority Level: | | |
| Non-Compliance Level: | | |
| Description: | | |
| Source of Findings: | | |
| 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. | |

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| Suggested Deadline Date: | | |
| Standard: | Reference Alliance Standards Part 7 Building Materials Section 7.2 Masonry-chip aggregate concrete (MCAC) | |
| **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: | No program in place to ensure that the live loads for which a floor or roof is or has been designed will not be exceeded. | |
| Source of Findings: | Worker Interviews: Management confirms no load program in place. | |
| 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: | 15 Jul 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: | Load Plans have not been prepared for each floor documenting the actual maximum operational loading that is intended and/or allowable on each floor. | |
| Source of Findings: | Visual Assessment: No load plans available for review. | |
| 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: | 15 Jul 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 | |

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| Description: | No floor load plans are posted. |
| Source of Findings: | Visual Assessment: No floor load plans observed. |
| 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 plans should be visibly posted on all levels of the building. |
| Suggested Deadline Date: | 15 Jul 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: | Areas used for storage of work materials and work products, are not clearly marked to indicate the acceptable loading limits. Additionally there are several areas of haphazard storage (no organized racking system). |
| Source of Findings: | Photograph: Photo of unorganized storage areas., Visual Assessment: No load limits observed. |
| 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. Install rack systems in storage areas to ensure organization of loads and as a means of controlling load stacks (make sure to properly design, install, and anchor racking systems). |
| Suggested Deadline Date: | 15 Jul 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: | No designated factory load manager on site. |
| Source of Findings: | Worker Interviews: Management confirms no load manager. |
| Suggested Plan of Action: | Designate a representative as the Factory Load Manager. The Factory Owner shall ensure that at least one individual, the Factory Load Manager who is located onsite full time at the factory, is trained in calculating operational load characteristics of the specific factory. The Factory Load Manager shall serve as an ongoing resource to RMG vendors and be responsible to ensure that the |

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| | factory operational loads do not at any time exceed the factory floor loading limits as described on the Floor Loading Plans. | |
| Suggested Deadline Date: | 15 Jul 2014 | |
| Standard: | Alliance Standards Part 8 Section 8.9 Factory Load Manager | |