BUILDING INTEGRITY | SUMMARY REPORT

SUPPLIER NAME	Cosmopolitan Industries Pvt Ltd
SUPPLIER ADDRESS	Khejur Bagan, Bara Ashulia, Savar, Dhaka, Bangladesh
AUDIT DATE	January 2014
AUDIT PERFORMED BY	Department of Civil Engineering, Bureau of Research, Testing and Consultation, Bangladesh University of Engineering and Technology (BUET)
AUDIT TEAM	2 auditors 1 engineer

GRAVITY LOADING EVALUATION

GREEN	The building is fully safe.

SEISMIC PERFORMANCE RATING

POOR	Possible significant structural and nonstructural damage and/or result in falling hazards in a major seismic disturbance, representing appreciable life hazards.

BRIEF DESCRIPTION OF METHODOLOGY

Visual inspection and ASCE 31-03 Tier-1 Analysis

DETAILED CONTENT

VISUAL INSPECTION AND CONCLUDING REMARKS

- The building may be rated as "GREEN" based on simple check of factor of safety of different types of column for gravity load only.
- lt is strongly recommended to restrict storage of any kind of goods in the cantilevered Peripheral slabs.
- The few cracks observed in the wall are not supposed to impair the safety of the building, however they should be repaired as soon as possible. The building owner/users should be vigilant about the development of any new distress (dampness, cracks, spalling) particularly in main structural elements (column, beam, slab). lf any crack appears, propagates and widens in primary structural elements, review of design may then be needed.
- Height of stored goods should be such that the applied maximum pressure does not exceed 100 psf in the loaded area and the average floor live load does not exceed 50 (fifty) psf.
- The existence of very heavy cooling tower units and water storage tanks on roof top, and existence of very heavy chiller units in 4th floor cause large mass irregularities. In addition there is major stiffness irregularity in the 4th floor due to presence of RCC roof, elevated RCC roof (above chiller locations), tin-shed roof and open space. There is a mezzanine floor in part of ground floor, The soft story effect in part of the building due to large height of ground floor need also to be investigated. The effects of all these mass and stiffness irregularities need to be checked for seismic safety by detail dynamic analysis.
- **The use of the building in its present condition may continue with due regards to the observations made above.**

SEISMIC PERFORMANCE EVALUATION

I. BASIC STRUCTURAL CHECKLIST NON-COMPLIANCES

Criteria	Description of Conditions	Comments	Unit
Configuration			
Soft Story	The stiffness of the lateral-force resisting system in any story shall not be less than 70 percent of the lateral-force-resisting system stiffness in an adjacent story above or below, or less than 80 percent of the average lateral-force	Ground floor (without mezzanine floor) is found as soft story based on measured story height and given column dimensions.	

	resisting system stiffness of the three stories above or below for Life Safety and Immediate Occupancy.		
Unreinforced Masonry Shear Walls			
Shear Stress Check	The shear stress in the unreinforced masonry shear walls, calculated using the Quick Check procedure of Section 3.5.3.3, shall be less than 30 psi for clay units and 70 psi for concrete units for Life Safety and Immediate Occupancy.	Some unreinforced masonry shear walls at ground and 1st floor do not satisfy the mentioned requirement. However, it is to be noted that the columns alone are compliant in shear stress check.	

II. GEOLOGICAL SITE HAZARDS AND FOUNDATIONS CHECKLIST NON-COMPLIANCES

Criteria	Description of Conditions	Comments	Unit

III. BASIC NON-STRUCTURAL COMPONENT CHECKLIST NON-COMPLIANCES

Criteria	Description of Conditions	Comments	Unit
Mechanical and Electrical Equipment			
Attached Equipment	Equipment weighing over 20 lb that is attached to ceilings, walls; or other supports 4 feet above the floor level shall be braced.	External AC units may not be adequately braced.	

DETAILED DESCRIPTION OF METHODOLOGY

1. The following criteria are used for the building integrity inspection:

   A. Permit review and verification.

   B. Visual assessment.

   C. Detailed assessment following ASCE-31 standards.
      i. Level of Investigation
      ii. Level of Performance
      Evaluation to Life Safety Performance Level (L.S.)
      iii. Level of Seismicity
      According to BNBC (1993) and based on geotechnical investigation report
      1. Zone coefficient
      2. Site Class (as per BNBC 1993)
      Design short period response acceleration S_{DS}
      Design spectral response acceleration at 1 sec. SD_1
      iv. Building Type
      v. Screening Phase (Tier 1)
      vi. Basic Structural Checklist

vii. Geological Site Hazards and Foundation Checklist
viii. Basic Non-structural Component Checklist

2. Gravity Loading Evaluation Definitions

GREEN	Factor of Safety (FS) of Column Strength is greater than 1.86 - the building is fully safe
YELLOW	Factor of Safety (FS) of Column Strength is between 1.5 and 1.86 - the building is marginally safe
AMBER	Factor of Safety (FS) of Column Strength is between 1.25 and 1.5 - the building's safety is not fully ensured
RED	Factor of Safety (FS) of Column Strength is less than 1.25 - the building is unsafe

3. Seismic Performance Ratings
(http://www.berkeley.edu/administration/facilities/safer/findings.html#rating)

GOOD	Buildings and other structures whose performance during a major seismic disturbance is anticipated to result in structural and nonstructural damage and/or falling hazards that would not significantly jeopardize life. Buildings and other structures with a GOOD rating would represent an acceptable level of earthquake safety, such that funds need not be spent to improve their seismic resistance to gain greater life safety.
FAIR	Buildings and other structures whose performance during a major seismic disturbance is anticipated to result in structural and nonstructural damage and/or falling hazards that would represent low life hazards. Buildings and other structures with a FAIR seismic rating would be given a low priority for expenditures to improve their seismic resistance and/or to reduce falling hazards so that the building could be reclassified GOOD.
POOR	Buildings and other structures expected to sustain significant structural and nonstructural damage and/or result in falling hazards in a major seismic disturbance, representing appreciable life hazards. Such buildings or structures either would be given a high priority for expenditures to improve their seismic resistance and/or to reduce falling hazards so that the building could be reclassified GOOD, or would be considered for other abatement programs, such as reduction of occupancy.
VERY POOR	Buildings and other structures whose performance during a major seismic disturbance is anticipated to result in extensive structural and nonstructural damage, potential structural collapse, and/or falling hazards that would represent high life hazards. Such buildings or structures either would be given the highest priority for expenditures to improve their seismic resistance and/or to reduce falling hazards so that the building could be reclassified GOOD, or would be considered for other abatement programs, such as reduction of occupancy.