# Environmental Health and Safety (EM&S) in Facility Design 01.81.16

## Description:

The purpose of the section is to highlight how design professionals can address potentially hazardous conditions related to the environment and safety to students, staff and general public engaged at the UMCP campus.

## Related Sections:

- TBD

## Effective Date:

- December 2, 2012

## Applicable Standards:

- **EH&S CODES, REGULATION, AND STANDARDS:**
  Consistent with the Governor's Executive Order 01.01.1996.03 - Regulatory Standards and Accountability, the design shall comply with the latest approved edition of applicable Federal, State, and local codes, regulations, and standards involving Environmental Health and Safety (EH&S) in the delivery of University facilities.
- **ICC International Mechanical Code** (IMC) 401.9
- **Regulatory Requirements:** Compliance with the following regulatory standards is mandated by Federal or State law.
  - **Federal Department of Labor (DOL)/Occupational Safety and Health Administration (OSHA) Regulations.**
    - Occupational Safety and Health Act of 1970
    - Title 29 CFR Part 1910 General Industry Standards
    - Title 29 CFR Part 1926 Construction Industry Standards
  - **Maryland Department Of Health And Mental Hygiene (DHMH/Division Of Labor And Industry (DOLI)/Maryland Occupational Safety And Health (MOSH) Regulations.**
    - Annotated Code of Maryland, Title 5 Occupational Safety and Health
    - Code of Maryland Regulations, COMAR Title 09, Subtitle 12
      - COMAR 09.12.20 - .24 Maryland OSH Act, General
      - COMAR 09.12.31 MOSH Incorporation by Reference of Federal Standards
      - COMAR 09.12.33 Access to Information About Hazardous and Toxic Substances
      - COMAR 09.12.35 Confined Spaces
      - COMAR 09.12.36 Field Sanitation
      - COMAR 09.12.38 GIS for Personnel Platforms Suspended from Cranes, Derricks, and Hoists
  - **Federal Environmental Protection Agency (EPA)**
    - Title 40 CFR Part 61, Subpart M - Asbestos NESHAPs
    - Title 40 CFR Parts 260 through 265 and 268 - Resource Conservation and Recovery Act (RCRA)
      - Part 260 Hazardous Waste Mgmt Systems: General
      - Part 261 Identification and Listing of Hazardous Waste
      - Part 262 Generators of Hazardous Waste
      - Part 263 - Transportation of Hazardous Waste
      - Part 264 - Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
      - Part 265 - Interim Storage Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
      - Part 268 - Land Disposal Restrictions
    - Title 40 CFR Part 112 - Oil Pollution Prevention
  - **Maryland Department Of The Environment (MDE)**
    - Code of Maryland Regulations, COMAR Title 26
      - COMAR 26.02.07 Procedures for Abating Lead Containing Substances form Buildings
      - COMAR 26.10.02 -.11 Oil Pollution and Tank Management

        - COMAR Title 26, Subtitle 11 - Toxic Air Pollutants
        - COMAR 26.11.02 Air Quality Permits, Approvals, and Registration
        - COMAR 26.11.06 General Emissions Standards, Prohibitions, and Restrictions.
        - COMAR 26.11.21 Control of Asbestos
    - COMAR 26, Subtitle 13 Hazardous Waste Regulations
    - COMAR 26.16.01 Accreditation and Training for Lead Paint Abatement Services
- **Federal Department Of Transportation (DOT)**
    - Hazardous Substances Title 49 CFR Parts 171 - 177

- **Mandatory Codes**
    - Governor's Executive Order 01.01.1992.11 - Building Performance standards for State Buildings, mandates adherence to the following codes in University facilities;
        - International Building Code (IBC)(Latest Edition)
        - ICC International Mechanical Code (Latest Edition)
        - WSSC Plumbing Code (Latest Edition), in College Park
        - Local/State/ICC Plumbing Code (Latest Edition), for other campuses
        - NFPA Codes and Standards (Latest Adopted Edition)

- **Contractual Provisions For Reliable EH&S Design**
  The following industry standards of care shall be incorporated into programmatic or design documents where such standards have application to the work.
    - Environmental Site Assessment
        - ASTM E 1527-93-Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process
    - General Building Ventilation
        - ASHRAE 62-1989-Ventilation for Acceptable Indoor Air Quality
        - ASHRAE 55-1981-Thermal Environmental Conditions for Human Occupancy
        - ASHRAE Handbooks
            - HVAC Applications (Latest Editions)
            - Refrigeration
                - Fundamentals
                - Systems and Fundamentals Equipment
    - Specialized Ventilation
        - ACGIH Handbook-Industrial Ventilation: A Manual of Recommended Practice, 22nd Edition
        - ANSI/AIHA Z9.3-1994-Standard for Spray Finishing Operations
    - General Laboratory Ventilation
        - ANSI/AIHA Z9.5 - American National Standard for Laboratory Ventilation (1993)
    - Spray Finishing Booths/Rooms
        - ANSI/AIHA Z9.3-1994 - Standard for Spray Finishing Operations
    - Eyewash/Safety Shower Stations
        - ANSI Z358.1-1998- American National Standard for Emergency Showers and Eyewash Stations
    - Laboratory Design For Biosafety
        - Biosafety Labs-DC/NIH 3rd Edition Biosafety in Microbiological and Biomedical Laboratories (Current Edition)
        - NIH Guidelines-Guidelines for Research Involving Recombinant DNA Molecules (Current Edition)
            - Primary Containment for Biohazards: Selection, Installation, Use of Biological Safety Cabinets (Current Edition)
    - BL3 Commissioning - USDA, Agricultural Research Service (ARS), Construction Project Design Standard, ARS Manual 242.1 (8/91)

- **Guidance Documents**
  Following are some select guidance documents related to noteworthy EH&S issues in facilities development.
    - Occupational Safety and Health Administration
        - Stairways and Ladders, OSHA Document 3124 (93)
        - Lead in Construction, OSHA Document 3142 (93)
        - Fall Protection in Construction, OSHA 3146 (95)
    - Environmental Protection Agency
        - Office Equipment - Design, Indoor Air Emissions, and Pollution Prevention Opportunities
        - Proposed Model Standards and Techniques for control of radon in New Buildings (FR4/12/93, Vol 58, #68)
        - Building air Quality: A Guide for Building Owners and Facility Managers (12/91)
        - Standardized EPA Protocol for Characterizing Indoor Air Quality in Large Office Buildings (6/94)
    - Maryland Occupational Safety and Health (MOSH)
        - MOSH Guides for Evaluating Indoor Air Quality (7/89)
    - Maryland Department of the Environment
        - Renovating Old Paint Safely: 8 Keys to Maryland's Lead Abatement Regulations
        - Lead Paint Hazard Fact Sheets 1-7 (6/92), 8 (1/94)
        - MDE Approved Encapsulation Products
    - National Institute of Building Sciences
        - Model Guide Specs for Asbestos Abatement
        - Model Guide Specs for Lead Paint Risk Reduction
    - American Conference of Governmental Industrial Hygienists
        - Threshold Limit Values (TLVs) for Chemical Substances and Physical Agents and Biological Exposure Indices (BEIs), Latest Edition
        - Guidelines for the Assessment of Bioaerosols in the Indoor Environment (1990)
    - American Industrial Hygiene Association
        - Industrial Hygiene Audit: manual for Practice (94)
    - American Society for Testing and Materials
        - Provisional Standard for Environmental Regulatory Compliance Audits, PS 11
        - Provisional Standard for the Study and Evaluation of an Organization's Environmental Management Systems, PS 12
        - Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites, E 1739
    - National Safety Council
        - Ergonomics: A Practical Guide, 2nd Edition (1993)
    - National Air Duct Cleaners Association (NADCA)
        - Mechanical Cleaning of Non-porous Air Conveyance System Components, Standard 1992-01

## General Requirements:

This section sets forth governmental regulations and fundamental building codes which are included and incorporated herein by reference and made a part of the University's "Design Criteria/Facilities Standards (DCFS) Manual." Requirements include;

- Adherence during design to conditions set forth in applicable codes, regulations, and standards.
- Securing notices, permits, licenses, inspections, releases, and similar documentation, as well as payments, statements, and similar requirements associated with compliance with codes, regulations, and standards in the design of campus facilities.
- Discernment of EH&S standards of care and best management practices, outlined herein which will assist in considering areas of EH&S compliance. Provisions shall be included in programmatic and design documents to address regulatory issues with reference to applicable standards as well as the "General Duty Clause" of the Occupational Safety and Health Act of 1970. Further, designs shall envision EH&S provisions which avoid contractual or tort liabilities (e.g., professional error or omission).

1. **Codes and Regulations:**
   Except to the extent that more explicit or definitive requirements are written directly into the DCFS Manual, all applicable codes, regulations, and standards have the same force and effect (and are made a part of the Manual by reference) as if copied directly into the DCFS Manual, or as if published copies are bound herewith.

2. **Best Management Practice In EH&S**
   During project development, the Project Team shall identify potential sources of pollution or other damage to the environment that may occur during facilities construction. When a potential source of environmental degradation is identified, suitable provisions shall be included in technical specifications to eliminate or minimize damage. Additionally, the following environmental policies affecting facilities development must be adhered to;

   - **Institutional Standards Of Care In EH&S**
     The following risk management programs at UMCP shall be consulted in relation to applicable EH&S design and construction issues. Many of these documents are available for review at the University's Department of Environmental Safety (DES) Website: http://www.des.umd.edu/

     - **Department Of Environmental Safety (DES)**
       - Asbestos Management Plan
       - Chemical Hygiene Plan
       - Confined space Entry Plan
       - Hazardous Waste Management Manual
       - Laboratory Safety Guide
       - Lead-Based Paint Management Plan
       - Lockout/Tag-out Program

     - **Facilities Management - Safety Analysis Unit**
       - Specifications for Industrial Hygiene Services
       - Hazardous Waste Management Requirements on construction

   - **Prohibited Building Materials**
     The use of the following materials is prohibited on all University Projects;
     - Products containing asbestos
     - Interior products containing urea/formaldehyde
     - Products containing polychlorinated biphenols (PCBs)
     - Solder or flux containing greater than two-tenths of one percent (0.2%) lead and domestic pipe or fittings containing greater than eight percent (8%) lead
     - Paint containing greater than six-one hundredths of one percent (0.06%) Lead by weight
     - Ductwork - Due to concerns for Indoor Environmental quality, the application of fibrous absorptive materials (e.g., ductliners) to ductwork interiors is strongly discouraged as a means to control noise. Duct liners shall be limited to the minimum application required to achieve programmatic noise criteria and shall be surface cleanable. Alternative technologies are preferred over the use of fibrous absorptive materials in the airstream of ductwork. Serviceable sound attenuation devices are preferred over the wholesale use of interior ductliners.

   - **Control Of Airborne Health Hazards**
     Construction operations which may result in the diffusion of dust and other particulates, toxic gases or other harmful substances in quantities hazardous to health shall be safeguarded by means of temporary local exhaust ventilation or other protective measures to ensure the safety of the public. Where applicable, physically isolate adjacent occupied areas with temporary partitions, mechanical system isolation, or other practical engineering controls.

Prior to building commissioning, indoor air shall be purged with outdoor air. Exhaust airborne particulates and wet pollutant emitters to the building exterior in a manner which precludes those health effects commonly associated with exposure to construction-related pollutants. Air purging shall be phased prior to furniture installations to avoid absorption of airborne pollutants and formation of a sink for remission of construction-related pollutants.

- **Lead-Based Paint During Building Alterations**
  Pre-1980 buildings scheduled for alterations which impact painted surfaces shall be surveyed for lead content consistent with regulatory requirements and the University's specifications for Industrial Hygiene services. In facilities used as residential facilities or child care centers, lead-based paint must be abated to the satisfaction of Maryland Department of the Environment (MDE). Approved encapsulation products allowed for use in the abatement of lead-painted surfaces are available from MDE.

- **Asbestos In Existing Buildings**
  Pre-1985 buildings scheduled for alterations which impact building materials shall be surveyed and assessed for asbestos conditions consistent with regulatory requirements and the University's specifications for Industrial Hygiene services. Where damage or disturbance is anticipated during construction, appropriate corrective action must be designed into the project. Where feasible, designs which avoid or minimize disturbance through in-place management techniques are preferred over wholesale removal.

  EPA-accredited Asbestos Project Designers shall use National Institute of Building Sciences (NIBS) Model Guide Specifications for Asbestos Abatement and Management in Buildings (Latest Edition) as the baseline minimum design performance standard. Project Designer minimum qualifications shall include;
  - $1,000,000 Professional Errors and Omissions (E&O) Insurance
  - Three (3) Years of Experience Designing Asbestos Abatement Projects
  - Four (4) year degree in industrial hygiene, engineering, or physical / natural science

  Project Designers shall consult with University representatives regarding campus specific criteria including (but not limited to) the following issue areas;
  - Preferred Means and Methods of Abatement
  - Preferred Means and Methods of Project Monitoring
  - Processing Submittals and Record keeping
  - Back Charges, Percent Payments, and Withholding Provisions
  - Specific Institutional Notifications
  - Work Initiation Conference Issues
  - Pollution Liability Insurance
  - Professional Errors and Omissions Insurance
  - Qualifications of Abatement Contractor
  - Qualifications of Subcontract Consultants and Laboratories
  - Training and Qualifications of Staff
  - Hazardous Waste Management requirements
  - Notifications of Completion (OSHA and MDE mandates)

  When approved during A/E negotiations, asbestos conditions may be managed through coordination of other trades under separate contract (e.g., On-Call Abatement Service Contact). Notwithstanding, all necessary coordination notes shall remain the responsibility of the A/E.

- **Radon Mitigation**
  - New Construction: Where the potential for radon release is identified through geotechnical studies, measures consistent with the ICC International Mechanical Code (IMC) 401.9 shall be proposed to mitigate indoor radon concentrations below levels which create a health hazard.
  - Alterations: Existing buildings scheduled for slab or structural wall alterations shall be measured for radon levels, where directed by University representatives. The University will provide previous radon readings where available. Radon levels exceeding those which require mitigation shall be managed consistent with IMC.