

**Description:**

The purpose of this document is to highlight to design and construction professionals the UMD potentially hazardous conditions and associated disciplines related to a safe environment and for student, staff and the general public at the UMD campus.

**Related Sections:**

- 01 41 13 Code References

**Effective Date:**

January 1, 2023

**Applicable Standards:**

- TBD

**General Requirements:****General Design 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 (DCFS) Manual." Those 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 Environmental Health and Safety (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).

**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.

Construction and/or renovation projects on UMD's Campus require approval from the Authority Having Jurisdiction (AHJ) prior to the general public being allowed to occupy the space or utilize equipment. All construction plans shall be submitted to the Office of the Fire Marshal for review and comment. Depending on the type and scope of the construction/renovation project, ESSR unit(s) will review construction documents for approval, and provide comments to ensure compliance with enforced codes and University policies. Project details that ESSR units will review include those discussed below.

**Department of Environmental Safety, Sustainability & Risk (ESSR) Authority**

In accordance with University of Maryland (UMD) Policy Number: VI-21.00(A), the Department of ESSR is responsible for the administration of the campus policies and is accountable for the University's compliance with all environmental, safety and health regulations. It carries out this mission by providing technical, regulatory and related management services to the colleges/schools and departments who have a shared responsibility for operational accountability for regulatory compliance. The Department of ESSR is responsible for all official University contact with external governmental regulatory agencies concerned with workplace health, safety and environmental compliance. In consultation with University legal counsel and, as required, representation by the Office of the Attorney General, ESSR shall coordinate all University responses to regulatory agencies' inquiries, complaints, lawsuits and other formal proceedings.

## **Office of the Fire Marshal**

The Office of the Fire Marshal (OFM) is the AHJ and is responsible for managing the University's compliance with the State Fire Prevention Code, the Maryland Building Performance Standards and other applicable fire safety laws and standards. The OFM conducts plan reviews and inspections for new and existing buildings and, upon determining that the buildings meet local zone and safety requirements, issues the Certificate of Occupancy which states that the operations may be conducted therein. OFM coordinates and works in conjunction with other ESSR units that provide plan review and inspections. When an existing space changes use or the researcher plans to change the laboratory chemicals (gas or liquid) quantities, OFM shall complete a review to determine if the renovation modifications follow current codes. As a research University, construction and renovation documents will have unique characteristics that will need review beyond NFPA 1, NFPA 101, and International Building Code (IBC). All campus-related projects are subject to (but not limited to) compliance with the following:

- NFPA 30 - Flammable and Combustible Liquids
- NFPA 45 - Standard on Fire Protection for Laboratories Using Chemicals
- NFPA 55 - Compressed Gases and Cryogenic Fluids
- NFPA 58 - Liquefied Petroleum Gas Code
- NEC 70 - National Electrical Code
- NFPA 70E - Standard for Electrical Safety in the Workplace
- NFPA 652 - Standard on the Fundamentals of Combustible Dust
- Additional requirements set forth by ESSR depending on project details, location/contracts, or specific types of laboratory equipment (ex: Fume Hoods, Biosafety Cabinets, Autoclaves, X-Ray machines, etc.)

## **Office of Environmental Affairs**

The Office of Environmental Affairs (OEA) is responsible for ensuring compliance with the University's various environmental permits, including air, stormwater, oil, and waste. The OEA is also responsible for the management of regulated wastes including hazardous waste, biohazardous waste, radioactive waste, and universal waste. The OEA assists with any site investigation or remediation efforts required, as well as facilitates property acquisition/divestment transactions. Construction and renovation projects shall follow:

### **Air Emissions**

- Environmental Protection Agency (EPA) certified stationary engines are to be used on campus (applies to gas and diesel fired engines).
- Generators >499 brake horsepower (BHP) require an air permit before construction can begin; the OEA will obtain the permit.
- Boilers, furnaces, water heaters, ovens, and other fuel burning equipment >0.99 Metric Million British Thermal Unit (MMBtu) require an air permit before construction can begin; the OEA will obtain the permit.
- Char broilers with a cooking surface >4.99 square feet (SF) require an air permit before construction can begin; the OEA will obtain the permit.

### **Oil Operations/SPCC**

- Underground storage tanks (USTs) are not to be installed.
- Aboveground storage tanks (ASTs) and associated piping will meet the requirements of COMAR 26.10, as well as American Petroleum Institute (API), Steel Tank Institute (STI), and National Fire Protection Association (NFPA) standards, as appropriate.
- All tanks must be labeled with contents, volume, appropriate NFPA label, and tank ID # (obtained from OEA).
- The OEA must be notified when any tank, container, or drum of oil with a volume of >50 gallons is brought onto the campus. Oil includes petroleum fuel, petroleum lubricants, used oil, general cooling oils, and food grade oils).

### **Stormwater**

- New non-stormwater discharges cannot be added to the stormwater system without consulting OEA (includes floor drains in mechanical rooms, cooling towers, steam condensate, or other potential discharges of liquid other than rainwater) relates to NPDES permit, as well as Illicit Discharge Program under the MS4 permit.

- Vehicle / equipment washing is strictly prohibited.
- Certain activities (fueling, maintenance, outside materials storage) may require coverage under the 12-SW stormwater permit; consult OEA to determine applicability.
- The University has certain outfalls that are governed by extremely prescriptive discharge limits; the OEA should be consulted prior to any discharge to determine if the discharge will be to one of these outfalls or if the discharge can be directed to another nearby outfall. Failure to comply with discharge requirements will be the responsibility of the contractor to pay fines or restore the area, as required by the regulating agency.

## **Occupational Safety and Health**

The Office of Occupational Safety & Health (OSH) ensures safe and healthful working conditions for the university's employees, students, contractors, and visitors by ensuring compliance with Occupational Safety and Health regulations and standards. All renovation and construction projects are subject to review by OSH subject matter experts.

All construction and renovation designs must comply with OSHA 29 CFR 1910 regulations (e.g., electrical safety, fall protection, machine guarding, etc.).

Abatement activities must be coordinated through Facilities Management.

Construction activities must comply with 29 CFR 1926 regulatory requirements. Oversight of site safety of contracted workers is the responsibility of the contractor.

Response to construction-related noise, poor air quality, and any other impact on the public or adjacent spaces must be managed by the Facilities Management project manager.

## **Research Safety**

The Office of Research Safety (ORS) is responsible for ensuring new spaces and laboratories are compliant with federal, state, and local regulations as well as accepted best practices for safe research operations. All laboratory or research support area renovation and construction projects are reviewed by ORS subject matter experts in chemical safety, industrial hygiene, physical safety, biosafety, and/or radiation safety.

### **General**

- Designs for new construction and renovations of laboratories that will contain hazardous materials are expected to conform to all elements of NFPA 45 and other related fire and building codes.
- In all spaces that contain hazardous materials or laboratory animals, materials used for furniture, casework, paints/sealants, and flooring must be smooth and non-porous so that decontamination can be achieved.
- Laboratories that contain hazardous materials or laboratory animals shall have facilities for handwashing within the space footprint.
- Specialized equipment must be installed to manufacturer requirements and recommendations (e.g., adequate floor load ratings, vibration sensitivity or dampening needs, ventilation, shielding, heat load management, etc.). Location of specialized equipment must not impede facility operations and maintenance activities.
- Primary office space and areas designed to allow for the consumption of food and drink shall be separated from spaces that contain hazardous materials or laboratory animals by full walls and a door.

### **Laboratory Ventilation**

Laboratory ventilation should follow requirements outlined in the current edition of ANSI/AIHA Z9.5.

Fume hood installations shall include as-installed ASHRAE-110 testing conducted by a third-party vendor as a part of the project after final balancing. Results of these tests should be sent to labhood-bsc@umd.edu.

Emergency Equipment:

- Both an emergency eyewash and safety shower shall be installed to the specifications of the current version of ANSI Z358.1 in all spaces that will contain any hazardous chemicals or infectious agents.
- Emergency eyewashes not located at a sink should be plumbed to a drain, if possible. If it is not, sufficient clearance for a catch bucket should be included so that routine testing can be performed without flooding.

## Specific Hazards

- Laboratories that have planned use of biological materials should comply with design specifications in the current edition of the Biosafety in Microbiological & Biomedical Laboratories and the NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules (NIH Guidelines), as applicable.
- Laboratories that have planned use of Biological Select Agents and Toxins as defined per the Federal Select Agent Program shall comply with the requirements in 7 C.F.R. Part 331: Agriculture, 9 C.F.R. Part 121: Animals and Animal Products, or 42 C.F.R. Part 73: Public Health, as appropriate.
- Animal facility design shall be coordinated with the Attending Veterinarian and the Institutional Animal Care and Use Committee Office.
- Designs related to laser laboratories shall comply with ANSI Z136 requirements.
- Plans for design for research areas that will contain radioactive materials or radiation producing devices shall coordinate with the ESSR Radiation Safety Office to ensure compliance with university licenses and applicable regulations.

## Risk Management

The Office of Risk Management (ORM) provides risk management expertise, resources, and a variety of insurance solutions to positively impact the university's financial, physical and reputational well-being. The ORM engages in collaboration and consultation to identify strategies to capitalize on opportunities to support the university's mission. The Office of Risk Management is responsible for ensuring that the University is protected from claims and costs related to project or building. Risk Management is responsible for adding the value of new buildings or substantial renovations to the UMD Master Property schedule for Property Insurance coverage through the Maryland State Treasurer's Office.

- Project and contract details should be sent to the Office of Risk Management to be reviewed. Risk Management will work with Procurement to ensure adequate types and limits of insurance are addressed.
- Risk Management should be notified as soon as a "substantial completion" date has been determined and will coordinate visits with the project managers and insurance inspectors.

## Sustainability

The University of Maryland is committed to advance sustainability through the ways we impact the world: teaching, research, service, and operations. The Office of Sustainability (OS) is responsible for ensuring that future projects and buildings are in line with the University long term sustainability goals.

- If the project contains sustainability measures, the OS should be consulted for proper transition once the project is complete.
- UMD is committed to carbon neutrality by 2025. All new buildings and major renovations must meet the campus carbon neutrality goal by mitigating energy consumption and greenhouse gas (GHG) emissions. Remaining GHG's must be offset annually.
- Projects must be designed to meet Maryland Green Building Standards.

## General Best Management Practices for 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
- Equipment containing or using hydrofluorocarbon (HFCs) products as refrigerants or propellants per COMAR 26.11.33 regulation.
- Materials that do not comply with the volatile organic compounds (VOC) content limitations per COMAR 26.11.32.
- VOC degreasing material that exceeds a vapor pressure of 1 mm Hg at 20 ° C per COMAR 26.11.19.09.

- Certain asphalt products per COMAR 26.11.11.02.
- Sealants, paints, and adhesives that do not comply with the VOC content limitations per COMAR 26.11.35.
- Paint containing greater than six-one hundredths of one percent (0.06%) Lead by weight
- Duct work - Due to concerns for Indoor Environmental Quality, the application of fibrous absorptive materials (e.g., duct liners) to duct work 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 duct work. Serviceable sound attenuation devices are preferred over the wholesale use of interior duct liners.

## **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;

- Sufficient Insurance in accordance with UMD Procurement specifications.
- 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
- Insurance in accordance with UMD Procurement specifications
- 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 contracts (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.
- Renovations: Existing buildings scheduled for slab or structural wall
- Renovate areas shall be measured for radon levels, as 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.