

2.2 Environmental Health and Safety

2.2.1 Siting/Zoning

General Guidelines

UNC Pembroke seeks to maintain a campus whereby the safety and well-being of faculty, staff, students, and visitors is assured. Thus, it may be necessary to segregate certain operations from high population density areas on campus. These operations would include, but not be limited to, hazardous material utilization or storage, and noisy, vibratory, or malodorous activities. The primary goal that should be used in siting such activities is that the smallest possible population would be adversely affected on a day to day basis by either the operation, or an emergency related to it such as fire, gas leak, or explosion.

Siting and zoning issue analysis must include easy egress for affected personnel and easy site access for emergency response. In all instances, it is necessary to ensure perimeter access (which may include road access) to buildings for fire and other emergency vehicles. Site evaluations may also include local micro meteorological evaluations to assure that adjacent building air intakes or adjacent ground-level areas would not be affected to chemicals, gasses, odors, noise, or vibration.

Siting of a facility must be a joint effort coordinated in accordance with the University Master Plan, the project manager, and other agencies such as emergency responders, as necessary.

2.2.2 Environmental Assessment

General Guidelines

Intent

The University's intent is that proper environmental assessment be performed at the life of the project. The designer will prepare the appropriate environmental assessment and/or environmental impact documentation according to the University of North Carolina System North Carolina Environmental Policy Act implementation procedure.

Resources

The current program is described in the UNC Administrative Memorandum No. 249. Also, the UNC System Design and Construction Guidelines, available via internet.

Documentation

All environmental documentation will be coordinated through the UNCP Department of Facilities Planning and Construction for review by on campus departments and the State Clearinghouse.

2.2.3 Regulatory Requirements and Permitting

General Guidelines

Intent

The project manager, in conjunction with the designer, will perform a complete environmental regulatory applicability analysis for the project. All permit application and other material to be submitted to any environmental regulatory agency will be coordinated through the project manager.

2.2.4 OSHA Compliance

General Guidelines

Intent

It is the intent of the University that all projects be designed in such manner that they can be constructed and built in accordance with OSHA. The designer must also require that all contractors and subcontractors meet all requirements specified in 29CFR1910 and 1926, and the Association of General Contractors Accident Prevention Manual.

Resources

Designers are referred to OSHA standards 1910 and 1926, Association of General Contractors Accident Prevention Manual, and to the UNCP Safety Officer. Each project will have a designated safety manager for each prime contractor.

Documentation

The designer must require contractors to designate, in writing, a safety manager for each project.

Design Criteria

Designers must take into consideration the following in their specifications:

It is the contractor's responsibility to:

1. Provide a safe and healthful workplace free from recognized hazards to minimize the likelihood of accident or injury to all personnel.
2. Comply with OSHA standards cited above and any other applicable environmental health and safety regulations.
3. Comply with the requirements of the AGC Accident Prevention Manual.
4. Provide adequate work-area protection to protect the safety and well being of faculty, staff, students, and visitors.
5. Maintain an accurate list of chemicals used during construction and provide the University project manager with MSDS sheets on a timely basis.
6. Establish and maintain effective safety and health program involving all levels of the contracting organization. A person designated as being responsible for safety must be present on site at all times work is in progress.
7. Assure that a "competent person" as defined by OSHA is present during all projects that involve trenching, the use of scaffolding, or work in confined spaces.
8. Assure that applicable training is provided for other especially hazardous operations such as confined space entry.
9. To provide information on items 5, 6, and 7 to the UNCP Safety Officer.

2.2.5 Asbestos Statement

General Guidelines

Intent

Various buildings and structures at UNCP contain (or may be presumed to contain), asbestos building materials. This section is intended to provide guidance to designers on abatement requirements.

Resources

Designers are expected to consult the UNCP Asbestos files to search for asbestos containing materials in affected work areas. These files are maintained by Facilities Planning and Construction. If the data are unclear, then the designer should arrange for testing of samples.

Documentation

Should asbestos abatement design be required, the designer should be certified by the State Construction Office to perform abatement design. Additional requirements and procedures are listed below.

Design Criteria

During initial design stages a designer should check the UNCP asbestos files for the record of tests performed to determine if asbestos containing material is present in an area.

Once the presence of asbestos has been determined, a project estimate and/or bid can be prepared. Depending on the presence, planned disturbance, and condition of asbestos in the work area, various actions will be necessary:

1. Where asbestos is present in the work area, in good condition, and will not be disturbed through the course of the project, the contractor must be informed of its presence in the bid document.
2. Where asbestos is present and will be directly disturbed through the project, the material will be removed prior to work by a licensed asbestos contractor.
3. Where asbestos is present, will not be directly disturbed through the project, but is in such condition as to pose a potential exposure to the contractor, the material must be removed prior to work by a licensed asbestos contractor.

Bid Document Requirements

All "Notice to Bidders" documents must contain the following wording, regardless of the database or test results obtained in conditions noted above:

"Various buildings and structures at UNCP contain (or may be presumed to contain), asbestos building materials. If asbestos containing materials are present in, or adjacent to, your work area, you will be informed by the bid documents. Should the completion of this project require disturbance of these asbestos containing building materials, this work will only be performed by qualified persons with UNCP Facilities Planning and Construction approval. It is your responsibility to inform your employees and subcontractors you supervise of this information, once received."

All "Contractors Responsibilities" documents must contain the following:

"UNCP will use reasonable efforts to notify contractor of known or suspected asbestos containing materials located in or adjacent to the work area. Notwithstanding the foregoing, contractor has the affirmative duty of contacting appropriate University officials to investigate whether or not the materials located in or adjacent to the work area are known or suspected asbestos containing materials. In addition, the contractor may notify the project manager immediately upon encountering any other suspected asbestos product. Any removal must be coordinated through Facilities Planning and Construction by approved contractors. UNCP is not responsible for compensation due to delays for asbestos removal."

Once asbestos removal work and associated air sampling is completed and the work area has been determined by an industrial hygienist to be suitable for reoccupancy, information on the material removed must be forwarded to Facilities Planning and Construction for inclusion in our asbestos files. All costs for asbestos removal, including the cost for bulk sampling, are to be charged as part of the project. A copy of air

sampling results associated with the project shall be included in the closeout documentation relating to the asbestos removal.

2.2.6 Lead Statement

General Guidelines

Intent

Various buildings and structures at UNCP contain (or may be presumed to contain) lead containing paint. This section is intended to provide guidance to designers on work procedures when lead is suspected to be present in the affected area. The following procedure will be followed when a request for work is generated in which painted structural surfaces will be disturbed.

Resources

Designers are expected to coordinate testing as part of the project design phase. Contact the project manager for selection of testing agency.

Documentation

Should lead abatement be required, the designer must assure that the work requirements listed below are followed.

Design Criteria

During initial design stages, the designer should coordinate testing for lead based paint if this is suspected. Costs for testing will be borne by the project and should not be included in the designer's fee. Once the presence of lead has been determined, a project estimate and/or bid proposal can be prepared. When lead test results and the scope of the project indicate that special procedures to prevent building contamination and occupant exposure are necessary, the designer will consult with the project manager to determine the appropriate course of action.

Bid Document Requirements

For other situations where painted surfaces are to be disturbed, the following information must be submitted with the bid documents:

"Contractor Advisory: Lead Containing Materials: It is anticipated that this job will involve disturbance of building materials with generation of airborne dust or fume. UNCP does not have sufficient information to verify the presence or absence of lead in all of the materials which may be disturbed by the contractor on this project. If testing has been conducted to determine the presence of lead, results are attached.

The contractor is advised to assume potential lead exposure according to 29 CFR 1926.62 "Lead in Construction" and to determine appropriate actions to take, including but not limited to consideration of the training, work clothing, respirators, hygiene, and medical surveillance sections of the referenced standard.

Particularly for interior renovations, the contractor will be expected to use work methods which contain dust levels within the work area and to assure that surfaces are free of dust when work is completed. The contractor will use appropriate measures to assure dust levels remain below the OSHA permissible airborne limit outside the work area at all times.

The successful bidder will be expected to provide in writing, prior to the start of work on this contract, the steps which will be taken to control dust levels during this project.

Activities judged by the project manager to have the potential to generate high dust or fumes levels (e.g. welding or burning over painted structures, abrasive blasting, power tool cleaning, demolition work, etc.) will be performed after review and consent of the UNCP project manager.

The following activities are not permitted at UNCP: Heat gun use for painting removal and the use of lead containing paints and mortars."

The statement will be provided to the contractor when lead test have been conducted. Below is a sample statement:

PROJECT NAME: _____

Enclosed are results from XRF analysis of lead in paint which is associated with this project. This represents UNCP's best effort to identify those locations and materials which may be disturbed through this project. However, there is no assurance that all materials which may be disturbed are represented here.

These XRF results are listed as either 'contains lead', 'inconclusive', or 'negative.' These results are indications of lead measured over a portion of a surface, such as a wall or door. These results cannot be compared directly to the OSHA 'action level' or 'permissible exposure level' which are measurements of lead in air, measured at the breathing zone of an employee and averaged over an 8 hour period.

For this reason contractors should realized that some jobs which generate little dust and are performed over a short duration on a surface noted as 'contains lead' may not result in an airborne exposure over the OSHA limit. Also, jobs which generate larger levels of dust for longer periods of time on a surface noted as 'inconclusive' could possibly result in a lead exposure in excess of the OSHA permissible limit.

The work methods and measures to be taken by the contractor to deal with lead will be based upon the contractor's past experience with the particular operations the contractor is performing. The information listed is provided in event it is useful to assist the contractor in his determination.

Building Name Floor # Room # Sample Location/Description Result/Outcome

2.2.7 Radiation Management/Shielding

General Guidelines

In general, the construction of a high-quality chemical laboratory will meet or exceed any special requirements of radiations protection. For example, intermediate and low-level labs approved for use of radioactive materials need only good chemical quality bench tops and a fume hood that has a face velocity that exceeds 125 feet per minute. An area that will contain high-level radioactive materials usage, on the other hand, will need special shielding and ventilation designs. Guidelines for this type of design are available as necessary from Facilities Planning and Construction.

2.2.8 Hazardous Gas Distribution and Monitoring

General Guidelines

The University's intent is to provide the safe and regulated environment in the case of use of hazardous gases necessary for high-level scientific experimentation. Guidelines for Gas Cabinets, Alarm Systems, Emergency Power, Gas Detection, Treatment Systems,

and Cylinder Storage monitoring design are available as necessary from Facilities Planning and Construction.

2.2.9 Hazardous Waste Disposal

General Guidelines

Intent

The project contractor is responsible for properly managing and disposing of any hazardous waste generated during the construction phase of a project in compliance with all applicable state and federal requirements.

Documentation

The project contractor is required to generate and maintain any disposal records required by EPA or State of NC Regulations.

2.2.10 Laboratory Design Guidelines

General Guidelines

Intent

This section discusses the safety features that must be included in University laboratories and the design rules for various classifications

Resources

Designers shall request updated information and guidelines from Facilities Planning and Construction. Also, refer to Section 2.8 for mechanical design information. Designers shall conform to the following:

- Animal Laboratories: ALAC Guidelines
- Radioisotope Laboratories - Guidelines upon request

The designer shall also follow ANSI/AIHA Z9.5-1992 (or the latest edition), and the American Congress of Governmental Industrial Hygienists (ACGIH) Ventilation Manual when designing laboratory ventilation.

Design Criteria

Laboratory Design: General Considerations

Labs should be designed with flexibility in mind. Research requirements change constantly. It is inadvisable to design to minimum standards as safety can be greatly enhanced by exceeding code requirements.

Labs should not be located in mixed occupancy areas. They should be separated from classrooms, offices, conference rooms, and other places of assembly.

Lab design should include adequate storage space for equipment and supplies. Storage is prohibited in service corridors.

Each lab must have at least two means of egress. Egress must not be through an adjoining space, but must be to a rated corridor.

All labs shall be equipped with emergency eyewashes and showers, with floor drains.

Each building shall have a designated hazardous materials receiving area that should include a separate waste storage removal area. Waste areas should be segregated to

accommodate chemical, radioactive, and biological waste, as well as nonhazardous and recyclable waste.

Corridors should be designed to transport chemicals. There should be a service elevator dedicated to chemical and equipment transport, and these should go to the roof.

Provide each lab space with an abundant supply of electrical requirements when designing cabinetry, hoods, etc. Typically the lack of sufficient outlets has caused the overuse of power strips and extension cords.

Laboratory Accessibility

The designer is required to be cognizant of universal design requirements when designing cabinetry, hoods, etc. Disposal receptacles for use must be within reach ranges for accessibility or alternate, accessible receptacles must be provided. Posted warnings such as signage and door hardware must be provided in hazardous areas such as hazardous storage closets, electrical closets, and mechanical closets.

BL3 Type Lab Construction Criteria

Guidelines available upon request as needed.

Laboratory Ventilation

General Requirements

General design requirements for laboratory ventilation will follow ANSI/AIHA Z9.5-1992 guidelines (or latest edition) unless pre-empted by information contained in this section or applicable sections of the NC Building Code. Specific applications shall follow the requirements listed in the latest version of the ACGIH manual unless covered in this section. Exhaust ventilation systems must also meet the requirements of the NC Mechanical Code. Where specific design requirements do not exist, design parameters should be reviewed and approved by Facilities Planning and Construction. For Gas Storage Cabinets, these shall meet the requirements listed in the NC Fire Code, section 2203.

Exhaust Flow Monitors

Flow monitors must be installed on each fume hood, laminar flow hood, or biological safety cabinet to detect low flow conditions and sound an alarm. Gas cabinets and exhausted equipment which house gasses and chemicals in closed systems also require monitoring. Duct monitors shall be of a type pre approved by Facilities Planning and Construction. Thermistor type devices are strongly discouraged.

Biological Safety Cabinets

These cabinets must meet NSF 49 requirements and must be approved prior to specification and installation.

Laminar Flow Hoods

Guidelines for these are available as needed.

Auxiliary air hoods and ductless hoods shall not be used or installed.

Balancing of Hoods

Balancing is required for fume hoods, gas cabinets, laminar flow hoods, and other exhausted devices where hazardous materials are stored or used. Where balancing is required, it will be performed by persons certified by the Associated Air Balance Council (AABC) or the National Environmental Balancing Bureau (NEBB), unless otherwise agreed to by Facilities Planning and Construction. Written certification of balance data shall be provided.

Duct traverse pilot holes shall be capped with a removable plug to allow for future readings at the same location..