

2.6 Building Interiors

2.6.1 General Considerations

General Guidelines

Intent

It is the intent of this section to provide the minimum criteria acceptable for the design of building interiors. Designers are expected to create an atmosphere that is inviting, conducive to learning and exchange of ideas, easily maintainable, durable and accessible.

Resources

Americans with Disabilities Act Standards for Accessibility
(ADASA)

NC Building Code, volume 1-C

Center for Universal Design (NC State University)

NC Department of Insurance (DOI)

Disabilities and Business Technical Assistance Center (DBTAC)

Documentation

Plans should show the location of low-use areas and means of access.

Design Criteria

Accessibility Considerations

Low-use areas such as rooms not open to the general public (e.g. projection rooms) shall be accessible to the greatest extent possible for the greatest number of people. Wheelchair lifts may be used for access to these areas. In new buildings, spaces shall be designed so that wheelchair lifts are not necessary.

Break Areas

Design should include space for vending machines, food storage, microwaves, etc. These items should not be placed in egress corridors, which violates DOI standards.

2.6.2 Service-Area Standards

General Guidelines

Intent

This section provides information on minimum service-area standards.

Resources

The designer is encouraged to involve operations personnel in the planning of service areas. The project manager can coordinate this activity.

Documentation

The design must provide adequate space for maildrops, vending areas, dumpster locations, loading docks, etc.

Design Criteria

Accessibility Considerations

The service entrance cannot be designated the accessible entrance unless it is the only entrance to the building.

Custodial Closets

There shall be at least one custodial closet on each floor of new buildings. These closets shall be equipped with mop sinks and adequate storage for supplies. Items such as electrical panels and telephone boards shall not be located in custodial closets. The exterior door shall be labeled in the same system as the rest of the building.

Dumpster Areas

These shall be enclosed with a brick screen, and have a concrete pad, sloped to drain water. They shall be sized for the standard university dumpster, and shall be secured with an appropriate gate.

2.6.3 Classroom Standards

General Guidelines

Intent

Classroom teaching and learning is the main component of UNC-Pembroke's mission. Therefore, providing an environment conducive to educational exchanges is an important responsibility of the designers of new and renovated classroom space.

Resources

The designer is encouraged to involve faculty early in the design Process. On-campus design professionals and the project manager Are available for additional guidance.

Design Criteria

The following are to be the minimum standards for new and renovated classrooms:

Seating

A variety of appropriate student stations shall be provided to satisfy different instructional needs.

Each classroom with fixed seating and tablet-style writing surfaces shall have at least 10% left-handed stations placed in a variety of locations throughout the classroom.

Movable tablet-arm chairs with a writing surface of at least 14" x 20" satisfy the requirements for both right-and left-handed students and shall be used in movable seating applications.

Likewise, each classroom shall have at least one mobility-impaired accessible station, with one station for each 50 stations in larger classrooms. In addition, instructional work stations appropriate for mobility-impaired instructors shall be provided.

Visibility and Lighting

Each student station shall remain unobstructed with clear visual sight of instructional space. Instructional space is defined as all space with instructors use for teaching, and where audio visual presentations are viewed. Since each classroom environment differs, the minimum standard for light will vary, but for the purpose of design, lighting shall be 80 foot candles as measured at the work surface of any station.

Chalkboard or Whiteboard

Each classroom shall have an acceptable and accessible Chalkboard or whiteboard.

Audio Visual Equipment

Appropriate permanent equipment such as projection screens and window coverings shall be provided for each classroom.

Communications Outlets

Each classroom is to be fully wired according to the UNC Baseline Wiring Standards (available from UNC General Administration), using enhanced Cat 5 wiring.

Audibility

All classrooms which have a capacity greater than 100 shall have a system for amplifying the instructor's voice.

2.6.4 Building Entrances**General Guidelines****Intent**

All entrances, to the greatest extent possible, must follow Universal design principles. They shall be on an accessible route to parking, public transportation, public streets, or sidewalks, and shall connect by accessible route to space and elements within the building. All public entrances shall be accessible.

Design Criteria**Double Doors**

Double doors must have at least one leaf with 32" clear opening. Doors in a series must have a minimum of 48" space between doors plus The width of any door that swings into the space between the doors.

Automatic Operators

Alterations or renovations to existing doors shall include additions of auto door operators in areas where maneuvering space is less than 18" or there is not 5' x 5' level floor area as required by NC Building Code. All exterior entrances in new construction shall have an automatic door operator. Door openers are to be hard wired.

2.6.5 Mechanical and Electrical Room Standards

General Guidelines

Intent

This section provides the university's expectations regarding the design of effective mechanical and electrical rooms. Daily operation of the building depends on good maintenance access to these rooms.

Resources

Resources available to designers are the NC Building Code, with lists **minimum** access required around equipment. Also, the designer is encouraged to consult with Facilities Planning and Design operations personnel to discuss specific needs and to inspect successful installations.

Documentation

Paths of access to equipment should be shown on the drawings. this specifically applies to access to chiller tubes and the removal of coils in air handling units. Where two or more services are to occupy the same mechanical room, proper coordination is necessary. All drawings should show heating, plumbing, air conditioning, and electrical equipment when more than one service is located in the same space, chase, manhole, or mechanical room.

Design Criteria

The general policy and intent of the university is that transformer vaults and mechanical equipment rooms should not be accessible to occupants of the building. It is therefore necessary that departmental equipment and controls be located so that the occupants of the building will not have to enter either transformer vaults or mechanical equipment rooms for routine operation of equipment. This include fuses, circuit breakers, disconnect switches, valves, etc., that serve departmental equipment.

Conversely, access to equipment rooms should not be through other rooms serving departmental functions, but rather should be through corridors, lobbies, or other services spaces. Also, custodial closets may not be used to house mechanical equipment, nor may they serve as access to mechanical equipment rooms.

Suitable location and adequate size of equipment rooms are essential to satisfactory building operation. Equipment rooms containing major pieces of equipment such as chillers, large pumps, tanks, and fans shall be located at grade, adjacent to loading docks, and with large doors through which the largest items may be removed and replaced.

For major facilities, mechanical-equipment room space in the range of 3% to 5% of gross building area is usually necessary. Equipment room lighting should be generous and well distributed to preclude the need for extension cords and portable lights in carrying out routine and predictable maintenance. In addition, provide convenient receptacles near major equipment and at reasonable intervals along walls and chases.

Maintenance access to equipment is to be through doors or other approved permanent opening. Equipment should be located at grade whenever possible, and when this is not possible, access to it is to be provided via permanent stairs and platforms with approved OSHA railings. Multiple-story buildings shall provide walk-in access to vertical chases at each floor, and permanent lighting. Mechanical room access must accommodate removal and replacement of all equipment. The plan should provide for all service operations such as removal and replacement of chillers, fans, coils, tube bundles, etc. plans will be reviewed carefully to avoid "trapped" equipment, valves, and piping, which will not be accepted. The designer should allow space for expansion and additions to the equipment, in addition to maintenance access.

2.6.6 Telecommunication Room Standards

General Guidelines

Intent

This section provides designers with requirements for design of telecommunications rooms within buildings.

Resources

UNC Pembroke Computer Information Systems Office

Design Criteria

Environment

All telecommunications rooms shall be air conditioned to maintain 70 deg F (nominal) temperature. Lighting: 60 foot candles minimum. No pipes shall pass through the telecommunications room.

Location

Because of electromagnetic field considerations, a 2 foot clearance Between boundaries of the telecommunications room and alternating current power lines or other sources of electromagnetic interference is required.

Other Equipment

The telecommunications room shall contain only communications equipment. No power equipment (such as transformers, ventilation equipment) shall be allowed in a telecommunications room. The telecommunications room is to be used as a communications room only. It shall not be designed to be utilized for any other purpose (for example, telecommunications rooms shall not be used as custodial closets, mechanical rooms, or storage rooms).

Security

Doors shall be equipped with substantial locks to conform with campus BEST key system. Hardware and locking shall be as customary for UNC-Pembroke for telecommunications closets. Locks are to be keyed to UNC-Pembroke Telecom Closet key. If the room must be accessible to unauthorized personnel (defined as an unsecured telecommunications room), equipment shall be secured within lockable equipment racks.

Room Power Supply

Each room shall have at least two separate circuits of 20 amps (120V) dedicated solely to telecommunications rooms. If emergency power is available, one of the two 20-amp circuits shall be fed from the emergency power system. Each wall of telecommunications room shall be equipped with at least one outlet located at 18" above the finished floor. Outlets shall alternate between the two 20-amp circuits. Where emergency power is available, all outlets connected to the emergency power circuit shall be white; all outlets connected to the normal 20-amp circuit shall be black. Circuit grounding shall be hospital standard grounding. Power distribution wire molding or EMT may be used to provide required outlets.

Telecommunications Room Layout

Type and minimum dimensions:

- a. Single-door telecommunications room: 6' x 8' with 8' ceiling.
- b. Double-door telecommunications room: 4' x 8' with 8' ceiling; Doors must be located on one of the 8' walls.
- c. Main telecommunications room: Main telecommunications room shall have minimum dimensions of 7' x 9' with 8' ceiling regardless of type of door.

Plywood sheet: One 4' x 8' x 3/4' plywood sheet shall be wall-mounted behind and horizontally offset from racks so that the 8' side is parallel to the floor and clearance in front of the plywood is maximized. The plywood is to be mounted to finished wall above the electrical outlets. The plywood is to be mounted to each wall not containing a door. The floor is to be concrete covered (tile) or uncovered suitable for placement of lag bolts. Doorways into telecommunications rooms are to be a minimum of 7' in height and 3' wide. Doors must open outward, not into the telecommunications room.

Location and Interconnection Requirements

The telecommunications rooms of a building shall be located to minimize both the number of telecommunications rooms and the lengths of the cables radiating from the telecommunications rooms. The maximum cable length from termination in the room to a communications outlet is 300 feet. The room where the communications services (voice, data, or video, whether carried over copper, broadband, or fiber-optic cable) enter the building shall be used as a telecommunications room. Where this is not practical, each room with incoming services shall be connected to the nearest telecommunications room.

The main telecommunications room is defined as the room into which all or the majority of building communications services enter. All other telecommunications rooms are satellites.

Telecommunication rooms on two or more floors: Telecommunication rooms on different floors shall be located so that they are vertically aligned, if possible.

Interconnection of Telecommunications Rooms

- a. On the same floor: Building wireways shall connect telecommunications rooms on the same floor. Wireway is to be a separate, distinct path from wireway used to

house distribution cables from telecommunications rooms to outlets.

- b. On different floors: A conduit or raceway system of appropriate size shall form a continuous connection between all telecommunications rooms on different floors with access to a riser at each floor. A minimum of two 4 inch conduits or equal must be provided.

2.6.7 Room Numbering and Miscellaneous Signage

General Guidelines

Intent

All campus facilities use a uniform methodology for numbering rooms and to provide a campus standard for interior signs and directories.

Resources

UNC-Pembroke Room Numbering Methodology (in progress)
UNC-Pembroke Interior Sign Standards (in progress)

Documentation

Designers shall refer to the above documents when preparing specifications for interior building signs. All room numbers (and door numbers) and signs must comply with the standards set forth in the above documents. Room numbers on the construction documents must comply with the room-numbering methodology. Room numbers on all construction document schedules must be consistent and comply with the standards.

2.6.8 Laboratory Design/Laboratory Signage

General Guidelines

Intent

Laboratories, by the nature of their purpose, may contain chemicals or processes that have inherent safety, biological, or environmental risks. The intent of this section is to ensure that laboratories are constructed to minimize these risks to the lab occupants, the general public, and the environment by enhancing their quality and maximizing their maintainability, adaptability, and efficiency.

Resources

Resources available to the designer include UNC-Pembroke Facilities Planning and Construction and applicable publications of NFPA, NIH, OSHA, and CRC.

Design Criteria

Laboratory design should comply with other sections of these guidelines relating to laboratories as well as applicable state and federal regulation.

Critical to the appropriate design of specific laboratories is the determination of the nature and purpose of the proposed laboratory. In order to determine the appropriate risk hazard classification. The designer is expected to ensure through dialogue with the above Resources that of lab activities and processes are clearly defined.

Accessibility Considerations

All undergraduate laboratories and at least one graduate and research lab within a department must comply with access workstation, counter-height, and sink-height requirements. 5% (but not less than one) of the lab counters in every lab shall be accessible. At least one fume hood shall be accessible; one sink per lab shall be accessible; and one emergency eye wash and shower shall be the hand-held type. Accessible lab counters shall be designed to be adjustable. Accessible counters shall be adjustable to have minimum knee clearance of 27" and maximum counter-top height of 32".

Air, gas, air, vacuum, and faucet controls must be placed on the side of the counter within 11" of the counter front, on the side opposite the sink. Provide removable cabinets at the accessible benches and sinks. Insulate hot water and drain pipes on accessible sinks. Locate accessible lab benches with 5' x 5' clear turning space behind the seating area for wheelchair users. Locate accessible benches on an accessible route close to an exit.

Safety shower and emergency eyewashes shall be accessible. At least one per lab must be of the hand-held accessible type. The height of activating rings shall be within reach of wheelchair users, and shall be located on clear floor areas within accessible routes.

2.6.9 Building Egress Guidelines

General Guidelines

Intent

Building egress guidelines must be designed to ensure all buildings have safe systems for vacating the buildings in emergencies, and are fully accessible, in compliance with both ADA standards and OSHA requirements.

Resources

North Carolina Building Code (latest edition)
National Fire Protection Association and NFPA
101 Life Safety Code

The minimum design standards as described in the following documents:

NC State Building Code, volume I- General Construction, latest edition
Occupational Safety and Health Standards for the
Construction Industry, with Amendments as of
October 1, 1994

Code of Federal Regulations, revised July 1, 1994

In addition, designers should follow the design criteria below. Also see section 2.3.13 Design Guidelines For Rails. All materials and construction methods shall follow recommended practices outlined in the Pipe Railing Manual, latest

edition, published by the National Association of Architectural Metal Manufacturers.

Documentation

The design shall include plans, sections, elevations, detailing and specifications adequate to build and install the egress structure. Construction details shall include sleeving, footing size, weld joints, materials connections, and all necessary information to meet the design criteria. Include plans, detailing and specifications for demolition and repair of existing surfaces.

Design Criteria

Pedestrian entrances to buildings and campus open spaces shall accommodate grade changes with the use of sloped surfaces rather than steps to the greatest extent possible.

Accessibility Considerations

All buildings, even those with supervised sprinkler systems, shall have areas of rescue with clear floor space, signage, and communications devices that comply. The minimum number of required building exits must be equal to the minimum number of accessible exits. All buildings with four or more floors should have at least one evacuation elevator in addition to areas of rescue at stairways.

Steps

Steps shall be designed to provide safe steps with handrails according to applicable codes for abrupt grade changes as an alternative to ramps.

A run of steps shall have no fewer than three risers. Exterior riser height is optimally 5' to 5 1/2" with 14" to 15" treads. The top tread shall match stair treads in contrast to the abutting walk. Stair width shall be 60" minimum. Treads shall be level horizontally and slope 1% maximum to the front of the tread. Create landings to break up long runs of steps. Cheek walls are desirable for ease of step maintenance and for attaching handrails. Steps with high night-time use shall be lighted from above with area pole lights.

Rails

See section 2.3.13 Design Guidelines for Rails.

Handrails shall increase safety and accessibility for pedestrians navigating steps and steep slopes. Guard rails shall provide pedestrian barricades. Additionally, rails are a design element that complement and reinforce the Master Plan by articulating pedestrian ways and pedestrian entrances and by guiding people into a building or through a campus gateway or neighborhood. Generally, building and freestanding rails shall be simple in design and of economical, low-maintenance materials. Rails shall maintain stylistic harmony with the surrounding environment, and be aesthetically pleasing.