

2.3 Site Design

2.3.1 Project Siting: The University's Intent

General Guidelines

Intent

This section provides a general guide to the siting of new buildings. The primary intent of siting decisions is to adhere to the conceptual instructions contained in the university Master Plan, and to provide accessibility to the greatest extent possible for the greatest number of people.

Resources

The primary resource to be used in siting a new building is the *University Physical Master Plan* and the guidelines defining Universal Design. A summary of this document is located in the Appendix. This plan encompasses a set of conceptual instructions for achieving the goals of this document, yet allows for flexibility and creativity. Additional resources for building siting are the Facilities Planning and Construction office, and the Building Committee for the specific project. Additional resources concerning accessibility are

Americans with Disabilities Act Accessibilities Guidelines (ADAAG)

NC Building Code, volume 1-C

NC Department of Insurance

Disabilities and Business Technical Assistance Center
(DBTAC)

Documentation

The designer is expected to demonstrate how a proposed facility will satisfy the requirements of the Master Plan and its impact on infrastructure, pedestrian and vehicular circulation, campus neighborhoods, visual corridors and campus focal points, and exterior spaces and activities. When alternative sites are proposed, a full assessment of all of the above considerations should be presented. The designer is expected to provide an overall level of design documentation and construction drawings that indicate thorough assessment of the design challenges and field conditions and meet the program for the facility.

Refer to the *State Construction Manual*, section 112 for Design Criteria and section 203 for details on requirements for submissions of documents for review. Also see sections 2.1.2 and 2.1.3 of this document for UNC-Pembroke requirements on drawing standards.

Design Criteria

The Master Plan Guidelines encompass nine design concepts:

- Campus Neighborhoods
- Campus Exterior Space
- Grounding to the Landscape
- Activities
- Circulation
- Places for Communication
- Campus Focal Points
- Building Design
- Parking Rooms

Campus Neighborhoods

Like a workable city, a campus can be a related group of strong, identifiable neighborhoods. Neighborhoods can unify certain areas on campus, and they can be distinct in character: academic, residential, or mixed use. A campus neighborhood provides an identifiable spatial identity to which one may belong.

A neighborhood concept requires that there be public life present. What is unique about campus neighborhoods is the great emphasis on creating opportunities for communication. The designer should seek to:

1. Define the campus as a fabric of related neighborhoods
2. Arrange clusters of buildings and activities to create campus neighborhoods.
3. Maintain the appropriate scale of a neighborhood. The scale of a neighborhood is defined by the distance a person can walk in two minutes (typically 600 feet), the distance at which one person can recognize another (typically 300 feet), the distance at which one person can hear another (typically 150 feet).
4. Arrange each neighborhood to create a focal point or center. That center should be a courtyard or courtyards, a greenspace, a street, or another shared common space.
5. Define a neighborhood's character in part by its activities (e.g. research, academics, residential living, administration, and so forth). To succeed, each campus neighborhood must combine several activities and be a microcosm of the entire campus.
6. Reveal the activities in a neighborhood so the character of the activities is evident.
7. Establish the physical character of a campus neighborhood with architectural and landscape design that is compatible and harmonious in its use of materials and scale.

Campus Exterior Space

Buildings and campus elements can be arranged so that identifiable public spaces are created. These spaces may range in size from a building court to a space formed by buildings, a courtyard, or a larger landscaped identity. Moreover, the connectors between the campus spaces are equally important.

The combination and organization of courts and connectors allows the campus to grow organically. Within these spaces much of the life of the campus happens. The designer should:

1. Arrange buildings and other elements so that positive outdoor space is created.
2. Locate the main people entrances and major views from the buildings into campus space.
3. Connect the campus spaces with clear, visible paths and announce the transition from connector to place with an appropriate marker (a gateway, for example).
4. Assess the impact on existing infrastructure and plan for future expansion of campus utility systems and the promotion of utility corridors. The project should enhance these efforts, rather than be a future barrier.
5. Where appropriate, establish a large campus place to create a unifying campus symbol.

Grounding to Landscape

Essential to both the campus and the university is a physical and philosophical connection to the natural environment. The scale of the connection can range from

natural light in views from a building to cluster development that follows and respects the vegetation, topography, and land. The designer should

1. Respect the campus landscape with managed, controlled development. Develop in such a way as to ensure preservation and enhance and/or create a variety of landscape and environmental conditions.
2. Let natural features (topography, orientation, climate) influence building and campus form and provide a framework for campus development. Save the best natural areas when considering sites for development. Those sites in need of repair should be considered first as suitable for development.
3. Create campus spaces and courtyards that consider orientation and natural conditions. Provide shade in the summer and exposures to the sun in winter. South-facing places are preferable to spaces where there is no sunlight.
4. Shape open landscape and the areas of development according to storm-water management responsibility.
5. Directly connect the ground floor of each building to the earth so that the building does not become isolated from it and so that there is an accessible connection to the landscape.
6. Develop campus landscape domains that consider plant requirements for nurture and maintenance.
7. Incorporate the landscape, the sky, and the sun in building and campus design and arrangement.

Activities

The character of a campus is defined more by the location of activities than by any other factor. Campus activities can best be located to promote encounter, interaction, and communication. The designer should:

1. Zone activities so that public and private domains are established.
2. Concentrate public activities toward campus focal points and campus spaces.
3. Locate interactive activities (food service, shops, large assembly rooms, libraries) in prominent, accessible areas so they will become important in establishing focal points in campus spaces.
4. Establish a campus domain at the ground plane that includes food service, shops, galleries, large assembly rooms, libraries or information centers, and lounges.

Circulation

Campus circulation includes the paths, corridors, stairs, curbcuts, ramps, and elevators that move people about the interior and exterior campus. This network provides an opportunity to reinforce the idea that the campus is a place of connected neighborhoods. The designer should:

1. Establish people and service circulation domains. Special care should be taken to provide for maintenance access and future expansion.
2. Design a circulation network that provides 'way finding' and an orientation to the campus by being clear and understandable.
3. Arrange the circulation so that it is expressed architecturally and becomes space-defining.
4. Express and celebrate circulation elements such as stairs and ramps so that they are understandable and obvious.
5. Make main entrances prominent and accessible. Some campus buildings, where appropriate, can be more porous and open.
6. Connect building entrances to one another around campus spaces, both visually and literally.

7. Provide connecting linkages between buildings by using arcades and other sheltering architectural means.
8. Provide clear, accessible linkages and connections between campus courtyards and places that are free from vehicular domains.
9. Dedicate a substantial portion of each building's ground plane to campus circulation and other public activities.
10. Use circulation to knit the various neighborhoods together to form a holistic campus.
11. Provide loading docks and service courts of sufficient size to accommodate current and future activities.
12. Provide for required emergency vehicle access around the buildings.

Places for Communication

Because interaction fuels the creation of knowledge, a campus must be designed to maximize communication, which encompasses teaching, guidance, learning, friendship, and personal and professional growth. Meaningful communication occurs in the time and space between the scheduled domain of classes and meetings, and the Master Plan creates and fosters opportunities for such interaction. The designer should:

1. Acknowledge the time and space between the scheduled dimension of the campus as an important domain for communication.
2. Arrange the campus to encourage both formal and informal communication.
3. Provide places for gathering before and after scheduled classes and activities.
4. Arrange spaces and locate activities that support and encourage spontaneous interaction and communication (lounges and food service facilities are examples).

Campus Focal Points

The designer shall consider the existing campus focal points that animate the concepts of Campus Neighborhoods and Places for Communication. These spaces, formal and informal, large and small, interior and exterior, become the gathering places, the social centers, the "hearths" of the campus. In fact, some level of food service is essential in establishing the social dimension necessary to many of these gathering places. The designer should:

1. Plan, arrange, and preserve space so that focal points exist in all buildings and outdoor campus spaces.
2. Locate focal points on main circulation paths.
3. Provide focal points, both interior and exterior, not more than 200 feet apart, arranged so that one is visible and related to another.
4. Include building cores (stairs, entrances, and so forth) as important focal-point elements.

Building Design

In their design and arrangement, university buildings are fundamentally different from other building types.

The architecture of the campus should express its unique function: buildings should express the creation and communication of knowledge.

In addition, campus architecture must create campus space. This is most often accomplished in conjunction with other existing or proposed buildings. Larger buildings can be arranged so that exterior courtyards or arrangements with wings of the building make an enclosed space. Campus buildings are contextual, rarely signature buildings, as they become part of an open-space campus fabric. The designer should:

1. Establish a building system in harmony with the campus neighborhood structure, circulation, network structure, and focal points. This system should be oriented towards campus space, which is the focus of the neighborhoods.
2. Assure that the architectural elements should increase in delicacy, variety, and structural complexity as they interface with people or public areas. At this interface, designers should locate the more interactive activities. Conversely, on the service side of a building, texture or grain can increase the volume or scale.
3. Assure that glass and openings are used to express and make visible activities within the building. Architectural elements should be related to the function and character of the activities they contain.
4. Assure that the materials and scale of the architecture provide continuity with other buildings in its neighborhood.

Parking Rooms

Because many people come to the campus in cars, parking presents a significant challenge to the preservation of the landscape. The university should not allow the parking requirement to make the campus look like a shopping center. The designer should, in conjunction with using the Masterplan,

Consider parking lots as campus rooms for cars. Use smaller lots in pedestrian areas and larger storage rooms for perimeter parking. Subdivide large lots into smaller rooms with landscaping. Use parking rooms as a transition from the vehicular domain to the pedestrian domain, appropriately connected to both. Design parking rooms to mitigate negative environmental impacts (run-off, heat, noise, and glare). Ensure that all lots have security phones.

2.3.2 Sitework Planning Considerations

General Guidelines

Intent

All site development shall reinforce the university Master Plan. Reconcile each site with the Master Plan existing conditions, the campus design plan, and future development opportunities which impact the development of the site. The Master Plan goals, vision, concepts, and strategies provide the foundation for site development.

Resources

The Masterplan showing building sites.

Documentation

With conceptual and schematic design submittals, the designer shall include illustrations of the project in the context of the Master Plan. Additional items which require separate illustration on the plans are listed below.

Design Criteria

Site Constraint Plans

Contract documents must include a site plan along with all necessary diagrams to show pedestrian route disruption and alternate accessible routes to be provided.

Contractors are responsible for maintaining accessible paths through and /or around both interior and exterior construction sites.

Contractors shall keep open and maintain existing accessible pedestrian paths unless adequate notice (10 days prior to construction start date) is given to the university and accommodations are made for a new or temporary accessible path that shall be maintained.

Construction Site Limits

The construction site limits shall indicate all areas of work, including materials staging and areas of protection. The designer shall establish the limits of construction in coordination with the project manager. The construction limits shall be indicated on all site drawings.

Construction Fence

The construction site shall be secured. A construction fence shall be included as a requirement for all exterior projects.

Certain circumstances may require that the construction fence and construction limits are not the same.

The contractor materials storage area shall be within the construction site fencing or shall be fenced separately.

No vehicles, materials, trenching, mechanical grading/clean up, or people activity may occur within the fenced tree-protection area. The designer shall take care to ensure no activity of this nature is required within the tree-protection area to complete the design.

Indicate fencing locations on all site layout drawings except the planting plan. The contractor materials storage area shall be identified on the drawings.

The designer shall include repair design, notes, and clean-up specifications to repair damages to the landscape caused by the fence and construction.

The fencing shall be galvanized chain link, with locking gate.

The contractor materials, vehicles, and activities must always be within designated areas. Only contractor vehicles are allowed to park on campus outside the construction area. These vehicles may park only in designated parking spaces and are subject to the transportation and parking rules of the UNC-Pembroke Transportation Department.

Prior to final inspection as agreed upon by the contractor and project manager, the construction fencing shall be removed, including all underground footings and fencing materials, and disposed of off campus.

Construction Sign

All formal construction projects shall be identified with a project identification construction sign. The sign shall be at a location visible to passersby and will identify the project location for workers.

Location and detailing of the construction sign shall appear in the construction documents. The copy for the sign shall be provided by the project manager.

Tree Conservation

Trees within the construction limits shall be protected.

Individual trees and/or groups of trees identified for protection during construction shall be fenced. For anticipated construction periods of three weeks or less, metal poles with plastic barricade fencing may be used. Longer construction durations require 6-foot-high chain-link tree-protection fencing. This fencing may not be removed without the consent of the project manager.

All trees on urban campus sites shall be surveyed. Large wooded areas or groups of trees shall be identified as a cluster on the survey. Existing tree survey information may be obtained from Facilities Planning and Construction. Major trees within these groupings, as determined by the designer with the Physical Plant Landscape Manager and project manager, shall be surveyed. Trees to be saved and removed shall be identified by the designer. As determined by the designer, Physical Plant, or project manager, trees outside the construction area at risk to construction damage may also be identified to remain and to be protected.

The contractor shall not remove or prune any landscape materials without prior consent from the owner. All tree work shall be by a trained, licensed, insured arborist and according to standards set forth in the National Arborist Association publication *Standards for the Pruning of Shade Trees*.

All debris from the pruning operation shall be disposed of lawfully off campus.

Take care that no materials or equipment enter the tree-protection area. Allow no poisoning of trees with the dumping of materials such as solvents, gas, paint, herbicides, or with the washing of toxic materials in the tree-protection area. Exercise care that no runoff from clean-up operations enter the tree-protection areas. Consider boring under major trees as an option to avoid root damage for utility construction.

In areas where construction-vehicle and equipment traffic over tree roots is unavoidable, place 12" of bark mulch or coarse wood chips as an organic base for traffic. Some of this organic matter may be left at the site to decay, thus avoiding clean-up destructive to feeder roots close to the surface of the soil.

Tree-protection fence locations shall be shown on all site plans. Trees to be saved and shall be labeled on each site layout drawing as well as being shown on the demolition plan and grading plans.

Tree protection should extend a minimum of 8' from the edge of the tree canopy. No equipment, vehicles, or materials should enter this area.

Stormwater Management

Stormwater must be managed in order to prevent downstream flooding and stream bank erosion, to prevent pollution of waters, and to comply with or exceed stormwater management regulations. Please refer to *Stormwater Management in North Carolina: A Guide for Local Officials*, prepared by

William M. Eaker, February 1994, and to the UNC Pembroke Stormwater Study.

Plans and details shall be provided for the design. Calculations supporting the design shall be available to the owner. The designer shall provide maintenance requirements and schedule as required for stormwater management devices.

Stormwater management for the campus shall be developed as an integrated systems approach. Stormwater runoff with its associated pollutants should be managed in a cost-effective manner to minimize its impacts on humans and the environment.

Incorporate preventive and control practices (best management practices) for the site to minimize generation of runoff and contamination of runoff by pollutants.

Site pollutant preventive measures (non-structural practices) shall be designed as the first line of defense (preventive maintenance, spill control programs, exposure reduction techniques, hazardous waste management, pollution prevention, worker education, street sweeping, catch-basin cleaning, trash removal, reduction of use of pollutants, etc.).

Design control measures to keep flow to pre-development levels, *to minimize contiguous impervious area, and to maximize* infiltration of water into soil on site. Use innovative methods for keeping water on site: infiltration devices (permeable surface materials, infiltration trenches, basins), vegetative practices (vegetative filter strips, grassed swales), detention/retention practices (ponds, artificial wetlands, sand filters). Implement-low maintenance control devices.

Site Grading

Balance cut and fill on site when feasible. Investigate other UNCP projects in design and construction for opportunities to balance cut and fill within campus.

Design finish grades to drain well, without eroding, and to support common maintenance practices. Provide a grading plan. For projects with station point sections, provide a site grading plan with contours in addition to limits of grading.

If excess material must be disposed of, develop a plan with the project manager for its disposal. Include the plan in the design documents. The designer shall be aware of the impact of grading on microclimates and shall maximize south-facing slopes for outdoor spaces for people. For positive drainage, all unpaved swales shall exceed 2% and be stabilized with grass or ground cover of a spreading type.

Utility Corridors

Where possible, consolidate utility services along roadways or service access. Concern for future repair should be a consideration in location of utility corridors. Design facilities to keep disruption to university function (transportation, pedestrian access, service and access to the facility, damage to landscape) to a minimum with future repairs.

Digging and Excavating

The University requires the completion of a Digging and Excavating permit prior to any work being done. (copy attached in the appendix) This permit is available from Facilities Planning and Construction and must be completed a minimum of 48 hours prior to any excavation work. Physical Plant will work with the contractor to mark University owned utilities and provide general guidance regarding excavation work. Any contractor not adhering to the Digging and Excavation policy will be responsible for damage of any disturbed utilities.

2.3.3 Walkways

General Guidelines

Intent

Walkways should provide safe, accessible walks to major destination points. Walkways shall be for all people, including those with a need for mobility access as well as able-bodied users. Walkways designed for mobility access only should be avoided because they separate and stigmatize people with disabilities, since able-bodied people may never want or need to use them. Where feasible, provide covered arcades over walks. Provide a reinforced base for brick pavers for all areas.

Resources

Americans with Disabilities Act

Documentation

Differentiate reinforced brick paving on site plans. Provide section details of each different walk profile.

Design Criteria

Campus sidewalks shall be 8 feet wide and shall be brick or stamped concrete in a brick pattern. Walks to service entrances/areas that do not accommodate heavy pedestrian use may be 5 feet wide. Where the sidewalk is adjacent to the back of the street curb and gutter, a minimum width shall be 12 feet. To satisfy accessibility requirements, gradient and cross slope shall be 1/20 running slope when possible and 2% maximum cross slope. All walkways shall be a minimum of 48' wide to accommodate wheelchair use, with a 60' width at intervals to allow 2 chairs to pass.

Use brick on all walks and for campus entrances and edges, courtyards, and people spaces. In special cases, other materials can be considered, using brick as trim or for accent, or to indicate pedestrian flow, mark entrances, and bus stop areas. Where budgets allow, use brick for walks, patios, people spaces, and plazas near building entrances.

Where walks meet grass, use a flush course of brick on edge. Where walks meet mulch beds raise the edging to keep mulch from washing on walk. Where sidewalks and/or greenways intersect with curb and gutter, a curb cut and ramp shall be installed to conform with Title III of the Americans with Disabilities Act. The walking surface shall be slip resistant, using 70% minimum color contrast brick pavers for contrast with the light pathway color and light gray for contrast with dark pathway colors. The color shall be integral with ramp material.

New brick paving shall match the existing brick pattern. Where possible, brick patterns should intersect at 90-degree angles and be interwoven to connect. If this is not possible,

place a band of brick pavers between intersecting patterns or resolve the intersection with a brick paving detail to be reviewed and approved by owner. Typical brick sidewalks shall be running bond in the direction of the walk.

Chamfered edged brick pavers shall be used for all areas intended for vehicular access. Walks that will be subject to vehicular traffic shall be of a herringbone pattern. The subgrade should be set up to road-grade specifications.

Concrete walks shall have a minimum thickness of 4 inches. At driveway and other locations where vehicles cross the walk, a 6-inch depth with appropriately designed sub-base is required. Sidewalks shall have a uniform slope toward the roadway of not less than 1/4' per foot and not greater than 1/2" per foot. The utility strip between the sidewalk and the back of curb shall not be less than 1/2" per foot nor greater than 3/4" per foot toward the roadway. Where concrete walks need repair, remove concrete to a control or expansion joint or saw-cut area to be removed. Irregular, small, or splotchy patching will not be acceptable.

2.3.4 Roadways

General Guidelines

Intent

Streets provide safe vehicular access and service to campus while providing a safe environment for pedestrian circulation. Roads and parking lots shall reinforce the campus Master Plan. All streets and parking lots shall be designed and constructed to the *NCDOT Standard Specifications* where applicable. NCDOT standards shall be used on all existing roads, parking lots, university extensions of existing state roads, parking lots, or roads to be maintained by UNC-Pembroke. All streets shall have sidewalks.

Documentation

The plans shall show a complete plan view layout with grading, site layout, landscaping, lighting and emergency telephones. Provide typical cross sections with station points, limits of cut and fill, and details necessary for construction. The pavement design and traffic analysis shall be signed and sealed by a North Carolina Professional Engineer. Boring logs and scaled drawings designating boring locations with CBR tests and other pertinent data shall accompany the pavement design. Pavement markings shall be noted on the roadway and parking lot plans. Sign locations shall be located on plans.

Resources

North Carolina Department of Transportation Standard *Specifications for Roads and Structures*

Manual for Uniform Traffic Codes and Devices (latest edition)

Physical Master Plan

1986 American Association of State Highway Transportation Offices (AASHTO) *Guidelines*.

Design Criteria

Roadways and Parking Lots

Main campus roads shall be designed for a speed of 25 mph unless otherwise directed by the project manager.

Materials shall be of asphalt with curb and gutter with sufficient sub base to support the type of traffic (service, bus, trash truck, passenger vehicles, etc.) and shall comply with North Carolina Department of Transportation *Standard Specifications for Roads and Structures*. Widths and number of lanes vary according to traffic. Traffic studies of existing patterns and projected vehicular use based on anticipated development needs may be required to justify roadway and parking-area design criteria. Pavement design shall be based on subgrade conditions, a 20-year design life and projected traffic loading. Subgrade conditions shall be based upon corrected soaked CBR values at 0.1 inch penetration as per ASTM D1883. Soil samples used for these CBR tests shall be obtained at intervals not greater than 500 feet. If a professional engineer with expertise in geotechnical engineering certifies that the soil in question is of the same type with similar engineering properties, this spacing may be increased to a 700-foot maximum spacing.

Approved pavement design methods shall include as a minimum those as proposed by NCDOT and the 1986 AASHTO *Guidelines*.

Rigid pavement design shall follow either the 1986 AASHTO Method or the Portland Cement Association Method. The road section shall be paved and have curb and gutter, and intersections shall have curbcuts meeting ADA requirements. Standard 2'6" curb and gutter shall be required on all streets and parking lots,

All campus roadways and parking lots shall be marked in accordance with NCDOT *Standard Specifications for Roads and Structures* and/or the latest revisions of the *Manual on Uniform Traffic Control Devices (MUTCD)* unless otherwise approved by the Engineer. Pavement markings must be completed prior to final acceptance of the roadway or parking lot by the engineer. Markings shall be Thermoplastic and applied in accordance with the manufacturer's instructions unless otherwise noted.

Street signs within the university shall be consistent with the university's signage standard unless otherwise approved by UNC-Pembroke.

Crosswalks and Curbcuts

Crosswalks and curbcuts are required where pedestrian pathways cross vehicular routes. Special consideration shall be given to safety. Avoid steps or any feature such as abrupt changes in ground surfaces which pose a hazard to those who are blind, or to any pedestrian. Raised pedestrian tables shall continue across vehicular routes where pedestrian traffic is meant to dominate. All slopes on these ramps shall be less than 1:12. Where possible, rework surrounding sidewalk to accommodate the reduced slope. Cross slope on the ramp floor shall be 2% max. Curbcuts shall be concrete with 4'x 6'slip-resistant, 70% color contrasting brick pavers as a visual warning. Rectangular shape curbcuts are to be used in locations where landing is less than 48".

Dropoff Zones

Where passenger loading zones or parallel parking spaces are provided, pull-up space must be the width of passenger vehicles plus 60 inches. Curbs at dropoff zones must have curbcuts or provide access to an adjacent sidewalk. Plans should show the layout of dropoff zone/parallel parking and access to adjacent sidewalk or building entrance, etc.

2.3.5 Parking

General Guidelines

Intent

Parking lots shall be designed in accordance with the Master Plan. They shall provide safe maneuverability and storage of vehicles (including motorcycles and bicycles) with safe integration of pedestrian networks to campus destination points.

Resources

Code of Federal Regulations

Campus Master Plan

All determinations of space and access aisle size, handicap space location, and number shall comply with ADA Standards for Accessible Design requirements.

Design Criteria

Provide parking for each facility in numbers to serve facility occupants/users/visitors, to support adequate service vehicles, and to compensate for any parking lost with development. Parking areas shall be subdivided by planting islands and pedestrian ways. Planting areas may be used as infiltration bays to trap surface runoff. Reinforce traffic flow and pedestrian movement with paving material changes, special planting, and lighting.

A minimum parking stall dimension of 8'x 18' shall be provided. Each handicap parking space shall be a minimum dimension of 8'x 18', and have a 60-inch access aisle. Accessible van parking must also be provided using a 96' aisle (see ADASA Universal Design for Parking). All minimum stall depths and module widths shall be measured to the face of curb when curb and gutter is used. All parking facilities shall have dimensions as outlined in figure 9, page 26 of *the Code of Federal Regulations* 28 CFR part 36. All distances from buildings to parking or transit services shall be limited to 200" or less.

At locations where sidewalks abut a parking bay, the walk shall be a minimum width of 6 feet.

2.3.6 Site Utilities, Including Storm Drainage

General Guidelines

Intent

As site utilities encompass multiple services, you may be referred to other sections for detailed discussion.

Resources

See also sections 2.8.1, 2.8.5, 2.8.6, and 2.9.2. Information on existing site utilities is available in various formats from Facilities Planning and Construction.

Documentation

The designer is expected to document fully all existing site conditions and utilities and show clear points of connection to existing utilities. Areas where existing utilities must be disturbed or relocated are to be delineated clearly.

Design Criteria

Location Considerations

Care should be taken when laying out locations of drain inlets, light poles, manhole covers, etc., to avoid crosswalks where curbcuts for accessible routes occur. Where utilities must be located on sidewalks or accessible routes, their surface elevation should be no higher than 6" above the gutter elevation and flush with the surface of the sidewalk.

Domestic Water

Domestic water and fire service is provided through a private (university-owned) distribution system connected to the City of Pembroke. Individual metering and cross-connection protection is required for individual buildings. Intra-building cross-connection protection should follow the guidelines in section 2.8.6 Plumbing System Design. Building meters may be inside the building but must be accessible to maintenance personnel. Main backflow preventors shall be located inside the building.

Sanitary Sewer

Sanitary sewer service is provided through a private (university-owned) collection system connected to the City of Pembroke Sewer System. Buildings with separate lab waste systems should include a sampling manhole outside of the building prior to combination with the normal building waste stream.

Electrical

See section 2.9 Electrical Systems. A diagram and study of the Campus Primary Distribution system is available.

Telecommunications

The university is the primary provider of voice and data services throughout the Campus. The designer must include provisions for raceways, wiring, and patch panels to be included in the construction.

Natural Gas

Natural gas is provided to the campus by NCNG, but the University owns its own gas distribution system.

Stormwater Drainage

Stormwater drainage systems must comply with campus stormwater management plans. Both temporary and permanent site stormwater management is required.

2.3.7 Underground Tanks and Piping

General Guidelines

Intent

Underground tanks and piping include all underground tanks in general and tanks containing hazardous and petroleum based products specifically. The specific design of underground tanks depends on the materials to be stored in the tanks

Design Criteria

Steel tanks shall have cathodic protection. All tanks shall include sand cushion, swing joints on piping, and ballast pads. Monitoring systems shall be included as appropriate to the materials being stored.

2.3.8 Exterior Fixtures

General Guidelines

Intent

Exterior furnishings shall be compatible with surrounding architecture and site features.

Documentation

The designer shall forward to the project manager the manufacturer's product information sheets of all specified products.

Design Criteria

Location Considerations

Street furniture, bicycle racks, signs, or protruding objects of any kind shall be placed so that there is an accessible route of 48" minimum in width around them. Accessible routes are to be maintained at all times.

Bollards

Permanent bollards are used to separate pedestrian and vehicular traffic and for protection of landscape features from damage by vehicles. Bollards and footings shall be indicated in plan and section detail.

For effective vehicular barricades, use 5'OC spacing. Fire lanes, service areas, and maintenance access may not be restricted by bollards.

Trash Cans

Place trash cans for convenience of pedestrians at high traffic pedestrian locations, intersections of pathways, entrances to buildings, outdoor recreation, seating and dining areas, and along pedestrian ways. Include trash cans, locations, and details for installation in project plans and specifications.

Mount cans to existing hardscape features in the environment or on a post.

Ash Urns

Provide exterior ash urns at designated outdoor smoking areas or other areas where cigarettes may be extinguished. Include exterior ash urn locations on project plans. Location of urns shall not obstruct 5' x 5' accessible maneuvering space at entrance.

Place ash urns on level, paved surfaces near building entrances under overhang or porch cover where possible and near outdoor seating.

Hose Bibs, Watering Hydrants, Irrigation

Place hose bibs every 200 linear feet of building face. Place yard hydrants every 100 feet away from the building in areas requiring water for landscape or clean-up purposes.

Pools and Fountains

Exterior pools and fountains shall be integrated into the landscape sparingly as a focal point for a major courtyard or outdoor space serving many. Avoid confined spaces as defined by OSHA. Design fountains with ease of on-going maintenance and repairs in mind.

Benches

Benches other than the standard provided in the details section shall be approved by the Facilities Planning and Construction and Physical Plant.

Fencing

Chain-link security and barrier fencing shall be black-vinyl coated.

Drinking Fountains

Exterior drinking fountains shall be precast exposed aggregate concrete freeze proof, barrier-free type similar to Haws model 3176FR.

Blue Lights

Site design must be received for possible siting of "Blue Light" emergency phones. "Blue Lights" must be accessible and require coordination for power, telephone, and future closed-circuit TV tie-in. Fixtures shall be "Code Blue."

2.3.9 Landscaping

General Guidelines

Intent

Landscaping may be used to define outdoor spaces, to screen and channel views, to improve climate, to abate noise, for esthetics, to complement architecture and other site forms, and for the enjoyment of nature.

Because of limited maintenance resources, use ornamental plantings conservatively and at locations to maximize their benefit: along pedestrian ways, at building entrances, outdoor seating areas, and at places where people can enjoy plants up close.

Foundation plantings shall be planted so that at maturity maintenance personnel can walk between the building face and the plant material.

In "natural" areas, greenway-type space, use native plant materials.

Plant material shall be arranged with safety and security issues in mind. Plant material over 3 feet in height at maturity shall be 10 feet from the edge of walkways to provide visual clearance.

Resources

The Facilities Planning and Construction and Physical Plant are available for recommendations and guidance. A recommended additional reference is *Standards for the Pruning of Shade Trees*, National Arborist Association, publisher. Also see the approved Plant List in the Appendix of this Section.

Documentation

Complete descriptions of specified landscaping material, along with fully detailed plans, are required.

Design Criteria

The designer should examine and test the soil and other environmental conditions carefully and select plants appropriate to the site. The designer shall be present to inspect and accept landscape materials delivered to the site.

Trees

Trees, because of their great visual and climatic impact, are the most important elements of the planting plan. Tree plantings present the greatest opportunity to unify campus neighborhoods visually.

Integrate new plantings with the surrounding context in accordance with the Master Plan and with guidance from Physical Plant and the Facilities Planning and Construction. If no tree species is identified for the project area, develop a planting plan that complements and enhances surrounding tree plantings.

Locate trees so leaves and needles do not collect on rooftops or in utility areas. Give each tree a large mulch area (ring or square) of at least 6 feet in diameter or width for 3-inch (and under) caliper trees. For larger caliper trees, increase the mulch ring size.

When possible plant trees in a group within a continuous mulch bed to avoid mowing around trees. Where this is not practicable, place trees a minimum of 15 feet on center for ease of mowing around trees. Where possible, plant trees with fruit and other droppings in large mulched or naturalized areas to avoid plant droppings in lawn or on pedestrian surfaces.

Trees should not be planted in such a manner that they will create present or future competition with each other, or with utilities, or above- or below-ground infrastructure.

Shrubs

Shrubs provide screening, barriers, and pedestrian channels while adding interest to the landscape. Select shrubs with mature form and size in mind. Take care to avoid security and sight distance problems for pedestrians and motorists. Select shrubs to avoid pruning so that shrubs may attain their natural height and shape without becoming security issues and without crowding or damaging building faces or other features in the landscape. As with trees, shrubs should not be planted to cause future competition. The design should take into account the mature size. Preferred varieties are yaupon hollies, dwarf nandina, and barberry.

Ground Covers

Ground covers shall be used to stabilize steep slopes, to reduce maintenance on slopes, and to add visual interest at the pedestrian scale. Choose plant materials with low-maintenance qualities. Avoid most broadleaf ground covers. Choose ground covers that can be chemically weeded. In large areas, treat the soils for weed seeds with pre-emergents.

Lawn

Mowed lawn areas should be used sparingly as a focal point in the landscape or as a recreational surface. Use lawn in large, easily mowable open space areas. Seed should be rye and centipede. Sod should be hybrid Bermuda.

Annuals

Use annuals sparingly at places with visual impact such as campus and building entrances, campus edges, and other high-traffic areas. Funding is not provided for maintenance of annuals. If annuals are to be included, they must be supported by a sustained maintenance budget.

Mulch

Mulch shall be used for plant bed cover, tree rings, and in shady areas that do not support other plant or lawn growth. Mulch shall be pine straw (clean). Mulch on steep slopes shall be tacked down with landscape netting until stabilized. Labels should be of permanent quality, and be affixed for educational purposes.

Soil

Each project site shall provide adequate topsoil for lawns and landscape planing areas. Provide a planting plan with botanical and common names. Label plant graphic symbols with the plant name (i.e., Ilex comuta), not plant key (i.e., IC).

Landscape Protection

Contractors are required to provide protection to landscape features that are not scheduled to be removed. This includes tree protection, sidewalk protection, and shrub protection. Damaged items will be replaced.

Vehicular Access

The contractor shall bridge all access and staging areas not located on roadways, designated parking areas, or reinforced paving. Examples of areas to be bridged are (but not limited to) brick paving, planting beds, grass areas, sidewalks, and curbs. The contractor will provide bridging materials for this purpose. A minimum of 3/4" 4'x8' plywood sheets are required for loads up to 9,000 lbs. For loads over 9,000 lbs, 2 layers of 3/4" plywood are required.

Irrigation

New plant beds shall be irrigated, and existing campus irrigation systems shall be extended as appropriate for new projects.

2.3.10 Exterior Lighting

General Guidelines

Intent

Lighting fixtures shall be approved by owner. Use vandal-resistant standards with raised concrete base for pole fixtures. Bollard lights may be used as an architectural feature to define the building entrance. Area safety lighting is required as well. Lighting of selected trees can also be used for safety purposes as well as to improve aesthetics.

Design Criteria

1. Follow EPA GreenLights recommendations and IES recommended lighting levels.
2. Use highly efficient lighting systems that improve lighting and meet the needs of the residents.
3. All outside and inside perimeter lighting should be on photocell controls.
4. All outside lighting must be designed for low temperature operation and protected from weather.
5. Maintain standard set of fixtures/tubes/components for facility. Minimize variations.
6. All hardware to have one-year warranty period following project acceptance.
7. Follow recommendations of the UNCP Lighting Study regarding implementation.
8. All exterior lighting shall be controlled by one of the existing lighting centers.

2.3.11 Outdoor Waste Collection

General Guidelines

Intent

Large waste containers shall be confined to service courts. With building renovations for existing facilities it shall be the goal of the design to consolidate and locate these operations within existing courts as part of the renovations Where service courts do not exist, create

new service areas screened architecturally from public view. Renovations may present the opportunity to examine waste collection and recycling operations of the surrounding area and further consolidate these activities

Documentation

Plans shall indicate the location of trash bins/dumpster boxes and engineering for paved approaches and pad.

Design Criteria

Service courts serve many functions. They provide an area for routine maintenance access to the building and a location for extra generators and construction dumpsters, for mail delivery, and for the collection of waste.

Service courts shall be accessible to a front-loading, 40' long trash truck. This requires 16' height overhead pass-through clearance, 23' height dump clearance at the dumping site, a 42' turning radius, and a 75' straight approach to the containers. Dumpster pads requiring drains shall connect to sanitary sewer and be designed not to receive stormwater. It is desirable for the dumpster containers to be located under cover.

Where containers abut a building or other site feature, place protective bollard(s) between the container and the feature that needs protection. Ensure pedestrian access to the container opening. Provide paved paths from the custodial exit of the building to the containers adequate to roll trash carts.

Dumpster pads and approaches shall be of reinforced concrete. Dumpster pads shall accommodate 8 cu yd containers. Trash containers shall be architectural bronze and provided by owner or by approved service contractor.

Collection areas shall be accessible. Consider recessing containers in the ground to provide accessible access, or other methods.

2.3.12 Exterior Signage

General Guidelines

Intent

It is the intent of the university that all exterior signage be uniform and attractive, enhancing the professional appearance of the campus while providing clear wayfinding instructions. To this end, the guideline referenced below has been developed.

Resources

The design guide for all campus **exterior** signage is the UNC-Pembroke *Campus Exterior Signage Plan*.

Design Criteria

Please refer to the UNC-Pembroke *Campus Exterior Signage Plan*, which are available from the project manager upon request.

2.3.13 Design Guidelines for Rails

General Guidelines

Intent

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 pedestrianways 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.

Resources

The minimum design standards as described in the following documents shall be employed:

NC State Building Code, volume I General Construction
Occupational Safety and Health Standards for the Construction Industry, with Amendments as of October 1, 1994
Code of Federal Regulations 28 CFR Part 36 (ADA), revised July 1, 1994

UNCP Masterplan

In addition, designers should follow the design criteria below.

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 rail.

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 if a rail or other hardscape element is removed to install the proposed rail.

Design Criteria

Rails attached to buildings shall be designed in context with their surroundings, be appropriate to the use of the building, and respond to the architectural style, materials, and finishes of the building. For example, the front or main entrances of a major academic building may have rails with special finishes or detailing. A storage building entrance or building service entrances that do not need to be publicly "celebrated" shall respond to the architecture and materials of the building with the simplest, most economical, low-maintenance materials and design.

Freestanding rails in the environment shall be designed in context with their surroundings, be appropriate to the use of the space, and use low maintenance materials such as stainless steel. Those rails in primary campus areas such as courtyards, major pedestrian spaces, and along campus edges may have a detailed design, color, finish, and materials that may require a higher level of maintenance than rails in secondary pedestrian areas.

Radial bends are preferred for freestanding metal rails in secondary pedestrian areas. End rails shall not overhang the terminal posts. Design rails to minimize impediments to circulation space on steps and path intersections and to maximize alternative use of stairs for social gathering and seating. Generally, metal rails are preferred for all rails. Where

possible, attach rails at steps into existing cheek walls. Detail connections to hardscape with care.

When installing rails into pavers-on-screenings, remove pavers, set rail in adequate footing below grade, and reset pavers on 1" minimum screening bed above the footing. Cut or core drill the brick pavers to conform to the shape of the post.

When attaching pre-fabricated rails into existing hardscape elements (solid steps, walls, slabs), core drill, insert rail, and set with quick-setting grout. If the existing structure is inadequate to support the rail, it must be removed with clean sawcuts at existing mortar, control, or expansion joints and rebuilt with an adequate footing. Shed water away from post at all base connections. When removing existing rails, remove all hardware and repair the surface to match existing. Avoid field joint welds on stainless steel, aluminum, and powder-coat rails. Align expansion joints vertically.

Radial bends are preferred for freestanding pipe rails. Mitered corners, steel "knuckles," and other joint fittings may be used at appropriate locations in context with surrounding architectural detailing.

Aluminum presents special considerations, since it is a weaker material than steel. Use Schedule 80 aluminum pipe. Provide adequate expansion joints by sleeving sections of pipe to alleviate stress on welded joints. Horizontal joints must be butt welded with sleeves. Protect aluminum in contact with other materials (i.e., concrete, metals) according to the *Pipe Railing Manual*.

Chapter Appendix

Section 1 – UNCP Digging and Excavating Policy and
Form

Section 2 – List of Approved Plant Material

Section 1

UNC Pembroke Physical Plant

Instructions for Preparation of Digging and Excavation Request Form

- A. **Purpose:** This form is to be used to provide the Physical Plant Administration with the appropriate information needed for authorization prior to digging and excavation operations on the UNCP campus and to ensure proper understanding of and compliance with the Digging and Excavation Procedure.
- B. **Where to Obtain Form:** Blank forms may be obtained from the Physical Plant Administration Office reception desk.
- C. **Distribution of Complete Form:** The requestor will complete the top portion of the form and deliver it to the Physical Plant Work Order desk. The Work Order clerk will initiate a work order to the appropriate shop, requesting that the shop accomplish the necessary site clearing, inspection and marking of utilities. After completion of the utility marking, a copy of the signed approval will be returned to the requestor. The requestor must have a copy of the signed approval prior to commencing digging work.

UNC Pembroke Physical Plant DIGGING AND EXCAVATING CONTRACTOR REQUEST FORM

General Guidelines/Instructions:

- This completed request should be submitted to the Physical Plant Work Order Control Center (521-6233).
- An appropriate area sketch should be attached to this request form.
- **UNCP Physical Plant request a minimum of 48 hours (after request submission for schedule and completion of utility markings)**
- UNCP Physical Plant will contact the telephone number and schedule or leave message of the planned date/time of locating utilities. Physical Plant recommends that the requestor/designee review the located utilities during or immediately after the markings. If the requestor/designee is not present during the Physical Plant utility locations it is the responsibility of the requestor/designee to contact and schedule a review with the Physical Plant locator/designee.
- **Responsibility:** The requestor/company will be responsible for repair cost to damaged underground utilities due to neglect or misunderstanding of marked utilities.
Tolerance: Physical Plant recommends hand digging any areas of the designated path within 2 ½ foot of UNCP marked utilities.
- **Surface Repair:** The requestor/company will be responsible for backfill (including settlement) and reseeded the trenched areas. Recommendations include reseeded with centipede and rye. Wheat straw is not recommended to cover the surface.
- **Valid Permit:** This permit will be valid for the completion of the entire project. In the event a remarking of requested areas is necessary a new permit/request will be required. Erasure of marked areas due to weather (after the requested date) is the responsibility of the requestor to verify and/or request a new permit.
- **It is the responsibility of the requestor to contact "NC ONE CALL" for telephone locations. UNCP Physical Plant will locate all other utilities on university property (electrical, fiber optic, gas, water, storm drainage, irrigation) UNCP will contact Time Warner Cable at 738-2427 for television cable locations.**

Requestor: _____ **Phone No.** _____

Company

Name: _____

UNCP

Project

Name/Number: _____

Purpose:

Date Utilities are requested to be marked: _____

Estimated Project Start Date: _____ **You must have an approved digging permit**

before starting work.
(Telephone #:1-800-632-4949)

“NC ONE CALL” Assigned # _____

Requestor Signature: _____ **Date:** _____

FOR PHYSICAL PLANT USE ONLY:	Record # _____
	Work Order # _____
<i>AREA UTILITIES LOCATED AND IDENTIFIED BY</i> _____	<i>DATE</i> _____
<i>PHYSICAL PLANT DIRECTOR/DESIGNEE APPROVAL</i> _____	<i>DATE</i> _____
<i>Copies should be distributed to the requestor and the UNCP Department of Design and Construction</i>	
<i>COMMENTS:</i> _____	

Section 2

PLANT LIST FOR NEW PLANTINGS

RUSSIAN SAGE

GINKO
WITCH HAZEL
MEDLANIA ROSES
OSMANTUS VARIGATED
CAMELIA
DAY LILLIES
TULIP POPLAR
AMERICAN BEECH
FORMOSA AZALEA
ORNAMENTAL GRASSES
SWEET SHRUB
BEAUTY BERRY
PAW PAW
QUEEN ANNE'S LACE
SUN FLOWER
STOKES ASTER
AJUGA
PALMETO
YARROW
BOTTLE BRUSH
SERVICE BERRY
SOUR WOOD
GALLBERRY
VIBURNUM SPARKLE BERRY
VITEX
ECULYPTUS
DECIDUOUS AZALEAS
YELLOW BELLE
SPIREA
TRUMPET VINE
WISTERIA
YELLOW JESSAMINE
CLEMATIS
CANDY TUFF
VIRGINIA CREEPER
GARDENIA
COLUMBINE
HYACINTH
VINCA MINOR
VINCA MAJOR
SNOW DROPS
TULIPS
JONQUILES
IRIS
COREOPSIS
GLADIOLUS
LILLIES
POPPY

**SWEET PEAS
PETUNIA
VERBENA
ZINNIA
BLUE BERRY
SYRINGA
WILLOWS
BLUE GRASS
POTELLA
BROOMS
PRIMROSE
CYCLAMAN
SANTOLINA
AEGOPODIUM (BISHOP'S GOUT WEED)
RED HOT POKER
TURK'S CAP
BLUE FESCUE
HAWTHORN
CROCOSMIA
CROCUS
DAWN REDWOOD
DIANTHUS
FOXGLOVE
ELEAGNES
HALESIA CAROLINA(SILVER BELL)
BAY TREE
BANANA SHRUB
PASSION VINE
MOCK ORANGE
ALTHEA
PYRACANTHA
CONFEDERATE ROSE
SCILLA
STAR OF BETHLEHEM
LANTANA
RED TWIG DOGWOOD
YELLOW TWIG DOGWOOD
CHOKEBERRY
GREEN ACUBA**