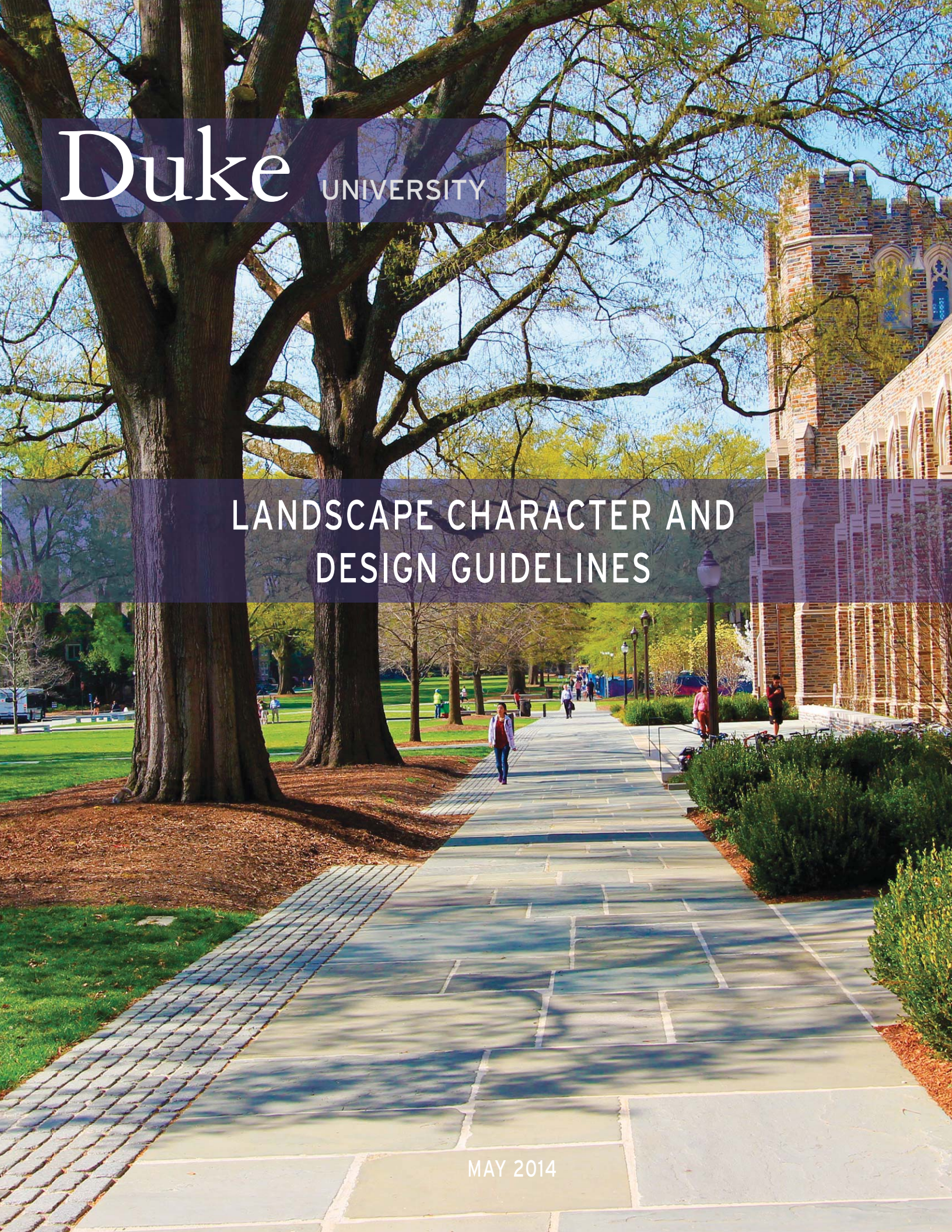


Duke UNIVERSITY

LANDSCAPE CHARACTER AND DESIGN GUIDELINES

MAY 2014

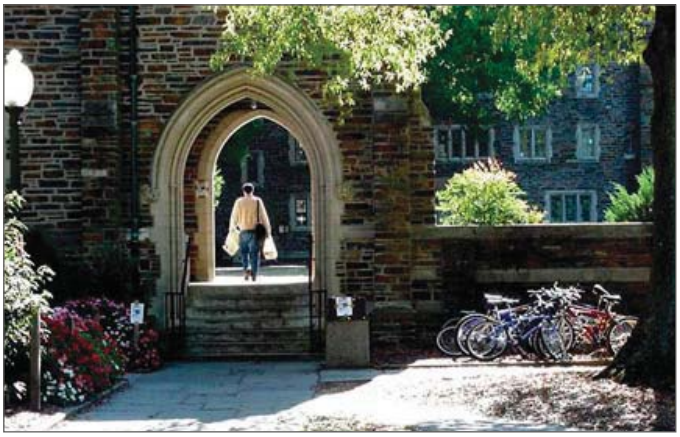


TABLE OF CONTENTS

Duke's campus is relatively large and spread out compared to many other universities. The main part of campus - aside from the Duke Forest and other properties - is nearly 2000 acres, with approximately 500 acres of that being actively maintained. The large amount of tree coverage, road network, topography, and natural drainage system, along with extensive designed landscapes, athletic fields and gardens, makes the campus an incredibly rich and complex place.

These guidelines are intended to be a resource for creating and maintaining a campus landscape with a certain level of consistency that exists across various precincts with specific contextual requirements. These guidelines will help to set the character for the different landscape types while also providing detailed recommendations and precedents for what has and has not worked on campus previously.

2024 Master Plan Illustrative Update - Campus Landscape

INTRODUCTION

DUKE IS A PREMIER UNIVERSITY:

Ensure the quality of all buildings, landscapes, and infrastructure as an expression of the University and as a reflection of the values of the institution

- by supporting strong master plan oversight with a process for continuous review and
- by following design and construction guidelines that support a high- quality built environment.

DUKE IS A HISTORIC AND DYNAMIC CAMPUS:

Strengthen the identity of the Duke campus as a continuously evolving environment with a unique historic beginning

- by identifying selected buildings and landscapes that should be preserved;
- by ensuring that new development contributes to, rather than detracts from, the existing environment; and
- by respecting and responding to Duke's historic architectural and landscape character while incorporating contemporary design where appropriate.

DUKE IS A UNIVERSITY IN THE FOREST:

Preserve and strengthen the identity of the Duke campus as a community within a forest

- by identifying natural areas to be preserved, particularly selected areas of the Duke Forest,
- by identifying natural areas that need to be conserved and restored, limiting construction and interventions to those that maintain the quality and character of the natural environment;
- by limiting expansion and using infill development where possible. and
- by identifying means of preserving tree canopy, habitat and air & water quality.

DUKE IS A COLLECTION OF MEMORABLE PLACES:

Direct development toward the creation of human-scale open spaces with distinct character

- by ensuring that all buildings and landscapes be viewed as part of their context, not in isolation;
- by ensuring that the landscape contributes to the campus aesthetic experience
- by seizing opportunities to improve the quality of the campus; and
- by relating building entries to streets, open spaces, plazas, and other buildings.

DUKE IS A LEADER IN ENVIRONMENTAL STEWARDSHIP:

Ensure that buildings, landscapes and natural areas are created and sustained to create a campus community that conserves natural resources, restores environmental quality and protects biodiversity.

- by being mindful of the interrelationship of human and natural systems;
- by designing to meet or exceed accepted standards for sustainability;
- by conserving energy, water and other natural resources;
- by reducing greenhouse gas emissions and solid waste;
- by developing and encouraging alternative transportation options;
- by fostering a healthy ecosystem and diverse habitat through the use of native plants; and
- by recognizing the built and natural environment as a 'living classroom' for the University and Durham community.

DUKE IS A PEDESTRIAN CAMPUS:

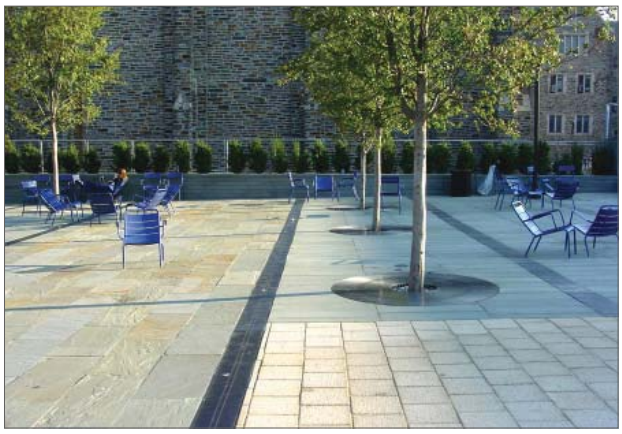
Redefine the movement systems throughout the campus to be functional, safe and comprehensible, built on a visible logic that supports wayfinding, "placemaking," and the cohesiveness of the overall campus

- by clarifying points of entry into the campus;
- by reducing vehicular through-traffic on campus;
- by creating universally accessible buildings and landscapes where possible;
- by integrating pedestrian, bicycle and transit circulation into the overall movement system, separating such systems where appropriate; and
- by exercising caution in the location of parking areas

While there is no desire to replicate historic design character to all locations across campus, there is an expectation that established precedent will inform all site design and landscape architecture. Even the most contemporary landscapes should still be recognizable as being of Duke, in terms of scale, materiality, quality of craftsmanship, color palette and use of various landscape elements.

Historic

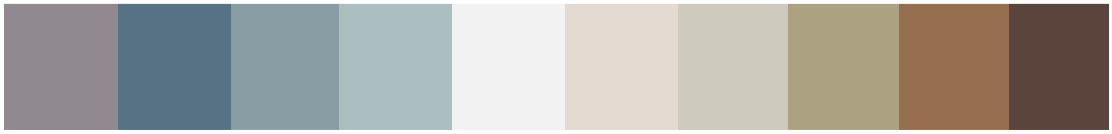
Historic Contextual



Contemporary Contextual

DESIGN CHARACTER

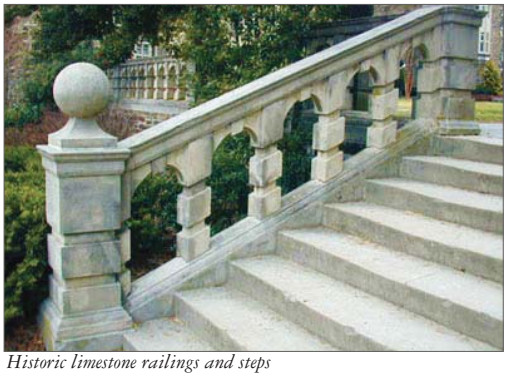
The over-arching philosophy behind the design of the Duke campus is that the landscape, including the predominance of the tree canopy, plays a defining role in creating a consistency in character. The East Campus Landscape Guidelines (produced by OUA in 2005) remains the document to refer to for that portion of the campus. West Campus is is much larger and has more diversity in context, and is therefore guided by less stringent standards. A basic color palette, established by historic campus precedent, should be used when selecting materials



Duke stone and Duke blend brick

Duke stone and bluestone paving

Bluestone and concrete pavers

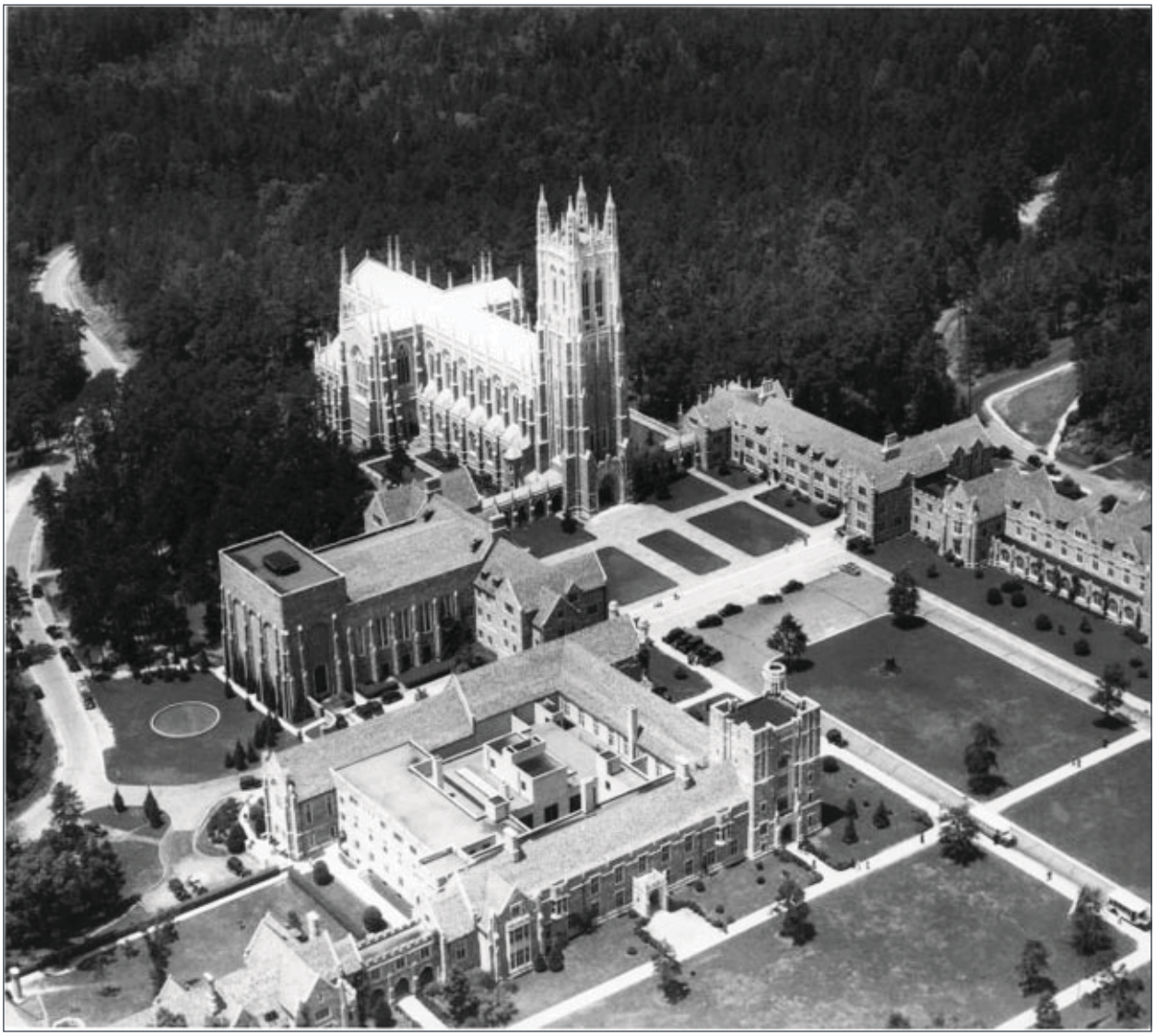


Historic limestone railings and steps

Full color range bluestone paving

Duke blend brick and precast concrete cap

WEST CAMPUS COLOR PALETTE



Duke's two legacy landscapes,the East and West Campus Quadrangles, display the traditional campus model of lawn-covered open spaces framed by buildings and punctuated with large canopy trees. Both are important examples of the traditional American campus, designed by the significant landscape architecture firm - Olmsted Brothers.With each landscape having reached - or surpassed - its mature status at nearly 100 years old, they are in need of complete restorations.

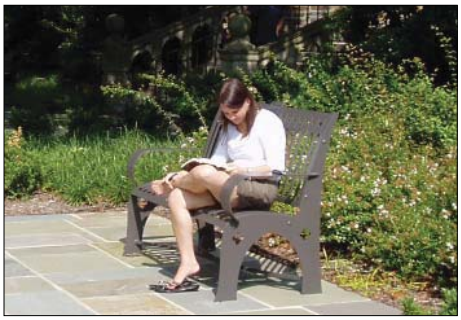
East and West Quads both have specific features and elements that define their character, and will be discussed in the upcoming chapter. However, there are some overarching issues that need to be considered:

- Replacement of existing historic features need to replicate original design intent where possible;
- New design interventions may reflect contemporary expression, but must relate directly to the scale, materiality and aesthetic character of the historic spaces;
- Maintaining the health of historic trees must be paramount;
- New landscape planning and design must strive to meet the University's commitment to creating a sustainable campus;
- Planting should be designed in a consistent manner with specific focus on low-maintenance and drought-tolerant plants that display multi-seasonal interest;
- All new planning and design for these spaces needs to balance historic design intent and contemporary program requirments in a manner than is sensitive to both,

HISTORIC LANDSCAPES

WEST QUAD

The West Quad is the picturesque embodiment of the entire campus landscape at Duke, even though it is only one small part. Landscape design guidelines were created by the Office of the University Architect in 2003 and. along with ongoing resoration work, should be referenced in regards to material selection.



Materials Palette

Planting:
Simple palette of low shrubs, trees, and groundcover that provides interest across different seasons by mixing deciduous, flowering and evergreen plants

Paving:
Bluestone in random ashlar pattern is the standard for all historic walks; uniform bluestone patterns allowed in contemporary applications; granite edge along main, interior walkway.

Seating:
Granite benches by NC Granite Corp. in special locations
Standard metal benches by Vega Metals
Wooden student house benches must be accommodated

Lighting:
Standard Duke acorn fixture

Site Walls and railing:
Duke stone with limestone cap
Historic railings or bronze to match/complement

EAST QUAD

Complete landscape guidelines and standards were produced by the Office of the University Architect in 2005. These should be referred to in regards to detail material selection and planting.

Materials Palette

Planting:
Simple palette of low shrubs, trees, and groundcover that provides interest across different seasons by mixing deciduous, flowering and evergreen plants

Paving:
Brick, marble, bluestone at buildings and poured concrete

Seating:
Granite benches by NC Granite Corp. in special locations
Standard metal benches by Vega Metals
Wooden student house benches need to be accommodated

Lighting:
Historic and contemporary version of globe fixture are required within the Quad. Up-lighting of Baldwin and other speciall situations will be considered as needed.

Site Walls and railing:
Bricks with limestone cap
Historic railings or bronze to match/complement

Since its inception, Duke has, for obvious reasons, considered itself a University in the forest. Trees are perhaps the single most important feature that defines the campus landscape and remnant woodlands make up significant, if shrinking, acreage on campus. It will be increasingly important to not only conserve what is left of the natural areas on campus, but to also cultivate the next generation of tree canopy and open spaces.

Naturalistic landscapes does not just refer to natural places; it also includes designed landscapes that are meant to evoke less formal places or those that take the natural environment - forests or wetlands - as their inspiration. How these places are designed will depend on their level of use and access. Where there will be 24-hour access by pedestrians, they must be safely lit and barrier-free where possible. Places that are accessible but not lit must be identified as closing at dusk in order to discourage people from entering them at night.

These landscapes should be seen as elements within the larger ecology of the campus while designed as individual and healthy ecosystems. As a general rule, native plantings should be used in these types of landscapes, with limited amount of manicured turf. The exception to this is within park landscapes, where turf is an important part of the landscape. .

NATURALISTIC LANDSCAPES

REFORESTATION AND MANAGED WOODLANDS

Duke's West Campus was originally designed and constructed as a "university in the forest" and that ideal has remained important throughout the decades of its development. Although there are few substantial natural woodlands remaining in the core of campus, there are several remant woodlands that need special attention. Management, operational and conservation issues are important when dealing with natural and managed woodlands that go beyond the purview of these guidelines.

PG-IV

Considerations:

- From a design perspective, the most important consideration is the creation of a healthy, diverse ecosystem that will survive into maturity and tie together the campus canopy;
- Paths through woods should be adequately lit for safety or signified as for day use only

Chapel Woods

Materials Palette

Planting:
A broad mix of native canopy and understory trees and shrubs. Diversity and seasonal interest should be considered. Species selection needs to respond to native habitat requirements related to sun exposure, water and soil.

Paving:
Hardwood mulch or stone dust.

Seating:
Teak benches by Country Casual
Other furniture is acceptable depending on location and context

Lighting:
Standard Duke acorn fixture

Law School Beber Garden

PARKLAND

A large portion of the Duke campus is made up of park-like landscape, with large, mature trees in open lawn areas. Although large areas of lawn can be maintenance intensive and run counter to broader goals for sustainability, parkland is a common, historically appropriate campus landscape typology. and supports Duke's goal to be a university in the forest. Although not appropriate everywhere, maintaining distinct manicured lawn in certain areas is encouraged as part of Duke's overall campus aesthetic. Options to traditional, high water use turf grasses are encouraged and should be studied. Irrigation should be limited in these types of landscapes.

Campus Drive

East Campus Grove

Landscape at Undergradusate Admissions

Materials Palette

Planting:
Primarily canopy trees in open lawn. Flowering understory trees may be strategically located along edges to add interest.

Paving:
Depends on context but typically mulch or stone dust paths.

Seating:
Teak benches by Country Casual

Lighting:
Standard Duke acorn fixture

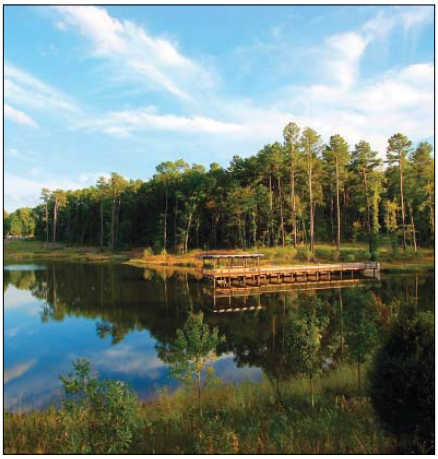
PONDS, STREAMS, WETLANDS AND RAINGARDENS

As the campus deals more directly with water conservation issues and initiatives, there will be an increasing demand for BMPs, rain gardens and other stormwater devices in the landscape. These are viewed as very natural looking environments, but still will be considered campus spaces that must meet aesthetic criteria and expectations.

The SWAMP

Considerations:

- These types of landscapes should have an educational component to them and include interpretive signage when and where appropriate;
- Level of required maintenance - from both an engineering and horticultural perspective - needs to be a driving factor of design and plant selection;



Duke Pond

Materials Palette

Planting:
Native plants that support and foster a healthy ecosystem are to be used. Non-natives and exotic plants should not be used, with a specific mandate against the use of any plant that could potentially become invasive. The use of plants that provide seasonal interest - primarily in spring and fall - is encouraged.

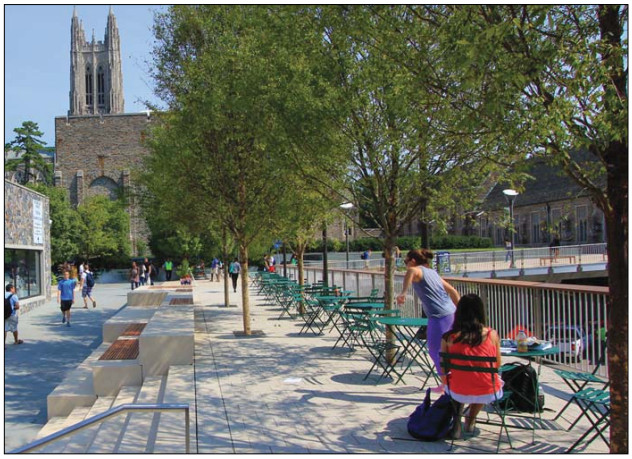
Paving:
Paths are to be made of soft materials such as stone screenings or mulch

Trent Semans Center

Seating:
Teak benches. The use of natural or special designed benches will be considered in specific areas removed from the more formal places on campus.

Lighting:
Many of these spaces are to be used only between dusk and dawn and, therefore, do not require lighting. When needed, the standard Duke acorn fixture is to be used.

Site Walls and railing:
Walls in natural areas should be Duke stone, unless another proposed material is specifically approved. Railings may be of either weathered steel or standard painted steel.



One of the most important principles outlined in Duke's Master Plan states that "*Duke is a collection of memorable places*." The goal of this is to ensure that all projects with a site component contribute meaningful open space to the overall campus landscape. The result of this has been the creation of many well-designed public landscapes, including the West Campus Plaza, Science Terrace, Engineering Quad, and others, that have added to the beauty and functionality of the campus.

For the sake of this document, "public landscapes" are identified as those designed spaces that serve a functional and programmatic use for the campus. They can be high or low use spaces but need to be accessible to the Duke community.

The design of these spaces need to relate to specific sites and context but should all use appropriate site furniture and other design elements to ensure they look and feel like "Duke" spaces. They must be universally accessible and well lit, with provisions made for bicycle parking and circulation.

PUBLIC LANDSCAPES

PLAZAS

Plazas are integral to implementing the principle that Duke is a collection of memorable spaces. They are identified as predominately hardscape areas built to accommodate groups of people for a variety of activities. Since they are often located adjacent to buildings, their character and detailing will depend heavily on the specific context and architecture. The goal, however, is to establish consistency between them through scale, paving, lighting, site furniture and detailing.

Bostock Plaza

K4 Plaza

Krzyzewsiville Plaza

West Campus Plaza

Considerations:

Plazas should be designed and detailed with the highest quality materials;
Varieties of sub-spaces within the overall space should be created in order to provide different experiences and opportunities for social interaction;

Materials Palette

Planting:
A limited selection of trees and, in some cases, evergreen groundcover. Shrubs are typically discouraged but, if used, should be in designed masses or hedges that respond to the geometry of the plaza and its detailing.

Paving:
Brick (Athletics and East Campus), bluestone (high impact and in/adjacent to historic areas), exposed aggregate concrete, and concrete unit pavers (within color range and approved) are all acceptable depending on context and location.

Seating:
Loose seating is suggested for plazas. The selection of furniture must come from pre-approved list and will be chosen based on a variety of issues, such as proximity to food service and design context.

Lighting:
Standard Duke acorn fixture or standard plaza-style down-lights (within contemporary areas) acceptable. Up-lighting trees and other types of lighting will be considered

Miscellaneous
Suggestions for special features - such as the mist fountain on the West Campus Plaza - are open for discussion.

GARDENS

Gardens on campus are typically designated as such by their name. They are usually small, informal spaces with limited hardscape and a horticultural intensity greater than what is usually found in the campus landscape. Sarah P. Duke Gardens is not included here, but should be used for inspiration and precedent.

Consideration:

Gardens need to be designed with the overarching goal that they be low-maintenance, water-efficient and have multi-seasonal appeal.

Materials Palette

Paving:
Bluestone is the preferred paving material where possible and appropriate. Its patterning and color selection should depend on its context. Brick pavers are acceptable on East Campus and in the Athletics Precinct. The Duke standard exposed aggregate concrete may be used as a complement to bluestone. Avoid using plain poured concrete or concrete pavers. Soft materials such as stone dust, mulch or gravel; may be used, preferably when removed directly from building entrances.

Site Furniture:
Most standard site furniture is acceptable and should respond to the site's context and program.

Lighting:
Standard Duke fixture, up-lighting on trees and low-scale path lighting in specific locations

Planting:

- select plant material for multi-season interest,
- select low maintenance, drought tolerant plants where possible,
- select only long lasting perennials and balance them with evergreen plants that provide year-round structure,
- avoid annuals except in certain specific, high impact locations,
- devise planting plan in a manner that maximizes the efficiency and effectiveness of the site's stormwater management.


Marcy's Garden at the Law School


Pratt Memorial Garden at Fitzpatrick Center


Beber Sculpture Garden at the Law School


Chapel Garden

COURTYARDS AND TERRACES

Courtyards and terraces may be similar in detailing to plazas, but the scale of the spaces are smaller and more intimate. These spaces are generally directly adjacent to, buildings, and therefore, their design needs to respond to the associated architectural style. This having been said, however, the palette of materials for the site design needs to fit established precedent on campus unless otherwise specifically approved.

Considerations:

- Courtyards and terraces should be designed and detailed as high impact spaces;
- Flexible, movable furniture should be used rather than any sort of fixed furniture;
- The use of seatwalls is encouraged to expand opportunities for seating;
- Spaces need to lit for necessary safety but should not be over lit.

Materials Palette

Planting:
Simple palette of low shrubs, trees, and groundcover depending on campus context

Paving:
Bluestone, exposed aggregate concrete, brick or concrete pavers dependent on context. Other materials can be used if specifically approved. Plain concrete is to be avoided.

Seating:
Loose site furniture; style dependent on location and context, see Duke Standards

Lighting:
Standard Duke acorn fixture or plaza style fixture dependent on context;. Supplemental lighting will be considered.


von der Heyden Terrace


Starr Pavilion Terrace


Craven Courtyard


Fuqua Terrace

PEDESTRIANWAYS

In support of Duke's principle that is be a walkable campus, pedestrian corridors have, and should continue to be, created in order to facilitate movement through campus.

While there is no set definition dictating the dimension and detailing of pedestrianways, they are typically identified as those walkways wide enough to support large groups of pedestrians, and bicyclists where possible. These paths do prescribe a higher level of finish than ordinary walkways, but the look of them will be dependent of context.

West Campus Pedestrianway at Fitzpatrick Center

French Family Science Center

Engineering Quad Walkway

Central Campus Pedestrianway

Considerations:

- Pedestrianways need to be understood as complete elements and designed as such in regards to paving material, site furnishings and planting - even if they are to be completed in phases;
- Pedestrianways need to be sized in a manner that accommodates current and expected future pedestrian traffic;
- Pedestrianways should be as barrier-free as the site will allow - avoiding steps as much as possible. Ramps and other grade transitions need to be incorporated in as seamless a manner as possible

Materials Palette

Planting:
Canopy trees along pedestrianways are encouraged to provide shade and comfort. Shrubs and accent plantings directly associated with the paths should be avoided.

Paving:
Standard exposed aggregate, bluestone, concrete pavers and brick pavers are allowed depending on campus context. Plain concrete is to be avoided, except in specific locations on East Campus (see guideleines)

Seating:
Standard metal benches by Vega Metals

Lighting:
Standard Duke acorn fixture

Campus landscapes are the composite of many disparate landscape spaces. Although the designed landscapes get most of the attention, those areas between buildings and specific projects are just as important in establishing the character of the campus as a whole. These areas are typically made up of informal walkway connections, informal planting and lawns.

Since these spaces are often heavily used by pedestrians crossing campus, it is imperative that they be safely lit and well-maintained. Bicycle circulation must be incorporated into the planning and on-going design of these areas.

It is critical the design projects pay careful attention to the edges of their sites in order to create a seamless experience and character. Logical transitions between designed landscapes and "fabric" areas need to be understood, planned and designed, whether as part of a specific project scope or as future work.

CAMPUS FABRIC

STREETSCAPES

Duke's streets should be designed as complete systems that effectively accommodate cars, buses, bikes and pedestrians. All major streets should be tree-lined where possible, and coordination with utility installations should take place in order to ensure this. Generous sidewalks should tie logically into the overall pedestrian framework of the campus, and traffic measures such as crosswalks, speed-bumps, signage and lighting should be consistent.

Considerations:

Crosswalks and speed bumps need to meet established standards and be prioritized based on location and use

Bike and pedestrian traffic should be kept separate from each other whenever possible

Materials Palette

Planting:

Street trees should be consistent per block but varying species across campus is encouraged assuming a basic consistency in scale and form.

Paving:

Varies depending on location and context - predominately asphalt for roads and integrally colored, heavy duty concrete at bus stops.

Lighting:

Standard Duke acorn fixture - street height along road ways and pedestrian height next to sidewalks and pedestrianways.

Science Drive at Bio-Sci

Towerview at West Quad crossing

Science Drive at Bio-Sci crossing

Science Drive at Thomas Center

INTERSTITIAL SPACES

There are many acres of land on Duke's campus that do not fall within a particular category and are not easily defined by boundaries. These are often the spaces between projects that collectively form the connective tissue that ties the campus together - sidewalks, pathways and low maintenance landscape zones.

These are rarely intensively designed spaces but are important to understand in relation to the campus as a whole and the other landscape typologies.

East Campus

LSRC

PG-IV

Card Gym Lot

Materials Palette

Planting:
Simple palette of low shrubs, trees, and groundcover depending on location and context. It is particularly important to use drought tolerant and low maintenance plants in these areas as they generally receive less intensive maintenance

Paving:
Dependent on context and location but typically plain concrete or asphalt. Exposed aggregate concrete may be used adjacent to buildings or when dictated by context.

Seating:
Teak Country Casual benches, if anything.

Lighting:
Standard Duke acorn fixture

Duke's landscape is envisioned as the cohesive element that ties everything together. An established palette of materials and criteria ensures that this goal is achieved, but there is always room for consideration of new details and materials where appropriate.

The primary concern with all design elements is that they respond to a logical hierarchy. For instance, Duke stone is considered the most important material and is to be used in historic and certain high impact locations. From there, Duke blend brick and other materials may be used based on location and context. Similarly, bluestone paving is the most important paving material - to be used in historic and high impact location - followed by exposed aggregate paving, concrete pavers and other materials dependent on location and context.

East Campus has its own palette of materials and details. Refer to the East Campus Landscape Design Guidelines for that information.

DESIGN ELEMENTS

PAVING: BLUESTONE


Full color range


Limited color range: blue-gray


Uniform color: blue

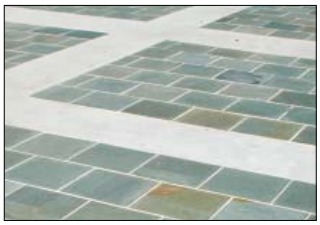
The historic bluestone is all in the full-color range and should be replaced and repaired in kind. Newer applications - even on West Quad - can be in more limited color ranged if there is clear distinction between it and the historic application. Designers may propose any color range for review in contemporary projects, even though some variation in color is encouraged.


Random ashlar pattern


Regular pattern using various sized pavers


Regular pattern using uniform sized pavers

The bluestone on the West Quad was laid in the random ashlar pattern using very large pieces of solid stone and should be replaced and repaired in kind. In new applications, smaller pavers are acceptable but the goal is to keep the stones as large as possible. More creative, regular patterning is encouraged in new projects to reflect a contemporary design aesthetic.



Designers are encouraged to explore new ways to use bluestone that respond to context, program, and budget.

Pennsylvania bluestone is the predominant paving material used in important campus spaces and should be the starting point when selecting materials for projects.

While there are specific design criteria for the historic walkways on West Quad, designers have flexibility when considering color range and patterning for new spaces.

Specific considerations:

- Since it is increasingly expensive to obtain and install very large pavers like the historic pieces on West Quad, smaller pavers are acceptable. The goal, however, is for the majority of pavers to be in the 24” x 36” range, as a minimum;
- Bluestone should be used in conjunction only with other approved paving materials, such as the standard exposed aggregate concrete;
- When used in areas that could potentially receive vehicular traffic, a 4” minimum poured concrete base is required; a mud slab or sand bed is discouraged, but acceptable in purely pedestrian areas.

Full color range in ashlar pattern at the West Campus Pedestrianway and Bostock Library

Uniform paver size and pattern in color vatiations (fields of both uniform blue and blue/gray/brown) at West Campus Plaza

Uniform paver size and color with contemporary detailing at Pratt Memorial Garden

Full color range in ashlar pattern on East Campus

Blue/blue gray/green gray color range in ashlar pattern as inset panel within field of exposed aggregate concrete at Bio-Sci

Uniform size, color and pattern with concrete banding as Fuqua Entry Plaza

Blue/blue-gray color range in varied pattern at Law School terrace

Full color range in ashlar pattern in Memorial Garden

Full color range in ashlar pattern on West Quad (non-historic application)

PAVING: CONCRETE UNIT PAVERS

The use of concrete pavers is an acceptable alternative to bluestone or brick in certain, non-historic, areas on campus. These are typically used as contemporary substitutions for the historic bluestone, but used to similar effect in plazas, pedestrianways, terraces and other applications, including pedestal pavers.

Penn Pavilion Terrace

Science Terrace

West Campus Plaza

The most important thing about the color of concrete pavers is that they fit within the color palette for campus (p.. As proprietary colors tend to change over time, it is more important to complement the color range rather than choose a particular paver by name and/or manufacturer. Pavers compatible with the Ironspot brick pavers can be considered on East Campus and in Athletics.

Application

Roadway

Plaza

Walkway

Concrete pavers are applicable to many different applications across campus and often in conjunction with other materials.

Patterning and mixing of materials

Science Terrace

Krzyzewski Center Plaza

West Campus Plaza

Specific considerations:

- Proposals for specific paver color must be presented and understood within the context of materials for the entire site;
- Designers are encouraged to propose patterning specific to projects they are working on;
- Degree of perviousness and drainage strategies must be clearly articulated in the design. Pervious pavers may be used in certain locations to meet goals for sustainability.
- When used in conjunction with other paving materials, a mock-up must be presented that shows the combination of materials and how they meet both aesthetically and practically.

Pervious paving

Smart Home

PAVING: EXPOSED AGGREGATE CONCRETE

The Duke standard exposed aggregate paving has become an accepted and important part of the Duke landscape. It essentially acts as the predominate paving material and acts as the transition between the historic bluestone (and other higher finishes) and the utilitarian use of plain concrete. It is important to consider how it fits into an overall hierarchy of paving. Its most common use is on pedestrianways, but is also used in many different applications, such as those shown above.

West Campus Pedestrianway

Used in combination with stone banding

Polished exposed aggregate concrete (K4). This can be used in high impact areas and where a distinction needs to be made between two paving types.

Bike rack pad

Transition material adjacent to bluestone

Pedestrian crossing table

Curb and gutter

Curb ramp with complemtary ADA detectable warning insets

Steps within other paving

Specific considerations:

- It is critical that mock-ups are created and approved for all projects. Contractors who have proven capable of producing quality paving are recommended over bringing in new contractors;
- Score joints and control joints must be saw-cut rather than troweled. Expansion joints must be caulked using an approved color;
- When used in areas that could potentially receive vehicular traffic, specify an 8” deep profile with rebar or other approved reinforcement.
- Carefully locate break points between pours, as true consistency is difficult to attain.

PAVING: BRICK PAVERS

The use of brick is largely limited to East Campus and the Athletics precinct on West Campus. Other, special uses of brick - such as for banding or as an accent material - may be proposed

Primary locations for brick on campus

West Campus Athletics - Krzyzewskiville

East Campus Athletics - Williams Field

East Campus - Historic Quad area

Other uses for brick

East Campus bike pad

West Campus Plaza banding

Engineering Quad accent paving

Specific considerations:

- Herringbone is the preferred pattern when creating fields of brick paving;
- Brick pavers should run perpindicular to the path of travel when used as the material for walkways;
- When used in areas that could potentially receive vehicular traffic, a 4" minimum poured concrete base is required;
- Ironspot is the color to be used on East Campus (outside the Quad) and in West Campus Athletics precinct;

PAVING: MISCELLANEOUS

In addition to the basic paving material palette allowed on campus, there are several substitutions allowed in limited situations. These materials are not ideal for most conditions and locations and must be approved early in the design phase if being considered.

Stone Screenings

Marcy's Garden at Law School

Path through Chapel Woods

Perimter trail around East Campus

Stone screenings are permitted in areas where a softer, less formal material is desired, such as trails, woodland paths and garden areas. Effective drainage and maintenance plans must be included when such areas are proposed. Alternative suggestions, such as processed fill, are welcome. Proposed use must be approved.

Asphalt walkways

Walkway to Hart House

Walkway connecting Duke Gardens and Admissions

Walkway from Campus Drive to Arts Annex

Asphalt is an acceptable material for informal walkways in certain locations where either distance, location or site conditions make concrete either cost prohibitive or difficult to install. These must be separate from an existing network of campus paths. Proposed use must approved.

Wood decking

West Campus Plaza

Bryan Center Deck

Edens steps

Due to the fact that it can get slippery in cold months, the use of wood as a paving material is strongly discouraged. However, it is permitted in certain locations away from direct pedestrian pathways - such as decks or steep outdoor steps. Wood should be allowed to weather and not be treated in order to reduce the potential for slipping.

SITE WALLS: DUKE STONE

Duke stone quarried from Duke's Hillsborough property is the default material for all site walls on West Campus. It is not the appropriate material for all walls in all locations but should be the starting point when identifying materials for projects.

Although the historic application for Duke stone walls is fairly specific in terms of joint and cap material, leeway is given for its use in new projects. The three basic methods for building/detailing walls is shown on the right. There are no set rules for when to use each type, but as a guide:

- The struck joint is used in historic applications (i.e. West Quad) and in formal applications where removed from adjacent Duke stone buildings, such as within traffic circles.
- The raked joint is the typical method for site walls on West Campus. This more rustic detail is used to distinguish site walls from building walls (examples of this can be found at Fitzpatrick Center) and in less formal applications.
- Although the construction is not actually dry laid, the use of minimal joint is acceptable in certain locations where a special detail is deemed appropriate. The best example of this in Athletics next to Krzyzewskiville.

Struck joint

Raked joint

Dry laid appearance

Specific considerations:

- Pre-approved stone masons must be used for all Duke stone wall construction on campus;
- Mock-ups are required for all new site walls and must be approved for style, joint type and dimension, cap, color range and quality of craftsmanship;
- Palleted stone rejected for use on buildings may be used for site walls;

Things not to do:

Successful precedent:

Stone should be laid in stacked manner rather than “applied” in a thin veneer manner.

Color range should be predominately a combination of blue/ gray and brown, with very few of the orangish, iron-rich stones used as accent.

Stone should be laid in a very horizontal manner with rectangular pieces. Avoid using rounded stones.

Accepted precedent for Duke stone wall caps:

Duke stone cap

No cap

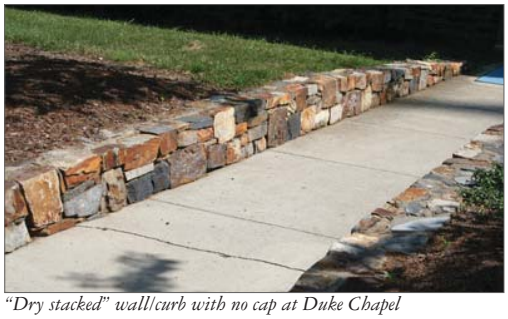
Limestone cap

Precast concrete cap

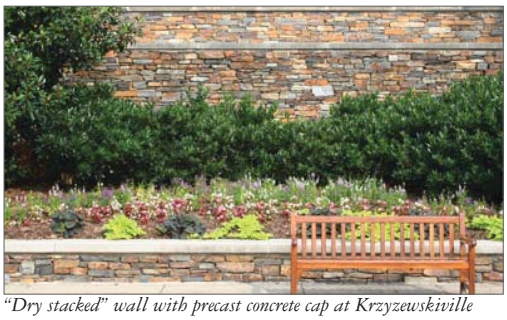
Bluestone cap

SITE WALLS: DUKE STONE

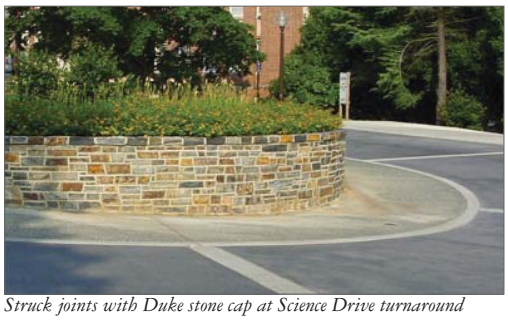
Raked joints with Duke stone cap at Pratt Memorial Garden



"Dry stacked" wall/curb with no cap at Duke Chapel

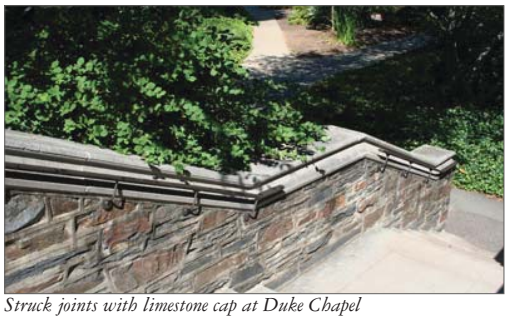


"Dry stacked" wall with precast concrete cap at Krzyzewskiville



Struck joints with Duke stone cap at Science Drive turnaround

Struck joint runnel structure with no cap at Trent Semans Center



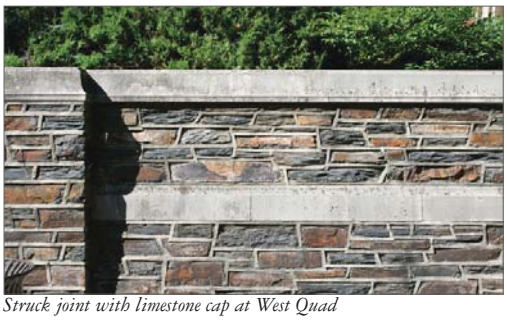
Struck joints with limestone cap at Duke Chapel

Struck joint seatwall with no cap at Medical Center Oval

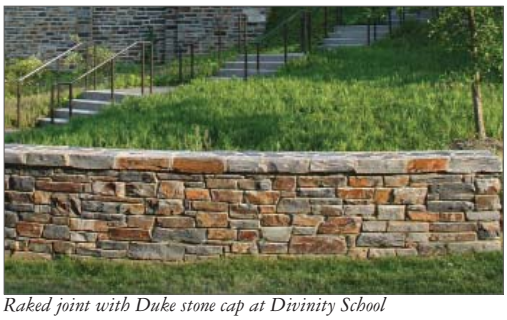
Raked joints with bluestone cap (seatwalls) and no cap at Doris Duke Center

Struck joint with precast concrete cap at von der Heyden Pavilion

Struck joint with bluestone cap at Law School Beber Garden



Struck joint with limestone cap at West Quad



Raked joint with Duke stone cap at Divinity School

Struck joint with Duke stone cap at Chapel Drive tunnel

"Dry stacked" wall with precast concrete cap at Krzyzewskiville

Struck joint with precast caps at the Hart House

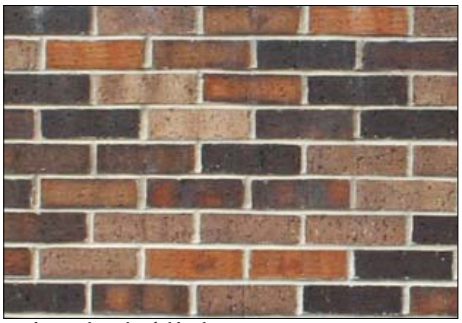
Raked joints with Duke stone cap at Duke Gardens entry

SITE WALLS: DUKE BLEND BRICK

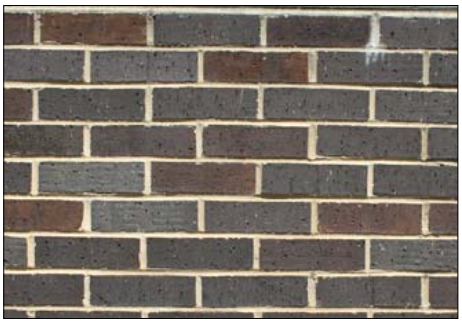
The Duke blend brick palette was created to provide a cost effective and complementary substitution for Duke stone on buildings and for site walls. Duke stone is the prefered material for site walls on West Campus, but the brick is an acceptable alternative in certain situations depending on the context of a specific project.

The light blend is most commonly used for site walls - especially in Athletics. The dark and medium blends have been used effectively, as well, but generally need to be justified as being most appropriate for a specific location.

3-color Light brick blend



3-color Medium brick blend



3-color Dark brick blend

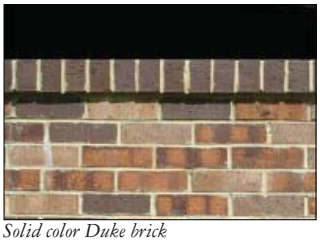
Specific considerations:

- The selection of color blend for brick site walls will depend on the treatment of adjacent architecture - typically to complement yet still contrast from the building;
- It is very important that the matrix of colors in the blend is intentional and clearly defined in order to create a uniform appearance;
-
- Mock-ups are required for all new site walls and must be approved for selection of brick blend, cap and matrix of individual colors within blend.

In the same way that there is flexibility with the blend of brick, the selection of the cap can change depending on location and context. Precast concrete is the preferred material - especially for seatwalls - but the other options are acceptable if approved as such.

Limestone

Bluestone



Solid color Duke brick

Precast Concrete

SITE WALLS: OTHER MASONRY

The Duke blend brick is used primarily on West Campus associated with newly constructed buildings. Other parts of campus will use different types of masonry depending on context, precedent and aesthetics.

West Campus, non-Duke blend: With the size and architectural diversity on West, there will be instances where other masonry material is appropriate. For instance, the West Campus Plaza contains a bluestone wall that was chosen because it presented a contemporary solution using a historic material. As stated before, special places such as the Plaza lend themselves to creative solutions so long as they fit within the overall character of the campus.

At the Craven Courtyard, recycled brick was used in lieu of Duke stone or Duke brick because there was interest in promoting a sustainable product and the color corresponding with some of the brick used in Keohane Quad. Such experiements are permitted, but not often, and need to fit character.

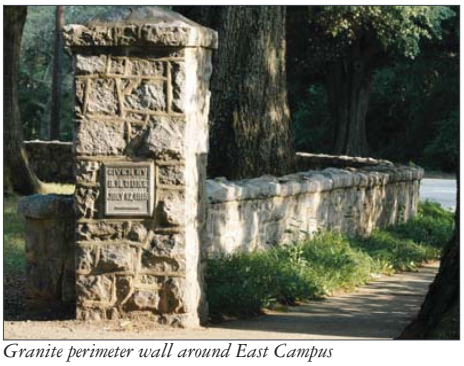
East Campus uses a red brick blend exclusively for site walls. This does not include the historic perimeter wall, which is made of granite and it not duplicated in other places.

Central Campus: There is not much masonry on Central. A red/tan blend has been established for site walls there - primarily in and around Mill Village.This is considered the standard.

Central Campus brick with precast cap at Mill Village

Recycled brick at Craven Courtyard

Bluestone wall at West Campus Plaza



Granite perimeter wall around East Campus

SITE WALLS: CONCRETE

Concrete walls are acceptable alternatives to Duke stone or brick in certain situations, such as constructability, cost, aesthetics and function/use. In any case, color, texture, scale and detailing need to designed in a manner that maximizes the wall's appearance and function, as quality is just as important with these as with other, higher-finish walls.

Poured concrete walls


Yoh Football Building


Penn Pavilion Terrace


Retaining wall beside Fuqua

Seatwalls

Concrete is an acceptable material for seatwalls in certain locations, so long as they express a certain level of design and detailing. Solid precast walls - such as used at K4 and Penn Pavilion - are good options for presenting a more contemporary character. Poured concrete walls are to be used only with specific approval or in areas where context dictates them, such as Fuqua.


Precast wall at K4


Poured wall with precast cap at Science Terrace


Poured wall with precast cap at Science Terrace

Segmental block is to be used exclusively as retaining walls and only in areas where context allows and budget demands. The wall color must fit within the established palatte for the campus and be approved by the University Landscape Architect. The straight face block is preferable to the scalloped face.


Walkway behind PG-IV


Smart Home Beackyard


Bassett Drive Practice Fields


Smart Home Raingarden


Law School Beber Sculpture Garden


West Campus Pedestrianway at Fitzpatrick Center


Entry Bridge into Parking Garage IV


Science Terrace at French Family Science Center


Law School Entry Plaza


West Campus Pedestrianway at Bostock Library


Pedestrian Connection at Keohane Quad


Terrace at Penn Pavilion


Schwartz-Butters Rear Entry

PRECEDENT IMAGES

STEPS

On a campus with as much topography as Duke's, grade transitions become an important element in the landscape. This can be clearly seen on West Campus, as the land terraces away from the ridge that holds the Quad down to Duke Gardens on one side and the LSRC on the other.

A variety of step types on found on campus and there are no set standards for their design.

Specific considerations:

- Poured concrete is the most common stair material on campus; high quality specifications, detailing and installation are required;
-
- Exposed aggregate is an acceptable material for exterior steps, but quality installation is mandatory and a mock-up is required for approval;
-
- Designers are encouraged to offer unique options to the material and design of steps as they are integral parts of the site design. An example of this is the salvaged granite coping used as steps at the Law School;
- Handrails should be provided as required by code but not added where not needed;
-
- Wood stairways are allowed only in low-impact areas where site conditions prohibit the use of concrete;
-
- Ramps and bicycle circulation need to be carefully integrated in the design of steps and stiarways.

Monumental Stairs


West Campus Pedestrianway at Bostock


Rear Entry to Fuqua

Landscape Steps


Science Terrace at French Family Science Center


Bryan Center

Informal Pathway with Granite Curbing Steps


Fitzpatrick Center


Hart House

Utilitarian Steps


Schwartz Butters


Nasher Museum of Art

Special Detail Steps


Precast Concrete steps at Penn Pavilion Terrace


Reclaimed Granite Coping Steps at Law School


Monumental Bluestone Steps at WC Plaza


Wood Steps at Edens

RAILINGS

Railings need to be selected and designed in a consistent manner across campus. Some flexibility is allowed in detailing and, in very specific locations, material, but the goal is for the railings to be one of the elements that ties the campus landscape together regardless of adjacent design style.

Specific considerations:

- Dark bronze railings are required on both East and West Quads;
- Painted steel pipe rail is the standard for most parts of the campus. Variations to this may be proposed in high impact areas and places where there are specific aesthetic conditions as determined by Duke;
- Glass railings are not permitted outside of buildings;
-
- Stainless steel railing are permitted only in specific areas where approved, such as the West Campus Plaza.

Historic Bronze Hand Rail

Allen Building

Languages Building

Basic Painted Steel Pipe Rail

Bryan Center

Fitzpatrick Building

Modified Pipe Rail

Science Terrace at French Family Science Center

Keohane Quad

Painted Steel Guard Rails

Bryan Center Deck

Schwartz Butters

Science Terrace

West Campus Pedestrianway

Variations on Guard Rails (all requiring specific approval)

Stainless at Law School Entry

Stainless at West Campus Plaza

Weathered Steel Pedestrian Bridge at Fuqua

Stainless with wood cap at West Campus Plaza

STEPS AND RAILINGS


Science Terrace at French Family Science Center


Divinity School

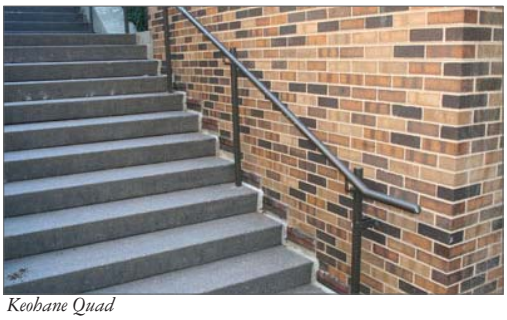

Angle Amphiteater at Duke Gardens


West Campus Pedestrianway


Schwartz Butters Building


Penn Pavilion Terrace


Central Campus Mill Village


Keohane Quad

PRECEDENT IMAGES

ACCESSIBILITY

As part of Duke's commitment to being a walkable and universally accessible campus, barrier-free and ADA compliant connections across campus are required. The goal is that these meet code where required, and exceed it where there are opportunities to make the campus more friendly to all users, including bicyclists.

Specific considerations:

- All accessible paths and connections need to meet the spirit of ADA and provide equal access for all users. They must also be well integrated into the site design and not appear as additive elements in the lansdcape;
- Ramps should be graded and designed to avoid the requirement of handrails or guardrails where possible;
- Where needed, railings must comply with campus standards;
- Paving material for ramps must be coordinated with that of adjacent sidewalks;
- High-use pedestrian road crossings should be made accessible with either curb cuts or raised crossing tables that conform with campus standards for crosswalks.


Law School

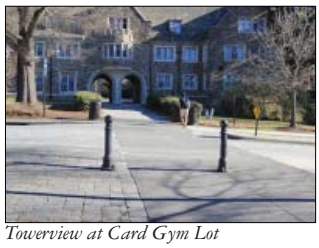

Krzyzewskiville


French Family Science Center


Fitzpatrick Center


West Quad


West Quad


Towerview at Card Gym Lot


Science Drive at Bio-Sci

FENCES, GATES AND GATEWAYS

For most all situations, the black metal estate fencing is standard across the entire campus, regardless of context. This applies to gates as well as fences. Fence and gate height will vary depending on location and safety requirements; 4' and 6' are generally preferred, but taller is acceptable where needed.

Specific considerations:

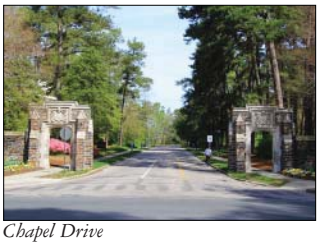
- Gateways with piers, columns and walls must be an approved material such as Duke stone, Duke brick blend or red brick. Caps will meet same requirements for walls;
- In areas such as adjacent to sports fields in Athletics and in low-visibilty locations, where exceptions to the estate fence are called for, black vinyl coated chain like is an acceptable option. This must be approved as an exception to the standard;
- Piers and columns at gateways need to be designed for a pedestrian scale, even at vehicular entries;
- Any proposed modifications to historic gateways need specific approval.


Koskinen Stadium


Union Drive


Williams Field


Krzyzewski Center


Chapel Drive


Buchanan and Main Street


Bassett Practice Fields


Koskinen Stadium

SITE FURNITURE - SEATING

The goal with outdoor seating on campus is to provide ample, strategically located furniture in a manner that is flexible and allows for multiple opportunities for social interaction. The approved palette has been chosen to meet these requirements and establish a consistency of scale, color and materiality across campus. Deviations from the standards (more detail of which can be found in FMD's Design Guidelines) may be allowed, but must be specifically approved.

Loose Tables and Chairs

Country Casual Teak - Craven Courtyard

Fermob Bistro - West Campus Plaza

Euramericas Segno - Bryan Center Deck

Loose table and chairs are provided in high-use social areas to accommodate people congregated in various sized groups. It is recommended that one selection be used per each identified location in order to prevent the appearance of clutter. Seating needs to organized in a logical manner that meets its aesthetic, and programmatic context.

Benches

Granite Benches - West Quad

Vega Metal Bench - West Campus Pedestrianway

Country Casual Teak - Medical Center

Benches should be located in lower-use areas than loose furniture. They need to be placed within the following hierarchy: granite benches on East and West Quad; Vega metal benches in high impact, public areas (including the Quads); and the teak benches in less formal and naturalistic areas.

Other Standards

Country Casual Rockers - West Campus Plaza

Gliders - West Campus Plaza

Country Casual Adirondack - Mill Village

This site furniture has been approved as part of the campus palette but must be approved as appropriate for a specific space before it used. These are typically used in less formal, student-oriented gathering spaces.

Special Situation Seating

These exceptions to the standards were approved on an individual basis. The student house benches are limited to one per residential house as dictated and managed by the Office of Student Affairs

SITE FURNITURE - BIKE RACKS

Although there is currently only one approved bike rack for the entire campus, an increased need for bike parking, along with ways to accommodate mopeds and scooters, may lead to more options.

Specific considerations:

- Bike parking must be located and designed in a logical manner that fits with campus-wide circulation patterns;
- Racks must be installed on paving/pads that are contextually appropriate and sized to easily accommodate access;
- Racks should be installed to accommodate access on both sides where possible;
-

SITE FURNITURE - BOLLARDS

There are three standard bollards on campus: decorative, breakaway and heavy duty. The decorative is the default in all situations except where temporary access, such as fire/emergency is required, where collapsible bollards are allowed, or where safety concerns require heavy duty protection. Concrete-filled pipe bollards are allowed in low impact or service areas as long as they have a cap.

Other options, such as the ones below. from Fuqua, are allowed only with specific approval and depend on historic precedent and aesthetic context.

Decorative bollard from Main Street Lighting Co,

Collapsible bollard (painted Duke brown or dark bronze

Heavy duty bollards filled with conrete.

SITE FURNITURE - LIGHT POLES AND FIXTURES

West Campus
There are two fixtures approved for West Campus: The traditional acorn light (with cap) and the contemporary reflector fixture. Both fixtures are on tapered and fluted dark brown poles. The acorn firxture is standard for the campus. The reflector fixture is allowed only in contemporary context such as the West Campus Plaza.

East Campus
There are two fixtures approved for East Campus: The historic globe and the campus standard acorn fixture. Both fixtures are on tapered and fluted dark brown poles. The globe is used exclusively on East Quad. The acorn fixture is to be used in all other locations.

SITE FURNITURE - WASTE AND RECYCLING

The main goal with locating receptacles on campus is for their to be enough of them on campus to effectively serve a need without placing too many unnecessarily.

Waste and recycling receptacles should be used in tandem where possible.

There are several options for waste and recycling receptacles on campus. The first two are the standard Victor Stanley models, the difference being that the recycling container can be with brown with appropriate labels, or blue. This will depend on context.

The other option is the solar powered Big Belly compactor model, which is recommended for very high-use areas where a large amount of trash and recyclables. Locations for these will also depend on site context.