Lehigh University

Exterior Design Guidelines
Asa Packer Campus

Final Submission - August 19, 2016
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5. Appendix

- Color Palette
- List of existing manuals, guides and master plans
The University has recognized the need to establish Exterior Architectural Design Guidelines to define design parameters as they relate to the Architectural aesthetic and the campus grounds, both landscape and hardscape. These guidelines will ensure that the architectural integrity of the campus is not compromised by identifying specific design requirements and clearly establishing a review process for any future design during the early stages of the design process. In support of this need EwingCole was engaged to produce an Exterior Design Guideline for the Asa Packer campus that encapsulates the collective design expectations of the University. As part of the process the team reviewed existing technical documents including the 2012 Campus Master Plan and Facilities Planning Design Standards, conducted multiple site visits and interviewed the following key stakeholders:

- Patrick Farrell – Provost and VP for Academic Affairs
- Patricia Johnson – VP for Finance and Administration
- Brent Stringfellow – University Architect
- Frederick McGrail – VP for Communications
- Joseph Sterrett – Director of Athletics
- Mark Ironside - Exec Dir. University Business Services
- John Smeaton - Vice Provost, Student Affairs
- Alan Snyder - VP and Assoc. Provost, Research and Graduate Studies
- Gary Sasso, Dean, College of Education
- John Welty - AVP, Advancement

Out of these individual interviews several common themes emerged. It was very clear that there is an enormous emotional attachment to the historic core of campus from current students, staff, faculty and alumni. There exists a great desire to maintain the aesthetics of iconic buildings such as University Center, Linderman Library, Packard Hall, Alumni Memorial Building and Packer Memorial Church. On the other hand, Trembly and Christmas-Saucon were identified as buildings that are out of context with campus aesthetics. It was acknowledged that main gateways to campus should be prominently announced. Outdoor spaces should function as an extension of living and learning space and these are in high demand. The stakeholders also unanimously agreed that campus signage and branding needs to be investigated, identified and implemented.

The result of this collaborative process has been cataloged in this Exterior Design Guideline document. This document will serve to guide the future physical expansion and modifications on the Asa Packer Campus.
INTRODUCTION
1. INTRODUCTION

1.1 Purpose

The Exterior Design Guidelines (EDG) aims to provide a holistic design guide for the Asa Packer campus at Lehigh University. By considering all the elements that make up the campus, the EDG was created to improve the quality of the built environment and identity of Lehigh.

The EDG is intended to assist Lehigh University in upholding the ideas and goals outlined in the 2012 Campus Master Plan. It takes into account the current individual specialty master plans, design guidelines and manuals produced over the years. The overarching goal of the EDG is to establish a set of design principles for the ongoing physical development and improvement of the University that complements the Master Plan.

In creating a design solution for individual projects, the spirit of these guidelines should be adhered to as closely as possible without compromising the programmatic needs.

The intent of the Guidelines is to create visual harmony on campus, rather than a uniform look. Designers should use the EDR as a tool to identify a range of acceptable materials and avoid design features that are visually disruptive to the cohesive campus aesthetic.
1.2 Vision and Goals

The primary goals and objectives of the EDG have been developed in support of several related planning studies and design standards, including the 2012 Campus Master Plan and the Lehigh University Strategic Plan. The vision and goals of the EDG are to:

- Reinforce the identity of Lehigh University and enhance campus pride.
- Maintain a cohesive and unified look for the entire campus.
- Promote sustainability and minimize impact to the environment.
- Create a safe and conducive learning environment for students, faculty, staff and the Lehigh community.

This guide is to be used by project managers, designers and engineers commissioned by Lehigh University working on any renovation or new construction on campus. It provides a set of planning guidelines only. All projects must go through the assessment process outlined by the Office of Facilities Management for final decisions. The design process at LU typically is reviewed by the following groups:

- Space Planning Committee
- Facilities Services/ Campus Planning and Projects
- Campus Planning and Operations Committee

1.3 Background

Located in Bethlehem, Pennsylvania, Lehigh University was founded in 1865 by Asa Packer as a private university with the original goal of providing education to men interested in the applied sciences and engineering. The university has expanded to a leading higher education institution located on a scenic 1,600 acre campus treading the line between town and forest with half of the campus being preserved as open space.

Comprising four colleges - Business, Education, Liberal Arts and Sciences, Engineering – the University offers a variety of undergraduate and graduate level studies. The university has approximately 5000 undergraduate students and approximately 2000 graduate students.

There are three geographically separate campuses that make up Lehigh University; the Asa Packer campus, Mountaintop campus and Goodman campus. Each has their own distinct character. This EDG focuses on the Asa Packer campus which has a natural park-like setting within an urban location.
1. INTRODUCTION

1.4 Campus Map
1. INTRODUCTION

1.5 2012 Campus Master Plan

Campus planning at Lehigh University has been a constant force that has been key in preserving the essential elements that make this institution unique. The 2012 Campus Master Plan establishes a physical framework that will:

- Facilitate interdisciplinary research and teaching
- Inspire learning and collaboration outside the classroom
- Participate in the renaissance of South Bethlehem
- Expand the student living and learning environment

The recommendations from the Campus Master Plan are designed to assist Lehigh University in efforts of achieving the goals listed above.

Fundamental Campus Design values:
- Nurture existing park-like setting
- Sensitivity for historic structures
- Encourage a sense of discovery
1. INTRODUCTION

Focusing on Asa Packer Campus, the proposed illustrative plan depicts the Campus Master Plan initiatives in and around the academic core campus. Growth and building improvements are depicted through both new buildings and renovations. Some proposed projects are catalysts such as the University Center renovation and addition, and some are proposals to accommodate University needs in ideal locations close to the academic core campus, such as the proposed new buildings west of Webster Street and east of Taylor Street.

Legend
- Proposed New Buildings
- Proposed Renovations
- Existing Campus Buildings
- Existing Structured Parking
- Major Pedestrian Paths, Existing and Proposed
- Proposed Car-free Zone Boundary
1. INTRODUCTION

1.6 Organization

In addition to this Exterior Design Guide, there are a number of technical manuals and studies that should be referenced when embarking on any design project on campus:

Current design standards: https://financeadmin.lehigh.edu/facilities/standards/guidelines

The 2012 Campus Master Plan: http://www.lehigh.edu/masterplan/

Signage Guidelines

Historic Guidelines for South Bethlehem

Lehigh University Visual Identity System

Lehigh University Lighting Study

2015 ADA Study (ongoing)
NEIGHBORHOOD CHARACTER GUIDELINES
Introduction

The Asa Packer campus is distinct in its setting with buildings that cascade down the north slope of South Mountain overlooking south Bethlehem. The spires of University Center and Packer Memorial Church can be seen from across the Lehigh River, serving as a beacon of the University.

There are three distinct neighborhoods on the Asa Packer campus. Each has its unique characteristics which are important to maintain in order to create a physical and psychological boundary as students move between each neighborhood. These unique characteristics build towards a "sense of place" within each neighborhood. It is the composition of buildings, open spaces and their relation to each other which creates this "sense of place" that impacts how people utilize a space, activate their environment and develop a feeling of "belonging" to a place.
2. NEIGHBORHOOD CHARACTER GUIDELINES

2.1 Historic Core

Located in the north zone of campus, the Historic Core is comprised of buildings dating back to the late 19th century. University Center, Linderman Library, Packard Hall, Packer Memorial Church are among the most iconic structures that visitors and alumni recall when reminiscing upon their experiences at LU. There is an enormous emotional connection to this core of campus.

These majestic buildings reflect the stature of Lehigh University and it is imperative that the character of this area shall never be compromised. Stone is a prominent design feature in this area of campus. Its impact on project costs, in particular for historic buildings must be taken into account early on in the concept and schematic design review process.

It is crucial to be aware that Packer Memorial Church is on the National Register of Historic Places. There are also minor historic certifications on Fritz Engineering Lab and Christmas-Saucon Hall.

The architectural styles range from Gothic Revival to Venetian to High Victorian among others. Composed of stone and featuring intricate ornamentation, they exude a pervasive sense of permanence. The challenge these structures face is the need to balance their historic integrity with the need for modern building systems (HVAC, electrical, plumbing, IT). Designers must be considerate of both issues as designs are being developed.

- Building massing: mid-rise. Do not exceed 4 stories.
- Architecture style: complement existing historic structures in massing and pattern.
- Materials:
  - Use of stone is encouraged but consideration must be given to its impact on the project cost.
  - Use of contemporary materials such as metal cladding and glazed curtainwall systems may be considered in minor amounts but must be sensitive to the context.
  - Slate roofs must be maintained
- Landscaping:
  - Celebrate legacy and old growth trees.
  - Maintain open lawn south of University Center
  - Encourage meandering paths to instill a sense of discovery
- Traffic and Circulation:
  - Promote a pedestrian focused historic core.
  - Vehicular traffic should be limited to the perimeter of this neighborhood
2. NEIGHBORHOOD CHARACTER GUIDELINES

Samples of Successful Additions/Renovations

- Princeton Theological Seminary Library Addition
- Residential Addition
- Gwynn Hall Tower Addition - University of Missouri
- KINSC Hall Addition - Haverford College
2.2 Campus Gateway

The main gateway to campus must be prominently announced. The first point of a visitor’s experience at Lehigh University is typically the Alumni Memorial Building (Visitor’s Center and Admissions) which is at the intersection of Brodhead Avenue and Summit Street. Currently there is a fountain at the terminus of this intersection but very little else to convey a sense of arrival and welcome. Furthermore, the path leading to the main entrance requires further articulation by means of broadening the street, sidewalk and formal landscaping.

There needs to be a modulated approach and arrival sequence beginning from the drive to the doorstep that creates a beautiful transition from the public realm to the front door of campus. This main gateway needs to reflect the stature of Lehigh University.

Clear visibility of the destination point is desired from all directions. Sidewalks should be spacious with formal landscape patterns. The gateway and approach should also complement the historic nature of the campus.

- **Building massing:** mid-rise. Do not exceed 4 stories. Set back buildings sufficiently from Brodhead Avenue so as not to impede views of Alumni Memorial Building.
- **Architecture style:** Contemporary but complementary of existing historic structures.
- **Materials:**
  - Use of stone is encouraged but consideration must be given to its impact on the project cost.
  - Use of contemporary materials such as metal cladding and glazed curtainwall systems may be considered in minor amounts but must be sensitive to the context.
- **Landscaping:**
  - Formal landscaping design is appropriate.
  - Monumental fountains and water features are suitable features that reinforce arrival and entrance.
- **Traffic and Circulation:**
  - Create wide streets flanked with spacious sidewalks on both sides and formal rows of large trees, allowing visual clarity of the destination point.
2. NEIGHBORHOOD CHARACTER GUIDELINES

Samples of Successful Campus Gateways

Purdue University Entrance

Barton College Gateway Concept

VMWare Campus Allee
2.3 Residential Zone

The residence halls are organized in clusters of buildings on the steeper south slope. The housing stock can be categorized into two types - traditional dorm style housing in low-rise structures clustered closer to the core of campus and Greek housing which is scattered further uphill.

This mix of housing types suit the needs of the different student populations. Traditional dorm style housing such as the Gothic stone structures of Richards House and Dravo House reflect the values and history of Lehigh and should be looked at as inspiration. On the other hand, designs like Trembly Park Apartments are products of an era that clash with the campus aesthetic and should be avoided.

Greek chapter housing has a long history of supporting the myriad fraternities and sororities on campus. Each building has their own distinct style but neutral tones, a consistency of massing and consistent use of traditional building materials (brick and stone) maintain harmony. In recent years, all buildings have been upgraded to meet current life safety codes.

- Building massing: mid-rise. Do not exceed 4 stories.
- Architecture style : residential and human scale
- Materials:
  - Use of stone is encouraged but not crucial
  - Brick and concrete are the predominant materials and continued use is encouraged.
  - Use of contemporary materials such as metal cladding and glazed curtainwall systems may be considered in minor amounts but must be sensitive to the context.
- Landscaping:
  - Celebrate legacy and old growth trees.
  - Maintain open lawn south of University Center
  - Encourage meandering paths to instill a sense of discovery
- Traffic and Circulation:
  - Maintain moderately sized parking lots adjacent to each building
  - Link all buildings with pedestrian walkways
- Provide a variation of small, medium and large scale communal spaces to accommodate multiple sizes of groups.
- Design courtyards to create a sense of community among residents of neighboring residence halls.
- Building floor plans, public space layouts and all exterior environment design must prioritize the users’ personal safety.
- Landscaped areas should be informal and allow areas of open grass for spontaneous play.
• Designs should contribute to the human scale and proportion of a pedestrian oriented campus
• Maintain low density
• Locate within 5-10 minute walk of campus
• Incorporate exterior gathering areas at each building for residence life activity (picnic areas, pergolas, etc)
• Main entrances must be distinctly discernible and provide ample protection from the elements.
2. NEIGHBORHOOD CHARACTER GUIDELINES

2.4 South Bethlehem

This area north of Packer Avenue is a post-modern urban environment and is physically separated from the historic core by the wide vehicular passageway of Packer Ave. This negative boundary allows building typologies to transition from the intricate Gothic and Victorian stone structures to the minimalist post-modern geometric buildings of a more contemporary era. This area is more suitable for a wider expression of design that is in line with the renaissance of the South Bethlehem. The goal is to allow for the university and its activities to breathe new life into the town surrounding the Packer campus.

That being said, the general consensus is that this area lacks the visual cohesion that is found in the Historic Core. As this post-modern/South Bethlehem district has been pegged in the master Plan as the site for future development, it is crucial that a cohesive design aesthetic is advanced.

- Build upon the academic strengths to address the issues of a post-modern environment: education, health, housing, small merchants, and entrepreneurs.
- Building massing: mid-rise to high-rise with a human scale on the lower levels
- Architecture style: Post-modern, Industrial, Urban, Sustainable
- Sensitivity toward the historic guidelines of South Bethlehem is crucial.
- Pedestrian level spaces should be translucent to allow activity within the building to be visible from the exterior.
- Avoid extensive lengths of solid walls that create a sense of desolation.
- Materials:
  - Brick, glass and steel
  - Use of contemporary materials such as metal cladding and glazed curtainwall systems may be considered
- Landscaping:
  - Open plazas with areas for serendipitous interaction
  - Incorporate shaded areas with ample seating for groups of various sizes
- Traffic and Circulation:
  - Pedestrian-focused core area with vehicular traffic limited to the perimeter
  - Provide wide sidewalks to accommodate large movements of pedestrian traffic
2. NEIGHBORHOOD CHARACTER GUIDELINES

Samples of Successful Urban campuses

University of Pennsylvania - Quadrangle

Plaza By Seattle Public Library
3

BUILDING DESIGN STANDARDS
3. BUILDING DESIGN STANDARDS
Introduction

The Building Design Standards are intended to support a unified campus fabric. While acknowledging that each campus neighborhood should celebrate its unique characteristics, it is also vital to ensure an architectural expression that promotes a cohesive campus atmosphere at Lehigh University. This architectural expression is defined by a composition of massing, relationships of open spaces and buildings, materials, circulation and much more.

The intent of these standards is to establish a set of guidelines for architects and designers without unduly restricting creativity or individual expression.

In general, when planning for new construction, additions or renovations on campus, it is important to take into consideration:

- Campus context through the relationship of the project to adjacent buildings, program functions, site views and projected development as mapped out in the Campus Master Plan.
- Historic sensitivity of the building or site.
- Accommodation for projected growth and potential future expansion of the building.
- Environmentally responsible design strategies that support the sustainability approach of the University and promote efficiency and conservation of resources.
3. BUILDING DESIGN STANDARDS

3.1 Building Placement

The architect of new buildings and additions must be cognizant of the impact on adjacent buildings, views throughout the site and circulation. Buildings need to act in concert with their neighbors and landscape to create a harmonious composition. A building’s mass and program will contribute to an area’s density and activity.

The landform at Lehigh consists of steep slopes that start at the Greek houses on the south ridge and flow downhill to the flatter terrain of South Bethlehem. Naturally, terrain significantly influences the location of building access and sightlines. These nuances of the landscape must be carefully considered when designing for new spaces. The location of entryways, courtyards, pathways and internal program visibility all play a part in activating a space. Architects should seize the opportunity to create a design that reinforces the spatial structure of campus using the following tenets:

Site Selection
- Locate buildings to take advantage of the slopes and maximize accessibility.
- When possible, reuse of existing structures is encouraged.
- Ground level uses should consider the interaction between interior and exterior activities.

Orientation
- Visual axes on campus should terminate appropriately with significant architectural or landscape features.
- Main entrances should have high visibility and be directly connected to pedestrian thoroughfares.
- Views should encompass natural landscapes and points of interest.
- New construction must be mindful to not obstruct sight lines of existing buildings.

Sustainable Design
- Orient buildings to optimize summer shading and winter passive solar heating.
- Maximize natural day lighting at spaces where programmatically appropriate.

Safety and Security
- Arrange building forms to make the campus inviting and transparent to promote a strong sense of safety.
- Consider visibility from surrounding streets.
- Security elements should be designed and located to blend with the physical environment.
- Determine if vehicular barrier is required and plan accordingly using bollards or buffer zones between building and parking/roadway.
- Provide emergency vehicle access to entire building perimeter.
3. BUILDING DESIGN STANDARDS

3.2 Building Structures

Lehigh’s campus is in a wooded and urban environment and its buildings have historically responded to its context by maintaining low and mid-rise massing and using smaller scale building elements. Nonetheless, the University recognizes that diversity enriches the experiential quality of the built environment and encourages overall design exploration, provided it maintains sensitivity to the landscape.

Scale & Massing
• Use articulation of material and the scale of building elements appropriate for human proportion.
• Along the community edge, building massing and orientation shall be designed to provide the most compatible relationship with surrounding community areas.

Existing Buildings
• Where adding to an existing building, new construction should be clearly differentiated so that the addition does not appear to be part of the historic structure.
• Integrate functions wherever possible to avoid duplication of service areas.
• When conducting renovations, bring existing facilities into compliance with current building codes.

Design
• All elements of the visual environment should blend to complement one another. Repetition of scale, form, color, and texture results in a unified visual impression.
• Provide physical or visual connection from the interior to exterior.
• Create engaging spaces that promote interaction and collaboration.
• Avoid long linear corridors.
• Individual forms should be designed to complement one another and the environment.
• Open to campus, and be inviting to the Lehigh Community.

3.3 Historic Architecture

Lehigh University is synonymous with its historic character. There is an enormous emotional connection to this core of campus. It is the goal of the University to maintain and preserve the integrity of these structures. These majestic buildings reflect the stature of Lehigh University and it is imperative that the character of this area shall never be compromised.
• Historic buildings are integral to the character of Lehigh University and are to be maintained and preserved, when feasible.
• New structures should avoid literal interpretations of historic buildings.
• Where applicable, incorporate recommendations from the Bethlehem Historic District Design Guidelines.
• All projects involving historic structures should follow the US Secretary of the Interior’s Standards for the Treatment of Historic Properties.
3. BUILDING DESIGN STANDARDS

3.4 General Building Materials

The University’s goal is to design and construct buildings with materials of high quality, durability and detailing to ensure minimal maintenance and high energy efficiency. Architects must be conscientious in selecting materials that are appropriate for the expected lifespan of a building and that harmonize with the original campus aesthetic. The vocabulary of materials, in particular stone masonry units, reflect the intimate atmosphere of the campus especially within the Historic Core.

• Use sustainable building materials that are non-toxic, structurally reliable and operationally efficient.
• Select materials that are compatible with adjacent structures and context.
• Materials vary between the four neighborhoods
• Specify materials that are durable, low maintenance and have low operating costs.
• Express a sense of permanence and design buildings to age well.

3.5 Wall Systems

Stone
• The predominant stone is ironstone and sandstone which is mainly used in the Historic Core.
• Use of stone is encouraged but the design must take into account the cost impact of this material in the overall project costs.

Brick
• Red brick is commonly used in the South Bethlehem district

Alternate Wall Materials
• Cast stone and architectural precast concrete is generally used for building base.

Other Materials
• Aluminum storefront/curtainwall with insulated glazing.
• Metal panel claddings, although contemporary are not encouraged as they do not blend into the aesthetic values of the Asa Packer campus.
• Terra Cotta
• Cement Panels

Color Palette
• University colors of brown and white should be incorporated when appropriate.
• Earth tones and neutral shades are also suitable options. Bright, bold colors are to be used sparingly and as accents as they do not blend well with the campus fabric.
3. BUILDING DESIGN STANDARDS

Accents/Detailing
• Use of ornamentation should be appropriate to building context. Precast or sandstone bands may be used to add detail and an order of hierarchy to the building components.
• Sandstone, precast concrete or cast stone lintels and copings are recommended.
• Incorporate layering of planes to give depth to prominent facades.
• Inscribed lettering if desired should be considered early on in the process.

Wall Components
• Ensure that wall joints are adequately concealed or occur at natural break points.
• When equipment cannot be concealed due to code requirements or location restrictions, elements such as meters, electrical panels and louvers that are visible in front of or on exterior walls are to be color matched to the mounting surface.

3.6 Roof Systems

Attention to detail is the key consideration when designing a roof system. Often a less thought about feature of a building, the roof is vulnerable to malfunction as it is constantly exposed to the elements and any problems that arise are not as quickly visible from ground level as those on vertical wall surfaces. Both flat and sloped roofs may be employed but their suitability depends on the function of the building.

Form and Materials
• Slate roofs in the Historic Core must be maintained as they are essential to the character of this neighborhood.
• Where flat roofs are employed, attention must be given to the roof finish as many rooftops are visible from other buildings on this steeply sloped campus. Sarnafil, or an equal membrane roofing system, is the current standard on Campus.

Roof Elements
• Minimize the amount of rooftop equipment to reduce noise pollution, especially in areas which are in close proximity to non-University property.
• Coordinate roof penetrations and roof equipment so that they are not visible or have minimal visual impact.
• Screen all roof mounted equipment.
• Integrate downspouts with architectural details to minimize visibility.
• Provide access to roof via internal stairs. Avoid roof hatches.
3. BUILDING DESIGN STANDARDS

3.7 Façades, Entrances and Windows

The façade of a building is the first impression a visitor receives upon arrival. It is the first opportunity of a building to convey its mission to the general public whether it is a place for business, social gathering or academic pursuit. Entrances and windows connect the user to the outdoors. Through careful coordination of program and building layout, the architect should articulate a meaningful and appealing composition of these elements best suiting the building.

Façades
- Main building façade and entrance should be located facing the major pedestrian route and be highly visible.
- Generally, this is the identifying feature of a building and must be carefully articulated.
- Plazas and courtyards are encouraged to be integrated with the building façade.

Entrances
- Too often, contemporary structures diminish the value of a strong entry point in favor of nonpartisan design, but this makes the access point difficult to locate. Entries should be prominently defined in the architectural statement of the facade.
- Ensure that main entrances are clearly identifiable upon approach and well lit at night.
- All entrances into buildings must be adequately protected from the elements.
- Minimize the visual impact of secondary and service entrances by proper siting, screening and material selection.

Windows
- Coordinate window size and style to complement the scale of the building.
- Avoid large expanses of glass in residential and historic buildings.
- All exterior glazing is to be IGU, Low-E coated and insulated with U value of 0.4 or less.
- Consider use of space where tinted glazing is applied, especially where art classes and computer graphic classes are held.
- SHGC should be appropriate to orientation.
- Use of mirrored glass is discouraged.
- When replacing windows of historic buildings, wood or fiberglass shall be used. Reconstruction of existing windows shall be considered on a case-by-case basis.
3. BUILDING DESIGN STANDARDS

3.8 Leased Spaces

In recent years, the university has started to lease buildings or spaces within buildings to meet the demand for office space. It is understood that with leased spaces, there is limited leverage when it comes to decision making on the building aesthetic. However, to the greatest extent possible, the following should guide the selection/renovation of leased spaces.

- Lease agreements should delineate the level of acceptable building finishes (exterior materials/paint)
- Employ the use of exterior signage to mark the space as an LU premise.
- All furnishings and fixtures should match campus standards so that a cohesive feel is established.
- Color schemes are to be in the palette, complimentary to brown and white, as elsewhere on campus.

3.9 Ancillary Structures

Often overlooked, these utilitarian components are vital to the smooth operation of the University. Though typically small in size, they contribute to the overall aesthetic of the campus. It is important to ensure that they are durable, function well and integrate seamlessly with the campus fabric.

**Pergolas**
- Pergolas provide sheltered respite and communal gathering spaces which are appropriate for this campus.
- Employ the use of pergolas to create a sense of discovery and intimacy.
- Pergolas should be freestanding destinations of their own accord.
- Designers should be judicious in locating pergolas so that they are interspersed around campus, they should not be clustered.

**Bus shelters**
- Bus shelters need to provide shade and protect waiting passengers from wind, rain and snow.
- Maintain design consistency of all bus shelters on campus.
- Materials must be vandal-resistant.
- Provide seating, information board, emergency phone (when warranted), trash receptacles, lighting and a campus map.

**Storage sheds**
- Stand-alone storage sheds are only allowed by exception and must be approved by the campus architect.
- Match materials and color to adjacent building(s) and/or site features.
- All sheds are required to be placed on a concrete pad.
3. BUILDING DESIGN STANDARDS

3.10 Social Spaces

A major part of the student life experience occurs not in buildings but in the interstitial realms between them. It is important to create social spaces that provide opportunities for spontaneous interaction, gathering and contemplation. Whether a space is used for exhibition, recreation or quiet contemplation is determined by its location and design nuances. A diversity of spaces is encouraged to enrich the student life experience.

- Create interest by use of scale, rhythm and changes in planes.
- Consider solar orientation and wind protection when selecting location for social spaces.
- Maintain open lawns for impromptu recreation.
- Plazas and courtyards can be terraced to add interest/character. Define boundaries of plazas by changing materials, framing views and creating variations in elevation.
- Incorporate niches in building exterior to create interesting rest stops or places for quiet study.
- Develop interstitial spaces into points of interest or spaces for gathering by providing seating and shade where appropriate.
- Plazas are best located by main entrances as this is frequently where students congregate while waiting for classes or meeting friends. Plazas should be active spaces.
- Create opportunity areas for the display of both interior and exterior art/sculpture.
- Where practical, retaining walls should be designed to accommodate seating but not skateboarding.
- When incorporating focal points such as fountains, sculpture or landscaping, be mindful of maintenance costs.
- Paving materials include: cast in place concrete, brick pavers, and stone.
- Designate outdoor seating near venues of high student population so that space is active at all times.
- Provide amenities such as seating, power and WiFi hotspots.
- Consider shading options to allow outdoor studying and to avoid glare when viewing electronic devices.
3. BUILDING DESIGN STANDARDS

3.11 Service Areas

Service areas are a crucial part of a building program but care must be given to separate them from the main and public components of the building.

- Service areas such as trash dumpsters, loading docks, emergency generators and cooling towers must be screened from view of primary use areas such as main entrances, courtyards, streets and parking lots.
- Use of evergreen plantings is the preferred method of screening, followed by lightweight metal screen walls.
- Loading docks should be visually and physically separated from the main building entrance.
- Service access must not cut across pedestrian circulation.
3. BUILDING DESIGN STANDARDS

3.12 Sustainable Design

Lehigh University places emphasis on environmentally responsible design. The use of sustainable building materials and energy efficient systems must be included in all new construction and renovation projects.

- Design buildings to meet LEED Silver requirements within the LEED (Leadership in Energy and Environmental Design) guidelines.
- Designers should be judicious in selecting which requirements are to be pursued. Some credits such as treatment of green power and carbon offsets may not be economically viable for LU. See the Lehigh checklist template that follows.
- The decision to obtain LEED certification will be reviewed with the campus architect prior to proceeding.
- Listed on the following chart are the recommended credits each new project should pursue.
## 3. BUILDING DESIGN STANDARDS

**LEED v4 for BD+C: New Construction and Major Renovation**

**Lehigh University Project Checklist**

<table>
<thead>
<tr>
<th>Required</th>
<th>Recommended</th>
<th>Optional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit 1</td>
<td>Integrative Process</td>
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### Location and Transportation

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<tr>
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<td>Credit 2</td>
<td>Sensitive Land Protection</td>
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<tr>
<td>Credit 3</td>
<td>High Priority Site</td>
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<tr>
<td>Credit 4</td>
<td>Surrounding Density and Diverse Uses</td>
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<tr>
<td>Credit 5</td>
<td>Access to Quality Transit</td>
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<tr>
<td>Credit 6</td>
<td>Bicycle Facilities</td>
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<tr>
<td>Credit 7</td>
<td>Reduced Parking Footprint</td>
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<td>Credit 8</td>
<td>Green Vehicles</td>
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### Sustainable Sites

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<tbody>
<tr>
<td>Credit 1</td>
<td>Construction Activity Pollution Prevention</td>
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<tr>
<td>Credit 2</td>
<td>Site Assessment</td>
</tr>
<tr>
<td>Credit 3</td>
<td>Site Development--Protect or Restore Habitat</td>
</tr>
<tr>
<td>Credit 4</td>
<td>Open Space</td>
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<tr>
<td>Credit 5</td>
<td>Rainwater Management</td>
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<tr>
<td>Credit 6</td>
<td>Heat Island Reduction</td>
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<td>Light Pollution Reduction</td>
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### Water Efficiency

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<tr>
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<td>Credit 2</td>
<td>Indoor Water Use Reduction</td>
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<tr>
<td>Credit 3</td>
<td>Building-Level Water Metering</td>
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<tr>
<td>Credit 4</td>
<td>Outdoor Water Use Reduction</td>
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<tr>
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<td>Indoor Water Use Reduction</td>
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<tr>
<td>Credit 6</td>
<td>Cooling Tower Water Use</td>
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<tr>
<td>Credit 7</td>
<td>Water Metering</td>
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### Energy and Atmosphere

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<td>Fundamental Refrigerant Management</td>
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<td>Optimize Energy Performance</td>
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### Materials and Resources

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<tr>
<td>Credit 2</td>
<td>Construction and Demolition Waste Management Planning</td>
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<td>Credit 3</td>
<td>Building Life-Cycle Impact Reduction</td>
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<td>Credit 4</td>
<td>Building Product Disclosure and Optimization - Environment</td>
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<td>Building Product Disclosure and Optimization - Sourcing of Materials</td>
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<td>Environmental Tobacco Smoke Control</td>
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<td>Credit 3</td>
<td>Enhanced Indoor Air Quality Strategies</td>
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<td>Low-Emitting Materials</td>
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<td>Construction Indoor Air Quality Management Plan</td>
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<tr>
<td>Credit 6</td>
<td>Indoor Air Quality Assessment</td>
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<td>Credit 7</td>
<td>Thermal Comfort</td>
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<td>Interior Lighting</td>
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<td>Daylight</td>
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<td>Quality Views</td>
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### Innovation

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### Regional Priority

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<td>Regional Priority: Access to Quality Transit</td>
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<td>Regional Priority: Building Life-Cycle Impact Reduction</td>
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<td>Regional Priority: Indoor Water Use Reduction</td>
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### Total

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<tr>
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**Exterior Design Guidelines**
3.13 Crime Prevention Through Environmental Design (CPTED)

CPTED is an established concept of using the qualities inherent in the built environment to deter criminal acts. By designing buildings and the site to meet these four principles, the goal is to prevent campus crimes ranging from vandalism to break-ins or assault.

**Principle # 1: Natural Surveillance**
- Windows should overlook sidewalks and parking lots.
- Encourage human activity.
- Promote high visibility.
- Exterior lighting must be well spaced and located at proper heights for lighting the faces of pedestrians.
- Eliminate potential for dark alleyways and hidden corners/drives.
- Provide emergency phone locations throughout campus as appropriate.

**Principle # 2: Natural Access Control**
- Channel public circulation towards reception areas.
- Use low thorny bushes beneath ground level windows.

**Principle # 3: Territorial Reinforcement**
- Avoid razor-wire fence topping and grille-front windows as they connote an absence of physical presence.

**Principle # 4: Maintenance**
- Repair vandalized/broken property and graffiti as quickly as possible. (Re: “Broken Windows Theory”)
- Ensure continuous maintenance and trimming of overgrown foliage/shrubs so that lighting is not obscured.
3. BUILDING DESIGN STANDARDS

3.14 Public Art

Public art humanizes the built environment and enriches the experience of public spaces. Public art is the unique expression of an institution and conveys its social and cultural values. The campus grounds is a perfect backdrop for the display of Lehigh’s extensive art collection as well as public art created by Lehigh University’s Department of Art, Architecture and Design.

- The display of art on campus has the ability to enhance a building’s identity or create points of interest throughout the landscape.
- Artwork designed to be placed in the open must be constructed of durable materials and withstand the elements.
- All public art must be reviewed by Campus Planning and Projects.
- Landscape design must be coordinated with LUAG to integrate with the display of artwork.

3.15 Accessibility

Lehigh University is committed to providing universal access all across its campus. To that end, the following should be adhered to:

- Accessibility must be thoughtfully incorporated as part of the design process, not added on as an afterthought.
- Design of new and renovated buildings must comply with the most stringent accessibility codes and/or standards.
- Where ramps are required, incorporate structure within building design, using the same material vocabulary.
- Because of the campus topography, Lehigh faces unique challenges in creating accessible routes. All new landscape and building projects should consult current Lehigh ADA assessments and prioritize work to advance accessibility on campus.
SITE AND LANDSCAPE
4. SITE AND LANDSCAPE

Introduction

Landscape strategies of the Campus Master Plan strive to preserve the essential character of the existing landscape while further accommodating a sustainable evolution of the contemporary institution. Strategies propose a new organization of open spaces within the present pattern of the built campus by translating topography into defined usable campus open spaces. The Campus Master Plan locates the areas of landscape improvements while recognizing that the campus landscape relies on various built and natural systems like ecology, topography, programming, land management, and maintenance practices.

Four landscape strategies have been suggested as a guiding framework for improving the present as well as future development of the campus landscape:

**Reinforce Existing Woodlands**: Use the existing South Mountain ecology systems as a driver to tackle issues of erosion and storm water management, frame campus entrances, and define campus open spaces and pedestrian circulation.

**Strengthen the Academic Core**: Strengthen the existing classical academic core by allowing for clear sightlines; define the core with bold lower storey planting and strategic editing of existing planting and physical construct of present day landscape.

**Establish Hierarchy of Open Spaces**: Reorganize or establish a new social landscape by defining or providing a variety of open spaces within the academic core and residential zones. Create open spaces for quiet study, small gatherings, or interdisciplinary interactive outdoor spaces.

**Establish Connection to South Bethlehem**: Maximize the use of the existing South Bethlehem fabric to better integrate the University with the community and enhance the gateway to the University.

~ Excerpted from the 2012 Campus Master Plan

In addition to the strategies from the Master Plan, this EDR recognizes the need and desire to create **Outdoor Social Spaces** by utilizing the landscape to create areas for serendipitous interaction that is the hallmark of the intimate campus experience unique to Lehigh University.
4.1  Landscaping

The Asa Packer campus has an idyllic park-like natural setting, and at the same time is an urban campus within the region of South Bethlehem that is in the midst of vibrant revitalization. Nurturing the best aspects of this dual identity can build on Lehigh’s powerful history and appeal to a wide range of potential students, faculty and staff, with a diversity of experiences and options.

The landscape is an important part of Lehigh University’s campus. Because it is the connective tissue that ties every aspect of the campus together, it affects and is affected by decisions made to campus buildings, utilities, vehicular circulation and parking. The landscaping guidelines aim to provide a holistic design approach for the Asa Packer campus by considering all the elements that make up the campus and its surroundings.

Campus Edges
The scale and character of campus edges adjacent to surrounding districts and neighborhoods shall communicate a strong sense of campus without creating a physical and visual barrier. Consider crossable boundaries that allow unobstructed pedestrian and vehicular access. The existing woodlands by the residential area should be reinforced and preserved.

Campus Entrances
Main gateways to campus are to be prominently announced. There needs to be a modulated approach and arrival sequence beginning from the drive to the doorstep that creates a beautiful transition from the public realm to the front door of campus. This main gateway needs to reflect the stature of Lehigh University.

The main vehicular gateway to campus is via Brodhead Ave and Summit Street to the driveway at Alumni Memorial Building. While the terminus has been designed, the approach is in need of improvement.

- Widen driveway and create clear visibility of the destination point (Alumni Memorial Building) from at least one block length before terminus.
- Create wide streets flanked with spacious sidewalks on both sides and formal rows of large trees, allowing visual clarity of the destination point.
- Use landscaping to shape and mold the view, choosing plants for their particular visual interest in all seasons. Plants add shape, line, color and texture leading the visitor through the arrival sequence.
- Monumental fountains and water features are suitable features that reinforce arrival and entrance.
- Complement with other landscape features to signify a sense of arrival.
- Materials should be stone with engraved or metal lettering.

Water Feature at Alumni Memorial Building
4. SITE AND LANDSCAPE

Minor Gateways
There are multiple entry points into campus and this is a feature that reflects the university’s philosophy of a student’s metaphorical arrival through myriad means.
- Less monumental in scale, these gateways are the pedestrian access points.
- Iron arches are appropriate as are low stone walls.
- Signage should be of scale that is prominent and constructed of materials like stone or steel that connote permanence and endurance.
- Complement the built form with simple and low planting features so as not to overwhelm the entrance feature.

Major Streets
- Major streets should have a formal aesthetic. This can be achieved by means of a single row of regularly spaced trees along both sides of the street.
- Trees may be different species for different streets but mixing species within any particular street is discouraged.
- Provide mulch or pea gravel as ground cover.

Walkways
- Observe a hierarchy of systems, typology, scale, consistency of materials and structure of pedestrian corridors to help define and articulate open spaces and enhance campus wayfinding.
- Walkways shall be concrete pavers in light gray or muted red in a pattern of clean lines.
- Diversity in pattern is encouraged at nodes to recognize focal points.
- Consider incorporating built-in seating along walking paths where retaining walls or planters are required.
- Organic and meandering paths are highly encouraged, especially in the residential zone. The straightest path is not necessarily the most desirable.
- Walkways that run diagonal and intersect with each other reflect strong natural desire lines and is suitable for routes across green spaces that connect buildings.
- Utilize a common palette of materials to create a cohesive aesthetic across campus.
- Low masonry walls are suitable elements to create interest along a walkway or within a plaza. Double sided low stone walls should be in a coursed ashlar pattern and capped with granite tops.
- Walkways that minimize slope and make more accessible and welcoming paths are encouraged.
Prioritizing the pedestrian experience includes further development of the pedestrian path system, the conversion of Upper and Lower Sayre Park Roads into a one-way multimodal loop, and expanding the car-free zone on Asa Packer Campus. The transformation of Sayre Drive into Sayre Walk as depicted above serves as an example of public realm improvements in the car-free zone. Further description of other pedestrian experience improvements are found in the following pages.
4. SITE AND LANDSCAPE

List of Recommended Plants
One major landscaping concern at LU is the deer resistant quality of plantings. The deer that browse in each neighborhood depends on the size of the deer herd, types of vegetation in the area, and many other variables. The following plant species are reported to be deer resistant and should be considered for use at Lehigh University. Check the detailed description with each plant in the nursery for more information.

Perennial Plants
- Actaea spp. (doll’s eyes)
- Agastache scrophulariifolia (giant purple hyssop)
- Allium cernuum/A. tricoccum (wild onion/leek)
- Amsonia (blue star)
- Andropogon gerardii (big bluestem)
- Aquilegia canadensis (wild columbine)
- Arisaema (Jack-in-the-pulpit)
- Aruncus dioicus (goat’s beard)
- Asarum canadense (wild ginger)
- Asclepias (butterflyweed, milkweed)
- Aster novae-angliae (New England aster)
- Aster oblongifolius (aromatic aster)
- Baptisia australis (blue false indigo)
- Cimicifuga racemosa (black cohosh)
- Clematis virginiana (Virgin’s-bower)
- Coreopsis lanceolata/C. tripteris (tickseed)
- Erigeron annuus (feather duster)
- Ferns
- Geranium maculatum (wood geranium)
- Helenium autumnale (Helen’s flower)
- Hibiscus moscheutos (swamp rose-mallow)
- Iris versicolor (blue flag iris)
- Jeffersonia diphylla (twin-leaf)
- Liatris spicata (dense blazing star)
- Lobelia siphilitica (great blue lobelia)
- Mimulus ringens (monkey flower)
- Monarda fistulosa (wild bergamot)
- Panicum virgatum (switch grass)
- Penstemon digitalis (beardtongue)
- Phlox divaricata (blue wood phlox)
- Phlox stolonifera (creeping phlox)
- Physostegia virginiana (obedient plant)
- Podophyllum peltatum (May-apple)
- Polemonium reptans (Jacob’s-ladder)
- Rudbeckia fulgida (black-eyed Susan)
- Scutellaria incana (skullcap)
- Solidago spp. (Goldenrods)
- Symphyotrichum novae-angliae (Aster eastern)
- Verbena hastata (blue vervain)
- Veronicastrum virginicum (Culver’s-root)
- Coreopsis rosea (rose coreopsis)
- Dicentra eximia (fringed bleeding-heart)
- Euphorbia corollata (flowering spurge)

Trees and Shrubs
- Acer spp. (maple)
- Amelanchier spp. (service berry)
- Betula spp. (birch)
- Calycanthus floridus (Carolina allspice)
- Carpinus spp. (hornbeam)
- Clethra alnifolia (summersweet)
- Dirca palustris (leatherwood)
- Fagus spp. (beech)
- Fraxinus spp. (ash)
- Gleditsia triacanthos (honeylocust)
- Hamamelis spp. (witchhazel)
- Hypericum prolificum (Shrubby St. John’s-wort)
- Lindera benzoin (spicebush)
- Liquidambar styraciflua (sweet gum)
- Lonicera sempervirens (trumpet honeysuckle)
- Magnolia spp.
- Myrica pensylvanica (bayberry)
- Nyssa sylvatica (sourgum)
- Quercus spp. (oak) - acorns attract deer, however
- Viburnum spp.
4. SITE AND LANDSCAPE

4.2 Outdoor Social Spaces

Outdoor Social Spaces are highly desirable features, utilizing the landscape fabric to create areas for serendipitous interaction. This serendipity is a hallmark of the intimate campus experience at Lehigh University.

It is human nature to seek outdoor spaces because of our need for social interaction. These spaces are realms for chance encounters and potential interactions with other people, and provide opportunities for individuals to engage in high-level social interaction not found elsewhere on campus.

Campus Greens

The exiting campus greens are the lawn in front of University Center and the Sacred Grove. These should remain as open informal areas and maintain a park-like atmosphere.
- Walkways should be organic and meander through the green.
- Utilize large drifts of tree massing to define and reinforce the edges.

Courtyards and Plazas

Courtyards and plazas are oases that tie together multiple buildings and often are viewed as an extension of the building itself. The expectation is for these spaces to be activated as a communal gathering area.
- Design these spaces to complement the axial relationships to buildings and in particular the building entrance.
- Provide ample space for gathering or seating
- Use of water features or sculptures are appropriate as focal points of plazas
- Plantings should be more formal and organized in the historic core
- Plantings should be more informal and playful in other sections of campus
- Use walkways or planting beds to reinforce the perimeter
- A change of materials or elevation is also appropriate as methods to define the boundaries of courtyards and plazas.
- If bollards are necessary, design them such that they are integral to the hardscape. The square bollards at Linderman Library are a good example.

Pedestrian Malls

Pedestrian malls are large promenades that are blocked off to vehicular traffic. There are currently two such malls on campus—Memorial Drive in the east-west axis and the mall extending north-south from the UC lawn to and from Campus Square.
- Malls should be formal in their design
- Single rows of large scale trees
- Walkway designs may be detailed with special pavement or accent details to provide interest and establish hierarchy.
- Select pavement material that is capable of being repaired and replaced with ease.
4.3 Site Furnishings

Site furnishings for the campus include but are not limited to: benches, waste and recycling containers, bike racks, tables and chairs. As with other elements of the built environment, it is important to create a harmonious composition throughout campus.

Design
• Furnishings should respond to the location and way in which they’re being used. Seating opportunities should be integrated with pedestrian circulation and plazas to take advantage of key vistas.
• Seating locations in potential gathering areas should create comfortable settings conducive to conversation as well as security.
• Incorporate adequate space to accommodate wheelchair accessible tables and companion seating.
• Allow a variety of seating options based on location and use.
• Place waste and recycling containers in designated concrete based alcoves that are set back from circulation paths.

Maintenance
• Anchor all site furnishings to prevent theft and vandalism.
• Provide a concrete pad base for any standalone furnishing within the landscape.

Picnic Furniture for Outdoor Plazas
• Stacking Chair: emuamericas, LLC, Model Ronda #116, silver aluminum finish
• Stacking Bar Height Chair: emuamericas, LLC, Model Ronda Bar #128, silver aluminum finish
• Umbrella Tables: emuamericas, LLC, Model Cambi, silver aluminum finish
• Historic Look Picnic Tables
4. SITE AND LANDSCAPE

**Adirondack Chairs**
Conveying a more relaxed atmosphere is the recent and popular use of Adirondack chairs in open lawn areas. Compared to linear fixed benches and picnic tables, these movable chairs foster more fluid conversation.
- Provide wooden Adirondack chairs in Pantone 16-5917 TCX Malachite Green.
- Cluster chairs in groups of 2 to 6 units under tree canopies.

**Bicycle Rack**
Bicycle racks are to be located close to the building entrance and sited so that they do not cause a cluttered appearance.
- Provide inverted U-shaped stainless steel bicycle racks anchored to a concrete pad.
- It is preferred that multiple racks are aligned in a single row.

**Plaques**
Lehigh University will recognize the generosity of certain donors for naming spaces or facilities at the university by placing their names on any donor walls and on plaques.
- Plaques will be created in the university standard, which is currently either cast bronze or brushed metal with colored letters, depending upon location and surrounding finishes.
- Plaques should be placed at a location from which they can easily be viewed by individuals of all abilities.

**Trash Receptacles**
Trash receptacles to be located within close proximity of uses expected to generate trash without obstructing travel routes or building entries, creating obnoxious odors or interfering with other site amenities and activities. Trash receptacles should be placed adjacent to rather than within pedestrian travel corridors. Facilities Services and Campus Planning and Projects (FSCPP) to review and approve of all trash receptacle locations prior to ordering and installation.
4. SITE AND LANDSCAPE

Tree Grate
Tree grates provide protection and security to the tree as well as a safe extension of the pedestrian walkway. Grates should be black powder coated cast iron.
- Tree grate: French Pattern as manufactured by Canterbury Designs Inc., 5632 West Washington Boulevard, Los Angeles, CA 90016, or equal. Square, round or half square/half round combination shape to be determined by Facilities Services and Campus Planning and Projects (FSCPP).

Emergency Call Stations
These blue lighted posts are equipped with an emergency signaling and direct voice communication with campus police. Provide Emergency Call Stations at strategic locations along pedestrian walkways and in parking lots. They are crucial in supporting the security measures implemented around campus. At minimum, provide emergency call stations at each major pedestrian intersection and in each parking lot, as well as at building entrances.
4. SITE AND LANDSCAPE

4.4 Roads and Walkways

Develop the transportation network to accommodate vehicular circulation on the exterior ring of campus and maintain the campus core for pedestrian circulation.

**Roads**
- Vehicular lanes should be 12'-0" wide at minimum.
- Provide 6" curb and gutter for all roadways.
- Minimize on-street parking along major roadways.
- Provide retractable bollards to control restricted access roads.

**Service Drives**
- Combine service drives for multiple buildings where possible.
- Utilize landscaping to screen view of service drives.

**Pedestrian Walkways**
- Size and design walkways appropriate to architectural style and volume of pedestrians in the design area.
- Walkways should incorporate the intuitive path between two destinations to avoid user-made “cow paths”.
- There shall be at least one wheelchair “accessible” route through the campus serving all public buildings.
- Primary walkways shall be 15'-0" wide and be designed for pedestrian and vehicular traffic (for maintenance vehicles).
- Secondary walkways shall be 10'-0" wide minimum and be designed for pedestrian and vehicular traffic.
- No walkway shall be less than 6'-0" wide.
- Landscaping, walls and bollards can all be used as a means to create barriers and direct traffic.
- Provide colored and textured detectable warning strips at signalized crossing locations.
Paving
Consistent treatment of the designs and details of paving contribute to the overall positive image of the whole campus. Distinguish areas of arrival or nodes by a change in material and articulation of detail.

Etched signage or patterns as part of walkway or plaza design is encouraged.

Permeable paving that is ADA compliant may be considered for walkways.

**RECOMMENDED PAVING MATERIALS:**

**Plazas and Courtyards:**
- Precast concrete pavers: 24" x 24" x 2" units in matte tan.
- Solid concrete interlocking pavers: 10 sided octagon-square combination - 9" long x 5 1/2" wide x 3 1/8" thickness by UNI-Decor

**Primary Pedestrian Walkways:**
- Precast concrete pavers: 24" x 24" x 2" units in matte tan.
- Solid concrete interlocking pavers: 10 sided octagon-square combination - 9" long x 5 1/2" wide x 3 1/8" thickness by UNI-Decor
- Solid concrete interlocking pavers: rectangular or square in light grey and muted red

**Secondary Pedestrian Walkways:**
- Cast-in-place concrete walkways with soft broom finish

**Service Yards and Roads:**
- Bituminous paving
- Heavy duty concrete
4. SITE AND LANDSCAPE

4.5 Parking

Parking at Lehigh University consists of mainly small surface lots and three multi-storey parking garages - Alumni Parking Pavilion, Zoellner Parking Garage and Campus Square Garage.

Surface parking lots are typically small due to steep slopes in the Residential Zone and the limited space in the Historic Core and Post-Modern/South Bethlehem neighborhoods. These small lots keep in scale with the pedestrian focused nature of the Asa Packer campus. Large surface lots are undesirable as they create unsightly "oceans of asphalt".

General
- Parking garages should be about 4-5 stories tall.
- Locate parking areas at the perimeter of campus. Avoid parking within the pedestrian-focused campus core, with the exception of ADA spaces.
- Combine open parking lots to serve multiple facilities where possible.
- Parking layout should provide continuous flow through the lot.
- Provide separate travel way for parking circulation and through traffic.
- Maintain separation of vehicular and pedestrian travel paths for safe movement to buildings.
- Design pedestrian walkways as part of parking lots to direct pedestrians to designated crossings and pedestrian linkages.
- Observe setback requirements.
- Use the 90-degree parking configuration when possible.
- Where parking is provided along a one-way road, use 45-degree parking configuration.
- Wherever possible, provide tree shading at parking areas.
- Utilize landscaping and planting islands to reduce the visual impact of large areas of surface parking.
- For landscaped medians and planting islands, provide a minimum dimension of 6'-0" to accommodate root system.
- Use concrete curbs and gutters for parking areas.

Parking stall size:
- Typical: 9’ x 18’
4. SITE AND LANDSCAPE

Paving
- Asphalt paving is the standard.
- Use heavy duty concrete where required for heavy vehicles, buses, motorcycle parking and where fuel spills may occur.
- For sustainability, use high-albedo concrete or permeable surfaces where appropriate.

Signage and Markings
- Identify reserved parking spaces by posting the appropriate signage.
- Provide 4 inch wide striping for all pavement markings.
- Use white surface markings to indicate general and student parking spaces.
- Use yellow surface markings to indicate restricted and faculty/staff parking spaces.
- Use green surface markings to indicate visitor parking spaces.
- Use blue surface markings to indicate accessible parking spaces.
4. SITE AND LANDSCAPE

4.6 Shuttle Bus Stops

Lehigh University Transportation and Parking Services offers free shuttle services between all three campuses and also into town.

**General**
- Provide sheltered bus stops on concrete pads that are set back from the pedestrian walkway. The current manufacturer is Duo-Gard.
- General construction material should be galvanized steel with a black powdercoat finish.
- Utilize transparent/translucent materials for vertical surfaces to ensure high visibility.
- Design shelters with standing seam galvanized steel barrel roof.
- Provide simple and comfortable built-in seating. Provide ADA compliant seating.
- Bus stops must be well lit.
- Provide space for information regarding bus routes and schedule.
- Identify each shuttle bus stop with signage indicating stop number and route.
4. SITE AND LANDSCAPE

4.7 Exterior Signage

Signage plays a major role in creating a visually cohesive campus. Signs are an important and positive element in the overall campus appearance. Furthermore, exterior signage is a relatively cost effective way to quickly boost campus branding. A standard exterior sign system serves to guide, direct, inform, identify, and regulate movement of people and vehicles at Lehigh University.

The existing directional signage and building exterior graphics are basic, but consistent. As new signs are implemented, consider the following:

**General Design**
- Use concise, clear signage in accordance with Lehigh University Signage Standards (document in progress).
- Minimize the number of signs used for each facility.
- Exterior digital signage is prohibited in the Historic Core and Residential Zone. In all other zones, exterior digital signage dimensions should not exceed 5'-0" x 3'-0".
- Sign copy should be kept to a minimum.

**Campus Vehicular Sign**
- Vehicular directional signage should face the oncoming direction of traffic and be scaled for legibility of moving traffic.
- Parking lot signage shall clearly indicate parking lot number and allowable use group (faculty/student/service/etc).
- Free standing building identifier signage should be double-faced and placed perpendicular to a vehicular way for better visibility.
- Do not cluster multiple signs in one location as this reduces driver clarity and creates confusion.
- Traffic control signs must conform with Pennsylvania Department of Transportation requirements.
- Street signs within the Asa Packer campus shall be marked with an additional LU logo.

**Campus Entrances**
- Main campus signs shall be located at major entries to the campus, project a positive, timeless image for the university.
- Appropriate material for campus entrance signs are metal lettering surface mounted into low stone walls.
4. SITE AND LANDSCAPE

Building Exterior Graphics
- Building identification signs shall reflect the formal building name as approved by Lehigh University.
- Consider the scale and location of building mounted exterior graphics so that it complements and does not distract from the design integrity of a building.
- Locate one sign indicating building name at the main entrance in a location that is easily visible to pedestrians from a distance.
- Building name should be surface mounted aluminum channel letters or engraved stone. Surface mounted letters are to be externally illuminated.
- Screenprinted signage is not acceptable for exterior building graphics.
- All main building signs need to include the building number per University requirements.

Pedestrian Directional Sign
- Provide campus maps and pedestrian guides at decision points along major pedestrian paths.
- The design and size of pedestrian signs must be consistent throughout the campus.

Shuttle Bus Stop Sign
- Identify each shuttle bus stop with signage indicating stop number and route.

Banner Signs
To enhance campus branding, vertical pole-mounted banner signs are encouraged, especially along the campus perimeter and pedestrian malls.
- Securely attach banners to top and bottom bracket arms fastened to vertical poles or building structure.
- Mounting of banners shall not alter or damage the exterior shell of a building.
- Banners proposed to be attached to leased facilities shall be reviewed for impact to the building by the University Architect.

Color
- Color palette for all signs must be in accordance with University colors: brown and white with yellow accent.
4. SITE AND LANDSCAPE

Samples of Successful Signage

Sample Banner Signage 1

Sample Pedestrian Directional Signage

Sample Banner Signage 2

Sample Campus Map Signage

Sample Banner Signage 3
4. SITE AND LANDSCAPE

4.8 Lighting

Proper and adequate lighting is a major factor in providing a safe and visually cohesive lighted environment in accordance with the Lehigh University Academic and Residential Lighting Master Plan.

General

• High color rendering LED sources with a color temperature of 4000 Kelvin and a minimum color rendering index (CRI) of 70 shall be used for all new lighting projects.
• These white light sources provide better color rendition of skin tones and material colors and easier identification of surroundings and people. White light sources above 4000K can impact the flight routes of migratory birds and the circadian rhythm in animals. LED light sources are preferred due to their long-life and low energy use. The Building Automation System (BAS) shall control all exterior lighting except for wall packs which shall be controlled by photocells.
• Consider light pollution in lighting design to balance the need for safety and environmental impact.
• All luminaires shall minimize uplight and glare.
• Backlight shall also be controlled when a luminaire is installed adjacent to property not owned by Lehigh University.
• Refer to the 2015 Lehigh University Site Lighting Design Criteria for comprehensive lighting requirements and specifications including lumen output, backlight, uplight and glare criteria.

Architectural Lighting

• Uplight architectural and landscaping features and building entrances to emphasize importance and hierarchy, while considering potential glare and light pollution concerns.
• Building entrances, active parking lots, bus shelters and 24-hour plazas shall be well lit in the evening.
• Areas which require special lighting, such as performance areas, sculpture lighting, etc. shall consider the immediately surrounding uses and be complementary.
• Consider symmetry when locating lighting fixtures on a building or within a plaza.
• For fixtures along sidewalks and paths, provide pedestrian-scale, pole-mounted lights along streets, sidewalks, and paths. Generally, spacing between pedestrian-scale fixtures shall be between 60 to 100 feet.
• Where lighting is also needed along the vehicular way, a combination fixture may be used to light the street and adjacent pedestrian way or open space, with a taller fixture lighting the street and a pedestrian-scale fixture lighting the adjacent sidewalk, path or open space.
4. SITE AND LANDSCAPE

• Lighting in open spaces shall be provided through pedestrian-scale, pole-mounted lighting, lighted bollards and, where unavoidable, building-mounted lighting. Excessive grouping of pole mounted fixtures shall be avoided to minimize glare.
• Grand building entrances, such as those which front on a plaza, shall include pedestrian-scale pole-mounted fixtures and may also consider building mounted fixtures.
• More modest building entrances may include only building-mounted fixtures.

Utility Lighting
• Areas on the campus which are intended to be unoccupied during the evening hours should be provided the minimum level of light required to support campus security and surveillance.
• Lighting fixtures should be equally spaced.
• Coordinate placement of lighting poles with parking islands and tree locations.
• Lighting shall be provided at the perimeter of and within surface parking areas.
• Light fixtures should be of the least height to provide the desired lighting level. Landscaping shall have precedence in islands; poles shall generally be located in grassed areas and within parking lots. Concrete foundations with extended height shall be installed for poles that are subject to vehicle damage.

Light Fixtures
Light fixtures have been selected for durability, ease of use and maintenance and aesthetic design.
• Tall pedestrian walkway lamps: LED Victorian Style Fixture: PennGlobe Newport 1000 Luminaire with Boston Fluted Post
• Residential Fixture: Beacon Lighting La Jolla
• Roadway and Parking Lot Fixture: Kim Lighting Altitude
4. SITE AND LANDSCAPE

4.9 Utilities
Utility systems provide the basic infrastructure of power, communication, water, and sewer services necessary for continued safe operation of campus.

Utility Components
- Use underground utility service to minimize unsightly overhead clutter.
- Substations and transformers should be designed and located to minimize their visual impact and be compatible with the character of their setting. Locate substations away from major public circulation areas and provide adequate screening.
- All utility equipment must be screened from view by means of architectural screening, perennial landscape screening, locating them in pits or locating them internal to the building.
- Water, steam, electric and gas meters shall be installed in all new construction or renovation work. Meters shall be tied into the campus energy management system.
- Clearly mark the position of fire hydrants using flexible flags to enable hydrant location in snowdrift.
- Provide an adequate number of outside GFCI receptacles and hose bibs, carefully located and freeze-protected, for proper watering and future maintenance of all grass and landscaped areas.
- Consider irrigation systems for planting beds at main entrances to buildings.
- A minimum of one emergency communications device shall be provided near each building. The location of the emergency communications device will be determined by the University’s Environmental Health and Safety department.
Color Palette

Building Base Colors

The campus has traditionally maintained a warm earth tone color palette for all its buildings and it is desired to continue this tradition.

Where stone is utilized for walls, they should be ironstone or similar.

Where brick is used in the Historic Core, the basis of design is Belden Brick: Belcrest 500

Glazing colors are to be light gray or clear. Mullions, railings and storefronts should be compatible with adjacent glazing color.

Precast concrete should be gray or light tan.

Accent trims may be darker tones of brown or burnt sienna.
6. APPENDIX

Official Colors
The official Lehigh University colors of dark brown and white were first established in 1867 to unify the student body. Today, Lehigh’s school colors are an important tool in creating an identity and generating school pride. It’s important that the colors are used accurately in all materials.

These color guidelines should always dictate the color palette used for internal and external palettes. Do not change the Lehigh colors under any circumstances by using an alternate PMS color in a different shade of brown. The official Lehigh brown is the only shade of brown permitted for use.

All color selections should be coordinated with the Department of Communications and Public Affairs “Visual Identity System”.

Brown
PMS 1545 C

White

Yellow
PMS 123 C
List of available manuals, guides and master plans for reference:

Current design standards:
https://financeadmin.lehigh.edu/facilities/standards/guidelines

The 2012 Campus Master Plan:
http://www.lehigh.edu/masterplan/

Signage Guidelines

Historic Guidelines for South Bethlehem

Lehigh University Visual Identity System

Lehigh University Lighting Study

2015 ADA Study (ongoing)