The Design Goals & Strategies describe the goals and strategies governing materials selection, architectural and landscape form and detailing in all architectural districts.

Architectural Strategies & Materials
- Sustainability
- Light Filled Public Spaces
- Circulation within & between Buildings
- Building Materials

Landscape Strategies & Materials
- Landscape Management Procedures
- Plant Materials
- Pedestrian Paths
- Site Elements
- Exterior Lighting
- Signage & Wayfinding
- Gateway Markings

Alternative Energy Development

Real Estate Gift Policy
**Sustainable Design**

High-performance, sustainable, energy-saving buildings are important to ensure the future of the environment locally, regionally, and globally. To reinforce the University of Vermont's commitment to sustainable design and its recently adopted (May 2005) Policy on Environmental Design and Vermont Purchasing in New and Renovated Buildings, all new buildings and major renovations will strive to achieve a level equivalent to LEED™ Certified.

The LEED™ (Leadership in Energy and Environmental Design) Green Building Rating System is a consensus-based national standard for developing high-performance, sustainable buildings. The rating system rates designs in five categories: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, and Indoor Air Quality. Each category lists prerequisites and credits for the building being rated. These prerequisites and credits cover a wide range of issues including: site erosion control, light pollution reduction, water use reduction, renewable energy, storage and collection of recyclables, building reuse, use of local/regional materials, use of certified wood, carbon dioxide monitoring, use of low-emitting materials, thermal comfort credits, and providing daylight and views. The overall score for the building determines the rating level. Levels are LEED™ Certified, LEED™ Certified Silver, LEED™ Certified Gold, and LEED™ Certified Platinum.

The first LEED™ certified building in Vermont is the ECHO Center on the lakefront in downtown Burlington, which opened in 2002. The Center was designed around a glass atrium that both allows views of the lake and brings energy-saving light into the building. Other features include a state-of-the-art HVAC system, efficient lighting, recycled content materials, super efficient windows and insulation systems, and human- and lake-friendly materials throughout.
Light Filled Public Spaces

Just as improving the quality of outdoor gathering spaces is a major goal of this Campus Master Plan, so too is the need to improve the quality of indoor spaces. Many of the University of Vermont’s buildings have small entrances and windows, and few have indoor public spaces in which to view the landscape. Therefore, these guidelines recommend that all new buildings, as well as additions to existing buildings, have glass-enclosed public spaces such as atriums, dining halls, cafes, lounges, stairwells, and lobbies that bring daylight inside and allow users to look out on to the campus and the Vermont environment. These glass spaces will help with the high performance of buildings, and the public spaces will foster a greater sense of community at the University of Vermont.

Circulation within & between Buildings

The guidelines will promote interior circulation through buildings to other campus destinations.

Buildings That Fit Into the Landscape

The guidelines will promote new buildings that have a strong relationship with the landscape spaces around them.
Building Materials

Acceptable exterior building materials will vary across the different architectural districts of the campus. In general the list of acceptable materials for the University of Vermont includes the materials listed below. Technological and material innovations will be considered for addition to the Architectural Materials & Standards list by the Campus Master Planning Design Review Committee.

1. Brick – Brick colors and textures should be in the range of adjacent buildings. Any variety in brick colors should be subtle. A mix of bonds (Flemish, running, etc.) is encouraged. Excessive striping or patterning is discouraged as is the use of stacked bond or “Utility” bricks. Limestone or precast trim is also encouraged.

2. Stone – The type and color of stone should be compatible with adjacent buildings. Limestone, granite, and slate are used on the campus now and would be acceptable. Stone quarried in Vermont would be particularly desirable to the University.

3. Architectural Precast – Precast may be used as trim or in some districts (such as the Gateway District) as wall cladding. The color and texture of precast should be in the range of the masonry on adjacent buildings.

4. Metal – Metal may be used as trim or as wall cladding, particularly to break down the scale of large brick buildings. Copper, lead-coated copper, zincoated copper and aluminum are acceptable.

5. Wood – Wood may be used as trim or as exterior siding, particularly for residential halls. Wood trim should be painted a color appropriate to the exterior of the building. Wood siding may be painted or stained a natural color.

6. Trim – Trim materials for masonry buildings include limestone, granite, slate, precast, wood and metal.

7. Curtain Wall – Aluminum curtain wall may be used at lobbies, lounges, circulation (such as stairs) and large public spaces. The frames may be clear anodized or painted a color appropriate to the building. Sun screening devices should be provided for southern facing exposures. Clear glass is preferred and any colored glass should be subtle. Reflective glass is discouraged.
8. Windows – Windows should be either wood (painted or clad), metal, or fiberglass. They should be operable wherever feasible. The frame color will vary throughout the campus but must be compatible with the exterior of the building (sample panels need to be developed for final design review approval). The standard window modules should be vertically proportioned. Bay windows may be considered. Clear glass is preferred and any colored glass should be subtle. Horizontal ribbon windows are discouraged.

9. Doors – Exterior doors should be either wood or metal with glazing. Overhead cover should be provided for all exterior doors. Loading and service doors should be designed with as much care as front doors.

10. Roofs – Roofs for new transitional buildings in the historic districts should have slate roofs. Standing seam metal roofs are acceptable. Asphalt shingles may be used in other districts if they are high quality.

11. Details – Chimneys, dormers, skylights, light fixtures, downspouts, signage and other details need to be carefully considered and designed appropriately for the exterior of the building and final design review approval.
An adaptable, custom-designed maintenance regimen is an essential tool for successfully preserving the appearance and design integrity of the diverse landscapes of the campus open space. Throughout the open spaces of the University, distinct areas that offer noticeable variety and challenge can be identified as requiring special maintenance attention. This necessitates a plan that defines the specific tasks and levels of maintenance for open space across the campus. Additionally, this plan addresses staff skills needed to realize the maintenance responsibilities.

The University’s Physical Plant Grounds staff is responsible for providing landscape management services that range from minimal to intensive. The groundskeeping program that has been implemented covers the range from simple custodial attention to a very detailed horticultural protocol. Included in this management plan are mowing, pruning, planting, mulching, fertilizing, integrated pest management, leaf and snow removal, and other inventive strategies that comprehensively meet the requirements of the open space areas while demonstrating environmental sensitivity and sensibility.

The campus is divided into two zones for landscape maintenance, one, north of Main Street, and the second one, south of Main Street. Each zone includes a full range of maintenance needs with priority levels defined. Landscape maintenance “teams” assigned to the campus zones consist of a full range of skill levels including horticultural specialists. With this approach the teams are able to meet the most difficult landscape challenges.
The dramatic setting of the University of Vermont’s Main Campus in Burlington, perched on a hill overlooking Lake Champlain with sweeping views of Vermont’s Green Mountains to the west, defines, in part, the institution’s sense of place and landscape context. It is the open space network of the campus and its associated landscape patterns, however, that provide the backdrop for the daily life of the University community. Thus it is critically important that the campus landscape reinforces the social and academic diversity that is the hallmark of a vibrant university. It is equally important that this landscape is developed and managed in a sustainable and functional manner. A beautiful, well maintained, ecologically sensitive campus environment will convey the image of the Environmental University and at the same time create engaging and amenable open spaces.

As a land grant institution with a College of Agriculture and Life Sciences and the Rubenstein School of Environment and Natural Resources, the University has a long tradition of instruction, research and public outreach in horticulture, landscape design, forestry and natural resource management. Every opportunity to tap into and build on this tradition and expertise should be taken advantage of. The involvement of faculty and students in the planning, design, development and management of the campus landscape will further the mission of the institution and community ownership and investment in its environment. Horticulture classes and programs have continued to make a mark on the campus with demonstration gardens and ornamental plantings.

The design frameworks and illustrative plans that are an integral part of this Campus Master Plan set forth a conceptual approach for future landscape development and how formal and informal plantings define the character and form of the open space network. There are a number of key overarching principles, considerations and methodologies that will provide guidance for the University as it continues to refine and enhance its campus landscape.

Native Plant Material
The structure of the campus landscape is and should continue to be comprised of a diverse population of hardy, native plant selections. The rigors of the Vermont climate and the recent trend of severe weather events and unseasonable patterns have stressed plant materials. The threat from devastating pests has also increased. Indigenous plant material planted in sufficient soils and in appropriate locations provide the best defense against these conditions and require less care than non-native materials. A listing of recommended native plant species is provided in this section.

Campus Arboretum
While it is clear that the campus landscape should be comprised primarily of native species, the University campus is also a place where unique ornamental species and specimen trees can be planted and appreciated for their distinct characteristics and aesthetic qualities. A range of non-native ornamentals such as magnolias, ginkgos, and crabapples are thriving at the University and can be added to as part of the Campus Master Plan initiative which envisions the entire campus as an arboretum. The arboretum can serve as an educational tool as well as create a new focus for campus enhancement. Invasive or inappropriate species such as the Norway Maple should not be planted anywhere on campus.

Memorial Plantings
These plantings are another on-going tradition at the University of Vermont and the program provides a unique opportunity to recognize and memorialize members of the University community. A policy and procedure for memorial tree plantings will be developed to ensure plantings are consistent with the overall design frameworks set forth in this plan. Memorial plantings can be an integral component of the development of the campus arboretum.

Historic Plantings
There are some distinct landmark planting areas on the University campus that are part of the institution’s legacy and historic landscape. The grove of stately pines at the University Green is the focal point for the campus and as recently as the 1960s was graced with the elegant forms of American Elms lining the walkways so that “the eye was led down allees and avenues of shady greenery that took one directly to the main buildings of campus”. The elms are gone, but recently developed cultivars of the American Elm are proving hardy and resistant to Dutch Elm Disease. Thus it is desirable to replant elms in appropriate locations, including the University Green, to restore their majesty to the campus.

Ecological Design
Species selection and locations should emphasize biodiversity rather than a reliance on monoculture planting. The rationale for this approach is to ensure a healthy variety of plant materials throughout the campus. Extensive plantings of single species can result in a significant loss of individual trees should a pest or disease affect that species. The classic example of this was the decimation of New England’s American Elm population when Dutch Elm Disease was introduced. Ecological design also implies planting in groupings that represent natural plant associations, that is tree and shrub species that are typically found together in the wild. There are some areas of campus where limited plantings of native woodland environments would be appropriate, and this may be one potential design approach for the area designated as the Gateway Arboretum.
Native evergreens serve as windbreaks and provide color in winter.

Unique ornamental specimen plantings, such as the Weeping White Pine shown above, add variety and interest to the campus landscape.

Junipers provide a low maintenance slope stabilizing alternative to lawns.

Perennial plantings add to the campus landscape color palette.

The Locust Grove with its grid-like geometry provides interest in the landscape. The continuous canopy of the honey locusts creates a shaded area in an otherwise open space.

Annuals add color to the campus.
PLANT MATERIALS

Bioretention areas with native species in well-drained soils can provide an important and effective stormwater function. Green roof technology has developed rapidly and can be employed as part of LEED® certification on new structures. Green roofs provide attenuation of runoff during rain events and thus provide a valuable function in managing stormwater on campus. The State of Vermont Agency of Natural Resources oversees stormwater permitting and will need to acknowledge green roofs as a permeable surface. However, at this time, the State has not accepted or approved this concept. Green roofs could then be employed as a means of reducing impermeable surfaces on campus as new developments occur.

Another aspect of ecological design is to consider plant material selection that provides wildlife habitat. For example, continuous canopies and corridors of trees and associated vegetation support songbird populations. Setback and buffer areas are appropriate sites for this type of landscape.

Functional Planting and Energy Conservation

Trees, shrubs, and groundcovers provide functional as well as aesthetic benefits. There are number of landscape design strategies that contribute to energy conservation strategies in both indoor and outdoor environment.

- Trees can provide shade for building fenestration in summer, thereby reducing the need for air conditioning. Trees in parking lots which shade and break up asphalt areas help prolong the life of the paving and also reduce ambient air temperatures.
- Evergreen trees and shrubs serve as excellent visual screens for utility areas and “living” fences can control drifting snow along roadways. These type of windbreaks also improve outdoor comfort, particularly in the colder months.
- Certain varieties of shrubs can provide guidance for pedestrians and vehicles by directing traffic away from sensitive areas, limiting damage to lawns and gardens.
- Shrub mastication has already been employed in slope stabilization in several locations around the campus and are an excellent substitute for lawns on steeper slopes where grass cover is difficult to maintain. Shrub plantings can be virtually maintenance free and provide a green carpet that is quite attractive. Note that care must always be given to planting locations which may conflict with winter time snow removal.

Lawn Alternatives

The primary groundcover for the University campus is lawn. Lawns serve their purpose and provide a green floor for a wide range of campus activities. But lawns require intensive maintenance that has environmental, financial, and labor costs associated with it. The University needs to reduce its overall lawn areas and can do so with other native groundcovers, low maintenance perennial gardens, shrub mastications and wildflowers, and seasonal plantings. Kentucky Blue Grass in particular is less suited for Vermont’s northern climate and there are new mixes of short grasses that may prove to be a viable alternative. The Physical Plant Department does an excellent job of providing colorful seasonal plantings of annuals that add interest and vitality to the University campus and this activity should continue.

Public Safety

Plantings need to be designed and placed with public safety and security as a key consideration. Plants used near pathways and building entrances should not have dense foliage and low limbs which obscure site lines and block illumination. Tree plantings at intersections and drive entries need to be set back so as to provide sufficient lines of sight for motorists. The City of Burlington requires a 25’ triangle at intersection corners to be free of plantings.

Tree Inventories

As part of its comprehensive mapping efforts the University should continue to develop detailed data bases and maps of the campus tree population. This can be facilitated by adding existing site information as new buildings are developed. This resource will provide the means of developing the arboretum concepts throughout the campus as well as monitoring tree diversity, health, stature, and assisting in the preservation of important specimens.

A number of useful references are available to guide plant material choices at the University of Vermont. They include: Landscape Plants for Vermont, the third edition, written by University Horticulturists, Norman E. Pellet and Mark C. Starrett, and published by the University of Vermont Extension Service; Recommended Trees for Vermont Communities, published by the Urban and Community Forestry Program of the Vermont Department of Forests, Parks and Recreation, Waterbury, 2001; and the City of Burlington Street Tree Planting Plan, published by the Department of Parks and Recreation.

Plant Materials

The accompanying plant materials list is derived from these sources, with an emphasis on the planting of native species. This list is only a sampling, and does not identify the extensive number of cultivars that are available for many of the selected species. This list is intended to provide a point of departure and guidance for implementing the landscape design frameworks of the Campus Master Plan.

Resources and References

The faculty and staff of UVM represent an important resource for campus landscape planting programs and initiatives. In addition to this expertise, the individuals responsible for the grounds and landscape at the University have the experience and technical capabilities to effectively manage this important resource. They should be involved and/or consulted with regard to any project that involves planting at the campus.
<table>
<thead>
<tr>
<th>TREE SPECIES</th>
<th>SCIENTIFIC NAME/COMMON NAME</th>
<th>QUALITIES &amp; CONSIDERATIONS</th>
<th>NATIVE TO VT</th>
<th>USES/CAMPUS APPLICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abies balsamea/ Balsam Fir</td>
<td>Symmetrically pyramidal, 2 to 4' cones well-drained, moist, acid soil</td>
<td>Y</td>
<td>Open groupings where security is a concern, specimen, windbreak</td>
<td></td>
</tr>
<tr>
<td>Acer rubrum/ Red Maple</td>
<td>Upright, fast color, irregular spread, maximum sunlight, some cultivars are moderate tolerant to salt, tolerant of very wet soil, select cultivars specific to site</td>
<td>Y</td>
<td>Most areas, bioerosion, along pathways</td>
<td></td>
</tr>
<tr>
<td>Acer saccharum / Sugar Maple</td>
<td>Upright, dense foliage, brilliant fall color, sun, well drained, moderately moist well site, select cultivars specific to site</td>
<td>Y</td>
<td>Shade tree, along pathways, groupings, architectural accents</td>
<td></td>
</tr>
<tr>
<td>Betula papyrifera/ Paper Birch</td>
<td>Fast growing, upright oval, irregular, cool to rounded crown, single or multi-stemmed, attractive peeling white bark, sun, dry, xeric on well-drained acid soil, moist easily or sandy soils</td>
<td>Y</td>
<td>Architectural accents</td>
<td></td>
</tr>
<tr>
<td>Celastrus occidentalis/ Hackberry</td>
<td>Vase shaped with winter branches, tolerated difficult sites, full sun, can serve as a replacement for the American Elm (Ulmus americana)</td>
<td>Y</td>
<td>Street and pathway tree, shade tree, specimen</td>
<td></td>
</tr>
<tr>
<td>Fagus grandifolia/ American Beech</td>
<td>Upright, slow grows in partial sun in compacted soil or adverse conditions, full sun, yellow to bronze fall foliage that persists into winter</td>
<td>Y</td>
<td>Specimen, shade tree, parks, along pathways</td>
<td></td>
</tr>
<tr>
<td>Fraxinus americana/ American Ash</td>
<td>Upright oval, medium tolerance to salt, high tolerance to soil, full sun, tolerance of well soil</td>
<td>Y</td>
<td>Street and pathway tree, shade, bioerosion</td>
<td></td>
</tr>
<tr>
<td>Micromalus/ Flowering Dogwood</td>
<td>Generally small and medium trees, shape varies with cultivars, full or partial sun, select cultivars specific to site</td>
<td>Y</td>
<td>Specimen, groupings, accent under utility trees, avoid next to pavement, parking lots</td>
<td></td>
</tr>
<tr>
<td>Rosa rugosa/ White Spicebush</td>
<td>Fast growing, pyramidal, symmetrical cones, full or partial sun, withstands heat, wind, cold, drought, and crowding, must lawn or above soil, adaptable to pruning</td>
<td>Y</td>
<td>Specimen, shade, columnar cultivars</td>
<td></td>
</tr>
<tr>
<td>Phlox subulata/ Creeping Phlox</td>
<td>Upright oval, heat growth, juicy, full sun, transplants easily, low elevations, sandy, clay, well drained soils. There are many native Phlox, this group is adaptable to woodland soil</td>
<td>Y</td>
<td>Street and pathway tree, specimen</td>
<td></td>
</tr>
<tr>
<td>Thuja occidentalis/ Arborvitae 'techny,' 'nigra'</td>
<td>Broadly pyramidal, techny is less than 10' tall, very adaptable, easy to transplant, moist soil</td>
<td>Y</td>
<td>Screen, hedge for enclosures</td>
<td></td>
</tr>
<tr>
<td>Tsuga canadensis/ Canadian Hemlock</td>
<td>Upright oval, very sensitive to salt spray and coastal, sun or shade, dry soils will result, needs shade establishment and growth difficult, fine texture and graceful form</td>
<td>Y</td>
<td>North facing slopes and shaded areas, hedge, screen, specimen</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SHRUB SPECIES</th>
<th>SCIENTIFIC NAME/COMMON NAME</th>
<th>QUALITIES &amp; CONSIDERATIONS</th>
<th>NATIVE TO VT</th>
<th>USES/CAMPUS APPLICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amelanchier canadensis/ Shadowleaf Serviceberry</td>
<td>Oval, sun or shade, suckers to form a broad mound</td>
<td>Y</td>
<td>Naturalizing, border</td>
<td></td>
</tr>
<tr>
<td>Amelanchier lamarckii/ Alniphyllus Sargentii</td>
<td>Upright oval, sun or shade, could be as a small, multi-stemmed tree or sparse, low branching shrub, sun or shade</td>
<td>Y</td>
<td>Specimen, naturalizing</td>
<td></td>
</tr>
<tr>
<td>Cornus alba/ Redstem Red Dogwood</td>
<td>Upright oval, fast growing but relatively short lived, sun or shade, attractive red stems, extend fall foliage</td>
<td>Y</td>
<td>Specimen, border</td>
<td></td>
</tr>
<tr>
<td>Cornus sericea/ Red-osier Dogwood</td>
<td>Upright oval, strongly multi-stemmed, colonizes by suckers, low-maintenance, moist, well-drained soil, sun or partial shade</td>
<td>Y</td>
<td>Border, informal hedge, naturalized areas, masses, biomantle, wet soil</td>
<td></td>
</tr>
<tr>
<td>Cornus sericea/ Red-osier Dogwood</td>
<td>Spreads rapidly by underground stems, high tolerance to salt, sun, and moist soil, attracts butterflies</td>
<td>Y</td>
<td>Greenland cover, massing border, biomantle</td>
<td></td>
</tr>
<tr>
<td>Euonymus alatus/ Redbud</td>
<td>Oval, adaptable to well soil</td>
<td>Y</td>
<td>Shrub, naturalized area</td>
<td></td>
</tr>
<tr>
<td>Ilex verticillata/ Common/ High Bush Blueberry</td>
<td>Upright oval, acid, moist soil</td>
<td>Y</td>
<td>Border, hedge, ornamental</td>
<td></td>
</tr>
<tr>
<td>Juniperus communis/ Western Juniper</td>
<td>Upright oval, acid, moist soil</td>
<td>Y</td>
<td>Border, hedge, ornamental</td>
<td></td>
</tr>
<tr>
<td>Vaccinium angustifolium var. laevifolium/ Lowbush Blueberry</td>
<td>Low growing, 4-9' tall, 3-4' wide, colonizes by suckers, shade or partial shade, moist soil</td>
<td>Y</td>
<td>Specimen, naturalizing</td>
<td></td>
</tr>
<tr>
<td>Vaccinium vitis-idaea/ Alpine Blueberry</td>
<td>Upright oval, 6-12' tall, sun or partial shade, moist soil, attractive fall foliage</td>
<td>Y</td>
<td>Specimen, screens, naturalizing</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GROUNDCOVER SPECIES</th>
<th>SCIENTIFIC NAME/COMMON NAME</th>
<th>QUALITIES &amp; CONSIDERATIONS</th>
<th>NATIVE TO VT</th>
<th>USES/CAMPUS APPLICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allegheny vine/ Virginia Creeper</td>
<td>Creeping, full or partial sun, self-limiters, transparent as cuttings or poligone</td>
<td>Y</td>
<td>Used alternates, ground cover</td>
<td></td>
</tr>
<tr>
<td>Carex sp. / Sedge</td>
<td>Creeping, spreading, full sun to partial shade</td>
<td>Y</td>
<td>Groundcover</td>
<td></td>
</tr>
<tr>
<td>Cornus sericea/ Bunchberry</td>
<td>Creeping, shade, foliage intact green through winter, can only in cold, moist situations in soils well, transect as cuttings or poligone</td>
<td>Y</td>
<td>Slope stabilization or June planting, ground cover, massing</td>
<td></td>
</tr>
<tr>
<td>Euonymus fortunei var. Wintercreeper</td>
<td>Creeping, shade</td>
<td>Y</td>
<td>In planters, under interior slope trees</td>
<td></td>
</tr>
<tr>
<td>Juncus communis var. tenuiflorus/ Creeping Juncus</td>
<td>Creeping, partial to full sun, does best in moist, acidic organic soil</td>
<td>Y</td>
<td>Groundcover</td>
<td></td>
</tr>
<tr>
<td>Vaccinium angustifolium var. Hewittii/ Lowbush Blueberry</td>
<td>Aggressive growths in acid soils, tolerates dry, sandy soils, sun to partial shade</td>
<td>Y</td>
<td>Groundcover</td>
<td></td>
</tr>
</tbody>
</table>
**Pedestrian Paths and Surfacing**

In an age of wireless networks and cyberspace communication, the University campus still thrives on and is, in part, defined by its network of pathways and plazas where the social and academic discourse of the academic community is conducted. The circulation system and its associated pedestrian environments support the University community as a diverse, inclusive and accessible environment that engages all lifestyles and cultures. This network must function on several levels: 1) the pathway system alignment must reflect the traffic patterns and desire lines of pedestrian circulation throughout the campus; 2) the pathway widths and surfacing are designed to accommodate volume and type of use; and 3) pathway design and construction must be highly stable, readily maintained and withstand the rigors of Vermont weather.

Currently there is a wide variety of paving and surfacing materials present throughout the University campus. There is no systematic application of surfacing types or a consistent vocabulary of paving materials. A vocabulary of materials should be adopted for the new pathway system. The Campus Master Plan has identified three major types of pathways:

**Multi-Use Paths**

20’ to 24’ in width to accommodate shuttle, service, and emergency vehicles such as will exist at University Place and Green Mountain Walkway. These pathways will be designed in accordance with American Association of State and Highway Officials (AASHTO) standards for pathway geometry and design, and built in conformance with Vermont Agency of Transportation (VTrans) construction specifications.

**Primary Walkways/Bikeways**

8’ to 15’ in width and should support bikes and pedestrians with limited service vehicular use for access to utilities, such as steam lines. At utility access points extra coverage should be built in to prevent vehicle damage to lawn areas.

**Secondary Walkways**

5’ to 8’ and primarily for pedestrian use only. These are typically city and limited-use sidewalks. These are almost always of concrete construction and where they follow or relate to the municipal networks, the surfacing should remain concrete.

Note that all pedestrian and bicycle facilities should follow where appropriate the guidelines and standards that are contained in the Vermont Pedestrian and Bicycle Facility Planning and Design Manual which is published by the Vermont Agency of Transportation.

Other key areas that require surface paving include:

**Entry Areas and Plazas**

Entry Areas and Plazas continue to be an integral part of the pedestrian campus when located as part of a building entry or to provide outdoor gathering spaces. These areas will be constructed of similar materials already being used around campus, such as concrete pavers, native stone or patterned concrete. Brick should be used as accent elements rather than as the primary surfacing materials due to its tendency to heave or separate from its setting bed as a result of climate and wear. Paving materials used for all pedestrian circulation elements on campus need to be selected and designed in a manner that provides an

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**Typical Pedestrian Pathways**

<table>
<thead>
<tr>
<th>Pathway Width</th>
<th>Description</th>
</tr>
</thead>
</table>
| 20’ to 24’    | Multi-Use Paths
| 8’ to 15’     | Primary Walkways/Bikeways
| 5’ to 8’      | Secondary Walkways

**Materials Detail**

- 1/4” = 1’
- 2” - 3” depth asphalt
- 8” aggregate bed
- 2’ pre-cast concrete curb
- Optional curb @ grade
- Reinforced edge below grade
- Aggregate
- Geotextile stabilization layer
- Compacted sub-grade
- Elevated or @ grade concrete curbing
- 2 layers of asphalt
- 8 - 15’ Asphalt Pathway
- 5 - 8’ Asphalt Pathway
- 24’ Asphalt Pathway
- Materials Detail Scale: 1/4” = 1’

Note: Final construction specifications shall adhere to or reference VT Agency of Transportation Specifications as appropriate.
accessible and consistent surface that is stable and thus safe and navigable for wheelchairs and other wheeled forms of pedestrian transport. The construction of these areas also needs to reduce or eliminate long-term maintenance costs.

**Exterior/Interior Circulation Connections**

This Campus Master Plan reinforces the opportunity to transition seamlessly from exterior to interior spaces as part of the University’s pedestrian circulation network. Interior circulation offers an alternative route in periods of inclement or cold weather. Consideration should be given to continuing materials from indoor to outdoor spaces to strengthen this connection.

**Guidelines for Design and Construction**

**Accessibility**
Pathways need to be designed and developed in accordance with standards for accessibility as set forth in the American with Disabilities Act and in accordance with applicable state and local codes. Detectable warnings and rampways are to be employed at all street crossings and curb transitions.

**Paving Patterns and Special Places**
These guidelines present several concepts for surface treatment and construction of the multi-use and primary pathway system on campus. The major pathways on campus such as the Redstone Walkway and the proposed Green Mountain Walkway deserve special design treatment. Descriptions for these pathways can include edge accents, imprinted, colored asphalt employing new technologies for this type of decorative treatment, or textured, interlocking paving patterns. When University Place is transferred to University ownership it is proposed that this street become a pedestrian area as well. Unique textured paving patterns which build on the historic environs of the street will reinforce the special qualities and sense of place of the University Green District.

**Permeable or Porous Paving**
The University, in its commitment to sustainable design practices should explore the use of porous or permeable paving alternatives as new technologies are developed. Several products such as GrassPave or Turfstone can provide stable surfaces for limited vehicular use such as emergency access ways and overflow parking areas. They represent two approaches: GrassPave is a subsurface stabilizing system and Turfstone is an ar grade concrete paver with open areas within it to allow turf establishment.

Another innovation that warrants special consideration is porous paving. New technologies are being developed for porous paving for northern New England applications. Porous paving design can be employed wherever asphalt is required; it may be particularly applicable to parking lot surfacing.

**Subbases and Stabilization**
The soils of the University campus are prone to frost and thaw cycles that create the potential for heaving and potholes. Therefore it is critical that subbases for paving are suitably designed and constructed to provide stable long term surfacing in northern climates. The University, in its commitment to sustainable design, the Vermont Agency of Transportation provides such specifications for roadway construction. In areas where saturated soils are of concern, geotextile stabilization mats are recommended. There are a range of suitable products available that meet the specifications. This stabilization approach can be and should be applied to pathways and plaza areas that are subject to vehicular use.

**Limiting Pathway Areas**
Most university campuses suffer from the proliferation of “cow paths” or eroded pathways worn through lawn or planted areas. These develop when walkway alignments and routes do not reflect pedestrian desire lines. These unofficial paths may signal the need for a legitimate route. It is critically important, however, to limit the number of pathways and paved surfaces on campus. Planning of new pathways needs to reflect the origins and destinations of pedestrian circulation. This will eliminate unnecessary paths and reduce impermeable surfaces.

**Surfacing Options**
A wide array of paving materials exist on campus today. Native flagstone, cobble, brick, concrete pavers and banded concrete are the typical materials employed. Interlocking concrete pavers, such as those used in front of the Waterman Building, resist heaving and come in a wide array of colors. Perhaps the most pleasing designs are present in plaza areas such as Kalkin Hall that has a pleasing pattern of concrete banding with brick infill. However the brick can settle differently than the concrete thus emphasizing the need for proper subbase design and construction. Brick paving should only be used for limited expanses of paving areas, as accent bands or edging or in special treatment areas. It is recommended that brick be used as banding with concrete as the principal surface element. A good example of this approach is at the entry to the Given Medical Building. Bricks have also been used in front of the Cook Building with names as imprints on them. While this is a good concept for funding the plaza, it doesn’t wear well over time and the names have worn off. A nice plaque with all the names would serve a similar purpose. Flagstone and cut native stone are very expensive relative to concrete or other pavers, but obviously wear very well over time. Selective use of this paving is recommended for plaza and entry areas. Concrete pavers are recommended for a wide variety of applications.

**Pedestrian Amenities**
The site elements section contains examples of site furniture that includes current or recommended benches, bicycle racks and trash receptacles. These elements are to be strategically and conveniently located to enhance the pedestrian experience.
Examples of Surfacing

- Special Textured Paving Pattern
- Patterned Walk
- Turfstone - Grass and Concrete
- GrassPave - Subsurface Permeable Paving
- Grass and Concrete Terrace
- Brick Edger with Asphalt
- Concrete Pavers at the Medical Education Center
- Brick and Concrete Plaza in front of Kalkin
PEDESTRIAN PATHS

Preliminary Concepts Only

Plazas & Primary Walkways

University Place

24' vehicular grade unit pavers
15' unit pavers
6' unit pavers
18' granite curb & cobblestone band
18' granite curb & cobblestone band
18' seat walls
18' seat walls
18" aggregate bed
3" depth unit pavers
setting bed
18" aggregate bed
optional geotextile
compacted subgrade to suitable depth
(Reference VT Transportation Roadway Design Specifications)

Green Mountain Walkway

20 - 24' walkway

vehicular grade unit pavers

6" min. Granite Curb

Walkway Axonometric View
PEDESTRIAN PATHS

Preliminary Concepts Only

Plazas & Primary Walkways (Continued)

Materials Detail

15' Asphalt Pathway
6' min.
Granite Curb
18" aggregate bed
compacted sub-grade
1' cobble band
1/4" chamfered edge
1/2" soil curb
geotextile stabilization fabric
asphalt walkway
4" granite curb
compacted sub-grade
Redstone Walkway

Redstone Walkway - Option

Materials Detail

3" curb edge
3" asphalt setting bed
18" aggregate bed
compacted sub-grade
1/2" soil curb
geotextile stabilization fabric
asphalt walkway
4" granite curb
compacted sub-grade
Redstone Walkway - Option

Walkway: Section
Walkway: Section
Walkway: Axonometric View
Walkway: Axonometric View

Pedestrian Paths
Special Paving Applications: the Redstone Walkway

Plazas & Primary Walkways
(Partially Illustrated)
The University of Vermont has a wide array of site furnishings on campus that have been placed for different purposes and different projects over time. The University has adopted consistent campus wide standards for signs and lighting; a standard receptacle system has also been in use for a number of years.

The addition of suitable numbers of site furnishings to all building entries and major and connective open spaces will contribute greatly to the transformation of the entire campus into an inviting environment for people. Benches, tables, chairs and trash receptacles should be located to enhance the open space experience by providing a variety of places for outdoor resting, eating and gathering. Seating should be comfortable and appropriately placed and designed to contribute to the human scale and pedestrian qualities of the campus environment.

### Overall Guidelines for Site Elements and Furnishings

- A consistent palette of form and color for site furniture as well as family of uniform or related designs should be employed to reinforce a sense of unity and the sense of place on the University campus. The University should build on the colors, forms and aesthetics and the functionality of the site elements as well as family of uniform or related designs that are already in use for a number of years.

- The principles of sustainability are to be addressed by involving the appropriate constituencies is a desirable, if not necessary, next step in achieving this goal.

- The historic bench style used throughout campus should be located proximate to major campus destinations and campus building entries. Locations should be chosen that are facing the sun or in the sun, although there needs to be some seating in shaded areas as well. Alternative bench styles should only be considered under unique circumstances where different designs may be appropriate.

- A high value needs to be placed on both the aesthetics and the functionality of the site elements that are selected. Products and furnishings need to reflect the needs and context of the campus.

- Where appropriate and feasible, the design and placement of site furniture should support the principles of accessibility and inclusion by creating places that serve the diverse populations of the University community.

- Site elements need to be properly installed with suitable foundations or ground plane treatments.

### Site Elements

#### Benches/Sitting Walls

Outdoor seats that are set down without regard for views and/or climate are almost useless. Location is more of an important factor than the seat itself. Sitting walls are appropriate for students but benches with backs are accessible for a broader range of people. Seating spots should be located proximate to major campus destinations and campus building entries. Locations should be chosen that are facing the sun or in the sun, although there needs to be some seating in shaded areas as well. It is important to consider opportunities where seats can face activities, capture views or promote interaction.

### Bicycle Racks

A number of bicycle rack styles are present on campus. There is a need to continue using a simple, moveable bike rack system to provide some degree of flexibility in placement as temporary construction and new developments warrant. The ribbon rack design, in place at the entrance of Lafayette Hall, is a new standard for adornment where permanent bicycle racks can be installed. This is a simple style preferred by bicyclists that readily accommodates all bikes. Covered bicycle storage is an important amenity and the University should include options for covered bicycle parking where feasible and appropriate.

### Trash Receptacles

There is a standard receptacle system in place currently at the University. These site furnishings are showing signs of wear and tear and a new system will be considered that is easier to service and maintain. The recycling receptacles should be part of this same system. All trash and recycling receptacles need to be sufficient-ly sturdy and yet easy to service.

### Handrails/Guardrails

All exterior handrails and guardrails on campus are to be made from steel and have a matte black powder coat finish. They need sufficient foundations or attachment methods to be safe and damage resistant. These handrails need to be designed in conformance with local codes and the provisions of the ADA. Exceptions might include guardrails that are incorporated into specific architectural designs as an integral part of new buildings.

### Posts and Bollards

The University should explore the use of collapsible bollards along multi-use paths to limit access and still accommodate service and emergency vehicles. A consistent system of bollards should be employed throughout the University campus and should relate to other site furnishings, specifically lightposts, in color and design.

### Fences/Stonewalls/Enclosures

The University campus has traditionally included decorative fencing in locations such as Main Street. Security fencing is also a requirement in certain instances. Widespread use of fencing is not necessarily desirable on the Central District. In those few instances where fences are required for functional reasons the initial preferred solution would be to employ a green approach using plant material such as arborvitee. This plant has cultivars such as Techny Arborvitae that only grow to a height of 6 to 10 feet. Other options are a hedge reinforced with an internal cable rail fence or a dense and thorny shrub such as rosa rugosa. For highly visible and/or historic areas of campus the preferred fencing option is granite posts with steel rails painted matte black, as exists along Main Street. Chain-link is acceptable for certain less visible applications or areas where space

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Covered bicycle storage at the entrance to Christie-Virgil-Patterson residential complex

Ribbon bicycle racks

Historic stonewall in the Redstone District

New stonewall at Converse Hall

Post and rail fencing that does not belong on campus and should be removed

Main Street granite posts and railings

A green fence for service enclosure

Campus bus shelter
is limited (i.e., around practice athletic fields, certain service areas, and around campus stormwater facilities). Chain-link is to be vinyl coated in black. Wrought iron or painted steel fences are to be matte black powder coated finish. No wood fences of any kind will be allowed on campus and those that exist should be removed over time and replaced with an alternative where necessary.

Native stone walls are part of the University landscape and provide delineation, amenity (for seating) and aesthetic value. Limited use of stone walls where appropriate can continue, but this form of fencing, while durable, is only fitting in certain locations. A good example of the appropriate use of stone walls on campus is the wall built around Converse Hall; it serves as both a retaining and sitting wall. Stone walls are costly to construct in a manner that is durable enough for campus applications. Dry laid stone walls are not appropriate.

**Dumpster and Service Area Screening**

Service areas should be screened where appropriate and all dumpsters should be gated and screened. Living fencing is desirable as a screening device or as an alternative. The use of an architectural fencing style should be considered and applied consistently throughout campus. There are a range of manufactured trellis systems that support vines that could be employed for this application. On a case by case basis, and for new facilities, the screening of dumpsters can be addressed with materials that respond to the architecture of those buildings or incorporated into the architectural design directly, through the use of wing walls or similar devices.
Exterior Lighting

Lighting Standards

Night time lighting is an essential component of the University environment as it provides safety, security and guidance for the campus community which is active after dark. Lighting on the University campus needs to be consistent, uniform and free from glare. The University has adopted lighting standards for street lighting, pedestrian pathways and parking lots. This lighting system has been highly successful and creates an engaging and secure evening environment.

Fixture Lamping

All campus lighting on future development will use metal halide bulbs, as energy efficiency and illumination are superior to all other types. Any advantages of other types of lights are outweighed by the visual comfort and color rendition offered by metal halide. The benefits of metal halide lighting over high-pressure sodium vapor lighting are based on aesthetic, safety, and regulatory considerations. Buildings, landscapes and signs are rendered naturally, and the color of parked cars is accurate, which makes them easier to find under metal halide lamps. Nighttime lighting, which resembles day light, also contributes to a psychological sense of comfort and safety.

For exterior lighting, photoelectric control is preferred. The photocell is to be mounted in a manner that provides for efficient repair, replacement, and maintenance.

Light Levels

Major pedestrian routes, including all routes from parking lots or garages to buildings, are to be lit to a minimum of 1 footcandle, with additional security provided by special lighting such as wall lights. Campus quadrangles and open areas, where people may walk or gather at night, may be lit to a level below 1 footcandle but must be designed to provide enough ambient light to afford security to nighttime users. Secondary pedestrian routes are to be lit to a minimum of 0.5 footcandles. Major vehicular ways, parking areas and service areas should be lit to a minimum of 2 footcandles. Lighting in Ambient Lighting zones is not to exceed, and may go below, 0.5 footcandles. Proper uniformity ratios need to be applied in lighting design to provide consistent lighting levels. Impacts to night sky conditions are a key concern and are not acceptable. Lighting design and placement under all circumstances must conform to the provisions of Act 250 and reflect the standards set forth in the Outdoor Lighting Manual for Vermont Communities which is published by the Chittenden County Regional Planning Commission, South Burlington, Vermont.

Fixture Type and Appropriate Uses

Pedestrian Light

Major pedestrian routes are to be lit by the Lumec Octagonal Lantern L73 on the VR507 stand. Major pedestrian routes are defined as those with the heaviest use. Fixtures are to be mounted on tapered poles at a height of 10'-1" (3' - 7” overall height).

Pedestrian Plaza Reflected Light

A special light fixture may be appropriate for major public plazas and to highlight special elements of the campus. Green Mountain Walkway will be highlighted by the use of the reflective light source, as will any new public plaza in the Gateway district. Light fixtures may be used with poles of various heights, depending on the location and spacing of the fixture. The default pole height is 16 feet. In the case of the Green Mountain Walkway, a 24' tall pole may be used.

Streetlights

The Lumec Octagonal Lantern (as described above, mounted on pendant bracket) will line vehicular access ways in an offset pattern, typically 70–80 feet on center along either side of the street. These are the same street light fixtures used along Main Street in the University District in Burlington.

Parking Deck Light/Surface Parking Lot Light

The Gardco Square Form 10, Parking Lot Fixture is designed to cover large expanses with minimum glare. New applications of the Gardco Square Form 10 are to utilize metal halide lights. Existing applications of the Gardco form lamp are to be adapted to fit metal halide lamps as resources become available. The mounting for the Gardco Light in surface parking lots, on and off campus (as in the Regional Parking Intercept Lotes), will be on a pole with a height of 19 feet. The whole fixture shall have an anodized bronze finish.

Gateway and Tree Uplight

Tree uplights will provide additional security among groves of trees by eliminating the areas of shadow usually found around the trunks of trees. Uplights also create a pleasing visual effect by highlighting the branch structure of the trees. The Hydrel 9400 Series fixture is one example that provides a housing to hold the fixture away from the surface and reduce surface heat.

Illuminated Bollards

The Lumec BOR80 with a black powder coat finish will be used for all bollard applications. This bollard has a light source to warn motorists of restricted access areas at night. A different bollard standard may be employed where unique architectural conditions are present in new projects.

Bases

Fixtures will have a concrete base that extends no higher than 2” above finished grade. The concrete should have a chamfered edge to reduce chipping. Bases should be located no less than 2 - 3’ from the edge of walkways. Bases need to be installed at a minimum depth of 4’ and with proper sub-base and backfill specifications to eliminate movement or heaving.
EXTERIOR LIGHTING

Historic Pedestrian Light
12 and 17 options
Octagonal Lamp
green powder coat finish

Streetlight
Octagonal Lamp
mounted on a bracket
green powder coat finish

Parking Lot Fixture
Finish: Bronze Anodized

Gateway/Tree Uplight
Architectural and Landscape Lighting; final fixture and type to be selected

Standard Bollard
black powder coat finish,
to be used in conjunction with lighting standard

Emergency Blue Light
Code Blue
Finish: Gloss Black
Signs and Wayfinding

The University of Vermont Sign and Wayfinding Program provides standards for the design, fabrication and installation of signs and wayfinding elements throughout University properties. The system has been designedated with the University’s Sense of Place and help define the campus boundaries. The wayfinding program has strengthened campus identity and improved legibility and accessibility through appropriate sequencing and messaging.

The sign system has been developed with a hierarchy approach to guide campus users from the edge of campus to their destination. The first level of signing begins with the Interstate and the “green and white” sign at Exit 14. Level two signs are the District signs, which evolved from the Burlington “hairpin” system already in place. These signs include University and Fletcher Allen Health Care directional and informational systems. These signs also direct motorists into various areas of the campus, including real-time electronic displays of parking availability at the University “Old Mill” logo. Building identification signs include E-911 street addresses. Finally, Interior Directories are located indoors at key entries to individual buildings. Once at the building destination, interior sign directories guide the visitor to their destination.

Signs are located at a sufficient distance from walkway edges to allow for safe snow plowing. Pedestrian wayfinding signs (blades) are designed to be high enough above the ground to allow for pedestrian movement.

UVM has made a commitment to inclusivity, diversity and accessibility throughout campus. The Wayfinding Program is consistent with this principle by employing accessible signs and information. Legibility is a primary design goal, wayfinding maps on Pedestrian Directories are accompanied by audio messaging, interpretive signs are wheelchair accessible and interior directories use ADA compliant design standards including braille.

The principle of sustainability is also integrated into the wayfinding system. Audio messaging in Pedestrian Directories is solar powered and interpretive signs provide information about the renewable energy installations on campus, including real-time electronic displays of power output. Materials and finishes of the sign system are selected to maximize durability and limit on-going maintenance. Recycled and recyclable aluminum is the primary material in all freestanding signs and powder coated finishes are a more ecologically sound alternative to solvent based paints.

The University’s Environmental Council has collaborated with Campus Planning Services to initiate a series of interpretive signs which offer information and education about alternative energy installations on campus. The University should continue to explore the use of environmental graphics in the design of new buildings and landscapes that convey the institution’s mission and enhance the visual environment.

The key final initiative in the wayfinding program will be a comprehensive sign system for Parking and Transportation. The system will build upon existing sign design standards and will be adaptive and flexible, in order to accommodate the evolving needs of the Parking and Transportation system.
Gateway Sign Element

The Gateway Sign at the University of Vermont will fit into a recognizable University standard of materials and form. The Gateway sign elements will take the form of low walls that are freestanding and integrated into the surrounding topography. The Gateway will define the Main Campus entry and a similar design could also be used to define other campus edges.

A preliminary concept is to construct the gateway walls from monolithic slabs of Mountain Green Granite or other native stone. These walls will begin at a height of at least 4' and curve back gently, disappearing into the sloping lawn.

The sign face of the gateway walls will have a Diamond 10 finish. All other sides will have a Natural Cleft finish. The gateway wall will not have a capstone. The sign elements will be brushed aluminum letters affixed with pegs drilled into the granite. The letters will project in relief from the surface of the granite. The University Seal will also be included etched or cast in aluminum, also raised from the granite surface.

The sign may be lit with halo lighting behind the UVM seal and the lettering. Halo lighting will cast a soft glow upon the wall around the sign elements. Another option will be to up light the sign with the appropriate uplight adopted as a University standard.

Drifts of flowering bulbs and low-growing perennials will complement the Gateway walls.
The University has initiated a commitment to explore alternative energy as part of its approach to Environmental Sustainability. Alternative energy is typically developed through the use of renewable resources and there are two examples of this approach on campus with the possibility of additional projects in the future, such as solar energy installations associated with new building construction.

The first example is a series of photovoltaic panels mounted on the roof of the University’s Central Heating Plant. There are 500 square feet of solar panels. The panels produce at least 5,000 kilowatt-hours of electricity annually, more than enough to power a large Vermont house, or two energy efficient homes. These panels provide the Central Heating Plant with clean, renewable electricity. They have a thirty year life span with minimal maintenance costs. The maximum power these panels can generate under bright sunlight is about 5 kilowatts (kW). They generate an average of nineteen kilowatt-hours of electricity per day, depending on the season. This is enough to run 19,100 watt incandescent light bulbs, or 2 window air conditioners.

New building construction will include where appropriate, solar energy installations to contribute to the electrical or heating and cooling needs of the building. Those buildings that employ this technology will need to be sited in a manner that provides:

1. year-round access to the sun for sufficient insolation;
2. appropriate roof pitch and building placement; and
3. access for maintenance or repair.

A more recent addition to the University’s power grid is the residential scale wind turbine designed to generate enough electric power for an average Vermont home or two energy efficient homes. It is located along one of the main entry drives to the University in the Gateway District. At a wind speed of 32 mph this wind turbine has a capacity to generate 10 kilowatts (kW) over the course of an hour which is enough to power about 40 100 watt incandescent light bulbs, or several appliances at one time. The performance of the wind generator thus far confirms that this is a viable form of electrical generation.

Wind turbines do have some siting issues associated with them and these will need to be taken into account when the University considers future alternative energy development. These considerations include:

1. the presence of an adequate wind resource;
2. visibility and overall visual impacts to surrounding properties and public vantage points;
3. adequate public safety measures including sufficient setbacks from buildings, roads and walkways;
4. impacts to bird and bat populations;
5. the design of access roads and consequent site clearing;
6. any applicable Federal Aviation Administration rules or guidelines; and
7. local zoning requirements or Vermont Public Service Board permit requirements.

Alternative energy development at the University can contribute to the educational process by informing students and the public about the viability and applicability of these energy sources. The solar panels on the Central Heating Plant and the wind turbine are both interpreted with sign panels mounted in a location that has direct visible access to the installations and provide a range of information about renewable energy generation.
The University has refined a “Real Estate Acquisition Data Sheet” to assess any real estate gift to the University or purchase by the University in order to determine whether the gift or purchase is in the best interests of the University and should be accepted or pursued. Major concerns are environmental conditions and the utilization of the building within the premises of this Campus Master Plan. Contact Campus Planning Services or Development & Alumni Relations for further information.