

CHAPTER 6 Campus Design Guidelines

A. Introduction

The purpose of the Campus Design Guidelines is to establish the framework for fruitful dialogue between designers, campus community, UW System, the Division of State Facilities and other stakeholders, as we collectively seek to interpret the intent of the 2005 Campus Master Plan. The ultimate goal of such effort is to create a well defined, functional, sustainable, beautiful and coherent campus environment that promotes intellectual and social exchange.

The campus should be seen as one large and complex composition consisting of many neighborhoods. Each neighborhood, in turn, is a composition made of other compositions such as buildings, open spaces, and other site features. This represents a complex nested arrangement of compositions within compositions from the large scale down to the smallest perceivable details.

The task of the designer is to create a well functioning and sustainable composition that is pleasing, at the detail scale and building scale, in a way that is in harmony with the larger urban scale within the neighborhood and campus at large. Buildings and campus places should contribute more, to their neighborhoods and the larger campus, than their own inherent aesthetic value. In other words, the whole should always be superior to the aggregate of its parts; so that every new project progressively perfects the whole.

Whereas the functional and sustainability requirements of buildings and campus places are more easily explained and understood, because standards about them exist, it is the notion of achieving a pleasing composition for our campus that needs to be addressed more clearly in this guide. For the purpose of this guide, richness, unity and balance are considered key ingredients to achieving a successful outcome.

Richness is exhibited by such works on campus that explore and employ diversity of *compositional elements* such as colors, details, patterns, textures, materials, multiple layers of depth and connections, transitions, scales and proportions, contrasts in light and shadow, solid and void, in order to enrich the visual and emotional experiences of the campus community and visitors. Such richness contributes to the vitality of the composition. Bascom Hall is such a building, and Bascom Hill is such a place on campus.

The appropriate placement and use of these *compositional elements*, in space and in two dimensions, creates balance by conveying a sense of visual equilibrium. This requires sound judgment about size relationships, appropriate use of scales and proportions, colors, patterns, textures, contrasts in light and shadow, solid and void,

relating interior and exterior, and balancing small parts against larger forms. Although the concept of balance is most readily evident in a symmetrical arrangement, our campus buildings and places are mostly asymmetrical. Therefore, the task of appropriately distributing visual weight presents greater challenge for designers, but also provides opportunities to create more dynamic arrangements that embrace the desirable pattern of activities on our campus.

Finally, the composition is unified when it is perceived as a whole. The University of Wisconsin-Madison has neither advocated stylistic consistency nor prescribed particular roof forms, colors or materials throughout its campus; instead it is our expectation that buildings and campus places should be designed to be sensitive to their neighborhood context. Clearly such intimate dialogue between new projects and their context will take account of materials, colors, quality, scale, proportions, massing, and overall character of existing buildings and spaces in the neighborhood. Unity also demands scaling coherence such that there is a perception of an inherent natural scaling factor that pervades the composition, and relates it to the human scale.

Each new project should always read as a whole, and help to make the neighborhood appear whole; it should also relate back to the larger campus. Campus open spaces, for example, serve as unifying elements that not only tie specific neighborhoods together, but also cross neighborhood boundaries to connect the larger campus. Henry Mall/Engineering Mall and the East Campus Mall are examples of north – south open space corridors that present great opportunity to tie two parts of campus that appear separated by two rivers of cars at West Johnson Street and University Avenue.

In implementing the 2005 Campus Master Plan, these criteria: richness, balance and unity should be applied to the treatment of open spaces, the buildings, and primary interior spaces. Open spaces on our campus are deemed as important as the buildings that help to frame them; so they should both be designed in an integrated fashion. In designing the buildings, special attention should be given to the volumetric treatment of exterior architecture as a whole, as well as the architectural treatment of the building facades. Finally, the primary interior spaces should be considered in relation to the exterior architecture, open space and patterns of movement around the site and campus.

So what architectural style should we employ? What are the heights of buildings? What about colors and materials? Answers to questions such as these are not prescribed; instead the guideline focuses on a process, through dialogue, that would lead to answers that are appropriate for our campus. It suffices to say that every project on campus should be acutely sensitive to its immediate and larger contexts, and contribute to a greater sense of coherence, even as it expresses its uniqueness and embodies the spirit of its age.

In the end, the way that our campus community and visitors experience our campus is very important. They must see it as sublime and functional at the same time. It must

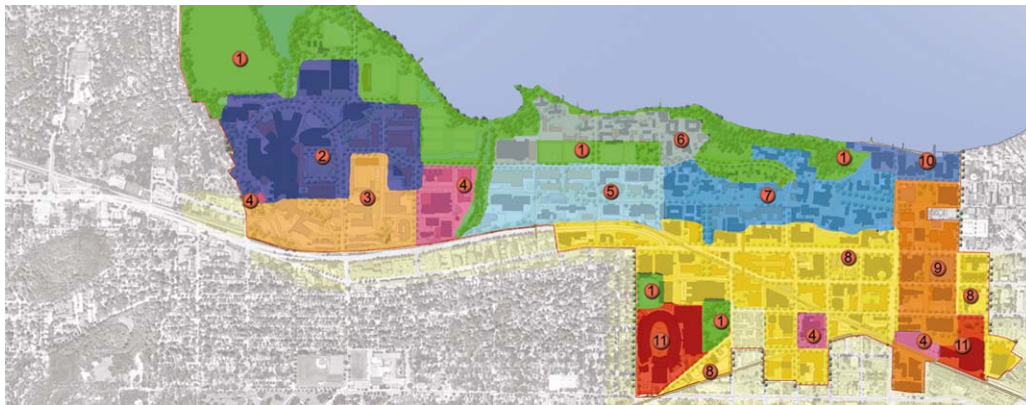
also be sustainable and make them feel comfortable. The designers' role is to help create appropriate stage sets for the plays that take place every day in our campus community. These plays, or patterns of events and activities, infuse the campus with energy; therefore buildings and campus places should incorporate *draws* that could support and enhance these patterns. Ultimately, our campus must be a place the campus community and visitors want to be rather than just a place they have to be.

B. Campus Neighborhood Design Districts

The 2005 campus master plan outlines 11 campus neighborhood design districts based on special character, challenges or design themes, and functions, programs or land use within these districts. These neighborhoods sit within the broader defined traditional collegiate campus (basically north of University Avenue) and the urban campus (south of University Avenue). It is important to understand and respect the special characteristics of these neighborhoods in order to successfully implement the current campus master plan. These are the eleven neighborhoods: Major Open Space, Health Sciences, Federal, Service and Infrastructure, Animal and Plant Sciences, Lakeshore Residence, Historic campus, Urban campus, East campus mall, Lakefront, and Event Centers.

Campus Neighborhoods

1. Major Open Spaces
2. Health Sciences
3. Federal
4. Service and Infrastructure
5. Animal and Plant Sciences
6. Lakeshore Residence
7. Historic Campus
8. Urban Campus
9. East Campus Mall
10. Lakefront
11. Event Centers



Campus Neighborhoods Map

Major Open Spaces Neighborhood

Major open spaces provide research, recreation and scenic functions. They serve to separate and delineate neighborhoods. They are significant scenic resources.

Major open spaces are critical to the structure and form of the campus and are inviolate.

Health Sciences Neighborhood

Clinical and related health research functions define this neighborhood. In addition the campus plan envisions a series of future social opportunities, including a West Campus Union.

Establish new architectural design criteria. Create rational open space and pedestrian circulation systems. Strengthen relationships with lakeshore and major open spaces.

Buildings in this neighborhood require large floor-plates, and significant service areas. This suggests special sensitivity to retain a sense of human scale, pedestrian flow and a sense of collegiality.

Federal Neighborhood (VA and Forest Products)

Land not controlled by the University of Wisconsin

Redevelopment must be coordinated with UW objectives. Consolidated facilities to benefit all, enhance arrival sequence, relationship with adjoining neighborhoods, pedestrian connections.

Service and Infrastructure Neighborhood (Walnut Street and Charter Street areas)

Utility production. Not general public destinations.

Typically inward looking districts. Need to buffer uses from adjoining neighborhoods and circulation corridors. Establish sense of perimeter/edge.

However, nothing on the UW campus should be viewed as too insignificant to be well designed, and all above ground utility infrastructure needs to be designed with an eye towards what the community will see from the ground or from adjacent buildings.

Animal and Plant Sciences Neighborhood

Research, teaching, and public animal care facilities. Classrooms, labs, and production.

Significant redevelopment in near future. Establish campus open space structure and linkages, present a better fact to campus Drive. Emulate traditional agriculture campus neighborhood building massing, and balance of open space yet increase density, scale, massing and height to address additional program needs .

Lakeshore Residence Neighborhood

Core Residential Life neighborhoods along the Lake Mendota shoreline. Creates places for community gathering and student oriented activities. Maintain sense of scale and architectural character and unique materials. Open views and re-orient campus to the lake.

Historic Campus Neighborhood

An academic center, classrooms, faculty and staff offices. Oldest section of campus.

Restore sense of scale, open space structure and building massing to more traditional campus relationships.

Urban Campus Neighborhood

Research, classroom, faculty and staff offices. Contains a number of individual schools and departments. Major regional vehicular transportation corridors and main points of pedestrian access from off-campus.

Consistent building setbacks for enhanced pedestrian circulation and continuous street tree planting zones. Require streetscape development with building projects. Taller buildings suggest strong devices to break down their scale. Courtyards encouraged to provide open space. Maintain active uses at the street to develop a sense of civic life.

East Campus Mall Neighborhood

Mixed use corridor. Housing and student services, performing arts, and intersection with main city downtown retail district.

Modest building setbacks for enhanced pedestrian circulation and continuous street tree planting zones. Require streetscape development with building projects. Taller buildings require significant detail and articulation to reduce scale. Courtyards to provide open space. Strong relationship and linkage to the north-south East Campus Pedestrian Mall.

Lakefront Neighborhood (Centered at the Memorial Union)

Social and outreach center. Memorial Union, student orientation, alumni and conferencing facilities. Direct, public access to waterfront.

Enhance physical and visual linkage to lake. Provide outdoor spaces that relate or connect directly with the lakeshore. Link lakeshore to inland activities.

Event Centers Neighborhoods (Camp Randall Stadium and Kohl Center)

Home of major event venues for thousands of campus users and visitors.

Provide extensive pedestrian access. Enhance physical appearance related to non-event periods. Plant as many trees as possible in appropriate places to breakdown scale of the large buildings.

C. Building Siting and Massing

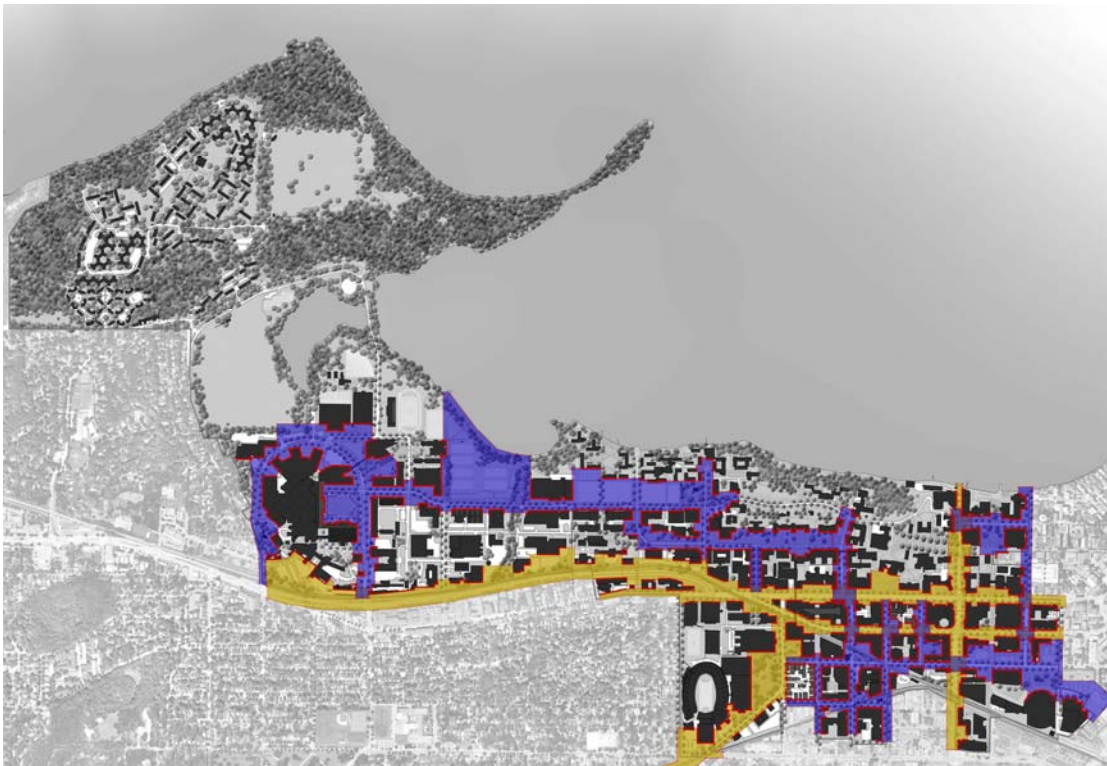
“University Hall (now Bascom Hall) on the crest of the Hill, and the two dormitories, North Hall and South Hall, at the right and the left. Too much credit cannot be given to the architect of these first buildings. Their simple, dignified style, correct proportions and honest treatment of materials gave the keynote for future work. Fewer regrets for present conditions would be felt had his example been followed more closely.” – Arthur Peabody, Supervising Architect, “General Design of University of Wisconsin, d. 1908”

The massing of campus buildings, that is the overall geometry of their perceived forms – footprint, height, and roof form, should demonstrate sensitivity to nearby buildings within their neighborhoods.

The Height of future buildings should conform to the range of heights in stories that is established for each district in the campus master plan. This information is included for reference. These heights do not represent rigid prescriptions but instead a guide to what is considered appropriate for the context. In certain areas of campus, east of Charter Street, the capitol view preservation height limits govern the maximum height of buildings.

The Shapes of future buildings' footprint shown in the master plan represent broad guidelines. Existing building footprints throughout campus are predominantly simple geometrical shapes such as North Hall or a combination of these simple shapes to form more complex ones for larger buildings. The roof form should be sensitive to the existing context of each neighborhood.

The Alignment of future buildings will follow the build-to lines established in the master plan. In the map shown below, the red lines represent the build-to lines with primary streets in yellow and secondary streets in purple.



BCampus wide Build-To Lines Map

D. Architectural Guidelines

Architectural Style, Building Shape, Color and Texture

Architectural Styles of campus buildings vary considerably. However, the more coherent parts of campus such as Bascom Hill share some basic textural, color and shape characteristics. Most buildings are composed of simple geometrical shapes, such as rectangles as is the case with South Hall, or a combination of these simple forms to create more complex geometries for more complex functions.

Scale and Proportion

It is important that the scale of buildings and campus places be related to the human scale and be perceived to be so. Careful consideration should also be given to the relationship of parts to the whole; these may be details and elements of a building in relation to larger elements, or relationships between groups of buildings and spaces – or outdoor rooms- they create. In general, those buildings and campus places that exhibit a clear hierarchy of scales, from the largest dimensions to the smallest perceivable differentiation, are among the favorite places on campus.

Façade Organization

The façade of favorite campus buildings have a tripartite division of base, middle and top. In addition, fenestration patterns and window material, scale and proportions shall be sensitive to the architectural character of each neighborhood. Fenestration pattern in the traditional campus core, for example, consists principally of punched windows that are single or ganged horizontally, and aligned vertically. Sometimes the exterior walls have rhythms of recessions and projections that are coordinated with window placement to create depth, and shadows. In contrast, the Health Sciences Campus is characterized predominantly by horizontal banding or patterns. Buildings in this area are also massive and tall requiring gestures that would relate them more to the human scale

Roofs

Roof forms and material also vary throughout campus. There are red tiled pitched roofs, flat roofs, as well as pitched asphalt roof. The general principal is to unify neighborhoods and make them read more like a whole. Therefore areas of campus like the Lakeshore neighborhoods that employ a good amount of red tile roofs, may be better served employing similar material. No specific material is prescribed but through dialogue and design review, appropriate choice would be made.

Elements

Elements such as porticos, gables cornices, columns, dormers, canopies are present in some of the favorite buildings on campus. These architectural elements are not style-dependent but could help to define the character of buildings and grounds by regulating their massing, scale, and façade rhythm. Canopies and accents at major door ways (such as the main south entry of the new Microbial Sciences building), protective projections (such as entries at Kronsage dormitories), or recessed doorways (as seen at the Red Gym) are encouraged to protect occupants and visitors from

inclement weather. These elements shall be of material and character that is consistent with the design of the building and its neighborhood. The main entrance to buildings should be easily identifiable, and part of a larger “entrance element”. This element should be in scale with its building plane.

Materials

Durable material of quality that is consistent with each design neighborhood should be used for new campus buildings. Material palette that do not convey a sense of permanence and institutional quality, such as EIFS, vinyl siding and concrete blocks, should not be used unless specific exception is made for certain structures in the service and infrastructure neighborhood. Modern and innovative materials shall be encouraged provided that they are composed in a manner that exhibit richness, balance and unity.

Miscellaneous Design Considerations:

Transparency and Permeability: To the extent possible and consistent with functional requirements, new buildings should be designed with a certain degree of transparency and permeability at the pedestrian level to encourage visual engagement between the interior and exterior. It is important that buildings and campus places enhance public awareness and feelings involvement in the academy. The large windows or glazed walls along pedestrian paths being proposed for WID, Biochemistry II, Chazen Museum addition and other campus buildings are good examples of how the larger campus as a public place can be experienced from within the buildings; and also allows those outside to feel like they are a part of what happens inside. Solid walls, particularly at ground level tend to emphasize boundary and separation, thereby undermining the notion of a campus as public place.

Parking Garages: They are necessary for our campus to function well; but their often austere architectural appearance needs to be softened. The design of parking structures should demonstrate sensitivity to the character of the neighborhoods. Wherever possible, fenestration patterns should more closely resemble inhabited buildings in the neighborhood; and screening may be a useful device to make the façade surface more regular. The Lot 76 parking garage in the Health Sciences neighborhood is an example of a sensitive treatment of a new garage that fits in well within its context. Where possible, the first floor level of parking garages could be used for human occupancy uses, such as retail or service functions that will maintain activity at ground level as is the case at the Park Street Welcome Center.

Screening of Roof Top Equipment: Rooftop mechanical equipment shall be screened in a manner that is consistent with the architectural character of the building and neighborhood.

Connections, Transitions and Thresholds: Bridges and tunnels are good connectors but should only be employed to improve functional ties between facilities and such that they do not create security concerns. However, primary movement paths should be developed and maintained at the street level. Bridges and tunnels are highly functional and convenient but they can compromise the quality of the pedestrian environment at the street level. Designers are encouraged, whenever possible, to explore the use of colonnades, arcades, and overhangs not only as transitions and thresholds between exterior and interior spaces, but also as protection from inclement weather thereby encouraging pedestrians to engage more with such buildings.

Exterior Signage: Each building shall have at least one campus standard building sign displaying the official Regent approved name of the building and the official street address. Signage may be incorporated on the face of the building as long as it is up and out of reach of pedestrian passing by at street level. (*Please see Signage Standards on file with Facilities Planning & Management.*)

E. Universal Design

“Universal design is an approach to the design of all products and environments to be as usable as possible by as many people as possible regardless of age, ability or situation”

It is the intent of this guide that all buildings and campus places be barrier-free or inclusive. Whilst our technical guidelines adopt the most restrictive provisions of ADAAG and ANSI standards, this guide considers those as minimum standards. The universal design approach goes beyond these standards. No user should receive negative special treatment. The accessible features of all buildings and campus places should be well integrated with the design aesthetically and functionally such that all users are equally accommodated in the same manner. For example, accessible ramps that are not integrated with primary entries, could be substituted with gently sloping sidewalks that bring all users to the same place at building entrances.

The strong message here, is that designers must consciously and actively strive to create buildings and campus places that are inclusively accessible, emotionally, socially, physically, and psychologically, to all.

F. Campus Open Space Design

“As many have observed, the axis of the Campus is at an angle with State Street on the east. Many have regretted this, and the architect, not being able to move mountains, have accepted the situation, and promise a dignified and adequate entrance to the campus at the intersection of State and Park streets.” – Arthur Peabody, Supervising Architect, “General Design of University of Wisconsin, d. 1908”

“The University Campus now sustains the condition of a beautiful park with university buildings in it. It has been the effort of the commission to preserve this so far as possible. It cannot be forgotten, however, that the university must one day dominate the campus, rather than have the campus dominate the university. As time passes and the demands press more imperatively, some of the wide open spaces must inevitably be built upon. Certain elements, like the wild-wood northwest of University Hall, will be permanently conserved, not only for its beauty, but for its value as the habitat of plants and animals of scientific interest. The picturesque views of Lake Mendota will likewise be as little disturbed as possible.” – Arthur Peabody, Supervising Architect, “General Design of University of Wisconsin, d. 1908”

“These, comparable to the lungs of the organism, as the thoroughfares suggest its arteries, add to the convenience of communications, permanently assure abundance of unobstructed natural light and protect the plan against congestion or overcrowding.” – Arthur Peabody, Supervising Architect, “Report of the Architectural Commission on the General Design of University of Wisconsin,” d. 1909.

The campus open space systems are as equally important as the buildings and provide the framework and connective tissue between the buildings. They are the life blood pumping through the organs and the whole could not survive without them. As we design for the campus buildings, we too must design for the open spaces that surround them such that they help integrate the building into the campus environment and blend the spaces into the respective neighborhood.

In general, the traditional collegiate campus open spaces north of University Avenue have a more fluid and picturesque quality utilizing native plantings and less formal site designs. The exception to this are the formally designed pedestrian malls (Henry Mall & Bascom Mall) as well as the linear streetscape systems that cross the campus.

Just as important are the large, sweeping open lawns in the traditional campus that provide also for large canopy trees on their edges, helping to define these spaces are outdoor rooms. Care must be taken in future building projects to preserve or create large open areas to accept the necessary large growth areas for these large trees. The open lawns must also be preserved as part of the character of the traditional collegiate campus. Spaces such as Bascom Mall, Henry Mall, the lawn at Human Ecology (the Greater Mall) and others would be devoid of their character and sense of place without these large panels of green lawn.

In the urban collegiate campus south of University Avenue, the campus landscapes take on a more rectilinear, formal urban landscape with more courtyards, hardscape plazas and defined open spaces based on the urban street grid. Taller buildings in this area however require that the open spaces be more carefully designed so that they provide spaces for

conducive outdoor use and help mitigate the vehicular dominated landscape.

Organized streetscapes are important across campus, not only in the urban street grid of the south campus, but also in the more pastoral traditional collegiate campus to the north. Street trees help provide a sense of enclosure, provide shade for pedestrians walking along the sidewalks and help slow traffic by visually narrowing the field of view along the streets. This will be extremely important in the urban campus south of University Avenue as a means of mitigating vehicular traffic impacts and slow cars going through the campus to points downtown or away from the campus. The streetscape must also take into consideration accommodation for benches, trash receptacles, traffic signage, directional signage, appropriate street and sidewalk lighting, as well as bus stops and transit oriented amenities.

The campus is also blessed with large open play fields and recreation spaces, mainly on the west campus with a few scattered on the east campus near the residence halls. These large open fields are important in providing organized recreational sports activities (football, soccer, rugby, ultimate frisbee, softball, golf, etc). These spaces must be preserved for long term use as open recreation fields to help students socially interact outside the classroom, for regular exercise and for general personal enjoyment. They also function as outdoor classrooms for teaching recreational sports through the physical education department on campus. The campus master plan guidelines protect these areas from future development.

Finally, the 300-plus acres of the Lakeshore Nature Preserve provides soothing respite from the rigors of campus life with its various environmental corridors and naturalistic landscapes. These areas are defined by their stark contrast with the traditional and urban campus landscapes and rely on the abundance of trees, understory plantings and open prairie landscapes. Their immediate adjacency to the traditional collegiate campus required that new facilities in the transitional areas between them be designed to help blend the picturesque campus landscapes with the natural landscapes of the Preserve.

Building setbacks that help define the open spaces shall comply with the master plan to complement existing buildings. The scale and continuity of site design should be in keeping with the size of the campus buildings and spaces. Site design should be of a dignified character appropriate to an institution of higher education.

Landscape plantings should typically be selected keeping hardiness in mind as well as survivability in sometimes harsh urban conditions. The campus typically does not use irrigation but in some cases it has become necessary to keep the plantings alive and to the character required of the institution. In general, landscape architects should utilize native plantings whenever possible as they typically require less care and maintenance in the long run. They survive better under extreme changes in the weather and generally fit better with the character of the Wisconsin landscape. Invasive species, as defined by the Wisconsin Department of Natural Resources, should always be avoided. Non-native and

cultivated plant selections can be used with discretion to help educate students on their use in the landscape.

Two basic campus lighting standards have been defined for use across campus. A historic character fixture is used in the historic neighborhood around Bascom Hill as well as along the East Campus Mall. A more modern, refined fixture is used through the remainder of the campus so as to unify the design element as well as blend with the eclectic nature of the campus buildings. These include sidewalk and street lighting as well as parking lot lighting. In rare instances, unique light fixtures are allowed in special use plazas. Please see our on-line construction and technical design guidelines at: <https://fpm-www3.fpm.wisc.edu/majorprojects/Default.aspx> for further detailed information.

Site Furnishings are also standardized across campus to help provide a sense of unity and visual cohesion to the overall campus. Standards are established for benches, picnic tables/chairs, trash receptacles, ash urns, planters, bicycle racks and signage. Please see further information at: <https://fpm-www3.fpm.wisc.edu/majorprojects/Default.aspx> under Construction and Technical Guidelines.

G. Transportation Design Guidelines

1. City Streets: See separate public works standards on City of Madison website <http://www.cityofmadison.com/business/pw/specs.cfm>.
Note: Campus standards are often based on and thus consistent with City standards.
2. Campus Streets, General:
 - Projects that include the reconstruction of all campus streets, including curb and gutter, terraces, and sidewalks should presume that restoration “as is” will not be sufficient, especially if the existing street was installed prior to 2005.
 - State-of-the-art pedestrian and bicycle orientation should be emphasized in any campus street design.
 - Street restorations must include the best possible ADAAG compliant features, including paired perpendicular wheel chair ramps and detectable warnings.
3. Primary/Collector Streets (through streets with higher traffic):
 - 12’ travel lanes, 10’ turn lanes, 5’ bicycle lanes, 6’ curb with 12” gutter pan, 12” curb with 12” gutter pan for medians, 5-8’ terrace per campus landscape standards, 8’ minimum sidewalk or 10’-12’ in high pedestrian traffic areas. Exceptions may be possible with approval.
 - Corner radii: 25’ standard; 35’ where warranted by bus turning movements.
 - Pedestrian crossings:
 - Mid-block crossings are strongly discouraged.
 - Three types of pedestrian crossing details available, depending on extent of pedestrian traffic and vehicular conflict. The strongest standard

involves colored concrete and, if warranted, should be specifically included in the project scope and estimate.

- If signalized, include countdown timer.
 - Pavement markings: Must include ASHTO-appropriate dashed or double solid center lines, bike lanes, and appropriate campus standard pedestrian crossing.
4. Local Street (typically, dead-end streets accessing buildings or parking lots):
- 24' wide minimum.
 - Simple ped crossing markings.
 - No centerline necessary.
 - 15' corner radii for parking lot and similar low traffic, slow speed access.
5. Pedestrian Circulation:
- Sidewalk standards as described above for streets.
 - Independent multi-use pedestrian and bicycle paths shall be 10' wide with 2' shoulders and otherwise follow ASHTO, MUTCD, and WisDOT bicycle design guidelines.
 - Building entrances and associated walkways should be oriented to discourage pedestrian circulation patterns that result in mid-block crossings or other unsafe behavior as well as erosion problems.
 - All walkways directly associated with a project must comply with ADAAG standards. Project walkways should connect to ADAAG-compliant campus pedestrian circulation routes or include modifications that do so.
6. Parking Lots, Structures in General:
- Design should maximize parking occupancy using 8.5' by 18' stalls.
 - Design should satisfy Crime Prevention Through Environmental Design (CPTED) criteria.
 - Incorporate a best practices horizontal and vertical spatial layout, pavement markings, and signage re: safe vehicular circulation.
 - Provide for easy maintenance and snow plowing.
 - Minimize impacts on area pedestrian, bicycle, and vehicular traffic.
 - Number of accessible stalls is based on campus wide determinations and does not relate to specific lots or buildings.
 - Satisfy other standards as detailed in campus construction guidelines.
7. Bicycle Parking Facilities:
- Number of spaces should meet or exceed City of Madison standards and the location of a sufficient number of spaces shall be included in the site and/or building plans at the 35% level or earlier. Projects must replace existing number of spaces (serving multiple buildings) at minimum even if this is greater than the standard for the building project. Projects with severely restricted sites should incorporate spaces within the building if necessary.

- Racks must be either the campus “duckbill” type or “U-shaped” and should be installed as described by campus construction guidelines.
- Access to racks should minimize pedestrian conflicts, especially on City streets.

8. Moped Parking Facilities:

- Number of spaces is specified in campus construction guidelines but may differ with approval of the campus transportation planner depending on number and type of building occupants.
- Moped parking areas should be located such that mopeds do not need to travel on walkways to access them. In general, these areas should not be located close to corner wheel chair ramps or on terraces.
- Direct street access shall be provided via a moped driveway that crosses the sidewalk if necessary. On City streets, an excavation permit for a residential driveway (moped driveway) will be necessary. See campus construction standards for more detail.
- Spaces shall be 3’ by 6’ with 5-6’ drive aisles.

9. Bus Shelters:

- Existing bus stops within or adjacent to project boundaries must be provided with 2008 campus standard shelters as deemed appropriate by the University.
- Shelters should be located on separate concrete pads at the back of sidewalk or otherwise out of the walkway and terrace.

H. Utilities

Utilities are the cardiovascular system and life blood to the healthy operation of a campus providing steam, chilled water, compressed air, electricity, city water and carrying away wastes and storm water. In spite of this importance, utilities should not impact the visual quality of the campus environment and their placement should be investigated thoroughly since they have a definite cost impact to the campus growth.

Existing Building Utility Guidelines

There are two existing guidelines in place currently for designers to use on campus – the Department of State Facilities (DSF) Master Specifications and the UW Major Project Construction Guidelines that are to be used in tandem with each other.

- DSF Guidelines are found at http://www.doa.state.wi.us/dsf/mastspec_new.asp. These master specifications/design guidelines are intended for use by consultants to the State of Wisconsin and by others for construction and remodeling of State owned facilities. Major building components and systems are addressed such as earthwork, building envelope, mechanical systems, plumbing, fire protection, lighting, communication and also CAD standards.

- UW Madison Design Guidelines are found at <http://www2.fpm.wisc.edu/major/Guide.html>. They were developed to assist architectural and engineering consultants in the design of quality building projects throughout the campus with an emphasis on reduced maintenance, lowered energy usage, and elevated durability.

Suggested Guidelines for Utility Sustainability and System Growth

Continuation of the planned extension of new utilities and upgrading of the existing utilities systems should proceed, with respect to energy efficiency, life cycle costs, system flexibility, reliability and redundancy, and compatibility with utility rate structures. The following is a list of critical features or parameters for successful utility growth strategies:

- Building Heights – The heights of buildings affect the chilled water system static pressure. Facilities operations staff should be consulted on buildings exceeding 8 stories in height to determine its impact.
- Energy Conservation and Building Efficiency:
 - Add energy meters and instrumentation at each major building on campus to benchmark energy usage for implementing conservation measures.
 - Increase chilled water return temperatures in existing and new buildings by using variable speed pumping and two-way control valves
 - Implementation of heat recovery systems
- Flexibility:
 - Keep fuel selection flexible at the heating and plants (solid fuels, gas and oil) so the most economical energy source may be used.
 - Investigate the use of obtaining 69kV power from ATC and transforming and distributing on campus
- Reliability and Redundancy:
 - Valves should be located at building service connections and major branch connections for proper isolation for maintenance purposes.
 - Critical research laboratories (Vivariums) and health care facilities should be served by looped utilities that provide redundant secondary service feeds in case of a failure or blockage from a primary feed.
 - Critical buildings should have valved taps for emergency cooling connections via temporary/rented air cooled equipment.
- Sizing – As new utility development occurs or upgrading of existing facilities occurs, consideration should be given to increasing the pipe size and providing additional or spare conduits. Also, if the velocity of the thermal utilities such as steam, water or compressed air is extreme in the piping, it affects the system pressure drop, efficiency and potentially erosion of the pipe. The following are

suggested minimum pipe sizes and maximum velocities for specific thermal utilities:

Utility	Minimum Size Main	Maximum Velocity¹	
Steam	4"	13,000 FPM	
Condensate	2"	6 FPS	
Chilled Water	12"	Mains	14 FPS
		≥8" building service	11 FPS
		6" building service	8 FPS
		4" building service	6.5 FPS
Compressed Air	2"	40 FPS	

- Sustainable Design Features – investigate feasibility of implementation of:
 - Cogeneration of electricity:
 - Centralized at the heating plants using large steam turbine generators, and
 - Decentralized at larger buildings by using steam turbine generators as steam pressure reducing stations.
 - Chilled water thermal storage to take advantage of any surplus capacity during the evening hours to forestall the addition of new cooling equipment.
 - Daylighting.
 - Photovoltaics.
 - Purchasing “green power” from local utilities.
 - Chilled beams to reduce airflow in high density heat gain areas in laboratories.
 - Campus Storm water Management Plan (SWMP) for every development or redevelopment project on campus
 - Best management practices (BMP) for storm water management and erosion control including:
 - Rain gardens/bio-retention
 - Green roofs
 - Rain cisterns
 - Detention ponds
 - Erosion matting
 - Grassed swales
 - Infiltration trenches
 - Native prairie plantings
 - In-line proprietary treatment devices

Distribution Corridors and Above Grade Structures

As new utility systems are developed or existing systems upgraded efforts should be directed toward development of defined utility corridors with the utilities installed below grade. Utility corridors keep distribution mains in a logical location, thereby

¹ Velocity should be confirmed with allowable pressure loss per 100 feet of piping.

creating the shortest length of main and the most direct connection of service lines. By maintaining protected corridors or easements, future campus expansion can be accommodated with the least disturbance or relocation of existing utilities.

As stated earlier, a fundamental goal for the campus involves overall beautification and “place-making”. While this objective is not necessarily a direct end product of utility systems expansion and improvement, careful planning and design will allow utility project implementation to further aesthetic objectives by incorporating aesthetic components and by focusing utility construction and site disturbance to discreet defined corridors.

- Non-paved open space is a premium resource on campus. In light of functional, aesthetic and potential storm water management objectives, non-paved open spaces should not become primary underground utility corridors. Therefore, utilities should be incorporated below paved areas whenever possible. Roads and major walkways should be viewed as first option utility zones.
- Terraces zones, the area between roadways and pedestrian circulation corridors whether paved or unpaved, should not be high priority utility zones. A primary objective for the campus is to incorporate an aggressive street tree planting program that will separate pedestrians and vehicles and begin to restore the campus, especially the more urban areas to a more collegiate and beautiful environment. Street tree planting concepts and detail guidelines are included in the campus master plan. These guidelines focus on improving and protecting street tree root zone characteristics. Where new utilities conflict with existing landscape development, efforts should be directed toward tunneling or boring rather than traditional trenching systems. This approach results in significantly less damage and ultimate loss to landscape plantings and other site improvements.
- Above ground utility structures, enclosures and buildings have significant impact visually and spatially. Nothing on the UW campus should be viewed as too insignificant to be well designed, and all above ground utility infrastructure must consider what the community will see from the ground or from adjacent buildings. Therefore, all above ground utilities should be located in unobtrusive locations, near buildings or site walls if possible and screened with informal landscaping, fences or screen walls that are integrated with the building design.
