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INTRODUCTION

The academic campus is among the greatest American inventions. Few things better embody American values at their best or have produced more great spaces. The American campus is our democracy, our sense of progress, and our ability to take diverse identities and create communities in courtyards, dorms, classrooms, laboratories, and other edifices of education. It is a physical model of what America wants to be.

Aaron Betsky
These University of Minnesota Design Guidelines convey the University’s commitment to create a vibrant, aesthetically and functionally designed environment that will optimize the University’s physical assets, ensure a safe campus and maximize the student experience.

The University’s intent is to achieve design excellence: that each individual project reinforces and enhances the identity and character of the campus. These guidelines provide a starting point for architectural design, with ample room for creativity and distinction. They are not intended to limit input from the design professionals or prohibit the use of alternative systems, methods or devices not specifically prescribed. Alternate solutions shall demonstrate at least the equivalent to, or superior to, the prescribed requirements in this document with regards to quality, strength, effectiveness, fire resistance durability and safety. Their purpose is to develop a campus that is unified, but not necessarily homogeneous. Where appropriate, variations within districts should be rooted in architecture and site elements, academic activities, and adjacent context, yet should contribute to campus-wide continuity.

The Guidelines inform architects, engineers, design professionals, University staff and contractors of the University’s requirements for materials, finishes, and form – features that contribute to the look and feel of a University of Minnesota campus.
Architecture is not an object that exists as an isolated element; it may have a strong formal or sculptural presence, but should also have the capacity to engage and be energized by those things around it. Human experience defines architecture. Regardless of temporal fashion, the University seeks attention to simple, overarching design criteria:

**Meaningful Placemaking:** Design should serve to refine learning and work environments, reinforcing personal and overall identities. Quality materials and detailing should convey a commitment to the interests and dignity of staff and public.

**Informal Learning:** Today’s student learns anywhere, at any time; the University needs space that facilitates this at multiple scales.

**Future/Flexibility/Adaptation/Change:** Change is now a constant; the design of supple infrastructure and furniture is critical to establishing lasting value.

**Cohesion vs. iconic:** We seek a more consistent campus (often at the District level due to the breadth of our campuses), versus heroic icons that contrast with a distinctive visual image and/or style.

**The Senses/Tactility:** Those design elements that ground us as human beings: materials, color, texture. The best design seeks a deeper resonance by contrasting the hard and soft, rough and smooth, quiet and loud, digital and analog.

**Ecologically Sustainable:** It is critical that we question the impact that building construction and operations have on our fragile ecological balance. Clean and fresh air, balanced and proper light spectra, non-intrusive acoustical properties, and benign materials improve student productivity and well-being.
There are five design scales that currently address the built environment at the University of Minnesota:

**University Principles – Framework**
- Macro-intangibles
- Learning models

**Planning/Development Principles**
- Pedestrian primacy, etc.
- Districts identified

**Master Plan and District Master Plans**
The University of Minnesota Twin Cities Campus Master Plan and District Master Plans provide a framework for the evolution of the campus environment, and a vision for the future of the campus district. They are detailed and customized to the character and context of each district.

**Design Guidelines**
Design guidelines align master-plan principles with the aesthetic and functional design of buildings, open space and wayfinding.

**Construction Standards**
The University of Minnesota Construction Standards provide detailed requirements and specifications for physical buildings and spaces on campus.

Within this hierarchy, the Guidelines fall between the high level vision of the Master Plan and the detailed requirements of the Construction Standards. The Guidelines are intended to address Form and Performance (Schematic Design) vs. Means and Methods (Construction Standards – Construction documents).

These Guidelines are divided into six sections:

1. **SITE**
2. **CONTEXT**
3. **AESTHETICS**
4. **DISTRICT APPLICATION**
5. **PROGRAM / UTILIZATION**
6. **PERFORMANCE**

This document provides design standards only, and is not intended for use, in whole or in part, as a specification.
INTRODUCTION

A Sense of Place

A meaningful marriage of building and site is instrumental to the success of any University project; landscape and site anchor the building to its specific place. In the best of projects, there is little separation between architecture and site.

The University of Minnesota recognizes a responsibility to provide safe, inviting and sustainable external public spaces for its students, faculty and staff, and visitors. To maintain the integrity of the campus environment, basic site and landscape elements, such as walkways, lighting, and plantings should be designed to provide continuity across broader campus areas. Projects should provide appropriate public spaces for circulation, gathering and service as required by the project’s program and as demanded by the surrounding context.

Site Selection, Protection and Preservation

Once a building site has been selected in collaboration with CPPM Planning staff, a thorough analysis of existing conditions is required to identify site constraints as well as existing elements to be preserved as assets during construction. Examples include topography, views, soils, drainage, and trees and other vegetation. Solar access to adjacent areas should be maximized, even where buildings are tall or in close proximity. Accordingly, every project is expected to contribute to the advancement of the Master Plan through design of natural features, open spaces, landscapes and built form.

SITE CONSIDERATIONS

Site / Building Relation
Connection / Access
Entry / Procession
Orientation / View
Landscape / Open Space
Exterior lighting
Security / CPTED
New construction should respond to a general set of design criteria, which:

Conforms to the UMN University of Minnesota Twin Cities Campus Master Plan (2009), District Master Plans, and other approved planning documents.

Reinforces collaborative relationships with other colleges or departments, and is compatible with neighboring uses.

Allows site visibility and image appropriate for the intended use.

 Allows for an aesthetic character that is appropriate for the campus District and/or Neighborhood.

Maximizes infill opportunities to utilize existing infrastructure and reinforce the definition of adjacent pedestrian corridors, vehicular pathways, and open space.

Meets access requirements – pedestrian, bicycle, vehicular (where allowed), service.

Maximizes the options for incorporating sustainability principles in terms of solar orientation, relationship to existing common infrastructure, etc.; avoids unnecessary environmental impacts.

Minimizes site development costs - clearance, utilities, access, parking, topography, and special conditions.

Districts and Campus Edges

Building sites should be considered within the surrounding context and should build on a site’s strengths. New building locations should extend the campus character, not contrast with it. Along the campus’ public edges, building sites should be carefully considered as having multiple frontages and orientations.

Clustered vs. Free-Standing

Buildings in groups should be oriented to form clear, inviting spaces. Examples include such historic, centralized spaces as Northrop Mall, the Knoll and Church Street, but also newer, linear spaces as the Bio-Discovery District. Building locations should not impede streets or walkways, or otherwise disrupt existing exterior spaces.

Siting of buildings should generally be orthogonal to adjacent structures and the predominant street grid. Where a new building will be free-standing, particular care should be taken during design to consider topography and distant views to the site.
District relationship

At campus edges, circulation patterns should reinforce connectivity between the campus and the surrounding city, connecting seamlessly with the existing pattern of streets, sidewalks and paths. Signature streets, as identified in the Master Plan, should signal a sense of arrival on campus by reinforcing campus identity and identifying welcoming routes to and from campus for all modes of travel. (See also “Signage and Wayfinding”)

Site Circulation

As called for in the campus master plan, design of circulation patterns should prioritize pedestrians first, then cyclists, and then vehicles. Conflicts between modes of travel should be minimized by providing continuous facilities wherever possible and prioritizing appropriately in the design of key features (such as intersections).

Pedestrian

Major components of the pedestrian system are the major pathways, standard pathways, plazas, and building approaches & entrances.

Pathways should accommodate the actual travel patterns of students, faculty, staff and visitors moving among campus destinations. Path location should generally follow the natural “desire line” between destinations, in recognition that 90 degree turns are uncomfortable and therefore unrealistic for pedestrian movement. Some walkways may not merely follow adjacent roadways, but will connect building entrances even when roads are not present.
Cyclist

Dedicated bicycle pathways should be considered only where connections can be made to a broader existing network. In high-traffic areas where extensive dedicated bicycle pathways should exist, separate facilities should be signaled using physical separation such as a median or curb, or at least through changes in pavement material. Mixing travel modes and facilities within smaller sub-areas should be avoided; merely striping a bicycle lane within a wider pedestrian walkway is not sufficient to achieve the safety goals of the University. See also “Signage and Wayfinding” below.

Pavement and Crosswalks

Pavement is a ubiquitous element with power to unify the campus across districts. Simplicity in pavement design contributes to a unified campus environment and makes legible the hierarchy of movement throughout the campus. Materials, scale and pattern each contribute to the character perceived by campus users.

Concrete pavers are preferred, and should be high-density materials designed for service vehicle traffic. Permeable pavers should be considered wherever supported by stormwater-management goals. (See Stormwater Management.) At major pedestrian corridors and crosswalks, any modular pavers should be contained within concrete bands to reinforce the visual and physical strength of the installation.

Custom-designed pavements should be considered only as part of iconic projects or signature streets, in the most highly visible, public areas of the campus.

Campus Connectivity

When deemed necessary (and funding available), buildings may be connected with enclosed skybridges or tunnels (the Gopher Way). Each building within the tunnel system should be identified upon entrance; buildings not connected to the tunnel system should have signage directing tunnel users to such buildings from the tunnel exit closest to the building.

Snow Removal

Due to the extensive amount of walks, roads and parking areas, the University uses trucks equipped with snow plows for snow removal. Most walks should be a minimum of 8’-0” wide to allow for plowing. The layout of parking lots, plazas, courtyards, and walkways to building entrances should allow for efficient plowing methods and provide location for the storage of snow. Paving materials and the base material of buildings should anticipate the corrosive effects of salt used in clearing Minnesota paths.
Entrances are frequent meeting and gathering places for those using the building and should be designed to encourage interaction. Building entrances should be visible to those arriving on campus, and should contribute to the life and activity of streets and walks. Where buildings front on public streets there should be public entrances and attractive, open streetscape facing the street. In general, buildings should open directly onto grade or onto terraces that are visually linked to and easily accessible from the surrounding grade.

Public entrances to a building should be easily found and accessed and be a welcoming feature on the campus. While each building entrance should be identifiable and well-articulated, the character of the adjacent district should flow uninterrupted to every building entrance; the impression should be of buildings placed within the continuous fabric of the campus:

- Appropriately-scaled landscaping should frame the building and lead to entrance doors.
- Buildings should have at least one handicapped accessible entrance at the main entrance, and which provides easy access to the elevator.
- Building signs should be located near the main entrance of the building in clear view of the closest major walkway.
- Service entrances should not be located in view of the main entrances, but also should not be difficult to access for deliveries (See “Services”)
- Outdoor transition space should be designed between the building approach and indoor lobbies. This transition space should include materials that relate to the materials used in the building interior or on the exterior walls. This space should also provide some protection from rain, sun, and wind.

Accessibility

The University is committed to providing equal access to all buildings for those with disabilities, and to doing so in a dignified manner. All new construction should comply with the Americans with Disabilities Act (ADA) guidelines; renovations of historic buildings should seek to improve access for disabled persons in a manner compatible with their historic integrity.

Walkways should provide accessible routes for all. Separate facilities for people in wheelchairs or with limited mobility should be avoided, except where necessary due to existing conditions at older buildings. In such cases, stairs and ramps should be designed as complementary elements leading to a main entrance.

Entrances should maximize accessibility for all users, regardless of mobility level. Where feasible, multiple entrance points should take advantage of site conditions to provide access to multiple floors. Main entrances should be ADA-compliant; separately accessible entrances should be considered where dictated by existing constraints such as existing building layout or extreme site topography.
ORIENTATION / VIEW

Most campus buildings are seen from perimeter streets as well as the campus interior, and should be designed so that they contribute to the building, street, and pedestrian ways on each side. Punctuations of taller structures or building elements within districts can be introduced for sites at view corridors, or to provide landmarks for wayfinding.

Areas with important view corridors to be preserved are shown in the Twin Cities Campus Master Plan, and include Northrop Mall, the Knoll, the Bowl, etc. New projects should not obstruct such views, and should be designed to enhance, not compete with existing views. Similarly, building heights in general should remain consistent within a given district; Northrop Mall is a prime example. For new districts or areas of major redevelopment, consider the size of common open spaces before finalizing building heights and massing.

Setbacks should, as much as practical, align with adjacent structures or respond to the definition of existing or planned open space; this includes preserving or creating view corridors and other civic responsibilities within the context of the project. Where no context exists, setbacks should be driven by planning/district masterplans that look to current and/or future open space development.

The academic activities of the University, if compatible, should be visible to passers-by. Windows should be placed to light and provide views to internal spaces, but also to give walks and streets the security and richness that derives from the visibility of adjacent activity. Highly reflective or deeply tinted glass is discouraged.

Finally, building design should take into consideration the planning and siting of possible future additions and/or expansion of the facility.
LANDSCAPE / OPEN SPACE

Buildings on the campus reflect many styles, and the essential quality of the campus is one of buildings that speak in their own voice about their purposes and the era in which they were built. It is the landscape and public spaces that integrate these buildings into a coherent whole.

**Planting**

Planting is a simple yet ubiquitous landscape element that creates the image of a unified campus, an oasis within the city. Throughout campus, planting designs should emphasize simplicity, scale, sustainability, and unity. Large groups or “drifts,” and repetition of species or groupings not only simplifies maintenance but also links spaces across distances. Careful placement of trees is especially important, as they come to define iconic spaces.

No single pattern is right for all situations. The use of geometric or naturalistic arrangements depends on each project and its context. A campus environment calls for a civic scale; overly-complex, residential plantings and species are not appropriate for most campus areas.

While species indigenous to the region may be most appropriate in general, it is more important to select plants that are well-matched to site conditions, project program and anticipated maintenance levels. Consider a plant at all stages of growth, but especially at its mature size. Plants should be selected for cold hardiness, pest and disease resistance and low maintenance needs.

Planting design should maintain sight lines according to CPTED principles, and should be considered in concert with exterior lighting and surveillance cameras as well as site furnishings. Unless a project specifically is programmed to receive special maintenance, never rely on the assumption that maintenance will contain a plant’s natural growth habit or mature size to meet a design intent.

**Landscape Adjacent To Buildings**

Plantings should not mask building entrances, but enhance and focus attention to the entrances and other architectural features.

*Planting locations for trees and large shrubs should avoid the location of underground utility lines.*

*Large plantings should be located far enough from building walls so to allow for air movement.*

*Plantings should not completely obstruct views from building windows. Plants located near windows should be near enough to filter glare and bright sunlight, but distant enough from windows to maintain views.*

*To protect building façades from lawnmower damage, provide planting beds or borders around buildings.*
Gathering Spaces

Each new building or site improvement project should incorporate gathering space at a scale that fits the site, program and context. Informal outdoor gathering spaces foster an environment of learning and social interaction on campus. Comfort throughout the seasons can be achieved by considering simple factors such as solar aspect, wind protection, shade, seating and views. Plaza materials and patterns should echo adjacent architecture.

Typology, Form and Scale

*Plazas and Quads:* formal, open designs that emphasize clear spatial volumes and extend architectural designs are most appropriate

*Streets and Pathways:* Linear designs that follow directions of movement are most appropriate

*Lawns:* naturalistic groupings usually are most appropriate

*Gardens and Special Projects:* smaller groupings and unique species may be appropriate
Plazas

Plazas function as paved areas for gatherings primarily in areas of heavy and frequent use. Plazas usually exist near building entrances, or at the intersections of major pathways, and are an essential element to provide focus to the pedestrian experience.

The design of plazas should be appropriate for the desired activity – sheltering trees or shrubs located close together to slow pedestrian traffic and provide quiet areas, open paved areas for large rallies, and benches in areas for resting and talking in smaller groups. Various activities can possibly occur within one plaza, if the space is large enough to accommodate it and a hierarchy of use is well defined:

*Clear definition of space can be accomplished through plantings, seating, elevation changes, or other landscape elements.*

*The ability to move through plazas is an important design element and should be based on the desired primary activity.*

*The relationship between the plaza and the surrounding buildings and significant landscape features should be an important consideration in the design.*

*Stairs should be minimized on plazas.*

*Views to and from plazas should be accommodated in the design.*

*Texture of plaza surfaces should be used to define space and suggest intended activity.*

*Sculpture or other “hard” elements should be interactive and engaging.*

*Seating arrangements should consider a variety of activities – intimate discussions, people-watching, quiet studying, group gatherings.*

*The design should consider the microclimate of area, including sun exposure and seasonal conditions.*

*Plantings can be an effective means to bring a human scale and intimacy to a plaza, as well as defining space and providing shade.*

*Plaza should be well-lit and attractive space in the evenings as well as the daytime.*

*On large open plazas, power should be provided for the occasional outdoor event.*

*An appropriate number of trash & recycling bins should be located in strategic places around the plaza.*

*Slopes of plazas and other paved open space or gathering areas should be 1% minimum for drainage, but not more than 2%.*
LANDSCAPE / OPEN SPACE

Landscape Walls

Walls are prominent landscape features; their configuration and materials should reflect the scale, character and form of the adjacent architecture or site. Wall design should be an expression of materials, site conditions, and surrounding space program.

Type, Scale and Character

Walls should provide seating whenever possible, especially adjacent to a plaza, sidewalk, etc. For seat walls, maximize cap depth to accommodate reading, eating, and group study.

Within visually connected areas, a wall type and material should be repeated to create unity.

If the total height of a retaining wall adjacent to a public space extends beyond a typical person’s height, terraces should be used to mitigate the impact of scale. Terraces should be graded and planted to discourage erosion and to facilitate maintenance; walls design should not impede site drainage.

Screening walls (see also Fences) should be used minimally and should not be considered as a solution for negative adjacencies that could otherwise be addressed through proper site planning. Screening walls should be only partially opaque to allow for passage of light and air and to adhere to CPTED principles. For walls that extend directly from buildings, materials, detailing and finishes should closely match or complement the architectural design.

Materials and Form

Materials such as brick, limestone, granite and precast or cast-in-place concrete are encouraged; materials and finishes requiring excessive maintenance such as sealing, tuck-pointing etc. are generally discouraged. Walls and caps should resist skateboard “grinding” through the use of skate-guards or other, integrated means. If brick or stone veneer is called for to match an architectural design, the veneer material should be full-depth and properly drained, and pre-cast concrete caps used. Thin veneer finishes are not acceptable.

Form and finish should be an expression of the wall’s materials and function. Wall materials should reflect and complement existing architectural and landscape features: cast-in-place concrete, precast concrete, full-depth brick veneer, or natural stone (either dry-laid or veneer). Modular block is not acceptable.
LANDSCAPE / OPEN SPACE

Fences

Fences should be considered only where required by program or security concerns. Fences are appropriate at major campus edges and gateways, or as a complement to existing conditions (as in historic districts). For projects within historic districts, new fencing should use material, color, scale and pattern to complement but not replicate existing fencing. Where fencing within a historic district is being extended, replaced or repaired, the designer should use measured drawings and photos to maintain existing character as closely as possible.

Where fencing is necessary in high-visibility areas such as primary walkways, design should be simple but substantial. Fabricated metal is strongly preferred; a simple picket and rail style should be considered before other alternatives.
Site Furnishings

Site furnishings should be positioned to maximize safety, convenience for the user, efficient maintenance, and durability. Locate benches and waste/recycling receptacles along major walkways, at gathering spaces and building entrances. Where site conditions permit, benches should be grouped in pairs. Where benches should be located in unpaved areas, provide a bench pad of concrete or crushed stone.

These guidelines encourage the continued use of a single palette of simple commercially-available site furnishings, compatible with all districts and contexts. Such unity strengthens campus identity and simplifies maintenance and replacement.

Refer to the current University of Minnesota Construction Standards to select from approved benches, and waste and recycling receptacles.

With prior approval, custom furnishings may be appropriate for historic spaces or select iconic projects. In such cases, durable materials and finishes are of paramount importance: precast concrete, solid stone, welded metal are appropriate. Wood furnishings are strongly discouraged. Any paint should be factory-applied over galvanized and/or primed surfaces.

During design, consult with University Landcare as the primary stakeholder and maintenance unit.

Bicycles

Bicycle parking areas should be treated as the important year-round facilities they are. During site planning, allocate space for current needs as well as potential future expansion. Locate small or moderately sized bicycle parking areas adjacent to main circulation routes and accessible to building entrances, but take care to avoid creating conflicts between cyclists, pedestrians and vehicles.

Preference should be given to smaller bicycle parking areas located throughout the campus rather than larger, concentrated facilities. When necessary, larger facilities or bicycle parking structures should be located at the edge of pedestrian districts or separate from main circulation routes.

Lighting should be consistent with adjacent areas; no special fixtures or flood lights should be used. Permeable surfaces should be used whenever practicable.

Bike racks should be surface-mounted and grouped on rails, not individual loops. Simple, galvanized finishes should be used. Major bicycle parking areas should include lockers or be at least partially weather-protected, and should include repair stations where feasible.

Location and spacing of bike racks should be determined in consultation with Parking and Transportation Services.
LANDSCAPE / OPEN SPACE

Stormwater Management

Stormwater management in the landscape should be integrated with site design as an amenity, not considered a free-standing element. A vegetated swale can form an attractive edge to a gathering space, for example, and some lawns can be graded to infiltrate runoff, rather than shed it. Areas of impermeable pavement should be minimized, while accommodating the space program.

Stormwater runoff should be captured and treated as close as possible to where rain falls on the site. Examples include a parking lot with a crisply designed vegetated swale edge, or a plaza with planted infiltration areas, rather than a free-standing holding pond.

Design of stormwater facilities or best management practices (BMPs) should model storm events as required by the current UMN Municipal Separate Stormwater Sewer Systems permit for runoff rates, volumes and water quality. The visual impact of BMPs should be considered, especially in prominent or historic areas; some stormwater detention and Infiltration can be accomplished with shallow turf basins indistinguishable from surrounding topography.
**EXTERIOR LIGHTING**

Exterior lighting design goals extend beyond safety and function. For the general public, light fixtures are among the most visible site elements on campus, and can bring continuity to widely varying environments. Because so much activity on campus occurs in winter months before or after daylight, lighting strongly influences the character of the campus for the University community, marking gateways and establishing main thoroughfares. The aesthetic impacts of exterior lighting should be considered of equal importance to safety and function.

Follow University policies regarding dark-sky compliance, especially when directly adjacent to natural areas such as the Mississippi River; design to minimize light trespass to adjacent areas. In general, exterior lighting should be limited to pathways, plazas building entrances and similar occupied places. Lighting may be considered for other areas (lawns, natural areas, etc.) only in special circumstances, for example where frequent programs or safety concerns warrant.

New projects should integrate any exterior lighting components with the existing fabric of the campus, even if the project is in an emerging district. At minimum, campus lighting should adhere to CPTED and sustainability principles, and should meet UM performance standards for lamp types, mounting heights, uniformity, horizontal and vertical illuminance levels (foot-candles), etc.

All fixtures and lamps should be selected from among UM standards. Fixture types that are prohibited include, landscape up-lighting and low-voltage fixtures of any kind. Lighted bollards are strongly discouraged but may be considered for limited use in special applications, for example in areas where such fixtures exist or where required by a specific program.

New lighting within historic districts such as the Knoll and Northrop Mall may vary to maintain existing character, but basic standards for illuminance and uniformity should be consistent with the rest of campus.

For iconic projects, exceptions to these lighting guidelines will be considered only as part of a holistic design and review process.

See *University of Minnesota Architectural Construction Guidelines* for guidance when lighting building exteriors. During design, consult Energy Management as the primary stakeholder and maintenance unit.
Crime Prevention Through Environmental Design (CPTED) is a multi-disciplinary approach to deterring criminal behavior through environmental design. CPTED strategies rely upon the ability to influence offender decisions that precede criminal acts. CPTED principles of design affect elements of the built environment ranging from small-scale (such as the strategic use of vegetation) to overarching, including the building form of an entire neighborhood or the opportunity for “eyes on the street”.

In addition to any provisions that may be required by law or code, design and construct both exterior and interior spaces to incorporate accepted principles of crime prevention through environmental design, using natural (in addition to technological) methods of providing surveillance, access control, and territorial reinforcement, wherever possible.

For purposes of physical security, elements at ground level are defined as any elements within 20 feet (6 m) of the ground, grade, or adjacent paving. Security zones are defined as follows:

**Public access zone:** an area to which the public has free access, including public corridors, grounds, and parking lots.

**Reception zone:** an area to which the general public has access but beyond which access is restricted at all times.

**Operations zone:** an area to which only employees (and visitors with a legitimate reason to be there) have access.

**Secure zone:** an area to which access is always controlled and which is monitored continuously.

**High-security zone:** an area indicated in project program, and an area named “vault”, “secure file room,” or “cash room.”
INTRODUCTION

All buildings should perform, but a great building will lend presence to its surroundings and connect to its Place. The University seeks a sensitive response to context and the principles which organize educational space:

*Coherence, quality, and a balance between building components*

*Sense of entry and arrival within*

*“Fit” – consistent architectural principles within each campus*

*Integrated open space and landscape*

*Recognizable campus identity*

CONTEXT CONSIDERATIONS

Mass / Scale

History / Campus DNA

Additions / Exterior Alteration

Solar orientation / Shadow
A campus building should succeed at many levels: from the street (where gestures to human scale and detail are perceived and welcome) to how a building meets the sky and contributes to the skyline (the distant view):

Generally, massing (footprint, shape and height) should be similar to the predominant massing in a given District, unless that District is subject to “reshaping” per University Planning Guidelines. [see Districts section in these Design Guidelines]

Building mass and articulation should reflect the building use.

To ensure a human scale, large expanses of uniform façade treatment (especially top to bottom) should be avoided in favor of more responsiveness to context and building function.

Campus development should be responsive to its surrounding context with a building height transition from campus edges to its core.

Where program or other requirements dictate a building larger or taller than others in the district, the building should be articulated to reduce height or mass. Punctuation of taller structures or building elements can be introduced for sites at ends of view corridors, to provide landmarks for wayfinding, or in locations defined by the University’s planning strategies.

Heights of Structures

Buildings should be in scale with surrounding structures, and the streets and public ways that are adjacent to them. This will vary by District, but as a goal, the establishment of a height of no more than four stories before a setback will give the district an overall human-scaled pedestrian quality. For solar access, structures should typically be no taller than approximately 75 feet fronting major east-west streets, and 50 feet fronting pedestrian ways. If portions of the buildings must be taller, they should be set back a minimum of 15 feet from the street wall, with lower portions addressing the street.
Context and the Public Realm - Historic Context / Modern Balance

Memory is a powerful component of a great campus, which is filled with physical, cultural, and institutional patterns that have appeared over time. Yet history is not static; tomorrow’s history is created today. A University cannot be static either – it should embrace evolving curricula, changing students and methods of learning.

The integration of new construction with historic buildings should reflect this confluence of history and future. The authenticity of materials found in the existing campus fabric should be continued, but possible juxtapositions of form and materials can evoke Tradition for the 21st Century. New buildings should express the aesthetic ideas of our times, so that looking back they also become a cultural record of ideas about architecture and campus life.

Above all, the most compelling balance of old and new is found in those elements of design which transcend time – and are present in any successful campus building:

Character of Form: the architectural representation of UMN’s pedagogical values

Quality of Space: reflecting human scale, celebrating the presence of light, views

Connections: with the site, within the building

A Sustainable Ethic: expressing the integrity of materials – their texture, feel, solidity

Completing a Campus - Building Context / Architectural Character

The University’s campus is architecturally diverse. Over 150 years of American architectural history are represented on campus, including Renaissance Revival, Richardsonian Romanesque, Public Works Administration (PWA) Moderne, International Style, New Brutalism, historic revivals from the turn of the twentieth century, and the contemporary eclectic styles of the last twenty-five years.

While recognizing the varied nature of the campus throughout its evolution, the Guidelines call for design cohesiveness through appropriate scale, common materiality, buildings that shape positive outdoor space, the treatment of primary entrances, and other thoughtful strategies. New buildings should not replicate historic styles and building language, but rather integrate new construction with respect for the character, scale and materiality of the existing built environment.
CAMPUS DNA / HISTORY

Architectural Style

Design new buildings to be in harmony with the massing, materials, color, texture, and aesthetic character of adjacent University buildings. Create a contemporary design while maintaining respect for adjacent historic resources.

Buildings should demonstrate stability and permanence through the use of brick, stone, glass and other substantial materials.

New and existing buildings should be integrated into the landscape.

At campus edges, consider the campus and the neighborhood as the context for the building.

Design buildings to create well-defined edges that frame streets, plazas, and open spaces and establish a comfortable, human-scaled, and connected public realm.

Buildings should favor cohesiveness of the whole rather than being iconic; exceptions are buildings on landmark sites which may require singular forms that emphasize the artistic qualities of the building and contribute to making the campus a collection of memorable places. Designation of landmark sites should be documented from approved physical planning guidelines.
Historic Architectural Stewardship

Integrity in design and sustainable practice requires preservation of our historic cultural resources, including historic buildings, archaeological sites, landscapes and objects:

For existing historic cultural resources - preserve, restore or rehabilitate to maintain and respect the original design, materials, and quality.

New buildings should be sensitive and respectful of the impact on extant historic cultural resources including consideration of adjacent historic sites and neighborhoods.
Intervention - a dialogue between traditional and modern form

It is the intent of these guidelines to encourage responsible stewardship of all existing University buildings. Each renovation project should include an investigation of all aspects, systems and features impacted by the specific intervention. Conditions discovered during project evaluation, design or construction that are in need of improvement should not be ignored.

New additions, exterior alterations, or related new construction shall not destroy historic materials that define the character of the building when dealing with buildings or features with architectural merit. In most cases, new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

Design issues in the integration of new construction with historic buildings include:

Development of a concept & logic for the design of the new spaces: the adaptive reuse should retain the clarity of the original building organization while opening up interior space. Properly understood and referenced, the existing will inform and guide the design of the new. This work will be done with the guidance of the requirements of the Interior Secretary’s Standards and/or SHPO.

Flexibility: Providing multiple-use space, and allowing for ease of reconfiguration

Cleaning & restoration of historic materials & finishes, where warranted

Thoughtful integration of new mechanical & electrical systems into existing structures

Public buildings will often have historic features in lobbies and hallways, requiring—and deserving—special design treatment in renovations. Maintain the historic character of spaces while modernizing for enhanced security, accessibility, and general circulation.
**SOLAR ORIENTATION / SHADOW**

Buildings should be oriented in alignment with any predominant street grid, strengthening the campus realm of streets and open spaces.

Care should be taken not to cast shadows on open spaces or important walkways. A shade/ shadow analysis must be submitted for review during the design review process; the impact of this analysis should be reflected in the design of the building, landscape and surrounding activity areas and the effect on adjacent facilities.

*Where possible, buildings should be oriented with the long axis east-west to limit east- and west-facing façade areas and maximize north- and south-facing façades; this will limit exposure to the most intense solar heat gain, assuming south facing façades incorporate sun shading or other technologies.*

*When a building’s long façade needs to face east or west to meet program requirements and/or reinforce a street edge or public space, sunshades and other architectural devices should be used to limit solar gain.*
AESTHETICS
INTRODUCTION

Architecture is practiced on both large and small scales to contribute positively to the social, built and natural environments. Combining programmatic need, real attention to the pragmatics of cost and time, and a respect for the local and global context of a University campus, we seek an architectural balance of the physical, emotional, and social aesthetic value. Without these attributes, design is just decoration defined by personal preference.

AESTHETIC CONSIDERATIONS

Architectural Character
Interior / Exterior Relationship / Transparency
Materials
ARCHITECTURAL CHARACTER

Building Façades and Entrances

Create a legible entrance, located along circulation paths and intuitively perceived as an entrance. Building entrances should provide protection from weather, be friendly, inviting, and appropriately proportioned to human scale.

Building entrances should be accented with landscape terraces and plantings.

Place windows overlooking sidewalks and parking lots to reinforce CPTED principles (see Appendix).

Exterior lighting on building façades should respect the character of the surrounding campus as well as the adjacent commercial and residential context. Choose light fixtures that meet Dark Sky requirements and do not create light trespass.

For exterior security lighting, see “Building Site and Landscape Guidelines”.

Select materials for their durability, beauty, and harmony within the building’s context.
ARCHITECTURAL CHARACTER

Building Articulation and Fenestration

Design new construction to relate to scale, materials and rhythm of adjacent buildings.

Each new building should acknowledge an articulated base, middle, and top.

Buildings should seek a variety of heights, textures, and scales. Consider articulating offices, support spaces, and circulation elements within the building massing.

A building’s ground level should establish a sense of human scale through articulation. On active streets where function of building allows, ground level façades should be transparent to animate the pedestrian environment.

Where programmatically appropriate, provide controllable natural daylight to the interior. New glazing should consider overall appearance in pattern, profile, texture, color, and other defining elements, as well as energy efficiency.

The scale of building openings, both windows and entries, should relate to human proportion. Large glass openings are to be broken by vertical and horizontal members to achieve appropriate scale.

Consider sound attenuation requirements for exterior envelope, based on the function within the space and the surrounding exterior context.
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INTERIOR / EXTERIOR RELATIONSHIP / TRANSPARENCY

Buildings should represent the disciplines, uses, and functions in/of the building and provide opportunities for informal teaching and learning outside the classroom. The design should encourage interaction, promote interdisciplinary collaboration and provide a setting that brings faculty and students together.

It is critical to campus vitality that streets and public spaces are activated by dynamic and publicly-accessible uses at the ground level of buildings:

Rather than privatizing and hiding community-oriented facilities in the upper levels of buildings, cafes, study commons, and other shared/collaborative spaces should be located at ground level.

Building facades should be designed to be as transparent as possible to reveal the activities within.

Outdoor gathering spaces should be located adjacent to these indoor activity nodes to allow spill-out in temperate seasons and views to the outdoors in winter.

Buildings should be joined into a coherent, navigable campus fabric by green spaces designed to enhance walking and offer users an opportunity to connect with the natural environment.

Wherever possible, primary building entrances should face onto the active edges to contribute to the animation of these key public spaces. Pedestrian zones should have extensive shade throughout to create a cooler, more comfortable microclimate for people walking in the district.
Materials should be appropriate to building form, mass, color, scale, and context, and reflect a building’s function. Emphasis should be placed on materials that have permanence, durability, and can withstand our Midwest climate.

A consistent palette of materials, colors, and textures within a district is preferred to reinforce the character within. Masonry, including brick, stone, or cast stone, should be a major feature of most buildings. Masonry establishes a general tenor for the campus, while complementary materials are used successfully — and in some cases dramatically — to signal different functions of buildings, and to take advantage of particular site or other design opportunities. While there should be no hard and fast rule, the presumption is that this pattern should continue, and that masonry should be the point of departure for new structures.

Historic buildings utilizing masonry usually feature headers and trim giving the buildings an individual richness as well as an appearance of campus accord. New construction need not mimic historical motifs; however, consideration should be made towards achieving similar richness through the detail and fenestration of individual facades. Designers are encouraged to thoroughly explore and expand on this basic vocabulary, and to find ways to contribute to the interplay of materials and textures.

Additions should typically match the materials of the existing building or respect the historic nature of existing buildings, but may in some cases contrast materials to denote original from new construction.

University structures at a campus edge may depart from predominant campus materials, but should be respectful in other ways (program, scale, contribution of life onto streets, etc.) to the University, and should not overwhelm residential or commercial neighbors.
MATERIALS

Glazing

Transparency is encouraged as appropriate for program and solar orientation. Glass, particularly at the first floor, should be clear – highly reflective or tinted glass is discouraged throughout. In addition, it is the intent of the Guidelines to be sensitive to bird migratory/flight patterns via bird-safe glazing (see Sustainability).

Cleanliness of exterior surfaces

Prevent the attraction and adherence of dust and airborne dirt; exterior surfaces should be able to be washed reasonably clean by normal precipitation.
Roofs should match the character and materiality of the district and should match or complement adjacent buildings in historic districts.

Roof color should be compatible with energy efficiency design. Use materials on roofing surfaces exposed to view that will conceal dirt. Arrange roof drainage to eliminate ponding.

Provide skylights where access to natural daylight is functionally required; minimize the use of skylights for decorative purposes.

Exposed rooftop mounted mechanical and electrical equipment is prohibited. Penthouse enclosures may be acceptable depending on site and visual impact.

All rooftop equipment and accessories, such as ladders, access stairs and fall restraints, should be visually screened from ground-level view, from windows in the project that overlook the roof, and (where possible) from windows in adjacent buildings overlooking the roof. Required screening should be in harmony with the design of the building and site, and compatible with the building in mass, materials, and color.
DISTRIBUTIONS
INTRODUCTION

The General Design Guidelines apply to all buildings; but because of the unique size of and variation within the Minneapolis campus, architecture style, material, and scale are more easily understood at a District scale. Districts are an opportunity to build an architectural consistency of place; they provide a way to understand distinct areas of our large campus in a more intimate and personal way.

Most districts have a unifying feature that conveys a sense of place and identity, and provide a physical way to organize buildings, spaces, and paths. Common features may be open space (Northrop Mall), a prominent natural feature (the Mississippi River), or a group of buildings that house similar activities, such as the Athletics arenas and stadiums. All districts are defined or envisioned as deliberate groups of buildings, open spaces, and paths. Usually, districts also have amenities that draw people to them.

DISTRICTS (MINNEAPOLIS CAMPUS)

- East Bank Core - Mall
- East Bank Core - Knoll
- River Bluff - East
- South of Washington
- Research Core
- University Row
- Venues
- Gateway East
- West Bank Core

District Table of Contents

Context
Function/use
Site
  - Grain
  - Open space
  - Circulation/Entry
  - Views
Aesthetics
  - Style(s)
  - Scale
  - Materials
Feature: Northrop Auditorium and groups of historical academic buildings frame Northrop Mall, pedestrian-focused paths along Church Street, and Scholars Walk.

Buildings: Historic buildings capturing two distinct eras in campus development, with ordered arrangement fronting the Mall and along Church Street. Additional eclectic architectural styles span over 50 years of design and construction.

Open space: The visually open center Lawn creates a powerful view corridor within the Mall and into adjacent secondary and tertiary spaces that feed adjacent districts. The Mall is used for passive recreation, has been the site of significant historical and cultural events, and is part of everyday student life.

Paths: Primarily pedestrian focused with some dedicated space to bicycles, with a low priority on auto.

Amenities/draw: The Mall serves as a major destination for academic, food, gathering, and service; open spaces facilitate gathering and lingering.

Function/use

Current: Largely academic/administrative; the heart of the campus.

Guidance: No significant changes to function/use. Opportunities to support and expand interdisciplinary study and adapt to shifting pedagogies will drive building uses and demands

Site

Grain

Current: Formal gridded pattern that responds to the Cass Gilbert plan. Grid shifts as the district responds to the city grid along University Avenue.

Guidance: Future buildings should continue to address the formal arrangement that defines the Northrop Mall while maintaining the grid of open space and circulation. The edges of the district respond to the shifting grids and serve as intermediaries/transitions to adjacent districts.

Open space

Current: The Mall is the prime open space of the East Bank. Northrop Mall is a formal, iconic focus; historic buildings enclose the Mall and contribute to its formality.

Guidance: Continue to respect the historic design and formal organization of Northrop Mall by considering the primary lawn as a no-build zone, and maintaining existing building frontages/setbacks. Any new projects should continue these patterns and respond to building and circulation interaction with the primary open space, reinforced by circulation to surrounding districts. The interstitial spaces between buildings reinforce circulation, and provide opportunities that heighten pedestrian experience.

At the edges, open space should be respected as connective tissue between the Mall and adjacent districts. New design should reinforce these connections and maintain setbacks that do not impose building footprints on these paths, while seeking to augment and enhance the experience of moving between districts by articulating areas of repose.

Context

Northrop Mall is arguably the most iconic landscape of the University of Minnesota Twin Cities Campus. Originally conceptualized by Cass Gilbert in 1907 and built over several decades, the Mall is eligible on the National Register of Historic Places. Church Street and Scholars Walk present pedestrian oriented paths that serve as organizing elements within the District.
EAST BANK CORE - MALL

Circulation/Entry

**Current:** This is a largely pedestrian focused district, with axial walks within the District. Northrop Mall and Church Street present primary circulation axis upon which buildings front and engage. Scholars Walk provides a perpendicular east-west pedestrian axis that stitches the Mall District into River Bluff East and the Research Core.

**Guidance:** Continue to reinforce established circulation patterns and building entries with a primary focus on the pedestrian. Opportunities to address pedestrian movement relate to the treatment of open space (see above). Primary entries should continue to create visual awareness and articulation focused to and from the Mall, Church Street, and Pleasant. Secondary entrances should be less prominent and engage perpendicular pedestrian paths such as Scholars Walk.

Views

**Current:** Because of the consistent building heights of the Mall, vistas are largely confined to the Mall landscape and the buildings that frame open space within the district (Northrop Auditorium). The same is true of Church Street, where the buildings that frame the procession through the space define views.

**Guidance:** Buildings should respect current building setbacks in an effort to retain the conceptual tradition of framing space with buildings, both in the Mall proper and the intersecting pedestrian paths.

Aesthetics

**Style(s)**

**Current:** Classical symmetry associated with Roman Renaissance in direct response to Mall, with a wider variety of architectural styles at the edges of the district. Buildings along Pillsbury Drive reflect a Richardson Romanesque style associated with some of the campus’ original buildings.

**Guidance:** New buildings or major additions should not replicate existing styles but complement existing mass, scale, and proportion. The formality of the Mall should be the basis of design in terms of rhythm of openings, pattern, and materiality. Buildings on the edge provide opportunities to break the rigid formality and introduce transitional design gestures.

Buildings include:

• Northrop Auditorium
• Kolthoff Hall
• Smith Hall
• Wilson Library
• Johnston Hall
• Morrill Hall
• John T. Tate Hall
• Vincent Hall
• Murphy Hall
• Ford Hall
• Pillsbury Hall
• Nicholson Hall
• Jones Hall
• Nolte Center
• Nolte Center
• Williamson Hall
EAST BANK CORE - MALL

Scale

**Current:** Consistent building heights within the District help maintain the equity associated with Land Grant academic offerings, while creating an identifiable pattern and atmosphere. The exception is Northrop Auditorium, which sits elevated at the apex of the Mall,-signifying its status as an iconic feature within the District. Cornice lines establish a strong datum at the top of buildings within the district.

**Guidance:** The design datums of existing buildings on Northrop Mall should be referenced and maintained; these include base conditions and cornice lines. These visual cues are present throughout the district, and maintain the scale of buildings within. In the interstitial space between buildings that serve as pedestrian paths, special attention should be paid to design elements that reinforce human scale and enhance the experience of moving through the space (see open space and circulation).

Materials

**Current:** Largely brick with stone articulation.

**Guidance:** Maintain existing building materiality to the degree possible. Additions and new buildings may complement existing building materiality with modern materials applied in a manner that reinforces notions of scale and architectural style. Permissible materials include: hand-laid Brick, Stone, Metal Panel, Glazing (curtain walls, storefront systems, and windows). Non-permitted materials: Precast panels with veneer brick, EIFS, Stucco, corrugated metal.

References

*Northrop Mall Improvement Study (2017)*
RIVER BLUFF - EAST

Feature: Located along the Mississippi River, this District has panoramic views of Minneapolis’ downtown skyline and river bluffs. The Eastern bridgehead of the Washington Avenue Bridge is a significant node that connects the East and West Banks of the Minneapolis Campus.

Buildings: Current buildings include an eclectic mix of historical campus buildings sited on the bluff, arranged in response to topography, and adjacent to the Knoll and Mall Districts. The Iconic Weisman Art Museum anchors the District at the Washington Avenue Bridge. Future buildings or building features should acknowledge physical adjacency and visual connection to the river.

Open space: The river bluff and flanking parkway create a continuous buffer or transition zone. Future projects should integrate pedestrian connectivity between campus and parkway with pedestrian amenities (such as river bluff overlooks) and enhanced visibility into campus.

Paths: Network of narrow auto-oriented parkway with incomplete network of sidewalks. Future development should seek to complete, high-quality pedestrian network with clear connections between the river bluff and campus.

Amenities/draw: Opportunities for visual and recreational connection to the natural environment along the River Bluffs juxtaposed against the urban skyline of Downtown Minneapolis.

Function/use

Current: The River Bluff East District is composed of academic classrooms and student service functions that support broader University programs. The Weisman is a public-focus building that fosters cultural and public outreach.

Guidance: As buildings are repurposed or repositioned within the district, functions are anticipated to continue to be supportive of academic uses and programs.

Site

Grain

Current: Current building layouts in the southern portion of this district respond to the rhythm of the Mall District, then transition with a more organic response to the natural landscape of the river’s bank. Façade cadence responds equally to the ordering elements of adjacent districts; the Mall presents a formal orientation and response, while the Knoll is internally focused to pastoral open space.

Guidance: The existing rhythm of building mass and open space should remain a primary organizer that enhances the connectivity of the campus to the River. Facades that front the river/bluffs should engage with the unique natural elements that define this unique edge condition on campus.

Context

The River Bluff East District is a transitional zone whose formality and linear form takes cues from adjacent districts (Historic Northrop Mall and Knoll) and the natural bluffs along the Mississippi River.
RIVER BLUFF - EAST

Open space

Current: Open space is at a premium along the River’s edge; consequently buildings often fail to capitalize on this opportunity. Interstitial space between buildings is equally subdued.

Guidance: New projects in the district should strengthen interstitial spaces and weave a connective fabric between the campus and river’s edge, in an effort to embrace and enhance this natural amenity and its value to the campus experience.

Circulation/Entry

Current: Roadways present automobile-focused circulation at the edge of campus. Pedestrian paths are disconnected along the River’s edge due to topographic constraints, and are not associated with primary building entrances. These building entries respond instead to the adjacent (Northrop) district’s organization, while treating the river as a back door and service zone.

Guidance: Buildings should continue to have primary entrances that extend to the formal circulation of the Northrop Mall along Pleasant Street. Setbacks and building articulation should be responsive to existing conditions, while enhancing pedestrian circulation that better engages the River’s edge and stitches together the built and natural environments of the campus (both interior/building and site/landscape circulation).

Views

Current: Buildings along East River Road somewhat address the visual relationship between river, city, and campus. The district presents panoramic view towards West Bank and downtown Minneapolis over the bluffs.

Guidance: When possible, new buildings and major additions should introduce greater opportunities to celebrate views across the river, both in the exterior space between buildings and from within the building.
**Aesthetics**

**Style(s)**

**Current:** At the head of the Washington Avenue Bridge, Bruininks Hall and the iconic Weisman Art Museum present contemporary clad forms that stand in sharp contrast to the more historic backs of the buildings that march up the river. Buildings include:
- Weisman Art Museum (1993)
- Bruininks (2015)
- Appleby Hall (19XX, 1987)
- Fraser Hall (1937, 1954)
- Wulling Hall (1892)
- Elliott Hall (19XX)

**Guidance:** As buildings are repositioned for future uses, embracing and celebrating the visual connections to river will create opportunities to better transition between modern and historic. Respectful compositions that relate new to old will require special attention to “points of inflection” – the relationship between.

**Scale**

**Current:** Building scales (heights) range between 3-4 stories, with a consistent datum that establishes a visible, continuous base along the receding bluff edge. Older buildings have a base/middle/top organization, with newer buildings taking on a monolithic mass.

**Guidance:** Future buildings should respect the scale of existing buildings along the bluffs, striking a balance between the natural vegetated edge and the building composition. New buildings are to respect the existing pattern of base/middle/top organization.

**Materials**

**Current:** Older buildings are primarily composed of brick and limestone, while newer buildings introduce metal and glass facades.

**Guidance:** Blend of traditional materials, brick and limestone, with increased transparency to reinforce visual connection between river and campus. Permissible materials include: hand-laid Brick, Stone, Metal Panel, Glazing (curtain walls, storefront systems, and windows), terra cotta. Non-permitted materials: Precast panels with veneer brick, EIFS, Stucco, corrugated metal.

**Special opportunities**

University of Minnesota Northrop Mall & Knoll Historic Districts: “the portions of the district that align Pleasant Street contribute to the Northrop Mall which has been identified for submission as a historic district/landscape. Likewise, the buildings that fall adjacent to the Knoll have a responsiveness and responsibility to reinforce the character defining elements of that historic district. Special attention should be paid to how buildings impact and contribute to the surrounding historical context.”
SOUTH OF WASHINGTON

**Feature:** Mississippi River and river flats. Washington Avenue light rail corridor.

**Buildings:** Coffman Memorial Union bisecting river flats and historic Northrop Mall; academic buildings and AHC fronting Washington Avenue; and UMN student housing fronting East River Road.

**Open space:** River Flats recreational area and various open spaces amongst dense urban fabric. Future developments to enhance composition of District open space and create safe access to and from campus and River Flats.

**Paths:** Parkway vocabulary with dedicated, separate lanes for walking, bicycling, and driving. Buildings are distinctly adjacent to urban network of sidewalks and commonly have zero setback from right-of-way. Future buildings or additions on Essex, Washington Avenue, and Church Street should better respond to pedestrian scale and movement.

**Amenities/draw:** Riverfront views and recreation opportunities.

**Function/use**

**Current:** The primary functions within South of Washington District are Instructional, Outreach, Academic Support, Research, Clinical, and Residential. As the origin point of the Academic Health Center, this area invites a diversity of student, staff, faculty, and public visitors. Contemporary development along Washington Avenue connects East Bank Core academic functions to clinical outreach. East River Road River links contemporary and historic student residential buildings.

**Guidance:** South of Washington student residential redevelopment is imminent. The character of development south of Washington will evolve with programs that reflect 21st Century learning, research, workplace, healthcare, and student life. New buildings/programs to promote interdisciplinary and hybrid uses.

**Site**

**Grain**

**Current:** Existing grain reflects the multiphase development of this district and clustering of buildings by use types. Rhythm of building mass and open space is not consistent throughout the district – in general, open space developed as a building-by-building response. Grain, at the building scale, reflects a similar multiphase disorganization and lacks pattern or consistency.

**Guidance:** The existing rhythm of building mass and open space should be seen as part of a district composition. Refer to UMN Development Guidelines for additional information. Buildings should be strongly connected to the ground plane and pedestrian edges softened with landscape, materiality, and transparency.

**Context**

*South of Washington District is a mix of historic and contemporary buildings defined by their functions: Instructional, Outreach, Academic Support, Research, Clinical, and Residential. The South of Washington District is organized by the Mississippi River, East River Road, Northrop Mall, Church Street, and Washington Avenue. In the future, Essex Street Corridor will be a main pedestrian corridor and all adjacent buildings will orient to this central path.*
SOUTH OF WASHINGTON

Open space

Current: Formal vegetation and hardscape define the AHC District; open space complements adjacent architecture and is isolated in its arrangement. Multiple scales of open space can be experienced throughout South of Washington, and are in general focused inward to building clusters or divided by fast-speed transit corridors.

Guidance: Future development should enhance north/south view corridors and east/west pedestrian corridors. New buildings or major renovations should orient building massing to complement adjacent parcels and create larger pockets of open space, respecting historic setbacks. The massing diagram (below) illustrates how the composition of two building masses can establish a common green space:

Circulation/Entry

Current: Vehicular and Light Rail focus on district edges with dedicated pedestrian-only circulation paths on Church Street, Essex, and internal to AHC complex. Large scale buildings make pedestrian circulation around and through the District difficult; overall, there is a lack of clear organization to existing building entries and wayfinding between buildings.

Guidance: Future developments to prioritize slow speed. Buildings and interior programming should respond to speed of vehicular circulation on East River Road and pedestrian focus of interior paths. Circulation to primary building entries should be visible, direct, and accessible. New buildings and additions should enhance north/south view corridors and east/west pedestrian corridors; building entries should orient to current and future pedestrian corridors along Washington Avenue and Essex Street.

Views

Current: Buildings and topography block views into and outside of the South of Washington District, keeping the District uniquely divided from the East Bank Campus Core and Mississippi River flats.

Guidance: New buildings and major additions should enhance view corridors into and out of the district – linkage back to the campus north of Washington Avenue is a particular goal. Buildings along East River Road to address visual relationship between river, city, and campus.
SOUTH OF WASHINGTON

Aesthetics

Style(s)

**Current:** The South of Washington District features an eclectic mix of buildings originally constructed from 1912-2002. At the center, the Mayo Complex (constructed between 1915 and 1954) is a physical remnant of AHC and Minnesota clinical/research history. This district is characterized by four main style zones, including: Moderne, Georgian Revival, Modern, and Contemporary. Buildings include:
- Jackson Hall (1912)
- Mayo Building and Additions (1915-1954)
- Pioneer Hall (1928; 1959) Georgian Revival
- Medical Sciences Building (1932)
- Comstock Hall (1940)
- Coffman Memorial Union (1940): Moderne
- Boynton (1950)
- Centennial Hall (1951)
- Variety Club Research Center (1951)
- Territorial Hall (1958)
- Masonic Memorial Building (1958)
- Frontier Hall (1959)
- Diehl Hall (1959)
- Children’s Rehabilitation Center (1964)
- 717 Delaware (1965)
- East River Road Parking Ramp (1966, 2000)
- Moos Tower (1973): Brutalist
- PWB (1977)
- Weaver-Densford (1980)
- Nils Hasselmo Hall (1996)
- Molecular and Cellular Biology (2002)
- Mark G. Yudof Hall (2002)

**Guidance:** New buildings or major additions should not replicate existing styles but complement existing mass, scale, and proportion. New developments should serve to clarify the complexity of past multi-phase developments.

Mass/Scale

**Current:** South of Washington District buildings range from 4-18 stories high; building height increases as you move towards Mayo Complex and Moos Tower. Scale of the buildings in AHC core is generally overwhelming for pedestrians, due to their zero setback from right-of-way, the scale of building massing, and lack of finer-grained landscape or architectural detail at ground level. Building plans and massing are a reflection of the building type and visible typology of clinical suites, labs, and residential dorms. Existing buildings generally have a base/middle/top organization.

**Guidance:** New buildings should be 4-10 stories and respond to immediate University context; surrounding non-University buildings will not be considered as a rationale for building height. A balance between large scale and fine detail can be achieved at the pedestrian realm with choice of materials, patterning, entry, and relationship between right-of-way and building façade. New buildings shall respect the notion of a base, middle, and top.

Materials

**Current:** A mix of red brick combinations/variations, limestone, large aggregate concrete, and glass materials.

**Guidance:** New buildings and major additions should consider brick, stone, concrete and glass as the primary exterior material palette. Design teams to consult with CPPM and Facilities Management regarding selection of durable building materials given the high level of traffic adjacent to and within this district. Complementary exterior materials can be introduced if consistent with existing mass, scale, and proportion. Transparency at the public realm is encouraged to enhance the pedestrian experience within this district; creating a connection between activities inside and outside.
**GATEWAY EAST**

**Feature:** Huron Boulevard.

**Buildings:** Mix of private and University owned buildings with no consistency in appearance, position, or use. Envisioned future: eclectic, urban mix of context oriented buildings with small increment frontage. Open space: streetscape, urban plazas.

**Paths:** Auto-focused urban right-of-way with separate, dedicated lanes for walking and driving.

**Guidance:** Balanced amenities for walking, bicycling, and driving.

**Amenities/draw:** Regional access, visibility, ability to support partnership activity/investments

**Context**

**North:** The district is burdened by its proximity to the TCF Stadium, with its massive scale contrasted with surrounding surface lots, which accent the scale shift and planar emptiness which results from the sporadic use of the Stadium. Consequently, the research buildings of the Biomedical District form an abrupt building wall along 6th Street SE.

**South:** The University presence to the south is currently a sporadic collection of built opportunities, lacking a critical mass for University presence yet ready for future growth and definition to the University’s eastern edge and entry Gateway.

**Function/use**

The primary organization of this district is centered on medical research, as a newer extension of the Academic Health area to the south. As a more recent edge to the Minneapolis campus, it still holds opportunities to forge identity, unity, and common purpose.

**Open Space**

**North Current:** Presently, the District is awaiting a critical use/building mass to create a “there” there. The Cancer/Cardio Research Building has created an open space corner which anticipates future development to complete it, while the Wallin Medical Biosciences Building offers north-facing open space which new development is slated to complete (however shadowed).

**North Guidance:** New buildings should seek to provide green/open space – created either by building form or specific landscape design – to counter the tight building grain and relentless surface parking (or future structured parking) of the TCF Stadium.

**Circulation/Entry**

**North Current:** 6th Street SE itself is planned around both future growth in the District and the peak loads of TCF events. Accordingly, there is a “boulevard” aspect to the street which will serve the District well in the future.

**North Guidance:** New development should extend the building frontage along 6th Street and SE 23rd Avenue, completing a building ring around the TCF stadium that will help mitigate the radical scale shift between Stadium and University/community development to the east.

**Skyway/skybridge circulation:** several (but not all) buildings in this area attempt to knit the area together via enclosed skybridges. Much like urban areas, these sky bridges address Minnesota’s climate issues, but at the cost of street/exterior/District vitality. As the density of this area is increased, it is hoped that skyway connections become minimized to increase the animation and vitality at street level.

**South Current:**

**South Guidance:**
Views

North Current: Outward views in this District are currently limited to the TCF Stadium mass to the south or rail yards to the north.

North Guidance: Internal courtyards are encouraged to create a sub-zone of greenspace and reflective Place. Building design should be oriented to support this: street frontage coupled with internal light and views.

South Current:

South Guidance:

Aesthetics

Style(s)/Organization

North Current: Due to its more recent development, architecture in this District is currently of a modern era; generally all buildings are individual expressions, surprising given their common/recent origins.

North Guidance: New building in this area should continue the modern vernacular, but with a renewed emphasis on tying the District together via:
  - Material continuity
  - Façade/entry street frontage
  - Pedestrian amenities/experience
  - Landscape

South Current:

South Guidance:

Mass/Scale

North Current: One design success in this district is the largely unified scale of the buildings as they front SE 23rd Avenue: buildings are typically 4-6 stories, providing a unified skyline to the area.

North Guidance: New construction should maintain this scale, as it mediates between the scale of TCF and the surrounding neighborhood.

South Current:

South Guidance:

Materials

North Current: Materials in this district are distinctly front/back in their common composition: brick/glass with horizontal precast accent/eyebrow articulation on the street façade, more subdued brick/glass composition to the rear. The result is some unifying character, but with a lack of pedestrian scale and a sense of “cool” given the white precast accents.
WEST BANK CORE

Feature: West Bank Plaza/roof deck and Washington Avenue bridgehead.

Buildings: Architectural consistency in material and form, arranged with primary entrances on an internal plaza. Future buildings are to face both in and out, acknowledging the plaza, courtyards, and riverfront.

Open space: West Bank Plaza hardscape and central green space. West Bank District has a variety of sunken courtyards, forming unique sectional complexities.

Paths: Bicycle and pedestrian focused on interior, autofocused at edges; Green Line LRT bisects on lower bridge deck. In the future, access to the riverfront should be easier, safer, and more direct. Pedestrian circulation should take priority over bicycles on the interior West Bank Plaza.

Amenities: Destination district for academics, music, fine arts, professional events, and study.

Context

Clarity of form and façade cadence defines the West Bank district and streetscape. The West Bank District is uniquely identifiable between cityscape, riverfront, and East Bank Campus; new development should improve access and views to each.

Function/use

Current: Instruction; Academic Support (University of Minnesota Wilson Library, Andersen Library of Special Collections and Archives), Arts (Ted Mann Concert Hall, Rarig Center, Regis, and Barker); Student Services; Residential; and Outreach.

Guidance: The West Bank may be reimagined over time, preserving Modernist and Brutalist architectural character, but reinventing the district to reflect 21st-Century learning, research, amenities, and workplace.

Site

Grain

Current: Buildings are generally sited along north/south pedestrian spine running from Washington Avenue bridgehead to Riverside Avenue; interrupted by Rarig Center. Although West Bank is often understood as modern and simple in form, there is a complex layer of sunken courtyards, amphitheaters, skylights, hardscapes and greenspaces; difficult for bicycles and pedestrians to navigate around and through. Each building has a unique plan organization and entry location.

Guidance: Cadence of building mass and open space to remain. New developments to orient main entry along north/south pedestrian spine and central green space (flanked by Wilson Library, Rarig Center, Blegen Hall, Social Sciences, and Ferguson Hall). Simplify pedestrian level experience and wayfinding at plaza level; avoid skylights or other barriers that act as pedestrian impediments.
**WEST BANK CORE**

**Open space**

**Current:** Open space on the West Bank varies in character, access, scale, and construction. A significant portion of the West Bank ground surface is rooftop plaza or concrete paver system over structural decking and interior space.

**Guidance:** Given existing roof plaza construction, the addition of green space on West Bank is not recommended for maintenance and facilities operations purposes, or should be designed as above-grade installations. Spaces that invite gathering at multiple scales should be added to open space from Wilson Library to the Upper Plaza deck. Circulation within and around all open spaces is critical; bicycle traffic should not cross pedestrian traffic. North/South pedestrian spine to remain center point of West Bank open space and pedestrian circulation. Open space between buildings should distinguish each building as an individual element within the West Bank District, maintaining the formal/ceremonial arrangement of existing Brutalist buildings.

**Circulation/Entry**

**Current:** Bicycle and pedestrian—focused with dedicated space to automobiles. Safe access to and from West River Road is absent. Parking access across 19th Street and South 4th Street is difficult to traverse. Building entry locations generally face the north/south pedestrian spine from Washington Avenue bridge deck, running west of Rarig Center, and along 21st Avenue South, and are flush to the ground surface.

**Guidance:** Future developments should prioritize slow speed. Building facades and interior programming should respond both to the speed of vehicular circulation on 19th Street and Riverside Avenue, and pedestrians on interior paths. Due to community concerns, designs should avoid a sense of “impenetrable wall” to the neighboring communities. All paths between and around buildings should recognize linear patterns of movement between building entries, gathering spaces, and district access points off Washington Avenue, 19th Street, and Riverside Avenue. Future development should prioritize ground level circulation around and through buildings; addressing skyway level connection as a secondary means of pedestrian circulation. Typical building entries should face the existing pedestrian north/south corridor and remain flush to ground level.

**Views**

**Current:** Mature vegetation, buildings, and topography block views into and outside of the West Bank, keeping the District divided from its neighboring community.

**Guidance:** New buildings and major additions should enhance view corridors to address the visual relationship between West Bank, Mississippi River and Twin Cities East Bank Campus.
Aesthetics

Style(s)

Current: The West Bank Core District features Modernist and Brutalist buildings originally constructed from 1961-1978; and a mix of Contemporary buildings constructed from 1980-2008. Buildings include:

- Heller Hall (1961): Modernist
- Blegen Hall (1962): Modernist
- Social Sciences (1962): Modernist
- Anderson Hall (1967)
- Wilson Library (1968): Modernist
- Middlebrook Hall (1969)
- Willey Hall (1972)
- Rarig Center (1973): Brutalist
- Mondale Hall (1978)
- Hubert H Humphrey Center (1985)
- Ferguson Hall (1986): Modernist
- Ted Mann Concert Hall (1993)
- Carlson School of Management (1997)
- Barbara Barker Center For Dance (1999)
- Regis Center for Art (2003)

Guidance: New buildings or major additions need not replicate existing styles, but rather complement existing mass, scale, proportion, clarity of material use, and sectional quality.

Mass/Scale

Current: West Bank District buildings range from 4-14 stories. District edges are 4-6 stories, and development reaches its maximum height at the District center. Scale of façade openings in central district core reflects the clarity/repetition of modernist patterning and rhythm.

Guidance: New buildings or additions should range between 4-10 stories and respond to existing heights within their immediate vicinity; maintain existing “crescendo” height patterns towards the center of the existing West Bank District. Large paved surfaces between buildings, such as between Wilson Library and Blegen Hall, are prime areas for reinvention and reintroduction of smaller scale gathering spaces; care should be taken with new interventions due to plaza roof deck construction. Scale of new façade openings should preserve the clarity of modernist intent while introducing transparency at ground level to enhance the architecture’s indoor/outdoor relationship.

Materials


Guidance: New buildings and major additions should consider brick, concrete, and glass as the primary exterior material palette, with a simplicity of palette consistent with Modernist architectural vocabulary. Buildings on the edge provide opportunities to break the rigid formality and introduce transitional design gestures and materials.
PROGRAM AND UTILIZATION
INTRODUCTION

Before the Building Design Process begins, a programmatic need is brought forward for resolution. Teams are assembled and the Macro Process begins to meet the established goals of University and Development/Planning principles for the project. As the site and building take shape, the program and its planned utilization are continually reviewed, revised and further developed.

PROGRAM / UTILIZATION

Interior Space
- Interior Design Principles
- Space Efficiency / Allocation (new/renovation)
- Building Area Calculations
- Interior Typology Guidelines
  - Unused Space
  - Knowledge/Teaching
  - Research/Laboratory
  - Office/Administrative
  - Student Support
- Transitional space: Lobby, atria, circulation
- Finish Palettes (future section)
- FFE Standard (future section)
INTERIOR DESIGN PRINCIPLES

As in Campus and Building Design, interior spaces should respond to the needs of the occupants, not as an isolated experience but a part of a place-based experience unique to a University campus setting.

Interior spaces should be functional, durable, flexible, and balanced within the building. University guiding principles of interior design are:

**Program Objective:** Define the purpose of each space and its function in support of the whole

**Flexibility:** Consider the purpose of spaces as they are envisioned today and what they could be in the future. Create design flexibility for future use and adaptation for the greater good of the Institution

**Scale and Proportion:** Create spaces in context to the enclosing architecture; interior design that relates and contributes to the experience of moving through or using the space

**Light:** Lighting supports the program objectives and can be enhanced with natural light; strive to balance spaces with both sources

**Color and Texture:** Material selection and color choice have an impact on the feel and use of space; be purposeful on the use of color and texture to enhance the place-based experience

**Significance and Relevance:** Use design elements to reinforce the programmatic use of the space, to balance art and architecture, and to create places of significance unique to the University.
The mission of the University is supported by a myriad of space types, each providing educational opportunities and experiences for its learners. Many spaces are very specific to their purpose and may be singular in its use, other spaces may be more general in their purpose and function; each is important and needs to balance design principles.

The guidelines provide specific reference data for planning new buildings. They are designed to help University units and Capital Planning and Project Management define the magnitude of new capital projects in the initial scoping, feasibility and programming phases of development. At subsequent planning and design stages of a project, the guidelines are intended to continue to serve as a reference for the size of the major building space types; given the complex nature of design and physical constraints inherent in building design (i.e. circulation, structural elements, mechanical systems, etc.), it is likely that deviations will occur. These guidelines are not meant to imply entitlement or to set rigid standards for space.

**New Construction**

With new construction, the University is not limited by an existing footprint, allowing a layout that will fit the pedagogy of a given department. Besides the obvious advantage of tailoring a building to the University’s current – and future – needs, new facilities often evoke institutional pride and a sense of (legislative, donor) excitement.

New construction has its benefits:

**Sustainable features:** The benefits of Green construction can be implemented from the outset, beginning with site selection and placement.

**New technology:** New technology that will enhance both the operation of the facility and the education of students can be incorporated easily.

**Better use of space:** By considering the current and future expectations of the student population, we can design space based on real-life usage rather than succumbing to existing layouts.

**Easier prioritization:** Typically, new construction does not require as much compromise as renovation, allowing the inclusion of more learning/work space.

**Maintenance savings:** Because of new construction and warranties, there will likely be fewer maintenance issues in the near term.
Existing Space

Planning space within existing buildings is often affected by structural limitations, aging utility and infrastructure systems, architectural design, or issues of historic preservation. Many older buildings were constructed for purposes other than those currently being served. Some academic programs “fit” more efficiently than others in specific buildings. However, this does not always afford the latitude to locate programs in buildings purely for efficiency and adjacency reasons. Complex issues are involved in allocating and planning academic space and meeting campus-wide space needs. When dealing with existing space, especially when major renovation projects or relocations are under consideration, the guidelines are designed to serve as a reference for planning decisions, maximizing the efficiency, modularity, and flexibility of the University’s space. Again, given the complex nature of design and physical constraints inherent in building design (i.e. circulation, structural elements, mechanical systems, etc.), it is likely that deviations will occur.

Typically, renovation is a more sustainable approach – architectural reuse and rehabilitation cause less destruction to natural resources than new construction – and often costs less. However, the quality of the existing building requires careful forensics. Depending on the facility’s age, the design may need to upgrade entirely to conform to the requirements of the Americans with Disabilities Act or current code requirements.

The following are additional considerations for renovation:

Architectural merit. Do the architectural attributes of the existing facility support the vision and learning methodologies of the University?

Structural integrity. Are mechanical, electrical, and plumbing systems sound? In particular, the quality of existing HVAC systems can be a disadvantage of renovation.

Hazardous material. Would the existence of hazardous materials make the cost of renovation prohibitive?
Space efficiency and multi-functional use is paramount for the University (in new or renovated buildings) to allow the institution to operate cost effectively and maximize each building’s utilization. Building area and usable space within buildings are defined by the US Department of Education Research and Improvement in their publication “Postsecondary Education Facilities Inventory and Classification Manual”. Building area calculations are defined as follows:

**Gross Square Feet (GSF):** The sum of all areas of a building included within the outside faces of its exterior walls, including floor penetration areas.

**Net Square Feet (NSF):** The sum of all areas in a building assigned for a specific room use and areas necessary for the general operation (non-assignable) of a building. Area taken up by structural building features should not be included in the calculation for Net Usable Area.

**Assignable Square Feet (ASF):** The sum of all areas of a building that are assigned, or are available, to an occupant or specific use. Building services, circulation, mechanical and structural elements are excluded.

**Building Efficiency Ratio:** Assignable (ASF) to Gross (GSF) - The efficiency ratio between ASF to GSF of a building. The goal of the institution is to create the highest overall building efficiency that can be achieved while meeting the program objectives. Refer to Appendix D for Building Efficiency Ratio Guidelines.
New learning space contains multiple large displays, collaborative work spaces, and flexible, reconfigurable furniture. Other design attributes include inviting/modern colors and shared writing surfaces such as multiple whiteboards (both large and small) or writable walls. Students and faculty tend to report greater levels of enjoyment, excitement, and instructional quality in more engaged learning environments, compared to traditional classrooms.

**Active Learning Classrooms (ALC)**

University of Minnesota Active Learning Classrooms (ALCs) are designed to foster interactive, flexible, student-centered learning experiences, and operate using central teaching stations and student-provided laptops. ALCs feature:

- A 360-degree glass-surface marker board.
- Multiple flat-panel display projection systems.
- Round tables that accommodate nine students each.
- A centered teaching station that allows selection and display of table-specific information.

The Office of Classroom Management is responsible for scheduling, management and technical support for the institution. Refer to [http://www.classroom.umn.edu/](http://www.classroom.umn.edu/) for a classroom design, space allocation and technical support requirements.
02 – Laboratories - Research Education & Design

The University as a Research Institution must address current faculty assignments, curriculum, teaching methodologies, and research foci, while creating flexibility to accommodate future change. Research and laboratory space needs and guidelines vary between schools and departments, types of research and special equipment needs. There are a number of different types of laboratories that exist on campus:

- Computational laboratories
- Wet laboratories
- Dry laboratories
- Studio or design-based laboratories
- Teaching laboratories
- Special large equipment or instrumentation laboratories

Design elements include:

**Active Collaborative Learning Environments:** Utilizing the entire building as a vehicle for learning opportunities dissolves the traditional laboratory and classroom segregated environments. Interaction between faculty and students is promoted by providing places for faculty/student research, study areas, peer learning and outreach within a dynamic physical environment.

**Research on Display:** Incorporating interior windows between laboratories and corridors, display of scientific artifacts, places for presentation of student work, electronic displays, etc. to let the building ‘speak’ of its function.

**Integration of Technology:** Accommodating a range of multi-media audio-visual and information technologies in laboratory and classroom spaces including projection, Smart boards, flat screen monitors, document cameras, desktop/laptop computers, tablet devices, etc. with a flexible infrastructure to support evolving technologies over the life of the building.

**Sustainable Laboratory Design:** Research buildings inherently consume a greater amount of energy than a typical University building due to the required air exchange rates and cooling requirements. Since they cost more to operate, energy efficient design can contribute significantly to larger savings in operating costs.

**Lab Planning Themes**

Laboratory types are generally program-specific for a department or college; however, the planning of such spaces has unifying themes for institutional consistency:

**Modularity:** Modular laboratory planning is fundamental to this thinking. Modular planning establishes a repeating space planning increment that over time can be aggregated into larger spaces or subdivided as needed. The dimensions of a laboratory module are developed to provide functional, flexible and safe laboratories and are typically based on factors such as laboratory bench dimensions, ergonomics, sightlines, codes, and laboratory equipment needs. The building mechanical, plumbing and electrical systems infrastructure can also be distributed on a modular, repetitive, predictable basis to provide long-term adaptability for changes in people, programs, equipment or technology.
**INTERIOR TYPOLOGY GUIDELINES**

**Flexibility:** While each lab is different and many specialized features are required, flexibility in design enables the institution to allocate additional space easily as research programs grow or shrink. Often, flexible planning enables co-location of similar laboratory programs, which furthers scientific goals and encourages collaboration.

**Zoning:** Creating laboratory “zones” which also enable flexibility and ease of operations is very important.

**Shared Laboratory Support and related spaces:** Developing shared support spaces is critical in constraining costs, utilizing space efficiently, and creating state-of-the-art facilities.

There is increasing emphasis on Smart Labs – sustainable laboratory designs that carefully integrate robust mechanical and electrical infrastructure with easily re-configurable laboratory space, meeting or exceeding the requirements of MN B3/2030 sustainability guidelines.

**Collaboration**

To facilitate different levels of collaborations, Hoteling Offices, Hoteling /Initiating Labs and inclusive incremental bench areas are proposed within labs. Hoteling Offices and Labs provide a modest level of accommodation for external researchers to “nest” for extended periods, while incremental bench space allows for research team cross-pollination/ utilization.

**Research Space**

Research spaces are based on a common “kit of parts” that includes a general bench area and an adaptable alcove to provide more appropriate areas for cell culture, microscopy, isotope handling, fume hoods, etc. By removing these specialized or more intense activities from the basic bench area, the bench becomes more responsive and the distribution of utilities can be targeted and easily controlled.

Three increments of general lab assignments have been developed:

**Anchor Labs:** This lab assignment is for primary or large research programs. The Anchor Lab is typically sized around four general bench labs and four flexible alcoves.

**Standard labs:** The primary lab assignment for the majority of the research teams, the Standard Lab is sized around two general bench labs and two flexible alcoves.

**Hoteling/Initiating Labs:** Typically the smallest lab assignment, Hoteling Labs support those with small, regenerating, or new teams, as well as visiting PI’s. The Hoteling Lab includes one-half of a bench lab and one half of a flexible alcove.
03 – Office / Administrative Space - Space Optimization

The University has advanced a new paradigm for responsible use of administrative space and new technologies. To help the university transition its thinking from strictly one of space assignment and rigid space models, the university partnered with Brightspot Strategy, a strategy consultancy, to develop an alternative workplace strategy program (Work+).

Space optimization is not simply the creation of “cutting edge” work environments, but truly uncovering, then solving the specific problems of the University in the 21st Century. The goals of the University are to maintain a strong organizational culture, reduce overhead spending while increasing productivity/profitability, and foster inspiration and innovation.

Workplace design today addresses a wide range of needs: accommodating creativity, idea generation, and collaboration as well as differing personal styles, task requirements, and team composition. Collaboration is fundamentally a social process, but rigorous concentration is not (even today, over half of our work time is spent on solo efforts).

Good design seeks a fundamental balance between distraction-free concentration and informal, impromptu interaction between staff; between freedom from interruption and the free flow of communication, information and problem solving.

The result is Choice: space options that are task-oriented, not hierarchical.

Task privacy. Differing layers of privacy exist; design should distinguish between the need for visual privacy and acoustic privacy (confidentiality).

Dedicated spaces for collaboration. More-private “think zones” open up to teaming spaces for meetings and collaboration.

“Choreographed” circulation and public spaces; these encourage spontaneous interactions that are casual, nonthreatening, and without obligation.

Workstyle Nomenclature

Workstyles describe how people work and specify the spaces needed to support that work:

Mobile

Mobile individuals are not assigned a workstation – they choose the space(s) that best support their work each day from the variety of individual, collaborative, & amenity spaces. They have personal storage space that is lockable and / or movable. Mobile staff can also work temporarily at touchdown stations, smaller workstations for visiting staff / clients / etc.

Campus Mobile Collaborative: Completely mobile individuals within the campus, working mostly with others (e.g.: consultant)

Mobile Collaborative: Highly mobile individuals within and outside their department, working on focused tasks and occasionally collaborating with others (e.g.: IT technician)

Mobile Individual: Generally in the office yet highly mobile (moving from workstation to meeting room to colleague’s space), working on a mix of individual and collaborative tasks (e.g.: unit team leader, student worker)
Resident

Resident individuals are assigned a workstation and have personal storage at their workstation. They can also choose to work at shared collaborative and amenity spaces.

Resident – Focus: Generally in the office, working individually at a desk on tasks that require high focus (e.g.: communications writer)

Resident – Paper: Generally in the office, working individually at a desk on tasks that require high focus and paper use (e.g.: graphic artist)

Resident – Confidential: Generally in the office, working individually at a desk on tasks that require privacy / confidentiality (e.g.: tenured / tenure-track full-time faculty, attorney)

These space types combine a number of programmatic functions and are arranged in a variety of ways which include enclosed offices, open offices, conference rooms and support spaces. When the program requires these spaces it is important to consider the following:

Application of a modular planning approach, to preserve flexibility of office use and to standardize the furniture within the space.

Placement of offices in the building core to create flexibility, improve air quality, and maximize light penetration for all building occupants.

Material and finishes should be selected to represent the nature of the work (i.e. carpet in private office), ease of maintenance and have a useful life appropriate to the spaces use. Life expectancy of finishes, furnishings and materials should be a minimum of 10 years.

Open offices are preferred to enhance and promote collaboration and to maximize the use of space for the institution.

The space Allocation Tool for the above Work+ work styles can be found in Appendix D.

Multiple Office Locations

The University endorses faculty and staff engagement across the entire University system. This engagement often results in the need for secondary office space near the location of the activity. In an effort to maximize space utilization within buildings, these secondary office needs should only be established if existing space that could be shared or used as a touchdown space is not available.

Office Conferencing – Up to 25 Occupants:

A conference room is considered as a meeting space planned for 25 or fewer people. Conference Room space is defined as seating around a table, space for audio/visual equipment and presentations, and space for food service or other conference needs as required.
Determining the Number of Conference Rooms Required

The range of space for a room supporting up to 25 people is approximately 16-26 ASF per person. The larger ASF is for a room with space for audio/visual equipment, a screen and/or white board for projection and display, bookcases or shelves, and a serving area for buffet food or coffee service. The following serve as framework for determining the number of conference rooms:

Private Office Environments

In predominantly private office environments (defined as areas with a majority of hard-wall offices, minority of cubicles), the guideline is:

1 conference/meeting space for every 20 people; 2/3 of these spaces should be for 8-10 people; 1/3 of these spaces should be for 5-7 people.

Open Office Environments

In predominantly open office environments (defined as areas with a majority of cubicles and a minority of offices), the guideline is:

1 conference/meeting space for every 10-12 people; 2/3 of these spaces should be for 8-10 people; 1/3 of these spaces should be for 5-7 people.

To diversify the office environment (private and open) create small private work areas seating 1-4 occupants to create and promote independent and small group work areas.

04 - Student Support Space

Student support spaces include:

- **Study areas / Small group discussion areas**
- **Knowledge Resource Centers – libraries, Study Hubs, etc.**
- **Student Services**
- **Housing and Dining**

This support infrastructure stands at the intersection of information and community. Activities range from dining to homework groups to mentoring sessions to local community outreach, as well as the essential “just doing nothing” – recharging, relaxing, replenishing. Social spaces are critical to the success of this intersection. They should provide casual interaction that is convenient, attractive, and informal.

Community is essential to the idea of Collaboration: interaction with ideas and with each other (“conversational learning”). These spaces can serve as an Information Bazaar where students come to learn, discuss and participate. Imagine a constantly evolving menu of technological opportunities – still identifying as gathering places for the student.

Diversity and Transparency

More than ever before, the University should reflect the great diversity of people on campus and the corresponding array of settings made available to them. Space can be made visually accessible – to community, students, and other departments within the campus. Physical transparency provides a sense of invitation and celebration of diversity – of users, technologies, and spaces to accommodate them all.
INTERIOR TYPOLOGY GUIDELINES

05 - Transitional Space: Lobby, Atria, Circulation

Interior Typologies emphasize the uses commonly associated with University pedagogy and research. However, buildings also embrace critical Transitional spaces which can significantly impact the casual or regular user:

Lobby

Lobby space often serve as the “public face” of buildings (and programs); these includes foyers, entries to halls, and possibly security screening areas at or near the entrance to a building; lobbies are meant to welcome and direct tenants and visitors, control access, and provide exit ways from buildings. The following are considerations per the Whole Building Design Guide of the National Institute of Building Sciences (NIBS):

Aesthetic:

Utilize appropriate finishes, furniture, signage, and art to reflect the public nature of the space

A spatial compression/release experience can enhance the aesthetic experience (compression thru entrance doors/vestibule, release in lobby/atrium)

Well-designed lobbies provide students/faculty/administration with a relief opportunity (such as breaks) from more confined spaces

Operational:

Design space to accommodate peak loads

Consider air pressurization and entrance door design to mitigate stack effect at tall building entrance and elevator lobbies

Specify durable finishes to accommodate maximum pedestrian traffic

Security should be considered in conjunction with art installations, visitor seating, and/or exterior entrances

Sustainable:

For lobby spaces at a building’s exterior, utilize daylighting to reduce electric lighting needs

Provide air lock/vestibules at entrance doors to prevent loss of heating/cooling
INTERIOR TYPOLOGY GUIDELINES

Atria

Atria (enclosed multi-storied spaces open vertically to multiple stories) appeal not only as a point of orientation, but also emotionally by providing a connection to the exterior. Atriums offer larger, more efficient floor areas than conventional buildings by allowing natural light deep into the building. They provide a pleasant all-weather gathering place, providing shelter from the more extreme climate conditions outside - while still maintaining a visual link with that environment. Good atrium design will maximize the natural environment to minimize energy consumption. And depending on surrounding context, views into an atrium can be more connective than an exterior view.

The complexity of atrium design does not lend itself to prescriptive standards, but sound life safety principles must be incorporated. Atriums can be configured in an infinite number of ways, but the first consideration of atrium design is an acknowledgement of the necessity of fire and smoke management.

Circulation

As Francis Ching has noted, the circulation path “can be conceived as the perceptual thread” that links the spaces of a building. Circulation space can – and should – be an energizing, unifying element in a building to accomplish far more than connecting Points A&B:

Configuration of the Path: attention to path continuity – or the significance of intersections – can offer important cues in the intended use of the building. Major directional changes can be signified or announced via level change, the play of light, etc.

Form of the Space: Circulation should accommodate the scale/amount of people using the building (movement); however, in the new learning dynamic of universities everywhere circulation space should also accommodate variation: niches for chance encounter, study opportunity, rest, etc.

Path-Space Relationships: circulation may pass by significant spaces, pass through them, or terminate in them – all with significant functional or symbolic effect.

Finish Palettes (Future Section)

FFE Standards (Future Section)
“…The real art and skill of a designer: to achieve elegance in design with the highest degree of efficiency.”

Davin Stowel, Smart Design
INTRODUCTION

The best creative work is a taut marriage of large insights and small details – beauty arises from the creative blending of aesthetics and function. Value is expressed as a balance of flexibility, cost, and aesthetics, achieved in tangible ways:

The sparing, strategic use of precious materials and amenities.

The intelligent placement of low-cost architectural amenities (such as daylighting).

Critical evaluation of Life Cycle Costs: Analyzing the costs of utilities and energy used by building systems throughout a facility’s life span.

Critical use of Value Engineering: assessment of the long-term costs of materials and building systems as they extend over the life of the building, selecting building materials based on their suitability, performance record, and durability.

PERFORMANCE CONSIDERATIONS

Sustainability

B3
SB2030

Services
Parking
Program/Utilization:

Human comfort/HVAC
Finish palette
FFE standards
Interior Space
Design for Collaboration
Wayfinding/signage
Art
SUSTAINABILITY

With more than 1,000 acres of land and 20,000,000 million gross square feet, the University of Minnesota Twin Cities campus has a profound impact on our ecosystem. Each decision during acquisition, design, construction and occupancy plays an essential part in how it All Adds Up (http://italladdsup.umn.edu/).

Sustainability is a continuous effort integrating environmental, social, and economic goals through design, planning, and operational organization to meet current needs without compromising the ability of future generations to meet their own needs (University of Minnesota Regents, Policy on Sustainability and Energy Efficiency, 2004). Sustainability requires the collective actions of the University community and its design consultants to balance use of all resources. The University intends to be a leader and champion of environmentally responsive design, demanding innovation and creativity from our design consultants and helping to educate our community.

Each project should be evaluated for its uniqueness and undertake an analytical and integrated design process; reducing building energy use and carbon, prioritizing life-cycle cost, and increasing the health and wellness of all building occupants. Our goals reach beyond a check-list and into a commitment to sustainability in teaching, learning, outreach, and operations. Our University commitment to sustainability is guided by six principles. Each principle should be effectively demonstrated within both the design of our processes and projects.

**Leadership**: Strive to be a world leader by promoting and demonstrating sustainability and energy efficiency and by producing leaders and informed citizens.

**Modeling**: Strive to be a model in the application of sustainability principles to guide campus operations

**Operations Improvements**: Undertake a continuous improvement process that seeks to meet the operational performance targets, goals, and objectives designed to achieve sustainability.

**Energy Efficiency**: Undertake a process to increase energy efficiency, reduce dependence on non-renewable energy, and encourage the development of energy alternatives through research and innovation.

**Research**: Promote innovative, high visibility research projects focused on sustainability and energy efficiency to inform campus operations as a whole as well as the broader community; and promote collaborative projects that include faculty research undertaken in partnership with operations staff, students, public entities, community organizations, and industry.

**Education and Outreach**: Promote educational and outreach activities that are linked to operational improvements and innovative principles.
University is committed to the protection of our environment at all stages of acquisition, design, construction, and operations. Capital Planning & Project Management and the University’s Office of Sustainability welcome the opportunity to work with project teams and to assist them in understanding University sustainability principles, objectives, and requirements.

Acquisition and Development: Acquisitions of new sites and development of existing sites should incorporate into their transactions and projects the review of the environmental impacts that range from microclimate to hazardous substances.

**Design:** Design Project Managers lead sustainable design processes for Capital Planning & Project Management. They work to ensure B3 Guideline performance by consultant teams and integrate University sustainability priorities in all phases of project delivery. CPPM Project Managers ensure that the design process identifies and addresses the environmental impacts of building and equipment, incorporates controls protective of environment, meets established environmental standards, and provides timely information for review and incorporation into University permits.

**Construction:** Project managers and contractors should ensure that construction and renovation of facilities is done in a manner that protects the waters of State, minimizes demolition and construction wastes, fulfills regulatory requirements, and addresses environmental discoveries.

**Operations:** Operate University facilities throughout their life cycle to provide restorative impacts to the natural environment and a healthy indoor environment for the University community.

The complete Policy can be found on the UWide Policy Library website at


Additional Information on Sustainable initiatives at the University

[http://www.userservices.umn.edu/sustainableU/](http://www.userservices.umn.edu/sustainableU/)
B3 Guidelines and the University of Minnesota

The design of University facilities significantly impacts the ability of the institution to follow the principles identified in the Policy on Sustainability and Energy Efficiency, and to achieve goals and strategies that advance policy objectives. Design teams play a critical role in furthering the institution’s sustainability priorities through the implementation of Minnesota B3/SB2030 Sustainable Building Guidelines and by bringing sustainability innovations to the forefront of design processes.

It is the intent of the Guidelines and University Sustainable Standards that all University building projects that meet the B3/SB2030 applicability criteria shall comply with the most current version of B3, regardless of project funding source. However, some projects by their nature while meeting the applicability criteria are not good candidates to meet the full B3 requirements. If a project is considered unlikely to meet the B3 requirements and is not legislatively funded, an exceptions request can be submitted to CPPM Design Project Manager for review. The exceptions request must be submitted during the pre-design or earliest phase of the project.

It is the intent of the University to follow sustainability principles, objectives, and requirements no matter the project size, funding source, or delivery method. Therefore, if a Capital project does not meet the criteria of Minnesota B3/SB2030 Guidelines, design teams are to use the Project Energy and Engineering Review (PEER) and Sustainability Opportunity Analysis Review (SOAR) as a guide to University sustainability practices during all phases of project delivery.

Complete information regarding B3/SB2030 Guidelines and Policies can be found at:

http://www.b3mn.org/guidelines/overview.html

Reference these other University sites for additional sustainability perspectives:

The Board of Regents policy on Sustainability and Energy Efficiency:

(http://regents.umn.edu/sites/regents.umn.edu/files/policies/Sustain_Energy_Efficiency.pdf)

The Administrative Policy on Environmental Management:

(http://policy.umn.edu/operations/environment)

The It All Adds Up site:

(http://italladdsup.umn.edu/index.php)
Areas devoted exclusively to building loading and services, to the removal of trash, or to mechanical equipment, should be designed so that their visibility from public areas is minimized.

Access

Appropriate service access should be accommodated in the design of all new campus buildings – whenever possible, consolidate service access points for multiple buildings.

Service access routes allow campus vehicles and outside vendors to access campus buildings for emergency vehicles, deliveries and service, as well as temporary short-term parking spaces. Roadways should have proper width and turning radii for large service trucks, and should be separated from pedestrian travel. Locate service areas away from main public thoroughfares.

Building Services

Services should be consolidated to a single location to accommodate all of the service, storage, trash, and recycling needs of the facility or facilities:

The sights, sounds, and smells of the service location should be minimized from pedestrian pathways through the use of landscaping, topography or other visual barriers. If a service area will be screened from public views, plantings or structures integrated with the associated building are preferred. However, CPTED security design should be employed to ensure a safe University environment.

All service functions of the building should be located and screened in consideration of adjacent future development, as well as for protection against climatic elements (wind, rain, snow). Consult with Landcare and Parking and Transportation Services to understand snow removal practices and snow storage locations in the design of outdoor spaces and parking facilities.

Screening

The careful screening of utility and service equipment and infrastructure required to service buildings is critical to the success of a compact, urban University:

Services should be placed on a secondary façade rather than a primary façade.

Consider access for building equipment installation, replacement and maintenance in the planning of exterior openings. Integrate large exterior openings into the articulation of the building façades.

Equipment

Rooftop mechanical equipment should be enclosed in structures integrated into the building design. Exhaust and plumbing stacks should be grouped and incorporated in the architectural composition of the building they serve. All major stack configurations should be subject to wind tunnel analysis.

Building air intakes should be appropriately located away from sources of pollution, especially loading/service/drop-off areas, adjacent roadways, and adjacent building exhausts.

Mechanical and electrical equipment and distribution in public and semi-public areas is to be discretely located out of normal sight. Acoustic mitigation should ensure the quality of the pedestrian environment.

Surface mounting of conduit or chases on the exterior façade of any University building is not permitted.
Vehicular parking lots should be integrated with the campus through the design of access paths, signage, lighting, and plantings. Safety and function should be balanced with visual appeal; site elements such as plantings and signage should maintain clear sight lines. Edges should be planted wherever possible. Surface stormwater management facilities should be treated as site amenities, framing parking lots but not screening them from view.

When designing parking ramps, follow the guidelines in this document for entrances, exteriors, signage and other site improvements. Pedestrian circulation for lot users should be clear; larger lots should have dedicated pedestrian ways marked by striping or contrasting pavement materials.

For the design of all parking facilities, refer to Parking and Transportation Services standards.
WAYFINDING / SIGNAGE

The purposes of signage and wayfinding are many:

Navigating between transit modes, campuses, districts, and buildings
Creating a welcoming campus environment
Supporting campus safety and accessibility through clear, direct signage and routes
Creating continuity across districts and varied architectural styles – a campus identifier

Location

Wayfinding is a decision-making process aided by well-located signage. Signage should be located at key decision points with clearly available information so users can determine their location ("you are here"), their destination location, and define the route between the two points.

Signage locations should be clearly visible from walkways, but offset so as to not interfere with pathways, key view corridors, architectural and landscape patterns, and physical landmarks that aid wayfinding. Signage should fit in with existing patterns in the physical environment and be readily available when they are needed. Visual clutter should be avoided; signage should be minimal, discrete, and combined with other signage or physical elements (for example: a bus stop sign integrated with a lamp post) where appropriate.

Design

Signage design should be uniform across campuses, districts, and buildings. Uniformity of color, scale, typography, symbology, materials, and location principles will reinforce campus identity and aid in defining the porous campus environment. Signage design should adhere to University graphic, branding and color standards, utilizing approved logos and colors. Primary signage colors should be maroon, gold, and neutrals.

Signage should be designed to be viewed from multiple angles and viewpoints to allow for increased wayfinding ability/signage availability and decreased visual clutter. Signage should complement University architecture and landscaping; signage should not obstruct significant architectural or landscape details. Signage installation methods should be minimal, discrete, reversible, and do no harm to University buildings and landscapes.

University signage should be designed primarily for the pedestrian and scaled appropriately; bicycle and vehicle signage should be scaled to their respective uses. Large signs should have transparency or breaks to allow enhanced visibility for safety.

Signage text should be a clear, easy-to-read, sans serif font. Symbols should be clear and uniformly recognized; use the AIGA approved symbols. Use contrasting colors to aid in legibility and visibility at greater distances. Adhere to Universal Design Standards.

Building Identification

Building identification signage should be planned during building design to thoughtfully orient users and complement the building and landscape.

Exterior building identification signage should adhere to University Signage Standards. These signs should generally be free standing or attached to the building wall. Building identification signs should identify only the building name. Schools, departments, offices, and individual identification will go on interior building directories; these should not be on exterior building identification signage, nor directly on the buildings themselves. Building identification signs should identify the campus district they are located in to align with campus maps and directories and other signage and wayfinding elements.
ART

The University has a percent-for-arts policy for Minnesota state-funded projects, and each qualifying building project should include a budget and program for works of art. These may be integral to the building (e.g., murals or artistic expressions in spaces), works purchased for permanent display in particular locations, or works commissioned for the structure. Whenever possible, projects should strive to create new art that advances the way we think about the world we inhabit.

Involve the artist as early in the building design process as possible; selection during Schematic Design to involve the artist during Design Development results in a well-integrated public art piece. Moreover, this allows the artist to identify the best opportunity/location for the art; each artist has a unique background and experience to leverage. Treat the artist as a full partner on the project design team.

Art procurement assistance is available to facilitate this process:

- Artist selection/contracting
- Conceptual bridge between artist and committee
- Fabrication oversight
- Installation
A  Masterplan Principles
B  CPTED Principles
C  Building Efficiency Ratios
D  Office Area Allocation Table (post-MFM)
E  Sustainability Elements
F  References and Resource Links
Guiding Principle One

*Cultivate a genuine sense of community*

The University aims to provide a welcoming experience, accessible to all. On our campus, human connections which are the essence of a sense of community are nurtured by the physical environment. The physical campus is comfortable, yet stimulating, and evokes a sense of openness and belonging. Campus spaces provide venues for academic and artistic expression.

Guiding Principle Two

*Strengthen connections to adjacent communities*

The University of Minnesota Twin Cities campus is situated within the vibrant urban core of the metropolitan region. The entwining of the surrounding cities with the campus creates opportunities and connections for the campus community and adjacent communities. The goal of strengthening these ties will guide future efforts and development. As the campus and surrounding communities change, these connections will ensure that both flourish.

Guiding Principle Three

*Create a cohesive, memorable system of public spaces*

Public spaces permeate the Twin Cities Campus, providing diverse, attractive areas for all aspects of academic and community life. These public spaces contribute to the campus character and create a comfortable welcoming experience. From grand civic gathering spaces, to green and vibrant streets, to intimate courtyards, and indoor atria, these public spaces support and enrich this community of interactive human activity. These and other public spaces should be flexible, sustainable, and supportive of the academic mission of the University.

Guiding Principle Four

*Provide a compatible and distinctive built environment*

Our campus is an ensemble of buildings and landscapes that work in concert to create a collective experience of place. Individual buildings are understood as important elements within comprehensive building, landscape, and transportation systems. Every building plays multiple roles, balancing the needs of interior function with the need for appropriate character and relationships. High quality architecture defines the campus. New buildings are flexibly designed to respond to the functional requirements of current programs, as well as future academic programming.

Guiding Principle Five

*Steward historic buildings and landscapes*

The University’s historic resources provide the residents of the State with a sense of history and identity. Adaptive reuse of these buildings and landscapes contributes to the image of the campus as an enduring institution and its sense of place. The promotion of a broad understanding, awareness, enjoyment and continued use of its historic resources is important to the stewardship of the University, and to the University’s commitment to sustainability.

Guiding Principle Six

*Foster a safe, secure and accessible campus environment*

The Twin Cities campus ensures equal opportunities for access through the design and retrofit of its facilities. The real and perceived sense of safety is enhanced through a diversity of design and construction actions including the inclusion of a mix of land uses, landscaping, wayfinding, and the configuration and detailed design of individual buildings and open spaces. Nighttime use is supported with well-designed lighting in the open spaces and along pathways. Corridors accommodating various modes of travel are preferred because they are safer and more vibrant. Pedestrian movement is given the highest priority.
APPENDIX A1 - MASTER PLAN PRINCIPLES

Guiding Principle Seven

*Preserve and enhance natural systems and features*

The Twin Cities Campus has a number of important and in some cases spectacular natural features. The Mississippi River, native plant communities, and topographic features contribute to the quality of life on campus and in the surrounding communities. Stewardship of these natural features requires balancing conflicting needs and desires for recreation, research, and contemplation. Such balance can be achieved through development that preserves, enhances and respects the value of these features within the broader regional ecosystem.

Guiding Principle Eight

*Integrate transportation systems to emphasize pedestrians, bicycles and transit*

Integrated transportation systems that ensure pleasant and safe access and movement give priority to pedestrians and bicyclists, followed by mass transit and then automobiles. These systems facilitate human interactions to promote a sense of community within the campus and between the campus and adjacent neighborhoods. These systems are integrated into the campus design and land use system to enhance movement as well as the overall campus design.

Guiding Principle Nine

*Optimize the use of campus land and facilities and apply best practices*

Campus facilities should be used efficiently and effectively in support of the academic mission. Assignment of space should encourage interdisciplinary use. Space needs are met first in ways other than building new facilities. Space is flexible and adaptable to ensure buildings can meet academic needs. The development and utilization of University facilities is guided by best practices.

Guiding Principle Ten

*Develop a campus that is environmentally and operationally sustainable*

A sustainable campus integrates ecological conservation, economic viability, and social equity through design, planning, and operational organization to meet current needs without compromising the ability of future generations to meet their own needs. The University strives to become a local, regional, and national leader in the application of sustainability practices, bringing appropriate methods and measures into all areas of our teaching, research, and outreach, and making sustainability a key component of our Master Planning efforts. Sustainability goals should inform campus decisions on energy, development and maintenance of buildings, protection of indoor and outdoor environments, and relationships with adjoining communities. Special attention is given to the University’s sensitive location on the Mississippi River.

Guiding Principle Eleven

*Utilize the campus as a living laboratory to advance the university’s mission*

The academic mission of the University is demonstrated by using the campus as a living laboratory. Open spaces and natural features become opportunities for research and discovery. Teaching uses on-campus examples where appropriate. Operating units partner with academic leadership to bring the best research of the University to guide changes made to the campus environment.
Community Connections

A Welcoming Campus Environment

1. Give priority to comfortable, safe, and accessible environments that dignify and show respect for all members of the university community and that encourage ongoing, frequent involvement with programs and services.
2. Continue to support teaching, applied research and service learning connections between the Twin Cities campus and surrounding communities.
3. Design flexible learning, living, working, and gathering spaces to support community.
4. Promote the use of certain campus areas as a 24/7 learning environment.
5. Coordinate academic and physical resources to establish learning communities that extend beyond learning spaces and classrooms.
6. Leverage use of technology-enabled learning spaces for both use by the University and its community partners.
7. Promote and enliven special spaces that define the University and enhance community.
8. Support the continued enlivening of the St. Paul campus following recommendations of the report, Defining the St. Paul Campus. (Feb 2008).

Boundaries & Integration with Surroundings

1. Apply the published Regent’s Boundary to guide future planning and expansion of campus activities and to convey to the broader community the University’s long term plans.
2. Strategically site new University and University-affiliated development in locations where they will contribute to defining, consolidating and adding to the vibrancy of campus and the surrounding community.

Shared Geography and Areas of Influence

1. Ensure that new development located at the campus’ edge conveys the institution’s image and physical identity, while acknowledging and respecting the adjacent urban environment.
2. Participate in initiatives that improve the visual image perceived along student and visitor pedestrian access routes.
3. Support efforts to promote local businesses and community services to students, staff and faculty as potential patrons of these enterprises.

Support for Diverse, Vibrant Neighborhoods

1. Support the mutually reinforcing relationships as well as shared interests between activities on the Twin Cities Campus and in adjacent neighborhoods.
2. Collaborate with other partners to reinvest in near-campus housing initiatives that meet the needs of members of the university community.

Attention to Essential Livability Issues

1. Promote community building and awareness among multiple stakeholders who live, work, visit, or own property in key neighborhoods adjacent to the University and ensure strong communications linkages with the University.
2. Expand community policing strategies and collaboration with other jurisdictions to provide crime prevention and enforcement resources that address issues such as property crime, nuisance noise infractions and other critical livability issues.
3. Incorporate crime prevention through environmental design (CPTED) principles in planning for new buildings, campus paths, entrances and gateways.
APPENDIX A2 - MASTER PLAN GUIDELINES

Natural Features and Systems

Mississippi River Corridor

1. Optimize physical and visual connections to the river corridor through:
   - Feasible extension of access corridors (e.g. Scholars Walk, Washington Ave Bridge, West Bank 4th Street to the riverfront recreational area).
   - Creation of new views from existing bridges, over looks and buildings.
   - Orienting new buildings and building ensembles to respond to unique riverside locations.
   - Use of the river flats and steam plant corridor (Dinkytown underpass) for sports and recreation facilities.
   - Creation of multipurpose utility corridors, boulevards, parks and streets as a way to preserve public views of the river corridor.
   - Selective demolition in the Knoll and on the West Bank to create visual and physical links.

2. Support the intent and spirit of the Critical Area Act and MNRRA guidelines by:
   - Protecting and preserving the River as a unique and valuable state and regional resource for the benefit of the health, safety, and welfare of the citizens for the state, region, and nation.
   - Preventing and mitigating irreversible damage to this resource.
   - Preserving and enhancing its natural, aesthetic, cultural, and historical value for public use.
   - Protecting and preserving the River as an essential element in the national, state, and regional transportation, sewer and water, and recreational systems.
   - Protecting and preserving the biological and ecological functions of the corridor.

3. Avoid disturbing topography and natural features or restore to natural conditions in the Mississippi River corridor wherever possible.

4. Protect river water quality from negative impacts of development and campus activities through stormwater management, energy development and use, or other ecologically significant development initiatives.

Wetlands and Other Water Resources

1. Use best hydrological practices to protect and restore critical natural areas and other watershed resources when planning, designing and building new or replacement infrastructure and buildings.

2. Manage compliance with state and federal standards and develop surface water performance standards to guide management and future planning and design. This should include surface and groundwater interactions, stormwater hydrological capacity, infrastructure connections and capacity, and wetland and surface water conservation among other issues.
Sustainable Use of Resources

1. Use an integrative, multi-purpose and conservation approach to resource consumption for all development, infrastructure and operations practices on campus.

2. Respect and respond to existing natural systems and multifunctional green infrastructure elements by:

   - Siting buildings and control of building footprint and other impervious surfaces.
   - Linking infrastructure upgrade projects (e.g. additions to heating and cooling capacity) with green infrastructure projects such as planting, vegetation restoration, and stormwater projects.
   - Preserving or restoring and managing existing and project-associated vegetation, including use of native species.
   - Preserving or restoring wetland areas and linked green infrastructure.
   - Enhancing livability, public accessibility and visual and experiential qualities of campus open spaces.
   - Utilizing the University’s subsurface database of geological and hydrological features in planning and development.

3. Identify areas that should be held as open spaces in perpetuity based on their environmental significance.

4. Manage campus landscapes with standards that achieve energy conservation, emission mitigation and reduction of other negative environmental impacts.

5. Promote the use of campus lands and open spaces as research, teaching and demonstration spaces for outreach and scientific activities.

Movement and Circulation

Wayfinding Recognizable Routes Into the Campus

1. Develop unified signage and orientation tools designed for each mode of travel so that campus users can better navigate between the two campus areas and within districts.

2. Deploy digital and wireless technology when practical to meet wayfinding goals.

3. Require legible, safe and welcoming pedestrian connections from public parking sites to centers of campus.

4. Designate gateway locations and make them readily identifiable by a) using signs and orientation devices to guide users and visitors between destinations such as parking and reception/welcome sites; b) introducing or expanding landscape features such as fences, planting, sidewalk treatments, lighting.

Pedestrian Priority

1. Establish vehicle-free zones where pedestrian volumes, iconic open spaces, and adjacent land use patterns preclude use except by pedestrians or cyclists.

2. Develop pedestrian connections that will:

   - Continue to share corridors with other modes of movement along streets or paths;
   - Enable pedestrians to take the most direct route between major destinations;
   - Prioritize pedestrian movement over other modes of travel whenever possible.

3. Extend the existing network of weather protected environments (tunnels or skyways) in appropriate locations.
APPENDIX A2 - MASTER PLAN GUIDELINES

Safe and Accessible Movement on Campus

1. Meet ADA requirements for pedestrian facility improvements to make all areas and facilities fully accessible.

2. Apply the following principles for safe, accessible design of the pedestrian environment:

   - Avoid the creation of isolated dead end spaces, sunken or elevated plazas out of direct view of passersby.
   - Increase the number of centrally monitored security cameras in highly traveled places on campus.
   - Ensure ground floor visibility from buildings that allows for a casual means of surveillance of outdoor activity.
   - Locate mixed uses such as retail or support services in buildings to extend the hours of activity next to public areas where market demand can support such uses.
   - Use multipurpose lighting scaled for pedestrians and vehicles.
   - Create unobstructed views, without landscape plantings in a zone between 2’ and 6’ above grade.
   - Provide diverse and abundant places to sit.
   - Create a clearly designated system of well-lit and secure after-dark walking routes.

Bicycle Movement on Campus

1. Subordinate bicycle travel to accommodate pedestrians within the campus.

2. Encourage cyclists to respect dismount zones and limit speeds (maximum 10 mph) to reduce conflicts where there is high pedestrian traffic.

3. Separate bike and pedestrian traffic when possible by integrating the bicycle network into the street network with on-street lanes.

4. Expand routes for bicyclists to get around within the campus districts.

Bicycle Travel to Campus

1. Collaborate with other governmental units to develop regional bike routes that provide access to campus.

2. Provide safe, convenient accommodation for cyclists on paths that are clearly delineated from other modes of traffic.

3. Ensure the safety of bicyclists sharing movement space with vehicles by providing signage that recognizes the presence and priority of bicycles in the roadway, especially on campus local streets.

Bicycle Support Facilities

1. Accommodate bike parking facilities at appropriate locations with guidance from the University’s Construction Standards. Bike parking will not interfere with primary pedestrian paths and public open spaces, and where possible parking should be located proximate to building entrances in well-lit visible locations.

2. Build bike centers that provide storage lockers, showers, and repair kiosks on each campus – East Bank, West Bank, and St. Paul.

Light Rail Transit

1. Pursue traffic mitigation on campus streets to minimize negative impacts on campus buildings.

2. Design streetscapes on LRT corridors to prioritize pedestrian comfort and convenience, wayfinding and visual recognition of the University campus

Regional Service

1. Coordinate route and schedule synchronization of intra-campus service with regional transit service providers.

2. Promote use of regional transit services by offering incentives and low-cost fares.

On Campus Service

1. Continue to operate the intercampus Transitway to accommodate a variety of bus types, and support use of the facility by bicyclists and pedestrians in appropriate locations.
Transit Rider Experience
1. Adapt the use of innovative technologies to improve transit facilities and service for members of the university community.

2. Develop transit shelters/waiting areas to accommodate rider volume while maintaining appropriate pedestrian thoroughfares in varied sidewalk conditions.

3. Use signage and shared design elements, including lighting, to identify primary pedestrian routes to and from major transit waiting areas.

4. Design streetscapes on LRT corridors to prioritize pedestrian comfort and convenience, wayfinding and visual recognition of the University campus.

Campus Signature Streets
1. Design signature streets to accommodate all modes of travel, with walking as the highest priority followed by bicycling, transit, and private vehicles.

2. Invest in streetscapes on signature streets that create meeting places, with spacious sidewalks, trees where feasible and attractive street furniture to foster interaction between people.

3. Work in partnership with key agencies to advance safe and convenient movement of all modes of traffic.

Street Function
1. Create a network that is easily understood and well connected for daily users and occasional visitors.

2. Design local campus streets for safe and comfortable use by multiple modes of transportation.

3. Discourage through traffic on local campus streets using techniques that limit speed.

Traffic Management
1. Encourage appropriate agencies to construct bypass routes to reduce congestion resulting from non-university destined trips.

2. Promote and support the regional transit system as a tool to manage vehicular demand on the street network.

3. Manage daily and event traffic operations by providing up-to-date traffic and parking condition information to travelers.

Service Access and Loading
1. Create centralized building service and loading facilities that support a pedestrian focused campus environment.

2. Consolidate loading and service facilities to serve multiple buildings.

3. Accommodate limited short-term delivery functions in areas where traffic and pedestrian movements will not be compromised

Parking
1. Promote existing park-and-ride lots and expand park-and-ride service to primary campus destinations.

2. Locate parking structures in proximity to arterial streets to minimize conflicts with pedestrian or bicyclist travel.

3. Maintain a limited supply of conveniently located short-term parking within a 10 minute walking distance of academic and administrative buildings.
Public Spaces and Buildings

Campus Organization

Axes and Paths
1. Preserve iconic public spaces that provide orientation and order.
2. Give special design attention to pedestrian amenities on dedicated pedestrian pathways.
3. Design vertical connections between grade and existing skyways and tunnels to be visible, understandable, and accessible.
4. Enhance access and orientation to the below grade network by providing natural light openings (skylights, clerestory windows) and highly visible signage.
5. Design building entrances with common paths to be used by people with and without disabilities.

Identity and Symbolism
1. Preserve the existing overarching visual order on campus by maintaining design continuity.
2. Create visual linkages between new buildings and existing buildings through similar scale, materials, style, window patterns and proportions.

Continuity and Variety
1. Preserve iconic public spaces and the buildings that border and define them. Allow only minor changes to the exterior of existing buildings. Design replacement buildings to recall the scale, architectural articulation and massing of their predecessors.
2. Provide public space furnishings that are compatible in style, materials and scale within each campus district.
3. Locate public art to provide focal points and variety within each district.

Definition and Borders
1. Form new outdoor public spaces to take maximum advantage of natural features, particularly the Mississippi River.
2. Evaluate new buildings designs for their effect on existing and new public spaces.
3. Preserve mature trees to continue to provide continuity, shade and a sense of enclosure.

Public Space Qualities

Visibility
1. Border public spaces with vehicular and pedestrian circulation paths to enhance visibility and security.
2. Furnish pedestrian circulation paths to be comfortable and safe.
3. Landscape and furnish public spaces to avoid interfering with views of the spaces from adjacent buildings and paths.
4. Celebrate natural features by designing interior and exterior spaces to take maximum advantage of their views.

Unity
1. Design campus public spaces to enhance the unified character of the campus while reinforcing individual district identity.
2. Provide consistent pedestrian-scale light fixtures throughout each campus district.

Flexibility
1. Provide a wide variety of flexible public space types within each district.

Durability
1. Design public spaces for durability and ease of maintenance.
APPENDIX A2 - MASTER PLAN GUIDELINES

Building Qualities

Integration

1. Design new buildings to contribute to a unified overall campus character, while reinforcing the identity of the particular district in which it is located.

2. Use brick and stone as the primary building materials in buildings throughout campus.

3. Limit the number of landmark buildings. Such buildings can vary from the norm, but should be the exception. Whenever possible, landmark buildings should be isolated from other campus buildings.

Optimization

1. Design new buildings to be flexible and adaptable to changing uses.

Collaboration

1. Design new buildings as a team collaborative process.

Preservation and Adaptive Reuse

1. Preserve historic buildings whenever possible by adapting buildings to new programmatic needs.

2. Remove obsolete buildings judiciously when required to meet academic goals, to improve space relationships between buildings, or to enhance appreciation of natural features.

Sustainable Design and Construction

1. Design new buildings to be environmentally sustainable and responsive to site-specific environmental conditions.

2. Maximize energy efficiency in all campus building and landscape design.
Strategies for the built environment

CPTED strategies rely upon the ability to influence offender decisions that precede criminal acts. Research into criminal behavior shows that the decision to offend or not to offend is more influenced by cues to the perceived risk of being caught than by cues to reward or ease of entry. Certainty of being caught is the main deterrence for criminals not the severity of the punishment so by raising the certainty of being captured, criminal actions will decrease. Consistent with this research, CPTED based strategies emphasize enhancing the perceived risk of detection and apprehension.

Consistent with the widespread implementation of defensible space guidelines in the 1970s, most implementations of CPTED as of 2004[update] are based solely upon the theory that the proper design and effective use of the built environment can reduce crime, reduce the fear of crime, and improve the quality of life. Built environment implementations of CPTED seek to dissuade offenders from committing crimes by manipulating the built environment in which those crimes proceed from or occur. The six main concepts according to Moffat are territoriality, surveillance, access control, image/maintenance, activity support and target hardening. Applying all of these strategies is key when trying to prevent crime in any neighborhood crime ridden or not.

Natural surveillance and access control strategies limit the opportunity for crime. Territorial reinforcement promotes social control through a variety of measures. Image/maintenance and activity support provide the community with reassurance and the ability to stop crime by themselves. Target hardening strategies round up all of these techniques to resolve crime into one final step.

Natural surveillance

Natural surveillance increases the threat of apprehension by taking steps to increase the perception that people can be seen. Natural surveillance occurs by designing the placement of physical features, activities and people in such a way as to maximize visibility and foster positive social interaction among legitimate users of private and public space. Potential offenders feel increased scrutiny and limitations on their escape routes.

Design streets to increase pedestrian and bicycle traffic

Place windows overlooking sidewalks and parking lots.

Leave window shades open.

Use passing vehicular traffic as a surveillance asset.

Create landscape designs that provide surveillance, especially in proximity to designated points of entry and opportunistic points of entry.

Use the shortest, least sight-limiting fence appropriate for the situation.

Use transparent weather vestibules at building entrances.

When creating lighting design, avoid poorly placed lights that create blindspots for potential observers and miss critical areas. Ensure potential problem areas are well lit: pathways, stairs, entrances/exits, parking areas, ATMs, phone kiosks, mailboxes, bus stops, children's play areas, recreation areas, pools, laundry rooms, storage areas, dumpster and recycling areas, etc.

Avoid too-bright security lighting that creates blinding glare and/or deep shadows, hindering the view for potential observers. Eyes adapt to night lighting and have trouble adjusting to severe lighting disparities. Using lower intensity lights often requires more fixtures.

Use shielded or cut-off luminaires to control glare.

Place lighting along pathways and other pedestrian-use areas at proper heights for lighting the faces of the people in the space (and to identify the faces of potential attackers).

Utilizing curved streets with multiple view points to multiple houses entrances as well as making the escape route difficult to follow.
APPENDIX B – CPTED PRINCIPLES

Natural surveillance measures can be complemented by mechanical and organizational measures. For example, closed-circuit television (CCTV) cameras can be added in areas where window surveillance is unavailable.

Natural access control

Natural access control limits the opportunity for crime by taking steps to clearly differentiate between public space and private space. By selectively placing entrances and exits, fencing, lighting and landscape to limit access or control flow, natural access control occurs.

*Use a single, clearly identifiable, point of entry*

*Use structures to divert persons to reception areas*

Incorporate maze entrances in public restrooms. This avoids the isolation that is produced by an anteroom or double door entry system.

*Use low, thorny bushes beneath ground level windows. Use rambling or climbing thorny plants next to fences to discourage intrusion.*

*Eliminate design features that provide access to roofs or upper levels*

In the front yard, use waist-level, picket-type fencing along residential property lines to control access, encourage surveillance.

*Use a locking gate between front and backyards.*

*Use shoulder-level, open-type fencing along lateral residential property lines between side yards and extending to between back yards. They should be sufficiently unencumbered with landscaping to promote social interaction between neighbors.*

*Use substantial, high, closed fencing (for example, masonry) between a backyard and a public alley instead of a wall which blocks the view from all angles.*

Natural access control is used to complement mechanical and operational access control measures, such as target hardening.

Natural territorial reinforcement

Territorial reinforcement promotes social control through increased definition of space and improved proprietary concern. An environment designed to clearly delineate private space does two things. First, it creates a sense of ownership. Owners have a vested interest and are more likely to challenge intruders or report them to the police. Second, the sense of owned space creates an environment where "strangers" or "intruders" stand out and are more easily identified. By using buildings, fences, pavement, signs, lighting and landscape to express ownership and define public, semi-public and private space, natural territorial reinforcement occurs. Additionally, these objectives can be achieved by assignment of space to designated users in previously unassigned locations.

*Maintained premises and landscaping such that it communicates an alert and active presence occupying the space.*

*Provide trees in residential areas. Research results indicate that, contrary to traditional views within the law enforcement community, outdoor residential spaces with more trees are seen as significantly more attractive, safer, and more likely to be used than similar spaces without trees.*

*Restrict private activities to defined private areas.*

*Display security system signage at access points.*

*Avoid cyclone fencing and razor-wire fence topping, as it communicates the absence of a physical presence and a reduced risk of being detected.*

*Placing amenities such as seating or refreshments in common areas in a commercial or institutional setting helps to attract larger numbers of desired users.*

*Scheduling activities in common areas increases proper use, attracts more people and increases the perception that these areas are controlled.*

*Motion sensor lights at all entry points into the residence.*

Territorial reinforcement measures make the normal user feel safe and make the potential offender aware of a substantial risk of apprehension or scrutiny. When people take pride in what they own and go to the proper measures to protect their belongings, crime is deterred from those areas because now it makes it more of a challenge. Criminals don't want their job to be hard, if it was hard they wouldn't do it. The more difficult it is to commit a crime in certain areas, the less crime will occur.
## APPENDIX C – BUILDING EFFICIENCY RATIOS

<table>
<thead>
<tr>
<th>Building Classification:</th>
<th>Space Factor</th>
<th>New Construction Efficiency</th>
<th>Remodeling</th>
<th>Remarks</th>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 General</td>
<td>1.79</td>
<td>53%</td>
<td>56%</td>
<td>59%</td>
</tr>
<tr>
<td>3 High % Private Office</td>
<td>1.54</td>
<td>60%</td>
<td>65%</td>
<td>70%</td>
</tr>
<tr>
<td>4 High % Cubicle</td>
<td>1.44</td>
<td>67%</td>
<td>70%</td>
<td>72%</td>
</tr>
<tr>
<td>5 Specification</td>
<td>1.46</td>
<td>65%</td>
<td>69%</td>
<td>72%</td>
</tr>
<tr>
<td>Laboratory</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Laboratory</td>
<td>1.67</td>
<td>59%</td>
<td>60%</td>
<td>61%</td>
</tr>
<tr>
<td>7 Laboratory: Wet</td>
<td>1.79</td>
<td>53%</td>
<td>56%</td>
<td>59%</td>
</tr>
<tr>
<td>8 Laboratory: Dry</td>
<td>1.59</td>
<td>60%</td>
<td>63%</td>
<td>66%</td>
</tr>
<tr>
<td>9 Laboratory: Wet and Dry</td>
<td>1.72</td>
<td>55%</td>
<td>58%</td>
<td>61%</td>
</tr>
<tr>
<td>10 Laboratory: Teaching</td>
<td>1.69</td>
<td>56%</td>
<td>59%</td>
<td>62%</td>
</tr>
<tr>
<td>Mixed Use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 Mixed Use (Office + Lab)</td>
<td>1.82</td>
<td>50%</td>
<td>55%</td>
<td>60%</td>
</tr>
<tr>
<td>12 Mixed Use (Office + Classroom)</td>
<td>1.60</td>
<td>60%</td>
<td>63%</td>
<td>65%</td>
</tr>
<tr>
<td>Conference Center</td>
<td>1.60</td>
<td>60%</td>
<td>63%</td>
<td>65%</td>
</tr>
<tr>
<td>Research: General</td>
<td>1.75</td>
<td>54%</td>
<td>57%</td>
<td>60%</td>
</tr>
<tr>
<td>Student Service</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 Residence Hall Gang Showers / Toilets</td>
<td>1.82</td>
<td>54%</td>
<td>55%</td>
<td>56%</td>
</tr>
<tr>
<td>16 Residence Hall In Room Toilets and Showers</td>
<td>1.67</td>
<td>55%</td>
<td>60%</td>
<td>65%</td>
</tr>
<tr>
<td>17 Recreation Facility</td>
<td>1.39</td>
<td>70%</td>
<td>72%</td>
<td>74%</td>
</tr>
<tr>
<td>18 Student Apartments(1)</td>
<td>1.54</td>
<td>60%</td>
<td>65%</td>
<td>70%</td>
</tr>
<tr>
<td>19 Recreation Complex</td>
<td>1.54</td>
<td>60%</td>
<td>65%</td>
<td>70%</td>
</tr>
</tbody>
</table>

Notes:
1) Assume this is an average of Efficiency Ratios from "The College and University Buildings Project Data Book 2001", SCUP emails, and Tradeline Inc. website 2003 (http://www.tradelineinc.com/projectprofiles/).
2) Sample Building Efficiency Model:

\[
\begin{align*}
10,000 & \quad \text{NASF (Net Assignable Square Feet)} \\
1.5 & \quad \text{Space Factor} \\
15,000 & \quad \text{GSF (Gross Square Feet)} \\
67\% & \quad \text{Building Efficiency Ratio (NASF / GSF)}
\end{align*}
\]
## APPENDIX C – BUILDING EFFICIENCY RATIOS

<table>
<thead>
<tr>
<th>Functional Type Classification: (Listed Alphabetically)</th>
<th>Space Factor</th>
<th>New Construction Efficiency</th>
<th>Remodeling</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Academic Center</td>
<td>1.33</td>
<td>71% 75% 79%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Administration Building</td>
<td>1.28</td>
<td>74% 76% 82%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Agricultural</td>
<td>1.61</td>
<td>59% 62% 65%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Animal (Vivarium)</td>
<td>1.75</td>
<td>54% 57% 60%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Animal Hospital</td>
<td>1.41</td>
<td>67% 71% 75%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Aquarium</td>
<td>1.47</td>
<td>65% 68% 71%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Astronomy</td>
<td>1.72</td>
<td>55% 58% 61%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Auditorium</td>
<td>1.67</td>
<td>57% 60% 63%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 Biomedical</td>
<td>1.56</td>
<td>61% 64% 67%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Biology (All Types)</td>
<td>1.67</td>
<td>57% 60% 63%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 Biochemistry</td>
<td>1.61</td>
<td>59% 62% 65%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 Biotechnology</td>
<td>1.61</td>
<td>59% 62% 65%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 Bookstore</td>
<td>1.64</td>
<td>58% 61% 64%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 Broadcast Facilities</td>
<td>1.67</td>
<td>57% 60% 63%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 Business</td>
<td>1.52</td>
<td>63% 66% 69%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 Central Power Plant</td>
<td>1.15</td>
<td>83% 87% 91%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17 Chemistry</td>
<td>1.69</td>
<td>56% 59% 62%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 Computer Science</td>
<td>1.61</td>
<td>59% 62% 65%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19 Conference Center</td>
<td>1.61</td>
<td>59% 62% 65%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 Data Center</td>
<td>1.59</td>
<td>60% 63% 66%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21 Dining Facilities</td>
<td>1.25</td>
<td>76% 80% 84%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22 Distance Learning</td>
<td>1.35</td>
<td>70% 74% 78%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23 Dormitories</td>
<td>1.20</td>
<td>79% 83% 87%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 Engineering</td>
<td>1.75</td>
<td>54% 57% 60%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 Environmental Studies</td>
<td>1.52</td>
<td>63% 66% 69%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26 Executive Education</td>
<td>1.27</td>
<td>75% 79% 83%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27 Geography / Geology</td>
<td>1.69</td>
<td>56% 59% 62%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28 Greenhouse</td>
<td>1.67</td>
<td>57% 60% 63%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29 Healthcare: Outpatient Care Center</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 Healthcare: Cancer Center</td>
<td>1.59</td>
<td>60% 63% 66%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31 Healthcare: Diagnostic Treatment</td>
<td>1.54</td>
<td>62% 65% 68%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32 Healthcare: Emergency</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33 Healthcare: Acute Care</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## APPENDIX C – BUILDING EFFICIENCY RATIOS

<table>
<thead>
<tr>
<th>Space Factor</th>
<th>New Construction Efficiency</th>
<th>Remodeling</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>34 Humanities</td>
<td>1.43</td>
<td>67%</td>
<td>70%</td>
</tr>
<tr>
<td>35 Law School</td>
<td>1.67</td>
<td>57%</td>
<td>60%</td>
</tr>
<tr>
<td>36 Learning Center</td>
<td>1.27</td>
<td>75%</td>
<td>79%</td>
</tr>
<tr>
<td>37 Library</td>
<td>1.54</td>
<td>62%</td>
<td>65%</td>
</tr>
<tr>
<td>38 Life Sciences</td>
<td>1.61</td>
<td>59%</td>
<td>62%</td>
</tr>
<tr>
<td>39 Mathematics</td>
<td>1.59</td>
<td>60%</td>
<td>63%</td>
</tr>
<tr>
<td>40 Nursing</td>
<td>1.69</td>
<td>56%</td>
<td>59%</td>
</tr>
<tr>
<td>41 Museum Space</td>
<td>1.47</td>
<td>65%</td>
<td>68%</td>
</tr>
<tr>
<td>42 NMR / MRI Facilities</td>
<td>1.64</td>
<td>58%</td>
<td>61%</td>
</tr>
<tr>
<td>43 Office: Research</td>
<td>1.67</td>
<td>57%</td>
<td>60%</td>
</tr>
<tr>
<td>44 Performing Arts</td>
<td>1.61</td>
<td>59%</td>
<td>62%</td>
</tr>
<tr>
<td>45 Physics</td>
<td>1.69</td>
<td>56%</td>
<td>59%</td>
</tr>
<tr>
<td>46 Pharmacology</td>
<td>1.59</td>
<td>60%</td>
<td>63%</td>
</tr>
<tr>
<td>47 Psychology</td>
<td>1.69</td>
<td>56%</td>
<td>59%</td>
</tr>
<tr>
<td>48 Research: Biotech</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>49 Research: Pharmaceutical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 Residential Campus</td>
<td>1.15</td>
<td>63%</td>
<td>67%</td>
</tr>
<tr>
<td>51 Science</td>
<td>1.64</td>
<td>58%</td>
<td>61%</td>
</tr>
<tr>
<td>52 Sports Facilities</td>
<td>1.52</td>
<td>63%</td>
<td>66%</td>
</tr>
<tr>
<td>53 Student Center</td>
<td>1.52</td>
<td>63%</td>
<td>66%</td>
</tr>
<tr>
<td>54 Study Center</td>
<td>1.27</td>
<td>75%</td>
<td>79%</td>
</tr>
<tr>
<td>55 Warehouse</td>
<td>1.35</td>
<td>70%</td>
<td>74%</td>
</tr>
</tbody>
</table>

### Common Breakdowns of Unassigned Space

<table>
<thead>
<tr>
<th>Common Breakdowns of Unassigned Space</th>
<th>CUH2A Office</th>
<th>CUH2A Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Circulation</td>
<td>16.0%</td>
<td>15.0%</td>
</tr>
<tr>
<td>2 Mechanical</td>
<td>5.0%</td>
<td>5.0%</td>
</tr>
<tr>
<td>3 Electrical/Data Closets</td>
<td>5.0%</td>
<td>5.0%</td>
</tr>
<tr>
<td>4 Structure &amp; Walls</td>
<td>7.0%</td>
<td>7.0%</td>
</tr>
<tr>
<td>5 Public Toilets</td>
<td>1.5%</td>
<td>1.5%</td>
</tr>
<tr>
<td>6 Janitor Closets</td>
<td>0.2%</td>
<td>0.5%</td>
</tr>
<tr>
<td>7 Unassigned Storage</td>
<td>0.5%</td>
<td>0.5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>35.0%</strong></td>
<td><strong>35.0%</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th><strong>CUH2A Office</strong></th>
<th><strong>CUH2A Lab</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Circulation</td>
<td>15.0%</td>
<td>15.0%</td>
</tr>
<tr>
<td>Mechanical</td>
<td>5.0%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Electrical/Data Closets</td>
<td>5.0%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Structure &amp; Walls</td>
<td>7.0%</td>
<td>7.0%</td>
</tr>
<tr>
<td>Public Toilets</td>
<td>1.5%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Janitor Closets</td>
<td>0.2%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Unassigned Storage</td>
<td>0.5%</td>
<td>0.5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>35.0%</strong></td>
<td><strong>35.0%</strong></td>
</tr>
</tbody>
</table>
APPENDIX D – AREA ALLOCATION TABLES (WET-BENCH LAB)

Knowledge/Teaching (Future Section)

Laboratories

Description and Application

This document is intended to assist administrators, lab planners and other design professionals as they plan for, design and build out wet-bench laboratory space at the University of Minnesota. The space planning themes expressed herein should be applied to wet-bench laboratory spaces occupied by University of Minnesota employees, whether owned or leased.

Wet-bench laboratory space in this document refers to laboratories where chemicals, drugs, or other material or biological matter are handled in liquid solutions or volatile phases, requiring direct ventilation, and specialized piped utilities (typically water and various gases).

Wet-bench labs are provided with appropriate plumbing, ventilation, and equipment to allow for hands-on scientific research and experimentation. It refers to the use of liquids for conducting experiments. (Dry-bench laboratories are, in contrast, characterized by the use computers or computer-generated models for analysis and experimentation.)

Before beginning a wet-lab design project, it is important that academic and administrative units evaluate the short-term and expected long-term use of the future space. It is expected that the academic unit review and comment on the viability of shared resources to avoid building out costly and specialized space that may be underutilized.

Goals for wet-bench laboratories: Optimization of flexibility and utilization

Over time, allocations of space in academic research change due to variables such as:

- Phases of the scientific career
- Viability of students as a labor resource
- Expectations on faculty for appointments in teaching, outreach and patient care
- Funding sources (internal or external)
- Levels of collaboration or interdisciplinary work
- Type of equipment
- Amount of departmental or ‘central’ administrative resources
- Type of media used (small animal, large animal, infectious tissues or material, yeast, fish, etc.)
- Institutional strategies for animal resources (centralized or distributed model, housing, care, procedure)
- Institutional academic and research strategy or focus
- Opportunities for private and/or public partnerships (life science parks)

It is therefore no longer practical to design a space for the needs of the initial occupant only. University spaces should be designed for long-term use and changes as mentioned above.

When designing a wet-bench laboratory for the University of Minnesota, design teams should illustrate how their designs not only meet the needs of the initial program, but also support the institutional goals of flexibility and utilization.

The following planning themes are intended to inform a design that supports on-going management and operations of the space. They will continue to be updated as new ideas and technologies evolve. These planning principles apply to both open and closed lab plans.

Please use the following table to explain how your design advances each of these planning themes.
APPENDIX D – AREA ALLOCATION TABLES (WET-BENCH LAB)

Modularity

Use a standardized and repeatable lab module (typically 10’6” width x variable length) to maximize utilization of available square feet on a floor in a general open lab design.

Use standardized kit of parts for benches and casework that can be easily adapted to the current research needs.

Benches and casework should not be built in or fixed to the floor or wall unless required by the equipment or specific research needs of the initial occupant of the lab. Keep fixed under-the-bench casework to a minimum to accommodate various storage needs over time.

Efficiency

Aisles should not exceed regulatory minimum requirements of the specified lab space (usually 5’ wide). If a lab module width is larger than the standard 10’6, it should not be due to excess aisle width, rather to the need for deeper bench tops or large equipment (fume hoods). If aisles are too large, this can cause inefficient building design and increase long-term operational costs of the space.

Smaller bench lengths are preferred. In a 12’ bench run, the preference is to use 3 4’ bench modules rather than 2 6’ bench modules as the three bench section offers work space for three individuals. This design allows for one to three individuals (knee holes), rather than a maximum of two. For many activities a 4’ run is adequate to meet the needs of the science. In those cases where it is not, more benches can be assigned.

Utilize and design for equipment and furniture that optimize height and width rather than depth. Consider refrigeration and storage units that have sliding front doors rather than hinged doors that open into the aisles. Consider end of the row equipment that is as wide as the width of the bench module to optimize use of available square feet on the floor.

Consider a 1:1:1 square foot ratio of office:bench:support space in the overall design of the research facility. Insufficient office and dry lab space may result long term in the need to over allocate costly wet-bench space or bench modules being used for desk work.

Zoning and Circulation

Designate zones for equipment, walkway, or social space by using visual markers on the floor. This will allow users of the space to know appropriate locations for equipment or special activities. It discourages improper placement of equipment and potential costly renovations.

Minimize walkways and circulation through the bench module. Dry bench, office and social spaces should be directly accessible via general circulation. One should not have to walk through the wet-bench and shared equipment zones to access these spaces.

Shared Resources

Proximity to shared resources (equipment rooms, storage spaces, lab services, hoods, etc.) should be optimized to avoid building out costly and specialized space that may be underutilized.

Redundant core facilities require justification. This avoids building out costly and specialized space that may be underutilized. A review of similar core facility functions in the building and neighborhood is required.

Sustainability

Look to best practice in fields of energy management and engineering to assure rightsizing for equipment loads, optimization of ventilation rates, energy efficiency and recovery.
Description and Application

This document is intended to assist administrators, space planners and other design professionals as they plan for, assess and program efficient and effective workspace (office space) at the University of Minnesota. The standards expressed herein should be applied to all space occupied by University of Minnesota employees, whether owned or leased.

They should be considered in the situations listed below:

1. When planning for new construction
2. When renovating existing space
3. During times of general or special space assessment

Office space in this document refers to the office and administrative type spaces specifically assigned to support the University’s academic (instructional and research), administrative, and service functions. This includes offices and workstations (private or open, dedicated or shared) as well as office support space, such as conference and meeting spaces, collaboration space, filing, copy, mail, circulation, lounge, etc. It does not include classroom space, training space, or outwardly facing public spaces, such as lobbies, restrooms and stairwells.

Before beginning a reallocation of office space resources or a new capital project, it is important that academic and administrative units evaluate the efficiency of existing office space to that of the efficiency standard listed in this document, as well as the unit’s utilization of their current space allocation. It may also be appropriate to assess the efficiency and utilization of spaces nearby or associated with affiliated units before spending money on costly renovations.

Office Space Efficiency Standard

The standard efficiency measure for a unit’s workspace is assignable square feet per full-time-equivalent employee (ASF/FTE). The calculation of the unit’s workspace assignment should include not only offices and workstations, but office support spaces (conference rooms, storage, etc.) and internal circulation. The calculation of a unit’s full-time-equivalent employee count should factor in those employees whose efforts are < 1.0 FT and consider the distribution of FTE throughout the day if employees work multiple shifts.

It is university employees (faculty, staff and employed students) who are included in FTE calculations. While office space is not provided for graduate and undergraduate students without an employee appointment, instructional and study space allocations are provided.

The total unit workspace should be designed or renovated to the efficiency standard of 150 ASF/FTE and not to exceed 180 ASF/FTE.

The expected efficiency ratio may need to be adjusted to accommodate a unit with special space needs or unique working styles.

Overall office space efficiency is expressed in a range to allow flexibility for the following:

Functional/programmatic variation within employee groups

The determination of appropriate workspace type involves the assessment of: time appointment, activity, supervisory roles, nature and frequency of interaction internally or externally, teaming, confidentiality, equipment, noise, isolation, etc.

Physical constraints of the occupancy layout (building floor plan)

For example, special consideration may be made if a department plans to move into space that is already built out in a functional way that matches the space need. It is not necessarily expected that a unit engage in a costly remodel of existing space simply to meet the guidelines.
Alternative Workplace Strategies: Work+

As we look to align our office workspaces with the ways in which we work today, alternative workspace strategies may be used to achieve that goal. These strategies are embodied in the Work+ program. The table below illustrates the space allocations and ratios used to calculate the amount of space generated by employees for the variety work styles represented in the Work+ program.

### University of Minnesota

#### Work+ Space Program Tool

<table>
<thead>
<tr>
<th>Workstyle</th>
<th>Mobile Campus Collaborative</th>
<th>Mobile Individual</th>
<th>Mobile Collaborative</th>
<th>Resident Individual Focus</th>
<th>Resident Individual Paper-Heavy</th>
<th>Resident Confidential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity Ranges:</td>
<td>At Desk &lt; 30% Collaborate &gt; 60%</td>
<td>At Desk between 30-70% Collaborate &lt; 60%</td>
<td>At Desk &gt; 70% Collaborate &lt; 60%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Area/Space</th>
<th>Recommended Office Space Design Ratios</th>
</tr>
</thead>
</table>

#### Neighborhood Individual Space

- **Unassigned Workstations (ratio)**: N/A, 3:1, 1.5:1, 1.5:1
- **Unassigned Workstations (decimal)**: 36 SF, 0.33, 0.67, 0.67
- **Dedicated Workstation (Focus)**: 36 SF, 1
- **Dedicated Workstations (Paper-Heavy)**: 64 SF, 1
- **Offices**: 120 SF, 1
- **Touch down Workstations**: 25 SF, 1/20, 1/20, 1/20, 1/20, 1/20, 1/20

#### Neighborhood Collaborative Space

- **Phone Booths (1-2 ppl)**: 35 SF, 1/20, 1/30, 1/10, 1/30, 1/30, 1/30
- **Huddle Rooms (1-4 ppl)**: 100 SF, 1/50, 1/100, 1/100, 1/100, 1/100, 1/100
- **Small Meeting Room (5-8 ppl)**: 200 SF, 1/50, 1/150, 1/150, 1/150, 1/150, 1/150
- **Medium Meeting Room (9-16 ppl)**: 400 SF, 1/50, 1/100, 1/100, 1/100, 1/100, 1/100
- **Large Meeting Room (17-24 ppl)**: 600 SF, 1/100, 1/100, 1/100, 1/100, 1/100, 1/100
- **Open Meeting Area (6 ppl)**: 150 SF, 1/20, 1/30, 1/10, 1/50, 1/50, 1/50
- **Working Lounge (24 ppl)**: 500 SF, 1/250, 1/250, 1/250, 1/250, 1/250, 1/250
- **Library/Literature Room**: 150 SF, 1/250, 1/250, 1/250, 1/250, 1/250, 1/250
- **Quiet Area / Room (8 ppl)**: 200 SF, 1/50, 1/20, 1/50, 1/50, 1/50, 1/50

#### Floor / Building Shared Amenity Space

- **Working Lounge (24 ppl)**: 500 SF, 1/250, 1/250, 1/250, 1/250, 1/250, 1/250
- **Library/Literature Room**: 150 SF, 1/250, 1/250, 1/250, 1/250, 1/250, 1/250
- **Quiet Area / Room (8 ppl)**: 200 SF, 1/50, 1/20, 1/50, 1/50, 1/50, 1/50

#### Storage Space

- **Central Storage for Floor**: 100 SF, 1/100, 1/100, 1/100, 1/100, 1/100, 1/100
- **Supply Storage for Neighborhood**: 50 SF, 1/50, 1/50, 1/50, 1/50, 1/50, 1/50
- **Personal Storage**: 2 SF, 1/1, 1/1, 1/1, 0, 0, 0

#### Support Space

- **Reception Area**: 74 SF, 1/250, 1/250, 1/250, 1/250, 1/250, 1/250
- **Copy / Print Area / Room**: 75 SF, 1/50, 1/50, 1/50, 1/50, 1/50, 1/50

#### Specialty Space

- **Multi-purpose Meeting Room (50 ppl)**: 1,000 SF, 1/250, 1/250, 1/250, 1/250, 1/250, 1/250
- **Mothers’ Room**: 75 SF, 1/250, 1/250, 1/250, 1/250, 1/250, 1/250
- **Furniture Storage**: 200 SF, 1/250, 1/250, 1/250, 1/250, 1/250, 1/250
- **Confidential Meeting Rooms (1-4 ppl)**: 100 SF, 1/40, 1/40, 1/40, 1/40, 1/40, 1/40
APPENDIX E – SUSTAINABILITY ELEMENTS

Proximity, Density, and Massing

Greenhouse gas emissions from human activities are the principal cause of climate change. Non-renewable energy consumption is a significant contributor to these emissions. Failing to slow or halt climate change will have tangible and significant costs to our campus and to our world.

Dense urban campuses have sustainability challenges and opportunities. One of those opportunities (and challenges) is creating a diverse and walkable campus community with buildings that balance density and open space. During the design process, consultants are to weigh aesthetic decisions with a sense of responsibility for enhancing daylighting opportunities and reducing the negative effects of wind on its neighboring buildings and campus development framework.

Building height and massing is critical to ground level pedestrian comfort. All buildings create obstacles to wind flows. This causes positive pressure on the windward building face and negative pressure zones on building sides, which in turn causes an increase in wind velocity where the two zones meet. The design of new buildings should mitigate pedestrian level wind discomfort or, where possible, redirect wind flows to lower pedestrian priority zones.

Implementing daylighting on a project goes beyond equipment specifications and requires an integrated approach to design. There is growing evidence that lack of bright light exposure during the day may result in disruption of the circadian system and lead to feelings of depression, poor sleep quality, lethargy, and illness. The design of new and additional building mass should allow for daylight infiltration and reduction of glare. Sustainable strategies that should be considered include: interior and/or exterior shading devices, glazing materials, opening locations, interior and exterior finishes, and integration of lighting controls. Where possible, B3 Guideline I.9 should guide design consultant reference to interior daylight requirements (http://www.b3mn.org/guidelines/i_9.html) and integration of daylight modeling during early phases of design.


Landscape and Native Plantings

By 2025 it is estimated that 1.8 billion people will be living with absolute water scarcity, and two-thirds of the world population could live under water stress conditions. In Minnesota, water resources contribute to billions of dollars of economic activity across a variety of sectors including agriculture, tourism, and utilities. However, ground water supplies in the state are being depleted faster than they are being replenished and a significant portion of Minnesota’s lakes, rivers, and streams are too polluted for recreation and consumption. It is our responsibility to reduce consumption of natural water resources.

Installation of native landscaping can reduce annual stormwater runoff volume as much as 65%, remove up on 80% of the suspended solids and heavy metals, and up to 70% of nutrients like phosphorus and nitrogen from storm water runoff.

In Minnesota, native plants are considered native if they occurred here at the time of the Public Land Survey (1847-1907). Native plant communities are vital components of our ecosystem; reducing water consumption and runoff volume, reduce dependence on fertilizers and pesticides, provide food and shelter to animals and insects, and can prevent soil erosion, reduce flooding, detoxify chemicals in the air and water, and store carbon.

Design teams are to work closely with UMN Landcare when designing new or renovating existing exterior landscapes. New landscapes should prioritize native plantings and also possesses a unique character to reflect the identity of the district.

Refer to Landscape Management Plan:

http://www.extension.umn.edu/garden/yard-garden/landscaping/native-plants-for-sustainable-landscapes/

Other References:

http://files.dnr.state.mn.us/assistance/backyard/gardens/native_plant/nativelandscaping.pdf

http://www.extension.umn.edu/garden/yard-garden/landscaping/native-plants-for-sustainable-landscapes/
APPENDIX E – SUSTAINABILITY ELEMENTS

Stormwater Management

The University is committed to minimizing the negative impact on the natural hydrologic cycle and thereby improving the overall quality and clarity as much as possible by treating stormwater close to where it falls, reducing downstream impacts, recharging groundwater through infiltration as local soils and subsurface conditions allow, and reusing stormwater wherever possible (Storm Water Master Plan Twin Cities Campus, 2012).

Impervious hardscape surfaces increase runoff and load on our stormwater management system. Sustainable stormwater management strives to improve the hydrologic cycle of water on site to avoid adverse impacts such as erosion, flooding, displacing critical habitat, and pollution. It promotes onsite collection and conveyance of stormwater on sustainably designed roofs, parking lots, streets, and other surfaces to infiltrate the ground or collect for reuse (Minnesota B3 Guidelines). Sustainable stormwater management at the University uses both structured and non-structured approaches, including: bio-infiltration basins, bio swales, dry ponds, forebays, grit chambers, media filters, porous pavements, turf infiltration swales, and underground retention system.

Design teams are to consult with CPPM Design Manager and Facilities Management Civil Engineer for best practices and approaches to stormwater management.

To learn more about the University Stormwater Management Program, please visit http://www.dehs.umn.edu/envircomp_swm_swpoverview.htm
http://www.b3mn.org/guidelines/s_2.html

Green roofs

Green roofs can lessen a buildings negative impact on energy consumption by reducing heat transferred through the roof and absorbing heat; thereby, reducing urban heat island effect, encouraging evapotranspiration, mitigating water runoff and improving our local ecosystem. Green roofs also provide additional open space in an urban campus landscape and can be utilized for both functional programming and occupant health and wellness.

There are two types of green roofs, extensive and intensive. The University supports the design and application of extensive green roofs which typically have shallower depths and less impact on structural capacity, and generally require less maintenance and water compared to intensive systems.

The feasibility of a green roofs system should be vetted during pre-design and analyzed within the University project budget and goals.

Material Selection – Embodied energy, local materials, and durability

(Future Section)

Onsite solar strategies – PV Panels

Placement of PV or photovoltaic panels should consider views from all angles, district design guidelines, and avoid impact on existing historic resources. Where possible, PV panels should be grouped as to prevent fragmentary development.

Space utilization

The utilization of our space resources is one of the most important University sustainable strategies. By maximizing our space assets, we reduce costs associated with energy, new building construction and other resources directed towards underutilized space. With over 14,000,000 square feet of assignable space on the Twin Cities campus, the University has a responsibility to manage, assign, and design spaces that are flexible and adaptable for future uses and generations of staff, students, and faculty. Design consultants are to prioritize existing space resources, when possible, and look towards CPPM Space Planning and Minnesota Facilities Model for predictive programming.
APPENDIX E – SUSTAINABILITY ELEMENTS

Bird Safe Buildings

According to the National Audubon Society, “Sustainable, high-performance buildings are designed to conserve energy and reduce carbon emissions, conserve water resources, harvest daylight and provide healthier indoor environments. Ironically, in our desire to bring the outside in, we may increase risks to birds. By attracting birds in and around glazed buildings we inadvertently increase the risk of bird-window collisions.”

It is the intent of the Guidelines to reduce our impact on the surrounding ecosystem by designing new facilities and renovating existing facilities which are sensitive to bird migratory and flight patterns. University design processes should consider the following bird friendly strategies:

New buildings and major renovations, no matter the funding source should consider B3 Guideline SS.14 Bird-Safe Building as standard practice.

If an existing University building is considered a priority bird collision building (see CPPM Design Project Manager), all replacement glazing is to meet bird safe recommendations as outlined below.

Site building(s) to reduce conflicts with existing and planned landscape features that may attached birds.

Be aware of reflections and see-through effects created by habitat adjacent to near buildings.

Avoid clear barriers such as transparent bus shelters, skyways, linkways, windscreens, railing and other elements that might pose a significant threat to birds. If clear barriers cannot be prevented, then glazing should be protected with a bird safe material or pattern approved by Capital Planning & Project Management.

Co-locate antennas or other rooftop equipment to minimize danger to birds.

Ventilation grates should have a porosity of no larger than .8 inches or cover larger grates with netting.

As applicable, utilize etching, fritting, translucent and opaque patterned glass to reduce bird collisions.

Eliminate light directed upwards for streetlights or external lights.

For additional information on bird friendly building design, visit: http://mn.audubon.org/sites/g/files/amh601/f/05-05-10_bird-safe-building-guidelines.pdf
The following regulations and standards are incorporated with these Guidelines by reference:

- UM Twin Cities Campus Master Plan, see especially Ch. 3 “Guiding Principles”
- CPPM Project Delivery Manual
- CPPM Predesign Checklist
- UM Standards and Procedures for Design
- UM Exterior Design Standards
- UM Municipal Separate Stormwater Sewer Systems permit (MS4), and Stormwater Pollution Prevention Program (SWPP)
- MN Dept. of Agriculture “State Prohibited Noxious Weeds” list
- CPTED (Crime Prevention through Environmental Design) Principles
- Designated historic districts and buildings on the Twin Cities campus (map)

### General:
University System Campuses
- U of M Twin Cities Master Plan (Released 2009)
- U of M Crookston: Campus Master Plan (Released 2010)
- U of M Duluth: Campus Master Plan (Released 2013)
- U of M Morris: Campus Master Plan (Released 2008)
- U of M Rochester: Campus Master Plan (Released 2014)

### Site and Landscape:
A. University of Minnesota Municipal Separate Stormwater Sewer Systems permit (MS4)
B. University of Minnesota Stormwater Pollution Prevention Program (SWPP)
C. Minnesota Department of Agriculture “State Prohibited Noxious Weeds” list

### Architecture:
A. B3/2030

### Signage/Wayfinding:
A. ANSI
B. AIGA
C. Universal Standards

### References and Resource Links
A. University of Minnesota Standards and Procedures for Design
B. University of Minnesota Exterior Design Standards
C. CPPM Project Delivery Manual
D. CPPM Predesign Checklist
E. CPTED (Crime Prevention through Environmental Design) Principles
http://www.cptedsecurity.com/cpted_design_guidelines.htm
F. Americans with Disabilities Act (ADA)
G. State accessibility
H. ANSI accessibility