

# DRAFT 8.19.10 Northfield Development Guidelines



## Character & Sense of Place

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- 4) Landscape
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- 5) Signage

**THIS SECTION  
WILL BE IN THE  
NEXT DRAFT**

# Introduction

The Master Plans for the North and South sites borrow from organizational characteristics found in Downtown Northfield, the campuses of Carlton and St. Olaf, and the surrounding agrarian landscape. Clear organization, axial relationships, and a hierarchy of public space orders the layout of buildings sites and open space parcels. Northfield's traditional patterns of development are recalled through smaller blocks, narrower streets, and public gathering spaces and buildings designed to support a vibrant streetscape. It is imperative that the design of the proposed site infrastructure, landscaping, architecture and site details be of high quality and that these elements be visually and functionally coordinated with the existing agrarian landscape as well as elements found within the city of Northfield to establish a sense of continuity and identity that is consistent with the city and the region. The mission of these Development Guidelines is to create a commonly understood set of expectations for the character and quality of Northfield's Business and Industrial Park.

## *Intent and Purpose*

The purpose of the development guidelines is to create a commonly understood set of expectations for the character and quality of development at Northfield's Business and Industrial Parks. These guidelines will aid private development in the creation of high quality, functional and aesthetically unified business and industrial parks that are consistent with the quality and character of the City of Northfield.

The guidelines are intended to establish development that demonstrates innovation and high levels of environmental and economic performance. They will guide and monitor development, individual sites and buildings, roadways, landscaping, signage and other site improvements. Used in conjunction with basic principles of good design, applicable jurisdictional regulations, the Business and Industrial Park Master Plan, and staff assistance, these Development Guidelines are intended to expedite the approval process and facilitate the development of quality projects within the Industrial Park.

A process has been established to review site planning, architecture, landscape design, lighting, and signage for conformance to these Development Guidelines, in addition to encouraging excellence and innovation in development. All private development on the Northfield Business and Industrial Park property shall be subject to the design specifics contained herein.

## *General Objectives*

The general objectives of the Northfield Business and Industrial Park Design Guidelines are to:

- » Promote a functional and attractive environment
- » Ensure a high quality development
- » Protect and enhance private property values and investments
- » Protect public investments
- » Preserve the character of Northfield
- » Employ Sustainable Design practices

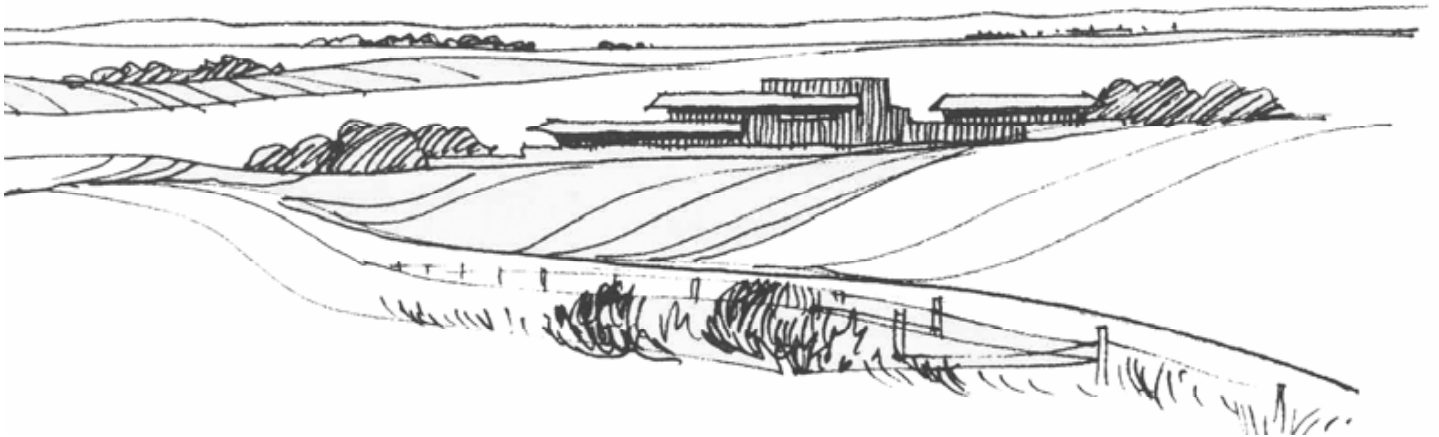
In achieving these objectives, such development is anticipated to be more competitive than in a conventional business-industrial park and to be more ecologically sensitive at the same time.

## *How the Guidelines are to Be Used*

The guidelines will provide direction to designers, developers, City staff, City commissions and decision makers regarding the City's expectations for design excellence at the Northfield Business and Industrial Parks. The guidelines provide review agencies with an implementation and planning tool that can be used to judge the merits of proposed projects at each of the business and industrial parks, informing the design review and approval of individual development projects.

## *Relationship to Other Planning Documents*

Used in concert with the City of Northfield Zoning Ordinances and applicable building codes, the development guidelines provide City staff, decision makers, and private interests a common basis for the evaluation of design and development issues during the design review and approval process for individual private development proposals. Once adopted by City Council, the City can incorporate specific guidelines into the City's Zoning Ordinance, providing the City with additional policies for enforcing the goals and guidelines outlined in the Northfield Business and Industrial Park Development Guidelines.





# Character/Sense of Place

The sense of place found in a community, from either the intrinsic character of a place or the meaning people give to it, greatly influences the quality of life of those who inhabit that space. Existing patterns of human development illustrate that the character of a place and the sense of attachment people have to it can be altered and affected by quality design and planning. By drawing upon the best from the past and the present, we can plan healthy communities that will successfully serve the needs of those who live and work within them. The term healthy community implies the presence of a vibrant social infrastructure that is directly related to the built and natural environment and its overall sense of place. Such planning for healthy communities should adhere to certain fundamental principles for site planning, parking and circulation, building mass and character, landscape design, lighting and amenities.





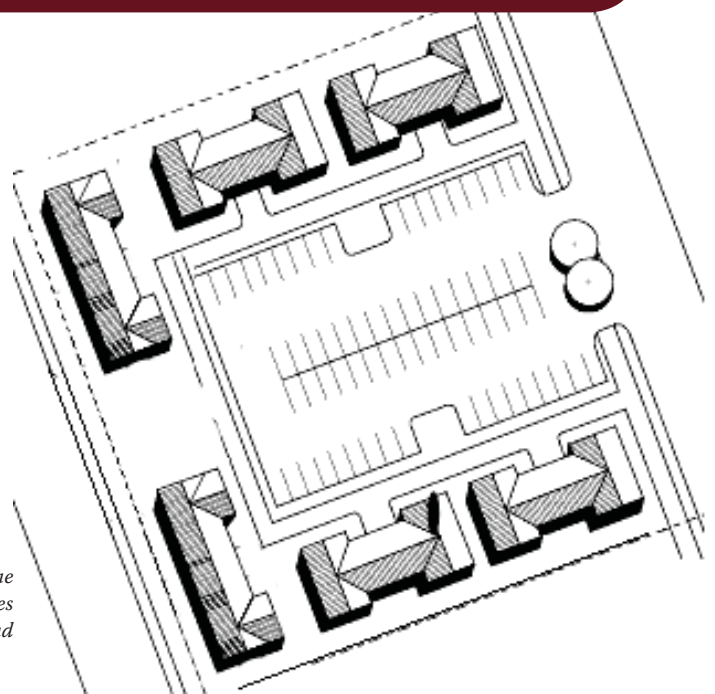
## Site Planning

The purpose of the Site Planning portion of the development guidelines is to consider the organization of the business and industrial parks and the relationship with the public right-of-way, adjacent properties and future projects. The overall site plan should provide direction for development and organization of the of the Business-Industrial Park in order to achieve a built environment that is in harmony with the natural setting, provides a comfortable, distinctive, and stimulating environment for the users of the park, and is based on the sound economic practice of thoughtful sustainable design. The intent is to create an environment that finds its' unique identity by becoming a part of the natural setting while also aligning with the character of Northfield; ultimately encouraging its users to experience this distinctive environment and spectacular outdoor setting that is an integrated component of the City of Northfield.

The built environment should generally be characterized as low in profile and hewn in colors and materials that complement the land and native environment, and fit into the rolling agricultural landscape and built character of Northfield. The arrangement of structures, parking, circulation areas, and open space are all key elements in site planning and design. The siting and orientation of each building shall be considered as it relates to its specific parcel, its affect on adjacent parcels, and, as it occurs, the massing of consecutive lots.



*Goal: The overall site design will be in harmony with the natural setting, contribute to the growing sense of place and character of Northfield, and will enhance the safety and vitality of the pedestrian environment.*



*Buildings should face the street and parking areas should be located behind primary buildings.*

## *Guidelines:*

- » Buildings should relate to the terrain and each other in their massing and forms. Larger masses should be located at the centers of building compositions, with smaller forms stepping outwards and down.
- » Consider breaking very large buildings into modules or sub-parts to reduce perceived scale.
- » The siting and orientation of the buildings should protect and enhance existing views and vistas.
- » Parking areas should be located behind primary buildings to encourage continuity of building uses that contribute to a pedestrian friendly environment.
- » Building placement that creates opportunities for plazas, courtyards, patios, or outdoor dining is strongly encouraged.
- » Building entrances should address and front the street.
- » Buildings should engage to the ground. Minimize the use of heavy bases and built up platforms for the buildings.
- » Where feasible and appropriate, keep buildings low and oriented to the contours of the topography so that the form of the rolling landscape continues to be dominant.
- » Buildings should enhance the character of existing land forms and site features.
- » Site and building design shall accommodate pedestrian circulation onsite from parking areas to plazas, open space, pedestrian pathways, and to adjoining buildings. Existing and proposed pedestrian and/or bicycle circulation systems and easements shall be integrated into site design.

## Mixed Use:

- » Buildings should be placed to occupy the street edge to the greatest degree possible, creating a continuous pedestrian-oriented façade along the street.
- » Encourage recessed space for front door entries, outdoor dining, and sales areas of plazas intended to invite pedestrian activity.
- » Building corners at primary intersections should be treated as prominent features, taking advantage of the opportunity to create a unique district identity by incorporating attractive entrances and architectural features.
- » Minimize gaps and openings between buildings in order to maintain continuity of the pedestrian environment.

## Residential:

- » Buildings should be set back a minimum of 15 feet, but no more than 50 feet from the public right-of-way.
- » The set back area should be utilized as a transitional experience from public to private and could include: front stoops, building entries, plaza/patio space, landscaping, ornamental fencing and building identity.



*Building occupy the street edge to create a continuous pedestrian-oriented facade.*



*Building and parking placement accommodates pedestrian access and amenities.*



*Building placement provides space for outdoor gathering.*



## Building Mass and Character

The siting, massing, orientation and a building's overall design character affect the way a building relates to and "fits" within its natural and manmade context as well as its environmental and energy performance. When designed well, a building can contribute to the continuity of street elevation, as well as emphasize a site's unique characteristics (e.g., slopes, street front, open space, corner lot, etc). Buildings with varied roof lines, window details, façade articulation, entry details, and different but complementary materials contribute to the interest of a streetscape. Consequently, a building's design, its shape, form, articulation and exterior materials can have a significant impact on how the structure is perceived and how it performs.

The use of different architectural elements can enhance a building's visual appeal and even diminish the perceived size of a large structure, thereby helping it fit into the proposed development pattern. Regularly spaced entrances, windows, balconies, and different rooflines provide visual relief to large buildings by dividing their total mass into smaller, identifiable sections with a more human scale. A building's roofline can also facilitate compatibility with adjacent structures and reinforce the architectural character of a street.

The development shall strive to also create buildings that through their placement, orientation and relationship with the prevalent site forces can take advantage of passive and natural climatic forces providing for the responsible use of energy and natural resources.



*Goal: The development will create buildings that through their massing, size, scale, orientation and physical characteristics will contribute to a positive, though varied, design aesthetic that responds to appropriate human scale.*

### Industrial/Warehouse

Buildings with large footprints (15,000 sf and higher) and/or elevations (1,500sf or higher), should be articulated in such a way as to break up the apparent scale of the building into smaller areas.



### **Commercial/Office/Mixed Use/Community**

The ability of small to large commercial buildings to articulate their massing, depth, texture and materials can help provide a unifying sense of character and context to both the streetfront and overall development.



### **Residential**

Whether single family or multi-family, housing can withstand - and in many cases, demand - the use of a variety of styles, scales and character while maintaining an overall sense of context and character.



## Guidelines:

### Massing, Size and Articulation:

#### Daylight Plane

- » Buildings should allow for an establishment and continuation of a daylight plane in order to maintain access to daylight for all buildings and sites. The daylight plane shall be established and measured from a point five feet above the property line and an angle of 45 degrees. ?????????????????? need to have access to daylight, but this may hinder design??
- » Buildings should utilize daylighting to the greatest extent appropriate and achievable for their use in order to increase energy efficiency of the building.

#### Building Composition

- » Build structures with a clear design concept. Designs may be symmetrical or asymmetrical, may highlight a courtyard or architectural elements (e.g., arcade, entry), or may use terracing and setbacks for daylighting and viewsheds (a technique that can reduce a building's impact on a site with steep slopes). Buildings should be designed and situated on sites to complement the existing natural and built environment, as well as to provide compatibility and connectivity with neighboring sites.
- » The desired condition is to have the building frame and enclose the street, which is achieved by providing building height that is proportionate to the width of the adjoining major street. A ratio of building height to street width of one-to-two creates a strong "room-like" street, while a one- to-three ratio provides good street definition and proportion. Shorter buildings of one story facing broad streets will not achieve the desired relationship
- » Use building forms that reinforce the perception of the natural topography.
- » Buildings that cut into slopes are encouraged where they can help minimize the perceived mass and size.
- » Step buildings down at hillside edges, to minimize visual impacts and reduce the apparent height.

#### Size, Scale and Height

- » A single, large, dominant building mass should be avoided. Where large structures are required, mass should be broken up through the use of setbacks, projecting and recessed elements, and similar design techniques. Changes in mass shall be related to entrances, the integral structure, and/or the organization of interior spaces and activities and not merely for cosmetic effect.
- » A variety of building sizes is appropriate according to function and type.
- » Building design shall emphasize a human scale at ground level, at entryways, and along street frontages through the creative use of windows, doors, columns, canopies, and awnings or other architectural elements.
- » Low-profile buildings are encouraged, though a minimum building height of 15 feet is required with 25 feet being preferred. On larger structures and sites, a minimum building height of 25 to 40 feet is preferred.
- » Avoid placing tall buildings at high points on the site or in other highly visible areas unless required by the building's function or development concept.



*Buildings should utilize daylighting to the greatest extent possible. Shown here: Aldo Leopold Center*



*Buildings shall emphasize a human scale at ground level and along street frontages. Shown here: Chartwell Conference Center*



*Low profile buildings are encouraged.*

### Relationship to Other Buildings

- » Building mass should reinforce the definition and importance of the street or open space.

### Articulation of Façade

- » In building façade design consider: compatibility, proportion, human scale, repeating patterns, consistent levels of detail, continuity of a theme, signage, durability of materials, color, texture, and window-to-wall-area ratio.
- » Buildings with façades possessing common elements (e.g., architectural features, building materials) contribute to a unified street character even though their uses may differ.
- » Variations in facade treatment may be continued through the structure, including its roof line and front and rear facades to reduce the perceived size of the building.

### Orientation

- » Major building entries shall be designed and located to provide the primary building access oriented to the public street and sidewalk.
- » Doorways should be prominent and obvious in appearance, so as to attract the users toward the entry. Major entry features should primarily address the street, with entry courts, display windows, signage, lights, walkways, and vestibules, as appropriate. Major entries should be adjacent to, or very close to, the street and public sidewalk
- » Orient buildings on the site to complement the natural topography.
- » Orient buildings on the site to take advantage of the site's microclimate, solar, daylighting, natural ventilation and energy flows.



*Building mass should reinforce the importance of the street, sidewalk, or open space.*



*Orient buildings on the site to take advantage of the site's microclimate, solar, daylighting, natural ventilation and energy flows.*



*Orient buildings on the site to complement the natural topography.*



*Building entrances should include architectural elements.*

## **Entrance Design:**

### Relationship to Street

- » Buildings should have entries directly accessible and visible from their principle roadway, plaza or open space. Buildings with the main entry on the side should include architectural elements that make the entry visible from their principle roadway, plaza or open space and include a generously proportioned sidewalk from the street to the entry. In multiuse buildings, each building use and ground floor tenant space should have at least one functional entrance directly visible and accessible from the street.

### Expression of Entries

- » Entries should be marked by architectural features that emphasize their importance. Features such as tall building features, a change in the building plane, projecting overhangs, special lighting, awnings and signage can signify the location and importance of an entry.

## **Façade Design:**

### Transparency and Openings

- » Building facades should animate the street, providing visual interest to passers-by. Transparency means that one can see or have a sense of what is behind a building facade, creating an interesting and lively street face.
- » Transparent doors and windows should extend at least 60% of ground floor facades facing principle streets and open spaces, and 50% of second floor facades. These percentages may be reduced if they are not appropriate for a buildings use or energy efficiency/performance.
- » Facades should have ample, articulated doors and windows to create visual interest and allow one to see inside. OR???:
- » Windows shall be located in all building facades visible from the public way, especially on building facades along the major public street or open space.
- » Limitations on transparency, such as dark or reflective glass, or interior coverings, should be avoided. Where interior uses are not conducive to transparent viewing from the public way, windows can still convey a sense of activity and presence



*Windows should be located on building facades visible from the public right of way.*



*Facades should have ample doors and windows so that one can see inside.*

along the street. Even these more private windows can convey occupancy and habitation when lighted from within, as during evening hours, even if the interior is screened from view.

### Glazing

- » Glazing should be designed and selected with energy performance in mind.
- » Glazing should not prevent one from seeing inside a building. The use of reflective or dark-tinted glass is discouraged, especially at ground level, because it prohibits transparency and lacks the visual interest of clear window openings

### Solar Control

- » Solar control devices should not interfere with the transparency of a building facade. Awnings and deep overhangs are appropriate because they provide protection from the elements and enliven facades without obstructing views into and out of buildings or obscuring the pattern of openings.
- » Sunscreens that mask windows and other facade articulation may also be appropriate if not detracting from the transparency of the facade or otherwise mask articulations which provide a sense of human and visual scale.

### Consistency of Expression

- » Residential or mixed-use residential projects should incorporate elements that signal habitation such as entrances, stairs, porches, bays and balconies that are visible to people on the street.
- » All exposed sides of a building should be designed with the same level of care and integrity. Buildings should be attractive and visually engaging from all exposed sides.
- » Architectural details and features should be architecturally valid, not just decorative. Features should be related to the building's structure, function and/or engineering, rather than rather than tacked on or arbitrary.

### Rhythm and Scale

- » Building facades should be designed to have a rhythm and pattern measured according to human movement and scale. Architectural elements can contribute to the rhythm and pattern of the facade, creating visual interest and an inviting pedestrian environment. Vertical proportions of doors, windows and projections should achieve human scale.

### Articulation and Depth

- » Building elevations should have variation and depth, rather than a false front treatment. Varied massing, projections and recesses can be used to create a sense of articulation and depth. Structural elements such as columns, parapets, rooflines and window fenestration can inform building design, as can functional elements such as location of entries, circulation spaces and special rooms.

### Street Front/Public Space Character

- » The street frontage should have continuous ground floor commercial uses characterized by display windows, recessed entries, and amenities such as arcades, awnings and seating areas. Grade-level and partially subgrade parking should be fronted with habitable building space such as storefront and building lobbies.



*Solar control devices should not interfere with the transparency of a building facade.*



*Solar control devices should not obstruct views into and out of the building.*



*Roofs that protect and frame viewsheds and provide access to daylight are encouraged.*



*Change in materials should be integral with building facade and structure.*



*Exterior building material should convey a sense of integrity, permanence and durability.*

## **Building and Roof Form**

### Flat Roofs and Parapets

- » Flat roofs with parapets are strongly encouraged. Gabled and hip roofs are generally discouraged except when used for solar energy production or in the case of mixed use or residential projects that are reflecting an appropriate residential character based on traditional building forms.
- » Parapets should be provided to articulate flat roofs and hide roof mounted equipment. Parapets may have strong cornice detailing to provide scale and visual interest.

### Roof Line Consistency and Integrity

- » Roofs and architectural elements should have functional integrity and should not be used primarily to create a style or image. False roof structures such as mansards are strongly discouraged.

### Roof Forms

- » Roof forms should be appropriate to the design of the building and style reflect the facade articulation and building massing, as opposed to a single-mass roof over an articulated facade.
- » Roof forms that protect viewsheds, access to daylight and views of significant features are encouraged

### Screening

- » Rooftop mechanical equipment should be screened with either a full height equipment screen wall or penthouse. The screen or penthouse should have a material and form similar or complimentary to the building.

## **Materials**

### Durability

- » Exterior building material and finishes should convey a sense of integrity, permanence and durability. The selection of appropriate materials and finishes has a powerful impact on the perception of quality.

### Articulation of Materials

- » Change in materials should be used to articulate building elements such as base, body, parapets caps, bays, arcades and structural elements. Change in materials should be integral with building facade and structure, rather than an application.

### Local Materials

- » As much as possible, give preference to locally (within 500 miles) harvested and manufactured materials.

### Recycled Content Materials

- » After durable and local material choices have been made, give preference to materials that contain recycled content.





## Parking and Circulation

A fundamental development objective for all sites is the safe and efficient movement of vehicles and pedestrians with the least amount of impact to the surrounding properties. The Business-Industrial Park must balance the need for truck and large vehicle circulation with the requirements of an active urban environment, which is often at odds with generous vehicular provisions. Large reservoirs of surface parking have detrimental effect on street life, as it produces a void in the street wall and subsequently no activity.

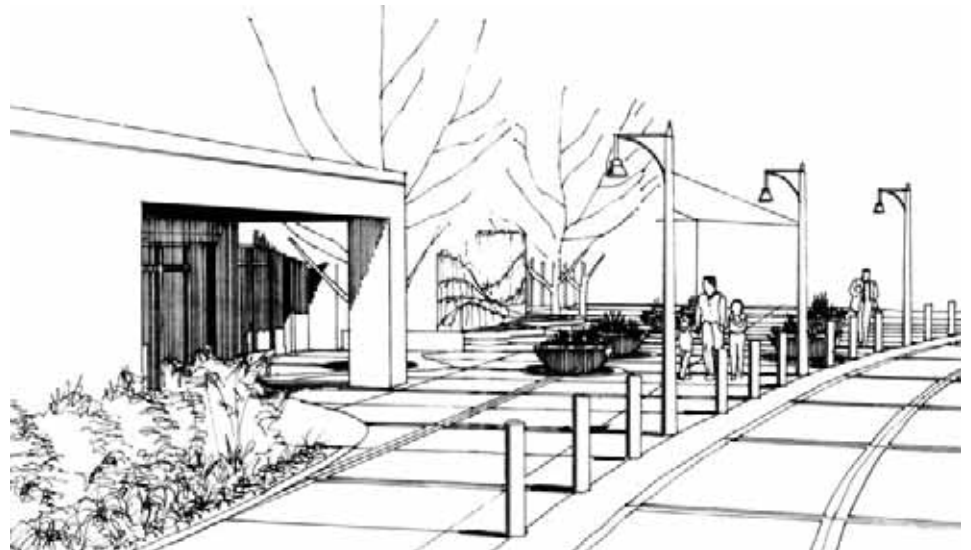
The design of commercial and residential buildings can sufficiently accommodate required parking while still contributing to good urban design. Adequate parking provision need not produce a dead realm of surface parking lots.



*Goal: Parking areas will be designed to provide safe and convenient movement of motor vehicles, limit vehicular/pedestrian conflicts, limit impervious surfaces, provide for screening of paved areas, and soften the visual impact of parking areas.*

### Guidelines:

- » Driveway access along streets shall be kept to a minimum which is essential for proper industrial traffic circulation.
- » Driveways should be aligned with existing or planned driveways on the opposite side of the street or oriented to existing or future street median breaks.
- » In order to minimize interference with street circulation, a minimum driveway length of twenty feet may be required between the property line and the first parking stall.
- » At least one sidewalk connection between the building and the perimeter street is required. Large parking areas shall have sidewalk connections to the building entries or ground plaza areas.



*Pedestrian circulation should be separated from vehicular circulation as much as possible.*

- » A combination of on-street public parking and off-street public parking should be utilized to be easily accessible and identifiable.
- » Where opportunities exist for shared parking between users with staggering peak parking demands, owners and developers shall make every possible effort to take advantage of this opportunity to reduce the total number of parking spaces within each site or parcel.
- » Parking facilities should be designed to limit conflicts between vehicles and pedestrians. Pedestrian circulation shall be separated from vehicular circulation as much as possible to reduce traffic hazards and make the pedestrian system safer, more efficient, and visually attractive.
- » In the locations where parking areas are exposed to the sidewalk they should be separated from the public right-of-way by a landscaped strip or hedge.
- » Surface parking areas should be landscaped with trees, shrubs and planting. Perimeter landscape planting and grading should be used to screen the parking from off-site views. Internal landscape planting should be used to break up the parking lots, provide shade, and provide opportunities to capture stormwater runoff.
- » Design interior landscape islands to be at least six feet wide and plant with a minimum of one shade tree and full groundcover of native plants for stormwater infiltration and uptake.
- » A maximum of 15 contiguous parking stalls are permitted before providing a landscape island.
- » Parking lot landscape islands are to be a minimum of 350 square feet.
- » Bicycle parking and/or carpool parking spaces should be provided at a amount equivalent to 10% of the total automobile parking for each non-residential and multi-family building on site (LEED ND)
- » Bicycle parking should be located close to the building entrance to help prevent vandalism. Avoid locating bicycle parking in hidden areas, dark locations, or garage recesses.

Mixed Use/Office/Retail

- » Parking areas shall be located behind primary buildings to encourage continuity of building uses that support pedestrian activity along the street. Ground floor parking should not be exposed to the street.
- » Parking should be accessed from the rear of buildings and along secondary streets, if possible. If not possible, the entrance to parking from the street should be designated as part of the rhythm of storefront, but not in such a way that it becomes a hazard for pedestrians.
- » When necessary, such driveways should be minimized in width and provide good visibility of pedestrians from vehicles using the driveway. A change in material for the sidewalk should be utilized to indicate or warn pedestrians where the access to parking is located.



*Large parking areas shall have sidewalk connections to the building entries or ground plaza areas.*



*Internal landscape planting in large parking areas should be used to provide shade and opportunities to capture stormwater runoff.*



*Bicycle parking should be located close to the building entrance to help prevent vandalism.*



## Landscape

The purpose of the landscape portion of the Development Guidelines is to provide guidance for site landscaping - an important sensory component that will define the overall visual character of the Business-Industrial Park and is critical for sustaining the ecological processes of water, land, plants, and animals. The concepts guiding these objectives aim to preserve and restore ecological processes that replicate natural conditions, while also sustaining the human community.

The water cycle represents the key response among these elements. Throughout the site design process, it is important to limit areas of high water use turf to areas of intensive use by people. Such areas include active recreation areas and areas highly visible by pedestrians (such as building main entrances). Turf grasses should be used as a ground plan amenity and not just as infill material. With natural hydrology established, the plan provides for the preservation of the ability for groundwater reserves to store rainfall for later use and to provide adequate habitats for people and wildlife.

A diverse and healthy urban forest provides many environmental benefits, including enhanced energy efficiency, stormwater management, air quality, and wildlife habitat, but also is one of the most important elements in creating a humane streetscape and attractive public realm. Trees and plants soften the development's hard surfaces and sharp edges, not just by screening but also by adding organic forms, colors, textures, and movement to the setting. They also add scale to the Business-Industrial Park environment that people can readily relate to, and, as living organisms that grow and change with the seasons, introduce a dynamic quality that mitigates the largely inanimate character of the built environment.



*Goal: The landscape will be aesthetically pleasing, maintain and support the character of Northfield, minimize water use for irrigation, increase wildlife habitat, and provide opportunities to encourage social interaction.*

*To minimize maintenance and water consumption, native, drought tolerant species should be selected.*



## Guidelines:

- » Landscaping should be introduced to the public realm to contribute to the quality of the pedestrian experience by adding color, texture, and form that add visual interest, and provide scale, shade, and buffering that contribute to the sense of comfort.
- » Landscaping should maintain and expand the City's urban forest. A minimum of 50% of the area shall have shade coverage at tree maturity.
- » Plant materials should be in scale and compatible with the adjacent land uses and buildings. Plant materials and landscaped areas should be used to enhance the appearance of structures, define site functions and edges, and screen undesirable views.
- » For maximum visual effect, plant material should be placed in masses rather than as isolated individual plantings sporadically placed.
- » Natural areas should be integrated seamlessly into the development. Employ mow strips where separation from natural area is desired and create appealing boundaries to natural landscapes such as clean edges or artful species layering.
- » Plant species should be selected for their suitability to climatic conditions in Minnesota, including native or naturalized species that provide potential habitat for local wildlife.
- » Prime habitat for sensitive wildlife species should be identified to protect their seclusion. Use vegetation screening to separate wildlife habitat from developed areas.
- » A design pattern of large habitat cores, buffers, and connecting corridors that include prairie, savannah, wetland, and marsh habitats should be used.
- » Wetlands should be designed as a functional and integrated natural system by using natural patterns of slope and soil to create new wetlands.
- » To minimize maintenance and water consumption, emphasis should be placed on the selection of native, drought-tolerant species, and all landscape areas should be irrigated with high-efficiency automatic drip and low-flow watering systems. High water use turf should not be used on slopes greater than 4:1, or in medians and narrow strips of planting that are less than 6 feet wide, whether in a parking lot application, roadway median or setback area.



*Native plant species should be selected for their suitability to climate conditions.*



*Plant materials and landscaped areas should be used to screen undesirable views.*



*Wetlands should be designed to function as an integral natural system.*



## Gateways & Access

Gateways provide a unique sense of transition, identity, and anticipation. The Northfield Business-Industrial Park Master Plan identifies the need for vehicular gateway features to be constructed at the edges of the Business and Industrial Park, particularly entries off of Highway 19. The primary functions of these major gateway features are to:

- » Serve as landmarks highlighting the arrival to the Business and Industrial Park.
- » Provide a transition from a rural setting into the Business-Industrial Park; and
- » Reflect the character of the Business-Industrial Park.

In addition to these aesthetic functions, gateway features may also serve as traffic calming features. As traffic calming features they perform two primary functions. The first is to slow traffic down to an acceptable speed within the Development Core and secondly increase the motorists' level of awareness that they are entering an area with a greater level of pedestrian activity. The design of a major gateway is subject to the function of the road and the width of the right-of-way, and is directly associated with pedestrian and vehicular access and movement.

Secondary gateways can exist within the community and provide transition between different districts and land uses. They should relate to the development's unique function, character, and features and can be identifiable through the use of landscaping, public art, signage, or other features. These design elements can quickly build a sense of place, orient people and define a quality that people will identify with and relate to.



*Goal: Special design and treatment of Gateways will enhance the character and identity of the development and will provide an appropriate sense of transition from adjacent properties.*



*Gateways provide a sense of transition and identity and convey a sense of entry.*

### Guidelines:

- » Public areas, including parks, common courtyards, schools, and civic spaces should incorporate threshold structures such as gateways, arbors, signage etc. that convey a sense of entry and clearly mark points of access to those spaces.
- » Medians as part of gateways should be designed to be accessible as refuges for pedestrians crossing the roadway.
- » Landscaping around gateway signage should be native and in keeping with the specific characteristics of the gateway's location. Plant material and planting designs that reflects the agricultural or horticultural heritage of Northfield (e.g., orchard-like) may be acceptable.
- » Where feasible, lighting may be incorporated in the gateway designs to enhance the entry experience at night. Any lighting should be the minimum needed for safety and sensitively placed to avoid light pollution and adding to visual clutter.
- » Materials for gateway signs, supporting structures and other landscape structures will be high-quality and durable, preferably natural, and consistent with the specific characteristics of its location.

# Lighting

Lighting needs vary and while it is important to safely light pedestrian and auto routes, it is also important to respect the visual sensitivity around residential areas and the adjacent rural landscape. Views of evening sunsets over the agricultural landscape are among the most enjoyable features of living in Northfield. Views can be ruined, however, by excessive light from street lights, athletic fields, parking lots, and buildings. Eliminating glare and reducing visibility of the light sources are important aspects to reducing the visual impacts to the residents of Northfield.



*Goal: Lighting will contribute to the visual continuity and ambiance of Northfield and will not distract from neighboring properties.*

## Guidelines:

- » Luminaire styles that reduce the amount of light thrown into the sky should be selected.
- » Pedestrian lighting shall utilize lens technology that sheds the light onto the path and away from windows.
- » Parking lot areas shall use cutoff fixtures to reduce glare and spillover onto adjacent sites.
- » Light poles within parking lots shall be a maximum of 24 feet in height.
- » Site lighting must be directed onto vegetation or prominent site features, such as boulders or signage, and shall be achieved with hidden light sources.
- » No lighting will be permitted in natural areas, with the exception of walkways and trails.
- » Lights should be kept low to provide lighting underneath tree canopies and to preserve the human scale of the development.
- » Exterior light fixtures shall be located and oriented to focus light inward to minimize light encroachment on neighboring tenants or residences.

*Lighting should contribute to the character of a place and can be incorporated with sculpture and art.*





## Signage

Signage should be used for information, direction, and wayfinding. High quality signs that are limited in number, appropriately sized, and suited to the context of the overall architectural theme of the building, street, or development enhance the appearance and character of the development. The size, placement, and design details of all signs are considered to be an integral part of the site development approval process, as well as an integral part of the entire Business & Industrial Park.



*Goal: Signage will provide project identity, adequate wayfinding, and create a functional information system that contributes to the city's character, while remaining subordinate to the surrounding buildings and landscape.*

The three basic sign categories for project signage addressed in these guidelines include project identification, informational/directional, and temporary.

- » Signs that provide the user with information about location, business hours, and other general information are Informational/Directional Signs. Any sign giving identity to three or more buildings shall be considered a Complex Identification Sign.
- » Project Identification Signs include signs for hotels and retail, distribution/warehouse, residential development, and business directory signs.
- » Temporary Signs can be used for construction and design team information or future tenant identification.



*The information provided on freestanding identification sign should be limited to company logo, building, and address.*

## Guidelines:

- » All project identification signs shall be integrated into the surrounding landscaping.
- » Over-signage should be avoided throughout the Business-Industrial Park.
- » Sign materials should be constructed of high quality, attractive, and durable materials.
- » Buildings with multiple tenants should have a common signage program and include a multiple directory.
- » The Informational/Directional sign system should provide information and wayfinding for all users (vehicles, transit, bicycles, and pedestrians).
- » Signs for pedestrians should be placed at decision points in parking lots, in plazas, and where highly traveled walkways intersect.
- » Location and size of signs shall preserve sight lines and enhance visual corridors to foster wayfinding and circulation. Visual conflicts with adjacent residential uses should be avoided whenever possible.
- » Parking lot entrances should be identified with employee and/or visitor designation along with the complex or building name.
- » Retail Identification Signs shall be building-mounted only. Signs may be mounted on building face or canopy.
- » Distribution/Warehouse Signs may be ground-mounted (single or double-faced) or building mounted.
- » Only one Distribution/Warehouse Sign at the main entry drive along the street frontage is allowed for any given building.
- » Distribution/Warehouse Signs may only contain the business name, logo, and principal service or product only if necessary to clarify the nature of the business.
- » Only one Temporary Sign may be installed and directed towards street frontage.
- » Hotel Signs may be ground-mounted, single or double-faced, or single-faced building mounted.
- » The information provided on a Complex Identification Sign shall be limited to the complex name, complex logo (if applicable), and address. The signs may be single or double-faced, ground-mounted monuments only.
- » The information provided on a Freestanding Building Identification Sign shall be limited to company logo (if applicable), building, and address. The signs may be single or double-faced ground-mounted monuments only.



*Retail Identification signs should be mounted on building face or canopy.*



*Ground-mounted project Identification signs should be integrated into the landscape.*



*Signs for pedestrians should be placed at decision points and where highly traveled walkways intersect.*



# Water Resources

Clean water is becoming an increasingly scarce resource throughout the world. In order to seamlessly integrate stormwater and greywater management systems into the natural landscape, greenways that run adjacent to the natural lowlands should be preserved and developed into a system of parks, trails, and natural open space. Onsite stormwater management can help transform water at the source from a potential nuisance as polluted and erosive runoff from gutters directly to wetlands and sewers, into a resource for the environment and communities. In turn, it will beautify the landscape, support wildlife habitat, provide recreational amenities, and reduce the need for more sewage lines and treatment plants. Properly utilizing native plantings, shade trees, porous paving, rain barrels and cisterns, rain gardens and bioswales, and onsite greywater management systems are a few of the ways by which to help Northfield remain a sustainable and prosperous community. Following is a list and description of sustainable devices and techniques strongly encouraged for every tenant to use in order to achieve sustainable water management and conservation.



## Green Roofs



A major source of stormwater is the high-velocity runoff coming directly from roofs. Green roofs can absorb rainwater and reduce runoff substantially. A green roof involves installation of a layered system of membranes, substrate and plants onto a conventional roof. There are two main types of green roofs: extensive and intensive. Extensive green roof systems are lightweight and typically do not require a roof to be designed with extra reinforcement. Intensive green roof systems offer greater stormwater retention capacity and better energy efficiency benefits for a building. They are also capable of supporting a greater variety of plants than extensive systems, and allow for the creation of different plant habitats. Intensive green roofs are generally more attractive aesthetically than extensive systems, but they have a higher capital cost.

## Ponds and Wetlands



Stormwater wetlands are designed specifically to receive and treat stormwater runoff. Water quality improvement is achieved through a combination of settling, microbial action and pollutant assimilation by wetland plants. Stormwater wetlands are designed to accommodate lower water quality and frequent fluctuations in water level. They can be an aesthetic feature, offering wildlife habitat as well as functioning as part of the stormwater management system.

## Bioswales and Rain Gardens

Bioswales are recommended for use in parking lots as a way to replace curbed, landscaped medians with an option that assists in stormwater management. A bioswale is a lightly excavated swale where the grade is a foot lower than surrounding pavement. Surface water enters the swale via openings in the curb, and then flows through a series of short pools created by low check dams. Water drains into a stormwater inlet and then flows through underground pipe to the next segment of the stormwater system. Bioswales can improve water quality through the removal of sediments and the assimilation of nutrients. A bioswale can be planted with trees for shade, and with low-growing prairie plants that tolerate road salt.



## Bioretention Areas



A bioretention area is a depressional stormwater management facility that uses a conditioned soil, mulch and plant matrix to collect, and infiltrate stormwater. It uses the substrate and its microbial action to filter and break down or assimilate pollutants. Stormwater is routed to or flows overland through a vegetated strip to the basin, then enters a shallow basin consisting of a prepared planting bed, organic mulch and woody and herbaceous plant species. Water is detained, passing slowly through the soil medium and allowing the physical and biological processes in the facility to enhance water quality before discharge.

## Permeable Pavement Systems



Another design technique is to utilize pervious paving materials that aid in percolation, such as individual brick or stone paving units, or pervious concrete. Permeable pavement enables stormwater to drain through the surface and into the soil below, rather than collect on the surface and run off into storm sewers. Permeable paving materials include, but are not limited to, porous concrete, permeable interlocking concrete pavers, concrete grid pavers, and porous asphalt. Permeable surfaces, if installed correctly and maintained properly, duplicate the structural and functional features of traditional pavement, but generate less runoff. The various forms of permeable pavements can be used in many areas, including low-traffic roads, emergency access roads, parking lots, sidewalks, and road shoulders.

Trees in urban areas function like public utilities, reducing stormwater runoff, improving air quality, and reducing energy consumption. Tree canopies intercept and capture rainfall, reducing the amount that reaches the ground and help to keep homes up to 20-degrees cooler in the summer time. Tree roots and forest soils allow for better infiltration of rainfall. Trees and Riparian Forests also protect and buffer streams and are critical to maintaining healthy, clean waterways. Tree roots provide streambank stability, reducing erosion, filter out sediments, remove nutrients, shade and cool the water, provide habitat for many different species, and provide the primary food source for aquatic insects that are a critical part of the aquatic food chain.

## Shade Trees



## Cisterns & Water Harvesting



Rainwater harvesting refers to a system of capturing stormwater runoff and using it to supplement or replace water from a centralized system or a well. Typically, water is captured from a rooftop and stored in a cistern for later use or released in a slow and controlled manner to facilitate infiltration into the soil. Harvested rainwater has many practical uses, from irrigation during dry periods and washing vehicles to flushing toilets, or virtually any industrial use that does not require treated water.

## Mulching



Organic mulches act to cool the soil during hot weather, thereby reducing the evaporation and subsequent water use. Mulches also reduce the growth of weeds and buffer soil temperature fluctuations throughout the year. Inorganic mulches are very beneficial and have excellent applications for specific purposes.

Landscaping with native plants serves an important role by slowing runoff from developed areas, facilitating infiltration, assisting in the uptake of moisture through transpiration, assimilating nutrients, filtering out particulates, stabilizing channels, slopes and shorelines. Native plants also do not require permanent irrigation and hence to not contribute to wasteful and costly water practices of the past.

## Native Plants



## Stormwater Management/Water Quality

Stormwater runoff from roofs, driveways, and roads carries pollutants such as oil, heavy metals, chemicals, and lawn fertilizers directly to nearby waterways, where they accumulate and seriously harm water quality. Despite the varying techniques, the purpose of such ecologically-conscious design is to allow water proper time to soak into the soil where it nourishes plants, can be cleaned, replenishes aquifers, and supports the water systems during dry periods. Onsite stormwater management transforms water from a potential nuisance as polluted and erosive runoff that flows from gutters directly to wetlands and sewers into a resource for the environment and the business-industrial park. The volume of stormwater generated can be reduced substantially or eliminated through compact design and the adoption of technologies such as green roofs, permeable pavement and bioretention systems. Additionally, proper management techniques will beautify the development and streetscapes.



*Goal: The development will implement a water management system that collects and filters stormwater, improves water quality, reduces infrastructure and long term maintenance costs, and provides a valuable aesthetic amenity for the community.*

### Guidelines:

- » Avoid direct connections from impervious surfaces to ponds and lakes
- » Integrate the stormwater management systems and community open space to provide unique public amenities.
- » Where feasible and appropriate, install non-traditional swales with natural meanders, native plants, and stone check dams to slow water runoff and uptake nutrients.
- » Use native grasses where possible and limit the use of bluegrass
- » Trees and shrubs should be placed in mulched areas rather than in turf areas so that irrigation can be zoned separately, the soil stays cooler, and for ease of maintenance.
- » Vegetated swales should be at least 20 feet wide, and designed with slopes that do not exceed 4:1.
- » Construct bioswales with side slopes that are 3:1 or flatter.
- » Maximum ponding depth in bioretention basins is six inches.
- » Standing water at or near the surface of a bioretention basin should be eliminated within 72 hours to avoid mosquito proliferation.
- » Route enough stormwater to the wetland basin to maintain a permanent pool.



*Rain Gardens improve water quality, reduce run-off, and can be aesthetically pleasing and attractive.*



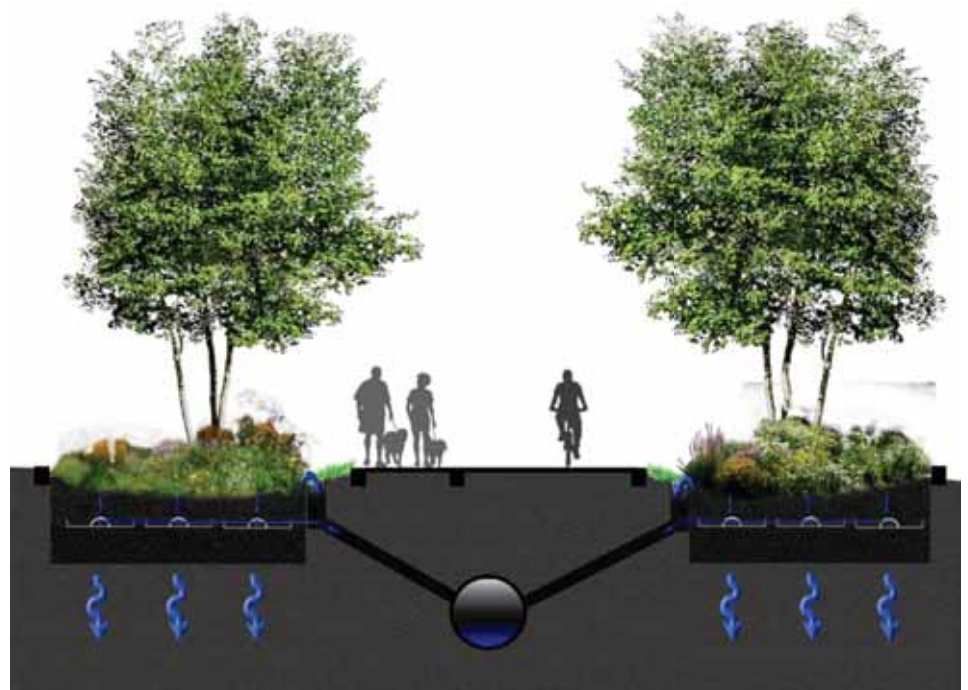
## Water Conservation

Water conservation is the planned management of water to prevent waste, overuse, and exploitation of the resource. Effective water conservation planning seeks to “do more with less,” without sacrificing comfort or performance. Demand-side management methods can reduce the amount of water consumed on-site at a facility or site, and include system optimization, water conservation measures, and water reuse and recycling systems. Other efficiency options at a building scale include leak detection and repair, industrial process improvements, and changing the way fixtures and equipment are operated and maintained. On a watershed scale, Northfield will provide leadership in sustainable and ecological design working with Dakota and Rice Counties to develop systems, both natural and manmade, that will help protect and enhance the sensitive watersheds of the communities that are built here.



*Goal: The development will design and implement a water system that minimizes water movement and overuse, prevents water waste; and reuses, recycles and conserves our water resource for generations to come.*

*Gravity based reservoirs beneath raingardens manage stormwater runoff, providing slow infiltration and the opportunity for later re-use of the resource. The chambers can also be utilized for passive irrigation, designed to slowly release water for later use, to keep the rooting zone of turf moist.*



## Guidelines:

- » Water conservation techniques should allow the community to maintain its ground and surface water levels and protect optimal water balance within the watershed.
- » Wherever feasible, re-use stored storm water supply for irrigation of public spaces utilizing sub-surface chambers and passive irrigation strategies.
- » Consider the provision of roof runoff storage and distribution to provide temporary water supplies utilizing cisterns or rain barrels.
- » Consider opportunities to re-circulate water, including collected stormwater or high quality wastewater within industrial operations and between businesses.
- » Sensible placement and design of water features should allow for enhancement of public areas with minimal resource consumption.
- » Water-efficient plumbing fixtures (e.g., ultra-low-flow toilets and urinals, waterless urinals, low-flow and censored sinks, low-flow showerheads, and water-efficient dishwashers and washing machines) should be considered in all buildings.
- » Where stormwater is not recycled for irrigation, water-efficient irrigation systems should be implemented to reduce water use associated with landscaping (irrigation-control systems, low-flow sprinkler heads, water-efficient scheduling practices, and xeriscaping)
- » All buildings should evaluate and consider the use of graywater and process recycling systems that recycle or reuse water for daily plumbing needs.



*Water from roof tops and impervious surfaces should be used for irrigation of landscaping.*



# Energy Resources

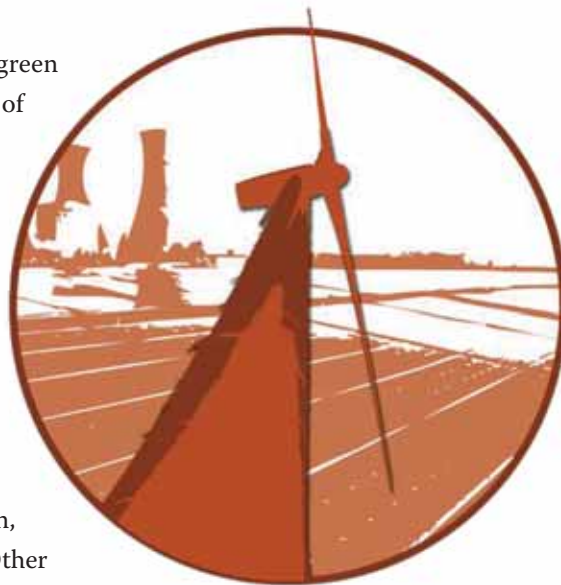
Whether the term used is sustainable design, zero energy building, or green living, all refer to the planning, design, construction, and maintenance of buildings that are energy-efficient, healthy, and environmentally-friendly. Traditional building use consumes 40% of the total fossil energy in the US and European Union, much of which can be attributed to our reliance, almost exclusively, on fossil-fuel-dependant mechanical systems for heating and cooling in our newer buildings.

In the context of the Northfield Business-Industrial Park, energy conservation methods, a primary component of sustainable development, consist of strategies to reduce the amount of fossil fuels required for a building to function. The Sustainable Design of buildings and sites requires an evolving palette of design tools. Some tools, like proper solar orientation, require the application of common sense and best practices for the region. Other tools require designers to incorporate the latest technologies for mechanical systems and material use.

Building at Northfield's Industrial Park presents an opportunity to incorporate green building strategies early in the design process and at an integrated systems level, which will provide both environmental and economic benefits. The amount of development projected for the Northfield Business-Industrial Parks provides a unique opportunity to promote more energy and resource efficient buildings, support greater recycling and waste reduction, and create greater synergies between adjacent Park tenants, integrating operations to create new value-streams.

Each project should undertake a comprehensive analysis to diminish the use of energy and reduce the use of non-renewable resources. The development intends to be a leader and champion of environmentally sensitive design, demanding innovation and creativity from each of the building project teams and sharing of resources and waste streams. . The development is committed to creating a cohesive environment that moves beyond merely sustainable, to one that actively improves the quality of life and the environment for its users. The following are energy goals that all sections of these design guidelines uphold:

- » Siting new structures mindful of orientation, shading and the effect on adjacent buildings and spaces.
- » Using landscape design to create healthy and ecologically appropriate spaces, provide pleasant outdoor environments, reduce exterior lighting demand and minimize stormwater runoff.
- » Reduce energy consumption of building and site systems (HVAC, hot water, lighting) through the use of appropriate mechanical and construction technology (natural cooling, light recovery, passive solar design, etc.)
- » Reducing dependence on non-renewable resources by using renewable energy sources, appropriate recycled materials and by promoting adaptive reuse of existing structures.
- » Reducing marginal energy costs by promoting selection of locally manufactured or fabricated products and materials.
- » Minimizing maintenance and operating costs by employing whole-systems lifecycle evaluation to determine the true project costs, and by integrating innovative daylighting and building engineering solutions at project inception.
- » Improving indoor environmental quality.
- » Maximizing building flexibility to satisfy the varied demands of current and future users and residents.



## Vegetated Shading



Trees and landscaping can reduce peak cooling loads through shading and can cool the ventilation air entering a building. Trees and vegetation are most useful as a mitigation strategy when planted in strategic locations around buildings or to shade pavement in parking lots and on streets. Vegetated shading in the urban environment provides benefits beyond reduced energy use. These benefits include improved air quality and lower greenhouse gas emissions, enhanced stormwater management and water quality, reduced pavement maintenance, and improved quality of life.

## Windbreaks & Earth Sheltering

Earth sheltering is the method of positioning buildings to take advantage of natural landforms as windbreaks. Earth sheltering offers extra protection from the natural elements, energy savings, provides substantial privacy, and is an efficient use of land, specifically for stand alone buildings that do not benefit from the efficiency of adjacencies found in denser urban cores. If designed properly, windbreaks around a home can reduce the cost of heating and cooling and save energy, especially in a winter climate. Winter winds can increase the rate of air exchange between the indoors and outdoors, increasing a building's heating demand and energy use.



## Green Roofs



The use of a green roof can provide benefits not available from regular construction. These benefits include improved thermal insulation for buildings, reduced heating and cooling requirements, increased life expectancy of roofing membrane from better protection from mechanical damage, ultra-violet rays, hail, and extreme temperature differences, reduced heat absorption, and natural production of oxygen and the consumption of carbon monoxide.

## Wind Power



Wind is a clean, inexhaustible, indigenous energy source that can generate enough electricity for millions of homes and businesses. Wind energy is one of the fastest-growing forms of electricity generation in the world. Wind turbines, which convert the kinetic energy of wind into electricity, provide an extremely clean source of energy. However, the turbines are land intensive, requiring a large area per turbine for the most efficient production of power. Smaller scale wind turbines within certain areas of the Business-Industrial Park, however, may power specific industrial processes. They should be sited in industrial areas that pose the least physical and visual disruption in the landscape.

Solar energy, radiant light and heat from the sun, has been harnessed by humans since ancient times using a range of ever-evolving technologies. Northfield's Business-Industrial Park should use a wide range of applications, from individual homes to large buildings, and from passive solar to active solar. Solar hot water heaters, photovoltaics, daylighting, solar architecture, and other passive solar techniques are just a few of the technologies that can be employed in the development. As technology continues to evolve, solar power will continue to be integrated into multiple facets of everyday life.



## Solar Power

## Biogas



Biogas, a source of energy produced from the biological breakdown of organic matter, should serve as a sustainable fuel source for the development. Biogas, which can be produced from farm waste and sewage, provides an effective way to recycle a variety of otherwise problematic waste streams into a renewable energy source. Biogas is a quick, easily controlled fuel, and is converted to fuel in a naturally simple process known as anaerobic digestion.



## Passive Energy

Passive design strategies refer to non-mechanical systems or architectural features that use the sun's natural energy to heat living spaces during colder seasons, while minimizing heat gain during winter seasons. Heating and cooling loads are minimized by designing standard building elements—windows, walls, and roofs—so that they control, collect, and store the sun's energy to optimum advantage. Utilizing energy efficient strategies and passive design strategies can increase energy efficiency by up to 30%, which translates into financial savings. This can be done by passive techniques, such as strategically siting and designing buildings to take advantage of natural sunlight, reducing the need to use artificial light. Additionally, energy can be conserved by mechanisms, such as green roofs, energy-efficient windows, automatic lighting, the use of solar energy and energy-efficient appliances. All of these methods will result in the preservation of limited energy resources.



*Goal: Energy efficient and passive design strategies will contribute to lower dependence on fossil fuels, a cleaner environment, increased cost savings and affordability for the tenants and residents of Northfield's Business-Industrial Park.*

## Guidelines:

- » Orient the buildings so that patios, courtyards, and windows take maximum advantage of the sun's heat in winter and are shaded in summer.
- » Where feasible, design and orient the development such that 75% or more of the project's blocks has one axis of each block within 15 degrees of geographical east/west, and the east/west length of the each block is as long, or longer, as long as the north/south length of the block (LEED ND).
- » Protect all glass areas exposed in summer with deep recesses, overhangs, or other devices to minimize heat gain.
- » Future development may be required to connect buildings to a District Energy System or to make provision for future connection to this system.
- » Consider planting trees and shrubs along Southern and Western sides of buildings.
- » Insulation should meet and exceed all energy conservation code requirements, including the International Energy Conservation Code and the National Home Energy Rating Standards.
- » At least half of the non-roof impervious site area should be shaded by vegetation or other devices.
- » Trees and major landscape elements should be located to provide useful shading and reduce cooling loads.
- » Utilize wind screens of evergreen vegetation on the northwest portions of lots but do not interfere with important solar access to adjacent indoor and outdoor spaces.
- » Reduce the size and number of windows on the heat-intensive west side of homes and use larger windows for greater ventilation and day lighting on the north and east sides of homes.
- » Where feasible and appropriate, nestle buildings into the landforms with creative land forming to provide earth sheltering.



*Orient the buildings so that patios, courtyards, and windows take maximum advantage of the sun's heat in winter.*



*Orient the buildings so that patios, courtyards, and windows take maximum advantage of the sun's heat in winter.*



*Protect all glass areas exposed in summer with deep recesses, overhangs, or other devices to minimize heat gain.*



## Alternative/Renewable Energy

There is a limited amount of nonrenewable energy sources on Earth; therefore it is critical to conserve our current supply or to use renewable sources so that our natural resources will be available for future generations. Renewable energy sources, those that are constantly renewed or restored, include wind (wind power), water (hydropower), sun (solar), vegetation (biomass), and internal heat of the earth (geothermal). Energy conservation is also important because consumption of nonrenewable sources impacts the environment; specifically, our use of fossil fuels (oil, coal, and natural gas) contributes to air and water pollution. Today, eighty-five percent of all energy produced in the United States comes from burning these fuels; and that energy powers almost two-thirds of our electricity and virtually all of our transportation.



*Goal: The development will evaluate all renewable energy harvesting opportunities as a means to cut greenhouse gas emissions and reduce our reliance on fossil fuels.*

### Guidelines:



*Consider the use of photovoltaics on roofs, especially on industrial buildings.*

- » New buildings and site plans shall be designed for optimum sustainability; especially with respect to energy performance derived from resource conservation and optimized on-site renewable energy sources (solar, geo-exchange, wind, biomass, etc).
- » Developers should conduct all required feasibility analyses (including, but not limited, to those described above).
- » Establish energy-use targets that surpass applicable codes and standards.
- » Ensure that the planned building configuration takes maximum advantage of the site and climate.
- » Use case studies and passive solar performance maps to help determine appropriate strategies for the specific project type at hand.
- » The developer should conduct a User Energy Needs Assessment that considers occupancy, operating hours, and all aspects of the interior and exterior climates
- » Investigate using renewable power sources as part of the facility's overall power supply. Consider using solar (domestic) hot water on building types with high hot water usage (such as laboratories) and building-integrated photovoltaics (BIPV) to reduce reliance on non-renewable power.

## By-Product Synergies

The principle underlying by-product synergy is that the waste stream of one industry can be used by another as a primary resource. By-Product Synergy is about creating and capturing value through matching producers of under-valued waste streams with users, and working with regulators to establish support for the process. This promotes a shift from a waste disposal system to a reuse methodology, saving energy and cutting emissions. Facilitated collaboration is utilized to identify innovative ways of integrating operations to cut pollution, save energy, reduce material costs and improve the bottom line. The design team takes advantage of the natural symbioses and commonalities that exist between building uses that might otherwise be overlooked.



*Goal: The development should strive to minimize energy use through the efficiency, sharing, and waste recovery principles of by-product synergy.*

### Guidelines:

- » The opportunities to share energy, heating and cooling, between site areas and with other parcels shall be considered.
- » The opportunity to pool backup generation systems with other buildings and parcels shall be considered.
- » Waste recovery opportunities shall be considered.
- » Appropriate site selection should be considered to increase the likelihood for other low-energy building strategies to be implemented.
- » The nature of the facility should be defined in order to match the end use with complementary energy needs and minimize the resulting wastes.



## Productive Landscapes

The properties of Northfield's Business-Industrial Parks are located in an area that has long agricultural history. Aesthetically the agricultural landscape pattern should focus on blending the new community with the rural context of the site. However, while it is common to think of landscape design as primarily an aesthetic exercise, the landscape at Northfield's Business-Industrial Park is intended to accomplish several objectives: habitat enhancement, stormwater cleansing, carbon sequestration, and provide an interaction between residents/employees and the land that results in a strong social fabric and a closer tie with our earth's supply of energy. These objectives are what may be referred to as a productive landscape.

While policy-level attempts to address agricultural land conservation focus primarily on the preservation of agricultural land and urban containment, few solutions have been explored at the edge – where the two meet. Present day strategies are generally characterized as prescriptions for land-use conflict mitigation and the resultant places – or placelessness – are largely defined by segregation and/or buffering of residential development from agricultural land. Northfield's Industrial Park proposes an alternative strategy of integration at the urban-agricultural edge based on agrarian values and the use of development as a mechanism for the transformation of our local food system.



*Goal: Supporting community-based and local food production will minimize the environmental impacts from transporting food long distances and increase direct access to fresh foods.*



*Dedicate permanent and viable growing space for food.*

### Guidelines:

- » Dedicate permanent and viable growing space and/or related facilities (such as greenhouses) within the project (LEED ND).
- » Provide fencing, watering systems, soil and/or garden bed enhancements (such as raised beds), secure storage space for garden tools, solar access, and pedestrian access for these spaces (LEED ND).
- » Ensure that the spaces are owned and managed by an entity that can include occupants of the project in its decision-making, such as community group, a homeowners association, or a public body (LEED ND).





# Utilities & Services





## Service and Loading

Service areas (loading docks, refuse collection areas and similar facilities) can be a source of odor, noise and smoke, or can be visually unpleasant. However, they serve an important daily need for the development. Therefore the design considerations for locating, screening, and accessing them are significantly important.



*Goal: Service and loading will be carried out with the least amount of impact on the surrounding properties and impediments to vehicular and pedestrian movement.*

### *Guidelines:*

- » Loading and service dock areas shall be located to the rear or sides of a building, away from the main building entrance, or related high visibility areas.
- » Preferably, service, loading, emergency generator, and trash areas should be enclosed within the building structure.
- » Locate loading docks and service areas so that views from adjacent properties, streets, open spaces, and pathways are minimized.
- » External facilities must be enclosed and screened with landscaping to minimize adverse views from adjoining streets, buildings, open space, or the golf course, and designed and constructed of the same design theme and material as the adjoining building.
- » Loading areas shall be designed to accommodate backing and maneuvering onsite, not from a public street, and when occupied shall not prohibit onsite vehicular circulation.
- » The developers may be encouraged to share service areas amongst buildings and with adjacent parcels (e.g., waster collection and sorting, shipping and receiving, parking, outdoor lunch areas).

## Utilities

Utility connections need to be optimally located so that they are both visible yet secondary to the building's key features, typically the main entrance or public areas. The visual and noise impacts of utility structures need to be minimized as much as possible at the Business-Industrial Park. There is also a strong desire for utility easements to be located within the open space system wherever feasible.



*Goal: Utility structures will be incorporated in a visually unobtrusive manner while still serving the need of the development.*

### Guidelines:

- » Integrate future water, sewer, and waste water infrastructure with existing utilities that will remain to serve the future residents and businesses of the business-industrial park
- » Any above grade utility structures should be screened with landscape materials, fencing, or other approved screening devices and not be left floating and exposed in setback zones.
- » Utilities connections to buildings should be designed to minimize their occurrence and mitigate their visual impact.
- » All utilities should be buried within a public right-of-way and make connections to individual projects from a “back of house” location.
- » Locate above ground utility and communication access points and/or structures away from major pedestrian and gathering areas, building entrances, windows, and drainage corridors.
- » Plumb buildings such that they may be connected to a future hydronic district heating system.
- » Plumb buildings to be “retrofit ready” for solar hot water pre-heating systems.
- » The design and installation of all public utilities should be coordinated with private utility companies to ensure timely installation of private utility infrastructure.



## Lighting (for Safety)

Exterior lighting is extremely important to the safety and visibility necessary for nighttime business-industrial campus functions and the movement of pedestrians, bicycles and automobiles. The site would be unsafe without appropriately lighting potential hazards for people and vehicles. Security is enhanced by illuminating potentially hazardous sites, directional and informational signage, movement routes and, in general, providing uniform lighting where people are present.

Ideally, street lighting needs to meet multiple objectives. In addition to ensuring that public safety and security criteria are met, street lighting should be designed to create a comfortable and attractive pedestrian environment and enhance the ambiance and character of the development. Lighting contributes to a human-scaled spatial definition of the streetscape, separating pedestrians from street traffic and providing for increased security and visibility. Pedestrian-scaled lighting can act both as a functional deterrent to unwanted activity and also as a stimulus to extend the active hours of street use.



*Goal: Lighting should contribute to the safety and ambiance, or perception of ambiance, of the development in Northfield.*

### *Guidelines:*

- » Lighting should be continuous (without dark gaps) along primary pedestrian routes and bikepaths.
- » Building mounted luminaires are encouraged for building entrances and should be compatible with the architecture
- » Safe lighting levels for vehicular and pedestrian movement in all parking lots shall be provided.
- » Generally, shorter light standards should be more closely spaced to provide appropriate levels of illumination. Although in lower activity areas where lower lighting levels are acceptable, closer spacing may not be necessary.
- » Within the Mixed-Use, Retail, Office, Public, and Residential areas, street lighting should be scaled to the pedestrian, with light fixtures that are more closely spaced and mounted closer to the sidewalk.

## Maintenance

The key to creating a sustainable development is to have implementation and maintenance build on the design process, each having sustainability as a major consideration. A development with sustainable practices will improve the environment by conserving resources and reducing labor inputs making it less expensive to implement and maintain. The aim is to maintain a high standard of appearance and function of the development in both the short term and the long term. This applies to the appearance and function of buildings, landscaped areas, fencing, storage areas, signage, etc.



*Goal: Development completed on the Northfield Business-Industrial Park will be continually maintained in a state of good repair and condition and will contribute to the overall sustainability of the Park.*

### Guidelines:

- » Advertising structures should be maintained as part of the maintenance of the building.
- » Landscaped areas should be maintained, including removal of weeds and replacement of any dead plants.
- » Car parking areas, vehicle access areas, and any pedestrian pathways, including all sealed/paved areas, should be maintained in a continuously useable condition.
- » Train end-users for sustainable landscape care. End-users should be provided with a written Landscape Maintenance Plan and trained as needed.
- » Essential maintenance equipment (such as mulching lawn mowers and chippers) should be built into the construction budget, or ensure that maintenance budget will provide them.
- » All broken, deteriorated, or missing site improvements shall be replaced and/or repaired within a reasonable amount of time.



## Waste Management

Northfield's Business-Industrial Park will promote comprehensive waste reduction practices and provide effective solid waste services including recycling, composting and trash disposal. Waste will be seen as both a resource and a liability. The Business-Industrial Park community will have the knowledge and resources in place to avoid waste and manage the resulting waste in a manner that allows for the least environmental impact. Proper waste management and waste avoidance will be considered in decisions made by all affiliates of the development on a daily basis.



*Goal: The Business-Industrial Park will promote waste reduction and provide effective solid waste removal services that minimize environmental impact.*

### Guidelines:

- » The trash pickup route should be located along alleys, where possible. Where alleys are designated as pedestrian routes, additional requirements may apply.
- » The waste storage area should not interfere with pedestrian or vehicular traffic to the building and should be separate from landscaped areas.
- » When the building contains food service operations, containers and exterior space must be allocated for food waste recycling and grease collection.
- » Considerations should be made for greenhouses, athletic venues, and other grounds maintenance facilities generating compostable plant material.
- » Retractable bollards on shared-use alleys and pedestrian alleys shall limit trash pick-up times to off-peak hours.
- » Trash storage areas shall not be in the 20' public right-of-way of the alley, but rather be recessed into the private parcel. The trash area should be protected from rain, and secured behind a lockage door or gate.
  - Where it is physically infeasible to provide waste storage facility within the developments' interior space, the outdoor trash storage facility should be designed as follows:
  - The walls of the trash enclosure shall be constructed of solid masonry material with decorative exterior surface finish compatible to the main building.
  - The structure shall have lockable, decorative, heavy gauge, solid metal gates and be designed with cane bolts to secure the gates when in open position.
  - The height of wall shall be minimum six feet and contain a decorative roof to screen bin from view.
  - The perimeter of the facility shall be landscaped

