Design Standards and Guidelines in Context

Design guidelines are recommendations that establish a framework for appropriate design responses to a variety of situations. Through outline text and diagrams they convey to prospective developers what the City’s preferred design outcomes are for different building types and urban conditions. It is important to emphasize that design guidelines are just that—guidelines—and are not requirements, however, as they represent “pre-approved” design responses, they facilitate City approval of development proposals, particularly when a property’s zoning designation requires a site plan review due to zoning type, scale of development, conditionally permitted use, and/or variance from base zoning.

At the discretion of the City, select guidelines may be considered for adoption as Standards included in the Detroit Zoning Ordinance. Standards are requirements for new development in defined areas. These may define sitting, massing, and/or building articulation and are typically more specific in nature than guidelines.

Within the context of the Eastern Market Neighborhood Framework Plan (NFP), design guidelines are important to ensure that urban design principles are carried through and reinforced at the scale of individual developments. For example, while it is critically important to present the vision for the expanded Eastern Market as a food business-centered neighborhood that is equally as open and accessible to pedestrians and bikes as it is to cars and semi-trailers, without design guidelines to direct future development to provide pedestrian-scaled facade articulation and street-level activity, there is little that encourages private developers to differentiate their projects from those that would be built in a typical industrial district. Moreover, because the City owns key parcels in both the Core Market and the Greater Eastern Market (GEM), it can ensure that design guidelines are followed as part of agreements made with a private developers in the disposition of public land. In this way, design guidelines provide an additional layer of specificity at the building scale to further the aims of the plan and make the achievement of its urban vision more likely.
A. Guidelines for Vertical Additions to Historic Buildings

The following guidelines apply to buildings identified in the reconnaissance-level survey of the Core Market conducted by Kraemer Design Group as:  
- contributing to the historic character of the Eastern Market National Register of Historic Places district established in 1977 and expanded in 2006, and  
- on parcels within or facing the area bounded by Russell St, Alfred St, Orleans St, and the northern E Fisher Service Dr.

Proposed updates to the Detroit Zoning Ordinance would limit the height of development in the area described above to encourage the renovation and expansion of the historic buildings there. Design guidelines will further shape future proposed vertical additions to these structures. The primary intent of these recommendations is to respect and maintain the legibility of the historic urban character of the commercial center of the Core Market in a way that does not discourage new development. As such the following recommendations are made:

1. **Additions should be set back a minimum of seven (7) feet from any building edge facing a public street** (i.e., this does not apply to alley-facing edges). This setback creates a clearly legible break between old and new structures and is the minimum depth needed for the space of the setback to be occupied as an outdoor terrace at the roof level of the original building.

2. **Exterior material differentiation between additions and original structures is strongly encouraged.** Such differentiation is more respectful of the existing structures than attempting to mimic their appearance; the legibility of the character and extent of the original buildings is preserved for future generations of market-goers to read in the urban fabric around them. For this reason the following materials, listed in order of preference, may be used singly or in combination as the primary means to clad additions:
   - Glass
   - Metal panels (including screens)
   - Brick of a different tone than is used in the existing structure

3. **Residential units should be located above street level.** This maximizes the potential for active ground-level uses to animate the pedestrian experience of the street. Lobbies or building entries may occupy a minimal portion of the ground level. This guideline maintains, and over time will enhance, the commercial character of the Core Market.

* In the event that the proposed zoning update mentioned above is not implemented, an additional design guideline should be made that recommends that **buildings in the area defined above should be no more than 4 stories tall.**

Defining the height limit in terms of stories rather than a specific dimension in feet and inches is flexible enough to accommodate residential or commercial uses which would likely require different floor-to-floor dimensions.
The basic form that results from following the design guidelines for vertical additions leaves ample room for further design specificity to meet the needs of individual developments.
B. Guidelines for New Mixed-Use Development in the Core Market

One important outcome of the NFP is the changing of land use and zoning in the Core Market to allow for a greater mix of uses on the periphery of the commercial center that surrounds the sheds. New ground-up mixed-use construction is intended to take the form of slab-and-podium construction, with a mix of uses in the lower podium levels and most residential units in the slab above.

Proposed updates to the Detroit Zoning Ordinance would conditionally permit multi-family residential uses of up to seventy (70) feet in select areas of the Core Market. Design guidelines are organized into two nested groups, with the first applying to all of these areas and the second applying only to those new mixed-use multi-family residential developments along Dequindre Cut. The former category includes the following recommendations:

1. Buildings more than four (4) stories tall should incorporate a step back at the top of the third story ten (10) feet from the edge where the building edge above this level is longer than seventy (70) feet. Particularly in areas closer to the center of the Core Market, this allows the podium to read at a scale similar to the existing fabric and creates a more comfortable pedestrian experience for those walking along the building edge.

2. Buildings should provide active, publicly accessible uses at street level. This maintains and enhances the existing commercial character of the market. Residential units may be placed at the ground level; however, other, more active uses are preferred.

3. The street faces of non-residential ground-level uses should be at minimum 50% transparent. This minimizes the possibility of long “dead” facades with little activity or articulation that might enliven the pedestrian experience. A transparency percentage of 50% is easily achievable for typical commercial and retail uses but does not present an undue burden for light manufacturing food business uses that will likely require greater areas of concealed back-of-house spaces.

* In the event that the proposed zoning update mentioned above is not implemented, an additional design guideline should be made that recommends that buildings should be no more than seventy (70) feet or six (6) stories above street level. This prevents new mixed-use multi-family developments from overwhelming the existing commercial scale and commercial character of the Core Market.
New ground-up mixed-use multi-family developments adjacent to Dequindre Cut should follow the previous four guidelines as well as the following:

4. **Buildings should provide active, publicly accessible uses at the level of Dequindre Cut in addition to at the level of the street.** This encourages visitors to the Cut to not only use it as a recreational space to move through, but also one to occupy for longer durations of time.

5. **Building faces at the level of Dequindre Cut should be at minimum 50% transparent.** Like the similar requirement for street level uses previously described, this is easily achievable for typical commercial and retail uses but is also plausible for light manufacturing food business uses as well. This guideline encourages activity at the Cut level and a more permeable relationship between interior and exterior spaces there.

6. **Buildings should provide public access between the street level and the Cut.** Within the Core Market the Cut may currently be accessed only at Mack Ave, Wilkins St, and Gratiot Ave, which are more than 1,400 feet (0.25 miles) from each other. Providing additional public access points mitigates this problem and could increase foot traffic to new uses at the level of the Cut.

7. **Buildings should provide additional public open space contiguous with the Cut.** The stretch of Dequindre Cut through Eastern Market is more a recreation space to move through than one to spend time in. Providing larger and more varied spaces by adding public open space that is contiguous to the Cut will allow for a greater variety of recreational uses to take place there for people of all ages and abilities.
C. Guidelines for New Development along Pedestrian-oriented Corridors in the Core Market

Pedestrian-oriented corridors are street segments in the Core Market that are intended for a greater concentration of foot traffic and ground-level commercial and retail uses. Design guidelines encourage the further activation of these corridors through the following recommendations for new construction along their lengths:

1. For every fifty (50) feet of continuous facade on a pedestrian-oriented corridor there should be either at least one street-facing building entry or one setback at least twenty-five (25) feet wide and ten (10) feet deep. Articulating facades in this way breaks up the scale of larger buildings and adds visual interest to buildings along pedestrian-oriented corridors.

2. Residential units should be located above the ground level on building facades facing pedestrian-oriented corridors. Lobbies and entries for residential units may be located along these building edges. Minimizing residential uses on these edges maximizes the potential for active ground-level uses to animate the pedestrian experience of the street.

3. The facades of street-level uses facing pedestrian-oriented corridors should be at minimum 50% transparent. This minimizes the possibility of “dead” facades with little activity to enliven the pedestrian experience. A transparency percentage of 50% is easily achievable for typical commercial and retail uses.
D. Guidelines for Food Business Buildings in the GEM

Guidelines for new development in the GEM will shape the area’s future urban form to create a walkable food business-centered neighborhood with active street edges rather than a typical industrial district of blank facades and negligible street life.

Proposed updates to the Detroit Zoning Ordinance would limit the height of development within the GEM to fifty (50) feet or one (1) story, whichever is taller. This takes into consideration cold storage buildings which may technically be only one story tall but may exceed 50 feet in height. The GEM is defined by Wilkins St from Saint Aubin St east to Chene St, Chene St north to Erskine St, Erskine St east to Grandy St, Grandy St north to Superior St, Superior St west to Dequindre St, Dequindre St south to Mack Ave, Mack Ave east to Saint Aubin St, and Saint Aubin St south to Wilkins St.

The following recommendations apply to food business buildings proposed in the GEM:

1. **Building edges facing public streets require no setback but should be no longer than two hundred (200) feet without being relieved by a recess of no less than forty (40) feet wide and no less than fifteen (15) feet deep.**

The existing block structure in the GEM will be modified to better accommodate large high-tech food business buildings by decommissioning select street segments. Requiring no setback maximizes the developable area within this new block structure and makes new food business buildings viable by combining only two existing blocks. If more existing blocks were combined for more generous development parcels, the block structure would become iminimal to pedestrians and recreate the character of a typical industrial district that the NFP aims to avoid. Requiring no setbacks also reestablishes consistent street edges in the GEM. Incorporating occasional recessed areas into the design of food business buildings’ street frontages creates a more comfortable pedestrian experience and could include amenities for employees and/or visitors.

2. **The length of any new parking or staging area along public streets other than Dubois St or Illinois St west of Saint Aubin St should not exceed one hundred and fifty (150) feet.** This encourages the creation of more consistent and active street edges for a more comfortable pedestrian experience. Parking or staging areas set back from the sidewalk behind planted areas will still be considered to face a public street.

3. **Building edges facing public streets other than Dubois St or Illinois St west of Saint Aubin St should be at minimum 15% transparent.** This breaks up what might otherwise be long, unarticulated facades and may encourage public-facing uses, like a small retail or service space. At minimum, facades that are partially transparent will present some sort of activity to the street and enliven the pedestrian experience.

**Streets Exempted from Guidelines D-2 and D-3**

- Streets exempted from transparency guideline
- DEPSA
- Field

Recommendations for maximum parking frontage and minimum facade transparency do not apply to street segments that are primarily intended for semi-trailer traffic.
4. **Parked and loading for food business parcels should be arranged to be accessed from a shared easement with other food businesses on the block.** Shared drive aisles to parking and staging areas are encouraged to minimize the visual impact of semi-trailers on the street experience and make more efficient use of developable area.

5. **Underground and/or green stormwater infrastructure should be considered in the design of surface parking and staging areas.** Stormwater infrastructure minimizes, or at least delays, the amount of runoff that enters the combined sewer system and thus reduces the risk of a combined sewer overflow event. Beyond their stormwater management function, green infrastructure elements may be designed to serve as visual or passive recreational amenities for employees or visitors of food business buildings.

6. **Trees should be planted along streets and between paved areas for private vehicle parking and for semi-trailer loading and staging.** Like the recommendation for shared access points and drive aisles, the recommendation to plant trees between semi-trailer staging areas and private vehicle parking minimizes the visual impact of semi-trailers, in this case by further concealing them from public view by a screen of trees. Street trees will make the neighborhood more pedestrian-friendly and further screen food business operations.

7. **Food business buildings should be developed in conjunction with a greenway(s).** These green open spaces are intended to spatially separate food business uses and their semi-trailer staging areas from live-work and residential uses. It is preferred that greenways operate as green stormwater infrastructure. Additional design guidelines for the organization and articulation of greenways are provided in section F below.

8. **Food business buildings should consider incorporating additional landscape features beyond the recommended greenway, or other features that manage stormwater runoff.** This could take the form of additional green space, cisterns, or green or blue roof treatments, all of which minimize the amount of stormwater runoff that needs to be treated during and after storm events. Roof treatments in particular should be considered because they would divert a significant amount of stormwater runoff from pretreatment facilities before entering stormwater landscape features (i.e., they could be piped directly) because they do not contain the same level of suspended solids; the oil, grease, and metals from vehicles; or the salt from snowmelt as would be found in overland runoff in this area.

9. **For lengths of facade that feature no windows at street level, the incorporation of public art should be considered** by making such walls available for an arts and culture installation. If, for example, these walls were made available to Murals in the Market, continuity between the existing and expanded markets could be reinforced through the proliferation of murals.

* In the event that the proposed zoning update mentioned above is not implemented, an additional design guideline should be made that recommends that **buildings should be no more than fifty (50) feet or one (1) story tall, whichever is taller.** As mentioned above, this qualifier allows for cold storage buildings which may technically be only one story tall but may exceed 50 feet in height.
The basic configuration of a newly developed food business building in the GEM. Note the shared access drive aisle between it and another food business building on the same block.
E. Guidelines for Live-work Buildings in the GEM

Live-work buildings are planned to line select street edges in the GEM to transition more seamlessly in scale and program from food business buildings to the existing single-family residential fabric. They are also planned to buffer the Detroit Edison Public School Academy (DEPSA) and its playing field from food business uses. The NFP does not specify a desired distribution of residential and non-residential uses within live-work buildings, and as such the precise mixture of “live” and “work” components will be determined on a case-by-case basis from the specifics of location and market demand for each new development. The guidelines for new live-work developments in the expansion area are as follows:

1. **Building height should not exceed three (3) stories.** This provides ample opportunity for buildings with generous residential and commercial or light manufacturing space that at the same time remain of a scale with existing single-family residential areas nearby.

2. **Front building entries must face the street.** This encourages the creation of the character of an urban neighborhood that contributes to a positive pedestrian experience, whereas concealed or indirect side entries present an introverted character that signals a lack of community or an exaggerated concern for security that detracts from a comfortable pedestrian experience.

3. **A minimum of one (1) on-site parking space should be provided per unit and accessed from a shared alley at the rear of the parcel.** Shared alley access minimizes curb cuts on the primary street and enables the creation of consistent street edges uninterrupted by driveways. This encourages the creation of a townhouse-like condition where multiple units are aligned in a row with shared fire walls, which would add variety to residential options in the area, and thus potentially a greater diversity in the types of residents who live there.

4. **Street facades should be set back a maximum of ten (10) feet from the front property line.** This guideline relies on proposed changes to zoning in the GEM, which would change some existing R1 (Single-Family Residential), R2 (Two-Family Residential), and R3 (Low Density Residential) zoning to SD2 (Special Development, Mixed-Use). The existing zoning designations require a setback of twenty (20) feet while an SD2 designation sets a maximum setback of twenty (20) feet. Even so, a setback of twenty (20) feet creates a suburban street experience unsuited to the NFP vision for the GEM. A setback of a maximum of ten (10) feet allows for live-work buildings that are more residential in character to be adequately set back from the street to a dimension similar to single-family houses in the neighborhood. Determining a maximum setback allows live-work buildings that are more commercial in nature to be placed closer to the street, which would likely be beneficial in attracting more foot traffic, if desired.
The prototypical massing and location of live-work buildings in the GEM will blend well with existing single-family residential areas and accommodate a mix of uses.
F. Guidelines for Greenways in the GEM

Greenways are intended to serve dual roles in the NFP that are critical to its success. First, it is strongly encouraged that they operate as stormwater infrastructure that can detain and treat runoff and minimize the amount of runoff that enters the sewer system. Any greenway designed for stormwater management must comply with City of Detroit Stormwater Management Regulations and follow the requirements and recommendations of the Detroit Water and Sewerage Department (DWSD) Stormwater Management Design Manual. The manual is available on the City website as a technical resource for developers and property owners to guide them to regulatory compliance. It provides developers and property owners the flexibility to choose the stormwater control(s) most appropriate for their project and outlines alternatives for compliance if on-site stormwater retention is not feasible. The manual enables DWSD and other key City departments to maintain uniform stormwater management standards and to conduct effective and efficient design reviews.

The second role greenways should play is as an alternative means of off-street circulation. In this way they act as amenities for employees, residents, and visitors and contribute substantially to the creation of the character of a neighborhood.

To achieve these goals the following guidelines apply to the design of greenways in the GEM:

1. **Greenways should cover a minimum of 20% of the surface area of the block on which they are located.** This ensures that greenways are of an adequate size that they could be designed as stormwater infrastructure that achieve DWSD drainage credits and comply with Detroit’s Post-Construction Stormwater Ordinance.

2. **Greenways shall be designed so that their longest dimension is oriented approximately north-south and that they maintain a consistent dimension in the east-west direction.** This takes advantage of the slight slope in the area to allow runoff to naturally filter through greenways by draining from north to south and creates the most efficient development parcels for future food business buildings. Block A9 is exempt from this guideline because the ideal distribution of developable land and greenway there (as illustrated in the reference plan) does not lend itself to the implementation of the greenway as a linear strip. Blocks C1 and C2 should instead follow this guideline in reverse, so that the longest dimensions of the greenways are oriented in the east-west dimension and that the greenways maintain consistent dimensions in the north-south direction as much as parcel lines allow.

Additionally, small strips of landscape that may be required to facilitate the flow of runoff to greenways due to the specifics of topography on a block, as illustrated on the southern edges of blocks A4, A7, and C3 in the reference plan, will not be considered to violate this guideline so long as they do not exceed twenty (20) feet in width. Recommended minimum east-west dimensions vary with the scale of the different blocks and are as follows:
• Blocks A1, A5, and A8: 90 feet
• Blocks A2, A6, and C3: 120 feet
• Block A3: 130 feet
• Blocks A4 and A7: 80 feet
• Blocks C1 and C2: As previously noted, the greenways on these blocks should be oriented in the east-west direction. It is recommended that a consistent north-south dimension for this greenway be 115 feet.
• Blocks D1, D2, and D3: 160 feet total, to be divided into two greenways oriented north-south of roughly equal width in the east-west direction. Note that these blocks are exempted from guideline 3 below.

3. **The breaking up of greenways into multiple discontiguous landscape features should be avoided.** The blocks labeled C1, C2, D1, D2, and D3 in the reference plan are exempted from this guideline. It is preferred that blocks D1, D2, and D3 split their greenway into two elements of approximately equal width on either side of the block to buffer food businesses from a potential future extension of the Dequindre Cut. Blocks C1 and C2 should use small greenways to separate food business and live-work developments there.

4. **Greenways shall provide public pedestrian through-access linking any adjacent public streets via a path measuring eight (8) wide and surfaced with limestone gravel (MDOT 26A aggregate).** This will create an off-street circulation network for people that enhances the safety of greenways and makes the area more welcoming to pedestrians, as it allows them to separate themselves from semi-trailer street traffic and enter the interior of food business blocks. This allows the public to experience firsthand stormwater management landscapes that may be developed within greenways, which may incorporate educational components to enhance this aspect. The edges of pathways should be maintained by regularly mowing a strip on either side of each path measuring at least three (3) feet wide.

Greenways should be of a consistent width throughout, be planted with trees, and provide pedestrian through-access.
5. **If stormwater is managed within a greenway, it must be done so in a manner that does not include perimeter fencing.** Greenways are publicly accessible spaces and therefore access should not be impeded by perimeter fencing. Security fencing is allowed to protect food industry facilities and their associated parking and truck staging areas. Per regulations from DWSD, because greenways are publicly accessible, standing stormwater in greenways is only allowed during a storm event and the landscape must drain within 24 hours following a storm.

6. **Trees must be planted in greenways at a density of one (1) tree per 800 square feet and each tree’s caliper must measure at minimum 2.5 inches.** Trees can screen views to food business buildings and their staging areas from the street to both improve the security of the staging areas and minimize the visual impact of semi-trailers on the pedestrian experience. The spacing of trees ensures each tree will have adequate space to grow and that together the new plantings will result in a moderately dense, linear grove of trees over time. The minimum tree size ensures that trees are of a manageable size and cost to plant and establish the stormwater management and aesthetic functions of the greenway immediately upon planting.

7. **The trees planted within each greenway must be composed of 60% primary species and 40% secondary species.** Primary species are Bald Cypress and Dawn Redwood. Secondary species are Bur Oak, Eastern Larch, Hackberry, Northern Catalpa, Red Maple, Swamp White Oak, and Sycamore. *A detailed description of the tree species can be found on the following pages.*

8. **Greenways must also include ground cover planting that requires very low maintenance.** Smaller plants help anchor soil to prevent erosion, hold or convert pollutants, encourage wildlife, and absorb and evapotranspire water as well as slow its movement through soil. Ground cover species selection should address these objectives and consider the specific climate and weather extremes of Detroit. Ground cover species should require very low maintenance to minimize the cost of care. A durable meadow mix comprising short plant species that are easily mowed is recommended. The following list outlines site preparation guidelines that should be followed to reduce the risk of erosion during plant establishment:

   - Open and cover crop soil should be monitored for invasive species if seed cannot be spread immediately after final grades are reached.
   - Species should be removed or sprayed prior to laying the final seed mix.
   - Soil should be loose and friable prior to seeding, and the soil bed should be ‘dimpled’ using a 2x4 or similarly sized object to help seed to remain on slopes.
   - The spreading of seed can be by broadcast (by hand or cart) or with hydromulch; hydromulch should be diluted with potable water to half the recommended mixture to prevent solar occlusion.
   - The seed should be mixed with a bulking agent such as high-clay content kitty litter to help with even dispersal.
   - A cover crop of a native rye is recommended to provide even, early growth.
   - To prevent dispersed seed from becoming mobile if stormwater areas fill up, the areas near the bottom of the basins should be raked and then covered with straw mats.
   - Seeded areas will need to receive regular, thorough watering and weeding to ensure quality establishment. First-year meadow management is vital; hand weeding is preferred, but if done en masse, the meadow should be cut back to 8 inches every time it reaches 24 inches. The intended effect of cutting is to reduce invasive species, which tend to grow quickly, but not hamper slower native growth. End-of-season or beginning-of-season cutting is acceptable; in either case, the meadow should be cut back to two inches to allow for the soil to warm and the grasses to reactivate.

   *A detailed description of meadow mixes and species can be found on page 19.*
Linear Groves — Primary Species

Trees from the Primary Species list should compose 60% of the trees per block.

Bald Cypress (*Taxodium distichum*)
Easily grown in average, medium to wet, moisture-retentive but reasonably well-drained soils in full sun. Prefers moist, acidic, sandy soils, but tolerates a wide range of soil conditions ranging from somewhat dry soils to wet soils in standing water. *Taxodium distichum*, commonly called bald cypress, is a long-lived, pyramidal conifer (cone-bearing tree) which grows 50 to 70 feet tall (less frequently to 125 feet). Although it looks like a needled evergreen (the same family as redwoods) in summer, it is deciduous and becomes “bald” in winter, as the common name suggests. Trunks are buttressed (flared or fluted) at the base, and when growing in water, often develop distinctive, knobby root growths (“knees”) which protrude above the water surface around the tree.

Dawn Redwood (*Metasequoia glyptostroboides*)
Best grown in moist, humusy, well-drained soils in full sun. Best foliage color is in full sun. Appreciates consistent moisture. Tolerates some wet soils. *Metasequoia glyptostroboides*, commonly called dawn redwood, is a deciduous, coniferous tree that grows in a conical shape to 100 feet tall. It is related to and closely resembles bald cypress (*Taxodium*) and redwood (*Sequoia*). From fossil records, dawn redwood is known to have existed as many as 50,000,000 years ago. As the tree matures, the trunk broadens at the base and develops attractive and sometimes elaborate fluting. Bark on mature trees is often deeply fissured. It features linear, feathery, fern-like foliage that is soft to the touch. Foliage emerges light green in spring, matures to deep green in summer, and turns red-bronze in fall.

Bald Cypress (above) and Dawn Redwood (below) are ideally suited for the sometimes saturated soils of greenways.
Linear Groves — Secondary Species
*Trees from the Secondary Species list should compose 40% of the trees per block.*

Bur Oak (*Quercus macrocarpa*)
Easily grown in average, dry to medium, well-drained soils in full sun. Prefers moist well-drained loams, but adapts to a wide range of soil conditions. Good drought tolerance. May take up to 35 years for this tree to bear a first crop of acorns. *Quercus macrocarpa*, commonly called bur oak or mossycup oak, is one of the most majestic of the native North American oaks. It is a medium- to large-sized deciduous oak of the white oak group that typically grows 60 to 80 feet (less frequently to 150 feet) tall with a broad-spreading, rounded crown. Acorn cups are covered with a mossy scale or bur near the rim, hence the common names.

Eastern Larch (*Larix laricina*)
A deciduous conifer whose green needles turn a showy yellow in fall before falling to the ground as winter approaches. This is a tree of very cold climates, growing to the tree line across North America. It is native to boggy soils, wet poorly-drained woodlands and some moist upland soils.

Hackberry (*Celtis occidentalis*)
Best grown in moist, organically rich, well-drained soils in full sun. Tolerates part shade. Also tolerates wind, many urban pollutants and a wide range of soil conditions, including wet, dry, and poor soils. *Celtis occidentalis*, commonly called common hackberry, is a medium- to large-sized deciduous tree that typically grows 40 to 60 feet (less frequently to 100 feet) tall with upright-arching branching and a rounded spreading crown. Trunk diameter typically ranges from 1 to 3 feet (less frequently to 4 feet). This tree is a U.S. native that is widely distributed throughout the east and Midwest.

Northern Catalpa (*Catalpa speciosa*)
A medium- to large-sized, deciduous tree that typically grows to 40 to 70 feet (less frequently to 100 feet) tall with an irregular, open-rounded to narrow-oval crown. In Michigan, it typically occurs along streams, bluff bases and in both low and upland woods. Leaves are light green to yellow green above and densely pubescent below. Foliage turns an undistinguished yellow in fall.

Red Maple (*Acer rubrum*)
Easily grown in average, medium to wet, well-drained soil in full sun to partial shade. Tolerant of a wide range of soils, but prefers moist, slightly acid conditions. Very cold-hardy. *Acer rubrum*, commonly called red maple, is a medium-sized, deciduous tree that is native to eastern North America from Québec to Minnesota south to Florida and eastern Texas. It typically grows 40 to 60 feet tall with a rounded to oval crown. In the northern U.S., red maple usually occurs in wet bottomland, river floodplains, and wet woods.

Swamp White Oak (*Quercus bicolor*)
Easily grown in average, medium to wet, acidic soil in full sun. *Quercus bicolor*, commonly called swamp white oak, is a medium-sized, deciduous tree with a broad, rounded crown and a short trunk which typically grows at a moderate rate to a height of 50 to 60 feet tall (sometimes larger). Leaves are dark, shiny green above and silvery white beneath, with five to ten rounded lobes or blunt teeth along the margins. Fall color is yellow, but sometimes reddish purple. Insignificant flowers in separate male and female catkins in spring. Native to Michigan in moist to swampy locations in bottomlands and lowlands, such as along streams and lakes, valleys, floodplains, and at the edge of swamps. Also has surprisingly good drought resistance.

Sycamore (*Platanus occidentalis*)
Easily grown in average, medium to wet, well-drained soils in full sun. Tolerates light shade. Prefers rich, humusy, consistently moist soils. Generally tolerant of most urban pollutants. *Platanus occidentalis*, commonly called sycamore, American sycamore, eastern sycamore, buttonwood, or buttonball tree, is generally regarded to be the most massive tree indigenous to eastern North America. It is a deciduous, usually single-trunk tree that typically grows to 75 to 100 feet (less frequently to 150 feet) tall with horizontal branching and a rounded habit.
Secondary tree species are suited to a variety of soil types and grow to a variety of heights and shapes to suit the soils and aesthetic goals of the design of individual greenways. Species include Bur Oak (top left), White Swamp Oak (top right), Sycamore (bottom left), and Northern Catalpa (bottom right).
Shallow swales could be naturalized with native plantings to aid in faster infiltration and to provide wildlife habitat. Native wildflowers and warm-season grasses are attractive and low-maintenance.
Ground Cover Species

In all stormwater management landscapes, ground cover species prevent erosion and slow water movement, hold or convert pollutants, enhance infiltration and evapotranspiration, and encourage wildlife. Plant species or mixes should be selected to meet these objectives and survive the local climate and weather conditions. Native grasses produce fibrous root systems that tolerate fast-moving water. Woody and herbaceous species add aesthetic value, provide wildlife food and habitat, assist with evapotranspiration, and prevent erosion. It is also important that ground cover species be easy to maintain. A durable meadow mix comprised of short plant species that are easily mowed for maintenance purposes is recommended.

When selecting a seed mix, choose one appropriate for the site’s hydrology to avoid stand failure. The following two commercially available seed mixes could both work as ground cover planting strategies:

**Shallow Swale Seed Mix 1**
- 45% Schizachyrium scoparium (Little Bluestem)
- 20% Elymus virginicus (Virginia Wildrye)
- 11% Chasmanthium latifolium (Inland Seaos)
- 8% Panicum rigidulum (Redtop Panicgrass)
- 7% Agrostis perennans (Autumn Bentgrass)
- 4.5% Carex vulpinoida (Fox Sedge)
- 3% Panicum sphaerocarpon (Round Seed Panicgrass)
- 1% Juncus effusus (Soft Rush)
- 0.5% Carex scoparia (Blunt Broom Sedge)

**Shallow Swale Seed Mix 2**
- 39% Schizachyrium scoparium (Little Bluestem)
- 15% Elymus virginicus (Virginia Wildrye)
- 8% Chasmanthium latifolium (Inland Seaos)
- 6.4% Panicum rigidulum (Redtop Panicgrass)
- 4% Chamaecria fasciculata (Partridge Pea)
- 4% Echinacea purpurea (Purple Coneflower)
- 3% Coreopsis lanceolata (Lanceleaf Coreopsis)
- 3% Rudbeckia hirta (Blackeyed Susan)
- 2% Carex vulpinoida (Fox Sedge)
- 2% Heliosis helianthoides (Oxyee Sunflower)
- 2% Verbena hastata (Blue Vervain)
- 1.5% Asclepias incarnata (Swamp Milkweed)
- 1.5% Juncus effusus (Soft Rush)
- 1% Liatris spicata (Marsh Blazing Star)
- 1% Panicum sphaerocarpon (Round Seed Panicgrass)
- 1% Penstemon digitalis (Tall White Beardtongue)
- 0.5% Carex scoparia (Blunt Broom Sedge)
- 0.5% Eupatorium coelestinum (Mistflower)
- 0.5% Pycnanthemum tenuifolium (Narrowleaf Mountainmint)
- 0.5% Senna hebecarpa (Wild Senna)
- 0.5% Tradescantia ohiensis (Ohio Spiderwort)
- 0.5% Zizia aurea (Golden Alexanders)
- 0.4% Monarda fistulosa (Wild Bergamot)
- 0.3% Agrostis perennans (Autumn Bentgrass)
- 0.3% Symphyotrichum laevis (Smooth Blue Aster)
- 0.3% Helenium autumnale (Common Sneezeweed)
- 0.2% Symphyotrichum umbellatum (Flat Topped White Aster)
- 0.2% Solidago patula (Roughleaf Goldenrod)
- 0.1% Veronicastrum virginicum (Culver’s Root)