









05.1

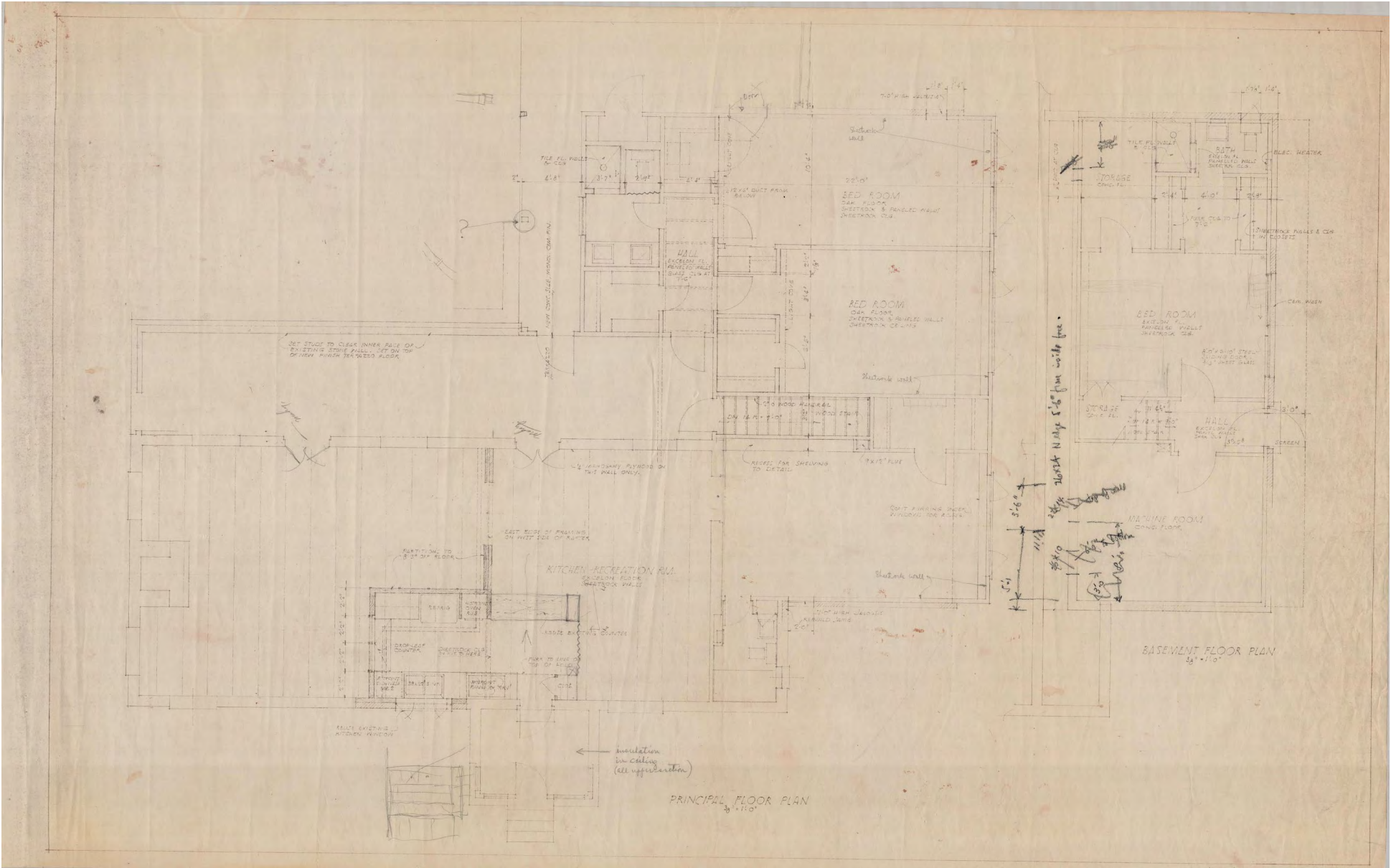
# Historic Preservation

# Historic Preservation

## Introduction

This assessment is based on visual observations conducted during a field investigation on July 28, 2023, a review of original architectural drawings by Jessen, Jessen, Millhouse & Greeven dated April 24, 1956, and a review of the National Register of Historic Places Registration Form (NPS Form 10-900) prepared by Hutson Gallagher, Inc. and Katie Robinson Edwards, UMLAUF Sculpture Garden + Museum Executive Director and Curator, dated July 30, 2022. The purpose of this assessment report is to document the existing conditions of the home, studio, and garden and to make general recommendations for the restoration of the same, considering programmatic needs and following the guidelines set forth in the **Secretary of the Interior’s Standards for the Treatment of Historic Properties**.

Charles and Angie Umlauf purchased their home in 1944. The original structure dates to the late 1920s, and was a one-story, gable-roof structure with limestone walls, a wood-framed pier-and-beam floors and wood roof structure. In 1950, Charles built a studio approximately 100 feet to the east of the house. The studio is a single-story, shed roof structure with slab-on-grade foundation, wood framed walls with wood siding and wood framed roof. In 1956, the Umlauf’s engaged Jessen, Jessen, Millhouse & Greeven to design an addition to enlarge the house. The addition built upon the original stone structure, creating an L-shaped plan with three bedrooms on the main level and a lower level with an additional bedroom, bathroom, and mechanical room. The renovation produced a minimalist aesthetic typical of mid-century, modern design.





# Secretary of the Interior's Standards

## Preservation

**The Secretary of the Interior's Standards for the Treatment of Historic Properties** is the professional standard for the preservation of historic buildings, structures, sites, objects, and districts, established by the Secretary of the Interior under the National Historic Preservation Act. The Standards develop four treatments for addressing historic properties: **preservation, restoration, rehabilitation, and reconstruction**. The Standards include Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings. These Guidelines contain baseline consistencies with specific direction for each treatment approach.

**Preservation** is defined as the act or process of applying measures necessary to sustain the existing form, integrity, and materials of a historic property as it has evolved over time. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. The limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project. However, new exterior additions are not within the scope of this treatment. **The Standards for Preservation require retention of the greatest amount of historic fabric along with the building's historic form.**

### Standards for Preservation:

1. A property will be used as it was historically, or be given a new use that maximizes the retention of distinctive materials, features, space and spatial relationships. Where a treatment and use have not been identified, a property will be protected and, if necessary, stabilized until additional work may be undertaken.

2. The historic character of a property will be retained and preserved. The replacement of intact or repairable historic materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.

3. Each property will be recognized as a physical record of its time, place, and use. Work needed to stabilize, consolidate, and conserve existing historic materials and features will be physically and visually compatible, identifiable upon close inspection, and properly documented for future research.

4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.

5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.

6. The existing condition of historic features will be evaluated to determine the appropriate level of intervention needed. Where the severity of deterioration requires repair or limited replacement of a distinctive feature, the new material will match the old in composition, design, color, and texture.

7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

8. Archaeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

Source: U.S. Department of the Interior, National Park Service, Technical Preservation Services, "The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring Reconstructing Historic Buildings (2017)"





# Secretary of the Interior's Standards

## Restoration

**Restoration** is defined by the Secretary of the Interior's Standards for the Treatment of Historic Properties as the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a restoration project. **The Restoration Standards allow for the depiction of a building at a particular time in its history by preserving materials, features, finishes, and spaces from its period of significance and removing those from other periods.**

### Standards for Restoration

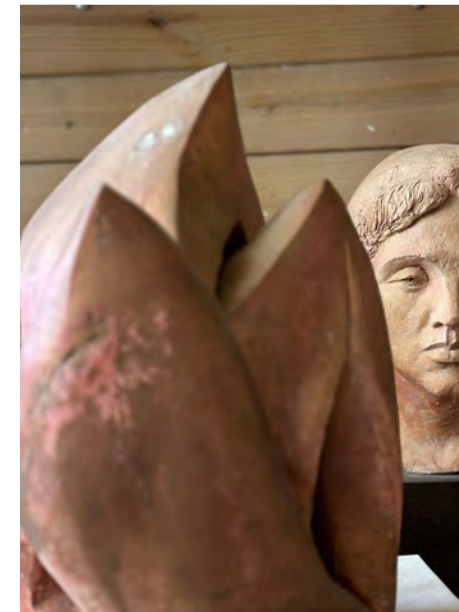
1. A property will be used as it was historically or be given a new use that interprets the property and its restoration period.
2. Materials and features from the restoration period will be retained and preserved. The removal of materials or alteration of features, spaces, and spatial relationships that characterize the period will not be undertaken.
3. Each property will be recognized as a physical record of its time, place, and use. Work needed to stabilize, consolidate and conserve materials and features from the restoration period will be physically and visually compatible, identifiable upon close inspection, and properly documented for future research.
4. Materials, features, spaces and finishes that characterize other historical periods will be documented prior to their alteration or removal.
5. Distinctive materials, features, finishes and, construction

### UMLAUF HPEU PLAN

techniques or examples of craftsmanship that characterize the restoration period will be preserved.

6. Deteriorated features from the restoration period will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials.
7. Replacement of missing features from the restoration period will be substantiated by documentary and physical evidence. A false sense of history will not be created by adding conjectural features, features from other properties, or by combining features that never existed together historically.
8. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
9. Archaeological resources affected by a project will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.
10. Designs that were never executed historically will not be constructed.

Source: U.S. Department of the Interior, National Park Service, Technical Preservation Services, "The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings (2017)"





# Secretary of the Interior's Standards

## Rehabilitation

**Rehabilitation** is defined by the Secretary of the Interior's Standards for the Treatment of Historic Properties as the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values. **The Rehabilitation Standards acknowledge the need to alter or add to a historic building to meet continuing or new uses while retaining the building's historic character building's historic form.**

### Standards for Rehabilitation

1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.
2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.
3. Each property will be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.
4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.
5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.
6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires

### UMLAUF HPEU PLAN

replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.

7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
8. Archaeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.
9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work will be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.
10. New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

Source: U.S. Department of the Interior, National Park Service, Technical Preservation Services, "The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings (2017)"





# Secretary of the Interior's Standards

## Reconstruction

**Reconstruction** is defined by the Secretary of the Interior's Standards as the act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location. **The Reconstruction Standards establish a limited framework for recreating a vanished or non-surviving building with new materials, primarily for interpretive purposes.**

### Standards for Reconstruction

1. Reconstruction will be used to depict vanished or non-surviving portions of a property when documentary and physical evidence is available to permit accurate reconstruction with minimal conjecture and such reconstruction is essential to the public understanding of the property.
2. Reconstruction of a landscape, building, structure or object in its historic location will be preceded by a thorough archaeological investigation to identify and evaluate those features and artifacts which are essential to an accurate reconstruction. If such resources must be disturbed, mitigation measures will be undertaken.
3. Reconstruction will include measures to preserve any remaining historic materials, features, and spatial relationships.
4. Reconstruction will be based on the accurate duplication of historic features and elements substantiated by documentary or physical evidence rather than on conjectural designs or the availability of different features from other historic properties. A reconstructed property will re-create the appearance of the non-surviving historic property in materials, design, color, and texture.

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5. A reconstruction will be clearly identified as a contemporary re-creation.

6. Designs that were never executed historically will not be constructed.

**Note: Reconstruction is not proposed as an approach for treating the historic Umlauf home, studio, or garden. This information is provided as reference only as a component of the secretary of the interior's standards.**



Source: U.S. Department of the Interior, National Park Service, Technical Preservation Services, "The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings (2017)"



# Preservation Zones





# Home: Exterior Approach

Foundations – monitor movement with benchmarks

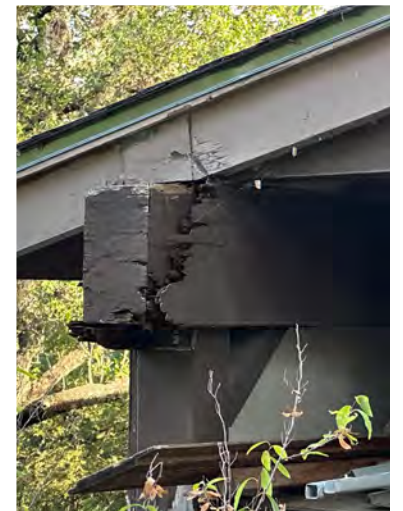
Stone masonry walls – test mortar, remove patches, repoint with compatible mortar

Wood siding and trim – remove vinyl siding, repair and replace damaged siding and trim, repair wood brackets, test for paint color, paint

Windows – abate asbestos glazing compounds, restore per Secretary of Interior's Standard, consider interior storm windows for thermal and sound control

Doors – restore per Secretary of Interior's Standards, modify thresholds for ADA access

Roof – inspect roof deck for water damage, re-roof if needed (evidence of gravel ballast on site to be confirmed with further investigation)





# Studio: Exterior Approach

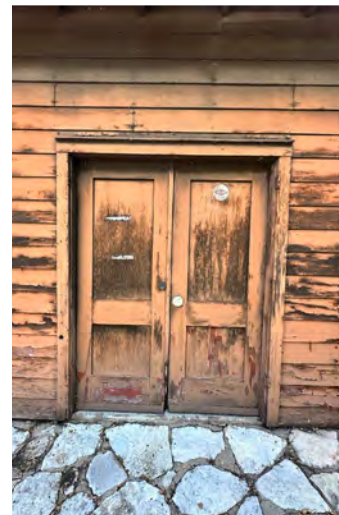
Foundations – monitor movement with benchmarks

Wood siding and trim – repair and replace damaged siding and trim, repair wood brackets, test for paint color, paint

Windows – abate asbestos glazing compounds, restore per Secretary of Interior's Standard, consider interior storm windows for thermal and sound control

Doors – restore per Secretary of Interior's Standards, modify thresholds for ADA access

Roof – inspect roof deck for water damage, re-roof if needed





# Home: Interior Approach

## Preservation + Restoration

Foundations – monitor movement with benchmarks

Flooring – abate asbestos, remove non-original flooring, restore original, new flooring per drawings

Gypsum Board Walls – test for paint color, abate asbestos, replace gypsum wall board, paint

Gypsum Board Ceilings - test for paint color, abate asbestos, inspect roof framing for water damage, replace gypsum ceilings, paint

Wood Panel Walls – repair and refinish

Interior Millwork – repair and refinish

Interior Doors – restore per Secretary of Interior's Standards, modify thresholds for ADA access





# Studio: Interior Approach

## Preservation + Restoration

Foundations – monitor movement with benchmarks

Flooring – abate asbestos, remove non-original flooring, restore original, new flooring per drawings

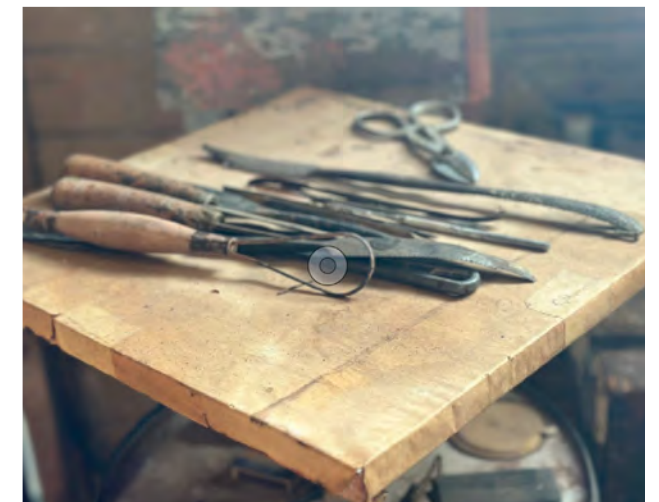
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Wood Panel Walls – repair and refinish

Interior Millwork – repair and refinish

Interior Doors – restore per Secretary of Interior's Standards, modify thresholds for ADA access





# 05.2

## Landscape



# Landscape Zones

The UMLAUF is valued by visitors as a quiet place to enjoy art and nature. A rich and diverse tree canopy provides an audible and visual buffer from the surrounding urban setting. These canopies are also home to many bird species including song birds, hawks, and owls. The waterfall, creek, and overhead canopy provide a unique and intimate setting for the sculptures and encourages visitors to pause, relax, and reflect on the artist's message. The proposed landscapes will maintain and enhance this art in nature experience.

Three main zones will be represented in the landscape: historic homestead, garden + museum, and natural zone.

The historic homestead will complement the surrounding neighborhood with lawn space and border planting to define spaces for gatherings and events, buffer planting to screen views from surrounding properties, and direct lines of sight to Angie's garden and downtown. The garden + museum zone will maintain existing natural aesthetic and utilize a signature plant pallet to diversify species, enhance visual interest, and manage water on site. The natural zone will increase plant diversity to provide food sources for wildlife, capture and reduce water runoff, provide educational opportunities.

- Historic Homestead
- Garden + Museum, Water Management
- Edge Treatment
- Natural Area
- Planting Strategies





# Landscape Zones

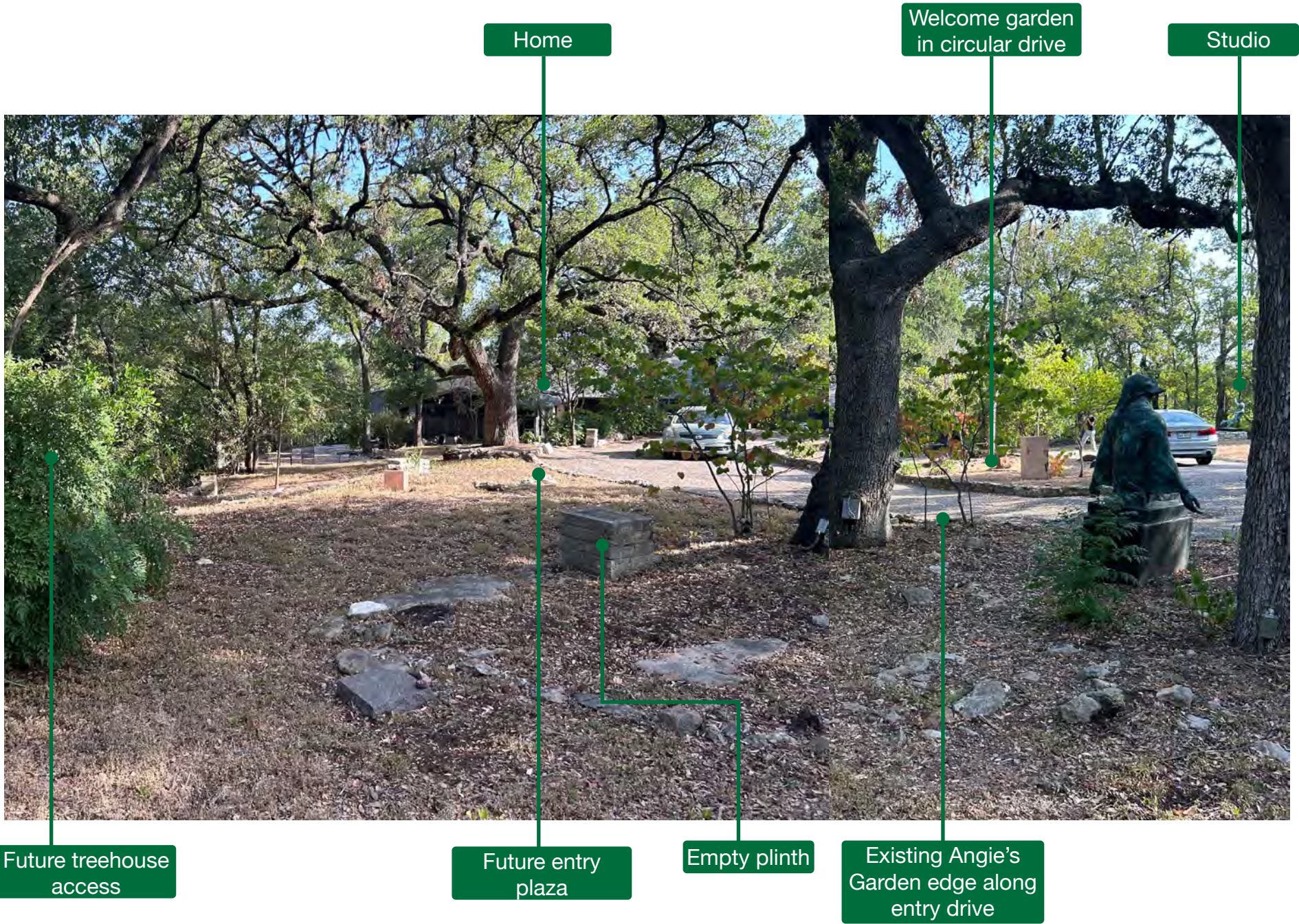
## Historic Homestead

The design concept for the historic homestead landscape zone prioritizes a formal layout, integrating open lawns, strategically positioned to serve as inviting gathering spaces. Emphasizing cohesion and continuity, this area seamlessly incorporates planting beds that artfully connect visitors to the life and works of Charles Umlauf.

The landscape along Barton Boulevard will maintain existing retaining walls that are reminiscent of the artists time living in the neighborhood with new diversified planting, or designed plant community, to provide a visual cue of entrance to this special place. The added layers of planting provide additional screening to buffer views to surrounding properties.

Vehicular circulation should be limited to deliveries, staff parking, and accessible parking for events. The existing entry from Barton Boulevard will remain in its current location to maintain required distance from intersections for queuing vehicles into the site.

Large trees define areas and create a ceiling for potential event spaces around the treehouse, home, and studio.





# Landscape Zones

Historic Homestead



Existing retaining walls facing Barton Blvd.

Drive from Barton Blvd.

Angie's garden entrance to be enhanced with hardscape elements that are part of a site wide vocabulary

Proposed garden edge with rehabilitated low wall and buffer plantings to create visitor's sense of discovery

Welcome garden to include enhanced planting and signage



Existing retaining walls facing Barton Boulevard to be enhanced with a designed plant community.  
**UMLAUF HPEU PLAN**



Suburban lot prior to designed plant community installation



Same lot after 2 years growth

Example of designed plant community on a suburban lot from “Planting in a Post-Wild World” by Thomas Rainer and Claudia West. Diversified species that flower and fruit throughout the year display varied textures which provide visual and physical buffer that is aesthetically pleasing.



# Landscape Zones

## Historic Homestead

Angie's Garden, the original sculpture garden situated adjacent to the entry drive, could benefit from the creation of a formal garden entry. This could be achieved through the addition of plantings, low walls, or other hardscape elements, serving to announce visitors' arrival while safeguarding the area from vehicular access. Charles Umlauf collaborated with local quarries to fashion plinths for sculptures in this garden, which should now undergo renovation. Additionally, new plinths may be designed to accommodate future sculpture additions, maintaining consistency with the site's overall hardscape aesthetic.

Event spaces for small outdoor gatherings are located near the entrances of existing and proposed structures. A grant-funded renovation of the retaining wall adjacent to the carport on the southern end of the home could provide an elevated vantage point overlooking the garden below, and creating a space for events. Another smaller event space located between the studio and the circular drive, featuring a lawn bordered by hardscape elements, could serve as an area for seating or temporary exhibits.

An intimate stone patio nestled between the home and studio boasts a fountain and planter, offering stunning views of downtown. Rehabilitation of this space is recommended, including updates to walking surfaces, utility lines, pond and plant beds, and the addition of a new railing or wall to ensure safety. Moreover, the plan suggests conducting a detailed analysis of fire truck maneuverability and parking options for the upper driveway if vehicular access is desired at this level (see initial vehicle tracking exhibit in appendix).



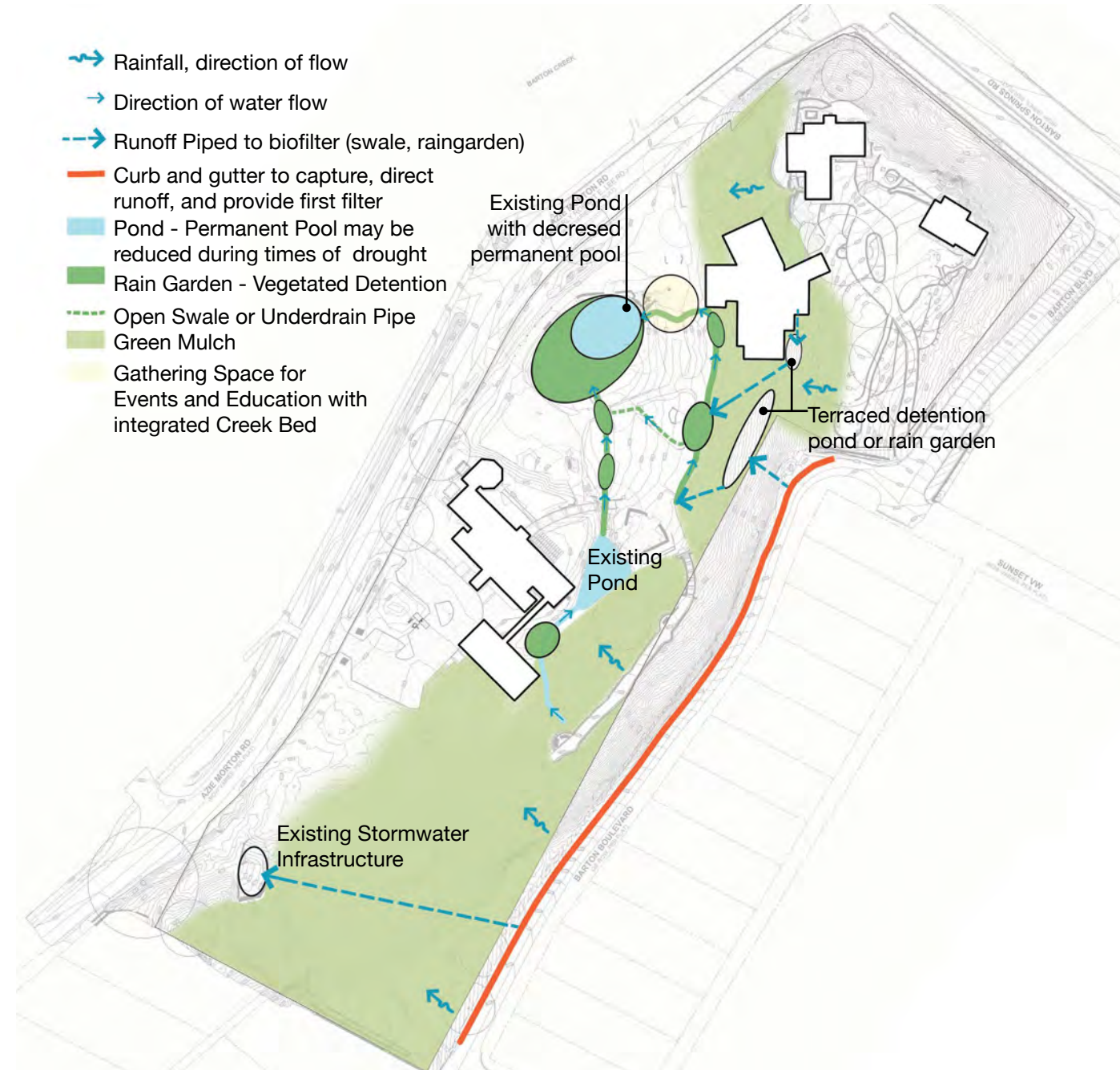


# Landscape Zones

## Sculpture Garden + Museum, Water Management

Steep slopes surround the garden which creates a dramatic, beautiful backdrop for Umlauf's sculptures. Rain fall is intercepted by the extensive tree canopy, but limited ground plantings and the sheer volume of water flowing on to the site erodes soils, damages existing walkways in the garden, and floods the sculptures, which may damage existing plinths and footings.

Several strategies are recommended to address excess water running on to and through the site including detention ponds at the top of slopes, green mulch or multi-layered planting on slopes, swales and rain gardens at the bottom of slopes to direct water to key locations, and improvements to the existing pond for additional detention capacity.





# Landscape Zones

## Sculpture Garden + Museum, Water Management

Water may be diverted from entering the site with the addition of a curb and gutter along Barton Boulevard, which is currently outside the property boundaries of the site. At the top of the slope within the property boundary, detention ponds with retaining walls located on the downhill side will capture and filter runoff from the road and the adjacent neighborhood for decreased erosion and trail damage while improving the quality of water that enters the garden.

A primary planting strategy for the entire site will increase the diversity of plant species and add layers of planting. There are three levels of planting, including groundcovers, mid-level, and tree canopy.

Groundcover, plants and vines that hug the ground, creates a green mulch that protects roots through extreme temperatures, holds moisture in the soil, intercepts or slows rain from falling on soil, captures water in the root system to be released through evapotranspiration, filters nutrients and toxins to improve water quality, provides food and nesting material for wildlife, and provides color and texture to arouse visitor's interest and enjoyment of the gardens.

Mid-level planting includes shrubs and perennials that add texture and color at eye level and may provide backgrounds for sculptures located along the slope. These plants also capture water and provide shelter and food for wildlife.





# Landscape Zones

## Sculpture Garden + Museum, Water Management

Trails may be edged by swales to capture water running from the existing slope and direct water to the pond. Think of swales as shallow, lineal depressions that create a trail system for water, nutrients, leaves, and other debris to travel and collect at key locations. These collection areas can be used as educational opportunities to see what flows downhill, monitor water quality, and collect seeds, leaves, and other natural objects that may be used for inspiration in sketches, sculpture, poems, and other art forms.

Swales may be vegetated as a bioswale, resemble creek beds with rock bottoms, or incorporate a combination of rock and planting. Natural edges are typical for the site but formal edges may be appropriate for some exhibits or near proposed buildings to connect the interior and exterior spaces. For linear walkways, plants may be encouraged to grow over the path to soften the edges.

Swales may be enlarged in areas to create rain gardens that slow down water flow through the site and hold additional volume of water to reduce the amount of water entering the pond during rain events. Rain gardens provide additional filtration for improved water quality and also allow water to infiltrate into the ground for increased water volumes to local aquifers.



Created in Midjourney by Asakura Robinson

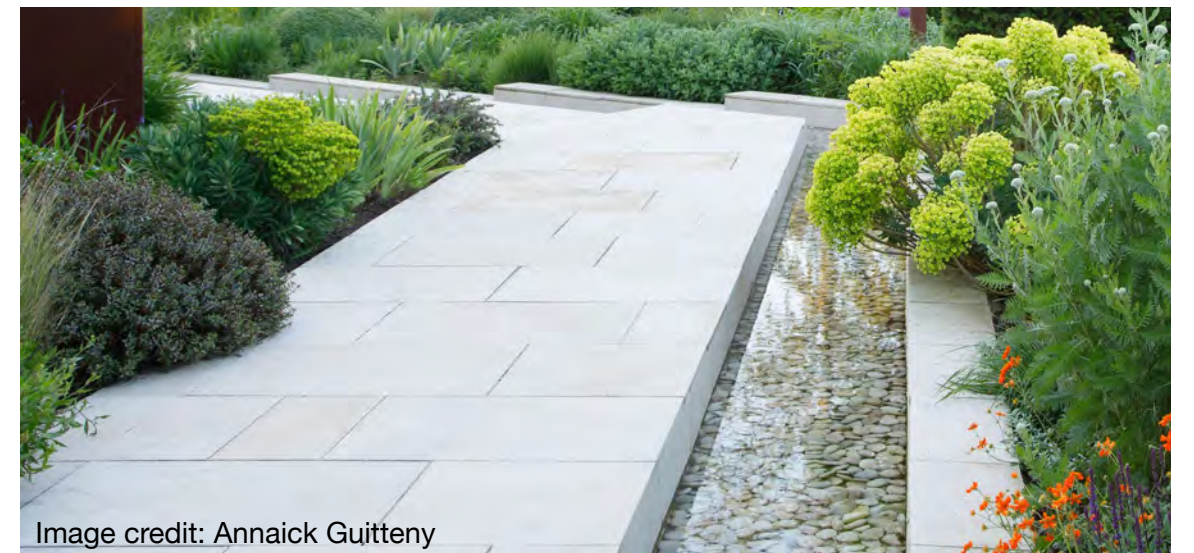
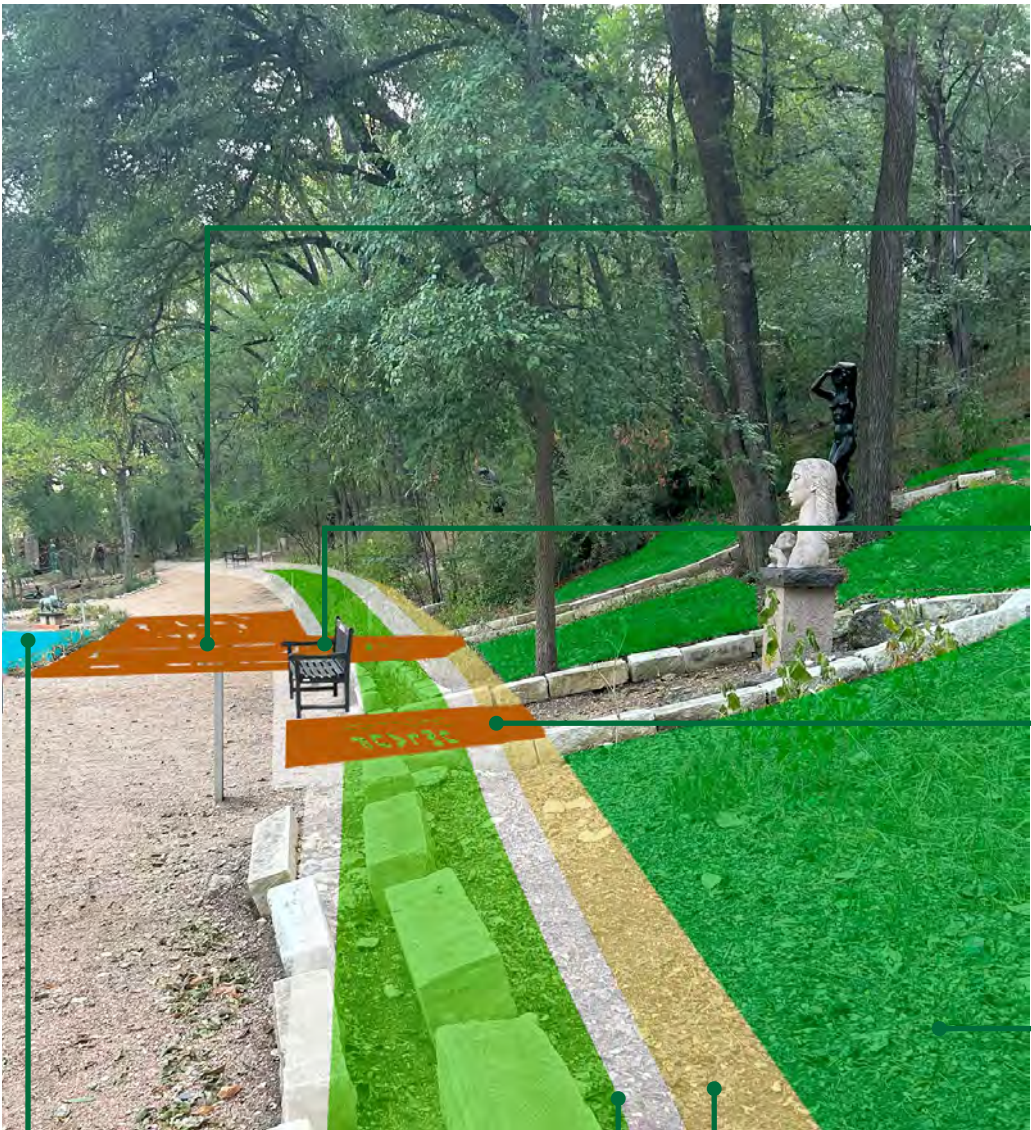


Image credit: Annaick Guitteny



# Landscape Zones

Sculpture Garden + Museum, Water Management



Swale expanded under the trail provides additional water storage and may overflow to pond

Seating or observation areas integrated and defined by swale edge

Metal grates over the swale provide access to sculptures and may be customized to include interpretive information or graphics

Planting acts as green mulch for water interception

Rain garden along trail provides environmental education opportunity

Gravel Bed

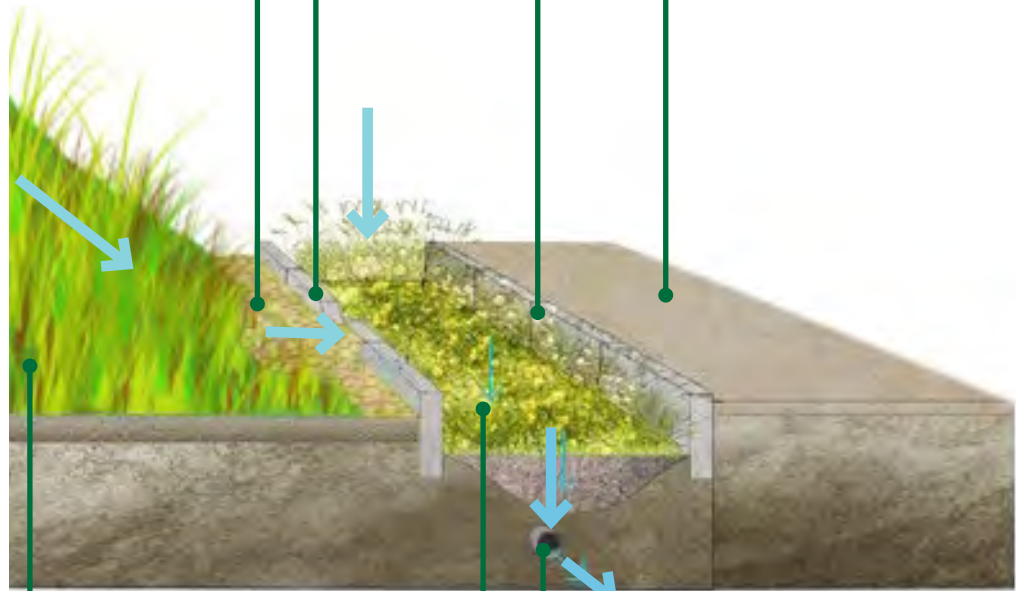
Continuous cut limestone or rough finish concrete curb

Cut limestone or rough finish concrete curb with cut outs or weep holes at specified locations to allow water through to bioswale

Gravel bed to slow water flow and capture large debris

Continuous cut limestone or rough finish concrete curb

Stabilized decomposed granite walkway



Existing slope with designed community planting

Perforated pipe drains to existing pond

Vegetated bioswale to filter water, and create a garden edge



# Landscape Zones

## Edge Treatment

Art and nature are Umlauf's gift to Austin's community. The plan recommends treating the site's edges to create a more welcoming experience for visitors, make the UMLAUF more visible, and enhance the experience for people walking/wheeling around the site. The walking, wheeling, and vehicular entry will be well defined and visible, while the sculptures in the welcome zone will provide a glimpse of Umlauf's work and begin the visitors interpretive experience.

To soften the appearance of the edge along Azie Morton Road, the plan proposes a new wall with a garden aesthetic. Made of metallic fence and a lower stone wall with pockets of planting that frame views into the garden. This new edge may also frame temporary banners for events and exhibitions.

Site identification and walking/wheeling improvements at the intersection of Azie Morton Road and Barton Springs Road may be accomplished by replacing the existing retaining walls and relocating them further away from the curb. Dividing the retaining wall into lower and upper tiers with planting bed between will create a formal edge at pedestrian scale. The UMLAUF logo and permanent banner space that is built into the wall will also welcome all who cross through this intersection.



Low stone or concrete wall with decorative fence embedded to allow views into garden from Azie Morton Road. Solid portions of wall used for permanent banner space welcomes visitors to the museum and garden with information about programming and exhibits.



Image credit: [www.fencingsouthflorida.com/](http://www.fencingsouthflorida.com/)



# Landscape Zones

Edge Treatment

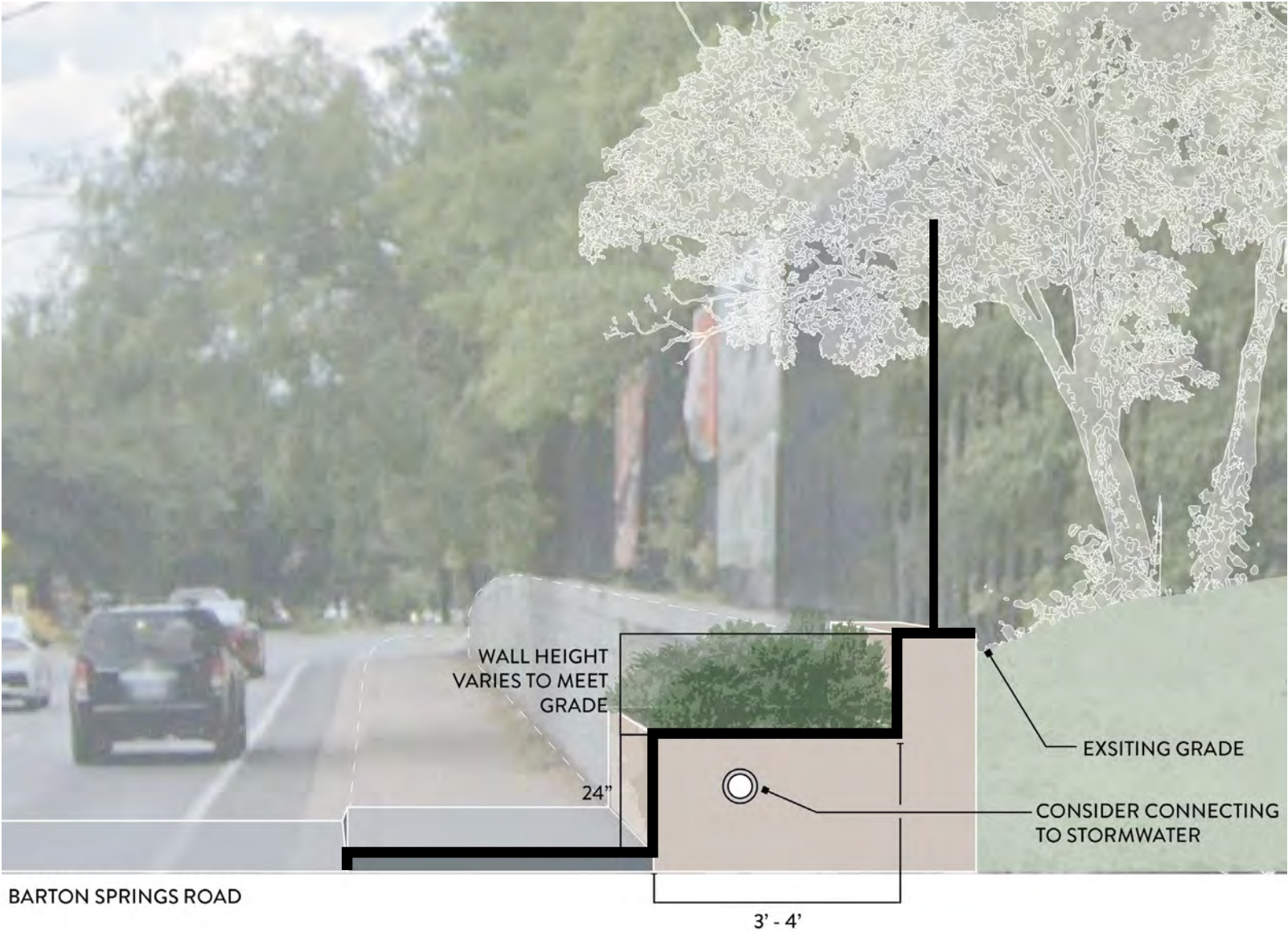


Relocate existing fence to top of slope to create a clean green edge

Relocate retaining wall to allow accessible pedestrian access around existing poles

Permanent banner space welcomes visitors to the museum and garden with information about programming and exhibits

Plant bed softens the wall material and leads pedestrians toward the entry with aromatic and showy planting





# Landscape Zones

## Natural Area

The natural area will increase plant diversity to provide food sources for wildlife, capture and reduce water runoff, and offer educational opportunities. The trail or boardwalk will guide visitors through the natural area which may feature temporary exhibits and interpretive signs for outdoor learning.

The UMLAUF's site is a green oasis within an urban area. However, native plant ecosystems have been disrupted by surrounding development over time. To optimize the landscape's performance in water management, habitat provision, and visual appeal, the selected plant community will comprise both native species and those well-adapted to the local environment. Given the prevalent tree canopy shading much of the site, the proposed plants will primarily thrive in shade conditions.

Diversifying plants in the natural zone will offer various benefits, including:

- Providing habitat, food and shelter for wildlife
- Creating visual interest with colorful flowers, a variety of leaf textures, and fruit bearing plants
- Slowing the water run-off and capturing rainfall in the leaf structure
- Increasing water infiltration through root absorption
- Cleansing soil and water toxins by plant uptake
- Providing environmental education by showcasing plants used by people throughout history

Trim and limb up branches for clear height of 8' above walking surface

Interpretive signage or temporary exhibit space

Enhanced planted adjacent to trail at interpretive or exhibit areas

Mowed or managed edge along trail, 18"-36" width





# Ecology + Biodiversity

The UMLAUF site is intricately connected to Austin's broader ecosystem, its ecology and biodiversity ebb and flow into the surrounding sites. It also represents a site of natural respite for Austin residents, providing moments of tranquility and joy as they immerse themselves in the garden.

In an effort to preserve the ecological balance and biodiversity of the area, the landscape efforts are primarily focused on three key objectives: removing invasive species, revitalizing mid-level vegetation, and enhancing plant diversity onsite. By undertaking these initiatives, the plan aims to uphold the integrity of the ecosystem and honor the diverse array of plant life that once thrived on this land before the establishment of site boundaries.

*"What a beautiful place. I am a native Austinite who believes in the importance of nature, community, public education and art for all. I hope we can continue to nurture this place and all of our other parks and art facilities with the unified goal of environmental stewardship, community, inclusivity, and art."*





# Green Mulch, Groundcovers

## Recommendations



*Achillea millefolium* (Yarrow):  
pollinator plant, historic medicinal and  
cultural use, soil remediation



*Ipomopsis rubra* (Standing  
Cypress): pollinator plant



*Lobelia cardinalis* (Cardinal  
Flower): pollinator plant, historic  
medicinal and cultural use



*Andropogon ternarius*  
(Splitbeard Bluestem): nesting  
material, pollinator plant, soil  
remediation



*Bouteloua curtipendula*  
(Sideoats Grama): nesting material  
and food/seeds, soil remediation



*Calyptracarpus vialis*  
(Horseherb): pollinator plant



*Monarda fistulosa* (Wild Bee  
Balm): pollinator plant, historic  
medicinal and cultural use



*Rivina humilis* (Pigeonberry):  
wildlife food



*Echinacea purpurea* (Purple  
Coneflower): pollinator plant,  
historic medicinal and cultural use,  
soil remediator



*Chasmanthium latifolium* (Inland  
Sea Oats): pollinator plant, nesting  
material and food/seeds



*Elymus canadensis* (Prairie  
Wildrye): pollinator plant, habitat  
food



*Viola odorata* (Sweet Violet):  
historic medicinal and cultural use



# Mid-Level Planting

## Recommendations

The landscape character of the UMLAUF is intricately linked to a canopy of mature oak and heritage trees, which provide essential ecosystem services to visitors and a diverse array of species year-round. However, there is room for improvement in the existing landscape’s spatial and temporal hierarchy. Introducing shrubs, mid-level, and ground-level plants can transform visitor interactions with the garden while also bolstering biodiversity, controlling erosion, and defining spatial boundaries. For instance, incorporating plant species with seasonal variations can offer dynamic experiences throughout the year. Additionally, remediation of certain areas presents opportunities for re-vegetation using native and diverse alternatives, further enriching the site’s ecological diversity.



*Sambucus nigra* (Elderberry): pollinator plant, habitat and culinary food, historic medicinal and cultural use



*Capsicum annuum* (Chile Pequin): habitat and culinary food, historic medicinal and cultural use



*Callicarpa americana* (American beautyberry): habitat and culinary food, pollinator plant, historic medicinal and cultural use



*Crataegus opaca* (Mayhaw): pollinator plant, historic medicinal and cultural use



*Malpighia glabra* (Barbados Cherry): habitat food, pollinator plant



*Symphoricarpos orbiculatus* (Coralberry): habitat food, nesting habitat

*“Identify all the vegetation species on site and include them in the learning experience.”*



06

# Design Guidelines

Review and compliance  
Architectural character  
Guidelines



# Review and Compliance

The UMLAUF HPEU Plan’s design guidelines aim to establish a framework that connects the site’s historical and natural elements with the wider community, expanding the existing offerings. The subsequent sections present guiding principles to prioritize future development for successful interventions. These principles do not offer fixed solutions but encourage flexibility and creativity, aligning with diverse project needs, functions, and budget constraints.

As each design challenge lacks a one-size-fits-all solution, these guidelines necessitate careful consideration during the design phase. They require expertise in design disciplines and a deep understanding of the unique context of the UMLAUF. It’s advisable for the Board to engage professionals in architecture or landscape architecture, either by involving them in the committee or seeking their advisory role during the design phases. Their input will be vital for reviewing compliance with these guidelines and ensuring thoughtful design implementation.



# Architectural Character

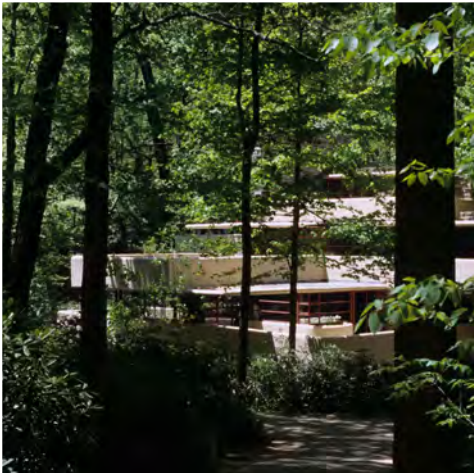
This UMLAUF HPEU Plan aims to create architecture that coincides with the goals of the UMLAUF, while reaching their desires for growth, and complimenting the existing structures and site. The architectural character of new buildings should harmonize with the original aesthetics of the house and studio, creating a seamless integration that pays homage to their design legacy. It's essential that these new structures complement the surrounding landscape, respecting its natural features while adhering to the established design guidelines. By echoing the design language and principles of the original architecture, the new buildings will not only honor the historical significance but also contribute to the overall visual coherence of the site. This approach ensures a unified aesthetic that respects the heritage of the space while embracing contemporary design sensibilities.



# Design Guidelines

Design guidelines are a set of principles or standards that offer direction and recommendations for creating and developing spaces or structures. They encompass various aspects of design, including architectural aesthetics, functionality, sustainability, and context within the environment. These guidelines serve as a framework to ensure consistency, quality, and coherence in design outcomes.

The following are used as a reference and framework during the planning and design phase of the HPEU Plan. They aid in maintaining a cohesive vision, ensuring that design decisions align with project goals, community feedback, and the intended user experience.



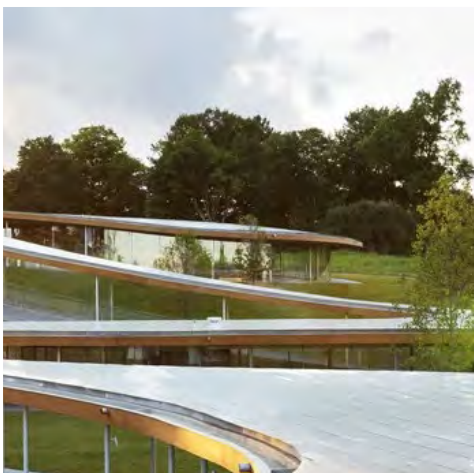
**Harmonize**  
Attunement of form to natural and historic resources. Careful placement of elements to blend in



**Synergize**  
Leverage environmental opportunities for high performance design and landscape



**Materiality**  
Use of natural materials



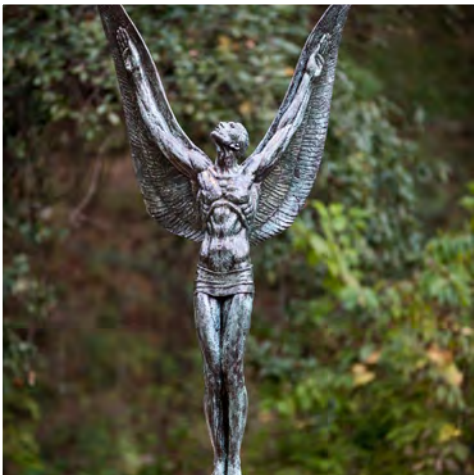
**Topography**  
Working with contour to enhance access, views, and discovery



**Views**  
Locate important program spaces to optimize view sheds



**Transparency**  
Glazed volumes provide views out and also dissolve the building into the trees and sky.\*



**Interpretive**  
Architectural opportunity to frame educational experience



**Biophilia**  
Holistic, healthful building, environmentally beneficial to occupants and ecosystems

\* Please view the Sustainability + Resiliency chapter for energy efficiency and bird-friendly requirements.



# Harmonize

Harmony is a quality of architecture that seeks to blend into and support the effects already present in a place, and often in a delicate balance. Harmony doesn't only imply the superficial imitation of appearances. That is camouflage. Harmony is adding something new into a place that augments and preserves it simultaneously and creates a whole greater than the sum of its parts. Harmony is the chord that must be struck for an intervention into the UMLAUF Sculpture Garden + Museum.

This historic place contains a rich history of sights, sounds, and experiences set in motion by the Umlauf family in which the new treehouse and gateway buildings must formally posture itself as the supporting character. On the wooded hillside the treehouse employs a dark, oxidized metal cladding to recreate the shadows and texture of ground covered by leaf litter. The matte texture avoids reflective distraction in favor of dappled light below foliage, providing minimal intrusion to the visual field of visitors enjoying the artworks and gardens. This attunement of every surface and material selection and form was similarly considered in detail and informs all of the architectural guiding principles, which is the function of harmony.



Fallingwater by Frank Lloyd Wright



# Synergize

The intervention should establish synergies with the environment, existing land use, architectural character, and local community. A primary opportunity of this site is to enhance the filtration of water bound for Barton Springs and Town Lake. The swales and contouring of new elements will serve to intercept water and direct it to biofiltration water features, and riparian areas. This holistic approach integrates the entire site into the hydrological system of its surroundings, enhancing its environmental synergy.

In addition to water management, careful consideration is given to the placement of key features such as the treehouse and gateway. These elements are strategically positioned at points of transition, direction change, and reorientation within the site. For instance, the treehouse location is meticulously aligned with the topography to seamlessly accommodate an elevator between the garden and hilltop levels. This approach not only enhances accessibility but also creates opportunities for implementing geo-thermal systems, thereby improving energy efficiency.

Furthermore, the treatment of the garden's edge along Azie Morton involves the creation of selective apertures, involving visitors in a new entry sequence. The revitalized welcome zone, incorporating amenities like a visitors' library and potential space for a food truck or other revenue-generating ventures, aims to integrate the UMLAUF with the surrounding neighborhood and the broader city. This area serves as a platform for collaboration with local businesses and extends the experience to those walking/wheeling around the site.





# Materiality

The choice of materials for new buildings should seamlessly integrate with the relaxed, natural ambiance that defines the UMLAUF's unique character. Reflecting the historical significance of the site's homestead, the materiality at UMLAUF draws inspiration from mid-century vernacular architecture, rooted in American Arts and Crafts traditions like the bungalow. This design ethos is evident in the existing museum and gallery structures, which are crafted from wood and employ traditional techniques tailored to local environmental and cultural conditions.

The proposed new construction must uphold the architectural legacy established by the house, studio, and pavilion, prioritizing openness to prevailing breezes and providing ample shelter from sunlight and occasional rain. Cross-laminated timber (CLT) emerges as a central element of the design strategy, allowing for innovative interpretations of stick-built shelters. By utilizing CLT as the primary structural material, rather than a veneer treatment, the design evokes the image of a treehouse while offering both aesthetic and sustainable benefits. The warm, inviting nature of wood can be expressed in various design elements, including column spacing, beam spans, and the exploration of expansive canopy cantilevers. Moreover, CLT's renewable and carbon-capturing properties align with the project's commitment to sustainability, as detailed in the sustainability chapter.

To complement the timber elements and harmonize with the site's natural surroundings, weathering steel (corten) and transparent, bird-safe glazing are recommended as additional primary materials for new constructions. The transparent glazing will facilitate the expansion of functional, environmentally controlled spaces, accommodating a range of flexible programs while maintaining visual connectivity with the site's landscape.





# Topography

Topography is a defining characteristic of Austin. Situated at the edge of the prairie and start of the Hill Country, Austin inherited the special rewards and challenges of occupying a limestone escarpment. The dramatic topography introduces protected pockets of nature into the urban grid, cherished by locals. Situated at the southwest edge of Zilker Park, the UMLAUF site occupies a pivotal boundary that offers an opportunity to forge stronger connections between the neighborhood, park, and broader city communities.

A primary objective of the plan is to honor and embrace the site's topography while simultaneously creating an accessible route that seamlessly integrates the entire site, enriching its natural and cultural offerings. Careful consideration of the grade change is essential, with a strategic approach that embraces the land's inherent character to inform architectural interventions. This approach not only prioritizes sustainability by minimizing disruption to the natural environment, but also endeavors to craft spaces that harmonize with the site's distinct identity, fostering a deeper sense of connection between the built environment and its surroundings. Implementation of landscape strategies on the steepest slopes will bolster stormwater management efforts and enhance hill stability.





# Views

The unique and striking elevations and topography of the UMLAUF site offer an exceptional opportunity to craft immersive experiences that showcase the beauty of nature and its surroundings. Intentional integration of architectural elements into the landscape will serve to accentuate and celebrate these breathtaking views, harmonizing the built environment with the site's remarkable natural contours.

Careful consideration of the building's orientation, placement of windows, and architectural features will play a pivotal role in framing the beauty of the UMLAUF's surroundings. Prioritizing the health and well-being of occupants, the design should maximize natural light exposure and provide views of the outdoor landscape, with the goal of reducing feelings of confinement, enhancing overall wellness, and mitigating stress levels. By strategically incorporating moments of openness and scenic vistas, the design can cultivate special experiences that foster a deep connection between users and the natural environment, as well as the art within it.





# Transparency

Transparency in architectural design embodies a concept that aims to dissolve physical barriers, enabling occupants to seamlessly transition between spaces, thus fostering a feeling of openness and interconnectedness. By welcoming natural light and providing unobstructed views, transparency creates an expansive, unified atmosphere that blurs the distinction between indoor and outdoor environments.

The plan recommends the strategic utilization of transparency to convey a sense of lightness and to maximize programmatic opportunities while preserving the site's natural ambiance. This could be achieved through the strategic incorporation of glass, open layouts, and design elements that establish visual connections between the interior and exterior surroundings. It is imperative to employ transparency responsibly, taking into account considerations such as visual and thermal comfort, energy efficiency, and the implementation of bird-safe glass and indoor lighting controls to safeguard the local ecosystem.



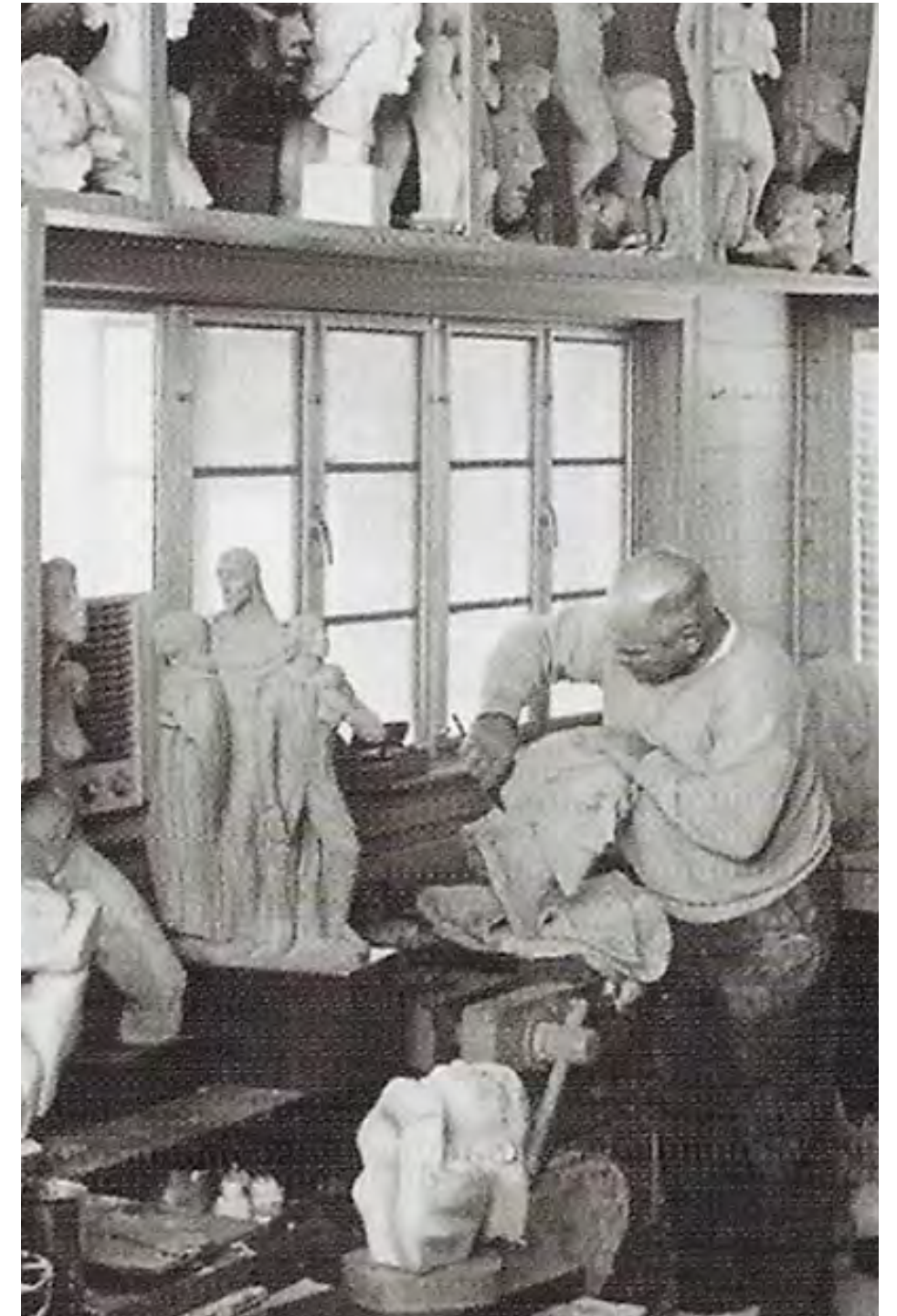


# Interpretive

The location and design of new elements in the plan present an opportunity to craft an immersive educational narrative that aligns with the programs it supports, weaving together Charles Umlauf's life with the world of art and its processes. This design concept envisions spaces capable of hosting elements inspired by Umlauf's artistic journey, spotlighting pivotal moments in his life and the evolution of his creations. These moments are seamlessly integrated into the explorative journey of the site, inviting visitors to embark on a discoverable path through the garden.

The architectural narrative must extend beyond biography. It should include spaces dedicated to understanding art processes, techniques, and inspirations. Through strategically positioned exhibits, interactive displays, and educational zones adjacent to the existing museum gallery, visitors can engage in a curated exploration of artistry. The design strategy should not only provide insights into Umlauf's legacy but also act as a gateway to appreciate diverse art forms, fostering a deeper understanding and connection to the creative world and its creators.

Additionally, the plan advocates for the incorporation of interpretation and education into outdoor and natural spaces. By integrating the water management strategy, promoting native species, and enhancing accessibility of natural trails, these elements become integral to the overall interpretive story. As the most recent addition to the UMLAUF's timeline, the improvements made to the site that enhance accessibility and awareness are embraced as part of its evolving history.





# Biophilia

Biophilia is the innate human tendency to seek connections with nature and other forms of life. By incorporating biophilic elements, such as plants, natural light, water, and materials derived from nature, architectural spaces can evoke a sense of harmony with the natural world. This concept holds particular importance in the implementation of the plan at the UMLAUF due to the site's inherent natural character. Examples of biophilic design elements include green spaces, living walls, abundant natural light, and opportunities for views of nature.

The plan recommends the adoption of biophilic strategies to enhance visitors' well-being, productivity, and overall satisfaction, thereby enriching the art viewing experience and highlighting the unique essence of the UMLAUF. Moreover, these elements can contribute to energy efficiency and sustainability by maximizing the use of natural light and ventilation, thus reducing dependence on artificial lighting and heating systems. Strategic building orientation and window placement are crucial for balancing a strong connection with the site while achieving energy efficiency.

Leveraging existing site elements and integrating additional biophilic design features will create spaces that seamlessly blend with the natural environment and promote a deeper connection with nature for all who visit the UMLAUF.






07

# Sustainability + Resilience

Health  
Energy  
Carbon  
Ecology  
Water  
Resilience  
Sustainability Strategies





*Sustainability goals are woven into the very fabric of UMLAUF's guiding principles and priorities.*



# Sustainability Commitment

## Quality Assurance

While the City mandates a certain baseline of sustainability, the UMLAUF aims to surpass these requirements by adopting a holistic approach to site improvement. This commitment encompasses every stage of the process, from planning and financing to designing, constructing, managing, renovating, operating, maintaining, and decommissioning buildings.

At the forefront of the site's objectives is the enhancement of landscape and stormwater management to bolster resilience during both droughts and floods. Following this, the priority is restoring the existing historic site, which involves weatherization, replacing components of the mechanical, electrical, and plumbing (MEP) systems, and eliminating hazardous materials that pose potential health risks. Lastly, the site seeks to incorporate spaces that serve the local community, fostering gatherings and promoting healthy lifestyles.

Dedicated to impact-forward design, the plan suggests to integrate additional non-traditional sustainability-related scopes into the project. These may include roles such as building performance consultants, enclosure consultants, commissioning officers, certification leads, rainwater subcontractors, solar subcontractors, geo-exchange systems installers, and more.





# Certifications

The Austin Green Building Policy mandates that all City-owned public-private partnerships must meet a minimum **3-star AEGB or LEED Silver rating**, ensuring adherence to sustainable practices in building construction. Furthermore, projects exceeding \$2 million in construction costs are obligated to acquire **SITES certified rating**, which prioritizes both human and environmental well-being through its principles. Whereas certifications like AEGB and LEED focus on the building, SITES focuses on everything on your site except the building (with a few exceptions). These three certifications have certain alignments and synergies which are to be considered when making a final rating decision.

In demonstrating their dedication as conscientious stewards of the environment, the UMLAUF plans to start the design process with a goal-setting exercise to explore options of achieving an exceptional 4-star AEGB rating and/or LEED Gold certification, as well as SITES Gold. In the pre-schematic design discussion, the UMLAUF will explore other certifications such as WELL building standard compliance and PHIUS certification.





# Impact Categories

The plan encompasses six primary impact categories to ensure that sustainability and resilience strategies are approached comprehensively, addressing key aspects crucial for cities and buildings to have a responsible and positive impact on their communities and the environment.

## Health



**Safeguard occupant health and well-being** by incorporating design elements that prioritize thermal and visual comfort, employing biophilic concepts, considering acoustic comfort, and implementing measures to enhance indoor air quality.

## Energy



**Reach net zero annual energy** by incorporating energy reduction strategies, solar panels, and a geoexchange heating + cooling system. Electrify site energy uses. Reduce site energy usage by 50% from ASHRAE 2019 and IECC 2021 baseline.

## Carbon



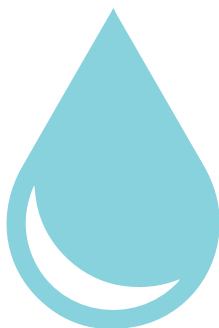
**Reduce embodied carbon by 50%** from baseline through carbon conscious material selection, and planting carbon sequestering ecology. Consider other forms of reducing greenhouse gas emissions such as accommodating for other forms of transit infrastructure (ex. bicycles & electric vehicles) and reducing refrigerant leakage by 25%.

## Ecology



**Enhance ecology and biodiversity** by introducing a diverse middle layer of shrubs and forbes, enriching the environment and providing additional vegetation for animals.

## Water



**Minimize water feature and irrigation water consumption** and use stormwater and rainwater exclusively for outdoor irrigation.

## Resilience



**Establish an effective water management strategy** for both routine rain events and extreme 500-year flood events using bioswales, increases in pond capacity, rain gardens stone path edges, and other relevant measures.



# 07.1

## Health



# Health

## Introduction

At the heart of the UMLAUF's design ethos lies a commitment to people and place. Human-centric design necessitates an understanding of the community's demographics and their specific needs, as detailed in previous sections of this report. This section shifts focus to human health and well-being within the space, particularly examining the impact of light, heat, and air quality on overall health and well-being.

Recognizing the profound influence of physical and social environments on well-being, parks like the UMLAUF play an essential role in nurturing health-conscious communities. These communal spaces serve as vital hubs for social interaction, addressing prevalent health concerns such as depression and loneliness by fostering connections among community members.

These verdant sanctuaries seamlessly blend nature with urban landscapes, offering solace, reducing stress, and augmenting mental and physical health through exposure to natural sunlight. Sunlight exposure intricately regulates the body's circadian rhythm, energy levels, and hormone releases, while the ecological setting provides both direct medicinal benefits and soothes nervous system responses.

By meticulously considering air quality, thermal comfort, and visual well-being, both the UMLAUF's indoor and outdoor spaces will harmoniously integrate sustainability with the well-being of its visitors, cultivating an environment where individuals thrive both physically and mentally.





# People

## Demographics

Part of the UMLAUF’s vision is to honor the Umlauf family’s contribution to the Austin community by offering experiences that integrate art with nature, health and wellness programs, and a peaceful breathing space within the heart of the urban capital city. The site’s special location not only offers a space to connect with nature, it also provides access to an outdoor oasis infused with art, which can contribute to both mental and physical well-being. To support equitable access to these experiences for all members of the community, particularly underserved and historically marginalized communities, the plan recommends the implementation of supporting operational and programming strategies to enhance accessibility to the site and programs.

Historically, health risks have correlated with factors such as the physical environment, education, race, ethnicity, and income. However, data from the Environmental Protection Agency’s (EPA) Building Environmental Justice (EJ) Tool, indicates that the UMLAUF’s immediate vicinity is primarily populated by affluent white individuals with better health indicators than the city’s average (please refer to the comparison on the right for further details). This underscores the importance of ensuring the plan’s real impact on community health.

The table on the right compares demographic data from some of Austin’s wealthiest, poorest (excluding university blocks), and median neighborhoods. Implementing accessibility strategies targeting underserved and historically marginalized communities could allow the UMLAUF to have a more positive impact. By doing so, more people could benefit from the physical and mental health benefits that spending time at a site like the UMLAUF’s can provide.

| Demographics   |  |  |   |
|--|--|--|---|
| Scenic Dr. near Colorado River in Tarrytown (zip code 78703) | Local 1/4 mile radius of the UMLAUF and majority visitor population (zip code 78704) | City of Austin Demographics from US Census Bureau    | Block at corner of 12th St & Airport Blvd. (zip code 78702) |
| Population Density<br><b>1,957</b><br>people/sq mile         | Population Density<br><b>5,689</b><br>people/sq mile                                 | Population Density<br><b>3,271</b><br>people/sq mile | Population Density<br><b>7,145</b><br>people/sq mile        |
| People of Color<br><b>3%</b>                                 | People of Color<br><b>11%</b>  | People of Color<br><b>36.8%</b>                      | People of Color<br><b>91%</b>                               |
| Per Capita Income<br><b>\$189,050</b>                        | Per Capita Income<br><b>\$101,672</b>  | Per Capita Income<br><b>\$86,556</b>                 | Per Capita Income<br><b>\$17,755</b>                        |
| Lack of Health Insurance<br><b>1%</b>                        | Lack of Health Insurance<br><b>1%</b>  | Lack of Health Insurance (Under 65)<br><b>13.9%</b>  | Lack of Health Insurance<br><b>14%</b>                      |
| Persons with Disability<br><b>5%</b>                         | Persons with Disability<br><b>2.5%</b>   | Disability Under Age 65<br><b>7.2%</b>               | Persons with Disability<br><b>8.5%</b>                      |
| Life Expectancy<br><b>84 yrs</b>                             | Life Expectancy<br><b>81 yrs</b>   | Life Expectancy<br><b>82 yrs</b>                     | Life Expectancy<br><b>72 yrs</b>                            |



# People

## Demographics

To promote greater equity in access to the UMLAUF, strategies are recommended that are aimed at making the site accessible to areas of the city with higher health risk factors and limited access to quality green spaces and cultural institutions. This initiative aims to extend the reach of the site’s tranquil environment and health and wellness programs offered by the UMLAUF.

The plan recommends incorporating inclusivity into the built environment by designing for different ages, genders, abilities, language barriers, and more. The UMLAUF has already implemented programs to enhance accessibility and inclusion, including Touch Tours that allow visitors to interact with sculptures, Family Day programs catering to all ages, and UMLAUF After Dark events offering museum visits after regular hours. Building upon these efforts, further community engagement needs to take place for the UMLAUF to become a resource for all Austinites, including historically underserved communities in the Eastern Crescent (neighborhoods and connecting areas in central East Austin, Colony Park, Del Valle, Dove Springs, Montopolis and Rundberg areas). The UMLAUF will take deliberate action to continue to reach these populations and identify what they need from the organization.

Below are a series of recommended strategies aimed at expanding the audience of who can benefit from visiting the UMLAUF. It is suggested to collaborate with existing community organizations to support and implement this vision. A comprehensive operations plan becomes essential in the later stages of planning to guarantee that both existing and new spaces are use in an equitable manner.

### Accessibility

- 1. Fully ADA accessible museum and garden experience
- 2. Site edge treatments for maximum visibility and a more welcoming arrival

### Inclusion

- 3. Universal Design principles
- 4. Increase awareness of the current free Touch Tours
- 5. Multilingual educational signage
- 6. Children-friendly programs
- 7. Recognition of historical and site context as well representation of diverse cultures and artistic practices
- 8. Water filling stations & outdoor outlets
- 9. Outdoor resting stations (benches in shaded areas)

### Equity

- 10. Free admission opportunities
- 11. After-hours access opportunities
- 12. Busing/shuttle initiatives
- 13. After-school engagement programs
- 14. Historically underserved communities art education program
- 15. School art field trips

*“I found peace at UMLAUF when I visited. Going there helped me through a tough spot.”*



The UMLAUF currently houses the largest collection of touchable bronze sculptures in Texas. The Touch Tours offer unique opportunities for the visually impaired and other kinesthetic learners to formally engage with the subject matter and materials employed by Charles Umlauf.



# Place

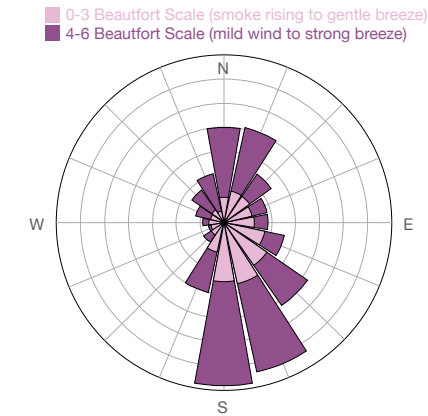
## City of Austin

Various resources such as Klimaat, Climate Check, Colombia’s Natural Hazard’s Index, and the Environmental Protection Agency’s (EPA) Building Environmental Justice (EJ) Tool, provide valuable insights into our local climate and inform strategies for designing for visual and thermal comfort. On the right, you’ll find some basic climate metrics, and at the bottom, the site is situated within the local climate for further analysis.

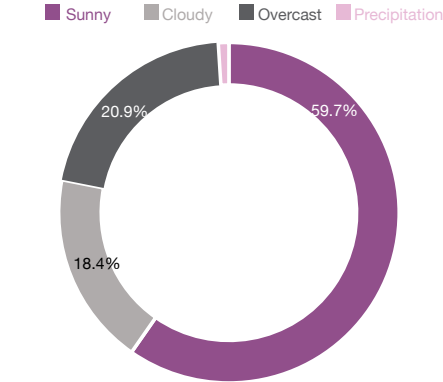
Austin experiences mild variations of typical heat and air quality challenges, yet it still grapples with issues such as extreme heat, drought, and flooding, particularly exacerbated by the urban heat island effect. Within this urban landscape, the UMLAUF functions as a green sanctuary, tempering city temperatures through a micro-climate fostered by biodiversity and water features, providing much-needed relief. Designing comfortable environments not only eases strain on the body’s thermal regulation but also enhances visual comfort.

Throughout the following pages, strategies will be presented to uphold occupant thermal and visual comfort and ensure good indoor and outdoor air quality. The Austin population grapples with air quality challenges, including those posed by COVID, allergies, and other harmful particles affecting human health. Air quality tends to spike during peak traffic times and settles down at night, presenting dynamic challenges that must be addressed.

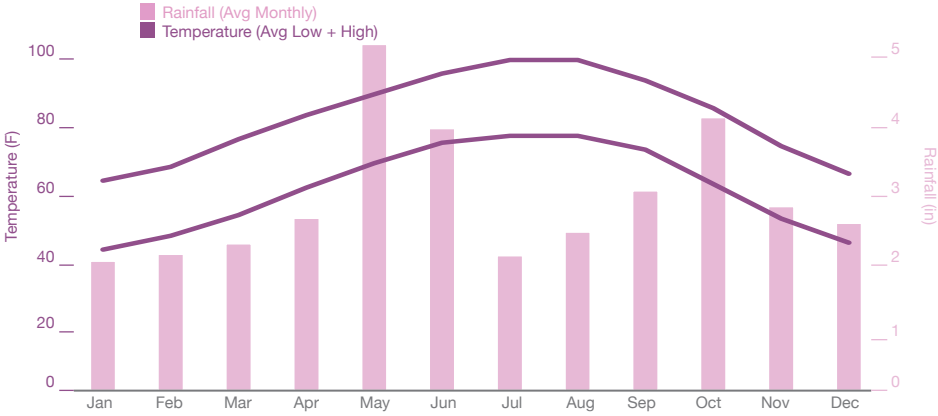
Wind Rose



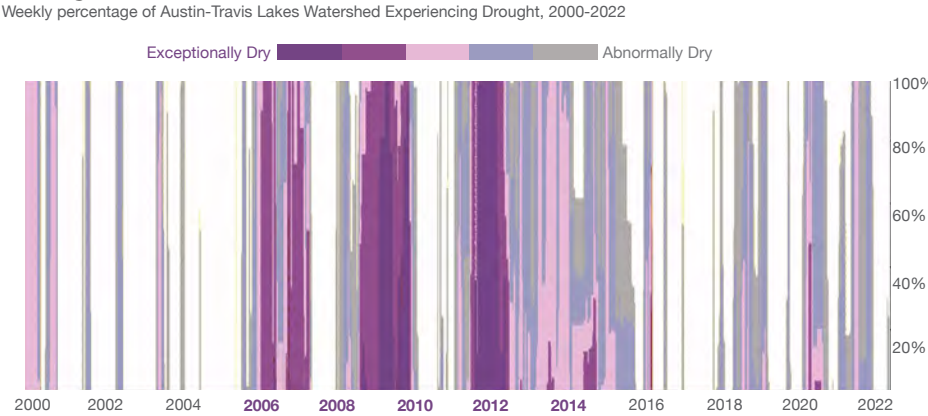
Weather Characteristics



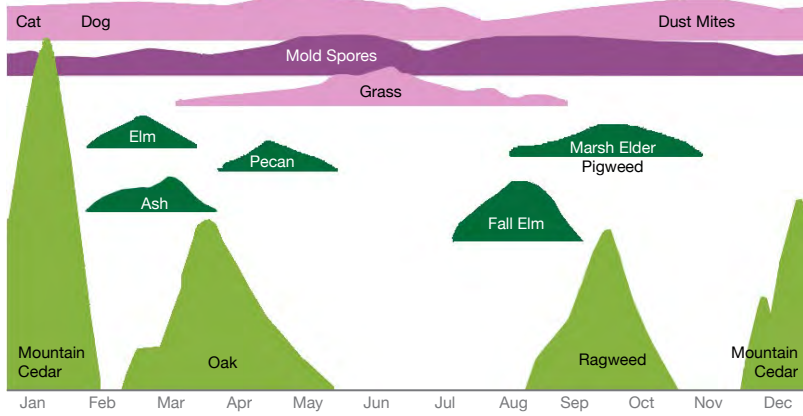
Rainfall + Temperature



Drought Risk



Austin Allergies



Asthma

8%  
Percent of population

Haphazardous Waste Proximity

.74 facility count/km  
compared to US avg of 1.9

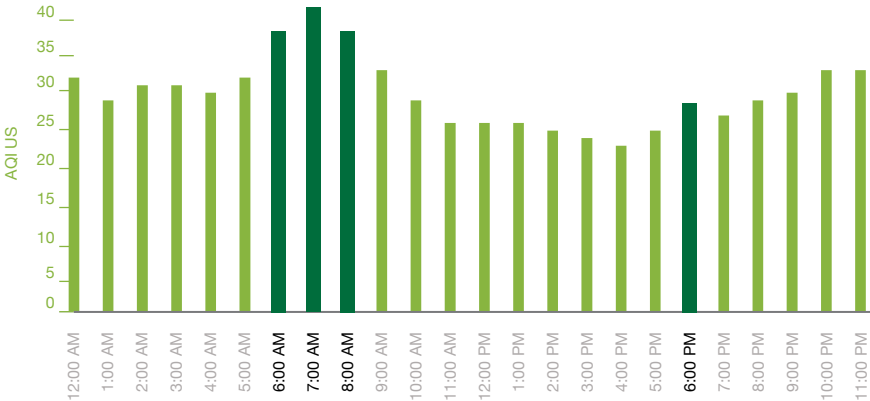
Particulate Matter

9.66  $\mu\text{g}/\text{m}^3$   
compared to US avg of 8.08

Ozone

62.7 ppb  
compared to 61.6 US average

Austin Air Quality Index





# People-centric Design

All Gender, All Age, All Occupants  
Health, Accessibility, Inclusion

The aim of the plan is to establish a space that is welcoming and physically accessible to people of all ages and transportation modes, inclusive of all genders, and promotes healthy practices for every visitor. This involves incorporating principles of Universal Design Guidelines and strategies from the WELL certification. Specific measures, such as installing additional water and bottle filling stations, cooling spray areas, bike racks, and electric vehicle (EV) parking spots, as well as including a lactation room, changing station, multi-lingual signage, and all-gender restrooms with showers, are essential for fostering a more inclusive and healthy environment on the site. Please see some of these recommendations on the map to the right.





# Visual and Thermal Comfort + Biophilia

## Architectural Design Strategies

Designing and maintaining spaces that prioritize thermal and visual comfort is fundamental for enhancing the quality of life for their users. The plan suggests that additional studies on daylighting, energy efficiency, and related subjects is imperative to achieve a balanced integration of daylighting, glare control, thermal comfort, and biophilic design elements. Design strategies such as thoughtful orientation, window-to-wall ratios, window specifications, shading techniques, meticulous enclosure detailing, air barrier continuity + testing, natural ventilation systems, and iterative thermal and visual modeling can all contribute to optimizing design outcomes. Please find below some recommendations and explanations of these critical health metrics.

### Biophilic design

Biophilic design principles can significantly contribute to stress reduction, enhance creativity and mental clarity, improve overall well-being, and facilitate healing processes. Incorporating elements that establish connections with nature, such as visual and auditory stimuli, dynamic and diffuse lighting, specific structural materials, and creating spaces of refuge and mystery, can all contribute to this effect.

The plan suggests biophilic strategies such as optimizing natural views and incorporating materials reminiscent of the outdoors. Dappled lighting, natural auditory cues like the babbling brook, and the sensation of seclusion within a forested area creates thoughtful experiential moments.

### Visual comfort

Visual Comfort plays a pivotal role in occupant satisfaction and performance. Natural light has been associated with improved mood, energy levels, physical health, productivity, and learning.

### UMLAUF HPEU PLAN

Moreover, proper lighting conditions influence circadian rhythms, impacting sleep patterns and hormone releases.

The primary recommendation is to iterate with the massing and orientation of the suggested structures and spaces, and analyze various dynamics of the space to achieve healthy conditions, which are attained when occupants are not subjected to glare or underlit conditions during hours of operation in key areas. Additionally, the art selection could require custom lighting considerations which will be evaluated in later stages of design.

### Thermal comfort

Maintaining optimal thermal conditions is equally critical for occupant well-being. By ensuring a comfortable temperature range, discomfort, fatigue, and stress can be minimized while promoting physical and mental health. Additionally, creating sustainable and energy-efficient thermal environments is essential for overall building efficiency.

The plan recommends to conduct mean radiant temperature, CFD (Computational Fluid Dynamics), and operational temperature studies to assess thermal comfort at the UMLAUF to achieve the recommended envelope-to-floor ratio of 1.53. Mechanical controls and passive design strategies can significantly impact thermal comfort.

### Acoustic Comfort

Considerations will be put into dampening street noise from the site occupants.



The plan suggests the use of natural materials such as mass timber and wood finishes, as well as implementing experiential nature, such as maximizing the dappled light of trees, outdoor smells, and nature sounds through design.



# Indoor Air Quality

## Mechanical Systems and Material Strategies

Ensuring optimal indoor air quality is crucial for occupant well-being. Poor air quality, including high CO2 levels, toxins, biological growth, and airborne diseases, can lead to Sick Building Syndrome. Emissions associated with PM 2.5, ozone, and toxins contain various compounds posing health risks, such as reduced lung function, cancer, and neurological damage. A proactive, multi-faceted approach is essential, as outlined in the provided strategies.

The plan recommends the following strategies for enhancing indoor air quality:

1. Providing adequate ventilation, bathroom and kitchen exhaust systems, and code-compliant filtration for existing buildings.
2. Conducting blower door tests and improving to 3 air changes per hour (ACH) for existing buildings and 0.06 ACH for new buildings.
3. Implementing MERV 16 air filtration for new buildings on outdoor and recirculating indoor air, capable of trapping 99.97% of air particles sized 0.3 microns. And selecting materials with low volatile organic compounds (VOCs), using Red List free materials, and opting for materials with Health Product Declarations (HPDs) to promote healthier indoor environments.
4. Using walk-off mats and vestibules, adopting green cleaning practices, and implementing Integrated Pest Management strategies, among other measures.
5. Monitoring indoor air quality in both new and existing buildings to engage the public and ensure indoor health standards are met.



**Filtration**  
A MERV 16 or HEPA equivalent filter at fresh air intake



**Fresh Air**  
Fresh air ensures that high levels of CO2 do not build up in the space and toxins get flushed out



**Dehumidification**  
In a climate like Austin, dehumidification is paramount to comfort and moisture control



**Low Duct Leakage**  
Perform Duct Leakage testing periodically during construction to ensure air tight ducts



**Building Air Tightness**  
Perform Blow Door Testing periodically through construction to ensure the enclosure is air tight



**Building Flush Out**  
Do several days of a whole building ventilation before occupancy



**Red List Materials**  
Red List chemicals and elements are known to pose serious human health risks



**Low VOC Materials**  
Volatile organic compounds (VOCs) mix with air pollutants and UV light to make ozone, a human health toxin



**Air Quality Monitoring**  
Post occupancy metrics show real-time data on air quality



**Walk-off Mats + Vestibule**  
Walk-off mats and vestibules prevent outdoor air and particles from contaminating indoor air quality



**Green Cleaning Products**  
Use non-toxic cleaning products. Use EPA Safer Choice label



**Integrated Pest Management**  
Certain plants act as pest repellents



# 07.2

## Energy



# Energy

## Introduction

The UMLAUF's primary energy objective is to achieve **Net Zero Annual Energy**, meaning the site generates as much renewable energy as it consumes over a year. The strategy involves initially reducing annual energy usage and then offsetting the remaining consumption by leveraging geo-exchange for heating and cooling while maximizing on-site energy production with solar panels.

The careful selection of energy sources is critical, considering that non-renewable options such as coal, natural gas, and propane significantly contribute to air pollution and global warming. Each unit of energy used on-site translates to three units of energy used at the source at coal or propane plants due to losses during conversion and transmission. The UMLAUF has committed to a fully electrified site, eliminating gas, diesel, or propane appliances and systems and providing EV transportation with chargers on-site and places for bikes and human-powered transportation. Despite remaining connected to the grid with a diverse energy portfolio, the UMLAUF is actively reducing its energy consumption and deploying on-site renewables to minimize its environmental footprint. As an option, UMLAUF is to consider enrolling in Austin Energy's GreenChoice program which is 100% renewable grid energy. This multifaceted approach underscores the UMLAUF's conscientious efforts to balance operational needs with environmental stewardship.





# Energy Balance

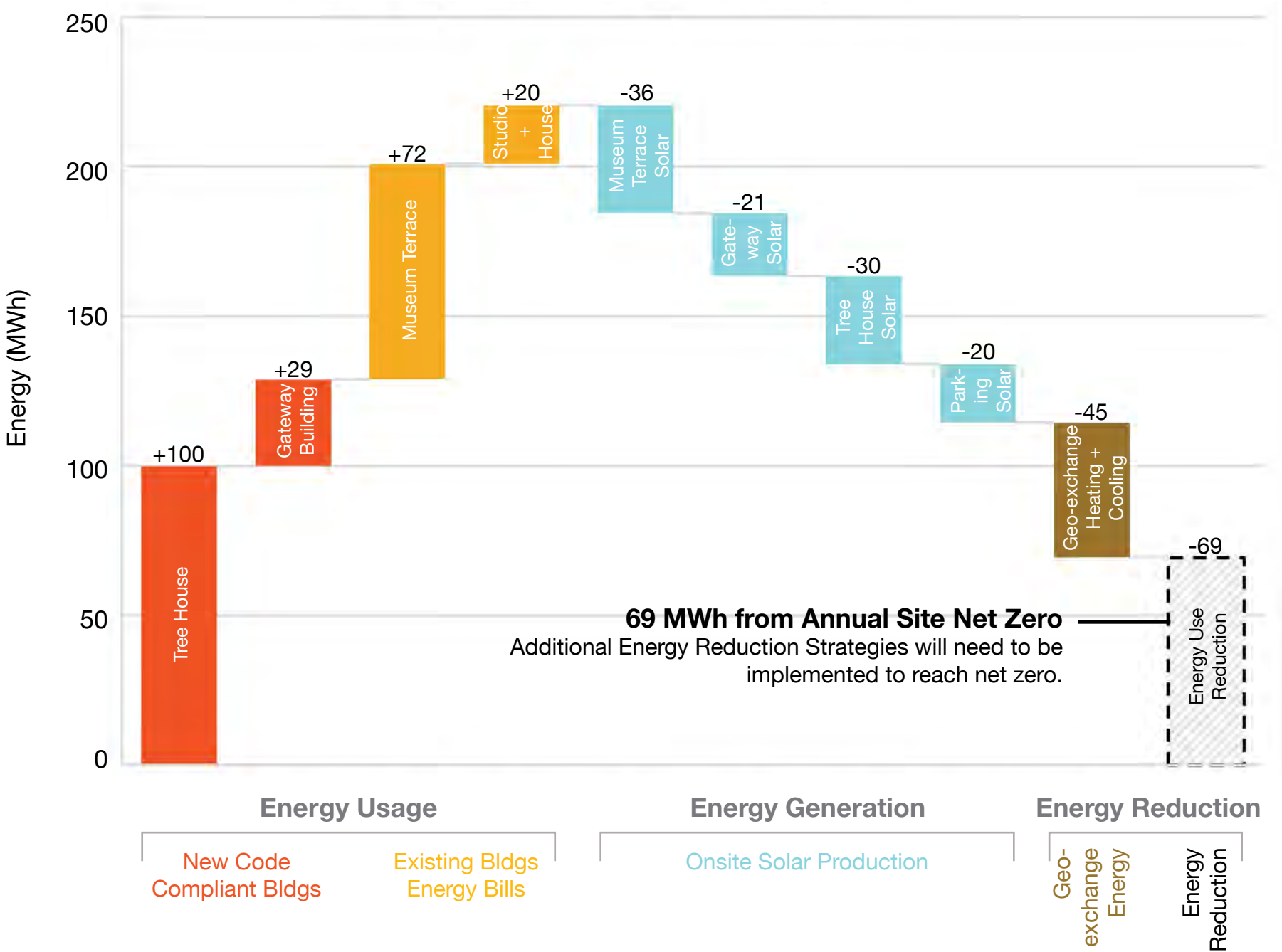
## Annual Energy Balance

The existing and new buildings are predicted to consume 221 MWh per year, which is more energy than 18 homes in Texas. Renewable energy generation from photovoltaic (PV) systems can offset 50% of the total annual energy use of the site. Using geo-exchange wells and ground source heat pumps, reduces an additional 10-20% of site energy consumption. To bridge the remaining gap to net zero annual site energy, existing meter data should be collected with energy audits to evaluate the most effective energy conservation strategies. A comprehensive building performance analysis is recommended to asses aspects such as building orientation, the window-to-wall ratio, the implementation of high performance enclosure, heat pump systems, decoupled ventilation with sensible HVAC systems, and the use of energy-efficient appliances. Integrating these solutions will reduce energy consumption and allow for the PV and geo-exchange systems to offset a larger percentage of the annual energy consumption. Other innovative energy recovery options are to be considered.

Solutions should first be applied to the new buildings to make them as energy efficient as possible. Followed by the Museum Gallery + Terrace, which is currently the highest energy consumer of the existing buildings. Lastly, the historic home and studio should be addressed carefully to retain historic context, while modernizing systems for the future. The improvements will be balanced with the budget of the project to find the most cost-effective solutions. Solutions such as proper orientation, window to wall ration, and passive design strategies will be considered first as cost effective solutions.

# Annual Net Energy Usage

Implementing energy production strategies — such as solar, geothermal, and additional reduction tactics — compensates for the energy consumption of new and existing buildings to reach net annual zero





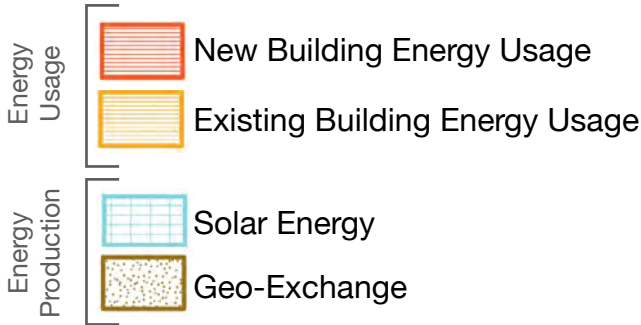
# Energy Use/Generation/Thermal

Energy Use, Solar Energy Production, Geo-exchange

The location and quantity of solar panels are impacted by site limitations, including existing and historic trees, shaded roofs, and utility provisions. Although historic building funding requirements restrict solar placement, all other buildings are recommended to be fit for solar panels and others are recommended to be solar ready. Implementing solar canopy over parking will make further strides towards reaching net zero annual energy.

Additionally, incorporating a geothermal heat pump system - which replaces traditional HVAC systems by harnessing the earth's relatively stable temperature to regulate buildings' heating and cooling - can further improve energy efficiency. A geo-exchange loop under the southern parking area can potentially cover the entire heating and cooling needs of the gateway and museum gallery. An additional geoexchange system near the northern parking lot in well or loop form could possibly provide heating and cooling to the treehouse. If the capacity of the goethermal system does not completely meet the needs of the historic buildings, the plan recommends using air source heat pumps.

Thinking ahead, as energy has an operational carbon impact, the plan recommends exploring hydronic systems to reduce the carbon footprint of the refrigerant. And think through radiant heating as a more efficient form of heating the space.



UMLAUF HPEU PLAN





# Energy Reduction Strategies

The UMLAUF’s building operations currently demand more energy than what can be generated on-site. The recommended energy conservation strategies outlined below aim to further reduce operational energy usage to achieve the target of net-zero emissions.

For existing buildings such as the Museum Gallery + Terrace and Historic Homestead, implementing circuit-level monitoring or conducting a building energy audit will provide valuable insights into current energy usage patterns. By implementing appropriate strategies based on these findings, the goal is to reduce energy consumption.

To diminish energy usage in new constructions by 50%, consideration towards factors like building orientation, shading, and enclosure will effectively curtail HVAC system energy consumption, reducing upfront equipment costs and long-term energy bills.

The plan also recommends additional energy-saving measures, such as enrolling the UMLAUF in a demand management program, which can contribute towards achieving an AEGB 3-star rating and LEED goals.

The provided recommendations are derived from the Passive House Institute US (PHIUS), representing the gold standard for energy reduction strategies.



**Design Strategies**  
Orientation, compact footprint, window-to-wall ratio, overhangs, tree shading, blinds, cross ventilation, tree buffers from wind, stack effect, and more are some of the biggest impact categories for energy usage. Early phase energy modeling could provide data-driven feedback and benchmarking



**Thermal Performance**  
Solar heat gain, low-e coating, thermally broken windows, no thermal bridging, high insulation, light roof membrane



**Air Tight Enclosure**  
Building air tightness, airtight ductwork



**Electrify Building Equipment**  
Heat, stoves, cars, and other typically gas appliances will be electric only



**Heat Pump Systems**  
Air Source Heat Pump systems are typically 3x more efficient than electric or gas systems



**Energy Efficient Appliances**  
Picking energy efficient appliances with Energy Star certification reduces energy usage



**Measuring Usage**  
Real-time circuit-level energy monitoring creates owner opportunities for energy conservation



**Join Demand Management Program**  
During peak power draws, opt into reducing thermostat settings



# 07.3

## Carbon



# Carbon

## Introduction

As a significant cultural landmark in Austin, the UMLAUF has a critical role to play in raising awareness of environmental issues. Leading by example, the following recommendations aim to reduce embodied carbon emissions by 50%. Various factors contribute to the overall carbon footprint, as defined below. The term CO<sub>2</sub>e, used in the following section, represents the global warming potential of greenhouse gases standardized in units of CO<sub>2</sub>e. For perspective, offsetting a single ton of CO<sub>2</sub>e requires planting 31-46 trees that photosynthesize for a year.

Key Terms:

**Embodied Carbon:** Total greenhouse gas emissions associated with the entire life cycle of a building or product, including extraction, manufacturing, transportation, and construction phases. This calculation includes CO<sub>2</sub> equivalents of greenhouse gas emissions released from refrigerant leakage.

**Operational Carbon:** Ongoing carbon emissions resulting from building operational energy consumption.

**Sequestered Carbon:** Carbon dioxide captured and stored, often through sustainable practices such as afforestation or the use of carbon-absorbing materials.

**Onsite Carbon Offset:** Carbon emissions offset by replacing grid energy with on-site renewables or by reducing energy usage with energy reduction strategies.





# Carbon Synthesis

## Carbon Balance over 30 Years

Goal: Achieve site carbon neutrality by 2055, balancing annual operational emissions and embodied carbon emissions with onsite carbon offsets and sequestration.

The plan suggests small footprints, minimizing energy usage, integrating on-site renewable energy sources, careful material selection, and reforestation areas of the site, to decrease the site’s carbon emissions. To the right is a projection of the carbon released into the atmosphere over 30 years, given that the City of Austin reaches their goal of decarbonizing their grid by 2040.

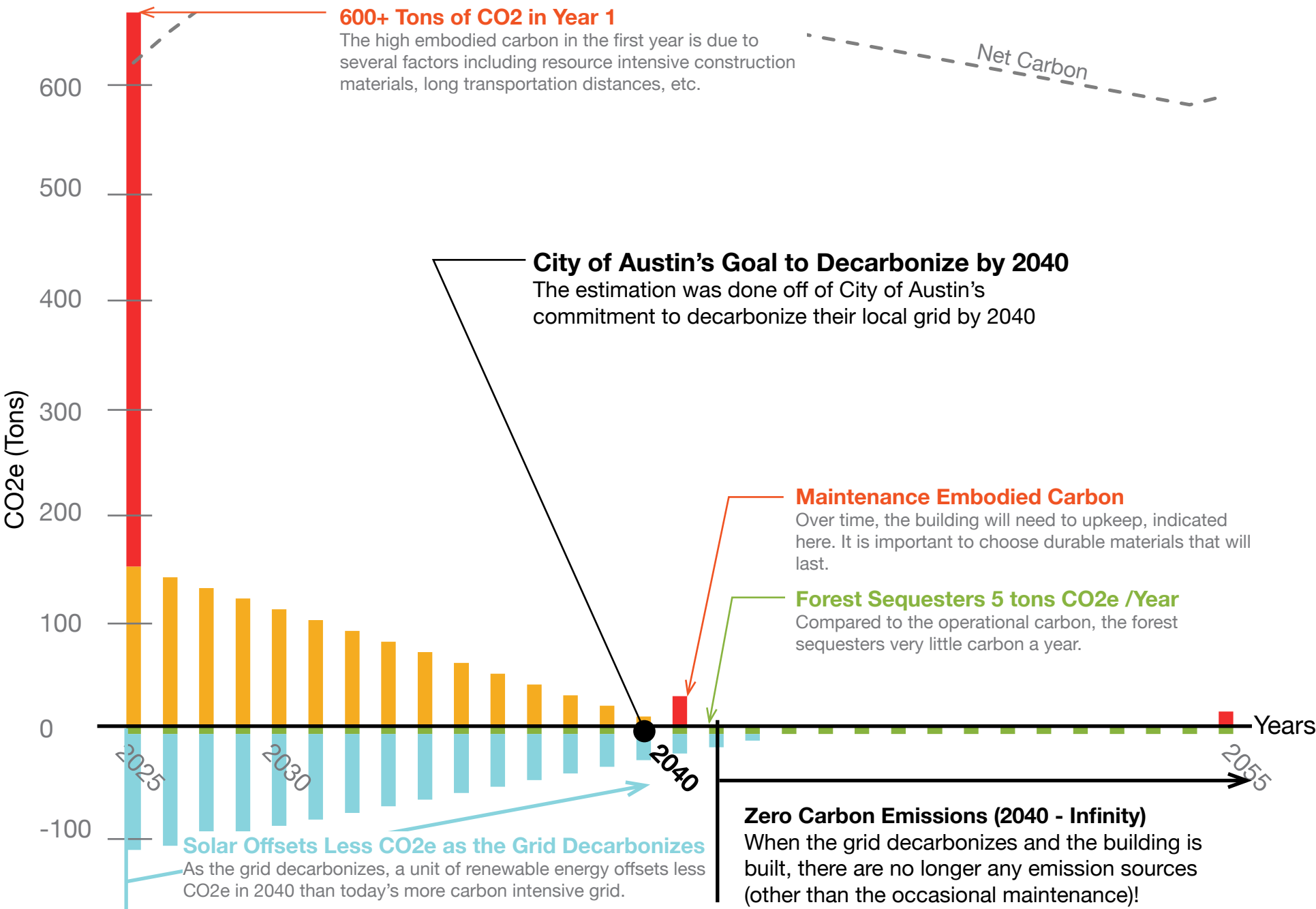
This analysis combines the impacts of:

- Embodied Carbon: Materials
- Operational Carbon: Energy Usage
- Carbon Sequestration: Landscape
- Onsite Offset Carbon: Renewable Energy

An early estimate was compiled using a combination of CBECs data, CARE Tool, City of Austin’s Carbon/kWh estimate, Cambium, and Helioscope. Transportation to and from the site was not considered, but refrigerants were factored into the estimate.

# UMLAUF Carbon Balance over 30 Years

Embodied carbon far surpasses other carbon emitters on day 1. The site’s trees sequester a minute portion compared to the emitted carbon. Producing energy onsite decreases the total carbon emissions tremendously.





# Carbon Emissions Breakdown

## Whole Site over 30 Years

Since embodied carbon accounts for a significant portion of emissions over a 30-year period, it is essential to dissect the information, using OneClick Tally Carbon Designer.

**95% Reduction in Carbon from Reuse** Using existing structures results in a remarkable 95% reduction in embodied carbon compared to building new, determined through analysis conducted with the CARE Tool.

**Enclosure** Incorporating strategies such as bio-based insulation, wood studs, CLT interiors, and others can potentially decrease the embodied carbon impact of the new building enclosure by over 50%.

**Refrigerants** Refrigerant leakage was factored into the analysis, constituting 25% of the total project’s embodied carbon for new construction and 50% for existing structures, based on estimates provided by LMN Architects. UMLAUF aims to align with the city’s Climate Equity Plan to reduce refrigerant leakage by 25% and consider natural refrigerants.

**Transportation:** The emissions from transportation were considered, accounting for 100 people visiting the site daily, driving a total of 6 miles, at an emission rate of 400 grams CO2e/ mile.

**Site vs Source Energy:** While not explicitly outlined here, energy generated by onsite solar panels reduces transmission losses and additional losses associated with petroleum and coal. The US Energy Information Administration states that about “60% of energy used for electricity generation is lost in conversion.”

This initial analysis serves as a foundation but needs to be supplemented with a detailed whole-building life cycle analysis that can be refined as the project progresses.

# Site Embodied Carbon Breakdown over 30 Years

The biggest carbon emitters on site are operational energy, structure, interiors, then MEP systems, envelope, and refrigerants. The landscape barely offsets carbon.





# Carbon Emissions and Drawdown

## Overall Site Plan

In pursuit of sustainable and eco-conscious design, the plan recommends measures aimed at minimizing carbon emissions. Central to those efforts are reducing impervious cover as sitework and concrete structure are some of the largest contributors towards embodied carbon emissions. As the project iterates, the plan recommends building with wood structure above ground and creating a small footprint.

Although the majority of the embodied carbon impact will occur on the reduction side, sequestration from vegetation restoration can draw down carbon out of the atmosphere every year.

The synergistic interplay between material choices and site vegetation underscores the plan’s commitment to sustainability and low-carbon initiatives.





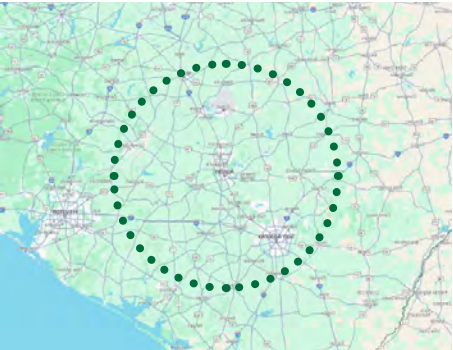
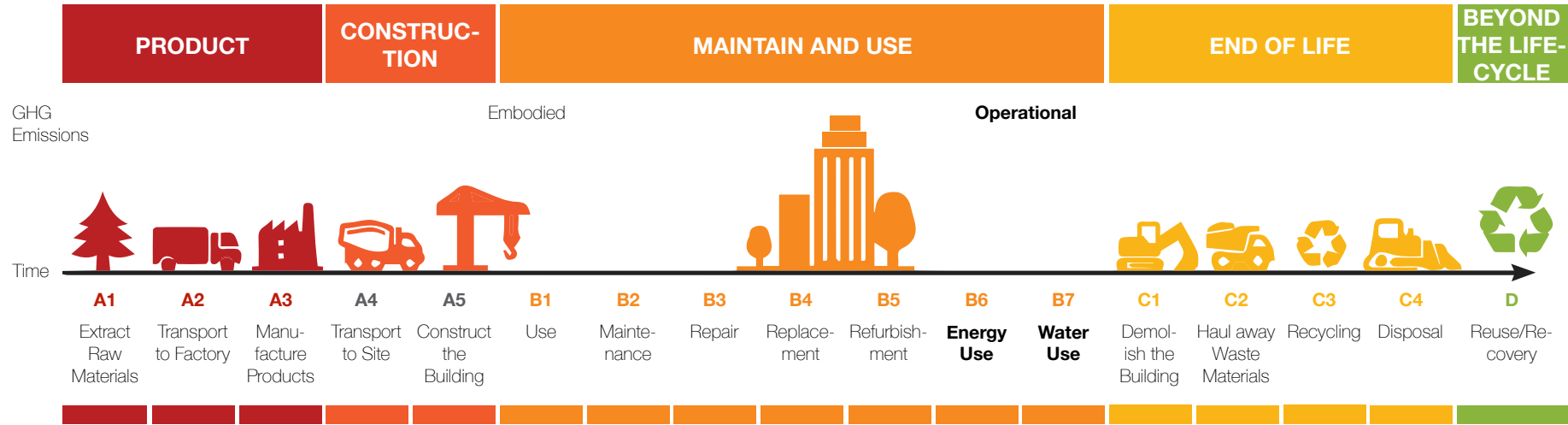
# Carbon Emissions Reduction

## Materials Strategy

Embodied carbon calculations use a set time span to measure the GHG emissions released into the atmosphere in equivalent CO2 from manufacturing, construction, transportation, maintenance, and end of life disposal, as shown in the graphic to the right.

As much as possible, preservation and mindful deconstruction reduces the need for additional materials and further greenhouse gas admissions. Concrete and steel are some of the largest contributors to the new building’s embodied carbon. Asking manufacturers for Type III Environmental Protection Declarations (EPDs) pushes the industry forward by encouraging transparency. Transportation is one of the contributors to a material’s embodied carbon and reinvests in the local economy. And wherever available, the plan recommends choosing materials with high recycled content (either by up-cycling or down-cycling) products at their end of life.

Starting with the higher impact categories, such as structure, enclosure, and interiors choosing materials with low carbon emissions during manufacturing and end of life plans reduces emissions. Where available the UMLAUF is committed to using resources like Mindful Materials and Forest Stewardship Council (FSC) to provide resources for low-carbon, labor justice, and healthier materials.



**Local Materials**  
Choose materials within a 100 mile radius



**CLT (structure)**  
Wood has a lower embodied carbon than other structural materials



**Wood Fiber, Cellulose, HEMP, Cork, Hay Bail Wall (Insulation)**  
Low embodied carbon insulations



**Concrete (Foundation)**  
Use low carbon concrete solutions such as: High Fly Ash Concrete



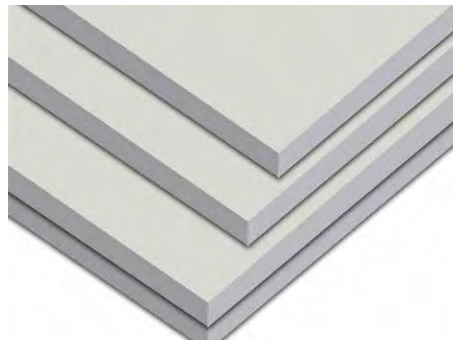
**Wood Framed (Windows)**  
Wood frames are less carbon intensive than aluminum frames



**Metals (Flashing, Strapping)**  
Using metal over peel-and-stick flashings will last longer



**Hardwood Flooring**  
Wood floorings are less carbon intensive and less toxic than vinyl



**Recycled/Reclaimed Materials**  
Seek salvaged materials and look for materials with recycled content



# Quality Assurance

## Resources + Commissioning

Material selection can be complex. It is recommended to put together an Owner Project Requirements (OPR) document to guide material selection which considers aesthetics as well as other qualities such as: durability, low VOC, and avoiding certain work toxins. The industry has developed a range of labels and certifications that offer assurance regarding the sustainability and equity of materials which can be worked into the OPR. Relying on these external sustainability product labels, vetting organizations, and other reputable resources will enhance the quality and confidence in the products selected for this project. This proactive approach ensures accountability and alignment with sustainability objectives throughout the project life cycle.

To ensure quality the plan recommends engaging a commissioning agent to verify that project goals have been successfully achieved during the construction phase.





# 07.4

## Ecology



# Ecology

## Introduction

The UMLAUF serves as a sanctuary for both Austin residents and the diverse plant and animal life that call it home. Dedicated to the flourishing of local flora and fauna, the site supports a dynamic ecosystem that extends beyond its borders. Situated within Austin’s Barton Springs watershed, and Edwards Aquifer Transition Zone, the UMLAUF plays a vital role in the city’s green corridor, underscoring the importance of responsible land stewardship for wildlife conservation.

Regarding ecology, the plan complies with Austin’s regulations, recommending that any invasive species are diligently removed from the site, while measures are taken to safeguard historic trees. Further restoration of the landscape includes the strategic planting of native, diverse mid-level shrubs, and forbs. It is recommended to consider participation in the Local Native Plant Rescue Project.

The ecological benefits of such practices extend far beyond environmental preservation. By incorporating permaculture, drought-resistant native plants, the site remains resilient throughout the seasons without placing undue strain on natural resources. These plants actively sequester CO<sub>2</sub>, mitigating the impacts of global warming, and contribute to air purification. Furthermore, the roots of trees and plants play a crucial role in filtering stormwater runoff and preventing soil erosion. Each plant species fulfills a unique role within the ecosystem, from nitrogen-fixing to repelling pests and providing medicinal benefits. Moreover, the introduction of diverse plant species attracts pollinators and other threatened wildlife, enriching the site’s biodiversity.

For further insights and details on landscaping strategies, please refer to the dedicated landscape section in the report.





07.5  
**Water**



# Water

## Introduction

Austin relies on the lower Colorado River for its primary drinking water, while San Antonio draws from the Edwards Aquifer. Water absorbed into the UMLAUF site replenishes both sources. By actively engaging water conservation efforts, the UMLAUF can contribute to the preservation of these invaluable resources. Strategies such as implementing bioswales, rain gardens, and minimizing impervious cover are employed to slow the flow of water, facilitating absorption into these bodies of water. Shallow rock beds and plant ecology further enhance the site's ability to filter runoff, removing toxins or pesticides that may be washed onto the property.

Currently, the pond and irrigation use city potable water. The plan recommends **targeting 100% of irrigation and the water feature to be supplied by non-potable sources**. This involves a combination of strategies to decrease water consumption and exploring other water sources like rainwater and greywater. By reducing reliance on potable water, the UMLAUF cuts its environmental impact and water utility costs.

### Key Terms:

**Potable:** Water that has been treated to meet safety standards for human consumption, as defined by the EPA and local regulations.

**Non-Potable:** Water not suitable for human consumption, which includes greywater and reclaimed water.

**Greywater:** Wastewater generated from activities like bathing and washing that is relatively clean and can be reused for non-potable purposes.

**Purple Pipe:** The City of Austin's reclaimed water pipe system, which supplies non-potable water for various uses.

**Blackwater:** Wastewater with pollutants like nutrients, metals, toxins, and pathogens that requires extensive treatment for reuse.





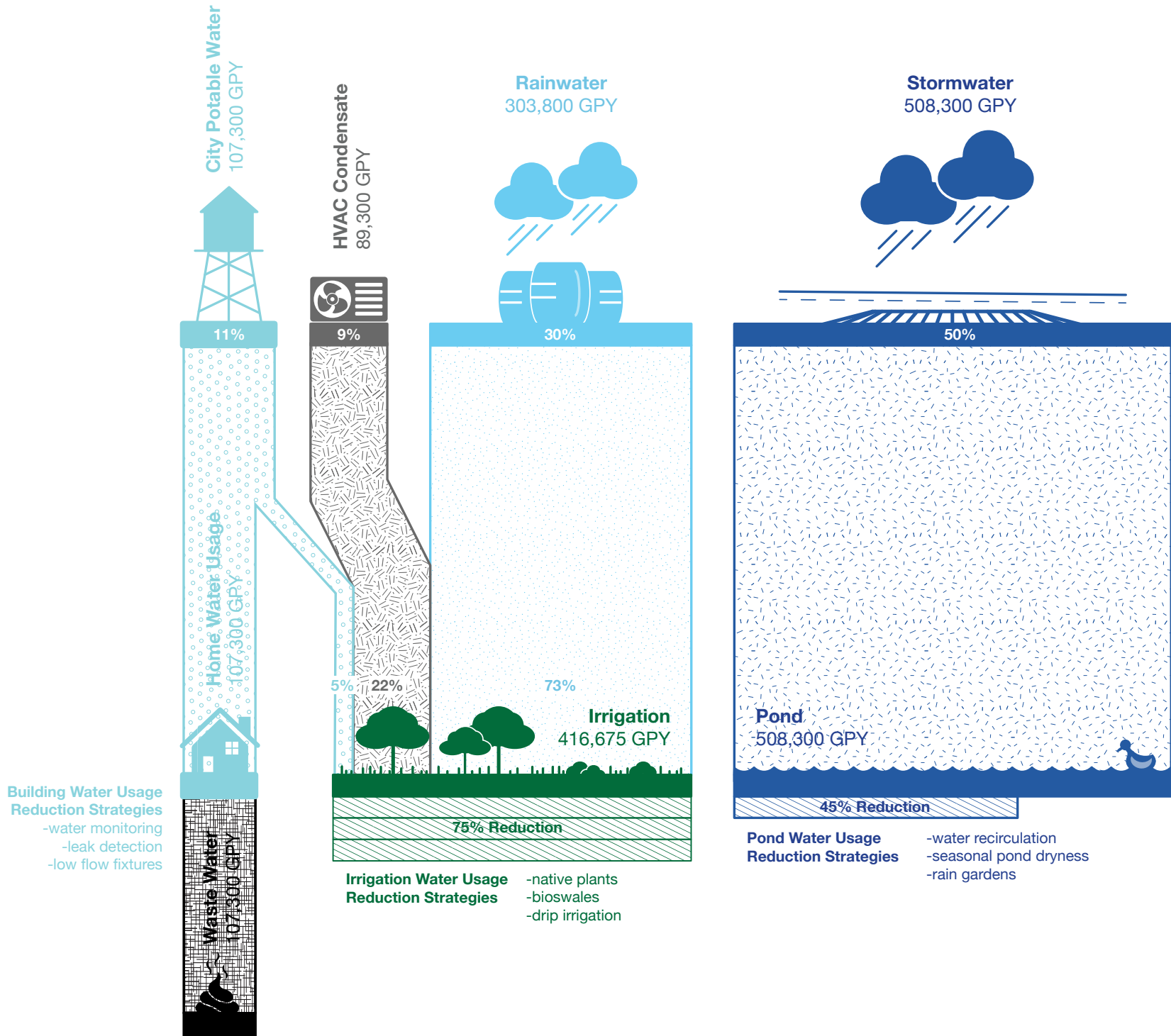
# Water Synthesis

## Water Catchment, Use, and Reuse

With a 45% reduction in pond consumption and a 75% decrease in landscape usage, the outdoor water demands at the site would significantly decline. Instead of relying on potable water, the plan recommends prioritizing sustainability by using stormwater, capturing rainwater, and using greywater (HVAC condensate) for irrigation. Despite these efforts, there remains a shortfall of 5,365 gallons annually. While the plan recommends targeting 100% of outdoor water supplied by non-potable sources, at least 5% or more may still need to come from city potable water.

Given that the project is confirmed to be in the Edwards Aquifer Transition Zone for TCEQ, but not in the Edwards Aquifer Transition Zone for the City of Austin (as these two entities use different maps to define the boundaries of the Aquifer), the project must abide by TCEQ guidelines but is exempt from City of Austin guidelines regulating construction on top of the Edwards Aquifer. TCEQ concerns itself with ensuring no toxic chemical tanks or petroleum tanks are located onsite which does not apply to this project. TCEQ allows greywater and condensate irrigation of sites above the Edwards Aquifer Transition Zone. To use greywater for toilets or irrigation, the water needs to be filtered and test at certain regulations. Although not considered in the current calculations or plan, it is recommended to explore on-site greywater use for toilets and irrigation. **Depending on the next version of AEGB, new construction may be required to dual-plumb fixtures.** Verify regulations with future Austin Water Forward and AEGB standards.

Further discussions and feasibility studies are required to connect to the existing purple pipe system located 1.11 miles from the site if desired. This could be a huge opportunity for keeping the water feature running year-round without potable water use.





# Water Use/Collection/Reuse

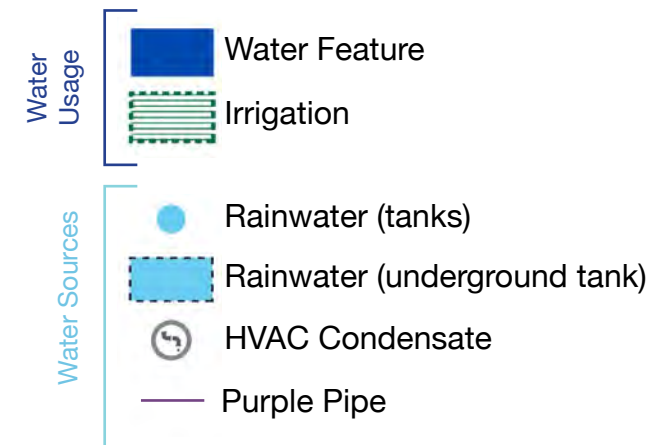
## Water Use, Rainwater Collection, and Greywater

The plan selected required irrigated areas which were picked out because of necessary upkeep required to allow the site to thrive for community events.

Placeholders have been indicated for one to two 15,000 gallon tanks at each new structure. Explore rainwater filtration for potable water, water feature refill, and irrigation uses. Certain considerations related to use will impact sizing, cost, filtration and other equipment, maintenance, and more.

The lower, upper, and water feature are to remain in the existing locations with adjustments to decrease potable water use for the water feature and irrigation.

The greywater from the condensate are implied in the structures indicated. The plan recommends to explore dual-plumbing and purple pipe connection. And the purple pipe system ends off the extents of the map, 1.11 miles away.





# Water Use Reduction

## Strategies

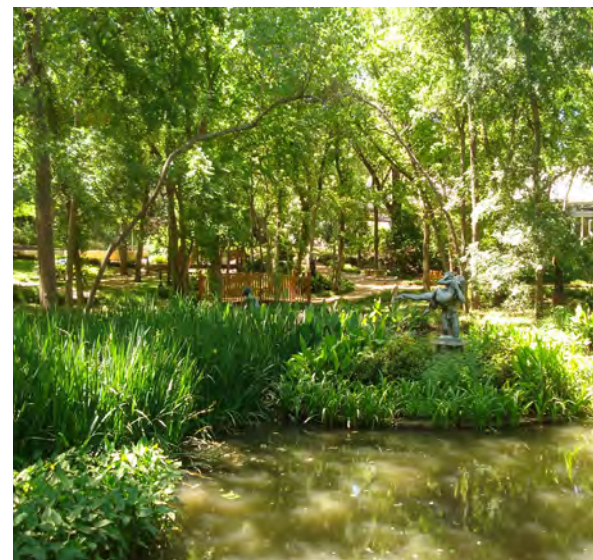
The majority of total on-site water use is allocated to irrigation, keeping the creek running, and the pond full for visitors. A substantial reduction in water consumption can be achieved by targeting these two sources. Implementing measure like removing invasive species, replacing the invasives with natives, introducing drip irrigation, and converting the water feature to a seasonal operation is projected to reduce pond usage by 45% and irrigation usage by 75%.

Efforts to curtail water usage play a crucial role in resource preservation. Given that irrigation and the water feature account for the majority of water consumption on site, key conservation strategies involve the implementation of landscape practices. These include recirculating water in the feature, incorporating bioswales, cultivating native plants, installing drip irrigation, leak detection (measuring and monitoring water use), smart watering systems that account for weather (rain), and soil moisture monitoring.



### Rain Gardens and Bioswales

Bioswales and rain gardens reduce run-off by 25%. They also retain water to seep into plant roots and groundwater and slow water down to reduce erosion. Filter beds also filter out contaminants.



### Seasonal Water Feature

Rather than replenishing the water feature year-round, using rainfall events to provide the water will reduce the water usage.



### Native Plants

Native plants require 75-80% less water than non-native plants. Native, drought-resistant plants significantly reduce irrigation water usage and decrease annual replanting.



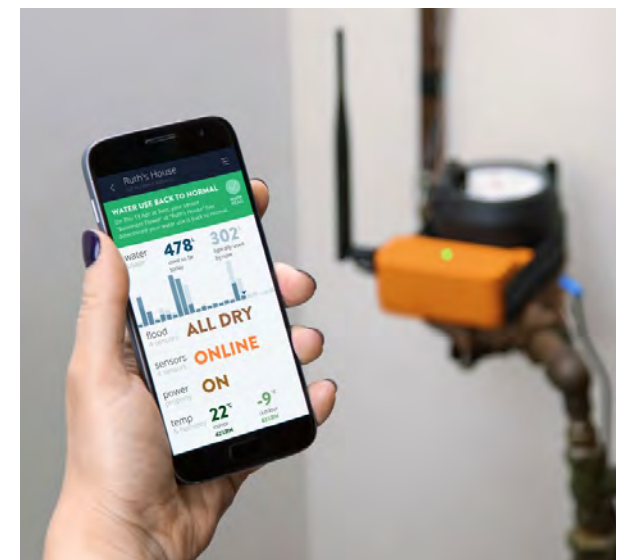
### Low-flow Fixtures

Use the WaterSense and Energy Star label created by the Environmental Protection Agency to choose low-flow fixtures.



### Drip Irrigation

Drip irrigation is 90% efficient, while sprinklers are only 65-75% efficient in watering plant life. Drip irrigation reduces evapotranspiration and ensures the water goes directly to the plants.



### Water Metering

Leak detection, circuit-level water metering, and remote shut-off will reduce usage.



# 07.6

## **Resilience**



# Resilience

## Introduction

Resilience encompasses varied aspects across different scenarios, including durability over time, energy and water availability during extreme events, and more. Specifically for the UMLAUF site, we are focusing on resilience through the lens of stormwater management.

Erosion control is a pressing concern, and implementing diverse landscaping strategies can play a pivotal role in mitigating the effects of water erosion. Planting a variety of shrubs and plants serve as a natural defense mechanism, as their root systems stabilize the soil and prevent it from being washed away by rainfall or runoff. Designing stepped terracing, especially on sloped areas, not only breaks the flow of water but also increases the capacity of water retention in a storm or flood event.

Amplified by unpredictable weather patterns, Austin also grapples with more frequent droughts and floods. Compounded with the UMLAUF's location in the 500-year flood zone — meaning once every 500 years the site is expected to experience a flooding event — resilience measures are becoming all the more pressing. However, with climate change, these floods happen more frequently than predicted. In preparation for the City of Austin denoted 500 year flood-line, UMLAUF is planning for floating floodgates and additional volume of water capacity in the existing pond. Conversely, droughts are longer and hotter. Planting native, drought-resistant species will play a big role in improving site resilience in extreme weathers.





# Stormwater Management

## Typical Year

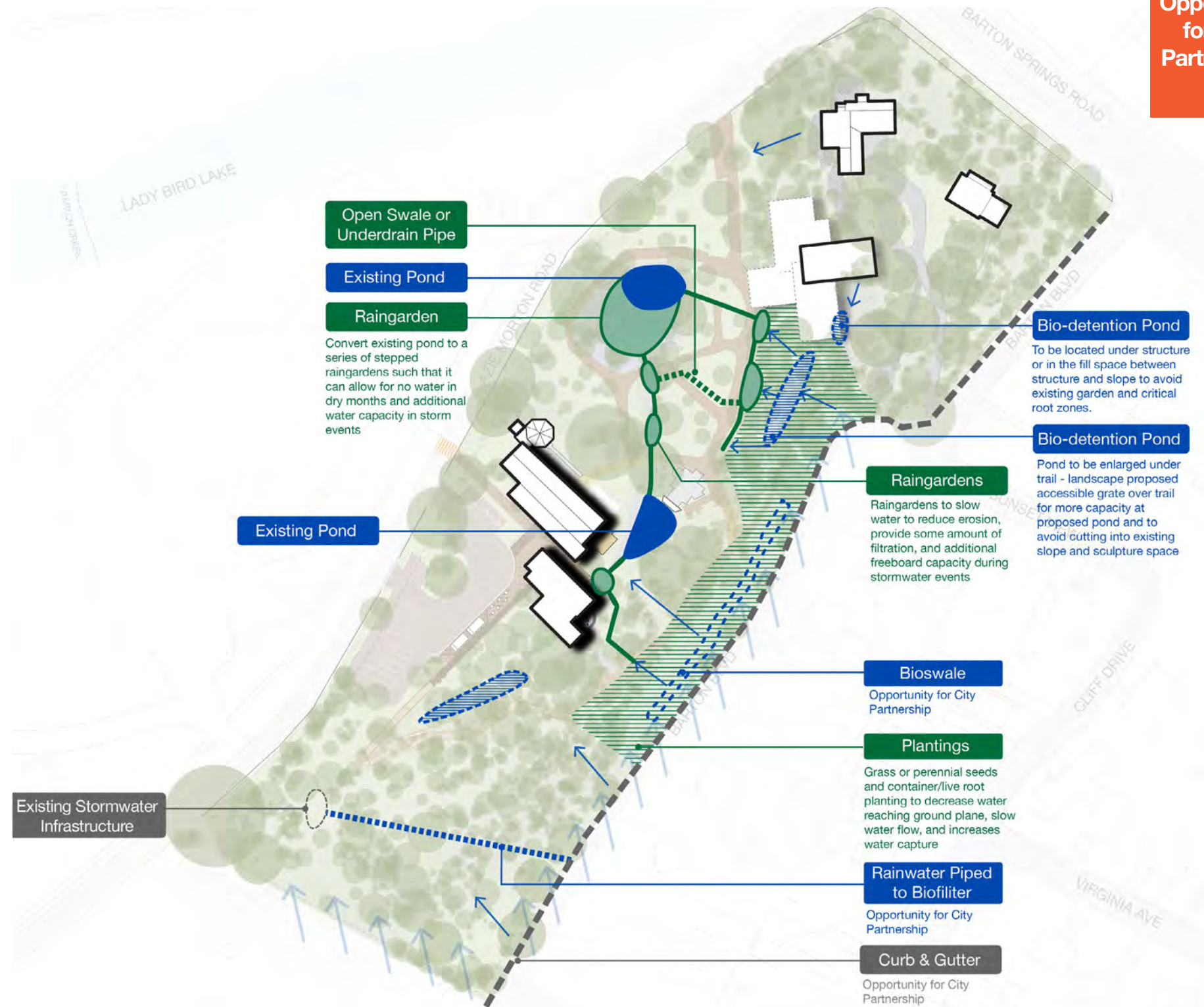
As water from the surrounding acres of land washes down through the UMLAUF site every rain event, the site experiences extreme stormwater issues include erosion and potential flooding.

Drainage from adjacent properties and neighborhoods are adding a significant amount of stormwater flow that impacts the overall site stormwater. 62.8 cfs of stormwater flows across the site without any type of stormwater controls. There is another 250.2 cfs from the adjacent neighborhood that is channeled through an earthen swale, without erosion control, along the banks. This flows into the concrete pond that slows the water and releases it at a controlled rate through a bar grate before flowing down-hill into the sunken gardens in Zilker Park. The predominant stormwater mitigation strategy (to be coordinated with the City) will include a bioswale or bio-detention pond and curb and gutter at the eastern edge of the site to mitigate stormwater coming from the neighborhood and Barton Blvd. This feature captures upstream drainage and release it downstream to the site/waterfall which would help mitigate erosion issues.

The second most significant stormwater management strategy is a series of bio-detention ponds and raingardens which are to hold extra water capacity during storm events. Landscape recommends all proposed ponds to be bio-detention as retention ponds require make-up water which can be from cistern or potable water sources. During droughts retention would require potable source. The bio-detention ponds, capture basins, and rain gardens are located to avoid existing garden features, critical root zones (CRZs), and sculptures.

Options for enlarging raingardens or ponds under trails, grates, decking, and more has been explored to avoid increasing impervious cover to manage stormwater and cutting into existing slope, expand stormwater capacity, slow water to reduce erosion, and clean water to reduce toxic runoff.

## UMLAUF HPEU PLAN



Opportunity  
for City  
Partnership



# Flood Management

## 500 Year FEMA Flood

The UMLAUF sits within the FEMA 500 year flood zone, meaning there is a 0.2% annual chance that a flood event could have a depth of less than 1 foot. The site could be flooded up to approximately the 468 ft contour (indicated with the light blue line). However, the City of Austin recognizes that each year the weather patterns have been more erratic, and sites need to provision for these events.

Given that the footprints overlap with the 500 year flood zone, all new construction is to be 1' above the 500 year storm line or the 468th foot contour, so the buildings have been raised where necessary. For existing buildings below that 500 yr + 1' contour, the flooding will be mitigated by constructing flood walls (retaining walls to direct water) along the perimeter to the elevation. The project plans to construct passive flood protection at all doors (i.e. floating flood gates).

The pond will play a key role in mitigating flooding waters. It is to be enlarged with added walls to increase retention capacity. The UMLAUF will need to coordinate with the city to determine downstream off-site improvements for flow downhill to the western street. Additional bio-detention ponds, raingardens, and more are to be sized for storage or freeboard during a 500 year flood event.

Opportunity  
for City  
Partnership





07.7

## **Sitewide Strategies**



# Summary of Sustainability Goals

## Health



### Improve occupant health and well-being

- Provide a minimum of MERV 16 air filter with exhaust, dehumidification, and ventilation
- Design for 80% Useful Daylight Illuminance (UDI) without glare and less than 5 degrees Operational Temperature stratification
- Select healthy materials by choosing those with low volatile organic compounds (VOCs), Red List free materials, and Health Product Declarations (HPDs)
- Provide acoustic noise/vibration control from street traffic and design for amplified sound/music

## Energy



### Achieve annual net zero energy

- All electric site (no on-site combustion)
- Place renewables on each available structure and provisions for a solar ready roof on all other structures
- Heat/cool new buildings with ground source heat pumps. Retrofit existing buildings with ground source heat pumps or air source heat pumps
- Reduce existing building energy usage by 25% and bring new building energy use 40% below code minimum
- Target 30% window to wall ratio

## Carbon



### Reduce embodied carbon emissions by 50%

- Track embodied carbon, aiming to reduce by 50%
- Achieve site carbon neutrality by 2055
- Select products with Environmental Product Declarations (EPDs)
- Separate construction waste into streams and divert 50% of waste by weight
- Source majority of materials from a 500 mile radius
- Place EV chargers and provide ease of walkability and public transportation access to site

## Ecology



### Replenish middle layer of ecology with regenerative species to create plant diversity.

- Remove invasive species
- Replant native species
- Preserve existing ecology & historically significant trees
- Create layers and diversity of plants to create ecological resilience
- Use high performance landscape strategies to reduce erosion and mitigate stormwater
- Support local fauna and protect endangered species

## Water



### Target 100% of irrigation and water feature to be supplied by non-potable sources

- Reduce site water usage by 80%
- Reduce new building water usage by 25% from an equivalent baseline code compliant building
- Collect all possible rainwater off roofs
- Collect all possible greywater for irrigation
- Use green stormwater infrastructure to create high performance landscapes which manage stormwater

## Resilience



### Preserve site through a 500 year flood and regular rain events

- Plan stormwater management for typical rain event without major erosion to the site
- Plan stormwater management for 500 year flood event without major damage to the existing structures