How Can Accommodating Curiosity in Garden Design Foster Learning and Play for Children with Disabilities?

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Bachelor's of Science in Horticulture

University of Cincinnati, School of Planning Horticulture Program

HORT 4091

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Trinity Tobe

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"We know we cannot plant seeds with closed fists. To sow, we must open our hands."

- Adolfo Perez Esquivel

Bachelor's of Science in Horticulture

Green Roofs Certificate

Cannabis Studies Certificate

Urban Agriculture Certificate

Previous Course Experience

Spring 2024, Hort 2031 Woody Ornamental II

Prof: Foltz, Steve

Woody tree identification and personal field guide creation

Spring 2024, Hort 3044 Urb Lnd Iv Rfs Fac

Prof: Ellis, Wendy; Seeger, Rose

Introduction and execution of green roof design

Spring 2024, Hort 4012 Plant Propagation

Prof: Grubb, Brian

Case studies and labs demonstrating multiple different propagation methods

Spring 2024, Hort 4092 Sr Project Hort

Prof: Famulari, Stevie

DAAPWorks Senior capstone project

Fall 2023, Daap 5061 Permaculture I

Prof: Smyth, Chris

Permaculture design, theory, and implementation

Fall 2023, Hort 2020 Plant Pathol Micro

Prof: Peterson, Dan; Moody, Brian

Execution and understanding of different plant diagnostic tests

Fall 2023, Hort 2030 Woody Ornamentals I

Prof: Foltz, Steve

Woody tree identification and personal field guide creation

Fall 2023, Hort 2040 Sust Land Design I

Prof: Famulari, Stevie

Master plan design and hand drawing skills

Fall 2023, Hort 3020 Hort Entomology

Prof: Kristky, Gene

Insect identification and nomenclature

Fall 2023, Hort 4081 Intro To Hemp & Med Cannabis

Prof: Rabin, Bonnie

Cannabis law, production, and case studies.

Summer 2023, Hort 2033 Herb Ornamentals II

Prof: Hansel, Jim

Understanding herbaceous plants' role in a landscape

Summer 2023, Hort 4084 Hops Hemp Field Exp

Prof: Volkman, Dave

Real-time Hops and Hemp production off-site

Summer 2023, Hort 4091 Ind Study Hort

Prof: Grubb, Brian

Execution of the Daylily Display Garden project at BCA

Spring 2023, Hort 1011 Hort Sci II

Prof: Hansel, Jim

Introduction to the horticulture industry and operations

Spring 2023, Hort 1011 Hort Chem

Prof: Grubb, Brian

Studying plant functions and plant anatomy

Spring 2023, Hort 2012 Agriculture Ecology

Prof: Burgos Hermandez, Tania

Agricultural studies and how it impacts us on a national level

Spring 2023, Hort 2032 Herb Ornamentals I

Prof: Grubb, Brian

Garden design with herbaceous perennials

Spring 2023, Hort 3010 Soil Sci Plant Nutrition

Prof: Peterson, Dan; Burgos Hermandez, Tania

How to perform a soil test and its relevance to horticulture, gardening, and agriculture

Spring 2023, Hort 3030 Edib Sust Lndscp I

Prof: Moore, Kathleen

How can sustainable gardening practices be used in a typical household setting?

Fall 2022, Hort 1010 Hort Sci I

Prof: Burgos Hermandez, Tania

Introduction to different scientific means and methods in the industry and how to conduct them.

Fall 2022, Hort 1010 Hort Tech

Prof: Hansel, Jim

Journaling different horticultural tools, jobs, and expectations that can be expected in the industry.

Fall 2022, Hort 1030 Native Plants I

Prof: Gressley, Dave; McCollum, Donna

Study of native plants

Fall 2022, Hort 3040 Urb Lnd I Forestry

Prof: Gamstetter, Dave

Urban arboriculture, the legality of it, and the design of the Belleview park beer garden

Fall 2022, Hort 3050 Lndsc Hist 1900

Prof: Lutz, Frederick

Case studies of landscape history until 1900.

Abstract

This research investigates the effects of gardening and interaction with plants in the development of children's intellectual and developmental skills, specifically inclusive of children with cognitive and/or physical disabilities. The project dives further into the inclusivity of accessible features for children in playground and naturescape design. Drawing inspiration from Ballam Bumps, Arlitt Children's Garden, and Els Sensory Art Garden; it is important to understand the value of high-intensity areas and low-intensity areas, as well as design that is versatile to a broad spectrum of ages. Children should form these relationships with plants from an early age, and the proposed design reflects the different learning styles/abilities of children with differing sensory needs. All of the listed elements are incorporated and considered when redesigning the Boone County Arboretum's Children's Garden, and shown through a series of designs, inventory & analysis.

Keywords

Children, Development, Gardening, Plants, Children's Garden, Arboretum, Disability, Accessibility, Inclusivity, Garden Design, Public Garden, Playscape, Boone County Arboretum

Problem Statement

How Can Accommodating Curiosity in Garden Design Foster Learning and Play for Children with Disabilities?

Playing outside is an important and vital part of child development. Gardening is proven to help children develop locomotor, body management, literacy, and object control skills; as well as indulge in sensory exploration, and visual and cognitive stimulation. Cognitive development is about intellectual skills such as remembering and analyzing information and predicting outcomes. You can do plenty of that in your garden with children. (Butcher et al.) The listed benefits are important to introduce to children while they are young. Data compiled by the Rauch Foundation found that 85 percent of a person's brain is developed when they are five years old! "Remember, all kids truly need in the early years of their development is a safe space to explore the world around them, and a caring adult to help them along the way!" (Ramos)

Developing these cognitive and physical skills can have an even greater impact on children with mental or physical disabilities. Gardening, whether it be working with a vertical garden or a large plot, is a wonderful way to get in touch with nature. For people living with intellectual or developmental disabilities, gardening (or horticultural therapy) can be a holistic way to learn a new skill while also feeling more grounded. (ALSOAdvocates for Life Skills & Opportunity)

Adults have the privilege to curate a garden to fit specific needs. However, for small children; the focus on safety, durability, engagement, learning opportunities, and more, is out of their control. Children only have the opportunity to experience design elements as well as they

are executed. The previous factors can make it easy for the consideration of children with mental and physical disabilities to be forgotten about in the design process. The goal of this project is to implement a garden design that encourages children to have a sensory rich experience while playing, and is inclusive of their physical or mental capabilities. The design product reflects the idea of accommodating curiosity, implying that every plant is touchable, explorable, and safe to learn about (with no exception to different learning accommodations and preferences).

This project is being conducted at the Boone County Arboretum's Children's Garden, which is currently in need of a redesign. Encompassing 121 acres, the Boone County Arboretum is also known as Central Park, and was the nation's first arboretum within an active recreation park setting. (Stone and Selm) Because of this, the site gets a lot of foot traffic, as well as vehicular; which is a great opportunity to reach the community. Boone County, KY is currently experiencing a housing boom, and the population is steadily rising. This is another reason to create an environment that facilitates children's desire for space, time, and resources to kick, climb, run, jump, and balance [which] is especially important in fostering a child's growth and promoting healthy development. (ALSO)

To execute this project, I went through a design process, which includes drafting base maps, site removal requirements, proposed concept plans, a final design, and plant index. I met with stakeholders and potential sponsors throughout the design process to gauge the client's overall interest in different proposed aspects of the site, and adjust accordingly. Along with this, I want to establish contact with Advocates for Life Skills & Opportunity (ALSO), which is an organization dedicated to inclusion and opportunity in design and community, in order to assure that my design is not only ADA compliant, but conducive.

Project Justification

Designing a garden that encourages children to have a sensory rich experience while playing, inclusive of their physical or mental capabilities, is important because experience should not have to be conducive to capability, if avoidable. This project makes me reflect on when I was a child, and the experiences I had outdoors that made me fall in love with horticulture as an adult. Access to the facilities to find that love should not be debatable on the means of accessibility, and that applies to more than just green spaces.

As someone who has a range of background in the green industry, it is my goal to propose a design that accommodates any child who is interested in participating, inclusive of mental or physical capabilities. I believe my personal experience as a staff member at the Boone County Arboretum helps to give me a better understanding of the site in question, as well as an understanding of the client's external concerns.

Along with this, I have the personal experience of having a close friend lose her mobility due to a spinal injury she sustained in highschool. Navigating mundane school activities was more than a struggle for her everyday on our campus, and it severely inhibited her learning. I don't think that any institute with a focus on education, or any other life skill, should be inaccessible, including the Boone County Arboretum.

The Boone County Arboretum's 'Arboretum on Wheels' program is a mobile educational outreach program that focuses on educating children about nature on-site and at their home schools. So, the demand for sensory experiences with nature is there, and it is important that this research and design reflects that for this community.

User Client Description

Family and athletes

There are few places in the Greater Cincinnati, Northern Kentucky area where you can see such a unique arrangement of diverse plants. Boone County Arboretum is located just outside Union, KY, only 25 minutes southwest from downtown Cincinnati. (Stone and Selm) Along with this, the arboretum is one of the only public sports complexes within a 15 mile radius of three different highschools. The Arboretum's slogan is "Where Friends and Family Take Root", which is very fitting for such a community hotspot.

Central Park at the arboretum hosts the parks and recreation events for the community, which means that there is an influx of families and athletes of a range of ages at the arboretum many weekends. The sports complex consists of four lit tennis courts, six baseball fields, a basketball court, and six soccer fields. Athletes and families take advantage of the arboretum's walking trails, playgrounds, and pollinator path after games. This is a key element in the design of the Children's Garden because in years past, the landscape has not been able to withstand the test of children with baseball bats and other athletic equipment. Because of this, the designer would like to include an emphasis on 'baseball bat-proof' structures in my design, so that it is conducive to the public during these weekend events.

Arboretum Staff

The Arboretum plants are kept by a staff of roughly six horticulture interns, one apprentice, and one horticulturist. Along with this, there are weekly volunteer opportunities for community members to work alongside staff on larger projects. The design of the Children's Garden must be manageable for a staff this size, considering the fact that there are 121 acres

aside from it that also need tended to. All of this is overseen by Arboretum Curator, Josh Selm, and Arboretum Director, Kris Stone.

Friends of Boone County Arboretum

FoBCA (Friends of Boone County Arboretum), is the nonprofit under which many aspects of the arboretum are run. Friends seek to create community awareness and participation at the arboretum by involving schools, sporting groups, community organizations, individuals, the business community, and garden clubs. These groups can become involved through memberships, donations, and active volunteer projects. Members also contribute to planning and building future projects and additions to [the] facility. (Stone and Selm) The FoBCA program will play a crucial role in funding this project. Board members, volunteers, and donors will have the opportunity to meet with me several times throughout this process so that I can make sure that they are aware and happy with all aspects of the proposal.

Incoming Residents

There is a Children's Hospital, as well as a new subdivision, both being built within a five-mile radius of the arboretum. This directly affects the amount and demographic of children in the area, as well as those children's educational needs. This also opens possibilities for funding and community engagement in installation.

Children

Finally the most important client, the children! The Arboretum's Children's Garden sits directly in between a large, metal, traditional playground; and a baseball field. As it sits, there is little appeal to children between the three elements. This garden design will be an accessible and inclusive space for children to touch, pick, smell, and play among greenery and other natural elements. The design will cater to children with challenges that require both calm and exciting

sensory experiences, as well as be safe and easy to navigate for wheelchairs, canes, and other forms of mobility assistive equipment. Specifically, this garden will be geared towards ages ten and under, in order to cater towards exploration during important, formative years

Major Project Elements

Accessible for different mobility devices

To ensure that this garden is accessible for a range of mobility devices, careful attention must be given to several key factors. Pathways should be wide and level, allowing smooth movement for wheelchairs and other devices. Ramps with gentle slopes should replace steps, providing access to different areas of the garden. Ample clearance around features such as seating areas and planters is essential for easy navigation. Comfortable seating at appropriate heights should be provided throughout the garden. Additionally, incorporating sensory and tactile elements enhances the experience for all visitors. Lastly, shaded areas offer respite from the sun and shelter from varying weather conditions, ensuring comfort and enjoyment for everyone. By prioritizing these considerations, gardens can be designed to welcome and accommodate individuals with diverse mobility needs, promoting inclusivity and enjoyment.

Accommodating to different sensory needs

This design incorporates high sensitivity areas as well as low sensitivity areas in order to ensure that children are learning and interacting with plants in a way that works best for them. Many mental disabilities are not conducive to overly sensational gardens, and many people learn better adjacent from these areas and in areas where the noises, smells, and other factors are toned down.

Versatility for the duration of childhood

The minimal aspects of this design ensure that play in this area can be accommodated throughout multiple different stages of childhood. This design is not for one age only, and can be enjoyed by children as they grow up and their needs in this space change.Versatility is important

in design because it promotes long-time beneficiaries of the space, which builds community value and responsibility.

Inventory & Analysis

[A] Photo Credit: Brian Grubb


[B] Photo Credit: Brian Grubb


[C] Photo Credit: Brian Grubb


[D] Photo Credit: Brian Grubb


[E] Photo Credit: Brian Grubb


[F] Photo Credit: Brian Grubb

[G] Photo Credit: Brian Grubb

[H] Photo Credit: Brian Grubb

Topography

The topography of the site is almost entirely flat and compacted, however it sits on top of almost a plateau. The south and east sides drop off directly to a hill, and water runs off of these surfaces. The north and west sides remain flat, and are covered in asphalt, gravel, and mulch. Because of the compaction in this area, there is a drainage issue that causes water to runoff to the east.

Sunlight

The garden itself is relatively full sun, and along the fence-line on the east and south sides are part shade, due to the surrounding woodland. The site sits high, and since it is partially surrounded by asphalt, this leads to heat being a factor. Plants will need to be tolerant of hot air, but not necessarily ground as there is sprinkler irrigation on the site.

Noise

This site is surrounded by baseball fields, a separate playground, walking trails, and other park attractions such as a pollinator path, vegetable garden, and amphitheater. It is also located just 800ft from Camp Ernst Rd., which generates a lot of vehicular noise. The entrance to the arboretum, and arboretum parking, are just outside of the entrance to the Children's Garden, so traffic and baseball will be two huge noise contributors.

Soil Conditions

The soil on this site is a rich Kentucky clay soil. However, the existing concrete was originally laid incorrectly, and the result of this was a lot of compaction underneath the concrete, as well as at least 2 ft of gravel underneath. This is something to consider when planting on top of where the path will be excavated, and is also a contributor to the drainage problems on this site.

Existing Vegetation

There are a five different large deciduous holly (*Ilex decidua*) cultivars, as well as a Colorado Blue Spruce (*Picea pungens*) on the north end of the children's garden that will need to remain intact, and they will be marked as such on design proposals. There is a Freeman Maple (*Acer x freemanii*) on the south end of the garden that also needs to remain intact. .

8’ x 12’ Shed

There is a shed on site that cannot be moved because it houses the control panel for irrigation. It is also currently used to store volunteer tools and equipment. The shed is 8’ x 12’, the longest side bordering the children’s garden. The shed also has a 5’ roof overhang on the southern end.

Metal Playground Access Gate

The playground on the west side of the garden has a 4’ fence gate access into the Children’s Garden. The client does not want that access to move locations, or be constructed in any fashion, as that fence is technically not a part of the Children’s Garden. This gate must also remain accessible, and is an important link between the two playscapes.

Pollinator Path

It is a goal of the client’s to connect the Children’s Garden down the south hill, to the ‘Pollinator Path’. It is important that this is accessible for mobility devices, and is not dug too deep because utilities run underneath it.

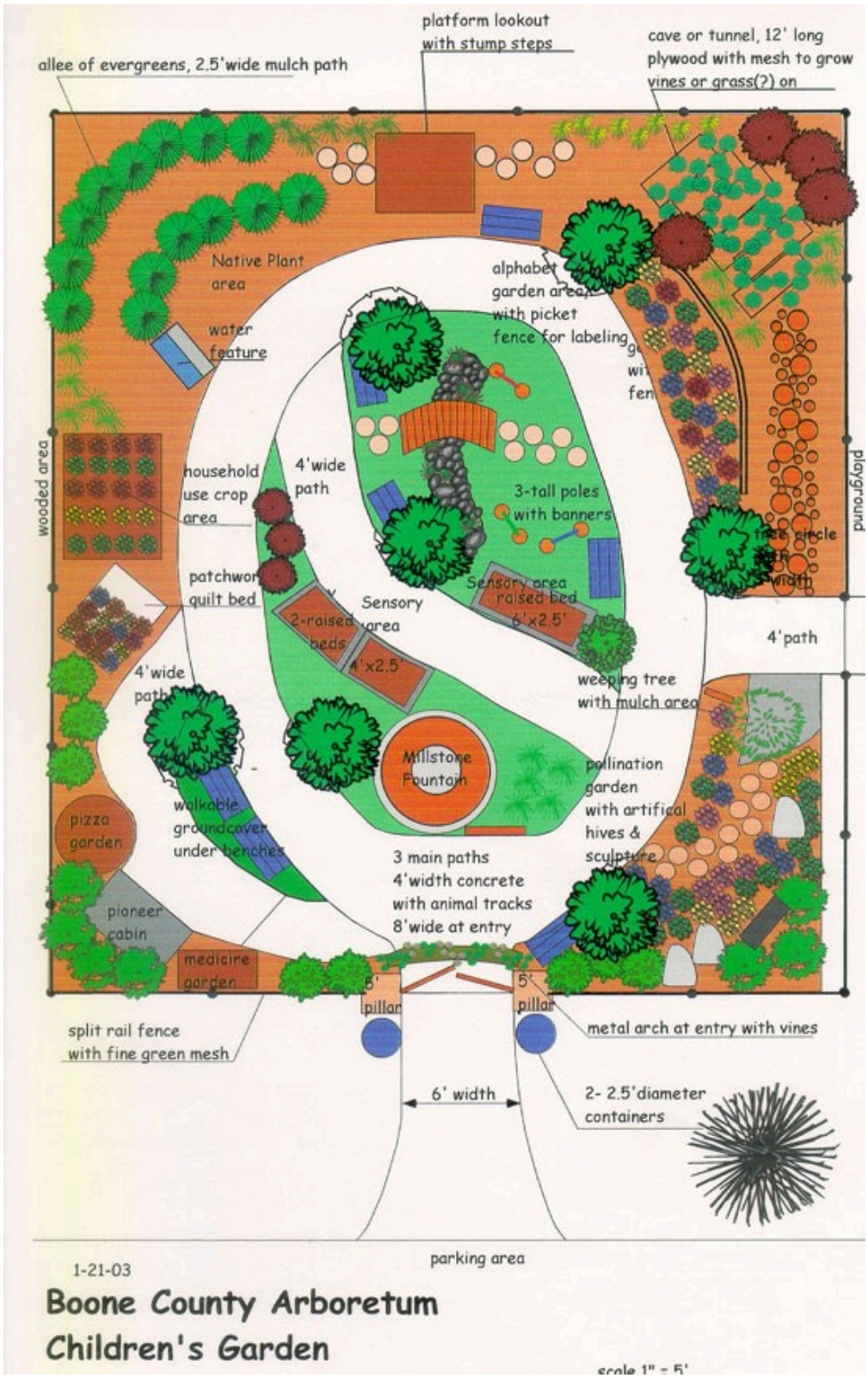
Amphitheater

On the east side of the garden is an amphitheater used for church, scout, and other community events. It is reservable, and it is important that this design does not inhibit the space and privacy of that area.

Roadway

The entrance to the Arboretum continues past the gateway to the Children's garden, with less than a car's length between the gate and the road, so safety is of concern when designing play equipment and garden access.

Original Design (2003) NTS



Case Studies

Els for Autism: The Sensory Arts Garden

The Els for Autism Corporation is a nonprofit based out of Florida, USA, with additional locations in Canada, the United Kingdom, and South Africa. In Florida, the Els Center For Excellence is a school that offers tuition-free learning and education programs to families and students with autism across their lifespans. The goal of the Els for Autism foundation is "[to] envision a world of limitless possibilities for individuals with autism spectrum disorder (ASD) and their families." (Els for Autism)

The Sensory Arts Garden is a garden located at the Els Center For Excellence, and is a 13,000 square-foot garden. The garden emphasizes different mediums to inhibit sight, taste, smell, hearing, touch, body awareness, balance, and socialization. Below is a photo of a map from Els' most recent garden brochure that labels the areas of the garden based on these senses, rather than location names. (Els Center For Excellence). It is portrayed this way so that students can experience the garden at their own pace, and choose the kind of sensory experience that they wish. This helps prevent over-stimulation, which is a common fault in many modern sensory garden designs. The Sensory Arts Garden features 'sensory rooms', which are hot spots for exploring the different sensations; as well as 'places away', which are parallel areas that provide a minimal, and more calming sensory experience for those experiencing hyper-sensitivity. Both of these areas remain separate, but within eyesight of each other, so that children do not feel excluded due to hyper-sensitivty or sensory-deprivation experiences.

Some elements of the garden design that reflect these senses are based around shape. For example, seating options in the garden are all ovate in order to reduce awkward corners. "Safety and security are reflected in the overall design, details and material selections; smooth and

consistent surfaces eliminate awkward corners and address potential collisions/adverse reactions." (Center for Health Design and Dirtworks Landscape Architecture) Along with this, there are a variety of different 'water-spheres' that encourage mobility by being placed low to the ground, and encourage curiosity by engaging in sight, touch, sound, and socialization.

The most recent map of the Els Sensory Art Garden, which uses senses and colors to dictate location rather than plant labels or activities. (Center for Health Design and Dirtworks Landscape Architecture)

Canopy plants are planted uniformly, with repetitive patterns. This offers a structural rhythm and uniform canopy providing a calming enclosure and relief from the sun. Within the recognizable patterns and geometry a degree of openness aids in creating opportunities for

discovery, free play and autonomy. (Center for Health Design and Dirtworks Landscape Architecture) The larger plants and design elements are cohesive enough that they are still providing value, but instead the value is in structure, safety, and reliability in design. There are not many surprises above, below, or to the side of anyone walking through. Because of this, visitors can focus more on roaming and exploring instead of being on high-alert.

An aerial view of the Els Sensory Art Garden, showcasing the uniformity in design that creates a safe and enclosed feeling as you walk through it - similar to the walls of a building. Within the recognizable patterns and geometry a degree of openness aids in creating opportunities for discovery, free play and autonomy. (Center for Health Design and Dirtworks Landscape Architecture)

The Els Sensory Art Garden provides critical information to the art of sensory gardening. Their research offers the idea of considering unique sensory experiences, and facilitating exploration in design. The combination of minimalism and variability in this garden give

students the ability to be curious, and explore their senses on their own terms. This gives visitors a sense of autonomy that is valuable for people who need intensive care for different mental capabilities, and may not always feel they have the freedom to roam.

Accommodating curiosity in garden design can produce more independent learners, and remove any shame that may come with willingness to investigate different garden elements. When executed similar to the Els Sensory Art Garden, this can go hand in hand with facilitating mobility exercises, and increasing bodily awareness as a whole. A great example of this is the use of water-spheres.

The Els for Autism Foundation attributes its successful design to working alongside occupational therapists primarily as opposed to garden designers. In an interview with David Kamp, who was one of the lead designers of the Els Sensory Art Garden; he explains that the unique panel of designers contributed to this project being one of the most meaningful in his career:

> "From day one, it was a deeply engaging dialogue with you, as an occupational therapist, educator, and researcher, and with Marlene Sotelo, a music therapist, special educator, and the Chief Operating Officer (COO) for the Els for Autism Foundation. This three-perspective approach was further enriched by engaging the staff—teachers, therapists, maintenance personnel, and others at the Els Center of Excellence—as the design advanced." (Wagenfeld)

Kamp further explains that it was the staff members picking through stones to make sure they were only using the roundest and softest ones that solidified the purpose and weight of the impact that the Sensory Art Garden would have on students. He now strives to have that kind of attention to detail and consideration in all of his designs.

ASLA, Sensory Gardens Study

The ASLA is the American Society of Landscape Architects. Founded in 1899, ASLA is the professional association for landscape architects in the United States, representing more than 15,000 members. Landscape architects lead the planning, design, and stewardship of healthy, equitable, safe, and resilient environments. (“About ASLA | asla.org”)

In October, 2016, the ASLA wrote an article about the importance of secondary senses in sensory garden design, amidst this design style's rise to popularity. The idea of secondary senses can be attributed back to German philosopher Hegel, who argued that we need to leave room for mortality and the weight of being in sensation. Hegel compares life and sensation to physics and kinetics, by proposing that perceiving a sensation itself is like a ball, but it is the act of the ball rolling (self-awareness) that equates sensation to living. (Hendrix) These are the foundations that built what we perceive as modern-day Kinesthetics.

Innovative Spinning Play Elements that encourage awareness in play, and heightens your vestibular senses. Image by Amy Wagenfeld

The ASLA encouraged the consideration of three additional senses when designing a sensory garden. Kinesthetic, Proprioceptive, and Vestibular senses are how we can implement interconnection between the five familiar senses that are more common. Vestibular senses are the sensory system that responds to the position of the head in relation to gravity and accelerated or decelerated movement. The vestibular system is the ‘dizzy’ and balance system. It also integrates neck, eye, and body adjustments to movement. Proprioceptive senses have to do with the perception or awareness of sensations from the muscles and joints and kinesthesia involves perception of the movement of individual body parts. Kinesthesia and proprioception guide us in understanding where our body is in space. (Kranowitz and Miller)

Sensory gardens can serve as so much more than just that. The acknowledgement of other senses can contribute to mindfulness and holistic properties in gardening. This is a strong reasoning behind the effects of healing gardens and gardens for the elderly. Spending time interacting with nature in a well-designed garden won't cure your cancer or heal a badly burned leg. But there is good evidence it can reduce your levels of pain and stress—and, by doing that, boost your immune system in ways that allow your own body and other treatments to help you heal. (Franklin)

Although many are proprietors of mindfulness in nature, one could argue that too much focus on secondary senses can be overwhelming for people with mental or physical barriers to the perception of them. These elements have their place in gardening, but if overdone would prevent the accessibility of sensation to at least 2.78% of the population. 1 in 36 people experiences autism spectrum disorder, and that is only one of many mental disabilities that can have an effect on sensory processing. (Els Center For Excellence)

When reflecting on the purpose of this research, this makes one consider how accommodating curiosity in gardening is a positive goal within its means. Too many play and learning opportunities without a parallel place to experience the opposite is no longer a mindful experience, but an overwhelming one.

The Ballam Bumps Regional Playspace

The Ballam Bumps Regional Playspace is a two-time award-winning playscape because it is a generous design that pushes the expectations about who a playground is for and how it can be used. This playground celebrates the need for play in an unstructured way, and caters for all age groups from toddlers to adults. (AILA Australian Institute of Landscape Architects) The Ballam Bumps Playscape serves the community as a recreational resource and 'third place'.

Ballam Bumps Regional Playscape, Image Credits: Steve Brown, Playce

The idea of a ‘third place’ is space between work and home where someone can freely attend for leisure. Many urban areas now lack these ‘third places’, particularly in the U.S. The Ballam Bumps Playscape was not only able to provide that for its region, but make it a third place that is exciting for a broader demographic.

It comes with difficulty to write this case study without referring back to Els Sensory Art Garden. Both of these gardens prove how powerful *intentional* minimalism can be in the landscape, and how it can accommodate a wider variety of people.

PLAYCE, design team of the Ballam Bumps, discuss how, for Australia, the Ballam Bumps re-design was initially done to accommodate toddlers, who were lacking adequate play equipment at the pre-existing park. However, as the design progressed, it became simplistic enough that it could accommodate skateboarding, basketball, and other recreational activities that appealed to older kids as well. This was not only recognized, but embraced, and now Ballam Bumps is a place where both children and adults can take risks, challenge themselves and improve fitness and strength. Ballam allows this to occur in a dynamic, contemporary and colorful space. (PLAYCE)

PLAYCE specializes in ‘bespoke’ design. Bespoke is an adjective meaning specially made for a particular person, organization, or purpose. The term also nods to the artistic style of feeling handmade or custom fit. So, aside from ramps and wheels, PLAYCE focuses on intention in design in urban areas, and tailoring towards community in micro-cultures.

Ballam Bumps, their most famous design, encompasses everything from a splash pad and skateboard parks, to an extensive list of dog friendly features as well. Along with this, all surfaces are made to be both wheelchair-accessible, and a textile experience. Low-glare materials are used to ease communication for children who use sign language and those with low vision.

Steel, instead of plastic slides, reduces static, which can be a concern for those with cochlear implants.

The plant material at Ballam Bumps is thorn-free, low-allergenic, and non-toxic, so that "parents and caregivers can be comfortable with any level of sensory stimulation that anyone wants to receive from plants." (PLAYCE) Water and sand combination features accompany this, as water can be an amazing sensory element for children and adults with autism.

An Interview with Rachel Robinson, the Designer of the Arlitt Children's Garden

Design Inspiration:

Q: What inspired the design of this children's garden?
A: A desire to meet preschool age children and their teacher's and family's needs from a social, physical and emotional perspective. Also provide an area for teachers and others to observe the children for research reasons.
Q: Were there specific themes or concepts you aimed to incorporate?
A: Definitely getting kids back to an environment that provided natural materials to bring children living in urban neighborhoods, closer to nature.

Age-Appropriate Design:

Q: How did you tailor the design to accommodate different age groups of children?
A: This is a space for preschool children but also open to the campus at large.
Q: Were there specific developmental stages you considered in your design?
A: We worked to provide different challenges and opportunities so that the children could take part in various activities as they felt ready to do so. These included climbing to the top of a hill, deciding what pathway to walk, running in open lawn areas, climbing steps, providing areas for socializing and ect.

Educational Elements:

Q: How did you integrate educational elements into the garden design?
A: We provided varying materials to manipulate.
Q: Can you provide examples of how the garden facilitates learning for children?

A: building with others, exploring movement of water, filling, emptying, counting tree cookies, categorizing, wayfinding using the maps, sharing, taking chances, exploring, touching different materials, observing moving leaves, clouds, growing vegetables.

Safety and Accessibility:

Q: What safety considerations were prioritized in the design?
A: All fall zone requirements, plantings, structures and the way they were built, height of risers, visibility for teachers to name a few.
Q: How did you make the garden accessible to children with different abilities?

A: Main path around the space is ada accessible including up to the main tree house.
Q: Can you elaborate on specific features or design choices made to enhance accessibility for all children?
A: We incorporated railings at an 8% slope ramp to the tree house, we had the main features off of the main path so that everyone had varying opportunities in their play.

Interactive Features:

Q: What interactive features did you include to engage children?
A: Tree cookies, water feature, sand play, vegetable/herb garden, rolling hill, wayfinding sign, tree house platform
Q: How did you balance interactivity with safety?
A: With a lot of care and consideration, following U.S. Consumer Playground Safety Handbook Guidelines.

Plant Selection:

Q: How did you choose the plants for the garden? Are there specific considerations for children?
A: Heights, enclosure, shade, texture, bloom, seasonal interest, toxicity.
Q: Were any of the plants selected for their educational or sensory value?
A: All of them.

Sensory Design:

Q: How did you incorporate sensory experiences into the garden?
A: With all the varying materials.
Q: Are there specific elements designed to stimulate different senses?
A: Water, stone, sand, plants, wood

Sustainability and Environmental Considerations:

Q: How did you address sustainability in the design of the children's garden?

A: We worked with the University regarding management requirements and how to best keep the Nature PlayScape in top shape through time. We used drip line irrigation to help establish plant material. We used locally sourced materials and local contractors.
Q: Were there considerations for attracting local wildlife or promoting biodiversity?
A: Yes, especially in the plant choices.

Community Involvement:

Q: Did the local community have any input or involvement in the design process?
A: We had many meetings with teachers, administrators,the university architect and landscape architect.
Q: How do you see the garden fostering a sense of community among children and families?
A: It is a unique space where children and adults have the ability to harvest plants, run, sit, gather through all seasons of the year in a university setting adjacent to neighborhoods with children of diverse backgrounds.

Accessibility for All:

Q: Beyond safety, how did you ensure that the children's garden is accessible to children with varying physical and cognitive abilities?
A: Entry to the garden, access to varying features, grade change meeting ada requirements, railings added as needed,
Q: Were there specific features or design elements implemented to promote inclusivity and accessibility?
A: Council ring, streambed, tree house platform, pathways, gathering deck above, access to the Curriculum Headquarters where materials are stored

Maintenance and Longevity:

Q: How did you plan for the long-term maintenance of the garden?
A: University and outsourcing to a well versed landscape company since the university's facilities team focused on larger scale properties. The University updated the Nature PlayScape after approximately ten years plus or minus of use.
Q: Were there considerations for adaptability or expansion in the future?
A: I do not believe that expansion is considered at this time.

Feedback and Iterations:

Q: Have there been any notable feedback or reactions from children and their parents?
A: I have heard positive feedback.
Q: Did the design undergo any iterations based on user feedback?
A: There has been upkeep of the paths, renovations of the streambed and some of the plantings.

Collaboration with Experts:

Q: Did you collaborate with child development experts, educators, or psychologists in the design process?

A: Yes, the team from Arlitt and Robin Moore of the Natural Learning Initiative.
Q: How did their insights influence the final design?
A: The entire project was reviewed and influenced by the administration and teachers of Arlitt as well as input by Robin Moore.

Challenges Faced:

Q: Were there any challenges encountered during the design process, and how were they overcome?
A: Only in that there was some effort in coming to terms with which architectural scheme for the Curriculum Headquarters best served the University's aesthetics and best fit the functional needs of Arlitt.
Q: Were there compromises made, and if so, how did they impact the final design?
A: No because the team involved worked through design decisions on all levels during the process.

Favorite Design Element:

Q: Do you have a particular favorite element or feature in the children's garden? Why?
A: The tree house platform because it gets children up off the ground, closer to trees and has a unique aesthetic quality with a tunnel as a structural component below. It is accessible to all.

Future Goals:

Q: Are there any future plans or goals for the children's garden, such as expansions or additional features?
A: Not at this time from what I understand.
Q: How do you envision the garden evolving over time?
A: My hope is that the University continues to take pride in the space and continues to maintain it through time while staying in close contact with Arlitt to understand their ongoing needs regarding the space.

Historical Context

There have been notable shifts in societal attitudes towards the concepts of children's gardens, more specifically in terms of childhood, education, and outdoor play. Historically, children's gardens can be traced back to the early 19th century in Europe and North America, coinciding with the rise of urbanization and industrialization. (Eller)

During this period, urban growth led people and communities to be concerned about their children's health and well-being. These people were often confined to distressed urban environments which were unsanitary and often overcrowded. In response, reformers and educators began to emphasize the importance of nature and outdoor experiences for children's physical, mental, and emotional development. (Eller)

One notable figure in the history of children's gardens is Friedrich Fröbel, a German educator. Fröbel founded the first kindergarten in the early 19th century. The educator believed in the transformative power of nature-play activities for the youth of Germany. He introduced the concept of 'kindergarten gardens,' in schools' outdoor spaces where children could engage in hands-on exploration, gardening, and play in natural settings. (Eller)

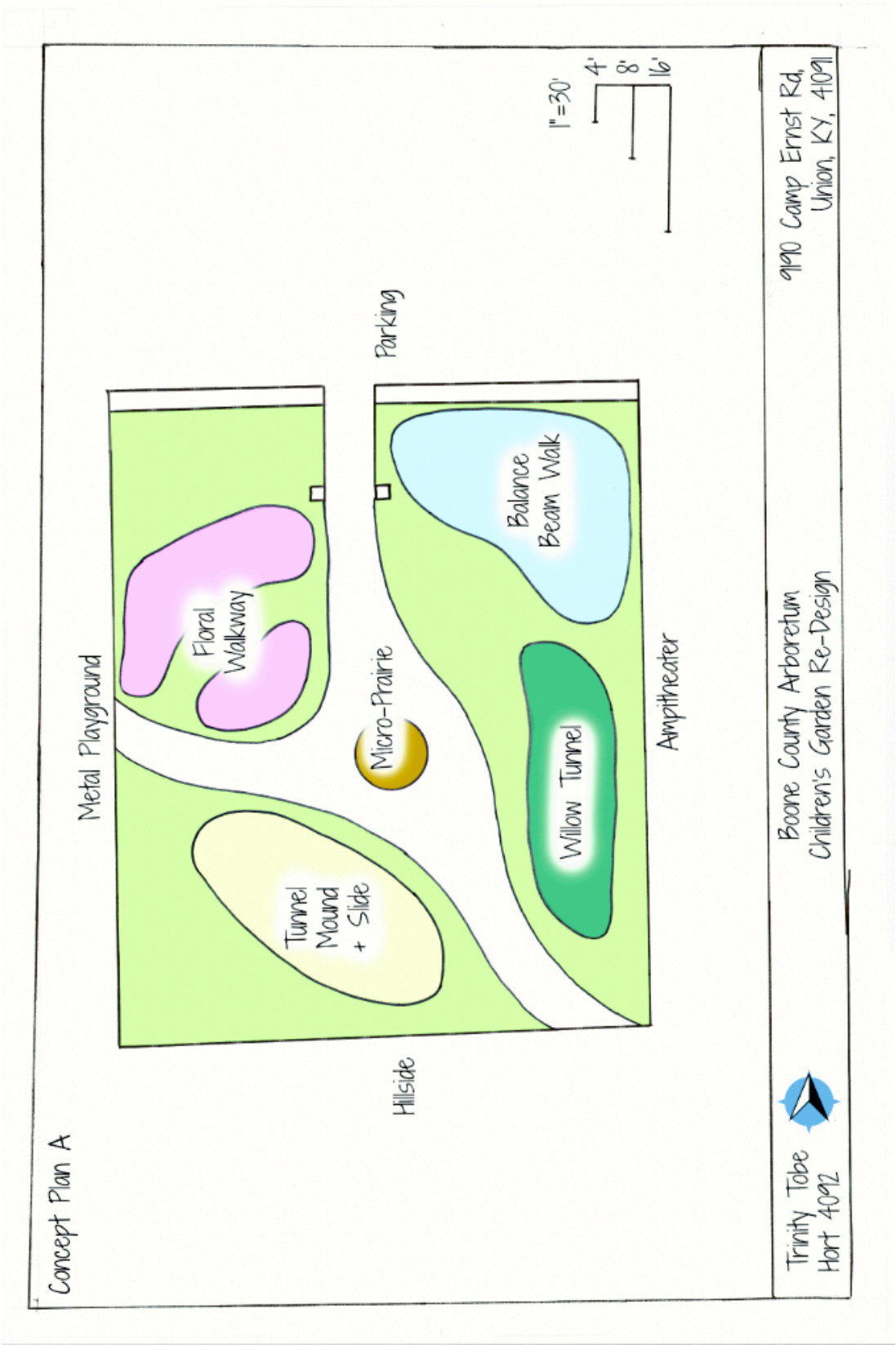
The idea of a 'children's garden' gained further traction during the late 19th and early 20th centuries. Formal education for youth began taking a more progressive approach during this time. Influential educators such as Maria Montessori and Rudolf Steiner shined a light on the importance of holistic child development, including connecting children to nature and outdoor learning experiences. (Eller)

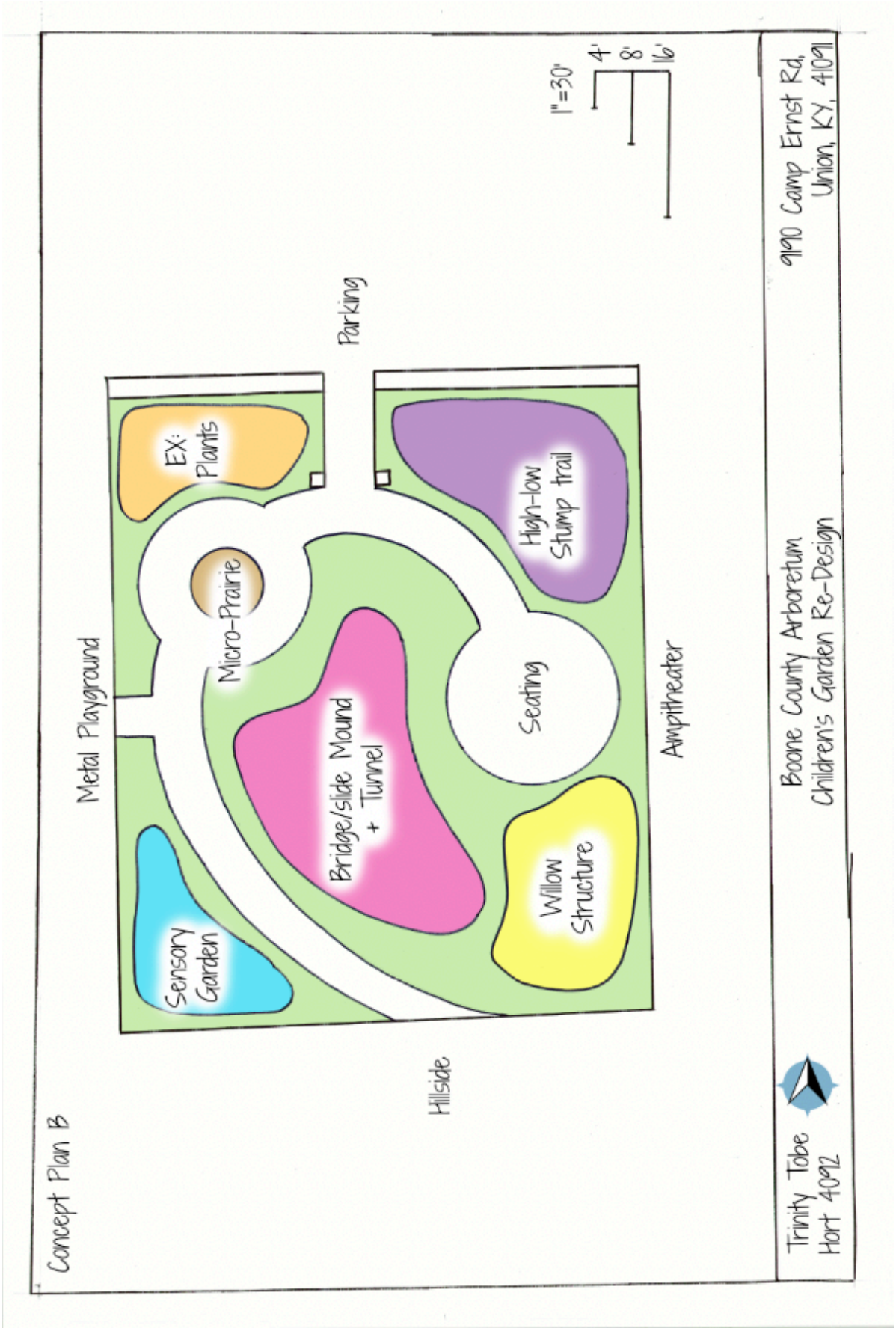
Furthermore, sometime during the mid-20th century, priorities shifted back towards academic learning. This was because parents and guardians had become increasingly concerned about the liability of their children as playing this way in private and public spaces could be

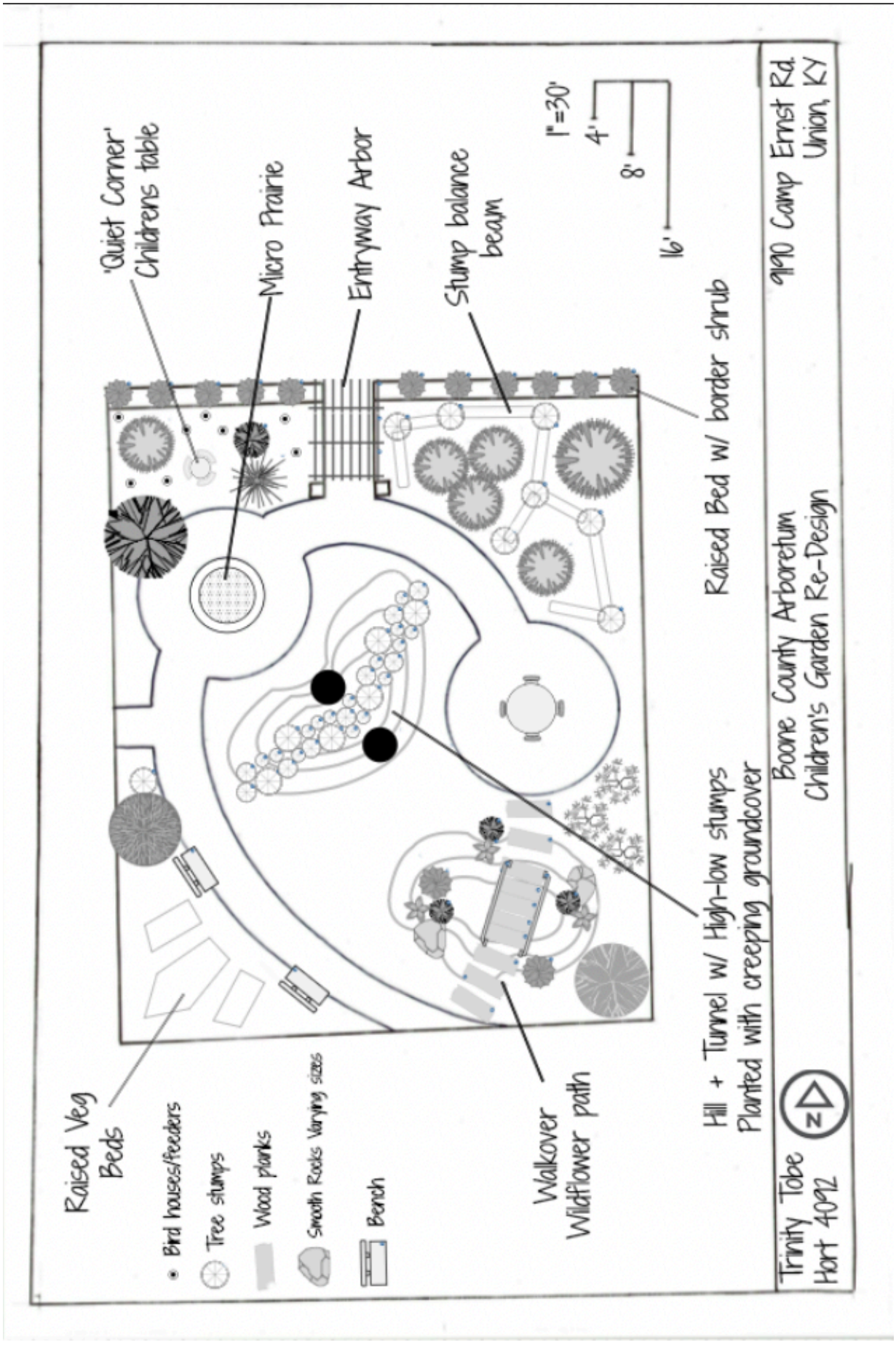
perceived as dangerous. However, there has been a resurgence of interest in children's gardens since the late 20th century, driven by growing awareness of the importance of environmental education, outdoor play, and reconnecting children with nature. (Eller)

Today, children's gardens can be found in a variety of settings, ranging from schools, local parks, community centers, and botanical gardens, to name a few. These gardens are designed to provide children with opportunities for unstructured play. Such places allow for hands-on learning, experiences with nature, and help foster a sense of wonder, curiosity, and stewardship for the environment.

Proposed Concept Plans




Concept Plan B
Metal Playground
Micro-Prairie
EX: Plants
Parking
Sensory Garden
Bridge/slide Mound + Tunnel
Seating
High-low Stump trail
Willow Structure
Amphitheater
Hillside
1"=30'
4'
8'
16'
Trinity Tobe
Hart 4092
Boone County Arboretum
Children's Garden Re-Design
9190 Camp Ernst Rd,
Union, KY, 41091

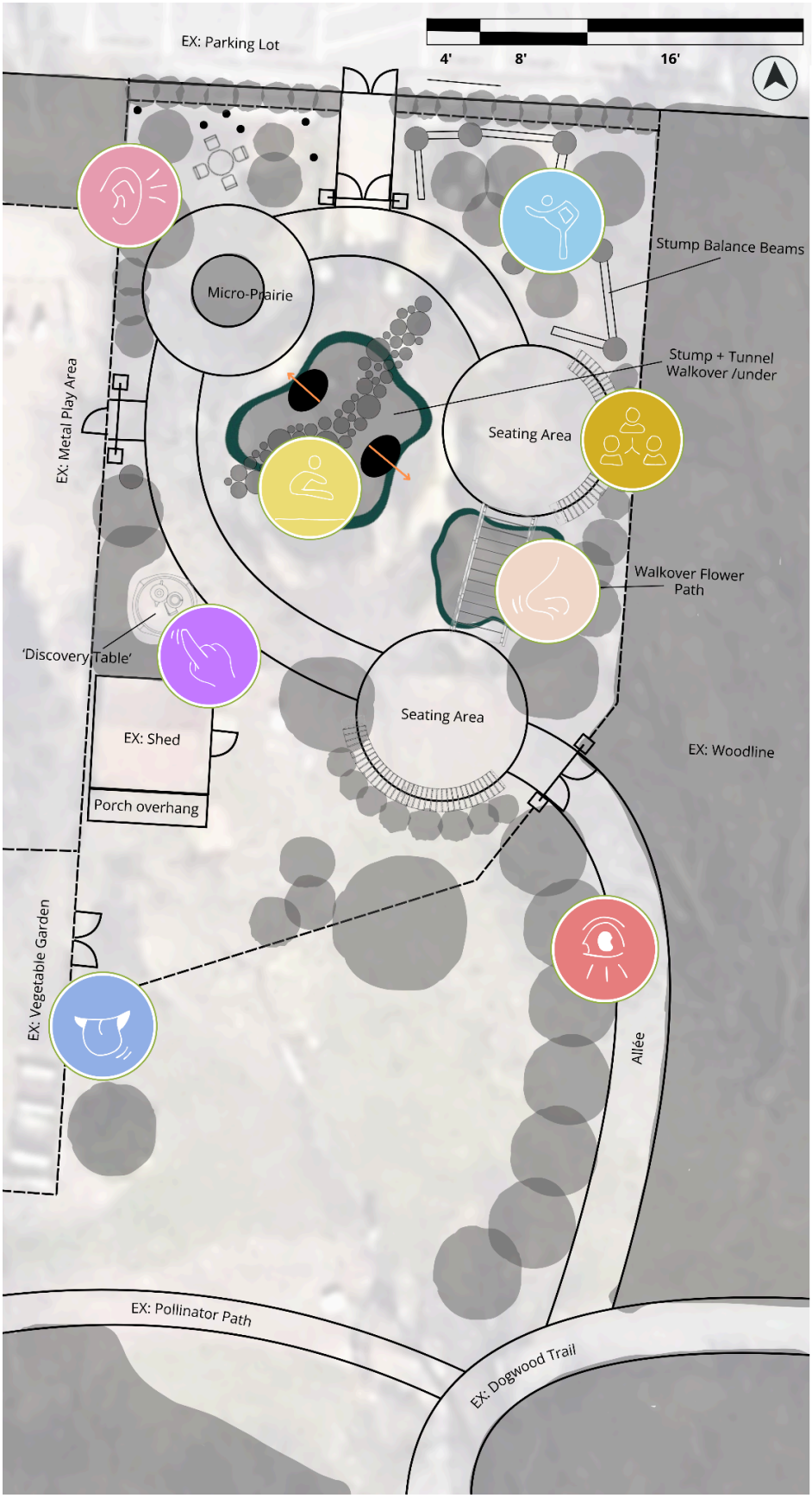

'Quiet Corner' Childrens table
Micro Prairie
Entryway Arbor
Stump balance beam
1"=30'
4'
8'
16'
Raised Veg Beds
Bird houses/feeders
Tree stumps
Wood planks
Smooth Rocks Varying sizes
Bench
Walkover Wildflower path
Hill + Tunnel w/ High-low stumps
Planted with creeping groundcover
Raised Bed w/ border shrub
Trinity Tobe
Hart 40912
Boone County Arboretum
Children's Garden Re-Design
9190 Camp Ernst Rd.
Union, KY

The following are the designer's original proposed concept and drafted plans. After meeting with stakeholders at the Boone County Arboretum, the designer continued to design based on their feedback. The stakeholder's shared their concerns about the seating area being between the two main gates, as well as factors such as liability concerns with play equipment, possibly expanding the space, and observing how traffic currently flowed through the garden.

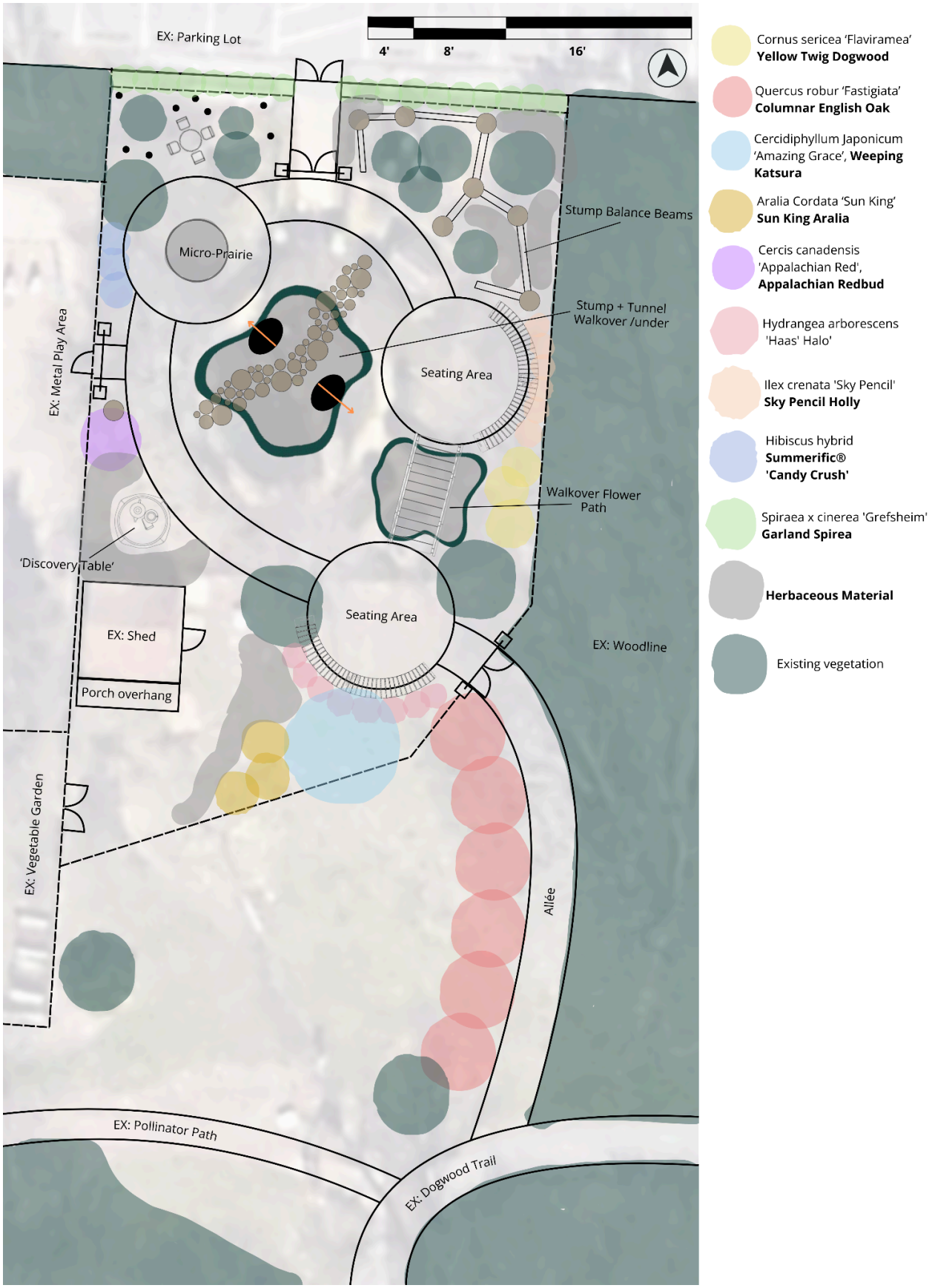
Final Plans


EX: Parking Lot
4'
8'
16'
Micro-Prairie
Stump Balance Beams
Stump + Tunnel Walkover /under
Seating Area
EX: Metal Play Area
Walkover Flower Path
'Discovery Table'
Seating Area
EX: Shed
Porch overhang
EX: Woodline
EX: Vegetable Garden
Allée
EX: Pollinator Path
EX: Dogwood Trail
Existing vegetation
Proposed green space
Arch- entryway
Tree stump (varying sizes)
Cantilever bench seating
Wooden fencing
'Bumps'
Birdhouses/feeders

Tobe, 44


EX: Parking Lot
4'
8'
16'
Micro-Prairie
Stump Balance Beams
Stump + Tunnel
Walkover /under
Seating Area
EX: Metal Play Area
Walkover Flower
Path
'Discovery Table'
Seating Area
EX: Shed
Porch overhang
EX: Woodline
EX: Vegetable Garden
Allée
EX: Pollinator Path
EX: Dogwood Trail

Tobe, 45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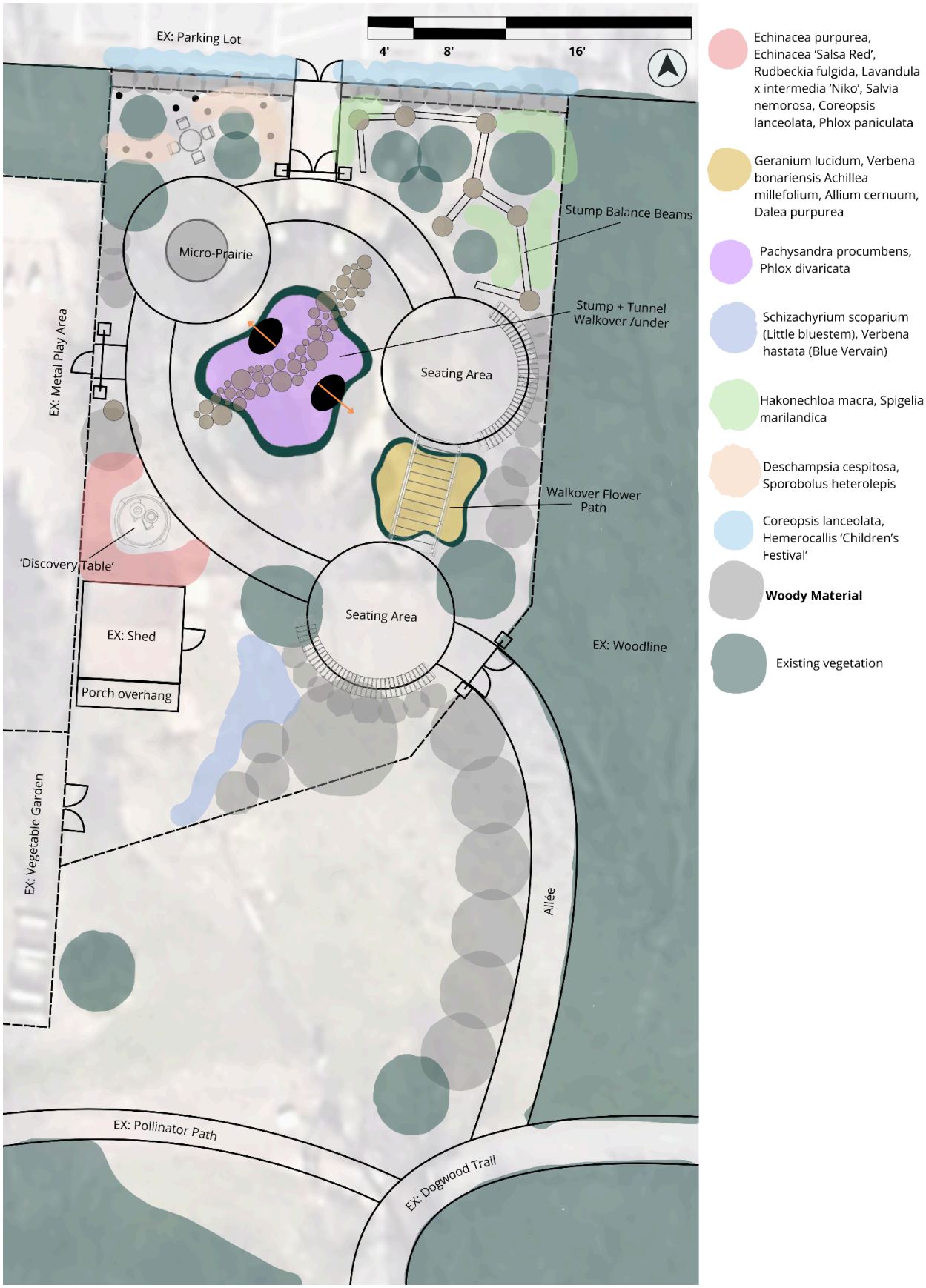
4'
8'
16'
Micro-Prairie
Stump Balance Beams
Stump + Tunnel Walkover /under
Seating Area
EX: Metal Play Area
Walkover Flower Path
'Discovery Table'
Seating Area
EX: Shed
Porch overhang
EX: Woodline
EX: Vegetable Garden
Allée
EX: Pollinator Path
EX: Dogwood Trail
Cornus sericea 'Flaviramea' **Yellow Twig Dogwood**
Quercus robur 'Fastigiata' **Columnar English Oak**
Cercidiphyllum Japonicum 'Amazing Grace', **Weeping Katsura**
Aralia Cordata 'Sun King' **Sun King Aralia**
Cercis canadensis 'Appalachian Red', **Appalachian Redbud**
Hydrangea arborescens 'Haas' Halo'
Ilex crenata 'Sky Pencil' **Sky Pencil Holly**
Hibiscus hybrid **Summerific® 'Candy Crush'**
Spiraea x cinerea 'Grefsheim' **Garland Spirea**
Herbaceous Material
Existing vegetation

Tobe, 46


EX: Parking Lot
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Stump + Tunnel Walkover /under
Seating Area
EX: Metal Play Area
Walkover Flower Path
'Discovery Table'
Seating Area
EX: Shed
Porch overhang
EX: Woodline
EX: Vegetable Garden
Allée
EX: Pollinator Path
EX: Dogwood Trail
Echinacea purpurea, Echinacea 'Salsa Red', Rudbeckia fulgida, Lavandula x intermedia 'Niko', Salvia nemorosa, Coreopsis lanceolata, Phlox paniculata
Geranium lucidum, Verbena bonariensis Achillea millefolium, Allium cernuum, Dalea purpurea
Pachysandra procumbens, Phlox divaricata
Schizachyrium scoparium (Little bluestem), Verbena hastata (Blue Vervain)
Hakonechloa macra, Spigelia marilandica
Deschampsia cespitosa, Sporobolus heterolepis
Coreopsis lanceolata, Hemerocallis 'Children's Festival'
Woody Material
Existing vegetation

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