City of Weatherford

Lake Weatherford Parks & Trails Master Plan

Standards and Design Guidelines

CITY OF WEATHERFORD

Pacheco Koch

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Introduction

STATEMENT OF PURPOSE

The purpose of this document is to provide design standards and guidelines for the future development and implementation of the Lake Weatherford Master Plan in Weatherford, Texas.

This document is organized into four sections. The first two sections briefly discuss the existing conditions and influences in and around the lake, the park and trail master plan design, and conceptual park designs. More information on these two sections can be found in Appendix A : Lake Weatherford Park & Trail Mater Plan - Public Input and Appendix B: Lake Weatherford Park & Trail Master Plan - Design and Concepts. Sections three and four discuss at length the design standards and guidelines to be implemented during design, construction, and trail and park system maintenance.

The overall goal of the Lake Weatherford Park & Trail Master Plan is to create a well connected and vibrant community destination by balancing the needs of the community and the ecological systems of the lake. Providing diverse choices for both passive and active recreation, the master plan looks to utilize existing infrastructure and provide additional enhancements to the area. Reflecting the community's input, the plan will create a long term, sustainable system to balance future growth and development with the current needs and desires of the community.

The master plan was created with guidance and input from citizens, elected officials, city staff, and key stakeholders establishing a unified vision for the lake area.

Section I

Existing Conditions & Influences

Section I

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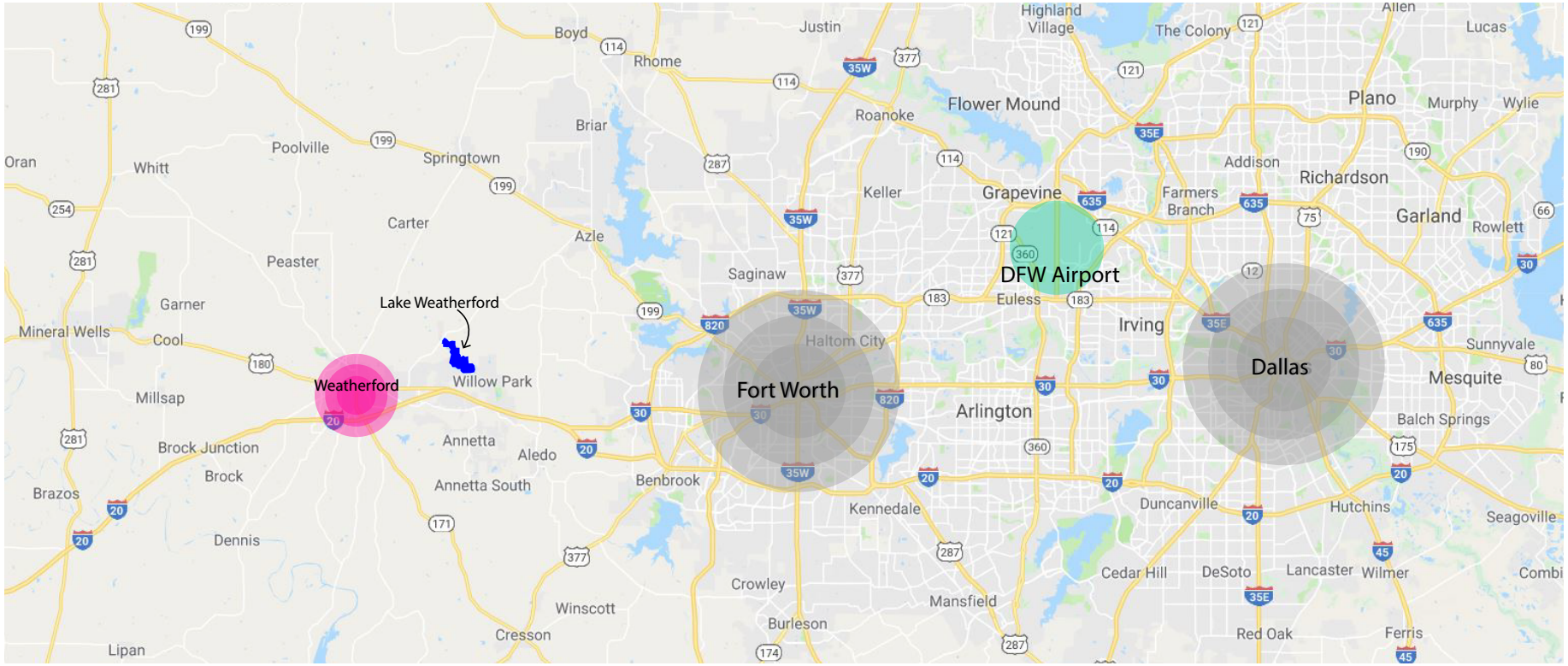
Project Location

Lake Weatherford is located along FM 730/Azle Hwy approximately 1.6 miles north of Interstate 20 West and approximately 26 miles west of Fort Worth. Interstate 20, connects Lake Weatherford to the larger Dallas/Fort Worth Metroplex, and has brought an abundance of traffic and economic opportunity through the City of Weatherford. Despite this major connection, Lake Weatherford continues to be a relatively quite community lake with only moderate activity taking place along it's shores. With the exception of major summer holidays when families can be found lining its banks and waters, it is rare for the lake to feel crowded.



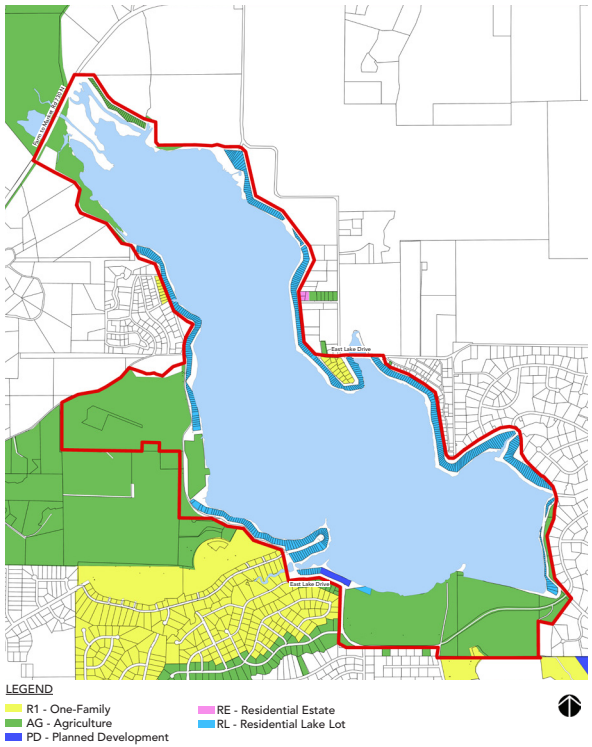
Section I

Existing Conditions & Influences

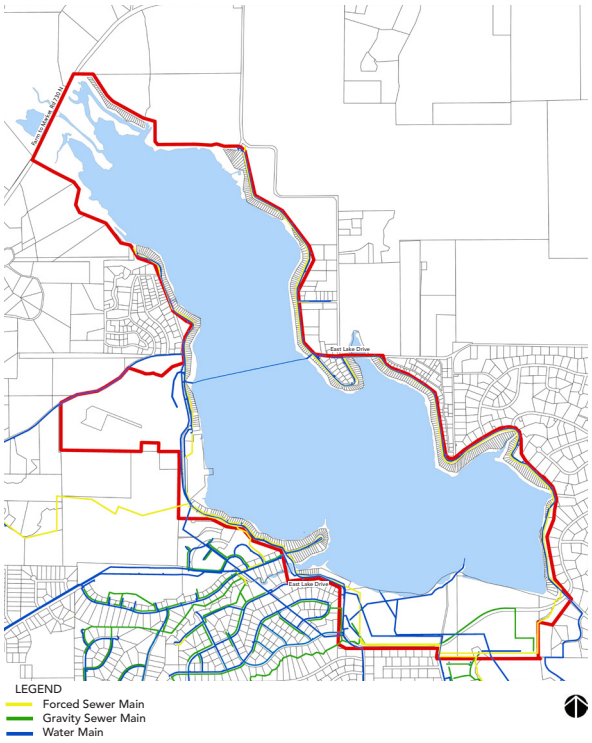
Infrastructure and Land Use

The majority of lake front property surrounding Lake Weatherford is owned by the City of Weatherford, zoned residential, and leased to residents. There is property zoned as planned development along the lake front that contains a private marina and park. The existing park areas and open space around the lake are zoned agriculture. Existing public utilities include sewer, water and electric. The majority of the sites examined are within the flood plan.

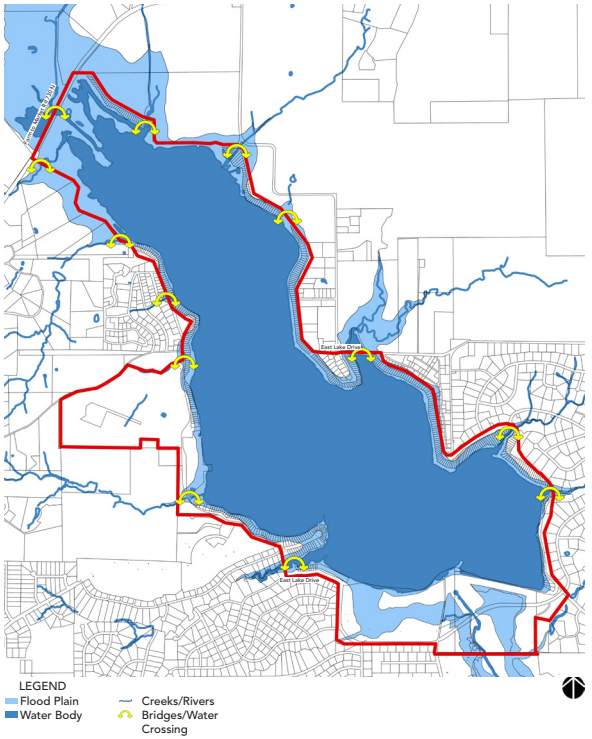
LAND USE AREAS



PUBLIC UTILITIES



WATERWAYS/FLOOD PLAIN

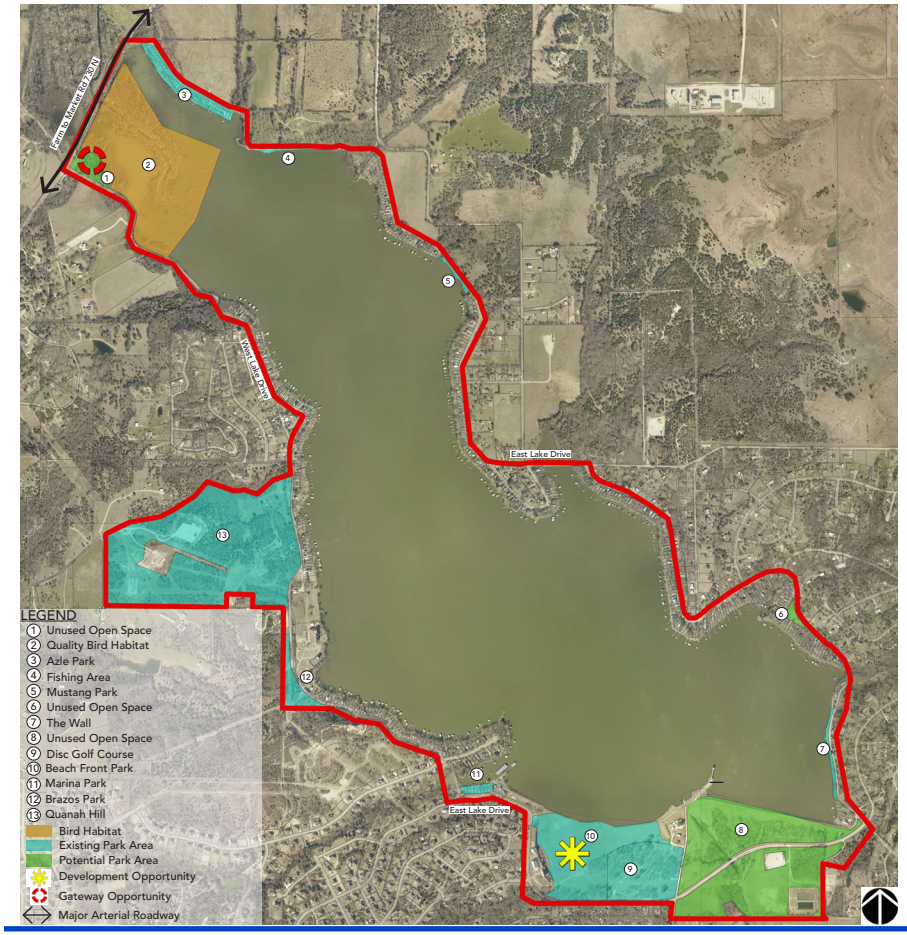


Section I

Existing Conditions & Influences

Existing Parks and Open Space

There are eleven focus areas around the lake that were examined during the course of the preparation of this document . A site analysis and amenity inventory was conducted and each site was explored to better understand the opportunities and constraints available.



Existing Site Images and Site Furnishing Inventories

3 AZLE PARK

- 6 Pavilions
- 7 Grills
- 5 Red Picnic Tables
- 2 Red Benches
- 8 Blue Garbage Cans
- 2 Fishing Docks
- 1 Port-A-Potty

4 FISHING AREA

- 1 Blue Trash Can

5 MUSTANG PARK

- 3 Blue Garbage Cans
- 1 Port-A-Potty

7 THE WALL

- 4 Blue Garbage Cans
- 1 Port-A-Potty
- 2 Red Benches

9 10 DISC GOLF COURSE / BEACH FRONT PARK

- 3 Pavilions
- 3 Grills
- Power
- Potable Water
- 2 Brown Benches
- 4 Red Benches
- 17 Blue Garbage Cans
- 4 Concrete Picnic Tables
- 1 Brown Picnic Table
- 3 Round Picnic Tables

11 MARINA PARK

- 4 Red Pavilions
- 7 Blue Garbage Can
- 3 Brown Bench
- 3 Grills
- 2 Red Benches
- 2 Concrete Picnic Tables
- 1 Port-A-Potty

12 BRAZOS PARK

- 3 Concrete Picnic Tables
- 2 Blue Garbage Cans

13 QUANAH HILL

- 1 Port-A-Potty
- Potable Water
- Power
- 1 Picnic Table

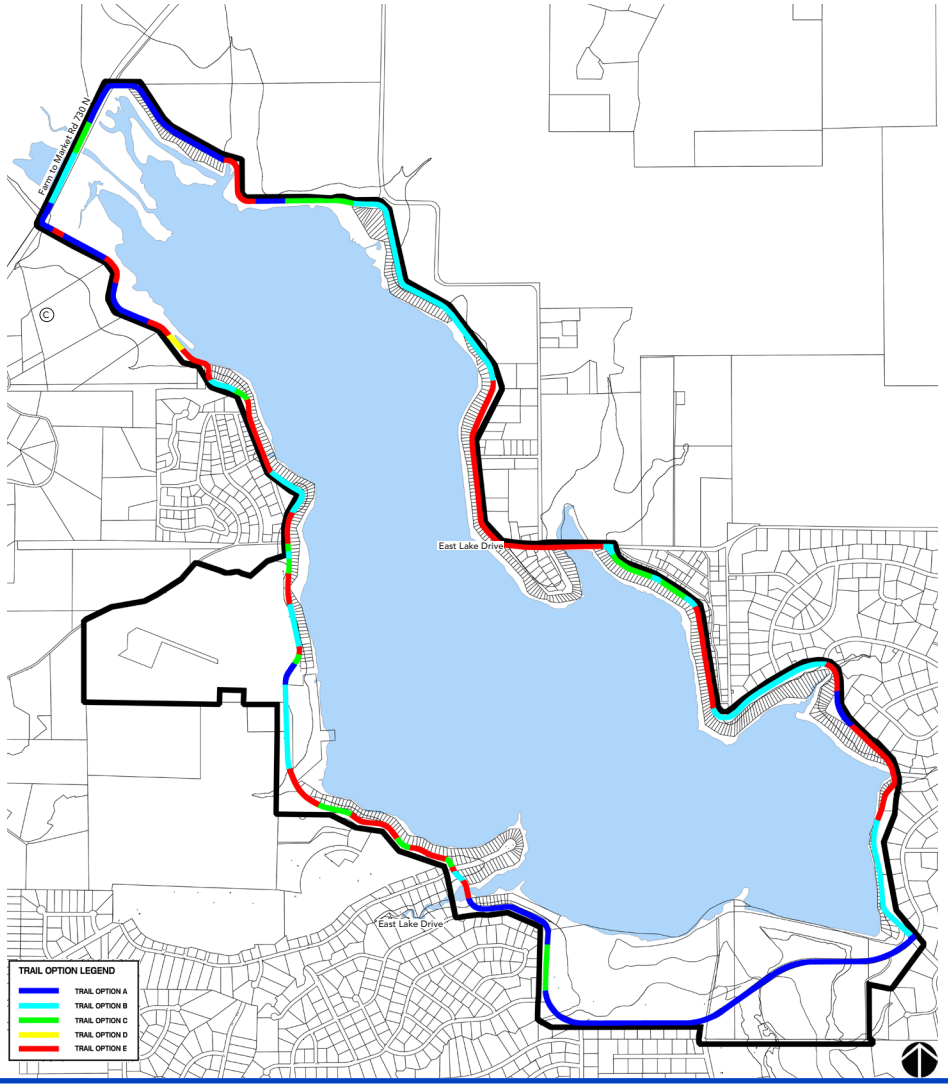
Section I

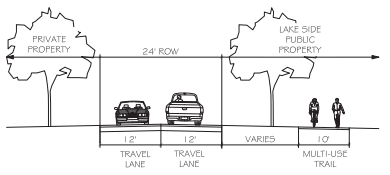
Existing Conditions & Influences

Right-of-Way Conditions

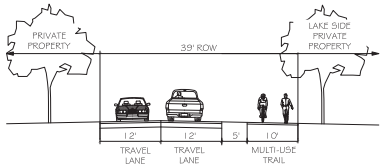
The public right-of-way both along the roadway and in public land surrounding the lake was examined to determine the viability of a looped trail to make it possible to walk or ride around the lake.

The examination took into consideration existing right-of-way, utilities, roadway widths ,and existing built features such as resident driveways and mailboxes.

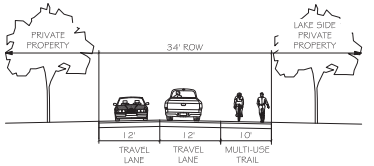




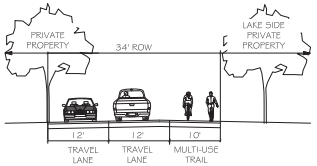
TRAIL OPTION A - Trail will located OUT OF the ROW in public property. Option is applicable when public property such as parks are adjacent to the lake side of the ROW.



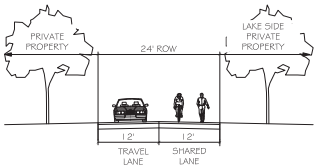
TRAIL OPTION B - Trail will located in the ROW. Option is applicable when ROW is a minimum of 39' and 15' of ROW is available on the lake side of the road.



TRAIL OPTION C - Trail will located in the ROW. Option is applicable when the ROW is a minimum of 34' wide and 10' of ROW is available adjacent to the lake side of the road.



TRAIL OPTION D - Trail will located in the ROW. 10' of the lake side travel lane will be converted to a multi-use trail. The travel lane opposite the lake would be extended 10'. Option is applicable when the ROW is a minimum of 34', less than 10' ROW is available on the lake side of the road, and 10' of ROW is available on the far side of the road.



TRAIL OPTION E - Trail will located in the ROW. Option is applicable when ROW is less than 34' wide. The lake side travel lane will be converted to a multi-use shared lane to accommodate vehicular, bicycle, and pedestrian traffic.

Section I

Existing Conditions & Influences

Community Engagement: Stake Holder Meeting 1

Essential to developing a master plan is involving the people and assets within the community to provide valuable insights into how the area functions. Having a good understanding of the critical issues that need to be addressed is vital to a successful study. Stakeholder meetings, public interviews and surveys are tools used to gather this valuable input.

On October 12, 2017, a public input meeting was held for the Lake Weatherford Parks & Trails Master Plan at the lake's disc golf course. Quantitative data was gathered through surveys and voting using the dot method. Over 70 surveys were handed out and completed in addition to general comments and comment boards. Conversations with attendees of the meeting provided unique insights regarding the current condition of the Lake, what was enjoyed and what needed improvements.

To start the meeting a brief introduction was given describing the project goals, funding, and the projected time-line. After the introduction, attendees were given a preference survey and a blank sticky note. The sticky note was to be filled out with words that answer the question "What do you enjoy most about Lake Weatherford?". The quotes below depict the words or phrases used the most.

"The quiet..."

"neighbors"

"quanah hill"

"disc golf"

"The views..."

Surveys and Dot Voting

The survey consisted of 21 potential uses for existing parks around the lake, and asked people to rank them from not important to very important. Top priority was a looped trail around the lake.

Dot voting allowed citizens to vote on the intended activities and character shown on four programming boards. Attendees were given different colored sticky dots and asked to use the dots to vote on the style of programming images they would prefer to have around the lake. The most popular images can be seen on the next page.

For additional infromation regarding the surveys and Dot Voting refer to Appendix A: Lake Weatherford Park & Trail Master Plan: Public Input.

LAKE WEATHERFORD PARKS MASTER PLAN QUESTIONNAIRE

How important are the following to you? Circle your top three upon completion.

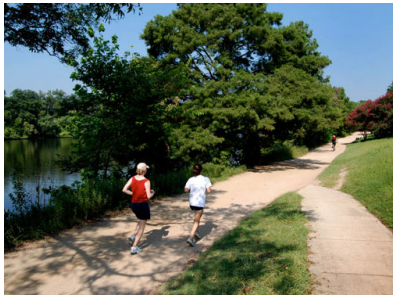
		not very important 1	2	3	4	very important 5
Looped trail around the lake	A.	7	2	4	7	32
Soccer Fields	B.	26	6	14	0	2
Baseball Fields	C.	23	12	6	4	2
Football Fields	D.	27	12	6	1	1
Disc Golf Course	E.	12	4	11	11	12
Playground	F.	7	5	12	13	14
Dog Park	G.	11	8	14	11	7
Boardwalks	H.	17	3	8	9	12
Community Open Space	I.	9	4	10	19	7
Education on wetlands, stormwater management, and bird habitats	J.	7	10	11	8	15
Camping	K.	23	7	8	6	6
Event Space	L.	10	12	12	12	4
Beach Area	M.	13	7	8	6	6
Kayaking	N.	7	4	13	12	14
Canoeing	O.	7	5	11	15	12
Paddle Boarding	P.	8	3	11	12	14
Mountain Biking	Q.	13	4	7	8	20
Fishing	R.	7	3	9	17	17
Bird Watching	S.	10	2	12	11	13
Picnics	T.	11	0	14	13	11
Boating	U.	9	3	10	11	19
Sailing						2
Community Center						1

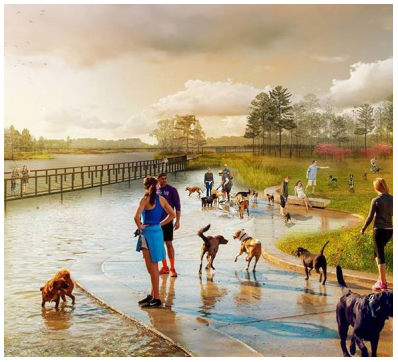
Section I

Existing Conditions & Influences

Active Recreation





Passive Recreation






Section 2

Master Plan Design and Concepts

Section 2

Master Plan and Concepts

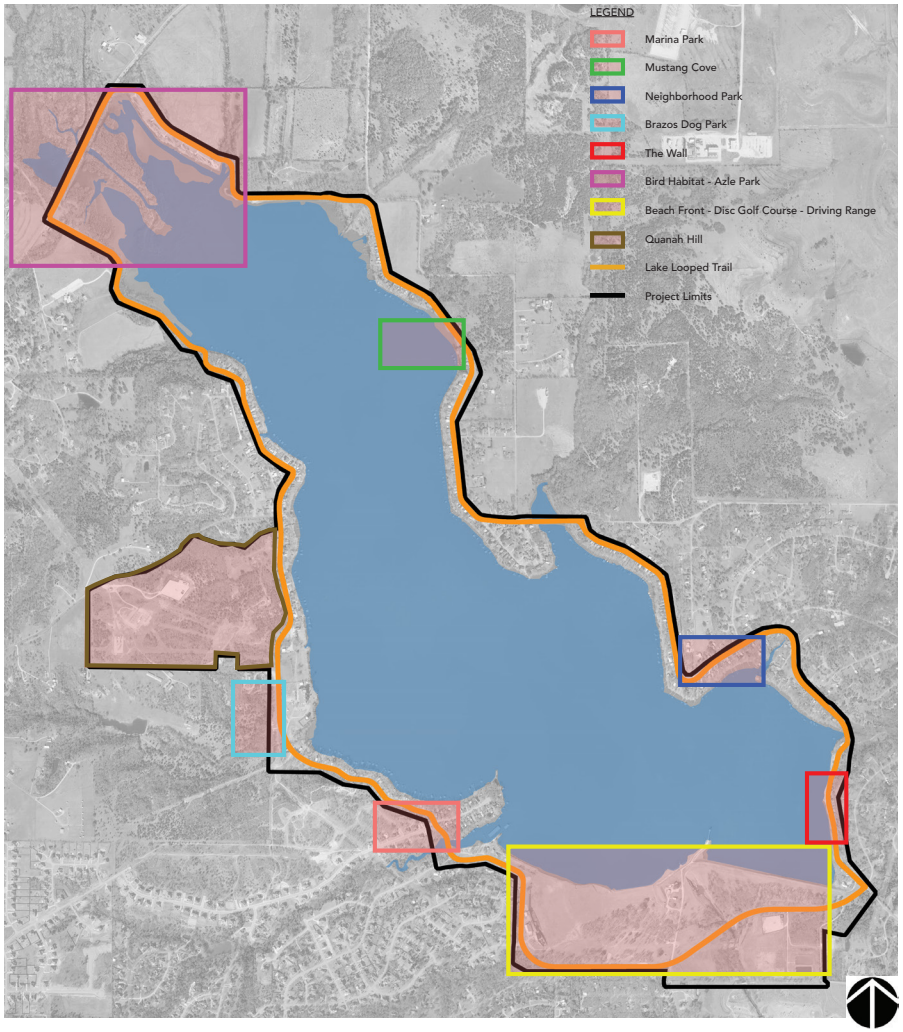
OVERVIEW

Eleven areas were selected for improvements and further development around Lake Weatherford based on the input received at the October 12th meeting, the inventory analysis and the existing park inventory assessment. Understanding what the primary actives around the lake are, how residents like to recreate and what they feel is missing set up the development of the concepts. Next available space was explored to develop the programming for both passive and active programming. To the right is a key of the different parks and how they relate to each other and the lake as well as the Looped Lake Trail.

PREFERRED MASTER PLAN CONCEPTS

One overall concept was developed for the Lake Weatherford Park & Trail Master Plan, encompassing the eleven different park areas and two main trails. On the north end of the lake, you will find primarily passive programming in the parks. Activities that include, a birding watching area with boardwalks, with additional fishing docks, picnic tables, and parking. On the south end of the lake primarily active programming elements were planned for. These include, a dog park, disc golf coarse expansion, playground, community gathering spaces, and additional marina boat and car parking to name a few. After the first concept was developed it was submitted to the city for review and input. The following pages show the final conceptual designs and brief descriptions for each park area. Additional information can be found in Appendix B: Lake Weatherford Park & Trail Master Plan.

Locator Map



Section 2

Master Plan and Concepts

Marina Park

LEGEND

① Vehicular Parking - 10 stalls
② Boat Trailer Parking - 24 stalls
③ Existing Pavilion - 3
④ Proposed Pavilion - 1
⑤ Picnic Area/Lake Access
⑥ Lake Looped Trail
⑦ Pedestrian and Vehicular Connection to Marina
⑧ Public Restroom

Located on the southwest end of the lake this park provides pavilions, picnic areas, lake access. Formalized vehicular parking, additional truck and trailer parking, enhancing vehicular and pedestrian connections to the existing marina, a public restroom, and connections to the looped lake trail. Estimated total cost of proposed improvements: $582,000

Mustang Cove

LEGEND

① Paved Vehicular Parking - 5 stalls
② Lake Looped Trail
③ Proposed Pavilion - 3
④ Picnic Area
⑤ Fishing Docks

Located on the northeast side of the lake, proposed improvements include docks, pavilions, picnic areas, lake access for swimming, vehicular parking and connections to the looped lake trail. Estimated total cost of proposed improvements: $156,000

Neighborhood Park

LEGEND

① Lake Looped Trail
② Large Pavilion
③ Picnic Area
④ Playground Area
⑤ Open Space

A neighborhood park is proposed on the southeast side of the lake and includes a large pavilion for group gatherings, picnic area, playground for all ages and flexible open space for group activities and play. Estimated total cost of proposed improvements: $72,000

Section 2

Master Plan and Concepts

Brazos Dog Park

Brazos Park is proposed to be repurposed as a Dog Park. The dog park will include multiple paddocks for different sized dogs and activity levels, entry plaza and parking. Existing utilities located in the area create opportunities for water fountains and other amenities often found in popular dog parks. Estimated total cost of proposed improvements: $435,000

The Sea Wall

The Sea Wall is an existing popular fishing spot that received its name by residents. This concept enhances the area by incorporating the looped lake trail allowing for easier access to the space along with several fishing docks with constructed habitat to provide additional access to the water and fishing opportunities. Estimated total cost of proposed improvements: $85,000

Brazos Dog Park

LEGEND

① Lake Looped Trail
② Vehicular Parking - 48 Stalls
③ Park Trail
④ Entry Plaza
⑤ Paddock 1 - Less Active Dogs
⑥ Paddock 2 - Small Dogs
⑦ Paddock 3 - Large Dogs
⑧ Paddock 4 - Rotational
⑨ Utility Line Access
⑩ Lift Station

The Sea Wall

LEGEND

① Lake Looped Trail
② Lake Wall
③ Fishing Dock - 7

Bird Habitat

The northern portion of Lake Weatherford is well know for its wetlands and wildlife habitat. It has high visibility from FM 730. The wetland setting makes it a key area for introducing visitors to Lake Weatherford. Because of this, gateway monuments are proposed at both E. Lake Drive and W. Lake Drive introducing lake users into the park and trail system. Several other amenities are proposed to facilitate easier access to this area and create education opportunities. The boardwalk system is incorporated with the looped lake trail and connects the Bird Habitat to Azle Park. Estimated total cost of proposed improvements: $2,793,000

Azle Park

Azle Park is one of the largest park areas within the master plan. The proposed improvements include non-motorized boat launch/dock, truck and trailer parking, picnic areas, pavilions, centralized vehicular parking and access to the looped lake trail. Estimated total cost of proposed improvements: $388,000

LEGEND

1. Lake Looped Trail
2. Gateway Monument
3. Bird Habitat Parking - 42 stalls
4. Bird Habitat Education Center
5. Drop-off
6. Pedestrian Boardwalk
7. Habitat Observation Location
8. Boat Launch Dock
9. Trailer Parking - 6 stalls
10. Vehicular Parking - 20 stalls
11. Existing Boat Docks
12. Existing Pavilion - 5
13. Park Trail
14. Fishing Area Parking - 8 stalls

Section 2

Master Plan and Concepts

Beach Front Park, Disc Golf Course & Driving Range

Beach Front Park

Located on the south end of the lake this is the largest and most developed park areas within the master plan. The plan adds additional area to the popular frisbee golf course along with additional programming elements that extend the park to the water front. Estimated total cost of proposed improvements: $2,597,000.

Disc Golf Course

The proposed expansion for the for the Disc Golf Course include a 9 hole course expansion and parking addition allowing it to facilitate tournaments.

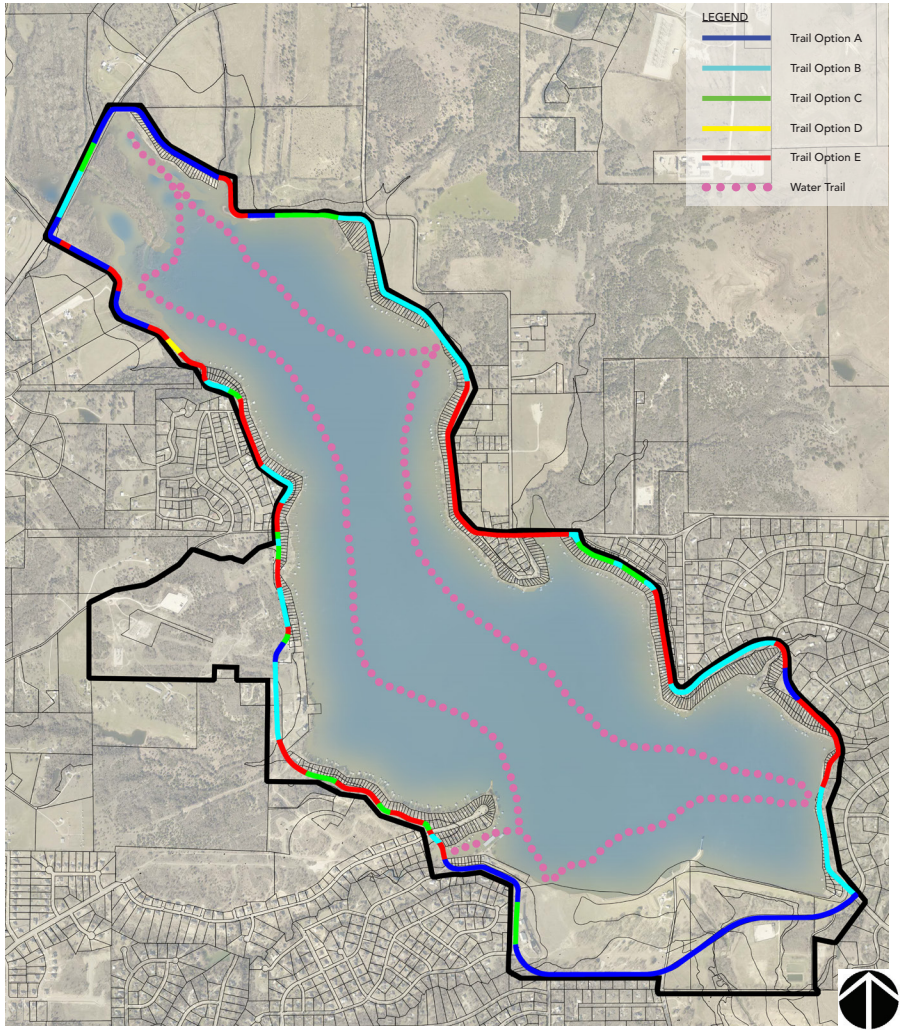
Driving Range

To compliment the existing golf full sized driving range has been proposed. It would feature 25 tee boxes, club house and associated parking. Estimated total cost of proposed improvements: $500,000

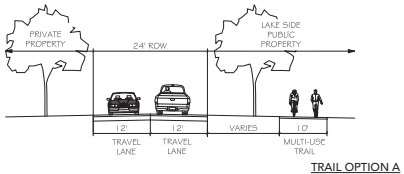
Section 2

Master Plan and Concepts

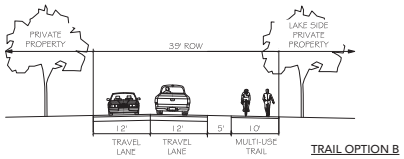
Trail Map



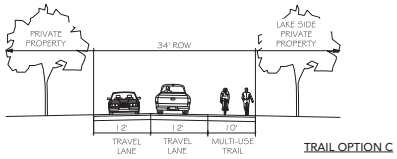
Trail Sections



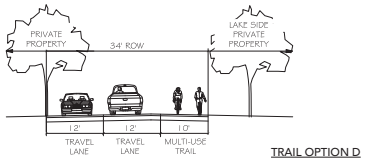
TRAIL OPTION A



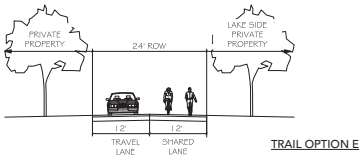
TRAIL OPTION B



TRAIL OPTION C



TRAIL OPTION D



TRAIL OPTION E

Looped and Water Trails

Access in and around the lake are key priorities in the development of the Master Plan. Two types of trails are proposed for access around the lake: a looped multi-use trail and a water trail.

The looped multi-use trails extends around the perimeter the entire lake and provides access to all eleven parks in the park system. Due to available right-of-way constraints five separate trail options have been proposed. These trail options range from meandering trails through parks to sharing a vehicular lane of traffic. In all scenarios, a 10' minimum width trail will extend around the entire lake. Estimated total cost of proposed improvements: $4,900,000

The water trail provides opportunities for non-motorized boats, such as canoes and paddle boats, to have access to the entire lake. Docks have been proposed at each park area abutting the lake providing resting areas, observations areas and access to the trail for boat launching. Water trail costs are built into the docks at the individual park locations.

Section 3

Design Standards and Guidelines

Section 3

Design Standards and Guidelines

Building Types and Form

Architecture plays an important role in designing a successful outdoor space, guiding the process of establishing a set of character-defining features. These features shall be used as guides in the expansion and development of the parks around Lake Weatherford. A contemporary rustic style fits within the context of Weatherford and relates to newer park improvements, like the pavilion at Heritage Park. This list of character-defining features will guide the development of the new and existing buildings:

- Exposed trusses
- No heavy ornamentation
- Simple rectilinear or curvilinear forms
- Cantilever or large overhangs
- Seemingly flat roof lines
- Large storefront windows
- Steel or metal feature columns
- Smooth finished concrete
- Exterior finishes: stone, wood and steel

Proposed structures shall be considerate of the scale and volume of the surrounding homes and respectful of the overall height, views and proportion of these adjacent buildings. Limiting the height to a maximum of two levels allows a more pedestrian-friendly experience and limits effects on surrounding view sheds.

The ecology and relationship to the lake should be a priority along with the framing of key views. Visual connections of indoor/outdoor relationships will provide a sense of security and connection to the outdoors. The use of roof-top access or balconies offers users an opportunity to experience the lake from an alternate and unique vantage point.

Overall, the architecture around Lake Weatherford should have a direct connection to the lake and surrounding views. Structures should provide a continuity atheistic tying together the different parks within Lake Weatherford park system, connecting visitors and providing a consistent and pleasant experience.


Angled roof with stone and wood.


Metal roof with wood siding.


Wood trusses with stone wraps.


Metal Flat roof with stone, wood & metal.

Section 3

Design Standards and Guidelines

Trails and Streetscape

Trails are a strategic element within the Lake Weatherford Master Plan. They promote walk-ability and are an opportunity for connectivity throughout the Lake Weatherford parks. Trails will connect the eleven primary use areas around the lake, providing users access to a range of activities. Designed to prioritize walking and biking, trails should be designed with social interaction in mind and include places to sit, gather and play.

Trail features should bolster the character-defining experience of the lake's parks and continue to guide the contemporary rustic style. This list of character-defining features should guide the development amenities associated with the trails:

- Simple rectilinear or curvilinear forms
- Finishes: stone, wood, steel & concrete
- Decomposed granite
- Boardwalks

The different types of trails within the master plan consist of, boardwalks, bridges, concrete paths or crushed rock such as limestone or decomposed granite.

Trail placement should be considerate of the surrounding homes and existing infrastructure, incorporating existing features as is practical. Mobility, connectivity, lake views, and points of interest should take priority when implementing the trail system.

Extensive distances should be considered for the bicycles, runners and dog walking.

Bridge asethics appropritae for design theme.

Boardwalks to be used in the Bird Habitat.

Signage & striping indicate road crossing of trail.

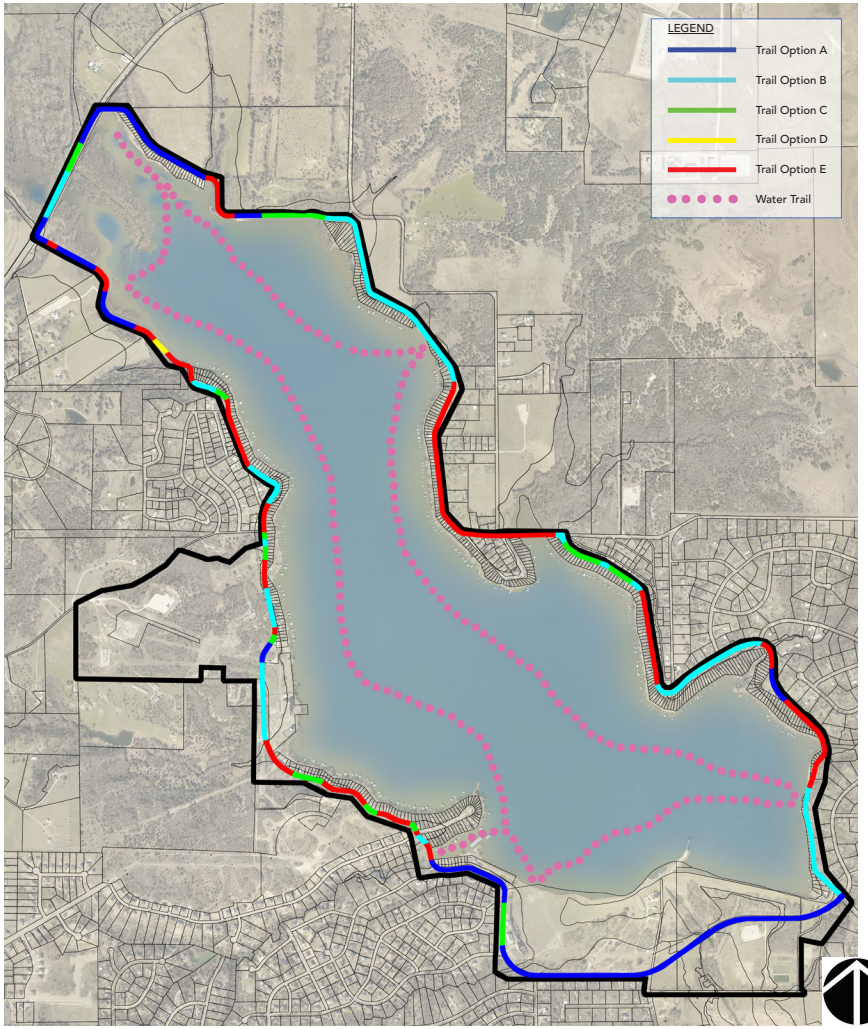
Sitting areas and lake view opportunities should be utilized along trail.

Lake Looped Trail

A trail going around the entire lake was the number one priority by respondents of the input surveys and dot voting. The Laked Looped Trail will be the dominate trail of the Lake Weatherford park system, connecting all of the parks. This trail should be highly identifiable and include amenities for cyclist & pedestrians. Multi-use trails should be no less than 10 feet wide, have clear signage and traffic claiming measures where vehicular lanes and the trail interact. Street trees, raised crosswalks and curb extensions are examples of appropriate measures.

Due to the varying width of the right-of-way along Lake Drive, 5 different trail sections were designed to accommodate the space needed for a multi-use trail.

Trail Option Map



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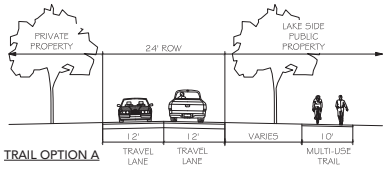
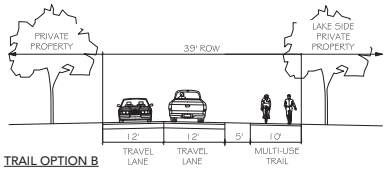
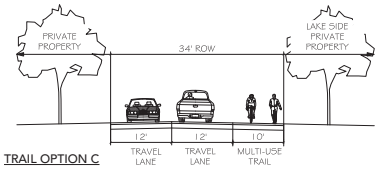


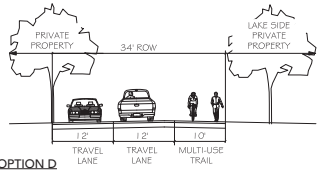
TRAIL OPTION A



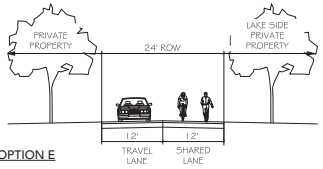
TRAIL OPTION B



TRAIL OPTION C



TRAIL OPTION D



TRAIL OPTION E

Section 3

Design Standards and Guidelines

Trail Option A: makes use of the space available outside of the ROW on the lake side public property. It places a variable width landscape buffer between the multi-use trail and vehicular travel lanes. Trees, benches, light post and trash receptacles are good uses for the buffer space between the trail and vehicular travel lanes that will help create separation between the two uses.

Trail Option B: will be used when a minimum 39′ ROW is available and 15′ of ROW is available on the lakeside of the road. A 5′ buffer is to be implemented between vehicular travel lanes and the multi-use trail. Light posts and plant materials now become the best options for use in the buffer space.

Trail Option C: will be used when the ROW is a minimum of 34′ and 10′ of ROW is available on the lakeside of the road. There will not be a buffer zone between the travel lane and multi-use trail. This option adds a 10′ trail onto the edge of existing roadway. Vehicular traffic calming measures will be critical for the success of this option.

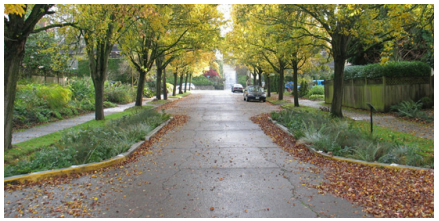
Trail Option D: will be used when the ROW is a minimum of 34′ and 10′ of ROW is not available on the lakeside of the road. This option will require vehicular lanes to be widened opposite the lakeside of the roadway and the lakeside travel lane to be converted into a 10′ multi-use trail. Traffic claiming measures will also be critical for the success of this option.

Trail Option E: is utilized in areas where the ROW is less than 34′ but a minimum of 24′. This option converts the existing lakeside travel lane into a shared lane. Vehicles, cyclist and pedestrians will share the same travel lane. Employing traffic claiming measures such as tight corner radii, street trees, narrow lanes, curb extensions, reduced speed limits, speed humps, painted lanes and signage are some measures that may be used in order to contribute to the success of this option.


Additional striping slows down vehicular traffic.

Speed table to slow down vehicular traffic.


Visually identify where cars need to share the roadway.


Curb bump outs to slow down vehicles.

Hardscape Elements

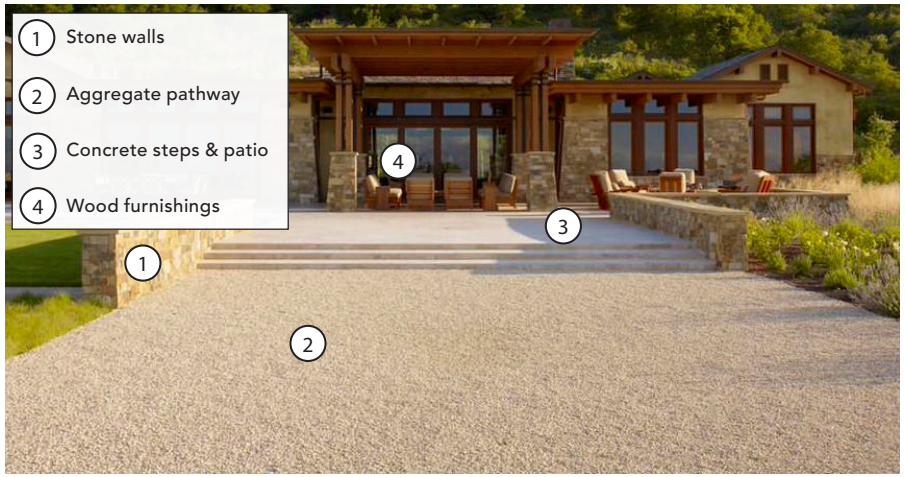
Hardscape Elements are key components to the character of a site. Due to the large separation between the parks along Lake Weatherford, repetition of these elements will strengthen the overall design and continuous feel of the Lake Weatherford Park and Park and Trail system. Hardscape elements may include:

- Paving
- Walls
- Boardwalks and Docks
- Pedestrian Bridges
- Site Furnishings
- Signage
- Lighting

These elements should reflect the over all contemporary/rustic style that fits within the larger context of the Weatherford park system, but also be specific to Lake Weatherford. The combination of these elements are key to designing a successful outdoor space, and establishing a character-defining feeling as you move from park to park.

This list of character-defining attributes will guide the selection of hardscape elements for the entire park:

- Clean lines
- Simple rectilinear or curvilinear forms
- No heavy ornamentation
- Re-purposed materials
- Exposed steel or metal
- Smooth finished concrete
- Finishes: stone, wood and steel
- Local aggregates and stone
- Subtle colors with a few accents




Simple retangular and curvilinear forms


Contemporary steel and wood site furnishing.


Identify where cars need to share the road.

Incorporate gabion baskets, steel and wood beams into signage.

Paving

Paving includes sidewalks, plazas, curbs, drives and parking areas.

Trails and Sidewalks: The standard paving for sidewalks shall be concrete. Accents such as pavers, integral color, special finishes and special scoring patterns should be used at significant intersections, trail junctions and splits. Patterns should be consistent throughout the entire length of a trail and convey a hierarchy of primary, secondary and tertiary entrances and trail connections to provide continuity throughout the park.

Plazas: Can be broken down into three different categories, to include: formal plaza, informal gathering spaces (such as trail heads and outside of minor buildings) and picnic areas. Formal plazas should primarily consist of impervious surfaces, such as concrete, mortared flagstone or pavers. If concrete is used, it should be enhanced with two or more of the following: pavers, special scoring patterns, special finishes or integral color. Informal gathering spaces can consist of concrete where enhancement with pavers, special scoring patterns, special finishes or integral color is optional or crushed stone. Picnic area surfacing should incorporate a mix of materials to include turf grasses, impervious paving and aggregate materials such as decomposed granite or small gravel. All materials should be durable and of a high quality to avoid cracking and damage. All material used should be low maintenance and easy to keep clean.

Curbs: Shall be concrete per the city's Standard. Use of stone, integral color or other special features may be used in certain areas where appropriate.

Drives and Parking areas: standard paving should be concrete per the city's standard. For smaller parking areas or parking that will not receive high use, and an alternate material is appropriate, aggregates and grass pavers can be considered if maintenance is low. Crosswalks in these areas should be enhanced with pavers, special scoring patterns, special finishes or integral color.


Concrete paving with special scoring and finish.


Combination of aggregate, pavers and concrete.


Concrete paving with pavers banding.


Integral colored concrete and curb.

Walls

Walls are a fundamental element of outdoor design. They define edges, create spaces and direct movement. Walls used at Lake Weatherford should adhere to the contemporary rustic style and complement the other hardscape elements.

Wall standards are as follows:

- Walls may be constructed out of concrete, CMU, gabion or stone.
- Wall finishes should be smooth concrete, stone or metal.
- Plants should be used to soften walls where appropriate.
- Walls should serve multiple functions when possible such as retaining earth, dividing a use, providing seating or directing the eye towards a view shed.
- Walls over 36 inches should only be used as necessary.
- Walls should be a minimum of 16 inches in height.
- Walls should coordinate with other Hardscape elements.

Retaining wall used to help define the space and create an edge between the maintained and unmaintained.

Terraced stone retaining walls also functioning as seating

Concrete walls should utilize a smooth or architectural finish.

Gabions can provide an inexpensive alternative to traditional retaining walls and create visual interest.

Boardwalks and Docks

Boardwalks and docks are found throughout the design of the Lake Weatherford Park & Trail Master Plan. They provide access to areas along and on the water otherwise not accessible by pedestrians and extend the usable space along the waters edge. Boardwalks and docks allow for a unique access to both the water and the natural systems that take place adjacent to or off land. Boardwalks and docks need to be constructed so that they provide a strong even surface that will hold up over time.

Boardwalk standards are as follows:

- Boardwalks and should adhere to the standard widths laid out for trails and be a minimum of 10 feet wide.
- Maintain the park theme of contemporary rustic appearance. Boardwalks may be composed of durable low maintenance wood, composite wood, and/or steel.
- Provide hand rails only at necessary locations.
- Adhere to ADA guidelines.

Docks standards are as follows:

- Docks and should be a minimum of 10' wide and no shorter than 15' in length.
- Maintain the park theme of contemporary rustic appearance. Docks may be composed of durable low maintenance wood, composite wood, and/or steel.
- Docks should not have handrails except where necessary.
- Space docks appropriately to allow for boat docking.

Boardwalk utilizing simple curvilinear layout and providing a variety of experiences for users.

Docks located in easily assessible areas and next to areas of vibrant activity.

Simple dock layout allowing for swimming and boat docking.

Pedestrian Bridges

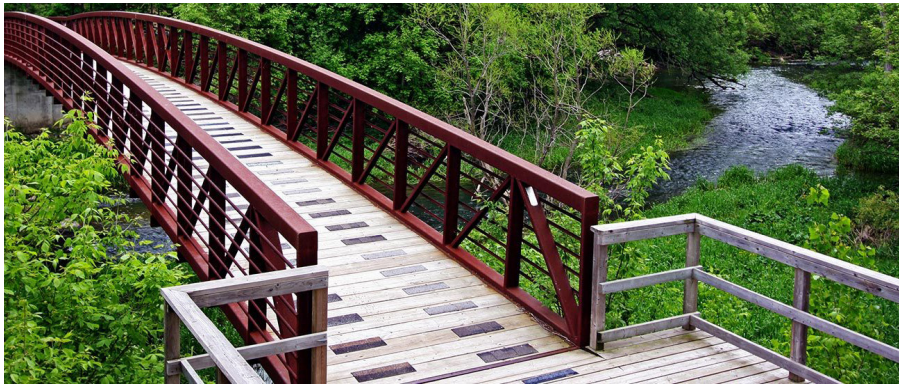
Pedestrian Bridges can serve as aesthetic elements and in addition to providing necessary functional use along trails systems.

Bridges should be used in areas that cross water elements such as creaks and where grade is too steep for paved trails.

Pedestrian bridge standards are as follows:

- Maintain the park theme of a contemporary rustic appearance.
- Bridges should be made of durable, mar resistant and low maintenance materials.
- Materials may include: concrete, wood and metal.
- Bridges should be pre-manufactured and set into place where feasible to reduce costs.
- Bridge widths should be as wide as the trail leading to it.
- Trails should not come into the bridge at an angle.
- Bridges need to adhere to ADA standards and should not exceed a 5% running slope or a 2% cross slope.

Pre-manufactured bridge that serves as a visual amenity and incorporates the elements of stone, steel, pavement.



Brides should have at least a 10 foot landing before they chance direction.

Site Furnishings

All site furnishings are intended to reflect a contemporary rustic style. They should reinforce the pedestrian scale, public safety, comfort, and should be carefully be considered in their look and location. Site Furnishings include: benches, tables, litter receptacles, bicycle racks, bollards and kiosks.

Benches: Outdoor seating can signal spaces to gather, points of interest or view sheds. They can be with or without backs and arm rests. They can have legs or be seat walls, steps, boulders or terraces. Benches should be coordinated with other site furnishings.

Locations - Potential locations for benches include gathering places, areas of interest, along trails, in plazas, at places with views or interpretive signage. When possible, benches should be located near lighting, trees and shelter. Lighting provides visibility at night, trees will give shade during the warm months and shelter will provide protection from rain.

Bench standards are as follows:

- Benches shall be well crafted to avoid cracking and sagging and be low maintenance.
- They shall be comfortable and made of non-abrasive materials.
- Seating heights shall be between 16 to 18 inches according to ADA standards with a minimum depth of 14 inches. Steps and ledges would be the exception and need only be the standard riser height.
- Seating may vary in length with a minimum of 28" feet.
- Seat walls, where one can sit on either side, should be a minimum of 28" wide.
- Benches should be anchored to hard surfaces or weigh enough not to be moved.
- Benches may be dedicated, but plaques should be consistent in both placement and look on all furnishings.
- Existing benches should be replaced as allowable.


Lounge seating for high traffic areas.


Limestone Lueders blocks used for informal seating and a as barrier between uses.


Wood and metal anti-skate bench.


Rustic timber and steel bench.

Tables and Chairs: Should be anchored or weighted down. Movable seating should only be used in high-use spaces that will generate a lot of foot traffic and be highly visible. This may include areas such as the Beach Front, near the large event plaza or at the driving range club house. Movable seating should be locked up at night as a security precaution.

Table Standards are as follows:

- Tables should be located in all park locations. One to two coordinating styles is recommended.
- As existing tables break down, they should be replaced by the same styles.
- Tables should be located in defined spaces, marked by paving treatments, landscaping or lighting.
- Tables should have surfacing beneath them other than grass that will allow for good drainage, paving or aggregates are recommended.

Product Recommendations: Streetlife & Forms+Surfaces - see images below for style guide.


Flexibility of seating space. Furnishings should include ADA access options.


Loose seating can be a dynamic addition to any space, but should be used conservatively in key areas.


Wood table top & benches with metal legs.


Tables with solid centers good for games or studying.

Section 3

Design Standards and Guidelines

Litter Receptacles: Help control and reduce litter. Litter receptacles provide a way to get rid of waste and should be conveniently located and easy to maintain.

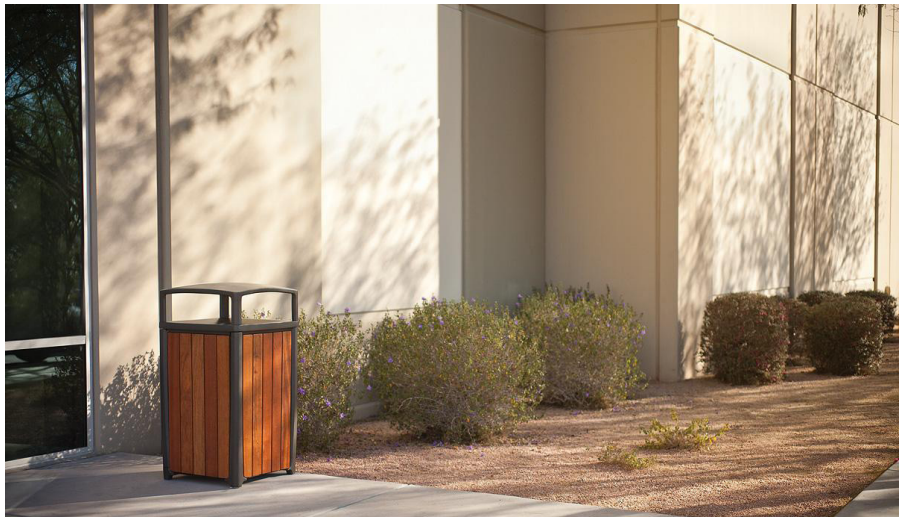
Location - Receptacles should primarily be convenient for people to use, however, access for emptying should also be considered. Good locations are where there are lots of people. Each park should have access to at least one litter receptacle.

Recycling receptacles should also be considered at select locations. Recycling receptacles offer an opportunity for education through additional interpretive signage.

Receptacle standards are as follows:

- Receptacles should be anchored to a hard surface such as concrete and be made of a durable material.
- They should be coordinated with other furniture for location and asthetics.
- Receptacles shall coordinate with other sitfurnishings
- Receptacles should have interior liners to contain waste. Bins should require pulling or lifting to discard waste to prevent critters from getting into cans.
- Bins should have an attractive high performance shell that resists vandalism and graffiti.
- As old receptacles are damaged and removed new ones consistent with these requirements should be installed to match.
- Bins should not block pedestrian pathways or access.
- Waste receptacles should be located near other site furnishings when possible.
- Receptacles should be added where there is a demonstrated need over time.
- Bins should have a capacity minimum of 30 gallons.

Product Recommendations: Landscape Forms & Forms+Surfaces - see images below for style guide.



Options with pull or lifting lids should be installed.

Recycling receptacle option.

Round waste receptacles.

Section 3

Design Standards and Guidelines

Bicycle Racks & Bollards: Should be permanently anchored or weighted down on pavement. In most instances, bollards should provide a visual deterrent rather than be a security rated embedded bollard. Some bike racks could function as bollards, examples of this can be seen in the images to the right.

Bike racks should provide secure parking for bicycles. They can be a stand alone element or clustered together.

Bike rack standards are as follows:

- Bike racks should always be located on a paved surface.
- They should be durable and mar resistant, minimizing maintenance.
- Bike racks should be located for ease of use and security. They should not block pedestrian routes, entrances or be intrusive.
- Placement of bike racks should allow for access to each bike.
- Bike racks should be placed near building entrances, next to high traffic areas, destination points and sheltered from weather when possible.

Bollards should separate the pedestrian areas from vehicles.

Bollard standards are as follows:

- Bollards should be durable and mar resistance, minimizing maintenance.
- Bollards can be a designed fixture or large boulders that reflect a contemporary rustic style.
- Bollards should be spaced a maximum of 5 ' from each other.
- Bollards should not be an obstacle to pedestrians or cyclists.
- Bollards can be permanent or removable to allow for multi-use spaces.
- Bollard locations should be coordinated with maintenance routes and emergency vehicle access.

Product Recommendations:
Landscape Forms: Stop Bollard & Emerson Bike Rack - see images for style guide.

Lighted bollards can provide low lighting for pedestrians and cyclist highlighting pathways.

Bollards can embedded or surface mounted and can be removeable.

Bicycle racks should be placed 3' off the back of curb if they are to function also as a visiaul sperator of vehicles and the pedestrian space.

Ease of access to bike racks and consistance rack spacing should be taken into consideration.

Section 3

Design Standards and Guidelines

Kiosks: are small stand alone structures used to host area information, mark key locations and advertisements in a public space.

Kiosk standards are as follows:

- The design of Kiosks should match the contemporary rustic style laid forth in this manual.
- Materials used to construct Kiosk should be durable, low maintenance and secure.
- Kiosk should be located in lighted areas or have lights to make them accessible at night.
- Kiosk should be located near main pedestrian use areas, out of the way of main pathways and routes.
- Information shared on the kiosks should be protected from the weather, vandal proof and have the ability to be locked up for security.
- Typical kiosks in parks contain information about trails, current locations within the larger park system, activities available and interpretive information about animals and the naturals systems encountered.
- Digital kiosk can be used in limited locations if a more interactive experience is wanted for children and other users.

Product Recommendations: Kiosks should be custom designed to match the architecture, signage and overall contemporary rustic design of other fixtures selected for the Lake Weatherford parks. - see images for style guide.

Kiosks should be off to the side of major trail heads and high traffic areas, accessible but not impede pedestrian or bicylce traffic.

Information on Kiosks should be coordinated and slightly altered per location to reflect the surrounding activities and natural systems.

Kiosks should be custom designed to match the other materials used within the Lake Weatherford park and trail system.

Section 3

Design Standards and Guidelines

Signage

Signage can have a large impact on a site's identity and branding. Because the Lake Weatherford Park system is spaced out and unattached, consistent signage will play an important role in identifying the individual parks as part of the larger Lake Weatherford System. Signs should be carefully designed and selected to be not only readable but interesting, attractive, and identifiers for the lake.

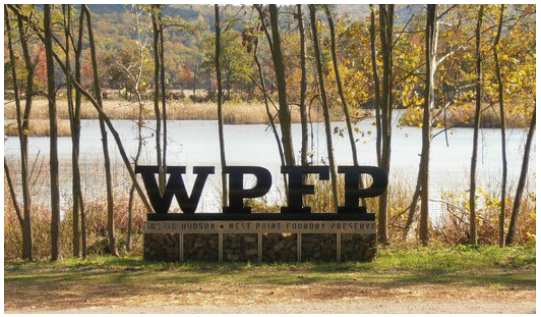
Different levels of signage:

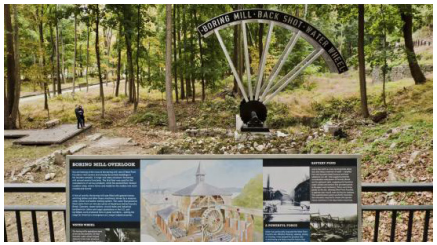
- Large Monument Sign: Should be used only in prime locations to notify vehicular traffic that it has entered the Lake Weatherford Parks area.
- Park Entry Sign: Should be used at the individual parks.
- Identifier Sign: Should be used within the individual parks or along trails to identify different areas or activities.
- Trail Head Sign: Should be used at the beginning of trails. There can be major and minor trail head signs to identify the major loop trail vs. smaller trails within parks.
- Trail Marker Sign: Should be small signs used along trails to indicate what trail pedestrians are traveling on and where on the trail they are located. They are typically quarter mile distances apart.
- Interpretive Sign: Should be used in locations where important natural systems are taking place.

Signage standards are as follows:

- All signs should be made of durable, vandal and weather resistant materials.
- All signage should be coordinated and made of similar materials.
- Signage should not inhibit travel along pedestrian, cyclist, vehicular or boat routes.
- As existing signage needs to be replaced, new signage should coordinate with this design manual.

Product Recommendations: See images for style guide.





All levels of signage should coordiante with each other and have a distinct style representing Lake Weatherford. The signs pictured above are not to be replicated, but serve as an example of cohesiveness.

Monument signage should be large and readable for drivers traveling at fast speeds.

Trail markers should be consistent and easy to locate and read. Slight variations may be used per trail.

Lighting

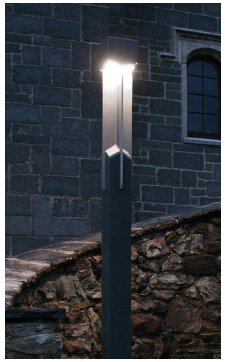
Lighting plays a crucial role in the comfort and security of a space. Going beyond streetlight and parking lot lighting, this also includes light at sidewalks, trail heads, boardwalks, building entrance, plazas and signage. Both the light fixture and pole can create visual characteristics that define a space at night and during the day. Illumination should be enough to provide security and support nighttime activities, but not hinder the night sky and natural systems that surround the lake or intrude into neighboring properties.

Lighting standards are as follows:

- Lighting should be made of durable materials and mar resistant.
- Illumination should not go past the horizontal line and should only be directed on the object and surfaces requiring illumination.
- Sign lighting should be downlit to prevent additional light pollution.
- Parking and Street light should not exceed 20' in height.
- Trail and pedestrian light should not exceed 12' in height.
- All lighting should adhere to city standards.
- Lighting should be evenly distributed along drives and pathways to create a rhythm and even spread of illumination.
- Lighting should be designed to reduce glare and unnecessary reflections.
- Only yellow and amber light temperatures should be used to lessen environmental impacts.

Product Recommendations: Landscape Forms, ERCO, Ashbery fixture, Forms+Surfaces, Knight Pedestrain Lighting fixture - See images for style guide.

A contemporary lantern style light fixture for active areas and along the main looped trail.



A simple fixture should be used in more passive recreational areas to blend into the natural setting.

Existing Light Fixture at Heritage Park in Weatherford.

Planting Elements

Planting elements play an important role in softening and highlighting public spaces. Studies will show that as areas are maintained and enhanced, they are shown more respect and enjoyed. Planting designs within the Lake Weatherford parks system should be used to highlight key areas, enhance open space and bolster the existing natural systems taking place around the lake. A consistent palette of plants should be used around the lake to help link the parks together just like the site furnishings and should reflect a contemporary rustic style. Plant materials should be durable, low maintenance and consist of native and near native plants.

Planting elements include:

- Trees
- Shrubs
- Perennials
- Grasses
- Groundcovers
- Turf

Trees: play an important role in parks throughout Texas. The average high for the City of Weatherford in the summer is 93 degrees. Trees help mitigate that heat by creating shade and through evapotransporation. A healthy amount of tree coverage should be maintained throughout the park system. Only in areas where prairie restoration is desired or open lawns for recreation should they be limited. Trees should be maintained around the banks of the lake to help with erosion. Newly planted trees should be consistent with the native species found in and around Weatherford. The only exception is if a specimen tree is desired to highlight a view shed or alley way, these tree should still be low maintenance and water wise.

Turf and Grasses: Turf should be low maintenance and low water. Irrigated turf should only be in areas where it will be maintained and should be used sparingly. Artificial turf may be considered for select lawn areas that will receive a hight foot traffic or within the dog park.

Wildflowers will encourage the existing natural systems around the lake including animals and the filtering of stormwater. They are low maintenance and drought tolerant.

Ormental grasses provide a sense of movement along trails and highlight important intersections.

Section 3

Design Standards and Guidelines

Plant Recommendations: See pages 38-43 see images for style guide.

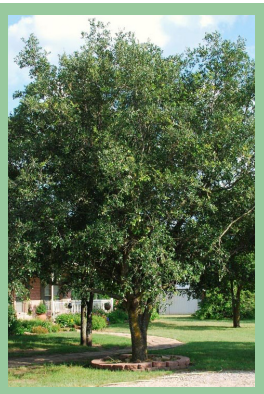
Ornamental grasses and agaves create a unique low water palate.

Longer grasses like Buffalo (pictured above) can be used in areas where a manicured look will not be needed or low pedestrian traffic is expected. Traditional turf grasses, like Bermuda & St. Augustine are more appropriate for event lawns and areas where increased foot traffic will occur.

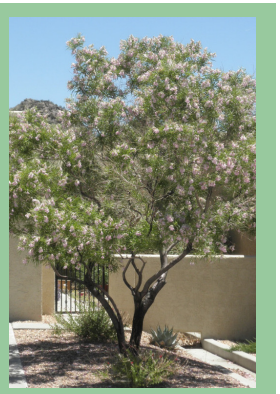
Section 3

Design Standards and Guidelines

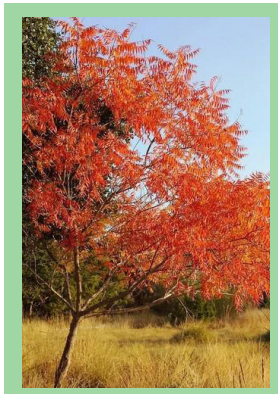
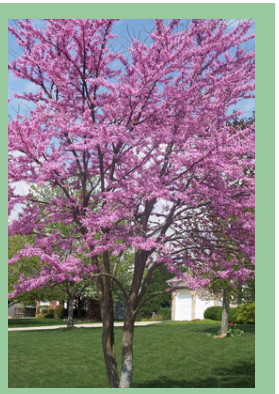
Canopy Trees:

				
Common Name	Shumard Oak	Live Oak	Cedar Elm	Bigtooth Maple
Botanical Name	*Quercus shumardii*	*Quercus virginiana*	*Ulmus crassifolia*	*Acer grandidentatum*
Install Sizes	3" cal 11'T x 6'W, 65 gal	3" cal 11'T x 6'W, 65 gal	3" cal 11'T x 6'W, 65 gal	3" cal 11'T x 6'W, 65 gal
Mature Sizes	80'T x 80'W	50'T x 60'W	80'T x 60'W	50'T x 40'W
Accent Color	Fall foliage	No accent color	Fall foliage	Fall foliage
Remarks	Does well in heavy clay soils and lime-stone.	Tolerant of poor conditions; moderate growth rate; prefers well - drained soil with medium moisture.	Drought tolerant; grow in dry limestone soils; handles reflected heat from pavement.	Drought tolerant; high heat tolerance; alkaline adaptable; prefers sun.

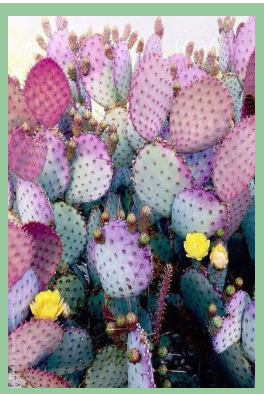
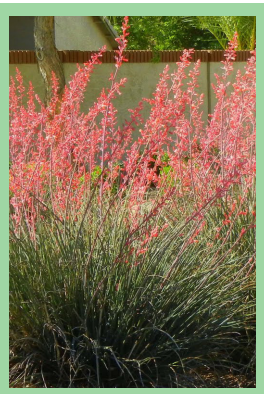
Accent and Evergreen Trees:

					
Common Name	Mesquite	Possumhaw Holly	Wax Myrtle	Blue Point Juniper	Desert Willow
Botanical Name	*Prosopis glandulosa*	*Ilex decidua*	*Myrica cerifera*	*Juniperus chinensis 'Blue Point'*	*Chilopsis linearis*
Install Sizes	5'T x 3'W; 30 gal	7'T x 5'W; 65 gal	9'T x 5'W; 65 gal	4'T x 2'W; 15 gal	3" cal 12' T x 5'W 60 gal
Mature Sizes	30'T x 30'W	20'T x 15'W	15'T x 10'W	8'T x 4'W	25'T x 15'W
Accent Color	No accent color	Red winter berries	No accent color	Soft blue foliage	Summer flowers
Remarks	Highly drought resistant; use in dry place with poor soil or limestone; may exceed 30' in special conditions.	Drought tolerant; grows in any soil; female has red berries all winter.	Drought tolerant; grows in any soil; moderately fast growing.	Medium - sized pyramidal tree that prefers full sun.	Drought tolerant; no known pests of major concern.

Accent and Evergreen Trees:

		
Common Name	Flame Leaf Sumac	Red bud
Botanical Name	*Rhus lanceolata*	*Cercis canadensis*
Install Sizes	6'T x 5'W; 30 gal	3" cal 9'T x 7'W; 65 gal
Mature Sizes	20'T x 15'W	35'T x 45'W
Accent Color	Fall foliage	Spring flowers
Remarks	Drought tolerant; must have open; sunny well-drained sites for best growth; best in mass plantings.	Drought resistant; will grow on limestone.

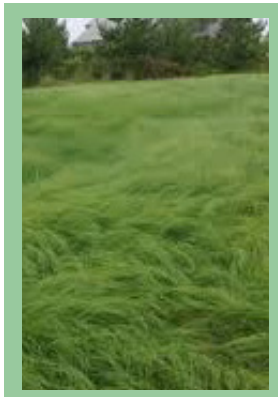
Shrubs:

					
Common Name	Soft Leaf Yucca	Prickly Pear	Red Yucca	Texas Sage	Spanish Dagger Yucca
Botanical Name	*Yucca recurvifolia*	*Opuntia violacea*	*Hesperaloe parviflora*	*Leucophyllum frutescens*	*Yucca ali*
Install Sizes	30”T x 30”W; 7 gal	10”T x 10”W; 3 gal	15” - 18”T x 12”-15”W; 3 gal	18”T -24”T x 15”-18”W; 5 gal	18”T -24”T x 15”-18”W; 5 gal
Mature Sizes	3’T x 3’W	6’T x 8’W	4’T x 4’W	7’T x 7’W	7’T x 7’W
Accent Color	Summer flowers	Late spring flowers	Summer flowers	Summer flowers	Summer flowers
Remarks	Tough plant; will grow almost anywhere.	Drought tolerant; requires well-drained soil.	Drought tolerant; use in any soil; can handle neglect.	Drought resistant; takes intense and reflected light.	Drought resistant; takes intense and reflected light.

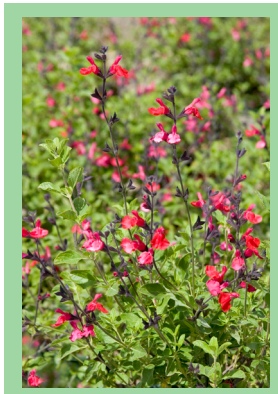
Section 3

Design Standards and Guidelines

Grasses:

					
Common Name	Weeping Love Grass	Native Sun Turfgrass Seed Mix	Blue Grama	Pink Muhly Grass	Lindheimer's Muhly
Botanical Name	*Eragrostis curvula*		*Bouteloua gracilis*	*Muhlenbergia capillaris*	*Muhlenbergia lindheimeri*
Install Sizes	4"pot, 1 gal, or 3 gal	Seed	4" pot or 1 gal	1 gal or 3 gal	1 gal or 3 gal
Mature Sizes	2' Tall (foliage)	5"-8" Tall	1' tall	4' T x 4'W	4'T x 4'W
Accent Color	No accent color	No accent color	Midsummer flowers	Late summer flowers	Summer through fall blooms
Remarks	Shimmers in wind; prefers well-drained soil and full to part sun; mow in late winter.	Drought resistant; blue-green foliage; prefers well-drained loam, clay, caliche, or limestone.	Drought tolerant; prefers well-drained soil.	Fast and easy growing; prefers well-drained soils.	Drought tolerant; prefers well-drained soil.

Perennial Plants:

			
Common Name	Autumn Sage	Gayfeather	Santolina
Botanical Name	*Salvia greggii*	*Liatris spicata*	*Santolina chamaecyparissus*
Install Sizes	12”T x 12”W; 3 gal	15”T x 7”W; 1gal	6”-8”T x 6”=8” W; 1 gal
Mature Sizes	3’T x 3’W	2’T x 1’W	2’T x 2’W
Accent Color	Summer through fall flowers	Summer flowers	Summer flowers
Remarks	Drought tolerant; requires well-drained soil. Attracts pollinators, fast growing perennial.	Mildly drought tolerant; requires well-drained soil. Attracts pollinators.	Drought resistant; takes intense and re-flected light; does best in well-drained, sandy, infertile soil.

Section 4

Additional Guidelines

Section 4

Additional Guidelines

IMPLEMENTATION

The build-out of the Lake Weatherford Master Plan will be phased over the course of several years and it is recommended that master specifications and guidelines be used to ensure a consistent quality of construction is carried throughout the implementation of the parks and trails. Master specifications should be developed with the construction documents of the first park that is selected for build-out. Guidelines can be found on the following pages.

Sustainable Site Design:

Sustainable site design looks to align land development and management with advanced and original sustainable design solutions. For the parks, sustainable design element will include:

- Waste management
- Water conservation
- Stormwater management
- Material selection
- Dark skies & lighting

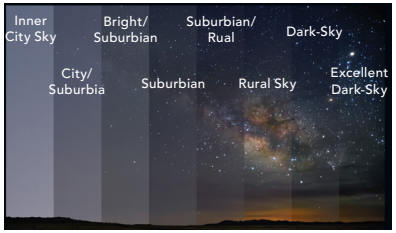
Waste management: Reducing waste during construction should be a primary goal, involving both the contractor and designer, maximizing the use of renewable resources and recycled materials. Buildings should also be designed to encourage recycling and waste reduction.

Water Conservation: Building fixtures, planting design and irrigation systems should be designed to minimize water use. Rainwater collection systems, storage and the use of grey water systems are additional alternatives to consider if they pair well with the location suggested on Lake Weatherford. Lake health and safety should be the primary concern.

Stormwater management: Should be carefully handled throughout the design and construction of each park. Increasing impervious surfaces around the lake increases the speed at which water moves leading to erosion and increase pollution as water collects trash and debris along the way. Bioswales, pervious paving and raingardens should all be used to help mitigate these responses to site development. Working with the existing topography is another key element of best practices for stormwater management.

Material Selection: Materials and products, when possible, should be renewable, non-toxic and locally produced, this includes furnishing, plants and other building materials. Products that require less energy and resources should be used as appropriate.

Native plants have extensive root systems that help them filter rainwater, withstand drought and erosion.

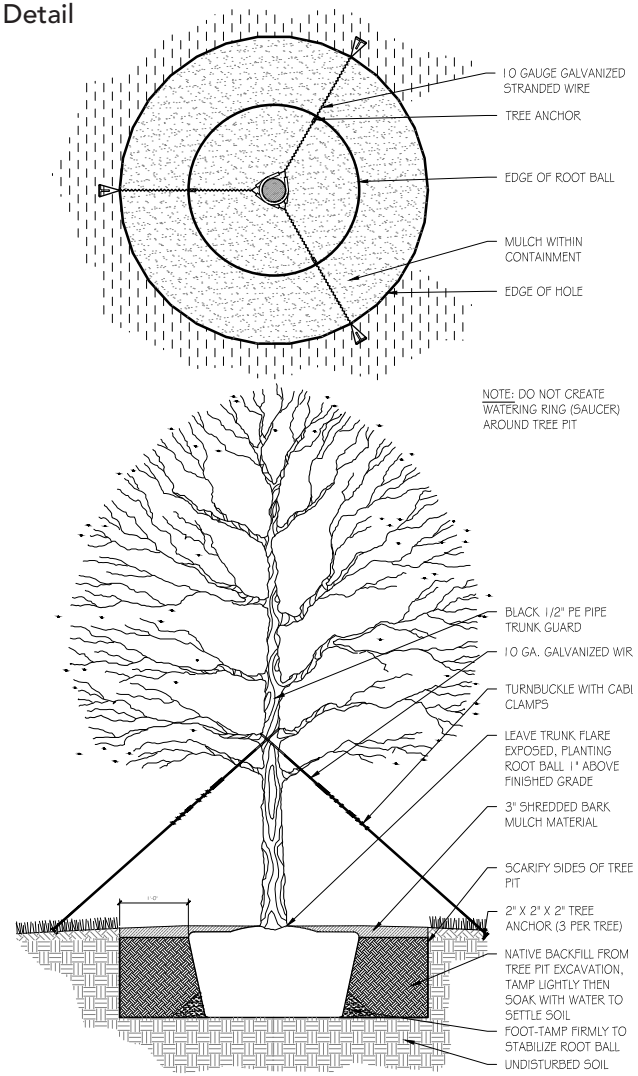


Dark skies & lighting: Lighting should be designed to minimize excess light and spread that goes past the surfaces and areas to be illuminated. Light color should be selected in order to provide the lowest impact on surrounding natural systems.

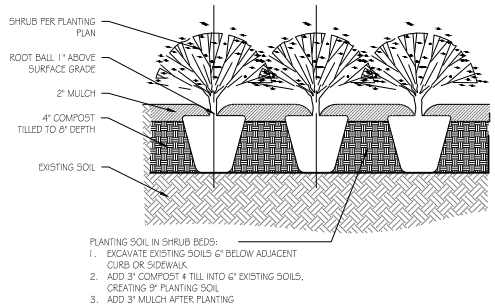
Section 4

Additional Guidelines

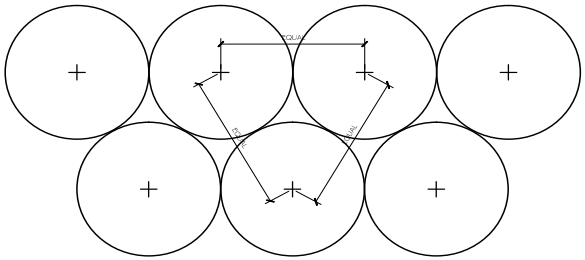
Tree Planting Detail



Shrub and Grass Planting Details



Spacing Plan



Section 4

Additional Guidelines

CONTRACTOR SELECTION, CONSTRUCTION MAINTENANCE

Contractor Pre-Qualification Selection Process

In order to obtain the highest quality landscape/irrigation contractor, a pre-qualification selection process is recommended. The process is as follows:

Potential contractors should respond by submitting a qualification package with a sealed price proposal. Evaluation criteria should include projects of similar size and scope, means to provide satisfactory insurance and bonding, financial stability, staffing and equipment resources. Each qualification package will then be rated using a scoring system. All candidates that do not score above the minimum acceptable number should have their price bids returned, unopened.

Contractors that have surpassed the minimum acceptable score on the qualifications package should have his/her price proposal opened. The project should then be secured by the most qualified bidder with the lowest price.

Construction

Existing Soils

Reuse surface soil, stockpiled on-site from mass grading. Clean surface soil of roots, plants, sod, stones, clay lumps and other extraneous materials harmful to plant growth.

In areas scheduled for plant materials surface soil should be amended by placing a 4" layer of well composted, stable, organic matter over existing bare soil. Thoroughly till to a total mixed depth of 12". The compost material used should have, a pH range of 5.5-8.0, a moisture content between 35% to 55% by weight, all particles passing through 1/2" sieve; soluble salt content of 5 to 10 decisiemens/m. It should be high in organic matter free from viable weed or plant seeds that meets Federal and Texas Natural Resources Conservation and Commission health and safety regulations.

Mow Curbs

12" wide x 6" deep reinforced concrete mow curbs should be used to separate all planted ares from turf areas. Mow curbs shall be contiguous with adjacent segments and have a true radii. To ease maintenance with large equipment, minimum radius of 100' is recommended.

Irrigation

Water Source

Potable water should be used throughout the system in which the landscape improvement area is located. After the conceptual design, the city water department should be contacted and a meter, of the appropriate size for that area, requested by the irrigation consultant. The water used within a 10 hour water window should determine the meter size.

To ensure that the meter can be accessed by meter readers, it should be located and installed by city personnel within the frontage road right-of-way. The contractor will be responsible for taking the water line from the placed meter to the improved landscape areas. The coordination of the water supply should happen early in the process, initiated by the consultant, to avoid project delay. Coordination with the city will be required to resolve any issues that may arise with installation costs.

Power Source

The irrigation controller can be connected to the same circuit as the site lighting for power service. If a service connection owned by city is not available, the local electric service provider can be contacted, by the consultant, and an electric meter and service to the controller location arranged.

Section 4

Additional Guidelines

Areas for Treatment
The irrigation system is intended to insure that the plant materials invested in will survive establishment and severe drought periods. The Irrigation for specific plant types should be as follows:

Trees, Shrubs, Ornamental Grasses, and Groundcovers in planter beds: Subsurface irrigation with inline emitter drip tubing should used to help conserve water and to conform with city design standards. Drip tubing should be installed and staked with tubing running perpendicular to the slope. The tubing should be located between the plant material rows and tubing should be installed in parallel runs. The tubing should be located between the mulch layer and the prepared soil. When trees are located in planter bed areas drip tubing should be adjusted to provide a ring around the tree for irrigation. Bubblers should not be used for tree irrigation in planter beds.

Trees: Bubblers should be utilized to irrigate both canopy and ornamental trees when located outside of a planter bed. Bubblers should be installed on a spray head body. A minimum of two bubblers should be installed per tree. Bubblers are to be located on the uphill side of the tree.

Turf Grasses and Native Grass Seed Mixes: Turf Grasses and Native Grass Seed Mixes should be permanently watered with overhead irrigation in key areas of the site. All other areas will typically not be permanently irrigated. These areas should be temporarily watered until established.

Landscape Maintenance

Turf Establishment and Maintenance
For all turf re-establishment one of the following two methods should be employed. All new turf should be planted on recently applied topsoil and begin with step 4 below. Turf re-established should go in locations where existing vegetation has become weedy and should begin with step 1.

Step 1 - Weed Control
In areas intended for turf establishment, a non-selective herbicide should be applied, at the manufacturer's recommended rates, in mid winter over all existing undesirable vegetation. Vegetation including native plants, weeds, wildflowers, etc. should be treated. The treatment must be timed to allow for 36 hours free of precipitation after an application.

Two to three calendar weeks after the initial application, an additional, follow-up treatment is required to kill any remaining vegetation.

Non-selective herbicides, such as 'Round-Up' , should be used with extreme caution. They should be applied when stands of existing plants are 100% dormant to avoid damage. It is recommended that a lower than standard dose is used. The manufacturer should be contacted for specific application needs.

Performance Spec: No more than 20 green plants should be visible in an acre for the post emergent weed control to be complete.

Step 2 - 1" Mowing
Mow all areas to a height of approximately 1" in mid-spring.

Performance Spec: Prior to re-seeding, any areas of dead vegetation killed by the weed control operations, everything should be mowed to a 1" height. Existing dead grasses (if any) should be mowed to a low enough height to view any holes, depressions, ruts, runnels, bare spots, etc.

Step 3 - Reducing Erosion
After the 1" mowing runnels, holes, depressions, and other defects caused by equipment, vehicles or erosion should be repaired. Level these areas then lighting roll with the wheels of small equipment, rollers or hand tampers, resulting in a lightly packed soil. After this, the soil shall then be raked to loosen the top 1" of soil following the compaction process. The

contractor should reuse displaced soil that has been eroded to repair areas of runnels, holes, and ruts. Otherwise, the contractor is to use 'topsoil'.

In areas of repair, where the slope exceeds 3:1, the contractor shall install the soil, then apply Class 1 retention blanket as defined by TxDOT.

Performance Spec: Once pervious areas are free from holes, runnels and defects of no deeper than 2", topsoil is added, and retention blankets are installed erosion reducing measures are complete.

Step 4 - Organic Soil Amendments
For topsoil, reuse surface soil stockpiled on-site. Clean surface soil roots, plants, sod, stones, clay lumps and other extraneous materials harmful to plant growth.

Use compost, Ph range of 5.5 - 8, 100 percent particles passing through a 1/2" sieve, 35% -55% moisture content and high in organic matter.

To evenly distribute the mulch, a blower truck will be needed for the compost mulching operations.

Compost mulch should be blown over all areas to be seeded to a consistent depth of 3/4", equal to a rate of 100 cubic yards per acre, till into existing soil 6". A mixture of fertilizer and/or water should accompany the operation for dust abatement purposes.

Slow-release fertilizer, granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the follow composition: 20 percent nitrogen, 10 percent phosphorous and 10 percent potassium by weight, can be mixed with the mulch and /or water in the blower truck for dust abatement and even dispersal.

Step 5 - Native Seed Mix
Moisten prepared turf areas before planting if soil is dry.

Following the mulching application, seed can be mechanically or manually broadcast over the mulch. Native seed is to be dispersed at a minimum rate as recommended by the manufacturer to provide the thickness of lawn.

Performance Spec: Seeding and mulching applications are complete when;

All areas have been covered with required mulch, seed and fertilizer.

Grass stems are actively growing in all permeable areas that are not designated 'planting beds'. Any area 3 square feet or larger that is bare of actively growing native seed stems at the time of first mowing shall be designated for 'Touch-up Hydro-mulch'.

Step 6 - Temporary Watering
Temporary watering should be used for all native seed areas. Water should be potable.

For at least the first four weeks, temporary water should be provided following seeding. Seeded areas should be watered to the point that the mulch is kept moist enough to allow for germination and the start of growth for the turf seed. Natural precipitation is expected to play some part in keeping the mulch moist. Per week, temporary water is forecasted at a rate of 25,000 gallons per acre. Water should be dispersed in a way that does not create run-off and erosion. It is anticipated that temporary watering should continue from the date of seeding through 6 calendar weeks following the first sign of native seed germination, if environmental conditions require, it may need to continue longer.

Performance Spec: Once applications have been finished and the 6 calendars weeks following native seed germination are complete,

temporary watering is concluded.

Step 7 - Introductory Mowing
Mowing should begin only to maintain the desired height without cutting more than 1/3 of the grass height. The first mowing should occur when the turf has reached an average height of 6". Turf should be cut to a finished height of 4" during the first mowing only.

If excessive precipitation does not allow mowing equipment to maintain the site without damage, mowing should be postponed.

Performance Spec: First mowing is complete when all turf areas are demonstrated to be at an average height of 4"

Step 8- Touch-up hydro-mulch

Following the first mowing, the contractor should apply the hydro-mulch and seed mix to those areas 3 square feet and larger without actively growing native seed.

During late summer, if satisfactory coverage, as defined in step 5, is not meet, the contractor should apply the hydro-mulch mix to these areas again.

Performance Spec: Touch-up hydro-mulch should be considered complete when a healthy, uniform, close stand of native seed has been established, free of weeds and surface irregularities with coverage exceeding 90 percent over any 10 sq. ft. areas and bare sports do not exceed 5 inches by 5 inches in an area that has been mowed at least twice.

General Turf Maintenance
Mowing
Mowing should only occur when site conditions allow for the maintenance to be performed without causing damage from the equipment or turf due to wet soils.

Turf should be cut when the average blade height exceeds 8". If less maintenance is required, once in the Spring and once in the Fall. Finish cut height should be 4".

Performance Spec: When all turf areas are at an average height of 4", the first mowing is complete.

Fertilization
Fertilization of native seed is typically not recommended. However, if it is needed the type of fertilizer and the rate of application should be as indicated by the native seed manufacturer.

Spring and Fall fertilizer application should consist of the following:

- Spring fertilization should take place after grass has greened up indicating the grass is going and can accept the fertilizer.
- Fall fertilization should take place prior to October 1st.

Performance Spec: Fertilization is complete when labeled materials have been mixed and shown to the Owner's Representative, then dispersed onto the site at designated rates.

Satisfactory Turf and Seed Mixes
Satisfactory Turf: Full rooted, evenly colored sod without visible sod joints that has been mowed at least twice.
In early summer, holes, depressions, runnels and other defects caused by erosion, maintenance equipment and vehicles should be repaired by the contractor. Effected areas should refer to step 3 for readjustment of the soil.

Section 4

Additional Guidelines

Use specified materials to re-establish lawns that do not comply with requirements and continue maintenance until lawns are satisfactory, free of erosion, ruts, holes and runnels more than 2 inches.

Pre-emergent Weed Control
Pre-emergent should be applied prior to March 1 and September 1 before weed germination begins and per the manufacturer's recommendations.

A significant amount of water may be needed to activate the chemicals and the application must be timed properly, approximately within 10 days of a projected rainfall event, or per the manufacturers recommendations.

Only apply a per-emergent in areas with thick, healthy stands of native seed.

Performance Spec: Once labeled chemicals are approved by the Owner's Rep and spread over all established turf areas, the pre-emergent weed control is complete.

Weed Control
Only green, weedy, growing vegetation needs to be treated within the native seed areas, refer to step 1. Approximately three calendar weeks after the first treatment, a second, follow-up treatment is required to kill any remaining weedy vegetation.

Non-selective herbicides should be labeled for use in buffalograss lawn (if buffalograss is in the seed mix) and the label checked for any potential problems. Post-emergent herbicides should be applied between late May to early June and late October to early November. Contact manufacturer for specific application needs.

Performance Spec: When there are no more than 20 green plants visible in any acre the post-emergent weed control is complete.

Summer Application: Apply a liquid, broad-leaf herbicide labeled for use in a buffalograss lawns at manufacturer's recommended rates, in early summer when the weather is not too hot or dry. A second follow-up treatment is recommended to get rid of any remaining weedy vegetation roughly three calendar weeks after the first treatment.

Performance Spec: When there are not more than 20 broad-leaf plants visible in any acre up to 4 weeks after the last application, weed control is complete.

Planting Area Weed Control
Bi-weekly, manual weed eradication should be conducted during the first year after all beds are planted. Following the initial year, it is acceptable to reduce the weeding to monthly.

Chemicals may be used in clear zone areas, with care.

In years one to three, a pre-emergent may be applied with the mulching to reduce weed growth, until planting has reached full coverage.

Ground Covers, Perennials, Shrubs, Ornamental Grasses
Establishment

Watering
At planting, all newly planted areas should be well watered at the time of planting to eliminate large air pockets allowing the plants to settle firmly in place. Twice a week waterings should take place there after, as the climate and conditions on site dictate. If the plant's leaves show signs of dryness, the plant should be watered more frequently.

More and less water may be required as plants are exposed to extremely hot weather, winds or full sun.

Section 4

Additional Guidelines

Newly planted trees and plants should be set plumb and in the center of pit or trench with top of root ball 1 inch above adjacent finish grades, according to ANSI Z60.1.

Apply 3-inches average thickness of organic mulch. Do not place mulch within 3 inches of trunks or stems.

Pruning
During the first two growing seasons after planting, remove only dead, dying or broken branches. Do not prune for shape. When pruning is necessary, do so in accordance with the following steps. Determine the branches that should remain as major limbs. Branches attached to the trunk at wide angles and that are smaller in diameter than the trunk should be selected. When the branch and trunk form a angle of less than 35 degrees, weak crotches are formed.

General Maintenance
Watering
For watering trees, moisture should penetrate the soil to a minimum depth of 10 to 12 inches and wet the area outside of the drip-line where roots to absorb the water exist.

The soil should be checked periodically to monitor moisture in the root zone, and determine how often watering is required.

Pruning
During the first two growing seasons after planting, remove only dead, dying or broken branches. Do not prune for shape. Young trees should only be pruned to effectively train and direct growth, and to correct any structural defects.

Prune trees with broken, crossing, dead or diseased limbs to improve their appearance, health and eliminate hazards. Remove branches to allow for a vertical space between major branches of at least 8 inches, preferable 18 inches. To open up a mature tree remove limbs 1 to 2 inches in diameter. Remove smaller limbs on ornamental trees.

Sharp tools should always be used to avoid ragged cuts. To prevent the transmission of disease, cutters should be sanitized after pruning a tree with disease symptoms. Chemicals in tree paints can inhibit wound sealing and should not be used.

Topping, heading, stubbing or dehorning should not be applied to any tree.

Pruning Evergreen Trees
Broad-leaf trees should only be pruned lightly if at all. Cuts should happen just above a side branch and just after flowering.

Narrow-leaf trees should be pruned as needed according to their growth characteristics.

Scale-like leaf trees. Plants are such as juniper and arborvitae may be pruned at any time when the wood is not frozen. Prune the tree to an upward growing branch or bud to hide the cuts.

Timing of Pruning
Pruning in late summer should be avoided.

The best time to prune most deciduous trees and shrubs is late winter or early spring. This is when wounds close fastest and limb placement and tree form can be seen easiest in deciduous trees. Elms and other trees known as “bleeders” do best pruned in late summer or fall.

Trees and shrubs that flower early spring, such as Redbuds, should be pruned directly after flowering. Trees and shrubs flowering after the end of

Section 4

Additional Guidelines

June should be pruned in the winter or early spring. Pruning, if required, should be timed to enhance or reduce flowering and fruit production.

Evergreen Trees and Shrubs. Broad-leaf evergreens should be pruned similarly to deciduous. The flowering time and natural shape should be considered. Upper branches should be thinned to allow for sunlight to penetrate the entire canopy, allowing the lower canopy to be wider than the top.

Fertilization

Time of Application

Fertilizer should be applied in the spring for evergreen trees and shrubs. Deciduous trees and shrubs should have fertilizer added in the late fall or early spring. Fall applications should not take place until dormancy has begun. Every two to three years, nitrogen should be applied, phosphorous and potassium every 5 years.

Rate of Application

Fertilizer should be applied at a rate of 2 to 4 pounds of active ingredient per inch of tree diameter at breast height. Apply half this amount for trees less than 6 inches in diameter.

Trash Pick-Up

Once a month, trash pick up should be completed.

Routine Irrigation Maintenance

Irrigation Field Cycles

Run each cycle on the system one time per month. Any broken, damaged or malfunctioning components shall be replaced with like parts.

As a general rule, apply 1" of irrigation every 14 days: June-September.

Apply 1" of irrigation every 21 days: October- May.

The central control system will monitor conditions to assist in determining water requirements. Different zones will require varying amounts of irrigation, and the system shall be adjusted accordingly.