

# ONION CREEK METRO PARK DISTRICT

## Operations and Maintenance Plan

Version 1.0



Prepared for:  
THE ONION CREEK METRO PARK  
DISTRICT BOARD OF DIRECTORS

May 2019



# ACKNOWLEDGMENTS

The Onion Creek Metro Park District Operations and Maintenance Plan was developed in coordination between the District Board of Directors, the Landscape Committee and Lionheart Places. A special thanks goes to all parties involved for their insight and support throughout the creation of this plan. The following individuals are recognized for their significant contributions to the preparation of the Onion Creek Metro Park Operations and Maintenance Plan.

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# 1.0 INTRODUCTION

## PURPOSE

The purpose of this document is to provide a high-level description of the operations and maintenance needs of the Onion Creek Metro Park District (the District) and to outline a comprehensive approach to operations and maintenance throughout the District's life. It is intended to be a tool used by the District Board of Directors to make informed decisions for the existing and future improvements contained within the District's boundaries and to set a baseline of recommended operations and maintenance activities and estimated costs. The recommendation in Chapter 2 are an agreed upon minimum amount of maintenance and should be shared with contractors and professional consultants that the District hires.

## LOCATION

The District is located in southeast Austin approximately 8 miles from Downtown. Its boundary includes the publicly accessible improved areas within the Austin Goodnight Ranch (Goodnight Ranch) Development and is just south the Onion Creek Metropolitan Park (OCMP).

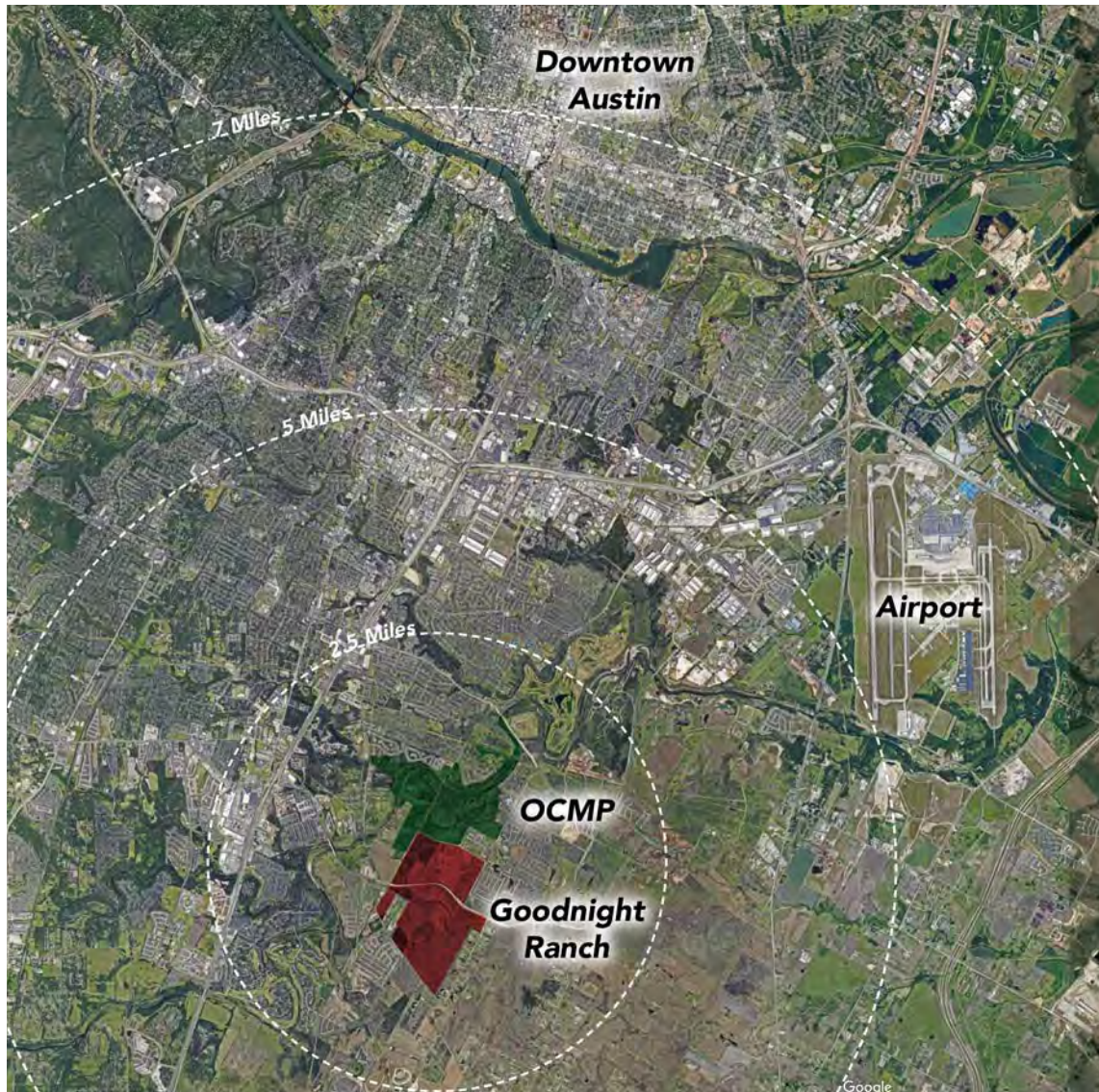


Figure 1.1: Location Map

## ONION CREEK METROPOLITAN PARK

In the late 1990's, the City of Austin purchased the land for the OCMP. Straddling 2.5 miles of Onion Creek and with 555 acres of space, it became one of the largest city owned parks. In February 2014 the Austin Parks Foundation, in collaboration with the City, kicked-off the planning process to identify a vision (framework and goals) and master plan (potential programs, layouts and character) for the park. The *Onion Creek Metropolitan Park Master Plan Report* was completed in the summer of 2015.



Figure 1.2: OCMP Master Plan

Source: Onion Creek Metropolitan Park Master Plan, 2015; Austin Park's Foundation

## GOODNIGHT RANCH

Goodnight Ranch is a 700-acre master planned community located directly south of the OCMP. This land is what makes up the District. Originally farm and ranch land, the development team for this project is working to transform the space into a vibrant mixed-use environment with 3,500 homes, a Town Center and 120 acres of green space. The master plan for this development will have 3 miles of trails that will connect to the OCMP trail network.

The *Consent Agreement* for the District was created in 2014 and is further described later in this chapter.



Figure 1.3: Goodnight Ranch Master Plan

Source: Benchmark

## DISTRICT HISTORY

While the City purchased the land for the OCMP in the late 1990's, due to the lack of available resources much of the park was still undeveloped 15 years later. To help fund capital improvements and operations and maintenance costs, S.B. 1872 was created in 2013. This bill established a special taxing district that would ensure a steady stream of maintenance revenue to be used towards both parkland within the District and OCMP.

## CONSENT AGREEMENT







The Consent Agreement is an arrangement between the City of Austin, Onion Creek Metro Park District and Austin Goodnight Ranch LP. It outlines the basic parameters for each party and how to govern the District.

Figure 1.4 District Maintenance Responsibilities Map illustrates the different entities (described below) responsible for maintenance within the OCMP and Goodnight Ranch boundaries.

- **District Maintenance:** This is the area that the District shall be responsible for maintaining.
- **Goodnight Ranch HOA Maintenance:** This area includes the amenity center within the development and shall be maintained by the homeowners association.
- **AISD Maintenance:** This area includes Blazier Elementary and Middle Schools and a future high school site. These shall be maintained by Austin Independent School District.
- **COA Maintenance:** This area is north of Onion Creek and is currently being maintained by the City of Austin.
- **FEMA Buy Out Area:** After the floods in 2013, FEMA provided funds to help remove homes from the floodplain. This area will be converted to parkland and maintained by the City.

The recommendations contained within this document only apply to the area identified as the *District Maintenance Boundary*. This map may evolve over time, if the map contained within this document differs from the District's Consent Agreement, the map shown in the Consent Agreement shall take precedence.

### LEGEND

|                                                                                     |                                                |
|-------------------------------------------------------------------------------------|------------------------------------------------|
|  | District Maintenance Boundary                  |
|  | Goodnight Ranch HOA Maintenance Boundary       |
|  | AISD Maintenance Boundary                      |
|  | COA Maintenance Boundary                       |
|  | FEMA Buy Out Area                              |
|  | No Service within District (Private Ownership) |

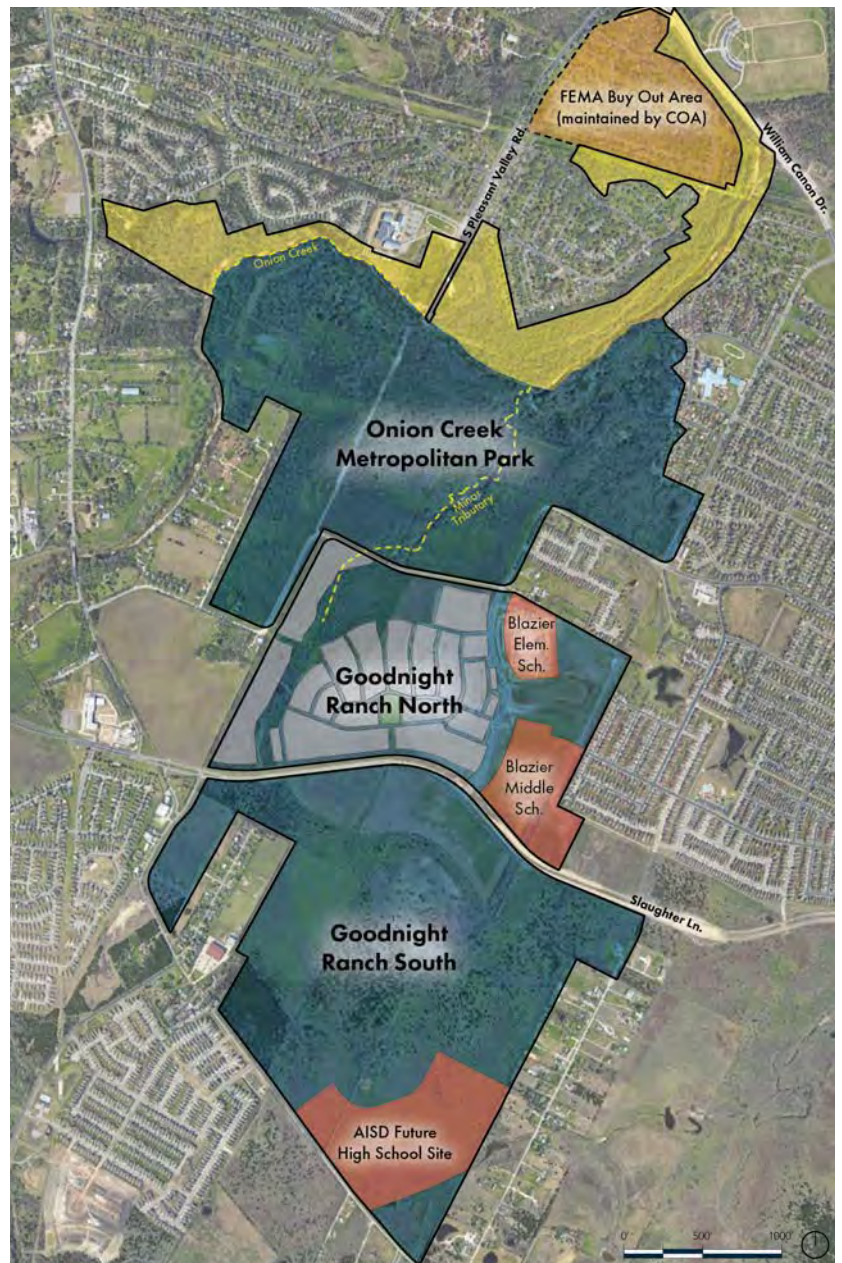


Figure 1.4: District Maintenance Responsibilities Map

## OVERVIEW OF RECOMMENDATIONS

The success of a park begins with its physical design, but is equally dependent upon how it functions once it has opened. The upkeep and programming of its spaces is key to creating a safe, usable and sustainable park. This document is divided into four main sections:

- Introduction (purpose);
- Recommendations (for operations and maintenance);
- Pro Forma (the expense and revenue projections); and
- Appendices (supporting documents).

The initial level of operations and maintenance for these recommendations are based on a development build out for five years from now (2019-2023). This was done so that the recommendations contained within this document could account for some anticipated growth. This document should be reviewed and reevaluated every three years to determine whether the intensity has changed, and if maintenance recommendations should be adjusted.



# 2.0 RECOMMENDATIONS

## DISTRICT ORGANIZATION

The following narrative describes the roles that are illustrated in *Figure 2.1 District Organizational Chart*.

### DISTRICT BOARD OF DIRECTORS

The District is governed by a Board of Directors. The makeup of the board is determined by the District's Consent Agreement and it is responsible for overseeing the construction, operations and maintenance within the District. It will also be the board's responsibility to determine the appropriate time to hire a full-time park manager.

### PARK MANAGER

The park manager shall be responsible for supervising, reviewing, scheduling and monitoring the operations and maintenance within the District. This will also include coordinating with third-party groups for maintenance needs before and after a special recreational event. It is anticipated at this time that the park manager will be the only employee of the District.

Potential programs to recruit a park manager include the Department of Recreation, Park and Tourism Sciences at Texas A&M University, the Division of Recreation Administration at Texas State and the LBJ School within the University of Texas at Austin.

### MAINTENANCE STAFF

The term *maintenance staff* may include consultant companies, staff from the city or any other party hired to conduct operations and maintenance work for the District by the park manager or Board of Directors.

#### *Maintenance Skill Levels*

There are two types of skill levels anticipated for maintenance tasks within the District: laborers and supervisors.

- Maintenance supervisor: This person shall oversee and verify the quality of work completed by the maintenance laborers. They will be the liaison between the park manager and the contracted maintenance laborers and will be responsible for informing the park manager of issues, concerns or questions that arise during maintenance schedules.
- Maintenance laborer: This person is generally supervised by a maintenance supervisor or the park manager. They may exercise technical and functional supervision over seasonal workers and volunteers. They are not responsible for making decisions that require additional resources.

### EVENT COORDINATION

Until an online reservation system becomes available, the park manager will coordinate with individual groups on using space within the District. All maintenance (setup and cleanup) for events shall be provided by the organizing group.

### DISTRICT ORGANIZATIONAL CHART

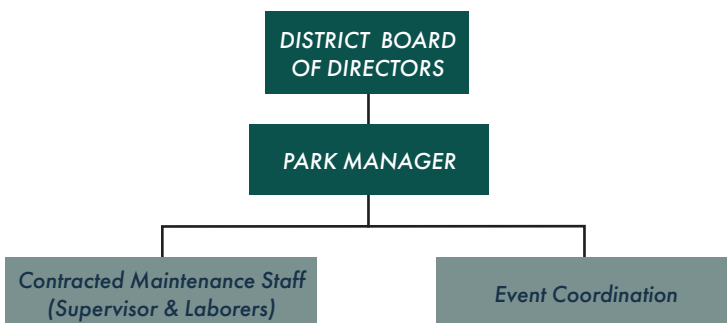


Figure 2.1: District Organizational Chart






## ACTIVITY LEVELS

To efficiently schedule and implement the maintenance tasks within the District, areas were grouped into three *activity levels*. These levels were based on the anticipated intensity of use for existing and planned programs and the spaces' physical design. The following is a brief overview for each level of activity. More detailed descriptions of recommended maintenance tasks and frequency associated with each level are described later in this chapter.

- Level 1 is typically associated with the highest amount of traffic or volume and intensity of use. They will require the most effort and resources for upkeep and oversight and many of the maintenance tasks within these spaces are recommended to occur on either a daily or weekly basis.
- Level 2 is typically associated with a low or moderate intensity of use. While these spaces are anticipated to be used regularly, the scheduled maintenance tasks within them typically occur weekly, monthly, yearly or as needed.
- Level 3 is typically associated with spaces in the District that are more natural and do not have formal amenities, spaces for events or large programs. These areas still require maintenance and oversight, but are anticipated to take the least amount of effort and resources for their upkeep.

The activity levels are illustrated in *Figure 2.2 District Activity Map*. This is a high level map used for planning purposes. Only areas that are existing, under construction, or identified in an approved master plan are shown on this map. Areas within the District's improvement boundary that are unplanned or undefined are identified as *future maintenance service areas*. This map should be updated every three years to reflect changes in activity level as park plans are approved and implemented.

### LEGEND

|                                                                                    |                                                                         |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
|  | Level 1 Activity                                                        |
|  | Level 2 Activity                                                        |
|  | Level 3 Activity                                                        |
|  | Future Maintenance Service Areas<br>(to include all levels of activity) |
|  | Not in Maintenance Service Area<br>(maintained by COA, HOA and AISD)    |

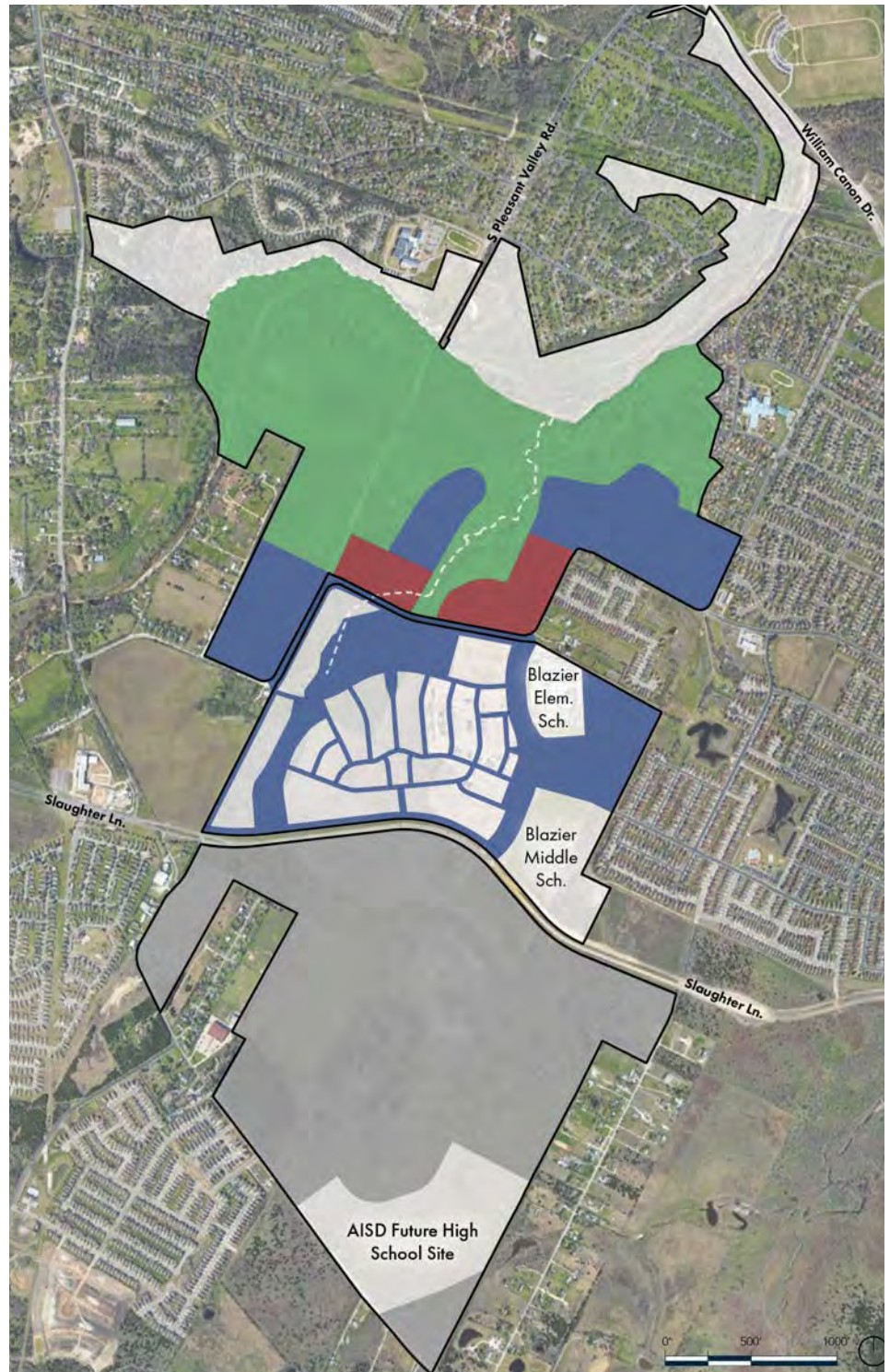


Figure 2.2: District Activity Map

# MAINTENANCE MAPS

Once an area has been identified within the District Activity Map and there is an approved design to be constructed, a *Maintenance Map* shall be created by the landscape designer or park manager. These maps visually show what type of maintenance occurs within that specific space based on the level of use and its physical elements. Maintenance task are represented by a number and letter combination. These tasks are described in more detail later in this chapter.

This map should be shared with maintenance staff to help them budget for maintenance tasks and align their services with these recommendations. *Figure 2.3: Example Mapping Sequence* illustrates how the same space may be visualized in the three different types of maps used within this plan.

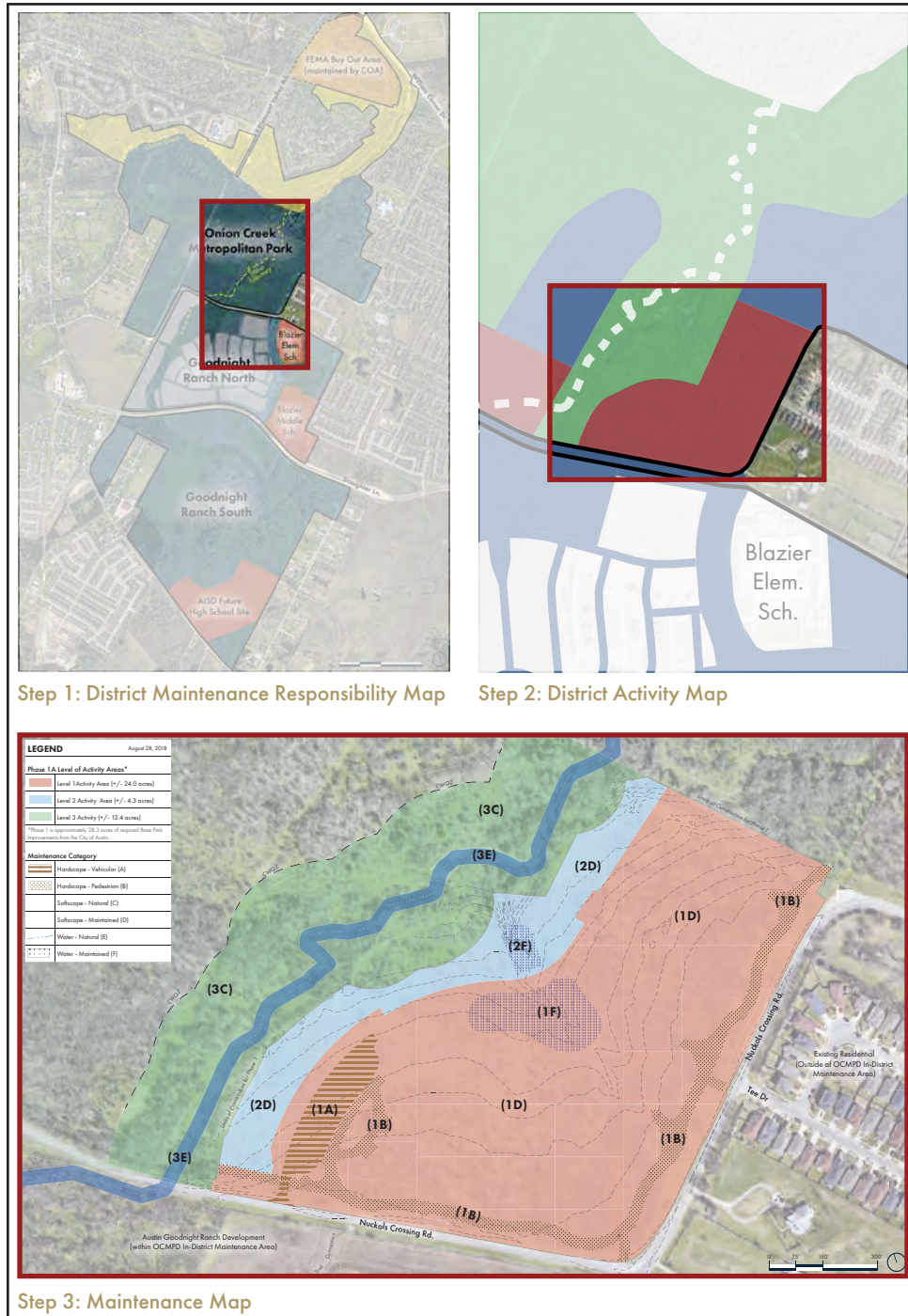


Figure 2.3: Example Mapping Sequence

## PARK CONCESSIONS + EVENTS

The Operations and Maintenance Plan is the first step to exploring potential revenue sources for spaces within the District. At the time these recommendations were written, these sources were not included in the pro forma. However, regardless of whether the District collects revenue for these spaces or not, they may require additional maintenance above what is recommended in this document. The following is a list of park concession areas and potential locations that events or additional activities could be held within the District.

### Existing or Designed Spaces

- OCMP Play Fields 1 (x3, completed within Phase 1)
- OCMP Pavilions (x4, completed within Phase 1)
- District Pocket Parks

### Future Potential Concession areas from the OCMP Master Plan

- Great Lawn
- Open Lawn
- Event Center
- Heritage Tree Lawn
- Community Garden Space
- Nature Center
- Amphitheater
- Community/Event Space
- Future Pavilion (6-10)
- Plaza (Private or Public Event)
- Equestrian Facility
- Model Airplane Field

### Example Revenue Generating Events and Activities

- Weddings
- Races
- Corporate Events
- Family Reunions
- Educational Camps
- Fitness Activities
- Farmers Market

### Responsible Party for Maintenance

Until revenue can be collected and/or maintenance staff resources allocated towards these spaces, all events shall operate under a *pack it in, pack it out* system. Meaning, the organizing party for an event shall be responsible for setup and clean up of a space. This includes tasks such as wiping down tables, sweeping floors, picking up trash and debris from the ground and removal of all trash and recycling generated from the event.



Source: Court Appointed Special Advocates (CASA)



Source: Austin Nature & Science Center



Source: Coalition of Austin Community Gardens

## MAINTENANCE BY ACTIVITY LEVEL

The maintenance recommendations in this document are organized by level of activity. All associated maintenance tasks for each level of activity are contained within the specified section (e.g. all Level 1 maintenance recommendations for Hardscape, Softscape, Water, and Structures + Activities Nodes are grouped together in the Level 1 maintenance section).

The number signifies the level of recommended maintenance based on a space’s activity level and the letter identifies the specific maintenance category. There are three levels of activity and four main categories of maintenance (*Hardscape, Softscape, Water, and Structures + Activity Nodes*). Each maintenance category is broken down into two subcategories. *Figure 2.4 Maintenance Key Chart* illustrates all the levels of maintenance and category combinations a space could have. For example, if the key code on a Maintenance Map listed something as 1A, this would mean that space would be categorized as a Level 1 Hardscape Vehicular area.

MAINTENANCE CATEGORIES

|                   |         | Hardscape     |                       | Softscape   |                | Water       |                | Structures + Activity Nodes |                        |
|-------------------|---------|---------------|-----------------------|-------------|----------------|-------------|----------------|-----------------------------|------------------------|
|                   |         | (A) Vehicular | (B) Pedestrian + Bike | (C) Natural | (D) Maintained | (E) Natural | (F) Maintained | (G) Utility Service         | (H) No Utility Service |
| LEVEL OF ACTIVITY | LEVEL 1 | 1A            | 1B                    | 1C          | 1D             | 1E          | 1F             | 1G                          | 1H                     |
|                   | LEVEL 2 | 2A            | 2B                    | 2C          | 2D             | 2E          | 2F             | 2G                          | 2H                     |
|                   | LEVEL 3 | 3A            | 3B                    | 3C          | 3D             | 3E          | 3F             | 3G                          | 3H                     |

Figure 2.4: Maintenance Key Chart

These maintenance categories are only shown on individual park Maintenance Maps. The Maintenance Maps that have been completed for the District at the time these recommendations were written are listed below and included in Appendix A:

- Existing Improvements (current streetscape areas, trails improvements, etc.);
- OCMP Phase 1A Metro Park;
- Northwest Pond Park;
- Northwest Trail and Greenway; and
- Goodnight Ranch Street Yard.

As additional spaces are designed, Appendix A should be updated to include the most current set of Maintenance Maps.



Source: Auditorium Shores

## LEVEL 1 ACTIVITY MAINTENANCE

Level 1 activity areas are anticipated to be the most widely used spaces and require the most upkeep and maintenance. The following are the maintenance recommendations for these activity areas.

### LEVEL 1 GENERAL MAINTENANCE

The following types of maintenance occur within the entire Level 1 activity area and are not specifically associated with an individual maintenance category. These tasks are considered to be universal to the area and are not specific to only one type of use or space.

#### ADA Accessibility

Each improved space within the District shall be maintained to the standards the space was originally designed to achieve such as ADA compliance and accessibility.

#### Emergency Management

In the event of a major emergency or disaster, call 911. Once the immediate danger has subsided, refer to the City of Austin Office of Homeland Security and Emergency Management (HSEM). The purpose of this department is to serve as focal point for all natural and man-made disasters within the Austin and Travis County community. They can be reached at (512) 974-0450 or through their website ([www.austintexas.gov/hsem](http://www.austintexas.gov/hsem)).

#### Litter Control

Parks and facilities shall be patrolled five times a week. Maintenance staff will check all trash and recycling receptacles and replace the liners if they are over half full. Extremely high visitation may increase the frequency of park patrolling and trash removal.

#### Park Signage

Signage shall be inspected monthly and repaired as needed. Inspection ensures that signage is clean, free of graffiti, hardware and frames are intact and is properly secured. It also guarantees there are no protrusions, exposed sharp edges or pointed corners that could pose a safety hazard. If damage or vandalism to signage is found, maintenance staff should report it to the park manager to coordinate repairs.

#### Guard Rails

If guard rails or other safety railings are installed adjacent to a walkway, these should be inspected for safety during routine maintenance and repaired as necessary.

#### Lighting

All area and security lighting shall be checked quarterly. The light pole base and pole shall be inspected for indications of damage or rust and the lighting system, timer and fixtures shall be checked for proper operations.

#### Graffiti and Vandalism

Maintenance staff shall report signs of graffiti or vandalism to the park manager. The park manager shall coordinate with the appropriate maintenance staff to clean up or repair the incident as soon as possible.

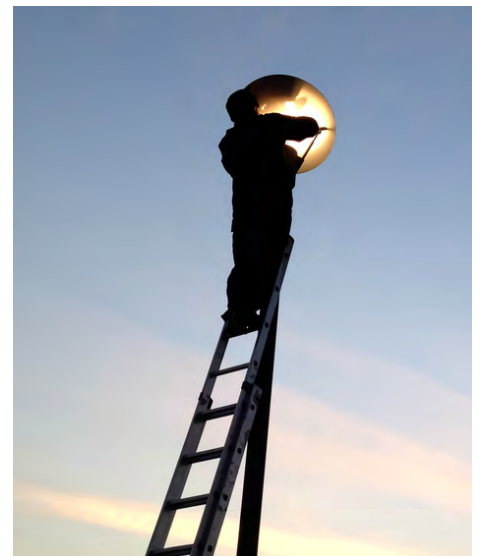
### HARDSCAPE MAINTENANCE

The term *Hardscape Maintenance* is used within this section to refer to non-porous features that deal with circulation and associated activities. They are divided into either *Vehicular* or *Pedestrian + Bike* areas.

- 1A Hardscape Vehicular areas include all public and privately-owned streets, drives, and parking areas.
- 1B Hardscape Pedestrian + Bike areas include all public and privately-owned concrete sidewalks and decomposed granite paths.



Source: Forms + Surfaces



Source: SpecGrade LED

### 1A *Hardscape Vehicular:*

Parking lots shall be inspected every one to two weeks as needed. Service driveways and streets shall be swept every two months or as necessary.

### 1B *Hardscape Pedestrian + Bike:*

If major maintenance is required (defined as depositing/redepositing or leveling of materials within large areas) for either sidewalks or decomposed granite paths, it should occur between major events or during periods of low park usage.

#### Sidewalks + Hardscape Paths

Sidewalks shall be inspected quarterly to ensure they are free of water collecting depressions, litter and debris and that they are clear from low or protruding tree limbs, guide wires, sign posts and ornamental plants. Grass growth and weeds should be removed from the cracks and expansion joints as needed.

#### Decomposed Granite Paths

Decomposed granite paths shall be inspected quarterly and after heavy rainfall events to ensure that they are free of water collecting depressions and erosion, have a uniform surface, positive drainage and are clear of trip and head clearance hazards. Maintenance staff should report any damage or maintenance issues to the park manager and repair the areas as directed. A pre-emergent herbicide shall be applied quarterly to the surface of the path to minimize weed growth.

#### Bike Stands

Bike stands shall be inspected on a monthly basis and repaired as needed.

## SOFTSCAPE MAINTENANCE

The term *Softscape Maintenance* is used within this section to refer to landscape elements and features in either a *Natural* or *Maintained* space.

- 1C Softscape Natural areas do not require gas or electrically powered machinery to conduct essential maintenance routines.
- 1D Softscape Maintained areas require gas or electrically powered machinery to conduct essential maintenance routines.

### 1C *Softscape Natural:*

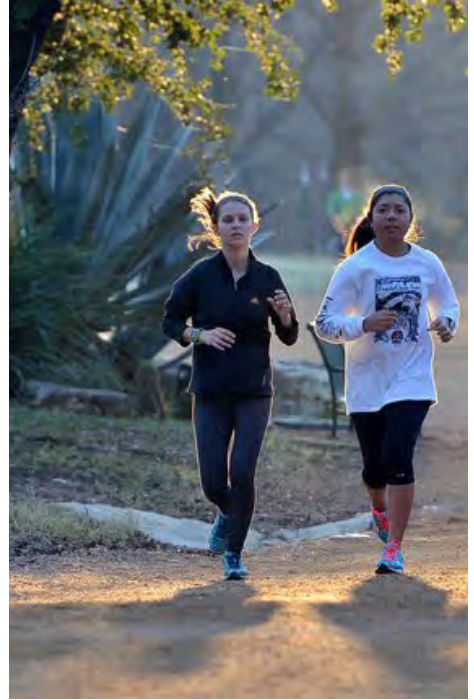
It is anticipated that all softscape features within a Level 1 area are to be maintained. In the future, if a natural softscape feature is located within a Level 1 service area this section should be revised as needed.

### 1D *Softscape Maintained:*

#### Turf Care

The following shall be required for all turf areas within a Level 1 service area:

- All turf areas shall be aerated a minimum of twice a year;
- Mowing and edging of turf areas shall be occur weekly between the months of March and September and every other week between October and February. Maintenance staff shall fill any ruts caused by mowing and will use the utmost care to avoid hitting trees, shrubs and planting beds during mowing;
- A pre-emergent herbicide shall be applied twice a year and general weeding preformed monthly;
- Reseeding or sodding shall occur twice a year or as needed; and
- Application of fertilizers to turf areas shall occur three times a year or as needed.



Source: The Daily Texan



Source: West Austin Youth Association



### Native Grass and Wildflower Care

Native grass and wildflower areas should be maintained to have a natural look. Within these areas the following maintenance shall occur:

- During the first year after initial installation, these areas shall be mowed once a month, reseeded in the spring and fall, and weeds controlled by hand and through chemical application as needed; and
- After the first year, these areas shall be mowed twice a year and weeding shall occur monthly.

### Tree and Shrub Care

In general, all maintenance activities shall coincide with low demand periods or to take advantage of special growing characteristics. The following shall be required for all tree and shrub care within a Level 1 area:

- All newly planted trees shall be staked and tied until roots are established and are able to stand without support (between one and two years from tree installation);
- Maintenance staff shall inspect the tree guys and adjust as needed to maintain tautness and avoid girdling of trees;
- When appropriate maintenance staff will remove and dispose of guying system;
- All newly planted trees and large shrubs should be irrigated for three years;
- Maintenance staff shall inspect all trees and shrubs for hazardous limbs weekly between the months of March and September and every other week between October and February;
- Pruning should not be done prior to a tree or shrub's bloom cycle and should only be done to promote the natural aesthetic appearance and removal of freeze damaged material;
- Maintenance staff shall prune trees eight inches in caliper or less twice a year;
- Safety pruning is required for all trees and shrubs adjacent to pedestrian areas. Limbs must be maintained to provide a 12 foot clearance over parking areas and a seven foot clearance above walkways;
- Sucker growth shall be removed to a height of six feet;
- Maintenance staff shall closely monitor and inspect all trees and shrubs during routine maintenance for insect and disease problems;
- If a problem is found, maintenance staff shall treat the area within 24 hours of observing the issue. All damaged or diseased trees (beyond help or treatment) shall be removed and new trees installed as resources are available;
- Fertilizer applications shall be applied once a year before the growing season; and
- Mulch shall be applied to the base of a tree or shrub twice a year.

### Planting Beds

Planting beds shall be maintained to promote the health, visibility, natural colors and variety of each species. Depending on the facility and landscape design, seasonal color replacement may be necessary. The following maintenance is required for these areas:

- Maintenance staff shall preform general maintenance (pruning, weeding, trimming, etc.) every week between the months of March and September and every other week between October and February.
- Groundcovers shall be trimmed to prevent encroachment onto walkways;
- Spent blooms from perennials shall be removed promptly after bloom cycle to achieve maximum blooming frequency;
- Fertilizer shall be applied every three months or as needed;
- Pre-emergent herbicides shall be applied twice a year; and
- Mulch shall be applied twice a year.



Site Photo: Goodnight Ranch



Source: Lionheart

### Application of Insecticides

Within the Onion Creek Metro Park, any application of herbicide or pesticide must be done in compliance with Austin Parks and Recreation Department's Integrated Pest Management Program. Special efforts shall be given to the control of fire ants infesting the site, especially in Level 1 areas. Fire ant infestations shall be treated by maintenance staff when observed during the performance of routine landscape maintenance. After control is accomplished, the ant mounds shall be lowered and tamped to the existing grade.

### Irrigation

All irrigation systems within the District shall be serviced by reclaimed water (if available) and maintained as follows:

- Irrigation system components shall be inspected at a minimum of every two weeks for signs of stress or weakness and identified problems shall be corrected or repaired as necessary; and
- Maintenance staff shall check the control valve area during routine maintenance for the presence of bee hives. Should a bee hive be found, maintenance staff shall inform the park manager immediately. The park manager shall coordinate with the appropriate contractor to remove the hive.

## **WATER MAINTENANCE**

The term *Water Maintenance* is used within this section to describe elements or features that detain, convey or clean water in either a Natural or Maintained system.

- 1E Water Natural are native areas that were not man-made and require maintenance only when safety or the ecological habitat is in jeopardy.
- 1F Water Maintained are man-made features that are not naturally occurring and require regular maintenance to continue performing as designed.

### **1E Water Natural:**

Currently it is anticipated that all water systems within a Level 1 area are to be maintained. In the future, if a natural element is located within this activity area, this section shall be revised as needed.

### **1F Water Maintained:**

Stormwater control systems are designed to help mitigate and control stormwater during rainfall events by reducing downstream flooding, erosion, and filtering pollutants from water. They can be designed in many forms, but within Level 1 it will mostly consist of: detention ponds, wet/retention ponds and rain gardens.

Within the District these systems are both a necessity and an amenity that should be treated and cared for equally as such. These features should be inspected monthly and within 24 hours after a heavy rain event. For all Maintained Water areas (except for wet ponds) the following general maintenance is required:

- Mow vegetation that exceeds 18 inches in height;
- Care should be taken that special plantings are not disturbed and are maintained as appropriate;
- Remove trash, debris and sediment build-up as necessary, especially at inlet and outlet structures;
- Provide corrective maintenance when a control does not drain properly;
- Repair any deterioration or damage to concrete elements as needed;
- Non-vegetated or washed out areas should be replanted as soon as possible to minimize erosion; and
- Remove nuisance and invasive plant species.



Source: Mueller

Maintenance staff shall report any inconsistencies, damage, or issues to the park manager as they arise.

### Wet Ponds

The grass area around the perimeter of the wet pond should be kept at a height of 18 inches or less.

The physical wet pond area shall be maintained to the quality described in the *Recommended Maintenance for Wet Ponds in the City of Austin* established by the COA Watershed Protection and Development Review on September 18, 2006. These recommendations are contained in Appendix B, but care should be taken to obtain updates and amendments directly from the City of Austin.

### Additional Rain Garden Requirements

These areas shall be inspected every two weeks and as needed following large storm events for trash and debris removal.

## **STRUCTURES + ACTIVITY NODE MAINTENANCE**

The term *Structures + Activity Nodes Maintenance* is used within this section to refer to places or man-made features that augment a space. They are divided into areas that either require or do not require utility service.

- 1G Structures + Activity Nodes Utility Service areas that require any combination of electrical, water or wastewater services.
- 1H Structures + Activity Nodes No Utility Service areas that do not require any combination of electrical, water or wastewater services.

### **1G Structures + Activity Nodes Utility Service:**

#### Restrooms

Maintenance staff will clean, sanitize and restock all restrooms daily. During peak usage additional cleanings may be required. Maintenance shall include wiping down the floors, walls, ceilings, toilets and urinals. During routine cleanings, maintenance staff shall inspect all plumbing fixtures, lighting and hand dryers to ensure they are working properly.

#### Skate Park + Parkour

All skate park, parkour courses and axillary equipment (i.e. lighting systems, timers, nets, rails, posts, etc.) are to be inspected weekly for safety, cleanliness, graffiti and general maintenance issues. Surfaces shall be swept during the inspection as needed. Any damaged or missing equipment should be reported to the park manager for replacement.

#### Sports Courts

All sports courts and axillary equipment (i.e. lighting systems, timers, nets, goal posts, etc.) shall be inspected weekly to ensure safe and clean conditions. Any damaged or missing equipment should be reported to the park manager for replacement.

**Hard surface courts:** shall be swept weekly and power washed as needed.

**Sand volleyball courts:** shall be inspected weekly and the base material leveled and fluffed as needed.

#### Concession Areas

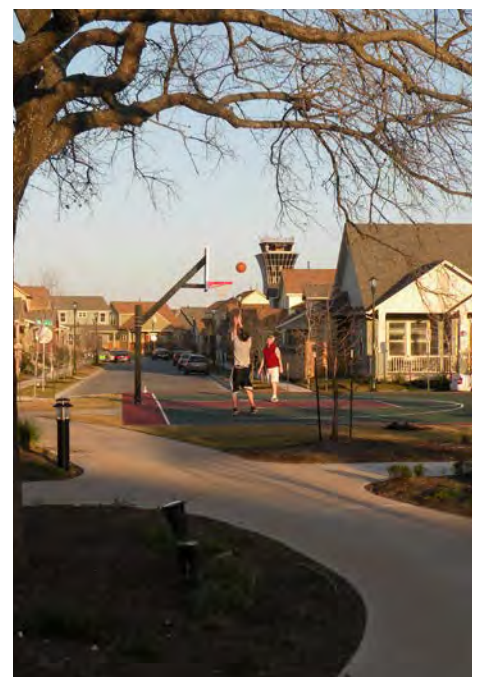
If utilities are provided within concession area, they must be inspected weekly to ensure they are working properly and meet applicable code requirements.

#### Water Features and Fountains

All water fountains and features will be turned off during the months of November through March. While they are in operation, water features shall be inspected and tested daily by maintenance staff to ensure they are safe, clean, in good condition and are operating properly. Drinking fountains shall also be inspected daily for operation and cleanliness during this time and maintenance staff will remove debris from the basins and repair as needed.



Source: The Trail Foundation



Source: Lionheart

## 1H Structures + Activity Nodes No Utility Service:

### Art Installations

Art installations shall be inspected annually for safety and visual appearance. Maintenance staff should inform the park manager if there are signs of vandalism or degradation. Repairs and maintenance are unique to each individual piece depending on its location, material construction and purpose and a separate maintenance plan should be created for individual pieces for optimal care.

### Flag Pole(s)

Flag poles shall be inspected monthly. This includes inspecting the ropes, cables, lighting, and flags. Flags will be replaced as needed due to wear and damage.

### Playgrounds and Exercise Stops

Maintenance staff shall inspect all playground equipment and areas daily to ensure it is safe, clean, in operating condition, and surfacing is free and clear of hazards. Exercise stops and fitness stations are to be inspected daily to ensure they are functioning properly. This includes visually inspecting that all nails, bolts or screws are flush with surfaces, equipment is clean and graffiti free.

### Pavilions and Picnic Areas

Maintenance staff will inspect and clean pavilions three times a week and as needed prior to an event. This will include cleaning the barbecue grills (if provided), emptying trashcans, sweeping the area and cleaning tables.

### Park Benches

Benches shall be inspected daily to ensure they are structurally sound. This includes verifying that hardware is intact, nails, bolts or screws are flush with the surface, and that seats and backing are smooth with no protrusions or exposed shared edges.



Source: The Trail Foundation



Source: Round Rock Parks and Recreation

## LEVEL 2 ACTIVITY MAINTENANCE

Level 2 activity areas are associated with low to moderate Level of use and amount of maintenance. The following are the maintenance recommendations for these activity areas.

### LEVEL 2 GENERAL MAINTENANCE

The following types of maintenance occur within the entire Level 2 activity area and are not specifically associated with an individual maintenance category. These tasks are considered to be universal to the area and are not specific to only one type of use or space.

#### ADA Accessibility

Each improved space within the District shall be maintained to the standards the space was originally designed to achieve such as ADA compliance and accessibility.

#### Emergency Management

In the event of a major emergency or disaster, call 911. Once the immediate danger has subsided, refer to the City of Austin Office of Homeland Security and Emergency Management (HSEM). The purpose of this department is to serve as focal point for all natural and man-made disasters within the Austin and Travis County community. They can be reached at (512) 974-0450 or through their website ([www.austintexas.gov/hsem](http://www.austintexas.gov/hsem)).

#### Litter Control

Maintenance staff shall check all trash and recycling receptacles five times a week and replace liners if they are over half full.

#### Park Signage

Signage shall be inspected monthly and repaired as needed. Inspection ensures that signage is clean, free of graffiti, hardware and frames are intact and is properly secured. It also guarantees there are no protrusions, exposed sharp edges or pointed corners that could pose a safety hazard. If damage or vandalism to signage is found, maintenance staff should report it to the park manager to coordinate repairs.

#### Guard Rails

If guard rails or other safety railings are installed adjacent to a walkway, these should be inspected for safety during routine maintenance and repaired as necessary.

#### Lighting

All area and security lighting shall be checked quarterly. The light pole base and pole shall be inspected for indications of damage or rust and the lighting system, timer and fixtures shall be checked for proper operations.

#### Graffiti and Vandalism

Maintenance staff shall report signs of graffiti or vandalism to the park manager. The park manager shall coordinate with the appropriate maintenance staff to clean up or repair the incident as soon as possible.

### HARDSCAPE MAINTENANCE

The term Hardscape Maintenance is used within this section to refer to paved elements and are divided into either Vehicular or Pedestrian + Bike spaces.

- 2A Hardscape Vehicular areas include all public and privately-owned streets and parking areas.
- 2B Hardscape Pedestrian + Bike areas include all public and privately-owned paved sidewalks.



Site Photo: Goodnight Ranch



Source: Lionheart

## 2A Hardscape Vehicular:

Parking areas within Level 2 areas shall be inspected once a week. This consists of sweeping the parking lots and picking up miscellaneous trash and debris. All service drives shall be inspected and swept on a quarterly basis.

## 2B Hardscape Pedestrian + Bike:

### Sidewalks

Maintenance staff will sweep sidewalks weekly and inspect surfaces for debris and hazards.

### Bike Stands

Bike stands shall be inspected on a monthly basis and repaired as needed.

## SOFTSCAPE MAINTENANCE

The term Softscape Maintenance is used within this section to refer to landscape elements and non-paved paths in either Natural or Maintained spaces.

- 2C Softscape Natural areas do not require gas or electrically powered machinery to conduct essential maintenance routines.
- 2D Softscape Maintained areas require gas or electrically powered machinery to conduct essential maintenance routines.

## 2C Softscape Natural:

### Tree Care

Trees shall be inspected on a yearly basis and trimmed as needed for public safety. All damaged or diseased trees should be removed and new trees installed as resources are available.

## 2D Softscape Maintained:

### Turf Care

The following shall be required for all turf areas within a Level 2 area:

- All turf areas shall be aerated once at the beginning of the growing season;
- Mowing shall occur once every one to two weeks between the months of March and September as needed and every other week during the months of October through February. Maintenance staff shall fill any major ruts caused by mowing and will use the utmost care to avoid hitting trees, shrubs and planting beds during mowing;
- Reseeding or sodding shall occur twice a year; and
- Application of fertilizers to turf areas shall be applied once a year.

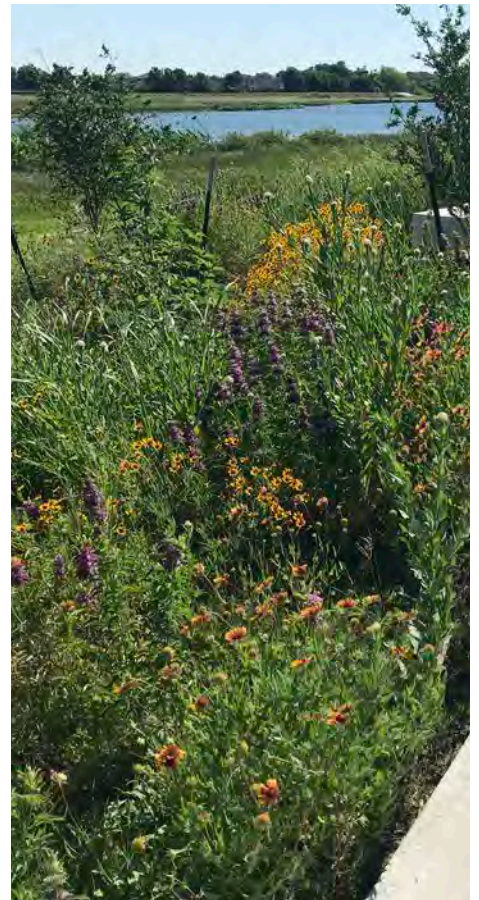
### Native Grass and Wildflower Care

Natural native grass and wildflower areas within Level 2 areas are intended to be maintenance free once established.

- During the first year after initial installation, these areas shall be mowed once a month, reseeded in the spring and fall, and weeds controlled by hand and through chemical application as needed; and
- After the first year, these areas shall be mowed twice a year and weeding shall occur monthly.



Source: The Trail Foundation



Source: The Trail Foundation

### Tree and Shrub Care

The following shall be required for all tree and shrub care within a Level 2 service area:

- All newly planted trees shall be staked and tied until roots are established and are able to stand without support (between one and two years from tree installation);
- Maintenance staff shall inspect the tree guys and adjust as needed to maintain tautness and avoid girdling of trees;
- When appropriate maintenance staff will remove and dispose of guying system;
- Maintenance staff shall inspect all trees and shrubs for hazardous limbs every two weeks;
- Safety pruning is required for all trees and shrubs adjacent to pedestrian areas. Limbs must be maintained to provide a 12 foot clearance over the parking areas and a seven foot clearance above walkways;
- Maintenance staff shall closely monitor and inspect all trees and shrubs during routine maintenance for insect and disease problems;
- If a problem is found, maintenance staff shall treat the area within 24 hours of observing the issue;
- All damaged or diseased trees (beyond help or treatment) shall be removed and new trees installed as resources are available; and
- Mulch shall be applied to the base of a tree or shrub twice a year.

### Planting Beds

Maintenance within these area are done to provide safety, visibility and to ensure the health of the plants. The following maintenance shall be preformed for all planting beds within a Level 2 service area:

- Maintenance staff shall weed planting beds every two weeks and remove deadheads from plants as needed during routine maintenance;
- Plant fertilization and pre-emergent herbicides shall be applied twice a year; and
- Application of mulch and reseeding shall occur once a year at the start of the growing season.

### Irrigation

All irrigation systems within the District shall be serviced by reclaimed water (if available) and maintained as follows:

- Irrigation system components shall be inspected at a minimum of every two weeks for signs of stress or weakness and identified problems shall be corrected or repaired as necessary;
- Maintenance staff shall check the control value area during routine maintenance for the presence of bee hives. Should be a bee hive be found, maintenance staff shall inform the park manager immediately. The park manager shall coordinate with the appropriate contractor to remove the hive.

### Decomposed Granite and Mulch Paths

Paths shall be inspected quarterly and as needed after a heavy rainfall event to ensure they are free of litter and debris and provide unobstructed access. Low and protruding tree limbs and other safety hazards shall be removed as necessary. Pre-emergent herbicides shall be applied to the surface of the paths quarterly to minimize weed growth.

## **WATER MAINTENANCE**

The term Water Maintenance is used within this section to describe elements or features that detain, convey or clean water in either a Natural or Maintained system.

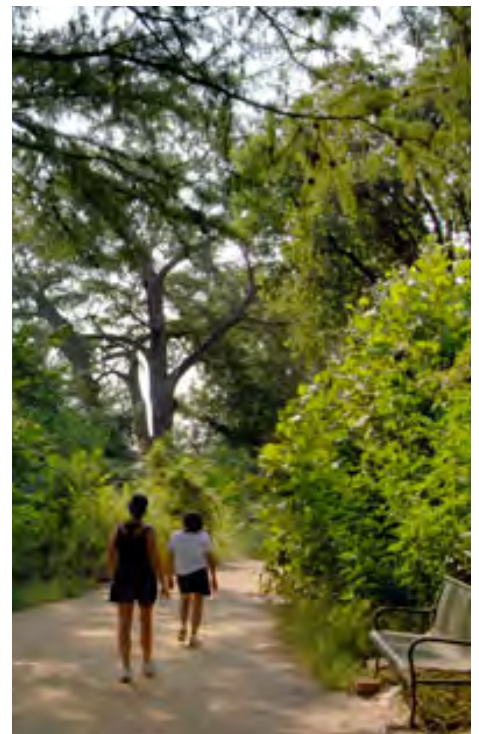
- 2E Water Natural are native areas that were not man-made and require maintenance only when safety or the ecological habitat is in jeopardy.
- 2F Water Maintained are man-made features that are not naturally occurring and require regular maintenance to continue performing as designed.



Site Photo: OCMP



Source: The Trail Foundation



Source: The Trail Foundation

## 2E *Water Natural:*

It is anticipated that all water systems within a Level 2 area are to be maintained. In the future, if a natural element is located within the service area, this section shall be revised as needed.

## 2F *Water Maintained:*

Stormwater control systems are designed to help mitigate and control stormwater during rainfall events by reducing downstream flooding, erosion and filtering pollutants from water. They can be designed in many forms, but within Level 2 it will mostly consist of: detention ponds, wet/retention ponds, rain gardens and vegetated filter strips. At a minimum, these features should be inspected once a month and as needed after a heavy rain event. For all maintained water areas (except for wet ponds) the following general maintenance is required:

- Mow vegetation that exceeds 18 inches in height;
- Care should be taken that special plantings are not disturbed and are maintained as appropriate;
- Remove trash, debris and sediment build-up, especially at inlet and outlet structures;
- Provide corrective maintenance when a control does not drain properly;
- Repair any deterioration or damage to concrete elements as needed;
- Non-vegetated areas should be reseeded or sodded as soon as possible to minimize erosion; and
- Remove nuisance and invasive plant species.

Maintenance staff shall report any inconsistencies, damage, or issues to the park manager as they arise.

### Wet Ponds

The grass area around the perimeter of the wet pond should be kept at a height of 18 inches or less.

The physical wet pond area shall be maintained to the quality described in the *Recommended Maintenance for Wet Ponds in the City of Austin* established by the COA Watershed Protection and Development Review on September 18, 2006. These recommendations are contained in Appendix B, but care should be taken to obtain updates and amendments directly from the City of Austin.

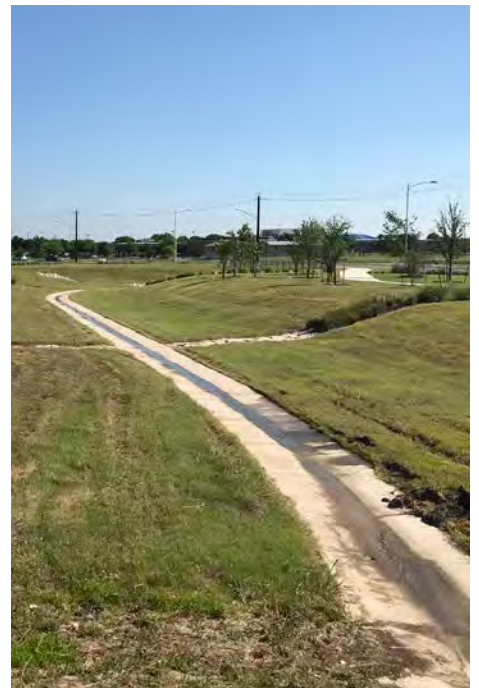
### Additional Rain Garden and Filter Strip Requirements

These areas shall be inspected every two weeks and as needed following large storm events for trash and debris removal.

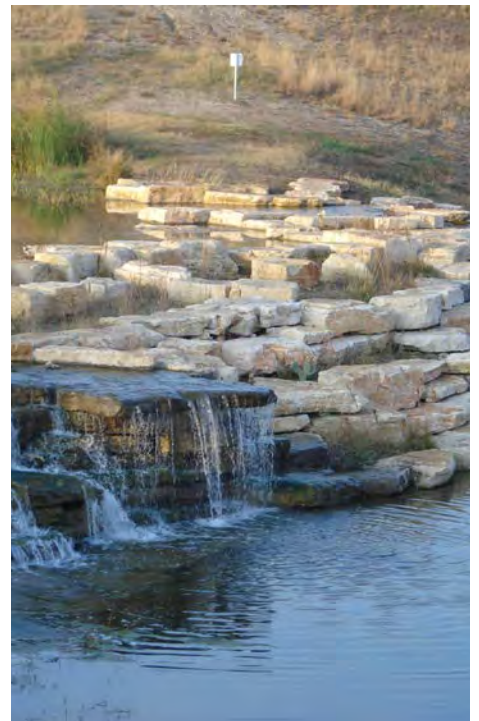
## **STRUCTURES + ACTIVITY NODE MAINTENANCE**

The term Structures + Activity Nodes Maintenance is used within this section to refer to places or man-made features that augment a space. They are divided into areas that either require or do not require utility service.

- 2G Structures + Activity Nodes Utility Service areas that require any combination of electrical, water or wastewater services.
- 2H Structures + Activity Nodes No Utility Service areas that do not require any combination of electrical, water or wastewater services.



Site Photo: Goodnight Ranch



Source: Lionheart



## 2G Structures + Activity Node Utility Service:

### Restrooms

Restrooms shall be cleaned and sanitized at a minimum of five times a week and restocked as necessary. This includes wiping down the floors, walls, ceilings, toilets and urinals. Maintenance staff shall inspect all plumbing fixtures, lighting and hand dryers during regular maintenance and repair as necessary.

### Water Fountains

All water fountains will be turned off during the months of November through March. While they are in operation, drinking fountains shall be inspected daily for operation and cleanliness and maintenance staff will remove debris from the basins and repair as needed.

## 2H Structures + Activity Node No Utility Service:

### Amphitheater

Amphitheatres should be inspected twice a week and be cleaned as needed. Floors should be power washed once a month or as needed.

### Art Installations

Art installations shall be inspected annually for safety and visual appearance. Maintenance staff should inform the park manager if there are signs of vandalism or degradation. Repairs and maintenance are unique to each individual piece depending on its location, material construction and purpose and a separate maintenance plan should be created for individual pieces for optimal care.

### Bird Blinds and Observation Tower(s)

The type of bird blind and design for the observation towers has not been determined. Once there is an adopted program, this section shall be revised as necessary.

### Disk Golf

The "fairways" should be mowed once a month between July and April and up to twice a month in May and June. Paths used by players shall be inspected quarterly for potential erosion and repaired as necessary. Disk pole holes, tee signs and tee pads shall be inspected during regular maintenance and repaired as necessary.

### Flag Pole(s)

Flag poles shall be checked monthly. This includes inspection of ropes, cables, lighting, and flags. Flags will be replaced as needed due to wear and damage.

### Pavilions and Picnic Areas

Maintenance staff will clean and inspect pavilions weekly. This will include cleaning the barbecue grills (if provided), emptying trashcans, sweeping the area and cleaning tables.

### Playgrounds and Exercise Stops

Maintenance staff shall inspect all playground equipment and areas on a weekly basis to ensure it is safe, clean, in operating condition, and surfacing is free and clear of hazards. Exercise stops and fitness stations are to be inspected on a weekly basis to ensure they are functioning properly. This includes visually inspecting that all nails, bolts or screws are flush with surfaces, equipment is clean and graffiti free.

### Park Benches

Benches shall be inspected monthly to ensure they are structurally sound. This includes verifying that hardware is intact; nails, bolts or screws are flush with the surface, and that seats and backing are smooth with no protrusions or exposed shared edges.



Site Photo: OCOMP



Site Photo: OCOMP



Site Photo: OCOMP



Source: Hill Country Conservancy

## LEVEL 3 ACTIVITY MAINTENANCE

Level 3 activity areas are associated with a low level of use and typically require minimal routine maintenance.

### LEVEL 3 GENERAL MAINTENANCE

The following types of maintenance occur within the entire Level 3 activity area and are not specifically associated with an individual maintenance category. These tasks are considered to be universal to the area and are not specific to only one type of use or space.

#### ADA Accessibility

Each improved space within the District shall be maintained to the standards the space was originally designed to achieve such as ADA compliance and accessibility.

#### Emergency Management

In the event of a major emergency or disaster, call 911. Once the immediate danger has subsided, refer to the City of Austin Office of Homeland Security and Emergency Management (HSEM). The purpose of this department is to serve as focal point for all natural and man-made disasters within the Austin and Travis County community. They can be reached at (512) 974-0450 or through their website ([www.austintexas.gov/hsem](http://www.austintexas.gov/hsem)).

#### Litter Control

Trash receptacles shall be placed at major trailheads. Maintenance staff will check all trash receptacles a once per week and replace if they are over half full. General litter and trash pick up around the trailheads shall be done once a month or as needed.

#### Lighting

All area and security lighting shall be checked quarterly. The light pole base and pole shall be inspected for indications of damage or rust and the lighting system, timer and fixtures shall be checked for proper operations.

#### Guard Rails

If guard rails or other safety railings are installed adjacent to a walkway, these should be inspected for safety during routine maintenance and repaired as necessary.

#### Illegal Campsites

Within less populated areas, it is common for illegal and transient campsites to form. If one of these of these sites are found it should be dismantled as soon as possible to prevent it from growing. The following is a summary of the procedures for removal of these sites per the City of Austin Parks and Recreation Department, Grounds Maintenance Division, *Standard Operating Procedure* manual. Some terminology has been modified to be applicable for this document (i.e. PARD Manager was replaced with park manager, etc.).

- If maintenance staff find an illegal campsite, they will notify the park manager immediately;
- The park manager shall notify APD to provide an escort into the site so that the police may notify any inhabitants to vacate the area;
- If the campsite is adjacent to private property, the park manager shall inform the private individual(s) that maintenance staff and APD will be on-site;
- The park manager shall schedule a date with APD to evict the site;
- The park manager shall schedule a date to clean up the site as soon as possible after eviction;
- Maintenance staff may require APD to provide security;
- Document materials removed from the site prior to disposal;
- Maintenance staff shall wear approved personal protective equipment; and
- Enforcement of illegal campsites are always performed by the APD and not individual private citizens.



Source: Lionheart

### Park Signage

Signage shall be inspected monthly and repaired as needed. Inspection ensures that signage is clean, free of graffiti, hardware and frames are intact and is properly secured. It also guarantees there are no protrusions, exposed sharp edges or pointed corners that could pose a safety hazard. If damage or vandalism to signage is found, maintenance staff should report it to the park manager to coordinate repairs.

### Graffiti and Vandalism

Maintenance staff shall report signs of graffiti or vandalism to the park manager. The park manager shall coordinate with the appropriate maintenance staff to clean up or repair the incident as soon as possible.

## HARDSCAPE MAINTENANCE

The term Hardscape Maintenance is used within this section to refer to all impervious areas. These are divided into either:

- 3A Hardscape Vehicular includes all public and privately-owned streets and parking areas.
- 3B Hardscape Pedestrian + Bike includes all public and privately-owned paved sidewalks and trailhead areas.

### 3A *Hardscape Vehicular:*

Parking lots within these areas shall be inspected for trash and debris once a week. Service drives shall be inspected and picked up quarterly.

### 3B *Hardscape Pedestrian + Bike:*

Trailheads shall be inspected once a week and picked up as needed. Paved walkways and bike stands shall be inspected once a month and picked up or repaired as needed.

## SOFTSCAPE MAINTENANCE

The term Softscape Maintenance is used within this section to refer to vegetative areas and non-paved paths. They are divided into the following:

- 3C Softscape Natural areas that do not require gas or electrically powered machinery to conduct essential maintenance routines.
- 3D Softscape Maintained areas that have man-made elements or require gas or electrically powered machinery to conduct essential maintenance routines.

### 3C *Softscape Natural:*

Natural softscape areas within Level 3 areas consist of forested areas, non-programmed or unplanned open areas and untouched vegetated spaces. Maintenance within this area shall be conducted on an as needed basis.

### 3D *Softscape Maintained:*

#### Trailheads

Trailhead area shall be mowed twice a week and pre-emergent herbicides applied three times a year. Inspection for hazardous limbs and diseased trees shall occur whenever maintenance staff is on-site.

#### Decomposed Granite and Mulch Trails

Paths shall be inspected after extreme rainfall events to ensure paths are free of litter and debris, and provide unobstructed access from low, protruding or fallen tree limbs. Maintenance shall occur as needed.



Source: The Trail Foundation



Source: Lionheart

### Proposed Equestrian Trails

The ultimate use and design for the proposed equestrian trails has not been determined. Once an approved plan is determined, this section shall be created as needed.

## WATER MAINTENANCE

The term Water Maintenance is used within this section to describe to elements that detain, convey or clean of water in either a Natural or Maintained system.

- 3E Water Natural are unaltered areas that were not man-made and require maintenance only when safety or the ecological habitat is in jeopardy.
- 3F Water Maintained are man-made features that are not naturally occurring and require routine maintenance to continue performing.

### 3E *Water Natural:*

All naturally occurring waterways within the District Maintenance Responsibility Map will be given a *grow area* which will be determined and maintained by the COA Watershed Department. The centerline for waterways shall be labeled and shown as a dashed line on the District Maintenance Responsibility Map.

### 3F *Water Maintained:*

Currently there are no maintained water elements anticipated within a Level 3 service area. If it is determined that they are required, this section shall be created as necessary.

## STRUCTURES + ACTIVITY NODE MAINTENANCE

The term Structures + Activity Nodes Maintenance is used within this section to refer to places or man-made features that augment a space. They are divided into areas that either require or do not require utility service.

- 3G Structures + Activity Nodes Utility Service areas that require any combination of electrical, water or wastewater services.
- 3H Structures + Activity Nodes No Utility Service areas that do not require any combination of electrical, water or wastewater services.

### 3G *Structures + Activity Node Utility Service:*

#### Water Fountains

All water fountains will be turned off during the months of November through March. While they are in operation, drinking fountains shall be inspected daily for operation and cleanliness and maintenance staff will remove debris from the basins and repair as needed.

### 3H *Structures + Activity Node No Utility Service:*

#### Art Installations

Art installations shall be inspected annually for safety and visual appearance. Maintenance staff should inform the park manager if there are signs of vandalism or degradation. Repairs and maintenance are unique to each individual piece depending on its location, material construction and purpose and a separate maintenance plan should be created for individual pieces for optimal care.

#### Exercise Stops and Benches

All equipment shall be inspected monthly and maintained for safety and function as needed.

#### Flag Pole(s)

Flag poles shall be checked monthly. This includes inspection of ropes, cables, lighting, and flags. Flags will be replaced as needed due to wear and damage.



Source: Lionheart



Source: Lionheart

## MAINTENANCE SCHEDULE AND COST

In order to generate an understanding of the District's operations and maintenance costs, a spreadsheet was developed for these recommendations that lists the maintenance tasks by category, the estimated number of hours per task and the frequency for each task.

Figure 2.5: *Maintenance Schedule Template* is a sample spreadsheet that was used to calculate estimated costs. A separate spreadsheet was created for each Level based on the recommended maintenance. The following describes each column used in the spreadsheet:

**TASK:** a specific maintenance action by category.

**QUANTITY:** a standard number used for all units of measurement (typically either 1 or 1000).

**UNIT:** a commonly accepted metric of measurement:

- Each (used when describing a numbered quantity, i.e. the number of total trees);
- Square Feet, Cubic Yard, or Acre (used when quantifying an area of space); and
- Linear Feet (used when quantifying distance).

**ACTUAL:** the real number of units within the area being calculated.

**MULTIPLIER:** an estimated quantity of that task. For example, if there is turf within a Softscape Maintained area that is 50,000 square feet and quantity for that task is based on 1000 square feet, the resulting multiple is 50.

**LABOR HOURS:** based on the hours necessary to complete the task for each unit.

**FREQUENCY:** the number of times a maintenance task is done on an annual basis.

**HOURLY RATE:** the estimated hourly rate for a maintenance laborer (includes compensation, transportation, equipment costs and profit).

**ANNUAL COST:** the estimated total cost of maintenance for that specific task for one year.

Each recommended maintenance task was given a separate line and associated cost. The initial cost assumptions were compiled from the interviews with city staff, existing contractors and our own field knowledge and experience.

### AS NEEDED MAINTENANCE

Within the maintenance recommendations, some tasks are addressed on an *as needed* basis. Primarily this includes repairing park amenities and equipment, and other tasks that should be done during regular maintenance but do not occur on a regular schedule (i.e. removal of bee hives, repairs to decomposed granite trails after heavy rainfall, etc.). Instead of estimating the number of times these tasks might be done within a year and accounting for them individually, a 20 percent contingency cost is added to the overall maintenance fee of each space. This contingency is intended to become the District's *rainy day fund* to cover additional operations and maintenance that is not specifically accounted for in the pro forma.

### MAINTENANCE SUPERVISOR COST

To simplify the spreadsheet all estimated costs were calculated using a maintenance laborer cost. 10 percent of the total estimated costs for a space was added to account for the hourly rate of the maintenance supervisor.

Figure 2.5: Maintenance Schedule Template

| Task                                                                        | Quantity | Unit | Actual | Multiplier | Frequency | Labor Hours | Hourly Rate | Annual Cost |
|-----------------------------------------------------------------------------|----------|------|--------|------------|-----------|-------------|-------------|-------------|
| <b>General Maintenance</b>                                                  |          |      |        |            |           |             |             |             |
| Litter Control (Check Trash Cans, Change Liners, Cleanup Around Receptacle) | 1        | Each |        |            | 260       | 0.00        | \$-         | \$-         |
| Inspecting Park Signage                                                     | 1        | Each |        |            | 12        | 0.00        | \$-         | \$-         |
| Inspection of Security Lighting System, Poles/Bases for Damage              | 1        | Each |        |            | 4         | 0.00        | \$-         | \$-         |
| <b>#A Hardscape Vehicular</b>                                               |          |      |        |            |           |             |             |             |
| Maintenance Task                                                            |          |      |        |            |           |             |             |             |
| <b>#B Hardscape Pedestrian + Bike</b>                                       |          |      |        |            |           |             |             |             |
| Maintenance Task                                                            |          |      |        |            |           |             |             |             |
| <b>#C Softscape Natural</b>                                                 |          |      |        |            |           |             |             |             |
| Maintenance Task                                                            |          |      |        |            |           |             |             |             |
| <b>#D Softscape Maintained</b>                                              |          |      |        |            |           |             |             |             |
| Maintenance Task                                                            |          |      |        |            |           |             |             |             |
| <b>#E Water Natural</b>                                                     |          |      |        |            |           |             |             |             |
| Maintenance Task                                                            |          |      |        |            |           |             |             |             |
| <b>#F Water Maintained</b>                                                  |          |      |        |            |           |             |             |             |
| Maintenance Task                                                            |          |      |        |            |           |             |             |             |
| <b>#G Structures + Activity Node Utility Service</b>                        |          |      |        |            |           |             |             |             |
| Maintenance Task                                                            |          |      |        |            |           |             |             |             |
| <b>#H Structures + Activity Node No Utility Service</b>                     |          |      |        |            |           |             |             |             |
| Maintenance Task                                                            |          |      |        |            |           |             |             |             |





# 3.0 PRO FORMA

## PURPOSE

A financial pro forma is a model that helps an entity consider costs and expenses each year. For the District it can be a tool to help anticipate future maintenance costs and revenues and create a common understanding of maintenance needs. It can also help identify potential target years to invest in improvements. The estimated pro forma for the District includes operations and maintenance costs (personnel and supporting costs), general administrative costs (soft costs), and potential projected tax revenue from the District (Payment in Lieu of Taxes (PILOT) payments, donations and grant funding).

## ASSUMPTIONS AND METHODOLOGY

This pro forma focuses on the next five years (2019-2023). This time period was chosen for the following reasons:

- Known park areas and developments are anticipated to come online during this time period;
- A general design has been established for these spaces and costs can be more accurately account for;
- It is far enough into the future to allow for some preliminary budgeting; and
- It is not so far that the cost and revenue assumptions will have changed significantly.

## REVENUE

Currently the OCMPD has two sources of revenue (1) tax revenue from the District and (2) PILOT Payments. In the future additional revenue sources may include funds from concessions and/or grants.

### *Tax Revenue from the District*

In order to estimate revenue from the development; the following methodology was used for (1) For Sale Residential Homes (2) Multi-Family Rental Products and (3) Commercial Development.

Aggregated Value (sum of the build out to date):

- For each year an annual number of units (for sale residential homes/multi-family rental products) or square footage (commercial developments) was assumed to be built.
- This number was multiplied by an associated estimated value (adjusted each year for 2 percent inflation) which was then combined with the previous year's cumulative value to determine the total sum of build out for the current year.

### *PILOT Payments*

Nonprofit entities are not required to pay property tax. Payment in Lieu of Taxes or "PILOT" payments are a negotiated agreement between the non-profit entity and the developer to recapture some of this revenue and are approved on a case-by-case basis. Currently, the OCMPD can account for two PILOT payments in their revenue stream (1) The Nightingale, a mixed-income development for active seniors and (2) Commons at Goodnight Ranch, an affordable multi-family project.

## **Concessions**

In addition to these revenue sources, the OCMPD will have the opportunity to collect rental and event fees once a space is constructed. This revenue could be used to offset general maintenance costs, additional maintenance or repairs due to the event or space being used or for the install and/or upgrades to improvements.

Potential rental and event fees could come from the following:

- Community Garden Plots;
- Open Lawn/Play Field (youth and adult sports, workout space, etc.);
- Event Center;
- Park Pavilions;
- Nature Center (school field trips, guest lectures, etc.);
- Amphitheater;
- Plaza; and
- Equestrian Facility (land sublease).

This potential revenue was not included in the current pro forma because the estimated usage and fee amount would be arbitrary at this point. If regular events and fees are anticipated in the future, it is suggested that the pro forma be updated.

## **Grant Funding**

At this time the District is not seeking or receiving any grant funding. If the District becomes the recipient of such funds, this pro forma can be updated to include the revenue source.

## **COST**

Currently there are two types of cost being accounted for in this pro forma: administrative costs, and operations and maintenance costs.

### **Administrative Costs**

Soft costs are the anticipated overhead costs (i.e. legal, mailing, book keeping, insurance administration, board meetings, etc.) that may occur within a given year. This amount is anticipated to fluctuate over time and should be reevaluated every three to five years, or after the occurrence of a significant cost change (i.e. hiring of a park manager, change in how maintenance is being conducted, etc.).

### **Operations and Maintenance Costs**

The operations and maintenance costs were calculated in a three-step process (1) quantify the annual time needed for recommended operations and maintenance activities, (2) estimate operations and maintenance costs by activity level and (3) right-sizing the recommendations based on an average revenue.

#### Quantify annual time needed for operations and maintenance activities:

This process involved compiling a database of existing maintenance recommendations from city manuals, maintenance standards and District maintenance contracts, interviews with city staff and existing contractors, and combining this research with our own field knowledge and experience. This database was the basis of the recommendations found in Chapter 2.

#### Estimated operations and maintenance costs by Level of Activity

A task hours spreadsheet of recommended maintenance was created for each level of activity, (described in Chapter 2). The initial cost assumptions for this spreadsheet were compiled from the interviews with city staff, existing District contractors and our own field knowledge and experience.

### Right-Sizing:

This was the final step in creating the estimated costs. It balances the initially proposed maintenance schedules and assumptions with realistic budgets. After the first template was created and vetted with existing maintenance costs and parks, it was shared with the District committee to gain additional feedback on feasibility and further align assumptions. The process and estimated costs were then shared with the Board of Directors for final approval.

### ***Discount for Early Under-Use***

When a park first opens it can take a couple years to become fully utilized. The pro forma accounts for this underutilization by discounting the maintenance costs for all new parks by 40 percent the first year and 20 percent the second year it is open to the public. This discount is also utilized if a space is not available or open to the public at the start of the year. In those instances, the percentage of discount is relative to when the space is completed.

### ***Contingency***

There is a 20 percent contingency added to each space. These funds are intended to be used towards as needed, unplanned or emergency repairs. While each space has its own contingency amount, the intent is to combine all contingency funds into one account to be used by the District as a whole.

### ***Compounded Escalation***

The pro forma accounts for a compounded escalation of 3 percent each year.

### ***Total Estimated Annual Cost***

The total estimated annual cost for a space is the sum of the estimated operations and maintenance costs, the 20 percent contingency and compounded 3 percent escalation, minus any discount for early under-use. The Balance section at the end of this chapter discusses the total estimated costs for the District.

## EXISTING MAINTENANCE MAPS

The following are current maintenance maps with associated five-year estimated operations and maintenance costs that exist within the District. Larger maps of these spaces and a full pro forma are included in the appendix.

### EXISTING IMPROVEMENTS

|                                             | Acres | 2019               | 2020               | 2021               | 2022               | 2023               |
|---------------------------------------------|-------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Estimated Operations and Maintenance Cost   |       | \$73,836.19        | \$73,049.70        | \$73,049.70        | \$73,049.70        | \$73,049.70        |
| Level 1 Activity Acres                      |       |                    |                    |                    |                    |                    |
| Level 2 Activity Acres                      | 53.6  |                    |                    |                    |                    |                    |
| Level 3 Activity Acres                      |       |                    |                    |                    |                    |                    |
| Discount for Early Under-Use                |       |                    |                    |                    |                    |                    |
| Contingency (20% for as needed maintenance) |       | \$14,767.24        | \$14,609.94        | \$14,609.94        | \$14,609.94        | \$14,609.94        |
| Escalation (compounded at 3% per year)      |       | \$2,215.09         | \$2,257.94         | \$4,518.46         | \$6,981.13         | \$9,603.70         |
| <b>Total Estimated Annual Cost</b>          |       | <b>\$90,818.51</b> | <b>\$89,917.58</b> | <b>\$92,178.10</b> | <b>\$94,640.77</b> | <b>\$97,263.34</b> |



Figure 3.1: AGR Existing Improvements




### NORTHWEST POND PARK

|                                             | Acres | 2019               | 2020               | 2021               | 2022               | 2023                |
|---------------------------------------------|-------|--------------------|--------------------|--------------------|--------------------|---------------------|
| Estimated Operations and Maintenance Cost   |       | \$76,392.77        | \$76,392.77        | \$76,392.77        | \$76,392.77        | \$76,392.77         |
| Level 1 Activity Acres                      |       |                    |                    |                    |                    |                     |
| Level 2 Activity Acres                      | 28.7  |                    |                    |                    |                    |                     |
| Level 3 Activity Acres                      |       |                    |                    |                    |                    |                     |
| Discount for Early Under-Use                |       | \$(38,196.39)      | \$(15,278.55)      |                    |                    |                     |
| Contingency (20% for as needed maintenance) |       | \$15,278.55        | \$15,278.55        | \$15,278.55        | \$15,278.55        | \$15,278.55         |
| Escalation (compounded at 3% per year)      |       | \$2,291.78         | \$2,360.54         | \$4,725.20         | \$7,300.62         | \$10,043.21         |
| <b>Total Estimated Annual Cost</b>          |       | <b>\$55,766.72</b> | <b>\$78,753.31</b> | <b>\$96,396.52</b> | <b>\$98,971.94</b> | <b>\$101,714.53</b> |






Figure 3.2: Northwest Pond Park

## NORTHWEST TRAIL AND GREENWAY

|                                                                                                         | Acres | 2019              | 2020               | 2021               | 2022               | 2023               |
|---------------------------------------------------------------------------------------------------------|-------|-------------------|--------------------|--------------------|--------------------|--------------------|
| Estimated Operations and Maintenance Cost                                                               |       | \$13,139.42       | \$24,087.47        | \$24,087.47        | \$24,087.47        | \$24,087.47        |
|  Level 1 Activity Acres |       |                   |                    |                    |                    |                    |
|  Level 2 Activity Acres | 8.7   |                   |                    |                    |                    |                    |
|  Level 3 Activity Acres |       |                   |                    |                    |                    |                    |
| Discount for Early Under-Use                                                                            |       | \$(6,569.71)      | \$(4,817.49)       |                    |                    |                    |
| Contingency (20% for as needed maintenance)                                                             |       | \$2,627.88        | \$4,817.49         | \$4,817.49         | \$4,817.49         | \$4,817.49         |
| Escalation (compounded at 3% per year)                                                                  |       | \$394.18          | \$734.45           | \$1,489.31         | \$2,301.91         | \$3,166.73         |
| <b>Total Estimated Annual Cost</b>                                                                      |       | <b>\$9,591.78</b> | <b>\$24,821.92</b> | <b>\$30,394.28</b> | <b>\$31,206.87</b> | <b>\$32,071.69</b> |

## GOODNIGHT RANCH STREET YARD AREA

|                                                                                                         | Acres | 2019              | 2020              | 2021              | 2022              | 2023              |
|---------------------------------------------------------------------------------------------------------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Estimated Operations and Maintenance Cost                                                               |       |                   |                   |                   |                   |                   |
|  Level 1 Activity Acres |       | \$3,592.25        | \$7,313.32        | \$7,313.32        | \$7,313.32        | \$7,313.32        |
|  Level 2 Activity Acres |       |                   |                   |                   |                   |                   |
|  Level 3 Activity Acres | 6.7   |                   |                   |                   |                   |                   |
| Discount for Early Under-Use                                                                            |       | \$(1,436.90)      |                   |                   |                   |                   |
| Contingency (20% for as needed maintenance)                                                             |       | \$718.45          | \$1,462.66        | \$1,462.66        | \$1,462.66        | \$1,462.66        |
| Escalation (compounded at 3% per year)                                                                  |       | \$107.77          | \$222.63          | \$452.16          | \$698.89          | \$961.47          |
| <b>Total Estimated Annual Cost</b>                                                                      |       | <b>\$2,981.57</b> | <b>\$8,998.62</b> | <b>\$9,228.14</b> | <b>\$9,474.88</b> | <b>\$9,737.45</b> |

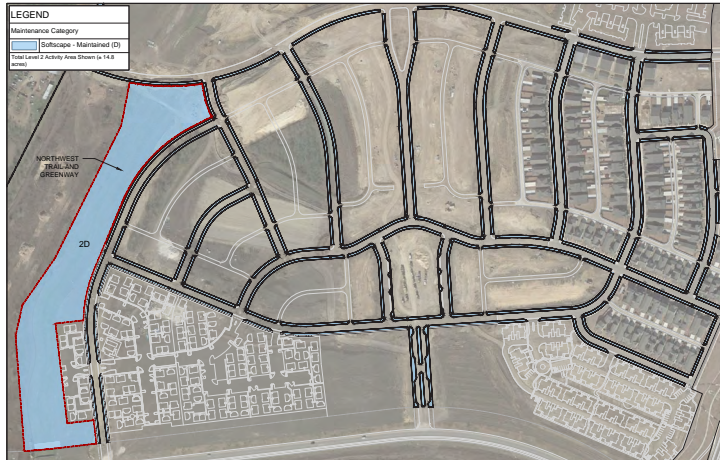





Figure 3.3: Northwest Trail and Greenway and Goodnight Ranch Street Yard Area

## OCMP PHASE 1A METRO PARK

|                                                                                                          | Acres | 2019                | 2020                | 2021                | 2022                | 2023                |
|----------------------------------------------------------------------------------------------------------|-------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Estimated Operations and Maintenance Cost                                                                |       | \$157,635.76        | \$157,635.76        | \$157,635.76        | \$157,635.76        | \$157,635.76        |
|  Level 1 Activity Acres | 24.0  |                     |                     |                     |                     |                     |
|  Level 2 Activity Acres | 4.3   |                     |                     |                     |                     |                     |
|  Level 3 Activity Acres | 13.3  |                     |                     |                     |                     |                     |
| Discount for Early Under-Use                                                                             |       | \$(26,272.63)       | \$(31,527.15)       |                     |                     |                     |
| Contingency (20% for as needed maintenance)                                                              |       | \$31,527.15         | \$31,527.15         | \$31,527.15         | \$31,527.15         | \$31,527.15         |
| Escalation (compounded at 3% per year)                                                                   |       | \$4,729.07          | \$4,870.94          | \$9,750.40          | \$15,064.75         | \$20,724.06         |
| <b>Total Estimated Annual Cost</b>                                                                       |       | <b>\$115,074.10</b> | <b>\$162,506.70</b> | <b>\$198,913.31</b> | <b>\$204,227.67</b> | <b>\$209,886.97</b> |

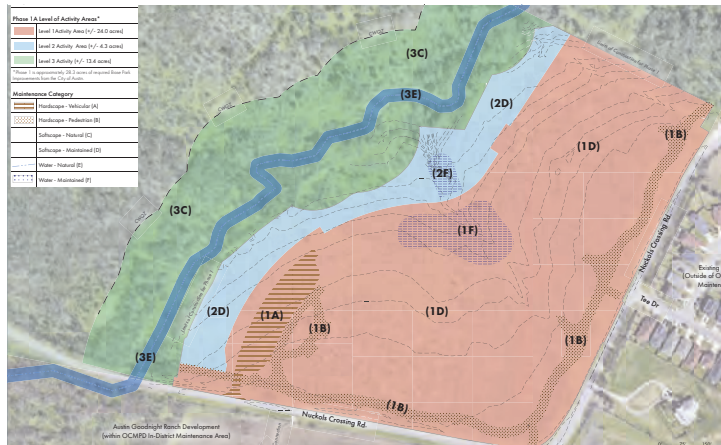


Figure 3.4: OCMP Phase 1A Metro Park




## UNPLANNED SPACES

Because future park areas and amenities are not designed, it is not possible to apply the same cost and revenue assumptions to these areas to determine anticipated operations and maintenance. In order to estimate these costs, an average cost per acre was calculated by level of activity for all existing spaces.

The existing maintenance maps were used to create an average estimated annual operations and maintenance cost for each activity level. This average was broken down into a per acre cost by activity level that was used to determine the anticipated costs for areas that have not yet been designed. As new parks and programmed spaces are designed and approved, additional maintenance maps and estimated costs should be calculated and the per acre costs updated.




## ADDITIONAL GOODNIGHT RANCH PARK AREAS

All improved spaces within Goodnight Ranch that are maintained by the District are anticipated to be a Level 2 activity area.

|                                                                                                         | Acres | 2019 | 2020 | 2021 | 2022 | 2023               |
|---------------------------------------------------------------------------------------------------------|-------|------|------|------|------|--------------------|
| Estimated Operations and Maintenance Cost                                                               |       |      |      |      |      | \$27,591.60        |
|  Level 1 Activity Acres |       |      |      |      |      |                    |
|  Level 2 Activity Acres | 10.0  |      |      |      |      |                    |
|  Level 3 Activity Acres |       |      |      |      |      |                    |
| Discount for Early Under-Use                                                                            |       |      |      |      |      |                    |
| Contingency (20% for as needed maintenance)                                                             |       |      |      |      |      | \$5,518.32         |
| Escalation (compounded at 3% per year)                                                                  |       |      |      |      |      | \$3,310.99         |
| <b>Total Estimated Annual Cost</b>                                                                      |       |      |      |      |      | <b>\$36,430.91</b> |

## ADDITIONAL OCMP AREAS

The additional acreages for OCMP was determined by looking at the total amount of space by level of activity within the District Activity Map. These areas were equally divided and added into the District every other year starting in 2023.

|                                                                                                           | Acres | 2019 | 2020 | 2021 | 2022 | 2023                |
|-----------------------------------------------------------------------------------------------------------|-------|------|------|------|------|---------------------|
| Estimated Operations and Maintenance Cost                                                                 |       |      |      |      |      | \$97,206.46         |
|  Level 1 Activity Acres | 7.5   |      |      |      |      |                     |
|  Level 2 Activity Acres | 16.0  |      |      |      |      |                     |
|  Level 3 Activity Acres | 40.0  |      |      |      |      |                     |
| Discount for Early Under-Use                                                                              |       |      |      |      |      |                     |
| Contingency (20% for as needed maintenance)                                                               |       |      |      |      |      | \$19,441.29         |
| Escalation (compounded at 3% per year)                                                                    |       |      |      |      |      | \$11,664.78         |
| <b>Total Estimated Annual Cost</b>                                                                        |       |      |      |      |      | <b>\$128,376.03</b> |

## THE BALANCE

The following table illustrates the balance between the estimated revenue generated from the District, and operations and maintenance costs for the next five years.

|                       | 2019                 | 2020                  | 2021                  | 2022                  | 2023                  |
|-----------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Total Revenue         | \$539,629.08         | \$137,281.08          | \$339,557.93          | \$456,958.52          | \$658,177.25          |
| Total Cost            | \$612,777.94         | \$650,998.13          | \$713,110.35          | \$724,522.13          | \$901,480.92          |
| <b>Annual Balance</b> | <b>\$(73,148.86)</b> | <b>\$(513,717.05)</b> | <b>\$(373,552.42)</b> | <b>\$(267,563.60)</b> | <b>\$(243,303.67)</b> |

**Total Revenue** is the sum of the aggregated values from the for sale residential homes, multi-family projects and commercial developments; and the PILOT payments in the years they are anticipated to be paid. The aggregated values for the for sale projects are conservative because they only account for revenue when a product is delivered, not when the land is sold. It also does not account for any potential revenue collected through concession areas.

**Total Cost** is the sum of the estimated annual costs from all the existing, planned and future spaces within the District. The costs are a combination of administrative costs, and estimated operations and maintenance. Each space has a 20 percent contingency built into it for as needed and unplanned maintenance or repairs. There may be some years that this contingency will not be used in its entirety and will carry over to the following year. If at some point the balance of funds in the account becomes great enough, the percentage of contingency may be reduced in subsequent years. For costs the pro forma uses a 3 percent compounded escalation. This is a conservative percentage and is 1 percent higher than the 2 percent inflation used for estimated revenue.

**Annual Balance** is the total revenue minus the total cost. In the beginning, the annual balance is expected to be negative because the District is choosing to improve some spaces and parks ahead of future developments. Over time the annual balance should even out as more revenue becomes available.





# 4.0 APPENDICES

*Appendix A - District Maintenance Maps*

*Appendix B - Maintenance Template Spreadsheets*

*Appendix C - Example Maintenance Bid Sheets*

*Appendix D - Recommended Maintenance for Wet Ponds in the City of Austin*



# APPENDIX A - DISTRICT MAINTENANCE MAPS

Figure 4.1: Goodnight Ranch Existing Improvements

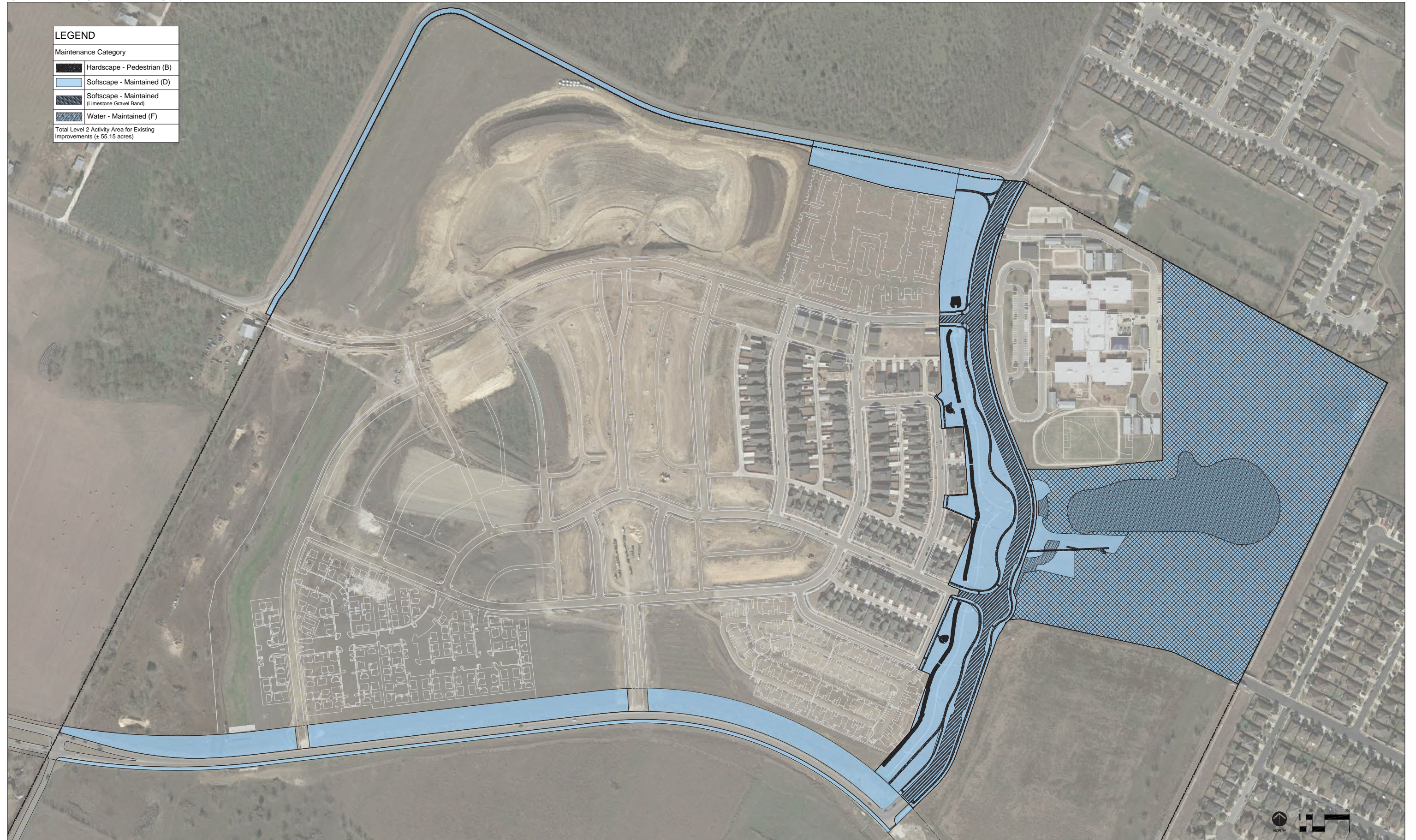


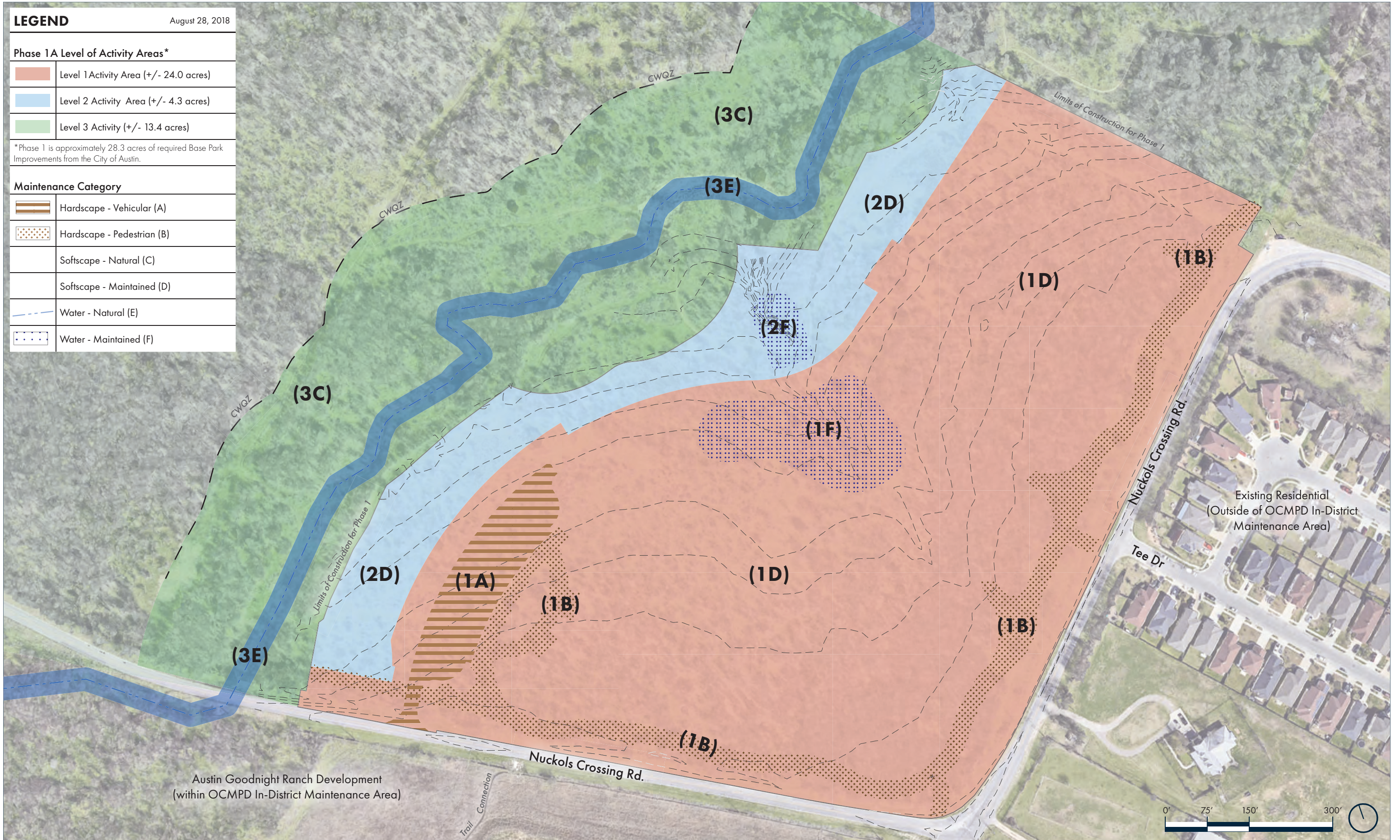
Figure 4.2: Goodnight Ranch Northwest Pond Park



Figure 4.3: Goodnight Ranch Northwest Trail, Greenway and Street Yard



Figure 4.4: OCMP Phase 1



## APPENDIX B - MAINTENANCE TEMPLATE SPREADSHEETS

### LEVEL 1 MAINTENANCE

| Task                                                                                                              | Quantity | Unit | Actual | Multiplier | Frequency | Labor Hours | Hourly Rate | Annual Cost |
|-------------------------------------------------------------------------------------------------------------------|----------|------|--------|------------|-----------|-------------|-------------|-------------|
| <b>Level 1 Area Wide Maintenance</b>                                                                              |          |      |        |            |           |             |             |             |
| Litter Control (Check Trash Cans, Change Liners, Cleanup Around Receptacle)                                       | 1        | Each |        |            | 260       | 0.05        | \$33.5      | \$-         |
| Inspecting Park Signage                                                                                           | 1        | Each |        |            | 12        | 0.08        | \$33.5      | \$-         |
| Inspection of Security Lighting System, Poles and Base                                                            | 1        | Each |        |            | 4         | 0.25        | \$33.5      | \$-         |
| <b>1A Hardscape Vehicular</b>                                                                                     |          |      |        |            |           |             |             |             |
| Parking Lot Inspections/Pick Up                                                                                   | 1000     | SF   |        |            | 78        | 0.08        | \$33.5      | \$-         |
| Service Drive Inspection/Pickup                                                                                   | 1000     | SF   |        |            | 6         | 0.25        | \$33.5      | \$-         |
| <b>1B Hardscape Pedestrian + Bike</b>                                                                             |          |      |        |            |           |             |             |             |
| Application of Emergent Herbicides to Decomposed Granite Paths                                                    | 1000     | LF   |        |            | 4         | 0.17        | \$33.5      | \$-         |
| Inspection of Bike Stand                                                                                          | 1        | Each |        |            | 12        | 0.08        | \$33.5      | \$-         |
| <b>1C Softscape Natural</b>                                                                                       |          |      |        |            |           |             |             |             |
| N / A                                                                                                             |          |      |        |            |           |             |             |             |
| <b>1D Softscape Maintained</b>                                                                                    |          |      |        |            |           |             |             |             |
| Softscape General Inspections (Inspection of Hazardous Limbs, Insect/Disease, Fire Ants, Irrigation System, etc.) | 1        | Acre |        |            | 42        | 0.25        | \$33.5      | \$-         |
| Turf Care                                                                                                         |          |      |        |            |           |             |             |             |
| Turf Aeration                                                                                                     | 1        | Acre |        |            | 2         | 1.50        | \$33.5      | \$-         |
| Mowing                                                                                                            | 1        | Acre |        |            | 42        | 1.50        | \$33.5      | \$-         |
| Edging and Nylon Line Trimming                                                                                    | 1000     | LF   |        |            | 42        | 0.17        | \$33.5      | \$-         |
| Weeding and Weed Control Application                                                                              | 1        | Acre |        |            | 12        | 1.50        | \$33.5      | \$-         |
| Reseeding                                                                                                         | 1        | Acre |        |            | 6         | 1.50        | \$33.5      | \$-         |
| Application of Fertilizers                                                                                        | 1        | Acre |        |            | 2         | 1.50        | \$33.5      | \$-         |
| Native Grass and Wildflower Care                                                                                  |          |      |        |            |           |             |             |             |
| Mowing (after first year)                                                                                         | 1        | Acre |        |            | 2         | 2.00        | \$33.5      | \$-         |
| Weeding and Weed Control Application                                                                              | 1        | Acre |        |            | 12        | 2.50        | \$33.5      | \$-         |
| Tree and Shrub Care                                                                                               |          |      |        |            |           |             |             |             |
| Pruning (general, removal of sucker growth)                                                                       | 1        | Each |        |            | 2         | 0.17        | \$33.5      | \$-         |
| Fertilization of Trees                                                                                            | 1        | Each |        |            | 1         | 0.08        | \$33.5      | \$-         |
| Application of Mulch around base                                                                                  | 1        | CY   |        |            | 2         | 0.08        | \$33.5      | \$-         |
| Planting Beds                                                                                                     |          |      |        |            |           |             |             |             |
| Planting Bed Maintenance (weeding, trimming, deadheading, etc.)                                                   | 1000     | SF   |        |            | 42        | 0.17        | \$33.5      | \$-         |
| Planting Bed Fertilization                                                                                        | 1000     | SF   |        |            | 4         | 0.17        | \$33.5      | \$-         |
| Weeding (pre-emergent)                                                                                            | 1000     | SF   |        |            | 2         | 0.50        | \$33.5      | \$-         |
| Application of Mulch                                                                                              | 1000     | SF   |        |            | 2         | 0.25        | \$33.5      | \$-         |
| Application of Insecticides                                                                                       |          |      |        |            |           |             |             |             |
| Treatment of Plant Problems or Fire Ants                                                                          | 1        | Each |        |            | 6         | 0.08        | \$33.5      | \$-         |
| <b>1E Water Natural</b>                                                                                           |          |      |        |            |           |             |             |             |
| N / A                                                                                                             |          |      |        |            |           |             |             |             |



| Task                                                           | Quantity | Unit | Actual | Multiplier | Frequency | Labor Hours | Hourly Rate | Annual Cost |
|----------------------------------------------------------------|----------|------|--------|------------|-----------|-------------|-------------|-------------|
| <b>1F Water Maintained</b>                                     |          |      |        |            |           |             |             |             |
| Dry Detention: Mow Vegetation >18 inches in Height             | 1000     | SF   |        |            | 12        | 0.08        | \$33.5      | \$-         |
| Wet Ponds: Mow Perimeter Vegetation >18 Inches in Height       | 1000     | SF   |        |            | 12        | 0.08        | \$33.5      | \$-         |
| Remove Sediment Build-Up/Debris                                | 1000     | SF   |        |            | 12        | 0.50        | \$33.5      | \$-         |
| Reseeding of bare areas                                        | 1000     | SF   |        |            | 6         | 1.00        | \$33.5      | \$-         |
| Removal of Nuisance and Invasive Plants                        | 1000     | SF   |        |            | 6         | 0.25        | \$33.5      | \$-         |
| <b>1G Structures + Activity Nodes Utility Service</b>          |          |      |        |            |           |             |             |             |
| Restroom Maintenance / Inspections                             | 1        | Each |        |            | 365       | 0.50        | \$33.5      | \$-         |
| Skate Park Inspections/Sweeping and Debris clean up            | 1000     | SF   |        |            | 52        | 0.50        | \$33.5      | \$-         |
| Sports Courts Inspection/Sweeping and Debris clean up          | 1        | Each |        |            | 52        | 0.50        | \$33.5      | \$-         |
| Sand Volleyball Court Inspections/Sweeping and Debris clean up | 1        | Each |        |            | 52        | 0.50        | \$33.5      | \$-         |
| Electrical Hookup Inspection for Trailers                      | 1        | Each |        |            | 52        | 0.08        | \$33.5      | \$-         |
| Water Play Features Inspection                                 | 1        | Each |        |            | 214       | 0.08        | \$33.5      | \$-         |
| Drinking Fountain Inspections                                  | 1        | Each |        |            | 214       | 0.08        | \$33.5      | \$-         |
| <b>1H Structures + Activity Nodes No Utility Service</b>       |          |      |        |            |           |             |             |             |
| Art Installation                                               | 1        | Each |        |            | 1         | 1.00        | \$33.5      | \$-         |
| Flag Poles (Inspecting the Ropes, Flags, Cables)               | 1        | Each |        |            | 12        | 0.25        | \$33.5      | \$-         |
| Inspection of Playground/Fitness Stop Equipment                | 1        | Each |        |            | 365       | 1.00        | \$33.5      | \$-         |
| Pavilion Inspection and Cleaning                               | 1        | Each |        |            | 156       | 0.50        | \$33.5      | \$-         |
| Inspection of Benches                                          | 1        | Each |        |            | 365       | 0.08        | \$33.5      | \$-         |

## LEVEL 2 MAINTENANCE

| Task                                                                                                              | Quantity | Unit | Actual | Multiplier | Frequency | Labor Hours | Hourly Rate | Annual Cost |
|-------------------------------------------------------------------------------------------------------------------|----------|------|--------|------------|-----------|-------------|-------------|-------------|
| <b>General Maintenance</b>                                                                                        |          |      |        |            |           |             |             |             |
| Litter Control (Check Trash Cans, Change Liners, Cleanup Around Receptacle)                                       | 1        | Each |        |            | 260       | 0.05        | \$33.5      | \$-         |
| Inspecting Park Signage                                                                                           | 1        | Each |        |            | 12        | 0.08        | \$33.5      | \$-         |
| Inspection of Security Lighting System, Poles and Base                                                            | 1        | Each |        |            | 4         | 0.25        | \$33.5      | \$-         |
| <b>2A Hardscape Vehicular</b>                                                                                     |          |      |        |            |           |             |             |             |
| Parking Lot Inspections/Pick Up                                                                                   | 1000     | SF   |        |            | 52        | 0.08        | \$33.5      | \$-         |
| Service Drive Inspection/Pickup                                                                                   | 1000     | SF   |        |            | 4         | 0.25        | \$33.5      | \$-         |
| <b>2B Hardscape Pedestrian + Bike</b>                                                                             |          |      |        |            |           |             |             |             |
| Inspections of Walkways/Cleaning                                                                                  | 1000     | LF   |        |            | 52        | 0.08        | \$33.5      | \$-         |
| Inspections of Bike Stands                                                                                        | 1        | Each |        |            | 12        | 0.08        | \$33.5      | \$-         |
| <b>2C Softscape Natural</b>                                                                                       |          |      |        |            |           |             |             |             |
| Tree Inspection (for safety)                                                                                      | 1        | Acre |        |            | 2         | 0.25        | \$33.5      | \$-         |
| <b>2D Softscape Maintained</b>                                                                                    |          |      |        |            |           |             |             |             |
| Softscape General Inspections (Inspection of Hazardous Limbs, Insect/Disease, Fire Ants, Irrigation System, etc.) | 1        | Acre |        |            | 26        | 0.25        | \$33.5      | \$-         |
| <b>Turf Care</b>                                                                                                  |          |      |        |            |           |             |             |             |
| Turf Aeration                                                                                                     | 1        | Acre |        |            | 1         | 2.00        | \$33.5      | \$-         |
| Mowing                                                                                                            | 1        | Acre |        |            | 30        | 2.00        | \$33.5      | \$-         |
| Weeding and Weed Control Application                                                                              | 1        | Acre |        |            | 12        | 2.50        | \$33.5      | \$-         |
| Reseeding                                                                                                         | 1        | Acre |        |            | 2         | 2.50        | \$33.5      | \$-         |
| Application of Fertilizers                                                                                        | 1        | Acre |        |            | 1         | 2.00        | \$33.5      | \$-         |
| <b>Native Grass and Wildflower Care</b>                                                                           |          |      |        |            |           |             |             |             |
| Mowing (after first year)                                                                                         | 1        | Acre |        |            | 2         | 2.00        | \$33.5      | \$-         |
| Weeding and Weed Control Application                                                                              | 1        | Acre |        |            | 12        | 2.50        | \$33.5      | \$-         |
| <b>Tree and Shrub Care</b>                                                                                        |          |      |        |            |           |             |             |             |
| Pruning (general, removal of sucker growth)                                                                       | 1        | Each |        |            | 1         | 0.17        | \$33.5      | \$-         |
| Application of Mulch around base                                                                                  | 1        | CY   |        |            | 2         | 0.08        | \$33.5      | \$-         |
| <b>Planting Beds</b>                                                                                              |          |      |        |            |           |             |             |             |
| Planting Bed Maintenance (weeding, trimming, deadheading, etc.)                                                   | 1000     | SF   |        |            | 26        | 0.17        | \$33.5      | \$-         |
| Planting Bed Fertilization                                                                                        | 1000     | SF   |        |            | 2         | 0.17        | \$33.5      | \$-         |
| Weeding (pre-emergent)                                                                                            | 1000     | SF   |        |            | 2         | 0.25        | \$33.5      | \$-         |
| Application of Mulch                                                                                              | 1000     | SF   |        |            | 1         | 0.25        | \$33.5      | \$-         |
| <b>Application of Insecticides</b>                                                                                |          |      |        |            |           |             |             |             |
| Treatment of Plant Problems or Fire Ants                                                                          | 1        | Each |        |            | 4         | 0.08        | \$33.5      | \$-         |
| <b>Decomposed Granite and Mulch Paths</b>                                                                         |          |      |        |            |           |             |             |             |
| Emergent Herbicides Application                                                                                   | 1000     | SF   |        |            | 4         | 0.08        | \$33.5      | \$-         |
| <b>2E Water Natural</b>                                                                                           |          |      |        |            |           |             |             |             |
| N / A                                                                                                             |          |      |        |            |           |             |             |             |

| Task                                                        | Quantity | Unit | Actual | Multiplier | Frequency | Labor Hours | Hourly Rate | Annual Cost |
|-------------------------------------------------------------|----------|------|--------|------------|-----------|-------------|-------------|-------------|
| <b>2F Water Maintained</b>                                  |          |      |        |            |           |             |             |             |
| Dry Detention: Mow Vegetation >18 inches in Height          | 1000     | SF   |        |            | 12        | 0.08        | \$33.5      | \$-         |
| Wet Ponds: Mow Perimeter Vegetation >18 Inches in Height    | 1000     | SF   |        |            | 12        | 0.08        | \$33.5      | \$-         |
| Remove Sediment Build-up/Debris                             | 1000     | SF   |        |            | 12        | 0.25        | \$33.5      | \$-         |
| Removal of Nuisance and Invasive Plants                     | 1000     | SF   |        |            | 6         | 0.25        | \$33.5      | \$-         |
| Inspections/Removal of Trash (rain garden/bioswale)         | 1000     | SF   |        |            | 26        | 0.17        | \$33.5      | \$-         |
| Inspections for Dead/Diseased Plants (rain garden/bioswale) | 1000     | SF   |        |            | 26        | 0.17        | \$33.5      | \$-         |
| <b>2G Structures + Activity Nodes Utility Service</b>       |          |      |        |            |           |             |             |             |
| Restroom Maintenance / Inspections                          | 1        | Each |        |            | 260       | 0.50        | \$33.5      | \$-         |
| Water Play Features Inspection                              | 1        | Each |        |            | 214       | 0.08        | \$33.5      | \$-         |
| Drinking Fountain Inspections                               | 1        | Each |        |            | 214       | 0.08        | \$33.5      | \$-         |
| <b>2H Structures + Activity Nodes No Utility Service</b>    |          |      |        |            |           |             |             |             |
| Art Installation                                            | 1        | Each |        |            | 1         | 1.00        | \$33.5      | \$-         |
| Amphitheater Inspection                                     | 1        | Each |        |            | 104       | 0.25        | \$33.5      | \$-         |
| Amphitheater Power Wash Floor                               | 1000     | SF   |        |            | 12        | 0.17        | \$33.5      | \$-         |
| Flag Pole Inspections (Ropes, Flags, Cables, etc.)          | 1        | Each |        |            | 12        | 0.25        | \$33.5      | \$-         |
| Disk Golf Maintenance Mowing                                | 1000     | SF   |        |            | 18        | 0.08        | \$33.5      | \$-         |
| Disk Golf Path Inspections                                  | 1000     | LF   |        |            | 4         | 0.25        | \$33.5      | \$-         |
| Inspection of Playground Equipment/Fitness Stops            | 1        | Each |        |            | 52        | 0.50        | \$33.5      | \$-         |
| Pavilion Inspection and Cleaning                            | 1        | Each |        |            | 52        | 0.50        | \$33.5      | \$-         |
| Bench Inspection                                            | 1        | Each |        |            | 12        | 0.08        | \$33.5      | \$-         |

## LEVEL 3 MAINTENANCE

| Task                                                                                   | Quantity | Unit | Actual | Multiplier | Frequency | Labor Hours | Hourly Rate | Annual Cost |
|----------------------------------------------------------------------------------------|----------|------|--------|------------|-----------|-------------|-------------|-------------|
| <b>General Maintenance</b>                                                             |          |      |        |            |           |             |             |             |
| Litter Pickup Around Trailheads                                                        | 1000     | SF   |        |            | 12        | 0.08        | \$33.5      | \$-         |
| Litter Control (Check Trash Cans, Change Liners, Cleanup Around Receptacle)            | 1        | Each |        |            | 52        | 0.05        | \$33.5      | \$-         |
| Inspecting Park Signage                                                                | 1        | Each |        |            | 12        | 0.08        | \$33.5      | \$-         |
| Inspection of Security Lighting System, Poles and Base                                 | 1        | Each |        |            | 4         | 0.25        | \$33.5      | \$-         |
| Patrolling for illegal campsites                                                       | 1        | Acre |        |            | 1         | 0.50        | \$33.5      | \$-         |
| <b>3A Hardscape Vehicular</b>                                                          |          |      |        |            |           |             |             |             |
| Parking Lot Inspections/Pick Up                                                        | 1000     | SF   |        |            | 52        | 0.08        | \$33.5      | \$-         |
| Service Drive Inspection/Pickup                                                        | 1000     | SF   |        |            | 4         | 0.25        | \$33.5      | \$-         |
| <b>3B Hardscape Pedestrian + Bike</b>                                                  |          |      |        |            |           |             |             |             |
| Inspections of Walkways/Cleaning                                                       | 1000     | LF   |        |            | 12        | 0.08        | \$33.5      | \$-         |
| Inspections of Bike Stands                                                             | 1        | Each |        |            | 12        | 0.08        | \$33.5      | \$-         |
| <b>3C Softscape Natural</b>                                                            |          |      |        |            |           |             |             |             |
| N / A                                                                                  |          |      |        |            |           |             |             |             |
| <b>3D Softscape Maintained (around trailheads)</b>                                     |          |      |        |            |           |             |             |             |
| Inspection of Hazardous Limbs and Insect/Disease on trees and shrubs, Fire Ants, etc.) | 1000     | SF   |        | 0          | 26        | 0.25        | \$33.5      | \$-         |
| Emergent Herbicides Application                                                        | 1000     | SF   |        | 0          | 4         | 0.17        | \$33.5      | \$-         |
| Mowing                                                                                 | 1000     | SF   |        | 0          | 26        | 0.17        | \$33.5      | \$-         |
| <b>3E Water Natural</b>                                                                |          |      |        |            |           |             |             |             |
| N / A                                                                                  |          |      |        |            |           |             |             |             |
| <b>3F Water Maintained</b>                                                             |          |      |        |            |           |             |             |             |
| N / A                                                                                  |          |      |        |            |           |             |             |             |
| <b>3G Structures + Activity Nodes Utility Service</b>                                  |          |      |        |            |           |             |             |             |
| Drinking Fountain Inspections                                                          | 1        | Each |        |            | 214       | 0.08        | \$33.5      | \$-         |
| <b>3H Structures + Activity Nodes No Utility Service</b>                               |          |      |        |            |           |             |             |             |
| Art Installation                                                                       | 1        | Each |        |            | 1         | 1.00        | \$33.5      | \$-         |
| Flag Poles (Inspecting the Ropes, Flags, Cables)                                       | 1        | Each |        |            | 12        | 0.25        | \$33.5      | \$-         |
| Inspection of Playground/Fitness Stop Equipment                                        | 1        | Each |        |            | 12        | 0.25        | \$33.5      | \$-         |
| Inspection of Benches                                                                  | 1        | Each |        |            | 12        | 0.08        | \$33.5      | \$-         |

## APPENDIX C - EXAMPLE MAINTENANCE BID SHEETS

### LEVEL 1 MAINTENANCE BID TAB (EXAMPLE)

| Item Number | Approx. Quantity Unit | Description of Item                                            | Unit Cost | Total Amount |
|-------------|-----------------------|----------------------------------------------------------------|-----------|--------------|
|             |                       | <b>Level 1 Area Wide Maintenance</b>                           |           |              |
|             | Each                  | Trash Cans, Recycling Receptacles and Pet Waste Receptacles    |           |              |
|             | Each                  | Park Signage                                                   |           |              |
|             | Each                  | Guard Rails                                                    |           |              |
|             | Each                  | Security Lights                                                |           |              |
|             | SF/LF/Each            | Additional Item Specific to Space                              |           |              |
|             |                       | <b>1A Hardscape Vehicular</b>                                  |           |              |
|             | SF                    | Parking Lot Area                                               |           |              |
|             | SF                    | Service Drive Area                                             |           |              |
|             | SF/LF/Each            | Additional Item Specific to Space                              |           |              |
|             |                       | <b>1B Hardscape Pedestrian + Bike</b>                          |           |              |
|             | LF                    | Non-porous Sidewalks or Walkways                               |           |              |
|             | SF                    | Non-porous Seating Areas                                       |           |              |
|             | Each                  | Bike Stands                                                    |           |              |
|             | SF/LF/Each            | Additional Item Specific to Space                              |           |              |
|             |                       | <b>1C Softscape Natural</b>                                    |           |              |
|             | -                     | N/A                                                            |           |              |
|             |                       | <b>1D Softscape Maintained</b>                                 |           |              |
|             | SF                    | Softscape General Inspections                                  |           |              |
|             | SF                    | Turf Care                                                      |           |              |
|             | SF                    | Native Grass and Wildflower Care                               |           |              |
|             | Each                  | Tree and Shrub Care                                            |           |              |
|             | SF                    | Planting Beds                                                  |           |              |
|             | LF                    | Emergent Herbicides Application (for Decomposed Granite Paths) |           |              |
|             | Lump Sum              | Fire Ant Insecticide                                           |           |              |
|             | Lump Sum              | Irrigation System                                              |           |              |
|             | Lump Sum              | Hardwood Mulch                                                 |           |              |
|             | SF/LF/Each            | Additional Item Specific to Space                              |           |              |
|             |                       | <b>1E Water Natural</b>                                        |           |              |
|             |                       | N / A                                                          |           |              |
|             |                       | <b>1F Water Maintained</b>                                     |           |              |
|             | SF                    | Dry Detention                                                  |           |              |
|             | SF                    | Wet Pond                                                       |           |              |
|             | SF                    | Rain Garden/Filter Strips                                      |           |              |

| Item Number | Approx. Quantity Unit | Description of Item                  | Unit Cost | Total Amount |
|-------------|-----------------------|--------------------------------------|-----------|--------------|
|             |                       | <b>1G Structures + Activity Node</b> |           |              |
|             | Each                  | Restroom Maintenance / Inspections   |           |              |
|             | Each                  | Skate Park + Parkour                 |           |              |
|             | Each                  | Sports Court                         |           |              |
|             | Each                  | Concession Area                      |           |              |
|             | Each                  | Water Play Features Inspection       |           |              |
|             | Each                  | Drinking Fountain Inspections        |           |              |
|             | SF/LF/Each            | Additional Item Specific to Space    |           |              |
|             |                       | <b>1H Structures + Activity Node</b> |           |              |
|             | Each                  | Art Installation                     |           |              |
|             | SF                    | Amphitheater Area                    |           |              |
|             | Each                  | Flag Poles                           |           |              |
|             | Each                  | Playground Equipment/Fitness Stops   |           |              |
|             | Each                  | Pavilions                            |           |              |
|             | Each                  | Benches and Picnic Benches           |           |              |
|             | SF/LF/Each            | Additional Item Specific to Space    |           |              |

## LEVEL 2 MAINTENANCE BID TAB (EXAMPLE)

| Item Number | Approx. Quantity Unit | Description of Item                                            | Unit Cost | Total Amount |
|-------------|-----------------------|----------------------------------------------------------------|-----------|--------------|
|             |                       | <b>Level 2 Area Wide Maintenance</b>                           |           |              |
|             | Each                  | Trash Cans, Recycling Receptacles and Pet Waste Receptacles    |           |              |
|             | Each                  | Park Signage                                                   |           |              |
|             | Each                  | Guard Rails                                                    |           |              |
|             | Each                  | Security Lights                                                |           |              |
|             | SF/LF/Each            | Additional Item Specific to Space                              |           |              |
|             |                       | <b>2A Hardscape Vehicular</b>                                  |           |              |
|             | SF                    | Parking Lot Area                                               |           |              |
|             | SF                    | Service Drive Area                                             |           |              |
|             | SF/LF/Each            | Additional Item Specific to Space                              |           |              |
|             |                       | <b>2B Hardscape Pedestrian + Bike</b>                          |           |              |
|             | LF                    | Non-porous Sidewalks or Walkways                               |           |              |
|             | SF                    | Non-porous Seating Areas                                       |           |              |
|             | Each                  | Bike Stands                                                    |           |              |
|             | SF/LF/Each            | Additional Item Specific to Space                              |           |              |
|             |                       | <b>2C Softscape Natural</b>                                    |           |              |
|             | Lump Sum              | Tree Inspection (for safety)                                   |           |              |
|             | SF/LF/Each            | Additional Item Specific to Space                              |           |              |
|             |                       | <b>2D Softscape Maintained</b>                                 |           |              |
|             | SF                    | Softscape General Inspections                                  |           |              |
|             | SF                    | Turf Care                                                      |           |              |
|             | SF                    | Native Grass and Wildflower Care                               |           |              |
|             | Each                  | Tree and Shrub Care                                            |           |              |
|             | SF                    | Planting Beds                                                  |           |              |
|             | LF                    | Emergent Herbicides Application (for Decomposed Granite Paths) |           |              |
|             | Lump Sum              | Fire Ant Insecticide                                           |           |              |
|             | Lump Sum              | Irrigation System                                              |           |              |
|             | Lump Sum              | Hardwood Mulch                                                 |           |              |
|             | SF/LF/Each            | Additional Item Specific to Space                              |           |              |
|             |                       | <b>2E Water Natural</b>                                        |           |              |
|             |                       | N / A                                                          |           |              |
|             |                       | <b>2F Water Maintained</b>                                     |           |              |
|             | SF                    | Dry Detention                                                  |           |              |
|             | SF                    | Wet Ponds                                                      |           |              |
|             | SF                    | Rain Garden/Filter Strips                                      |           |              |
|             | SF/LF/Each            | Additional Item Specific to Space                              |           |              |

| Item Number | Approx. Quantity Unit | Description of Item                  | Unit Cost | Total Amount |
|-------------|-----------------------|--------------------------------------|-----------|--------------|
|             |                       | <b>2G Structures + Activity Node</b> |           |              |
|             | Each                  | Restroom Maintenance / Inspections   |           |              |
|             | Each                  | Water Play Features Inspection       |           |              |
|             | Each                  | Drinking Fountain Inspections        |           |              |
|             | SF/LF/Each            | Additional Item Specific to Space    |           |              |
|             |                       | <b>2H Structures + Activity Node</b> |           |              |
|             | Each                  | Art Installation                     |           |              |
|             | SF                    | Amphitheater Area                    |           |              |
|             | Each                  | Bird Blinds                          |           |              |
|             | Each                  | Flag Poles                           |           |              |
|             | SF                    | Disk Golf Course                     |           |              |
|             | Each                  | Playground Equipment/Fitness Stops   |           |              |
|             | Each                  | Pavilions                            |           |              |
|             | Each                  | Benches and Picnic Benches           |           |              |
|             | SF/LF/Each            | Additional Item Specific to Space    |           |              |



## LEVEL 3 MAINTENANCE BID TAB (EXAMPLE)

| Item Number | Approx. Quantity Unit | Description of Item                                            | Unit Cost | Total Amount |
|-------------|-----------------------|----------------------------------------------------------------|-----------|--------------|
|             |                       | <b>Level 3 Area Wide Maintenance</b>                           |           |              |
|             | Each                  | Trash Cans, Recycling Receptacles and Pet Waste Receptacles    |           |              |
|             | Each                  | Park Signage                                                   |           |              |
|             | Each                  | Guard Rails                                                    |           |              |
|             | Each                  | Security Lights                                                |           |              |
|             | SF/LF/Each            | Additional Item Specific to Space                              |           |              |
|             |                       | <b>2A Hardscape Vehicular</b>                                  |           |              |
|             | SF                    | Parking Lot Area                                               |           |              |
|             | SF                    | Service Drive Area                                             |           |              |
|             | SF/LF/Each            | Additional Item Specific to Space                              |           |              |
|             |                       | <b>2B Hardscape Pedestrian + Bike</b>                          |           |              |
|             | LF                    | Non-porous Sidewalks or Walkways                               |           |              |
|             | SF                    | Non-porous Seating Areas                                       |           |              |
|             | Each                  | Bike Stands                                                    |           |              |
|             | SF/LF/Each            | Additional Item Specific to Space                              |           |              |
|             |                       | <b>2C Softscape Natural</b>                                    |           |              |
|             | -                     | N/A                                                            |           |              |
|             |                       | <b>2D Softscape Maintained</b>                                 |           |              |
|             | Each                  | Softscape General Inspections around Trailheads                |           |              |
|             | LF                    | Emergent Herbicides Application (for Decomposed Granite Paths) |           |              |
|             | SF/LF/Each            | Additional Item Specific to Space                              |           |              |
|             |                       | <b>2E Water Natural</b>                                        |           |              |
|             |                       | N / A                                                          |           |              |
|             |                       | <b>2F Water Maintained</b>                                     |           |              |
|             |                       | N / A                                                          |           |              |
|             |                       | <b>2G Structures + Activity Node</b>                           |           |              |
|             | Each                  | Drinking Fountain Inspections                                  |           |              |
|             | SF/LF/Each            | Additional Item Specific to Space                              |           |              |
|             |                       | <b>2H Structures + Activity Node</b>                           |           |              |
|             | Each                  | Art Installation                                               |           |              |
|             | Each                  | Fitness Stops                                                  |           |              |
|             | Each                  | Benches                                                        |           |              |
|             | Each                  | Flag Poles                                                     |           |              |
|             | SF/LF/Each            | Additional Item Specific to Space                              |           |              |

## APPENDIX D - RECOMMENDED MAINTENANCE FOR WET PONDS IN THE CITY OF AUSTIN

### Recommended Maintenance for Wet Ponds in the City of Austin

John Gleason - City of Austin Watershed Protection and Development Review  
September 18, 2006

Wet ponds are water quality ponds that have a permanent pool of water. They are designed to capture and hold stormwater runoff to allow settling of suspended solids and removal of pollutants. The following recommendations expand on the maintenance criteria for wet ponds found in the City of Austin Environmental Criteria Manual, section 1.6.3. Design criteria for wet ponds are located in section 1.6.6 of the same document. Owners of a wet pond are required to carry out both short-term and long-term maintenance tasks.

- 1) **Landscape management:** Maintain a clean and attractive appearance to the wetland and adjacent landscape at all times.
  - a) Remove excess debris and litter on a regular basis (minimum every 3 months) from the pond area. Areas needing attention include pond side slopes, the water's edge, the pond inlet and outlet.
  - b) Maintain turf adjacent to the pond at regular intervals so that the height does not exceed 6". Mow at least 4 times a year to prevent woody growth and control weeds. Mowing more often may be required during periods of warm temperatures and high rainfall.
  - c) Exercise caution when using landscape or lawn chemicals in areas that drain to the wet pond. If weeds are a problem, manual removal is recommended. If herbicides are necessary, they should be used to spot-treat weeds, and never broadcast throughout the landscape (e.g. 'weed & feed'). A thick, well-maintained turf is the best approach to minimizing lawn weeds.
  - d) Prevent and control erosion at the pond slopes and embankment. Accumulation of sediment in the pond is the primary reason the pond will require intensive maintenance (See 4.b this document). Corrective measures such as regrading and revegetation will be necessary if erosion occurs.
- 2) **Pest management:** A 'least-toxic' approach should be used to treat pest infestations. This management method is often called integrated pest management, or IPM.
  - a) Remove invasive woody trees, such as Willows, that typically colonize the perimeter of the pond. These should be removed to prevent any potential future impact on the pond liner. Refer to the Table 1 for woody plants that often invade ponds. If the trees are small, physical removal by the roots is the desired treatment method. A tool called a tree wrench (or weed wrench) is an effective way to remove small trees without the use of chemicals. This tool is most effective when there is a hard surface against which the operator can gain leverage. Using some type of support in wet soils will help.
    - i) If physical removal of weed trees is impractical a herbicide may be necessary. To minimize the amount of chemical needed, cut off the top of the tree and treat the stump to prevent re-sprouting. 'Brush-B-Gone', Roundup, or similar products are sometimes used. In all cases, the herbicide shall contact the weeds only, and shall not impact adjacent desirable vegetation or contact nearby water.
    - ii) Do not use an herbicide if rainfall is expected within 48 hours, or if wind speed is greater than 8 miles per hour.

**Table 1. – Woody Plant Weed List**

| Common Name        | Botanical Name         | Weed Type        |
|--------------------|------------------------|------------------|
| Ash                | Fraxinus spp.          | Pond-edge tree   |
| Chinaberry         | Melia azedarach        | Pond-edge tree   |
| Chinese Tallow     | Sapium sebiferum       | Pond-edge tree   |
| Cottonwood         | Populus deltoides      | Pond-edge tree   |
| Giant Cane         | Arundo donax           | Tall woody grass |
| Mulberry           | Morus spp.             | Pond-edge tree   |
| Poison Ivy         | Toxicodendron radicans | Woody vine       |
| Rough-leaf Dogwood | Cornus Drummondii      | Pond-edge tree   |
| Willow             | Salix nigra            | Pond-edge tree   |

- b) The presence of algae in wet ponds is to be expected, however excessive algae growth should be managed. There should be a minimal use of fertilizers in the pond's drainage area, since stormwater runoff may transport the nutrients to the pond. Excess use of fertilizers will result in an overgrowth of algae. It is preferable that excess algae be removed through physical or manual methods. There are several practices that may help to minimize the growth of algae:
    - i) Algae growth may be minimized if the pond is well aerated. Aeration can be achieved through mechanical as well as biological methods. Fountains and underwater bubblers will not only oxygenate the water, they can physically break up algae growth as well. The use of submergent (underwater) plants is a low-cost natural way to aerate the pond.
    - ii) Shade helps to minimize algae growth. The use of floating-leaved plants (e.g. water lilies, etc.) can provide some shade. Be careful not to over-use these plants, since they spread quickly and may have undesirable aesthetic impacts.
    - iii) Consider using a microbial pond clarifier to achieve the desired results. These microbes are naturally occurring bacteria that break down organic matter and nutrients in the pond. They work best as a preventive technique for minimizing algal growth. An internet search is a good way to determine where such products are available. An herbicide shall not be used to treat excess algae.
  - c) Invasive aquatic plants, such as water hyacinth (*Eichornia crassipes*), must be removed if they appear. Cattails (*Typha* spp.) tend to invade most local wet ponds and aggressively colonize shallow water areas. While cattails are beneficial for water quality, an overabundance of the plants can be unhealthy for a pond; thus excessive quantities of cattail should be removed.
  - d) Mosquitoes are usually not a problem with wet ponds due to the presence of mosquito fish (*Gambusia affinis*). Mosquito fish are efficient predators of mosquito larvae, and are a requirement in wet ponds within the City of Austin. If mosquitoes become a problem on-site, survey the area for standing water where fish are not present. The use of a product with the active ingredient *Bacillus thuringiensis*, or B.t. (e.g. 'Mosquito Dunks') is a natural, although temporary, way to treat water for mosquito larvae.
  - e) Domestic waterfowl, such as ducks and geese, can destroy vegetation and increase pollutant loading in the pond and thus should not be introduced.
  - f) Fire ant infestations around a wet pond should be managed through the application of a bait insecticide. Treat only when fire ants are present.
- 3) **Water and pool management:** The pond shall remain at, or near, the permanent pool elevation, at all times throughout the year.
- a) Exercise care with the pond liner, which must remain intact for the pond to work correctly. Prevent tree roots, excavation or other elements from threatening the integrity of the liner.
  - b) If an extended drought causes excessive water loss in the pond, then water should be added to raise the level to the design elevation. This water is called 'make-up' water. If the make-up water is chlorinated then it should be added very slowly to allow dissipation and avoid high chlorine levels in the pond.
- 4) **Long-term maintenance:** Major maintenance is required infrequently, but is necessary for pond longevity and health.
- a) Structural repairs and replacement may be necessary as the pond ages. Pipes, including the inlet, outlet, and inter-basin pipe, may deteriorate over time. Inspect the following on an annual basis:
    - i) Inspect the pond side slopes for erosion
    - ii) Inspect all structural elements for damage and repair if necessary.
  - b) Remove sediment from the pond when sediment accumulation significantly reduces the storage capacity. Remove sediment if accumulation impairs functioning of the inlet or outlet structure.
    - i) The accumulation of sediment in the sediment forebay should be checked every three years. Remove the sediment if more than one-third of the forebay volume is lost.
    - ii) Check the sediment accumulation in the main pool every six years, and remove when 20% of the volume is lost.





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