



**Roxborough Village Metropolitan District
Parks and Open Space
Renovation Master Plan**

October, 2006



Acknowledgements

This master plan is the result of the Roxborough Village Metropolitan District Board's effort to develop a vision for the future of the District, and a strategy to implement that vision. In addition to the many residents of the District who provided input for the master plan, the individuals below made a substantial contribution by sharing their time, passion, insight, and thoughtful review.

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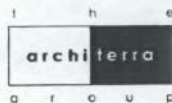
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INTRODUCTION

Purpose and Goals of the Plan

The Roxborough Village Metropolitan District (District) Parks and Open Space Renovation Master Plan (Plan) is a strategic guide toward renovating the parks and open space system for the District. The purpose of the Plan is to provide a vision that can be implemented over several years as site-specific park, open space, trail, and streetscape renovation projects take place. Ultimately, the goal of the Plan is to provide a park and open space system that better meets the needs and desires of District residents and at the same time provide facilities that are easier, more economical, and more efficient to maintain.

Specific goals of the Plan include:

- Provide an inventory and analysis of existing recreation facilities
- Provide an assessment of the District's park and open space needs
- Develop a Parks and Open Space Renovation Master Plan
- Develop an Implementation Plan

Limits of the Plan

The Plan will look at all parks, trails, and major streetscapes located in the District. This will include some properties that are not owned or managed by the District board. While the board may not control how some of the properties are managed, it is important to study the parks, trails, and streetscapes as a district-wide system. This will ultimately provide a more comprehensive and farther reaching plan for the residents of the District.

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Open Space and Natural Systems

Open space within the District can be classified in three basic categories: the Dakota Hogback, the Little Willow Creek drainage, and upland open areas. The open space areas provide wildlife habitat and recreation opportunities and are critical in providing a unique character and identity for the District. The Dakota Hogback provides a beautiful foreground for the views of the foothills from the District. Little Willow Creek runs generally north-south and collects almost all of the drainage from the District. With the trails along the creek, and the central location of the drainage through the District, the corridor is an important spine for bicycle and pedestrian circulation. The ponds, creek, wetlands, and associated riparian habitat afford beautiful views and provide a wonderful recreation amenity in the District. The other upland open areas are scattered throughout the District. Some of these simply provide open, undeveloped areas within the District, while other areas provide recreational opportunities and important trail links.

Landscape Features

Dakota Hogback

The sharp up thrust of the Dakota Hogback is part of a large geologic structure running from Larimer County south to El Paso County. This formation is a very recognizable upland corridor for wildlife on the west side of the District. Vegetative cover varies considerably along the hogback, from forested areas dominated by ponderosa pine along the crest to shrublands dominated by Gambel oak and grasslands on the lower slopes.



As a result of this vegetative cover, a large variety of wildlife uses the corridor by ground and by air. Some species known to occur along the hogback include mule deer, black bear, raptors, and mountain lion (rare sightings). Development along both sides of the hogback is quickly fragmenting this corridor in the immediate vicinity of the District.

Little Willow Creek

Little Willow Creek flows north out of an area near Roxborough State Park through the District and into the Highline Canal. Patches of sandbar willow and broadleaf cattail, two obligate wetland species, dominate areas of wetlands along Little Willow Creek. The overstory is dominated in some areas by peachleaf willow and plains cottonwood. Herbaceous species include reed canary-grass and curly dock.



Upland boundaries are often defined by the dominance of smooth brome. Although small and fragmented by surrounding development, the creek does provide a corridor for small mammals and habitat for songbirds and waterfowl.

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Small rodents with the potential to occur in wetland habitat along Little Willow Creek include deer mouse, prairie vole, meadow vole, house mouse, and western harvest mouse. Other mammals that occur or are likely to occur include coyote, red fox, striped skunk, beaver, and raccoon. All of these species probably frequent the wetland habitat or habitat along Little Willow Creek, although coyote may be more common in open areas. The Preble's meadow jumping mouse, which has been trapped along Little Willow Creek, is discussed below.



Federally Threatened and Endangered Species

Federally threatened and endangered species are protected under the Endangered Species Act (ESA) of 1973 as amended (16 U.S.C. 1531 et seq.). Significant adverse effects to a federally listed species or its habitat resulting from a project with a federal action (e.g., a 404 Permit) requires consultation with the U.S. Fish and Wildlife Service (Service) under Section 7 of the ESA. Two species, listed under the ESA, that potentially occur in the District are the bald eagle and Preble's meadow jumping mouse.

Bald Eagle

Species Background, Habitat Requirements and Distribution

The bald eagle is a large North American bird with a historical distribution throughout most of the U.S. The bald eagle was listed as an endangered species in 1978. Population declines are attributed to habitat loss, the use of organochlorine pesticides, and mortality from shooting. Since its listing, the population trend for the bald eagle has been increasing. The bald eagle was downlisted from endangered to threatened in 1995 and the Service is proposing to delist the bald eagle due to population recovery. If the bald eagle is removed from the list of threatened and endangered species, it will continue to be protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Bald eagles are primarily winter residents in Colorado, although nesting along the Colorado Front Range has increased in recent years. Most nesting in Colorado occurs near lakes, reservoirs, or along rivers. Typical bald eagle nesting habitat consists of forests or wooded areas that contain many tall, aged, dying and dead trees (Martell 1992).

Potential Habitat

Some of the larger cottonwood trees along Little Willow Creek or ponderosa pine on the Dakota Hogback provide potential perches for foraging bald eagles. In fact, bald eagles have been found nesting nearby along the High Line Canal. However, the District is not in an area with ideal winter roost sites or important foraging areas for bald eagles.

Recommendations

No known nesting or winter roost sites for bald eagles and no designated critical or essential bald eagle habitat are within the District. In general, no action is

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necessary in association with general management activities. Projects with a federal action (e.g., 404 Permit) would require consultation with the Service under Section 7 of the ESA.

Preble's Meadow Jumping Mouse

Species Background, Habitat Requirements and Distribution

Preble's meadow jumping mouse is listed as threatened under the ESA. Along Colorado's Front Range, the Preble's meadow jumping mouse (Preble's) is found below 7,800 feet in elevation, generally in lowlands with medium to high moisture along permanent or intermittent streams. Preble's typically inhabits areas characterized by well-developed plains riparian vegetation with relatively undisturbed grassland and a water source in close proximity (Armstrong et al. 1997). Recent studies have suggested that Preble's may have a wider ecological tolerance than previously thought, and that the requirement for diverse vegetation and well-developed cover can be met under a variety of circumstances (Meaney et al. 1997). Radio-tracking studies conducted by the Colorado Division of Wildlife (CDOW) have documented Preble's using upland habitat adjacent to wetlands and riparian areas (Shenk and Sivert 1999). Additional research by CDOW has suggested that habitat quality for Preble's can be predicted by the amount of shrub cover available at a site (White and Shenk 2000).

Potential Habitat

In addition to being captured just north of Village Circle West, Preble's has been captured upstream of the District on Little Willow Creek in Roxborough State Park and downstream along the South Platte River in Chatfield State Park. The capture locations indicate that dispersing Preble's could use Little Willow Creek as a movement corridor. Potential Preble's habitat in the District consists of upland grasslands adjacent to the floodplain and riparian/wetlands in and adjacent to the Little Willow Creek channel. The upland areas would likely be used for occasional to frequent foraging, while the riparian/willow areas would likely be used for resting, foraging, and breeding. In general, the Preble's habitat in the District is low to moderate quality. Based on current Service guidelines for Preble's, generally a setback of 300 feet from the edge of the 100-year floodplain of a perennial stream is considered potential Preble's habitat (Service 1999).

Recommendations

In general, no action is necessary in association with current management activities such as mowing existing manicured areas. If mowing operations are slated to expand beyond what has historically been mowed, the District should consult with the Service. In addition, any new construction or renovation projects occurring within the above stated 300' setback from the 100 year floodplain would require consultation with the Service.

Rare Plants and Plant Communities

No rare plants or plant communities have been identified by the Colorado Natural Heritage Program in the District.

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Noxious Weeds

Noxious weeds threaten native plant communities and species diversity by displacing desirable native species. Alien plants that are highly invasive usually do not have natural pathogens and predators to keep their populations under control. Some non-natives, such as diffuse knapweed (*Acosta diffusa*), contain allelopathic chemicals that can suppress the growth of other species and allow diffuse knapweed to grow in single-species stands.

Noxious weeds observed or reported in the District's open space appear in Table 1. All of the species in Table 1 pose a significant threat to native communities and potential restoration efforts in the District.

Table 1. Noxious weeds observed or reported in the District's open space.

Scientific Name	Common Name
<i>Acosta diffusa</i>	Diffuse knapweed ²
<i>Cirsium arvensis</i>	Canada thistle ²
<i>Conium maculatum</i>	Poison hemlock ³
<i>Eleagnus angustifolia</i>	Russian olive ³
<i>Euphorbia esula</i>	Leafy spurge ^{1,2}
<i>Onopordum acanthium</i>	Scotch thistle ²

¹Reported in the District's open space, but not observed during the field visit.

²List B species designated to be contained and suppressed by Douglas County.

³List B species to be monitored and managed as funds are available.

The authority and responsibility to formulate and implement a Noxious Weed Management Plan comes from Colorado Revised Statutes 35-5.5-101 et. seq., and the Colorado Weed Management Act (Act). The Act identifies both statewide and countywide noxious weeds and obligates all Colorado counties to use Integrated Weed Management (IWM) techniques to control them (Table 2). When used together, these techniques are the least harmful and most beneficial methods for weed control.

Table 2. Integrated weed management techniques.

Technique	Definition
Mechanical	Physical removal by mowing, mulching, tilling, prescribed burning, grazing or hand pulling.
Cultural	Enhancement of the native plant community using fertility management or re-vegetation.
Biological	Releasing a weed's native natural enemies using insects, grazing animals or disease.
Chemical	Destroying weeds using herbicides that do not adversely affect the desired plant community.

Integrated weed management is a decision-making process that selects, integrates, and implements control methods to prevent or manage noxious weeds (Table 2). It focuses on long-term prevention or suppression of undesirable species while reducing the impact that control techniques may have on the environment, human health, and non-target plants and animals.

The spread of noxious weeds has often been termed a biological wildfire. As with wildfire, the most important part of a noxious weed management program is early detection and prevention. Areas such as road shoulders and trail corridors should be surveyed

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annually to find new infestations. Infestations should be removed before they become well established. The District also should note noxious weeds along open space boundaries and on adjacent property and notify the appropriate landowners or managers about problem plants.

Prevention will have the most significant long-term benefit for the District's open space and surrounding areas. Vigorous and consistent prevention reduces the opportunities for dispersal of noxious weeds, which, in turn, minimizes the need for future control actions. Prevention is proactive rather than reactive, and is the most cost-effective management action considered in this section. Restoring and maintaining healthy plant communities and reducing human impacts and use patterns also can prevent noxious weed invasion.

Weed management is potentially the most serious management issue the District faces in its open space. Noxious weed management should be integrated into every aspect of land management.

Streetscapes

There are three main streetscapes in the District: Rampart Range Road, Village Circle West, and Village Circle East. Rampart Range Road bisects the District north-south and is the primary access road for the District. Village Circle East and Village Circle West create a large loop road through the District. Almost all of the neighborhoods in the District are accessed by this loop road.

Specific Streetscapes

Rampart Range Road

Rampart Range Road is a four-lane road that serves as the main entrance to the District both from the north and the south. Most people will typically enter the District from the north. There are medians at the north end of Rampart Range Road. The medians are bermed and planted with irrigated bluegrass turf and mature shade trees and pine trees.



The median on Rampart Range Road

The east side of the road is primarily bordered by open space and dryland grasses. This includes open space outside the District on the north and south ends, and the linear piece of open space between the two intersections with Village Circle East. North of Village Circle East, there is a strip of irrigated bluegrass and trees adjacent to the road. There are no trails or sidewalks directly adjacent to Rampart Range Road on the east side, except for a 4' detached sidewalk near the south intersection with Village Circle East. The trail then separates from the road and while it continues to parallel Rampart Range Road, it is far enough from the road to feel separate from the streetscape.



Views along the east side of Rampart Range Road

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Views on the west side of Rampart Range Road

On the west, there are numerous land uses adjacent to Rampart Range Road. These include commercial businesses, open space, Roxborough Village Community Park, and residential areas. The landscape treatment along the west side of the road varies and includes irrigated bluegrass, dryland grasses, and gravel mulch. There is a trail along Rampart Range Road from the intersection with Waterton Road south to the north intersection with Village Circle West. There is also a trail along Rampart Range Road at the north and south ends of the street, but as described later in the trails section, there is no trail along the middle portion of the street.

In general there is no unified design along the entire streetscape. There is no contiguous pathway for bicycle and pedestrian traffic. The lack of a consistent landscape treatment within the right-of-way gives the street a disorganized and non-descript appearance. There is no definitive “entry” to the District either from the north or the south.

Village Circle West

Village Circle West is a two-lane loop road on the west side of Rampart Range Road that provides access to most of the residential neighborhoods on the west side of Rampart Range Road. Village Circle West provides access to some of the older neighborhoods in the District and therefore has more mature trees along the streetscape. Village Circle West also provides access to Roxborough Elementary School.

There are several land uses along the road, but a majority of the road is bordered by residential areas and open space. There is a trail along the entire east side of Village Circle West. As described later in the trails section, this is one of the main trails in the District. There is a small portion of trail along the west side of the road just west of Little Willow Creek, but there are no other trails on the west side of the street.

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Along both sides of the street there are multiple kinds of fencing along the boundary of the residential property. These include multiple varieties of 6' high wooden privacy fence and an open ranch style fence. These fences are a visually significant part of the streetscape. Most of the fencing along Village Circle West is 6' high privacy fencing, with the ranch style fence being located on the south end of the street. In general, the 6' high privacy fences are older and are in poor condition, and the ranch style fences are newer and in good condition. The developer installed the privacy fencing when the neighborhoods were first built. The fencing is on the homeowner's property and is privately owned by the individual homeowners. Any fencing repair or replacement is the responsibility of each homeowner. Therefore, the District cannot control the condition of the fencing, or what type of fencing is installed if homeowners elect to replace their fencing.



There are multiple types of fencing along Village Circle West

On the west side of the street, there are two basic landscape treatments. Where residential areas are adjacent to the street, there is a 6' high wooden privacy fence along the road located 5' to 6' away from the curb. Between the curb and fence is irrigated bluegrass turf with mature trees. Where residential areas are not adjacent to the road, there is open space and dryland grasses. These grasses are mowed within about 5' of the curb.



Views along the west side of Village Circle West

On the east side of the street there are three basic landscape treatments. Where residential areas are adjacent to the street, there is a 6' high wooden privacy fence along the street located 15'-20' from the curb. The trail along the road runs through this area. The areas on both sides of the trail are planted with irrigated bluegrass with trees. On the south end of the road, however, the landscape areas on both sides of the trail are covered with gravel mulch and planted with trees. Where there is open space on the east side of the trail, the space between the curb and trail is generally planted with irrigated bluegrass lawn with trees.



Views along the east side of Village Circle West

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The multiple landscape and fence treatments give the streetscape a disorganized appearance. As discussed in more detail in the irrigation portion of the plan, the narrow irrigated bluegrass areas are inefficient. In addition, they portray an image more of typical suburbia rather than a community surrounded by the unique landscape where the plains meet the foothills.

Village Circle East

Village Circle East is a two-lane road that provides access to all of the residential neighborhoods on the east side of Rampart Range Road. Village Circle East is the newest of the main roads in the District and therefore has smaller, younger trees along the streetscape.

There are two land uses along the road. Residential areas border a majority of the road, however, there is some open space adjacent to the road as well. There is a trail along the entire east side of Village Circle East. As described in the trails section, this is one of the main trails in the District. There is a trail on the southern half of the west side of the road from the south intersection with Rampart Range Road to Elmwood Street. Both of these trails are generally separated from the curb by approximately 4 feet, however there are areas where they are attached to the curb.

There are multiple kinds of fencing along the boundary of the residential property. These include multiple varieties of 6' high wooden privacy fence and an open ranch style fence. Again, these fences are a visually significant part of the streetscape. The majority of the fencing is the ranch style fence which is located along the entire east side of the street, and along the entire southern half of the west side of the street. The 6' high privacy fencing is located along the west side of the north end of the street. The fences vary from about 3' to 50' from the curb. In general, the 6' high privacy fences are older and are in poor condition, and the ranch style fences are newer and in good condition.

On the west side of the street there are several landscape treatments. Along much of the road, the landscape areas adjacent to the trail are irrigated turf with trees. On the south end of Village Circle East the landscape area between the



Views along the west side of Village Circle East

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sidewalk and the curb is planted with trees and shrubs, and is covered with cobble mulch. On the north half of the road where there is no trail adjacent to the road, the landscape treatment between the curb and the fence varies from irrigated blue grass, to gravel mulch, to open space.

There are also multiple landscape treatments on the east side of the Village Circle East. There is open space and dryland grasses adjacent to the road at the north and south ends of the street. Where there are residential areas adjacent to the street, there are three different landscape treatments between the curb and the fence along the private property: irrigated bluegrass with shrub beds and trees, gravel mulch with no plantings, and dryland grasses with trees and shrub beds.



Views along the west side of Village Circle East

As with Village Circle West there are multiple landscape treatments that give the streetscape a disorganized appearance. As discussed in more detail in the irrigation portion of the plan, the irrigated bluegrass areas represent an unnecessary and in some cases inefficient use of water. Again, they portray an image more of typical suburbia rather than a community surrounded by the unique landscape where the plains meet the foothills.

Entry Monumentation

There are many entry signs throughout the District. The size, materials, and designs of these signs vary greatly. Neighborhoods with entry signs include: Roxborough Village, Chatfield Farms, Chatfield Farms West, Arrowhead Shores, Red Mesa Roxborough Ridge, and Blue Mesa Roxborough Ridge. Materials include stucco, buff colored stone veneer, red colored stone veneer, and slabs of red stone. The condition of the signs varies, but in general, the newer signs are in good condition, and the older signs are in poor to moderate condition.

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Conclusion

The three main streetscapes in the District provide good vehicular and pedestrian circulation throughout the District. However, there is no sense of entry into the District, and no specific character for the District is consistently expressed in the streetscapes. The poor condition of some of the fencing detracts from the visual potential of the streetscape. There is an opportunity to unify the streetscapes and provide a unique identity for the in the District by adopting a uniform landscape and fence treatment, and by using uniform entry monumentation throughout the District.

Trails

The District currently has almost 12 miles of hard surface off-street trails. These trails consist of asphalt and concrete trails. In general, the trail surfaces are in good condition, with isolated areas needing repair. The trail widths vary from 4 feet wide to 8 feet wide. The trail system consists of main trails along Little Willow Creek, Village Circle West, Village Circle East, and along portions of Rampart Range Road. There is also a loop trail around the lake in Arrowhead Shores, and several small segments of trail that provide connections throughout the District. In addition to these trails, every secondary street within the district has a 4' wide attached sidewalk providing safe pedestrian traffic throughout the district.



In general, the trail system provides good access to most park facilities and other amenities in the District. All of the parks can be accessed by the trail system. In addition, Roxborough Elementary School and the new shopping center at the corner of Rampart Range Road and Waterton Road are accessible via the current trail system.

There are some issues with the current trail system, however. Several of the trails are very steep and do not meet the Americans with Disabilities Act Accessibility Guidelines for the slope of trails. In addition, there is no directional signage within the trail system to let users know where they are with in the District, or to let them know of the many facilities that they can access from the trail system.

There are also a few notable gaps in the trail system. Access to Roxborough Village Community Park from the north and east is awkward. There is no trail along the west side of Rampart Range Road from the north intersection of Village Circle West and Rampart Range Road south to Roxborough Village Community Park. In addition, while there is an un-signalized crosswalk at the south intersection of Village Circle East and Rampart Range Road, there is no curb ramp or sidewalk to accept pedestrians on the west side of Rampart Range Road once they have crossed the street. There are also several street intersections along Village



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Circle West that do not provide curb ramps to allow for safe bicycle and pedestrian access across the road to the trail on the east side of Village Circle West.

There are three bridges and a pipe culvert crossing over Little Willow Creek. The two bridges located down stream of Village Circle West are prefabricated corten steel bridges with wood decks that were built in 2003 and are in excellent condition. The bridge located just down stream of Roxborough Village Community Park is a black



painted steel bridge with a wood deck. This bridge is older and is in moderate condition. The wood deck is in poor condition and is currently a hazard. There is a pipe culvert crossing at Roxborough Village Community Park. The District's maintenance contractor noted that the creek often overflows the trail at this location.

Currently, District residents have no off-street connection to Denver's regional trail network. The High Line Canal Trail is located directly adjacent to the District across Waterton Road. The trail along Little Willow Creek provides a ccess to an un-signalized crosswalk across Waterton Road. However, to provide access to the High Line Canal Trail, a bridge will have to be built across the canal that stands between Waterton Road and the High Line Canal Trail. Construction of this connection will eventually provide District residents with an off-street bicycle and pedestrian access to Waterton Canyon, Chatfield State Park, and Denver's regional trail network that includes the High Line Canal Trail, the South Platte River Trail, the C-470 Trail, the Cherry Creek Trail, and access throughout the Denver Metropolitan Area.

Conclusion

The trail system throughout the District is very good and currently provides access to almost all of the amenities in the District. There are opportunities to improve the trail system by adding a few important links and by improving some current street crossings and adding some new ones. Some sections of the existing trail could be upgraded for improved safety. Finally, adding some directional signage and uniform monumentation would help to create a unique identity in the District and would allow users to know the extent of the trail system and all of the amenities they can reach on the trails.

Parks

There are ten locations within the District that provide active recreation for District residents. These locations are: 1) Roxborough Village Community Park, 2) The park at the corner of Village Circle West and Stacy Place, 3) The playground located in the open space along the east side of Rampart Range Road, 4) Chatfield Farms Park, 5) The park along Mule Deer Place, 6) The park between Elk Mountain Circle and Brown Bear Court, 7) The park along



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Marmot Ridge Circle, 8) The park located along the lake near the Roxborough Center, 9) Roxborough Elementary School, and 10) the privately owned Roxborough Center. This section will give an overview of each park. A detailed inventory of specific park elements follow this section.

Specific Parks

Roxborough Village Community Park

Roxborough Village Community Park is the biggest park in the District. This park is centrally located within the district and serves residents of the entire District. This 18 acre park includes several active and passive park amenities, two parking areas, a small lake, and the natural area along Little Willow Creek. The park is almost entirely irrigated bluegrass, and being approximately 20 years old has many large mature shade and evergreen trees.



The central location of the park is ideal. Vehicular access to the park is good and there are two parking lots with a total capacity of approximately 145 cars. Bicycle and pedestrian access to the park from the south and west is also good. However as previously discussed, bicycle and pedestrian access should be improved along Rampart Range Road for access from the east and north.



While Roxborough Village Community Park satisfies many of the recreation needs of the community, there is no organized design for the park. There is no sense of entry for people arriving either by car, foot, or bicycle. Park elements seem to be scattered throughout the park. In many cases, there are no paved connections to the park elements.

The park is sited on the west facing slope from Rampart Range Road down to Little Willow Creek. This provides several benefits. First, the park facilities are separated from the noise and traffic of Rampart Range Road, providing a more quiet relaxing atmosphere within the park. In addition, the sloped nature of the park affords beautiful views of the natural areas along the lake and Little Willow Creek. There are also wonderful vistas across the valley to the Dakota Hogback and the foothills. This grade separation from the road also presents several challenges.

First, the park's street presence is very poor. From Rampart Range Road, the park is almost not visible. In fact, for a driver approaching the north entrance of the park from the north, the only portion of the park that is visible is the small bulletin board/entry sign. The entry sign text is small enough that is not legible to passing motorists. Visibility of the park from the south entrance is slightly better, since the tennis courts are visible, however, there are no entry signs, and most of the park is not visible from this location.



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The other challenges stem from the amount of topography within the park. From Rampart Range Road to the trail on the east side of Little Willow Creek, the park falls approximately 80 feet over about 750 feet. The average grade across the park east to west is steeper than 10 percent. This grade is desirable for some features such as amphitheaters, sledding hills and skateparks. However, most park amenities such as fields, courts, shelters and playgrounds require relatively flat areas. Therefore to add these features to the park could require a great deal of earthwork, or the installation of retaining walls. Either of these options would greatly increase the cost of such work.

Also, because of the steep grades, it is difficult to access many of the park amenities. In fact, the only amenities in the park that provide ADA access are the shelter and the tennis courts. The current steep grades of the trails can be difficult for the elderly, young children, and people with disabilities, and the trails can become dangerous when they are wet or icy.



Large portions of this park contain irrigated turf on steep slopes that are not used for organized recreation. These areas provide an opportunity for the District to reduce maintenance costs. By converting these un-utilized areas of the park to dryland grasses, the District could save money by significantly reducing the amount of irrigation water needed in the park, and by reducing the amount of maintenance required in the park.

Finally, the District's maintenance contractor reported that vandalism has been a significant problem in the District, primarily in Roxborough Village Community Park. Some features in the park are not designed for the rigors of park use and are more easily vandalized. Much of the site furniture in the park is not secured to the ground and can be moved around the park or stolen.

Imperial Park

This is a small park located at the northwest corner of Village Circle West and Stacy Place. This park includes a playground and a small seating area and likely serves residents in a $\frac{1}{4}$ to $\frac{1}{2}$ mile radius. This .75 acre park is somewhat linear in shape with most of the improvements located on the south side of the park. The park is generally flat and consists of irrigated bluegrass turf. One of the best features of this park is the numerous mature shade and evergreen trees.



Most users of this park will access the park by foot or bicycle. Bicycle and pedestrian access to the park is good as the park is easily accessible from local sidewalks and from the trail along Village Circle West.

As with Roxborough Village Community Park, there is no sense of entry and no organized design for the park. While access to the park is good, access within the park needs improvement. One sidewalk dead ends into Village Circle West with

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no curb ramp or crosswalk to accept pedestrians. This sidewalk includes a stair and is not accessible to bicycles or wheelchairs. Also, there is no connection within the park to the corner of Stacey Place and Village Circle West where many park users will likely enter the park. Finally, there are no paved connections to the playgrounds.

Playground on East Side of Rampart Range Rd.

This small park consists of a playground located adjacent to the trail on the east side of Rampart Range Road. The playground is the only feature of this park. The park likely serves residents in a $\frac{1}{4}$ mile radius. The area surrounding the playground is dryland grasses. There is no vehicular access to this playground. Although the playground is located along the trail, it is located some distance from any trailhead. Therefore, this playground does not have convenient access for most potential users.



Chatfield Farms Park

This park is located on the north edge of the District on Liverpool Road. This park includes a playground, seating area, parking lot, and a large flat area that could be renovated for use as a multi use field. This 5 acre park likely serves residents in a $\frac{1}{2}$ mile radius. The park has two levels. The upper level includes all of the current park improvements, while the lower level includes the area that could be converted to a multi-use field. Little Willow Creek runs along the west edge of this field area. The upper level is almost entirely covered with bluegrass turf, while the lower level was planted with dryland grasses. This park is approximately 2 years old and has many young shade and evergreen trees.



Vehicular access to the park is good with access from Liverpool Road and there is a parking lot with approximately 20 parking spaces. Bicycle and pedestrian access to the park needs improvement. There is a nice connection to the trail along Little Willow Creek. However, most park users will come from the residential area south and east of the park. Those users can access the park along the neighborhood sidewalks, but no

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pedestrian access is provided from Liverpool Road at the main entrance. Residents have to walk through the parking lot to access the park. In addition, the only access to the trail along Waterton Road includes steps and therefore is not accessible to bicycles, strollers, or people with disabilities.

Chatfield Farms Park has a more organized design than the previously discussed parks. All of the elements within the park have a similar character, and the materials and colors are consistent throughout the park. There is a nice stone seat/planter wall that separates the park area from the parking lot.

Park Along Mule Deer Place

This is a small park located at the south end of the detention pond on the east side of Mule Deer Place. This .4 acre park includes a playground and seating for parents and likely serves residents in a ¼ mile radius. The park is generally flat and consists of irrigated bluegrass turf. This park is relatively new and provides a few young shade and evergreen trees and some shrub beds.



Most users of this park will access the park by foot or bicycle. Bicycle and pedestrian access to the park is good as the park is easily accessible from local sidewalks.

This park has an organized design. The playground is set back away from the street to provide a safer, more pleasant experience for park users.

Park Between Elk Mountain Circle and Brown Bear Court



This is a small park located between Elk Mountain Circle and Brown Bear Court. This .15 acre park includes a playground and seating for parents and likely serves residents in a ¼ mile radius. The park is generally flat and consists of irrigated bluegrass turf. This park is relatively new and provides a few young shade and evergreen trees.

Most users of this park will access the park by foot or bicycle. Bicycle and pedestrian access to the park is good with sidewalks

connecting to the park from the local sidewalks along the streets.

The park is located between the backyards of houses from both streets. In fact, the park is almost not visible from the streets. This can provide a more pleasant experience for playground users, but it limits security surveillance from the road.

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Park along Marmot Ridge Circle

This small park is located along the south side of Marmot Ridge Circle. The park includes a playground and seating for parents and likely serves residents in a ¼ mile radius. The 1.25 acre park includes a steep hill on the south that is used for sledding, but is otherwise generally flat. The park is relatively new and consists of irrigated bluegrass turf, and a few young shade and evergreen trees.



Most users of this park will access the park by foot or bicycle. Bicycle and pedestrian access to the park is good along local sidewalks along the streets. There is also a dead end trail spur towards the west.

Park by the Roxborough Center

This is a small park located along the lake near the Roxborough Center. This 1.3 acre park includes a playground, a picnic area, and a volleyball court. There is also an open area that could be used for the addition of new park facilities. The park likely serves residents in a ¼ to ½ mile radius. The park is generally flat and is located along the lake in Arrowhead Shores. The park is relatively new and consists of dryland grasses with a few young shade and evergreen trees.



Vehicular access to the park is good with parking available at the Roxborough Center, although most users of this park will access the park by foot or bicycle. Bicycle and pedestrian access to the park is good with the trail around the lake providing direct access to the park, and a trail connecting to the park from the local streets.

This park provides a pleasant experience separated from roads and located along the lake. The central location of the park and views to the park from around the lake make this park more likely to be used by a greater number of people than the other parks in Arrowhead Shores.

Roxborough Elementary School

Roxborough Elementary School provides outdoor recreation facilities when school is not in session. These amenities include a baseball field, basketball courts and other asphalt court facilities, and a large universally accessible playground. Groups and organizations must acquire permission from the School District to use the facilities.

The Roxborough Center

The Roxborough Center is a privately owned recreation center located in the District at 9755 South Crystal Lake Drive. Anyone can become a member as there are no residency requirements to join. The center provides an outdoor pool and an outdoor tot pool, an indoor weight and fitness room, and several fitness programs.

INVENTORY AND ANALYSIS

Conclusion

The parks within the District provide many different opportunities for recreation. There are a good number of parks in the District and most residents have a park relatively close to their house. There are opportunities to improve the park system in the District. First, almost none of the parks in the district have names or entry signage. A very easy remedy would be to name the parks and install a uniform park sign in each of the parks. There is no consistent character or identity expressed in the different parks. Throughout the District there are different colors and different types of site furniture in place giving a piecemeal appearance to the parks. Adopting a standard family of site furnishings, signage, and structures could rectify this. By selecting items designed to withstand the rigors of park use, the District's amenities will have a longer life span and will be much more resistant to vandalism. Finally, several park amenities throughout the District should be renovated due to their age and condition. For example, only three of the District's eight playgrounds meet the current ADA design guidelines. These future renovation projects will provide the District with opportunities to install unique and creative designs in the different parks, while creating a District-wide identity.

Irrigation

Irrigation Water Supply:

- a) The irrigation water supplied to the District and associated H.O.A.'s is pumped out of Aurora Rampart Reservoir by the Roxborough Park Metropolitan District (hereinafter referred to as the Provider). The Aurora Rampart Reservoir is filled by an underground trans-mountain diversion which generally provides clean raw water with low turbidity and minimal sediment loads.
- b) The annual raw water allocation for the District irrigation system is eighty acre feet per year.
- c) Arrow Head Golf Course has first priority for available raw water from Aurora Rampart Reservoir and the District will receive raw water for irrigation, if available, only after Arrow Head Golf Course has received its raw water allocation.
- d) Irrigation water is distributed to the District and Arrow Head Golf Course through a common raw water pump station and pressurized distribution network. The pump station is capable of supplying 800 G.P.M. The Provider prefers to pump water to both the Golf Course and the District simultaneously to reduce wear on the distribution system. During simultaneous supply, the District receives raw water at the rate of 400 G.P.M. via a 6" P.V.C. pond fill service line installed in 2001.
- e) The Provider is considering restricting irrigation in the District to two days per week during the 2006 irrigation season. The two designated watering days have no hourly restrictions within their respective twenty four hour windows.
- f) The Provider has increased the cost for raw irrigation water to \$2.54 per 1,000 gallons for the 2006 irrigation season.

INVENTORY AND ANALYSIS

Irrigation Water Impoundment:

- a) Raw water from the Aurora Rampart Reservoir is pumped to and stored in the seven acre pond located in Arrow Head Shores.
- b) The first priority for all water delivered to the Pond shall be to maintain the minimum aesthetic pond level, defined as, the bottom of the three foot perimeter boulder edge.
- c) The maximum irrigation water storage capacity, above the bottom of the perimeter boulder edge, is twenty one acre feet.
- d) The maximum twenty-four hour pond draw down based on historical July evaporation and transpiration for bluegrass turf is calculated as follows:
$$598 \text{ G.P.M.} \times 60 \text{ minutes} = 35,880 \text{ gallons per hour} \times 24 \text{ hours} = 861,120 \text{ gallons per watering day} / 7.48 \text{ gallons in a cubic foot of water} = 115,122 \text{ cubic feet} / 43,560 = 2.64 \text{ acre feet. This 2.64 acre feet equals a pond draw down of approximately 4.5" during the worst case irrigation cycle.}$$

Irrigation Water Pressurization:

- a) Irrigation water stored in the pond is pressurized by two packaged turbine pump stations each capable of providing 550 G.P.M. at 125 P.S.I.
- b) Both pumps are equipped with separate intakes and rotating drum screens.
- c) The primary pump is controlled with a variable frequency drive and the secondary pump is equipped with a two horse jockey pump to maintain mainline pressure.
- d) The pumps are located in an area with limited vehicular access required for maintenance and repair.

Irrigation System Distribution Network:

- a) Irrigation water is distributed throughout the District and adjacent H.O.A.'s with a P.V.C. mainline system that varies in age from 1985 to 2005. The 3" irrigation mainline serving Arrow Head Shores and Village Circle East is separated at the pump station from the 6" P.V.C. irrigation distribution line that provides irrigation water to the District and Chatfield Farms.
- b) The 6" P.V.C. irrigation distribution line (installed in 2001) serving the commercial and residential development at Chatfield Farms also back feeds the 1986 irrigation mainline along Rampart Range Rd., the 1985 irrigation mainline within Roxborough Village Community Park and the 1986 irrigation mainline along Village Circle West.
- c) Water pressure is regulated at the pump station and at the point of connection where the 6" P.V.C. irrigation distribution line back feeds the older mainlines along Rampart Range Rd.
- d) The metering system for tracking water consumption between the District and adjacent H.O.A.'s is currently not operational.
- e) Irrigation mainlines are comprised of different classes of P.V.C. and the secondary piping is a combination of various grades of P.V.C. and polyethylene.

INVENTORY AND ANALYSIS

Irrigation Control System:

- a) The irrigation control system consists of commercial grade controllers installed in the manufacturer's cabinets and mounted on either pedestals or along the back of entry or retaining walls. Only one controller is installed in a weather proof and vandal resistant enclosure.
- b) For the most part these are older generation controllers manufactured by the Irritrol Company and lack the multiple programming flexibility available today.

Irrigation Water Application:

- a) Median island and right-of-way areas along Rampart Range Rd. are irrigated with a combination of pop-up spray heads and small impact and or gear drive rotary heads installed primarily along the back of curb.
- b) Roxborough Village Community Park is irrigated with a combination of pop-up spray heads and large area impact drive rotary heads with secondary zones running parallel to the contours in the Park.
- c) Right-of-way areas along Village Circle West are irrigated with single row pop-up and small area gear drive heads installed primarily along the back of curb. Sidewalks and paths are generally over sprayed.
- d) Through ongoing maintenance and repair operations the large and small area impact drive rotary heads are being replaced with closed case gear drive rotary heads.
- e) In general, the irrigation improvements within Roxborough Village Community Park along the Rampart Range Rd. medians and right-of-way and along the Village Circle West right-of-way represent commercial grade irrigation installation in terms of design, product mix and installation detailing.

NEEDS ASSESSMENT

Resident Questionnaire

In April 2006, a questionnaire was sent to each household within the District. The questionnaire was intended to provide input from the District's residents about their recreational habits, needs, and concerns, and to provide insight to the residents' priorities for renovating the parks, trails, and open space facilities.

We received 440 responses. This represents 20% of the 2,198 questionnaires that were sent to each household in the District. This is an exceptionally high rate of return for a mail-in survey, and indicates the community's high degree of interest in the recreational opportunities in the District.

Limitations of the Questionnaire

This survey was not a scientific survey, and therefore does not represent the opinions of all residents in the District. The results reflect only the opinions of those individuals who chose to respond. In addition, not all people who returned the survey answered all of the questions. The percentages listed in the summary are based on the total number of people who responded.

Questionnaire Results

The original questionnaire that was sent to the public, and the tabulated responses of the survey are included in the Appendix. In general terms, a great majority of residents responded that they are very satisfied or somewhat satisfied with the existing trails, open space, and parks. Residents reported a very high need for trails, as a great majority of respondents participate in walking, running, hiking, or cycling. Both in the given questions, and in the write-in questions, residents expressed a fairly high degree of dissatisfaction with the streetscapes.

Other Public Input

While it was not part of the master plan research, it should be noted that there has been a strong showing of interest from the community regarding the addition of a skatepark to the District. Based on the number of requests from the public to provide a skatepark, the District held a preliminary meeting regarding skatepark design in October of 2004. More than 40 community members attended the meeting to express their strong desire and support for a skatepark.

RECOMMENDATIONS

Open Space (See Exhibit D)

Noxious Weed Management

The spread of noxious weeds has often been termed a biological wildfire. As with wildfire, the most important part of a noxious weed management program is early detection and prevention. Areas such as road shoulders, trailheads, and picnic areas, should be surveyed annually to find new infestations. Infestations should be removed before they become well established. The District also should note noxious weeds along open space boundaries and on adjacent property and notify the appropriate landowners or managers about problem plants.

Program Focus

Prevention will have the most significant long-term benefit for District open space and surrounding areas. Vigorous and consistent prevention reduces the opportunities for dispersal of noxious weeds, which, in turn, minimizes the need for future control actions. Prevention is proactive rather than reactive, and is the most cost-effective management action considered in this section. Restoring and maintaining healthy plant communities and reducing human impacts and use patterns also can prevent noxious weed invasion. Weed management is potentially the most serious management issue The District faces in its open space. Noxious weed management should be integrated into every aspect of land management. The District should establish the development of a weed management plan for its open space as a top priority. Five components that should be included in the development of a weed management plan are:

1. A description of the management area.
2. An inventory of weeds in the management area.
3. Priorities for weed management.
4. Integrated weed management techniques.
5. Monitoring and evaluation.

Environmental Education/Interpretation

Ensuring that the District's open space areas are maintained and preserved in perpetuity will require that visitors, adjacent landowners, contractors, and county departments appreciate and understand the value in protecting open space. Environmental education and outreach activities are often the most effective means of stimulating understanding and appreciation of open space. Education and outreach are also useful means of providing information and orientation, ensuring resource protection, and promoting visitor safety.

Program Focus

Environmental education and outreach efforts in the District's open space primarily should focus on providing educational and interpretive signage at various points in the District. This will also help satisfy the public's stated interest in nature study. There are many opportunities in the District to provide interpretive signage to educate



Examples of appropriate interpretive signage

RECOMMENDATIONS

the public about the history and ecology of the area. Interpretive signage could be installed at appropriate locations along the trails and in the parks within the District. Interpretive opportunities include: riparian ecology, the Preble's Meadow Jumping Mouse, upland ecology, water use/conservation issues, flora, fauna, historic and present mining operations, and hogback geology. The signage should be built of materials resistant to weather and vandalism. The possibilities for interpretive signage design are endless and could include text, photos, drawings, sounds, etc. Regardless of the signage design, it is important to create a system-wide theme for a unified interpretive program.

In addition, there is an opportunity to create an interpretive overlook or boardwalk at the two ponds along Little Willow Creek just south of Village Circle West. This overlook could contain information about wetlands, riparian habitat, etc. This particular location is desirable due to its proximity to Roxborough Elementary School.

The District could explore opportunities to partner with other organizations for the development and implementation of interpretive signage and facilities. Potential partners include: Douglas County Division of Open Space and Natural Resources, Douglas County Division of Parks and Trails, Douglas County School District, Colorado State Parks, and the Audubon Society.

In the future, the District should work to expand education and outreach efforts to include a broader range of interpretive opportunities. These could include nonpersonal interpretation through the use of kiosks and brochures and personal interpretation on-site or through public outreach programs. District staff would initiate these efforts, and other voluntary interpretive and maintenance staff would provide additional assistance.

Vegetation Overview

Some of the major influences affecting plant community character and condition are natural disturbances, soil types, topography, hydrology, wildlife interactions, invasion by non-native plant species, land use, and land management. Although the areas surrounding the District may appear to be in a "natural" state, indicators of disturbance include: historical mining, channelization of Little Willow Creek, historical livestock grazing, noxious weed infestations, and heavy recreational use. The vegetation communities that make up the open space areas of the District are, to some extent, a product of these past and current disturbances.

Program Focus

Priorities for native vegetation management in the District's open space should be to preserve biological diversity at a variety of scales and to improve the condition of native plant communities. Allowing and encouraging the function of natural processes and simulated natural processes, integrated weed management, and other restoration activities can accomplish these priorities.



The Hogback could be designated a "Habitat Conservation Area"

RECOMMENDATIONS

The hogback represents an important piece of open space. Preserving this open space intact will benefit both the local ecology and the residents of Roxborough. As stated in the inventory, the hogback provides an important upland wildlife corridor, and provides habitat for native plant communities. In addition, the hogback is a visually critical piece of the District's identity. It helps define the identity of the neighborhood, and represents the environment that likely brought most people to live in Roxborough. Therefore, it is recommended that the District designate the hogback a "Habitat Conservation Area". With this designation, the District can limit or prohibit public use of the open space and conserve the land for the benefit of all District residents. If the board wants to allow limited public access within the Habitat Conservation Area, a formalized soft surface trail should be provided to control where access is allowed. In addition, signage should be installed to inform users that they must stay on the designated trails, and what uses are and are not allowed on the trail.

Another area within the District that could be improved to provide better habitat, restore biological diversity, and provide an amenity for residents is around the lake at Arrowhead Shores. This area could be enhanced with native and xeric trees and shrubs. This would provide shade for trail users, and generally improve the appearance of this open space that currently has a rather stark appearance. The board does not currently manage this area. The board could partner with the current land managers for this improvement, or undertake this project in the future if they assume management of the land.

Wetland and Riparian Areas

Wetlands are often thought of as marshy or swampy areas while riparian areas are the narrow, thickly vegetated strips along streams and the edges of ponded water, typified by plants and trees that require higher amounts of soil moisture than exists in surrounding uplands. Riparian areas are a type of wetland, which is generally defined by the presence of hydric soils, hydrophytic ("water-loving") plants, and semi-annual inundation by surface water. In addition to serving as habitat for many species of plants and wildlife, wetland and riparian areas filter runoff and protect the water quality of reservoirs and creeks.

Many plant species exist in riparian areas that would otherwise not be able to survive. A healthy riparian area contains sedges, willows and other water-loving plants, and is typified by undercut stream banks with overhanging vegetation, large structures formed by rock or woody debris, and a well-defined, meandering stream channel. The aquatic life of a healthy riparian area is often as rich as the terrestrial life. As productive as they may be, riparian areas make up only a small part of the total land area (less than 3 percent) in Colorado, yet they house 40 percent of all the known plant species in the State and provide habitat for nearly 80 percent of the wildlife species that live in and migrate through Colorado (Kittel et al. 1999).

References

Kittel, G., E. VanWie, M. Damm, R. Rondeau, S. Kettler, A. McMullen, and J. Sanderson. 1999. A Classification of Riparian Wetland Plant Associations of Colorado: User Guide to the Classification Project. Colorado Natural Heritage Program, Colorado State University, Fort Collins, Colorado.

Program Focus

Management of wetland and riparian areas should focus on protecting undeveloped areas, preventing further degradation and, where possible, restoring natural systems to a functional condition. Future trails should avoid significant

RECOMMENDATIONS

wetlands, and passive recreational use should be compatible with wetland and riparian corridor preservation. The critical factor in assessing wetland and riparian areas is their condition. Currently, wetland and riparian areas within the District's open space are disturbed primarily by recreation activity and adjacent residential land use along the Willow Creek corridor. Opportunities to restore or enhance degraded wetland and riparian areas within the District's open space exist and should be explored.

Streetscapes (See Exhibit E)

The intent of the streetscape planting concepts are to:

- Unify the streetscapes with a consistent landscape treatment.
- Reduce water usage and maintenance costs through design, plant selection, and irrigation renovation.
- Create an image for the neighborhood that embraces the local ecology.
- Screen the private fences along the sides of the street on Village Circle West.

Specific Streetscape Recommendations

Village Circle West

The streetscape concept shown on the plan includes turf grass between the sidewalk and the curb. This will provide a more manicured appearance between the street and the sidewalk. While this turf grass could be bluegrass, the District could also explore grasses that offer some of the benefits of bluegrass but use less water such as tall fescue. The use of sub-surface irrigation will greatly reduce the water waste currently experienced due to the inherently inefficient spaces created between the meandering sidewalk and the curb.

The areas on both sides of the road from the fence line to the sidewalk or curb would be planted with native grass seed, and planted with beds of xeric shrubs and groupings of trees. The concept is to remove the existing bluegrass, then install the native seed. The existing irrigation system could be used for the first few years to get the grasses established, then be turned off and only used for supplementary watering during particularly dry years.



Renderings of Village Circle West Streetscape with native grasses and shrub beds.

RECOMMENDATIONS

This concept will reduce the amount of water used along the streetscapes once the new plantings are established. The use of xeric perennials, shrubs, and trees will add beauty to the streetscape, and will integrate with the natural landscape surrounding the neighborhood. The shrub beds and trees will provide some screening of the existing fences, particularly for drivers looking along the roadway where the plantings may screen large portions of the fence due to the oblique view angle. However, large portions of the fence will remain unscreened with this option.

Another option is to eliminate the native seed areas and install shrubs along the entire streetscape in front of the fences. While this option will cost significantly more, it will meet the goals of reducing water use, creating a unifying landscape treatment, creating a specific image, and it will screen the fencing along the entire streetscape.



Renderings of Village Circle West Streetscape with shrubs planted along entire fence line.

An option that the District could explore regarding the fencing is to install new fencing on the District's side of the property line. While constructing a new fence, the District could offer to remove the homeowner's existing fences. This solution is the only way that the District will be able to control the appearance and condition of the fencing and is therefore worth consideration. However, new fencing will be very expensive to install, will require ongoing maintenance, and will eventually require replacement. There are many materials that could be used for fence construction including wood, Trex, brick, stone, faux stone, and concrete. Both the materials used, and the design of the fencing will significantly impact the installation price and ongoing maintenance costs associated with the fence. There are approximately 10,150 linear feet of fencing that would be replaced along Village Circle West and Rampart Range Road. Depending on materials used, pricing for a new fence could be as low as \$40/linear foot, to well over \$100/linear foot, for a total cost of around \$400,000 to well over \$1,000,000.

Village Circle East

The Plan does not provide specific recommendations for Village Circle East since the District does not manage this streetscape. However, if the District manages the streetscape in the future, or if the current managers elect to adopt a similar landscape treatment to what is proposed for Village Circle West, there will be several benefits.

RECOMMENDATIONS

First, Village Circle West and Village Circle East will create a loop road through a good portion of the District that will have a unified and cohesive design. Second, the water savings will be even greater on Village Circle East because of the higher square footage of irrigated area.

Rampart Range Road

Rampart Range Road is a very different streetscape than Village Circle West and Village Circle East which are almost completely bordered by residential areas and open space. By contrast, the land uses along Rampart Range Road vary significantly along the streetscape. Land uses include commercial, residential, open space, park, and privately owned land. In addition, the RVMD does not own or manage the land directly adjacent to the road for large portions of the streetscape, particularly on the south, and therefore, cannot control what happens in the streetscape for those areas.

The concept for Rampart Range Road is to build on the tree groupings that already exist along the sides of the street in some places. Adding some additional trees will help create a corridor along the streetscape. The intent is to plant the trees in natural groupings rather than in a rigid, evenly spaced pattern. Along the sides of the street, the existing bluegrass areas can be converted to native grasses. Where the existing irrigation system currently exists it can be used to establish the native grasses. An irrigation system will have to be added in locations where there is currently no irrigation. The native grasses and tree groupings will allow the streetscape treatment to integrate with the open space that borders portions of the streetscape.

Portions of the west side of Rampart Range Road currently have a trail adjacent to the road. In the trails section of these recommendations, a new trail is proposed that would complete the trail along the entire west side of Rampart Range Road. The area between the trail and the curb could be planted with turf grass for the same reasons listed above in the discussion of Village Circle West.

It is recommended that the landscaping in the medians be revised as well. The bluegrass should be removed and replaced with native grasses. Shrub beds can be installed along the medians to provide visual interest. Flowering perennials and shrubs can be used to accentuate the major intersection of Rampart Range Road, Village Circle West, and Village Circle East. In addition, groupings of large shade trees can be added to provide some vertical mass and shade to the median.

It is the board's understanding that Douglas County plans to extend the existing median in Rampart Range Road to the south. The board should discuss this with Douglas County to explore partnering opportunities for the project. These opportunities could include landscape and irrigation improvements along other portions of Rampart Range Road, installing the new trail on the west side of the road, improved pedestrian crossings, and the installation of streetlights.

These recommendations will meet the goals of reducing the water usage and creating an image for the neighborhood. In addition, using the same palette of native and xeric plants as the other two streetscapes will help the streetscapes integrate with the native landscape, and will create a cohesive design among all three of the major streetscapes in the District.

RECOMMENDATIONS

Entry Monumentation

In the last several years, the District has expanded beyond the original development. All of the residences used to be accessed via Village Circle West or Village Circle East. At that time, all District residents would pass the "Roxborough Village" sign at the intersection of Rampart Range Road and Village Circle West on the way to their homes. This point served as the entrance to the entire District. Now there are entrances to neighborhoods directly from Waterton Road and from Rampart Range Road.

These changes have rendered the "Roxborough Village" sign obsolete, as its location no longer represents the entrance to the District. In fact, it is difficult to identify a single entrance to the District since there are multiple entrances to neighborhoods that can be accessed via different routes. Further confusing the issue is the fact that many of the new neighborhood entrances have signs of different designs and made of different materials.

As a result, it is recommended that the "Roxborough Village" sign be removed. A fairly simple way to delineate the boundary of the District is to add the words "at Roxborough Village" to the existing neighborhood entrance signs (ie: Chatfield Farms at Roxborough Village, Arrowhead Shores at Roxborough Village). This is a more flexible system that easily accommodates any future expansion of the District. In addition, it is recommended that the District adopt standards for neighborhood signage so that all future entry signs, either at new neighborhoods, or replacing old signage, will have a District-wide standard design.

Trails (See Exhibit F)

Trail Maps

As mentioned in the inventory portion of this master plan, the current trail system in the District is very good. It provides access to almost all of the recreational and commercial amenities in the District, and it provides good access to Roxborough Village Elementary School. One observation that has been made by the District board is that many residents likely don't know where the boundaries of the District are, or what amenities are currently available to them. One simple way to educate the public is to provide trail map signage at trailheads and key destinations. The maps should identify the boundaries of the District, locations and names of parks, commercial areas, schools, major roads, all of the trails in the District, and connections to the regional trail system. The signage should also include trail etiquette, rules and regulations, emergency and maintenance information.



Example of trail map

RECOMMENDATIONS

Trail Design Standards

It is recommended that the District adopt a set of trail design standards. These standards will help ensure the safety of trail users, ensure that facilities are easily maintained, and help to create a District wide identity for the trail system. These standards should include:

Trail Width: All major trails and major trail connections in the District should be 8' wide. Smaller trail connections and sidewalks can be 4' wide. Major trails should be 6" thick to allow maintenance and emergency vehicle access without damaging the trails.

Materials: All trails in the District should be concrete. Concrete provides the best trail surface for all users, and is much more durable than asphalt or other construction materials.

Shoulders: All trails should be constructed with a shoulder along both sides of the trail. The shoulder should be 3' wide where possible, and 2' wide at a minimum and clear of all obstructions. The shoulder can be planted with native grasses or sod as is appropriate based on the location of the trail. The shoulder provides a recovery zone for cyclists and provides a safe buffer from steep grades, trees, signage, and other obstructions.

Trail Grades: All trails should have a 2% cross slope to create positive drainage across the trail. Longitudinal slopes of 5% or less are ideal for multi-use trails. All trail grades should conform to the intent of the Americans with Disabilities Act (ADA) Design Guidelines wherever possible. Where it is not practical or possible to meet these guidelines, warning signage should be installed to alert trail users of the conditions.

Regulatory Signage: Stop, yield, sharp curve, low clearance, steep grades, and other warning signage should be located along the trails to provide for user safety.

Sign Structures Design: The District should adopt standard structures for all signs. This will create a uniform family of trails signs throughout the District including all regulatory, directional, and interpretive signs. The materials for the sign structure and placards should be weather and vandal resistant.

Vertical Clearance: Minimum vertical clearance to obstructions such as overhead branches should be 8 feet.

Bridges: All future pedestrian bridges should be constructed of cor-ten weathering steel. This will match the two newer bridges located along Little Willow Creek, and will blend into the landscape. Railings should meet all current building codes and design guidelines. The bridges should be 12 feet wide to accommodate maintenance and safety vehicles. Concrete decks should be included with the bridge rather than wood, as wood can become slippery when wet, and requires additional maintenance.



Example of a pedestrian bridge

RECOMMENDATIONS

Trails Recommendations

While the current trail system provides good access throughout the District, several of the trails are older and in need of replacement. Also, some of the trails are 4' wide, which is not wide enough to serve as a multi-use trail. The recommendations for the trail system focus on achieving a core system of three 8' wide, concrete, multi-use trails through-out the District. These three trails are the Little Willow Creek Trail, The Rampart Range Road Trail, and the Village Circle West/Village Circle East Trail.

The only new trail link proposed is the trail along the west side of Rampart Range Road. This trail will provide much improved access to Roxborough Village Community Park and the commercial areas along Rampart Range Road. Other improvements include upgrading sections of the Little Willow Creek Trail from asphalt to concrete, and converting sections of Village Circle West/Village Circle East loop from 4' wide to 8' wide concrete.

Another critical link is the proposed bridge on the north side of Waterton Road connecting the District's trail system with Denver's regional trail system. This bridge is currently being planned, designed, and built by Sunset Management.

The District may want to explore opportunities to partner with other groups to provide trail connections to other nearby trail networks. These could include Roxborough State Park and Sharptail Open Space.

Finally, the recommendations include improving the safety of street crossings throughout the District. Several crossings require that curb ramps be installed to provide access to the trail system. Many other crossings require crosswalks and/or signage to improve the safety for trail users. The District can pursue funding and implementation of these improvements through the Douglas County Public Works Department.

Parks (See Exhibit D)

Park Identity

As previously mentioned, the District board has commented that many District residents are not aware of the many facilities that are currently available for their use. This is further complicated because many of the parks do not have names, so it is cumbersome to describe where the parks are. A relatively easy way to remedy this is to name all of the parks in the District, and install signs with the park name at all of the parks. The names can be shown on the trail maps that are described earlier in these recommendations to further inform the public.



Example of a park identity sign

Park Design Standards:

Many of the issues that were identified during the inventory of the parks can be addressed by adopting a set of District wide park design standards. These standards will help insure that future park improvements will be durable, vandal resistant, and easily maintainable which will reduce replacement and maintenance costs over time. Standards can also ensure that elements within all District parks will look the same, which will help create a uniform identity for all District Parks. Standards should include:

Park Signage: A standard sign structure should be adopted for all park signs. Sign text should be large enough to be read by passing motorists.

RECOMMENDATIONS

Site Furniture: A standard family of site furnishings should be adopted to include benches, litter receptacles, picnic tables, and dog stations. To ensure that the site furnishings are durable enough for outdoor public park use, they should be made of steel and have a powder coat painted finish. Wood, and recycled plastic furnishings, while less expensive initially, are much more vulnerable to weather and vandalism. To create a District wide identity, the all of the furnishings should have a similar design and uniform color. The board should select a specific manufacturer, model number, and color for each type of site furniture that will be used in the District.

Shelters: A standard family of park shelters should be adopted. This would include shade/picnic shelter, restroom enclosures, and other structures such as baseball field dugout roofs, etc. Again, the structures should be powder coated steel, and all structures should have a uniform design and color throughout the District.

Landscape Standards: Adopting general landscape standards for new parks or park renovations will help ensure that these projects will efficiently use water and have an aesthetic that is consistent with other parks in the District. These standards should include guidelines for where it and is not acceptable to install irrigated bluegrass, requirements for the use of xeric trees, shrubs, and grasses, and guidelines for efficient irrigation design.

Specific Park Recommendations

Roxborough Village Community Park (See Exhibit G)

The recommendations for this park focus on creating an "entrance" to the park, improving access to various park amenities, improving various park amenities, and reducing the amount of bluegrass on un-programmed land. Exhibit G is a conceptual master plan for the park and is meant to be a foundation for the development of a park master plan. The board should develop a more detailed master plan that includes detailed grading and a more refined design. The recommendations in this plan include:

Entrance Improvements: The recommendation is to improve the park's street presence by adding plantings and signage at the vehicular entrances to the parking lots. In addition, pedestrian entrances should be created where people enter the park either from the parking lot, or from the trail. These entrances could include seating areas, special paving, shade trees and other plantings, information signage, kiosks for posting notices of community events, etc. The entrances will in essence be the front door for the park and will start to create a sense of organization for the park.

Create Upper Activity Corridor: The idea here is to focus as many of the active uses in the park as possible along the upper portion of the park between the existing parking lots. This area is some of the flattest, and therefore most economical land to build on in the park. In addition, this area is relatively easy to access in terms of distance and grade from the two parking lots. A primary walkway can connect the two parking lots, and provide access to the park amenities. The plan provides a shelter/overlook centered on this walkway. Amenities included in this upper corridor include the existing tennis courts and basketball court, a new playground, a new skatepark, and a relocated volleyball court. The proposed playground is a large destination playground for the entire District and replaces

RECOMMENDATIONS

the existing smaller playgrounds in the park. This would provide play structures for 2-5 year olds, and 5-12 year olds, swings, and could provide unique features such as climbing walls, art, etc. All future playgrounds in the District must be built to meet the current safety and accessibility guidelines. The community and the RVMD Board have expressed interest in providing a skatepark in the District. This plan allows for a 14,000 square foot skatepark.

Multi-use Field: The plan expands the existing baseball field to provide an additional multi-use field. This is the only practical place to provide additional playing field area due to the slopes in the rest of the park. This expanded field would require a fair amount of earthwork, and the relocation of the volleyball court. In addition, there is an opportunity to upgrade the baseball field with dugouts, a paved area behind the backstop, shade trees.

Picnic Area: The residents expressed a need for picnic facilities in the resident survey. This plan proposes creating a picnic area along the north end of the existing 1-acre pond. The location of the picnic area takes advantage of the beautiful scenery provided by the pond and Little Willow Creek, and is located in one of the quieter portions of the park. The picnic area should include a shelter, grills, picnic tables, and shade trees.

Revised Walkways: The plan provides for a new network of paths throughout the park. These paths allow for grades that meet the intent of the ADA Design Guidelines. In addition, there are two stairways that provide more direct access between the upper and lower park uses.

Existing Amenities to Remain: Several existing park amenities are in good condition so it makes sense to leave them in their current location. These amenities include the parking lots, tennis courts, basketball courts, and restroom. The restrooms are currently not in an ideal location, however it would likely be cost prohibitive to move them. If in the future, it is necessary to replace the restrooms, the District should consider relocating the restrooms near the upper shelter/overlook.

Landscaping: The plan recommends converting a majority of the park to a native landscape of xeric grasses, shrubs and trees. The intent is to restore a more natural landscape to the open portions of the park that are not programmed for specific uses. This will greatly reduce water usage in the park, reduce maintenance costs, and provide a beautiful surrounding for the other park uses.



Example of the type of landscape that could replace the non-utilized bluegrass areas in Roxborough Village Community Park

Imperial Park

The primary recommendation for this park is to replace the playground and associated seating areas. This playground is a neighborhood playground, and therefore will be smaller than the playground proposed at Roxborough Village Community Park. The playground should include, at a minimum, swings and play structures for both 2-5 year olds

RECOMMENDATIONS

and 5-12 year olds. The walkways and seating areas should be redesigned as part of the playground replacement. There is an opportunity to create a small neighborhood gathering place at this park with the addition of a shelter and improved seating areas. In addition, the bluegrass areas in the park should be re-established with seed or sod to allow an area for informal play. The irrigation system will need to be renovated in this area, as the grass is not being properly irrigated, resulting in its current poor condition.

Playground on East Side of Rampart Range Rd.

The recommendation for this park is to replace the playground and provide a seating area. Like Imperial Park, this is also a neighborhood playground, so it should include swings, and play events for 2-5 year olds, and 5-12 year olds. Again, a shelter would provide a place for the community to gather, and would provide some much needed shade.

Chatfield Farms Park

Chatfield Farms Park provides one of the only opportunities in the District to provide a multi-use field. The existing field has been graded and irrigation has been installed. The field should be fine graded and have seed or sod installed to provide a suitable playing field. The playground should be made accessible by installing a ramp into the play pit, and replacing the pea gravel surface with engineered wood fiber or another play surface that is accessible and provides impact protection. In addition, the playground could be expanded to provide an additional play pit with swings or other equipment. Finally, pedestrian access should be provided to the park from Liverpool Road.

New Park

A new park could be created in the open space between Blue Mesa Drive and Red Mesa Drive. This area currently has pedestrian and maintenance access via the asphalt trail. A park in this location would serve a portion of the District that is currently furthest from existing park facilities. A park in this area should be small in scale and provide amenities such as a playground, shelter, and seating areas.

Parks in Arrowhead Shores

This master plan will not make specific recommendations for the parks in Arrowhead Shores as the RVMD does not manage these parks. However, it is recommended that any future improvements to these parks be made per the above stated park design guidelines. In addition, ramps should be added to the playgrounds that do not meet the ADA accessibility guidelines.

Irrigation

Irrigation Water Supply and Impoundment:

Recommendations

- a) The raw water pump station and distribution network should be upsized to offset the one month July evaporation-transpiration irrigation requirement of 6.5" per month for the approximately 35 acres of irrigated turf grass served by the District.

RECOMMENDATIONS

- b) This monthly irrigation requirement of 6,104,330 gallons per month would require the delivery of 635 gallons per minute during the twenty-eight hour monthly fill cycles currently being scheduled by the Water Provider.
- c) To supply 635 gallons per minute within safe flow of 5.5 feet per second for CL-200 P.V.C., (required to avoid drawing down the irrigation pond level in Arrow Head Shores during the peak of the irrigation season), the existing 6" pond fill line would need to be replaced with an 8" line or supplemented with the installation of a second 4" pond fill line to work in tandem with the existing 6" feed.
- d) The recommendation above, assumes that water the velocity within the pond fill line must be maintained at 5.5 feet per second and that the five eight hour weekly fill cycles currently being scheduled by the Water Provider cannot be increased.

Irrigation Water Pressurization:

Recommendations

- a) If the Water Provider restricts the weekly watering window to less than the 24 hours per week required to stay under the 1,100 gallon per minute operational ceiling of the existing pump station, the station may need to be upsized.
- b) The pump station, in its current location, should be enclosed in a 6' cedar fence to discourage vandalism, buffer noise and provide visual screening.
- c) During any significant future pump station retrofit, upgrade or replacement the station should be relocated and a maintenance easement executed to provide safe and efficient vehicular access.
- d) The existing abandoned pump station should be disassembled and the components auctioned off or sold for scrap. All utilities should be terminated in conformance with all utility provider standards and specifications. The vault should be backfilled and the hatch access removed to eliminate any future safety related liability and to eliminate any conflict with future picnic improvements planned for this portion of Roxborough Village Community Park.

Irrigation System Distribution Network:

Considerations

- a) Because of the friction loss incurred from both elevation change and length of run in irrigation distribution networks as extensive as the District's, pressure regulation becomes critically important to the efficient distribution of irrigation water throughout the system.
- b) One way to supply irrigation water at a uniform pressure at different elevations and over longer distances in larger systems is to construct a high pressure transmission mainline served directly from the pump station and extending to the end of the entire service area. This high pressure transmission mainline would be constructed of a higher class of pipe with upgraded joint restraint to handle higher static and surge pressures.

RECOMMENDATIONS

- c) A series of pressure regulated sub mainline loops would be tapped off of the high pressure transmission mainline to supply irrigation water at a uniform pressure to the different landscape areas within the District.

Recommendations

- a) Abandon the existing redundant 1986 irrigation mainline running along Rampart Range Road.
- b) Extend the existing 2001 6" irrigation distribution line south along Rampart Range Road to serve Roxborough Village Community Park.
- c) Re-feed Roxborough Village Community Park, Village Circle West and the Rampart Range Road medians and R.O.W. directly off of the existing 2001 6" irrigation distribution line.
- d) Install pressure regulating flow meter master valves (Bermad 920-55-P) at the sub main point of connection to the 2001 6" irrigation distribution line for Arrow Head Shores, Village Park, Village Circle West, Rampart Range Road Medians and Chatfield Farms.

Irrigation Control System:

Considerations

- a) Generally speaking, an irrigation distribution network as extensive as the District's would be a good candidate for central control. However, with no full time permanent maintenance staff, any central irrigation control system would have to be located in and operated out of the irrigation maintenance contractor's facility. The success of this type of arrangement is contingent on a stable long-term relationship between the District and the Contractor and on the quality of the communication link between the two locations.

Recommendations

- a) Replacement irrigation controllers should be stand-alone field units generally configured and upgraded as follows:
 - 1) Replacement controllers should have state of the art multiple programming capabilities and be of the same Model and Manufacturer.
 - 2) Replacement controllers should be remote ready and supplied with two (2) hand held transceivers to reduce the time required for system tests and routine maintenance.
 - 3) Replacement controllers should be installed with wireless rain sensors with manual by pass (Hunter Rain Click or approved equal).
 - 4) All replacement controllers should be installed in NEMA rated pedestal mounted stainless steel enclosures (Strongbox or approved equal).
 - 5) Replacement controllers should be grounded as required by the Manufacturer or as recommended in the A.S.I.C. Guideline 100-2002 Figure 2 including one 5/8" by 10' copper ground rod and one

RECOMMENDATIONS

- 4" by 96" by .0625" copper ground plate which ever is more stringent.
- 6) Replacement controllers should be relocated to provide ease of access and visual confirmation of operation.
 - 7) Replacement controllers should be selected to provide compatibility with any future upgrade to central control.
 - 8) Replacement controllers should be installed with line side surge protection and interior disconnect.

Irrigation Water Application:

Recommendations

- a) Replacement electric control valves should be equipped with pressure regulation.
- b) Linear landscape areas (less than 12' wide) along the Village Circle West and Rampart Range Road right-of-way and medians should be irrigated with sub-surface irrigation.
- c) Landscape areas (between 12" and 24" wide) should be irrigated with pop-up spray heads equipped with 6" risers and low angle nozzles to reduce wind drift.
- d) Landscape areas (wider than 24') should be irrigated with closed case gear drive rotary sprinklers with 6" stainless steel risers and low angle nozzles (where practical) to reduce wind drift.
- e) Spray irrigation designed for active / athletic turf grass areas should have a minimum Distribution Uniformity (DU) of .9 and a corresponding maximum Scheduling Coefficient (SC) of 1.11. Spray irrigation designed for passive turf grass areas should have a minimum Distribution Uniformity (DU) of .8 and a corresponding maximum Scheduling Coefficient (SC) of 1.25.

Landscape Integration:

Recommendations

- a) Landscape renovation and new additions should be designed on multiples of 12' or 15' to insure efficient nozzle selection for pop-up and or gear drive sprinklers.
- b) Irrigation systems should be replaced in conjunction with the implementation of the master plan improvements. Standalone irrigation replacement is discouraged so as not to limit, restrict or preclude implementation of the proposed master plan improvements. No landscape improvement or renovation should be undertaken without a corresponding and comprehensive irrigation renovation / replacement.

Funding The Recommended Improvements

A conceptual estimate of probable construction costs is included in the appendix. As was stated in the introduction to this master plan, the purpose of this plan is to provide a vision for the parks, trails, open space, and streetscapes that can be implemented over several years as renovation projects take place. With that in mind, the District may want to

RECOMMENDATIONS

explore additional funding sources to supplement their annual budget for capital improvements. The appendix includes a list of potential funding sources.

Additional Opportunities

Based on the results of the resident questionnaires, and the fact that the District has grown in population in the last several years, there are some recreational needs that are not provided for in this master plan. In particular, the number of multi-use athletic fields, and athletic courts. After assessing the current parks and open space managed by the RVMD, there simply is no land that is suitable for the construction of these facilities.

The District can pursue several options to help meet these needs. One option is to partner in some way with other park and recreation providers. Fifty three percent of respondents to the resident survey reported using Foothills Park and Recreation District facilities.

Another opportunity is to partner with future developments near the District. The District may consider contributing funding, or providing recreational opportunities to the residents of future developments in exchange for the use of parks and other recreational facilities in those developments. If future developments are included in the District prior to development, the board can ensure that new parks and trails will provide needed facilities, and can ensure that the facilities will meet the District's design standards.

Finally, the District could seek ways to acquire additional lands. Exhibit D provides property owner information for the open lands within and surrounding the District. The District could explore opportunities to acquire lands either through purchase, lease, donation, or conservation easements to provide additional active recreation opportunities, or to preserve additional open space.

IMPLEMENTATION

Use of this Plan

As stated in the introduction, the purpose of this master plan is to create a strategic guide toward renovating the parks and open space system for the District. This plan should be a "living document". The recommendations in the plan are based on the current conditions of facilities and issues facing the District as of September 2006, as well as the public's input, and the Board's input. Some of the recommendation in this plan will become obsolete over time as recommended improvements are accomplished, as new issues arise, and as the public's and the board's needs, desires, and priorities shift.

Therefore, for this plan to continue to be an effective guide, it must be changed and updated over time. The board should plan, at a minimum, a yearly review of this master plan. These reviews should include updating the text, plans, cost estimates, and the priority list to reflect and recognize any accomplished projects, and to provide new recommendations, as they are needed. In addition, as the board develops more detailed plans and standards, those documents should be adopted into this masterplan.

Priorities

The board has developed the following list of priorities and a rough schedule for implementing the recommended improvements to the master plan. This list is not meant to be a strictly followed schedule, but rather, a planning tool that the board can use to define priorities and strategize funding sources and design/construction time lines. This list should be updated regularly as individual items are accomplished, as priorities shift, as funding is determined, and time frames are determined.

2007

- Prepare noxious weed survey and management plan
- Implement noxious weed management plan
- Develop and adopt trail design standards
- Develop and adopt park design standards
- Develop and adopt neighborhood entry sign standards
- Name all parks
- Create District website and newsletter
- Develop and install park entry signs as budget allows
- Develop and install trail map signage as budget allows
- Define and designate the hogback a "Wildlife Conservation Area"
- Develop master plan for Roxborough Village Community Park
- Resurface baseball infield and re-install bases at Roxborough Village Community Park
- Rampart Range Road streetscape improvements – coordinate with Douglas County on their proposed project. Explore opportunities to:
 - install extended median
 - provide xeric landscape improvements in median
 - install trail along west side of road
 - remove existing "Roxborough Village" sign
 - install street lights
 - improve pedestrian access across Rampart Range Road.

IMPLEMENTATION

- Restore BMX track and clean up trash in Little Willow Creek corridor
- Re-pave upper parking lot at Roxborough Village Community Park after Rampart Range Road improvements are complete.
- Apply for grants and begin skatepark design
- Fine grade and sod field in Chatfield Farms Park
- Replace playground surfacing at Chatfield Farms Park
- Re-sod open space in Imperial Park
- Explore partnering opportunities for interpretive signage
- Discuss street crossing improvements throughout the district with Douglas County

2008

- Develop and install interpretive signage
- Design and construct improved entrances to Roxborough Village Community Park
- Design and build main path connecting parking lots in Roxborough Village Community Park
- Begin skatepark construction
- Replace trail section #1 – Little Willow Creek Trail north of Village Circle West (see Exhibit F)
- Begin converting bluegrass areas to native grass in Roxborough Village Community Park

2009

- Replace trail section #2 – Little Willow Creek Trail west of Rampart Range Road (see Exhibit F)
- Design and begin construction of trail improvements in Roxborough Village Community Park
- Design and begin construction on picnic area in Roxborough Village Community Park
- Design and begin construction of expanded multi-use field area in Roxborough Village Community Park.
- Relocate volleyball court in Roxborough Village Community Park
- Design and begin construction on improved playground/shelter at Imperial Park

2010

- Design and begin construction on new playground in Roxborough Village Community Park
- Replace trail section #3 – Village Circle West Trail (see Exhibit F)
- Add shrubs/trees to open space areas in Roxborough Village Community Park
- Expand playground in Chatfield Farms Park with new swing set

2011

- Replace trail section #4 (Village Circle West Connector Trail (see Exhibit F)

2012

- Replace trail section #5 (Village Circle East Trail)
- Begin design/implementation of Village Circle East/West streetscapes



Exhibits

Exhibit A - Open Space and Natural Systems Plan

Exhibit B - Existing Parks and Trails Plan

Exhibit C - Existing Irrigation Inventory and Distribution Diagram

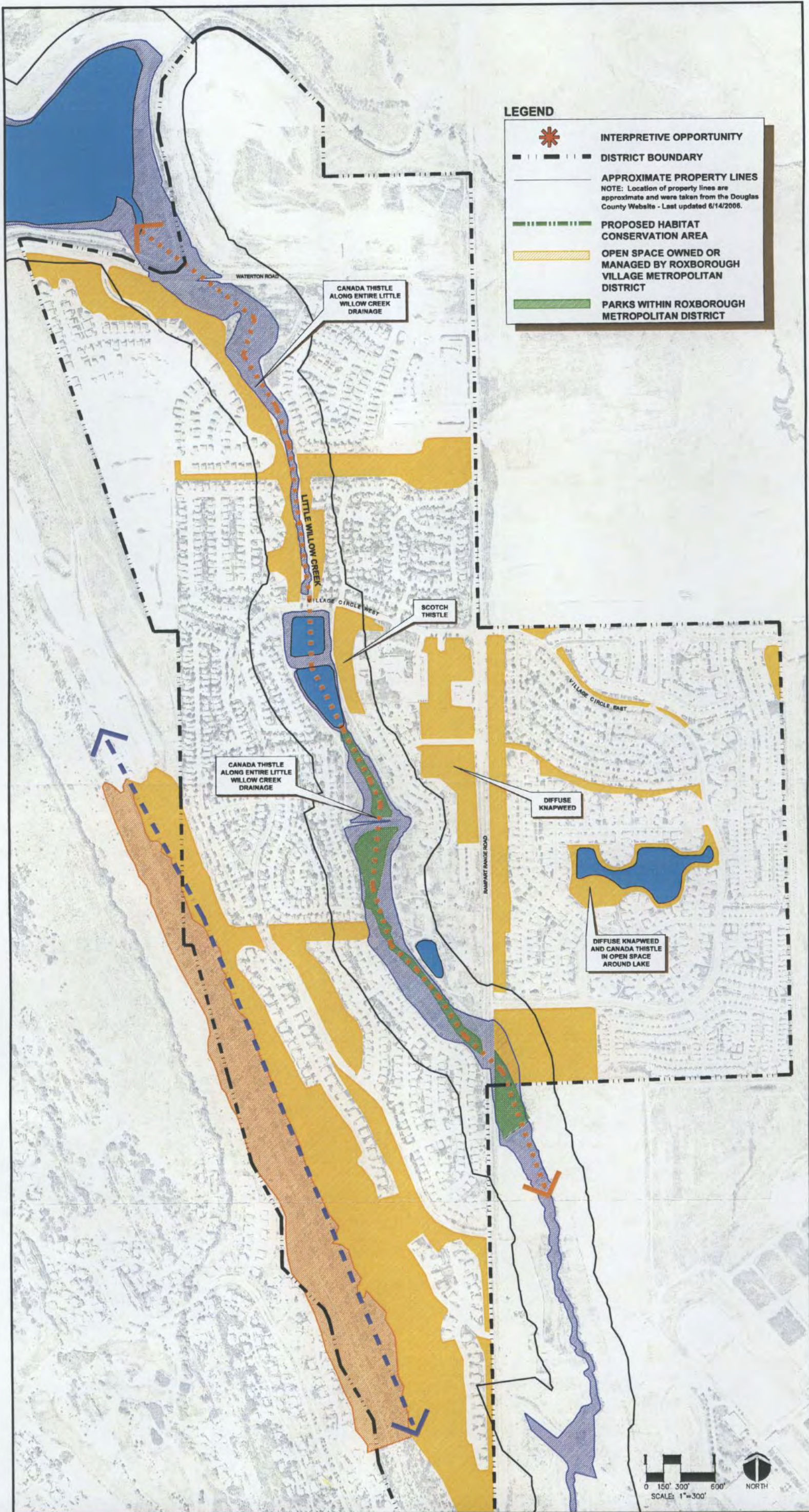
Exhibit D - Parks and Open Space Recommendations Plan

Exhibit E - Streetscape Improvement Concepts

Exhibit F - Trails Recommendations Plan

Exhibit G - Roxborough Village Park Master Plan





LEGEND







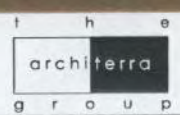
-  INTERPRETIVE OPPORTUNITY
-  DISTRICT BOUNDARY
-  APPROXIMATE PROPERTY LINES
NOTE: Location of property lines are approximate and were taken from the Douglas County Website - Last updated 6/14/2006.
-  PROPOSED HABITAT CONSERVATION AREA
-  OPEN SPACE OWNED OR MANAGED BY ROXBOROUGH VILLAGE METROPOLITAN DISTRICT
-  PARKS WITHIN ROXBOROUGH METROPOLITAN DISTRICT

EXHIBIT A - OPEN SPACE AND NATURAL SYSTEMS PLAN
 Park and Open Space Renovation Master Plan
 Roxborough Village Metropolitan District



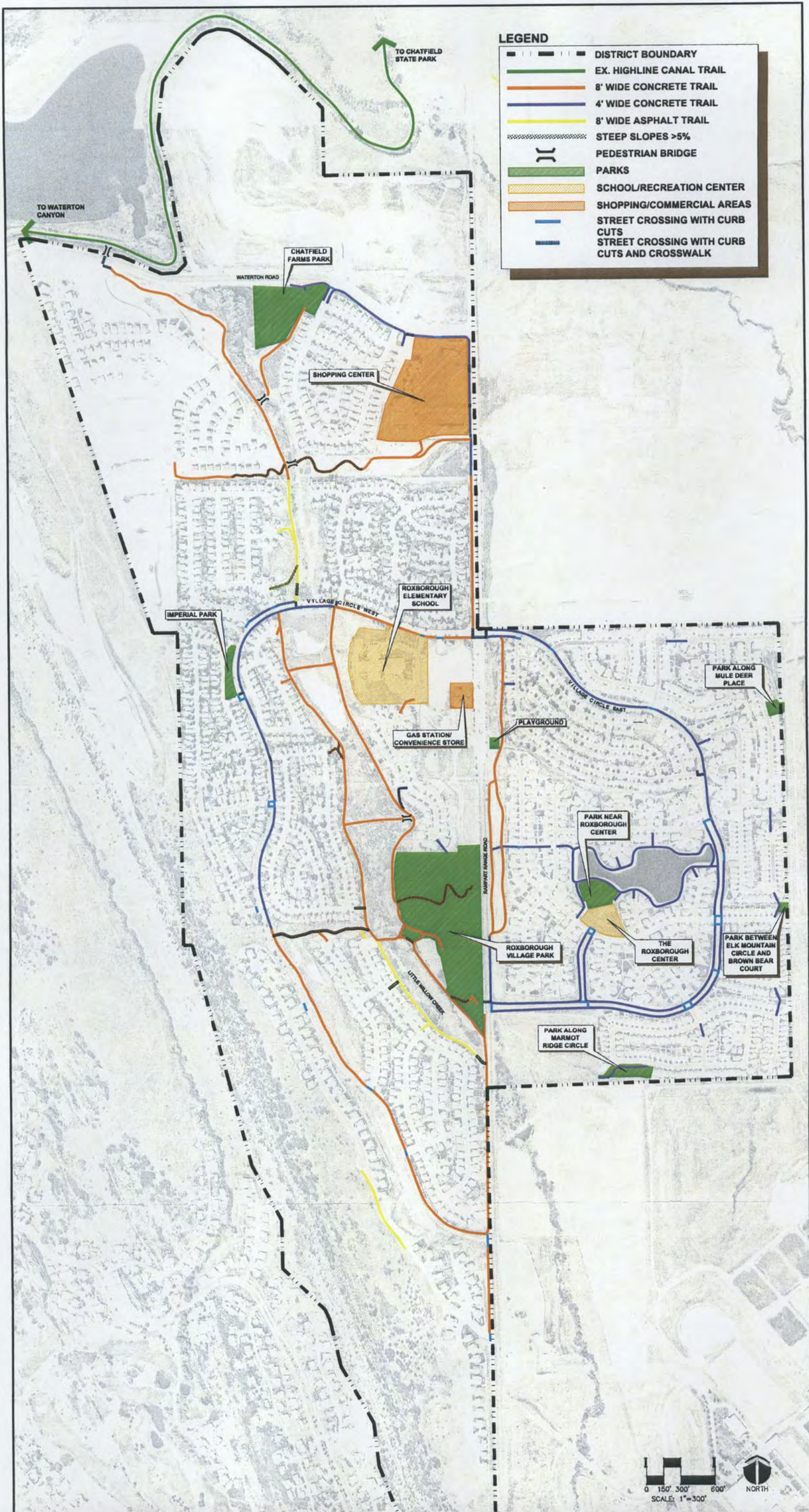


EXHIBIT B - EXISTING PARKS AND TRAILS PLAN

Park and Open Space Renovation Master Plan
 Roxborough Village Metropolitan District

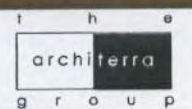
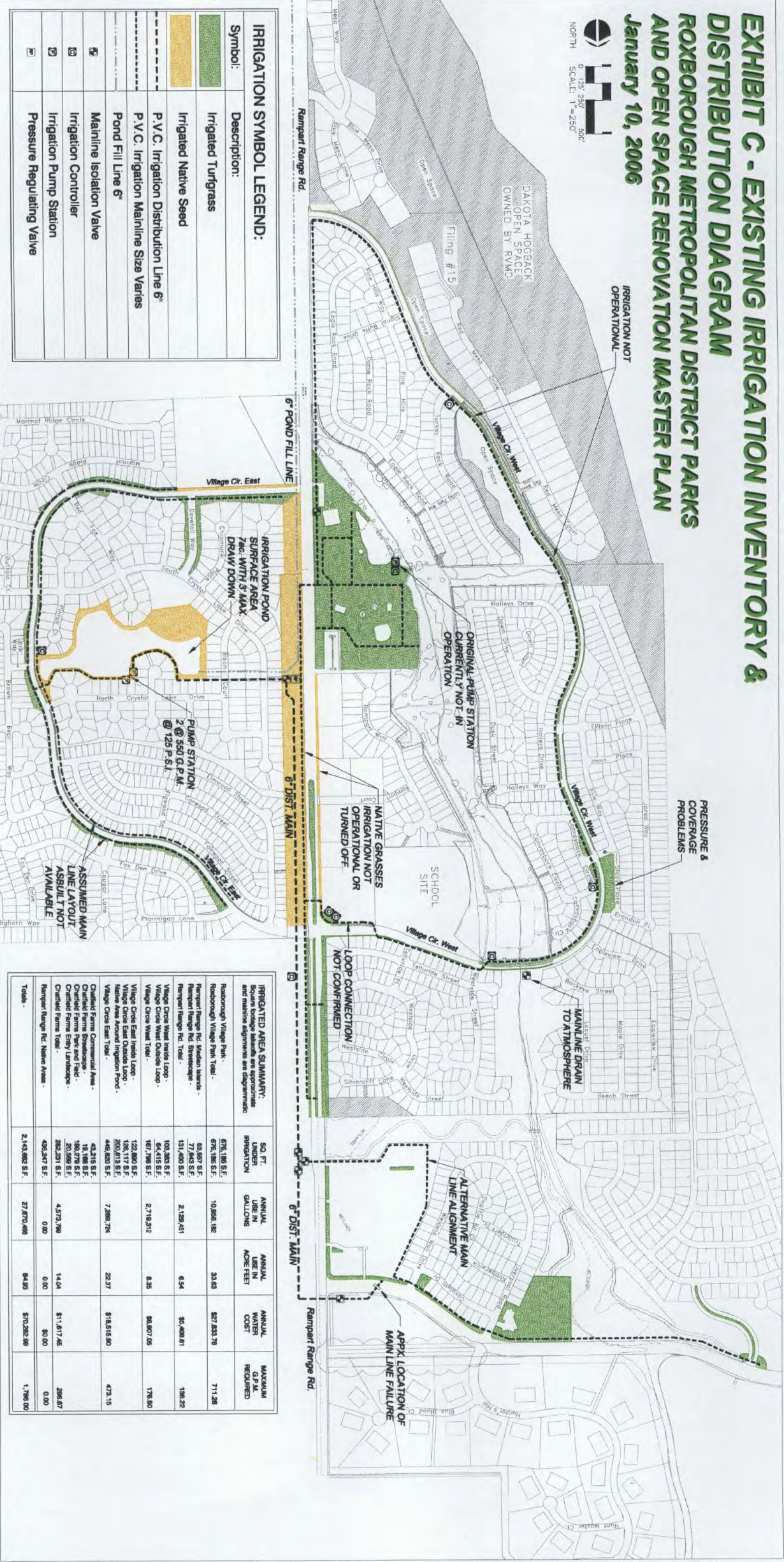
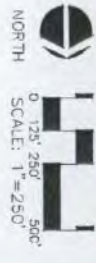


EXHIBIT C - EXISTING IRRIGATION INVENTORY & DISTRIBUTION DIAGRAM

ROXBOROUGH METROPOLITAN DISTRICT PARKS AND OPEN SPACE RENOVATION MASTER PLAN

January 10, 2006



IRRIGATION SYMBOL LEGEND:

Symbol:	Description:
	Irrigated Turfgrass
	Irrigated Native Seed
	P.V.C. Irrigation Distribution Line 6"
	P.V.C. Irrigation Mainline Size Varies
	Pond Fill Line 6"
	Mainline Isolation Valve
	Irrigation Controller
	Irrigation Pump Station
	Pressure Regulating Valve

IRRIGATED AREA SUMMARY:
Square footages are approximate and mainline alignments are diagrammatic.

	SQ. FT. UNDER IRRIGATION	ANNUAL USE IN GALLONS	ANNUAL USE IN ACRE FEET	ANNUAL WATER COST	MAXIMUM G.P.M. REQUIRED
Roxborough Village Park -	676,186 S.F.	10,956,182	33.83	\$27,833.78	711.28
Roxborough Village Park Total -	676,186 S.F.	10,956,182	33.83	\$27,833.78	711.28
Rampart Range Rd. Median Islands -	83,907 S.F.	27,843 S.F.	0.54	\$5,408.81	138.22
Rampart Range Rd. Streetscape -	151,400 S.F.	2,129,461	6.54	\$5,408.81	138.22
Rampart Range Rd. Total -	235,307 S.F.	2,129,461	6.54	\$5,408.81	138.22
Village Circle West Inside Loop -	103,383 S.F.	64,415 S.F.	0.35	\$8,807.05	178.50
Village Circle West Outside Loop -	167,798 S.F.	2,719,312	8.35	\$8,807.05	178.50
Village Circle West Total -	271,181 S.F.	2,719,312	8.35	\$8,807.05	178.50
Village Circle East Inside Loop -	122,880 S.F.	126,117 S.F.	0.00	\$0.00	0.00
Village Circle East Outside Loop -	126,117 S.F.	200,813 S.F.	0.63	\$1,617.45	296.87
Mainline Area Around Irrigation Pond -	449,820 S.F.	7,289,724	22.37	\$18,515.90	473.15
Village Circle East Total -	251,997 S.F.	2,226,930	6.98	\$1,617.45	296.87
Chenfield Farms Commercial Area -	43,215 S.F.	0.00	0.00	\$0.00	0.00
Chenfield Farms Streetscape -	18,186 S.F.	0.00	0.00	\$0.00	0.00
Chenfield Farms Park and Field -	198,278 S.F.	0.00	0.00	\$0.00	0.00
Chenfield Farms Entry Landscaping -	20,598 S.F.	0.00	0.00	\$0.00	0.00
Chenfield Farms Total -	280,277 S.F.	0.00	0.00	\$0.00	0.00
Rampart Range Rd. Median Areas -	436,247 S.F.	0.00	0.00	\$0.00	0.00
Totals -	2,143,682 S.F.	27,870,469	84.53	\$70,292.99	1,798.00

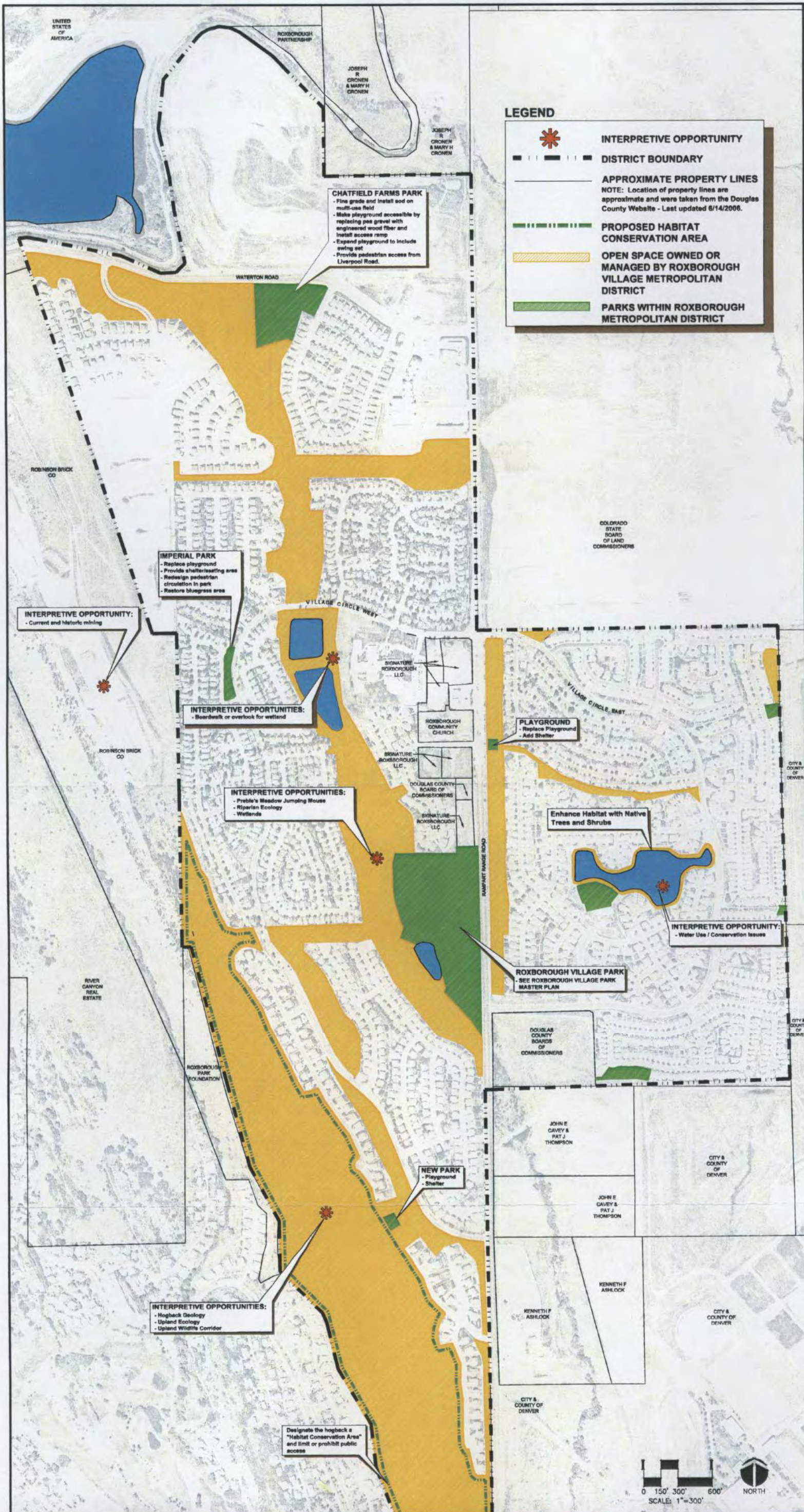
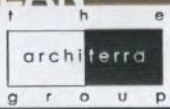
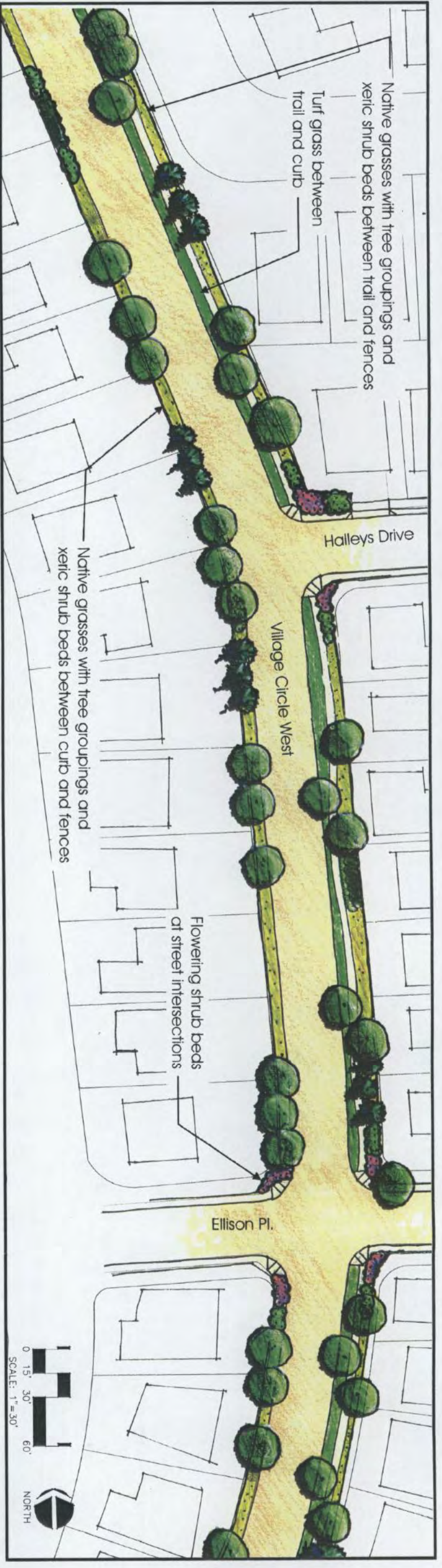
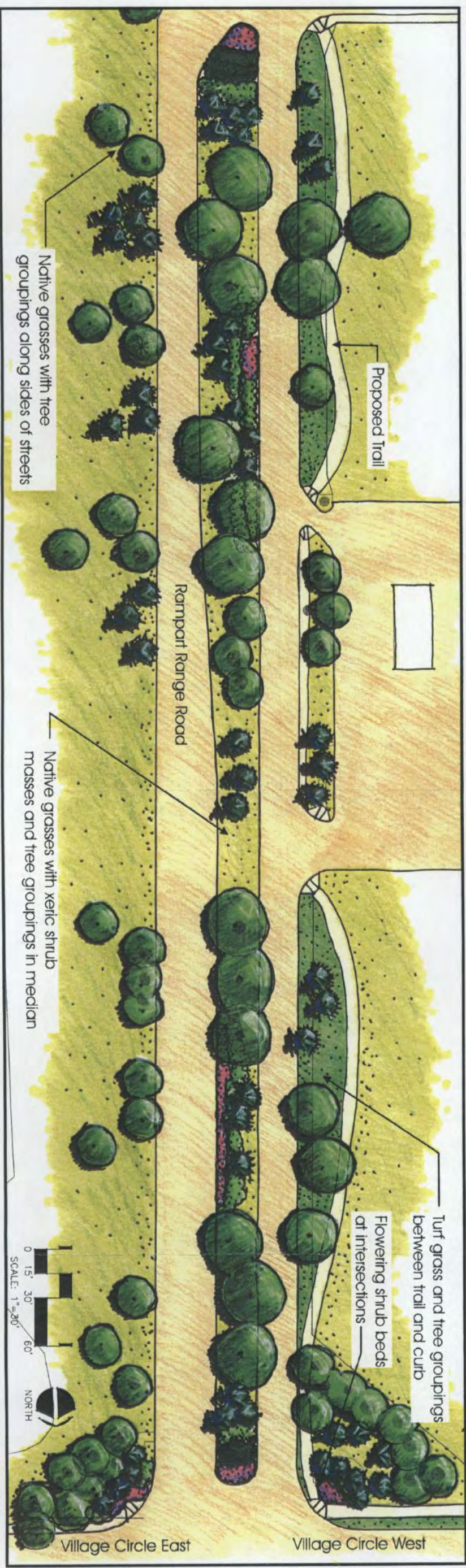


EXHIBIT D - PARKS AND OPEN SPACE RECOMMENDATIONS PLAN
 Park and Open Space Renovation Master Plan
 Roxborough Village Metropolitan District





Village Circle West - Streetscape Improvement Plan



Rampart Range Road - Streetscape Improvement Plan

EXHIBIT E - STREETSCAPE IMPROVEMENT CONCEPTS
Park and Open Space Renovation Master Plan
 Roxborough Village Metropolitan District



LEGEND

- DISTRICT BOUNDARY
- EX. HIGHLINE CANAL TRAIL
- 8' WIDE CONCRETE TRAIL
- 4' WIDE CONCRETE TRAIL
- 8' WIDE ASPHALT TRAIL
- STEEP SLOPES >5%
- PEDESTRIAN BRIDGE
- PARKS
- SCHOOL/RECREATION CENTER
- SHOPPING/COMMERCIAL AREAS
- STREET CROSSING WITH CURB CUTS
- STREET CROSSING WITH CURB CUTS AND CROSSWALK
- NEW CONCRETE TRAIL
- REPLACE EXISTING TRAIL

TRAIL RECOMMENDATIONS:

- A. PROVIDE NEW TRAIL CONNECTION ALONG RAMPART RANGE ROAD.
- B. INSTALL MAPS/DIRECTIONAL SIGNAGE.
- C. REPLACE TRAIL SECTION #1.
- D. REPLACE TRAIL SECTION #2.
- E. REPLACE TRAIL SECTION #3.
- F. REPLACE TRAIL SECTION #4.
- G. REPLACE TRAIL SECTION #5.
- H. INSTALL BRIDGE (BY SUNSET MANAGEMENT).
- I. INSTALL CROSSWALKS (BY DOUGLAS COUNTY).
- J. INSTALL CURB RAMPS (BY DOUGLAS COUNTY).

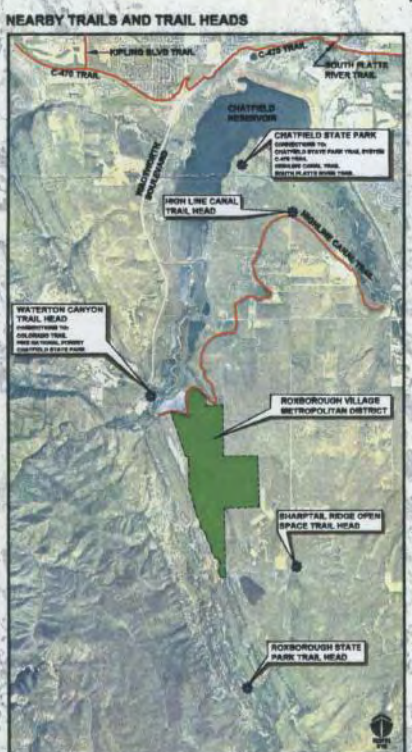
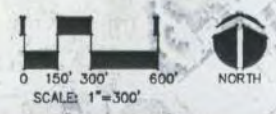


EXHIBIT F - TRAILS RECOMMENDATIONS PLAN
 Park and Open Space Renovation Master Plan
 Roxborough Village Metropolitan District



Proposed Park Amenities/Improvements

- A. Enhance Vehicular Entrance
 - Signage
 - Plantings
- B. Create Pedestrian Entrance
 - Signage/Map
 - Plantings
 - Seating Area
 - Special Paving
 - Kiosk/Bulletin Board
 - Entry Monumentation
- C. Native/Xeric Landscaping
 - Convert Steep and Unused Areas to Native/Xeric Landscaping
 - Grasses, Trees, and Shrubs
- D. Stairway
 - Provide Direct Access Between Upper and Lower Park Amenities
- E. Replace Walkways in Park
 - Concrete Walks
 - Meet ADA Design Guidelines
- F. Add Trail Along Rampart Range Road
 - Remove Existing Playgrounds in the Park
 - Large Community Wide Destination Playground
 - Accommodate 2-5 Year Olds and 5-12 Year Olds
- G. Playground
 - Remove Existing Playgrounds in the Park
 - Large Community Wide Destination Playground
 - Accommodate 2-5 Year Olds and 5-12 Year Olds
- H. Skatepark
 - 10,000 - 14,000 S.F.
- I. Relocate Volleyball Court
- J. Re-Pave Upper Parking Lot
- K. Seating Areas
 - Shelters
 - Overlooks
 - Shade Trees
 - Special Paving
- L. Improve Baseball/Softball Field
 - Provide Dugouts
 - Provide Paved Plaza at Bleachers
 - Provide Shade Trees
- M. Expand Field Area
 - Regrade Existing Area
 - Provide Additional Youth Size Field
- N. Park Entrance from Trail
 - Special paving
 - Seating area
 - Entry Monumentation
 - Signage
- O. Picnic Area
 - Shelter
 - Shade Trees

Existing Park Amenities to Remain

- P. Tennis Courts
- Q. Parking Lots
- R. Basketball Courts
- S. Restrooms
- T. Baseball/Softball Field
- U. Pond

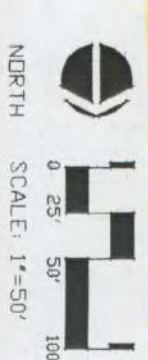


EXHIBIT G - ROXBOROUGH VILLAGE COMMUNITY PARK MASTER PLAN
Park and Open Space Renovation Master Plan
 Roxborough Village Metropolitan District





Appendix

Park Element Inventory

Irrigation System - Existing Gallon Per Minute Demand Calculation Sheet

Irrigation System - Existing Annual Water Consumption/Water Budget Calculations

Resident Questionnaire

Resident Questionnaire Results

Conceptual Estimate of Probable Construction Costs

Irrigation System - Proposed Annual Water Consumption/Water Budget Projections

**Roxborough Village Park
Village Circle West
Rampart Range Road Medians
Rampart Range Road R.O.W.
Arrowhead Shores Lake**

Funding Sources



Park Element Inventory

Roxborough Village Park

Item	Condition
Parking Lots	
North parking lot	Asphalt parking lot with concrete curbs The parking lot is in poor condition with significant cracking
South parking lot	Asphalt parking lot with concrete curbs The parking lot is in moderate condition with some cracking
Structures	
Shelter	Wooden shelter with steel railing Painted maroon with asphalt shingle roof The shelter is not "park" grade and is subject to vandalism
Restroom	Beige building with fully plumbed restrooms. These are operational during the summer months The maintenance contractor reports that the restroom is in good mechanical condition.
Court Sports	
Basketball Court	The post-tensioned concrete court is in good condition. The fencing and goals are in good condition. The court needs to be re-stripped. The orientation of the court is with the long axis east-west. North-south is a preferred orientation
Tennis Courts	The post-tensioned concrete court is in good condition There are 2 tennis courts on the slab The surfacing, fencing, and nets are in good condition. The orientation of the courts is with the long axis north-south which is ideal.
Volleyball Court	Sand play surface Timber edging is in moderate condition. The timber posts for the net are in moderate condition. The orientation of the court is with the long axis north-south which is ideal.
Baseball Field	Grass outfield with skinned infield Approximately 300' outfield No dugouts The backstop is in good condition The outfield sod is in moderate to poor condition. The orientation of the field is toward the northwest. This is suitable, however, a northeast orientation is preferred
Playgrounds	The playgrounds do not meet the current ADA accessibility guidelines for playgrounds. There is no paved access to either play area. Play pit #2 is hazardous as the play pit is clearly not large enough to cover the use zone of the swings, and the sand depth is relatively thin.
Play pit #1	
<ul style="list-style-type: none"> Play structure 	Playworld Systems play structure Color scheme: yellow, red, and blue Good condition
<ul style="list-style-type: none"> Playground surfacing 	Sand – non accessible
<ul style="list-style-type: none"> Playground edger 	Wood timber
Play Pit #2	
<ul style="list-style-type: none"> Swing Set 	Includes 2 tot swings and 4 belt seats

	Metal finish Poor condition
• Teeter Totter	Metal finish Poor condition
• Slide	Color scheme: beige and brown Moderate condition
• Playground surfacing	Sand – non accessible
• Playground edger	Wood timber Moderate condition
Sidewalks and Pavement	There are two main paths within the park that connect from the parking lots to the Little Willow Creek Trail The concrete is new and in good condition, however, most of the trail is very steep and does not meet ADA design guidelines Many park features are not accessible by a paved path
Landscape	
• Bluegrass sod	Ranges from moderate to poor condition Some bare areas or unhealthy areas.
• Trees	Trees are mature and in good condition
Site Furniture	
• (7) Benches	Green vinyl coated mesh with black painted frame Good condition
• (12) Trash Receptacles	Two varieties: Exposed aggregate concrete with brown metal top Green vinyl coated mesh Range from good to moderate condition
• (15) Picnic Tables	Two varieties: Wood table and benches with black frame Red vinyl coated mesh with black frame Range from poor to good condition
• (4) Grills	Metal grills Poor to moderate condition
• (2) Bleachers	Metal bleachers Moderate condition

Park at Stacy Place and Village Circle West

Item	Condition
Playground	This playground does not meet the current ADA accessibility guidelines for playgrounds There is no paved access to either play area
Play Pit #1	
• Swing set	Playworld Systems swing set Painted yellow and red Includes 4 belt swings Good condition
• Tot swings	Playworld Systems swing set Color scheme: yellow and blue Includes 2 tot swings Good condition
• Playground surfacing	Engineered wood fiber - accessible Needs to have additional material spread under swings Good Condition
• Playground edger	Black Plastic Edger There is no ramp providing access to the play pit Good Condition

Play Pit #2	
<ul style="list-style-type: none"> • Tot structure 	Color scheme: yellow, white, blue, and red The structure is not "park" grade The structure is not ADA accessible Good condition
<ul style="list-style-type: none"> • Playground surfacing 	Sand – non accessible
<ul style="list-style-type: none"> • Playground edger 	Wood timber
Sidewalks and Pavement	The sidewalks are concrete and are in good condition The sidewalk to Village Circle West meets the road at a location where there is no curb ramp or crosswalk. The sidewalk to Village Circle West includes a step that makes it inaccessible to wheelchairs and strollers. There is no direct connection to the playgrounds There is no direct connection to the corner of Village Circle West and Stacy Place
Landscape	
<ul style="list-style-type: none"> • Bluegrass sod 	Poor condition Several bare areas
<ul style="list-style-type: none"> • Trees 	Trees are mature and in good condition
Site Furniture	
<ul style="list-style-type: none"> • (2) Benches 	Green vinyl coated mesh with black frame Touch up painting and hardware repair needed Moderate condition
<ul style="list-style-type: none"> • (1) Trash Receptacle 	Brown vinyl coated mesh with plastic top Moderate Condition

Playground on East Side of Rampart Range Road

Item	Condition
Playground	This playground does not meet the current ADA accessibility guidelines for playgrounds.
<ul style="list-style-type: none"> • Play structure 	Color scheme. red and yellow Good condition
<ul style="list-style-type: none"> • Playground surfacing 	Sand – non accessible
<ul style="list-style-type: none"> • Playground edger 	Wood timber There is no ramp providing access to the play pit Poor condition
Sidewalks and Pavement	The sidewalk connection to the playground is concrete and is in good condition.
Site Furniture	
<ul style="list-style-type: none"> • (1) Benches 	Brown vinyl coated mesh with galvanized frame Moderate condition
<ul style="list-style-type: none"> • (1) Trash Receptacle 	Exposed aggregate concrete with brown metal top Good condition

Chatfield Farms Park

Item	Condition
Parking Lot	Asphalt parking lot with concrete curbs The parking lot is in good condition
Shelter	Steel prefabricated shelter by Poligon Color: green Good condition, however some paint is peeling on the roof The footer details create potential tripping hazards

Restroom Enclosure	Steel prefabricated enclosure by Poligon Color green Good condition
Seat/Planter Wall	The buff colored stone wall is in good condition.
Playground	This playground does not meet the current ADA accessibility guidelines for playgrounds The plaza surrounding the playground slopes significantly toward the west, allowing the safety surfacing to spill out of the play pit It appears that the play structure was set approximately 1' too high, making it impossible to install the safety surfacing at the proper height under the equipment .
• Play structure	Miracle play structure Color scheme. green The structure is not ADA accessible Good condition
• Playground surfacing	Pea gravel – non accessible
• Playground edger	Concrete edge There is no ramp to provide access into the pit
Sidewalks and Pavement	The sidewalks and plaza are concrete and are in good condition. There is no pedestrian access to the park from the main entrance at Liverpool Circle The connection to the trail along Waterton Road is inaccessible to wheelchairs, strollers, and bicycles because there is a staircase along the sidewalk.
Landscape	
• Bluegrass sod	Good condition
• Trees	Trees are young and in good condition
Site Furniture	
• (4) Benches	Green painted steel benches by Thomas Steel Good condition

Park along Mule Deer Place

Item	Condition
Playground	This playground does not meet the current ADA accessibility guidelines for playgrounds because there is no ramp providing access into the play pit.
• Play structure	Miracle play structure Color scheme: red, yellow, blue, beige Good condition
• Playground surfacing	Engineered wood fiber - accessible
• Playground edger	Concrete edge There is no ramp to provide access into the pit
Sidewalks and Pavement	The sidewalk around the playground is concrete and is in good condition. The sidewalk from the street to the playground is crusher fines.
Landscape	
• Bluegrass sod	Good condition
• Trees and shrubs	Trees and shrubs are young and in good condition
Site Furniture	
• (1) Bench	Green vinyl coated mesh with black painted frame Good condition

Park between Elk Mountain Circle and Brown Bear Court

Item	Condition
Playground	This playground meets the current ADA accessibility guidelines for playgrounds
• Play structure	Little Tikes play structure Color scheme: green and beige Good condition
• Playground surfacing	Engineered wood fiber - accessible
• Playground edger	Concrete edge with accessible ramp
Sidewalks and Pavement	The sidewalks to and around the playground is concrete and is in good condition.
Landscape	
• Bluegrass sod	Good condition
• Trees	Trees are young and in good condition
Site Furniture	
• (3) Benches	Green vinyl coated mesh with black painted frame Good condition
• (1) Trash Receptacle	Green vinyl coated mesh Good condition

Park along Marmot Ridge Circle

Item	Condition
Playground	This playground meets the current ADA accessibility guidelines for playgrounds.
• Play structure	Little Tikes play structure Color scheme: red, green and beige Good condition
• Playground surfacing	Engineered wood fiber - accessible
• Playground edger	Concrete edge with accessible ramp
Sidewalks and Pavement	The sidewalks to and around the playground are concrete and are in good condition.
Landscape	
• Bluegrass sod	Good condition
• Trees	Trees are young and in good condition
Site Furniture	
• (2) Benches	Green vinyl coated mesh with black painted frame Good condition
• (1) Trash Receptacle	Green vinyl coated mesh Good condition

Park along lake near Roxborough Center

Item	Condition
Playground	This playground meets the current ADA accessibility guidelines for playgrounds
• Play structure	Playland play structure Color scheme: green and beige Good condition
• Playground surfacing	Engineered wood fiber - accessible
• Playground edger	Concrete edge There is no accessible ramp, however, the wood fiber meets the grade of the surrounding sidewalk.

Volleyball Court	Sand play surface, concrete edger, and net are all in good condition
Sidewalks and Pavement	The sidewalks to and around the playground are concrete and are in good condition.
Landscape	
• Dryland grass	Moderate condition
• Trees	Trees are young and in good condition
Site Furniture	
• (2) Benches	Green vinyl coated mesh with black painted frame Good condition
• (2) Trash Receptacles	Exposed aggregate concrete with brown metal top Good condition
• (2) Picnic Tables	Green vinyl coated mesh with black painted frame Good condition
• (1) Grill	Black anodized finish Good condition

IRRIGATION SYSTEM - EXISTING GALLON PER MINUTE DEMAND CALCULATION

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan
 Date: Jan. 10, 2006

IRRIGATION SYSTEM PEAK FLOW WATER OUT DEMAND:

GENERAL NOTES:

The Roxborough Park Metropolitan District is considering restricting irrigation to two days per week for 2006. The following gallon per minute demand calculations are based on supplying 1.625" of irrigation per week (historical July E.T. for bluegrass turf) within two eight water windows per week.

ROXBOROUGH VILLAGE PARK: **676,186 SQUARE FEET OF:
ATHLETIC AREA TURF GRASS**

AREA OR VOLUME:	AREA OR VOLUME DESCRIPTION:	(X OR / BY:)	VALUE:
676,186	SQ. FT. OF IRRIGATED AREA	MULTIPLIED BY:	0.135 EQUALS:
91285.11	CU. FT. OF WATER REQUIRED PER WEEK	MULTIPLIED BY:	7.48 EQUALS:
682812.62	GALLONS OF WATER REQUIRED PER WEEK	DIVIDED BY:	2.00 EQUALS:
341406.31	GALLONS REQUIRED PER DAY OR CYCLE	DIVIDED BY:	8.00 EQUALS:
42675.79	GALLONS OF WATER REQUIRED PER HOUR	DIVIDED BY:	60.00 EQUALS:
711.26	GALLONS OF WATER REQUIRED PER MINUTE TO APPLY 1.625" OF WATER PER WEEK TO THE TURFGRASS AREA IN COMMUNITY PARK		

RAMPART RANGE ROAD: **131,400 SQUARE FEET OF:
ATHLETIC AREA TURF GRASS**

AREA OR VOLUME:	AREA OR VOLUME DESCRIPTION:	(X OR / BY:)	VALUE:
131,400	SQ. FT. OF IRRIGATED AREA	MULTIPLIED BY:	0.135 EQUALS:
17739.00	CU. FT. OF WATER REQUIRED PER WEEK	MULTIPLIED BY:	7.48 EQUALS:
132687.72	GALLONS OF WATER REQUIRED PER WEEK	DIVIDED BY:	2.00 EQUALS:
66343.86	GALLONS REQUIRED PER DAY OR CYCLE	DIVIDED BY:	8.00 EQUALS:
8292.98	GALLONS OF WATER REQUIRED PER HOUR	DIVIDED BY:	60.00 EQUALS:
138.22	GALLONS OF WATER REQUIRED PER MINUTE TO APPLY 1.625" OF WATER PER WEEK TO THE TURFGRASS AREA ALONG RAMPART RANGE ROAD		

VILLAGE CIRCLE WEST: **167,798 SQUARE FEET OF:
ATHLETIC AREA TURF GRASS**

AREA OR VOLUME:	AREA OR VOLUME DESCRIPTION:	(X OR / BY:)	VALUE:
167,798	SQ. FT. OF IRRIGATED AREA	MULTIPLIED BY:	0.135 EQUALS:
22652.73	CU. FT. OF WATER REQUIRED PER WEEK	MULTIPLIED BY:	7.48 EQUALS:
169442.42	GALLONS OF WATER REQUIRED PER WEEK	DIVIDED BY:	2.00 EQUALS:
84721.21	GALLONS REQUIRED PER DAY OR CYCLE	DIVIDED BY:	8.00 EQUALS:
10590.15	GALLONS OF WATER REQUIRED PER HOUR	DIVIDED BY:	60.00 EQUALS:
176.50	GALLONS OF WATER REQUIRED PER MINUTE TO APPLY 1.625" OF WATER PER WEEK TO THE TURFGRASS AREA ALONG VILLAGE CIRCLE WEST		

VILLAGE CIRCLE EAST WITH POND PERIMETER:

**449,820 SQUARE FEET OF:
ATHLETIC AREA TURF GRASS**

AREA OR VOLUME:	AREA OR VOLUME DESCRIPTION:	(X OR / BY:)	VALUE:
449,820	SQ. FT. OF IRRIGATED AREA	MULTIPLIED BY:	0.135 EQUALS:
60725.70	CU. FT. OF WATER REQUIRED PER WEEK	MULTIPLIED BY:	7.48 EQUALS:
454228.24	GALLONS OF WATER REQUIRED PER WEEK	DIVIDED BY	2.00 EQUALS:
227114.12	GALLONS REQUIRED PER DAY OR CYCLE	DIVIDED BY:	8.00 EQUALS:
28389.26	GALLONS OF WATER REQUIRED PER HOUR	DIVIDED BY:	60.00 EQUALS:
473.15	GALLONS OF WATER REQUIRED PER MINUTE TO APPLY 1.625" OF WATER PER WEEK TO THE TURFGRASS AREA ALONG VILLAGE CIRCLE EAST WITH POND		

CHATFIELD FARMS:

**282,231 SQUARE FEET OF:
ATHLETIC AREA TURF GRASS**

AREA OR VOLUME:	AREA OR VOLUME DESCRIPTION:	(X OR / BY:)	VALUE:
282,231	SQ. FT. OF IRRIGATED AREA	MULTIPLIED BY:	0.135 EQUALS:
38101.19	CU. FT. OF WATER REQUIRED PER WEEK	MULTIPLIED BY:	7.48 EQUALS:
284996.86	GALLONS OF WATER REQUIRED PER WEEK	DIVIDED BY:	2.00 EQUALS:
142498.43	GALLONS REQUIRED PER DAY OR CYCLE	DIVIDED BY:	8.00 EQUALS:
17812.30	GALLONS OF WATER REQUIRED PER HOUR	DIVIDED BY:	60.00 EQUALS:
296.87	GALLONS OF WATER REQUIRED PER MINUTE TO APPLY 1.625" OF WATER PER WEEK TO THE TURFGRASS AREAS IN CHATFIELD FARMS		

GALLON PER MINUTE DEMAND SUMMARY:

Community Park Maximum Irrigation G.P.M. demand is -----	711.26	G.P.M.
Rampart Range Road Maximum Irrigation G.P.M. demand is -----	138.22	G.P.M.
Village Circle West Maximum Irrigation G.P.M. demand is -----	176.50	G.P.M.
Village Circle East With Pond Maximum Irrigation G.P.M. demand is -----	473.15	G.P.M.
Chatfield Farms Maximum Irrigation G.P.M. demand is -----	296.87	G.P.M.
Total maximum G.P.M. demand is -----	1,796.00	G.P.M.

IRRIGATION SYSTEM - EXISTING ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: Jan. 10, 2006

AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (ROXBOROUGH VILLAGE PARK):

APPROXIMATE SQUARE FEET OF IRRIGATED TURF GRASS: 676,186 Sq. Ft.

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Historical E.T.	1.0"	3.0"	4.5"	6.5"	6.0"	4.0"	1.0"	
Turf Coefficient 80%	80%	80%	80%	80%	80%	80%	80%	
Water Requirement	.80"	2.40"	3.60"	5.20"	4.80"	3.20"	.80"	
System Efficiency	80%	80%	80%	80%	80%	80%	80%	
Monthly Requirement In Inches	1.0"	3.0"	4.5"	6.5"	6.0"	4.0"	1.0"	26"
Weekly Requirement In Inches	.25"	.75"	1.12"	1.63"	1.50"	1.0"	.25"	
Monthly Requirement In Cubic Feet	56,347	169,047	253,570	366,222	338,093	225,373	56,347	1,464,998
Weekly Requirement In Cubic Feet	14,087	42,262	63,392	91,556	84,523	56,343	14,087	
Monthly Requirement In Gallons	421,472	1,264,468	1,896,702	2,739,343	2,528,936	1,685,788	421,472	10,958,182
Weekly Requirement In Gallons	105,368	316,117	474,175	684,836	632,234	421,447	105,368	
Annual Requirement In Acre Feet: -----								33.63
Water Cost - Tier No.1 Use Fee	\$1,070.54	\$3,211.75	\$4,817.62	\$6,957.93	\$6,423.50	\$4,281.90	\$1,070.54	\$27,833.78
Total Annual Water Cost: -----								\$27,833.78
<p>Water Use Fee for 2006 = \$2.54 per 1,000 gallons.</p> <p>Water costs are subject to change and should be verified with the utility provider.</p>								

IRRIGATION SYSTEM - EXISTING ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: Jan. 10, 2006

AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (RAMPART RANGE RD. STREET SCAPE AND MEDIANS):

APPROXIMATE SQUARE FEET OF IRRIGATED TURF GRASS: 131,400 Sq. Ft.

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Historical E.T.	1.0"	3.0"	4.5"	6.5"	6.0"	4.0"	1.0"	
Turf Coefficient 80%	80%	80%	80%	80%	80%	80%	80%	
Water Requirement	.80"	2.40"	3.60"	5.20"	4.80"	3.20"	.80"	
System Efficiency	80%	80%	80%	80%	80%	80%	80%	
Monthly Requirement In Inches	1.0"	3.0"	4.5"	6.5"	6.0"	4.0"	1.0"	26"
Weekly Requirement In Inches	.25"	.75"	1.12"	1.63"	1.50"	1.0"	.25"	
Monthly Requirement In Cubic Feet	10,950	32,850	49,275	71,166	65,700	43,796	10,950	284,686
Weekly Requirement In Cubic Feet	2,737	8,213	12,319	17,792	16,425	10,949	2,737	
Monthly Requirement In Gallons	81,903	245,718	368,577	532,323	491,436	327,591	81,903	2,129,451
Weekly Requirement In Gallons	20,476	61,430	92,144	133,081	122,859	81,898	20,476	
Annual Requirement In Acre Feet: -----								6.54
Water Cost - Tier No.1 Use Fee	\$208.03	\$624.12	\$936.19	\$1,352.10	\$1,248.25	\$832.08	\$208.03	\$5,408.81
Total Annual Water Cost: -----								\$5,408.81

Water Use Fee for 2006 = \$2.54 per 1,000 gallons.

Water costs are subject to change and should be verified with the utility provider.

IRRIGATION SYSTEM - EXISTING ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: Jan. 10, 2006

AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (VILLAGE CIRCLE WEST WITH POCKET PARKS):

APPROXIMATE SQUARE FEET OF IRRIGATED TURF GRASS: 167,798 Sq. Ft.

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Historical E.T.	1.0"	3.0"	4.5"	6.5"	6.0"	4.0"	1.0"	
Turf Coefficient 80%	80%	80%	80%	80%	80%	80%	80%	
Water Requirement	.80"	2.40"	3.60"	5.20"	4.80"	3.20"	.80"	
System Efficiency	80%	80%	80%	80%	80%	80%	80%	
Monthly Requirement In Inches	1.0"	3.0"	4.5"	6.5"	6.0"	4.0"	1.0"	26"
Weekly Requirement In Inches	.25"	.75"	1.12"	1.63"	1.50"	1.0"	.25"	
Monthly Requirement In Cubic Feet	13,983	41,950	62,924	90,879	83,899	55,927	13,983	363,544
Weekly Requirement In Cubic Feet	3,496	10,487	15,731	22,720	20,975	13,982	3,496	
Monthly Requirement In Gallons	104,590	313,782	470,673	679,778	627,565	418,335	104,590	2,719,312
Weekly Requirement In Gallons	26,147	78,446	117,668	169,944	156,891	104,584	26,147	
Annual Requirement In Acre Feet: -----								8.35
Water Cost - Tier No.1 Use Fee	\$265.66	\$797.01	\$1,195.51	\$1,726.64	\$1,594.01	\$1,062.57	\$265.66	\$6,907.05
Total Annual Water Cost: -----								\$6,907.05
<p>Water Use Fee for 2006 = \$2.54 per 1,000 gallons.</p> <p>Water costs are subject to change and should be verified with the utility provider.</p>								

IRRIGATION SYSTEM - EXISTING ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: Jan. 10, 2006

AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (VILLAGE CIRCLE EAST WITH POND PERIMETER):

APPROXIMATE SQUARE FEET OF IRRIGATED TURF GRASS: 449,820 Sq. Ft.

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Historical E.T.	1.0"	3.0"	4.5"	6.5"	6.0"	4.0"	1.0"	
Turf Coefficient 80%	80%	80%	80%	80%	80%	80%	80%	
Water Requirement	.80"	2.40"	3.60"	5.20"	4.80"	3.20"	.80"	
System Efficiency	80%	80%	80%	80%	80%	80%	80%	
Monthly Requirement In Inches	1.0"	3.0"	4.5"	6.5"	6.0"	4.0"	1.0"	26"
Weekly Requirement In Inches	.25"	.75"	1.12"	1.63"	1.50"	1.0"	.25"	
Monthly Requirement In Cubic Feet	37,484	112,455	168,683	243,623	224,910	149,925	37,484	974,562
Weekly Requirement In Cubic Feet	9,371	28,114	42,171	60,906	56,228	37,481	9,371	
Monthly Requirement In Gallons	280,377	841,163	1,261,745	1,822,296	1,682,327	1,121,439	280,377	7,289,724
Weekly Requirement In Gallons	70,094	210,291	315,436	455,574	420,582	280,360	70,094	
Annual Requirement In Acre Feet: -----								22.37
Water Cost - Tier No.1 Use Fee	\$712.16	\$2,136.56	\$3,204.83	\$4,628.63	\$4,273.11	\$2,848.46	\$712.16	\$18,515.90
Total Annual Water Cost: -----								\$18,515.90
<p>Water Use Fee for 2006 = \$2.54 per 1,000 gallons.</p> <p>Water costs are subject to change and should be verified with the utility provider.</p>								

IRRIGATION SYSTEM - EXISTING ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: Jan. 10, 2006

AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (CHATFIELD FARMS INCLUDING):
 (COMMERCIAL AREA, STREET SCAPE, PARK, FIELD, AND ENTRY)

APPROXIMATE SQUARE FEET OF IRRIGATED TURF GRASS: 282,231 Sq. Ft.

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Historical E.T.	1.0"	3.0"	4.5"	6.5"	6.0"	4.0"	1.0"	
Turf Coefficient 80%	80%	80%	80%	80%	80%	80%	80%	
Water Requirement	.80"	2.40"	3.60"	5.20"	4.80"	3.20"	.80"	
System Efficiency	80%	80%	80%	80%	80%	80%	80%	
Monthly Requirement In Inches	1.0"	3.0"	4.5"	6.5"	6.0"	4.0"	1.0"	26"
Weekly Requirement In Inches	.25"	.75"	1.12"	1.63"	1.50"	1.0"	.25"	
Monthly Requirement In Cubic Feet	23,518	70,558	105,837	152,856	141,116	94,068	23,518	611,470
Weekly Requirement In Cubic Feet	5,880	17,639	26,459	38,214	35,279	23,517	5,880	
Monthly Requirement In Gallons	175,917	527,772	791,658	1,143,365	1,055,544	703,626	175,917	4,573,799
Weekly Requirement In Gallons	43,979	131,943	197,914	285,841	263,886	175,906	43,979	
Annual Requirement In Acre Feet: -----								14.04
Water Cost - Tier No.1 Use Fee	\$446.83	\$1,340.54	\$2,010.81	\$2,904.15	\$2,681.08	\$1,787.21	\$446.83	\$11,617.45
Total Annual Water Cost: -----								\$11,617.45
<p>Water Use Fee for 2006 = \$2.54 per 1,000 gallons.</p> <p>Water costs are subject to change and should be verified with the utility provider.</p>								

Resident Questionnaire

Roxborough Village Metropolitan District

Parks and Open Space Renovation Master Plan

The Roxborough Village Metropolitan District (RVMD) is currently preparing a master plan that will be used to prioritize improvements to the parks, open space, and streetscapes within the District. As part of developing the master plan, we would like your input regarding your family's satisfaction with the current parks and recreation facilities in the District, and where you would like the District to focus its priorities in the future. Your input is critical and will be used in shaping the future of the parks and recreation opportunities in Roxborough Village. Please complete the survey and return it to R.S. Wells L.L.C., 6399 S. Fiddler's Green Circle, Suite 102, Greenwood Village, CO 80111-4974, or drop in the drop box at the Safeway located at 8355 N. Rampart Range Road. Responses must be received no later than April 7, 2006.

1. Please rank the following items within RVMD in order of importance to you.

Give the item most important a "1," the least important a "4":

Open Space (wildlife habitat, wetlands, etc.)	1	2	3	4
Trails (paved and maintained)	1	2	3	4
Streetscapes (plantings, fencing, sidewalks, and entry signage)	1	2	3	4
Parks (playgrounds, sport fields, sport courts, etc.)	1	2	3	4

2. How satisfied are you with the current resources in RVMD in these four areas:

	Very Satisfied	Somewhat Satisfied	Dissatisfied	Very Dissatisfied
Open Space				
Trails				
Streetscapes				
Parks				

3. How would you rate the quality of existing facilities in RVMD for the following activities:

	Excellent	Good	Fair	Poor	I don't participate in this activity
Hiking					
Walking/Running					
Cycling					
Softball/Baseball					
Football					
Soccer					
Volleyball					
Basketball					
Tennis					
Playgrounds					
Picnicking					
Nature study					

4. From the following list of outdoor activities, check all of the items that you have a need for, and circle the three items that are of most importance to you:

- | | | |
|--|--|---|
| <input type="checkbox"/> Hiking | <input type="checkbox"/> Basketball | <input type="checkbox"/> Soccer |
| <input type="checkbox"/> Walking/Running | <input type="checkbox"/> Tennis | <input type="checkbox"/> Roller Hockey |
| <input type="checkbox"/> Cycling | <input type="checkbox"/> Playgrounds | <input type="checkbox"/> Volleyball |
| <input type="checkbox"/> Softball/Baseball | <input type="checkbox"/> Skateboarding | <input type="checkbox"/> Picnicking |
| <input type="checkbox"/> Football | <input type="checkbox"/> Skateparks | <input type="checkbox"/> Nature study |
| <input type="checkbox"/> Multi-use Fields | <input type="checkbox"/> Disk Golf | <input type="checkbox"/> Shelters/Gathering Areas |

5. Indicate your level of satisfaction with the following items within RVMD:

	Very Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Very Dissatisfied
Maintenance of Parks				
Maintenance of Trails				
Maintenance of Streetscapes				
Maintenance of Open Space				
Number of Parks				
Quality of Parks				
Extent of the Trail System				
Quality of Athletic Fields				
Quality of Athletic Courts				
Number of Athletic Fields				
Number of Athletic Courts				
Landscaping Along Streets				
Neighborhood Entry Signage				
Open Space/Natural Areas				

6. Over the next five years, which one item should receive the most attention from the RVMD:

- Improvements to the Trail System
- Improvements to Parks
- Improvements to Streetscapes/Entry Signage
- Improvements to the Open Space/Natural Areas

7. Which three of the following amenities are in most need of improvement:

- | | |
|---|--|
| <input type="checkbox"/> Trails | <input type="checkbox"/> Playgrounds |
| <input type="checkbox"/> Softball/Baseball Field | <input type="checkbox"/> Shelters/Gathering Areas |
| <input type="checkbox"/> Football/Soccer Fields | <input type="checkbox"/> Volleyball Courts |
| <input type="checkbox"/> Basketball Courts | <input type="checkbox"/> Tennis Courts |
| <input type="checkbox"/> Picnic Facilities | <input type="checkbox"/> Landscaping Along Streets |
| <input type="checkbox"/> Neighborhood Entry Signage | <input type="checkbox"/> Open Space/Natural Areas |

8. Select all of the organizations that you use for parks and recreation services:

- RVMD Parks, Open Space, and Trails
- Foothills Park and Recreation District
- South Suburban Park and Recreation District
- Other Park and Recreation Districts
- The Roxborough Center
- Other Private Health Clubs
- Private or Public Schools
- Churches
- Other

9. Select the reasons below that indicate why you may not currently use the parks, trails and open space at Roxborough Village:

- To busy/not interested
- Use facilities in other districts/agencies
- Too far from residence/difficult to get to
- Do not know the locations
- The right equipment is not provided
- Not well maintained
- Lack of parking
- Insufficient security/safety

10. If you could change one thing about RVMD parks, trails, open space, and streetscapes, what would it be?

11. The following demographic questions are optional:

- a. What is your age? _____
- b. Are you. Male Female
- c. How long have you lived in Roxborough Village? _____
- d. How many people live in your household? _____
- e. What are the ages of the people in your household? _____

12. Please provide any additional comments:

Resident Questionnaire - Roxborough Village Metropolitan District

Summary of Responses as a Percentage of 440 Returned Questionnaires

#1 Please rank the following items within RVMD in order of importance to you. Give the item most important a "1", the least important a "4"

Item:	1	2	3	4
Open Space	44%	17%	17%	20%
Trails	29%	32%	24%	13%
Streetscapes	30%	21%	20%	27%
Parks	25%	30%	23%	20%

#2 How satisfied are you with the current resources in RVMD in these four areas:

Area:	Very Satisfied	Somewhat Satisfied	Dissatisfied	Very Dissatisfied
Open Space	33%	52%	9%	4%
Trails	33%	53%	10%	2%
Streetscapes	13%	39%	30%	16%
Parks	22%	56%	14%	5%

#3 How would you rate the quality of existing facilities in RVMD for the following activities:

Activity.	Excellent	Good	Fair	Poor	I don't participate in this activity
Hiking	20%	46%	19%	6%	5%
Walking/Running	28%	55%	11%	3%	2%
Cycling	16%	37%	19%	12%	13%
Softball/Baseball	4%	17%	21%	16%	39%
Football	3%	7%	19%	19%	48%
Soccer	4%	10%	20%	20%	44%
Volleyball	4%	13%	20%	18%	42%
Basketball	6%	15%	20%	15%	40%
Tennis	10%	33%	18%	4%	32%
Playgrounds	9%	36%	28%	6%	19%
Picnicking	9%	31%	29%	13%	15%
Nature Study	11%	25%	21%	11%	28%

#4 From the following list of outdoor activities, check all of the items that you have a need for: Circle the 3 items that are of most importance to you:

Hiking	75%	45%
Walking/Running	86%	61%
Cycling	61%	34%
Softball/Baseball	25%	9%
Football	10%	2%
Multi-use Fields	37%	15%
Basketball	23%	4%
Tennis	27%	8%
Playgrounds	51%	30%
Skateboarding	13%	3%
Skateparks	19%	8%
Disk Golf	12%	3%
Soccer	19%	5%
Roller Hockey	11%	4%
Volleyball	17%	4%
Picnicking	58%	18%
Nature Study	37%	13%
Shelters/Gathering Areas	53%	15%

#5 Indicate your level of satisfaction with the following items within RVMD:

Item.	Very Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Very Dissatisfied
Maintenance of Parks	27%	49%	14%	6%
Maintenance of Trails	32%	47%	14%	3%
Maintenance of Streetscapes	14%	36%	28%	17%
Maintenance of Open Space	23%	50%	19%	4%
Number of Parks	20%	48%	22%	5%
Quality of Parks	19%	52%	19%	5%
Extent of the Trail System	25%	48%	17%	6%
Quality of Athletic Fields	10%	42%	21%	10%
Quality of Athletic Courts	15%	45%	17%	5%
Number of Athletic Fields	12%	38%	22%	9%
Number of Athletic Courts	13%	40%	22%	7%
Landscaping Along Streets	11%	28%	30%	24%
Neighborhood Entry Signage	17%	36%	21%	20%
Open Space/Natural Areas	22%	50%	16%	7%

#6 Over the next five years, which one item should receive the most attention from the RVMD:

Improvements to the Trail System	18%
Improvements to Parks	25%
Improvements to Streetscapes/Entry Signage	34%
Improvements to Open Space/Natural Areas	22%

#7 Which three of the following amenities are in most need of improvement:

Trails	32%
Softball/Baseball Fields	12%
Football/Soccer Fields	14%
Basketball Courts	4%
Picnic Facilities	25%
Neighborhood Entry Signage	28%
Playgrounds	30%
Shelters/Gathering Areas	21%
Volleyball Courts	3%
Tennis Courts	3%
Landscaping Along Streets	57%
Open Space/Natural Areas	36%

#8 Select all of the organizations that you use for parks and recreation services:

RVMD Parks, Open Space, and Trails	83%
Foothills Park and Recreation District	53%
South Suburban Park and Recreation District	37%
Other Park and Recreation District	42%
The Roxborough Center	23%
Other Private Health Clubs	20%
Private or Public Schools	24%
Churches	18%
Other	19%

#9 Select the reasons below that indicate why you may not currently use the parks, trails and open space at Roxborough Village:

Too busy/not interested	10%
Use facilities in other districts/agencies	19%
Too far from residence/difficult to get to	6%
Do not know the locations	16%
The right equipment is not provided	14%
Not well maintained	20%
Lack of parking	4%
Insufficient security/safety	5%

#10. If you could change one thing about RVMD parks, trails, open space, and streetscapes, what would it be?

Percent of responses with comments regarding

Open Space	15%
Trails	22%
Streetscapes	35%
Parks	28%

#11 The following demographic questions are optional:

a. What is your age?

20-29	8%
30-39	35%
40-49	27%
50-59	12%
60-69	5%
70 and up	1%

b. Are you male, female?

Male	44%
Female	56%

c. How long have you lived in Roxborough Village?

under 1 year	5%
1 - 3 years	30%
4 - 6 years	30%
7 - 9 years	11%
10 - 12 years	6%
13 or more years	8%

d. How many people live in your household?

1	6%
2	30%
3	21%
4	21%
5	9%
6 or more	4%

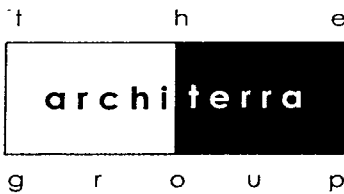
e. What are the ages of the people in your household?

0 - 5 years	43%
6 - 10 years	23%
11 - 15 years	15%
16 - 20 years	9%
21 - 54 years	149%
55 and over	15%

#12 Please provide any additional comments:

Percent of responses with comments regarding:

Open Space	5%
Trails	15%
Streetscapes	22%
Parks	58%



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**Roxborough Park and Recreation District
 Parks and Open Space Renovation Master Plan
 Conceptual Estimate of Probable Construction Costs
 (In 2006 Dollars)
 August 11, 2006**

FULL MASTER PLAN IMPLEMENTATION

ITEM	UNIT	QTY	UNIT COST	SUBTOTAL
Open Space	LS	1	326,150.00	326,150.00
Streetscapes	LS	1	1,907,510.50	1,907,510.50
Trails	LS	1	1,455,300.00	1,455,300.00
Parks	LS	1	3,395,390.00	3,395,390.00
Total				\$7,084,350.50

OPEN SPACE IMPROVEMENTS

ITEM	UNIT	QTY	UNIT COST	SUBTOTAL
Weed Management				
Prepare Noxious Weed Survey and Management Plan	LS	1	\$5,000.00	\$5,000.00
Subtotal				\$5,000.00
Interpretive Opportunities				
Interpretive Signage	EA	8	\$2,000.00	\$16,000.00
Wetland Boardwalk/Overlook	LS	1	\$50,000.00	\$50,000.00
Subtotal				\$66,000.00
Habitat Improvement				
Install Native Trees and Shrubs at Arrowhead Shores Lake	LS	1	\$200,000.00	\$200,000.00
Irrigation	LS	1	\$55,150.00	\$55,150.00
Subtotal				\$255,150.00

TOTAL OPEN SPACE IMPROVEMENTS				\$326,150.00
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STREETSCAPE IMPROVEMENTS

ITEM	UNIT	QTY	UNIT COST	SUBTOTAL
Village Circle West Streetscape Improvements - Dryland Grasses with Shrub Beds				
Landscaping - Both Sides of Street	LF	8,400	\$80.00	\$672,000.00
Irrigation	LF	8,400	\$38.55	\$323,820.00
Subtotal				\$995,820.00
Rampart Range Road Streetscape Improvements				
Landscaping - Both Sides of Street	LF	9,350	\$50.00	\$467,500.00
Irrigation - Both Sides of Street	LF	9,350	\$27.63	\$258,340.50
Landscaping - Median	SF	45,000	\$3.00	\$135,000.00
Irrigation	LF	45,000	\$1.13	\$50,850.00
Subtotal				\$911,690.50

TOTAL STREETSCAPE IMPROVEMENTS				\$1,907,510.50
---------------------------------------	--	--	--	-----------------------

Alternate - Village Circle West Streetscape Improvements - All Shrub Beds				
Landscaping - Both Sides of Street	LF	8,400	\$125.00	\$1,050,000.00
Irrigation	LF	8,400	\$38.55	\$323,820.00
Subtotal				\$1,373,820.00

TRAIL IMPROVEMENTS

ITEM	UNIT	QTY	UNIT COST	SUBTOTAL
New Trail Connection Along Rampart Range Road				
8' Wide Concrete Trail	LF	3,350	\$70 00	\$234,500.00
Subtotal				\$234,500.00
Install Directional Signage/Maps				
Directional Signs	EACH	8	\$2,000 00	\$16,000 00
Subtotal				\$16,000.00
Replace Trail - Section 1 - Little Willow Creek Trail North of Village Circle West				
Remove Existing 8' Wide Asphalt Trail	LF	1850	\$10 00	\$18,500 00
8' Wide Concrete Trail	LF	1,850	\$70.00	\$129,500 00
Subtotal				\$148,000.00
Replace Trail - Section 2 - Little Willow Creek Trail West of Rampart Range Road				
Remove Existing 8' Wide Asphalt Trail	LF	1950	\$10.00	\$19,500.00
8' Wide Concrete Trail	LF	1,950	\$80 00	\$156,000 00
Subtotal				\$175,500.00
Replace Trail - Section 3 - Village Circle West Trail, Jared Way to Westside Street				
Remove Existing 4' Wide Concrete Trail	LF	3,400	\$10 00	\$34,000 00
8' Wide Concrete Trail	LF	3,400	\$70.00	\$238,000.00
Subtotal				\$272,000.00
Replace Trail - Section 4 - Roxborough Village Park to Village Circle West				
Remove Existing 4' Wide Concrete Trail	LF	1090	\$10 00	\$10,900.00
8' Wide Concrete Trail	LF	1,600	\$70.00	\$112,000.00
Subtotal				\$122,900.00
Replace Trail - Section 5 - Village Circle East Trail				
Remove Existing 4' Wide Concrete Trail	LF	6080	\$10 00	\$60,800 00
8' Wide Concrete Trail	LF	6,080	\$70 00	\$425,600 00
Subtotal				\$486,400.00
TOTAL TRAIL IMPROVEMENTS				\$1,455,300.00

PARK IMPROVEMENTS

ITEM	UNIT	QTY	UNIT COST	SUBTOTAL
Imperial Park Improvements				
Replace Playground and Walkways	LS	1	\$250,000 00	\$250,000.00
Provide Shelter/Seating Area	LS	1	\$60,000 00	\$60,000 00
Replace Turf Grass	LS	1	\$45,000.00	\$45,000.00
Subtotal				\$355,000.00
Chatfield Farms Park Improvements				
Fine Grade and Sod Multi-purpose Field	LS	1	\$150,000.00	\$150,000.00
Playground Improvements	LS	1	\$50,000 00	\$50,000.00
Subtotal				\$200,000.00
Playground in Open Space Improvements				
Replace Playground	LS	1	\$200,000.00	\$200,000.00
Provide Shelter/Seating Area	LS	1	\$60,000.00	\$60,000.00
Subtotal				\$260,000.00
Provide New Park Between Red Mesa and Blue Mesa				
Provide New Playground	LS	1	\$250,000.00	\$250,000.00
Provide Shelter/Seating Area	LS	1	\$60,000 00	\$60,000.00
New Irrigation Water Tap	LS	1	\$20,000.00	\$20,000.00
Subtotal				\$330,000.00
Roxborough Village Park Improvements				
Enhance Vehicular Entrances (Signage, Plantings)	LS	1	\$50,000 00	\$50,000.00
Create Pedestrian Entrance Plazas (Seating, Paving, Etc)	LS	1	\$100,000.00	\$100,000.00
Convert Turf Grass to Native Seed	LS	1	\$200,000.00	\$200,000.00
Install Xenc Shrubs and Trees	LS	1	\$200,000.00	\$200,000.00
Replace Walkways Throughout the Park	LS	1	\$250,000.00	\$250,000.00
Playground	LS	1	\$350,000.00	\$350,000.00
Skatepark (14,000 S.F. Concrete)	LS	1	\$500,000.00	\$500,000.00
Volleyball Court	LS	1	\$25,000.00	\$25,000.00
Repave Parking Lot	LS	1	\$75,000.00	\$75,000.00
Irrigation Modification	LS	1	\$75,390.00	\$75,390.00

Shelters/Seating Areas (Shelters, Paving, Site Furnishings)	LS	1	\$120,000.00	\$120,000.00
Improve Softball/Baseball Field (Dugouts, Paving, Etc.)	LS	1	\$30,000.00	\$30,000.00
Expand Field Area	LS	1	\$175,000.00	\$175,000.00
Picnic Area (Shelter, Trees, Site Furnishings)	LS	1	\$100,000.00	\$100,000.00
Subtotal				\$2,250,390.00
TOTAL PARK IMPROVEMENTS				\$3,395,390.00

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET SUMMARY PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (ROXBOROUGH VILLAGE PARK REDEVELOPMENT):
 ASSUMES A FIVE YEAR MASTERPLAN IMPLEMENTATION SCHEDULE AS FOLLOWS:

- Year No.1** ----- Maintenance of ballfield turfgrass and existing trees and conversion of passive park areas to native seed first year germination and establishment.
- Year No.2** ----- Maintenance of ballfield turfgrass and existing trees and second year grow in for native seed conversion areas.
- Year No.3** ----- Maintenance of ballfield turfgrass and existing trees and third year grow in for native seed conversion areas.
- Year No.4** ----- Maintenance of ballfield turfgrass and existing trees and establishment of new trees and shrubs.
- Year No.5** ----- Maintenance of ballfield turfgrass, existing trees, new trees and shrubs and establishment of playground and skate court turfgrass buffer.

Irrigation Season:	Existing	Year No.1	Year No.2	Year No. 3	Year No.4	Year No.5
Annual water consumption in gallons:	10,958,182	8,448,794	5,295,612	4,394,708	2,690,739	3,182,603
Annual water cost:	\$29,258.35	\$22,558.28	\$14,139.28	\$11,733.87	\$7,184.27	\$8,497.55

Water Use Fee for 2006 = \$2.67 per 1,000 gallons - confirmed with Steve Howell - Roxborough Park Metropolitan District - August 11, 2006.

Water costs are subject to change and should be verified with the Utility Provider.

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET SUMMARY PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

**OPINION OF PROBABLE IRRIGATION SYSTEM CONSTRUCTION COSTS FOR - (ROXBOROUGH VILLAGE PARK REDEVELOPMENT):
ASSUMES A FIVE YEAR MASTER PLAN IMPLEMENTATION SCHEDULE AS FOLLOWS:**

- Year No.1 ----- Reconfigure existing zones and install new zones with backup heads at interface between athletic turfgrass area to remain and new native seed conversion area.
- Year No.2 ----- Maintenance of existing irrigation to water up native seed and maintain trees.
- Year No.3 ----- Maintenance of existing irrigation to water up native seed and maintain trees.
- Year No.4 ----- Install bubblers for new tree and shrub plantings.
- Year No.5 ----- Install small area gear drive and pop-up spray irrigation to playground and skate court turfgrass buffer

Irrigation Season:	Existing	Year No.1	Year No.2	Year No.3	Year No.4	Year No.5
Probable construction costs:	\$0.00	\$21,000 00	\$0.00	\$0.00	\$31,625.00	\$22,765.00

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (ROXBOROUGH VILLAGE PARK - EXISTING CONDITION)

APPROXIMATE SQUARE FEET OF IRRIGATED TURF GRASS: 676,186 Sq. Ft.

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Historical E.T.	1.0"	3.0"	4.5"	6.5"	6.0"	4.0"	1.0"	
Turf Coefficient 80%	80%	80%	80%	80%	80%	80%	80%	
Water Requirement	.80"	2.40"	3.60"	5.20"	4.80"	3.20"	.80"	
System Efficiency	80%	80%	80%	80%	80%	80%	80%	
Monthly Requirement In Inches	1.0"	3.0"	4.5"	6.5"	6.0"	4.0"	1.0"	26"
Weekly Requirement In Inches	.25"	.75"	1.12"	1.63"	1.50"	1.0"	.25"	
Monthly Requirement In Cubic Feet	56,347	169,047	253,570	366,222	338,093	225,373	56,347	1,464,998
Weekly Requirement In Cubic Feet	14,087	42,262	63,392	91,556	84,523	56,343	14,087	
Monthly Requirement In Gallons	421,472	1,264,468	1,896,702	2,739,343	2,528,936	1,685,788	421,472	10,958,182
Weekly Requirement In Gallons	105,368	316,117	474,175	684,836	632,234	421,447	105,368	
Annual Requirement In Acre Feet: -----								33.63
Water Cost - Tier No.1 Use Fee	\$1,125.33	\$3,376.13	\$5,064.19	\$7,314.05	\$6,752.26	\$4,501.06	\$1,125.33	\$29,258.34
Total Annual Water Cost: -----								\$29,258.34

Water Use Fee for 2006 = \$2.67 per 1,000 gallons.

Water costs are subject to change and should be verified with the Utility Provider.

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (ROXBOROUGH VILLAGE PARK - BALL FIELDS REVISED):

APPROXIMATE SQUARE FEET OF IRRIGATED TURF GRASS: 160,000 Sq. Ft.

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Historical E.T.	1.0"	3.0"	4.5"	6.5"	6.0"	4.0"	1.0"	
Turf Coefficient 80%	80%	80%	80%	80%	80%	80%	80%	
Water Requirement	.80"	2.40"	3.60"	5.20"	4.80"	3.20"	.80"	
System Efficiency	80%	80%	80%	80%	80%	80%	80%	
Monthly Requirement In Inches	1.0"	3.0"	4.5"	6.5"	6.0"	4.0"	1.0"	26"
Weekly Requirement In Inches	.25"	.75"	1.12"	1.63"	1.50"	1.0"	.25"	
Monthly Requirement In Cubic Feet	13,333	40,000	60,000	86,656	80,000	53,328	13,333	346,650
Weekly Requirement In Cubic Feet	3,333	10,000	15,000	21,664	20,000	13,332	3,333	
Monthly Requirement In Gallons	99,729	299,200	448,800	648,187	598,400	398,893	99,729	2,592,939
Weekly Requirement In Gallons	24,932	74,800	112,200	162,047	149,600	99,723	24,932	
Annual Requirement In Acre Feet: -----								7.96
Water Cost - Tier No.1 Use Fee	\$266.28	\$798.86	\$1,198.30	\$1,730.66	\$1,597.73	\$1,065.05	\$266.28	\$6,923.15
Total Annual Water Cost: -----								\$6,923.15

Water Use Fee for 2006 = \$2.67 per 1,000 gallons.

Water costs are subject to change and should be verified with the Utility Provider.

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August-15, 2006

**AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (ROXBOROUGH VILLAGE PARK):
CONVERSION OF PASSIVE PARK AREAS FROM BLUEGRASS TURF TO NATIVE SEED - YEAR ONE**

APPROXIMATE SQUARE FEET OF IRRIGATED NATIVE SEED: 516,186 Sq. Ft.

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Seed Germination Requirement	2.8"	5.6"	2.8"	2.8"	2.8"	1.4"	0.0"	
Turf Coefficient 80%	80%	80%	80%	80%	80%	80%		
Water Requirement	2.24"	4.48"	2.24"	2.24"	2.24"	1.12"		
System Efficiency	80%	80%	80%	80%	80%	80%		
Monthly Requirement In Inches	2.8"	5.6"	2.8"	2.8"	2.8"	1.4"		18.2"
Weekly Requirement In Inches	1.4"	1.4"	.7"	.7"	.7"	.035"		
Monthly Requirement In Cubic Feet	120,442	240,883	120,442	120,442	120,442	60,218		782,868
Weekly Requirement In Cubic Feet	30,110	60,221	30,110	30,110	30,110	15,055		
Monthly Requirement In Gallons	900,904	1,801,808	900,904	900,904	900,904	450,433		5,855,855
Weekly Requirement In Gallons	225,226	450,452	225,226	225,226	225,226	112,608		
Annual Requirement In Acre Feet: -----								17.97
Water Cost - Tier No.1 Use Fee	\$2,405.41	\$4,810.83	\$2,405.41	\$2,405.41	\$2,405.41	\$1,202.65	\$0.00	\$15,635.13
Total Annual Water Cost: -----								\$15,635.13

Water Use Fee for 2006 = \$2.67 per 1,000 gallons. Water costs are subject to change and should be verified with the Utility Provider.

Annual consumption above is based on seed installation April 15 and the following first season establishment water schedule:

April 15 - April 30 ----- 2/10" per day	July 1 - July 31----- 1/10" per day
May 1 - May 31 ----- 2/10" per day	August 1 - August 31----- 1/10" per day
June 1 - June 30 ----- 1/10" per day	September 1 - September 30 ----- 1/20" per day

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

**AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (ROXBOROUGH VILLAGE PARK):
CONVERSION OF PASSIVE PARK AREAS FROM BLUEGRASS TURF TO NATIVE SEED - YEAR TWO**

APPROXIMATE SQUARE FEET OF IRRIGATED NATIVE SEED: 516,186 Sq. Ft.

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Seed Germination Requirement	1.4"	2.8"	2.8"	1.4"	0.0"	0.0"	0.0"	
Turf Coefficient 80%	80%	80%	80%	80%				
Water Requirement	1.12"	2.24"	2.24"	1.12"				
System Efficiency	80%	80%	80%	80%				
Monthly Requirement In Inches	1.4"	2.8"	2.8"	1.4"				8.4"
Weekly Requirement In Inches	.7"	.7"	.7"	.7"				
Monthly Requirement In Cubic Feet	60,218	120,442	120,442	60,218				361,320
Weekly Requirement In Cubic Feet	15,055	30,110	30,110	15,055				
Monthly Requirement In Gallons	450,433	900,904	900,904	450,433				2,702,673
Weekly Requirement In Gallons	112,608	225,226	225,226	112,608				
Annual Requirement In Acre Feet: -----								8.29
Water Cost - Tier No.1 Use Fee	\$1,202.65	\$2,405.41	\$2,405.41	\$1,202.65	\$0.00	\$0 00	\$0.00	\$7,216.14
Total Annual Water Cost: -----								\$7,216.14

Water Use Fee for 2006 = \$2.67 per 1,000 gallons. Water costs are subject to change and should be verified with the Utility Provider.

Annual consumption above is based on the following second season establishment water schedule:

April 15 - April 30 ----- 1/10" per day July 1 - July 15----- 1/10" per day
 May 1 - May 31 ----- 1/10" per day
 June 1 - June 30 ----- 1/10" per day

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

**AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (ROXBOROUGH VILLAGE PARK):
CONVERSION OF PASSIVE PARK AREAS FROM BLUEGRASS TURF TO NATIVE SEED - YEAR THREE**

APPROXIMATE SQUARE FEET OF IRRIGATED NATIVE SEED: 516,186 Sq. Ft.

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Seed Germination Requirement	1.4"	2.8"	1.4"	0.0"	0.0"	0.0"	0.0"	
Turf Coefficient 80%	80%	80%	80%					
Water Requirement	1.12"	2.24"	1.12"					
System Efficiency	80%	80%	80%					
Monthly Requirement In Inches	1.4"	2.8"	1.4"					5.6"
Weekly Requirement In Inches	.7"	.7"	.7"					
Monthly Requirement In Cubic Feet	60,218	120,442	60,218					240,878
Weekly Requirement In Cubic Feet	15,055	30,110	15,055					
Monthly Requirement In Gallons	450,433	900,904	450,433					1,801,769
Weekly Requirement In Gallons	112,608	225,226	112,608					
Annual Requirement In Acre Feet: -----								5.53
Water Cost - Tier No.1 Use Fee	\$1,202.65	\$2,405.41	\$1,202.65	\$0.00	\$0.00	\$0.00	\$0.00	\$4,810.72
Total Annual Water Cost: -----								\$4,810.72

Water Use Fee for 2006 = \$2.67 per 1,000 gallons. Water costs are subject to change and should be verified with the Utility Provider.

Annual consumption above is based on the following third season establishment water schedule:

April 15 - April 30 ----- 1/10" per day

May 1 - May 31 ----- 1/10" per day

June 1 - June 15 ----- 1/10" per day

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

**AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (ROXBOROUGH VILLAGE PARK).
WOODY TREE AND SHRUB ESTABLISHMENT AND MAINTENANCE:**

APPROXIMATE NUMBER OF DECIDUOUS TREES (2" to 3" CALIPER): 75 Trees
 APPROXIMATE NUMBER OF CONIFEROUS TREES (6' to 8' TALL): 50 Trees
 APPROXIMATE NUMBER OF WOODY SHRUBS (NO. 5 CONTAINER): 475 Shrubs

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Weekly Requirement in Gallons	2,925	2,925	4,250	4,250	4,250	2,925	2,925	
Monthly Requirement in Gallons	11,700	11,700	17,000	17,000	17,000	11,700	11,700	97,800
Weekly Requirement in Cubic Feet	391	391	568	568	568	391	391	
Monthly Requirement in Cubic Feet	1,564	1,564	2,273	2,273	2,273	1,564	1,564	13,075
Annual Requirement In Acre Feet: -----								0.30
Water Cost - Tier No.1 Use Fee	\$31.24	\$31.24	\$45.39	\$45.39	\$45.39	\$31.24	\$31.24	\$261.13
Total Annual Water Cost: -----								\$261.13

Water Use Fee for 2006 = \$2.67 per 1,000 gallons. Water costs are subject to change and should be verified with the Utility Provider.

Annual consumption above is based on the following water requirements for woody tree and shrub establishment and maintenance:
 Deciduous trees (2" to 3" caliper) require 12 gallons of water per week spring and fall and 15 gallons of water per week during the summer.
 Coniferous trees (6' to 8' tall) require 12 gallons of water per week spring and fall and 15 gallons of water per week during the summer.
 Woody shrubs (No. 5 container) require 3 gallons of water per week spring and fall and five 5 gallons of water per week during the summer.

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

**AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (ROXBOROUGH VILLAGE PARK):
PLAYGROUND AND SKATE COURT TURF GRASS BUFFER**

APPROXIMATE SQUARE FEET OF IRRIGATED TURF GRASS: 30,351 Sq. Ft.

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Historical E.T.	1.0"	3.0"	4.5"	6.5"	6.0"	4.0"	1.0"	
Turf Coefficient 80%	80%	80%	80%	80%	80%	80%	80%	
Water Requirement	.80"	2.40"	3.60"	5.20"	4.80"	3.20"	.80"	
System Efficiency	80%	80%	80%	80%	80%	80%	80%	
Monthly Requirement In Inches	1.0"	3.0"	4.5"	6.5"	6.0"	4.0"	1.0"	26"
Weekly Requirement In Inches	.25"	.75"	1.12"	1.63"	1.50"	1.0"	.25"	
Monthly Requirement In Cubic Feet	2,529	7,588	11,382	16,438	15,176	10,116	2,529	65,757
Weekly Requirement In Cubic Feet	632	1,897	2,845	4,110	3,794	2,529	632	
Monthly Requirement In Gallons	18,918	56,756	85,135	122,957	113,513	75,668	18,918	491,864
Weekly Requirement In Gallons	4,730	14,189	21,284	30,739	28,378	18,917	4,730	
Annual Requirement In Acre Feet: -----								1.51
Water Cost - Tier No.1 Use Fee	\$50.51	\$151.54	\$227.31	\$328.30	\$303.08	\$202.03	\$50.51	\$1,313.28
Total Annual Water Cost: -----								\$1,313.28
<p>Water Use Fee for 2006 = \$2.67 per 1,000 gallons.</p> <p>Water costs are subject to change and should be verified with the Utility Provider.</p>								

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET SUMMARY PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (VILLAGE CIRCLE WEST):
TYPICAL 1000 LIN. FT. SECTION

- Year No.1 ----- Sub surface irrigation for tree lawn, spray irrigation for native seed germination and first year grow in and bubblers for trees and shrubs.
- Year No.2 ----- Sub surface irrigation for tree lawn, spray irrigation for native seed second year grow in and bubblers for trees and shrubs.
- Year No.3 ----- Sub surface irrigation for tree lawn, spray irrigation for native seed third year grow in and bubblers for trees and shrubs.
- Year No.4 ----- Sub surface irrigation for tree lawn and bubblers for trees and shrubs.
- Year No.5 ----- Sub surface irrigation for tree lawn and bubblers for trees and shrubs.

Irrigation Season:	Existing	Year No.1	Year No.2	Year No. 3	Year No.4	Year No.5
Annual water consumption in gallons:	356,529	232,237	180,314	165,479	135,809	135,809
Annual water cost:	\$951.93	\$620.07	\$481.44	\$441.83	\$362.61	\$362.61
Annual water cost per linear foot:	\$0.95	\$0.62	\$0.48	\$0.44	\$0.36	\$0.36

Water Use Fee for 2006 = \$2.67 per 1,000 gallons - confirmed with Steve Howell - Roxborough Park Metropolitan District - August 11, 2006.

Water costs are subject to change and should be verified with the Utility Provider.

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET SUMMARY PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

OPINION OF PROBABLE IRRIGATION SYSTEM CONSTRUCTION COSTS FOR - (VILLAGE CIRCLE WEST):

TYPICAL 1000 LIN. FT. SECTION

Year No.1 ----- Salvage existing irrigation equipment and install new sub-surface irrigation in the tree lawns along Village Circle West. Install new spray irrigation for the native seed areas between the walk and or back of curb and the private fences. Install bubblers for shrubs in bed areas and trees in native seed areas. Cost includes directional boring at three cross streets typical.

Irrigation Season:	Existing	Year No.1	Year No.2	Year No.3	Year No.4	Year No.5
Probable construction costs lump sum:	\$0.00	\$38,550.00	\$0.00	\$0.00	\$0.00	\$0.00
Probable construction costs per linear foot:	\$0.00	\$38.55	\$0.00	\$0.00	\$0.00	\$0.00

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (VILLAGE CIRCLE WEST - EXISTING CONDITION):
TYPICAL 1000 LIN. FT. SECTION

APPROXIMATE SQUARE FEET OF IRRIGATED TURF GRASS: 22,000 Sq. Ft.

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Historical E.T.	1.0"	3.0"	4.5"	6.5"	6.0"	4.0"	1.0"	
Turf Coefficient 80%	80%	80%	80%	80%	80%	80%	80%	
Water Requirement	.80"	2.40"	3.60"	5.20"	4.80"	3.20"	.80"	
System Efficiency	80%	80%	80%	80%	80%	80%	80%	
Monthly Requirement In Inches	1.0"	3.0"	4.5"	6.5"	6.0"	4.0"	1.0"	26"
Weekly Requirement In Inches	.25"	.75"	1.12"	1.63"	1.50"	1.0"	.25"	
Monthly Requirement In Cubic Feet	1,833	5,500	8,250	11,915	11,000	7,333	1,833	47,664
Weekly Requirement In Cubic Feet	458	1,375	2,063	2,979	2,750	1,833	458	
Monthly Requirement In Gallons	13,713	41,140	61,710	89,126	82,280	54,848	13,713	356,529
Weekly Requirement In Gallons	3,428	10,285	15,428	22,281	20,570	13,712	3,428	
Annual Requirement In Acre Feet: -----								1.09
Water Cost - Tier No.1 Use Fee	\$36.61	\$109.84	\$164.77	\$237.97	\$219.69	\$146.44	\$36.61	\$951.93
Total Annual Water Cost: -----								\$951.93
<p>Water Use Fee for 2006 = \$2.67 per 1,000 gallons.</p> <p>Water costs are subject to change and should be verified with the Utility Provider.</p>								

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (VILLAGE CIRCLE WEST):
 TYPICAL 1000 LIN. FT. SECTION - BLUEGRASS TREE LAWN

APPROXIMATE SQUARE FEET OF IRRIGATED TURF GRASS: 5,000 Sq. Ft.

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Historical E.T.	1.0"	3.0"	4.5"	6.5"	6.0"	4.0"	1.0"	
Turf Coefficient 80%	80%	80%	80%	80%	80%	80%	80%	
Water Requirement	.80"	2.40"	3.60"	5.20"	4.80"	3.20"	.80"	
System Efficiency	80%	80%	80%	80%	80%	80%	80%	
Monthly Requirement In Inches	1.0"	3.0"	4.5"	6.5"	6.0"	4.0"	1.0"	26"
Weekly Requirement In Inches	.25"	.75"	1.12"	1.63"	1.50"	1.0"	.25"	
Monthly Requirement In Cubic Feet	417	1,250	1,875	2,708	2,500	1,667	417	10,833
Weekly Requirement In Cubic Feet	104	313	469	677	625	417	104	
Monthly Requirement In Gallons	3,117	9,350	14,025	20,256	18,700	12,465	3,117	81,029
Weekly Requirement In Gallons	779	2,338	3,506	5,064	4,675	3,116	779	
Annual Requirement In Acre Feet: -----								0.25
Water Cost - Tier No.1 Use Fee	\$8.32	\$24.96	\$37.45	\$54.08	\$49.93	\$33.28	\$8.32	\$216.35
Total Annual Water Cost: -----								\$216.35

Water Use Fee for 2006 = \$2.67 per 1,000 gallons.

Water costs are subject to change and should be verified with the Utility Provider.

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (VILLAGE CIRCLE WEST):
 TYPICAL 1000 LIN. FT. SECTION - WOODY TREE AND SHRUB ESTABLISHMENT AND MAINTENANCE:

APPROXIMATE NUMBER OF DECIDUOUS TREES (2" to 3" CALIPER): 25 Trees
 APPROXIMATE NUMBER OF CONIFEROUS TREES (6' to 8' TALL): 25 Trees
 APPROXIMATE NUMBER OF WOODY SHRUBS (NO. 5 CONTAINER): 335 Shrubs

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Weekly Requirement in Gallons	1,605	1,605	2,425	2,425	2,425	1,605	1,605	
Monthly Requirement in Gallons	6,420	6,420	9,700	9,700	9,700	6,420	6,420	54,780
Weekly Requirement in Cubic Feet	215	215	324	324	324	215	215	
Monthly Requirement in Cubic Feet	858	858	1,297	1,297	1,297	858	858	7,324
Annual Requirement In Acre Feet: -----								0.17
Water Cost - Tier No.1 Use Fee	\$17.14	\$17.14	\$25.90	\$25.90	\$25.90	\$17.14	\$17.14	\$146.26
Total Annual Water Cost: -----								\$146.26

Water Use Fee for 2006 = \$2.67 per 1,000 gallons. Water costs are subject to change and should be verified with the Utility Provider.

Annual consumption above is based on the following water requirements for woody tree and shrub establishment and maintenance:
 Deciduous trees (2" to 3" caliper) require 12 gallons of water per week spring and fall and 15 gallons of water per week during the summer.
 Coniferous trees (6' to 8' tall) require 12 gallons of water per week spring and fall and 15 gallons of water per week during the summer
 Woody shrubs (No. 5 container) require 3 gallons of water per week spring and fall and five 5 gallons of water per week during the summer.

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

**AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (VILLAGE CIRCLE WEST):
TYPICAL 1000 LIN. FT. SECTION - CONVERSION OF BLUEGRASS TURF TO NATIVE SEED - YEAR ONE**

APPROXIMATE SQUARE FEET OF IRRIGATED NATIVE SEED: 8,500 Sq. Ft.

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Seed Germination Requirement	2.8"	5.6"	2.8"	2.8"	2.8"	1.4"	0.0"	
Turf Coefficient 80%	80%	80%	80%	80%	80%	80%		
Water Requirement	2.24"	4.48"	2.24"	2.24"	2.24"	1.12"		
System Efficiency	80%	80%	80%	80%	80%	80%		
Monthly Requirement In Inches	2.8"	5.6"	2.8"	2.8"	2.8"	1.4"		18.2"
Weekly Requirement In Inches	1.4"	1.4"	.7"	.7"	.7"	.035"		
Monthly Requirement In Cubic Feet	1,983	3,967	1,983	1,983	1,983	992		12,891
Weekly Requirement In Cubic Feet	496	992	496	496	496	248		
Monthly Requirement In Gallons	14,835	29,670	14,835	14,835	14,835	7,417		96,428
Weekly Requirement In Gallons	3,709	7,418	3,709	3,709	3,709	1,854		
Annual Requirement In Acre Feet: -----								0.30
Water Cost - Tier No.1 Use Fee	\$39.61	\$79.22	\$39.61	\$39.61	\$39.61	\$19.80	\$0.00	\$257.46
Total Annual Water Cost: -----								\$257.46

Water Use Fee for 2006 = \$2.67 per 1,000 gallons. Water costs are subject to change and should be verified with the Utility Provider.

Annual consumption above is based on seed installation April 15 and the following first season establishment water schedule:

April 15 - April 30 ----- 2/10" per day	July 1 - July 31----- 1/10" per day
May 1 - May 31 ----- 2/10" per day	August 1 - August 31----- 1/10" per day
June 1 - June 30 ----- 1/10" per day	September 1 - September 30 ----- 1/20" per day

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (VILLAGE CIRCLE WEST):
 TYPICAL 1000 LIN. FT. SECTION - CONVERSION OF BLUEGRASS TURF TO NATIVE SEED - YEAR TWO

APPROXIMATE SQUARE FEET OF IRRIGATED NATIVE SEED: 8,500 Sq. Ft.

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Seed Germination Requirement	1.4"	2.8"	2.8"	1.4"	0.0"	0.0"	0.0"	
Turf Coefficient 80%	80%	80%	80%	80%				
Water Requirement	1.12"	2.24"	2.24"	1.12"				
System Efficiency	80%	80%	80%	80%				
Monthly Requirement In Inches	1.4"	2.8"	2.8"	1.4"				8.4"
Weekly Requirement In Inches	.7"	.7"	.7"	.7"				
Monthly Requirement In Cubic Feet	992	1,983	1,983	992				5,950
Weekly Requirement In Cubic Feet	248	496	496	248				
Monthly Requirement In Gallons	7,417	14,835	14,835	7,417				44,505
Weekly Requirement In Gallons	1,854	3,709	3,709	1,854				
Annual Requirement In Acre Feet: -----								0.14
Water Cost - Tier No.1 Use Fee	\$19.80	\$39.61	\$39.61	\$19.80	\$0.00	\$0.00	\$0.00	\$118.83
Total Annual Water Cost: -----								\$118.83

Water Use Fee for 2006 = \$2.67 per 1,000 gallons. Water costs are subject to change and should be verified with the Utility Provider.

Annual consumption above is based on the following second season establishment water schedule:

April 15 - April 30 ----- 1/10" per day	July 1 - July 15 ----- 1/10" per day
May 1 - May 31 ----- 1/10" per day	
June 1 - June 30 ----- 1/10" per day	

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (VILLAGE CIRCLE WEST):

TYPICAL 1000 LIN. FT. SECTION - CONVERSION OF BLUEGRASS TURF TO NATIVE SEED - YEAR THREE

APPROXIMATE SQUARE FEET OF IRRIGATED NATIVE SEED: 8,500 Sq. Ft.

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Seed Germination Requirement	1.4"	2.8"	1.4"	0.0"	0.0"	0.0"	0.0"	
Turf Coefficient 80%	80%	80%	80%					
Water Requirement	1.12"	2.24"	1.12"					
System Efficiency	80%	80%	80%					
Monthly Requirement In Inches	1.4"	2.8"	1.4"					5.6"
Weekly Requirement In Inches	.7"	.7"	.7"					
Monthly Requirement In Cubic Feet	992	1,983	992					3,967
Weekly Requirement In Cubic Feet	248	496	248					
Monthly Requirement In Gallons	7,417	14,835	7,417					29,670
Weekly Requirement In Gallons	1,854	3,709	1,854					
Annual Requirement In Acre Feet: -----								0.09
Water Cost - Tier No.1 Use Fee	\$19.80	\$39.61	\$19.80	\$0.00	\$0.00	\$0.00	\$0.00	\$79.22
Total Annual Water Cost: -----								\$79.22

Water Use Fee for 2006 = \$2.67 per 1,000 gallons. Water costs are subject to change and should be verified with the Utility Provider.

Annual consumption above is based on the following third season establishment water schedule:

April 15 - April 30 ----- 1/10" per day

May 1 - May 31 ----- 1/10" per day

June 1 - June 15 ----- 1/10" per day

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET SUMMARY PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (RAMPART RANGE RD. MEDIAN):
TYPICAL 1000 LIN. FT. SECTION

Year No.1 ----- Spray irrigation for native seed germination and first year grow in and bubblers for trees and shrubs.

Year No.2 ----- Spray irrigation for native seed second year grow in and bubblers for trees and shrubs.

Year No.3 ----- Spray irrigation for native seed third year grow in and bubblers for trees and shrubs.

Year No.4 ----- Bubblers for trees and shrubs.

Year No.5 ----- Bubblers for trees and shrubs.

Irrigation Season:	Existing	Year No.1	Year No.2	Year No. 3	Year No.4	Year No.5
Annual water consumption in gallons:	534,794	380,014	218,746	172,670	80,520	80,520
Annual water cost:	\$1,427.90	\$1,014.64	\$584.05	\$461.03	\$214.99	\$214.99
Annual water cost per square foot:	\$0.043	\$0.031	\$0.018	\$0.014	\$0.007	\$0.007

Water Use Fee for 2006 = \$2.67 per 1,000 gallons - confirmed with Steve Howell - Roxborough Park Metropolitan District - August 11, 2006.

Water costs are subject to change and should be verified with the Utility Provider.

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET SUMMARY PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

OPINION OF PROBABLE IRRIGATION SYSTEM CONSTRUCTION COSTS FOR - (RAMPART RANGE RD. MEDIAN):
TYPICAL 1000 LIN. FT. SECTION

Year No.1 ----- Salvage existing irrigation equipment and install new pop-up and gear drive spray irrigation for native seed areas and install bubblers for shrubs in bed areas and trees in native seed areas. Cost includes directional boring to cross street.

Irrigation Season:	Existing	Year No.1	Year No.2	Year No.3	Year No.4	Year No.5
Probable construction costs lump sum:	\$0.00	\$37,150.00	\$0.00	\$0.00	\$0.00	\$0.00
Probable construction costs per square foot:	\$0.00	\$1.13	\$0.00	\$0.00	\$0.00	\$0.00

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (RAMPART RANGE RD. MEDIAN - EXISTING CONDITION):
TYPICAL 1000 LIN. FT. SECTION

APPROXIMATE SQUARE FEET OF IRRIGATED TURF GRASS: 33,000 Sq. Ft.

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Historical E.T.	1.0"	3.0"	4.5"	6.5"	6.0"	4.0"	1.0"	
Turf Coefficient 80%	80%	80%	80%	80%	80%	80%	80%	
Water Requirement	.80"	2.40"	3.60"	5.20"	4.80"	3.20"	.80"	
System Efficiency	80%	80%	80%	80%	80%	80%	80%	
Monthly Requirement In Inches	1.0"	3.0"	4.5"	6.5"	6.0"	4.0"	1.0"	26"
Weekly Requirement In Inches	.25"	.75"	1.12"	1.63"	1.50"	1.0"	.25"	
Monthly Requirement In Cubic Feet	2,750	8,250	12,375	17,873	16,500	10,999	2,750	71,496
Weekly Requirement In Cubic Feet	687	2,063	3,094	4,468	4,125	2,750	687	
Monthly Requirement In Gallons	20,569	61,710	92,565	133,689	123,420	82,272	20,569	534,794
Weekly Requirement In Gallons	5,142	15,428	23,141	33,422	30,855	20,568	5,142	
Annual Requirement In Acre Feet: -----								1.64
Water Cost - Tier No.1 Use Fee	\$54.92	\$164.77	\$247.15	\$356.95	\$329.53	\$219.67	\$54.92	\$1,427.90
Total Annual Water Cost: -----								\$1,427.90

Water Use Fee for 2006 = \$2.67 per 1,000 gallons.

Water costs are subject to change and should be verified with the Utility Provider.

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (RAMPART RANGE RD. MEDIAN):
 TYPICAL 1000 LIN. FT. SECTION - WOODY TREE AND SHRUB ESTABLISHMENT AND MAINTENANCE:

APPROXIMATE NUMBER OF DECIDUOUS TREES (2" to 3" CALIPER): 20 Trees
 APPROXIMATE NUMBER OF CONIFEROUS TREES (6' to 8' TALL): 15 Trees
 APPROXIMATE NUMBER OF WOODY SHRUBS (NO. 5 CONTAINER): 625 Shrubs

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Weekly Requirement in Gallons	2,295	2,295	3,650	3,650	3,650	2,295	2,295	
Monthly Requirement in Gallons	9,180	9,180	14,600	14,600	14,600	9,180	9,180	80,520
Weekly Requirement in Cubic Feet	307	307	488	488	488	307	307	
Monthly Requirement in Cubic Feet	1,227	1,227	1,952	1,952	1,952	1,227	1,227	10,765
Annual Requirement In Acre Feet: -----								0.25
Water Cost - Tier No.1 Use Fee	\$24.51	\$24.51	\$38.98	\$38.98	\$38.98	\$24.51	\$24.51	\$214.99
Total Annual Water Cost: -----								\$214.99

Water Use Fee for 2006 = \$2.67 per 1,000 gallons. Water costs are subject to change and should be verified with the Utility Provider.

Annual consumption above is based on the following water requirements for woody tree and shrub establishment and maintenance:
 Deciduous trees (2" to 3" caliper) require 12 gallons of water per week spring and fall and 15 gallons of water per week during the summer
 Coniferous trees (6' to 8' tall) require 12 gallons of water per week spring and fall and 15 gallons of water per week during the summer.
 Woody shrubs (No. 5 container) require 3 gallons of water per week spring and fall and five 5 gallons of water per week during the summer.

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (RAMPART RANGE RD. MEDIAN).
TYPICAL 1000 LIN. FT. SECTION - CONVERSION OF BLUEGRASS TURF TO NATIVE SEED - YEAR ONE

APPROXIMATE SQUARE FEET OF IRRIGATED NATIVE SEED: 26,400 Sq. Ft.

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Seed Germination Requirement	2.8"	5.6"	2.8"	2.8"	2.8"	1.4"	0.0"	
Turf Coefficient 80%	80%	80%	80%	80%	80%	80%		
Water Requirement	2.24"	4.48"	2.24"	2.24"	2.24"	1.12"		
System Efficiency	80%	80%	80%	80%	80%	80%		
Monthly Requirement In Inches	2.8"	5.6"	2.8"	2.8"	2.8"	1.4"		18.2"
Weekly Requirement In Inches	1.4"	1.4"	.7"	.7"	.7"	.035"		
Monthly Requirement In Cubic Feet	6,160	12,320	6,160	6,160	6,160	3,080		40,039
Weekly Requirement In Cubic Feet	1,540	3,080	1,540	1,540	1,540	770		
Monthly Requirement In Gallons	46,076	92,152	46,076	46,076	46,076	23,037		299,494
Weekly Requirement In Gallons	11,519	23,038	11,519	11,519	11,519	5,759		
Annual Requirement In Acre Feet: -----								0.92
Water Cost - Tier No.1 Use Fee	\$123.02	\$246.05	\$123.02	\$123.02	\$123.02	\$61.51	\$0.00	\$799.65
Total Annual Water Cost: -----								\$799.65

Water Use Fee for 2006 = \$2.67 per 1,000 gallons. Water costs are subject to change and should be verified with the Utility Provider

Annual consumption above is based on seed installation April 15 and the following first season establishment water schedule:

April 15 - April 30 ----- 2/10" per day	July 1 - July 31----- 1/10" per day
May 1 - May 31 ----- 2/10" per day	August 1 - August 31----- 1/10" per day
June 1 - June 30 ----- 1/10" per day	September 1 - September 30 ----- 1/20" per day

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (RAMPART RANGE RD. MEDIAN):
 TYPICAL 1000 LIN. FT. SECTION - CONVERSION OF BLUEGRASS TURF TO NATIVE SEED - YEAR TWO

APPROXIMATE SQUARE FEET OF IRRIGATED NATIVE SEED: 26,400 Sq. Ft.

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Seed Germination Requirement	1.4"	2.8"	2.8"	1.4"	0.0"	0.0"	0.0"	
Turf Coefficient 80%	80%	80%	80%	80%				
Water Requirement	1.12"	2.24"	2.24"	1.12"				
System Efficiency	80%	80%	80%	80%				
Monthly Requirement In Inches	1.4"	2.8"	2.8"	1.4"				8.4"
Weekly Requirement In Inches	.7"	.7"	.7"	.7"				
Monthly Requirement In Cubic Feet	3,080	6,160	6,160	3,080				18,479
Weekly Requirement In Cubic Feet	770	1,540	1,540	770				
Monthly Requirement In Gallons	23,037	46,076	46,076	23,037				138,226
Weekly Requirement In Gallons	5,759	11,519	11,519	5,759				
Annual Requirement In Acre Feet: -----								0.42
Water Cost - Tier No.1 Use Fee	\$61.51	\$123.02	\$123.02	\$61.51	\$0.00	\$0.00	\$0.00	\$369.06
Total Annual Water Cost: -----								\$369.06

Water Use Fee for 2006 = \$2.67 per 1,000 gallons. Water costs are subject to change and should be verified with the Utility Provider.

Annual consumption above is based on the following second season establishment water schedule:

April 15 - April 30 ----- 1/10" per day July 1 - July 15----- 1/10" per day
 May 1 - May 31 ----- 1/10" per day
 June 1 - June 30 ----- 1/10" per day

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (RAMPART RANGE RD. MEDIAN):
 TYPICAL 1000 LIN. FT. SECTION - CONVERSION OF BLUEGRASS TURF TO NATIVE SEED - YEAR THREE

APPROXIMATE SQUARE FEET OF IRRIGATED NATIVE SEED: 26,400 Sq. Ft.

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Seed Germination Requirement	1.4"	2.8"	1.4"	0.0"	0.0"	0.0"	0.0"	
Turf Coefficient 80%	80%	80%	80%					
Water Requirement	1.12"	2.24"	1.12"					
System Efficiency	80%	80%	80%					
Monthly Requirement In Inches	1.4"	2.8"	1.4"					5.6"
Weekly Requirement In Inches	.7"	.7"	.7"					
Monthly Requirement In Cubic Feet	3,080	6,160	3,080					12,320
Weekly Requirement In Cubic Feet	770	1,540	770					
Monthly Requirement In Gallons	23,037	46,076	23,037					92,150
Weekly Requirement In Gallons	5,759	11,519	5,759					
Annual Requirement In Acre Feet: -----								0.28
Water Cost - Tier No.1 Use Fee	\$61.51	\$123.02	\$61.51	\$0.00	\$0.00	\$0.00	\$0.00	\$246.04
Total Annual Water Cost: -----								\$246.04

Water Use Fee for 2006 = \$2.67 per 1,000 gallons. Water costs are subject to change and should be verified with the Utility Provider.

Annual consumption above is based on the following third season establishment water schedule:

April 15 - April 30 ----- 1/10" per day

May 1 - May 31 ----- 1/10" per day

June 1 - June 15 ----- 1/10" per day

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET SUMMARY PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

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AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (RAMPART RANGE RD. R.O.W.):
TYPICAL 1000 LIN. FT. SECTION

Year No.1 ----- Sub surface irrigation for tree lawn and bubblers for trees and shrubs.

Year No.2 ----- Sub surface irrigation for tree lawn and bubblers for trees and shrubs

Year No.3 ----- Sub surface irrigation for tree lawn and bubblers for trees and shrubs.

Year No.4 ----- Sub surface irrigation for tree lawn and bubblers for trees and shrubs.

Year No.5 ----- Sub surface irrigation for tree lawn and bubblers for trees and shrubs.

Irrigation Season:	Existing	Year No.1	Year No.2	Year No. 3	Year No.4	Year No.5
Annual water consumption in gallons:	0	216,965	216,965	216,965	216,965	216,965
Annual water cost:	\$0.00	\$579.30	\$579.30	\$579.30	\$579.30	\$579.30
Annual water cost per linear foot:	\$0.00	\$0.58	\$0.58	\$0 58	\$0.58	\$0 58

Water Use Fee for 2006 = \$2.67 per 1,000 gallons - confirmed with Steve Howell - Roxborough Park Metropolitan District - August 11, 2006.

Water costs are subject to change and should be verified with the Utility Provider.

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET SUMMARY PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

OPINION OF PROBABLE IRRIGATION SYSTEM CONSTRUCTION COSTS FOR - (RAMPART RANGE RD. R.O.W.):
TYPICAL 1000 LIN. FT. SECTION

Year No.1 ----- Salvage existing irrigation equipment and install new sub-surface irrigation in the tree lawns along Rampart Range Rd. and install bubblers to shrubs in beds and trees in native seed areas.

Irrigation Season:	Existing	Year No.1	Year No.2	Year No.3	Year No.4	Year No.5
Probable construction costs lump sum:	\$0.00	\$27,625.00	\$0.00	\$0.00	\$0.00	\$0.00
Probable construction costs per linear foot:	\$0.00	\$27.63	\$0.00	\$0.00	\$0.00	\$0.00

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

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AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (RAMPART RANGE RD. R.O.W. - EXISTING CONDITION).
 TYPICAL 1000 LIN. FT. SECTION

APPROXIMATE SQUARE FEET OF IRRIGATED TURF GRASS: 0 Sq. Ft.

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Historical E.T.	1.0"	3.0"	4.5"	6.5"	6.0"	4.0"	1.0"	
Turf Coefficient 80%	80%	80%	80%	80%	80%	80%	80%	
Water Requirement	.80"	2.40"	3.60"	5.20"	4.80"	3.20"	.80"	
System Efficiency	80%	80%	80%	80%	80%	80%	80%	
Monthly Requirement In Inches	1.0"	3.0"	4.5"	6.5"	6.0"	4.0"	1.0"	26"
Weekly Requirement In Inches	.25"	.75"	1.12"	1.63"	1.50"	1.0"	.25"	
Monthly Requirement In Cubic Feet	0	0	0	0	0	0	0	0
Weekly Requirement In Cubic Feet	0	0	0	0	0	0	0	
Monthly Requirement In Gallons	0	0	0	0	0	0	0	0
Weekly Requirement In Gallons	0	0	0	0	0	0	0	
Annual Requirement In Acre Feet: -----								0.00
Water Cost - Tier No.1 Use Fee	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Total Annual Water Cost: -----								\$0.00

Water Use Fee for 2006 = \$2.67 per 1,000 gallons.

Water costs are subject to change and should be verified with the Utility Provider.

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (RAMPART RANGE RD. R.O.W.):
 TYPICAL 1000 LIN. FT. SECTION - BLUEGRASS TREE LAWN

APPROXIMATE SQUARE FEET OF IRRIGATED TURF GRASS: 11,000 Sq. Ft.

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Historical E.T.	1.0"	3.0"	4.5"	6.5"	6.0"	4.0"	1.0"	
Turf Coefficient 80%	80%	80%	80%	80%	80%	80%	80%	
Water Requirement	.80"	2.40"	3.60"	5.20"	4.80"	3.20"	.80"	
System Efficiency	80%	80%	80%	80%	80%	80%	80%	
Monthly Requirement In Inches	1.0"	3.0"	4.5"	6.5"	6.0"	4.0"	1.0"	26"
Weekly Requirement In Inches	.25"	.75"	1.12"	1.63"	1.50"	1.0"	.25"	
Monthly Requirement In Cubic Feet	917	2,750	4,125	5,958	5,500	3,666	917	23,832
Weekly Requirement In Cubic Feet	229	688	1,031	1,489	1,375	917	229	
Monthly Requirement In Gallons	6,856	20,570	30,855	44,563	41,140	27,424	6,856	178,265
Weekly Requirement In Gallons	1,714	5,143	7,714	11,141	10,285	6,856	1,714	
Annual Requirement In Acre Feet: -----								0.55
Water Cost - Tier No.1 Use Fee	\$18.31	\$54.92	\$82.38	\$118.98	\$109.84	\$73.22	\$18.31	\$475.97
Total Annual Water Cost: -----								\$475.97

Water Use Fee for 2006 = \$2.67 per 1,000 gallons

Water costs are subject to change and should be verified with the Utility Provider.

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (RAMPART RANGE RD. R.O.W.):
 TYPICAL 1000 LIN. FT. SECTION - WOODY TREE AND SHRUB ESTABLISHMENT AND MAINTENANCE:

APPROXIMATE NUMBER OF DECIDUOUS TREES (2" to 3" CALIPER): 35 Trees
 APPROXIMATE NUMBER OF CONIFEROUS TREES (6' to 8' TALL): 40 Trees
 APPROXIMATE NUMBER OF WOODY SHRUBS (NO. 5 CONTAINER): 100 Shrubs

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Weekly Requirement in Gallons	1,200	1,200	1,625	1,625	1,625	1,200	1,200	
Monthly Requirement in Gallons	4,800	4,800	6,500	6,500	6,500	4,800	4,800	38,700
Weekly Requirement in Cubic Feet	160	160	217	217	217	160	160	
Monthly Requirement in Cubic Feet	642	642	869	869	869	642	642	5,174
Annual Requirement In Acre Feet: -----								0.12
Water Cost - Tier No.1 Use Fee	\$12.82	\$12.82	\$17.36	\$17.36	\$17.36	\$12.82	\$12.82	\$103.33
Total Annual Water Cost: -----								\$103.33

Water Use Fee for 2006 = \$2.67 per 1,000 gallons. Water costs are subject to change and should be verified with the Utility Provider.

Annual consumption above is based on the following water requirements for woody tree and shrub establishment and maintenance:
 Deciduous trees (2" to 3" caliper) require 12 gallons of water per week spring and fall and 15 gallons of water per week during the summer.
 Coniferous trees (6' to 8' tall) require 12 gallons of water per week spring and fall and 15 gallons of water per week during the summer.
 Woody shrubs (No. 5 container) require 3 gallons of water per week spring and fall and five 5 gallons of water per week during the summer.

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET SUMMARY PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

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**AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (ARROW HEAD SHORES):
LAKE SHORE PLANTING**

Year No.1 ----- Install bubblers for new trees and shrubs.

Year No.2 ----- Maintain bubblers for new trees and shrubs.

Year No.3 ----- Maintain bubblers for new trees and shrubs.

Year No.4 ----- Maintain bubblers for new trees and shrubs.

Year No.5 ----- Maintain bubblers for new trees and shrubs.

Irrigation Season:	Existing	Year No.1	Year No.2	Year No. 3	Year No.4	Year No.5
Annual water consumption in gallons:	0	414,576	414,576	414,576	414,576	414,576
Annual water cost:	\$0.00	\$1,106.92	\$1,106.92	\$1,106.92	\$1,106.92	\$1,106.92

Water Use Fee for 2006 = \$2.67 per 1,000 gallons - confirmed with Steve Howell - Roxborough Park Metropolitan District - August 11, 2006.

Water costs are subject to change and should be verified with the Utility Provider.

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET SUMMARY PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

OPINION OF PROBABLE IRRIGATION SYSTEM CONSTRUCTION COSTS FOR - (ARROW HEAD SHORES):
LAKE SHORE PLANTING

Year No.1 ----- Install bubblers to new shrubs and trees.

Irrigation Season:	Existing	Year No.1	Year No.2	Year No.3	Year No.4	Year No.5
Probable construction costs lump sum:	\$0.00	\$55,150.00	\$0.00	\$0.00	\$0.00	\$0.00

IRRIGATION SYSTEM - PROPOSED ANNUAL WATER CONSUMPTION / WATER BUDGET PROJECTION:

Project: Roxborough Metropolitan District Parks and Open Space Renovation Masterplan

Date: August 15, 2006

**AVERAGE ANNUAL IRRIGATION SYSTEM WATER REQUIREMENTS FOR - (ARROW HEAD SHORES).
LAKE SHORE PLANTING**

APPROXIMATE NUMBER OF DECIDUOUS TREES (2" to 3" CALIPER): 185 Trees
 APPROXIMATE NUMBER OF CONIFEROUS TREES (6' to 8' TALL): 100 Trees
 APPROXIMATE NUMBER OF WOODY SHRUBS (NO. 5 CONTAINER): 2,857 Shrubs

Irrigation Season:	April	May	June	July	August	Sept.	Oct.	Total:
Weekly Requirement in Gallons	11,991	11,991	18,560	18,560	18,560	11,991	11,991	
Monthly Requirement in Gallons	47,964	47,964	74,240	74,240	74,240	47,964	47,964	414,576
Weekly Requirement in Cubic Feet	1,603	1,603	2,481	2,481	2,481	1,603	1,603	
Monthly Requirement in Cubic Feet	6,412	6,412	9,925	9,925	9,925	6,412	6,412	55,425
Annual Requirement In Acre Feet: -----								1.27
Water Cost - Tier No.1 Use Fee	\$128.06	\$128.06	\$198.22	\$198.22	\$198.22	\$128.06	\$128.06	\$1,106.92
Total Annual Water Cost: -----								\$1,106.92

Water Use Fee for 2006 = \$2.67 per 1,000 gallons. Water costs are subject to change and should be verified with the Utility Provider

Annual consumption above is based on the following water requirements for woody tree and shrub establishment and maintenance:
 Deciduous trees (2" to 3" caliper) require 12 gallons of water per week spring and fall and 15 gallons of water per week during the summer.
 Coniferous trees (6' to 8' tall) require 12 gallons of water per week spring and fall and 15 gallons of water per week during the summer.
 Woody shrubs (No. 5 container) require 3 gallons of water per week spring and fall and five 5 gallons of water per week during the summer

Funding Sources

Education and Interpretation

Sources of Funds

- **Colorado Division of Wildlife Schoolyard Habitat Grants.** Any Colorado educator trained in projects WILD, WET, or Project Learning Tree may apply for up to \$500 for a schoolyard habitat project. Projects must be student-led and student-oriented.

Revegetation

Sources of Funds

- **Center for Invasive Plant Management (CIPM) Cooperative Weed Management Area Support Grants.** Support the establishment and/or enhancement of cooperative weed management areas (WMAs) that involve diverse landowners and land managers - for example, private landowners, community groups, conservation groups, and local, state, and federal agencies. The goal of this program is to promote cooperative efforts to manage invasive plants and build healthy ecosystems at the watershed level. (<http://weedcenter.org/>)
- **Colorado State Conservation Board Natural Resources Conservation Matching Grants.** Provides funds to assist the conservation districts in addressing conservation problems identified at the local level. The State Legislature appropriated \$250,000 in 1997 and because of need \$500,000 each year since to help Districts implement enduring conservation practices for the preservation and protection of Colorado's natural resources. These grant funds must be matched 50 – 50 with local, private or federal funds or in-kind match. Applications for Matching Grants are due in the State Conservation Board office by June 1 each year. (<http://www.ag.state.co.us>)
- **National Fish and Wildlife Foundation Pulling Together Initiative (PTI).** Provides a means for federal agencies to be full partners with state and local agencies, private landowners, and other interested parties in developing long-term weed management projects within the scope of an integrated pest management strategy. PTI provides support on a competitive basis for the formation of local Weed Management Area (WMA) partnerships. These partnerships will be financed by funds from federal agencies together with matching funds from state, local, and private partners. (<http://www.nfwf.org/>)

Wetlands

Sources of Funds

- **Colorado Division of Wildlife Duck Stamp Program.** The Colorado Waterfowl Stamp Program is designed to conserve wetlands for waterfowl and water birds. All revenue generated from the sale of the hunter version of the Waterfowl Stamp (more than \$6.7 million to date) is used to fund wetlands projects throughout the state. (<http://wildlife.state.co.us/>)

- **North American Wetlands Conservation Act.** To provide funding assistance to promote conservation of wetlands and associated habitats for migratory birds and other wildlife. (<http://grants.fws.gov/>)
- **North American Wetlands Conservation Act (Small Grants Program).** Preference given to projects that have a grantee or partners that have never participated in a NAWCA supported program. Grants may not exceed \$50,000; maximum federal share is 50 percent. (<http://grants.fws.gov/>)

Recreation and Trails

Sources of Funds

- **Bikes Belong Coalition Grants Program.** Historically, the grants program strived to put more people on bicycles more often by funding important and influential projects that leveraged TEA-21 money and built momentum for bicycling. At the end of 2002, in response to changing conditions, the Bikes Belong board of directors decided to broaden the mandate of the grants program to include education and capacity projects, in addition to bicycle facility projects. (<http://bikesbelong.org/>)
- **Colorado State Parks, State Trails Grants Program.** Funds projects involving design, planning or construction of trails. State Trails Grants are a partnership between Colorado State Parks, Great Outdoors Colorado, the Colorado Off-Highway Recreation fund, the Recreational Trails Program, and the Land and Water Conservation Fund. (<http://parks.state.co.us/>)
- **Federal Funding Sources for Bicycle and Pedestrian Projects.** Bicycle and pedestrian projects are broadly eligible for funding from almost all the major Federal-aid highway, transit, safety, and other programs. Bicycle projects must be “principally for transportation, rather than recreation, purposes” and must be designed and located pursuant to the transportation plans required of States and Metropolitan Planning Organizations. Some examples:

National Highway System funds may be used to construct bicycle transportation facilities and pedestrian walkways on land adjacent to any highway on the National Highway System, including Interstate highways.

National Scenic Byways Program funds may be used for “construction along a scenic byway of a facility for pedestrians and bicyclists.”

Recreational Trails Program funds may be used for all kinds of trail projects. Of the funds apportioned to a State, 30 percent must be used for motorized trail uses, 30 percent for nonmotorized trail uses, and 40 percent for diverse trail uses (any combination).

Surface Transportation Program (STP) funds may be used for either the construction of bicycle transportation facilities and pedestrian walkways, or nonconstruction projects (such as maps, brochures, and public service announcements) related to safe bicycle use and walking. TEA-21 added “the modification of public sidewalks to comply with the Americans with Disabilities Act” as an activity that is specifically eligible for the use of these funds.

Ten percent of each State's annual STP funds are set-aside for **Transportation Enhancement Activities (TEAs)**. The law provides a specific list of activities that are eligible TEAs and this includes "provision of facilities for pedestrians and bicycles, provision of safety and educational activities for pedestrians and bicyclists," and the "preservation of abandoned railway corridors (including the conversion and use thereof for pedestrian and bicycle trails)." (<http://www.fhwa.dot.gov>)

Acquisition

Sources of Funds

- **Douglas County Open Space Program.** The Douglas County Open Space Program was created in 1994 with the passage of a sixth-of-a-cent sales and use tax. Douglas County has purchased land at today's prices, however much of the program's revenue stream is committed to bond payments. Future land acquisition will require additional funding sources. (<http://www.douglas.co.us/openspace/index.html>)
- **Great Outdoors Colorado (GOCO).** In 1992, Coloradans took a major step toward preserving their state's outdoor heritage by voting to create the Great Outdoors Colorado (GOCO) Trust Fund, which now forms Article XXVII of the Colorado Constitution. The GOCO Amendment dedicates a portion of state lottery proceeds to projects that preserve, protect, and enhance Colorado's wildlife, parks, rivers, trails, and open spaces. Since it began awarding grants in 1994, GOCO has awarded almost \$489 million for 2,100 projects throughout the state. (<http://www.goco.org/>)

Local Government Grants. Competitive grants assist local governments in acquiring, expanding, enhancing and improving parks, outdoor recreation and environmental education facilities. Eligible recipients of these grants are municipalities, counties and special districts, such as park and recreation districts.

Open Space Grants. Competitive grants are awarded to non-profit land conservation organizations, local governments, Colorado State Parks and the Colorado Division of Wildlife for projects that protect land and natural areas such as urban open space, riparian corridors, wildlife habitat, agricultural land and community separators.