DC Ranch Association

LANDSCAPE MAINTENANCE GUIDELINES

02.03.2020

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The purpose of this document is intended to define the general responsibilities of the landscape maintenance program as well as provide insight into the typical procedures and requirements necessary to maintain the community's common area landscape at a level consistent with the DC Ranch Brand.

The establishment of a continuous, thorough, and professional maintenance program will aid in reducing long term maintenance costs by improving the successful growth and longevity of plant material, lighting, irrigation systems, and other landscape elements

It must be understood that landscape design involves a living commodity that will continue to change and require different levels of maintenance throughout its useful life. As the landscape matures, certain maintenance procedures may need to be added, modified or deleted. While these specifications go beyond conventional guidelines, success of the developed landscape will only occur if the implementation and performance of these specifications are monitored, measured and adjusted over time.

The Landscape Manager, under the guidance of the Maintenance Services Director, Executive Director and Ranch Association Board of Directors, shall be wholly responsible for the implementation and scheduling of work, communication, observations, health, and overall attractive appearance of the landscape as required by the Ranch Association.

While specific frequencies and methodologies provided herein have been identified to meet important Community criteria, the information provided within these guidelines should be modified, further defined and customized by the landscape maintenance organization so that program requirements, and Community expectations are refined, and integrated. Any proposed refinements must ensure that expectations of the Community are met, and are clearly identified between the Ranch Association, and the Landscape Manager prior to execution of a contract.

The landscape maintenance program should include specific programming schedules, methods of record keeping, and shall document the approach to defining and isolating tasks / scope on a daily, weekly, monthly, and annual basis.

COMMUNITY PHILOSOPHY

The development approach to the DC Ranch Community is unique in several ways. All site improvements have been extensively planned, coordinated and implemented to preserve the unique character of the landscape. Additionally, site improvements are utilized to integrate the constructed environment with the natural elements.

Many subtleties of the natural landscape have been developed or replicated within the constructed landscape. As a result, certain aspects within selected areas of the landscape are not intended to be thoroughly manicured or "picture perfect" at all times. Instead, they should exemplify the irregular and unique natural beauty of the landscape, including the imperfections that give the natural environment its "character". This is not to say that any aspect of the Community should ever appear unkempt, but rather that "planned naturalization" in NAOS and NOS areas has been applied to achieve that landscape design for a specific reason.

It is critical that the landscape maintenance department continues the process of integration. Landscape maintenance will require an understanding of where, and when to apply certain maintenance techniques, and when to celebrate the wonderful diverse variations that occur in nature. This is very important and must be carried out with a thorough and well-planned approach. A complete understanding of the DC Ranch Community design philosophy and character as it applies to the site, as well as specific elements, will be paramount to the continued success of the Community.

LANDSCAPE

GENERAL ZONE REQUIREMENTS

Maintenance requirements will differ in several ways based on the planting zone, location of the planting zone, maturity of the landscape, and the type of plant material (trees, shrubs, groundcovers). In general, the level of maintenance required for various planting zones can be qualified as follows:

Natural Landscape Zones

These areas are represented by many different zones on the landscape plans and are **intended to replicate natural desert conditions**. Little or no cultural maintenance will be necessary in these zones once they have become established. Although the irrigation system in some of these areas has been developed as a "permanent" system, it is intended to be used to provide supplemental summer irrigation only, or to be turned off indefinitely by the Ranch Association. Typically, these areas can be weaned from the program schedules as the landscape matures (refer to irrigation requirements).

Vegetation should be allowed to grow (and die) in these zones as a natural process. Existing tree and cacti skeletons should remain. Typically, these areas are located within scenic setbacks, scenic corridors, lower density residential areas, drainage channels, etc.

Modified Natural Landscape Zones

These zones utilize the DC Ranch Native plant palette as a foundation but have been augmented with selected Sonoran plant species for interest, and increased color. Typically, these zones occur within improved streetscape areas, walkways, and at high visibility areas such as residential parcel entries, medians, cul-de-sacs, mailboxes, etc. As such, these zones may require a slightly higher level of maintenance with respect to plant pruning, replacement, and cleanup than Natural zones. This zone serves as a Transitional zone from the Natural zones to Level "B" landscape zones.

Modified Natural Landscape Zones

These zones are similar to Modified Natural Zones; however, they may also include a percentage of Southwestern and Arid Region plant species. Typically, these zones occur within higher density residential streetscapes, and high use areas such as the Neighborhood common areas, parks, and Community Center sites. In response to the increased volume of pedestrian, and vehicular traffic, plus the high visibility of these zones, maintenance will require more substantial, and frequent attention. Increased plant pruning, weeding, plant replacement and cleanup should be anticipated.

Specialty Landscape Zones

Many specialty zones occur throughout the Community and fall under the general criteria of the Natural and Modified Natural landscape zones. The specific considerations for each of the specialty zone areas follows:

Landscape Sightline Zones (SLN, SLA, SUA), Sight Visibility Easements and Visibility Triangles

For general public safety, sight visibility easements and visibility triangles (SVE's and VT's) have been established as required by the City of Scottsdale. These areas will require care to ensure that minimum sightline distances are maintained. **These areas are planted with materials that typically do not exceed 24" in height or are clear to 7' above ground as referenced from the adjacent top of curb.** A limited number of plants exceed this height limitation (Saguaro, Ocotillo, Creosote, Desert Milkweed etc.), and have been granted special approval primarily because of their minimum visual impact.

Shrubs in these areas are to be maintained in accordance with the City of Scottsdale requirements. Any pruning of shrubs should amount to selective "thinning" rather than sheared or flat-topped massing of plants. Trees must be pruned to maintain a 7' high canopy clearance above adjacent curb.

Wildflower Zones

Refer to the Wildflower section for complete maintenance requirements.

Seeding Zones

These areas are predominantly "low visibility" areas where landscape restoration is primarily dependent on a native seed mix application augmented with native cacti. Typically, these areas are non-irrigated; however, some areas may have been supplemented with irrigated, native trees. The success of the restoration process will require occasional attention including weeding and cleanup.

Noxious weed species that thrive in disturbed sites must be controlled (see Pest Control). Promotion of the obscure perennials, forbes and grasses as an integral part of the natural revegetation process is encouraged. It is imperative that the personnel maintaining these specific areas are well trained in identifying native plant species seedlings that are to remain, from unwanted weed species.

Natural Area Open Space (NAOS) and Natural Open Space (NOS) Areas

These areas are undisturbed or landscaped with the intention of being naturalized. No Maintenance should not be required in these areas unless the area is under restoration or specifically requested by the Ranch Association.

Enhanced Zones

Enhanced landscape zones are primarily limited to internalized areas associated with the clubhouse, village commons, park areas, and private residential yards. These zones may incorporate plant material from all landscape palettes and can be considered the most "ornamental" plant zone. **These areas will receive the highest level of maintenance. Maintenance criteria will be defined in future editions of this document as projects come on-line and Community expectations can be more clearly defined.**

CULTURAL LANDSCAPE GUIDELINES

Pruning

A thorough knowledge of the mature natural appearance of each plant is critical when considering any type of pruning. Selective and corrective pruning techniques are allowed when needed. **Shear pruning is strictly forbidden**.

Special attention should be given to the development of proper trunk taper on young trees. By allowing low breaking branches to remain in place, the thickness (taper) of the trunk will increase. Tree suckering should be allowed to develop as part of the natural growth process; except where the Ranch Association specifically requests selective pruning be administered.

Consideration should be given to the bloom cycles of all plants. Avoid any pruning immediately prior to the start or before the end of any bloom cycle.

All Palo Verde species are susceptible to sun burning. Most all native tree pruning should occur in the fall.

Do not use sealers or wound dressings on cuts. Trimming techniques should be in accordance to the Western Chapter of the International Society of Arboriculture Pruning Standards.

Integrated Pest Management (IPM)

The concept of integrated pest management should be well understood and practiced. To fully achieve the design intent through sound landscape management at D.C Ranch, the determination of what is truly a pest must be well understood prior to any treatment.

Integrated pest management (**IPM**), also known as **integrated pest control** (**IPC**) is a broad-based approach that integrates practices for economic control of pests. IPM aims to suppress pest populations below the economic injury level (EIL). IPM emphasizes the growth of a healthy plant with the least possible disruption to ecosystems and encourages natural or chemical pest control mechanisms based on economic feasibility and effectiveness.

Invasive plants

Plant species that are considered weeds or invasive plants within the DC Ranch Community include the following species:

Desert broom	Camphor weed
Russian thistle	Pig weed
London Rocket	Fountain grass
Mediterranean grass	Leafy Spurge
Mistletoe	Purple three awn
Puncture vine	Buffel Grass
Tamarisk	Johnson Grass
Quack Grass	

Over time, volunteer species will germinate in both Natural and Modified Natural zones. **The weeds identified in the list above should be eradicated from all zones. Other species should be allowed to establish in Natural zones as long as plant densities do not become excessive. While volunteer species are encouraged in Natural zones, all Modified Natural zones, and Wildflower zones should be maintained with only limited densities of volunteer species**

Due to the use of wildflowers and other supplemental seed within the DC Ranch Community, pre-emergent herbicides are allowed only with special approval of the Landscape Manager.
Predominate Pests

Mistletoe is a common parasite occurring in all native species of trees. All Mistletoe occurring in Modified Natural zones should be eradicated. . When practical, branches with Mistletoe should be pruned completely out of the affected tree.

Special attention should be given in controlling two particular insect pests. The Palo Verde root borer and a parasitic mite that distorts the branch growth of Blue Palo Verde. Identification of areas with high infestations will be identified and treated annually, till populations are in control.

Most common pesticide labels do not include species names common to the DC Ranch landscape. Prior to any chemical applications, plant compatibility and effectiveness should be evaluated.

All chemical or cultural control should be documented by utilizing the "Pest Control Record" (see Exhibit E-3).

Fertilization

Selected irrigated plants, in modified natural (level B) or enhanced zones may be fertilized yearly with a complete fertilizer that is horticulturally compatible with the region and individual species of D.C Ranch Turf areas will be fertilized in accordance with guidelines in the turf section of this document.

Isolated nutrient deficiencies for enhanced plant and turf areas shall be corrected based upon lab-based soil testing, on an as needed basis. Fertilizer may be of organic or chemical formulation, based on economic feasibility and effectiveness.
Most nutrient deficiencies among native, and arid type plants can be corrected through cultural means and do not require fertilizing (i.e. managing water relations and identifying seasonal changes in the appearance of individual species).

All fertilization should be recorded utilizing the "Fertilization Record" (see Exhibit E-4). Refer to specific fertilization requirements within the Turf Care section of this document

GENERAL LANDSCAPE MAINTENANCE

As the design intent emphasizes, the landscape goals are dependent on a combination of Landscape zones, materials and arrangements that create a natural transition from the untouched desert to the developed environment. Conventional desert landscape maintenance typically involves an intensive program of grooming (raking). The custodial tasks of landscape maintenance at DC Ranch should be confined to the following:

Tree Staking/Guying

Tree staking should be avoided whenever possible and only required at the direction of the Landscape Manager Some trees may require stakes or guy assemblies at the time of installation. These assemblies should be monitored, adjusted, and removed to promote proper development.
Long term staking of trees is ultimately very detrimental to the health and structure of the tree. Typically, only 24" boxed size trees, and smaller will require temporary staking until they become established. Occasionally, larger purchased material may require staking; however, it is preferable that the trees are hand selected for structure, and form which will preclude the need to stake. Often nursery stakes can be removed at the time of planting and allowed to "straighten" over the course of a few months.

Tree stakes should not be a "crutch" for trees and should be utilized for a limited duration only. Stake ties are commonly set too taught which prevents trees from flexing and gaining adequate trunk strength and girth. Trees can typically be weaned from the stakes with selective pruning attention and removed as soon as practical.

Tree guying should be utilized in emergency circumstances only. In some cases, storm damaged trees may require staking or guying. Only under the Landscape Manager's direction shall assemblies be installed. All staking or guying shall be per plan specifications or at the Landscape Manager's direction. The Landscape Manager may then determine if the tree can be salvaged or replaced.

Vines and Espaliers

Vines have been utilized on a limited basis within the streetscape zones. The vines are intended to sprawl on fences, walls, and trees, and should generally remain untrimmed.

Ornamental vines that occur within Modified Natural, and Enhanced zones will require varying levels of pruning based on the habit of each species. Vine ties or supports may also be required to allow the vines to climb. Depending on the species vine supports should be checked or added on a monthly (minimum) basis during the growing season. At no time shall vines or espaliers cause damage to or compromise the structural integrity of the adjacent structure.

Seed Pods

Most native trees will seasonally drop a significant number of seedpods (early summer). In Enhanced or Modified Natural zones the majority of seedpods should be disposed of. Otherwise, seedpods shall remain as a part of the natural plant litter within all other plant zones.

Spent Blooms

Within the Modified Natural zones, dry blooms that remain on plants should be removed, when practical. Only pinching or selective pruning techniques should be used. See the "Wildflower Management Guidelines" for the proper procedures regarding spent blooms on wildflowers.

Plant Replacement

All plants needing to be replaced due to damage, death or old age should be replaced in accordance, when possible, with the original landscape design plans established by the developer. Planting zone maturity and current plant densities should also be considered. All dead plants that cannot be immediately replaced should be removed and noted.

They should be replaced with the same or similar plant on the next replanting rotation. If maintenance personnel cannot identify the plant species to be replaced, the plant skeleton should not be removed until the Landscape Manager can properly identify the species. At such times, all drip tubes should be temporarily plugged at the location of the removed plant or permanently capped if the plant is not to be replaced.

Prior to installation the Landscape Manager must approve all plant replacements.

Tree Management Program

The Landscape Manager will implement an Urban Forestry Management Plan to enhance the quality of life in the DC Ranch Community by promoting sustainability, safety and aesthetics in the urban forest, through sustained planning, planting, protection, maintenance, and care of trees, and related resources in and around the DC Ranch Community for economic, environmental, social, and public health benefits for its residents and guests.

Turf Management Program

Mowing: Mid Iron Hybrid Bermuda should be mowed to an approximate height of 2-3" based on the landscape managers discretion, at least once a week. Perennial Ryegrass should be mowed at 2-3" based upon the Landscape managers discretion. Both lawn types should be mowed often enough to avoid cutting off no more than 1/3 of the leaf blade at a time. Turf areas should be edged a minimum of twice a month.

Fertilization: Turf areas should be fertilized a minimum of three to four times over the Fall overseeding period at a rate of 1lb/1000 S.F. During the winter months (December through April), fertilization should consist of supplemental iron to harden-off, and green up the Ryegrass. Additional fertilization may occur if indicated by a soil test. Complete fertilizer applications should resume again during the warm season transitional period (May through June), and continued with Ammonium based nitrogen on an as needed basis throughout the summer.
Fertilizer should be a complete (12-12-12 or 15-15-15), commercial grade, slow-release fertilizer, 75% Urea, and 25% monoammonium phosphate based, at the rates specified by the manufacturer.

Fall Overseeding (Bermuda to Ryegrass): All turf zones must be overseeded during the cool season months (October or November) to remain green year-round. Turf should be thinned (dethatched) once during the summer months, if necessary, prior to over-seeding. Overseed and fertilize with a perennial Ryegrass at a rate of 500 lbs./acre and fertilize as stated above. Spot seeding should include the application of a minimum of ¼" of 3/8" screened organic material.
Repeat overseeding as required after initial germination to ensure complete and even growth.

Spring Transitioning (Ryegrass to Bermuda): To deter Ryegrass growth in the Spring when temperature have begun to warm up, reduce the mowing height of the Ryegrass to 1" gradually. This will distress the Ryegrass and expose the Bermuda to more sunlight thereby encouraging Bermuda growth.

Specific Species

Agaves

Agaves, unlike Yucca species, die after blooming. Once Agaves have completed the bloom cycle, the entire plant should be removed. All Agave "Pups" (secondary plants that emerge from the base) should be allowed to remain in natural and NAOS areas only. Agaves are susceptible to a weevil species infestation that is quite harmful to plant health. Care should be taken to identify this problem and initiate proper corrective measures immediately.

The Landscape Manager should first approve all Agave removals. Prior to installation the Ranch Association will be required to approve proposed replacements (see Plant Replacement).

Saguaros

Saguaros are susceptible to a wound pathogen that causes a bacterial rot. A thorough knowledge of the identification and treatment of this pathogen is required. Severe cases are detrimental and potentially dangerous. All cases of bacterial rot should be reported to the Landscape Manager.

All Saguaros that fall over should also be reported to the Association. No attempt should be made to replant the Saguaro without the direction of the Landscape Manager.

Fire Fuel Management

Hazardous fuels are live and dead vegetation that has accumulated and increases the likelihood of unusually large wildland fires. When fire encounters areas of heavy fuel loads (continuous brush, downed vegetation or small trees) it can burn these surface fuels and may quickly move from a ground fire into a crown fire.

Hazardous fuel reduction generally requires the reduction of surface fuels. It may also require thinning out dense tree stands, preserving mature sized trees. It can be accomplished using fire, biological methods, chemical and/or mechanical treatments to remove or modify fuels in wildland areas.

Fuel treatments are intended to lower the risk of catastrophic wildfires by managing vegetation to modify/reduce hazardous fuels. The goal of fuel treatment projects is to modify fire behavior to reduce environmental damage and aid in suppressing wildfires.

GENERAL SITE GROOMING

Trash Removal

All trash should be removed from all landscaped areas when observed.

Erosion Control

Within certain areas of the community natural erosion processes are desirable. It is intended that swales, washes and drainage channels should be allowed to erode naturally. Maintenance personnel should only repair and restore eroded areas that threaten to undermine paths, curbs, walls or other structures, or that may otherwise cause personal injury.
Normal eroded conditions in pedestrian areas caused by irrigation overflows or breaks, rain, pedestrian or equestrian traffic should be immediately re-established to pre-existing conditions.

Wash and Drainage Channels

To allow the natural cleansing process to take place, debris and silt deposits removed from roadways or other areas will not be redistributed into the wash or drainage channels. These materials are best removed and deposited in on-site soil stockpile areas or used to repair erosion damage in other areas.

Wash, and drainage channels should be reviewed during, and after moderate to heavy storms thus assuring channel flows are unobstructed, and do not pose a hazard to public safety. Culverts, and drain grates should be checked, and cleaned as needed. Access locations into washes should be cleared under Landscape Manager's direction. Potentially hazardous conditions resulting from storm flows should be immediately signed and flagged appropriately. Storm damage on roadways, paths and trails, should be cleaned up as soon as is practical.

Transit Stops / Mailboxes

These facilities should be monitored on a weekly basis (at a minimum) for general trash collection and clean up. The level of "hardscape" and landscape maintenance in many ways will parallel those of a commercial use area.
Quite often these areas will collect posted notices that become outdated or unsightly. Due to the intensity of use of these areas vandalism and graffiti can become prevalent, particularly if the problems are not addressed and corrected quickly. Report all vandalism and graffiti to the Landscape Manager immediately.

WILDFLOWERS

GENERAL

The purpose of the DC Ranch wildflower program is to provide visitors and residents with year-round displays of wildflowers that create a memorable visual impression of this unique Sonoran Desert setting. The wildflower program is a unique way in which DC Ranch sets itself apart as a community.

Irrigation

Landscape Maintenance personnel shall be responsible for monitoring seed areas to ensure they are sufficiently watered to promote vigorous growth. Watering of the seeded areas shall be based on the guidelines outlined within the irrigation section of the specifications.

Post Germination Maintenance

a) **Weed Control:** It is imperative that seeded areas are kept free from undesirable weeds. Bi-weekly monitoring and weekly weeding of seeded areas is recommended to ensure that weeds do not sprout and re-seed. Weeds may be sprayed with a contact herbicide, or preferably, pulled out by hand. Herbicide applications should be made only on windless days by a certified applicator. Extreme caution must be exercised with the use of herbicides to prevent overspray onto desirable plants.

b) **Removal of Seed Stocks:** After perennial plants have produced and dropped all seed, seed stocks should be pruned at the base. If the density of selected species of plants becomes excessive according to the Landscape Manager, seed stocks should be pruned prior to the ripening of the seeds to prevent further spread.

c) **Collection of Seed Produced:** In areas where abundant seed is produced, seed should be collected to supplement areas that have produced insufficient results. Seed can be collected as identified in e), below or by raking debris from the bases of desired plants as well as anthills for distribution.

d) **Fertilization:** Apply ammonium phosphate (16-20-0) at 0.5 lbs/100 S.F. to all seeded areas in the spring. This application should be thoroughly watered or raked into the soil.

e) **Clean-Up and Additional Seed Dispersal:** After seeds have been collected the plants should be pulled by hand and shaken over the area to disperse any remaining seeds. The remaining stalks may also be thoroughly mulched and distributed across the area to return additional nutrients to the soil.

Long Term Maintenance Care

Although many annuals re-seed naturally each season, it is recommended that additional seed be applied to ensure consistent wildflower stands are produced. Seed should be hand broadcast per the rates specified in the DC Ranch Master Landscape Specifications for a minimum of three years. It may be desirable to adjust the seed mix in subsequent seasons to attain optimum success and display of color. The Landscape Manager, and the Ranch Association, prior to implementation, should first approve any alterations to the approved seed mix.

WILDLIFE AND HABITAT MANAGEMENT

The presence of wildlife within the DC Ranch Community is encouraged. Wildlife plays an integral role in the balance of the environment and is an important aspect to the continued preservation of the Sonoran Desert.

Great lengths have been made to preserve, protect and restore the existing desert environment. As such, no provisions have been made to control mammals or reptiles, and other wildlife that are indigenous to the site. Rabbits, rodents, coyote, deer, snakes and javelina are all present in this area, and their presence may result in increased maintenance; particularly where newly installed landscapes are involved. The use of plants, which are less susceptible to consumption or, the temporary protection of newly planted material are the most effective solutions to foraging animals.
Feeding animals is discouraged as this practice encourages greater than normal densities and attracts non-native species that may further upset the balance.

IRRIGATION

DESCRIPTION OF IRRIGATION SYSTEM

Materials and Equipment

The irrigation system for DCR can be broken down into the following major components:

a) Points of Connection: Fittings, pipe, meters, backflow preventers, and valves required to connect the irrigation system to its water source – the supply mains of the City of Scottsdale.
b) Pressure Supply Line Piping: A network of piping, and valves to deliver water from the points of connection to each electric control valve.
c) Electric Control Valves: Special valves which can be remotely activated so that water is exclusively delivered to groups of drip emitters or sprinkler heads.
d) Drip Emitters: Water emission devices, which apply water at a very slow rate to the landscape.
e) Sprinkler Heads: Water emission devices, which, through a variety of delivery mechanisms and distribution patterns, apply water to the landscape.

Additional components to aid in the maintenance of the irrigation system and landscape include:

a) Gate Valves: To enable the isolation and shutdown of any chosen section of the pressure supply line distribution system for repair while the remainder of the system remains operational.
b) Quick Coupling Valves: For supplemental deep watering of new plant material and any other incidental watering.
c) Manual Drain Valves: For rapid draining of the pressure supply line when piping changes or repairs must be made.

The type of landscaping, daily evapotranspiration rate (ET), soil conditions, terrain and exposure all dictate the landscape's water requirements in terms of both quantity and frequency. DC Ranch irrigation has been designed using a central control computer, automatic satellite controllers, and electric control valves with the combined flexibility to accommodate all of the different requirements of the landscape.

Irrigation Zones and Design Intent

To optimize the application of water to the landscape, it is necessary to define distinct irrigation zones. These zones are determined based on plant material type and size of the planting area. Zoned plant materials have been grouped on separate control valves as follows:

a) Trees (drip)
b) Saguaros (drip)
c) Non-native, irrigated cacti (drip)
d) Shrubs in "LN" landscape zones (drip)
e) Shrubs in "WN" landscape zone (drip)
f) Shrubs in "non-LN" or "non-WN" landscape zones (drip)
g) Wildflower seeded areas (overhead spray)
h) Turfgrass (overhead spray)

Additionally, trees and large spaded shrub material within wildflower seeded areas are valved separately, allowing them to receive supplemental drip irrigation. It is intended that shrubs and cacti within wildflower seeded areas will get their water from the overhead spray system and will not be given individual drip irrigation.

The irrigation system is optimized to require that all emitters and sprinklers that have been grouped to operate under the control of any given electric control valve will be from the same irrigation zone. This allows irrigation of groups of similar plant materials (e.g., turf or shrubs) on a separate basis.

Components alone do not make an irrigation system an effective tool for conserving water. Each of the advantages cited above is greatly affected by both the design and the operation of the irrigation system.

The irrigation system has been designed in conformance with water conserving guidelines, which emphasize uniform water coverage across site areas of varying size and shape. Proper operation of this irrigation system primarily depends on how irrigation watering is scheduled, and on how the system is maintained. The following sections address the topics of operational scheduling and system maintenance.

IRRIGATION SCHEDULING

Central Control System Overview

DC Ranch is being irrigated by means of an office-based central computer running specialized Rain Bird Maxicom and ET Water scheduling software and communicating over dedicated telephone lines with Cluster Control Units (CCU's) in the field. All irrigation will be scheduled according to ET information collected from local weather stations. The irrigation central control systems will be updated as new technology becomes available and audits dictate.

Suggested Guidelines

Seasonal overseeding and re-establishment of Wildflower seeded areas requires additional. General guidelines for Wildflower germination and continued growth are as follows:

a) Watering for Germination: Seed is to be watered a total of approximately 0.1 inches per day.
b) Post germination Watering: After germination (35-45) days, adjust to one watering cycle every other day, providing a total of 0.1 inches of water. If plants begin to wilt, increase water to provide an additional 0.075 inches. Continue to apply this amount until evening ambient temperatures reach 75 degrees F. (mid May to early June). During summer months, water every other day, providing a total of 0.15 inches of water. Continue until evening ambient temperatures fall below 75 degrees F.

During unseasonably hot conditions when plants show signs of wilting during daylight hours, increase watering to 0.175 inches, every other day.

Watering guidelines presented above are only recommendations, and will need to be adjusted for actual temperature, wind, and other environmental conditions.

When wind conditions are such as to create inadequate or unbalanced irrigation coverage for overhead spray irrigation, watering must be temporarily delayed or performed by other methods as required to provide uniform coverage of affected areas. The Central irrigation controller will be linked to an on-site weather station that can be programmed to automatically shut down of specific areas should the need arise.

At no time shall operation of the irrigation system be allowed to create a safety hazard or nuisance. Overspray onto roadway surfaces or automobiles is unacceptable. Overspray onto pedestrian walkways should be minimized and only allowed as needed to adequately water wildflowers or turf that is immediately adjacent to walkway edges.

Leaching of drip-irrigated plant material may be required to remove the buildup of undesirable salts and minerals in the soil. Leaching shall be performed twice a year (once in April, once in August) by applying extra amounts of water:

Calendar of Activities

Interval	Type of Irrigation	Activity
Daily	All Irrigation	Make scheduling adjustments based on previous 24-hour alarms.
Weekly or After Each Mowing	Turf Rotors and Sprays	Trim turf from sprinkler heads, as necessary, to avoid spray blockage.
		Briefly activate each electric control valve and observe sprinklers for proper coverage and operations. Immediately repair or replace any sprinklers that may have become damaged or misaligned by mowing operations.
		Straighten sprinklers and adjust nozzles for proper direction of throw. Also check for irrigation overspray or runoff and correct as necessary.
Weekly during June, July, August / Semi-monthly otherwise	Drip	Coordinate drip system operation to occur during daylight hours in those areas where landscape maintenance crews are scheduled to be working. Noting that a plant in stress is often a very visible indicator of irrigation problems, check emitter operation and immediately replace if discovered to be malfunctioning or missing.
Monthly	Drip	Clean and flush inline filters located at each control valve assembly.
	Non-turf Rotors and Sprays	Trim wildflowers or shrub foliage from sprinkler openings as necessary to avoid spray blockage.
		Straighten sprinklers and adjust nozzles for proper direction of throw. Also check for irrigation overspray or runoff and correct as necessary.
Semi-Annually	All Irrigation	Maintain satellite controllers in accordance with manufacturer's directions, including periodic inspection for loose wiring, accumulated debris, and deteriorating housings. Report malfunctions or needed repairs to Owner's Representative.
	Drip	Flush each system by opening each end flush assembly until water runs clear.

Interval	Type of Irrigation	Activity
Annually	All Irrigation	Test each backflow preventer for certification by local governing agency.
	Rotors and Sprays	Balance the throttling control on each electric control valve. Check each sprinkler, also make arc and radius adjustments as needed. Adjust components to eliminate misting.
Bi-Annually	All Irrigation	Check weather stripping on doors of controller enclosures and replace as necessary to maintain water-tightness.
As Needed	All Irrigation	Repair or replace all damaged equipment within one watering period.
		Keep all valve boxes free of debris and accumulated silt.
	Drip	For any lateral line breakage, repair and flush thoroughly by opening each end flush assembly downstream of line break.
	Rotors and Sprays	Clean dirt and debris from sprinkler bodies and nozzles to insure proper water discharge.
		Extend the height of sprinklers as necessary in shrub and turf areas to avoid interference with adjacent foliage.

EXHIBITS

The exhibits listed below are examples only for use in establishing "customized" maintenance records and forms. By utilizing the following forms, all cultural activities performed in the landscape can be documented. The Landscape Manager prior to any adjustment or application should reference these forms. Copies of all forms should accompany monthly billings sent to the Ranch Association.

E-1 General Plant Maintenance Reference
E-2 Seeding Table of Expected Germination Results
E-3 Pest control record
E-4 Fertilization record
E-5 Pruning record

EXHIBIT E-1 – (SAMPLE)

GENERAL MAINTENANCE REFERENCE

COMMON	BOTANICAL	WATER NEEDS	YEAR 1 PRUNING NEEDS	YEAR 2+ PRUNING NEEDS	FERT. NEEDS
Chilean Mesquite	*Prosopis chilensis*	A	B,C	B,C	B
Salvage Boxed Tree[1]		A,B	A	B,C	A,B[2]
Texas Ebony	*Pithecellobium flexicaule*	A,B	A	B,C	A,B[2]
Feather Acacia	*Acacia berlanderii*	A	A	B,C	A,B[2]
Blue Palo Verde	*Cercidium floridum*	A,B	B,C	B,C	A,B[2]
Ocotillo	*Fouquieria splendens*	B	A	A	D
Saguaro	*Carnegia gigantea*	D	A	A	D
Mescal Bean	*Sophora secundiflora*	A	B,C	B,C	B
Desert Spoon	*Dasylerion wheeleri*	A,B	A	A	D
Red Yucca	*Hesperaloe parviflora*	A	A	G	D
Texas Sage	*Leucophyllum frutescens* 'Green Cloud'	A	A	B	A
Mexican Bird of Paradise	*Caesalpinia mexicana*	A	A	B	A
Mexican Honeysuckle	*Justicia spicigeria*	A	A	D	A
Red Autumn Sage	*Salvia greggii*	C	A	E,F	A,B
Purple Hop Bush	*Dodonea viscosa 'purpurea'*	A	A	B	A
Creosote	*Larrea tridentata*	B	A	A	D
Agave	*Agave murphii*	B	A	A	D
Century Plant	*Agave americana*	C pots	A	A	D
Trailing Acacia	*Acacia redolons*	A	A	A	B
Rosemary	*Rosemarinus officinalis*	C	A	A	B
Trailing Indigo	*Dalea greggii*	A	A	F	B
Annuals	*Species varied*	C	G	G	C
Purple Prickly Pear	*Opunita violacea*	D	A	A	D
Lantana	*Lantana monteviensis*	C	B,C	B,C	A,B[2]

Water needs
A-Summer only
B-Establish Only
C-Year Round
D-None

Fertilization Needs
A-Spring Feed
B-Fall Feed
C-As Needed
D-None

Pruning Needs
A-No Pruning
B-Selective
C-Corrective
D-Remove Frost Damage
E-Renovate in Fall
F-Renovate in Spring
G-Spent Blooms Only

1. Salvaged Trees require supplemental Irrigation for appx. 2 Years.
2. Deep root injections are preferred.

EXHIBIT E-3 - (SAMPLE)

PEST CONTROL RECORD

DATE	:	
APPLICATION AREA / PROJECT WIDE	:	
TIME OF APPLICATION	:	
NAME OF APPLICATOR	:	
NAME OF BUSINESS	:	
LICENSE NUMBER	:	CERT. NUMBER:
WEATHER CONDITIONS	:	
PEST BEING CONTROLLED	:	
PLANT AFFECTED	:	
CONTROL MEASURE	:	
PESTICIDE USED	:	
RATE	:	
METHOD OF APPLICATION	:	
FOLLOW UP APP. DATE	:	

EXHIBIT E-4 - (SAMPLE)

FERTILIZATION RECORD

DATE :

APPLICATION AREA / PROJECT WIDE :

TIME OF APPLICATION :

NAME OF APPLICATOR :

NAME OF BUSINESS :

WEATHER CONDITIONS :

NUTRIENT DEFICIENCY :

PLANT AFFECTED :

FERTILIZER USED :

RATE :

METHOD OF APPLICATION :

METHOD OF INCORPORATION :

FOLLOW UP APP. DATE :

NOTES :