

# THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA CALIFORNIA FRIENDLY MODEL HOME PILOT PROGRAM

## Sample Specifications for “California Friendly” Landscapes

The design and construction of California Friendly landscapes follows the same industry standard specifications as typical landscapes, with a few changes. The following sections are suggested specifications to be incorporated into contract documents for California Friendly projects.

### GENERAL PROVISIONS AND DESIGN STANDARDS

#### WATER CONSERVATION

The contractor will take proper precautions to ensure water is conserved to the maximum extent possible during construction.

#### PROJECT CONDITIONS AND COORDINATION

##### Applicable Publications

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

- A. American National Standards Institute (ANSI) Publication:
  - 1. Z60.1, American Standard for Nursery Stock, latest edition.
- B. American Sod Producers Association, Inc. (ASPA) Publication:
  - 1. Guideline Specifications to Sodding (Undated).
- C. Department of Water Resources (DWR) / UC Cooperative Extension (UCCE) / US Bureau of Reclamation (USBR) Publication:
  - 1. Estimating Irrigation Water Needs of Landscape Plantings in California – The Landscape Coefficient Method and WUCOLS III, latest edition.
- D. Irrigation Association (IA) Publication:
  - 1. *Guidelines (to be confirmed)*

##### Irrigation Products

Due to rapidly developing irrigation technology, the following shall apply:

- A. The contractor shall verify that equipment and materials supplied for project conform exactly to requirements of Contract Documents. Approval of a manufacturer's name by (XXXX) does not relieve Contractor of responsibility described above.
- B. Manufacturer's requirements for product installation shall govern work unless expressly specified or indicated otherwise.
- C. Reference to manufacturer's specifications is to latest published standard for the product specified.
- D. Equipment specifications are based on models and/or construction and installation methods prevailing at bid date.
- E. All irrigation products specified shall achieve an irrigation operational distribution uniformity of 70% or greater in all turf areas and 80% in all other landscaped areas.

**Conservation**

The contractor will coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

**DESIGN STANDARDS**

**Site Planning**

- A. The site plan shall consider natural drainage features to minimize runoff. The landscape topography shall be designed to capture as much nuisance water and storm water as possible, thereby avoiding off-site runoff. The use of pervious surfaces and areas is preferred; the use of impervious surfaces and materials within the landscaped area shall be limited to the greatest extent possible.
  
- B. The solar orientation of the property and its relationship to other properties shall be considered in design and plant selection as this may produce different microclimate exposures (e.g. sun vs. shade, southern vs. northern exposure, surrounded by heat-reflective surfaces, etc.)

**Soils**

- A. Soil analysis information shall be used for plant selection and soil amendments. An agronomic soil analysis based on a random sampling shall be performed by a reputable soil-testing lab. The analysis shall contain the following information:
  - Determination of soil texture, indicating percentage of organic matter
  - Measurement of pH and total soluble salts
  - Estimated soil infiltration rate
  
- B. Organic soil amendments shall be incorporated as necessary to achieve a recommended percolation rate of one (1) inch per hour. The use of fully stabilized, certified compost as a soil amendment is encouraged where appropriate.
  
- C. All planting and turf areas shall be rototilled to a depth of six (6) inches prior to final landscape grading.
  
- D. Existing horticulturally suitable topsoil shall be stockpiled and re-spread during final landscape grading.
  
- E. Any new soil required shall be similar to existing soil in pH, texture, permeability, and other characteristics, unless evidence is provided that a different type of soil amendment approach is justified.

**Appropriate Plant Selection, Location and Arrangement**

- A. Plant selection shall be based on the plant's adaptability to the existing conditions present at the site, particularly water use requirements, appropriate hardiness zone, soil type and moisture conditions, light, mature plant size, desired effect, color and texture.
  
- B. The combined plant palette, including turf, shall not exceed a plant factor ( $K_s$ ) of 0.5 (moderate), per the WUCOLS rating system.
  
- C. Plants shall be grouped in hydrozones in accordance with their respective water, cultural (soil, climate, sun and light) and maintenance needs. Each hydrozone shall be clearly delineated on the site, irrigation, and planting plans. A summary table of the square

footage of each hydrozone and the sum of the totals shall be included in the construction documents.

- D. Both Maximum Applied Water Allowance (MAWA) and Estimated Water Use (EWU) shall be calculated per the formulas below and results incorporated into the contract documents. In no event shall EWU exceed MAWA.

$$\text{MAWA} = (\text{ET}_o)(0.72)(\text{LA})(0.62)$$

$$\text{EWU} = \frac{(\text{ET}_o)(\text{PF})(\text{HA})(0.62)}{\text{IE}}$$

*Definitions:*

ET<sub>o</sub> = Reference Evapotranspiration (inches per year)

LA = landscaped area (square feet)

PF = Plant Factor (K<sub>s</sub> per WUCOLS)

HA = Hydrozone Area (square feet)

(0.72) = ET adjustment factor for California Friendly designation

(0.62) = conversion factor to gallons per square foot

IE = Irrigation Efficiency

- E. Planting design (species, quantity, size and spacing) shall achieve 70% landscape area coverage within two (2) growing seasons from installation.

### **Turf Areas**

Turf areas shall be sized and shaped to optimize irrigation efficiency. Turf type and location shall be selected in the same manner as other plantings. Turf shall not be treated as a fill-in material but rather as a planned element of the landscape. All turf areas shall be on separate irrigation zones. The following conditions shall apply:

- No turf may be used on slopes greater than 4:1.
- If turf is used in isolated areas (i.e. driveway strips) subsurface irrigation or micro-spray heads shall be required to avoid over-spray.
- Turf areas less than eight (8) feet wide on the shortest side shall be irrigated with subsurface irrigation or micro spray heads.
- Irregular shapes that cannot be irrigated efficiently shall be avoided.

### **Mulch**

All exposed soil surfaces of non-turf areas shall be covered with a layer of organic, fully stabilized composted mulch to a minimum depth of two (2) inches; this shall be specified on the planting plan. The mulch shall not be placed directly against any plant stem or tree trunk.

## **IRRIGATION SYSTEM**

### **Controller and Valves**

- A. An automatic irrigation controller is required and shall be installed on the interior of the garage or other approved location. The controller shall have at a minimum the following capabilities:

1. Water budgeting feature (percent adjustment)
2. Automatic periodic adjustments to the irrigation program, accomplished through external sensors, internally stored historical weather data or a provider-supplied signal.
3. Multiple start time capability
4. Runtimes able to support low-volume applications
5. Irrigation intervals for days of the week or same day intervals.
6. More than one operating program {A (turf) / B (shrubs) / C (water feature)}

- B. Electric irrigation control valves shall have a manufacturer's specified minimum operating flow of 0.5 gallons per minute or less.
- C. Irrigation operating pressures shall be maintained near thirty (30) psi, per manufacturer's specifications, to reduce misting and prolong the life of irrigation hardware.
- D. Individual valve zones shall only irrigate similar hydrozones.
- E. Irrigation system shall be designed to achieve 70% or greater distribution uniformity in turf areas and 80% in all other landscaped areas.

**Turf Areas**

- A. Turf areas shall be irrigated with equipment that has a precipitation rate of one (1) inch or less per hour as specified by the manufacturer. Stream rotator heads are preferred; use of standard spray heads shall be avoided.
- B. Turf areas less than eight (8) feet on the shortest side shall be irrigated by a subsurface method, or micro spray heads to avoid over spray.

**Low Volume Irrigation**

- A. Non-turf shrub areas shall be irrigated with low-volume micro spray or point application devices, where manufacturer's specification indicates output measured and expressed in gallons per hour (gph). Maximum flow shall be 60 gph (1 gpm) for each point.
- B. All low-volume irrigation systems shall have a filter installed on the supply side with a maximum 150-mesh screen size.
- C. Low-volume irrigation systems shall have a flush valve at the end of all lateral runs.

**Irrigation Installation**

- A. Irrigation system shall be installed per IA guideline specifications.
- B. Ball valves shall be installed on the supply side of all irrigation valve manifolds in order to isolate the irrigation supply from the main house supply.
- C. Turf and non-turf plant irrigation zones shall be installed on individual valves.
- D. For the future backyard irrigation system, a point of connection (POC) shall be installed and marked above ground for easy identification and location.
- E. All surface installed low-volume irrigation piping shall be covered with mulch where applicable.
- F. Upon completion of installation the contractor shall provide the property owner with all pertinent information about the installed irrigation system. At a minimum the contractor shall provide the following:
  - 1. Precipitation rate for each valve zone
  - 2. Maximum runtimes that will be scheduled for the month of July (highest water requirements)
  - 3. Location of the irrigation supply shut off

4. Irrigation system maintenance checklist detailing items to be checked periodically
5. Irrigation distribution uniformity percentage.
6. Internet address for Watering Index information

## **TREES, SHRUBS AND GROUNDCOVERS**

### **Plant Material**

- A. Trees, shrubs, and groundcovers shall be grown in pots, tubs, cans, boxes, or flats as scheduled and shall conform to ANSI Z60.1. Plants shall have sufficient roots to hold earth intact after rootball is removed from the container without being rootbound.
- B. Planting stock shall be well-branched and well-formed, sound, vigorous, healthy, and free from disease, sun-scald, windburn, abrasion, and harmful insects or insect eggs and shall have healthy, normal, and unbroken root systems. Plants shall have been grown under climatic conditions similar to those in the locality of the project.

### **Mulch**

Mulch shall be fully stabilized and certified, free from deleterious materials and stored so as to prevent inclusion of foreign materials.

### **Planting Pits**

- A. Planting pits for container grown plant material shall be excavated twice the size of the container diameter of the plant being planted, or as shown in the drawings.
- B. Plant pits shall be dug to produce tapered sides that are rough and soft, and flat uncompacted bottoms. When pits are dug with an auger and the sides of the pits become glazed, the glazed surface shall be scarified so planting hole sides are rough and soft. The size of plant pits shall be as shown on planting details.
- C. Remove plants from containers without disturbing the rootball. Set plants in pit, cradling and supporting the rootball. Position plant for the "best side" view and for minimum obstruction to traffic on adjacent pavement, if applicable.
- D. Bare-root stock, if any, shall be planted so that the roots are arranged in a natural position. Damaged roots shall be removed with a clean cut. Planting soil mixture shall be carefully worked in among the roots. Remainder of backfill of planting soil mixture shall be tamped and watered. Water basins shall then be formed around isolated plants as specified on drawings below the final grade of the surrounding area to facilitate the passive harvesting of normal rainfall.
- E. Backfill pit with the site's amended topsoil. When the plant is set and the backfill has been water-settled, the top of the rootball shall be one (1) inch above finish grade-or as shown.
- F. Mulch all plant pits, shrub beds, and groundcover beds with a two (2) inch depth of approved organic ground mulch immediately after planting.

### **Sodded Turf Installation**

- A. Sod shall be installed per the ASPA guideline specifications.
- A. During transportation and storage, turf materials shall be sprinkled with water and covered with moist burlap, straw, or other approved covering and protected from

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exposure to wind and direct sunlight. Covering shall be such that air can circulate and heating will not develop.

- B. Work shall be performed only during periods when beneficial results are likely to be obtained.
- C. Sod type to be as specified on drawings.
- D. Sod shall be field-grown in same climatic conditions as that of the project site.
- E. Sod shall be strongly rooted, not less than (8) months old, free of weeds and undesirable native grasses. Sod must be capable of growth and development when planted. Sod strips to be not more than fifteen (15) inches wide by four (4) feet long.

### **Irrigation after Installation**

- A. Irrigation intervals and frequency during establishment period shall be suitable for plant type used and weather conditions. Passive collection of rainfall shall be accomplished through the use of temporary berms around trees and shrubs.