

**CITY OF ORANGE**  
**LANDSCAPE STANDARDS AND SPECIFICATIONS**  
**DEPARTMENT OF COMMUNITY SERVICES**  
**REVISED 2016**

CITY OF ORANGE  
LANDSCAPE STANDARDS AND SPECIFICATIONS

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## I. INTRODUCTION

Landscaping is an important element in defining the image of any community. The City wishes to promote quality landscape design and construction in order to maintain and enhance a positive aesthetic image. To achieve this goal, these Landscape Standards and Specifications have been prepared to establish standards for landscape design and construction and inspection of both private and public works projects.

This document addresses all phases of landscape planning from conceptual design through construction documentation. It is intended to serve as an easy-to-use manual, providing information on plan preparation and processing, and containing regulations which will assure an acceptable level of landscape treatment commonly encountered in the industry.

This manual further recognizes that large scale projects may address landscape planning in a comprehensive manner through the Specific Plan process. In such instances, an exception to these standards and specifications may be requested.

All installation of public works projects must follow the “Standard Specifications for Public Works Construction” (Green Book). The standards and specifications of this manual do not supersede any other applicable standards for public contracts. Where there are differences, the more stringent shall apply. In addition, all landscape and irrigation designs shall be in compliance with the City of Orange Landscape Standards and Specifications Section IX, Water Efficient Landscapes.

### IMPORTANT

A complete set of landscape planning documentation will be made available upon request. Other available documents include: Design Review Board Requirements, Fuel Modification Requirements, Landscape Handout for Product and Installation, Inspection Handout, and Standard Details and the Water Efficient Landscape Guidelines for Implementation

**NOTE: When conflicts exist within Sections of this document, requirements within Section IX shall prevail.**



## II. GLOSSARY

**Backfill** – Soil which is replaced in a hole after excavation and placement of irrigation lines or plant materials.

**Comprehensive Development** – A development which provides its own specific plan addressing landscape planning.

**Drought-Tolerant Plants** – Plants that will grow with little or no water during normal dry seasons once they are established.

**Erosion** – The transportation of soil particles, or mass movement of soil (mass wasting) by water, wind or mechanical means.

**Fuel Modification** – A strip of land where native flammable vegetation has been removed or modified, or both, and partially or totally replaced with drought-tolerant, fire-resistant plants. Fuel modification also provides a reduction of radiant and connective heat, thereby providing fire suppression forces a safer area in which to take action.

**Green Book** – Most current edition of Standard Specifications for Public Works Construction Hand Book.

**Large Project** – A development where the total area of the site exceeds 10,000 square feet.

**Mulch** – Soil-covering materials which are usually derived from shredded ground bark and leaf mold.

**Native Plants** – Plants which grow natural in the region and are indigenous to plant communities throughout the specific region. These plants are capable of living with the climatic conditions of the region and are found in the inland valleys of Southern California.

**Ornamental Plants** – Plants introduced to Southern California from other places that have become established with cultivation.

**Parkway** – That area of public street that is between the curb and sidewalk, or between the sidewalk and the property line of the adjacent property owner, which is used for planting purposes.

**Preliminary Plans** – An exhibit which adequately expresses the intent of the landscape concept.

**Public Land** – Government-owned land maintained exclusively for public use.

**Setback** – Distance between property line and permanent structure. Note: The zoning ordinance establishes minimum setback distances from property lines in which structures may not be located.

**Slope** – An inclined ground surface, the inclination of which is expressed as a ratio of horizontal distance to vertical distance.

**Small Project** – A development site with a gross area of 10,000 square feet or less.

**Street Trees** – Trees planted in the public right-of-way along city streets for beautification and benefit of the general public.

**Street Tree Planting** – A species of tree which has been selected by the city on the basis of habit, character, and grouped by street or development to create a sense of community.

**Topsoil** - Soil which is within the top six inches (6”) of the soil surface profile, containing organic matter, nutrients and the micro-organisms necessary for normal plant growth.

**Water Conservation** – Efficient water management procedures, including design, maintenance procedures and the use of drought-tolerant plant materials.

Note: Refer to Section IX.6, Water Efficient Landscape Guidelines, Appendix E, Definitions.

**LANDSCAPE STANDARDS AND SPECIFICATIONS**

**CITY OF ORANGE**  
**Department of Community Services**

**LANDSCAPE PLAN SUBMITTAL**

## III. LANDSCAPE PLAN SUBMITTAL

### III.1 GENERAL

Where landscaping is required as part of a private development or public works project, review and approval of landscape and irrigation plans are required. All landscape design and installation shall comply with provisions of this document.

Landscape plans will be considered in conjunction with overall project review. It is the intent of the City to promote a comprehensive planning effort in which all design elements of a project complement each other and are compatible with their surroundings. In addition, landscape design must be suitable for the topography and coordinated with the preparation of the site grading plan.

This section of the Landscape Standards and Specifications defines submittal and processing requirements for landscape plan review and identifies the types of projects subject to landscape review.

### III.2 TYPES OF PROJECTS

Landscape plan review is required in conjunction with all development projects within the City as follows:

- Residential projects consisting of two or more units
- Residential tracts
- Commercial, industrial and institutional developments
- Comprehensive developments (developments which provide an individualized plan specifically for landscape planning)
- Public Works projects

Refer to Section X.6, Water Efficient Landscapes, Chapter 1.2 of the Guidelines, “Applicability,” for additional information.

The types of property within such projects which must be landscaped include, but are not limited to:

- Public rights-of-way and areas adjacent to public rights-of-way
- Easements
- Setbacks
- Slopes
- Open Space

### **III. 3 REVIEW PROCESS**

#### **III.3.1 Submittal**

At such time as a development proposal is submitted to the City Department of Community Development for review of site and building plans, a preliminary landscape plan shall also be submitted. Landscape plans shall be reviewed concurrently with the development plans as a component of the overall development project.

Exception: Preliminary landscape plans are not required for project sites less than 10,000 square feet in size, when proposed development complies with all zoning ordinance requirements and no discretionary Planning Commission or City Council action is required. For these types of projects, planting and irrigation plans shall be submitted to the Design Review Board prior to issuance of building permits.

Preliminary landscape plans shall contain enough information to illustrate the landscape concept, but need not identify all the plant names and container sizes. Landscape plans shall also include the Water Efficient Landscapes Specifications information as stated in Chapters 1.2 and 2.0., Submittal Requirements for New Landscape Installations or Landscape Rehabilitations of the Water Efficient Landscapes Guidelines for Implementation. Preliminary plans shall include a legend describing the shape and size of proposed plants shown on the plan, such as “large deciduous shade tree” (Example: *Platanus racemosa*, California Sycamore), or “small flowering tree” (Example: *Lagerstroemia indica*, Crape Myrtle), or “low ground cover shrubs” (Example: *Myoporum pacificum*, *Myoporum*). The plan should include cross-sections of the site or elevations showing how the mature planting will look in relation to the building and parking streets. Section III.7 delineates required contents of preliminary plans.

#### **III.3.2 Preliminary Plan Review**

Community Development staff will forward preliminary landscape plans to the Department of Community Services Parks Division for review and comment. Comments may take the form of recommendations and/or conditions to be referred to the final reviewing/approval body. Any questions regarding landscape requirements or procedures should be directed to Community Services staff.

#### **III.3.3 Construction Documents**

Once the overall development project, including preliminary landscape plans, is approved by the final reviewing body (Design Review Board, Planning Commission or City Council) the applicant shall prepare and submit landscape construction documents incorporating all conditions of approval. See Section III.8 for specific information regarding construction document plan sheet requirements.

Construction document submittal shall include the following:

- Approved preliminary landscape plan
- Conditions of approval
- Construction document blue lines
- Specifications
- Soil Agronomic Report
- Requirements of the Water Efficient Landscapes Guidelines

Construction document package shall be submitted to Community Services Department and may be submitted either concurrently with other plans for building permit plan check, or subsequent to building permit issuance. Concurrent processing is not required in order to allow for completion of structural plan check corrections which may affect the final site plan, prior to preparation of landscape construction documents.

Landscape construction plans are subject to review and approval by the Department of Community Services and all landscape and irrigation installation is subject to inspection and approval. Final building inspection, power release and occupancy permit shall not occur prior to satisfactory completion of landscape as required by the Department of Community Services.

#### III.4 LANDSCAPE PLAN PREPARATION

For public works projects, landscape plans shall be prepared under the direct supervision of a Registered Landscape Architect (State of California). For large scale or complex private development projects, the City recommends that plans be prepared by a licensed professional landscape architect.

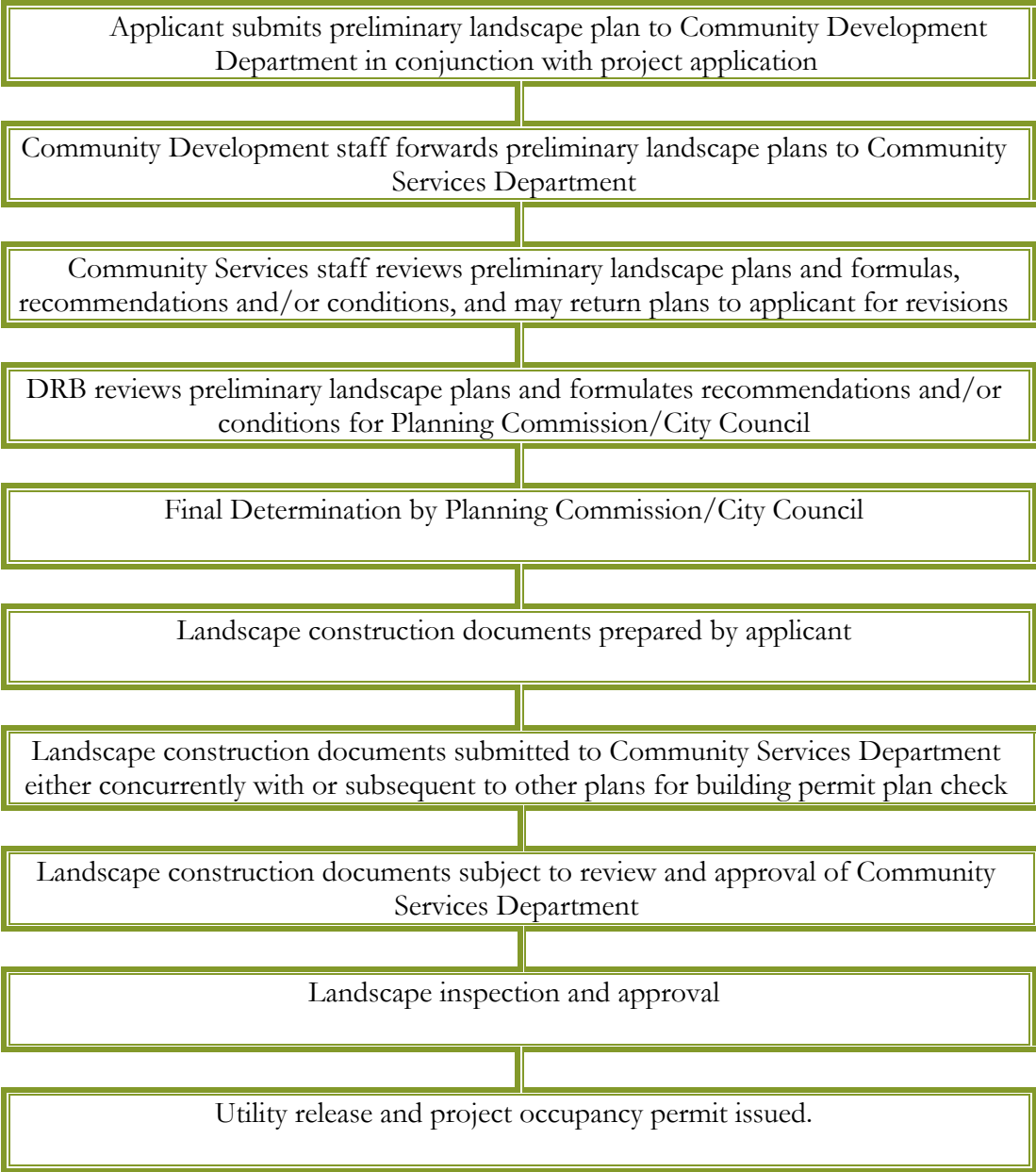
If a landscape project meets the criteria defined in Section IX.6, Chapter 1.2A, “Applicability,” of the Water Efficient Landscapes Guidelines, the plans shall be prepared by a licensed professional landscape architect.

For smaller or less complex projects, licensed landscape contractors or professional nurserymen may also prepare the plans.

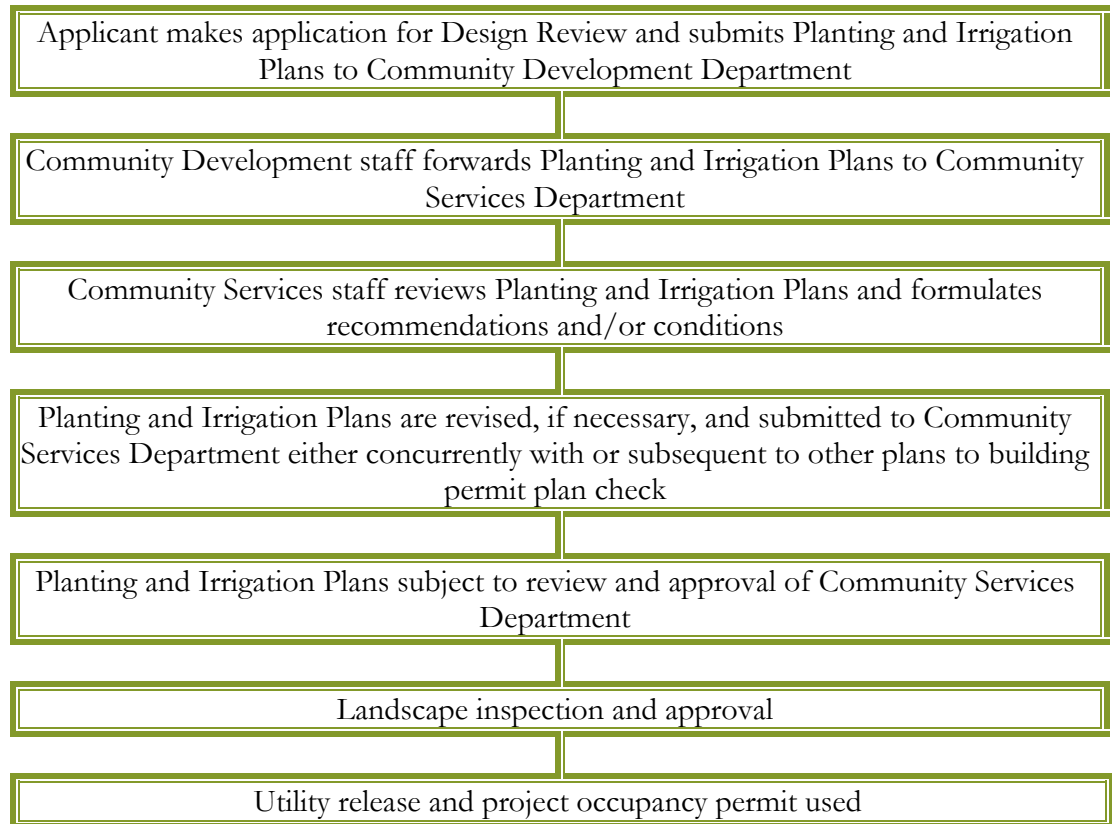
All landscape plans shall conform to City Standards and Specifications, and shall be consistent with the City’s Manual of Grading. In addition, public works projects must also comply with the **Standard Specifications for Public Works Projects**. If plans are found to be incomplete by the City, they shall be returned unchecked to the owner/agent for completion.

III.4.1 Plan Review Flow Chart

CONSTRUCTION PROJECTS REQUIRING PLANNING  
COMMISSION OR CITY COUNCIL APPROVAL



SMALL CONSTRUCTION PROJECTS (LESS THAN 10,000 SF)  
WHEN PROJECTS COMPLY WITH ZONING  
(Planning Commission or City Council approval not required)



### III.5 FEES

Fees will be paid in accordance with the Master Schedule of Fees and Charges as adopted by the City Council and available from the Department of Community Development. Fees will be assessed for Plan Check and Inspection Services based on staff time spent in review and inspection.

### III.6 NUMBER OF PLANS

The number of sets of preliminary landscape plans needed are dictated by the review process required for the overall development project and will therefore vary with each development. For example, projects requiring Design Review Board review and Planning Commission approval will have a wider distribution than those requiring only Design Review Board approval. Therefore, only the initial submittal requirements are listed below for preliminary plans. Additional copies of plans will be requested by staff once plan review has commenced.



Preliminary landscape plans – **5 sets**

Landscape construction documents – **3 sets**

In addition, upon final City approval of landscape plans for public works projects, residential tracts containing common interest open space areas or large scale private development projects, applicants shall provide to the Department of Community Services one complete record set of plans, including revisions, on signed mylar reproducibles, 30” x 42” in size.

### **III.7 CONTENT OF PRELIMINARY LANDSCAPE PLANS**

Preliminary plans must be prepared for the entire project site including all phases of development. For example, landscape plans associated with a tentative map shall address all the common ownership areas within the boundaries of the map and shall not be submitted piecemeal in conjunction with construction or other type of phasing. If approved, construction documents and landscape installation may be developed in phases.

#### **III.7.1 Landscape Design Requirements**

Criteria to be considered on a Preliminary Landscape Plan (or Construction Documents when no Preliminary Plans are required for project sites less than 10,000 square feet in size) are as follows:

- How the preliminary design integrates with and complements existing landscape
- How the preliminary design relates and complements the architecture on site or proposed
- How the preliminary design provides for screening of unsightly areas, as well as wind, sun and noise
- How the preliminary design integrates with and complements existing and proposed slopes, as well as general topography
- Whether the design provides improvements which are permanent and of a quality designed to accommodate low maintenance
- Whether the design provides plantings of parkway tree/shrubs in accordance with the City ordinances and conditions
- Refer to Section IX.6, Water Efficient Landscape Guidelines, Chapter 1.2, “Applicability,” for additional information

#### **III.7.2 Preliminary Plan Sheet Requirements**

- Project title

- Scale and north arrow
- Vicinity map
- Graphic symbols showing proposed and existing trees, shrubs and ground covers
- Indicate any existing planting to be removed
- Legend of the proposed planting and sizes
- A cross-section or elevation of the site showing the mature size and form of proposed planting
- Label all walls, fences, gates, banks, berms, retardation basins, trash enclosures, site lighting and other elements that relate to, or affect, the planting
- Notes indicating the type of irrigation proposed
- Name, license number, address and phone number of person preparing plans
- Property lines/project limits, easements/setbacks
- Building foot prints, existing and proposed paved areas, including street sidewalks

### **III.8 CONTENT OF LANDSCAPE CONSTRUCTION DOCUMENTS**

Landscape plans being submitted as required must conform to the format items listed below. Incomplete designs and details will not be accepted.

All final drawings are to be of the detail and extent that is required for construction and installation.

#### **III.8.1 Cover/Title Sheet**

The first sheet shall be a Title Sheet and shall include:

- Project locations on regional map
- Vicinity map showing the street configuration within or adjacent to the project, nearest arterial highway and street names
- Signature block for approvals with space for Landscape Inspector, Police Department and Fire Department

- A revision index for City approvals shall appear on the Cover/Title Sheet
- Project title, (for example ,Tentative Tract or Tract Number), and developer's name
- Consultant names, preparers name, sheet index, sheet key map and project address shall be added to the project title section of the cover/title sheet

### **III.8.2 Title Block Contents**

- Project title
- Tract developments shall include tract and lot numbers
- Project address and cross streets
- Landscape architect's firm name, address, telephone number, date plans prepared, State license number, stamp and signature
- Owner/Developer's name, address and telephone number

### **III.8.3 Items on Plan Sheets**

- Property lines/project limits
- Building foot prints, existing and proposed paved areas, including street sidewalks
- All walls and fences (including gates)
- Sheet reference map, portion of project each sheet covers (if required, a sheet cross reference which relates to corresponding plan sheets)
- Scale: 1" = 20" scale shall appear on each sheet 30' and 40' scales are acceptable for slopes and open space projects
- "North" arrow shall appear on each sheet. North orientation shall be toward top of left sheet only
- Show all match lines and label to provide easy plan reference
- Utilities, easements, street lights, fire hydrants, etc.
- All sheets shall delineate right-of-way lines and all areas to be maintained by City must be so noted
- All areas within the right-of-way to be maintained by others must be so noted

### **III.8.4 Grading Sheets**

Grading plans for projects that require grading permits shall conform to the “Manual of Grading” (current edition). Refer to the grading ordinance to determine when a grading permit is required.

All landscape grading plans (including those that do not require permits) shall include the following:

- If applicable, include Storm Water BMP’s
- Indicate existing and proposed grades with contours and spot elevations
- Note all grades, flow lines, etc., within public right-of-way
- Handicap Grades: 8.33% maximum slope. (Refer to Standard OCEMA Detail)
- Minimum grade within turf areas: 2%
- Grading and drainage within public right-of-way shall be subject to approval by the City Engineer
- Refer to Section IX.1, Water Efficient Landscape Guidelines, Chapter 2.6, Grading Design Plan

### **III.8.5 Detail Sheets**

All construction plans for projects shall include the following:

- Construction notes and details
- Construction Legend, providing part or model no., manufacturer and description

### **III.8.6 Irrigation Sheets**

Locate and identify, if required, the following information for both irrigation point of connection and controllers:

*Refer to Section IX.6, Water Efficient Landscape Guidelines, Chapters 2.0-2.5 and Appendices A, B, & C for additional information*

- Static water pressures
- Meter size

- Peak irrigation demand in GPM
- Design pressure/residual pressure
- Automatic irrigation controllers
- Indicate power and water point of connection
- Indicate who coordinates water service connection
- Electrical pedestal manufacturer and model number

Included on the irrigation drawings shall be a complete and comprehensive irrigation legend indicating sprinkler head, valves, automatic controller, backflow device, etc., and the following:

- Manufacturer number
- Model number
- Radius (in feet)
- Operating pressure in PSI
- Flow and GPM at each valve
- Miscellaneous materials shall indicate manufacturer, model number, size and brief description
- Irrigation Plan shall be on a separate sheet from planting plan

Provide the following notes for Landscape Construction Documents:

NOTIFY CITY COMMUNITY SERVICES DEPARTMENT AT TELEPHONE (714) 744-7274 FOR IRRIGATION MAIN LINE PRESSURE TEST AND COVERAGE TEST. 48 HOUR NOTICE REQUIRED.

NOTIFY CITY COMMUNITY SERVICES DEPARTMENT AT TELEPHONE (714) 744- 7274 FOR LANDSCAPE INSPECTION PRIOR TO EXCAVATION OF PLANTING PITS FOR PLANT MATERIAL, CITY STREET TREES, SETBACK REQUIREMENTS AND FINAL INSPECTION. LANDSCAPE INSTALLATION SHALL NOT INTERFERE WITH LIGHTING OR ADDRESS SIGNATURE. 48 HOURS NOTICE REQUIRED.

### **III.8.7 Planting Sheets**

Planting Plan shall be on a separate sheet from the Irrigation Plan. Drawings shall include a complete and comprehensive legend indicating the following:

- Plant material symbol
- Plant material size
- Botanical name
- Common name
- Turf and seed mixes (public works projects only)
- If applicable, include Storm Water BMP's
- Square footage for turf and ground cover areas (public works projects only)
- Planting notes
- Fuel modification (if required)

**LANDSCAPE STANDARDS AND SPECIFICATIONS**

**CITY OF ORANGE**  
**Department of Community Services**

**DESIGN CRITERIA**

## IV. DESIGN CRITERIA

### IV.1 SUPPLEMENTAL LANDSCAPE ATTACHMENTS

The design criteria listed below pertain to both public and private projects. The references to the Standard Specifications for Public Works Construction in this section are to alert the designer that a design drawn for public land or privately-owned land maintained for public use, must comply with additional implementation procedures commonly found in **Standards and Specifications for Public Works**. In addition to the design criteria contained in this section, supplemental landscape attachments contain further requirements.

1. Landscape Construction Specifications
2. Inspection Guidelines for Private Development
3. Inspection and Acceptance for Public Work Projects
4. Public Works Projects Maintenance
5. Standard Details
6. Water Efficient Landscape Guidelines

### IV.2 GRADING AND SOIL PREPARATION

All grading and drainage within public rights-of-way shall be subject to rules and regulations of the City's "Manual of Grading" and Sections IX, "Water Efficient Landscapes," and IX.6 of Water Efficient Landscape Guidelines.

Soil shall be graded to a smooth and even surface conforming to required finish grade. Finish grade adjacent to walks, paved areas, curbs, manholes, clean outs, valve boxes and similar features shall be 1" below the surface in turf, ground cover and shrub areas. See **Standard Specifications for Public Works Construction**.

### IV.3 TOPSOIL

Topsoil shall consist of a natural, fertile, friable, sandy loam soil possessing the characteristics of representative soils in the vicinity. Topsoil shall be free from Bermuda grass, crab grass, noxious weeds or grasses, subsoil, refuse, heavy roots, clay lumps and stones larger than 1" in size. See **Standard Specifications for Public Works Construction** and refer to Section IX.6 of Water Efficient Landscape Guidelines, Chapter 2.6, "Grading Design Plan."

### IV.4 HEADERS AND MOW STRIPS

The use of headers is recommended to separate planting areas. Concrete mow strip shall be 8" wide by 6" deep placed between turf and shrub areas, and are required on all public works projects.



## **IV.5 RECREATION TRAILS AND FENCES**

Trails shall meet all City standards as defined in the 1989 General Plan or in the subsequent Master Plan of Recreation Trails. Owner shall develop all trails with a 10' minimum width. Fencing for trails shall occur on both sides of trail unless otherwise approved by the City Engineer and Department of Community Services. Fencing shall be of lodgepole construction or approved equivalent, and a minimum of 4' in height.

## **IV.6 CONCRETE WALKS**

Concrete walks shall be constructed per City of Orange Standard Plan No. 118.

## **IV.7 CROSSINGS**

Pedestrian, equestrian and bicycle trails which cross arterial or collector streets shall be signed, striped and marked per State of California Standards. Use of stamped concrete or various enriched paving shall require approval of City Engineer and Department of Community Services.

## **IV.8 LIGHTING**

Any lighting systems to be located within the public rights-of-way shall be designed by a Registered Electrical Engineer, and shall be subject to City approval.

## **IV.9 PARKING AREAS**

Landscape development in parking areas shall be designed to provide safety and comfort to the drivers and pedestrians and enhance the visual quality of the City.

All unenclosed parking, circulation and setback areas shall be landscaped consistent with Title 17 of the Orange Municipal Code and Sections IX of Water Efficient Landscapes and IX.6 of Water Efficient Landscape Guidelines.

- Parking lot landscaping shall be designed so as to discourage pedestrians from crossing any landscaped areas to reach building entrances or parked cars. This can be achieved through installation of identifiable walkways.

## **IV.10 WATER CONSERVATION**

The City is very concerned about proper water management. We encourage the use of alternate water-saving applications, such as reclaimed water, water saving irrigation systems and drought-tolerant plant materials. The use and application of water shall be in conformance to City of Orange Mandatory Water Conservation Program and Resolution Number 7793 and Sections IX, Water Efficient Landscapes and IX.6 Water Efficient Landscape Guidelines.

The use of drought-tolerant plant material and California natives is highly recommended in rural and slope landscapes. Refer to the “Slopes” Section IV. 13 and County of Orange Preferred Plant List, Exhibit A

Irrigation systems in restricted planting areas, i.e., parking lot islands, raised planters, shall:

- Be designed to accommodate the lowest infiltration rate present
- Have additional watering cycles available to avoid runoff and meet water requirements for the landscape

#### **IV.10.1 Provisions For Existing Landscapes**

Refer to Section IX, Water Efficient Landscapes, Section IX.6, Chapter 3 of the Guidelines, “Provisions for Existing Landscapes” for additional information.

### **IV.11 IRRIGATION SYSTEMS**

The on-site irrigation water system shall be designed and operated to promote water conservation.

All irrigation systems shall be designed to avoid runoff and overspray onto adjacent property, non-irrigated areas, walks, roadways or structures. Where varying soil types are present, the design of the irrigation system shall be compatible with the lowest percolation rate present.

An applicant shall provide a complete automatic landscape irrigation design for all landscaped areas within a project development. For open space re-vegetation, a temporary irrigation system may be required as directed by the Department of Community Services.

Irrigation systems shall be designed to provide 100% uniform coverage to all planting areas. As part of the scope of work, any additional heads, special nozzles or patterns are required to achieve proper coverage with a minimum of overspray. All systems will be required to be inspected for 100% coverage. See **Standard Specifications for Public Works Constructions.**

The landscape architect shall verify existing water pressure at job the site prior to designing the irrigation system. Verification shall be made with the City of Orange Water Department.

Allowances shall be made in sizing irrigation main line pipe when requirements for future systems extending beyond the limits of the current project have not yet been completed.

#### **IV.11.1 Gate Valves**

Sectionalized gate valves shall be provided to allow shutting down various sections of the system independently without affecting the entire system. See **Standard Specifications for Public Works Construction.**

#### **IV.11.2 Remote Control Valves**

Slope conditions require separate control valves for sprinkler lines operating systems at the top, toe and intermediate areas of slopes.

#### **IV.11.3 Master Valves**

Master valves shall be required for all irrigation systems which operate on slopes. See **Standard Specifications for Public Works Construction**.

#### **IV.11.4 Quick Coupling Valves**

Provide quick couplers at a maximum of 150' on center for all public works projects. Locate quick couplers adjacent to hardscape in planting areas. See **Standard Specifications for Public Works Construction**.

#### **IV.11.5 Check Valves/Anti-Drain Valves**

Provide check valves and/or anti-drain valves as required to prevent drainage of irrigation water from sprinkler system due to changes in elevation. See **Standard Specifications for Public Works Construction**.

#### **IV.11.6 Pressure Regulating Devices**

Pressure regulation devices shall be installed per detail between meter and reduced pressure device wherever mainline working pressure exceeds 80 p.s.i., unless it is not required by site condition and/or approval of irrigation calculations. See **Standard Specifications for Public Works Construction**.

#### **IV.11.7 On Grade Piping**

On-grade piping cannot be used in slope conditions without prior approval from the Department of Community Development.

Plastic UVR-PVC pipe shall be required for all irrigation systems on-grade. Pressure main line on-grade shall be galvanized pipe. See **Standard Specifications for Public Works Construction**.

#### **IV.11.8 Sprinkler Heads**

Pop-up sprinklers shall be used to minimize safety hazards and vandalism. All sprinkler heads shall be of the same size, type and deliver the same rate of precipitation with the diameter (or radius) of throw, pressure and discharge as shown on the plans. All sprinkler heads of the same type shall be of the same manufacturer. See **Standard for Public Works Construction**.

#### **IV.11.9 Trenching and Backfill Procedures**

Dig trenches straight and support pipe continuously on bottom of trench. Lay pipe to an even grade. Trenching excavation shall follow layout indicated on drawings and as noted. Trenching on slopes shall receive prior approval of the Department of Community Services. See **Standard Specifications for Public Works Construction**.

#### **IV.11.10 Trenching and Backfill Under Paving**

Generally, piping under existing walks may be accomplished by jacking or boring. Any necessary cutting or breaking of sidewalks and/or concrete shall be done and replaced by the contractor as part of the contract cost. Permission to cut or break sidewalks and/or concrete shall be obtained from the City. See **Standard Specifications for Public Works Construction**.

#### **IV.11.11 Automatic Controllers**

Controllers shall automatically operate the irrigation system and be able to accommodate all aspects of design, including rain shutoff, multiple schedules and repeat cycles. Controllers shall be secured in locking enclosure. See **Standard Specifications for Public Works Construction**.

Irrigation controlling units shall be enclosed in secure weather and vandal-resistant, locking housing manufactured expressly for that purpose or located within a structure. Controller cabinets shall not be install within an irrigation spray pattern.

#### **IV.11.12 Outdoor Automatic Controller Enclosure**

Irrigation controlling units shall be enclosed in secure weather and vandal-resistant, locking housing manufactured expressly for that purpose or located within a structure. Contoller cabinets shall not be installed within an irrigation spray pattern.

#### **IV.11.13 Backflow Devices**

All systems will be required to have backflow devices at a minimum size equal to the size of the water main.

All backflow devices shall be inspected, tested and approved immediately after installation. A copy of the Backflow Test shall be delivered to the Department of Community Services. See **Standard for Public Works Construction**.

#### **IV.11.14 Drip irrigation Systems**

Drip irrigation may be used when promoting water conservation on private projects.

#### IV.11.15 Sensors

Refer to Section IX, Water Efficient Landscapes, Section IX.6, Chapter 2.5.1.A, D & G of the Water Efficient Landscape Guidelines.

### IV.12 PLANTING

Overall appearance shall consist of massed shrubs (large and small scale), erosion control ground cover and trees. Designer shall relieve the “planned” appearance of manufactured slopes through effective slope planting design.

#### IV.12.1 Street Tree Planting

Trees are to be a minimum of 15 gallon container size and staked with a 3” x8’ lodge pole. Unless approved otherwise by Public Works Department, trees shall be located in compliance with Public Works setbacks as follows:

- 30’ from street intersection on corner lots
- 15’ from lamp standard
- 10’ from fire hydrants
- 5’ from service walks
- 8’ from gas and electric
- 8’ from driveways
- 8’ from water meter
- 10’ from sewer lateral
- major streets planting location will be approved by City
- Telephone and cable lines
- Plant 35’ O.C. maximum

All tree selections will be approved on a project by project basis based upon Master street Tree list maintained by the Department of Community Services Parks Division at telephone (714) 744- 7274.

#### IV.12.2 Root Control Barriers

Root control barriers shall be installed as required by the Department of Community Services on plantings which do not meet set back criteria. See Section IV.12.1, “Street Tree Planting of Design Criteria.”

#### IV.12.3 Tree Staking and Guying

Trees shall be staked or guyed in an approved manner which permits tree movement and support. All trees in turf shall have tree guards placed at the base of the trunk or approved equivalent. See **Standard Specifications for Public Works Construction**.

### IV.13 SLOPES

Slope stabilization is a primary concern in the City of Orange. Therefore, all slopes as described in “Manual of Grading,” are required to be landscaped and irrigated. However,

when a slope condition is created which interfaces with environmentally sensitive habitats as defined by an approved Environmental Impact Report, habitat enhancements may be required.

All slopes along public streets, areas separated by a fence, wall or other barrier from the structure, or sloping away from (and not visible from) the structure, shall be maintained by a Homeowner's Association, Landscape Maintenance Assessment District or other method acceptable to the City. Slopes not within these categories shall be the maintenance responsibility of the individual homeowner.

#### **IV.13.1 Show Slopes**

Show slopes are visually- prominent slopes which occur along arterial highways and the Eastern Transportation Corridor (ETC). Show slopes are located at development edges and open space edges with toe of slopes at elevations equal to or greater than said highways. Promote visually- prominent show slopes where arterial highways abut open space with re-vegetative native and compatible drought-tolerant plant materials. Show slopes shall be planted as follows:

- **Trees:** Shall be provided with a minimum forty percent (40%) of tree coverage. Percentage of tree size shall be forty percent (40%) five (5) gallon, thirty percent (30%) fifteen (15) gallon, thirty percent (30%) 24" box or larger, and a variety of deciduous and evergreen trees. Tree spacing within coverage area shall be planted at a minimum of one (1) tree per 800 square feet.
- **Shrubs:** Shall have a minimum of fifty percent (50%) shrub coverage. Such slopes must be planted with sixty percent (60%) one (1) gallon and forty percent (40%) five (5) gallon size shrubs. Shrub spacing within coverage area shall be planted at a minimum of eight (8) feet o.c. liner stock may be used on a per project basis upon approval.
- **Ground Cover:** May be hand planted with rooted cuttings from flats, spacing from twelve inches (12") to eighteen inches (18") on center based to ensure adequate coverage within one (1) year from time of planting, or may be hydroseeding, utilizing mixtures which will insure coverage within one (1) year.

#### **IV.13.2 Transitional Slopes**

Transitional slopes occur where development areas abut open space. Re-vegetation with native and compatible drought-tolerant plant materials are required in this category. Fuel modification programs are required in this category.

- **Trees:** Within coverage area shall be planted at a minimum of one (1) tree per 1200 square feet for tree coverage. Such slopes shall be planted with fifty percent (50%) one (1) gallon, twenty five percent (25%) five (5) gallon,

twenty five percent (25%) 15 gallon or larger, and mix of deciduous and evergreen trees.

- Shrubs: Shall be provided with a minimum of twenty percent (20%) shrub coverage. Such slopes shall be planted with one (1) gallon minimum size shrubs. Shrub spacing within coverage area shall be planted at a minimum of eight (8) feet o.c.
- Ground Cover: May be planted by hydroseeding, utilizing approved mixtures which will insure coverage within one (1) year.

#### **IV.13.3 Secondary Slopes**

Secondary slopes are less visually-prominent down slopes where the top of the slope occurs at elevations equal to or less than elevations of arterial highways and the Eastern Transportation Corridor (ETC). Secondary slopes also include slopes within development areas which are equal to or greater than 20 feet in height.

- Trees: Shall be a minimum of forty percent (40%) tree coverage. Such slopes shall be planted with thirty percent (30%) one (1) gallon, forty percent (40%) five (5) gallon, thirty percent (30%) 15 gallon minimum size trees. Tree spacing within coverage area shall be planted at a minimum of one (1) tree per 800 square feet.
- Shrubs: Shall have a minimum of fifty percent (50%) shrub coverage. Such slopes must be planted with one (1) gallon minimum size shrubs and be a minimum of twelve inches (12”) in height or have a minimum twelve inch (12”) spread at time of planting. Shrub spacing within Coverage area shall be planted at a minimum of 8 feet o.c.
- Ground Cover: May be hand planted with spacing at twelve inches (12”) on center to ensure 100% coverage within one (1) year from time of planting, or may be planted by hydroseeding, utilizing approved mixtures which will ensure 100% coverage within one (1) year.

#### **IV.13.4 Interior Slopes**

Interior slopes occur within development areas which are not visually prominent from arterial highways and are less than twenty feet (20”) in height.

- Trees: Shall be planted with ornamental plantings at a minimum of forty percent (40%) tree coverage. Such slopes shall be planted with thirty percent (30%) one (1) gallon, fifty percent (50%) five (5) gallon, twenty percent (20%) 15 gallon minimum size trees. Tree spacing within coverage area shall be planted at a minimum of one (1) tree per 800 sq. ft.

- Shrubs: Shall be provided with a minimum of thirty percent (30%) shrub coverage. Such slopes shall be planted with one (1) gallon minimum size shrubs. Shrub spacing within coverage area shall be planted at a minimum of 8 feet o.c.
- Ground Cover: May be hand planted with spacing at twelve inches (12”) on center to ensure 100% coverage within one (1) year from time of planting, or may be planted by hydroseeding, utilizing approved mixtures which will ensure coverage within one (1) year.

#### **IV.13.5 Landscape Setback/Arterial Highways**

Setbacks between edge of roadway and project screen walls shall be landscaped. This area shall be landscaped with appropriate materials which effectively screen the walls and are low-maintenance types. All slope plant materials and street trees shall be approved by the Department of Community Services.

Trees or ornamental landscaping shall never be placed so as to obstruct the vision of drivers and/or pedestrians within public rights-of-way. If the project includes an intersection, the plan shall show the intersection and its approaches, noting vehicular sight distance which shall conform to the Public Works Intersection Sight Distance Standard. Mounding and shrubs (at mature height without pruning) shall not exceed 30 inches above top of curb within the limited use area as determined by City.

#### **IV.13.6 Extreme Erosion Hazards**

Extreme erosion hazards, such as steep slopes of highly erodible soils, nutrient poor soils or impermeable soils, may necessitate the use of more stringent control measures as determined by the Department of Community Services. Such measures may include, but are not limited to:

- Erosion control planting by hydroseeding, container stock or cuttings beyond normal requirements.
- Erosion control matting or special requirements for irrigation. Erosion control installation will be required in locations specifically delineated on the drawings as necessary due to field conditions
- Any cut slopes steeper than 2:1 or fill slopes steeper than 3:1 are required to have erosion control matting or special requirements for irrigation unless soil reports indicated otherwise.

#### **IV.13.7 Weed Abatement (Slope Plantings)**

If live perennial weeds exist on site at the beginning of work, spray with a nonselective translocative herbicide as recommended and applied by an approved, licensed pest



control advisor and applicator. Clean and remove existing weeds by mowing or grubbing.

Upon completion of soil preparation and planting of all specimen trees, begin weed abatement program by applying a commercial fertilizer per manufacturer's instructions.

Water all areas daily for twenty-one (21) consecutive days and until weed seeds have germinated. Cease watering and spray a nonselective, translocative herbicide to eradicate the germinated weeds. Translocation shall be 7-10 days or an approved alternate time period.

Allow herbicide to kill all weeds. Remove all dead weeds to a minimum depth of ¼ inch below the surface of the soil.

If perennial weeds or grasses still exist, re-water daily for fourteen (14) consecutive days, until new growth appears. Reapply herbicide. Remove weeds after herbicide has had sufficient time to kill.

#### **IV.13.8 Mulching Procedures**

The City shall require mulching procedures when a soil erosion condition exists.

Jute netting and/or other approved geotextile materials shall be installed and secured per manufacturer's specifications. See **Standard Specifications for Public Works Construction**. Hydromulch material shall be produced from 100% wood cellulose fiber and shall be of such character which will disperse into a uniform slurry when mixed with water. The fiber shall be of such character that when used in the applied mixture, an absorptive or porous mat, but not a membrane, will result on the surface of the ground. Materials which inhibit germination or growth shall not be present in the mixture.

Commercial fertilizers and soil amendments for hydromulch slurry shall be as recommended by the approved agronomic soils report for products and application rates. See **Standard Specifications for Public Works Construction**. Refer to Section IX, "Water Efficient Landscapes," Section IX.6, Chapter 2.4.2, "Mulch and Amendments" of the Water Efficient Landscape Guidelines.

### **IV.14 DESIGN REVIEW BOARD CRITERIA**

The following Design Review Board (DRB) landscape criteria is used as a benchmark for review, unless otherwise approved by the reviewing body (DRB or Planning Commission), which are to be used for all multifamily, residential tract, retail, office, industrial, or commercial projects:

Landscape 4'-0" min. (clear inside dimension) along all side and rear property lines, where the building is not on the property line. Car overhangs shall not be included as part of the 4'-0".

If perpendicular parking is used at property lines the minimum planter area is to be 6'-0", inside clear, (excluding overhang).

All parking visible from the streets, including front and side yard areas is to be screened with five (5) gallon shrubs at 3'-0" on center. Berms of 3'-0" may be used if landscape area is 20'-0" wide or greater.

Trees are required throughout the project within all parking areas and along all property lines, including side yards and backyards, where buildings are away from the property line. 25% shall be in 24" box and 75% shall be in 15 gallon container.

Larger sizes will be required on sites over one acre.

To calculate the quantity of trees required on a project, add together the total length of all the perimeter property lines (all sides), the total length of the perimeter of the buildings, and the total length of all parking rows on the site, and divide by 36. These trees are to be located randomly throughout the project unless otherwise noted. Larger specimens are to be used at the front part of project.

All shrubs shall be five (5) gallon, except for plants like AGAPANTHUS, DAY LILIES, and plants used for ground cover, which maybe one (1) gallon, or flatted material.

Show all species of plant materials to be used, with sizes and quantities.

4'-0" (clear inside dimension) of landscaping shall be provided on at least two (2) sides of all trash enclosures.

Applicant is required to verify street tree requirements with the Parks Division (714) 532-6464. (see Street Tree Planting, section IV.12.1)

Show all hardscaping and proposed site ground signage.

Landscape the front yards of all buildings facing a street, entire setback area or 10'-0" minimum planter width, whichever is greater. Car overhangs shall not be included in the 10'-0".

Shrubs at the foundation lines of all buildings and 4'-0" minimum width planters at all elevations seen from the street, shall be planted with five (5) gallon materials at 3'-0" on center.

Show any existing trees to be removed – indicate species and trunk diameters. Save existing trees whenever possible.

Show all existing street trees and the variety used in existing parkways. Also show location of backflow preventer for irrigation system.

Note on plan that a fully automated irrigation system will be provided.

Wheel stops (other than curbs) are not recommended.

Parking areas in the middle of the lot shall have a minimum 2'-0" of planting area down the middle with 2'-0" of car overhang on both sides – 6'-0" total space, or 4'-0" square inside clear area tree wells at 36'-0" on center.

Finger planters in parking area shall be 5'-0" wide minimum, all locations. Fingers are required at the ends of all rows of parking

**LANDSCAPE STANDARDS AND SPECIFICATIONS**

**CITY OF ORANGE**  
**Department of Community Services**

**OTHER APPLICABLE STANDARDS AND GUIDELINES**

## V. OTHER APPLICABLE STANDARDS AND GUIDELINES

### V.I DESIGN STANDARDS

Compliance with the latest editions of the City's Standards and Specifications shall be required for private development or public works projects. A number of guidelines/standards may apply to each project and each shall be referenced on the plans. Where one or more sets of specifications or criteria are applicable, the more restrictive will take precedence. The following list includes various standards which affect landscape design and City Departments where available:

- "Design Standards for the Amendment to the Southwest Project Area," prepared by City of Orange Redevelopment Agency, also available through the Community Development Department
- "Tustin Street Design Standards," City of Orange Redevelopment Agency, also available through the Community Development Department
- "Historic Preservation Design Guidelines for Old Towne," City of orange Community Development
- "Standard Specifications for Public Works Construction," including "Regional Standard Special Revision," and "City of Orange Standard Provision" as documented in the Office of the City Clerk
- "Minimum Submittal Requirements for the City of Orange Design Review Board," City of Orange Department of Community Development
- "Standard Plans and Specifications," City of Orange Department of Public Works Engineering Division
- "Manual of Grading," City of Orange Department of Public Works Engineering Division
- "Guidelines for Landform Grading and Planting," City of Orange Department of Community Development
- "Handicapped Access Regulation, Title 24," prepared by the Office of the State Architect. Questions should be referred to City of Orange Community Development Department Building Division at telephone: (714) 744-7200

**LANDSCAPE STANDARDS AND SPECIFICATIONS**

**CITY OF ORANGE**  
**Department of Community Services**

**FUEL MODIFICATION REQUIREMENTS**

## VI. FUEL MODIFICATION

### VI.1 INTRODUCTION

A fuel modification zone shall be required at the interface of a proposed development that abuts a required natural or native open space area. The combination of slopes, accumulations of flammable vegetation, hot, arid climate (Santa Ana Winds), erodible soils and the intrusion of urban activity creates the potential for loss of life, property and natural resources along the wildland urban interface fire. A fuel modification program is used to implement an acceptable and effective means to reduce the loss of life, property and natural resources from future wildland fires. Through proper development criteria, land use alternatives, a comprehensive fuel modification and management program, we can:

- Reduce the numbers of uncontrolled fires
- Reduce levels of risk
- Reduce the intensity and spread of fires
- Increase our ability to fight and control fires
- Reduce erosion and flooding as a result of post fire rains

A fuel modification zone is a wide strip of land where flammable native vegetation is removed and/or modified, and partially or totally replaced with permanent and/or temporarily irrigated, drought-resistant, low-fuel or slow-burning plant materials.

Fuel modification requirements may vary depending upon the type and density of natural vegetation at the project interface, topography, orientation or exposure to wind patterns, site planning factors and construction type and design. Fuel modification concerns should be analyzed early in the planning stages of a project so that requirements may be potentially reduced through the utilization of single loaded streets, irrigated greenbelt layout, parks layout, project siting or other noncombustible uses as part of, or in lieu of, the fuel modification zoning.

Refer to Orange Municipal Code, Title 15, City of Orange Fire Code For additional Fuel Modification Requirement Information, contact City of Orange Fire Prevention Bureau at telephone (714) 288-2541

**LANDSCAPE STANDARDS AND SPECIFICATIONS**

**CITY OF ORANGE**  
**Department of Community Services**

**LANDSCAPE CONSTRUCTION SPECIFICATIONS  
(SUPPLEMENTAL)**



## VII. LANDSCAPE CONSTRUCTION SPECIFICATIONS

### VII.1 GRADING

#### VII.1.1 Grading and Soil Preparation

In all planting areas, a layer of soil amendments shall be uniformly spread and thoroughly cultivated by means of mechanical tiller as recommended by the approved agronomic soils report. Planting areas shall be free of all weeds and debris 1” in diameter or larger for a minimum of 2” in depth.

Soil shall be graded to a smooth and even surface conforming to required finish grade. Finish grade adjacent to walks, paved areas, curbs, manholes, clean outs, valve boxes and similar features shall be 1” below the surface in turf, ground cover and shrub areas. See **Standard Specifications for Public Works Construction**. Refer to Section IX.6, Chapter 2.6 (a), (b), (d), “Grading Design Plan” of the Water Efficient Landscape Guidelines for more information.

#### VII.1.2 Eliminate All Erosion Scars

After preparation of soil, the areas to be planted with turf shall be rolled, raked and floated to finish grade by any acceptable method with the finish grade being smooth, even and reasonably well-firmed. Refer to Section IX.6, Chapter 2.6 (c), “Grading Design Plan” of the Water Efficient Landscape Specifications Guidelines for additional information.

#### VII.1.3 Topsoil

Topsoil shall consist of a natural, fertile, friable, sandy loam soil possessing the characteristics of representative soils in the vicinity. Topsoil shall be free from Bermuda grass, crab grass, noxious weeds or grasses, subsoil, refuse, heavy roots, clay lumps and stones larger than 1” in size. See **Standard Specifications for Public Works Construction**.

### VII.2 IRRIGATION

#### VII.2.1 Site Conditions

Contractor shall not install the irrigation system as indicated on the drawings when it is obvious in the field that there are obstructions, grade differences and/or discrepancies in the area dimensions until such conditions are brought to the attention of the Department of Community Services.

#### VII.2.2 PVC Pipe and fittings

Solvent cement and primer for PVC solvent-weld pipe and fittings shall be of type and installation methods prescribed by the manufacturer. See **Standard Specifications for Public Works Construction**.

All PVC pipe must bear the following markings:

- Manufacturer's name
- Nominal pipe size
- Schedule of class
- Rating in PSI
- NSF (National Sanitation Foundation) approval
- Date of extrusion
- UPC Shield Logo

Pressure main line piping for sizes 2" and smaller shall be PVC Schedule 40 with solvent-welded joints.

Solvent-welded type pressure main line piping for sizes 2-1/2" or larger shall be PVC Class 315.

Rubber gasket type pressure main line piping for sizes 3" and larger shall be Ring-Tite PVC Class 315.

Non-pressure buried lateral line piping shall be Class 200 or greater with solvent-weld joints unless otherwise specified for public projects.

All fittings shall be Schedule 40 PVC and bear the manufacturer's name or trademark, material designation, size applicable IPS schedule and NSF seal of approval.

### **VII.2.3 Assemblies**

PVC pipe and fittings shall be thoroughly cleaned of dirt, dust and moisture before installation. Installation and solvent-welding methods shall be as recommended by the pipe and fitting manufacturer. See **Standard Specifications for Public Works Construction**.

### **VII.2.4 Galvanized Pipe and Fittings**

Galvanized pipe and fittings shall be allowed upon approval by the Department of Community Services. See **Standard Specifications for Public Works Construction**.

On PVC to metal connections, the Contractor shall work the metal connections first. Teflon tape, or approved equal, shall be used on all threaded PVC to metal joints.

### **VII.2.5 Remote Control Valves**

When grouped together, allow at least 12" between valves.

Install each remote control valve in a separate valve box.

The valve shall have a slow uniform closure to eliminate water hammer or chatter. All valves shall have a manual flow adjustment.

Valve body and bonnet shall be cast brass unless plastic is specified with non-corrosive components.

Valve shall be pressure rated to 150 PSI. See Standard Specifications for Public Works Construction.

#### **VII.2.6 Quick Coupling Valves**

Quick coupling valves shall be 3/4" size and shall be equipped with a locking vinyl cover, yellow in color.

#### **VII.2.7 Check Valves**

Spring-loaded check valves shall be installed on lateral systems with a differential of ten feet (10') or greater in elevation.

Anti-drain valves shall be of heavy-duty virgin PVC construction with FIP thread inlet and outlet. Internal parts shall be stainless steel and neoprene, or provided in sprinkler head.

#### **VII.2.8 Valve Boxes**

Use 10" round plastic valve box with green bolt-down cover for all gate valves and quick couplers, if required.

Use 9-1/2" x 16" x 11" rectangular plastic valve box with bolt-down green cover for all remote control valves. See **Standard Specifications for Public Works Construction**.

#### **VII.2.9 Gravel**

Provide one (1) cubic foot of 3/4" gravel at the base of all gate valve boxes, quick coupler boxes and RCV boxes.

#### **VII.2.10 Identifying Valves**

All electric control valves will be identified by a number branded on the valve box lid (2" letters) and identified on the curb/walk nearest to valve.

#### **VII.2.11 Sprinkler Heads**

Use only new materials of brands and types noted on drawings specified herein or approved equals.

All sprinkler heads shall be of the same size, type and shall deliver the same rate of precipitation with the diameter (or radius) of throw, pressure and discharge as shown on the plans.

Spray heads shall have a screw adjustment.

Riser units shall be fabricated in accordance with the details shown on the plans.

Riser nipples for all sprinkler heads shall be the same size as the riser opening in the sprinkler body.

All pop-up sprinklers shall have an approved wiper seal mechanism.

All sprinkler heads for the same type shall be of the same manufacturer. See **Standard Specifications for Public Works Construction**.

#### **VII.2.12 Sprinkler Heads for On-Grade Systems**

Sprinkler heads for on-grade systems shall be gear-driven rotary shrub type heads or approved equivalent. Refer to Section IX.6, Chapter 2.5, "Irrigation Design Plan" of the Water Efficient Landscape Guidelines for additional information.

#### **VII.2.13 Larger Turf and Ground Cover Sprinkler Heads**

Sprinkler heads for large turf and ground cover areas shall be gear-driven rotary type pop-up.

The body shall be constructed with 3/4" or 1" bottom inlet.

6" pop-up lawn spray sprinklers shall be similar to the Rainbird 1800 or Toro 570 Series or approved equivalent.

12" pop-up shrub spray sprinklers shall be similar to the Rainbird 1800 Series or approved equivalent.

Impact drive pop-up type sprinkler heads shall be Rainbird or approved equivalent. In turf areas, sprinkler heads shall have a protective rubber cover.

#### **VII.2.14 Moisture Sensing Equipment (if required)**

Provide as indicated on the drawings and install in conformance with the accompanying detail(s).

Provide low-voltage wire to each remote control valve controlled by a sensor. Pilot wires for sensors shall be the color blue.

Perform a complete review and check of system to ensure that sensors are working correctly (minimum of 4 times over each 30 day period).

Install all equipment per manufacturer's recommendations/details.

A rain shutoff feature shall be required for all irrigation systems. Refer to Section IX.6, Chapter 2.5 (a, l, b & d), "Irrigation Design Plan" of the Water Efficient Landscape Specifications Guidelines for additional information.

### VII.2.15 Trenching and Backfill Procedures

Dig trenches straight and support pipe continuously on bottom of trench. Lay pipe to an even grade. Trenching excavation shall follow layout indicated on drawings and as noted.

- Provide a minimum of 36" of cover for all pressure supply lines 6" or larger
- Provide a minimum of 24" of cover for all pressure supply lines 2" and larger in size
- Provide a minimum of 18" of cover for all pressure supply lines 1-1/2" and smaller
- Provide a minimum cover of 12" for all non-pressure lines
- Provide a minimum cover of 18" (or directly below mainline where possible) for all control wiring

Trenching on slopes shall receive prior approval of the Department of Community Services. See **Standard Specifications for Public Works Construction**.

### VII.2.16 Trenching and Backfill Under Paving

Trenches located under areas where paving, asphaltic concrete or concrete will be installed shall be backfilled with sand (a layer 6" below the pipe and 3" above the pipe) compacted in layers to 90% compaction using manual or mechanical tamping devices. Trenches for piping shall be compacted to equal the compaction of the existing adjacent undisturbed soil and shall be left in a firm unyielding condition. All trenches shall be left flush with the adjoining grade.

Provide for a minimum cover of 18" between the sleeve and the bottom of the aggregate base for all pressure and non-pressure piping installed under asphaltic concrete paving. All sleeves under paving shall be Schedule 40 PVC for 1-1/2" or smaller, and Class 315 for 2-1/2" or larger. Sleeves shall be installed under all paving /concrete area.

Generally, piping under existing walks may be accomplished by jacking or boring. Any necessary cutting or breaking of sidewalks and/or concrete shall be done and replaced by the contractor as part of the contract cost. Permission to cut or break sidewalks and/or concrete shall be obtained from the City. See **Standard Specifications for Public Works Construction**.

### VII.2.17 Line Clearance

All lines shall have a minimum clearance of 6" from each other.

Parallel lines shall not be installed directly over one another. Installation of lines for other trades shall not be laid on irrigation trenches, but shall be installed in a separate trench. See **Standard Specifications for Public Works Construction**.

### **VII.2.18 Control Wiring**

Pilot wires shall be a different color wire for each automatic controller. Common wires shall be white with a different color stripe for each automatic controller. Install in accordance with valve manufacturer's specifications and wire chart. In no case shall wire size be less than #14.

Where more than one (1) wire is placed in a trench, the wiring shall be taped together at intervals of 10'.

All control wire installed where mainline is not called for shall be installed in Schedule 40 PVC sleeving.

An expansion curl shall be provided every 100' on runs of more than 100' in length. Provide an expansion curl at any changes in direction of 90 degrees.

All splices shall be made with Pen-Tite Wire Connector or approved equal. Use one (1) splice per connector sealing pack.

Field splices between the automatic controller and electrical control valves will not be allowed without prior approval for the Department of Community Services. See **Standard Specifications for Public Works Construction**.

### **VII.2.19 Thrust Blocks (if applicable)**

Thrust blocks for all specified piping shall be size and type required by the manufacturer's installation guide.

Form thrust blocks in such a manner as to utilize 6 mill or thicker Visqueen barrier to prevent any concrete from coming in contact with the pipe. Thrust blocks shall be between solid soil and the fitting.

### **VII.2.20 Backfilling**

Trenches shall not be backfilled until all required tests are performed. Trenches shall be carefully backfilled with excavated materials. No foreign matter larger than one half inch (1/2") in size will be permitted in the initial backfill.

If settlement occurs and subsequent adjustments in pipe, valves, sprinkler heads, lawn, planting or other construction are necessary, the contractor shall make all required adjustments without cost to the City.

All PVC irrigation main lines shall be installed in trenches with nomenclature lettering facing up and readable by City Landscape Inspector. See **Standard Specifications for Public Works Construction**.

### **VII.2.21 Automatic Controller**

It shall be possible to operate the controller manually and to select and operate manually any station.

Controller shall be equipped with a reset circuit breaker and shall be housed in a locking, weatherproof cabinet.

The controller shall have, as standard built-in features, electrical circuit for a master valve operation.

Time clocks shall be installed for automatic operation of the irrigation system. Time clocks shall be enclosed in a pedestal-locking enclosure separate from the backflow prevention device and next to a wall where possible. Refer to Section IX.6, Chapter 2.5 (a, b & l), "Irrigation Design" of the Water Efficient Landscape Guidelines for additional information.

All controllers shall be equipped with 4" x 4" electrical junction box with an on/off switch and a grounded duplex receptacle mounted inside the enclosure. See **Standard Specifications for Public Works Construction**. Refer to Section IX.6, Chapter 2.5 (a, b & l), "Irrigation Design" of the Water Efficient Landscape Guidelines

#### **VII.2.22 Outdoor Automatic Controller Enclosure**

Irrigation controlling units shall be enclosed in secure, weather and vandal-resistant, locking housing manufactured expressly for that purpose or located within a structure. Controller cabinets shall not be installed within an irrigation spray pattern.

#### **VII.2.23 Backflow Devices**

Refer to Section IV.11.12, "Design Criteria" of this document.

### **VII.3 PLANTING**

All planting areas shall have a finish grade conforming to approved plans and specifications after full settlement has occurred.

All excavated holes shall have vertical sides with roughened surfaces and shall be of a size that is at least two (2) times the width and 6" in depth below the root ball.

Soil which has been salvaged during the digging of planting holes may be used for backfill. Backfill mix for all container plants shall follow the recommendation as detailed in the soils report.

Vine planting shall have wood stake support removed and shall be trained upon the adjacent posts or walls.

Immediately after planting, apply water to plant material. See **Standard Specifications for Public Works Construction**.

#### **VII.3.1.a Sod**

Sod shall be fully mature, well-maintained, of the grass variety specified, free of all other grasses or weeds, and shall be evenly cut with a conventional sod cutting machine to a root mass thickness of 2". All material shall be from the same growing ground and delivered fresh to the job site.

Sod shall be laid in one direction only with close-fitting butt joints. The ends of each strip shall be staggered to eliminate continuous seams.

After laying sod, roll lightly to eliminate irregularities and to form good contact between sod and soil. Avoid heavy roller or excessive initial watering which may cause roller marks. See **Standard Specifications for Public Works Construction**.

#### **VII.3.1.b Artificial Turf**

Artificial turf shall have a natural appearance where the grass-like surface covering replicates lush natural grass in appearance and function, and be maintained in a green, fadeless condition. Turf shall be free of rips, tears, visible seam lines, stains, weeds, debris, impressions and discolorations. Maintenance should consist of cleaning and brushing, stain removal and seam repair.

Artificial turf should be installed by a licensed professional and have a permeable surface that provides adequate and consistent draining throughout the surface.

Artificial turf panels or rolls should be sewn together with a high strength sewing thread to form a permanent, tight and secure surface that is layered in a consistent manner so as to appear seamless.

The use of infill materials, such as crumb rubber that intensify heat and emits a tire smell, are discouraged.

#### **VII.3.2 Hydroseeding Procedures**

Seed mixes shall be specified by the pure live seed of each species.

An approved hydromulch company shall apply hydroseed in a form of a slurry consisting of wood cellulose fiber, seed, chemical additives, commercial fertilizer and water.

Equipment used for the application of slurry shall have a built-in agitation system to suspend and homogeneously mix the slurry. The slurry mix shall be dyed green. The equipment must have a pump capable of applying slurry uniformly.

Worksheets shall be filled out by the nozzleman with the following information: Seed type and amount, fertilizer analysis and amount, mulch type and amount, seeding additive type and amount and delivered to the Department of Community Services, See **Standard Specifications for Public Works Construction**.

#### **VII.3.3 Tree Stakes**



As required by height of tree, the top of the stake will extend mid-way into the head of the tree as per detail, with stake extending 18” below rootball. In no case shall stake be allowed closer than 8” to tree.

Street tree stakes shall be a heavy treated pine lodgepole, 3” in diameter. See **Standard Specifications for Public Works Construction**.

#### **VII.3.4 Tree Ties**

Tree ties shall be corded-type or approved equivalent. The tree ties shall be fastened to the stakes with galvanized nails. Two (2) double ties shall be used near the top of the main tree trunk and near the middle of the main tree trunk.

#### **VII.3.5 Guying Materials**

Wire shall be zinc-coated iron, 10-gauge minimum and solid core. Wire covering at tree shall be 1/2” diameter minimum, new two-ply garden hose (reinforced rubber or plastic).

All guys are to be flagged. 90% of the wire length is to be covered. White PVC 1/2” diameter tube covering shall be used.

#### **VII.3.6 Certification of Completion**

Refer to Section IX.6, Chapter 2.7, “Certification of Completion” and Appendix D of the Water Efficient Landscape Guidelines.

#### **VII.3.7 Post-Installation Irrigation Scheduling**

Refer to Section IX.6, Chapter 2.8, “Post-Installation Irrigation Scheduling” of the Water Efficient Landscape Guidelines.

#### **VII.3.8 Post-Installation Landscape and Irrigation Maintenance**

Refer to Section IX.6, Chapter 2.9, “Post-Installation Landscape and Irrigation Maintenance” of the Water Efficient Landscape Guidelines.

#### **VII.3.9 Public Projects**

Prepare and deliver to the City for public projects, prior to acceptance of improvement (start of the 90-day maintenance period), two (2) hard cover binders with three rings containing the following information:

- Index sheet stating contractor’s address, telephone number and list of equipment with name and address of manufacturer’s local representative
- Catalog and part sheet(s) on every type of material and equipment installed
- Guarantee statements (irrigation and plant material)

- Complete operating and maintenance instruction on all major equipment
- Provide the City's maintenance instruction on all major equipment
- Provide the City's maintenance personnel with instruction for major equipment for public works projects

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## VIII. INSPECTION GUIDELINES FOR PRIVATE DEVELOPMENT

### VIII.1 INSPECTION GUIDELINES FOR PRIVATE DEVELOPMENT

Contact City Parks Division at telephone (714) 744-7274, for landscape inspection.

48-hour notice is required for all landscape inspections.

Inspection work hours are 8 a.m. to 5 p.m., Monday thru Thursday.

A complete approved set of landscape plans shall be present at the site for all inspections.

Landscape Inspector shall be notified for the following inspections:

- PRE-JOB CONFERENCE – Landscape Inspector shall be informed to attend pre-job meeting to explain inspection procedures and City requirements
- IRRIGATION MAIN LINE PRESSURE TEST - A main line pressure test will be required for all irrigation system installations for 3 hours at 150 PSI
- IRRIGATION COVERAGE TEST - Inspection will be for 100% uniform irrigation coverage, automatic controller, irrigation equipment and backflow device as per approved plan. All irrigation systems shall be adjusted so there is no overspray/runoff onto any hardscape, paving, buildings, etc.
- STREET TREE PLANTING – Street tree designation and locations shall be approved by Landscape Inspector prior to excavation of planting pits
- FINAL INSPECTION AND APPROVAL – Inspection shall be for soil amendment, plant location, quantities and size compliance as per landscape plan approved by Design Review Board

#### VIII.1.1 General Information

A letter of Certificate of Compliance by the landscape architect may be required for the landscape and irrigation installation before project is released.

Submit proof to the City of Orange Water Department that backflow device(s) have been tested by a certified tester, if required.

When conditions exist in the field which prevent design improvements from being installed, minor adjustments may be approved as directed by the Landscape Inspector.

#### VIII.1.2 Street Trees

Street tree designation, location and tree well size shall be approved by the Department of Community Service prior to planting. Only designated street trees shall be planted within City rights-of-way.

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## **VIII.2 INSPECTION AND ACCEPTANCE FOR PUBLIC WORKS PROJECTS**

Contractor shall be responsible for notifying the Department of Community Services 48 hours (2 working days) in advance for all inspections.

After installation, but prior to backfill, an inspection of all irrigation mainline, controller wires, gate valves, quick couplers, lateral lines and remote control valves will be required.

### **VIII.2.1 Irrigation Systems Inspections**

Required inspections include:

- Pre-job conference
- Trenching and sleeving
- Main line pressure test (3 hours at 150 PSI)
- Irrigation coverage test
- Final inspection

### **VIII.2.2 Testing of the Irrigation System**

No inspections will be given without updated as-built drawings. In the event the contractor calls for an inspection without updated as-built drawings, or without completing previously-noted corrections, or without preparing the system for inspection, he shall not receive inspection.

Test all pressure lines for three (3) hours under hydrostatic pressure of 150 lbs. per square inch and prove watertight.

Testing of pressure main lines shall occur prior to installation of electrical control valves.

All piping under paved areas shall be tested under hydrostatic pressure of 150 lbs. per square inch and proven watertight prior to paving.

All hydrostatic tests shall be made only in the presence of a City Inspector. No trench shall be backfilled until pipe has been inspected, tested and approved. If leak develops, replace joints and repeat test until entire system is proven watertight.

When the sprinkler irrigation system is completed, perform a coverage test in the presence of a City representative to determine if the water coverage for planting areas is complete and adequate. This test shall be accomplished before any ground cover is planted.

### **VIII.2.3 Adjustment of the System**

Upon completion of each phase of work, the contractor shall flush and adjust all sprinkler heads for optimum performance and prevent over-spray onto walks, roadways and buildings.

#### **VIII.2.4 Final Inspection Prior to Acceptance**

- Submittal of as-built drawings, manuals and controller charts
- Certification of Compliance by the Landscape Architect of Record
- The contractor shall operate irrigation system in its entirety for the City at time of final inspection and Certification of Completion by the Landscape Architect of Record will be required
- Any items deemed not acceptable by the Inspector shall be re-worked to the satisfaction of the City
- The contractor shall show evidence that the City has received all accessories, charts, record drawings and equipment as required before final inspection can occur
- End of maintenance shall occur only on the written acceptance by the City of Orange Department of Community Services

#### **VIII.2.5 Record and As-build Drawings**

Record and as-built drawings shall be updated and kept current on a weekly basis.

#### **VIII.2.6 Controller Charts**

As-built drawings shall be approved by the City before controller charts are prepared.

Provide two (2) controller charts for each controller. The chart shall be the maximum size which the controller door will allow.

The chart is to be a reduced drawing of the actual as-built drawings. When the drawing is reduced, it shall be a size that will be readable.

The chart shall be a blackline or blue line ozalid print and a different color shall be used to indicate the area of coverage for each station.

When completed and approved, the chart shall be hermetically sealed between two (2) pieces of plastic, minimum 10 mils thick.

These charts shall be completed and approved prior to final inspection of the irrigation system.

#### **VIII.2.7 Equipment to be Furnished**

All projects must supply the City's maintenance personnel with the following tools:

- Two (2) keys for each automatic controller

- Two (2) keys for each controller enclosure
- Two (2) 3/4" quick coupler keys
- Gate valve key, if applicable

In the event the developer elects to allow his contractor to complete his responsibilities prior to final acceptance of improvements, it is strongly recommended these foregoing requirements be completed at the earliest date, otherwise, the developer shall be solely responsible for completing these requirements.



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Inspections include:

- Pre-job conference
- Rough grading/erosion control
- Final grading/soil amendments/pre-plant weed control
- Plant material delivery
- Plant pit excavation/amendments/installation
- Tree staking
- Ground cover and turf planting or hydroseeding
- Start of maintenance
- Final inspection and acceptance

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## **VIII.4 PLANT MATERIALS**

### **VIII.4.1 Right of Inspection**

The Department of Community Services reserves the right to approve or reject at any time upon delivery or during the work any or all plant material regarding size, variety or condition. Each group of plant materials delivered to the site shall be clearly labeled as to species and variety.

### **VIII.4.2 Rejection or Substitution**

Any such plant considered defective, whether in place or not, shall be marked as rejected and immediately removed from the site of work and replaced with new plants.

### **VIII.4.3 Quality and Size**

Plants shall be in accordance with the California State Department of Agriculture's Regulations for Nursery Inspections, Rules and Grading. All plants shall have a normal habit of growth and shall be sound, healthy, vigorous and free of insect infestations and plant diseases.

### **VIII.4.4 Protection**

All plants at all times shall be handled and stored so that they are adequately protected from drying out from wind burn or from any other injury.

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## VIII.5 PUBLIC WORKS PROJECT MAINTENANCE

### VIII.5.1 Introduction

The goal for the maintenance of public landscape areas in the City is to perpetuate the landscape by enhancing all vegetation through proper maintenance practices.

### VIII.5.2 Scope of Work

The work required is indicated on the drawings and includes, but is not limited to, the following:

- Guarantees and replacement
- Maintenance of the site, irrigation and planting

### VIII.5.3 Tree Replacement

Any tree, five (5) gallon or larger, shown on the approved plan which is dead or not in a satisfactory growth condition during a one year period from date of acceptance, shall be removed from the site and replaced within fourteen (14) calendar days of notification. Failure to comply will result in appropriate action by the City to assure completion. These and any trees which are missing shall be replaced by the contractor at no expense to the City with the same variety and size as originally designated on the plans.

### VIII.5.4 Maintenance

Final acceptance of landscape improvements will be made at such time as all planting is in place, established in a healthy condition and irrigation systems are installed as shown on approved plans, in accordance with City of Orange Standards and Specifications. Owner/Agent in control of the property shall maintain landscaping and irrigation systems to the satisfaction of the Department of Community Services for ninety (90) days. After acceptance of improvements, the City will assume maintenance responsibility.

During the maintenance period the contractor shall provide all watering, weeding, fertilizing, cultivating, mulching, spraying, pruning and mowing necessary to keep all plants and turf in a healthy weed-free growing condition and to keep the planted areas neat, edged and attractive.

After planting and during the maintenance period, a balanced fertilizer shall be applied at the rate recommended by the approved agronomic soils report, every thirty (30) days. In the event that ground cover, turf, trees or shrubs exhibit micronutrient deficiency symptoms, necessary corrective action shall be taken by the contractor

Should the appearance of any plant indicate weakness during the maintenance period, that plant or cutting shall be replaced immediately by the contractor with a new healthy plant. Any trees or shrubs with damaged cambium shall be replaced immediately. At the end of the maintenance period, all plant materials shall be in a healthy, growing condition and spaced as indicted on plans.

### **VIII.5.5 Start of Maintenance**

Maintenance period shall not commence until all elements of the project are completed in accordance with the approved plans. Partial acceptance of improvements within the scope of work of approved plans shall not be authorized without approval by the Department of Community Services representative.

Permanent power to automatic controllers shall be continuous and established prior to the beginning of the maintenance period.

The landscape architect's Certificate of Compliance shall be submitted prior to beginning of the maintenance period.

Written approval by the City of Orange Department of Community Services must be obtained prior to the beginning of the maintenance period.

If the project maintenance fails to continuously meet the specifications contained herein, the maintenance period shall be suspended. An additional maintenance period of up to ninety (90) days shall begin when the contractor has corrected all deficiencies.

### **VIII.5.6 Maintenance Operation for Trees**

Prune trees to select and develop permanent scaffold branches that are similar in diameter than the trunk of branch to which they are attached: 1.) to eliminate diseased or damaged growth; 2.) to eliminate narrow V-shaped branch forks that lack strength; 3.) to reduce toppling and wind damage by thinning out crowns to maintain growth within space limitations; 4.) to maintain a natural appearance; and, 5.) to balance crown with roots.

Under no circumstances will stripping of lower branches (raising up) on young trees be permitted. Retain lower branches in a tipped back or pinched condition with as much foliage as possible to promote caliper trunk (tapered trunk). Lower branches can be cut to the growth collar on the trunk only after the tree is able to stand erect without staking or other support.

Thin out evergreen trees and shape when necessary to prevent wind and storm damage. Do primary pruning of deciduous trees during dormant season. Prune damaged trees or those that constitute health or safety hazards at any time during the year as required.

### **VIII.5.7 Maintenance Operations for Shrubs**

The objectives of shrub pruning are the same as for trees. Do not clip shrubs into balled or boxed forms unless such is required by the design. Make pruning cuts to lateral branches or buds. Pinch prune as necessary to encourage new growth and to eliminate sucker growth. Old wilted flowers and dead foliage shall be pinched or cut off.

### **VIII.5.8 Maintenance Operations for Ground Cover**

Control weed growth as required.

Apply approved pre-emergent herbicide to all ground cover areas in accordance to manufacturer's instructions.

Edge ground cover to keep in-bounds. Trim top growth as necessary to maintain an overall uniform appearance.

Replace dead and missing plants.

Remove accumulated trash, as required.

#### **VIII.5.9 Maintenance Operations for Turf**

The maintenance of turf includes all work required to germinate the planted grass seed and to grow a healthy, uniform turf of smooth and even texture and grade. All turf shall be mowed to a height recommended for the species at least once a week. Grass clippings shall be removed off-site. All turf shall be trimmed around sprinklers, valve boxes and trees during entire maintenance period.

Control weed growth when necessary using selective herbicides.

#### **VIII.5.10 Maintenance operations for Irrigation**

Contractor shall properly and completely maintain all irrigation systems, automatic and manual. A balanced watering program shall be maintained to ensure proper germination.

#### **VIII.5.11 Maintenance Operations for Site Clean-up**

All planted areas shall be neat and clean and free of all clippings, debris and trash as required.

All sub-surface drains shall be periodically flushed with clear water to avoid build up of silt and debris. Keep all drain inlets clear of leaves, trash and other debris.

All paved area shall be kept free of trash, debris and silt.

### **VIII.6 END OF MAINTENANCE ACCEPTANCE**

All filters and irrigation heads shall be cleaned. Valve boxes and sprinklers shall be adjusted to heights required in relation to finish grade.

Turf shall be mowed, edged, weeded and clipped around sprinklers, valve boxes and tees. All plant material not showing vigor or showing damage shall be replaced.

Proof of Certification for reduced pressure type backflow preventers shall be tested and approved by the City prior to final acceptance.



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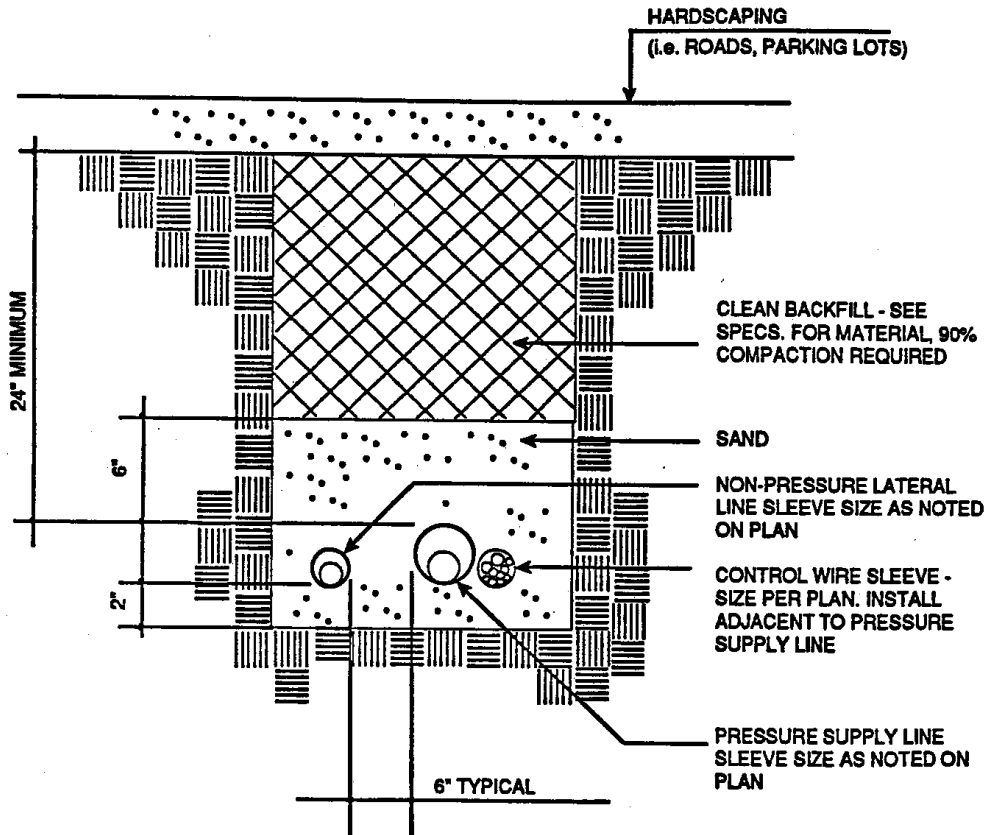
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## VIII.7 STANDARD DETAILS

### VIII.7.1 Typical Sleeving

**NOTE:**

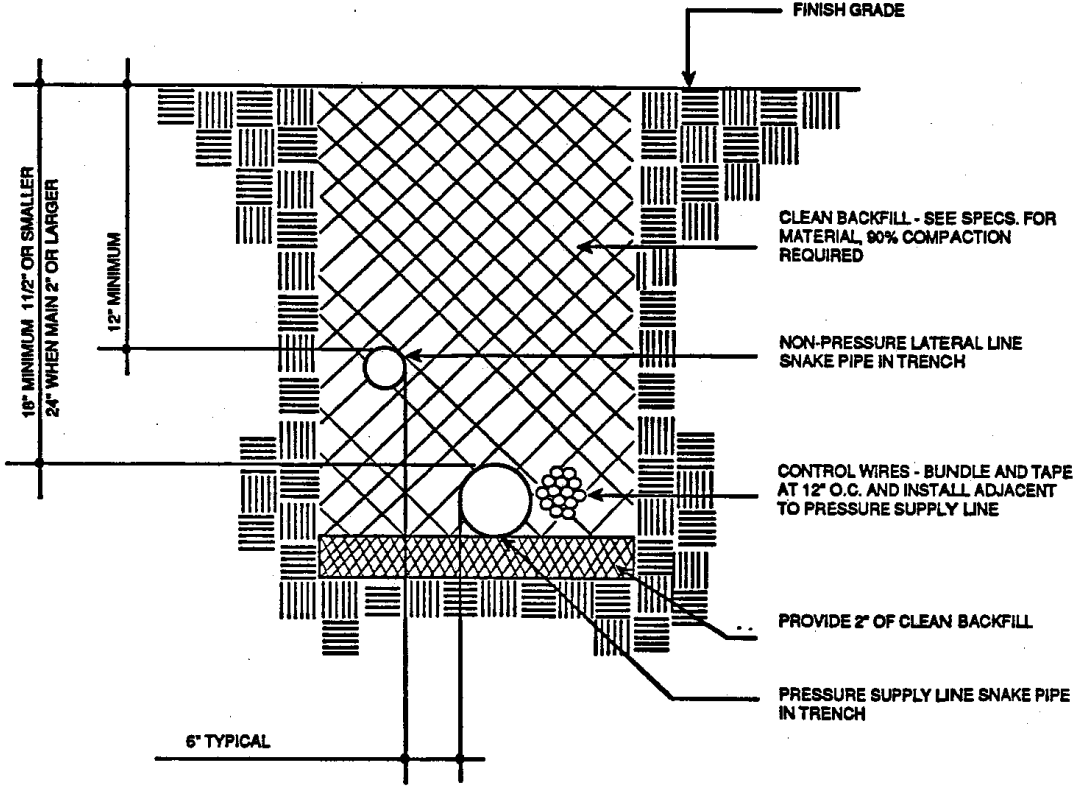
1. ALL SLEEVES TO BE SCH 40 PVC.
2. EXTEND ALL SLEEVES 12" BEYOND EDGE OF HARDSCAPING AT BOTH ENDS.
3. INSTALL SLEEVES UNDER HARDSCAPING AREAS AS INDICATED ON IRRIGATION PLANS.



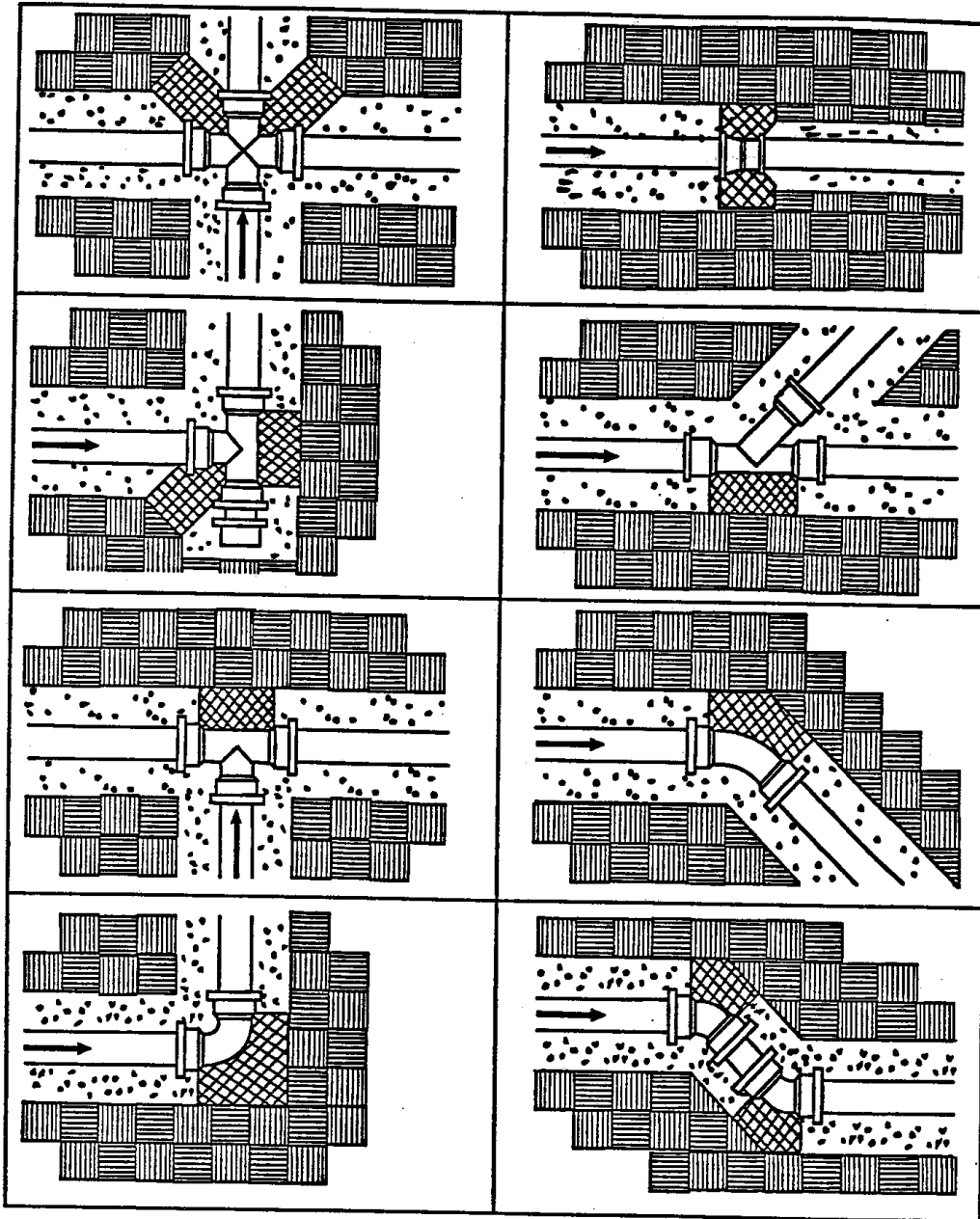
### VIII.7.2 Typical Trenching

**NOTE:**

- 1. PIG TAIL AND LOOP CONTROL WIRE AT ALL 90° CHANGES IN DIRECTION.

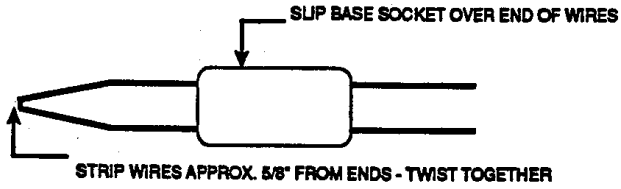


### VIII.7.3 Typical Thrust Block Details

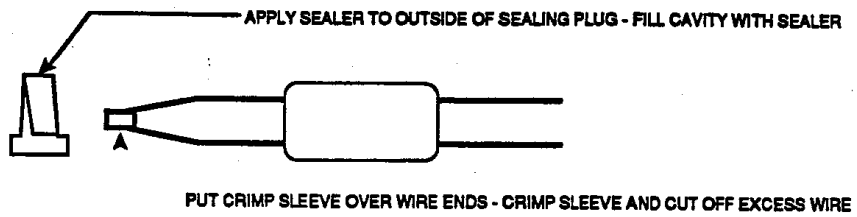


## VIII.7.4 Wire Connector

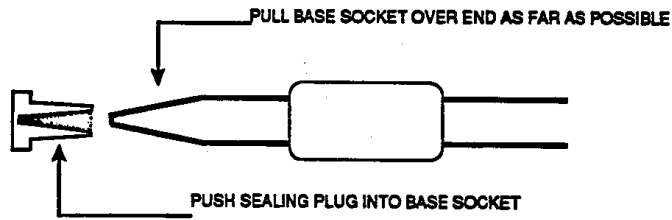
### STEP 1



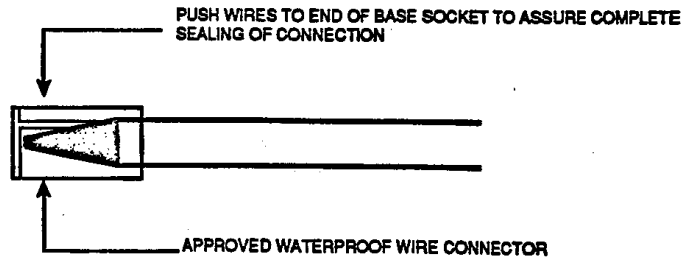
### STEP 2



### STEP 3

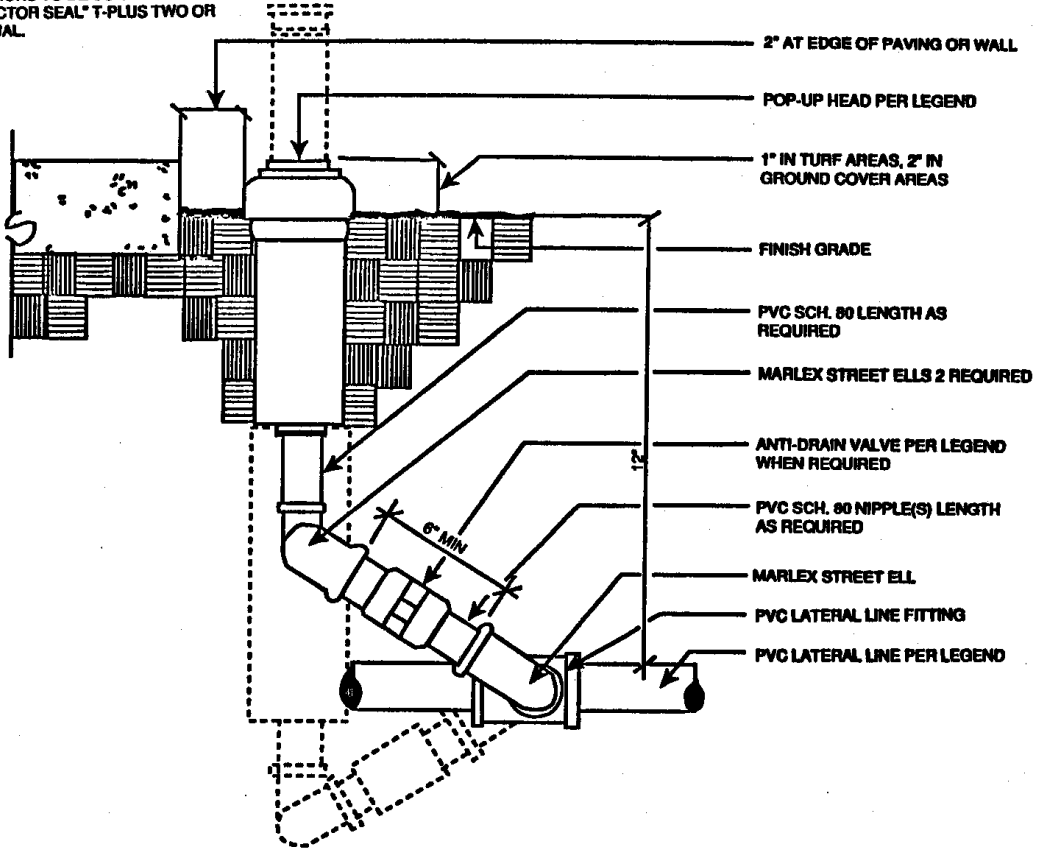


### STEP 4



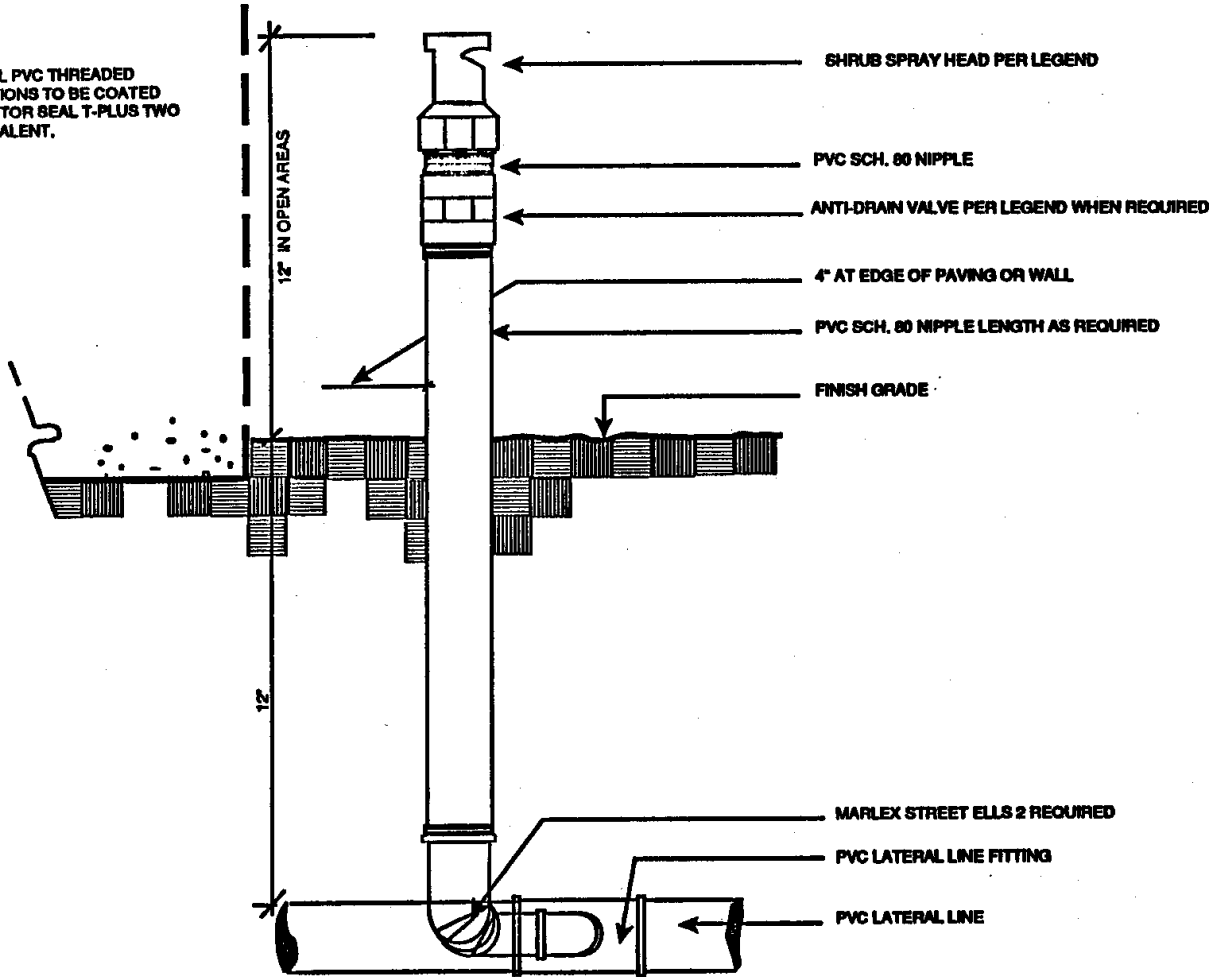
### VIII.7.5 Pop-Up Head Detail

NOTE: ALL PVC THREADED CONNECTIONS TO BE COATED WITH "RECTOR SEAL" T-PLUS TWO OR EQUAL.

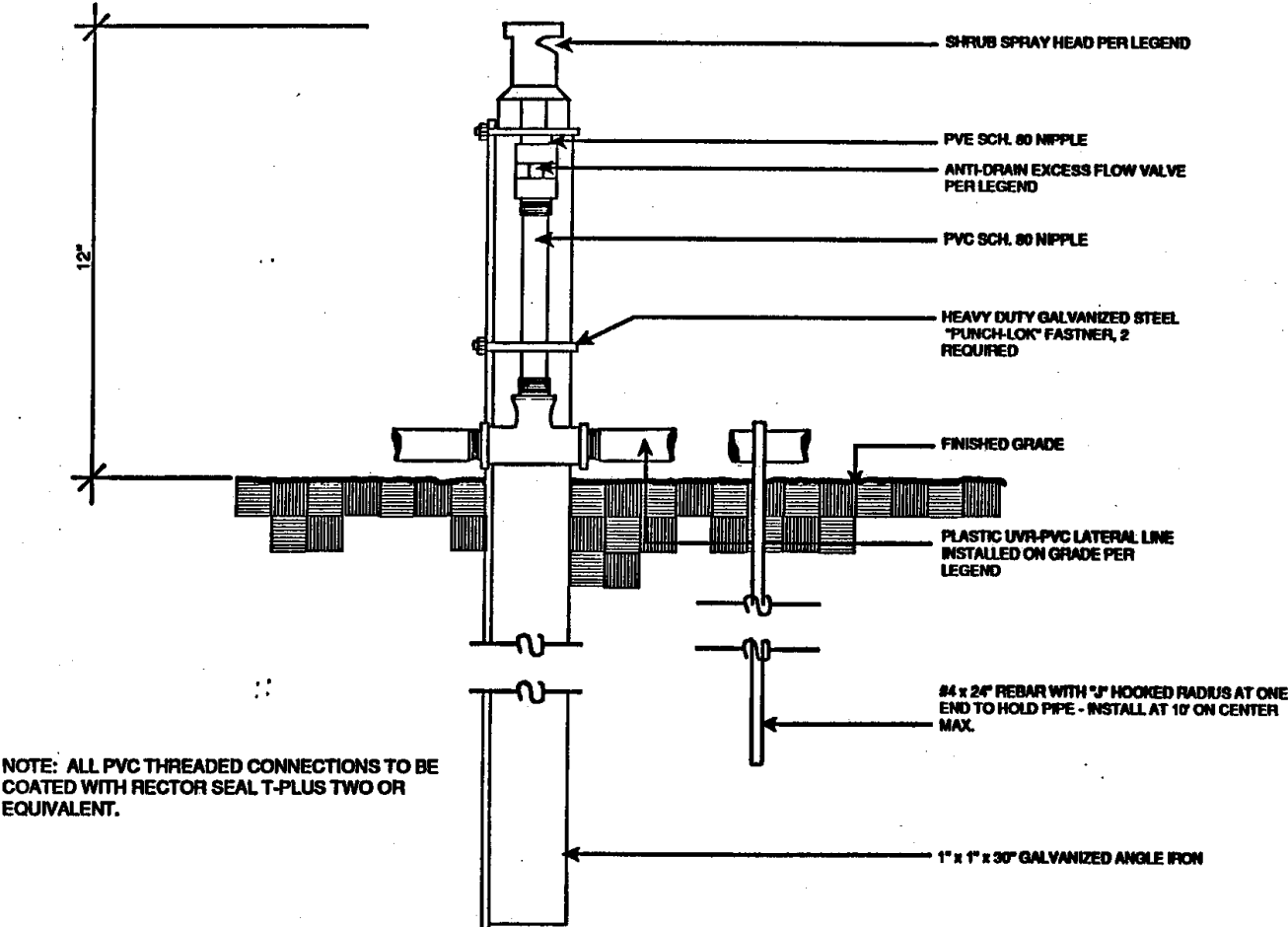


### VIII.7.6 Shrub Head Detail

NOTE: ALL PVC THREADED CONNECTIONS TO BE COATED WITH RECTOR SEAL T-PLUS TWO OR EQUIVALENT.

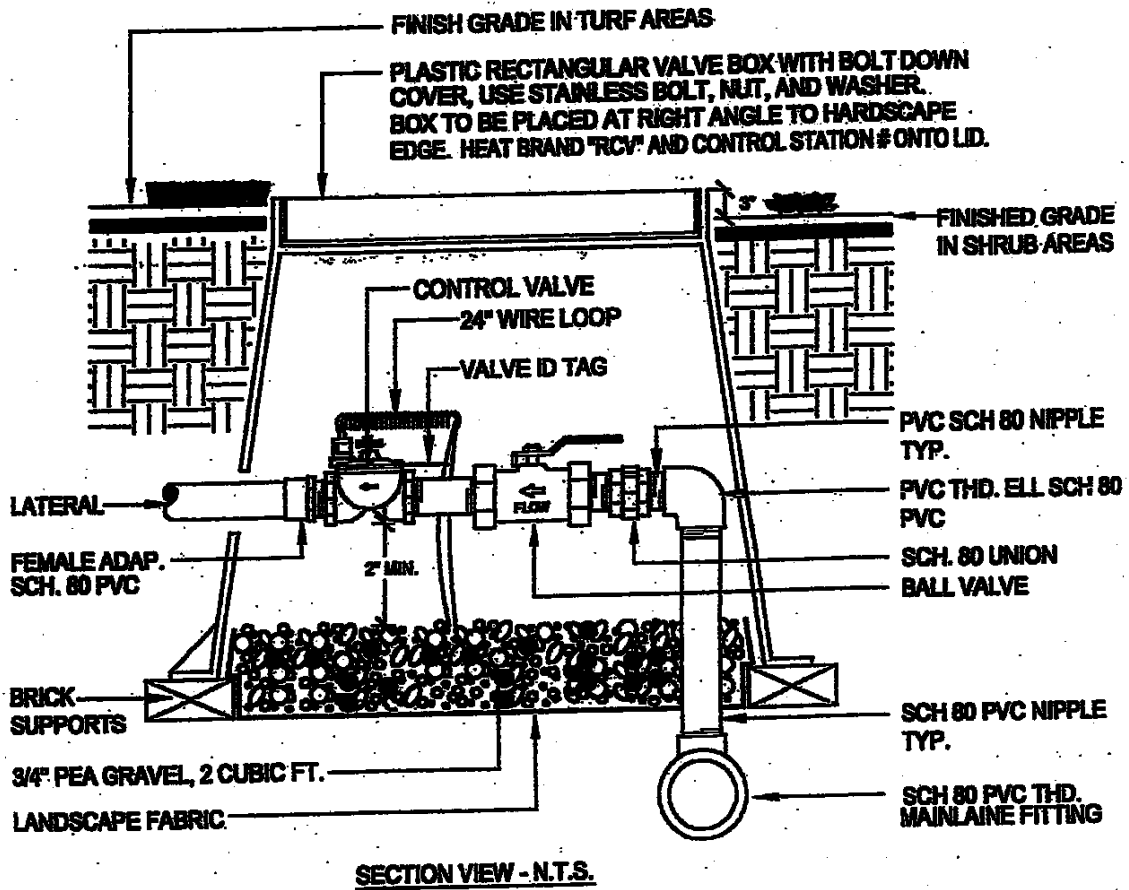


VIII.7.7 Shrub Head On Grade Detail

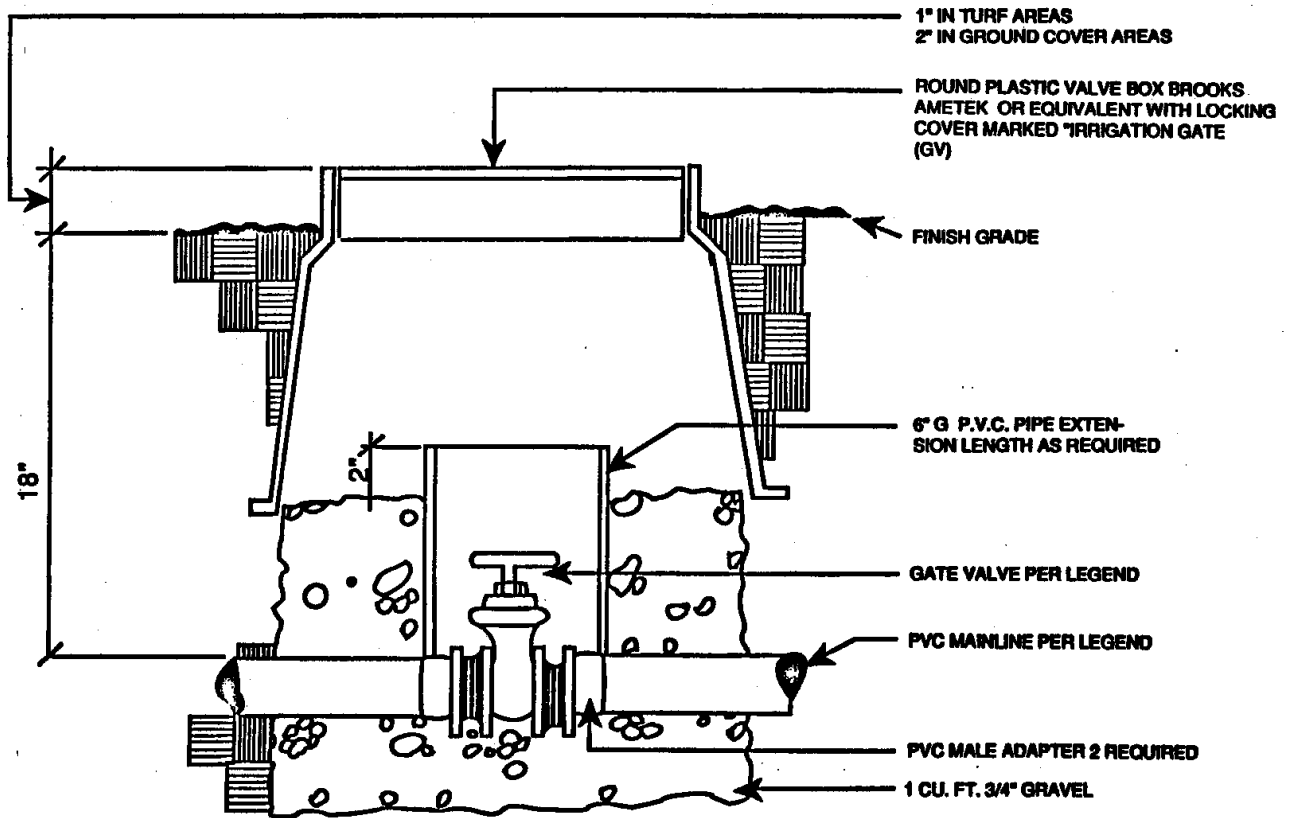




VIII.7.8 Remote Control Valve Detail

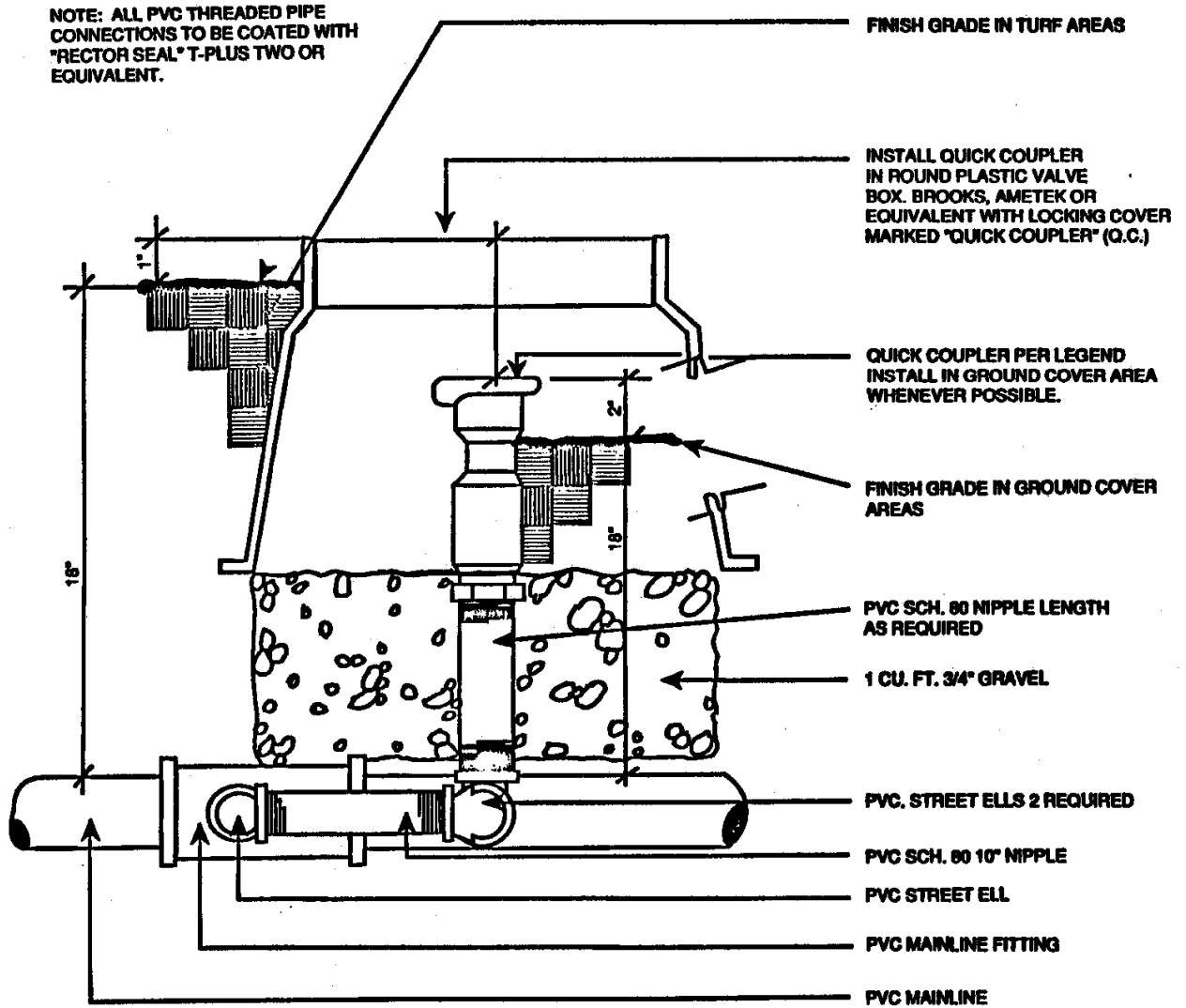


### VIII.7.9 Gate Valve Detail



**NOTE: ALL PVC THREADED PIPE CONNECTIONS TO BE COATED WITH "RECTOR SEAL" T-PLUS TWO OR EQUIVALENT.**

### VIII.7.10 Quick Coupler Valve Detail

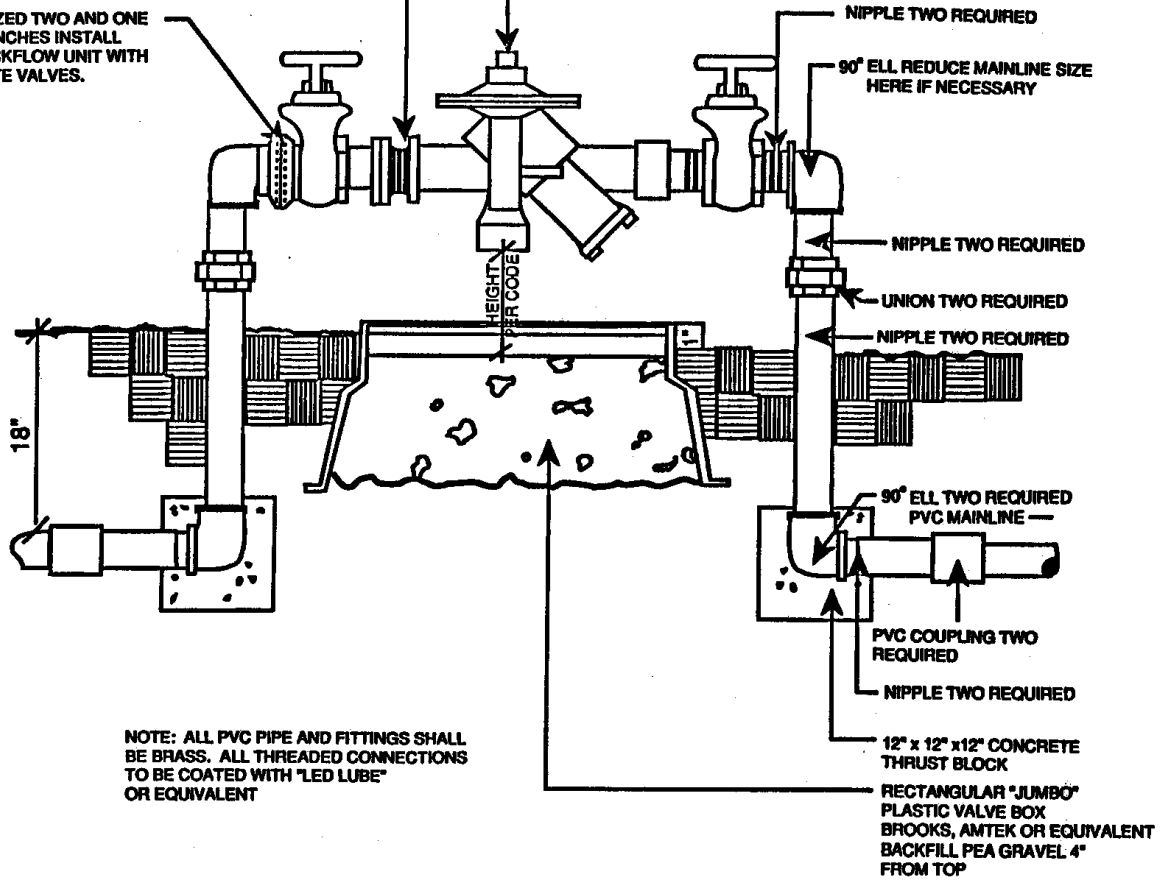


### VIII.7.11 Backflow Assembly Detail

FOR UNITS SIZED TWO (2) INCHES INSTALL WITH COMPANION FLANGE BETWEEN BACKFLOW UNIT AND GATE VALVES.

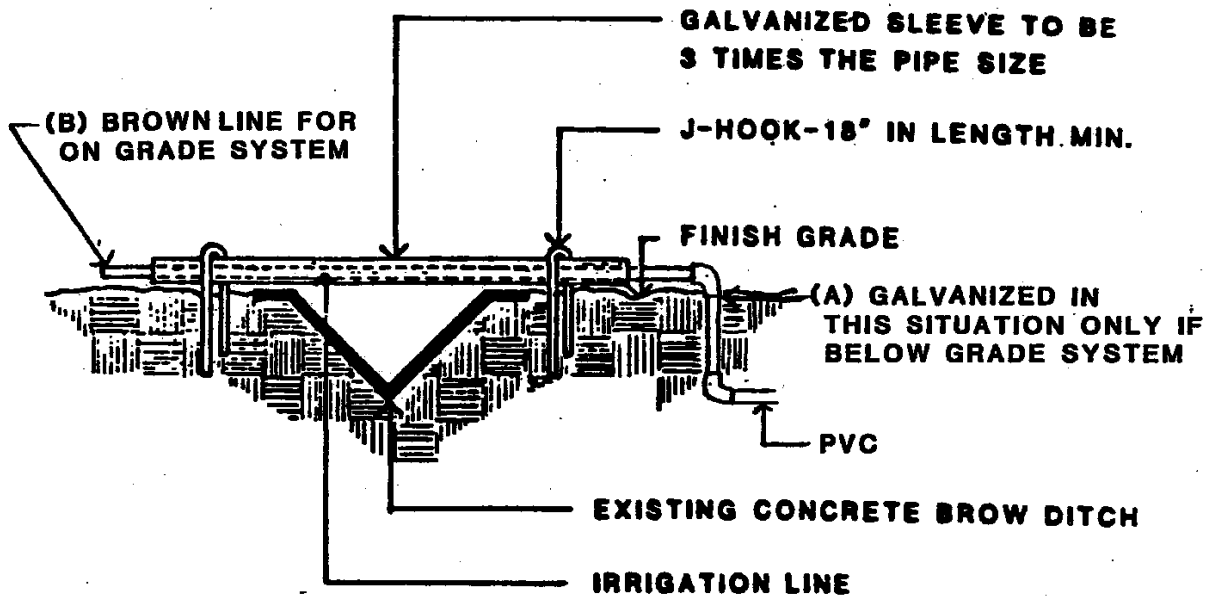
FOR UNITS SIZED TWO AND ONE HALF (2 1/2) INCHES INSTALL FLANGED BACKFLOW UNIT WITH FLANGED GATE VALVES.

REDUCED PRESSURE BACKFLOW ASSEMBLY WITH GATE VALVES PER LEGEND

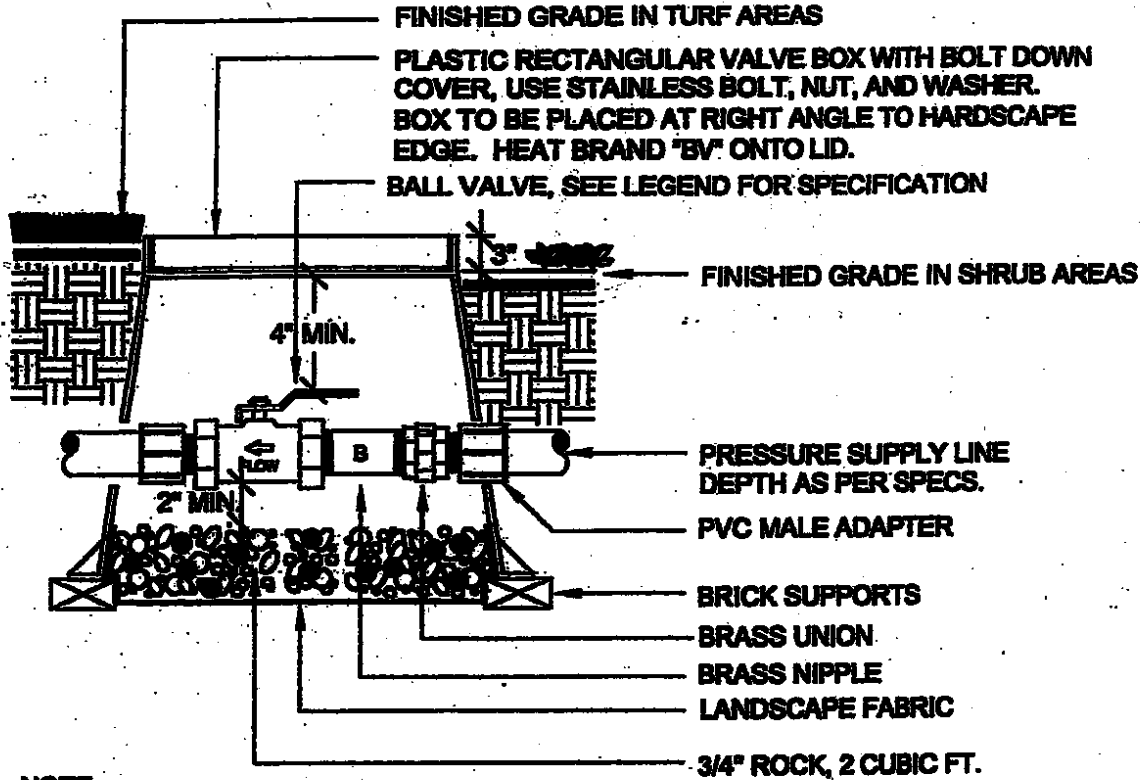


VIII.7.12 V Ditch Sleeve

**ANY CONTROL WIRE  
CROSSING BROW DITCH  
MUST BE SLEEVED**



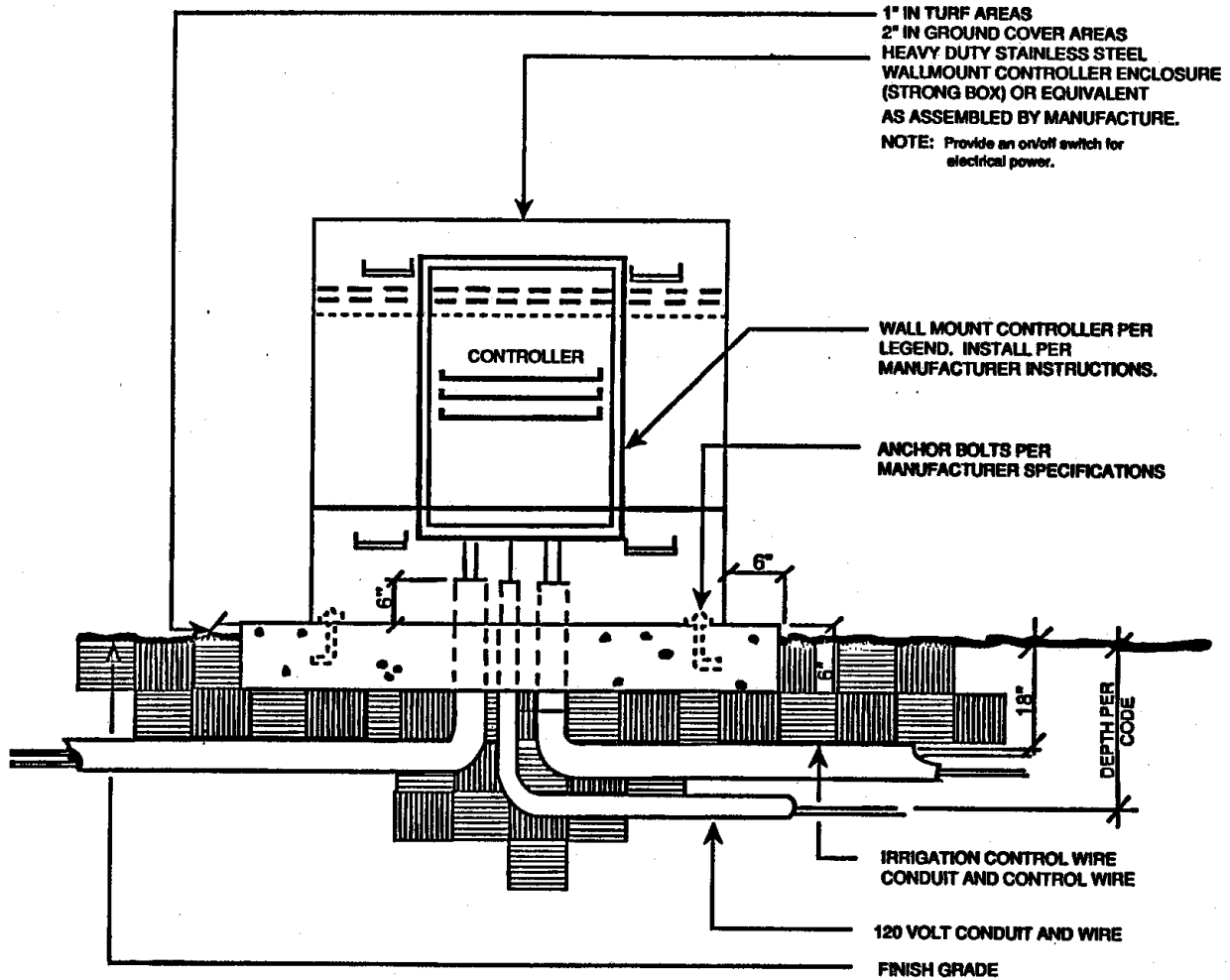
VIII.7.13 Ball Valve



**NOTE:**

**BOX TO BE INSTALLED AS TO ALLOW FOR PROPER OPERATION OF BALL VALVE**  
**INSTALL AT RIGHT ANGLE TO HARDSCAPE EDGE, INSTALL VALVE OFF-CENTER IN BOX.**  
**INSTALL VALVE BOX EXTENSIONS AS REQUIRED TO ACHIEVE PROPER VALVE**  
**INSTALLATION AT MAIN LINE DEPTH.**

### VII.7.14 Controller and Enclosure Detail



### VIII.7.15 Tree Slope Planting Detail

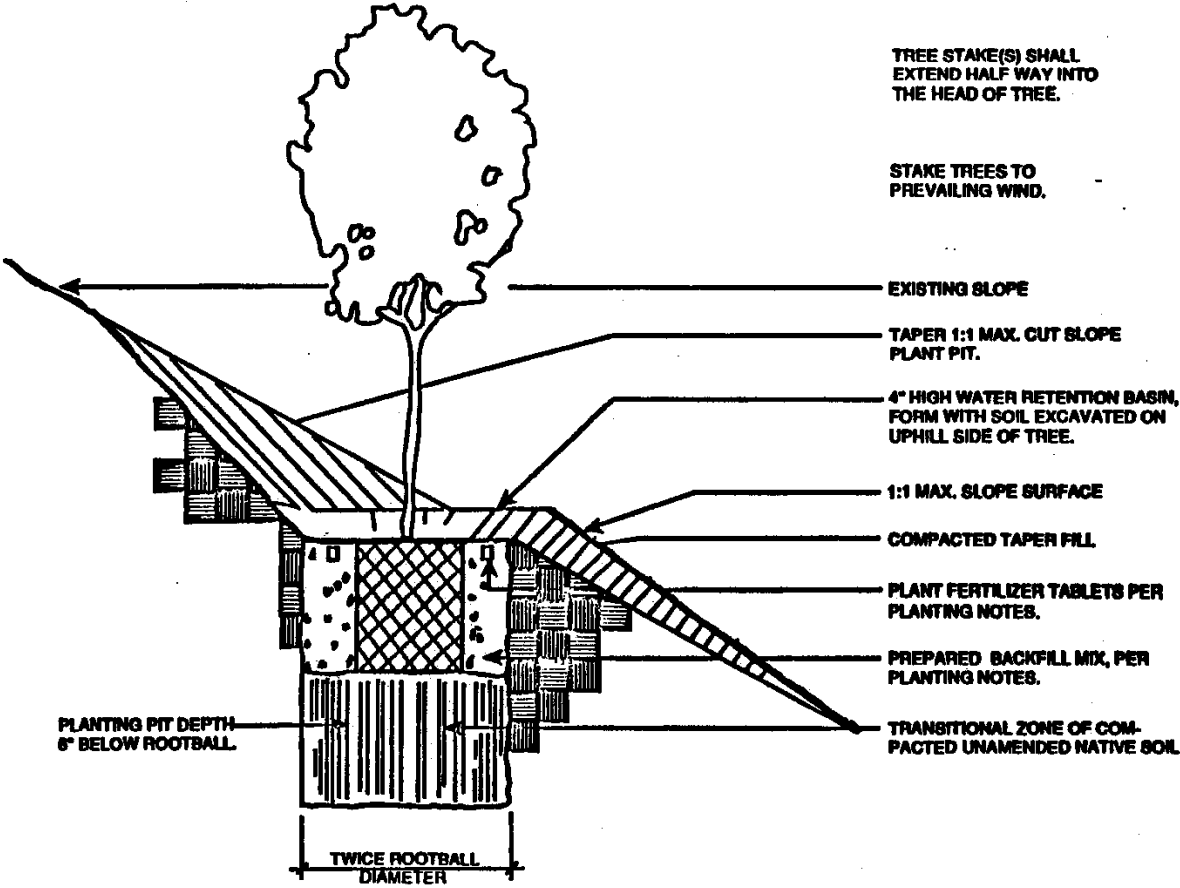
**NOTE: STAKE 5 GAL AND LARGER TREES PER DETAILS THIS SHEET.**

**PLANTING NOTES:**

**PRUNE TREES AS DIRECTED BY LANDSCAPE INSPECTOR**

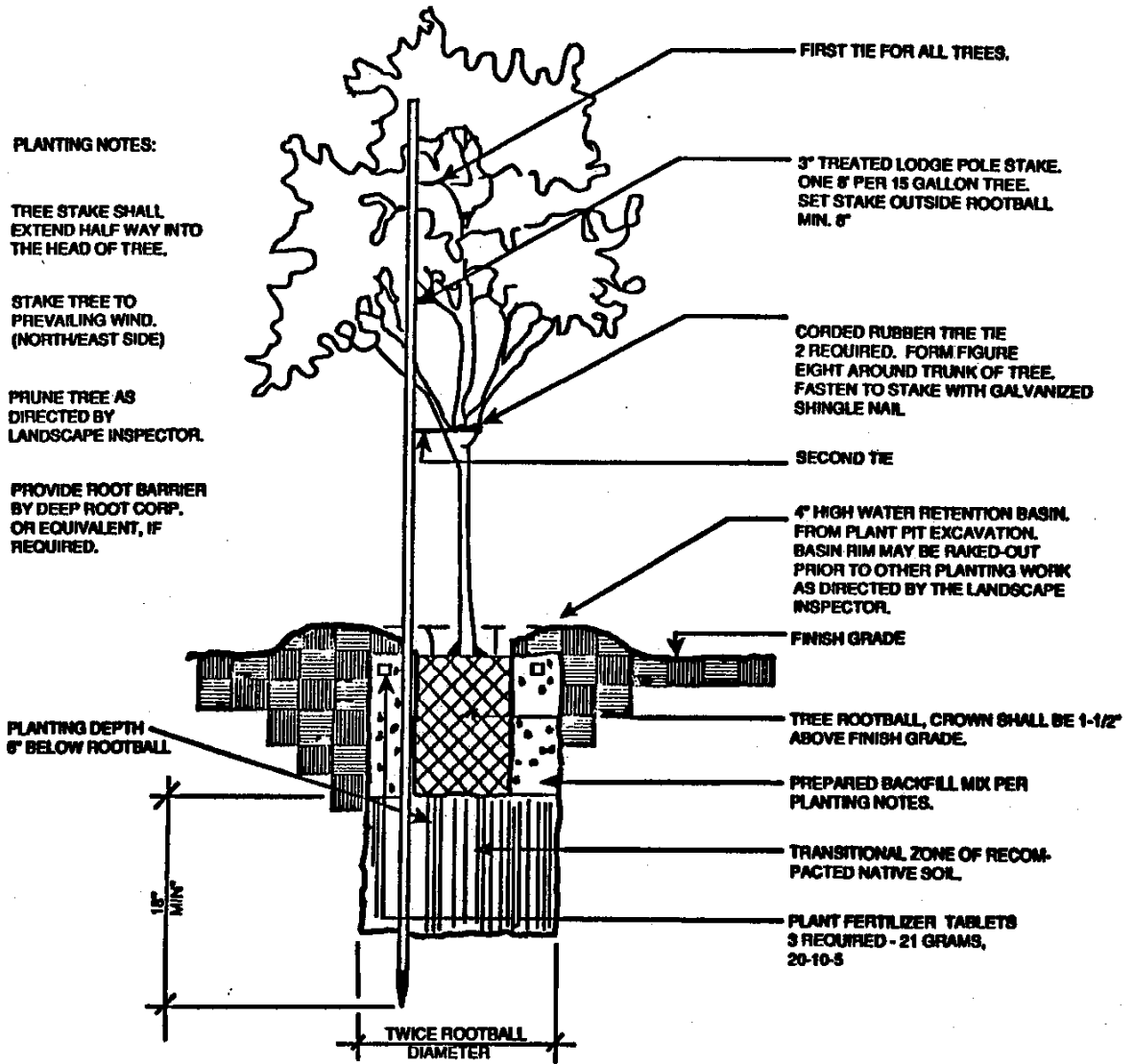
**TREE STAKE(S) SHALL EXTEND HALF WAY INTO THE HEAD OF TREE.**

**STAKE TREES TO PREVAILING WIND.**

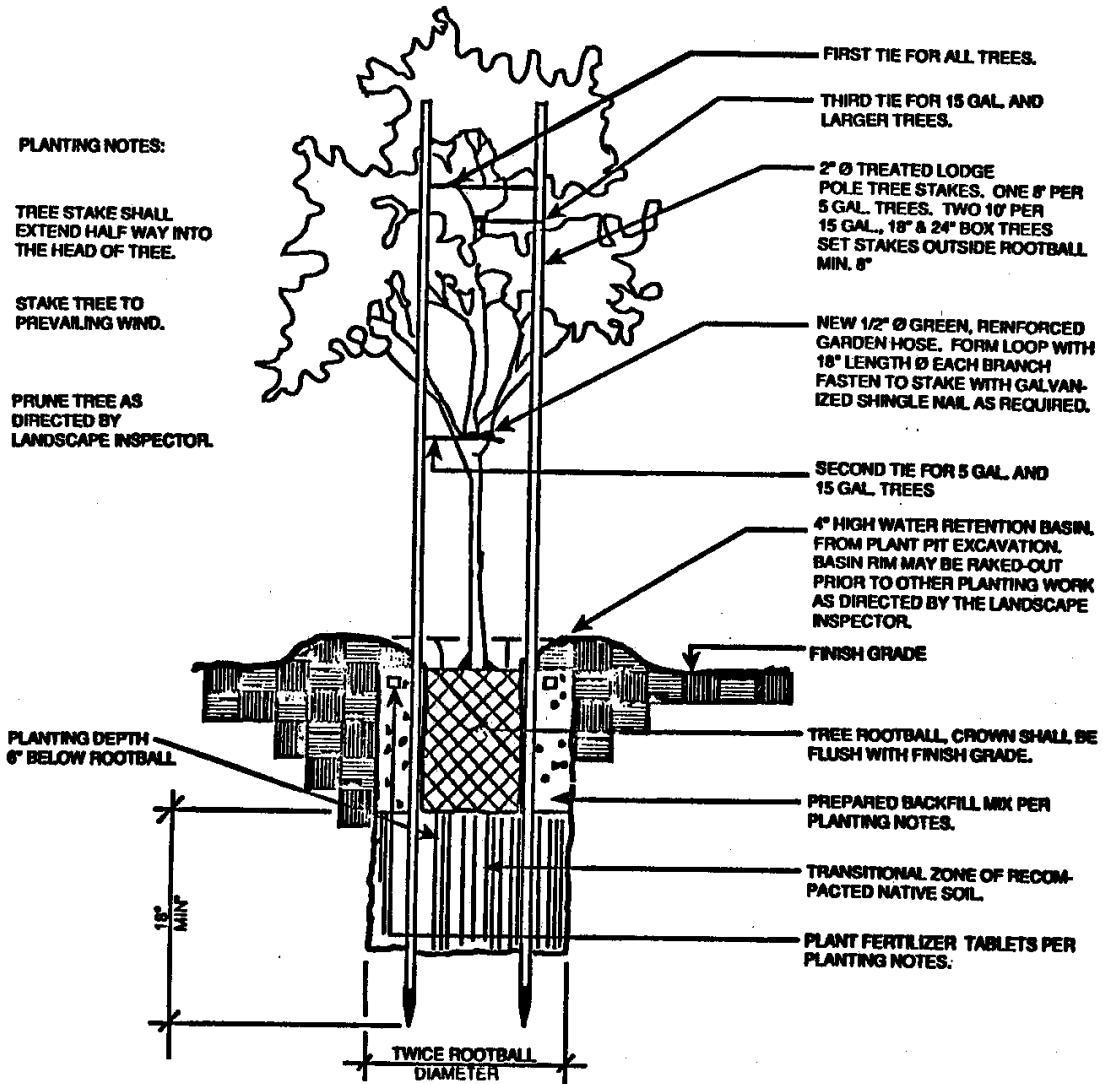




VIII.7.16 City Street Tree Standard Form Planting Detail

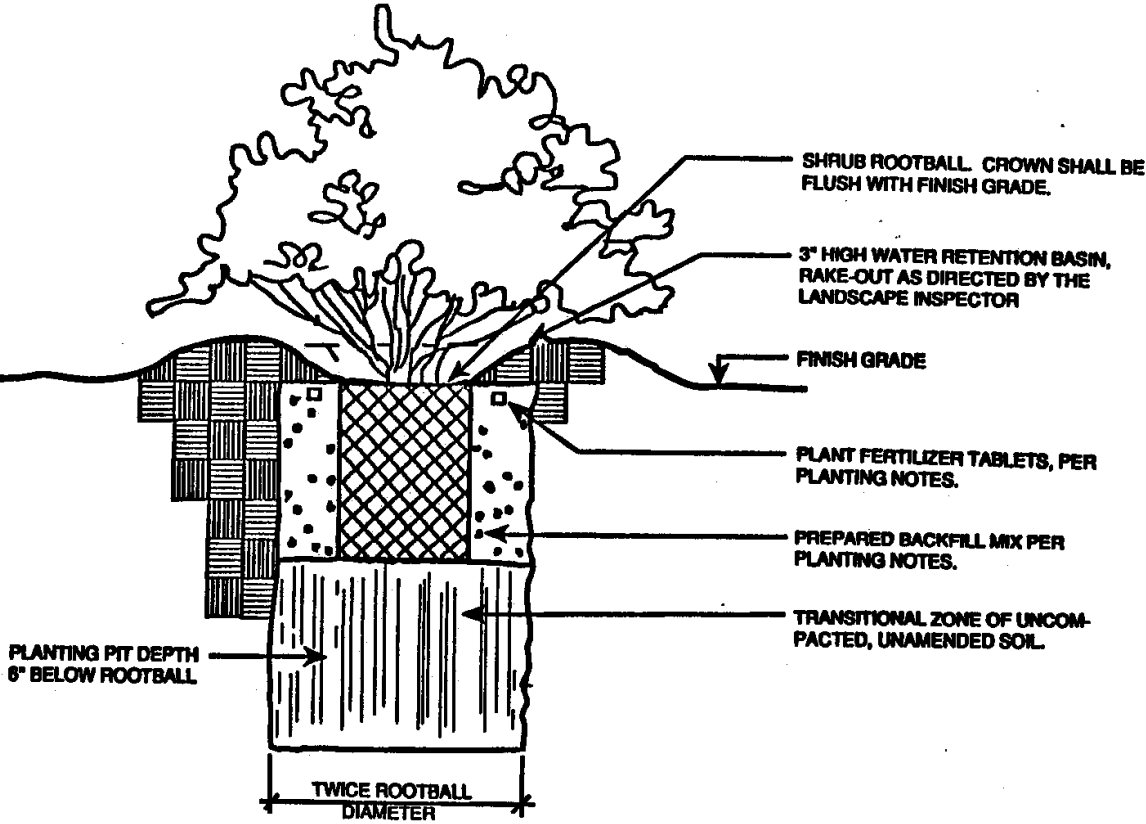


### VIII.7.17 Standard Tree Form Planting Detail

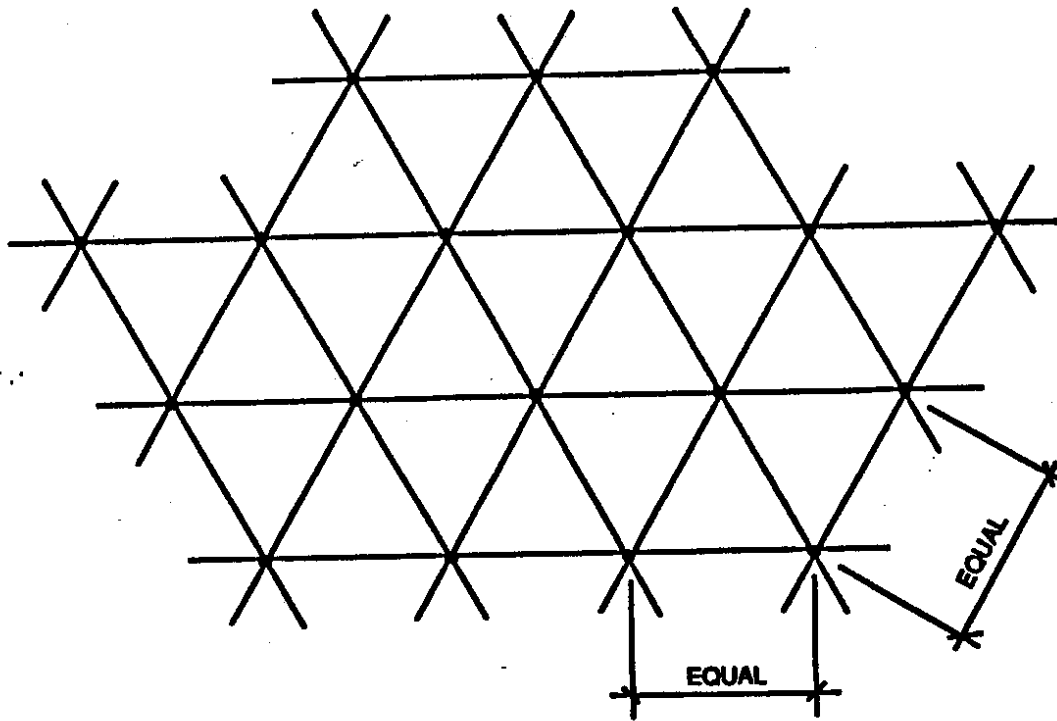


VIII.7.17 Shrub and Vine Planting Detail

NOTE: TIE ALL VINES PER PLANTING NOTES.



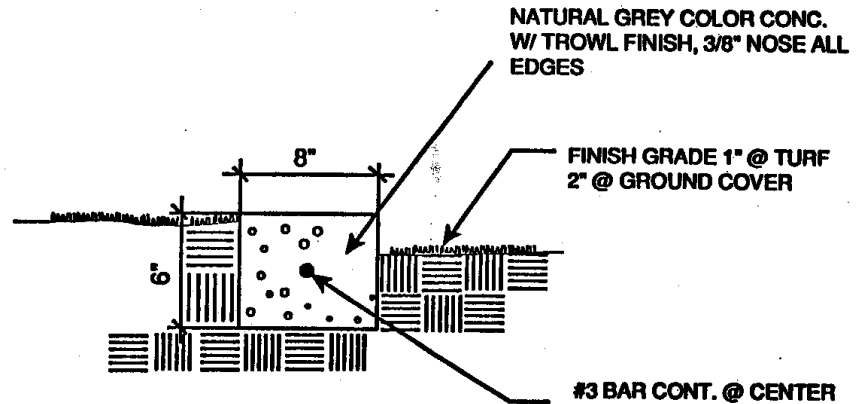
VIII.7.19 Shrub & Ground Cover Spacing



**NOTE:**

- 1. ALL SHRUBS/GROUND COVER TO BE PLANTED AT EQUAL SPACING (TRIANGULAR) UNLESS OTHERWISE INDICATED ON PLANS: SEE LEGEND FOR SPACING REQUIREMENTS.**

### VIII.7.20 Concrete Mow Strip



**NOTE:**

1. JOIN ALL CURBS AND SIDEWALKS FLUSH.
2. EXPANSION JOINTS SHALL BE IN MITER PATTERN @ ALL SQUARE CORNERS.
3. CONCRETE SHALL ACHIEVE 2500 PSI @ 28 DAYS.
4. POUR AGAINST FIRM UNDISTURBED OR RECOMPACTED SUB-GRADE PER STRUCTURAL SOILS REPORT.
5. PROVIDE 1/4" PREFORMED EXPANSION JOINT @ 15' O.C. MAX. (EVENLY SPACED).

**SECTION**

---

**SCALE: 1-1/2"=1'-0"**

**LANDSCAPE STANDARDS AND SPECIFICATIONS**

**CITY OF ORANGE**  
**Department of Community Services**

**WATER EFFICIENT LANDSCAPES**

## IX. WATER EFFICIENT LANDSCAPES

### IX.1 Applicability

Beginning February 1, 2016, and consistent with Executive Order No. B-29-15 this Water Efficient Landscapes Section IX of the City of Orange Landscape Standards and Specifications shall apply to the following *landscape projects*:

New landscape projects, as defined in this Section, with an aggregate landscape area equal to or greater than 500 square feet, requiring a building or landscape permit, plan check or design review;

Rehabilitated landscape projects, as defined in this Section, with an aggregate landscape area equal to or greater than 2,500 square feet, requiring a building or landscape permit, plan check or design review;

New or rehabilitated landscape projects, as defined in this Section, with an aggregate landscape area of 2,500 square feet or less may comply with the performance requirements of this Section IX or conform to the prescriptive measures contained in Appendix A of the Guidelines;

New or rehabilitated projects, as defined in this Section, using treated or untreated graywater or rainwater capture on site, any lot or parcels within the project that has less than 2,500 square feet of landscape area and meets the lot or parcel's landscape water requirement (Estimated Total Water Use) entirely with the treated or untreated graywater or though stored rainwater capture on site is subject only to Appendix A of the Guidelines.).

Sections 2.2, 2.8 and 2.9 of the <i>Guidelines</i> shall apply to new landscape installations or landscape rehabilitation projects at cemeteries.
---

Section IX.3 of the *Landscape Water Use Standards* of this Water Efficient Landscapes Section IX shall apply to:

All *landscaped areas*, whether installed prior to or after January 1, 2010; and

All *landscaped areas* installed after February 1, 2016, to which Section 1.1(a) of the Guidelines is applicable.

This Water Efficient Landscapes Section does not apply to:

Registered local, state, or federal historical sites;

*Ecological restoration projects* that do not require a permanent irrigation system;

*Mined-land reclamation projects* that do not require a permanent irrigation system; or

Plant collections, as part of botanical gardens and arboretums open to the public.

[Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.]

## IX.2 Implementation Procedures

Prior to installation, a *Landscape Documentation Package* shall be submitted to the City for review and approval of all *landscape projects* subject to the provisions of this Water Efficient Landscapes Section IX. Any *Landscape Documentation Package* submitted to the City shall comply with the provisions of the *Guidelines*.

The *Landscape Documentation Package* shall include a certification by a professional, appropriately-licensed in the State of California stating that the landscape design and water use calculations have been prepared by or under the supervision of the licensed professional and are certified to be in compliance with the provisions of this Water Efficient Landscapes Section IX and the *Guidelines*.

Landscape and irrigation plans shall be submitted to the City for review and approval with appropriate water use calculations.

Water use calculations shall be consistent with calculations contained in the <i>Guidelines</i> and shall be provided to the <i>local water purveyor</i> as appropriate, under procedures determined by the City.
---

Verification of compliance of the landscape installation with the approved plans shall be obtained through a *Certification of Completion* in conjunction with a Certificate of Use and Occupancy or Permit Final process as provided in the *Guidelines*.

[Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.]

## IX.3 Landscape Water Use Standards

For applicable landscape installation or rehabilitation projects subject to Section 1.1(a) of this Water Efficient Landscapes Section IX Guidelines, the *Estimated Applied Water Use* allowed for the *landscaped area* shall not exceed the *MAWA* calculated using an *ET adjustment factor* of 0.7, except for *special landscaped areas* where the *MAWA* is calculated using an *ET adjustment factor* of 1.0; or the design of the *landscaped area* shall otherwise be shown to be equivalently water-efficient in a manner acceptable to the City; as provided in the *Guidelines*.

Irrigation of all *landscaped areas* shall be conducted in a manner conforming to the rules and requirements, and shall be subject to penalties and incentives for water conservation and water waste prevention as determined and implemented by the *local water purveyor* or as mutually-agreed by *local water purveyor* and the local agency.

## IX.4 Delegation

The City may delegate to, or enter into a contract with, a *local agency* to implement, administer, and/or enforce any of the provisions of the Water Efficient Landscape Section IX on behalf of the City.



## IX.5 Definitions

The following definitions are applicable to this [chapter/division/title]:

“*Aggregate landscape areas*” pertains to the areas undergoing development as one project or for production home neighborhoods or other situations where multiple parcels are undergoing development as one project, but will eventually be individually owned.

“*Applied water*” means the portion of water supplied by the irrigation system to the landscape.

“*Budget-based tiered-rate structure*” means tiered or block rates for irrigation accounts charged by the retail water agency in which the block definition for each customer is derived from lot size or irrigated area and the evapotranspiration requirements of landscaping.

“*Community Aesthetics Evaluation*” – While not subject to permit, plan check or design review, the Community Aesthetics Evaluation may be performed to ensure the aesthetic standards of the community and irrigation efficiency intent is maintained.

“*Ecological restoration project*” means a project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.

“*Estimated Applied Water Use*” means the average annual total amount of water estimated to be necessary to keep plants in a healthy state, calculated as provided in the *Guidelines*. It is based on the *reference evapotranspiration* rate, the size of the landscape area, *plant water use factors*, and the relative *irrigation efficiency* of the irrigation system.

“*ET adjustment factor*” or “*ETAF*” is equal to the *plant factor* divided by the *irrigation efficiency factor* for a *landscape project* as described in the *Guidelines*. The *ETAF* is calculated in the context of local *reference evapotranspiration* using site-specific *plant factors* and *irrigation efficiency factors* that influence the amount of water that needs to be applied to the specific *landscaped area*.

A combined plant mix with a site-wide average *plant factor* of 0.5 (indicating a moderate water need) and average *irrigation efficiency* of 0.71 produces an *ET adjustment factor* of  $(0.7) = (0.5/0.71)$ , which is the standard of water use efficiency generally required by this Water Efficient Landscapes Section IX and the *Guidelines*, except that the *ETAF* for a *special landscape area* shall not exceed 1.0.

“*Guidelines*” refers to the Guidelines for Implementation of the Water Efficient Landscapes Section IX of the City of Orange Landscape Standards and Specifications as adopted by the City, which describes procedures, calculations and requirements for *landscape projects* subject to this Water Efficient Landscapes Section IX.

“*Hardscapes*” means any durable material or feature (*pervious* and *non-pervious*) installed in or around a *landscaped area*, such as pavements or walls. Pools and other *water features* are considered part of the *landscaped area* and not considered *hardscapes* for purposes of this Water Efficient Landscapes Section IX.

“*Irrigation efficiency*” means the measurement of the amount of water beneficially used divided by the amount of water applied. *Irrigation efficiency* is derived from measurements and estimates of irrigation system characteristics and management practices. The *irrigation efficiency* for purposes of this Water Efficient Landscapes Section IX are 0.75 for overhead spray devices and 0.81 for drip systems.

“*Landscaped area*” means all the planting areas, *turf* areas, and *water features* in a landscape design plan subject to the *Maximum Applied Water Allowance* and *Estimated Applied Water Use* calculations. The *landscaped area* does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other *pervious* or *non-pervious hardscapes*, and other non-irrigated areas designated for non-development (e.g., open spaces and existing native vegetation).

“*Landscape contractor*” means a person licensed by the State of California to construct, maintain, repair, install or subcontract the development of landscape systems.

“*Landscape Documentation Package*” means the documents required to be provided to the City for review and approval of landscape design projects as described in the *Guidelines*.

“*Landscape project*” means total area of landscape in a project as provided in the definition of “*landscaped area*,” meeting the requirements under Section IX.6 of this Water Efficient Landscapes Section IX.

“*Local agency*” means a city or county, including a charter city or charter county, that is authorized to implement, administer and/or enforce any of the provisions of the Water Efficient Landscapes Section IX. The *local agency* may be responsible for the enforcement or delegation of enforcement of this Water Efficient Landscapes Section IX including, but not limited to, design review, plan check, issuance of *permits* and inspection of a *landscape project*.

“*Local water purveyor*” means any entity, including a public agency, city, county, or private water company that provides retail water service.

“*Maximum Applied Water Allowance*” or “*MAWA*” means the upper limit of annual *applied water* for the *established landscaped area* as specified in Section 2.2 of the *Guidelines*. It is based upon the area’s *reference evapotranspiration*, the *ET Adjustment Factor* and the size of the *landscaped area*. The *Estimated Applied Water Use* shall not exceed the *Maximum Applied Water Allowance*.  $MAWA = (ET_o) (0.62) [(ETAF \times LA) + ((1-ETAF) \times SLA)]$

“*Mined-land reclamation projects*” means any surface mining operation with a reclamation plan approved in accordance with the Surface Mining and Reclamation Act of 1975.

“*New construction*” means, for the purposes of this Water Efficient Landscapes Section IX, a new building with a landscape or other new landscape such as a park, playground or greenbelt without an associated building.

“*Non-pervious*” means any surface or natural material that does not allow for the passage of water through the material and into the underlying soil.

“*Pervious*” means any surface or material that allows the passage of water through the material and into the underlying soil.

“*Permit*” means an authorizing document issued by local agencies for *new construction* or *rehabilitated landscape*.

“*Plant factor*” or “*plant water use factor*” is a factor, when multiplied by *ET<sub>o</sub>*, that estimates the amount of water needed by plants. For purposes of this Water Efficient Landscapes Section IX, the *plant factor* range for very low water use plants is 0 to 0.1; the *plant factor* range for low water use plants is 0 to 0.3; the *plant factor* range for moderate water use plants is 0.4 to 0.6; and the *plant factor* range for high water use plants is 0.7 to 1.0. *Plant factors* cited in this Water Efficient Landscapes Section IX are derived from the publication “Water Use Classification of Landscape Species.” *Plant factors* may also be obtained from horticultural researchers from academic institutions or professional associations as approved by the California Department of Water Resources (DWR).

“*Recycled water*” or “*reclaimed water*” means treated or recycled waste water of a quality suitable for non-potable uses such as landscape irrigation and *water features*. This water is not intended for human consumption.

“*Reference evapotranspiration*” or “*ET<sub>o</sub>*” means a standard measurement of environmental parameters which affect the water use of plants. *ET<sub>o</sub>* is given expressed in inches per day, month or year as represented in Appendix A of the *Guidelines*, and is an estimate of the evapotranspiration of a large field of four-to seven-inch tall, cool-season grass that is well watered. *Reference evapotranspiration* is used as the basis of determining the *Maximum Applied Water Allowances*.

“*Rehabilitated landscape*” means any re-landscaping project that meets the applicability criteria of Section 1.1(a) of the *Guidelines*, where the modified landscape area is greater than 2,500 square feet.

“*Smart automatic irrigation controller*” means an automatic timing device used to remotely control *valves* that operate an irrigation system and which schedules irrigation events using either evapotranspiration (weather-based) or soil moisture data.

“*Special landscape area*” means an area of the landscape dedicated solely to edible plants, such as orchards and vegetable gardens, areas irrigated with *recycled water*, *water features* using *recycled water*, and recreational areas dedicated to active play, such as parks, sports fields, golf courses and where *turf* provides a playing surface.

“*Turf*” means a ground cover surface of mowed grass. Annual bluegrass, Kentucky bluegrass, Perennial ryegrass, Red fescue, and Tall fescue are cool-season grasses. Bermuda grass, Kikuyu grass, Seashore Paspalum, St. Augustine grass, Zoysia grass and Buffalo grass are warm-season grasses.

“*Valve*” means a device used to control the flow of water in an irrigation system.

“*Water feature*” means a design element where open water performs an aesthetic or recreational function. *Water features* include ponds, lakes, waterfalls, fountains, artificial streams, spas and swimming pools (where water is artificially supplied). The surface area of *water features* is included in the high water use *hydrozone* of the *landscaped area*. Constructed wetlands used for on-site wastewater treatment, habitat protection or storm water best management practices that are not irrigated and used solely for water treatment or storm water retention are not *water features* and, therefore, are not subject to the water budget calculation.

[Note: Authority Cited: Section 65595, Government Code. Reference: Sections 65592, 65596, Government Code.]

## **IX.6 Exemption from California Environmental Quality Act.**

The City Council hereby determines that this Section of the City of Orange Landscape Standards and Specifications is exempt from review under the California Environmental Quality Act (“CEQA”) (California Public Resources Code Section 21000 *et seq.*), because pursuant to State CEQA Regulation 15307 (14 Cal. Code Regs., § 15307), this Section is covered by the CEQA Categorical Exemption for actions taken to assure the maintenance, restoration, enhancement, or protection of a natural resource where the regulatory process involves procedures for protection of the environment. The adoption of this Landscape Standards and Specifications document containing Section IX, titled *Water Efficient Landscapes*, will result in the enhancement and protection of water resources in the City, and will not result in cumulative adverse environment impacts. It is therefore exempt from the provisions of CEQA. The City Council hereby directs the City Manager or designee to prepare and file a Notice of Exemption as soon as possible following adoption of this Landscape Standards and Specifications and Section IX contained within.

## **IX.7 Severability**

The provisions of this Section IX are severable, and the invalidity of any section, paragraph, phrase, clause, or part of this Section IX shall not affect the validity or effectiveness of the remainder of this Section IX.

## **IX.8 Effective Date**

This Section IX of the City of Orange Landscape Standards and Specifications shall become effective thirty (30) days after its adoption in accordance with the provisions of California law.

## **IX.9 City Clerk Certification**

The City Clerk shall certify to the passage of this Section IX of the City of Orange Landscape Standards and Specifications, and cause the same or a summary thereof to be published within fifteen (15) days after adoption in a newspaper of general circulation, printed and published in Orange, California.

# GUIDELINES

## FOR IMPLEMENTATION OF THE

## CITY OF ORANGE

## WATER EFFICIENT LANDSCAPES

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# 1. Purpose and Applicability

## 1.1 Purpose

- (a) The primary purpose of these Guidelines is to provide procedural and design guidance for *project applicants* proposing landscape installation or rehabilitation projects that are subject to the requirements of the *Water Efficient Landscapes Section IX*. This Section is also intended for use and reference by City staff in reviewing and approving designs and verifying compliance with the *Water Efficient Landscapes Section IX*. The general purpose of the *Water Efficient Landscapes Section IX* is to promote the design, installation and maintenance of landscaping in a manner that conserves regional water resources by ensuring that landscaping projects are not unduly water-needy and that irrigation systems are appropriately designed and installed to minimize water waste.
- (b) Other regulations affecting landscape design and maintenance practices are potentially applicable and should be consulted for additional requirements. These regulations include but may not be limited to:
  - (1) State of California Assembly Bill 1881;
  - (2) National Pollutant Discharge Elimination Permit for the Municipal Separate Storm Sewer System;
  - (3) City of Orange Fire Department Regulations for Fuel Modification in the Landscape;
  - (4) Water Conservation and Drought Response Regulations of the Local Water Purveyor;
  - (5) Regulations of the Local Water Purveyor governing use of Recycled Water;
  - (6) Zoning Code;
  - (7) Building Code;
  - (8) Specific Plans, Master Plans, General Plan, or similar land use and planning documents; and
  - (9) Conditions of approval for a specific project

## 1.2 Applicability

- (a) The Water Efficient Landscape Section IX and these Guidelines apply to all of the following landscape projects:

- (1) New landscape projects with an *aggregate* landscape area equal to or greater than 500 square feet requiring a building or landscape permit, plan check, or design review;
  - (2) Rehabilitated landscape projects with an *aggregate* landscape area of 2,500 square feet, requiring a building or landscape permit, plan check or design review;
  - (3) New or rehabilitated landscape projects with an *aggregate* landscape area of 2,500 square feet or less may comply with the performance requirements of this Section IX or conform to the prescriptive measures contained in Appendix A;
  - (4) New or rehabilitated projects using treated or untreated *graywater* or rainwater capture on site, any lot or parcels within the project that has less than 2,500 square feet of landscape area and meets the lot or parcel's landscape water requirement (Estimated Total Water Use) entirely with the treated or untreated *graywater* or though stored rainwater capture on site is subject only to Appendix A Section (5).
- (b) The requirements of the Guidelines may be partially or wholly waived at the discretion of the *City* or its designee, for landscape rehabilitation projects that are limited to replacement plantings with equal or lower water needs and where the irrigation system is found to be designed, operable and programmed consistent with minimizing water waste in accordance with local water purveyor regulations.
- (c) Unless otherwise determined by the *City*, the Water Efficient Landscapes Section IX and these Guidelines do not apply to:
- (1) Registered local, state, or federal historical sites;
  - (2) Ecological restoration projects that do not require a permanent irrigation system;
  - (3) Mined-land reclamation projects that do not require a permanent irrigation system; or
  - (4) Plant collections, as part of botanical gardens and arboretums open to the public.

## **2. Submittal Requirements for New Landscape Installations or Landscape Rehabilitation Projects**

- (a) Discretionary approval is typically required for landscape projects that are subject to site plan reviews, or where a variance from a local building code is requested, or other procedural processes apply such that standard or special conditions of approval may be required by the City. Discretionary projects with conditions of approval may be approved administratively by *City* staff, or acted on formally by

the Planning Commission, City Council or other jurisdictional authority. A typical standard condition of approval reads:

*“Landscaping for the project shall be designed to comply with the City’s Water Efficient Landscapes Section IX and with the Guidelines for Implementation of the Water Efficient Landscapes Section IX of the City of Orange Landscapes Standards and Specifications.”*

Landscape or water features that typically require a ministerial permit (i.e., a building, plumbing, electrical, or other similar permit), thereby triggering compliance with the Water Efficient Landscapes Section IX requirements independently of the need for discretionary approval include, but are not limited to, swimming pools, fountains or ponds, retaining walls, and overhead trellises.

**2.1 Elements of the Landscape Documentation Package**

(a) A *Landscape Documentation Package* is required to be submitted by the *project applicant* for review and approval prior to the issuance of ministerial permits for landscape or water features by the City, and prior to start of construction. Unless otherwise directed by the City, the *Landscape Documentation Package* shall include the following elements either on plan sheets or supplemental pages as directed by the City:

- (1) Project Information, including, but not limited to, the following:
  - (a) Date;
  - (b) Project name;
  - (c) Project address, parcel and/or lot number(s);
  - (d) Total *landscaped area* (square feet) and rehabilitated *landscaped area* (if applicable);
  - (e) Project type (e.g., new, rehabilitated, public, private, cemetery, homeowner-installed);
  - (f) Water supply type (e.g., potable, recycled, or well) and identification of the local retail water purveyor if the *project applicant* is not served by a private well;
  - (g) Checklist or index of all documents in the *Landscape Documentation Package*;
  - (h) Project contacts, including contact information for the *project applicant* and *property owner*;
  - (i) *Certification of Design* in accordance with **Exhibit A** of these *Guidelines* that includes a *landscape professional’s* professional



stamp, as applicable, signature, contact information (including email and telephone number), license number and date certifying the statement that, “the design of this project complies with the requirements of the City’s *Water Efficient Landscapes Section IX*” and shall bear the signature of the *landscape professional* as required by law; and

- (j) Any other information the City deems relevant for determining whether the landscape project complies with the *Water Efficient Landscape Section IX* and these *Guidelines*.
- (2) *Maximum Applied Water Allowance (MAWA)* and *Estimated Applied Water Use (EAWU)* expressed as annual totals including, but not limited to, the following:
- (a) *Water Efficient Landscapes Worksheet* (optional at discretion of the *City*) for the landscape project;
  - (b) *Hydrozone* information table (optional at the discretion of the *City*) for the landscape project; and
  - (c) Water budget calculations (optional at the discretion of the *City*) for the landscape project.
- (3) A soil management report or specifications, or specification provision requiring soil testing and amendment recommendations and implementation to be accomplished during construction of the landscape project.
- (4) A landscape design plan for the landscape project.
- (5) An irrigation design plan for the landscape project.
- (6) A grading design plan, unless grading information is included in the landscape design plan for the landscape project, or unless the landscape project is limited to replacement planting, and/or irrigation to rehabilitate an existing landscaped area.

[Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.]

## 2.2 Water Efficient Landscapes Calculations and Alternatives

- (a) The *project applicant* shall provide the calculated *Maximum Applied Water Allowance (MAWA)* and *Estimated Applied Water Use (EAWU)* for the landscaped area as part of the *Landscape Documentation Package* submittal to the City. The MAWA and EAWU shall be calculated based on completing the *Water Efficient Landscapes Worksheets* (in accordance with the sample worksheets in **Appendix**

C) which contain information on the *plant factor*, irrigation method, *irrigation efficiency* and area associated with each *hydrozone*. Calculations are then made to show that the *evapotranspiration adjustment factor* (ETAF) for the landscape project does not exceed a factor of 0.55 for residential areas and 0.45 for non-residential areas, exclusive of *Special Landscape Areas*. The ETAF for a landscape project is based on the plant factor and irrigation methods selected. The *Maximum Applied Water Allowance* is calculated based on the maximum ETAF allowed (0.55 for residential areas and 0.45 for non-residential areas) and expressed as annual gallons required. The EAWU is calculated based on the plants used and irrigation method selected for the landscape design.

- (b) The EAWU allowable for the landscaped area shall not exceed the MAWA. The MAWA shall be calculated using an *evapotranspiration adjustment factor* (ETAF) of 0.55 for residential areas and 0.45 for non-residential areas, except for the portion of the MAWA applicable to any *special landscaped areas* within the landscape project, which shall be calculated using an ETAF of 1.0. Where the design of the *landscaped area* can otherwise be shown to be equivalently water-efficient, the *project applicant* may submit alternative or abbreviated information supporting the demonstration that the annual EAWU is less than the MAWA, at the discretion of and for the review and approval of the local agency.
- (c) Water budget calculations shall adhere to the following requirements:
  - (1) The MAWA shall be calculated using the *Water Efficient Landscapes Worksheets* and equation presented in **Appendix B** on page B-1. The example calculation on page B-1 is a hypothetical example to demonstrate proper use of the equation.
  - (2) The EAWU shall be calculated using the *Water Efficient Landscapes Worksheets* and equation presented in **Appendix C**.
  - (3) For the calculation of the MAWA and EAWU, a *project applicant* shall use the *ETo* values from the closest location listed the Reference Evapotranspiration Table in **Appendix D**. For geographic areas not covered in **Appendix D**, data from other cities, or zip codes, located nearby in the same reference evapotranspiration zone may be used.
  - (4) For calculation of the EAWU, the *plant water use factor* shall be determined as appropriate to the project location from the *Water Use Efficiency of Landscapes Species (WUCOLS) Species Evaluation List* or from horticultural researchers with academic institutions or professional associations as approved by the California Department of Water Resources (DWR). The *plant factor* ranges from 0 to 0.1 for very low water use plants, 0.1 to 0.3 for low water use plants, 0.4 to 0.6 for moderate water use plants, and 0.7 to 1.0 for high water use plants.

- (5) For calculating the *EAWU*, the plant water use factor shall be determined for each valve *hydrozone* based on the highest-water-use plant species within the zone. The *plant factor* for each hydrozone may be required to be further refined as a “landscape coefficient” according to protocols defined in detail in the *WUCOLS* document, to reflect planting density and microclimate effects on water need at the option of the *project applicant* or the *City*.
- (6) For calculation of the *EAWU*, the area of a water feature shall be defined as a high water use hydrozone with a *plant factor* of 1.0.
- (7) For calculation of the *EAWU*, a temporarily irrigated hydrozone area, such as an area of highly drought-tolerant native plants that are not intended to be irrigated after they are fully established, shall be defined as a very low water use hydrozone with a *plant factor* of 0.1.
- (8) For calculation of the *MAWA*, the *ETAF* for *Special Landscape Areas (SLA)* shall be set at 1.0. For calculation of the *EAWU*, the *ETAF* for SLA shall be calculated as the *SLA plant factor* divided by the *SLA irrigation efficiency factor*.
- (9) *Irrigation efficiency (IE)* of the irrigation heads used within each *hydrozone* shall be assumed to be as follows, unless otherwise indicated by the irrigation equipment manufacturer’s specifications or demonstrated by the project applicant:

Irrigation Method	DU <sub>LQ</sub>	DU <sub>LH</sub> *	EU	IE**
Spray nozzles	65%	79%		71%
High efficiency spray nozzles	70%	82%		73%
Multi stream/Multi trajectory rotary (MSMT) nozzles	75%	85%		76%
Stream rotor nozzle	70%	82%		73%
Microspray	75%	85%		76%
Bubblers			85%	77%
Drip emitter			90%	81%
Subsurface drip			90%	81%

\*DU<sub>LH</sub> = .386 + (.614)(DU<sub>LQ</sub>)

\*\* IE (spray) = (DU<sub>LH</sub>)(IME)

\*\* IE (drip) = Emission uniformity (EU)(IME)

- (10)
  - (d) The *Maximum Applied Water Allowance* shall adhere to the following requirements:
    - (1) The *Maximum Applied Water Allowance* shall be calculated using the equation presented in **Appendix C**. The *reference evapotranspiration*

(*ETo*) values used in this calculation are from the *Reference Evapotranspiration* Table in **Appendix D** and are for planning purposes only. For actual irrigation scheduling, automatic irrigation controllers are required and shall use current *ETo* data, such as from the California Irrigation Management Information System (CIMIS), other equivalent data, or soil moisture sensor data.

### 2.3 Soil and Stormwater Management

- (a) All planted landscape areas are required to have friable soil to maximize retention and infiltration. On engineered slopes, only amended planting holes need meet this requirement.
- (b) In order to reduce *runoff* and encourage healthy plant growth, a soil management report shall be completed by the *project applicant*, or his/her designee, as follows:
  - (1) Submit soil samples to a certified agronomic soils laboratory for analysis and recommendations.
    - (a) Soil sampling shall be conducted in accordance with laboratory protocol, including protocols regarding adequate sampling depth for the intended plants.
    - (b) The soil analysis may include, but is not limited to:
      - 1. soil texture;
      - 2. infiltration rate determined by laboratory test or soil texture infiltration rate table;
      - 3. pH;
      - 4. total soluble salts;
      - 5. sodium;
      - 6. percent organic matter; and
      - 7. recommendations.
  - (2) In projects with multiple landscape installations (i.e. production home developments or *common interest developments* that are installing landscaping) a soil sampling rate of 1 in 7 lots or approximately 15% will satisfy this requirement; evenly disbursed throughout the development. Large landscape projects shall sample at a rate equivalent to 1 in 7 lots or approximately 15% landscaped area. The *project applicant*, or his/her designee, shall comply with one of the following:

- (a) If significant mass grading is not planned, the soil analysis report shall be submitted to the local agency as part of the Landscape Documentation Package; or
- (b) If significant mass grading is planned, the soil analysis report shall be submitted to the *City* as part of the *Certification of Completion*.
- (c) The soil analysis report shall be made available, in a timely manner, to the professionals preparing the landscape design plans and irrigation design plans in order to make any necessary adjustments to the design plans.
- (d) The *project applicant*, or his/her designee, shall submit documentation verifying implementation of soil analysis report recommendations to the local agency with the Certification of Completion.

[Note: Authority Cited: Section 65595, Government Code.  
Reference: Section 65596, Government Code.]

## 2.4 Landscape Design Plan

- (a) For the efficient use of water, a landscape shall be carefully designed and planned for the intended function of the project. The following design criteria shall be submitted as part of the *Landscape Documentation Package*.
  - (1) Plant Material
    - (a) Any plant may be selected for the *landscaped area* provided the *EAWU* in the *landscaped area* does not exceed the *MAWA*. Methods to achieve water efficiency shall include one or more of the following:
      1. protection and preservation of non-invasive *water-conserving plant, trees* and *turf species*;
      2. selection of *water-conserving plant, tree* and *turf species*;
      3. selection of plants based on local climate suitability, disease and pest resistance;
      4. selection of trees based on applicable City and local tree ordinances or tree shading guidelines; and size at maturity as appropriate for the planting area;
      5. selection of plants from local and regional landscape program plant lists;;

6. selection of plants from local Fuel Modification Plan Guidelines.

- (b) Each *hydrozone* shall have plant materials with similar water use, with the exception of *hydrozones* with plants of mixed water use, as specified in Section 2.5(a)(2)(D) of these *Guidelines*.
- (c) Plants shall be selected and planted appropriately based upon their adaptability to the climatic, geologic and topographical conditions of the project site. Methods to achieve water efficiency shall include one or more of the following:
  - (1) Use the Sunset Western Climate Zone System which takes into account temperature, humidity, elevation, terrain, latitude and varying degrees of continental and marine influence on local climate;
  - (2) Recognize the horticultural attributes of plants (i.e., mature plant size, invasive surface roots) to minimize damage to property or infrastructure (e.g., buildings, sidewalks, and power lines); allow for adequate soil volume for healthy root growth and
  - (3) Consider the solar orientation for plant placement to maximize summer shade and winter solar gain.
- (d) *Turf* is discouraged on slopes greater than 25% where the toe of the slope is adjacent to an impermeable hardscape and where 25% means 1 foot of vertical elevation change for every 4 feet of horizontal length (rise divided by run x 100 = slope percent).
- (e) *High water use plants, characterized by a plant factor of 0.7 to 1.0 are prohibited in street medians.*
- (f) A landscape design plan for projects in fire-prone areas and fuel modification zones shall comply with requirements of the local Fire Authority where applicable. Refer to the local Fuel Modification Plan Guidelines. When conflicts between water conservation and fire safety design elements exist, the fire safety requirements shall have priority.
- (g) The use of *invasive* such as those listed by the California Invasive Plant Council is strongly discouraged.
- (h) The architectural guidelines of a *common interest development*, which include community apartment projects, condominiums, planned developments and stock cooperatives, shall not prohibit or include conditions that have the effect of prohibiting the use of *water efficient plant species* as a group.
  - (1) Water Features
    - (a) Recirculating water systems shall be used for water features.

- (b) Where available and consistent with public health guidelines, recycled water shall be used as a source for decorative water features.
- (c) The surface area of a water feature shall be included in the high water use *hydrozone* area of the water budget calculation.
- (d) Pool and spa covers are highly recommended.

(2) *Soil Preparation, Mulch and Amendments*

- (a) Prior to planting of any materials, compacted soils shall be transformed to a friable condition. On engineered slopes only amended planting holes need to meet this requirement.
- (b) Soil amendments shall be incorporated according to the recommendation of the soil report and what is appropriate for plants selected.
- (c) For landscape installations, compost at a rate of a minimum of four cubic yards per 1,000 square feet of permeable area shall be incorporated to a depth of six inches into the soil. Soils with greater than 6% organic matter in the top 6 inches of soil are exempt from adding compost and tilling.
- (d) A minimum three inch (33") layer of *mulch* shall be applied on all exposed soil surfaces of planting areas except in turf areas, creeping or rooting groundcovers, or direct seeding applications where *mulch* is contraindicated. To provide habitat for beneficial insects and other wildlife, up to 5% of the landscape area may be left without mulch. Designated insect habitat must be included in the landscape design plan as such.
- (e) Stabilizing mulching products shall be used on slopes that meet current engineering standards such as those detailed in the USDA/USAID Low-Volume Roads Engineering Best Management Practices Field Guide.
- (f) The mulching portion of the seed/*mulch* slurry in hydro-seeded applications shall meet the mulching requirement.
- (g) Organic *mulch* materials made from recycled or post-consumer shall take precedence over inorganic materials or virgin forest products unless the recycled post-consumer organic products are not locally available. Organic mulches are not required where prohibited by local fuel Modification Plan Guidelines or other applicable local ordinances.

- (i) The landscape design plan, at a minimum, shall:
- (1) Delineate and label each *hydrozone* by number, letter or other method;
  - (2) Identify each *hydrozone* as low, moderate, high water, or mixed water use. Temporarily irrigated areas of the *landscaped area* shall be included in the low water use *hydrozone* for the water budget calculation;
  - (3) Identify recreational areas;
  - (4) Identify areas permanently and solely dedicated to edible plants;
  - (5) Identify areas irrigated with recycled water;
  - (6) Identify type of *mulch* and application depth;
  - (7) Identify soil amendments, type and quantity;
  - (8) Identify type and surface area of water features;
  - (9) Identify *hardscapes* (*pervious* and *non-pervious*);
  - (10) Identify location and installation details, and 24-hour retention or infiltration capacity of any applicable storm water best management practices that encourage on-site retention and infiltration of storm water. *Project applicants* shall refer to the local agency or regional Water Quality Control Board for information on any applicable storm water technical requirements. Storm water best management practices are encouraged in the landscape design plan and examples are provided in section 2.4(c)-(d).
  - (11) Identify any applicable rain harvesting or catchment technologies (e.g., rain gardens, cisterns, etc.);
  - (12) Contain the following statement: “I have complied with the criteria of the *Water Efficient Landscapes Section IX* and applied them for the efficient use of water in the landscape design plan;” and
  - (13) Bear the signature of a California-licensed *landscape professional*.

[Note: Authority Cited: Section 65595, Reference: Section 65596, Government Code and Section 1351, Civil Code.]

## 2.5 Irrigation Design Plan

- (a) This section applies to landscaped areas requiring permanent irrigation, not areas that require temporary irrigation solely for the plant establishment period. For the efficient use of water, an irrigation system shall meet all the requirements listed in this section and the manufacturer’s recommendations. The irrigation system and its



related components shall be planned and designed to allow for proper installation, management and maintenance. An irrigation design plan meeting the following design criteria shall be submitted as part of the *Landscape Documentation Package*.

**(1) System**

- (a)** Landscape water meters, defined as either a dedicated water service meter or private sub meter shall be installed for all non-residential irrigated landscapes of 1,000 sq. ft. but not more than 5,000 sq. ft. (the level at which Water Code 535 applies) and residential irrigated landscapes of 5,000 sq. ft. or greater. A landscape water meter may be either:

  - 1.** A customer service meter dedicated to landscape use provided by the local water purveyor; or
  - 2.** A privately owned meter or submeter
- (b)** Automatic irrigation controllers utilizing either evapotranspiration or soil moisture sensor data utilizing non-volatile memory shall be required for irrigation scheduling in all irrigation systems recommending U.S. EPA Water Sense labeled devices as applicable.
- (c)** *Sensors* (rain, freeze, wind, etc.), either integral or auxiliary, that suspend or alter irrigation operation during unfavorable weather conditions shall be required on all irrigation systems, as appropriate for local climatic conditions. Irrigation should be avoided during windy or freezing weather or during rain.
- (d)** If the water pressure is below or exceeds the recommended pressure of the specified irrigation devices, the installation of a pressure regulating device is required to ensure that the dynamic pressure at each emission device is within the manufacturer's recommended pressure range for optimal performance.

  - 1.** If the static pressure is above or below the required dynamic pressure of the irrigation system, pressure-regulating devices, such as inline pressure regulators, booster pumps or other devices, shall be installed to meet the required dynamic pressure of the irrigation system.
  - 2.** *Static water pressure*, dynamic or *operating pressure*, and flow reading of the water supply shall be measured at the point of connection. These pressure and flow measurements shall be conducted at the design stage. If the measurements are not available at the design stage, the measurements shall be conducted at installation.

- (e) *Backflow prevention devices* shall be required to protect the water supply from contamination by the irrigation system. A *project applicant* shall refer to the applicable *City* code (i.e., public health) for additional backflow prevention requirements.
- (f) A *master shutoff valve* shall be as close as possible to the point of connection and is required on all projects; with the exception for landscapes that make use of technologies that allow for the individual control of sprinklers that are individually pressurized in a system equipped with low pressure shut down features.
- (g) Flow sensors that detect high flow conditions created by system damage or malfunction are required for all non-residential landscapes and residential landscapes of 5,000 sq. ft. or larger. The flow sensor must be in combination with a *master shut-off valve*.
- (h) *Manual isolation valves* (such as a *gate valve*, *ball valve*, or *butterfly valve*) shall be required downstream of the point of connection of the water supply to minimize water loss in case of an emergency (such as a *main line* break) or routine repair.
- (i) The irrigation system shall be designed to prevent *runoff*, low head drainage, *overspray* or other similar conditions where irrigation water flows onto non-targeted areas, such as adjacent property, non-irrigated areas, *hardscapes*, roadways or structures.
- (j) Relevant information from the soil management plan, such as soil type and *infiltration rate*, shall be utilized when designing irrigation systems.
- (k) The design of the irrigation system shall conform to the hydrozones of the landscape design plan.
- (l) All irrigation emission devices must meet the requirements set in the American National Standards Institute (ANSI) standard, American Society of Agricultural and Biological Engineers' / International Code Council's (ASABE/ICC) 802-2014 Landscape Irrigation Sprinkler and Emitter Standard. All sprinkler heads installed in the landscape must document a distribution uniformity low quarter of 0.65 or higher using the protocol defined in ASBE.ICC 802-2014.
- (m) Average irrigation efficiency (IE) for the project shall be determined in accordance with the EAWU calculation sheet in **Appendix B**. Unless otherwise indicated by the irrigation equipment manufacturer's specifications or demonstrated by the *project applicant*, the *irrigation efficiency* of the irrigation heads used within each hydrozone shall be as listed in Section 2.3(c)(9).

- (n) It is highly recommended that the *project applicant* or local agency inquire with the local water purveyor about peak water operating demands (on the water supply system) or water restrictions that may impact the effectiveness of the irrigation system.
- (o) In *mulched* planting areas, the use of *low volume irrigation (drip or low volume overhead irrigation)* is required to maximize water infiltration into the root zone; with the exception of areas with fuel modification requirements and/or those that require plant establishment to comply with local grading ordinances.
- (p) *Sprinkler heads* and other emission devices shall have matched *precipitation rates* unless otherwise directed by the manufacturer's recommendations.
- (q) Head to head coverage is recommended. However, sprinkler spacing shall be designed to achieve the highest possible *distribution uniformity* using the manufacturer's recommendations.
- (r) *Swing joint* components are required on all sprinklers subject to damage that are adjacent to hardscapes or in high traffic areas of turf.
- (s) *Check valves* or *anti-drain valves* are required on all sprinkler heads where low point drainage could occur.
- (t) Areas less than ten (10) feet in width in any direction, shall be irrigated with subsurface irrigation or other means that produces no runoff or overspray.
- (u) *Overhead* irrigation shall not be permitted within 24 inches of any non-permeable surface. Allowable irrigation within the setback from non-permeable surfaces may include drip, drip line or other low flow non-spray technology. The setback area may be planted or unplanted. The surfacing of the setback may be *mulch*, gravel or other porous material. These restrictions may be modified if:
  1. the *landscaped area* is adjacent to permeable surfacing and no *runoff* occurs; or
  2. the adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping; or
  3. the irrigation designer for the landscape project specifies an alternative design or technology as part of the *Landscape Documentation Package*, and clearly demonstrates strict adherence to the irrigation system design criteria in Section 2.5

(a)(1)(H) hereof. Prevention of *overspray* and *runoff* must be confirmed during *an irrigation audit*.

4. Slopes greater than 25% shall not be irrigated with an irrigation system with application *rate* exceeding 0.75 inches per hour. This restriction may be modified if the landscape designer of the landscape project specifies an alternative design or technology as part of the *Landscape Documentation Package*, and clearly demonstrates no *runoff* or erosion will occur. Prevention of *runoff* and erosion must be confirmed during the *irrigation audit*.

**(2) Hydrozone**

- (a) Each *valve* shall irrigate a *hydrozone* with similar site, slope, sun exposure, soil conditions and plant materials with similar water use.
- (b) *Sprinkler heads* and other emission devices shall be selected based on what is appropriate for the plant type within that *hydrozone*.
- (c) Where feasible, trees shall be placed on separate valves from shrubs, groundcovers and *turf* to facilitate the appropriate irrigation of trees. The mature size and extend of the root zone shall be considered when designing irrigation for the tree.
- (d) Individual *hydrozones* that mix plants of moderate and low water use or moderate and high water use may be allowed if:
  1. the *plant factor* calculation is based on the proportions of the respective plant water uses and their respective *plant factors*;  
or
  2. the *plant factor* of the higher water using plant is used for the calculations.
- (e) Individual *hydrozones* that mix high and low water use plants shall not be permitted.
- (f) On the landscape design plan and irrigation design plan, *hydrozone* areas shall be designated by number, letter or other designation. On the irrigation design plan, designate the areas irrigated by each *valve* and assign a number to each *valve*.
- (g) The irrigation design plan, at a minimum, shall contain:
  1. the location and size of separate water meters for landscape;

2. the location, type and size of all components of the irrigation system, including controllers, main and *lateral lines*, *valves*, *sprinkler heads*, *moisture sensing devices*, rain switches, quick couplers, pressure regulators, and *backflow prevention devices*;
3. *static water pressure* at the point of connection to the public water supply;
4. *flow rate* (gallons per minute), application rate (inches per hour) and design *operating pressure* (pressure per square inch) for each *station*;
5. irrigation schedule parameters necessary to program smart timers specified in the landscape design;
6. the following statement: “I have complied with the criteria of *Water Efficient Landscapes Section IX of the City of Orange Landscape Standards and Specifications* and applied them accordingly for the efficient use of water in the irrigation design plan;” and
7. the signature of a California-licensed *landscape professional*.

[Note: Authority Cited: Section 65595, Government Code.  
Reference: Section 65596, Government Code.]

## 2.6 Grading Design Plan

- (a) For the efficient use of water, grading of a landscape project site shall be designed to minimize soil erosion, *runoff*, and water waste. Finished grading configuration of the *landscaped area*, including pads, slopes, drainage, post-construction erosion control and storm water control Best Management Practices, as applicable, shall be shown on the Landscape Plan unless this information is fully included in separate Grading Plans for the project, or unless the project is limited to replacement planting and/or irrigation to rehabilitate an existing *landscaped area*.
- (b) The *project applicant* shall submit a landscape grading plan that indicates finished configurations and elevations of the *landscaped area* including:
  - (1) height of graded slopes;
  - (2) drainage patterns;
  - (3) pad elevations;
  - (4) finish grade; and

- (5) stormwater retention improvements, if applicable.
- (c) To prevent excessive erosion and *runoff*, it is highly recommended that the *project applicant*:
  - (1) grade so that all irrigation and normal rainfall remains within property lines and does not drain on to non-permeable *hardscapes*;
  - (2) avoid disruption of natural drainage patterns and undisturbed soil; and
  - (3) avoid soil compaction in *landscaped areas*.
- (d) The Grading Design Plan shall contain the following statement: “I have complied with the criteria of the ordinance and applied them accordingly for the efficient use of water in the grading design plan” and shall bear the signature of the *landscape professional*, as required by law.

[Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.]

## 2.7 Certification of Completion

- (a) Landscape project installation shall not proceed until the *Landscape Documentation Package* has been approved by the City and any ministerial permits required are issued.
- (b) The *project applicant* shall notify the City at the beginning of the installation work and at intervals, as necessary, for the duration of the landscape project work to schedule all required inspections.
- (c) *Certification of Completion* of the landscape project shall be obtained through a Certificate of Use and Occupancy or a *Permit Final*. The requirements for the Final Inspection and *Permit Closure* include submittal of:
  - (1) *A Landscape Installation Certificate of Completion* in the form included as **Appendix D** of these *Guidelines* which shall include: (i) certification by a *landscape professional* that the *landscape project* has been installed per the approved *Landscape Documentation Package*; and (ii) the following statement: “The landscaping has been installed in substantial conformance to the design plans and complies with the provisions of the *Water Efficient Landscapes Section IX* of the City of Orange Landscape Standards and Specifications for the efficient use of water in the landscape.”
    - a) Where there have been significant changes made in the field during construction, these “as-build” or record drawings shall be included with the certificate.
    - b) A diagram of the irrigation plan showing hydrozones shall be kept

with the irrigation controller for subsequent management purposes

- (2) Documentation of the irrigation scheduling parameters used to set the *controller(s)*;
- (3) An irrigation audit report from a local agency landscape irrigation auditor or third party *certified landscape* irrigation auditor, documentation of enrollment in regional or local water purveyor's water conservation programs, and/or documentation that the MAWA and EAWU information for the *landscape project* has been submitted to the local water purveyor, may be required at the option of the *City*. Example Inspection Affidavit is included as **Appendix H**.
  - (a) Landscape audits shall not be conducted by the *person* who designed or installed the landscape.
  - (b) In large projects or projects with multiple landscape installations (i.e. production home developments or *common interest developments*) an auditing rate of 1 in 7 lots or approximately 15% will satisfy this requirement.

[Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.]

## 2.8 Post-Installation Irrigation Scheduling

- (a) For the efficient use of water, all irrigation schedules shall be developed, managed and evaluated to utilize the minimum amount of water required to maintain plant health. Irrigation schedules shall meet the following criteria:
  - (1) Irrigation scheduling shall be regulated by automatic irrigation controllers.
  - (2) *Overhead* irrigation shall be scheduled in accordance with the local water purveyor's Water Conservation Ordinance. Operation of the irrigation system outside the normal *watering window* is allowed for auditing and system maintenance.

[Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.]

## 2.9 Post-Installation Landscape and Irrigation Maintenance

- (a) Landscapes shall be maintained to ensure water use efficiency in accordance with existing local agency code. Orange Municipal Code 7.02

### 3. Provisions for Existing Landscapes

- (a) Irrigation of all *landscaped areas* shall be conducted in a manner conforming to the rules and requirements and shall be subject to penalties and incentives for water conservation and water waste prevention as determined and implemented by the *local water purveyor* and as may be mutually agreed by the *City*.
- (b) The *City* and/or the regional or *local water purveyor* may administer programs such as irrigation water use analyses, irrigation surveys and/or irrigation audits, tiered water rate structures, water budgeting by parcel, or other approaches to achieve landscape water use efficiency community-wide, to a level equivalent to or less than would be achieved by applying a *MAWA* calculated with an ETAF of 0.8 to all *landscaped areas* in the *City* over one acre in size.
- (c) The architectural guidelines of a *common interest development* including apartments, condominiums, planned developments and stock cooperatives shall not prohibit or include conditions that have the effect of prohibiting the use of low-water use plants as a group.

### 4. Public Education

- (a) Publications. Education is a critical component to promote the efficient use of water in landscapes. The use of appropriate principles of design, installation, management, and maintenance that save water is encouraged in the community.
- (b) Model Homes. All model homes that are landscaped shall use signs and written information to demonstrate the principles of water efficient landscapes as described.
  - (1) Signs shall be used to identify the model as an example of a water efficient landscape featuring elements such as *hydrozones*, irrigation equipment, and others that contribute to the overall water efficient theme. Signage shall include information about the site water use as designed per the local ordinance; specify who designed and installed the site water efficient landscape; and demonstrate low water use approaches to landscaping such as using appropriate plants, alternative water sources, or rainwater catchment systems.
  - (2) Information shall be provided about designing, installing, managing, and maintaining water efficient landscapes.

**[Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.]**



## Appendix A: Prescriptive Compliance Option

### PRESCRIPTIVE COMPLIANCE OPTION

- (A) This appendix contains prescriptive requirements which may be used as a compliance option to Section IX of the City of Orange Landscape Standards and Specifications.
- (B) Compliance with the following items is mandatory and must be documented in a landscape plan in order to use the prescriptive compliance option:
- (1) Submit a *Landscape Documentation Package* which includes the following elements:
    - (a) Date
    - (b) *Project applicant*
    - (c) Project address (if available, parcel and/or lot number (s))
    - (d) Total landscape area (square feet), including a breakdown of turf and plant material
    - (e) Project type (e.g., new, rehabilitated, public, private, cemetery, homeowner-installed)
    - (f) Water supply type (e.g., potable, recycled, well) and identify the local retail water purveyor if the applicant is not served by a private well
    - (g) Contact information for the project applicant and property owner
    - (h) Applicant signature and date with statement, “I agree to comply with the requirements of the prescriptive compliance option to Section IX Water Efficient Landscapes of the City of Orange Landscape Standards and Specifications”
  - (2) Incorporate compost at a rate of at least four cubic yards per 1,000 square feet to a depth of six inches into landscaped area (unless contra-indicated by a soil test);
  - (3) Plant material shall comply with all of the following:
    - (a) For residential areas, install climate adapted plants that require occasional, little or no summer water (average WUCOLS plan factor 0.3) for 75% of the plant area excluding edibles and areas using recycled water; For non-residential areas, install climate adapted plants that require occasional, little or no summer water (average WUCOLS plan factor 0.3) for 100% of the plant area excluding edibles and areas using recycled water;

- (b) A minimum three inch (3”) layer of *mulch* shall be applied on all exposed soil surfaces of planting areas except in *turf* areas, creeping or rooting groundcovers, or direct seeding applications where *mulch* is contraindicated.

(4) *Turf* Shall comply with all of the following:

- (a) *Turf* shall not exceed 25% of the landscaped area in residential areas, and there shall be no turf in non-residential areas
- (b) *Turf* shall not be planted on sloped areas which exceed a slope of 1 foot vertical elevation change for every 4 feet of horizontal length;
- (c) *Turf* is prohibited in parkways less than 10 feet wide, unless the parkway is adjacent to a parking strip and used to enter and exit vehicles. Any turf in parkways must be irrigated by sub-surface irrigation or by other technology that creates no overspray or runoff.

(5) Irrigation systems shall comply with the following:

- (a) Automatic irrigation controllers are required and must use evapotranspiration or soil moisture sensor data
- (b) Irrigation controllers shall be of a type which does not lose programming data in the event the primary power source is interrupted.
- (c) Pressure regulators shall be installed on the irrigation system to ensure the dynamic pressure of the system is within the manufacturers recommended pressure range.
- (d) Manual shut-off valves (such as a gate valve, ball valve, or butterfly valve) shall be installed as close as possible to the point of connection of the water supply.
- (e) All irrigation emission devices must meet the requirements set in the ANSI standard, ASABE/ICC802-2014. “Landscape irrigation Sprinkler and Emitter Standard.” All Sprinkler heads installed in the landscape must document a distribution uniformity low quarter of 0.65 or higher using the protocol defined in ASABE/ICC 802-2014.

(C) At the time of final inspection, the permit applicant must provide the owner of the property with a certificate of completion, certificate of installation, irrigation schedule and a schedule of landscape and irrigation maintenance.

**Appendix B: Certification of Landscape Design**

**CERTIFICATION OF LANDSCAPE DESIGN**

I hereby certify that:

- (1) I am a professional appropriately-licensed in the State of California to provide professional landscape design services.
- (2) The landscape design and water use calculations for the property located at \_\_\_\_\_  
\_\_\_\_\_  
(provide street address or parcel number(s)) were prepared by me or under my supervision.
- (3) The landscape design and water use calculations for the identified property comply with the requirements of the Water Efficient Landscape Section IX of the City of Orange Landscape Standards and Specifications (Municipal Code Sections 16.50.040) and the Guidelines for Implementation of the City of Orange Water Efficient Landscape Section IX of the City of Orange Landscape Standards and Specifications.
- (4) The information I have provided in this Certificate of Landscape Design is true and correct and is hereby submitted in compliance with the Guidelines for Implementation of the Water Efficient Landscape Section IX of the City of Orange Landscape Standards and Specifications.

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

\_\_\_\_\_  
License Number

\_\_\_\_\_  
Address

\_\_\_\_\_  
Telephone

\_\_\_\_\_  
E-mail Address

Landscape Design Professional's Stamp  
(If applicable)

## Appendix C: Water Efficient Landscape Worksheet

### WATER EFFICIENT LANDSCAPE WORKSHEET

This worksheet is filled out by the project applicant and it is a required item of the Landscape Documentation Package.

Reference Evapotranspiration (ET<sub>o</sub>)<sup>a</sup>: \_\_\_\_\_

Landscape Area Sector Type  Residential  
(select one):  Non-Residential

	Hydrozone #/Planting Description	Location	Plant Factor <sup>b</sup> (PF)	Irrigation Method <sup>c</sup>	Irrigation Efficiency <sup>c</sup> (IE)	ETAF (PF/IE)	Landscape Area (sq-ft)	ETAF x Area	Estimated Total Water Use <sup>d</sup> (ETWU)
<b>Regular Landscape Area</b>									
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									

<b>Average</b>	<b>Total</b>	<b>Total</b>

Average ETAF for Regular Landscape Areas<sup>e</sup> (circle one):      **In Compliance**      **Not In Compliance**

**Special Landscape Area**

SLA-1									
SLA-2									
SLA-3									
SLA-4									
SLA-5									

**Totals**

**Total Landscape Area**   
**Site wide ETAF**   
**ETWU Total**   
**Maximum Allowed Water Allowance (MAWA)<sup>f</sup>**

## WORKSHEET INFORMATION & EQUATIONS

<sup>a</sup> Local monthly evapotranspiration rates are listed in Appendix D.

<sup>b</sup> The following table can be used for common plant factors:

Plant Factor	PF
Very low water use plant	0.1
Low water use plant	0.2
Medium water use plant	0.5
High water use plant	0.8
Lawn	0.8
Pool, spa, or other water feature	1.0

<sup>c</sup> *Irrigation efficiency* is derived from measurements and estimates of irrigation system characteristics and management practices. The minimum average *irrigation efficiency* for purposes of these *Guidelines* is 0.71. The following *irrigation efficiency* may be obtained for the listed irrigation heads with an *Irrigation Management Efficiency* of 90%:

Irrigation Method	IE
Spray nozzles	71%
High efficiency spray nozzles	73%
Multi stream/Multi trajectory rotary (MSMT) nozzles	76%
Stream rotor nozzle	73%
Microspray	76%
Bubblers	77%
Drip emitter	81%
Subsurface drip	81%

<sup>d</sup> Estimated Total Water Use (ETWU) is the annual gallons required

$$ETWU = (ET_o) \times (0.62) \times (ETAF \times \text{Area})$$

where,  $ET_o$  = annual evapotranspiration rate in inches per year  
 0.62 = factor used to convert inches per year to gallons per square foot  
 $ETAF$  = plant factor  $\div$  irrigation efficiency

<sup>e</sup> Average  $ETAF$  for Regular Landscape Areas must be 0.55 or below for residential areas, and 0.45 or below for nonresidential areas.

<sup>f</sup> Maximum Allowed Water Allowance (MAWA) is the annual gallons allowed

$$MAWA = (ET_o) \times (0.62) \times [(ETAF \times LA) + ((1-ETAF) \times SLA)]$$

where,  $ET_o$  = annual evapotranspiration rate in inches per year  
 0.62 = factor used to convert inches per year to gallons per square foot  
 $ETAF$  = plant factor  $\div$  irrigation efficiency  
 $LA$  = total (site wide) landscape area in square feet  
 $SLA$  = total special landscape area

**Appendix D: Reference Evapotranspiration Table**

**REFERENCE EVAPOTRANSPIRATION (ET<sub>o</sub>) TABLE**

<b>City</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>	<b>Annual Total (inches per year)</b>
<b>Irvine (North)</b>	2.6	2.5	3.7	4.5	5.4	5.5	6.1	6.0	5.0	3.6	2.6	2.1	49.5
<b>Irvine (South)</b>	2.6	2.5	3.6	4.4	5.3	5.2	5.8	5.7	4.8	3.4	2.6	2.0	47.9
<b>Laguna Beach</b>	2.6	2.5	3.5	4.3	5.1	4.9	5.5	5.4	4.6	3.4	2.5	2.0	48.4
<b>Orange</b>	2.7	2.7	3.3	4.6	5.3	5.7	6.0	6.0	5.2	3.4	2.7	2.0	49.7
<b>Santa Ana</b>	2.6	2.6	3.4	4.5	5.2	5.3	5.7	5.7	4.9	3.4	2.6	2.0	47.8

\* The values in this table were derived from California Irrigation Management Information System (CIMIS) Spatial CIMIS data by zip code. Cities with multiple zip codes present monthly averages.

**Appendix E: Certificate of Completion**

**LANDSCAPE INSTALLATION CERTIFICATE OF COMPLETION**

I hereby certify that:

(1) I am a professional appropriately licensed in the State of California to provide professional landscape design services for \_\_\_\_\_ (project name, mailing address and telephone).

(2) The landscape project for the property located at \_\_\_\_\_ (provide street address or parcel number(s)) was installed by me or under my supervision.

(3) The landscaping for the identified property has been installed in substantial conformance with the approved Landscape Documentation Package and complies with the requirements of Water Efficient Landscape Section IX contained in the City of Orange Landscape Standards and Specifications (Municipal Code Sections 16.50.040) and the Guidelines for Implementation of the Water Efficient Landscape Section IX in the City of Orange Landscape Standards for the efficient use of water in the landscape.

(4) The following elements are attached hereto:

- a. Irrigation scheduling parameters used to set the controller;
- b. Landscape and irrigation maintenance schedule;
- c. Irrigation audit report; and

d. Soil analysis report, if not submitted with Landscape Documentation Package, and documentation verifying implementation of the soil report recommendations.

(5) The site installation complies with the following:

- a. The required irrigation system has been installed according to approved plans and specifications and if applicable, any prior approved irrigation system alternatives.

\_\_\_\_\_ Yes      \_\_\_\_\_ No

- b. Sprinklers comply with ASABE/ICC 802-2014 Landscape Irrigation Sprinkler & Emitter Standard.

\_\_\_\_\_ Yes      \_\_\_\_\_ No

(6) The information I have provided in this Landscape Installation Certificate of Completion is true and correct and is hereby submitted in compliance with Section IX of City of Orange Landscape Standards and Specifications and the Guidelines for Implementation of Water Efficient Landscapes Section IX of the City of Orange Landscape Standards and Specifications.

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

\_\_\_\_\_  
License Number

\_\_\_\_\_  
Address

\_\_\_\_\_  
Telephone

\_\_\_\_\_  
E-mail Address

Landscape Design Professional's Stamp  
(If Appropriate)

E-1



## Appendix F: Definitions

### DEFINITIONS

The terms used in these *Guidelines* have the meaning set forth below:

“*Backflow prevention device*” means a safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system.

“*Conversion factor*” means the number that converts acre-inches per acre per year to gallons per square foot per year.

“*Check valve*” or “*anti-drain valve*” means a valve located under a *sprinkler head*, or other location in the irrigation system, to hold water in the system to prevent drainage from *sprinkler heads* when the sprinkler is off.

“*Certified Landscape Irrigation Auditor*” means a *person* certified to perform landscape irrigation audits by an accredited academic institution, a professional trade organization or other program such as the US Environmental Protection Agency’s WaterSense irrigation auditor certification program and Irrigation Association’s Certified Landscape Irrigation Auditor program.

“*Certification of Design*” means the certification included as Exhibit E of these Guidelines that must be included in the *Landscape Documentation Package* pursuant to Section 2.1 of these Guidelines.

“*City*” means the City of Orange or its authorized designee.

“*Common interest developments*” means community apartment projects, condominium projects, planned developments, and stock cooperatives per Civil Code Section 1351

“*Distribution Uniformity*” or “*DU*” is a measure of how uniformly an irrigation head applies water to a specific target area and theoretically ranges from zero to 100 percent.

“*Drip irrigation*” means any non-spray *low volume irrigation* system utilizing emission devices with a *flow rate* measured in gallons per hour. *Low volume irrigation* systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

“*Emitter*” means a *drip irrigation* emission device that delivers water slowly from the system to the soil.

“*Estimated Applied Water Use*” or “*EAWU*” means the annual total amount of water estimated to keep plants in a healthy state. It is based on factors such as reference *evapotranspiration rate*, the size of the *landscaped area*, *plant water use factors*, and the *irrigation efficiency* within each hydrozone.

“*Evapotranspiration adjustment factor*” or “*ETAF*” means a factor of 0.7, that, when applied to *reference evapotranspiration*, adjusts for *plant factors* and *irrigation efficiency*, two major influences upon the amount of water that needs to be applied to the landscape. A combined plant mix with a site-wide average of 0.5 is the basis of the *plant factor* portion of this calculation. For purposes of the ETAF, the average *irrigation efficiency* is. Therefore, the ET Adjustment Factor is  $(0.7) \times (0.5) = 0.35$ . ETAF for a Special Landscape Area shall not exceed 1.0. ETAF for existing non-rehabilitated landscapes is 0.8.

“*Evapotranspiration rate*” means the quantity of water evaporated from adjacent soil and other surfaces and transpired by plants during a specified time.

“*Flow rate*” means the rate at which water flows through pipes, *valves* and emission devices, measured in gallons per minute, gallons per hour, or cubic feet per second.

“*Hardscapes*” means any durable material or feature (*pervious* and *non-pervious*) installed in or around a *landscaped area*, such as pavements or walls. Pools and other water features are considered part of the *landscaped area* and not considered *hardscapes* for purposes of these Guidelines.

“*Hydrozone*” means a portion of the *landscaped area* having plants with similar water needs and typically irrigated by one *valve/controller* station. A *hydrozone* may be irrigated or non-irrigated.

“*Infiltration rate*” means the rate of water entry into the soil expressed as a depth of water per unit of time (e.g., inches per hour).

“*Invasive plants species*” or “*noxious*” means species of plants not historically found in California that spread outside cultivated areas and can damage environmental or economic resources. *Invasive plant species* may be regulated by county agricultural agencies as *noxious species*.

“*Irrigation audit*” means an in-depth evaluation of the performance of an irrigation system conducted by a *Certified Landscape Irrigation Auditor*. An *irrigation audit* includes, but is not limited to: inspection, system tune-up, system test with *distribution uniformity* or emission uniformity, reporting *overspray* or *runoff* that causes overland flow, and preparation of an irrigation schedule.

“*Irrigation Management Efficiency*” or “*IME*” means the measurement used to calculate the *irrigation efficiency* of the irrigation system for a landscaped project. A 90% IME can be achieved by using evapotranspiration controllers, soil moisture sensors, and other methods that will adjust irrigation run times to meet plant water needs.

“*Irrigation efficiency*” or “*IE*” means the measurement of the amount of water beneficially used divided by the amount of water applied to a *landscaped area*. *Irrigation efficiency* is derived from measurements and estimates of irrigation system characteristics and management practices. The minimum average *irrigation efficiency* for purposes of these *Guidelines* is 0.71. Greater *irrigation efficiency* can be expected from well designed and maintained systems. The following irrigation efficiency may be obtained for the listed irrigation heads with an IME of 90%:

Irrigation Method	DU <sub>LQ</sub>	DU <sub>LH</sub> *	EU	IE**
Spray nozzles	65%	79%		71%
High efficiency spray nozzles	70%	82%		73%
Multi stream/Multi trajectory rotary (MSMT) nozzles	75%	85%		76%
Stream rotor nozzle	70%	82%		73%
Microspray	75%	85%		76%
Bubblers			85%	77%
Drip emitter			90%	81%
Subsurface drip			90%	81%

\*DU<sub>LH</sub> = .386 + (.614)(DU<sub>LQ</sub>)

\*\* IE (spray) = (DU<sub>LH</sub>)(IME)

\*\* IE (drip) = Emission uniformity (EU)(IME)

“*Landscape coefficient*” (*K*) is the product of a *plant factor* multiplied by a density factor and a *microclimate* factor. The *landscape coefficient* is derived to estimate water loss from irrigated *landscaped areas* and *special landscaped areas*.

“*Landscape Documentation Package*” means the package of documents that a *project applicant* is required to submit to the *City* pursuant to Section 2.1 of these Guidelines.

“*Landscape Installation Certificate of Completion*” means the certificate included as Exhibit F of these *Guidelines* that must be submitted to the *City* pursuant to Section 2.7(a)(1) of hereof.

“*Landscape professional*” means a licensed *landscape architect*, licensed landscape contractor, or any other *person* authorized to design a landscape pursuant to Sections 5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the California Business and Professions Code, Section 832.27 of Title of the California Code of Regulations, and Section 6721 of the California Food and Agriculture Code.

“*Landscaped area*” means all the planting areas, *turf* areas, and *water features* in a landscape design plan subject to the *Maximum Applied Water Allowance* and *Estimated Applied Water Use* calculations. The *landscaped area* does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other *pervious* or *non-pervious hardscapes*, and other non-irrigated areas designated for non-development (e.g., open spaces and existing native vegetation).

“*Lateral line*” means the water delivery pipeline that supplies water to the *emitters* or sprinklers from the *valve*.

“*Low volume irrigation*” means the application of irrigation water at low pressure through a system of tubing or *lateral lines* and low-volume *emitters* such as drip, drip lines, and bubblers. *Low volume irrigation* systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

“*Low volume overhead irrigation*” means aboveground irrigation heads with an upper flow limit of 0.5 GPM.

“*Main line*” means the pressurized pipeline that delivers water from the water source to the *valve* or outlet.

“*Maximum Applied Water Allowance*” or “*MAWA*” means the upper limit of annual applied water for the established *landscaped area*, as specified in Section 2.2 of these *Guidelines*. It is based upon the area’s *reference evapotranspiration*, the *ETAF*, and the size of the *landscaped area*. The *Estimated Applied Water Use* shall not exceed the *Maximum Applied Water Allowance*.

“*Microclimate*” means the climate of a small, specific area that may contrast with the climate of the overall landscaped area due to factors such as wind, sun exposure, plant density, or proximity to reflective surfaces.

“*Mulch*” means any organic material such as leaves, bark, straw or compost, or inorganic mineral materials such as rocks, gravel, or decomposed granite left loose and applied to the soil surface for the beneficial purposes of reducing evaporation, suppressing weeds, moderating soil temperature, and preventing soil erosion.

“*Non-pervious*” means any surface or natural material that does not allow for the passage of water through the material and into the underlying soil.

“*Operating pressure*” means the pressure at which the parts of an irrigation system of sprinklers are designed to operate at by the manufacturer

“*Overspray*” means the irrigation water which is delivered beyond the target area.

“*Person*” means any natural person, firm, joint venture, joint stock company, partnership, public or private association, club, company, corporation, business trust, organization, public or private agency, government agency or institution, school district, college, university, any other user of water provided by the *City* or the *local water purveyor*, or the manager, lessee, agent, servant, officer, or employee of any of them or any other entity which is recognized by law as the subject of rights or duties.

“*Pervious*” means any surface or material that allows the passage of water through the material and into the underlying soil.

“*Plant factor*” or “*plant water use factor*” is a factor, when multiplied by *ET<sub>o</sub>*, that estimates the amount of water needed by plants. For purposes of this *Water Efficient Landscape Ordinance*, the *plant factor* range for low water use plants is 0 to 0.3; the *plant factor* range for moderate water use plants is 0.4 to 0.6; and the *plant factor* range for high water use plants is 0.7 to 1.0. *Plant factors* cited in these *Guidelines* are derived from the Department of Water Resources 2000 publication “Water Use Classification of Landscape Species.”

“*Precipitation rate*” means the rate of application of water measured in inches per hour.

“*Project applicant*” means the *person* submitting a *Landscape Documentation Package* required under Section 2.1 to request a permit, plan check, or design review from the local agency. A *project applicant* may be the property owner or his or her designee.

“*Property owner*” or “*owner*” means the record owner of real property as shown on the most recently issued equalized assessment roll.

“*Reference evapotranspiration*” or “*ETo*” means a standard measurement of environmental parameters which affect the water use of plants. *ETo* is given expressed in inches per day, month, or year as represented in Appendix C of these Guidelines, and is an estimate of the evapotranspiration of a large field of four to seven-inch tall, cool-season grass that is well watered. *Reference evapotranspiration* is used as the basis of determining the *Maximum Applied Water Allowances*.

“*Recycled water*” or “*reclaimed water*” means treated or recycled waste water of a quality suitable for non-potable uses such as landscape irrigation and *water features*. This water is not intended for human consumption.

“*Runoff*” means water which is not absorbed by the soil or landscape to which it is applied and flows from the landscaped area. For example, *runoff* may result from water that is applied at too great a rate (application rate exceeds *infiltration rate*) or when there is a slope.

“*Special Landscaped Areas*” or “*SLA*” means an area of the landscape dedicated solely to edible plants such as orchards and vegetable gardens, areas irrigated with *recycled water*, *water features* using *recycled water*, and areas dedicated to active play such as parks, sports fields, golf courses, and where *turf* provides a playing surface.

“*Sprinkler head*” means a device which delivers water through a nozzle.

“*Static water pressure*” means the pipeline or municipal water supply pressure when water is not flowing.

“*Station*” means an area served by one *valve* or by a set of *valves* that operate simultaneously.

“*Swing joint*” means an irrigation component that provides a flexible, leak-free connection between the emission device and lateral pipeline to allow movement in any direction and to prevent equipment damage.

“*Turf*” means a ground cover surface of mowed grass. Annual bluegrass, Kentucky bluegrass, Perennial ryegrass, Red fescue, and Tall fescue are cool-season grasses. Bermuda grass, Kikuyu grass, Seashore Paspalum, St. Augustine grass, Zoysia grass, and Buffalo grass are warm-season grasses.

“*Valve*” means a device used to control the flow of water in an irrigation system

“*Water Efficient Landscape Section IX*” means the Section contained within the City of Orange Landscape Standards and Specifications, adopted by the City Council on January, 12 2015, and codified in the Municipal Code in Title 16, Chapter 16.50, Section .040.

“*Water Efficient Landscapes Worksheets*” means the worksheets required to be completed pursuant to Section 2.2 of these *Guidelines* and which are included in Appendix B hereof.

“*Water feature*” means a design element where open water performs an aesthetic or recreational function. *Water features* include ponds, lakes, waterfalls, fountains, artificial streams, spas, and swimming pools (where water is artificially supplied). The surface area of *water features* is included in the high water use *hydrozone* of the *landscaped area*. Constructed wetlands used for on-site wastewater treatment, habitat protection, or storm water best management practices that are not irrigated and used solely for water treatment or storm water retention are not *water features* and, therefore, are not subject to the water budget calculation.

“*Watering window*” means the time of day irrigation is allowed.

“*WUCOLS*” means the Water Use Classification of Landscape published by the University of California Cooperative Extension, the Department of Water Resources, and the Bureau of Reclamation, 2000. [www.owue.water.ca.gov/docs/wucols00](http://www.owue.water.ca.gov/docs/wucols00)

## Appendix G: Irrigation Plan Checklist

This is a voluntary compliance tool template developed by the Irrigation Association.

### IRRIGATION PLAN CHECKLIST

Please complete the following checklist by checking all appropriate categories under APPLICANT column, indicating compliance with these content requirements. All submitted plans shall contain the following information:

LANDSCAPE PLAN NUMBER: \_\_\_\_\_

NAME OF PROJECT: \_\_\_\_\_

Applicant		Planner
<input type="checkbox"/>	1. Prevailing winds	<input type="checkbox"/>
<input type="checkbox"/>	2. Slope aspect and degree of slope	<input type="checkbox"/>
<input type="checkbox"/>	3. Soil type and infiltration rate	<input type="checkbox"/>
<input type="checkbox"/>	4. Vegetation type	<input type="checkbox"/>
<input type="checkbox"/>	5. Microclimates	<input type="checkbox"/>
<input type="checkbox"/>	6. Expansive or hazardous soil conditions	<input type="checkbox"/>
<input type="checkbox"/>	7. Water harvesting potential	<input type="checkbox"/>
<input type="checkbox"/>	8. Available water supply, including non-potable and recycled water	<input type="checkbox"/>
All pertinent system information is indicated, including:		
<input type="checkbox"/>	9. Irrigation zones substantially corresponding to hydrozones on the landscape plan and labeled by precipitation rates and method of application	<input type="checkbox"/>
<input type="checkbox"/>	10. Water meters	<input type="checkbox"/>
<input type="checkbox"/>	11. Tap-in location	<input type="checkbox"/>
<input type="checkbox"/>	12. Static water pressure at the point of connection	<input type="checkbox"/>
<input type="checkbox"/>	13. System controller	<input type="checkbox"/>
<input type="checkbox"/>	14. Rain sensor/shut-off device	<input type="checkbox"/>
<input type="checkbox"/>	15. Backflow preventers	<input type="checkbox"/>
<input type="checkbox"/>	16. Shut-off valves and zone control valves	<input type="checkbox"/>
<input type="checkbox"/>	17. Main line and lateral piping	<input type="checkbox"/>
<input type="checkbox"/>	18. Sprinkler heads	<input type="checkbox"/>
<input type="checkbox"/>	19. Bubblers and drip irrigation tubing runs	<input type="checkbox"/>
<input type="checkbox"/>	20. Type and size of main irrigation system components	<input type="checkbox"/>
<input type="checkbox"/>	21. Total required operating pressure for each control valve/zone	<input type="checkbox"/>
<input type="checkbox"/>	22. Graphic depiction of the locations of irrigation system components	<input type="checkbox"/>
<input type="checkbox"/>	23. Total required operating pressure for each control valve/zone	<input type="checkbox"/>
<input type="checkbox"/>	24. Any supplemental stormwater and/or runoff harvesting	<input type="checkbox"/>
System design is in conformance with the following standards:		
<input type="checkbox"/>	25. Certification of Professional Qualifications, attached	<input type="checkbox"/>
<input type="checkbox"/>	26. Pedestrian surfaces located on plan	<input type="checkbox"/>
<input type="checkbox"/>	27. Equipment installed flush with grade for safety	<input type="checkbox"/>
<input type="checkbox"/>	28. Compliance with local codes	<input type="checkbox"/>
<input type="checkbox"/>	29. Overspray onto impervious areas minimized	<input type="checkbox"/>

## Appendix H: Inspection Affidavit

This is a voluntary compliance tool template developed by the Irrigation Association.

### IRRIGATION INSPECTION AFFIDAVIT (To be submitted in conformance with Code Section 309.C)

Irrigation Plan File No: \_\_\_\_\_ Name of Project: \_\_\_\_\_

Irrigation Plan Designer: \_\_\_\_\_ Inspector: \_\_\_\_\_

Date(s) of Inspection: \_\_\_\_\_

**This project was inspected within the limits of customary access for compliance with the approved irrigation plan on file in City Planning. At least two (2) inspections were conducted. The findings are as follows:**

	(Check One)	<u>Yes</u>	<u>No</u>
<b>A. Inspection during construction to check main line in open trench:</b>			
1. Location of main line conforms to as-built plan	_____	_____	_____
2. Size of main line conforms to plan	_____	_____	_____
3. Depth of main line conforms to plan	_____	_____	_____
4. Main line condition is undamaged	_____	_____	_____
5. Main line pressure tested with water and meter to check for visible leaks	_____	_____	_____
6. Specific observations attached if needed	_____	_____	_____
<b>B. Inspection after completion of system installation prior to seeding or sodding:</b>			
1. Settling along trenches is absent	_____	_____	_____
2. System components (i.e., controller, backflow preventer, rain sensor, etc.) installed as specified	_____	_____	_____
3. Rotary heads pressure tested	_____	_____	_____
4. System activated for observation of compliance	_____	_____	_____
5. Landscape components are not blocking application	_____	_____	_____
6. Each station complies with design / as-built plan	_____	_____	_____
7. Matched precipitation rates provided by zone	_____	_____	_____
8. As-built plan provided to owner	_____	_____	_____
9. Specific observations attached as needed	_____	_____	_____

I hereby certify that I am qualified to submit this irrigation inspection affidavit based on the qualification indicated below: (check one)

- Certified Irrigation Designer certified by The Irrigation Association, indicate year of certification \_\_\_\_\_
- State: \_\_\_\_\_ Licensed No. \_\_\_\_\_
- State Agency Phone No. ( \_\_\_\_\_ ) \_\_\_\_\_

\_\_\_\_\_  
Name  
(PRINT)

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date