

*CITY OF CHICO*  
**PARK DEPARTMENT**

**LANDSCAPE DESIGN  
MANUAL**

for  
Public Right-of-Ways, Parks  
and Other Public Facilities

*DESIGN MANUAL  
DROUGHT TOLERANT PLANT LIST  
STANDARD DETAIL PLANS*

Approved by the Bidwell Park and Playground Commission  
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*Prepared by  
City of Chico  
Park Department  
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## **PREFACE**

The Design Manual provides development standards for landscape architects and others, in the preparation of construction documents for median islands, back-up landscaping, parks, natural areas and other public facilities, where the City will assume operations and maintenance activities. These requirements will be used as a minimum standard during the review process, prior to approval of the construction documents by the Chico Park Department and Chico Public Works Department.

The development and implementation of this manual is consistent with Sections 14.40.020 and 18R.08.090 of the Chico Municipal Code.

Use of this manual for private or residential landscape development is voluntary.

## **SECTION 1 DEFINITIONS**

When encountered in these guidelines, the terms below shall have the following definitions.

**Architect.** A Landscape Architect, Architect or Civil Engineer authorized to prepare and stamp landscape plans and specifications under Chapter 3.5 of Division 3 of the California Business and Professions Code, entitled "Landscape Architects Law".

**Adjacent Land Uses.** Existing or proposed uses of the land adjacent to the landscape site, e.g., commercial, industrial or residential. This information is used to determine the scope direction of the landscape.

**Back-up Landscape.** The landscape area located between the back of curb or edge of pavement, and the adjacent private property line, typically in association with "No Access Strips". The back-up area may include park strips where the sidewalk is separated from the curb, or may extend out from a graveled shoulder.

**Inspector.** The individual assigned by the City of Chico to oversee the construction of a landscape project, including Construction Inspector, Senior Civil Engineer, Urban Forester, Park Director or Public Works Director.

**Median Island Landscaping.** The landscape area located in the center of the roadway between the travel lanes. Landscape median islands are typically installed where curb improvements are in place.

**Public Facilities.** Public facilities include municipal building grounds, parks, green belts, redevelopment projects and projects funded by at least 10% of public funds.

## SECTION 2 SUBMITTAL REQUIREMENTS AND PROCEDURES

The following items are required for a project submittal to be considered complete, to facilitate the approval process and to accommodate the City's filing system.

### I. PLANTING AND IRRIGATION CONSTRUCTION DOCUMENTS

- ! All sheets shall be 22" x 34" format (Standard City Format).
- ! Scale of plans to be 1"=20' (Engineer's).
- ! Final plans submitted for Park Department approval shall be stamped with architect's seal and signed by the architect on photo Mylar or similar quality medium.
- ! The Title block on each sheet shall include the project file number and name, the name of the street where the project is located, the name and phone number of project owner and architect, and the name of the contact person for the project.
- ! The limits of work shall only include areas within the public right-of-way or public facility that are to be maintained by the Park/Public Works Department. The project architect is responsible for verifying these limits of work. Identify adjacent conditions and land uses on the plans.
- ! The architect is responsible for verifying that the public facility, back-up or median island geometries are the correct configuration, including "as built" conditions, and have been approved by the Park/Public Works Department - Engineering Division.
- ! A location map that clearly shows the project site shall be placed on the project cover sheet. Major cross streets and freeways should be indicated on the location map. If there is more than one base sheet, include a key map on every sheet that shows the location of the work on that sheet in relation to the whole project.
- ! City standard plan sheets in the LS series shall be used to depict irrigation and planting details.
- ! Sound walls and/or fences located adjacent to back-up areas shall be clearly shown on all plans and labeled with type of material and height. Such structures shall clearly be shown as located on City or private property. Where the wall is to be located on private property the plans shall be labeled with the following note:

"Sound walls and/or fences are a development condition attached to private property. They are not public improvements. All maintenance of sound walls and/or fences is the responsibility

of the adjoining property owner or homeowner's association."

Sound walls located on existing or dedicated right-of-way or on City property shall be permanent and low maintenance, constructed of concrete block, stucco on steel framing or other alternate concrete material. Wood fencing or other temporary material will not be accepted as a sound wall.

- ! Landscape detail and specifications sheets provided by the City shall be incorporated into the construction documents. The sheets shall not be redrawn or revised without prior approval or direction from the Park Department. Details that do not apply to the project shall be crossed out and marked "void" or "omit".
- ! All plans shall indicate locations of existing trees to be preserved, existing and proposed above and below ground utilities, easements, right-of-ways, street lights and traffic signals which occur within or adjacent to limits of work.
- ! Project plans shall be prepared by or under the supervision of a licensed architect. Final reproducible plan sheets must be wet stamped with the architect's seal.

### **Additional Documents Required**

- ! Maintenance Performance Specification and Cost Analysis Report. This report shall provide detailed guidelines for an annual calendar of maintenance activities and ten-year cost associated with maintenance. These costs should allow for replacement of short-lived or frost sensitive plant materials.

This document will be used by the Park Department as a permanent reference for on going maintenance and cost accounting of the site. This document shall be in an 8.5" x 11" format and stapled together with a cover sheet that contains the project title, project #, name of the streets improved, date, name and phone number of project architect, and location map. Refer to the sample Maintenance Performance Specification and Cost Analysis Report provided in Appendix A.

- ! Water Audit. In compliance with the City's Water Conservation Ordinance, a water audit shall be prepared by an auditor certified by the Irrigation Association (IA) or California Landscape Contractor's Association (CLCA). The water audit shall be prepared at the following points in the design process. A sample water audit form is shown in Appendix B.

1. Upon completion of the design phase of the irrigation design, a water audit shall be prepared utilizing the design criteria proposed by the designer of the irrigation system. The irrigation designer shall submit data substantiating that the proposed design has a distribution uniformity (DU) of 65%. No approval shall be granted by the City of Chico for any design that is submitted under this DU.

2. Upon completion of the irrigation system installation and prior to installing plant material, a field test shall be conducted by the water auditor to verify that the installed system provides a minimum DU of 65%. Upon completion of the water audit, the auditor shall also provide an irrigation schedule for review and approval by the City. Approval of the watering schedule must occur prior to the end of the ninety (90) day maintenance period.

## **II. PRELIMINARY PROJECT REVIEW**

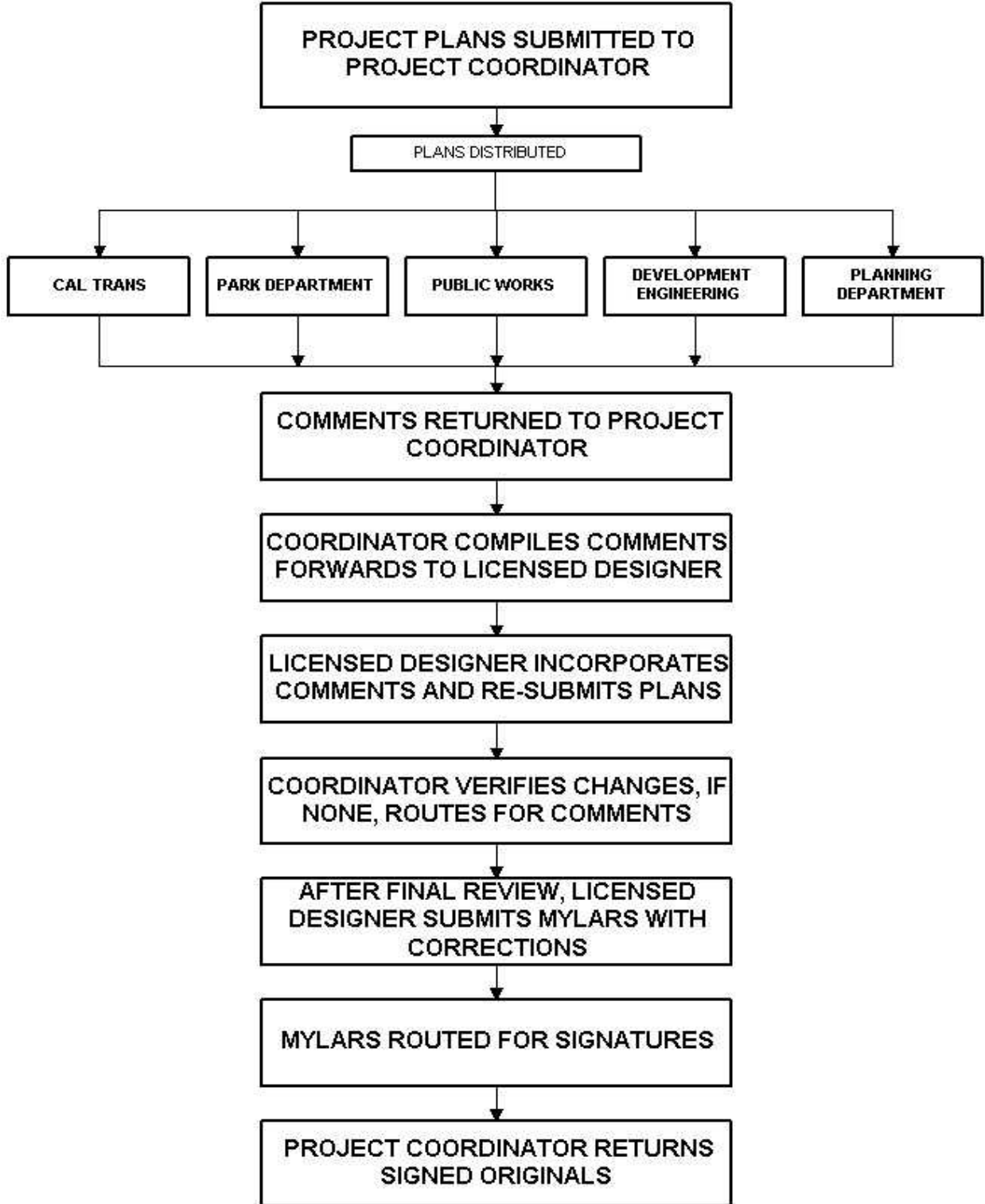
The project proponent is encouraged to submit a preliminary landscape plan, along with other project plans, to the City's Development Review Committee for review to avoid extensive revisions of construction documents. This preliminary plan should address basic design issues.

## **III. PROJECT REVIEW**

All project plans submitted for review shall be routed through the Development Engineering project coordinator, Engineering - Capital Projects project coordinator or City project coordinator. Two (2) complete blue line or xerox plan sets, stamped "Preliminary-Not For Construction", including any backing documentation, will be required to start the project review process outlined on page 5. Where the project involves a Cal Trans right-a-way, please submit four (4) plan copies.

Following the design review process, the project architect shall submit an original print for City official signatures. Each page of the FINAL landscape plan set shall be wet stamped and signed by the Architect. Plans submitted without the wet stamp will be considered as drafts and rejected.

# CITY OF CHICO PROJECT SUBMITTAL REVIEW FLOW CHART





## SECTION 3 LANDSCAPE DESIGN

### I. DESIGN CRITERIA

Plant materials for the project shall be selected from the City's Water Conserving Plant List. The City recognizes that new plant materials are frequently introduced and that new information on existing plant varieties often becomes available. It is the project architect's responsibility to provide the backing information on the plant choice should the architect elect to use plants not included on the City's list.

The architect should take into consideration the plant's useful life span and cultural requirements. For example, Hypericum calycinum requires mowing to maintain a full growth form. Although many species of Ceanothus and Cistus are attractive and drought tolerant, their short life cycles would require them to be replaced on a regular basis. Plant materials shall be selected for their ability to adapt to the limitations caused by the existing soils.

Site visibility along roadways shall be a prime concern for the architect. As such, planting areas located in median islands and parking strips receiving shrub or ground cover massing shall not exceed twenty-four (24) inches from top of curb, based upon the maximum mature plant height.

Decomposed granite or basalt dust surface treatment in lieu of mulch may be used in park strips where foot traffic will occur. The decomposed granite surface treatment accommodates foot traffic and serves as a mulch. Where decomposed granite or basalt crusher dust is used, a border shall be used to separate the planting space from the walking space. Planting areas located between sidewalks and sound walls receive bark mulch for water conservation.

The minimum plant container sizes shall be #1 (one gallon) for low growing shrubs, #5 (five gallon) for large shrubs and #15 (fifteen gallon) for trees. The City may specify a smaller or larger container size depending on the plant species or special site requirements. The architect may also request alternate size plants based upon specific design needs. Ground covers shall be planted from the container size that will provide the fastest plant establishment for the chosen species.

The planting plan shall provide a legend of only plant materials used in the project, and provide the following information for each species: botanical and common names, container size, minimum size and height of plant in the container per the most current ANSI Z60.1 American Standard for Nursery Stock.

On-site landscape designs shall not be intermixed with public landscape designs.

While Chico may have adequate water supplies, State laws and regulations regarding water use restrict landscape water usage. Plant materials selected for municipal facilities and public right-of-ways should be able to survive limited periods of water use restriction, while continuing to maintain an attractive appearance. Plant materials watered by a common irrigation circuit shall have similar watering requirements.

## II. LEVELS OF MAINTENANCE SERVICE

The Park Department has established different levels of maintenance service for median island and back-up landscaped areas, based upon operation costs and available funds to pay for operations and maintenance service levels are shown below.

Level	Landscape Design	Application
1	Parcels without landscaping that receive periodic weed control.	Areas set aside for future landscaping as a project is built out.
2	Projects without automatic irrigation, which would receive trucked in water during a period of establishment.	Revegetation projects or roadside tree planting projects.
3	Projects with automatic irrigation during the establishment period.	Revegetation projects or roadside tree planting projects.
4	Landscaping in these areas consists of trees, low growing shrubs, ground covers, soil preparation and automatic irrigation.	Retention/detention facilities, bike paths.
5	Landscaping in these areas consist of trees, shrubs, woody and perennial-type ground covers, automatic irrigation and minimal soil preparation.	Traffic circles, some back-up areas
6	Landscaping in these areas consist of trees, shrubs, woody shrub and perennial-type ground covers, turf areas, automatic irrigation and significant soil preparation.	Maintenance Assessment Districts, Chico Municipal Airport, Municipal Building, or other such areas.

Table 1. Landscape Maintenance Levels

The project architect is responsible for verifying the level of maintenance service intended for the project site. Submit a maintenance schedule and an estimated ten (10) year maintenance cost for the project. Examples of maintenance schedules and maintenance cost estimates are shown in Appendix A.

## III. MAINTENANCE ACCESS AT MEDIAN ISLANDS

Maintenance personnel require safe access on all median islands to perform their maintenance activities. The required access is provided by a one-foot (1'-0") wide concrete band surrounding all median planting areas as shown in detail LS-25.

#### IV. SELECTION AND LOCATION OF STREET TREES

The species and maximum on-center spacing of street trees shall be determined by the Urban Forester, Park Department (530-895-4944).

All trees shall be located per the recommended minimum setbacks as follows:

Facility	Minimum Distance	Maximum Distance
Traffic signals	30'	varies
Street lights	15'	20'
Water and gas laterals	5'	10'
Driveway aprons	6'	10'
Sewer laterals	6'	10'
Fire hydrants	5'	10'
Projected street corners	varies	varies

Table 2. Minimum/Maximum Clearance Requirements

In working with the listed restrictions, the architect shall attempt to space the street trees as equidistant as possible. Where site constraints prohibit planting trees using the minimums set forth above, the architect may request a variance to the minimum setbacks. Approval of variances shall be at the discretion of the Park Director based upon individual site conditions.

#### V. MINIMUM WIDTHS OF PLANTING AREAS

The minimum width of planting areas shall be as follows:

Vegetation Type	Planter Width	Comments
Ground cover areas	2'	
Shrub areas	3'	
Turf areas	5'	
Trees	5'	Areas less than 5' will require smaller scale trees.
Tree wells	4' X 4'	Use standard tree well detail.

Table 3. Planter Widths

Install twelve-inch (12") root barriers adjacent to sidewalks and eighteen-inch (18") root barriers adjacent to curbing in tree planting areas less than fourteen feet (14') in width, or where specified by the City due to specific site constraints.

## VI. TRAFFIC SAFETY

For safety reasons, proposed plant materials shall not interfere with the sight visibility of vehicular traffic at intersection. No shrubs or ground covers located within median islands, intersections or parking strips shall exceed twenty-four inches (24") in height at maturity from top of adjacent curb. Proposed trees in median islands and intersections shall conform to the following specifications. Copies of the standard plans are included in Appendix C.

<b>Tree Location Layouts</b>	<b>Standard Plan</b>
Non-signalized intersections	LS-24
Median islands	LS-25

Table 4. Intersection Tree Layout

## SECTION 4 IRRIGATION DESIGN

### I. DESIGN CRITERIA

- ! The first and foremost consideration to be given in the design of the irrigation system is the performance of the system. Application methods that are the most efficient for the location and provide the maximum amount of water available to the plants, with the least amount of waste, shall be used on landscapes scheduled for operations and maintenance by the City. It is the architect's responsibility to investigate and implement such methods. Over spray onto street and sidewalk paving shall be reduced to an insignificant level through proper irrigation design.
  
- ! The irrigation plan shall provide an equipment legend and a valve control chart. The equipment legend shall include at a minimum, symbols of all equipment used, name of manufacturer, equipment specifications and architect annotations specific to the project. The valve control chart shall list each valve used in the project, including controller station, program (if applicable), grouping of valves (if applicable), valve size, gpm and number of heads per circuit.  
  
When subterranean irrigation, drip irrigation or alternate irrigation is used, provide emitter flow rating, spacing or triangulation, flushing valves and other pertinent information for each valve.
  
- ! The developer or architect shall complete a Cal Water demand sheet, Form 1318, for meters 1 inch or greater.
  
- ! Construction notes and irrigation notes for the project shall be inked or printed onto the final submittal. Final plans with a "sticky back" photocopy will be rejected.
  
- ! The water meter, backflow prevention device and controller shall be located at back of sidewalk within a public right-of-way or easement. The backflow prevention device shall be located no farther than seven feet (7') from the meter.
  
- ! Provide a separate controller, meter and backflow prevention device for City-maintained landscape areas. No shared utilities with adjacent private property.
  
- ! Verify with the local water utility company for the location and size of the water main and the available water pressure. Fill in the water pressure information on the Specifications sheet.
  
- ! Use a common trench for mains and control wire chases wherever possible. Sleeve all mains, laterals, and control wires under all pavement as shown in standard plan LS-14.
  
- ! Where trees are to be planted in open areas separate from other landscape plants, install one temporary bubbler for each tree, with bubblers grouped together on a separate circuit. Rigid irrigation lines are not to be placed under or directly adjacent to the rootball of a tree.

- ! Spray heads shall not be used in the parking strip areas less than five feet (5') wide. Trees and shrubs in CalTrans right-of-way shall be irrigated with bubblers, with one bubbler to each tree and shrub. Trees and shrubs in City right-of way shall be irrigated with a subterranean drip irrigation system.
- ! Space quick coupler valves a maximum of 150 feet apart. All of the median islands and back-up areas, including paving, shall be accessible with three 50 foot or two 75 foot hose lengths connected to the quick coupler.
- ! Chico has strong prevailing southerly or northerly winds that develop in the late afternoon. In median island areas, when circuiting the spray heads, keep the upwind side on a separate valve from the downwind side. It is incumbent upon the architect to investigate alternate irrigation methods to reduce the amount of over spray and water waste.
- ! Where there is the potential for water to collect and infiltrate the roadway base rock and subgrade, the architect shall use appropriate means to drain excess irrigation and prevent water infiltration below the roadway.
- ! Wiring for electrical control valves shall be in a conduit. Provide an empty conduit chase for telecommunications leading from the controller enclosure to the nearest Pacific Bell pull box.
- ! Where future expansion of the landscape area will take place, extend the irrigation main line and control wire chase to the both ends of the project site. This information will be provided by the Project Coordinator.

## II. SELECTION OF EQUIPMENT

To ensure the highest quality landscape installation and to facilitate efficient landscape maintenance, the City of Chico has developed a set of minimum requirements for landscape materials. Listed below are the specified components for landscape irrigation systems. Irrigation equipment is continually being improved and new equipment introduced. New material or equipment will be considered during the design review stage only. It is the responsibility of the architect to provide the Project Coordinator, through the initial submittal, with adequate information to justify using the new material or equipment.

Controller. Controllers shall be solid state with trickle charge Ni-Cad batteries for back-up power. The standard controller shall be an Irritrol MC+ B series controller. On extremely long project sites, provide voltage drop calculations for the conductors.

Backflow Prevention Device (BPD). State law requires the use of a reduced pressure principle cross-contamination prevention device where the chemical contamination is possible. The backflow prevention device shall be a Wilkins Model 975 reduced pressure principle assembly. If the water supply exceeds fifty (50) PSI, an appropriate pressure regulating device shall be installed.

Enclosures. The required enclosure for irrigation controllers is a LeMeur "AK" or LeMeur "JR" pedestal mount enclosure, with the fan option. The requested enclosure for the backflow unit is manufactured by Strongbox. For BPD's less than two and one-half inches (2½"), the enclosure shall be one piece. Where the BPD is greater than two and one-half inches (2½"), a clamshell type enclosure shall be used. Enclosures shall be painted with a forest green eggshell enamel paint.

Valves. Hardie 700 or Rainbird PEB series remote control valves. Pressure regulating modules may be required where the valve controls a drip irrigation system.

Quick Coupler. Rainbird Model 44 LRC one-inch (1") quick coupling valve with locking rubber cover (LRC).

Spray Nozzle Bodies. Bodies shall be Stop-a-matic (SAM) seal type with pressure regulating stems; six-inch (6") for lawn and bubblers and twelve-inch (12") for shrubs and ground cover. The requested nozzles are Rainbird 1800 series. Requests for equals will be based upon the performance of the nozzles and the durability of the bodies.

Rotors. Rotor heads shall be Hunter I or Rainbird Falcon series; six-inch (6") for lawn and twelve-inch (12") for shrubs and ground cover.

Bubblers. Bubblers shall be Rainbird pressure compensating full circle or stream bubblers.

Irrigation Lines. Laterals shall be minimum of SCH 40 PVC, three-quarter inch (¾") size. Main lines shall be Schedule 40 PVC for one-inch (1") to one and one-half inch (1½"), and Class 315 PVC for two-inch (2") or larger mains. No mainline less than one-inch (1") in size.

Sleeves. Class 315 PVC, minimum four-inch (4") size for water lines and three-inch (3") size for electrical lines. For sleeves six-inch (6") and larger, the sleeve material shall be Schedule 40, or heavier, PVC pipe. High Density Polyethylene(HDPE) culvert material, meeting or exceeding Caltrans specifications, may be used for sleeves greater than six-inch (6") and larger.

Conduit. Irrigation control chase shall be gray Schedule 40 PVC conduit, with a minimum diameter of one and one-half inch (1½"). Electrical supply and phone conduit shall be gray Schedule 40 PVC, with a minimum diameter of three-quarter inch (¾").

## SECTION 5 SPECIFICATION NOTES

### I. GENERAL

- A. The contractor shall perform all work shown on plans in conformance with City of Chico Landscape Design Manual.
- B. The contractor shall notify Underground Service Alert (U.S.A.) at least 48 hours prior to any excavation on this project (Phone No. 800-642-2444) as required by State law.
- C. The contractor shall take precautions not to damage any existing trees and facilities including underground utilities, pipes, structures, and traffic signal loops. It is the contractor's responsibility to replace or repair such trees and facilities at his own expense if damage occurs. Contractor shall contact the Urban Forester prior to excavating in or around root systems of existing trees and shall contact the Department of Public Works - Engineering or the inspector prior to excavating near City facilities. The contractor shall use any alternate means available to avoid damage to the roots of trees or underground facilities. Such methods include, but are not limited to hand trenching, pneumatic or hydraulic excavation, tunneling, boring, probing or equipment substitution.
- D. The contractor shall be responsible for adjusting all existing utility pull boxes, monuments, valves, manholes, etc., as necessary to meet finish grades shown on the plans.
- E. Keep all planting, paving, and curb areas, including the paved nose areas, free from weeds, debris and trash during the entire duration of the contract. The contractor shall apply pre-emergent herbicides per specifications. Post-emergent weed control herbicides may be applied if the inspector deems it necessary. The type of herbicide to be used and method of application shall be approved by the Park Department.  
  
State law requires a licensed Pest Control Advisor to write pest control recommendations prior to application.
- F. "As-Built" plans shall be provided to the inspector prior to commencing the ninety (90) day maintenance period.
- G. Maintenance period shall be ninety (90) days and include, but not be limited to, all watering, weeding, staking, and plant replacement.

### II. PRE-CONSTRUCTION MEETING

- A. The contractor is responsible for coordinating and attending a pre-construction meeting, which shall be attended by the inspector(s) assigned to the project, the Urban Forester and project



architect.

- B. Contractor shall notify the inspector a minimum of twenty-four (24) hours prior to starting work, to arrange the pre-construction meeting (530-895-4884). Contractor shall request site inspections twenty-four (24) hours prior to time needed.

### **III. SURVEY MONUMENTS**

- A. Survey monuments must remain intact and undisturbed unless otherwise indicated on the improvement plans. When the existing monuments must be removed and reset to perform the work in this contract:
  - 1. The contractor shall re-install survey monuments per City standards using a registered engineer or land surveyor.
  - 2.. The contractor shall reference monuments as specified by the City engineer.

### **IV. EXCAVATION OF EXISTING SOIL AND PLACEMENT OF IMPORTED TOPSOIL**

- A. All topsoil delivered shall meet the project specifications. The architect shall submit soil sample(s) and report(s) to the inspector for approval prior to the delivery of any topsoil to the site. In addition to the soil reports, the architect shall identify the supplier of the soil and the source of the soil. Soil from areas known to be contaminated petroleum products, soil sterilants or other chemical contamination will be rejected.
- B. Contractor shall remove existing soil, concrete, asphalt, road base or other debris in the median island planting areas to a depth of thirty inches (30") below top of curb, and replace with imported topsoil specified by the architect.
- C. Back-up areas are defined as the area between curb and sound walls and/or property line. Contractor shall provide soil samples and reports for these areas. The contractor shall remove existing soil, concrete, asphalt, road base or other debris in back-up landscape areas to a depth of eighteen inches (18") below finish grade and replace with topsoil specified by the architect.
- D. When called for on the plans, compacted native soil shall be ripped to a minimum depth of twenty-four inches (24") below the existing grade level. Where the native soil is not compacted, rip the soil surface to a minimum of twelve inches (12").
- E. Where topsoil of a different texture is placed upon the native soil, the initial six-inch (6") layer of soil shall be ripped into the native soil. Care must be taken to avoid abrupt soil horizon layers when working with differing soil texture types.

- F. Construction vehicles are not to be driven on import or native soils after ripping has taken place.

## **V. DROUGHT RESTRICTIONS**

- A. The Contractor shall install plant materials per City Water Conservation Ordinance response requirements as outlined in Titles 18R and 19 of the Chico Municipal Code.
- B. In keeping with the Water Conservation Ordinance, a water audit of the irrigation system, performed by an IA or CLCA certified Water Auditor, shall be conducted after the contractor completes the irrigation system and prior to the installation of plant material.

Irrigation improvements recommended by the audit shall be installed by the contractor as directed by the inspector. The improvements shall be paid for by the owner at rates agreed upon by the owner and the contractor prior to start of work .

## **VI. IRRIGATION NOTES**

- A. The contractor shall verify all existing conditions and water pressure prior to the start of work. If any discrepancy exists between the design and actual field conditions, notify the inspector. The inspector will review the discrepancy with the architect, who will provide design updates prior to any installation.
- B. The water meter shall be installed by Cal Water Company. The installation shall be coordinated by the contractor.
- C. Contractor shall provide electrical hook-up for irrigation controller in conformance with standard plan LS 27. Work is to be performed by licensed electrical contractor.
- E. Mainline and control conduit locations are diagrammatic. Locations of mains, control conduit, laterals, valves and heads are shown for visual clarity. It is the contractor's responsibility to arrange and fit all facilities into the area to be landscaped. Adjust heads to provide complete coverage of planting areas and to eliminate over spray onto streets and sidewalks.

**SECTION 6**  
**IRRIGATION AND PLANTING PLAN NOTES**

**I. General**

- A. All irrigation and planting work, including soil preparation, shall be done by a licensed landscape contractor in a professional manner.
- B. Prior to landscape construction, there shall be a pre-construction meeting between the Project Coordinator, the inspector (phone 530-895-4884), and the contractor.
- C. Contractor shall be responsible for the installation of a working irrigation system, including but not limited to:
  - 1. Coordination and make payments of water meters with California Water Service for the location, connection of the irrigation mains to the new water service and obtaining all permits.
  - 2. Verification of all existing piping, utility lines and wiring within the work area.
  - 3. Connection of quick couplers onto existing irrigation mains.
  - 4. Coordination of installation and connection to the 120V electrical service point.
  - 5. Trenching and backfilling of trenches.
  - 6. Maintenance and guarantee of the irrigation system.
- D. Contractor shall be responsible for the preparation and installation of the planting areas including, but not limited to:
  - 1. Removing all existing exposed and/or buried concrete, gravel, asphalt pavement, rocks (over one-inch (1") in size), weeds, including all underground propagules, and debris within the planting area.
  - 2. Excavation of existing site soil to the depth called for on the plans and disposal off the site.
  - 3. Thoroughly rip and scarify existing soil in the excavated area to a depth of 12". Use smaller equipment or hand tools in tight areas where damage could occur to walks, curbing, pavement or walls.
  - 4. Importation and placement of good quality friable soil free from weeds, contaminants and other noxious materials.
  - 5. Importation, placement and cultivation of organic soil amendment into the imported soil.
  - 6. Application of a pre-emergent weed control in the planting area.
  - 7. Planting , staking and fertilizing of plant materials.
  - 8. Supplying and placing of mulch within planted areas.
  - 9. Maintenance and clean-up of project area during the installation work and the ninety (90) calendar day maintenance period.
  - 10. Guarantee all plant materials for six (6) months and trees for one (1) year after the final acceptance by the City of Chico.

## **II. Irrigation**

### **A. General Conditions**

1. Irrigation plans are drawn to scale with pipe runs shown schematically. Installation shall be adjusted to meet site specific conditions.
2. The system is designed to operate on \_\_\_\_\_ PSI from the Point of Connection (POC) of the service line to the Cal Water main. A pressure check should be taken prior to the start of construction to verify service pressures. If the pressure falls below \_\_\_\_\_ PSI, the project inspector shall be contacted immediately before installation work begins. The optimal system operating pressure is 50 PSI. If pressure is greater than 50 PSI, a Wilkins 70 Series Pressure Reducing Valve shall be installed on the outlet side of the supply as per local codes.
3. The irrigation main shall be hydraulically pressure tested at 150 PSI static pressure for three (3) hours and be approved by the project inspector prior to filling trenches.
4. Completed warranty cards for the automatic controller and other irrigation material shall be delivered to the inspector prior to final acceptance.
5. To avoid overspray and excessive evaporation, the overhead spray systems shall be set to operate from 12 midnight to 6:00 A.M. only. Drip systems may run at any time of the day.
6. Contractor shall adjust the irrigation system to prevent overspray onto adjacent streets or sidewalks.
7. All irrigation work shall conform to City standard plans.
8. All equipment shall be installed per manufacturer specifications.
9. All work shall conform to local codes and regulations.

### **B. Materials**

All materials and equipment shall be new in condition and in working condition when installed.

1. Pipes shall be:
  - a. Class 315 PVC, pressurized main over two-inch (2") size and sSchedule 40 for one and one-half inch (1½").
  - b. Lateral line shall be Schedule 40 PVC.
  - c. Conduit shall be gray Schedule 40 PVC.
2. Fittings shall be:
  - a. Schedule 40 PVC and Schedule 80 PVC, as called for on the plans
  - b. Galvanized steel for backflow prevention devices, or as called for on the plans.
3. Risers shall be:
  - a. Schedule 80 PVC, one-half inch (½"), three-quarter inch (¾") or one-inch (1"), as called for on the plans.
  - b. Schedule 40 galvanized steel on fixed impact heads.
4. Remote control valve boxes shall be Carson , Brooks or Ametek with locking covers.
5. Control wires shall be single strand copper sized for the length of run. Common wires shall be one size larger than the largest control wire. All wires must be suitable for use in conduit and be looped up a minimum of three feet (3') in every valve box intercepted on the way to the controller.
6. Reduced pressure backflow device, gate valves, electric solenoid valves, quick coupler valves and

controllers shall be the working model and size specified in the irrigation legend.

### **C. Installation**

1. All irrigation piping running parallel to the planting areas shall be installed in the planter areas.
2. Heads, location of heads and pipe sizes shall be as per plan. Irrigation plans are diagrammatic. The final location may be adjusted slightly to varying site conditions.
3. Pipe shall be installed in trenches no less than six inches (6") wide and free from debris and rocks over one-inch (1") in diameter. All non-threaded PVC joints shall be primed and solvent welded.
4. Pipes shall be installed at the following depths.
  - a. Main line supply, twenty four inches (24").
  - b. Lateral lines, eighteen inches (18").
5. Plastic fittings shall be a minimum of eighteen inches (18") apart to facilitate removal and replacement of individual fittings
6. Class 315, Schedule 40 or corrugated HDPE pipe sleeves shall be placed under all paved areas. Trench backfill material shall be placed as shown on the plans and compacted in six-inch (6") lifts.
7. All lines shall be flushed and checked for leaks prior to backfilling of trenches. Repairs shall be made while the piping is still exposed.
8. Shrub and strip heads shall be placed no farther than six inches (6") from walls or fences. Shrub and strip heads adjacent to sidewalks shall be located six inches (6") behind the walk.
9. Manual gate valves shall be installed in a locking valve box per standard plan LS-11. Valve box shall correspond to the size of the valve, with the minimum size being six inches (6").
10. Install reduced pressure backflow device and filter assemblies as per details.
11. Remote control valves shall be located in valve boxes placed with the planting areas with the top of boxes set one-inch above finish grade. Allowances shall be made for settling. All electrical connections shall be protected with Rainbird "Snap-Tite" connectors, or equal.
12. Control wire conduit shall be placed in the same trench as the main line.
13. Quick coupler valves shall be 1 inch with locking rubber cover in stalled one hundred-fifty feet (150') on center (maximum) one-inch (1") above grade or in a valve box when installed in turf. QCV shall be installed with the City standard triple swing joint. QVC shall be placed within twelve inches (12") from the edge of the sidewalk or curb.

## **III. Soil Preparation and Planting**

### **A. General Conditions**

1. Planting plan is drawn to scale. Planting should be located in the relative locations shown on the plans, with adjustments for existing conditions allowed. Spacing on shrubs and ground covers shall be as called for on the planting plan. Final planting locations shall be approved by the inspector.
2. All contaminants and debris shall be removed from the native soil prior to ripping and placement of imported topsoil. Minimum ripping depth shall be twenty-four inches (24"). Place imported topsoil and rough grade to uniform slope as shown on the plans, compacting the soil to a maximum relative density of 85%.

3. Finish grading shall consist of finely finished surfaces by raking smoothly and evenly, removing all extraneous matter to facilitate natural runoff. Finish grades shall slope to drain, without water pockets or irregularities. Finish grades shall meet all existing controls and shall be one inch below tops of sidewalks or curbs. Grades shall be of uniform slope and not exceed 4:1.
4. Plant trees, shrubs and ground covers only during periods which are normal for such work as determined by the season, weather and accepted practice. At the option of, and full responsibility, the contractor may conduct operations under unseasonable conditions without compensation.
5. All plant materials are to be inspected and approved by the inspector prior to installation. Contact the project inspector two (2) days prior to inspection of plant materials.

## **B. Materials**

1. Imported topsoil shall be a natural, fertile, friable loam or clay loam possessing characteristics of productive soils in naturally well drained areas and shall be free from subsoil, construction or chemical contaminants, noxious weeds or any other material harmful to plant growth. Submit sample and soils analysis report prior to delivery to site. The soil be in the pH range of 6.0 to 7.0, with a SAR of 0 - 3, and an Ece of 0 - 2. The imported topsoil shall be approved prior to delivery to the site.
2. Amendments and commercial fertilizers shall be incorporated at the rates called for on the architects drawings. The amendments shall be thoroughly incorporated into the top six inches of soil.
3. Planting backfill shall consist of existing site soil, less any rocks or debris over one-inch (1") in diameter.
4. Water shall be suitable for irrigation and free of contaminants harmful to plant growth.
5. Supports for trees shall be two (2), three-inch (3") treated lodgepole pine stakes. See "Tree Staking" detail for spacing information.
6. Plant materials provided shall be the quantity, genus, species, variety, size, and condition as shown on the Planting Plan and plant list. Plants are to be healthy nursery stock meeting the ANSI Z60 Standard, well branched, with central leaders intact, and free from disease, insect, injury or weeds.
7. Provide clean, dry mulch materials for the entire planting area, consisting of three-quarter inch (3/4") to one and one-quarter inch (1¼") fir bark, or approved equal, free from foreign and harmful materials. Submit mulch sample prior to delivery to the site. Caltrans project shall receive mulching within the watering ring.
8. Pre-emergent weed control shall be an herbicide applied as per the Pest Control Advisor's recommended rate and application method.

## **C. Execution**

1. Remove all existing soil, concrete, asphalt, road base or other debris to a depth of thirty inches (30") in median planter areas and replace with imported topsoil. Remove surface concrete, asphalt, base and other debris in areas other than median island planters.
2. Rip compacted native soil to a depth of twenty-four inches (24") below existing grade level. Where native soil is not compacted, as determined by the or Urban Forester, rip to a depth of twelve inches (12") below existing grade before placing imported topsoil on site.
3. Place the initial topsoil in a six-inch (6") lift. Mix the first lift into the native soil to eliminate soil texture

- barriers. Add the remaining soil.
4. Evenly spread organic and fertilizer amendments at the rate called for by the architect. Thoroughly mix applied amendments into the top six inches (6") of soil.
  5. Mixed soil shall be raked and otherwise sufficiently worked so that after 85% compaction the soil level is one inch below the top of the curb or sidewalk, as shown on the plans.
  6. Planting holes shall be two (2) times the rootball width. Place trees and shrubs plumb and faced to give best appearance or relationship to adjacent plants and structures. Backfill planting hole as per standard plan.
  7. Slow release plant tabs, if called for, shall be placed within the lower two-thirds of the root ball.
  8. Stake trees and form basins around trees and shrubs as indicated on the standard plans.
  9. The planting area shall be restored to finish grades after planting. Fill any low areas after settling and re-compact.
  10. After each planting area is finished, apply the pre-emergent weed control as specified using the Pest Control Advisor's recommended application rate and method.
  11. Apply a uniform two-inch (2") layer of fir bark mulch in all landscaped areas. Remove mulch from plant foliage and paved areas. Hose down all mulched areas with a fine spray of water.
  12. All areas of work shall be kept in a neat and orderly condition at all times. Where public access is available to the site during construction, provide public protection measures as necessary. Clean-up of the area will be required prior to final acceptance for operations and maintenance by the City of Chico.

#### **D. Maintenance**

1. Maintenance shall be the responsibility of the contractor during construction prior to acceptance for maintenance by the City of Chico and during the ninety (90) calendar day maintenance period.
2. The ninety (90) calendar day maintenance period shall commence upon the 100% completion of the project, inspection by the inspector and delivery of the project As-builts.
3. The contractor shall be responsible for maintaining walks, drives and pavement free of hazardous materials and conditions resulting from the irrigation and planting work.
4. General requirements during the ninety (90) calendar day maintenance period include , but are not limited to, weeding, plant repair or replacement, irrigation system operation or repair and keeping the project area neat and orderly.
5. All plant material must be in a healthy growing condition and all areas weed free before acceptance for maintenance and final acceptance for maintenance and operation by the City of Chico. Plants replaced immediately before the end of the ninety (90) day maintenance period shall be deemed unacceptable and delay the final acceptance of the project.

#### **E. Guarantee**

1. Guarantee shall commence upon the final project acceptance for operations and maintenance by the City of Chico.
2. The Contractor shall guarantee the irrigation system in writing against defects in materials and workmanship for one (1) year after the final acceptance for maintenance and operation by the City

of Chico and shall furnish the City with all equipment warranties and guarantees. Repairs shall be made by the contractor without additional cost to the City of Chico, unless the damage is a result of vandalism or neglect and abuse.

3. The Contractor shall guarantee that all soil preparation, weed control and planting were performed in accordance with these specifications and acceptable practices, and that all plant materials were planted in a healthy, growing condition. Shrubs shall be guaranteed for six (6) months following final acceptance. Trees shall be guaranteed for one (1) year following final acceptance.
4. The guarantee period shall be at not additional cost to the City of Chico.

#### **F. "As-Built" Plans**

1. Provide legibly marked annotations on the original 22" X 34" Mylar to show actual construction layout.
2. Provide a reduced drawing, 11"X17", of the actual "As-Built" irrigation system. The drawing shall be black ozalid or xerox print and colored to show the area of coverage for each valve. The drawing shall be hermetically sealed between two sheets of 10 mils plastic and placed in the irrigation controller cabinet.
3. The project **will not be accepted** for maintenance and operations by the City of Chico until the "As-Built" originals are received by the inspector.



## **Appendix A**

### **Maintenance Performance and Cost Analysis Examples**

## Landscape Project Maintenance Requirements

### Anticipated Service Requirements

Parcel Location	LOS										
Bruce Road Median and Back-up	6	7 Day Service	Daily Service	X Weekly Service	Twice Weekly Service	Summer Bi-Weekly	Winter Bi-Weekly	Winter Monthly	X Monthly Service	X Annual Service	X Specialized Services
8 <sup>th</sup> Street Median	6			X Weekly Service					X Monthly Service	X Annual Service	X Specialized Services
Park/Retention Pond	6	X		X					X	X	X
Retention Pond	4					X		X			

Table 1. Service Matrix

### Cost Analysis

#### Estimated Yearly Costs

Cost Center	Parcel	Parcel Area	Area Cost	Monthly Cost	Yearly Total
Maintenance	1 (Median)	9,600 sq ft	\$0.035/sq ft	\$336.00	\$4032.00
	2 (Median)	2,800 sq ft	\$0.02/sq ft	\$56.00	\$672.00
	3 (Park)	108,900 sq ft	\$0.0225/sq ft	\$2,450.25	\$29,403.00
	4 (Retention)	3,500 sq ft	\$0.015/sq ft	\$52.50	\$630.00
Water	Meter Charges			\$86.08	\$1,032.96
	Water Used			\$380.00	\$4,560.00
Electricity				\$60.00	\$720.00
Materials				\$150.00	\$1,800.00
<b>Totals</b>				<b>\$3,570.83</b>	<b>\$42,849.96</b>

Table 2. Estimated Maintenance Cost Calculations

## Activity Definitions

The following is a listing and description of the work activities to be performed at the locations listed on the matrix

### A. REGULARLY SCHEDULED ACTIVITIES

SEVEN DAY SERVICE: Seven days per week service shall consist of the following.

- a. Visual check for hazards & damage due to vandalism & repair of damaged areas & facilities.
- b. Visual inspection of play equipment for hazards or damage, maintaining a daily inspection log & repairing defective equipment or hazards immediately.
- c. Trash, litter & debris removal.
- d. Special Surfaces Cleaning as required by the site.

DAILY SERVICE: Daily service shall consist of the following.

- a. Visual check for hazards & damage due to vandalism & repair of damaged areas & facilities.
- b. Visual inspection of play equipment for hazards or damage, maintaining a daily inspection log & mitigating defective equipment or hazards immediately, where appropriate.
- c. Trash, litter & debris removal.

TWICE WEEKLY SERVICE: Twice weekly service shall consist of the following.

- a. Trash, litter and debris removal.
- b. Visual inspection of play equipment for hazards or damage, maintaining a daily inspection log and mitigating defective equipment or hazards immediately, where appropriate.
- c. Watering planters by hand, where required.
- d. Visual check for hazards and damage due to vandalism and normal wear and tear.

WEEKLY SERVICE: Weekly service shall consist of the following.

- a. Trash, litter and debris removal
- b. Weed control
- c. Pest and insect control
- d. Clean walks and drives
- e. Irrigation system maintenance
- f. Remove suckers and water sprouts from trees
- g. Mow and edge once per week minimum, February through November
- h. Deadhead flowers, where applicable

SUMMER BI-WEEKLY SERVICE: Every other week service shall be conducted from March 31 to December 1 and consist of the following.

- a. Trash, litter and debris removal
- b. Weed control
- c. Pest and insect control
- d. Irrigation system maintenance
- e. Mow as necessary, if applicable

WINTER BI-WEEKLY SERVICE: Every other week service shall be conducted from December 1 to March 31 and consist of the following.

- a. Trash, litter and debris removal
- b. Weed control
- c. Pest and insect control
- d. Irrigation system maintenance

- f. Mow as necessary

WINTER MONTHLY SERVICE: Once per month service shall be conducted from December 1 to March 31 and consist of the following.

- a. Trash, litter and debris removal
- b. Weed control
- c. Pest and insect control
- d. Mow as necessary

MONTHLY SERVICE: Monthly service shall consist of the following.

- a. Fertilize turf six to eight times per year
- b. Rough mowing - March through October
- c. Prune shrubs informally or formally
- d. Fertilizer shrubs two to three times per year

ANNUALLY: Annual service shall consist of the following.

- a. Renew chip mulch in all planter areas
- b. Fertilize trees via soil injection
- c. Core and thatch lawns per specifications, as required

## B. SPECIALIZED/SEASONAL ACTIVITIES

Specialized/seasonal services shall include the following:

Play Surfaces: Inspect play equipment and play surfaces. Renew or replace sand or fall zone materials.

Painting: Paint tables, benches, picnic tables, trash containers and light standards.

Overseeding: Overseed lawns after thatching, per specifications.

Groundcover Mowing: Mow hypericum and honeysuckle to a height of four (4) inches and fertilize per contract specifications.

Informal Shrub Pruning: Prune shrubs in an informal manner.

Formal Shrub Pruning: Shear shrubs for formal appearance.

Roadway Edging: Prune ground covers back from graveled shoulders.

Flat Mowing Weed Control: Five (5) times per year minimum.

Retention Pond Cleaning: Clear cat tails and other aquatic vegetation from the pond bottom in late-October.

Upgraded Surface Cleaning: Surface cleaning shall include:

- a. Washing of walks, parking areas, or driveways, as needed to remove dirt and other debris not removed by normal means.
- b. Remove cobwebs and dust from carports lights to maintain a neat appearance. Cleaning shall be conducted a minimum of three (3) times per year.

Annual Color: Change annual color display beds a minimum of four (4) times per year.

## **Appendix B**

### **Water Audit Forms and Examples**

## ESTIMATED WATER EFFICIENCY STATEMENT

### SITE INFORMATION:

Project Site:	
Project Location:	
Project Number:	
Landscape Architect:	
Irrigation Designer:	
Contractor:	
Submittal Date:	
Approval Date:	

### ESTIMATED WATER USAGE:

WATER SOURCES:	ESTIMATED GALS OR CU. FT. PER YEAR
<b>MAXIMUM APPLIED WATER ALLOWANCE, MAWA = (E<sub>to</sub>)(0.8)(LA)(0.62)</b> WHERE: MAWA=MAXIMUM APPLIED WATER ALLOWANCE (GALLONS PER YEAR) E <sub>to</sub> =REFERENCE EVAPOTRANSPIRATION (INCHES PER YEAR) 0.8 =ET ADJUSTMENT FACTOR LA =LANDSCAPE AREA (SQUARE FEET) 0.62 =CONVERSION FACTOR (TO GALLONS PER SQUARE FOOT)	
ESTIMATED WATER APPLIED FROM PROPOSED IRRIGATION SYSTEM ( NOT TO EXCEED MAXIMUM APPLIED WATER ALLOWANCE).	
PERCENTAGE (25%) OF AVERAGE PRECIPITATION OF SITE.	
<b>ESTIMATED TOTAL WATER USAGE FOR SITE, ETWU = <math>\frac{(E_{to})(PF)(HA)(.62)}{(IE)}</math></b> WHERE: ETWU=ESTIMATED TOTAL WATER USE (GALLONS PER YEAR) E <sub>to</sub> =REFERENCE EVAPOTRANSPIRATION (INCHES PER YEAR) PF =PLANT FACTOR (0-0.3 LOW, 0.4-0.6 MEDIUM, 0.7-1.0 HIGHPLANT WATER USAGE) HA =HYDROZONE AREA (SQUARE FEET) (.62) =CONVERSION FACTOR IE =IRRIGATION EFFICIENCY	





## CERTIFICATE OF LANDSCAPE PROJECT COMPLETION

**POST-INSTALLATION INSPECTION:**

INSPECTIONS:	SIGNED DATE OF COMPLETION:
PLANTS INSTALLED AS SPECIFIED	
IRRIGATION SYSTEM INSTALLED AS DESIGNED	
a. Dual distribution system for recycled water	
b. Minimal run off or over-spray	
LANDSCAPE IRRIGATION AUDIT PERFORMED	

**SIGNED DOCUMENTS:**

DOCUMENT:	SUBMITTAL DATE:	APPROVAL DATE:	SIGNED COMPLETION DATE:
LANDSCAPE DESIGN PLAN			
IRRIGATION DESIGN PLAN			
GRADING DESIGN PLAN			
WATER EFFICIENCY STATEMENT			
WATER AUDIT			
MAINTENANCE SCHEDULE			
SOIL ANALYSIS			

**WATER USAGE:**

WATER SOURCES:	ESTIMATED GALS OR CU. FT. PER YEAR
<p><b>MAXIMUM APPLIED WATER ALLOWANCE, MAWA = (ET<sub>o</sub>)(0.8)(LA)(0.62)</b>            WHERE= MAWA=MAXIMUM APPLIED WATER ALLOWANCE (GALLONS PER YEAR)            E<sub>to</sub> =REFERENCE EVAPOTRANSPIRATION (INCHES PER YEAR)            0.8 =ET ADJUSTMENT FACTOR            LA =LANDSCAPE AREA (SQUARE FEET)            0.62 =CONVERSION FACTOR (TO GALLONS PER SQUARE FOOT)</p>	
WATER APPLIED FROM PROPOSED IRRIGATION SYSTEM ( NOT TO EXCEED MAXIMUM APPLIED WATER ALLOWANCE).	
PERCENTAGE (25%) OF AVERAGE PRECIPITATION OF SITE.	

<p><b>TOTAL WATER USAGE FOR SITE, ETWU = <math>\frac{(ET_o)(PF)(HA)(.62)}{(IE)}</math></b></p> <p>WHERE: ETWU=ESTIMATED WATER USE (GALLONS PER YEAR)          Eto =REFERENCE EVAPOTRANSPIRATION (INCHES PER YEAR)          PF =PLANT FACTOR (0-0.3 LOW, 0.4-0.6 MEDIUM, 0.7-1.0 HIGH PLANT WATER USAGE)          HA =HYDROZONE AREA (SQUARE FEET)          (.62) =CONVERSION FACTOR          IE =IRRIGATION EFFICIENCY</p>	
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**SIGNATURES OF COMPLETION**

I/we certify that work has been installed in accordance with the contract documents.

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_____ Contractor	Signature	Date	State License Number
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I/we certify that based upon periodic site observations, the work has been substantially completed in accordance with the Water Efficient Landscape Ordinance and that the landscape planting and irrigation installation conform with the approved plans and specifications.

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_____ Landscape Architect	Signature	Date	State License Number
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As a representative of the City of Chico, I/we certify that I/we have received all of the contract documents and that it is our responsibility to see that the project is maintained in accordance with the contract documents.

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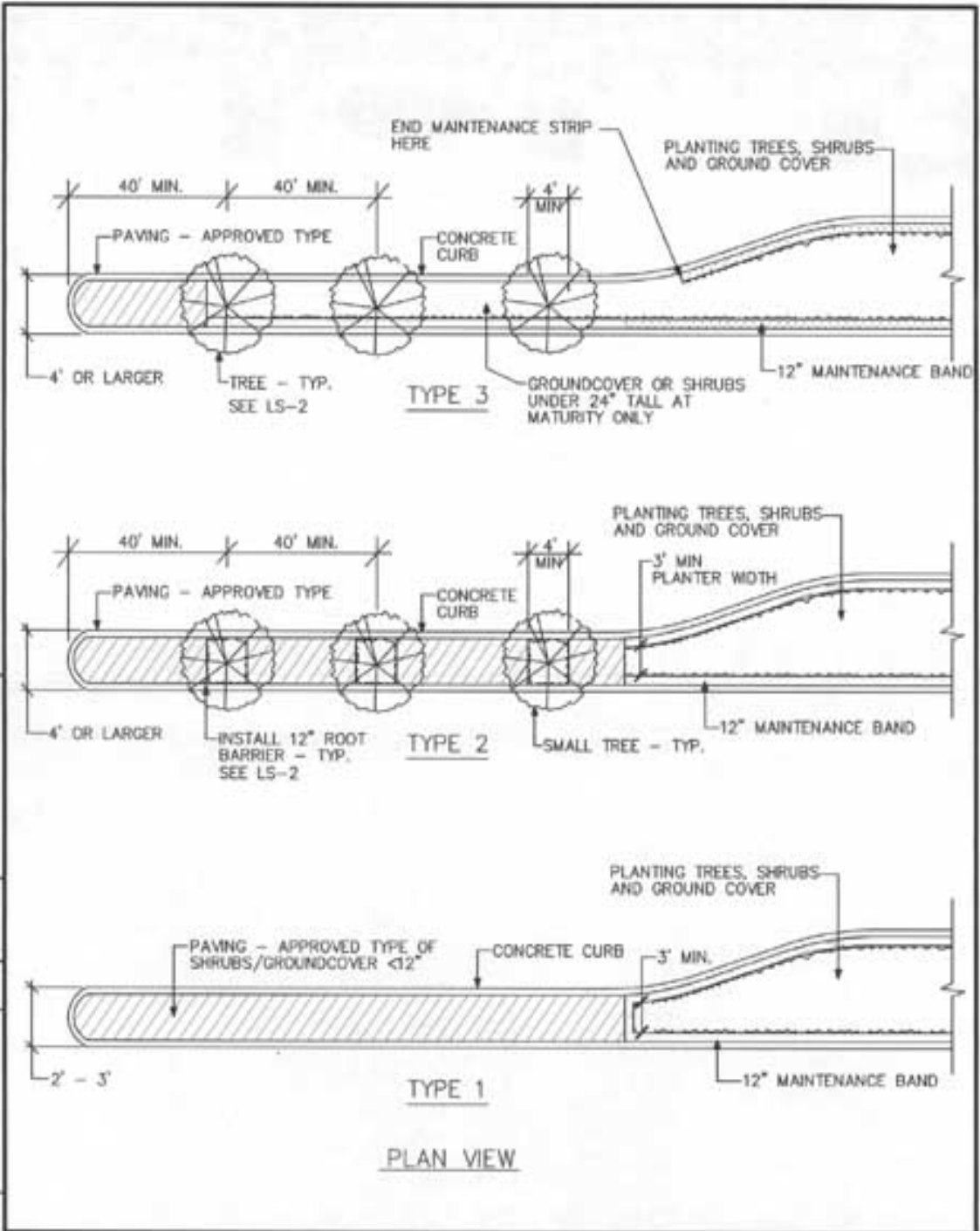
_____ City of Chico	Signature	Date	Position of Employment
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\_\_\_\_PROJECT SUBMITTAL PACKAGE AND A COPY OF THIS CERTIFICATION HAS BEEN PROVIDED TO THE CITY OF CHICO.

## **Appendix C**

### **Intersection Layouts**

REVISION	BY	DATE	APP.	BY	COUNCIL



CITY OF CHICO		STANDARD PLAN	
DRAWN BY	L.I.	DATE	8/97
CHECKED	C.B.	SCALE	NONE
APPROVED	<i>[Signature]</i>		
DIRECTOR OF PUBLIC WORKS R.C.E. NO.			
TREE AND PAVEMENT LAYOUT IN MEDIAN ISLANDS RELATED TO WIDTH OF MEDIAN			NO. LS-25
			SHEET 1 OF 1