CITY OF ANAHEIM

DEPARTMENT OF PUBLIC WORKS
LANDSCAPE AND IRRIGATION MANUAL
FOR
PUBLIC STREET AND HIGHWAY
RIGHTS-OF-WAY AND EASEMENTS

Policies and Guidelines
Procedures
Specifications
Standard Drawings

August 2003

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INTRODUCTION

Purpose

The City of Anaheim is a dynamic, growing community engaged in redevelopment as well as new developments. As the City is noted for the landscape personality of its streets and highways, there is an apparent need to uphold this identity. This Landscape and Irrigation Manual is presented as a tool to build on the City's beautification legacy.

The objective of the Landscape and Irrigation Manual is to provide a formalized guide to City staff, designers, and developers for new and refurbished improvements in the public street and highway rights-of-way and easements.

The mission of the manual is to:

1. Articulate City policies related to the beautification of Anaheim's public street and highway rights-of-way and easements.

2. Formulate policies and guidelines to guide City staff, designers, and developers through the planning and design development and approval process.

3. Develop procedures in sufficient detail to accomplish aesthetic, construction, and maintenance objectives while providing latitude in design.

4. Provide standard specifications and drawings to achieve consistency in construction and promote public safety.

Use of this Manual

The format of this manual is designed to expedite preparation of landscape and irrigation construction documents. Each division has a purpose, from describing desired results to eliminating the need for development of special details and specifications for each project. A detailed Table of Contents and a complete Index are included to assist the user.

Division I – Policies and Guidelines presents a results oriented overview, the "who, what, and why" for these public landscapes. All projects must conform to the applicable policies and guidelines.

Division II – Procedures outlines the formal process for plan preparation, submittal, and approval, providing the "where and when." Each project shall follow the required steps to approval.

Division III – Specifications and Division IV Standard Drawings are to be used in conjunction with the "Greenbook" Standard Specifications for Public Works Construction and its companion publication Standard Plans for Public Works Construction. The included standard specifications and drawings modify, replace, or supplement the "Greenbook" provisions to which they are referenced. These are the "how" for the construction documents.

Approvals

Recommended by: _____ 6/17/04
Deputy City Engineer — Date

Approved by: _____ 6·22·04
Director of Public Works and City Engineer — Date

DIVISION I

POLICIES AND GUIDELINES

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DIVISION I

POLICIES AND GUIDELINES

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POLICIES AND GUIDELINES

SECTION I – GENERAL

1-1 GENERAL REQUIREMENTS

The City of Anaheim Department of Public Works is responsible for design, construction, and maintenance oversight for all landscape and irrigation within the public street and highway rights-of-way and easements. Please note the exception at the end of this subsection 1-1.

It is the policy of the City of Anaheim that all such landscape projects must be submitted in accordance with the established requirements described in this manual.

In general, plans shall be limited only to the landscape and irrigation within City-owned rights-of-way and easements. Landscape and irrigation plans for onsite development should be submitted directly to the Planning Department.

Plans that show landscaping and irrigation shall be submitted under the following conditions:

A. Separate public plans, if maintained by City.
B. Combined private plans, if maintained by property owner.

Reference made to product brand names and/or other specific requirements are intended for all installations. However, product brand and/or specific requirements may be changed or waived by the City Engineer under certain circumstances.

Please contact the City of Anaheim Department of Public Works at (714) 765-5176 for specific information.

EXCEPTION: The City of Anaheim Department of Community Services is responsible for street trees within the public street rights-of-way and easements for local streets outside the boundaries of the Anaheim Resort Maintenance District. Local streets are all those public streets not classified as a type of arterial street or highway on the Circulation Element of the City of Anaheim General Plan.

Please contact the City of Anaheim Department of Community Services, Urban Forestry Division, at (714) 765-6920 for specific information.

1-2 MAINTENANCE REQUIREMENTS

It is the policy of the City of Anaheim that, at the time a landscape project is proposed, the proposal shall include one, a statement of public benefit; two, a statement of maintenance responsibility; and three, a proposed maintenance funding vehicle if public maintenance is proposed.

Projects of regional public benefit will generally be publicly maintained by the Public Works Department. Typical of this category are major arterial highway median projects that are consistent in design within the City limits.

Projects of area-wide public benefit will generally be publicly maintained by the Public Works Department. Funding for maintenance needs to be identified from a Citywide source. This category includes major arterial highway parkways and general arterial highway medians and parkways.

Projects of general public benefit will generally be publicly maintained by the Public Works Department. Funding for maintenance needs to be identified from general sources such as a lighting and landscape district. The category includes collector street parkways.

Projects of localized public benefit will generally not be publicly maintained by the Public Works Department. Maintenance and its funding shall be by the property owners or homeowner's association (HOA). This category includes local street parkways and medians.

Projects without public benefit will not be considered for public street and highway rights-of-way and easements.

SECTION 2 – GRADING

2-1 LANDSCAPE GRADES

2-1.1 Median Island Grading. Cross-slope grades for landscaped and hardscape areas shall be a minimum of 1 percent and a maximum of 10 percent

2-1.2 Parkway Grading. Parkways shall be graded to the ultimate road right-of-way.

Parkway areas containing both landscape planting and hardscape shall be maintained at a 2 percent cross-slope.

Parkway areas that will be landscape planting only may vary from 2 percent cross-slope with the City Engineer's approval. The minimum cross-slope allowed is 1 percent; the maximum is 10 percent.

Areas beyond parkways that will be planted with trees, shrubs, and groundcovers (not turf) shall have a maximum cross-slope ratio of 3:1 (3-feet horizontal distance to 1-foot vertical distance).

In special cases, the City Engineer may approve a maximum slope ratio of 2.5:1.

Areas beyond parkways that will be planted with turf shall have a maximum cross-slope ratio of 5:1. In special cases, the City Engineer may approve a maximum slope of 4:1.

Mounding shall not occur within the ultimate rights-of-way.

2-2 PLANTING SOILS

2-2.1 Planting Soils.

During preliminary design, representative soil samples shall be taken by a qualified soils technician, and analyzed for agricultural suitability as specified in Section 212-1.1.2 of the Standard Specifications. The samples shall also be tested for the presence of any residual chemicals that may be detrimental to healthy plant growth.

In addition to test results, the soils report shall also recommend corrective measures for soil amendment and fertility to be included in the project specifications.

Should site soil prove unsuitable, import soil meeting the Standard Specification requirements for Class A topsoil shall be specified.

Prior to planting procedures, import soil shall be tested as specified at the source. The soils report, including amendment recommendations, shall be approved by the City Engineer prior to delivery to the project site.

Following planting procedures, all planting soils shall be re-tested to assure compliance with the specifications.

SECTION 3 – HARDSCAPE

3-1 MEDIAN ISLAND PAVING

3-1.1 Paving Material. All median island paving shall be patterned colored portland cement concrete. See Standard Detail No. 143.

3-1.2 Grades. All median paving shall have a minimum cross slope of 1 percent; maximum cross slope of 10 percent.

3-1.3 Dimension. All median areas 7 feet or less in width shall be concrete paved.

3-1.4 Maintenance Walks. All maintenance walks paving shall be patterned colored portland cement concrete. The minimum width behind curbs shall be 18 inches.

3-2 MEDIAN ISLAND WATER BARRIER

All planted medians, without exception, shall be constructed with a 30-inch deep-water barrier to protect adjacent pavement. See Standard Detail No. 143.

3-3 ROOT BARRIERS

3-3.1 Median Islands. Root barriers shall not be used in median islands

3-3.2 Parkways. All street trees in parkways, except palm species, shall be installed with linear root barrier protection. See Standard Detail No. 520-A.

3-3.3 Tree Well/Planters. Street trees in tree well/planters, except palm species, shall be installed with a linear root barrier. See Standard Detail No. 520-A.

SECTION 4 - IRRIGATION

4-1 GENERAL

4-1.1 System Design. All irrigation systems shall be fully automatic operating systems utilizing electrically operated controllers and valves. Shrub and turf areas shall be valved separately. Design shall maximize water efficiency and uniform distribution.

4-2 COMPONENTS

4-2.1 Controller. All irrigation systems shall utilize a controller compatible with the City's centralized system. The controller assembly shall include a rain shut-off device. The entire assembly shall be protected by a vandal resistant enclosure.

4-2.2 Backflow Prevention. All systems shall be protected by an approved reduced pressure type backflow prevention device (BFP). Install the BFP and all piping between the point of water connection and the BFP in accordance with City codes.

4-2.3 Master Valves. All systems shall be protected by a Master Control Valve with a flow sensor, installed in a locking valve box. See Standard Detail No. 526.

4-2.4 Piping. All irrigation piping 2½-inches in diameter and larger shall be PVC Class 315 with solvent weld joints. All irrigation piping 2-inches in diameter and smaller shall be PVC Schedule 40 with solvent weld joints.

Pipe sizes shall conform to those shown on the drawings. No substitutions of smaller pipe sizes shall be permitted, but substitutions of larger sizes may be approved. All damaged and rejected pipe shall be removed form the site at the time of said rejection.

All mainline piping and control wires under paving shall be installed in separate sleeves. Mainline sleeve size shall be a minimum of twice (2x) the diameter of the pipe to be sleeved. Control wire sleeves shall be of sufficient size for the required number of wires under paving.

Galvanized Schedule 40 sleeves are to be used on all main line or lateral line crossing at concrete benches or V-ditches.

All lateral line piping under paving shall be PVC Schedule 40 pipe and shall be installed prior to paving.

4-2.5 Isolation Valves. Brass ball valves shall be installed in an approved locking valve box in order to isolate irrigation system for each planting pocket (or as directed by the City).

4-2.6 Quick Coupler Valves. Quick coupler valves shall be installed along mainline to provide hose connection and operation at 100 linear foot intervals continuously along all landscaped areas.

4-2.7 Valve Boxes. All remote control valves, gate valves, quick couplers control wire, and computer cable pull points shall be installed in HDPE valve boxes with locking covers as shown on details. All shall be marked indicating controller and station numbers for control valve boxes and/or as titles in the equipment legend with 2-inch white heat braded letters.

4-3 INSTALLATION

4-3.1 General. The design is diagrammatic. All piping, valves, etc., shown within paved areas is for design clarification only and shall be installed in planting areas unless otherwise approved by the City Engineer. The Contractor shall locate all valves in shrub areas. When shrub areas do not exist, valves in turf area are acceptable.

It is the responsibility of the Contractor to familiarize himself with all grade differences, location of walls, retaining walls, structures, and utilities. The Contractor shall repair or replace all items damaged by his work. He shall coordinate his work with other Contractors for the location and installation of pipe sleeves and laterals through walls, under roadways and paving, etc.

Contractor shall verify water pressures prior to construction. Report any difference between the water pressure indicated on the drawings and the actual pressure reading at the irrigation point of connection to the Engineer.

Do not install the sprinkler system as shown on the drawings when it is obvious in the field that unknown obstruction, grade difference or differences in the area dimensions exist that might not have been considered in the engineering. Such obstructions or differences should be brought to the attention of the City Engineer. In the event this notification is not performed, the Contractor shall assume full responsibility for any revisions necessary.

4-3.2 Location. Final location of the backflow preventer, the master valve, and automatic controller shall be approved by the Engineer.

4-3.3 Electrical Connection. One hundred twenty (120) VAC electrical power source at controller location shall be provided by others, unless noted otherwise. The Contractor shall make the final connection from the electrical source to the controller.

All control and common wires shall be minimum 14 gauge. Common wire shall be white with different color strip for each controller. Control wires shall be different color for each controller when multiple controllers are utilized.

4-3.4 Irrigation Heads. All irrigation heads shall be set perpendicular to finish grade unless otherwise specified.

Flush and adjust all irrigation heads and valves for optimum coverage with minimal overspray onto walks, streets, walls, etc.

Provide reduced radius or spray radius nozzle adjustments as necessary to reduce or eliminate overspray onto streets, sidewalks, wall etc., or other areas as directed by the City Engineer.

Install anti-drain valves on all heads in areas where finish grades exceed 4:1, where post valve shut-off draining of the irrigation head occurs, or as directed by the City Engineer.

4-4 COORDINATION WITH SPECIFICATIONS

4-4.1 Standards. Refer to specifications and standard details for additional information.

All sprinkler equipment not otherwise detailed or specified shall be installed according to manufacturer's recommendations and specifications.

4-5 EQUIPMENT SUBSTITUTION

4.5.1 Submittals. If the Contractor wishes to substitute any equipment or materials for equipment or materials listed on the irrigation drawings and specifications, he may do so by providing the following information to the City Engineer for approval:

a. Provide a statement indicating the reason for making the substitution. Use a separate sheet of paper for each item to be substituted.

b. Provide descriptive catalog literature, performance charts, and flow charts for each item to be substituted and for the specified item.

c. Provide the amount of cost savings if the substituted item is approved.

4-5.2 Approval. The City Engineer has the sole responsibility for accepting or rejecting any substituted item as an approved equal to equipment and materials listed on the irrigation drawings and specifications.

SECTION 5 – PLANTING

5-1 PLANT MATERIALS

5-1.1 Tree Selection. It is the policy of the City of Anaheim that all street trees selected for planting within the right-of-way be chosen from the City of Anaheim's Street Tree List. On major arterial streets, the City of Anaheim Master Street Tree Plan for Arterial Corridors will provide the basis for the tree species to be selected. Final tree selection shall be made by the City Engineer.

An appointment must be scheduled by telephoning (714) 765-6920. Emphasize species that require relatively low levels of corrective training and pruning, and that the ultimate natural mature size is compatible with the width of the median islands or other planted areas. Container size of trees at the time of planting will be determined based on the growth rate of the trees and their ultimate placement within the medians or other planted areas. Refer to Appendix II – Acceptable Street Tree Palette.

5-1.2 Shrubs and Groundcover Selection. Selection of species shall concentrate on low maintenance plant types as approved by the City Engineer. Refer to Appendix III – Acceptable Plant Palette.

5-1.3 Design Considerations. Tree planting locations will offer variety in planting schemes, including some staggering of alignment and grouping of trees, yet removed from the edge of curb sufficiently to allow natural maturity without conflicts with vehicular movement.

Shrub planting shall feature drifts or mass plantings of shrubs that display flower color and/or unique foliage color.

Mulch, creeping ground covers and sprawling shrubs shall be used in planting schemes to cover bare soil.

5-1.4 Turf. Turf shall be used only under special circumstances approved by the City Engineer.

Turf variety selected must be a medium textured, low maintenance cultivar approved by the City Engineer. If the selected variety is available only from seed, the Engineer will allow either contract-grown sod or seeding.

Under the contract-grown sod option, the landscape establishment and maintenance period shall be a minimum of 90-calendar days which may be extended based on the weather and time of year.

Under the seeding option, the landscape establishment and maintenance period shall be a minimum of 150-calendar days which may be exended based on the weather and time of year.

5-1.5 Availability. Owner/consultant shall ensure that the plant material species noted on the approved plans will be available upon the commencement of construction. If necessary, the owner/consultant shall make references on the approved plans regarding plant procurement by the Contractor.

5-2 PLANT MATERIAL INSPECTION

5-2.1 Inspection. Plants will be inspected by the City Engineer prior to any planting. Where container-grown plants are from several sources, the roots of not less than two plants of each species or variety from each source will be inspected. In case the sample plants inspected are found to be defective, the Engineer reserves the right to reject the entire lot or lots of plants represented by the defective samples. The Engineer is the sole judge as to acceptability.

Trees will be inspected and tagged by a representative of the City Engineer at the nursery source prior to shipping. These trees will again be inspected by the representative upon delivery to the project site.

All other plants will be inspected on the project site upon delivery.

5-2.2 Standards. All plants, including trees, must be healthy, shapely, full-grown specimens for their species and container size. Plans that are too small or too large for their respective container size; that are root bound and/or not fully rooted throughout the container; and that are diseased, scarred, disfigured or poorly trained will be rejected.

5-3 INSTALLATION

5-3.1 General. All landscape planting shall be installed in compliance with the approved plans and specifications for the project, including the Standard Specifications and Standard Special Provisions.

5-3.2 Erosion Control. All sloped landscaped areas 3:1 and steeper shall have jute mesh installed for erosion control purposes.

5-4 MAINTENANCE/ESTABLISHMENT

5-4.1 General. All landscaped areas are subject to a 90-calendar day minimum, 180-calendar day maximum, landscape maintenance period. The period shall be specified based on type of planting and time of year of installation. Maintenance period can be extended by the Engineer if the area has not been maintained properly and is not in acceptable condition at the end of the maintenance period.

In the landscape areas that require turf seeding, the maintenance/establishment period shall have an additional 60 calendar days along with the 90-calendar day minimum and 180-calendar day maximum maintenance/establishment.

When turf is part of the landscaped areas to be maintained/established, the following shall apply:

a) Sodded Areas – Normal maintenance and establishment periods.
b) Seeded Areas – Normal maintenance and establishment periods plus additional 60 calendar days.

See Specification section for maintenance and plant establishment requirements.

5-4.2 At completion of the last planting, the Contractor shall request an inspection of all landscaped areas by the City Engineer. If all areas are acceptable, the Contractor will be issued a letter indicating acceptance and authorization to proceed into the maintenance and plant establishment period. The City Engineer may reject all or any portion of the work which is not acceptable at the time of inspection and order corrective measures be performed by the Contractor at no expense to the City. All areas rejected will be maintained by the Contractor at his expense until acceptance is issued by the City Engineer.

In addition, all landscaped planting areas (including hydroseeded or broadcast seeded area) shall be treated with an approved herbicide application according to manufacturer's recommendations to ensure a weed free condition prior to City acceptance of the work.

5.5 GUARANTEE

All landscape installed under the contract shall be guaranteed for the periods noted below against any and all poor, inadequate, or inferior materials, and/or workmanship for the noted period following the date the Project Notice of Completion is filed with the County Recorder. During the guarantee period, any trees, shrubs, ground cover, or turf found to be dead, missing, or in poor condition shall be replaced by the Contractor within 10-days of written notification. The City's authorized representative shall be the sole judge as to the condition of the landscape materials. Replacement shall be made in accordance with City standards; replacement shall be same size, and kind as originally planted. Landscape materials shall be furnished, planted, and fertilized as specified and guaranteed within these documents. Contractor shall provide material and labor involved in replacing landscape at no additional cost to City.

A. Shrubs, Ground Cover, and Turf: All shrubs, ground cover, and turf shall be guaranteed for a period of 90-calendar days from the Notice of Completion.
B. Canopy Trees: All canopy trees shall be guaranteed for a period of 1 year from the Notice of Completion.
C. Palm Trees: All palm trees shall be guaranteed for a period of 2 years from the Notice of Completion.
D. Irrigation System: The entire system, including trenching shall be guaranteed for a period of 1-calendar year from the Notice of Completion.

5.6 SURETY BOND

The Contractor shall post a surety bond in an amount equal to 10 percent of the final construction cost of the landscape planting and irrigation system. The bond shall be filed with the City under the same requirements as the Contractor's Performance and Labor and Material bonds. The bond shall continue in effect for the same period as the guarantees for the project.

SECTION 6 – PLAN COMPLIANCE

6-1 INSPECTION PROGRAM

The following inspections are the minimum required.

- Upon completion of clearing and grubbing.
- Upon completion of rough grading.
- Irrigation system:
  - Trench depth
  - Pipe and wire location
  - Mainline flushing
  - Mainline pressure test. Includes all points of connection, backflow prevention devices, control valves, electrical connections, and controller.
  - Coverage test

- Soil preparation and finish grading
- Tree locations
- Plant pits
- Tree and shrub planting, including backfill and staking
- Start of maintenance and plant establishment period

Contact the Engineer a minimum of 48 hours (two working days) prior to requesting an inspection.

6-2 FINAL INSPECTION

Prior to the approval and acceptance of improvements, an inspection of the completed landscape installation shall be arranged at least two (2) working days in advance with the Engineer. This inspection will include, but not be limited to:

1. An irrigation coverage test

2. Compliance with approved landscape plans

3. Condition of plant materials, including the absence of weeds.

4. Review for compliance of any special conditions of approval attached to the project by the Planning Commission and/or City Council.

5. Submittal of mylars, as-builts drawings as well as manuals, controller charts and all required turnover items.

6-3 FINAL ACCEPTANCE

Final acceptance of landscape improvements will be made at such time as all planting is in place and established in a healthy condition with irrigation systems installed as shown on approved plans and in accordance with these guidelines. The owner or agent in control of the property shall maintain landscaping and irrigation systems to the satisfaction of the City Engineer from the time of initial installation, continuing until full acceptance of improvements by the City. Final acceptance will occur upon the approved completion of the landscape maintenance/establishment period.

APPENDIX I

APPROVED LANDSCAPE AND IRRIGATION EQUIPMENT

ITEM	MANUFACTURER	MODEL
Irrigation Controller	Rain Master	EVOLUTION DX2
Control Enclosure	H.S. Strongbox	
Flow Meter	Rain Master	
Master Valve	SUPERIOR	3100
Backflow Device[1]	Febco	8501-08 with valve setter (2½" and larger) 825YA – 2" size and smaller
Backflow Enclosure	Guard Shack	Stainless steel
Remote Control Valve	Rainbird	PESB
Ball Valve	Nibco (brass)	T-585
Quick Coupler	RainBird	44 LRC/44NP
Spray Head	RainBird	1800-NP-SAM
Bubbler	RainBird	1400
Rotor Medium Radius	Hunter	PGM-XX
Rotor Large Radius	Hunter	I-20-XX
Valve Box	NDS (plastic)	Pro-series Plus
Check Valve	King Brothers	CV-XXX-MF
Basket Strainer	Hayward	
Wye Strainer	Wilkins	100 series YB-Line size
Waterproof Wire Connectors	3M	DBY #09053
Tree Ties	V.I.T.	Twist brace
Arbor Guard	Deep Root	AG9-4
Fertilizer Tablets	Agriform Planting Tabs	20-10-5
Root Control Barriers	Deep Root, NDS, or approved by City of Anaheim	Panel series
Pressure Regulator (if required)	Wilkins	500 Series of 90/91 series determined by system requirements
Rain Shut-Off Device	WCS	RainGuard with vandal resistant enclosure

[1] Valve setter is only utilized with "N" series backflow preventers.

APPENDIX II
ACCEPTABLE STREET TREE PALETTE

Grow Space	Botanical Name	Common Name	Zone(s)	Hgt.	Spread	Type
3'+	Callistemon citrinus	Lemon Bottlebrush	8, 9 & 12-24	25	20	Evergreen
3'+	Chamaerops humilis	Mediterranean Fan Palm	4-24	20	20	palm
3'+	Cercis canadesis	Eastern Redbud	1-3 & 7-20	35	30	Deciduous
3'+	Chionanthus retusus	Chinese Fringe Tree	2-9 & 14-24	20	15	Deciduous
3'+	Chitalpa tashkentensis	Chitalpa	7-9 & 12-14 & 18-21	25	25	Deciduous
3'+	Eucalyptus erythrocorys	Red Cap Gum	18-24	25	25	Evergreen
'+	Eucalyptus torquata	Coral Gum	5, 6 & 8-24	20	30	Evergreen
3'+	Hymenosporum flavum	Sweetshade	8, 9 & 14-24	40	20	Evergreen
3'+	Lagerstroemia indica	Crape Myrtle	7-9 & 12-14 & 18-21	25	20	Deciduous
3'+	Pittosporum phillyraeoides	Willow Pittosporum	8, 9 & 12-24	20	15	Evergreen
3'+	Prunus c. "Purple Pony"	Dwarf Purple Leafed Plum	2-22	15	10	Deciduous
3'+	Pyrus kawakamii	Evergreen Pear	8, 9 & 12-24	30	30	semi
3'+	Stenocarpus sinuatus	Firewheel Tree	16, 17 & 20-24	25	15	Evergreen
3'+	Syagrus romanzoffianum	Queen Palm	12, 13 & 15-17, 19-24	50	20	palm
3'+	Tabebuia chrysotricha	Yellow Trumpet Tree	12, 13 & 20-24	25	20	Deciduous
3'+	Washingtonia robusta	Mexican Fan Palm	8, 9 & 11-24	20	90	palm
5'+	Acer paxii	Acer Paxii	8, 9 & 14-24	30	40	Evergreen
5'+	Albizia julibrissen	Silk Tree	2-23	40	40	Deciduous
5'+	Bauhinia variegate	Purple Orchard Tree	13 & 18-23	30	20	semi
5'+	Brachychiton acerfolius	Flame Tree	16-21 & 23	40	30	Evergreen
5'+	Calodendrum capense	Cape Chestnut	19 & 21-24	40	40	semi
5'+	Cassia leptophylla	Gold Medallion Tree	21-24	25	20	Evergreen
5'+	Eucalyptus nicholii	Nichol's Willow-Leafed Peppermint	5, 6 & 8-24	40	40	Evergreen
5'+	Eucalyptus sideroxylon	Red or Pink Ironbark	5, 6 & 8-24	60	40	Evergreen
5'+	Fraxinus angustifolia 'Raywood'	Raywood Ash	3-9 & 12-24	35	30	Deciduous
5'+	Geijera parviflora	Australian Willow	8, 9 & 12-24	40	25	Evergreen
5'+	Ginkgo biloba "Autumn Gold"	Maidenhair Tree	1, 10, 12 & 14-24	60	40	Deciduous
5'+	Gleditsia triacanthos "Inermus"	Honey Locust	1-16 & 18-20	50	40	Deciduous
5'+	Jacaranda mimosifolia	Jacaranda	12-13 & 15-24	40	50	semi
5'+	Koelreuteria paniculata	Goldenrain Tree	2-21	25	25	Deciduous
5'+	Liriodendron tulipifera	Tulip Tree	1-12 & 14-23	80	40	Deciduous
5'+	Magnolia g. "Magestic Beauty"	Majestic Beauty Magnolia	4-12 & 14-24	40	20	Evergreen
5'+	Melaleuca linarifolia	Flaxleaf Paperbark	9 & 13-23	30	30	Evergreen
5'+	Phoenix dactylifera	Date Palm	9 & 12-24, H1, H2	80	40	palm
5'+	Phoenix canariensis	Canary Island Date Palm	9 & 12-24, H1, H2	60	30	palm
5'+	Pinus eldarica	Afghan Pine	16-18 & 21-23	60	50	Evergreen
5'+	Pistacia chinensis	Chinese Pistache	4-16 & 18-23	40	40	Deciduous
5'+	Tabebuia avellanedae	Pink Trumpet Tree	15, 16 & 20-24	30	30	Deciduous
8'+	Cinnamomum camphora	Camphor Tree	8, 9 & 12-24	50	60	Evergreen
8'+	Koelreuteria bipinnata	Chinese Flame Tree	8-24	50	50	Deciduous
8'+	Liquidambar styraciflua	American Sweetgum	1-12	60	35	Deciduous
8'+	Lophostemon confertus	Brisbane Box	19-24	60	40	Evergreen
8'+	Magnolia grandiflora	Southern Magnolia	4-12 & 14-24	60	40	Evergreen
8'+	Pinus canariensis	Canary Island Pine	16-18 & 21-23	60	50	Evergreen
8'+	Pinus pinea	Italian Stone Pine	16-18 & 21-23	60	40	Evergreen
8'+	Platanus acerifolia	London Plane Tree	2-24	60	40	Deciduous
8'+	Podocarpus gracilior	Fern Pine	8, 9 & 13-24	60	60	Evergreen
8'+	Quercus agrifolia	Coast Live Oak	7-10 & 12-24	70	80	Evergreen
8'+	Quercus virginiana	Southern Live Oak	4-24	60	100	Evergreen
8'+	Schinus molle	California Pepper	8, 9 & 12-24	40	45	Evergreen
8'+	Tipuana tipu	Tipu Tree	13-16 & 18-24	50	60	semi
8'+	Zelkova serrata	Sawleaf Zelkova	3-21	40	40	Deciduous

APPENDIX III

ACCEPTABLE PLANT PALETTE

SHRUBS AND GROUND COVERS

BOTANICAL NAME	COMMON NAME
Agapanthus africanus (white & blue)	Lily of the Nile
Carex testacea	Orange New Zealand Sedge
Cistus x purpureus	Purple Rock Rose
Cuphea hyssopifolia	False Heather
Dietes iridioides	African Iris
Escallonia 'Compakta'	Escallonia
Festuca idahoensis 'Warren Peak'	Idaho Fescue
Gazania 'Mitsuwa'	Mitsuwa Trailing Gazania
Helictotrichon sempervirens	Blue Oat Grass
Hemerocallis cultivars (evergreen variety)	Daylily
Juniper c. 'Parsonii'	Prostrata Juniper
Juniperus s. 'Tamariscifolia' 'New Blue'	Tam Juniper
Lantana montevidensis	Trailing Lantana
Lantana montevidensis 'Dwarf Yellow'	Dwarf Yellow Lantana
Lantana montevidensis 'Spreading Sunset'	Dwarf Orange Red Lantana
Leucophyllum frutescens 'Compactum'	Compact Texas Ranger
Limonium perezii	Sea Lavender
Liriope muscari	Big Blue Lily Turf
Nandina domestica 'Nana'	Dwarf Heavenly Bamboo
Phormium tenax 'Dazzler'	Weeping Bronze Flax
Phormium 'Jack Sprat'	Dwarf Flax
Phormium tenax 'Tom Thumb'	Dwarf Flax
Pittosporum tobira 'Wheeler's Dwarf'	Wheeler's Dwarf Tobira
Raphiolepis indica 'Pinkie'	India Hawthorn
Sesleria autumnalis	Moor Grass
Strelitzia reginae**	Bird of Paradise
Trachelospermum jasminoides	Star Jasmine
Tulbaghia violacea 'Silver Lace'	Society Garlic
Xylosma congestum 'Compacta'	Dwarf Shiny Xylosma

* Species appropriate only in larger planting areas
**Limited use only

TYPE	VARIETY	DISTRIBUTOR	RATE*
Dwarf Tall Fescue	Matador	Stover Seed Co.	10 lbs. per 1,000 S.F.
Dwarf Tall Fescue	Bonsai 2000	Stover Seed Co.	10 lbs. per 1,000 S.F.

* Sod acceptable if only pure strain variety has been contract grown by an authorized 'Turf Seed' sod farm.

APPENDIX IV

MINIMUM TREE AND PLANT SIZE

TREES	**SIZE**
A. General Canopy (i.e.)	24-inch box
Lagerstroemia indica (Crape Myrtle) Tipuana tipu (Tipu Tree) Koelreuteria paniculata (Golden Rain Tree)	
B. Palm (i.e.)	
Syagrus romanzoffianum (Queen Palm)	12-feet brown trunk height
Phoenix dactylifera (Date Palm)	18-feet brown trunk height
Washington robusta (Mexican Fan Palm)	15-feet brown trunk height
SHRUBS (i.e.)	
Nandina 'Nana' (Dwarf Bamboo)	5 gallon
Phormium 'Maori Maiden' (Dwarf Phormium)	5 gallon
Hemerocallis hybrids (Daylily)	1 gallon
GROUND COVER (i.e.)	
Trachelospermum (Star Jasmine)	1 gallon
Lantana montevidensis (Trailing Lantana)	1 gallon
Gazania 'Mitsuwa' (Mitsuwa Trailing Gazania)	rooted cuttings from flats

DIVISION II

PROCEDURES

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DIVISION II

PROCEDURES

DIVISION II

PROCEDURES

SECTION 1 – LANDSCAPE PLAN APPROVAL PROCESS

Plan Submittal

Landscaping or the installation of an irrigation system for landscape development on public street and highway rights-of-way and easements in the City of Anaheim shall not be undertaken until the City Engineer has reviewed and approved the plans and specifications covering the proposed use of plant materials and irrigation systems. The review and approval of this process will determine:

- That proposed plant material will be suitable aesthetically, physiologically and ecologically for the particular planting situation.
- That soil preparation is adequate as provided for in a certified soils report.
- That proposed planting will meet minimum requirements as set forth in this document.
- That proposed irrigation systems will be adequate to properly irrigate proposed plantings and is in accordance with this document.
- That improvements are permanent and of a nature and quality to ensure low water consumption and maintenance costs.

The landscape plan approval process typically consists of:

A. Concept Plan Submission and Approval;
B. Construction Drawings Submission, Plan Check and Approval;
C. Revisions to Approved Plans, if necessary; and
D. Record Set of Drawings for Public Improvements.

A. Concept Plan Submission and Approval

Prior to the submission of the construction documents, the owner/consultant shall submit a landscape concept plan to the City Engineer for review and approval. The concept plan shall be submitted on a 24-inch by 36-inch sheet(s) and drawn at 20-scale minimum. The plan shall illustrate the following:

1. Layout of the entire project limits;
2. Existing and proposed landscape and hardscape areas;
3. Easements, power poles, street lights, drainage structures, walls and fences, and any facilities or objects that will impact the landscape improvements; and
4. Plant material selection.

The number of concept plans submittals shall be determined by the City Engineer on a project-by-project basis, depending on the complexity and/or characteristics of the landscape improvements.

B. Construction Drawings, Submission, and Approval

Owner/consultant shall submit to the City the necessary documents for all projects where landscape improvements in the public right-of-way are required as a part of the project development. All plans submitted shall be prepared under the direct supervision of a Registered Landscaped Architect, Registered Civil Engineer or Licensed Landscape Contractor (State of California), with all drawings bearing his/her stamp and signature (unless specifically waived).

C. Plan Check Procedures

1. **The Initial Plan Review** requires the submittal of two (2) sets each of the following documents to the address stated below:

   (a) Construction Drawings
   (b) Specifications
   (c) Irrigation Calculations (Anaheim Municipal Code – Landscape Water Efficiency, AB 325 Water Conservation Calculations and Pressure Loss Calculations)
   (d) Soil Analysis Report
   (e) Cost Estimate

   For public rights-of-way projects, submit to:

   Address: City of Anaheim
   Department of Public Works
   City Engineer
   200 S. Anaheim Boulevard
   Anaheim, California 92805
   Telephone: 714-765-5176

   For private development projects, submit to:

   Address: City of Anaheim
   Department of Public Works
   Development Services Manager
   200 S. Anaheim Boulevard
   Anaheim, California 92805
   Telephone: 714-765-5176

   Allow a minimum of twenty (20) working days for plan check. All contract documents are subject to review (plans, general conditions of contract, specifications, etc.).

All plans are to be checked by the City Engineer for consistency, accuracy, clarity and conformity with City Standard Specifications, drawings and design criteria before submission for approval. If during review by the City the plans are found to be incomplete, they will be returned to the Landscape Architect for completion.

2. **Subsequent Review Submittal**

(a) To the City Engineer:

1) Two sets construction drawings (corrected if required)
2) Two sets specifications (corrected if required)
3) Two sets revised estimate (if required)

Return marked set of plans and specifications if corrections were required.

Allow a minimum of fifteen (15) working days for subsequent landscape plan check.

3. **Final Plans for Approval**

One mylar set of construction documents for signatures on all sheets.

4. **Approved Drawings**

Upon City approval of plans, owner/consultant shall deliver to the City Engineer:

(a) One (1) complete, clearly legible set of signed and stamped mylar reproducible reduced to 24" x 36".
(b) Five (5) complete sets of signed and stamped 20 pound bond prints (full size).
(c) One (1) copy of electronic file (CD format) of construction drawings, specifications and estimates. The formats shall be as follows:

Construction Drawings	AutoCAD 2006
Specification	Microsoft Word
Estimates	Microsoft Excel

5. **Approval Required**

All plan approvals must be accomplished prior to commencing any landscape improvement work.

6. **Cost Estimates**

Public Rights-of-Way Projects:

Each level of submittal shall include a cost estimate.

The final cost estimate, submitted prior to approval, must include:

a. An itemized unit price estimate of probable construction cost corresponding to the bid form for the project.

b. An estimate of probable annual maintenance cost after project installation and acceptance.

Private Development Projects:

Property Owner shall post a Performance Bond in the amount of the total estimated probably construction cost, prior to plans approval. In addition, the Property Owner shall submit to the City along with the Performance Bond Declaration an itemized unit price estimate of probable construction cost.

D. Revisions to Approved Plans

The Engineer must approve revisions to the plans before any plant materials and/or irrigation components are installed that are inconsistent with the original plans. Submit two (2) sets of the revised plans to the Engineer for review and approval.

E. Record Set of Drawings For Public Performance Improvements

Prior to the City acceptance of landscape improvements within public right-of-way areas, owner/consultant shall provide to the City:

1. One marked-up set of 20-pound bond prints of “as-built” changes. Once reviewed by the Engineer, these prints shall be returned to the owner/consultant, who shall transfer all annotations onto the City’s set of mylars, checked by the Engineer. Revision/deletions shall be made by Contractor to represent a replica of the “as-builts.” Return of final corrected mylars to the City shall be accomplished, prior to project acceptance.

2. Provide original marked up mylar record drawings and two copies, "as-builts" originals, and controller charts.

3. All warranty information.

4. All operational manuals/instructions.

5. Any specified water keys/tools/lock keys.

SECTION 2 – PLAN PREPARATION

The following outline summarizes plan preparation information for those preparing plans and detailed drawings for landscape projects on City rights-of-way projects in the City of Anaheim.

A. General

The landscape plans must be for the complete map area of the project unless otherwise approved by the Engineer. The plan cannot be submitted piecemeal as in construction or other type phasing. The improvements can be installed in phases and/or shown in phases on the overall map, but the entire plan must be submitted. (If approval is given for phased plan submittal, each phased set must include reference to other phase drawings).

For privately funded projects, the landscaping Conditions of Approval for the project are normally required to be met prior to recordation of the final map or approval of street improvement plans. The cost estimate of the project must be provided to allow the establishment of bonds to cover the cost of construction.

1. Standard size sheets will be used for all plans submitted. All plans shall be of the same size. Final mylars shall be reduced to 24 inch by 36 inch and shall be in the City plan format.

2. Incomplete designs, details, etc., will not be accepted. Plan checking will be done only on plans which are complete in all phases of design. The Engineer prefers a review of conceptual plans of the entire project area prior to preparation of construction drawings.

3. Number sheets consecutively, i.e., “Sheet __ of __.”

4. Minimum scale: 1 inch = 20 feet. Scale shall appear on each sheet.

5. North arrow shall appear on each sheet.

6. Show all match lines clearly and label to provide easy plan reference.

7. Vicinity map shall appear on title sheet and identify streets within project and those directly adjacent.

8. The following items related to landscape and irrigation development shall appear on all plan sheets:

    a. Definition of rights-of-way, versus privately maintained areas – show clearly.

    b. Property lines/project limits.

c. Paved areas (including street, sidewalks, driveways, and intersections).

d. Other appropriate information such as utilities and screening devices, easements, streetlights, fire hydrants, traffic signals, major street signage, and trees to remain as they relate to landscape development.

9. Should revisions be made to plans after approval by the City of Anaheim, such revisions shall be approved by the City and noted on the Title Sheet, and subsequent sheets affected by the revisions, prior to implementation in the field.

10. Stationing shown on construction plans for development of improvements shall match existing street stationing, available from the Public Works Department.

B. Cover/Title Sheet

The first sheet shall be a title sheet and shall include:

1. **Project location** on location map.

2. **Vicinity map** showing the following:

   a. Street configuration within or adjacent to the tract or project.

   b. Nearest arterial highway intersection.

   c. Street names

   d. North arrow

   e. Match lines, if applicable

   f. Project limits

3. **Phasing Plan** Index (plan indicating the anticipated phasing of the overall project if all drawings are not going to be submitted at one time).

4. **Sheet Index** (plan indicating portion of project each sheet covers).

5. **General Notes** (not limited to the following):

   a. Rights-of-Way construction permits shall be obtained from the Department of Public Works.

   b. The Contractor must notify the Engineer at 714-765-5126, 48 hours (two working days) prior to starting construction.

c. The Contractor shall have a qualified soils lab perform agricultural soils tests. Soils testing for agricultural suitability shall be accomplished at the conclusion of rough grading and for all imported topsoil prior to delivery.

d. Landscape or irrigation Contractor shall verify existing water pressure at job site prior to installing landscape irrigation system. Verification shall be made with City of Anaheim Water Engineer, Public Utilities Department.

e. The Contractor is responsible for obtaining required plumbing and electrical permits prior to commencing irrigation installation.

f. All landscape improvements work shall be done in accordance with City of Anaheim's Department of Public Works Landscape and Irrigation Manual for Public Street and Highway Rights-of-Way and Easements.

g. Contractor shall contact the Underground Service Alert 48 hours (two working days) prior to beginning construction.

h. Contractor shall apply for and pay the appropriate fees for both the water meter and electrical service. In addition, the Contractor shall pay for all water and electrical usage until the project is accepted by the City.

i. Inspection Program. The following inspections are the minimum required:

- Upon completion of clearing and grubbing.
- Upon completion of rough grading.
- Irrigation system:
  - -- Trench depth
  - -- Pipe and wire location
  - -- Mainline flushing
  - -- Mainline pressure test. Includes all points of connection, backflow prevention devices, control valves, electrical connections and controller.
  - -- Coverage test.
- Soil preparation and finish grading
- Tree locations
- Plants pits
- Tree and shrub planting, including backfill and staking.

Contact the Engineer a minimum of 48 hours (2 working days) prior to requesting an inspection.

6. **Title Block**

   a. Project title

   b. Tract number and/or tentative tract number (if applicable) and parcel numbers if drawings reflect only a portion of the complete tract. These specific reference numbers shall conform to the approved tract map.

   c. Project address and cross streets.

7. **Signature Block for Approvals -** Signature block shall be provided on Title Sheet for the following signatures:

   a. City Engineer

   b. Water Engineering Division, if applicable

   c. Electrical Engineering Division, if applicable

   d. Development Services Manager (Private Development Projects)

8. **Submittal Dates Block** – Clearly indicate date(s) plans were submitted (for each submittal).

9. **Revision Date Block** – Clearly indicate date(s) revisions were made to plans.

10. **Consultant's firm name**, address, phone number, date plans prepared, signature and seal of Registered Landscape Architect.

11. **Owner/developer's name**, address and phone number.

C. Plan Sheets

1. **Grading**

   a. Indicate existing and proposed grades with contours and spot elevations.

   b. Shrub and ground cover areas shall have a maximum design slope of 3:1. Turf areas shall have a maximum design slope of 5:1. Mounding shall not occur within the ultimate street right-of-way.

   c. Note all grades (including finished surface and existing grades), flow lines, etc., within public right-of-way.

d. Drain inlets shall be clearly identified along with invert elevations.

2. **Hardscape**

a. Median areas seven feet (7') or less in width shall be continuously paved with concrete pavement.

b. Maintenance walks eighteen inches (18") in width of concrete pavement shall be installed continuously along back of curb in all planting areas of medians.

3. **Irrigation Plans**

a. Irrigation legends shall be shown on each sheet of the irrigation plans. The legend shall include symbols for all referenced material used on the plans. Sprinkler and/or rotor description shall include model, manufacturer, nozzle type, body type, PSI, radius and GPM. Conform to APWA Standard Plan 500-1 for legend symbols.

b. Irrigation construction details shall include all components used in the design. Details may be illustrated by referencing the Standard Drawing Number or attaching the drawing on the plans.

c. **Irrigation Design shall include**:
1) Sprinkler and/or rotor layout.
2) Lateral line and mainline layout.
3) Location of remote control valve(s), ball valve(s), quick-coupler valve(s), master valve, flow sensor, and backflow prevention device.
4) Location of automatic irrigation controller along with power supply source.
5) Existing utilities (under and above ground).

d. **Water Services**

1) A description and location of the water services, along with meter location.
2) Installation requirements and responsibility of the appropriate water district.
3) Available static water pressure.
4) Design water pressure.
5) Peak flow through meter in GPM.
6) Total area serviced through each meter in acre-feet and cubic feet
7) Yearly water demand in acre-feet required after the completion of the 90-calendar day minimum – 180-calendar maximum maintenance/establishment period.
8) Total site square footage.

e. **Pressure calculations** shall be performed at each point of connection (POC). The calculations shall include worst condition, and also at the farthest irrigation head away from the POC.

f. **Location of all existing plant materials to remain on-site** with specific requirements for work around them.

g. **AB 325 Water** Conservation Calculations (EAWU and ETWU).

4. **Planting Plans**

a. **All plans** shall have plant materials listed within a standard legend. The plant legend shall incorporate the following:

1) Abbreviation and/or symbol
2) Botanical name
3) Common name
4) Quantity
5) Size
6) Notes (staking, etc.)
7) Square footage of all public maintained areas on that plan
8) Planting details. Details may be illustrated by referencing the Standard Drawing Number or attaching the drawing on the plans.

ii. **Planting design** shall include:

1. Trees, shrubs, groundcover and turf layout
2. Existing vegetation to remain
3. Existing utilities (under and above ground)

Refer to guidelines for acceptable plant material.

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DIVISION III

SPECIFICATIONS

DIVISION III

SPECIFICATIONS

All City of Anaheim landscape and irrigation projects shall be based on the **"Greenbook" Standard Specifications for Public Works Construction,** (SSPWC), 2006 Edition, including al supplements published by Building News Incorporated.

Section 212, 300, and 308 of the SSPWC and herby accepted and modified, deleted, and or replaced with the following Special Provisions.

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SPECIAL PROVISIONS

(This Table of Contents refers to Greenbook sections. Bold sections refer to the subject matter)

PART 2

CONSTRUCTION MATERIALS

PART 3

CONSTRUCTION METHODS

SECTION 212 – LANDSCAPE AND IRRIGATION MATERIALS

212-1 LANDSCAPE MATERIALS

212-1.1 Topsoil.

212-1.1.2 Class A Topsoil.

(For import topsoil, use the following):

Topsoil shall be Class A. Add the following:

Imported soil shall be sandy loam textured. Silt plus clay content of this soil shall be not greater than 15 percent by weight. The boron content of this soil shall be not greater than 1 part per million as measured on the saturation extract. The sodium absorption ration (SAR) shall not exceed 3.0 millimhos per centimeter at 25 degrees C.

In order to ensure conformance, samples of the imported soil shall be submitted to an agronomic soils testing laboratory, approved by the Engineer for analysis prior to use. Results of testing shall be delivered to the Engineer for approval. The soil test shall include analysis and recommendations for amendment.

(For sidewalk tree well planting only, add the following):

Soil for tree well backfill shall be Class A Topsoil with the following restrictions: Gradation limits shall be 85 percent through 95 percent sand, maximum 10 percent silt, maximum 5 percent clay. The permeability rate shall be not less than 38mm (1½ ") per hour and no greater than 75mm (3") per hour.

(For use of site soil, use the following):

212-1.1.4 Site Soil. Add the following:

Topsoil shall be Class C.

Existing soil on the site shall be used as topsoil for planting purposes when possible, but shall be free of debris, oil, weeds, or other foreign matter. Contaminated soil shall be removed and replaced with acceptable existing soil or imported soil.

212-1.2 Soils Fertilizing and Conditioning Materials.

212-1.2.3 Commercial Fertilizer. Add the following:

Commercial fertilizer shall be 16-6-8 NPK in granular form.

Deliver fertilizer in standard bags, marked with weight, analysis, and name of manufacturer. Keep in dry storage.

Planting tablets shall be tightly compressed, long-lasting, slow-release fertilizer tablets weighing 21 grams, with a potential acidity of not more than 5 percent by weight and having an analysis of 20-10-5.

Samples. Submit 5 copies of manufacturer's printed literature for each product.

212-1.2.4 Organic Soil Amendment.

Organic soil amendment shall be Type 1.

Salinity shall not exceed 3.5 millimhos per centimeter at 25 degrees centigrade.

212-1.2.5 Mulch.

Mulch shall be Type 5 graded fir bark chips, 1 inch to 3 inch in size by 3/8 inch to 5/8 inch in diameter.

212-1.2.6 Add New Section 212-1.2.6 Soil Conditioner:

212-1.2.6 Soil Conditioner.

a) Iron Sulfate. Iron sulfate shall be ferric sulfate or ferrous sulfate in pelleted or granular form, containing not less than 18.5 percent iron expressed as metallic iron and shall be registered as an agricultural mineral with the State Department of Agriculture in compliance with Article 2, "Fertilizing Materials," Section 1030 of the Agricultural Code.

212-1.6.4 Fertilizer.

Hydromulch Fertilizer shall be a 15-15-15 NPK controlled release type, of uniform beaded mixture, 100 percent passing the No. 4 screen, having the following guaranteed analysis:

Total Nitrogen	15%
Ammoniacal Nitrogen	4.3%
Urea Nitrogen*	10.7%
Available Phosphoric Acid**	15%
Soluble Potash***	15%
Humus (composted organic & mineral matter)	25%
Humic Acids [derived from compost]	5.0%
Iron [expressed as elemental] derived from iron sulfate	1.1%
Zinc [expressed as elemental] derived from zinc sulfate	0.38%
Sulfur	4.5%

* derived from sulfur coated urea (controlled release)
** derived from triple super phosphate
*** derived from compost and muriate of potash

212-1.6.5 Binding Agent. Binder shall be dry powder organic concentrate, Ecology Controls M-Binder, or equal.

212-1.4 Plants.

212-1.4.1 General. Add:

Varieties shall be as shown on the drawings.

All quantities shall be verified by an actual count on the drawings.

Plants, including trees, shrubs, and ground covers, shall have been grown in nurseries inspected by the State Department of Agriculture.

Inspection and approval of plants is required. Engineer may reject entire lot of plants represented by defective samples. Plants not approved are to be removed from site immediately and replaced with suitable plants. All plants will be inspected on site of work prior to installation, and at any time during progress of the work.

Tag plant materials and name and size in accordance with standards of practice recommended by American Association of Nurserymen.

Size of tree and shrub containers shall be as stated on the planting plan. Container stock shall have grown in containers for at least 6 months, but not over 2 years. Samples shall be shown to prove that no root bound conditions prevail. No containers shall be planted, except upon specific approval.

Do not prune, prior to delivery, except by specific approval.

Protect all plants from damage by sun, wind, or rain at all times before planting.

Substitutions will not be permitted; except when proof is submitted that any plant specified is not obtainable. In this case, a proposal will be considered for use of the nearest equivalent in size or variety with an equitable adjustment of contract price. All substitutions will be subject to the Engineer's approval.

Plants shall have grown under climatic conditions comparable to those of the project site, unless otherwise specifically approved by the Engineer.

212-1.4.2 Trees. Add:

(a) Agency Furnished Trees: All trees noted on the drawings as "Agency-Furnished" or "City-Furnished" shall be inspected for acceptability by the Contractor, who shall make all arrangements for delivery of trees to the site of work.

The Contractor shall assume responsibility for agency-furnished trees upon acceptance for delivery to the job site. Contractor's responsibility includes, but is not limited to, scheduling, off loading, delivery, placement, installation, maintenance, and replacement if required.

(b) Contractor Furnished Trees: All trees not noted as "Agency-Furnished" or "City-Furnished" shall be selected by the Contractor and inspected by the Urban Forestry Section Representative. All trees of 24-inch (600mm) box size or larger shall be inspected at the nursery. Inspections at no cost to the Contractor will be limited to three nurseries, all within a 50-mile (80Km) radius of the site of work. Additional inspections and inspections out of the area will be charged to the Contractor at the Urban Forestry Section Representative standard billing rate in effect at the date of bid, plus mileage costs, and will be deducted from payments due to the Contractor.

(c) Specimen palm trees shall be measured from the ground line to the base of the heart leaf (ANSI 1990 Standard). (Dead frond stubs shall be removed to create a "diamond" pattern with a 2-inch (50mm) maximum protuberance from the trunk.)

(d) All canopy trees of 15-gallon (No. 15) size or larger shall be guaranteed for 1 year. All palm trees shall be guaranteed for 2 years. Guarantee period shall start on the date the Contractor is relieved of landscape maintenance responsibility.

212-1.4.5 Sod. Sod shall be per Appendix III (Acceptable Plant Palette) Page A-111 or equal, grown and harvested from a commercial sod nursery.

Contractor shall provide nursery certification that sod is true to name and variety.

212-1.5 Headers, Stakes, and Ties.

212-1.5.3 Tree Stakes. Stakes shall be round, 10-feet (3m) long, conically pointed at one end, minimum 2-inch (50mm) diameter. Stake material shall be Lodgepole pine, pressure treated with wood preservative.

Root ball stakes shall be round, 4-feet (1.2m) long, conically pointed at one end, minimum 2-inch (50mm) diameter. Stake material shall be Lodgepole pine, pressure treated with wood preservative.

212-1.5.4 Tree Ties. Tree ties shall be 18-inch V.I.T. Twist Brace or equivalent approved by the Urban Forestry Section. Wire devices shall not be used.

Add new Section 212-1.6 Hydromulch Materials.

212-1.6 Hydromulch Materials.

212-1.6.1 Water. General precautions should be observed when drawing water from sources other than main pressure. The use of filters may be required when directed. Such water must be free of impurities.

212-1.6.2 Seed. *(Edit as required.)*

Turf Hydroseed Mix	% by Weight	% by Purity	Percent Germination	Pounds per Acre	Kg per hectare
Total weight					

Slope/Ground cover Hydroseed Mix	% by Weight	% by Purity	Percent Germination	Pounds per Acre	Kg per hectare

212-1.6.3 Wood Fiber Mulch. Fiber shall be produced from cellulose such as wood pulp or similar organic material and shall be of such character that it will disperse into a uniform slurry when mixed with water. This 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.

212-1.6.4 Fertilizer.

Hydromulch Fertilizer shall be a 12-8-8 NPK controlled release type, of uniform beaded mixture, 100 percent passing the No. 4 screen, having the following guaranteed analysis:

Total Nitrogen	12.00%
Coated slow release nitrogen	9.00%
Urea Nitrogen*	3.00%
Available Phosphoric Acid**	8.00%
Soluble Potash***	8.00%
Humus (composted organic & mineral matter)	25.00%
Humic Acids [derived from compost]	5.00%
Iron [expressed as elemental] derived from iron sulfate	4.00%
Manganese [expressed as elemental] derived from manganese sulfate	0.05%
Zinc [expressed as elemental] derived from zinc sulfate	0.05%
Sulfur	7.00%

* derived from sulfur coated urea (controlled release)
** derived from triple super phosphate
*** derived from compost and muriate of potash

212-1.6.5 Binding Agent. Binder shall be dry powder organic concentrate, Ecology Controls M-Binder, or equal.

Add new Section 212-1.7 Landscape Materials.

212-1.7.1 Filter Cloth. Filter cloth shall be a geo-textile fabric, as specified in Table 213-2.2 (A), a Type 90N.

212-1.7.2 Moisture Barrier. Moisture barrier shall be single width sheet flexible PVC or PE membrane of 30-mil thickness.

212-1.7.3 Root Control Barrier. (Refer to Section 308-3.2) Root control barrier shall be 24-inches (600mm) wide by 0.080-inches (2mm) thick high impact injection molded or polypropylene sheeting with reinforced double top edge, manufactured for root barrier purposes. Sheeting shall have integrally molded 90 degrees root deflector ribbing and integrally molded joiner strips.

212-1.7.4 Samples. Within 35 days of award of contract, submit one 24-inch by 24-inch (600mm x 600mm) sample of each item with joining strip or seam and two copies of manufacturer's technical data for approval.

Add new Section 212-1.8 Erosion Control Netting:

212-1.8.1 Jute Mesh. Jute mesh shall be new and shall be of a uniform, open, plain-weave mesh. The mesh shall be made from unbleached single jute yarn. The yarn shall be of loosely twisted construction and shall not vary in thickness by more than one-half its normal diameter. Jute mesh shall be furnished in rolled strips and shall meet the following requirements:

Width	48 inches, plus or minus 1 inch	1.2 meter plus or minus 25mm
Warp ends	78 minimum per yard	85 minimum per meter
Weft ends	41 minimum per yard	44 minimum per meter
Weight	1.16-1.28 pounds per linear yard	.62 Kg

Add new Section 212-1.9 Tree Well Covers:

212-1.9.1 Tree Well Covers. Tree well covers shall be precast porous concrete covers as specified in APWA Standard Drawing 519-1, Type 3, and as shown on the Plans. Poured-in-place covers will not be acceptable.

Add new Section 212-1.10 Tree Grates:

212-1.10 Tree Grates. Tree grates shall be cast iron tree grates with steel frames.

Tree well frames and grates shall be as manufactured by _____.

Model of tree grate shall be _____ cast-iron tree grate, 48" (1.2m) square, in halves, standard 16" (400mm) tree opening, ¼" (6mm) maximum slot openings, black enamel finish.

Model tree grate frame shall be _____ one piece steel angle frame (1¾" x 1¾" x ¼") (45mm x 45mm x 6mm), with standard #4 bar integral cement anchors, black enamel finish, 48-7/8" (1.241m) square overall.

212-2 IRRIGATION SYSTEM MATERIALS

General. Within 35 days after award of contract, submit for review 5 copies of a complete materials list, including manufacturer's name and number, covering all material required under this contract, together with 5 copies of descriptive literature on all items listed. Commence no irrigation system construction prior to receipt of Engineer's determination.

MATERIAL LIST

(Edit as required.)

Item Description	Item Description)
□ Shut-off ball & butterfly valves (S.O.V.)	□ S.O.V. valve box, lid and sleeve/extension
□ Irrigation controller	□ Irrigation controller enclosure
□ Backflow preventer	□ Backflow enclosure
□ Plastic pipe, pipe fittings, swivel joints	□ Primer and solvent for plastic pipe
□ Metal pipe, fittings	□ Pipe anchors
□ Main filter and element	□ Main filter valve box and lid
□ Remote control valves (R.C.V.)	□ R.C.V. valve box and lid
□ Master R.C.V., box & lid	□ Flow sensor, valve box & lid
□ Identification wire and tape	□ Wire and connectors
□ Quick coupling valves (Q.C.V)	□ Q.C.V. valve box and lid
□ Flush valves	□ Flush valve box and lid
□ Irrigation heads, bodies, and nozzles	□ Check valves
□ Drip emitters, tubing, connectors, boxes	□ Drip filter, relief valve, drain valve
□ Irrigation control wire and connectors	□ Control wire conduit and pull boxes
□ Hose swivels	□ Valve operating wrenches
□ Quick couplers	□ Pressure switch
□ Moisture sensor and wire	□ Time delay relay
□ Rain sensor and wire	□ Radio transmitter/receiver

212-2.1 Pipe and Fittings. Plastic pipe ¾ inch (20mm) to 1½ inches (40mm) shall be PVC 1120, Schedule 40 solvent welded pipe.

Plastic pipe 2 inches (50mm) and over shall be PVC 1120, Class 315 solvent welded pipe for lateral line, and up to 2½ inches for main line.

Mainlines (pressurized) 3 inches and larger shall be Class 315 bell and gasket PVC, unless otherwise noted or except where sleeved.

All buried pipe sleeving shall be PVC 1120, Schedule 40 solvent welded pipe.

All exposed pipe sleeving shall be Schedule 40 galvanized steel pipe.

Swing joints shall be as detailed on the drawings. Swing joints and all fittings shall be same pipe size as sprinkler body inlet. Pressure pipe risers and fittings shall be PVC Schedule 80.

Risers and fittings for backflow prevention device shall be red brass, standard weight.

212-2.1.3 Solvent Weld Plastic Pipe and Fittings. All plastic pipe shall be new normal impact rigid polyvinyl chloride PVC 1220 or 1120 pipe extruded from 100 percent virgin materials. All pipe O.D. sizing shall be done in conformance with AWWA iron pipe sizing (I.P.S.). All pipe shall be National Sanitation Foundation approved. Conforms to ASTM D-1784 or D-2241.

Pipe shall be homogenous throughout, free from visible cracks, holes, blisters, dents, wrinkles, die and heat marks, and foreign materials.

Continuously and permanently mark pipe with manufacturer's name or trademark, kind and size pipe, material, manufacturer's lot number, schedule, or Class and NSF seal of approval.

The physical specifications of the Society of Plastic Industries for each type of pipe used shall be deemed and construed as a part of this Specification.

Pipe dating shall be done in conjunction with records held by the manufacturer for 2 years, covering quality control tests, raw material batch numbers, and any other information required by the manufacturer.

Nominal pipe sizes in I.P.S. and Metric shall be as shown in the table below:

Iron Pipe Size (I.P.S.)	Metric Standard Diameter Nominal (D.N.)
½"	15 mm
¾"	20 mm
1"	25 mm
1¼"	32 mm
1½"	40 mm
2"	50 mm
2½"	65 mm
3"	75 mm
4"	100 mm
6"	150 mm

Solvent weld fittings shall be PVC manufacture, heavy wall and of the I.P.S. solvent welded types, Schedule 40. Fittings containing threads shall be Schedule 80.

Primer and solvent cement shall be of the type and make approved by the pipe manufacturer for use on its pipe. Unless noted otherwise by manufacturer, primer shall meet ASTM F-656, and cement shall meet ASTM D-2564.

212-2.1.4 Plastic Pipe for Use with Rubber Ring Gaskets.

Delete this section and replace with the following:

Conform to ASTM D-1784 Type 1, Grade 1, 2,000-psi design stress. Standard dimensional ratio for pipe shall be SDR 21 (Class 200). All pipe shall conform to Commercial Standards CS-256-64 (pressure rated pipe), and National Sanitation Foundation (NSF) testing laboratories. Rubber gaskets shall conform to ASTM 1869.

All pipefittings shall bear the following markings: Manufacturer's name, nominal pipe size, schedule or class, pressure rating psi, NSF, and date of extrusion.

212-2.1.5 Copper Pipe. Add.

Fittings shall be wrought solder joint type in accordance with ANSI B1622.

Solder joints with silver solder: 45 percent silver, 15 percent copper, 16 percent zinc, 24 percent cadmium and solidus at 1,125 degrees F. and liquidus at 1,145 degrees F., conforming to ASTM B206 and FS QQB-655C.

Add new section:

212-2.1.6 Brass Pipe and Fittings.

Brass pipe shall be 85 percent red brass, American National Standard Institute (ANSI), Schedule 40 screwed pipe.

Fittings shall be medium brass, screwed, 125-pound class.

Add new section:

212-2.1.7 Ultra-Violet Resistant Pipe.

Pipe shall be extruded of an improved PVC virgin pipe compound featuring high-impact strength. Conform to ASTM D-1784 or D-2241 to meet the requirements of cell classification 12454B for pipe. Compound shall have a 2,000-psi hydrostatic design stress rating. UVR water pipe shall be manufactured using a process and/or ingredients proven to resist weakening or corrosion by ultra-violet radiation. Pipe shall be color-coded brown. UVR water pipe shall use Schedule 40 PVC fittings manufactured of the same material or process as the UVR pipe on which they are used.

Add new section:

212-2.1.8 Rubber Gasket Fittings.

Fittings shall be ductile iron deep bell type. Fittings shall be constructed of grade 65-45-12 ductile iron in accordance with ASTM A-536. Fitting gaskets shall be rubber in accordance with ASTM F-477. All ductile iron fittings shall be manufactured with exterior lugs and be fitted with a joint restraint system.

212-2.2 Valves and Valve Boxes.

212-2.2.2 Shut-Off Valves (SOV)

Ball valves 2 inches and smaller shall be of a brand, size, and type indicated on the irrigation plans.

Ball valves shall have a one-piece body constructed of 600 pounds WOG bronze material conforming to ASTM B-584 alloy 844. Ball valve shall have a vented ball with a blowout proof system. Ball valves shall have a working pressure of not less than 150 psi and shall conform to AWWA standards.

Shut-off valves 2½ inches (65mm) and larger shall be butterfly valves with iron, brass, or plastic body with a square operating nut meeting AWWA standards, and shall be as manufactured by Nibco (lug butterfly type).

212-2.2.4 Remote Control Valves. Remote control valves shall be normally-closed type so designed that the pilot line and solenoid shall not be energized when the valve is in closed position.

Valves shall automatically close in event of electrical power failure or due to breakage of pilot wire.

Manual override shall provide for manual operation prior to electrical connection. This device shall be installed by the valve manufacturer.

No external tubing connection other than waste line will be allowed.

Remote control valves shall be of the brand, size, and type indicated on the irrigation plans.

The remote control valve shall be normally closed 24 VAC solenoid actuated glove pattern, spring-loaded diaphragm type. The valve shall be pressure rated up to 200 psi at 150 degrees F.

The valve shall have a 60-pound test fabric reinforced rubber diaphragm assembly with self-cleaning stainless steel screen.

Remote Control Valve: The body and bonnet shall be brass and the valve shall have a stainless steel control/shut-off stem and manual operator.

Drip Remote Control Valve: The body and bonnet shall be fiberglass, reinforced nylon and the valve shall have a brass control/shut-off stem and manual operator.

All remote control valves shall have a bronze angle type shut-off valve installed as part of the valve assembly immediately upstream of the control valve, if specified.

The valve shall provide for all internal parts to be removable from the top without disturbing the valve installation.

Solenoid shall be corrosion proof and constructed of stainless steel molded in epoxy to form one integral unit, 24-volt AC watt maximum holding milliamp in-rush, current: 0.41 amp (9.i VA, holding current: 023 amp (5.5 VA).

212-2.2.6 Quick Coupling Valves and Assemblies. Quick coupling valves shall be two-piece type of the size as specified on the drawings, 150-psi working pressure. They shall be all brass and so constructed that they automatically close when the coupler is removed. All such valves shall be equipped with locking lids and vinyl or rubber cover.

Quick coupler key is part of this assembly.

Quick coupler assembly shall have a pre-assembled double o-ring PVC swing joint with a viton o-ring sealed brass MIPT nipple factory molded into the outlet end. Inlet shall be PVC MIPT. Assembly shall be 1-inch size, 12-inch lay length and equipped with both horizontal and vertical supports. Vertical support shall allow for insertion of rebar stabilizing rods to secure the quick coupler.

Hose bibs for quick coupler assemblies shall be constructed of brass bodies, rubber gaskets, and a malleable iron handle. Hose bibs shall have a 1-inch FIPT inlet and a ¾-inch MHT outlet.

212-2.2.7 Valve Boxes.

Rectangular valve boxes shall be 11.75-inches wide by 17-inches long by 12-inches high constructed of rigid polyolefin, chemically inert plastic with valve box extensions where required. Valve boxes shall have locking plastic covers. Valve boxes and covers shall be green in color unless used with reclaimed water where they shall be color-coded purple and embossed with the required reclaimed water warning statements. Heat brand box lid with the appropriate program and station number.

Identification letters or numbers shall be 2-inches high and heat branded onto the box cover. Identification shall be as indicated on the detail drawings.

Heat branding shall be accomplished using branding irons specifically designed for this purpose. Heat branding shall not weaken or in any way puncture the valve box cover.

Valve box covers shall be green in color unless directed to be purple in color for used with reclaimed water. Reclaimed water valve boxes shall have appropriate reclaimed water warnings embossed onto the cove in English and Spanish, as well as the international "Do Not Drink" symbol.

Valve box covers shall locking type, secured with a 3/8-inch stainless steel bolt, washer and nut.

Rectangular valve boxes shall be used for all valves.

Gravel: All gravel used in valve boxes shall be washed crushed gravel of approximately ¾ inch size. No pea gravel shall be used.

Landscape Fabric: Landscape fabric for valve box assemblies shall be 5.0-ounce weight woven polypropylene weed barrier. Landscape fabric shall have burst strength of 225 psi, puncture strength of 60 pounds and capable of water flow of 12 gallons per minute per square foot.

Identification tags with numbers are required on all valves.
Type: Christy Tags (yellow background with black lettering) or approved equal.
Christy Tags (purple background with reclaimed water warnings) or approved equal.

Add new section:

212-2.2.8 Remote Master Valve. Remote master valve shall be Superior, normally open valve. A pressure switch shall be mounted on the remote master valve to detect excess flow. Pressure switch shall be connected to a time delay relay in the automatic controller assembly. Relay shall be set for 3 minutes.

Add new sections:

212-2.2.9 Check Valves.

Swing Check Valve: Swing check valves shall be constructed of bronze and stainless steel internal parts. Swing check valve shall permit water to flow up slope not down.

Spring Check Valve (adjustable): Spring check valves shall be constructed of bronze and stainless steel internal parts. Spring check valve shall be adjustable between 5 to 15 pounds.

Add new section:

212-2.2.10 Sensors:

Flow Sensor – as specified on irrigation plan.
Rain Sensor – as specified on the irrigation plan.

212-2.3 Backflow Preventer Assembly. Backflow prevention device shall be of the size and type as indicated on the drawings. Use only brass fittings in assembly.

212-2.3.1 Backflow Mounted Equipment.

Backflow mounted wye filter shall be a brass construction valve, as manufactured by Wilkins, type YSBR 100, or equal. The unit size shall be the same size as the related backflow preventer device. The filter element shall be 80 mesh Monel or stainless steel.

Backflow mounted pressure regulator valve shall be an automatic adjustable pressure regulating valve of brass construction as manufactured by Wilkins, type 500 Series, or equal. The size shall be the same as the related backflow preventer device.

212-3 ELECTRICAL MATERIALS

212-3.1 General. All wiring and pull box details shall conform to drawing details, these Specifications and as follows:

(a) National Electrical Code.

(b) Local Codes and Ordinances.

(c) Recommendations as printed by the respective supplier.

(d) All wiring shall be continuous, soldered and encapsulated in 3M DBY 9053 containers, at connections to remote control valves.

It shall be the Contractor's responsibility to call out any conflict between the above-listed recommendations.

212-3.2 Conduit and Conductors.

212-3.2.1 Conduit. The first paragraph of Subsection 212-3.2.1 of the Standard Specifications is hereby deleted and replaced with the following:

Conduit shall be PVC 1120, Schedule 40 solvent welded pipe.

Conduit shall be a minimum size as shown in the table below:

Conduit Size	Maximum Number of Wires (#14 AWG)
15mm (½")	2
20mm (¾")	4
25mm (1")	6
32mm (1¼")	10
40mm (1½")	14
50mm (2")	25

212-3.2.2 Conductors. The second paragraph of Subsection 212-3.2.2 of the Standard Specifications is hereby deleted and replaced with the following:

LOW VOLTAGE CONDUCTORS

Pilot lines and common wire connecting remote control valves to automatic controller shall be direct burial, U.F. type with approved 4/64-inch thick waterproof coating, 600 volt, 75 degrees centigrade, copper single-strand wire, U.L. approved.

All control wires shall be black in color. When more than one controller is installed use a different color wire for each controller.

All common wires and only common wires shall be white in color. When more than one controller is installed, use white colored wire with a different color stripe for each controller. Color of the stripe shall match the color of the control wire.

Flow sensor wires shall be #14 gauge as part of a two pair shielded cable. Cable shall be direct burial type with one black wire and one red wire.

212-3.3 Controller Units. Automatic controller shall be constructed to operate 24-volt electric normally closed type remote control valves.

Controller shall operate the number of valves shown on the drawings at one valve per station.

Controller shall be as shown on drawings.

Add new section.

(Edit as required.)

212-3.4 Supplemental Irrigation Control Systems.

Supplemental irrigation control systems include, but are not limited to:

- Moisture sensors, sensor wires, and relays
- Flow sensor, valve box, flow sensor wires and relays
- Radio transmitter/receiver controller module
- Radio transmitter/receiver hand-held unit
- Master valve module and relay
- Pump start module and relay
- Pressure switch module and relay
- Radio Antenna

Add new section.

212-4 ENCLOSURES

212-4.1 General. Materials for enclosures shall conform to Section 206 and fabrication shall conform to Section 304 of the Standard Specifications.

(Edit as required.)

212-4.2 Controller Enclosure. Enclosure shall be as called out on drawings

212-4.3 Backflow Device Enclosure. Enclosure shall be as called out on drawings.

Enclosure shall have sufficient space to house the specific backflow devise complete with test gauges.

Enclosure shall have sufficient space to house the specific backflow device complete with test gauges.

212-4.4 Painting. Paint two coats epoxy enamel, color selected by Engineer. Stainless steel enclosures shall not be painted.

212-4.5 Stainless Steel Enclosures. All stainless steel enclosures shall be stamped with 2-inch letters "COA".

212-5 STABILIZERS

212-5.1 J-hooks.

All pipe installed on grade shall be secured to the ground surface using #4x 18-inch rebar j-hooks at 8 feet on center. All j-hooks shall be painted with black epoxy paint prior to installation.

212-5.2 Stabilizing Rods.

All assemblies requiring stabilization shall be equipped with #4x 30-inch rebar stabilizer rods. Quantity of stabilizing rods shall be as indicated on the detail drawings.

212-5.3 Vandal-Proof Clamps.

All assemblies requiring stabilization shall be equipped with vandal-proof clams constructed of stainless steel and be installed with a tool specifically for this purpose. Clamps shall be one time only use type and not be removable with screwdrivers or wrenches. Quantity of clamps shall be as indicated on the detail drawings.

SECTION 300 - EARTHWORK

300-1 CLEARING AND GRUBBING

300-1.1 General. Add:

Demolition and removal of PCC walks, AC paving, irrigation equipment, tree removal, furnishing and installing temporary 6-foot high chain link fence to protect area of improvements; and such other items not mentioned that are required by the Plans and Specifications, are part of this work in this section.

Footings and base debris removed for concrete walk, AC paving, etc., shall be disposed of offsite in a legal manner at no additional costs to the Agency.

All obstructions within project limits shall be removed to a minimum of 12-inches below subgrade.

Soil backfill for holes caused by the removal of the existing structures foundations shall be filled with selected site soils and recompacted in 6-inch layers to the density of 95-percent relative compaction.

All existing trees shown on the Plans to remain shall be protected from damage during construction. The barricade material and protected area shall be determined by the Engineer.

Tree removal shall include grinding stumps and associated roots to the diameter of the trunk at existing grade and to 3-foot depth below existing grade. Grindings shall be removed from this 3-foot hole. The hole shall then be filled with soil and compacted to 95-percent relative compaction.

All equipment and facilities shown on the Plans to be salvaged, removed and stockpiled, adjusted, and/or relocated shall be measured, marked, and identified in the field.

Contractor shall note the locations, dimensions, and configurations of all existing equipment to be salvaged, and shall clearly mark or tag all equipment to be reused in the field prior to removal to facilitate reassembly; Contractor shall notify Engineer of any damaged or non-salvageable materials **prior** to commencing any removal or grading operations. Materials found to be damaged after the work commences shall be assumed to be the responsibility of the Contractor. Contractor will not be paid for the replacement or repair of facilities or equipment believed by the Engineer to be damaged after the work commences.

The application of herbicide to kill turf and weeds, per manufacturers' recommendations, including roots; and the removal and disposal of turf offsite, and such other items not mentioned that are required by the Plans and Specifications, are part of the work in this section.

The last paragraph of Subsection 300-1.1 is hereby deleted and replaced with the following:

Tree branches which hang within 4.1 m (13.5) feet above finished roadway grade, or 2.7 m (9 feet) above finished sidewalk or parkway grade, shall be removed to the branch collar in accordance with the current pruning standards of the International Society of Arboriculture (ISA). The Contractor shall remove additional tree branches, under the direction of the Engineer, in such a manner that the tree will present a balanced appearance. No paint or tree sealant shall be applied to the resulting scars. All pruning shall be done under the supervision of an ISA Certified Arborist in the Contractor's employ.

The following is hereby added to Subsection 300-1.1:

All the root pruning required to place or replace walks, or other permanent facilities shall be limited to the minimum amount necessary to set forms.

All roots 2 inches and larger shall be cut with sharp tool such as axe or chainsaw. No roots shall be broken off by trenching or other heavy equipment.

No root shall be removed within five (5) diameters of the tree trunk measured at 1.5 m (4 feet, 9 inches) above grade without the express written permission of the City. Any such root removed without the City's written permission may create a hazardous condition for which the Contractor shall be liable.

Should the Contractor create a hazardous condition in the sole judgment of the Engineer the Contractor shall remove the tree and replace it with a specimen of the same specie and value at the Contractor's expense.

All significant root pruning (3 inch diameter and larger) shall be performed under the direct supervision of an ISA Certified Arborist in the Contractor's employ.

300-4 UNCLASSIFIED FILL

300-4.1 General. Add the following:

The site shall be graded to the limit lines and elevations shown on the drawings with such allowances as may be required for the construction of walks, and other site improvements. Tolerance for rough grading is 1/10th of a foot (30mm), plus or minus, at drainage swales, and paved areas. At other areas, appearance shall be the governing factor.

Finish grades shall slope to drain without water pockets or irregularities and shall conform to the intent of all plans and sections, after thorough settlement, and compaction of the soil. Finished grades shall meet all existing or established controls of sidewalks, curbs, and walls and shall be of uniform slope and grade between points of fixed elevations or elevation controls from such point to established grades. Tolerance for finish grading is ¼ inch (6mm), plus or minus.

300-4.1 General. Delete the second and third paragraphs and replace with the following:

Rocks, broken concrete, or other solid materials which are larger than 25mm (1 inch) in greatest dimension shall not be placed in fill areas that are to be planted.

Clods or hard lumps of earth 25mm (1 inch) or more in greatest dimension shall be broken up before compacting the material in fill areas to be planted. Fill material containing large rocks, boulders, or hard lumps (such as hardpan or cemented gravel which cannot be broken readily) over 300mm (12 inches) in greatest dimension shall not be incorporated in the fill. Such materials shall be removed from the site.

Selected material from the site that meets the requirements for Class C topsoil may be used in landscaped areas in the upper 300mm (12 inches) of fill. (Ref: Sec. 300-2.7)

Make-up fill material in landscaped areas shall be Class A topsoil for the upper 300mm (12 inches) of fill. (Ref: Sec 308-2)

300-4.9 Measurement and Payment. The text of Subsection 300-4.9 of the Standard Specifications is hereby deleted and replaced with the following:

Full compensation for furnishing all labor, materials, tools and equipment, and doing all the work involved in unclassified fill construction shall be considered as included in the contract bid lump-sum price bid for demolition, removals and earthwork. No separate payment shall be made therefor; in addition, the unclassified fill shall include all costs for grading, shaping, compacting spreading, consolidating, placing selected site materials, and other work that is required under this subsection.

(or)

Payment for Class A topsoil shall be at the contract bid unit price per cubic yard in place and graded to within 30mm ($1/10^{th}$ of a foot) of finish grade. Measurement shall be at the theoretical volume per Plans.

Payment for subgrade preparation required for PCC walks and AC pavement shall be considered included in those items of work, and no separate payment will be made therefor.

303-6 STAMPED CONCRETE

303-6.1 General. Add the following:

Color shall be determined by Engineer and shall be applied by Method A of Subsection 303-7 of the Standard Specifications. Color hardener shall be applied evenly to the plastic surface by a dry shake method in accordance with the approved manufacturer=s printed instructions. It shall be applied in two applications, wood floated after each, and trowled only after the final floating.

While the concrete is still plastic, the forming tools shall be applied to make the patterned surface. After curing a minimum of 7 calendar days, Contractor shall pressure clean the concrete to remove residual dust and excess release agent. After concrete is cleaned, it shall be sealed with clear sealant.

Only the concrete work so indicated on the Plans will receive color treatment. If any concrete work not indicated for color treatment, any curb and gutter, or any existing concrete which is to remain in place should receive any color treatment, it shall be removed and replaced by the Contractor at the Contractor's expense.

Stamped concrete shall be placed, formed, and cured in conformance with the printed instructions, specifications, and technical bulletins issued by the manufacturer of the color hardener and color wax curing system.

The applicator shall be an experienced stamped concrete specialist. The stamped concrete specialist and a supervisor of proven ability (who can provide at least three examples of high-quality installation) shall be listed on the bid form.

Prior to start of stamped concrete work, Contractor shall submit the following to the Engineer, for approval:

- Three copies of the manufacturer's printed instructions, bulletins, and specifications.
- A 1 m^2 (10 ft. ^{2}) square sample of stamped, finished concrete for the Engineer's approval prior to the start of stamped concrete work.

The finished concrete sample shall reflect the personnel, procedures, and materials to be used, and shall match the color, pattern, and finish of the stamped concrete to be installed by the Contractor.

The stamped concrete shall be installed in the locations shown on the Plans, and shall be subject to approval by the Engineer. Work not conforming to color(s), pattern, texture, appearance, or otherwise not complying with the Specifications shall be removed and replaced at no additional cost to the City.

Add new section:

303-6.5 Payment.

Payment for stamped concrete will be at the contract unit bid amount per square foot in place.

SECTION 308 – LANDSCAPE AND IRRIGATION INSTALLATION

308-1 GENERAL (Add the following):

All existing lawn and landscape areas disturbed by the Contractor as part of or as a result of the work shall be prepared and reseeded and/or replanted in kind, except as otherwise designated in the Plans. Existing irrigation systems shall be repaired and restored to operating condition to the satisfaction of the Engineer.

308-2 EARTHWORK AND TOPSOIL PLACEMENT

308-2.1 General. Add the following:

After topsoil has been placed and prior to amendment, the topsoil will be sampled and tested by the Agency to assure compliance with the Specifications and the approved source testing. Supplemental tests may be made to assure compliance with amendment and fertilization specifications.

308-2.2 Trench Excavation and Backfill. Add the following:

308-2.2.1 Depth of cover in planted areas.

Pressure mainlines: 24 inches
Non-pressure lines (lateral lines): 18 inches
Control wiring: 24 inches
Electrical conduit: 24 inches

308-2.2.2 Depth of cover under roadways.

Minimum depth of cover for all lines under roadways is 36 inches.

308-2.3 Topsoil Preparation and Conditioning

308-2.3.2 Fertilizing and Conditioning Procedures. Add the following:

Amend all planting areas with a grade of 3:1 or less.

The topsoil shall be amended as recommended by the testing laboratory. Should the amendment recommendations furnished by the laboratory exceed those required by the bidding documents, the laboratory recommendations shall be applied at no additional cost to the Agency.

Incorporate into the top 150mm (6") of the soil, using a mechanical tiller, tilling in two separate directions the following materials, in all areas to be planted:

Material	Rate per 100m^2 (1,076 square feet)
Type I Amendment	1.5 m^3 (2 cubic yards)
Commercial Fertilizer	5.7 Kg (12 pounds)
Agricultural Gypsum	45 Kg (100 pounds)

The above soil conditioning quantities shall be used for bidding purposes only. The Contractor shall obtain soil samples at a rate of one per every 25,000 square feet of planted area in the presence of the Engineer. Soil tests shall be conducted by an approved agronomic soils testing laboratory approved by the Engineer. Copies of the soil test shall be provided during the pre-site meeting and verified by the Engineer. The Contractor shall add amendments per soils report recommendations for individual planting areas and as approved by the Engineer.

All rocks or unbroken soil clods over 1-inch in diameter brought to the surface shall be removed from the project site.

308-3 HEADER INSTALLATION

Add new Section 308-3.1 MOISTURE BARRIER

308-3.1 Moisture Barrier Installation. Moisture barrier membrane shall be installed in all median islands, completely surrounding the areas to be irrigated and planted. Membrane shall extend a minimum of 30-inches (760mm) below top of curb.

Attach membrane securely and continuously to the back of curb with a mastic adhesive.

Lengths of sheeting shall be joined by folded and cemented lap seams, completely waterproof. Furnish two samples of a completed seam to the Engineer for approval prior to start of this work. Seams shall be minimum 4-inches (100mm) wide by width of sheet.

303-3.2 Root Control Barrier Installation.

(Use for tree wells.)

308-3.2.1 Install root control barrier in all tree wells to form a continuous barrier at the perimeter. Install and join sections in strict accordance with manufacturer's printed instructions.

(Use for parkways.)

308-3.2.2 Install root control barrier at back of curb and in front of walk. Length of barrier shall be 12 feet, centered on the tree.

308-4 PLANTING

308-4.1 General. Add the following:

308-4.1.1 Agency Furnished Trees (Reference: Section 212-1.4.2). The Contractor shall make all arrangements for delivery of Agency furnished trees to the site. The Contractor shall notify the Agency at least 3 weeks in advance of scheduled planting date, and the supplier at least 5-working days in advance of desired delivery date.

The Contractor is responsible to schedule tree deliveries. Daily deliveries shall not exceed the Contractor's capability to place delivered trees on site unless the Contractor has provided adequate off-site storage space. All charges for extra handling shall be borne by the Contractor.

The Contractor shall provide off-loading and placing equipment of adequate capacity to safely handle the furnished trees.

308-4.5 Tree and Shrub Planting.

Add the following:

Excavate planting pits with vertical sides for all plants. Shrub pits shall be twice the diameter and 1½ times the depth of the root ball. Tree pits depth shall include the root ball and a transitional zone of compacted, unamended native soil.

If planting pits are cut with power auger, vertical sides of pit shall be additionally broken with balling bar or spade to interrupt continuous curve influence on root development.

All trees in turf areas shall have an arbor guard installed around the base of the tree.

All trees shall be planted per Standard Detail Nos. 518 and 520.

All shrubs shall be planted per Standard Detail 528.

Delete the fourth paragraph of Subsection 308-4.5 of the Standard Specifications and replace it with the following:

All planting holes (except for palms) shall be backfilled with a prepared backfill mix consisting of the following unless otherwise specified in the soils report recommendations:

Five parts native on site soil.
Three parts soil amendment.
Five pounds commercial fertilizer per cubic yard of mix or approved equal.
Five pounds gypsum per cubic yard of mix.

Insert planting tablets as follows:

1 gallon	1 tablet
5 gallons	2 tablets
15 gallons	5 tablets
24-inch box	7 tablets

Follow the manufacturer's directions for larger sizes.

Delete the first sentence of the fifth paragraph and insert in its place:

Plant material shall be planted in such a way that after settling, the root crown of the plant shall be at finish grade or slightly higher.

308-4.5.1 Palm Tree Planting.

a. **Digging**. Dig trees as close to date of planting as practical. Hand dig palm and wrap root ball in burlap. Keep moist and tie securely.

b. **Pruning and Tying**. Prune off dead fronds to balance root pruning. Tie fronds together with organic twine to protect heart.

c. **Planting**. Planting holes shall be at least one-third larger than the root ball. Determine the water percolation rate for each hole by filling the hole with water, allowing it to drain completely and refilling the hole with water. If the hole fails to drain completely within a 24-hour period, then excavate to break through the impermeable layer or to provide a thicker layer of sand under the root ball. The slower the percolation rate, the deeper the sand layer must be beneath the root ball.

Backfill shall be 100 percent clean concrete sand. Do not use organic amendment.

Add moist fill to the bottom of the hole, blending one to two cups of blood meal into the soil. Thoroughly compact soil to depth required to set tree soil line at finish grade. After insertion of the tree, add moist backfill and thoroughly compact to assure stability.

d. Installation. Palm tree planting shall be per Standard Detail No. 529.

308-4.6 Plant Staking and Guying. Tree staking shall be as shown on the drawings.

308-4.8 Lawn Planting.

308-4.8.1 General. Add the following:

Lawn planting shall be performed by sodding or as indicated on the Plans and as suitable for the species of turf specified and as acceptable to the City.

308-4.8.2 Seed. Add the following:

Lawn (and slope) planting shall be by Method B.

Hydroseeding: The seed bed shall be inspected by the Engineer to determine its suitability prior to seeding. The Contractor shall obtain such approval before seeding. No seeding shall be performed until all other construction operations have been completed, except by authorization of the Engineer.

Hydraulic Slurry: Mixing shall be performed in tank with a built-in continuous agitation and recirculation system of sufficient operating capacity to produce a homogenous slurry of fiber, M-Binder, seed, fertilizer, and water in the designated unit proportions:

Fiber	2,000 pounds per acre
Seed	400 pounds per acre
M-Binder	100 pounds per acre
Water	3,000 gallon per acre
Fertilizer	450 pounds per acre

With water agitation system operating at part speed, water shall be added to the tank, good recirculation shall be established. Materials shall be added in such a manner that they are uniformly blended into the mixture in the following sequence:

When tank is one-third filled with water:

Add binding agent at one-half of the per acre requirement
Add three 50-pound bales of fiber
Add seed at one-half of the per acre requirement
Add NPK fertilizer at one-half of the per acre requirement

Agitate mixture at full speed when the tank is half filled with water.

Add remainder of fiber requirements, seven bales before tank is three-quarters full. Slurry distribution shall begin immediately.

Area to be hydromulched shall be moistened to a depth of 6 inches just prior to application.

Application: Hydromulch slurry shall be applied under high pressure evenly and result in a uniform coat on all areas to be treated. Care shall be exercised to assure that plants in place are not subjected to the direct force of an application. Slurry shall be immediately removed from walks, structures, etc., that are inadvertently sprayed.

308-4.8.3 Sod. Add the following:

All areas to receive sod shall be finish graded prior to commencement of sodding. Grade smooth all surfaces to be sodded. Soil surface should be 1-inch below adjacent walks after settling. Roll lightly and fill in all soil depressions. All areas to be sodded shall be moistened to a depth of 6-inches just prior to application. Rooting agent shall be applied per the written recommendations of the sod grower. Contractor shall provide a copy of such recommendations to the City Engineer prior to installation of the sod. Lay sod in parallel rows with a running bond pattern using uniformly sized strips of sod. Use whole pieces wherever possible. Lay sod smooth with tight joints, no gaps greater than 1/8 inch in size. All irrigation heads shall be marked with flags for ease of location. Cut sod neatly trimming it away from around each irrigation head a maximum of 1/8 inch all around to allow for proper spray pattern and smooth pop-up and retract operation. Immediately following completion of sodding operations, irrigate as necessary.

At no time either during or after planting shall sod be subject to dry conditions. Freshly planted sod shall immediately be irrigated to a depth of 8 inches and shall be kept moist at all times thereafter for a period of minimum 10 to 20 days depending upon weather conditions, until the new planting are sufficiently rooted and well established to withstand less frequent irrigation. After the first irrigation, water shall be applied as often and in sufficient amounts as conditions may require to keep the soil moist.

At the point that the turf is generally showing signs of establishment, all bare or dead spots shall be replanted within 10 days by Contractor, with new sod as designated by City Engineer. Contractor shall be responsible for all replanted turf areas for as long after replanting as is necessary until acceptable rooting and establishment is realized and approved by the City Engineer.

308-4.9.5 Watering. Add the following:

It shall be Contractor's responsibility to maintain a balanced watering program to ensure proper growth until final acceptance of the work.

Immediately after planting, apply water to each plant. Apply water in a moderate stream in the planting hole until the material around the roots is completely saturated from the bottom of the hole to the top of the ground.

Apply water in sufficient quantities and as often as seasonal conditions require to keep the planted areas moist at all times, well below the root system of plants.

Irrigation:

1. Contractor shall properly and completely maintain the irrigation system. A balanced water program shall be maintained to ensure proper germination and growth until final acceptance of the work. Plants which cannot be watered sufficiently with the irrigation system shall be watered by means of a hose.

2. All controllers are to have each station individually adjusted on a weekly basis until final acceptance. System shall be set considering the application rate each area is capable of receiving. The system shall operate on short intervals, with the cycle repeating at a later time to reduce runoff.

Add new section.

308-4.10 Mulch

308-4.10.1 Installation. Following acceptance of plant material installation, apply even layer of mulch, 3 inches thick, over all areas shown as planting areas on the Plans, except lawn. The mulch blanket side watering basins shall be 3 inches thick. Taper thickness of mulch to meet pavement 15mm (½") minimum below the finished surface of pavement. Keep mulch 6 inches away from tree root crown.

Add new section.

308-4.11 Erosion Control Netting

308-4.11.1 Installation. Install jute mesh erosion control netting on all slopes where shown on the Plans.

Jute mesh shall be installed loosely on the slopes. Longitudinal seams of the jute mesh shall be at right angles to the slope contour lines. The installed mesh shall fit the soil surface contour and shall be held in place by 9-inch long, 11-gage minimum steel wire staples driven vertically into the soil at approximately 24-inch spacing. Jute mesh strips shall overlap the adjacent jute mesh a minimum of 6-inches. Ends of strips shall be buried into the soil a minimum of 6-inches.

Cut mesh for openings at existing trees and shrubs that remain and for sprinkler risers, etc.

308-5 IRRIGATION SYSTEM INSTALLATION

308-5.1 General. Add the following:

All abandoned domestic irrigation lines must be cut and capped at the mainline. The remaining portions of the existing system is to be maintained and operational during construction.

Delete the last paragraph of Section 308-5.1 and insert the following:

308-5.1.1 Record Drawings.

Record accurately on one set of black and white prints (irrigation drawings), and all changes in work constituting departures from the original contract drawings. Include changes in both pressure and non-pressure lines.

Upon completion of each increment of work, transfer all such information and dimensions to the prints. Record changes and dimensions in a legible and professional manner. When the drawings are approved, transfer all information to a set of reproducible drawings.

Dimension from two permanent points of reference (monuments, sidewalks, curbs, pavement). Post information on as-built drawings day-to-day as the work is installed. All dimensions noted on the drawings shall be ¼ inch in size.

- Point of connection (P.O.C.).
- Master valve and flow sensor.
- Routing of irrigation pressure mainlines (dimension maximum 10 feet along routing and all directional changes).
- Ball shut-off valves.
- Irrigation control valves.
- Automatic controller, rain sensors, and electrical conduits.
- Sleeves and pull boxes.
- Other related equipment as directed by the Engineer.

Maintain as-built drawings on site at all times. These drawings are subject to inspection at any time.

Make all changes to reproducible drawings in ink. Erase or use eradicating fluid when revising drawings. Make changes in a manner equal to the original drawings.

Contractor must submit as-built (sepia mylars and one set of bluelines) to the Engineer inspecting the site 7 calendar days prior to the start of the maintenance period for approval.

Add the following:

308-5.1.2 Controller Charts

The Engineer shall approve as-built drawings before charts are prepared.

Provide two controller charts for each controller supplied, showing the area covered by the automatic controller.

The chart shall be a reproduction of the as-built system drawings. If the controller sequence is not legible when the drawing is reduced, enlarge it to a size that will be readable when reduced.

Charts shall be blackline print with a different transparent color used to show area of coverage for each station.

When completed and approved, hermetically seal the chart between two pieces of plastic, each piece being a minimum of 10 mils thick.

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

Add the following:

308-5.1.3 Operation and Maintenance Manuals.

Prepare and deliver to the Engineer, prior to the completion of the maintenance period, all required and necessary descriptive material in complete detail and sufficient quantity, properly prepared in four individually bound copies. Describe the material in sufficient detail to permit qualified operating personnel to understand, operate, and maintain all equipment. Each manual shall include the following:

a. Index sheet stating Contractor's address and telephone number.
b. Duration of guarantee period with guarantee forms.
c. List of equipment with names and addresses of manufacturer's local representatives.
d. Operating instructions and a parts list as printed by each manufacturer of each type equipment included in this contract; refer to "Materials" section of the Specifications and legend on drawings.

In addition to the maintenance manuals, provide the maintenance personnel with instructions for major equipment and show written evidence to the Engineer at the conclusion of the work that this service has been rendered, if required.

Add the following:

308-5.1.4 Turn-over Items.

Prepare and deliver to the Engineer, prior to the end of the maintenance period, all required spare parts, tools, and equipment. Spare parts, tools, and equipment shall include the following:

(a) Two sets of keys for each automatic controller cabinet.

(b) Two sets of keys for lock on controller enclosures.

(c) One coupler for every six quick coupler valves; each coupler shall be equipped with 20mm (3/4")diameter 300mm (12") tall bronze hose bib, bent-nose type, with handwheel.

(d) Two loose keys for each three quick coupler valves installed under this contract.

(e) Two special wrenches suitable for operating each type of shut-off valve installed under this contract.

(f) Two tools for disassembly and assembly or adjustment of each type equipment used in this installation requiring such special tools.

(g) One valve box key for every six lock-lid valve boxes used in this installation.

(h) Six extra sprinkler heads of each size and type used on this project.

(i) Two sets of operating instructions and a parts list as printed by each manufacturer of each type equipment included in this contract; refer to "Materials" section of the Specifications and legend on drawings.

(j) One specified padlock for each controller enclosure, as approved by the City.

Note: Depending on the project size, the City may require that a Rain Master remote control unit be included with turnover items.

Add the following:

308-5.1.5 Close Out. The irrigation system shall be ready for complete automatic operation to the satisfaction of the Engineer. Contractor shall provide all appurtenances, devices, record documents, and manufacturers literature necessary to operate and maintain the system, and guarantees, in writing.

Add the following:

308-5.1.6 Utilities.

(a) **Water Meter Installation**. Contractor shall arrange with the serving Water Utility to have meter location marked in field.

Contractor shall cut, excavate, and backfill all trenches; furnish and install meter box; and install meter.

Water Utility will hot tap water main; install service line to meter location, and furnish meter.

Water meter box shall conform to Water Utility standards.

(b) **Water Connection**. Contractor shall arrange water service with the serving utility.

(c) **Electric Connection**. Contractor shall arrange electric service with the serving utility.

(d) **Telephone Connection**. Contractor shall arrange telephone service with the serving utility.

(e) The City shall prepare all applications for services, pay any required application and/or service fees, and shall pay for the water, electricity, and telephone services required for irrigation and landscape only, as shown on the drawings.

(f) Contractor shall notify the Engineer 14-calendar days minimum prior to the anticipated date of service connection.

308-5.2 Irrigation Pipeline Installation

308-5.2.1 General. Add the following:

Compact backfill to dry density equal to the adjacent undisturbed soil, conforming to adjacent grades without dips, sunken areas, humps, or other irregularities.

In appropriate types of soil, the Engineer may authorize the use of flooding in lieu of tamping.

Under no circumstances shall vehicle wheels be used for compacting soil.

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

308-5.2 Irrigation Pipeline Installation. Add new section:

308-5.2.6 Trench Backfill in Roadways and Parking Areas.

a. All trenches for pipeline and electrical conduit under roadways shall be backfilled with a portland cement concrete treated slurry conforming to Subsection 201-1.1.2. Class Use Table for Trench Backfill Slurry. Sand bedding material shall extend at least 6 inches (150mm) above the pipe or conduit.

b. Paving for trench cover shall meet the pavement requirements for this project and shall be at least the thickness of adjacent undisturbed paving plus 1-inch (25mm), thoroughly compacted in place, and finished to a neat continuous surface.

c. Under public roads, all mainlines and lateral piping must be in sleeves and have a minimum cover of 36 inches.

Sleeves shall be two (2) times the diameter of lateral line, mainline, and wire bundle size, and a minimum of one (1) inch size. Install sleeves for each use.

308-5.3 Installation of Valves, Valve Boxes, and Special Equipment. Add the following:

Pull boxes for control wires that are set in pavement shall be flush with the finish surface.

All valve boxes and pull boxes shall be installed parallel to adjacent hardscape.

308-5.4.2 Location, Elevation and Spacing. Delete this section, and replace it with the following:

Install irrigation heads as indicated on the irrigation drawings. Spacing of heads shall not exceed the maximum indicated. In no case shall the spacing exceed the maximum recommended by the manufacturer. Final sprinkler head heights shall be as indicated on the City standard irrigation detail drawings. All sprinkler heads installed adjacent to hardscape features shall be located one (1) inch off of the edge of the hardscape feature and adjusted to eliminate overspray.

All irrigation heads shall be set perpendicular to finish grades unless otherwise indicated on the plans.

308-5.5 Automatic Control System Installation. Add the following:

The Automatic Irrigation Controller Assembly shall include the following:

- Automatic Irrigation Controller, 24 station
- Moisture sensors, sensor wires, and relays
- Flow sensor, valve box, flow sensor wires and relays
- Radio transmitter/receiver controller module
- Radio transmitter/receiver hand-held unit
- Master valve module and relay
- Pump start module and relay
- Pressure switch module and relay
- Radio Antenna

Supplemental irrigation control systems equipment shall include furnishing and installing the specified equipment in conformance with the manufacturer=s written instructions and specifications, including communications equipment, sensors, wire, valve boxes, special connectors, terminal boards, and any other equipment required to provide a complete operating system.

308-5.6 Flushing and Testing.

308-5.6.1 General. The text of Subsection 308-5.6.1 of the Standard Specifications is hereby deleted and replaced with the following:

Flush Main Lines. Flushing of the lines will be done before quick coupling valves and remote control valves are in place. All open ends shall be piped (temporarily) to exhaust flushing water up and out of the trenches. No water will be permitted to fall into the trench. Flushing procedure will be to first open the ports nearest the source, then recap and move progressively toward the end of the line with only one open port flushing at any one time.

308-5.6.2 Pipeline Pressure Tests. The text of Subsection 308-5.6.2 of the Standard Specifications is hereby deleted and replaced with the following:

a. **Main Lines**: Pressure tests on main lines shall be made after lines have been flushed and before control valves and quick coupling valves are set in place. Pipes shall be centerloaded leaving all fittings exposed. Contractor shall furnish force pump and pressure gauges necessary to complete pressure tests.

b. **Pipe**: All metal main lines in the system shall be capped and pressure tested at 125 psi (860 Kpa) for a period of 1 hour with no drop in pressure. All leaks found shall be corrected by turning the pipe in the fittings as no caulking or epoxy fillers will be permitted.

c. **Plastic Pipe**: All plastic main lines in the system shall be capped and pressure tested at 150 psi (860 Kpa) for a period of 2 hours with no drop in pressure. All leaks found shall be corrected by removing the leaking pipe or fittings and installing new material in place thereof and retesting.

d. **Closing in Uninspected Work**: The Contractor shall not allow nor cause any of this work to be covered or enclosed until it has been inspected, tested and approved by the Engineer. Should any of this work be enclosed or covered before such inspection and test, the Contractor shall uncover the work at his own expense and after it has been inspected, tested and approved, shall make all repairs with like materials necessary to restore all his work and that of the other contractors to its original condition.

Add new section.

308-5.6.5 Approval. Subsection 308-5.6.5 is hereby added to Section 308 of the Standard Specifications as follows:

Written approval and acceptance of the irrigation system must be obtained before final payment is considered.

308-5.7 Irrigation Maintenance. Subsection 308-5.7 is hereby added to Section 308 of the Standard Specifications as follows:

308-5.7.1 The entire irrigation system shall be under full automatic operation for a period of seven (7) days prior to planting or hydroseeding (excluding tree planting).

308-5.7.2 The entire irrigation system shall be maintained during the plant establishment/maintenance period as outlined in Specifications Section 308-6.

308-6 MAINTENANCE AND PLANT ESTABLISHMENT

Delete the entire text and insert in its place the following:

308-6.1 General Requirements. Maintain all areas within the work limits of the contract on a continuous basis until final acceptance.

Furnish all labor, equipment, materials, tools, services, and special skills required to perform the landscape maintenance as set forth in these Specifications and in keeping with the highest standards of quality and performance.

308-6.1.1 Scope of Work.

Maintenance shall include continuous maintenance of plant materials, trees, irrigation systems, litter pickup, and cleaning of hardscape areas. Maintenance of plant material shall include, but not be limited to, dead leaf and flower removal, pruning, fertilization, weed control, pest control, syringing, tree pruning, and plant replacement. It is expected that these maintenance practices will keep each site in a state of healthy, vigorous growth. When the Contractor observes any tree or plant that appears to be declining due to causes that are beyond his control, he must notify the City Engineer in writing within 48 hours of observance. The City Engineer will investigate, and if in agreement, will provide Contractor with written validation thereby releasing the Contractor of replacement responsibility. The work includes graffiti removal from controllers, enclosures, backflows, etc., excluding block walls and/or hardscape.

Landscaped areas will be maintained in a vigorous, healthy, and stress-free condition at all times.

Failure by the Contractor to immediately take corrective action to eliminate plant stress due to i.e., lack of water, insect infestation, etc., will result in penalties assessed against the Contractor.

The City reserves the right to require the Contractor to apply plant dye within 24 hours of notification to landscape that has been stressed due to Contractor's neglect. The dye will be applied at no extra charge to the City.

308-6.1.2 Schedule.

(a) **General**. Coordinate with and provide the City Engineer with a maintenance schedule including, but not limited to, schedule for mowing, aerating, renovating and fertilizing turf, as well as tree pruning, insecticide/herbicide application, fertilization of shrubs, ground cover and trees.

(b) **Hours of Work**. Perform all work between the hours of 7:00 a.m. and 5:00 p.m., Monday through Friday, unless approved in advance by the City Engineer. No work shall be performed on weekends or the following City recognized holidays without written City approval:

January 1	New Years' Day
Third Monday in January	Martin Luther King's Birthday
Third Monday in February	President's Day
Last Monday in May	Memorial Day
July 4	Independence Day
First Monday in September	Labor Day
November 11	Veteran's Day
Fourth Thursday in November	Thanksgiving Day
Friday after Thanksgiving	
December 25	Christmas Day

(c) **Weekly Work Schedule**. Provide the City Engineer with a written schedule each Thursday of the work to be performed during the following week. If the Contractor finds that he will be unable to maintain the submitted schedule, he shall immediately advise the City Engineer.

308-6.1.3 Maintenance Function Report. Maintain and keep current a report form that records all ongoing and additional work, and maintenance functions performed on a daily basis by Contractor's personnel. The report shall be in a form and content acceptable to the City Engineer and shall be submitted to the City concurrent with the monthly invoicing. The monthly payment will not be made until such report is received by the City.

308-6.1.4 Personnel.

(a) General. Provide sufficient personnel to accomplish the work within the allotted time frames as indicated in this Specification.

Immediately notify the City when the work force has been removed from the job site due to inclement weather, or other reasons.

(b) Additional Personnel. The City reserves the right to require the Contractor to provide additional landscape personnel and equipment at no additional cost to the City in the event the Contractor fails to adhere to the maintenance schedule or provide and perform landscape work as specified herein the General Requirements and Maintenance Specifications of the contract.

(c) Supervisor. Provide an English-speaking supervisor who is fully trained in all maintenance responsibilities for the areas. This supervisor shall be onsite at all times while work is being performed.

(d) Dress Code. Employees shall present a neat, well-groomed appearance at all times. Hair (including facial hair) shall be maintained in a neat, well-groomed fashion. Employees with tattoos and/or body piercing that are determined by the City Engineer to be objectionable shall be immediately replaced with a satisfactory employee.

The Contractor shall pay for and bear the maintenance cost of uniforms for all employees working on the project. The uniforms shall bear the Contractor's company name, as well as the employee name.

The uniform shall be worn as a complete unit and be fitted properly. The uniform shall be maintained in a clean and neat order with no rips, tears, or permanent stains present.

The proper uniform includes:

Shoes – Safety boots or shoes in good condition. No sandals or tennis shoes shall be worn on the job.

Shirts – All workers shall wear shirts with long or short sleeves with the maintenance company name or other identifying marks.

Employees shall wear a City approved safety vest at all times.

(e) Conduct. Employees shall act in a courteous, professional manner at all times while working on the project. Every effort shall be made to perform the work while creating minimum disturbance to the citizens. Any employee who is determined by the City Engineer to be incompetent, disorderly, intemperate, or otherwise objectionable shall be immediately removed from the project and replaced with a satisfactory replacement.

308-6.1.5 Safety.

(a) General. Perform all work to meet all accepted standards for safe practices during the maintenance operation and to safely maintain equipment, machines, and materials, or other hazards consequential or related to the work; and additionally accept the sole responsibility for complying with all local, County, State, or other legal requirements including, but not limited to, full compliance with the terms of the applicable OSHA and CAL OSHA Safety Orders at all times so as to protect all persons, including Contractor's employees, agents of the City, vendors, members of the public or others from foreseeable injury or damage to their property. The Contractor shall inspect all potential hazards at said areas under maintenance and keep a log indicating date inspected and action taken.

(b) Responsibility. It is the Contractor's responsibility to inspect and identify any condition(s) that renders any portion of the areas under maintenance unsafe, as well as any unsafe practices occurring thereon. The City Engineer shall be notified immediately of any unsafe condition that requires major correction.

The Contractor shall be responsible for making minor corrections including, but not limited to, filling holes and replacing valve box covers so as to protect members of the public or others from injury.

(c) Telephone Response.

The Contractor shall maintain a telephone, listed in the telephone directory in his own name or in the firm name by which he is most commonly known, and shall at all times have some responsible person(s), employed by the Contractor, to take the necessary action regarding all inquiries and complaints that may be received from the City and/or private citizens during normal work hours.

The Contractor's supervisor shall be equipped with a two-way radio, pager, or cellular phone with the capability to respond to emergency calls/complaints within 1 hour of notification. The supervisor shall be in the Anaheim area and reachable by the City Engineer between 7:00 a.m. and 4:00 p.m., Monday through Friday.

NOTE: All emergency after-hour calls will be responded to by Anaheim staff.

All complaints shall be abated as soon as possible after notification, to the satisfaction of the City. If any complaint is not abated within a reasonable time, the City shall be notified immediately of the

reason for not abating the complaint, followed by a written report to the City Engineer within 5-calendar days. If the complaints are not abated within the time specified, or to the satisfaction of the City, the City may correct the specific complaint and the total cost incurred by the City will be deducted and forfeited from the payments owing to the Contractor from the City.

308-6.1.6 Emergencies. Wherever immediate action is required to prevent impending injury, death, or property damage to the facilities being maintained, the City, may after reasonable attempt to notify the Contractor, cause such action to be taken by the City work force and shall charge the cost thereof against the Contractor, or may deduct such cost from any amount due to the Contractor from the City.

The Contractor shall cooperate fully with the City in the investigation of any accidental injury or death occurring on the contracted areas, including a complete written report thereof to the City Engineer within 5-calendar days following the occurrence.

308-6.1.7 Traffic Control. Cooperate with local authorities relative to handling traffic through the area and make arrangements relative to keeping the working area safe and clear of vehicles. It is intended that most maintenance work be performed without obstructing the flow of traffic whenever possible. However, if lane closure is required, all traffic delineation and work area protection shall conform to the Work Area Traffic Control Handbook (WATCH).

When performing work, make every effort to keep sidewalks, vehicle travel lanes and driveways open at all times.

308-6.1.8 Sound Control. Comply with all local sound control and noise level rules, regulations, and ordinances which apply to any work performed pursuant to the contract.

Each internal combustion engine used for any purpose on the job or related to the job shall be equipped with a muffler of a type recommended by the manufacturer of such equipment. No internal combustion engine shall be operated on the project without said muffler.

308-6.1.9 The City's Right to do Work. The City reserves the right to do work as required within the contract area. If such alterations affect the provision of this agreement, the Contractor will be asked to submit a cost for extra work as a result of the alterations.

308-6.1.10 Protection of Facilities, Structures, and Utilities. Exercise due care during the performance of work in protecting from damage all existing facilities structures, and utilities both above surface and underground on the City's property. Any damage of City property deemed

to be caused by the Contractor's neglect shall be corrected and paid for by the Contractor at no cost to the City.

If the City requests or directs the Contractor to perform work in a given area, it will be the Contractor's responsibility to verify and locate any underground utility systems and for taking reasonable precaution when working in these areas. Any damage or problems shall be reported immediately to the City Engineer.

308-6.1.11 Service Level Inspection. The Contractor's supervisor shall tour the contracted area with the City Engineer on a weekly basis for the purpose of determining compliance with the specifications or to discuss required work. The Contractor's representative must be authorized to sign documents and/or effect changes to the work being performed.

308-6.1.12 Inclement Weather. During periods of storms, the Contractor will provide supervisory inspection of the project during regular hours to prevent or minimize possible damage from inclement weather. If remedial work is required beyond the scope of the project, it shall be considered as extra work.

During periods of inclement weather, i.e., rain/wind, the Contractor's workforce shall accomplish work not affected by such weather, i.e., litter pickup/spent blossom removal, preventative maintenance, etc.

(a) Contractor shall stake and re-tie trees, as required.
(b) The Contractor shall remove all branches and debris resulting from inclement weather as directed by the City.
(c) Drains shall be checked and cleaned, as necessary.
(d) The Contractor may be required to perform clean-up tasks as requested by the City during inclement weather.

308-6.2 Start of Maintenance and Plant Establishment.

308-6.2.1 General. After all work indicated on the plans and herein specified has been completed, inspected and approved by the City Engineer, the maintenance and plant establishment period will start.

In order to carry out the work, the Contractor shall maintain a sufficient number of men and adequate equipment to perform the work herein specified from the time any planting is done until the final approval.

If at any time the Contractor is not performing plant establishment or maintenance work in the opinion of the City Engineer, the maintenance and establishment period shall be suspended and not restarted until all deficiencies have been corrected to the satisfaction of the Engineer. No payments will be made for work

required during the suspended period and the period shall be extended by the length of time of the suspension.

308-6.2.2 Criteria for Start of Maintenance and Plant Establishment Period.

. The maintenance and plant establishment period shall not start until all elements of the project that impact the landscape are completed in accordance with the contract documents. Projects will not be segmented into phases.

a. Permanent power to remote controllers shall be established.

b. Written acceptance of the City Engineer must be obtained to start the maintenance and plant establishment period.

c. If the project maintenance fails to continuously meet standards required, the maintenance and plant establishment "day count" will be suspended and will not recommence until Contractor has corrected all deficiencies.

308-6.2.3 Inspections. A written notice requesting an inspection should be submitted to the Engineer at least 48 hours prior to the anticipated date.

Prior to start of the maintenance and plant establishment period, the Contractor will be required to have a complete inspection and approval of all landscape construction items.

An inspection shall be scheduled at intervals during the landscape and maintenance establishment period.

308-6.3 Maintenance Tasks.

During the contract period provide all watering, weeding, mowing, fertilizing and cultivation and spraying necessary to keep the trees, plants, and turf in a healthy growing condition and to keep the planted areas neat, edged, and attractive. All shrubs planted by Contractor shall be pinched and pruned as necessary to encourage new growth and to eliminate rank sucker growth as approved by the City Engineer. **Do not** clip shrubs into balled or box forms unless such is required or designated by the plans. Old wilted flowers and dead foliage shall be immediately pinched or cut off. **Do not** prune trees without written approval of the City Engineer.

308-6.4 General Maintenance.

- Remove trash weekly.
- Edge ground cover to keep in bounds and trim top growth as necessary to achieve an overall even appearance.
- Exterminate vertebrate pest's gopher, mole, etc., and repair damaged areas, as required.
- Test irrigation system weekly and submit reports to City Engineer.

308-6.4.1 Turf (Sod). The turf areas shall be kept moist, but not glistening wet, until time for the first cutting of grass. Water turf to maintain a thriving condition. Any area where the turf fails to establish satisfactorily shall be immediately replanted.

The Engineer must approve the turf areas prior to the first mowing.

Workmen shall not be allowed to walk on the grass unnecessarily before, during, or after planting operations. Grass areas that have been damaged or compacted shall be recultivated and sodded at the Contractor's expense.

Immediately after the first cutting of grass, where trees occur in grass areas, the grass shall be manually turned under and neatly edged 12 inches (300mm) away from the trees. The turf edges shall be maintained in a neat condition until acceptance of the work.

Chemical edging around trees is prohibited.

Turf shall be mowed on Monday or Tuesday of each week. Mowers shall be properly sharpened to avoid ripping and/or tearing the grass. The mowing schedule may be altered due to weather and/or other conditions upon approval and/or direction from the City Engineer. All litter shall be removed from the turf prior to each mowing. Turf shall be mowed (maintained) with rotary type mowers at a height of 3 inched during Spring, Summer, and Fall. In the Winter turf areas shall be mowed at a height of 2 inches. The turf should never be cut more than one-third of the top growth or approximately three-quarter inch at any one mowing. Avoid Scalping.

Grass clippings shall be collected during each mowing and properly disposed of offsite at the Contractor's expense. Visible clippings remaining on the turf after the mowing cycle shall be vacuumed or otherwise removed from the turf.

Turf shall be mechanically edged during the mowing of each week. The edging along sidewalks, curbing and other concrete shall be performed with a blade type edger. Other fixtures, such as valve boxes, poles and around buildings can be edged with the use of string trimmers providing care is exercised to avoid damage by such action. **(Chemical edging is prohibited.)** Sidewalks and other hard surfaces shall be properly cleaned after each edging, including grass stains or marks made as result of the mowing process.

308-6.4.2 Turf (Hydroseed).

Upon acceptance of hydroseeding application, the contractor shall maintain all hydroseeded areas as follows:

Germination: Approximately 25 hours after hydroseeding the turf areas, the Contractor shall start the watering applications. The watering cycles shall be long enough to moisten the soil (seed bed) thoroughly to the depth of the slurry mulch. The contractor must exercise care not to over saturate (puddling) or wash away the slurry and seed. The Contractor shall perform frequent, light irrigation until all seed has germinated. After germination, the Contractor shall reduce the watering cycle and repair all seed washings and erosion as they occur. The specific watering program written by the Contractor shall be submitted to the City Engineer for review and approval prior to hydroseeding.

Fertilization: The Contractor shall fertilize all hydroseeded areas with an approved commercial fertilizer recommended by the seed manufacturer. The application shall start 30 calendar days from the start of the maintenance/establishment period and continue once every 60-calendar days until the completion of the maintenance/establishment period.

Weeding: All concentrated developments of weed growth appearing in the seed mix planting areas during the maintenance/establishment period shall be removed at two-week intervals. The contractor may elect to remove such concentrations of weeds manually or by a City-approved herbicide program.

Mowing: Mowing shall be performed when the grass blades are between 2” to 3” high. The lawn shall be mowed with a sharp blade rotary mower set at 2” cutting height.

Minimum Coverage and Acceptance:

Final acceptance may be given at the end of the maintenance and establishment period if an acceptable germination of turf and adequate plant establishment has been obtained, as determined by the City Engineer.

Final approval and acceptance will be given in writing by the City Engineer following a final acceptance inspection. The City Engineer reserves the option to extend the maintenance and establishment period to achieve complete germination of all turf areas with a uniform height, color and density throughout all hydroseeded areas.

308-6.4.3 Trees, Shrubs, and Ground Covers.

No pruning shall be performed by the Contractor unless directed in writing by the City Engineer. The City Engineer must be present for any attempted pruning operations. Seventy-two (72) hours prior notice to the City is required before commencing pruning operations.

All pruning performed by the Contractor shall be done under the supervision of an I.S.A. Certified Arborist whose credentials must be furnished by the Contractor to the City Engineer.

All pruning shall conform to the standards adopted by the International Society of Arboriculture (I.S.A.).

ANY TREES PRUNED WITHOUT PERMISSION OR IN A FASHION UNACCEPTABLE TO THE CITY SHALL BE REPLACED IN KIND AND SIZE BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE AGENCY.

If pruning is permitted by the City Engineer:

All trees and shrubs shall be pruned to maintain natural structure. Clipping into formal shapes such as boxes and balls will not be allowed unless such is specified in the design.

Young trees shall be pruned to select and develop permanent scaffold branches; to remove overlapping and rubbing limbs; to eliminate narrow crotches; and to maintain growth within space limitations. All cuts shall be made to lateral branches, or buds, or flush with branch bark collar. Side pruning of young trees, stubbing or heading back will not be permitted.

Evergreen trees shall not be pruned, except under the direction of the Urban Forestry Section Representative.

The objectives of shrub pruning are the same as for trees.

Ground covers shall be edged and trimmed to keep in bounds and to achieve an overall even appearance. Keep ground cover 12-inches (300mm) clear of the base of shrubs, and clear of low branches.

308-6.4.4 Palm Tree Maintenance. Each irrigation should be deep enough to assure wetting of the entire root ball. During hot months, maintain a watering basin, apply water every day for the

first week, and every other or third day thereafter for the next 4 to 6 weeks. Sample soil for moisture content before watering to avoid over saturation at the root ball. Soil sampling shall be done with a soil probe. Do not allow water to stand at base of tree.

Remove frond ties at 60 days after planting during hot months, and after 90 days during the winter months. Do not trim palms for 30 days after untying them.

308-6.5 Weed Control.

308-6.5.1 Keep basins and areas between plants free of weeds. Apply pre-emergent herbicides recommended by a licensed pest control advisor to all non-seeded landscape areas only. Avoid frequent soil cultivation that destroys shallow roots and disturbs per-emergent herbicide application. Weeds shall be removed and disposed of off the site.

308-6.5.2 Eradicate all noxious weeds from site (i.e., nutgrass, Bermuda grass, kikuyu grass, crab grass, etc.)

308-6.6 Replacement Plantings. During the maintenance and plant establishment period, all plant materials shall be in a healthy, growing condition and spaced as indicated on the Plans. All plants that show signs of failure to grow at any time during the life of the contract or those plants so injured or damaged from any cause, including vandalism, as to render them unsuitable for the purpose intended shall be immediately replaced in kind and size at the expense of the Contractor.

308-6.7 Fertilization. Make three applications (minimum) of commercial fertilizer at the rate of 5 to 6 pounds per 1,000 square feet at the following periods: (The fertilization must be observed by the City Engineer)

- Thirty (30) calendar days after the maintenance period has begun.
- Sixty (60) calendar days after the maintenance period had begun.
- Just prior to the end of the 90-calendar day maintenance period.
- After planting and during the plant establishment period, in the event that any plantings exhibit iron chlorosis symptoms, apply FE 138 Geigy or equivalent at manufacturer's recommended rates.

308-6.8 Planting Establishment. All planting areas that do not show a prompt establishment of plant material, and areas where plant material is missing, shall be replanted at 10-day intervals until the plant material is established. For turf sod plantings, sod shall exhibit sufficient root growth knitting into the subgrade such that the sod can no longer be removed by hand. If a good rate of growth has not been demonstrated within 30 days of first planting/hydroseeding, Contractor shall be responsible to determine the appropriate horticultural practices necessary to obtain good growth. Contractor shall obtain agronomic soils testing of all areas not showing

good growth and shall provide copies of the test results to the City Engineer to verify the appropriateness of all maintenance work performed. If additional soil amendments are needed, up to a maximum 25 percent beyond the application rate specified, Contractor shall provide such amendments at no additional cost to City.

308-6.9 Grading and Drainage. During the plant establishment period all flow lines shall be maintained to allow for free flow of surface water. Displaced material, which interferes with drainage, shall be removed and placed as directed. Low spots and pockets shall be graded to drain properly. Jute netting shall be installed at flow lines and other locations where erosion is evident, when directed by the City Engineer.

308-6.9.1 Damage to planting areas shall be repaired immediately and throughout the plant establishment period. Depressions caused by vehicles, bicycles, or foot traffic shall be filled and leveled. Replant damaged areas.

308-6.9.2 All paved areas shall be washed and maintained in a neat and clean condition at all times.

308-6.9.3 All subsurface drains and inlets shall be periodically cleared of debris, leaves, and trash and flushed with clear water to avoid build up of silt and debris.

308-6.9.4 Debris and trash shall be removed from the site daily.

All litter and debris generated during the performance of this contract shall be removed from the site the same day it is generated and disposed of off-site in the proper manner at the Contractor's expense.

Papers, plant clippings, animal feces, and other debris shall be removed from sidewalks and other hard surfaces immediately following each maintenance function.

At no time shall paper, plant clippings, or other debris be blown or swept from the landscaped areas and/or hard surfaces into the parking lots, onto private property, storm drains or public streets.

308-6.10 Disease and Pest Control. (a) Throughout the maintenance and plant establishment period, all plants shall be maintained in a disease and pest free condition. A licensed pest control operator shall be retained by the Contractor to recommend and apply all pesticides, herbicides, and fungicides. Exterminate gophers, moles, and all other rodents, and repair damage. The Contractor shall be responsible for detecting diseases and pests as soon as their presence is manifested. He shall take immediate action to identify the disease and/or pest and apply such remedies as are

necessary to control the infestation. He shall remove all rodents, taking control measures immediately upon discovery.

(b) Pesticides. All materials shall be in strict accordance with and applied within the Standards set forth in the EPA regulations and the California food and Agricultural Code.

Pesticides shall be selected from those materials which characteristically have the lowest residual persistence. Use of emulsifiable concentrates shall be used when possible to limit windblown particles. The use of adjuvants will be utilized to increase pesticide efficiency thereby reducing the total amount of technical material required to gain control.

Contractor is responsible for obtaining all required permits, and maintaining the required usage documentation with copies sent to the City Engineer.

Pesticides shall be applied at times which limit the possibility of contamination from climatic and other factors. Early morning application shall be made when possible to avoid contamination from drift. Applicator shall monitor forecast weather conditions to avoid making application prior to inclement weather to eliminate potential runoff from treated areas. Irrigation water applied after treatment shall be reduced to eliminate runoff. When water is required to increase pesticide efficiency, it shall be applied only in quantities of which each area is capable of receiving without excessive runoff.

All pesticide applications shall be in accordance with written recommendations provided by a licensed pest control advisor (PCA) with application performed by a licensed qualified applicator (QAC) with copies of the written recommendations sent to the City Engineer.

Spray equipment shall be in good operating condition, quality, and design to efficiently apply material to the target area. Drift will be minimized by avoiding high-pressure application and using water-soluble drift agents.

Care shall be taken in transferring and mixing pesticides to prevent contaminating areas outside the target area. Application methods shall be used which ensure that materials are confined to the target area. Spray tanks containing leftover materials shall not be drained on the site to prevent contamination. Disposal of pesticides and tank rinsing materials shall be within the guidelines established in the California Food and Agricultural Code or EPA regulations.

(c) Rodent Control. Continuously control all rodents within the boundaries of the project. Damage as a result of rodent activity shall be repaired at the Contractor's expense.

308-6.11 Irrigation Systems.

308-6.11.1 General.

Provide efficient use of water at all times. The controllers shall be programmed and monitored to maintain adequate moisture optimal for growth and appearance, while eliminating excessive runoff. Adequate soil moisture shall be determined by visual observation, plant resiliency, turgidity, examining cores removed by soil probe, moisture sensoring devices, and programming irrigation controllers accordingly. Considerations must be given to soil texture, structure, porosity, water holding capacity, drainage, compaction, precipitation rate, runoff, infiltration rate, percolation rate, evapotranspiration, seasonal temperatures, prevailing wind condition, time of day or night, type of plant and root structure.

308-6.11.2 Weekly Inspections. Inspect the irrigation systems on a weekly basis for broken and clogged heads, malfunctioning or leaking valves, or any other condition which hampers the correct operation of the system. Each irrigation controller(s) and system shall be checked weekly for proper water scheduling and coverage. Make all necessary adjustment to heads which throw onto roadways, walkways, windows, or out of intended area of coverage. The Contractor shall clean and adjust sprinkler heads, as needed, for proper coverage. Each system shall be manually operated at the irrigation controller and weekly basis. Controllers shall be programmed to water during nighttime hours between approximately midnight and 7:00 a.m. No watering shall occur during the daytime unless associated with an irrigation check/repair or with prior approval by the City Engineer.

A written irrigation tracking sheet indicating the system location, date inspected, and watering schedule shall be submitted to the City Engineer at the end of each week.

308-6.11.3 Repair. Repairs made to the irrigation system must be made in accordance with the system's original design with products equal to or higher quality. Workmanship shall be performed in accordance with City standards.

Automatic controllers and/or enclosures shall be locked while unattended.

Sprinkler heads (if applicable) shall be kept clear of overgrowth which may obstruct maximum operation. Chemical edging around heads will not be permitted unless approved by the City Engineer.

308-6.12 End of Maintenance and Plant Establishment Period.

308-6.12.1 Request for Inspection. When Contractor believes the maintenance and plant establishment period is complete, and the project is ready for final acceptance, the Contractor shall request inspection of the project. The City Engineer will not inspect the project for final acceptance until all deficiencies are corrected.

308-6.12.2 Established Plantings. All planting areas shall show a good rate of growth and shall be well-established "filled in" plantings free of voids. Bare areas will be unacceptable. Contractor shall provide sod or plantings from flats as necessary to fill in all bare areas. Such sod or plantings shall be planted a minimum of 10 days prior to the end of the maintenance and plant establishment period and shall have roots "knit-in" to the native soil.

308-6.12.3 Written Acceptance. Final acceptance and assumption of maintenance responsibilities by City shall occur only upon the City Engineer's written acceptance of the project for maintenance by the City.

308-6.13 Clean Up.

308-6.13.1 Remove surplus materials from the site and leave premises in a neat and clean condition each day.

308-6.13.2 Remove all tags, labels, nursery stakes and ties from all plant material only after the approval of the City Engineer.

308-6.13.3 Prior to acceptance of the project for maintenance, clean up and remove all remaining debris and surplus materials, leaving the premises neat and clean.

308-7 GUARANTEES

Add the following:

308-7.1 Irrigation System Manufacturer's Guarantees. A letter guarantee from each manufacturer shall be submitted to the Agency guaranteeing materials for a period of 1 year against material defects and workmanship. In cases where longer guarantees are required by these Specifications, such guarantees are separate and distinct from the Contractor's general guarantee.

308-7.2 Guarantee. All irrigation systems and landscape installed under the contract shall be guaranteed for the periods noted below against any and all poor, inadequate, or inferior materials, and/or workmanship, for the noted period following the date the Project Notice of Completion is filed with the County Recorder. During the guarantee period, irrigation system components, any trees, shrubs, ground cover, or turf found to be dead, missing, or in poor condition shall be replaced by the Contractor within 10 days of written notification. The City's authorized representative shall be the sole judge as to the condition of the materials. Replacement shall be made in accordance with City standards; replacement shall be same size, and kind as originally installed. Landscape materials shall be furnished, planted, and fertilized as specified and guaranteed within these documents. Contractor shall provide material and labor involved in replacing landscape and irrigation system at no additional cost to the City.

A. Shrubs, ground Cover, and Turf; All shrubs, ground cover, and turf shall be guaranteed for a period of 90 calendar days from the Notice of Completion.
B. Canopy Trees: All canopy trees shall be guaranteed for a period of 1 year from the Notice of Completion
C. Palm Trees: All palm trees shall be guaranteed for a period of 2 years form the Notice of Completion.
D. Irrigation System: The entire system, including trenching shall be guaranteed for a period of 1 calendar year from the Notice of Completion.

The Guarantee form shall be re-typed onto the Contractor's letterhead and contain the following information:

GUARANTEE FOR IRRIGATION SYSTEM AND LANDSCAPE PLANTING

accordance with the drawings and specifications, ordinary wear and tear, unusual abuse, or neglect excepted.

We agree to repair or replace any defects in material or workmanship, which may develop during the following periods dating from the date the Project Notice of Completion is filed with the County Recorder:

Shrubs, Groundcover, and Turf	90 calendar days
Canopy Trees	1 calendar year
Palm Trees	2 calendar years
Irrigation System	1 calendar year

We also agree to repair or replace any damage resulting form the repairing or replacing of such defects at no additional cost to the City. We shall make such repairs or replacements within a reasonable time, as determined by the City, after receipt of written notice. In the event of our failure to make such repairs or replacements within a reasonable time after receipt of such written notice from the City, we authorize the City to proceed to have said repairs or replacements made at our expense, and we will pay for the costs and charges therefore upon demand.

Project Name: _____

City Engineer: _____

Location: (Legal Description of Project Property)_____

Signed: _____ Title:_____

Address: _____

Telephone: (_____) _____ Date of Signature: _____

The surety bond shall be attached.

308-7.3 Surety Bond. The contractor shall post a surety bond in an amount equal to 10 percent of the final construction cost of the landscape planting and irrigation system. The bond shall be filed with the City under the same requirements as the Contractor's Performance and Labor and Material bonds. The bond shall continue in effect for the same period as the guarantees for the project.

SAMPLE

GUARANTEE PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS:

WHEREAS, the City of Anaheim, a municipal corporation of Orange County, California, has awarded to _____,
(hereinafter called "Principal",.
License No. _____a contract for _____,
Which said contract is hereby referred to and made a part hereof; and

WHEREAS, said Principal is required under the terms of said contract to furnish a bond for guarantee performance of said contract.

NOW, THEREFORE, we, _____, as Principal, and _____ as Surety, are held and firmly bound unto the City of Anaheim, a municipal corporation (hereinafter called "City"), in the penal sum of _____ Dollars ($_____), lawful money of the United States of America, for the payment of which sum well and truly to be made, we bind ourselves, or heirs, successors, executors, and administrators, jointly and severally, firmly by these presents.

The condition of this obligation is such that, if the above-bounded Principal, his or its heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by and well and truly keep and perform all the undertakings, terms, covenants, conditions and provisions in the said contract and any alterations thereof made as therein provided, on his or their part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless City, its officers, agents and employees, as therein stipulated, then this obligation shall become null and void; otherwise, it shall be and remain in full force and effect.

As a part of the obligation secured hereby and in addition to the face amount specified therefor, there shall be included costs and reasonable expenses and fees, including reasonable attorneys' fees, incurred by City in successfully enforcing such obligation, all to be taxed as costs and included in any judgment rendered.

The said Surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract, or to the work to be performed hereunder or to the specifications accompanying the same shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alternation or additions to the terms of the contract or to the work or to the specifications.

IN WITNESS WHEREOF, three identical counterparts of this instrument, each of which shall for all purposes be deemed an original thereof, have been duly executed by the Principal and Surety herein named, on the _____ day of _____, 20__, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative pursuant to authority of its governing body.

_____
PRINCIPAL

By _____
President

By _____
Secretary

_____
SURETY

_____
Attorney in Fact

CORPORATE ADDRESS OF SURETY:

_____

_____

_____

APPROVED AS TO FORM:

JACK L. WHITE, CITY ATTORNEY

By _____

Date _____

Please Note: All signatures must be notarized.

308-8 PAYMENT

Add the following: *(Edit as required.)*

Payment for Landscape Planting and Irrigation System shall be as follows:

( ) **Topsoil**: Payment for Class A topsoil shall be at the contract bid unit price per cubic yard in place and graded to within 30mm (1/10 of a foot) of finish grade. Measurement shall be at the theoretical volume per Plans.

( ) **Soil Preparation**: Payment shall be at the contract bid unit price per square foot, and shall include all costs of furnishing and installing fertilizers and conditioners, tilling, fine grading, and other work required to prepare soils for planting.

( ) **Moisture Barrier**: Payment shall be at the contract bid unit price per linear foot in place, and shall include all costs for furnishing and installing moisture barrier.

( ) **Root Control Barrier**: Payment shall be at the contract bid unit price per linear foot in place, and shall include all costs for furnishing and installing root control barrier.

( ) **Erosion Control Netting**: Payment for erosion control netting will be made at the contract bid unit price per square foot installed, and shall be full compensation for furnishing and installing erosion control netting.

( ) **Trees and Shrubs**: Payment shall be at the appropriate contract unit bid price per each size of tree or container, and shall include all costs for furnishing and installing trees and shrubs.

( ) **Installing Agency Furnished Trees**: Payment shall be at the contract bid unit price per each size of tree or container, and shall include all costs for scheduling delivery, off-loading, placement, installation, maintenance, and replacement.

( ) **Ground Covers**: Payment shall be at the contract bid unit price per square foot, and shall include all costs for furnishing and installing ground cover.

( ) **Sod Lawn**: Payment shall be at the contract bid unit price per square foot, and shall include all costs for work appurtenant to furnishing and installing sod lawn.

( ) **Mulch**: Payment shall be at the contract bid unit price per cubic yard installed, and shall be full compensation for furnishing and installing mulch.

( ) **Seeding**: Payment shall be at the contract bid unit price per unit area for each seed mix, and shall include all costs of materials, tools and equipment, and labor required to install hydroseeding.

( ) **Connection to Electric Service**: Payment shall be at the contract bid lump-sum price for connection to service at the point shown on the drawings, including meter service pedestal, all devices, appurtenances, materials, labor, tools, and equipment required to provide an operating electrical service and all connecting to electrical equipment.

( ) **Connection to Water Service**: Payment shall be at the contract bid lump-sum price for connection, including meter, at the point shown on the drawings.

( ) **Irrigation Main Line**: Payment for irrigation main line shall be at the contract bid unit price per linear foot in place for each size specified in the bid.

( ) **Type A Sleeve (Trenched Non-Roadway Pipe Sleeving)**: Payment shall be at the contract bid unit price per linear foot in place for each size specified in the bid and shall include all costs for saw cutting, excavation, backfill, compaction, and pavement replacement.

( ) **Type B Sleeve (Trenched Roadway Pipe Sleeving)**: Payment shall be at the contract bid unit price per linear foot in place for each size specified in the bid and shall include all costs for saw cutting, excavation, backfill, compaction, and pavement replacement.

( ) **Type C Sleeve (Bored Pipe Sleeving)**: Payment shall be at the contract bid unit price per linear foot in place for each size specified in the bid and shall include all costs for saw cutting, excavation, backfill, compaction, and pavement replacement.

( ) **Trenched Control Wire Conduit**: Payment for trenched control wire conduit shall be at the contract bid unit price per linear foot in place of each size as shown on the bid form, and shall include all costs for furnishing and installing control wire conduit by trenching.

( ) **Bored Control Wire Conduit**: Payment for bored control wire conduit shall be at the contract bid unit price per linear foot in place of each size as shown on the bid form, and shall include all costs for furnishing and installing control wire conduit by boring.

( ) **Shutoff Valve Assembly**: Payment for shutoff valves shall be at the contract bid unit price per each valve of the size specified in the bid, and shall be for a complete operating assembly, including valve box.

( ) **Remote Control Valve Assembly**: Payment for Remote Control Valves shall be at the contract bid unit price per each valve of the size specified in the bid, and shall be for a complete operating assembly, including valve box and cover and furnishing and installing control wires to controller.

( ) **Automatic Irrigation Controller Assembly**: Payment for Automatic Irrigation Controller shall be at the contract bid lump-sum price, and shall include all costs for furnishing and installing a complete operating system, including conduit and enclosure as required.

( ) **Control Wire**: Payment for control wire shall be included in the contract bid unit price for Remote Control Valve Assembly.

( ) **Quick Coupling Valve Assembly**: Payment for quick coupling valves shall be at the contract bid unit price per each, and shall be for a complete operating assembly, including valve box.

( ) **Backflow Prevention Device Assembly**: Payment for backflow prevention device shall be at the contract bid unit price, and shall include all costs for furnishing and installing a complete operating assembly, including enclosure, backflow mounted wye filter, and backflow mounted pressure regulator (if required).

( ) **Supplemental Irrigation control systems**: Payment for flow control sensors and devices, rain gauges, and soil moisture sensors shall be paid for as part of the Automatic Irrigation Controller Assembly, and no additional payment will be made.

( ) **Pressure Regulating Valve Assembly**: Payment for the pressure regulating valve assembly shall be at the contract bid unit price, and shall be a complete operating assembly, including valve box.

( ) **Irrigation Head Assembly**: Payment for irrigation heads shall be at the contract bid unit price per each for each type of head specified, and shall

include serving lateral piping between heads and from control valve, and all other appurtenant devices and work.

( ) **Pressure Relief Valve Assembly**: Payment for the pressure relief valve assembly shall be at the contract bid unit price, and shall be a complete operating assembly, including valve box.

( ) **Drain Valve**: Payment for drain valve shall be included in the payment for the device in which the drain valve is installed, and no additional payment will be made.

( ) **Flush Valve Assembly**: Payment for the flush valve assembly shall be at the contract bid unit price, and shall be a complete operating assembly, including valve box.

( ) **Filter Assembly**: Payment for the filter assembly shall be at the contract bid unit price, and shall be a complete operating assembly, including valve box.

( ) **Check Valve**: Payment for valve shall be included in the payment for the device in which the check valve is installed, and no additional payment will be made.

( ) **Landscape Maintenance and Establishment Period**: Payment shall be at the contract lump-sum bid price, and shall include all costs of labor, materials, equipment, tools, and appurtenances to maintain the landscape planting and irrigation system.

All costs for testing, record drawings, and other miscellaneous costs shall be distributed among the various items, and no additional payment will be made therefor.

DIVISION IV

STANDARD PLANS & DETAILS

DIVISION IV

STANDARD PLANS AND DETAILS

All City of Anaheim landscape and irrigation projects shall be based upon the City of Anaheim, Department of Public Works, Standard Plans and Details, Section 5 – Landscape and Irrigation Improvements which are hereby included in the manual by reference.

All City of Anaheim landscape and irrigation projects shall be based on the **"Greenbook" Standard Plans for Public Works Construction (SPPWC)** 1997 edition and 1999 Revisions supplement, published by Building News Incorporated.

Section 5 of the SPPWC are hereby accepted and modified, deleted, and or replaced with the following Standard Plans and Details.

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SECTION 5 – LANDSCAPE AND IRRIGATION SYSTEMS

STANDARD PLANS AND DETAILS

TITLE	AGENCY[1]	NUMBER	COMMENT
Median Tree Planting with Double Staking	COA	518	
	--	--	
Parkway Tree Planting	COA	520	
Pressure Regulator Installation	APWA	521-1	Add four brick supports at each corner and filter fabric between soil and crushed rock.
	--	--	
Root Pruning	APWA	523-1	
Temporary Tree Well Cover	APWA	524-1	
Trenching Depths for Mainline, Lateral Lines and Conduits	COA	525	
Remote Control Master Valve and Flow Meter	COA	526	
Backflow Preventer Device Location in Median and Parkway	COA	527	
Shrub Planting	COA	528	
Palm Planting	COA	529	
Parkway and Median Island Tree Planting Clearance	COA	530-A	
Tree Well/Planter at back of PCC Sidewalk	COA	531	

[1] APWA: American Public Works Association, Southern California Chapter – "Standard Plans for Public Works Construction" 1997 Edition w/1999 supplement.
[1] COA: City of Anaheim – "Standard Details"