CITY OF OCEANSIDE

PUBLIC WORKS DEPARTMENT

ENGINEERING DIVISION

LANDSCAPE DEVELOPMENT

MANUAL

Resolution No. 82-79
Landscape Development Manual
Adopted by the City Council
City Of Oceanside on
April 14, 1982

Resolution No. 85-44
Revised Landscape Development Manual
Adopted by the City Council
City Of Oceanside on
March 13, 1985

Resolution No. R91-286
Revised Landscape Addenda
Adopted by the City Council
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(3) Where more than one (1) wire is placed in a trench, the wiring shall be taped together at intervals of ten (10) feet.

(4) An expansion curl should be provided within three (3) feet of each wire connection and at each change in direction. Expansion curls shall be formed by wrapping at least five (5) turns of wire around a one-inch in diameter pipe, then withdrawing the pipe.

(5) All splices shall be made with Scotch-Lok #3576 Connector Sealing Packs, Pen-Tite wire connector or approved equal. Use one splice per connector sealing pack.

(6) Field splices between the automatic controller and electrical control valves will not be allowed without prior approval of the City, and placed inside approved pull box (see Detail #107).

N. Automatic Controller

(1) The automatic controller shall have at least the minimum number of stations as indicated on the drawings and shall be completely automatic in operation, and shall electronically start the sprinkler cycle and electronically time the individual stations. Controller and valve shall be by the same manufacturer or as approved by City Landscape Architect.

(2) The controller shall have a standard 117 volt, 60 cycle power input, and 26.5 volt, 2.2 amp output.

(3) The controller shall have 14-day programming and be capable of automatically starting a watering cycle at any time on the hour for 23 hours per day.

(4) Each station shall have an off switch for zero time and individual timing control for 2 to 60 minutes for each station.

(5) Each station shall have an off switch for eliminating one or more stations from the automatic timing sequence or for initiating a repeat cycle on any or all stations after the normal watering cycle has been completed.

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

(7) Controller shall be equipped with a reset circuit breaker, and shall be housed in a locking, waterproof cabinet.

(8) The controller shall have as standard built-in features, an electrical circuit for booster pump operation and an electrical circuit for a master valve operation.

(9) Automatic controllers shall be approved by City Landscape Architect.

(10) Install all automatic controllers as per Standard Detail #102 and 103.

O. Electric Control Valves

(1) The electric control valve shall be a normally closed, 24 volt 60 cycle valve.

(2) The valve shall have a slow uniform closure to eliminate water hammer or chatter.

(3) All valves shall have a manual flow adjustment.

(4) Valve body and bonnet shall be of cast brass with non-corrosive components.

(5) Valve shall be pressure rated at 150 P.S.I.

(6) Electric control valves shall be by the same manufacturer as the automatic controller.

(7) Electric control valves shall be approved by City Landscape Architect.

(8) Install all electric control valves per Standard Detail #117.

(9) All controllers will be equipped with soil sensors in conjunction with tensiometers in electric control valve boxes.

P. Outdoor Automatic Controller Enclosure

(1) All automatic sprinkler controllers installed outside of a building shall be wall mounted within a vandal resistant automatic controller enclosure.

(2) The outdoor pedestal mount controller enclosure shall be of appropriate size to adequately house specified controller made of weather resistant and collision resistant 12 gauge hot rolled steel, finished with weather resistant medium green epoxy paint. Lockable hinged doors shall be equipped with full length stainless steel gasketed hinges. Enclosures shall be as manufactured by Cross Brothers, Inc., (213) 266-2000.

Q. Control Valve Boxes

(1) Use 9" x 24" round box for all gate valves, Brooks #9 or approved equal.

(2) Use 9 1/2" x 16" x 11" rectangular box with green bolt-down cover for all electrical control valves, Carson Industries 1419-12B or approved equal.

R. Sprinkler Heads

(1) General

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

(b) Spray heads shall have a screw adjustment.

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

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

(e) The City Landscape Architect encourages using heads with a low precipitation rate where possible.

(f) All sprinkler heads of the same type shall be of the same manufacturer.

(2) Type "A" Gear Driven Rotary Pop-Up Sprinklers

(a) All type "A" sprinklers shall be high pop-up type with tough, corrosion resistant, durable bodies injection molded out of Cycolac.

(b) All type "A" sprinklers shall have an easily accessible screen to prevent plugging of nozzle orifices from debris in water supply source.

(c) All type "A" sprinklers shall have a special nozzle piston seal which continually wipes any dirt from the nozzle piston. This feature, plus positive spring retraction, shall prevent sticking up of nozzle pistons.

(d) In lawn areas use Toro 300 series stream rotor, Toro 320 series Rain Pro, Toro 620 series gear driven rotary, Toro 640 series gear driven rotary or approved equal.

(e) In ground cover and shrub areas use 12" pop-up Toro 300 series stream rotor, 12" pop-up Toro 320 series Rain Pro or approved equal.

(3) Type "B" Pop-Up Lawn Spray

(a) Pop-up lawn spray heads shall have a minimum 4" pop-up nozzle piston with a stainless steel retraction spring. The sprinkler body shall be manufactured of a corrosion resistant material such as high strength, ultra-violet and impact resistant plastic.

(b) Nozzles for 4" pop-up lawn spray sprinklers shall be of brass construction and shall be adjustable.

(c) 4" pop-up lawn spray sprinklers shall be similar to the Moody 4400 series, Safe-T-Lawn GL-74 series or approved equal.

(4) Type "C" Pop-Up Shrub Spray

(a) Pop-up shrub spray heads shall have a minimum 6" pop-up nozzle piston with a stainless steel retraction spring. The sprinkler body shall be manufactured of a corrosion resistant material such as high strength, ultra-violet and impact resistant plastic.

(b) Nozzles for 6" pop-up shrub spray sprinklers shall be of brass construction and shall be adjustable.

(c) 6" pop-up shrub spray sprinklers shall be similar to the Moody 4600 series, Safe-T-Lawn GL-71 series, or approved equal.

(d) Type "C" pop-up shrub spray heads should be used within low growing ground cover areas only.

(5) Type "D" Pop-Up Shrub Spray

(a) Pop-up shrub spray heads shall have a minimum 12" pop-up nozzle piston with a stainless steel retraction spring. The sprinkler body shall be manufactured of a corrosion resistant material such as high strength, ultra-violet and impact resistant plastic.

(b) Nozzles for 12" pop-up shrub spray sprinklers shall be of brass construction and shall be adjustable.

(c) 12" pop-up shrub spray sprinklers shall be similar to the Moody, Safe-T-Lawn GL-78 series, or approved equal.

(6) Type "E" Shrubbery Spray

(a) All shrub spray heads shall be of one or two piece brass construction with adjustable nozzle. Body shall be quipped with 1/2" F.I.P. threads.

(b) Shrub spray heads shall be similar to Rainbird 2400 series, Moody 24S series, or approved equal.

(7) Type "F" Impact Sprinkler

(a) Impact sprinklers shall be of brass construction and equipped with a bearing to seal out sand and silt and a replaceable wearing ring.

(b) Part circle impact sprinklers shall be equipped with an anti-backsplash device and adjustable breakup pin to regulate radius of coverage.

(c) Part circle impact sprinklers shall be equipped with a vandal resistant locking arc stop.

(d) Impact sprinklers shall be similar to those manufactured by Rainbird or approved equal.

(8) Type "G" Gear Driven Rotary Shrub Sprinkler

(a) Type "G" sprinklers shall be constructed with tough corrosion resistant, durable bodies molded out of Cycolac.

(b) Type "G" sprinklers shall be gear driven and have an easily accessible screen to prevent plugging of nozzle orifices from debris in water supply source.

(c) Gear driven rotary shrub sprinklers shall be similar to the Toro 300 series shrub stream rotor, Toro 320 series shrub Rain Pro Rotor, or approved equal.

S. Booster Pump

(1) Pump shall be equipped with tapped holes for pressure gauges on suction and discharge ports of pump.

(2) All fittings shall be brass.

(3) Suction line assembly shall be sized the same as the pump section inlet.

(4) All pumps shall be equipped with a pump panel within 10' of pump location. Pump panel shall be housed in a lockable waterproof enclosure with the following components: a) HOA (Hand, Off, Automatic) switch. "Hand" position shall be spring loaded to return to "Off" position. b) 24 volt transformer. c) Minimum run timer with settings from 0-10 minutes.

(5) Irrigation plan submittals shall include complete detailed drawing of pump assembly and all electrical installation from electric meter through panel, and to pump motor. All details and/or equipment will be submitted to the City Landscape Architect for approval and/or approved equals.

(6) All booster pumps and electric panels shall have a slump stone (or approved equal) block wall installed around them, for vandalism as well as asthetic purposes. Minimum clearance around pumps and panel will be 24". Height of block wall fence will be determined by the City Landscape Architect.

(7) All booster pumps will have LeMeur type enclosures from LeMeur Welding and Mfg. Co. or approved equal. See City Standard Detail #106 for proper installation procedures. (213)-427-5421.

4. INSTALLATION PROCEDURES

A. Site Conditions

(1) Exercise extreme care in excavating and working near existing utilities. Contractor shall be responsible for damages to utilities which are caused by his operations or neglect. Check existing utilities drawings for existing utility locations. Call out mark-out crews for each utility.

(2) Coordinate installation of sprinkler irrigation materials, including pipe, so there shall be NO interference with utilities or other construction or difficulty in planting trees, shrubs, and ground covers.

(3) The Contractor shall carefully check all grades to satisfy himself that he may safely proceed before starting work on the sprinkler irrigation system.

B. Water Supply

(1) Sprinkler irrigation system shall be connected to water supply points of connection as indicated on the drawings.

(2) Connections shall be made at approximate locations as shown on drawings. Contractor is responsible for minor changes caused by actual site conditions. Connection will be made by the Contractor in coordination with the Water Department.

C. Electrical Supply

(1) Electrical connections for automatic controller shall be made to electrical points of connection as indicated on the drawings.

(2) The electrical point of connection will be noted on plan by the landscape Architect in coordination with San Diego Gas and Electric Company. This will include connection to electrical controller, showing type and details of all equipment necessary for hook-up procedures.

(3) Electric pedestal and all equipment will be as per City of Oceanside Details 100 and 101 or City-approved equals. Hook-up procedures will be noted on plan by the Landscape Architect.

(4) If booster pumps are involved on a project, details and equipment as well as hook-up procedure will be submitted by the Landscape Architect and/or for approved equals.

(5) The contractor will inform the City Landscape Architect of minor changes caused by actual site conditions.

D. Trenching

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

(2) Trenching on slopes shall receive prior approval of the City Landscape Architect.

(3) Provide a minimum of thirty six (36) inches of cover for all pressure supply lines 6" and larger.

(4) Provide a minimum of twenty four (24) inches of cover for all pressure supply lines 3" and 4" in size.

(5) Provide for a minimum of eighteen (18) inches cover for all pressure supply lines 2 1/2" and smaller.

(6) Provide for a minimum cover of twelve (12) inches for all non-pressure lines.

(7) Provide for a minimum cover of eighteen (18) inches (or at same depth as mainline) for all control wiring.

E. Backfilling

(1) The trenches shall not be backfilled until all required tests are performed. Trenches shall be carefully backfilled with the excavated materials approved for backfilling, consisting of earth, loam, sandy clay, sand, or other approved materials, free from large clods of earth or stones. Backfill shall be mechanically compacted in landscaped areas to a dry density equal to adjacent undisturbed soil in planting areas. Backfill will conform to adjacent grades without dips, sunken areas, humps or other surface irregularities.

(2) A fine granular material backfill will be initially placed on all lines. No foreign matter larger than one-half (1/2) inch in size will be permitted in the initial backfill.

(3) Flooding of trenches will be permitted only with approval of the City.

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

F. Trenching and Backfill Under Paving

(1) Trenches located under areas where paving, asphaltic concrete or concrete, will be installed shall be backfilled with sand (a layer six (6) inches below the pipe and three (3) inches above the pipe) and compacted in layers to 90% compaction, using manual or mechanical tamping devices. Trenches for piping shall be compacted to equal the compaction of the existing adjacent undisturbed soil and shall be left in a firm unyielding condition. All trenches shall be left flush with the adjoining grade. The sprinkler irrigation Contractor shall set in place, cap and pressure test all piping under paving prior to the paving work.

(2) Generally, piping under existing walk may be accomplished by jacking or boring, but where any cutting or breaking of sidewalk and/or concrete is necessary, it shall be done and replaced by the Contractor as part of the contract cost. Permission to cut or break sidewalks and/or concrete shall be obtained from the City.

(3) Provide for a minimum cover of eighteen (18) inches between the top of the pipe and bottom of the aggregate base for all pressure and non-pressure piping installed under asphaltic concrete paving. All sleeves under paving shall be schedule 40 P.V.C. which shall be installed under all paving/concrete areas.

G. Assemblies

(1) Routing of sprinkler irrigation lines as indicated on the drawings is diagramatic. Install lines (and various assemblies) in such a manner as to conform with the details per plans. See page 21 for "As-built" responsibilities.

(2) Install NO multiple assemblies on plastic lines. provide each assembly with its own outlet.

(3) Install all assemblies specified herein in accordance with respective detail. In absence of detail drawings or specifications pertaining to specific items required to complete work, perform such work in accordance with best standard practice with prior approval of the City.

(4) PVC pipe and fittings shall be thoroughly cleaned of dirt, dust and moisture before installation. Installation and solvent welding methods shall be as recommended by the pipe and fitting manufacturer.

(5) On PVC to metal connections, the Contractor shall work the metal connections first. Actual PVC to metal connections shall only be accomplished by PVC male adapters screwed into PVC female fittings. Teflon tape or approved equal, shall be used on all threaded PVC to PVC, and on all threaded PVC to metal joints. Light wrench pressure is all that is required. Where threaded PVC connections are required, use threaded PVC adapters into which the pipe may be welded.

H. Line Clearance

All lines shall have a minimum clearance of six (6) inches from each other and from lines of other trades. Parallel lines shall not be installed directly over one another. Installation of lines for other trades shall not be laid in irrigation trenches, but shall be installed in a separate trench.

I. Automatic Controller

Install as per manufacturer's instructions. Remote control valves shall be connected to controller in numerical sequence as shown on the drawings.

J. High Voltage Wiring for Automatic Controller

(1) 120 volt power connection to the automatic controller shall be provided by the contractor.

(2) All electrical work shall conform to local codes, ordinances, and union authorities having jurisdiction.

K. Remote Control Valves

Install where shown on drawings and details. When grouped together, allow at least twelve (12) inches between valves. Install each remote control valve in a separate valve box.

L. Flushing of System

(1) After all new sprinkler pipe lines and risers are in place and connected, all necessary diversion work has been completed, and prior to installation of sprinkler heads, the control valves shall be opened and a full head of water used to flush out the system.

(2) Sprinkler heads shall be installed only after flushing of the system has been accomplished to the complete satisfaction of the City.

M. Sprinkler Heads

(1) Install the sprinkler heads as designated on the drawings. Sprinkler heads to be installed shall be equivalent in all respects to those itemized on plans and in details.

(2) Spacing of heads shall not exceed the maximum indicated on the drawings. In no case shall the spacing exceed the maximum recommended by the manufacturer.

N. Drip Irrigation Systems

Drip irrigation is encouraged within City limits, particularly where chance of run-off is imminent.

Drip systems within public right-of-way shall require approval by the City Landscape Architect.

Details and all equipment used will be submitted for City approval. See Standard Details #132, 133 and 134.

O. Temporary Repairs

The City reserves the right to make temporary repairs as necessary to keep the sprinkler system equipment in operating condition. The exercise of this right by the City shall not relieve the Contractor of his responsibilities during the 90-day maintenance period.

P. Existing Trees

Where it is necessary to excavate adjacent to existing trees, the Contractor shall use all possible care to avoid injury to trees and tree roots. Excavation in areas where two (2) inch and larger roots occur shall be done by hand. All roots two (2) inches and larger in diameter, except directly in the path of pipe or conduit, shall be tunneled under and shall be heavily wrapped with burlap, to prevent scarring or excessive drying. Where a

ditching machine is run close to trees having roots smaller than two (2) inches in diameter, the wall of the trench adjacent to the tree shall be hand trimmed, making clean cuts through. Trenches adjacent to trees should be closed within twenty-four (24) hours, and where this is not possible, the side of the trench adjacent to the tree shall be kept shaded with burlap or canvas.

Q. Field Quality Control

(1) Adjustment of the System

(a) The Contractor shall flush and adjust all sprinkler heads for optimum performance and to prevent over-spray onto walks, roadways, and buildings as much as possible.

(b) If it is determined that adjustments in the irrigation equipment will provide proper and more adequate coverage, the Contractor shall make such adjustments prior to planting. Adjustments may also include changes in nozzle sizes and degrees of arc as required.

(c) Lowering raised sprinkler heads by the Contractor shall be accomplished within ten (10) days after notification by City.

(d) All sprinkler heads shall be set perpendicular to finished grades unless otherwise designated on the plans.

(2) Testing of Irrigation System

(a) The Contractor shall request the presence of the City at least 48 hours (2 working days) in advance of testing.

(b) Test all pressure lines under hydrostatic pressure of 150 pounds per square inch, and prove watertight.

NOTE: Testing of pressure main lines shall occur prior to installation of electric control valves.

(c) All piping under paved areas shall be tested under hydrostatic pressure of 150 pounds per square inch, and proved watertight, prior to paving.

(d) Sustain pressure in lines for not less than three (3) hours. If leaks develop, replace joints and repeat test until entire system is proven watertight.

(e) All hydrostatic tests shall be made only in the presence of the City. No pipe shall be back-filled until it has been inspected, tested and approved.

(f) Furnish necessary force pump and all other test equipment.

(g) When the sprinkler irrigation system is completed, perform a coverage test in the presence of the City, to determine if the water coverage for planting areas is complete and adequate. Furnish all materials and perform all work required to correct any inadequacies of coverage due to deviations from plans, or where the system has been willfully installed as indicated on the drawings when it is obviously inadequate, without bringing this to the attention of the City. This test shall be accomplished before any ground cover is planted.

(h) Upon completion of each phase of work, entire system shall be tested and adjusted to meet site requirements by the Contractor and City Landscape Inspector.

R. Inspection Schedule

(1) The Contractor shall be responsible for notifying the City Landscape Architect 48 hours (or 2 working days) in advance for the following inspections (619/439-7157):

(a) Pre-job conference - 2 working days
(b) Trenching - 2 working days
(c) Pressure supply line installation and testing - 2 working days
(d) Lateral line and electrical valves - 2 working days
(e) Coverage tests - 2 working days
(f) Pre-maintenance and final inspection - 2 working days

(2) No work shall be backfilled until appropriate inspections and testing has been completed and approved by the City.

(3) No inspection will commence without as-built drawings. In the event the Contractor calls for an inspection without as-built drawings, without completing previously noted corrections, or without preparing the system for inspection, he shall not receive inspection.

S. Maintenance

(1) The entire sprinkler irrigation system shall be under full automatic operation for a period of seven (7) days prior to any planting.

(2) The City reserves the right to waive or shorten the operation period.

(3) Landscape irrigation systems within public rights-of-way and within landscape maintenance assessment districts shall be fully maintained by the Contractor/Developer for a period of one (1) year prior to final acceptance by the City. This period commences upon approval of landscape improvements by the City Council, generally at the same time as acceptance of all public works improvements. This time may be extended if the maintenance provisions are not met (see Section III - Maintenance and Inspection).

T. Clean-Up

Clean-up shall be made as each portion of work progresses. Refuse and excess dirt shall be removed from the site, all walks and paving shall be broomed or washed down, and any damage sustained on the work of others shall be repaired to original conditions.

U. Final Inspection Prior to Acceptance

(1) The Contractor shall operate each system in its entirety for the City at time of final inspection. Any items deemed not acceptable by the Inspector shall be reworked to the complete satisfaction of the City.

(2) The Contractor shall show evidence that the City has received all accessories, charts, record drawings, and equipment as required before final inspection can occur.

(3) End of maintenance shall occur only on the written acceptance by the City of Oceanside.

II-B - LANDSCAPING

1. MATERIALS

A. Plant Material

(1) Nomenclature - The scientific and common names of plants specified shall conform with the approved names given in "A Checklist of Woody Ornamental Plants in California" Manual 32, published by the University of California School of Agriculture (1963).

(2) Labeling - Each group of plant materials delivered to the site shall be clearly labeled as to species and variety and nursery source.

(3) Quality and Size - Plants shall be in accordance with the California State Department of Agriculture's regulation for nursery inspections, rules and grading. All plants shall have a normal habit of growth and shall be sound, healthy, vigorous, and free of insect infestations, plant diseases, sun scalds, fresh abrasions of the bark, or other objectionable disfigurements. Tree trunks shall be sturdy and well hardened off. All plants shall have normally well-developed branch systems and vigorous and fibrous root systems which are not root or pot bound. In the event of disagreement as to condition of root system, the root condition of plants furnished by the Contractor in containers will be determined by removal of earth from the roots of not less than two plants of each species or variety. 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 City landscape Architect reserves the right to reject the entire lot or lots of plants represented by the defective samples. The City Landscape Architect is the sole judge as to acceptability.

The size of the plants will correspond with that normally expected for species and variety of commercially available nursery stock, or as specified in the drawings. The minimum acceptable size of all plants, measured before pruning with the branches in normal position, shall conform with the measurements, if any, specified on the drawings in the list of plants to be furnished. Plants larger in size that specified may be used with the approval of the City landscape Architect, but the use of larger plants will make no change in contract price.

Bare root plantings in publicly maintained areas shall be done only with special approval of the City landscape Architect.

(4) Rejection or Substitution - All plants not conforming to the requirements herein specified, shall be considered defective, and such plants, whether in place or not, shall be marked as rejected and immediately removed from the site of the work and replaced with new plants at the Contractor's expense. The plants shall be of the specie, variety, size and condition specified on the drawings. Under no condition will there be any substitution of plants or sizes for those listed on the accompanying plans, except with the expressed consent of the City Landscape Architect.

(5) Pruning - At no time shall the tree or plant materials be pruned, trimmed or topped prior to delivery, and alteration of their shape shall be conducted only with the approval and when in the presence of the City landscape Architect.

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

(7) Right of Inspection - The City Landscape Architect reserves the right to approve or reject at any time upon delivery or during the work any or all plant material regarding size, variety or condition.

(8) Soils Test - Two (2) copies of soils tests performed by an approved agronomic soils testing laboratory shall be submitted with plans. All soil samples shall be taken in the field by a qualified soils technician unless prior approval for alternative procedures is given by the City Landscape Architect. Tests shall include a fertility and suitability analysis with written recommendations. Consultant shall comply with recommendations given for soil amendments, plant material selections and irrigation equipment.

B. Topsoil

Topsoil shall consist of a natural, fertile, friable, sandy loam soil possessing the characteristics of representative soils in the vicinity which produce heavy growth of crops, grasses, or other vegetation and shall be obtained from natural well drained areas. Before removal of the topsoil, the surface at the source of supply is to be stripped to a depth of two inches in

order to remove weed seeds, roots, etc. The source of topsoil shall be free from Bermuda grass, crab grass, and all noxious weeds or grasses. The topsoil shall be free from subsoil, refuse, heavy roots, clay lumps, stones larger than one inch in size, noxious weeds, sticks, brush, litter and other deleterious substances. In no case shall there be more than five percent by volume of the following: stones larger than one inch, coarse sand, and small clay lumps.

The soil shall be free from insoluble carbonates and shall have the following analysis, which shall be verified by a soil analysis made at the Contractor's expense.

pH - maximum of 7.0; minimum of 6.0
ECo - zero to three maximum (electrical conductivity)
ESP - zero to twelve maximum (exchangeable sodium percentage)

The soil shall be subject to inspection, at the source of supply prior to delivery.

C. Soil Conditioners and Fertilizers

(1) Soil conditioner with fertilizer included, shall consist of organic materials comprised of decomposed animal and vegetable matter and composted to support bacterial cultures. Soil conditioner shall be "Gro-Power Plus" or approved equal, and shall conform to the following analysis:

(a) Particle Size - 63 1/2% thru +100 Screen
36 1/2% thru -100 Screen

(b) pH - 4.5 to 4.7

(c) Organic Content - Humus - 50%
Humic Acids - 15%
Note: Poultry, Animal or Human waste not acceptable (Organic fiber, not Humus: see definition of Humus in Western Fertilizer Handbook-Fifth edition)

(d) Chemical Analysis:

Total Nitrogen.....5.00%
*Ammonic nitrogen.....1.00%
**Organic nitrogen.....4.00%
Available phosphoric acid***.....3.00%
Soluble potash****.....1.00%
Iron (derived from iron sulfate).....1.00%
Zinc (derived from zinc sulfate).....0.05%
Manganese (derived from manganese sulfate)0.05%
*derived from ammonium phosphate
**derived from compost, meat meal and urea
***derived from compost, meat meal and diamonium phosphate
****derived from compost and muriate of potash

Soil Penetrant - Alkyl Naphthalene Sodium Sulfonate.....2.00%

(e) Materials shall be mixed thoroughly and bagged in 50 lb. or 80 lb. bags.

(2) Organic Soil Amendments - derived from Redwood, Fir or Pine wood or bark, granular in nature stabilized with nitrogen, and having the following properties:

(a) Particle size - Minimum 95% passing 4 mesh screen (6.35 MM standard sieve)
Minimum 80% passing 8 mesh screen (2.33 MM standard sieve)

(b) Nitrogen content - 0.5% based on dry weight for Redwood sawdust, 0.7% based on dry weight for Fir sawdust.
1.0% based on dry weight for Fir or Pine Bark.
NOTE: Pine sawdust not acceptable.

(c) Salinity - Saturation extract conductivity shall not exceed 3.5 millimhos/ centimeter at 25 degrees centigrade.

(d) Organic content - Minimum 90% by weight

(3) Minerals:

(a) Soil Sulfur (S)....As required from soil report.

(b) Ferrous Sulfate - as metalic 20%.....As required from soil report.

(c) Agricultural Gypsum ($CaSO_4 2H_2O$).As required from soil report.

(d) Lime (CaO).....As required from soil report.

(4) Redwood Shavings - redwood shavings shall be leeched and nitrogen fortified with the residual nitrogen content of 1%.

(5) Pre-Plant Commercial Fertilizer - shall be uniform in composition, free flowing, suitable for application with approved equipment, and delivered to the project site in unopened original container or package, each bearing the manufacturer's statement of guaranteed analysis, and shall contain the minimum available percentage by weight of plant food as specified in the approved agromonic soils report.

D. Subsurface Planter Box

Planter box incorporated into street tree planting (15 gal.) for the purpose of long-term root control shall be a pre-fabricated high-impact polystyrene planter box as manufactured by Deep Root Corp. or approved equal. Install per Standard Details #210-212.

E. Tree Ties

Tree ties shall be installed per Standard Detail(s) and shall be corded rubber tree straps, side nailed to stake with 1" roofing nail. Tree straps by "Gro-Strait" products or approved equal. Secure in three places minimum.

F. Tree Stakes

Tree stakes shall be straight grained lodge pole pine, free from knots, splits or disfigurements. Stakes shall be 10' long except when staking Eucalyptus which shall receive 12' long stakes. Install per Standard Details #208-212.

G. Guying Materials

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

All guys are to be flagged. Ninety percent wire length is to be covered. White PVC 1/4 inch diameter tube covering shall be used.

H. Bark Chips

Bark chips shall be regular, ground, redwood or fir bark, consisting of 1/2" to 1" chips. Prior to delivery to the site, the Contractor shall submit samples to the City Landscape Architect for approval.

I. Erosion Control Matting

Erosion control matting shall be of open weave, furnished in rolled strips as follows: Length - approximately 225 feet; width - 48 inches plus or minus one inch, with an approximate one (1) inch square mesh. Fabric shall average .4 pounds per linear foot. The erosion control matting shall be manufactured from loosely twisted jute yarn not varying in thickness by more than one-half its normal diameter, equal in quality to "Ludlow Soil Saver #48' or approved equal.

J. Staples - Staples for erosion control shall be 11 gauge steel wire bent in a U shape six inches minimum length and one inch wide.

K. Wetting Agent - 95% alkyl Polyethylene Glycol Ether such as: "Commercial Water In" or approved equal.

L. Seed

All seed used for lawn plantings or erosion control planting or for any other reasons specified in the plans shall be labeled and furnished in sealed standard containers with duplicate signed copies of a statement from the vendor, certifying that each container of seed delivered is fully labeled in accordance with the California State Agricultural Code. Seed which has become wet, moldy, or otherwise damaged in transit or storage will not be accepted.

Erosion control and permanent seed mixes shall be specified in detail and subject to review for compatibility with soil type(s), adjoining land uses, and maintenance practicality.

M. Sod

Sod shall be fully mature, well maintained, of the grass variety specified, free of all other grasses or weeds, and shall be evenly cut with a conventional sod cutting machine to a thickness of 1 1/2 inches. All material shall be from the same growing ground and delivered fresh to the job site.

N. Hydromulching

(1) Wood Cellulose Mulch - Mulch shall be clean, natural, wood cellulose fiber. Natural wood cellulose fiber shall be processed in such a manner that it will contain no growth or germination inhibiting factors and shall be dyed green to facilitate metering of materials. It shall be manufactured in such a manner that after each addition and agitation in slurry tanks with fertilizer, seed, water and other approved additives, the fibers in the material will become uniformly suspended to form a homogeneous slurry; and that when hydraulically sprayed on the ground cover impregnated uniformly with seed; and which, after application, will allow the absorption of moisture and will allow rainfall to percolate to the underlying soil.

(2) Fertilizer shall consist of organic materials comprised of decomposed animal and vegetable matter and composted to support bacterial cultures. Fertilizer shall be "Gro-Power" or approved equal.

(3) Humectant - HL-80 Humectant or approved equal.

(4) Soil Binder - Terra Tack III or approved equal.

(5) Equipment - Hydraulic equipment used for the application of slurry shall have a built-in agitation system with an operating capacity sufficient to agitate, suspend, and homogeneously mix above slurry. Distribution lines shall be large enough to prevent stoppage and to provide even distribution of the slurry over the ground. In order to facilitate proper coverage, pump must be capable of exerting up to 150 psi at the nozzle. The slurry tanks shall have a minimum capacity of 1500 gallons and shall be mounted on a traveling unit which will place the slurry tank and spray nozzles within sufficient proximity to the areas to be seeded so as to provide uniform distribution without waste.

O. Weed Abatement Program

The use of the herbicide "Round-up" or approved equal shall be accomplished for slope/planting areas. Refer to page 57 for guidelines for proper application procedures.

2. INSTALLATION PROCEDURES

A. Grading and Soil Preparation

(1) All finish grading and mounding shall be completed prior to soil preparation.

(2) Planting areas shall be free of all weeds (plants not specified in planting areas), stones, stumps, roots, or other debris 1 inch in diameter or larger for a minimum of 2 inches in depth.

(3) Soil shall be graded to a smooth and even surface conforming to required finish grade. Finish grade adjacent to walks, paved areas, curbs, manholes, cleanouts, valve boxes, and similar features shall be 1 inch below the surface in turf and 2 inches below in ground cover/shrub areas. Grades between such features shall be carefully sustained and blended to eliminate abrupt changes.

(4) Planting areas to receive sod shall sustain a finish grade of such depth that installed sod shall be flush with finish surfaces (walks, paved areas, etc.)

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

(6) Eliminate all erosion scars.

B. Ground Cover

(1) After preparation of the soil in accordance with the section on "Grading and Soil Preparation," the areas to be planted with ground covers will be given an additional pre-fertilization as specified in the soils report, evenly broadcast over the area.

(2) Ground cover plants shall be grown in flats or peat pots. Flat grown plants (rooted cuttings) shall remain in those flats until transplanting. The flat's soil shall contain sufficient moisture so that it will not fall apart when lifting the plants. If plants from peat pots are used, the pots shall be protected at all times prior to planting to prevent unnecessary drying of the root ball.

(3) Ground covers shall be planted in straight rows and evenly spaced, unless otherwise noted, and at intervals called out in the drawings. Triangular spacings shall be used unless otherwise noted on the plan.

(4) To avoid drying out, plantings shall be immediately sprinkled after planting until the entire area is soaked to the full depth of each hole. Evenly spread ammoniated redwood shavings or other approved mulching material in the area planted with ground cover to a depth of 1/2".

C. Planting of Trees, Shrubs and Vines

(1) Excavation for Planting - Excavation for planting shall include the stripping and stacking of all acceptable topsoil encountered within the areas to be excavated for trenches, tree holes, plant pits, and planting beds.

(a) All excavated holes shall have vertical sides with roughened surfaces and shall be of a size that is at least two times the width and one and one half times the depth of the original plant container. The holes shall be, in all cases, large enough to permit handling and planting without injury or breakage to the roots or root ball. Refer to Standard Planting Details #206-209.

(b) Excavated holes for slope plantings shall be dug two times original plant container depth, providing a permanent 6 inch berm around plant pit.

(c) Excess soil generated from the planting holes may be distributed on the site and amended as specified in general soil preparation.

(2) Planting

(a) No more plants shall be distributed in the planting area on any day than can be planted and watered on that day.

(b) Containers shall be cut and plants shall be removed in such a manner that the ball of earth surrounding the roots is not broken, and they shall be planted and watered as herein specified immediately after the removal from the containers. Containers shall not be cut prior to placing the plants in the planting area.

(c) Acceptable topsoil which was salvaged during the digging of planting holes may be used for backfill. Backfill mix for all container plants shall follow the recommendation as detailed in the soils report.

(d) Backfill shall be placed at the bottom of each hole and thoroughly compacted to a height that when a plant is placed in the hole its root crown is lightly above the established final grade. Any plants which settle deeper than specified above shall be raised back to the correct level. After the plant has been placed, additional amended backfill shall be added to the hole to cover approximately one-half the height of the root ball. At this stage, water shall be added to the top of the partly filled hole to thoroughly saturate the root ball and adjacent soil.

After the water has completely drained, the remainder of the hole shall then be backfilled with the amended material.

After backfilling, an earthen basin shall be constructed around each plant. Each basin shall be of a depth sufficient to hold at least six inches of water. Basins shall be the same size as the container size of each individual plant. The basins shall be constructed of amended backfill material.

Immediately after planting, apply water to each tree and shrub by means of a hose. 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 grass and plants. Generally, water once each day for 7 days in cool seasons, and for 14 days in hot weather. Berms around shrubs and trees on slopes shall be permanently maintained with periodic inspection to prohibit siltation of material around plant crown. In turf areas, berms shall be maintained for 30 days following tree planting, typically through the weed abatement program.

(e) Vine Planting - Vines shall have wood stake support removed, without damage to plant and the vine trained upon the adjacent posts and walls as directed by the plan, or Landscape Architect. Vines shall be held to posts and overheads by plastic green ribbon - "heavy duty" and plastic adhesive vine tabs, no nails - as directed by the City Landscape Architect.

(f) Pruning - Pruning shall be limited to the minimum necessary to remove injured twigs and branches, and to compensate for loss of roots during transplanting, but never to exceed one-third of the branching structure. Upon approval of the City Landscape Architect, pruning may be done before delivery of plants, but not before plants have been inspected and approved. Cuts over three-quarters of an inch in diameter shall be painted with an approved tree wound paint.

(g) Where street trees occur within treewells or are adjacent to a substantial amount of pavement, a sub-surface planter box ("Deep-Root" or approved equal) shall be used. Box shall be installed per Standard Details #210, 212.

(h) Location for street trees adjacent to any light standards or utility equipment shall be adjusted to maintain suitable clearance, as approved by the City Landscape Architect.

D. Lawn

Lawn will be planted by hand seeding, hydroseeding, and/or sodding as indicated on the plans.

(1) After preparation of soil in accordance with the section on "Grading and Soil Preparation", the areas to be planted to lawn shall be rolled, raked, and floated to finish grade by any acceptable method with the finish grade being smooth and even, free of rocks and clods and reasonably well firmed. Prior to planting, the surface of the area shall be sufficiently loose and fiable to receive the seeds, or sod.

(2) Pre-fertilization - Just prior to the planting of turf, evenly broadcast appropriate fertilizer as specified in the approved soils report.

(3) Method

(a) Seed - A satisfactory method of sowing shall be employed, using an approved mechanical power drain driller seeder, mechanical hand seeder, or other approved equipment. The rate of application of seed will be specified on the plans and in the specifications.

The seed shall be covered by means of a wire drag, spiked toothed harrow cultipacker or other approved device. Seeded areas shall immediately be compacted by means of a cultipacker, roller or other approved equipment weighing 60 to 90 pounds per linear foot of roller. Final rolling shall be at right angles to slopes to prevent erosion wherever possible.

(b) Sodding - Soil preparation, finish grading and fertilization shall be as specified for seeded lawns, except that the sub-soil finish grade shall be two inches below final grade to allow for the thickness of sod.

Lay sod in one direction only, with close fitted butt joints. The ends of each strip shall be staggered to eliminate continuous joining. Staple sod on steep slopes with metal staples typical for those used on erosion control matting, if necessary.

(4) Watering - Immediately following planting or top dressing, if applied, apply a light, fine mist spray to anchor the seed, and/or dressing to the soil, forming a protective crust to prevent wind erosion and drying of the seed. The lawn areas shall be kept moist until fully germinated.

Fully germinated lawn areas shall be allowed to dry sufficiently to permit rolling with approximately two hundred to three hundred pound water weighted roller to satisfactorily compact the soil around the grass roots and to provide a firm, smooth mowing surface.

E. Hydroseeding Installation/Weed Abatement Program

(1) Weed Control - Upon the completion of the irrigation system and after all existing weeds and growth have been removed from the planting area, apply 200 pounds of a commercial fertilizer 21-0-0 per acre, as per manufacturer's instructions.

Water all areas four (4) times daily for twenty-one (21) consecutive days and until weed seeds have germinated. Cease watering for three (3) days. Spray the non-selective herbicide "Round-up," to eradicate the germinated weeds. Translocation or approved equal period should be 7-10 days.

Allow herbicide to kill all weeds. Rake or hoe off all dead weeds to a depth of 1/4 inch below the surface of the soil.

If perennial weeds or grasses still exist, rewater four (4) times daily for fourteen (14) consecutive days, until the new growth appears. Reapply a non-selective herbicide. Remove weeds after herbicide has had sufficient time to kill.

(2) Equipment - Hydraulic equipment used for the application of the fertilizer, seed and slurry of prepared wood pulp shall be of the "Super Hydroseeder" type as approved by the Landscape Architect. All seed will be delivered to site in sealed bags with guaranteed analysis.

(3) Preparation - The slurry preparation shall take place at the site of work and shall begin by adding water to the tank when the engine is at half throttle. When the water level has reached the height of the agitator shaft, good re-circulation shall be established and the fertilizer shall then

be added to the mixture when the tank is at least one-third filled with water.

The engine throttle shall be opened to full speed when the tank is half filled with water. All the wood pulp mulch shall be added by the time the tank is two-thirds to three-quarters full. At this time the seed shall be added. Spraying shall commence immediately when the tank is full.

(4) Application - The operator shall spray the planting areas with a uniform, visible coat by using the green color of the wood pulp as a guide. The slurry shall be applied in a sweeping motion, in an arched stream so as to fall like rain allowing the wood fibers to build on each other until a good coat is achieved and the material is spread at the required rate per acre.

(5) Time Limit - All slurry mixture which has not been applied to the slopes within four hours after mixing will be rejected and removed from the project at the Contractor's expense.

(6) Protection - Special care should be exercised by the Contractor in preventing any of the slurry to be sprayed inside any reservoir basin or onto drainage ditches and channels which may impede the free flow of rain or irrigation water. Any slurry spilled into restricted areas shall be cleaned up at the Contractor's expense to the satisfaction of the owner or City.

All areas designated for hydroseeding shall be thoroughly watered prior to the hydroseeding. The Contractor shall note any discrepancy for complete water coverage and correct. The Contractor shall at this time note wind and weather conditions and submit a watering program to the Landscape Architect for approval prior to hydroseeding.

(7) Reseeding - All bare spots shall be reseeded by the Contractor within 10 days. The Contractor will be responsible for all reseeded areas for as long after seeding as necessary until an acceptable stand of hydroseeded material is realized and approved by the City.

(8) Watering

(a) A balanced full-coverage watering program shall be maintained to ensure proper germination and until the acceptance of work.

(b) Plants which cannot be watered efficiently with the existing water system shall be watered by means of a hose.

(9) Fertilization (turf) - Apply recommended fertilization program 45 days after the first mowing. Continue every 190-120 days.

F. Erosion Control

Erosion control installation will be required in locations specifically delineated on the drawings or as necessary due to field conditions.

(1) Surface of the slopes shall be uniformly graded and even with all debris and rocks raked out. The soil shall be sufficiently moist to permit the firm laying of erosion control matting and to prevent sloughing of topsoil.

(2) The erosion control matting shall be laid with the direction of flow of surface drainage, and in accordance with the manufacturer's directions. The matting shall be cut to provide a visually pleasing slope.

(3) The matting shall be stapled in place and firmly embedded by means of tamping or rolling, as approved by the City Landscape Architect, to insure that the matting is in contact with the soil and that no erosion can take place under the matting.

(4) Planting of turf, ground covers, shrubs and/or vines may be required in areas protected by erosion control matting as specified in the plans or as become necessary.

G. Natural Planted Areas

(1) Any planting areas designated as natural planting that are cleared off during any phase of development must be re-established with an approved planting prior to acceptance of the tract.

(2) Refer to City zoning and subdivision ordinance.

(3) Natural vegetation areas are subject to review and approval by the Fire Marshall and City Landscape Architect. Appropriate fuel management programs shall be addressed as a part of the contract documents for execution during site development. Budgeting for on-going fuel management programs should also be addressed as a part of the maintenance programs.

CITY OF OCEANSIDE

GUIDELINES & SPECIFICATIONS FOR

LANDSCAPE DEVELOPMENT

January 1982

(Revised August 1984)

SECTION III

MAINTENANCE AND INSPECTION

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MAINTENANCE AND INSPECTION

OBJECTIVES

The objective of the Landscape Maintenance Guidelines is to present the landscape design concepts, guidelines and regulations of the City of Oceanside as well as to outline maintenance procedures and desired results for the maintenance team.

The landscape goal for the City is to visually unify the various land uses and to maintain a standard of quality for community appearance in order to protect and enhance real estate value. Plantings accentuate views of adjacent properties as well as distant views.

The goal for the maintenance of the landscape areas in the City are to perpetuate the landscape goal by enhancing all vegetation through proper care. Moderate visibility areas shall have a moderately groomed appearance. High visibility areas, which include medians and slope plantings adjacent to streets, shall have a manicured appearance. In these areas maintenance shall maximize safety of users with tree pruning practices and trimming of groundcovers away from walkways and other hardscape elements.

The City has attempted to guide landscape development planning to insure plant material has been selected for low water requirements due to the possibility of water shortages in the future. In the event of a water shortage, a gradual transition from normal water application to a reduced water application shall take place over a 3 to 4 month period. Existing high water demanding plantings in high visibility areas may be replaced to include lower water requirement plantings as directed by the City Landscape Architect.

1. PURPOSE

The general requirements are for publicly managed landscape improvement areas within the City of Oceanside. They outline general qualifications and procedures for the Contractor.

2. EMERGENCY NUMBERS

The Contractor shall provide and maintain a current list of emergency telephone numbers for 24 hour emergency response. The Contractor shall initiate remedial action within 2 hours from the time of notification.

3. PROTECTION OF PROPERTY DURING INCLEMENT WEATHER

During periods of storms, the Contractor will provide supervisory inspections of the project during regular assigned hours to prevent or minimize possible damage from inclement weather. The Contractor shall report any storm damage to the Owner's representative. If remedial work is requested beyond the scope of this contract, it shall be paid for as extra work.

4. WORK FORCE

The Contractor shall be responsible for having adequate manpower for general maintenance and any emergency situations as specified in this manual.

5. FAILURE TO RESPOND TO AN EMERGENCY OR AS REQUESTED

In the event the Contractor does not respond to an emergency or special request within 4 hours or as directed, the City may consider reduction of the next invoiced amount by costs associated with sending City forces to respond in lieu of the Contractor.

6. PROTECTION OF EXISTING FACILITIES AND STRUCTURES

The Contractor shall exercise due care in protecting from damage all existing facilities, structures, and utilities both above surface and underground on the City/Owner's property. Any damage to City/Owner's property deemed to be caused by the Contractor's neglect shall be corrected or paid for by the Contractor at no cost to the City/Owner. If the City/Owner requests or directs the Contractor to perform work in a given area, it will be the City/Owner's responsibility to verify and locate any underground systems, i.e., utility lines. This does not release the Contractor of the responsibility for taking reasonable precautions when working in these areas. Any damage or problems shall be reported immediately to the City/Owner's representative.

7. SOIL ANALYSIS AND PLANT TESTING

A. The Contractor may be directed to take samples of soil or plant tissue for testing purposes. These tests shall be used to determine specific causes of plant failure, fertility levels, etc. If these tests are requested, the laboratory costs will be paid for by the Owner. The labor cost, as a result of taking the test, will be borne by the Contractor.

B. Soil tests shall be done annually as directed by the City/Owner. Soil testing shall be done by an approved Agronomic testing firm.

8. MATERIALS

A. All materials used shall conform to the contract specifications. The contract specifications shall be available from the City/Owner. The Contractor shall submit product descriptions of any alternate products/equipment being used which do not conform to the project specifications. This submittal must be approved by the City prior to installation.

B. All materials specified shall be delivered on the site in original unopened containers with the name of the product, manufacturer, chemical date of analysis, plainly marked on the containers.

C. The Contractor shall submit a monthly record of all herbicides, insecticides and disease control chemicals used, to the County Agricultural Commissioner's Office, as required by law.

9. PROJECT INSPECTIONS

Upon request the Contractor or his representative will walk the project with the City/Owner's representative for the purpose of determining compliance with the specifications.

10. SERVICE SCHEDULE

A monthly schedule shall be given to the City/Owner's representative indicating the frequency of time and days of the week services are to be performed. This should be submitted at least two weeks in advance.

11. SUPERVISION

The Contractor shall give his personal supervision to the work or shall have a competent foreman on the job site at all times during progress of the work.

12. EXTRA WORK

A. In the event the Contractor is requested and agrees to perform work above which is specified under this contract, the following procedure will govern such extra work.

1. Work will be executed under a time and material basis or an agreed upon lump sum price, depending on the nature of the work.

2. The City/Owner will issue a work request for such extra work to be performed.

3. Extra work will be initiated and cost itemized on monthly billing.

4. Contractor, at City/Owner's request, will submit an itemized invoice indicating materials, labor/manhours and cost of requested work.

5. Extra work may include, but not be limited to, the following:

   a. Replacement of plant materials due to failures beyond the Contractor's control.
   b. Replacement of worn or damaged sprinkler heads, valves, quick couplers, etc.
   c. Additional treatment required for planting or soil as set forth specifically in this specification.
   d. Soil or plant testing.
   e. Remedial landscaping.
   f. Repairs or replacements due to vandalism or Acts of God.
   g. Replacement of Annual Color.
   h. High tree pruning which is above the reach of an orchard ladder.
   i. Emergency or special conditions.

13. INSURANCE AND LICENSING

Contractor will furnish the Owner with evidence of insurability and carry the following minimum coverage with a company approved by the Owner.

A. Workmens Compensation - full coverage required.
Public Liability Insurance - $1,000,000.00
Property Damage Insurance - $1,000,000.00

B. License: Contractor must by law have a C-27 State Landscape Contractor's license if more than $100 of replacement landscaping is to be done. Contractor agrees to purchase all other licenses required by City, County, State of Federal Government.

C. Taxes: Contractor agrees to pay all applicable taxes, including sales taxes on materials supplied.

D. Bonds: Contractor shall provide performance and payment bonds when required by City/Owner.

SPECIFIC REQUIREMENTS

1. PURPOSE

The specific requirements outline maintenance procedures necessary to preserve the design goal of the City of Oceanside. Visual unity of the various land uses and a standard of quality for community appearance shall be achieved through proper care of all vegetation.

2. SCOPE OF WORK

A. The Contractor shall furnish all labor, equipment, materials, tools, transportation, hauling, dumping, fertilizers, insecticides, chemicals, services, and special skills required to perform the landscape maintenance as set forth in these specifications. Maintenance shall include routine maintenance of plant material, irrigation system and walk areas.

B. Maintenance of plant material shall include, but not be limited to, mowing, trimming, pruning, watering, fertilization, aeration, thatching, weed control, cultivation, pest control and clean-up. It is the intent to provide plant material maintenance methods to keep the site in a state of perpetual growth and repair. Irrigation maintenance shall include operation of system, adjustments and minor repairs.

C. All walkways shall be kept clear of debris from the maintenance operations, erosion, run-off from storms, irrigation or wind blown debris. Clean-up of walks, driveways and parking areas shall be the Contractor's responsibility. Street gutters shall be included within the debris/siltation removal program.

D. The Contractor shall provide a general clean-up operation at least once a week for the purpose of picking up trash or debris which may accumulate from the use of the area, wind blown debris, dropping of twigs or branches from trees.

E. Contractor or Contractor's representative shall make at least six (6) general inspections of the project per year (one every two months) with the City.

F. If work is to be conducted in Public Rights of Ways, the Contractor shall adhere to all safety rules using cones or other required safety equipment and obtain all necessary permits and approvals.

G. All personnel on the project shall be well-trained, clean and neat at all times, and shall be conversant with these specifications.

H. All work shall be performed in accordance with the best landscape maintenance practices and in keeping with the high aesthetic level of the facilities being maintained.

I. Contractor shall be responsible for removing all weeds in cracks of sidewalks, curblines, and hardscape areas throughout the project.

J. All landscape areas shall be patrolled weekly to check for vandalism damage, broken tree branches, rodents, insects, snails, pests and diseases, etc.

K. Water Management: Water only as required to allow penetration into the soil and avoid excess run-off. Plant material has been selected for low water requirements due to the possibility of water shortages in the future. Once plant material is established, water only as needed to maintain healthy plant material.

L. Clearance and Visibility: Avoid blocking the clear view of signs, illumination of light fixtures, the air flow out of vents and conflict with pedestrians and vehicles.

M. Moderate visibility areas shall have a moderately groomed appearance. Trim groundcover away from hardscape elements. Shrubs and trees shall be pruned to retain their natural character, not a clipped character. Prune trees and shrubs to not allow breakage from wind and weather elements.

N. High visibility areas, which include medians, monument signage areas and slope planting adjacent to streets, shall have a manicured appearance. Signage shall be enhanced but not obstructed by plant material. Trees shall be pruned as frequently as necessary to preserve visual access for pedestrians as well as automobile traffic. Trees and shrubs shall be pruned to maintain their natural form. Remove dead flowers weekly and replace annual color plants where required to maintain a continuous field of flowers.

O. Safety of users shall be a prime goal of maintenance especially in regards to pruning of trees and trimming of groundcovers away from walkways and/or structures.

3. TREES AND SHRUB CARE

Maintain trees and shrubs in a healthy, growing condition by performing all necessary operations, including the following:

A. Watering

1. Plants shall not be watered until a moisture check has been made of representative points in the landscape. Use a probe or other tool to check the moisture in the root ball as well as the soil surrounding the root ball. The need for water shall dictate the frequency of watering by the automatic sprinkler system.

2. Maintain a large enough water basin around plants so that enough water can be applied to establish moisture through the major root zone. When hand-watering, use a water wand to break the water force. Use mulches to reduce evaporation and frequency of watering.

B. Pruning:

1. Trees:

a. Prune trees annually to select and develop permanent scaffold branches that are smaller in diameter than the trunk or branch to which they are attached which have vertical spacing of from 18" to 48" and radial orientation so as not to overlay one another; to eliminate narrow V-shaped branch forks that lack strength; to reduce toppling and wind damage by thinning out crowns; to maintain growth within space limitations; to maintain a natural appearance; to balance crown with roots.

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

c. Evergreen trees shall be thinned out and shaped when necessary to prevent wind and storm damage. The primary pruning of deciduous trees shall be done during the dormant season. Damaged trees or those that constitute health of safety hazards shall be pruned at any time of the year as required.

d. All pruning cuts shall be made to alteral branches, or buds, or flush with the trunk. "Stubbing" will not be permitted.

e. All tree pruning shall be done on an Orchard ladder. If trees are larger than able to be pruned in such a manner, the condition will be brought to the attention of the City who shall secure the services of an arborist.

f. Remove no more than 50% of a plant's foliage during pruning operations.

g. Lower branches on established street trees shall be pruned 8' from curb and 10' from gutter.

2. Shrubs:

a. The objectives of shrub pruning are the same as for trees. Shrubs shall not be clipped into balled or boxed forms unless such is required by the design. Retain as much of the natural characteristics or branching as possible.

b. All pruning cuts shall be made to lateral branches or buds or flush with the trunk. "Stubbing" will not be permitted.

c. Pruning shall be accomplished by removing woody/stems from the inside of shrubs at least twice a year. Topping of shrubs shall be done only after interior selective branch pruning has been completed.

d. After flowering, remove any spent blossoms or flower stalks where applicable.

C. Staking and Guying:

1. For Eucalyptus, remove stake after the first year or at the beginning of the growing season, whichever comes first.

2. For trees other than Eucalyptus, consider removal of the existing stakes and guys when the trees attain a trunk caliper of 4". If unstable at this time, replacement shall be decided by the City.

3. Stakes and guys are to be inspected at least twice per year to prevent girdling of trunks or branches, and to prevent rubbing that causes bark wounds.

4. All restaking shall be done with 2" diameter by 10' long lodge pole stakes treated with copper naphthanate and pointed at one end. Adjust length to fit tree. Tree supports shall be corded rubber straps; nail to sides of stake with 1" roofing nail.

D. Weed Control:

Keep basins and areas between plants free of weeds. All trees in groundcover areas shall have open soil maintained around the base of the trunk. This will reduce damage to tree trunks and roots by machinery and by excess water. Use recommended, legally approved herbicides, such as Round-up, whenever possible to control growth in this open area. Avoid frequent soil cultivation that destroys shallow roots and breaks the seal of pre-emergent herbicides. Use mulches to help prevent weed seed germination.

E. Insect and Disease Control:

Maintain a reasonable control with approved materials as recommended by a licensed Pest Control Advisor.

F. Fertilization:

1. Avoid applying fertilizer to the root ball and base of main stem; rather, spread evenly under plant to drip line. Rates will vary from about a cup of nitrate fertilizer (depending on nitrogen percentage) around a newly installed small plant to about one-half (1/2) lb. of actual nitrogen per inch of trunk diameter measured four feet from the ground for mature trees. Refer to recommendations of applicable soils reports.

G. Replacement of Plants:

Dead plants and those in a state of decline shall be brought to City's attention immediately. Replacement plants shall be of a size, condition and variety acceptable to City to be paid for by City/Owner unless due to negligence of Contractor.

4. GROUNDCOVER CARE

Foster attractiveness at all times by following these practices:

A. Weed Control:

Control weeds, preferably with pre-emergent herbicides, but also with selective systemic herbicides. Hoe weeds as little as possible, since this may result in plant damage.

B. Fertilization:

Apply four (4) lbs. of actual nitrogen per 1,000 sq. ft. per year in two to four applications during first year of a new planting or if groundcover is nitrogen starved. One application should be in early Spring when growth begins.

Reduce to three (3) lbs. actual N in following years or as needed to maintain vigorous growth and good color. Complete fertilizers are not desired unless soil test shows specific nutrient deficiencies based on soil tests.

C. Operate irrigation system to maintain a uniform moist condition until the root structure develops to a depth of 12". Thereafter reduce watering schedule to produce a deep rooted groundcover with healthy growth.

D. Remove trash weekly.

E. A cleared circle, 12" diameter, should be maintained at base of trees to reduce competition for nutrients by groundcover.

F. Edge groundcover to keep in bounds and trim top growth as necessary to archieve an overall even appearance. Every 2 years, mow Ivy, to four inches above ground level in order to renew growth and improve density and attractiveness.

G. Control rodents, insects and diseases as necessary, using legally approved materials.

H. Replace dead and missing plants after obtaining Owner's agreement to pay for replacement. Damages due to Contractor's negligence as determined by the City/Owner shall be made good without charge.

I. Slopes:

Check weekly for uniform coverage of groundcover for maximum erosion protection. Remove weeds as necessary to maintain an attractive appearance.

J. Growth Retardants:

Apply a growth retardant to minimize safety problems of trimming and edging in these high maintenance areas.

5. ANNUAL COLOR

A. Planting areas requiring Annual Color shall be replanted twice a year with 4" pot material at 8" o.c.

B. Provide water for color on a routine basis to maintain uniform soil moisture and assure maximum growth.

C. Fertilize color every two weeks, using 1/4 oz. per gallon of 15-30-15 water soluble high phosphate commercial fertilizer or equal program.

D. Remove dead or faded blossoms, stems and foliage weekly to encourage bloom and maintain a neat appearance.

E. Cultivate and weed soil weekly to ensure proper drainage and porosity.

F. Apply all insecticides and fungicides as required to control and prevent pest infestation.

6. LAWN CARE

Lawns shall be maintained in a healthy growing condition by furnishing necessary services, including the following:

A. Mowing and Edging:

1. Upright grasses such as Bluegrass and Ryegrass shall be mowed to minimum height of two inches in warm weather and one and one-half inches during the rainy season. Mowing shall be done at least every seven days during Spring and Fall seasons, and as needed at other seasons. Alternate mowing pattern to avoid rutting of lawn.

2. "Weed Eaters" or similar equipment shall not be used around trees or shrubs. Trimming around trees shall be done by hand or chemically until tree trunk is to a caliper that will not be damaged by mechanical trimming.

3. Edges shall be trimmed at least twice monthly or as needed for neat appearance and all clippings will be removed from site.

4. Allow lawn areas sufficient time to dry prior to mowing to minimize compaction and ruts, caused from excessively wet soil.

5. Care should be exercised in trimming around trees, light fixtures, and electrical boxes to avoid damaging these items.

B. Watering:

Lawns shall be watered at such frequency as weather conditions require, to replenish soil moisture below root zone. Watering shall always be done at night and early

in the morning so as to not interfere with public use of the facility. normally a total of one and one-half inches of water are needed weekly in hot weather, but not all at one time. Water run-off across pavements and into gutters shall be avoided. It is the Contractor's responsibility to apply water as necessary for healthy growth.

C. Fertilization:

Lawns shall be fertilized with a total of six (6) lbs. of actual nitrogen per 1,000 sq. ft. per year. The number of applications will be dependent on the type of nitrogen used.

D. Weed Control:

If needed, control broadleaf weeds with selective herbicides. In areas where crabgrass has infested the lawn, apply a selective post-emergent herbicide as soon as possible. Pre-emergent herbicides shall be applied prior to crabgrass germination.

E. Insect and Disease Control:

If necessary, apply with approved insecticides and fungicides when needed.

F. Renovating:

1. Removal of thatch by verticutting is done preferably in the Fall, but otherwise, in the Spring. At this time overseed if needed. Overseeding must precede pre-emergent herbicides by at least four to six weeks. normally, this means that lawns which have been invaded by Crabgrass should be renovated and overseeded in the Fall, and treated for Crabgrass control in the following late Winter.

2. Mechanically aerate lawn areas two times per year using a plug aerator with 1/2" tines in March and October.

3. Any areas that show excessive compaction from pedestrian traffic shall receive additional aeration as required to alleviate problem conditions.

G. Replacement:

1. Reseed or resod turf as required in medians, parkways, and greenbelts as directed by the City.