

SECTION 20 LANDSCAPING

20.1 GENERAL

20-1.1 Scope - This work shall consist of, but not necessarily limited to, furnishing all labor, materials, plant materials, tools and equipment required to grade, prepare soil, seed, fertilize, plant, and complete the landscaping as shown on the Contract Plans and these Specifications.

The Contractor shall coordinate layout and installation of plant material with installation of the irrigation system to insure that there will be complete and full irrigation coverage of planting in accordance with these Contract Plans, Special Provisions and contract documents. Irrigation system shall be installed and tested prior to installation of plant material.

The *"Model Water Efficient Landscape Ordinance"* by the State Department of Water Resources" shall apply.

20-1.2 Related Work

General Provisions Section 6-11 - General Safety
Technical Provisions Section 18-1 - Trenching
Section 18-5 - Backfill
Section 19 - Landscape Irrigation

20-1.3 Planting Conditions - No planting or seeding shall occur during weather conditions which will adversely affect materials or when soil is in a muddy condition. Contractor shall not plant at the end of the day, on Fridays or before holidays unless a special crew has been assigned to care for plants on the next calendar day, and on weekends and holidays.

20-1.4 Preservation of Existing Improvements - The planting and seeding operations shall be conducted in such a manner that no damage shall result to existing site improvements and plantings. The Contractor shall be responsible for any damage resulting from the Contractor's operations, and shall repair or replace such damage at Contractor's own expense and to the satisfaction of the Engineer. Vehicles of any kind shall not be allowed to pass over curbs, sidewalk, planting areas, etc., unless proper protection is provided.

Damage to utility lines, underground structures and improvements shall be repaired at the Contractor's expense to the satisfaction of the Engineer or owner of the utility involved.

When necessary to protect existing trees the Engineer may require may require the Contractor to modify its operations. Existing trees within the limits of construction not to be removed shall be protected and treated in accordance with Section 22-3, "Tree and Plant Protection," of these Technical Provisions.

Under no circumstances shall earth, debris and materials be piled against trees or stored within drip line of trees.

20-1.5 Underground Obstructions - Rocks and other obstructions shall be removed to a depth necessary to permit proper planting according to Contract Plans and these specifications. If underground utilities, construction or solid rock ledges are encountered, the Engineer shall be contacted immediately for determination of extent of obstruction. The Engineer shall direct the selection of alternate locations.

20-1.6 Personnel - Planting shall be performed by personnel familiar with the procedures required of their trade and shall be supervised by a qualified planting foreman.

20-1.7 Sequence of Work - Landscaping shall not begin until all other improvements have been installed and inspected by the Engineer. Contractor must receive approval to proceed from the Engineer prior to starting landscaping work.

20-1.8 (Blank)

20-1.9 Quality - All work shall be of the highest quality and shall be subject to the approval of the Engineer. Any work that is deemed unacceptable by the Engineer shall be removed by the Contractor promptly and replaced with work that is acceptable to the Engineer. Such removal of defective work and replacement shall be at the Contractor's expense.

Any commercially processed or packaged materials shall be delivered to the site in the original unopened containers bearing the manufacturer's guaranteed analysis.

20-1.10 Storage of Materials

- 1) Plants not installed on the day of arrival at the site shall be stored and protected as follows:
 - a) Outside storage shall be shaded and protected from wind and sun.
 - b) Plants shall be kept in a moist condition until planted, by watering.
- 2) Fertilizer and lime shall not be stored with any other landscape materials.
- 3) Soil sterilant shall not be stored with any other landscape materials.
- 4) Storage of materials shall be only in designated areas, or areas approved by the Engineer.
- 5) Seed containers shall be stored in a dry, weather and damp proof structure. Any seed, which has become wet, moldy or is otherwise damaged in transit or storage will be rejected.

20-1.11 Submittals

- 1) The Contractor shall submit to the Engineer within 14 days following the date of the Notice to Proceed, all descriptive data and samples for the Work as required by the the Specifications, and offers of alternatives, if any. Such submittals shall be checked and coordinated by the Contractor with other trades involved before they are submitted to the Engineer for examination.
- 2) Submittals shall be made by a letter of transmittal that shall contain a list of all materials submitted and identification of all deviations from the Contract Plans and Specifications contained in the submittal. The letter and all accompanying items shall be fully identified by project name and location, Contractor's name, with ample cross-references to the contract documents, to facilitate identification of items and their location in the work.
- 3) Two copies of submittals shall be presented to the Engineer.
- 4) Contractor shall supply the Engineer with a list of all products, e.g. fertilizer, soil amendments, and plant materials, including name of nursery or supplier.
- 5) When requested by the Engineer the Contractor shall supply the Engineer with a sample of all supplied materials accompanied by analytical data from an approved laboratory source illustrating compliance or bearing the manufacturer's guaranteed analysis.

20-2 MATERIALS

20-2.1 General - Plants shall be the variety, quantity and size indicated. When total quantities are shown tabulated on the Contract Plans, they shall be considered approximate and are furnished for convenience only. Contractor is responsible for installing all of the plants shown on the Landscape Plan of the Contract Plans, and for computing the quantity of ground cover required within the area specified and planted at the specified spacing.

All plant quality and size shall conform to the State of California Grading Code of Nursery Stock, No. 1 grade as adopted by the American Association of Nurseryman, and in prime condition when installed and accepted. Plants shall be nursery grown under climatic conditions similar to those at the location of the Project, and shall be free from insect pests and diseases.

All plants shall comply with Federal and State laws requiring inspection for plant diseases and infestations. Inspection certificates required by law shall accompany each shipment of plants, and certificates shall be delivered to the Engineer. All plants shall be true to species and size indicated, and shall be tagged in accordance with the standard practice recommended by the American Association of Nurserymen; however, determination of plant species or variety will be made by the Engineer whose decision will be final.

Plants shall be healthy and vigorous, symmetrical and shapely, and well rooted. Roots shall show no evidence of having been root bound, restricted or deformed. Plant material that has just been upgraded in container size shall be rejected. Root condition of plants in containers will be inspected by the Engineer and determined by removal of earth from the roots of not less than two plants of each species or variety from each source.

All plants declared by the Engineer to be unsuitable for planting as a result of inspection of materials shall be removed from the site promptly. They shall be replaced with specimens that conform to the specifications. The removal of rejected plants and replacement with plant materials conforming to the specifications and satisfactory to the Engineer shall be at the Contractor's expense.

The Engineer may inspect plant materials at the grower or project site during the course of the work. Contractor shall notify the Engineer of the source of plant materials no later than fourteen (14) days after issuance by City of Notice to Proceed. Contractor shall request inspections a minimum of five (5) working days in advance of the time that the plant materials are ready for inspection. Contractor shall facilitate inspection and identification by labeling trees and bundles or containers of the same shrub, groundcover or vine with a durable waterproof label and weather resistant ink. Labels shall state the correct plant name and size as specified in the project plant list and shall be legible for 60 days after delivery to the planting site. Plant material that is not labeled shall be rejected.

Contractor shall be responsible for providing transportation to the source of plant materials if the source location is more than 60 miles from the Project location. If additional inspection trips to the source location of plant materials must be made due to Contractor's failure to adequately coordinate inspections according to these provisions, Contractor shall bear all costs incurred by City for these additional inspections. Said costs shall be deducted from any Contract payment due to Contractor.

20-2.2 Transporting - All plants shall be handled and packed carefully to avoid damage. All necessary precautions shall be taken to insure that the plants will arrive at the site of work in proper condition for successful growth.

Plants shall be transported in enclosed trucks. Trees that are too large for enclosed trucks may be transported in open trucks provided that they are wrapped to prevent damage and windburn. Trees in transport or prior to shipping shall not be tipped so that the container of the adjacent plant is leaning on the trunk of the next tree. Adequate protection shall be placed between trees so that trunks are not scarred in transport and branches are not broken.

20-2.3 Plants - Plants shall have straight trunks with the leader intact, undamaged and uncut. All old abrasions and cuts shall be completely callused over. All plants shall be measured when their branches are in their normal position. Height of plant is measured from root crown to top of plant. Width of plant is measured at branching at the widest point. Indicated sizes shown are before pruning. Plants shall not be pruned prior to delivery.

Ground cover shall be rooted plants, grown in flats unless otherwise noted on the Contract Plans or as approved by the Engineer.

20-2.4 Trees - Trees shall be well tapered in the trunk so that when the nursery stake is removed, the tree supports itself upright without further staking. Trees shall have a main leader. The main branches shall be spaced vertically and alternately along the trunk. Branching shall not be concentrated in one location nor shall there be severe crossing of branches. Branches shall be smaller in diameter than the trunk. Branch attachments shall be free of embedded bark. At least one half of the foliage on the branches shall be located along the lower two thirds of the trunk.

Trees shall be of the specified size. The height shall be measured from the root crown. The diameter shall be measured 6 inches above the root crown.

20-2.5 Seed - Seed mixture shall be 98 percent pure, and noxious weed free, with a minimum of 88 percent germination. All seed shall be re-cleaned Grade A "new crop" seed, delivered in the original unopened containers, and shall bear a guaranteed analysis and dealer's label. The dealer may mix the seed provided a guaranteed statement of composition of mixture and percentages of purity and germination of each variety is attached to the sealed container. The seed shall be pretreated with a pre-emergence fungus preventative such as "Thiram", or approved equal, in accordance with manufacturer's specifications.

20-2.6 Topsoil - Topsoil shall be furnished by City and installed in place by Contractor. Contractor shall notify the Engineer five (5) working days in advance of his scheduled need for topsoil to arrange for delivery. The notice shall designate a delivery location within the project limits that is approved by the Engineer. Contractor shall prepare his forces to receive, store, and/or handle the topsoil. Once the delivery is made to the approved designated location, further transport, storage, protection, and handling of the topsoil become solely the responsibility of the Contractor and at his own expense.

Contractor shall place topsoil in accordance with these Provisions, Contract Plans and Specifications, and as directed by the Engineer. Depth of topsoil installed in all landscape areas shall be per the planting details. Native subgrade in areas to receive imported topsoil shall be scarified to a minimum depth of 4 inches. Imported topsoil shall be rototilled, or hand worked if tree roots are encountered, and mixed into native soil to create a composite zone prior to placing the new topsoil layer on top as specified.

20-2.7 Organic Soil Amendment - Soil amendments shall be used to condition existing native soil or imported topsoil to be suitable for the establishment and growth of the plants specified in the project. City may accept "Premium Humus" organic compost, as available from Redi-Gro Corporation (800-654-4358), or its approved equal, for use on Project.

Notwithstanding the above, soil amendment shall have at least 90% of its material pass a ½-inch screen and at most 50% passing a No. 8 mesh. Material passing a ½-inch screen shall conform to the following requirements.

- 1) Free of all contaminants, such as glass, metal, plastics, grass, or leaves.
- 2) Dark brown to black in color, with no sour, ammonia, or putrid odor.
- 3) Minimum 50% organic content based on dry weight.
- 4) Minimum 250 lbs. organic matter per cubic yard of amendment.
- 5) Maximum 35:1 carbon to nitrogen ratio if material is claimed to be nitrogen stabilized.
- 6) pH of 5.5 to 8.0 as determined in a saturated paste.
- 7) Moisture content between 35% to 60%.

20-2.8 Fertilizer - - Fertilizers shall comply with applicable requirements of the State Food and Agriculture Code and as specified herein. Fertilizer shall be a commercial inorganic fertilizer in the granular or pellet form. Fertilizer shall be delivered to the site in containers labeled in accordance with the applicable State of California regulations, bearing the warranty of the producer for the grade furnished. It shall be uniform in composition, dry and free flowing.

Planted and Seeded Areas: Pellet type with an analysis of 6-20-20 (N-P-K) and granular type 16-6-8 (N-P-K).

Planting Holes: Tablets, 21-gram size, or approved equal, with an analysis of 20-10-5 (N-P-K).

When required by the Engineer the Contractor shall submit a Certificate of Compliance, conforming to Section 6-3.05E of the State Standard Specifications, stating that the material meets these specifications.

20-2.9 Herbicide - The Contractor shall submit written chemical weed control program prepared by a licensed pest control advisor for approval by the Engineer.

Herbicide shall be compatible with plant materials used in this contract. Proof of such compatibility shall be included in weed program submitted. The program shall specify the recommended waiting period between spraying and planting.

20-2.10 Mulch - Mulch shall be Black Mini Bark from Contra Costa Topsoil (925-228-4007), or approved equal. Contractor shall submit a sample of the mulch for approval by Engineer prior to ordering.

20-2.11 Planting Hole Backfill - Backfill to be used in planting holes shall be 100% topsoil as specified in Section 20-2.6 "Topsoil."

20-2.12 Tree Stakes and Ties

Tree stakes - Stakes shall be 3 inches in diameter, straight, closed grained, Lodge Pole Treated Pine or Fir, or construction heart rough sawn redwood, pointed at one end, and chamfered at the top. Pine and Fir stakes shall be pointed prior to treatment with Copper Napthanate. The treatment shall penetrate stake surfaces to a minimum depth of 1/4".

Tree Straps - Straps shall be corded rubber tire straps, or approved equal, 1" wide by 1/4" to 1/2" thick and length as required. Straps shall not contain steel within or have wire tie ends.

Guy Wire - Guy wire shall be No. 12 BWG zinc-coated iron.

Plastic Ribbon Ties - Plastic ribbon ties shall be a minimum of 1 inch wide with a minimum tensile strength of 500 pounds.

20-2.13 (Blank)

20-2.14 Root Barrier - Root barrier shall be panel-type UV inhibited copolymer polyethylene with anti-lift tabs and self-locking joiners. Barriers shall measure 24 inches deep, 0.08 inch thickness, with ½-inch raised 90 degrees molded root-deflecting ribs at 6 inches on center. Barrier material shall have a minimum tensile yield stress of 3,800 psi as tested by

ASTM D638. City may accept UB24-2 Deep Root Universal Barrier, by Deep Root Corporation (714-898-0563), or Root Booster, by Shawtown Industries (805-527-7720), or approved equal.

20-2.15 Decomposed Granite - Where required to be installed by Plans and Specifications, Contractor shall provide California Gold Decomposed Granite Path Fines (Tan/Gold), available through Granite Construction Company (925-600-8311), or Felton Quarry (831-335-3445), or approved equal. Notwithstanding the above, materials shall have a maximum dry density of 130 lbs. per cubic foot, with an optimum moisture of 8.8%, and meet the following requirements:

Gradation	
Sieve Size	Percent Passing
#4	85-100
#8	55-80
#30	30-45
#200	10-20

20-2.16 Substitutions - Substitutions of plant materials shall not be permitted, unless proof is submitted to the Engineer that any plant specified is not obtainable. The Engineer will consider use of the nearest equivalent size or variety. Such proof shall be substantiated and submitted in writing by the Contractor within 14 days after the effective date of Notice to Proceed. The Engineer will make appropriate deductive adjustments to the contract bid items for substitute materials; there will be no additional compensation for approved substitutions.

20-3 GRADING AND SOIL PREPARATION

20-3.1 Rough Grading - Prior to any planting bed preparation or planting, Contractor remove all weed and debris from the ground and Project site. Contractor shall also remove all foreign materials and construction debris, by excavation of the contaminated soil if necessary.

Contractor shall grade all planting areas, fill as needed or remove surplus dirt and float areas to a smooth uniform grade. Slope all planting areas to drain. Roll, scarify, rake and level as necessary to obtain smooth planting surfaces. Rough grades shall be inspected and approved by the Engineer before any amendments and fertilizers are installed. Soil shall have the proper moisture content to be workable. It shall not be so dry that dust will form in the air, or that clods of soil will not break readily. It shall not be wet so as to create excessive compaction. Native soil shall be thoroughly cultivated to a depth of four (4) inches using a rotary hoe. When Imported topsoil is used to fill the planted area, it shall be rototilled into the native subgrade to create a composite zone of at least four (4) inches.

20-3.2 Soil Amendments, Fertilizers and Cultivating - Where imported topsoil is not being used, or where shown to be required by the Plans and Special Provisions, the existing soil shall be amended. Spread soil amendment and fertilizer evenly over all areas, including grass-from-seed areas, at the following rates:

Soil Amendment: 6 cu. yds. per 1,000 sq. ft.
Fertilizer: 30 lbs. per 1,000-sq. ft. of 6-20-20.

Contractor shall request that Engineer observe and approve the application of amendment and fertilizer. After approval of amendment and fertilizer applications by the Engineer, they shall be incorporated into top 6 inches of soil by repeated rotary-hoe cultivation.

20-3.3 Watering - All seeded and planted areas shall be watered to settle the soil. In locations where irrigation is by drip or bubblers, the Contractor may, at Contractor's option and expense, install a temporary irrigation system to keep soil moist. The Contractor shall be responsible for insuring that the temporary irrigation system does not create a safety hazard.

20-3.4 Spraying with Chemical Weed Killer - Where imported topsoil is not being used, or where shown to be required by the Plans and Special Provisions, the planting area shall be sprayed with an approved general chemical weed killer to eliminate all weed growth and roots, including broadleaf and grass seedlings in non-grass areas. Spraying shall occur after the soil has been watered to settle. Chemicals used shall be part of the chemical weed control program prepared by a licensed pest control advisor and approved by the Engineer. Chemical shall not sterilize soil and shall be applied per manufacturer's directions. Alternate weeding methods can be used upon approval of the Engineer.

20-3.5 Finish Grading - When weeding and soil conditioning have been completed and soil has been thoroughly water settled, all planting areas shall be finish graded for placement of plant materials and seeding operation. Grading shall be done when soil is at optimum moisture content for working. Protect all finished areas against compaction by equipment.

Grades not indicated on the Contract Plans shall be uniform levels or slopes between points where elevations are given, or between points established by walks, paving, curbs or catch basins. Finish grades shall be smooth, even, and on a uniform plane with no abrupt change of surface and no erosion scars. Minor adjustments of finish grades shall be made at the direction of the Engineer if required.

Planting areas including seeded areas shall be true to grade within 0.10' when checked in any direction with a 10-foot straightedge. All grades shall provide for natural runoff of water without low spots or pockets. Flow line grades shall be accurately set and shall not be less than two percent (2%) gradient wherever possible unless otherwise shown on the Contract Plans.

Finished grade of earth in planting beds shall be 1 inch below top of adjacent pavement, curbs or headers, unless otherwise indicated on the Contract Plans. Finish grade of earth in grass areas shall be 1/2" below top of adjacent pavement, curbs or headers. Tops and toes of all slopes shall be rounded to produce a gradual and natural-appearing transition between relatively level areas and slopes.

20-4 PLANTING

20-4.1 Staking Locations - After all other construction work in conflict has been completed, Contractor shall mark tree and shrub locations on site using stakes or similar means. The Engineer shall approve locations before plant holes are dug, and adjustments made as required.

20-4.2 Planting Holes - The size of planting holes shall be as shown on the Project Plans or as determined and approved by the Engineer. Planting holes shall be circular in outline with vertical sides. After planting holes are made the sides shall be roughed up to allow root penetration. The bottom 3 inches of soil shall be loosened. A foot tamped mound shall be made in the bottom of pit to support plant at the proper level.

20-4.3 Water Test Selected Plant Holes - The Engineer shall select tree-planting holes to be tested for drainage. Approximately one (1) location per 80-square feet of planting area shall be selected. Contractor Fill holes with water and safely and securely covered and protected for 24 hours. Contractor shall check the holes after the test period to determine if water has drained out. If not, Contractor shall notify the Engineer to determine drainage mitigation measures, including installation of drainage holes and adjustment of the size and locations of planting holes.

20-4.4 Plant Placement - Contractor shall not handle container plants by the tops, stems, or trunks at any time. All plants shall be lifted so that root balls may be supported from the underside. Plants that do not have a satisfactory root system shall be rejected. Contractor shall cut root ball vertically in a few places to encourage new feeder root development along perimeter of the root ball.

All plants shall be planted immediately after the containers are cut. Containers shall be removed promptly from the site. Contractor shall place plants in an upright and plumb position.

Spacing of groundcovers shall be a minimum of 12" on centers or as shown on the Contract Plans, if closer. Plants shall be evenly spaced and staggered in rows. Each plant shall be placed in the planting hole so the root system lies free without doubling and so the roots are planted vertically. The soil around the plant shall be hand tamped firmly around the plant. Plants shall be watered promptly to avoid drying out.

20-4.5 Fertilizing and Backfill - Prior to backfilling, fertilizer tablets shall be placed in the bottom perimeter of the hole as follows:

Plant Size	Number of Tablets
1 Gallon	1
5 Gallon	3
15 Gallon	5
Box Trees	7

The planting hole shall be backfilled with topsoil meeting the requirements of Section 20-2.6, "Topsoil," of these Technical Provisions. Backfill shall be watered so that it settles thoroughly prior to planting, so that the plants do not settle. Backfill shall be tapered around sides and up to top of plant root-ball so that rootball is completely covered.

A three-(3) inch high berm shall be constructed around the outside of the planting hole. The planting hole shall be thoroughly watered to the full depth of the planting hole.

In areas to receive grass the berm shall be removed and seeded after the third thorough watering

20-4.6 Tree Staking - A minimum of two stakes shall be installed for each tree at right angles to the prevailing wind. Nursery stakes shall be removed and discarded legally outside the Project limits. Tree stakes shall be plumb and not penetrate the rootball. For 24-inch box trees, two 30-inch long wood crosspieces shall be nailed between the stakes. Unless shown otherwise on the Contact Plans, a minimum of two ties shall be installed on each tree.

Ties shall be placed as low on the trunk as possible but high enough so the tree will return to upright position after deflection. To find the proper height for tie locations, hold the trunk in one hand, pull the top to one side and release. The height at which the trunk will just return to the upright position when the top is released is the height at which to attach the ties. Ties are to form a loose loop around the tree trunk and stakes so that the trunk cannot work towards the support stakes. Tree ties shall be nailed securely in position. Ties shall be sufficiently loose to allow lateral movements of the tree trunk by at least three (3) inches.

Support stakes are not to exceed 6 inches above the top tie location. A flexible auxiliary stake shall be attached to those trees needing extra trunk support as determined by the Engineer.

One tree of each size shall be staked as a field mock-up and approved by the Engineer prior to continued staking.

20-4.7 Root Barrier - Where shown on the Plans, root barriers shall be installed at tree locations according to manufacturer's instructions. The top of root barriers shall be installed flushed with the finished native grade, or two (2) inches below the finished grade of areas receiving mulch or decomposed granite.

20-4.8 Pre-emergent Herbicide Application - Pre-emergent herbicide shall be applied to all areas to receive mulch. Chemicals used are to be in a written chemical weed control program prepared by a licensed pest control advisor and approved by the Engineer.

Pre-emergent shall be applied before mulching during a windless period. Areas to receive seed shall be protected from contamination by pre-emergent. Any area to receive seed that is contaminated with pre-emergent shall have the soil stripped to a 6 inch depth and replaced with imported topsoil to the satisfaction of the Engineer and at the Contractor's expense.

20-4.9 Mulching - Install a 3" layer of specified mulch in all planted areas not planted with grass or hydro-seed. Mulch shall be kept away from stems and trunks of plants by four (4) inches at groundcover locations, and by eight (8) inches for all other plant locations.

20-4.10 Adjustment of Plants - After plants have fully settled, the natural grade in the container shall be two (2) inches above the finished grade of the adjacent planting bed. Plants that settle deeper than specified shall be raised to the correct level. Plants that go out of plumb shall be straightened and re-staked.

Contractor shall not prune plants unless specifically directed by Engineer.

20-5 GRASS SEEDING - Installed plants and trees shall be approved by the Engineer before seeding operations begin. Just prior to seeding, areas to be seeded shall be loosened by harrow or rototiller to a depth of 2 inches, raked to remove rocks 3/4 inch or larger in size along with sticks and debris, floated level, rolled and floated again. Seed shall not be sown during windy periods.

Seed shall be sown evenly using a mechanical spreader. Seed mixture shall be spread at the rate of 10 pounds per 1,000 square feet of area. One half of the seed shall be sown in one direction, and the remaining seed sown in a direction 90 degrees to the first.

Existing undisturbed lawn adjacent to new areas being seeded shall be over seeded to provide even grass coverage. Upon completion of sowing fertilizer, (16-6-8) at the rate of 6 lbs./1,000 sq. ft. shall be uniformly spread over seeded areas.

After fertilizing, the surface shall be lightly raked to cover seed and mix with fertilizer. After covering, the seeded areas shall be compacted with a 200-lb. roller. Soil shall be irrigated immediately and kept moist but not saturated until the seed has fully germinated.

Unless approved otherwise by the Engineer, seeded areas shall be protected with temporary fencing. Fencing shall not interfere with pedestrian or vehicular traffic. Prior to installation the Contractor shall obtain approval of the Engineer for fence type and locations. Fencing shall be maintained by the Contractor and kept in an orderly condition at all times until the Engineer approves its removal. Any damage to turf shall be repaired promptly at the Contractor's expense.

20-6 CLEAN UP - Clean up shall conform to the provisions of Section 5-18, "Final Clean Up," of the General Provisions of the City Standard Specifications and as specified herein.

The Contractor shall at all times keep the premises free from accumulations of waste material or rubbish caused by Contractor's work. At the completion of the work the Contractor shall remove all rubbish, tools, scaffolding, and surplus materials from the site and neatly dress and finish all planting areas. Streets and walks open to public traffic shall be broom cleaned at the end of the work day and all plant materials within the construction area rinsed as often as necessary to keep the foliage free of dust.

20-7 PRE-FINAL INSPECTION - Prior to the a final inspection, as provided for in Section 5-15, "Inspection," of the General Provisions of the City Standard Specifications, the Contractor shall request an inspection of the completed planting work. At the time of the pre-final inspection:

- 1) All planting shall be healthy and free of infestations.
- 2) All planting areas shall be free of weeds.
- 3) Grass areas shall show a uniform, smooth ground surface without eroded ruts or gullies, and evidence of uniform seed germination.
- 4) Grass shall be mowed to 2" above finish grade.
- 5) Stakes and ties shall be as specified.
- 6) Mulch shall be raked to uniform surface. Areas not mulched shall be raked to uniform surface.
- 7) All debris shall be removed from site, all pavements swept clean and foliage be washed clean.
- 8) All plants shall have been installed per the Contract Documents.

Any deficiencies identified by the preliminary final inspection shall be corrected to the satisfaction of the Engineer before the final inspection for the project is scheduled.

20-8 MAINTENANCE

20-8.1 General - The Contractor shall be responsible for maintenance of the completed Landscaping for a minimum period of 30 days or as specified in the Special Provisions, if longer. The first day of the contract maintenance period shall begin the day following the Engineer's issuance of a written determination that all Contract Work related to landscape and irrigation (except for maintenance) has been satisfactorily completed.

Maintenance shall include, but is not limited to:

- 1) Watering (except cost of water)
- 2) Adjusting Automatic Irrigation Timers
- 3) Adjusting Sprinkler Heads
- 4) Adjusting Emitters
- 5) Mowing
- 6) Edging
- 7) Replacing Annual Plants
- 8) Weeding
- 9) Fertilizing
- 10) Cultivating
- 11) Spraying/Pest Control

- 12) Pruning
- 13) Litter Removal
- 14) Sweeping and/or Blowing
- 15) Disposal of all Debris from Maintenance Activities

Maintenance shall include all other work and materials, not specifically listed above, required to keep all plants, trees, shrubs and turf in a healthy growing condition, and to keep the planted areas neat and attractive in appearance throughout the maintenance period.

Plants installed under this contract shall be properly maintained by regular watering, cultivating, weeding, re-mulching, repair of stakes, pruning, and treatment of insects and pests.

Until completion of the required maintenance period the Contractor shall provide maintenance of grass areas installed under this contract by watering, weeding, seeding, mowing (includes trimming and edging), rolling and by performing any other necessary operations of maintenance including treatment for fungus diseases, insects, pests of rodents. Re-seed all bare spots at intervals of 10 days until a full stand of grass is established over the entire grass area in scope of work.

Whenever the grass reaches a height of 3 inches, but in no event less than weekly, it shall be mowed to a height of 2 inches above the ground surface. All clippings shall be removed. After second mowing of grass, a second application of fertilizer shall be made. The fertilizer (16-6-8) shall be applied at the rate of 6-lbs./1,000-sq. ft. uniformly over turf area. A third application of fertilizer shall be made, at the same rate, 2 weeks prior to completion of the specified maintenance period.

Maintenance shall also include treatment for fungus, diseases, rodents, and insects, the requirements for approval of treatment program shall be the same as for herbicide

20-8.2 Watering - Except during periods of extended inclement weather, all plants shall be watered not less than twice a week. Each watering shall be of such quantity as to provide optimum growth conditions. When an irrigation system is not part of Contract Work, Contractor shall provide the equipment and means for the proper application of water, and shall bear the cost of water.

Water will be furnished by the City when an irrigation system is available under Contract. Contractor shall make judicious use of water so that only amounts necessary for maintenance of plants are used. Contractor shall not waste water. If the Engineer determines that Contractor is not making all reasonable efforts to curb abuse and waste of water furnished by City, the Engineer may deduct \$100 per incident of such abuse or waste from Contract Payments due to Contractor.

20-8.3 Plant Replacement - Plants that are vandalized, damaged by herbicide, diseased, dead, or in an unhealthy condition, shall be replaced by the Contractor at Contractor's expense within two weeks after notification from the Engineer. Any plant exhibiting weakness and the probability of dying, shall be replaced promptly by the Contractor at Contractor's expense.

Replacements of plants or grass shall be made in the same manner as specified for the original planting. Heaved, settled, or eroded areas shall be restored by excavating, filling, finish grading, and rolling as required.

Work under this Section shall include complete responsibility for maintaining adequate protection for all areas. Any damaged areas shall be repaired at the Contractor's expense. At the end of the maintenance period, all plant material shall be in a healthy growing condition, weed free, and free of physical injury of any kind.

20-8.4 Mowing - Grass shall be mowed each time it reaches 3" in height and with blades set to 2" above grade. Grass shall be trimmed at the edges of curbs, paving, drains and headers. Grass areas that fail to germinate shall be re-seeded at maximum 10-day intervals until a vigorous, even stand of grass is established. Seeding operation shall follow these specifications for initial installation. Grass areas shall be kept free of weeds by hand pulling, or by spraying with the approved selective chemical herbicide before weeds exceed 2" in height. Clippings and debris shall be removed from the site.

20-8.5 Weeding - During the maintenance period the Contractor shall weed all areas at intervals of not more than ten (10) calendar days, or at such interval as may be approved in writing by the Engineer. Rocks, clods, and debris, which appear on the surface, shall be removed at the time of weeding.

20-8.6 Final Maintenance Inspection - A Final inspection will be conducted at the end of the required maintenance period. Notice requesting final inspection shall be submitted by the Contractor to the Engineer at least fourteen (14) calendar days prior to the end of the maintenance period.

The irrigation system shall also be tested and inspected at this time in accordance with Section 19-6, "Final Maintenance Inspection," of these Technical Provisions.

Prior to the final inspection, the Contractor shall also have performed weeding, repair or touch-up of paving, equipment, and structures, and the thorough cleaning of the site.

Just prior to final maintenance inspection, 16-6-8 granular form commercial fertilizer shall be applied as follows:

Plant Size	Quantity
Ground Cover	10lbs/1000sf
Specimen Plant	1 pint
1 gal	¼ cup
5 gal	½ cup
15 gal	1 cup
Box Tree	2 cups

Mulch shall be raked away from around plant bases. Fertilizer shall be spread around plant base and worked into the top 2 inches of soil. Mulch shall then be replaced.

The Contractor shall make any required replacements within one week after final inspection

If the Contractor is not, in the opinion of the Engineer, properly maintaining the landscaping and irrigation system the City may have any required work performed and deducted any such costs thereof, plus 20 percent markup for administration, from monies due or to become due to the Contractor.

20-8.7 Acceptance - Acceptance of the project by City will be contingent upon proper maintenance and the establishment of vigorous plant materials. Any portion thereof which does not show vigorous growth is subject to continued maintenance at the Contractor's expense. If project improvements, corrective work, and maintenance have not been performed as specified, and to the satisfaction of the City, maintenance shall continue at the Contractor's expense until the work has been successfully completed and accepted by the City.

Upon written acceptance of the landscaping by the Engineer the Contractor will be relieved from any further maintenance.

20-9 GUARANTEE - All trees, and other plant materials shall be guaranteed to take root and grow, and thrive for a period of one year after final acceptance of work or thirty (30) calendar days following acceptance of the landscaping by the City at the conclusion of the required maintenance period, which ever is later.

Any trees or other plant materials that die back, lose their shape or size as originally specified shall be replaced, even though they have taken root and are growing.

Within 15 calendar days of written notification by the Engineer, the Contractor shall, at Contractor's own expense remove and replace all guaranteed plant materials which, for any reason, fail to meet requirements of the guarantee. Replacements shall be made to same specifications as required for original materials and shall carry the same guarantee starting from the time they are replaced.

20-10 MEASUREMENT - Landscaping shall be measured as a lump sum or by contract units as provided for in the "Bid Proposal". Maintenance shall be measured as a lump sum item. There shall be no separate measurement for required guarantees.

20-11 PAYMENT

20-11.1 General - The provisions of Section 9, "Measurement and Payments," of the General Provisions of the City Standard Specifications, are hereby modified as necessary to comply with these provisions.

20-11.2 Guarantee - There shall be no separate payment for guarantees required or provided under the Contract. Full compensation for furnishing and compliance to guarantee requirements shall be considered as included in various contract items of work and no separate compensation shall be allowed therefor.

20-11.3 Maintenance - The contract price for maintenance will be paid in monthly payments, in arrears, on a pro-rata basis. The pro-rata basis shall be the total contract price for maintenance divided by the number of months covered by the maintenance period. The Contractor shall submit monthly invoices to the City. Payments will be paid within 30 days after receipt of the invoice subject to successful completion of monthly period being invoiced.

The compensation for Maintenance shall also include full compensation for maintenance of the irrigation system.

20-11.4 Landscaping - The Contract lump sum price, or unit prices, shall be considered as full compensation for furnishing all labor, materials, tools, equipment, incidentals and for doing all landscaping work including but not necessarily limited to; grading, soil preparation, fertilizing, staking, watering, as provided for in the Contract Documents, and no additional compensation shall be allowed therefor.