

SECTION 16 LANDSCAPING

16.01 DESCRIPTION

This work shall consist of furnishing all labor, materials, plant materials, tools and equipment required to grade, prepare soil, fertilize, plant, seed and otherwise complete the landscaping as shown on the approved plans, per these specifications and the Standard Details and the City Water Efficiency Landscape Ordinance (WELO).

16.02 PRESERVATION OF PROPERTY

The planting 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 its operations and shall repair or replace such damage at his own expense. Vehicles of any kind shall not be allowed to pass over curbs, sidewalks, planting areas, etc., unless proper protection is provided and in place.

16.03 PERSONNEL

Planting and seeding operations shall be performed by personnel trained in proper planting procedures and under the supervision of a licensed contractor and certified landscape technician.

16.04 WEATHER

No planting shall occur during weather conditions which will adversely affect materials or when soil is in a muddy condition.

16.05 MATERIALS

- A. IMPORTED TOPSOIL - Topsoil shall be an imported fertile, friable soil of loamy character containing a normal amount of organic matter. It shall be obtained from well-drained arable land and shall be free from refuse, roots, heavy or stiff clay and stones larger than one (1) inch in size. Soil shall meet ASTM soil standards D5268.
- B. SOIL AMENDMENT - Soil amendment shall be completed per the soil test requirements, Supply sample to the City Engineer within two (2) weeks of aware of Contract with a certified laboratory organic amendment analysis.
- C. FERTILIZER - Fertilizer shall be used on site per soil testing and nursery recommendations. Fertilizer shall be a commercial inorganic fertilizer in granular or pelleted 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, and shall be uniform in composition, dry and free flowing.

1. Turf Areas and Planting Areas.
 2. Pelleted types with analysis of 16-6-8 (sixteen (16) percent Nitrogen, six (6) percent Phosphorus, and eight (8) percent Potassium).
 3. Planting Holes.
 4. Agriform Blue -Chip Tablets, twenty-one (21) gram size, or approved equal, with an analysis of 20-10-5 (twenty (20) percent Nitrogen, ten (10) percent Phosphorus, and five (5) percent Potassium).
 5. Microhoizea packets may be considered as an alternative, similar to Earthworks 3-3-3, as dictated by Landscape Architect or soil report.
 6. If commercial fertilizer having these analyses is not available, another commercial fertilizer may be used upon approval of the City Engineer.
- D. HERBICIDE/PESTICIDE - Submit a written chemical weed control program prepared by a licensed pest control advisor for approval by the City Engineer. Additional pesticides used onsite to be prepared by a licensed pest control advisor for approval by the City Engineer.
- E. SEED - Seed mixture shall be ninety-eight (98) percent pure and noxious weed free, with a minimum of eighty-eight (88) percent germination. Seed variety or mix shall be as specified on the plans or in the special provisions. 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 or composition of mixture and percentages of purity and germination of each variety is attached to the sealed container. The seed shall be pre-treated with a fungus preventative in accordance with manufacturer's specifications. The seed containers shall be stored immediately in a dry, weather- and damp-proof structure. Any seed, which has become wet, moldy or is otherwise damaged in transit or storage will not be acceptable. Supplier and Seed submittal shall be approved by the City Engineer prior to delivery.
- F. HYDROMULCH SEED
1. Seed - as specified on the plans or in the special provisions or otherwise as approved by the City Engineer.
 2. Fertilizer - use 16-6-8 (sixteen (16) percent Nitrogen, six (6) percent Phosphorus, and eight (8) percent Potassium), forty-five (45) lbs. per acre.
 3. Cellulose: The mulch shall be a green colored, fibrous, wood cellulose mulch containing no growth or germination inhibiting factors. It shall be manufactured in such a manner that after 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, the material will form a blotter-like ground cover impregnated uniformly with seed and mulch after application, will allow the absorption of moisture and allow the rainfall to percolate to the underlying soil.

Cellulose shall be certified to indicate that laboratory and field-testing of the product has been accomplished and that it meets all of the foregoing requirements. Weight specification of this material from suppliers and for all applications shall refer only to air-dry weight of the fiber material. Each package of the cellulose fiber shall be marked by the manufacturer to show the air-dry weight content, one-thousand-eight hundred (1,800) lbs. per acre.

4. Water: Water for hydromulching shall be clean, potable and added to the slurry mixture in sufficient amount to spread uniformly the required quantity of hydromulch solids (approximately three thousand (3,000) gallons per acre). Usage of water from any fire hydrant within the City shall conform to the City's Fire Hydrant Permit Program and shall be subject to a Fire Hydrant Permit. See City Standard Construction Specifications Section 15.05 "Process Water" for additional information on obtaining City water for construction.
 5. Equipment: Hydromulching equipment used for the application of seed, fertilizer and slurry of prepared wood pulp shall be of the type as approved by the City Engineer. This equipment shall have a built-in agitation system and operating capacity sufficient to agitate, suspend and homogeneously mix a slurry containing up to forty (40) pounds of fiber plus combined total of 70 pounds fertilizer solids and seed for each one hundred (100) gallons of water. The slurry distribution lines shall be large enough to prevent stoppage. This discharge line shall be equipped with a set of hydraulic spray nozzles which will provide a continuous nonfluctuating discharge and delivery of the slurry in the prescribed quantities uniformly, without misses, waste, or erosion. The slurry tank shall have a minimum capacity of one thousand (1,000) gallons and shall be mounted on a traveling unit which may be either self-propelled or drawn. The City Engineer may authorize equipment with smaller tank capacity provided that the equipment has the necessary agitation system and sufficient pump capacity to spray the slurry in a uniform coat.
- G. PLANT STOCK AND GROUND COVER - Plants shall be the variety, quantity and size indicated on the approved plans. When total quantities are tabulated, they shall be considered approximate and are furnished for convenience only. Quality and size shall conform to the State or California Grading Code of Nursery Stock, No. 1 grade. Nursery-grown stock only shall be used 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 City 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, approval of plant species or variety will be made by the City Engineer and his/her approval shall be final.

Plants shall be healthy, shapely, and well-rooted, and roots shall show no evidence of having been root bound, restricted, or deformed. Root condition of plants in containers will be inspected by the City Engineer and determined by removal of earth from the roots of not less than two plants of each species or variety from each source. In case the sample plants inspected are found to be defective, the City Engineer reserves the right to reject the entire lot or lots of plants represented by the defective samples. All plants rendered unsuitable for planting because of this inspection shall be immediately removed from the site.

Each plant shall be handled and packed in the approved manner for that species or variety, and all necessary precautions shall be taken to ensure that the plants will arrive at the site of work in the proper condition for successful growth without scarred or broken branches. Trucks used for transporting plants shall be equipped with covers to protect plants from windburn.

Substitutions will not be permitted, unless proof is submitted to the Landscape Architect and City Engineer that any plant specified is not obtainable. The City will consider use of the nearest equivalent size or variety. Such proof shall be substantiated and submitted in writing by the Contractor within thirty (30) days after the effective date of the Notice to Proceed.

Plants with a central leader shall have straight trunks with the leader intact, undamaged, and uncut. Trees shall be well tapered in the trunk so that they will stand alone without the support of the nursery stake. Branching on the main leader shall be in alternate locations and well-spaced apart with no severe crossing of branches. All old abrasions and cuts shall be completely calloused over. All plants shall be measured when their branches are in their normal position. Height and spread dimensions indicated refer to the main body of the plant and not from branch or root tip to tip. Indicated sizes shown are before pruning. Plants shall not be pruned prior to delivery except upon approval of the Landscape Architect and City Engineer.

Ground cover shall be rooted plants, grown in flats unless otherwise approved by the Landscape Architect and City Engineer.

- H. MULCH - Mulch shall be a fibrous, woody bark mixture called "Recycled Mocha Mulch" as distributed by Greenwaste Florin Perkins Landscape Materials, Sacramento, CA, (916) 303-9900, or an approved equal.
- I. BACKFILL - Backfill to be used in tree and shrub holes shall be a mixture of soil amendment and excavated material (a thorough mix of fifty (50) percent soil amendment and fifty (50) percent excavated materials). Backfill shall also include granular fertilizer thoroughly mixed with soil amendment and excavated materials at a rate specified in Section 16.06.A.
- J. TREE STAKES AND TIES - Tree stakes shall be straight, close grained, hardwood pointed at one end. Stakes shall be pointed prior to treatment with Copper Naphthenate, which shall penetrate stake surfaces to a minimum depth of one quarter (1/4) inch.

Tree stakes will consist of two (2) inch diameter round stakes to height required by Standard Detail #701.

Tree ties shall be flexible belt rubber hose tree ties or approved equal.

Metal tree stakes are to be used when specified by the plans and approved by the City Engineer. Metal stakes are generally used to bolt down metal tree grates.

- K. EARTH ANCHORS FOR SPECIMEN TREES shall be equal to the Duckbill as specified by Site One Landscaping Supply, Sacramento, CA, 95819, (916) 452-8041. The size of the trees to be supported shall determine the necessary holding capacity of the anchors used. Anchor holding capacity to be approved by the City Engineer.
- L. ROOT BARRIER - The root barrier shall be deep root control panel style or equal as shown on the Standard Detail. The root barrier shall be ten (10) feet in length minimum and centered on the tree.

16.06 PLANTING

- A. SOIL PREPARATION AND FINE GRADING - Prior to any planting bed preparation or planting, finish grade all planting areas, fill as needed or remove surplus dirt and float areas to a smooth uniform grade as indicated on Grading Plans. Slope all planting areas to drain. Roll, scarify, rake and level as necessary to obtain true, even planting surfaces. Landscape irrigation installation and finish grades shall be approved by the City Engineer before any planting is done. All planting areas shall be thoroughly wet down and sprinkler or emitter coverage, and operation confirmed. Allow soil to dry to make it workable after which thoroughly cultivate to a depth of twelve (12) inches and allow to dry out. Spread soil amendment and fertilizer evenly over all areas at the following rates:
 - 1. Soil Amendment - Six (6) cubic yards per one thousand (1,000) square feet.
 - 2. Fertilizer - Five (5) pounds per one thousand (1,000) square feet of 16-6-8 or approved equal.

After approval of amendment and fertilizer applications by the City Engineer, incorporate into top twelve (12) inches of soil by repeated rotary-hoe cultivation.

When rough grading and soil conditioning have been completed, all planting areas shall be smooth graded, ready for placement of plant materials and for seeding. Grading shall be done when soil is at optimum moisture content for working.

Finished grades shown on plans are given in feet and decimals of feet. Slope uniformly between given spot elevations. Planting areas, including lawns, shall be true to grade within one (1) inch when tested in any direction with a ten (10) foot straightedge.

Grades not otherwise indicated 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 and even on a uniform plane with no

abrupt change of surface. Minor adjustments of finished grades shall be made at the direction of the City Engineer if required.

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 (2) percent gradient wherever possible unless otherwise indicated.

Finished grade of all shrubs, annuals, and ground cover areas shall be three (3) inches below top of adjacent pavement, headers, curbs, or walls unless otherwise indicated on the drawings. Finished grade of lawn areas shall be one half ($\frac{1}{2}$) inch 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.

- B. TREE, SHRUB, AND GROUND COVER PLANTING - Mark tree and shrub locations on site using stakes or similar means. Locations shall be approved by the City Engineer before plant holes are dug, and adjustments are made as required.

Dig pits circular in outline with dimensions as shown on the Standard Details.

Do not handle container plants by the tops, stems, or trunks at any time. Lift all plants so that root ball is supported from the underside. Plants that do not have a satisfactory root system will be rejected.

If plants do not have young feeder roots showing at the edge of the container, loosen their roots and cut the root ball in a few places to encourage new feeder root development along the perimeter or the root ball.

Place plants in holes in upright position and place fertilizer tablets (if required by the City Engineer). Backfill until the hole is one-half ($\frac{1}{2}$) full, thoroughly water and complete the backfill. Place a three (3) inch high berm outside the excavated area and fill the watering basin with water. The crown on the plant after settlement shall be one (1) inch above finished grade for shrubs and two (2) inches above finished grade for trees. No basins are required if plants are in a lawn area or are watered by a drip emitter system.

After any pruning, place stakes where required alongside root ball and two (2) feet into undisturbed ground and tie to trees as shown on the Standard Detail. Mulch the inside of each basin with a three (3) inch layer of bark mulch.

Specimen trees shall be guyed a minimum three directions. When trees are planted in parks or areas subject to pedestrian traffic, install twenty-four (24) inches x one half ($\frac{1}{2}$) inch white PVC pipe on each guy wire for visibility, as directed by the City Engineer.

All plants shall be planted immediately after the containers are cut and containers shall be removed from the site to prevent a hazard to persons accessing the area.

Apply fertilizer (16-6-8) at a rate of five (5) lbs. per one thousand (1,000) square feet uniformly over area to receive ground cover.

Ground covers shall be installed at spacings indicated on the drawings and shall be evenly spaced and staggered in rows. Place each plant in a pit so the root system lies free without doubling and so the roots are planted vertically. Firmly hand compact the soil around each plant and sprinkle the area immediately to avoid drying out.

C. PRE-EMERGENT HERBICIDE SHALL BE APPLIED to all shrub and ground cover areas including plant basins after grading and planting. Chemicals used are as submitted in the written chemical weed control program prepared by a licensed pest control advisor and approved by the City Engineer. Apply prior to any mulching.

D. HYDROMULCH SEEDING

1. Preparation: The slurry preparation shall take place on the site. The slurry preparation 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 recirculation shall be established; and at this time, the seed shall be added. Fertilizer shall then be added, followed by wood pulp. The wood pulp shall only be added to the mixture after the seed and when the tank is at least one-third filled with water.

The engine throttle shall be opened to full speed when the tank is one-half (1/2) filled with water. All the wood pulp shall be added by the time the tank is two-thirds (2/3) to three-fourths (3/4) full. Spraying shall commence immediately when the tank is full.

Note that water obtained from any fire hydrant within the City shall comply with the City's Fire Hydrant Permit Program and shall be subject to a City Fire Hydrant Permit.

2. Application: All areas to receive hydromulch shall be sprayed with a uniform, visible coat by using the green color of 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 one thousand, eight hundred (1,800) pounds wood fiber per acre plus seed and fertilizer. Hydromulch shall not be allowed to fall on the ground cover and shrub areas.

3. Time Limit: Any slurry mixture which has not been applied to the slopes within four (4) hours after mixing will be rejected by the City Engineer and shall be removed from the project at the Contractor's expense.

E. SEEDING - Installation of plants shall have been completed before seeding operations are begun. Just prior to sowing, areas to be seeded shall be made sufficiently loose and friable to receive the seed.

Seed shall be sown evenly using a mechanical spreader at the rate specified on the plans or in the special provisions. One-half (1/2) the seed shall be sowed in one (1)

direction, and the remaining one-half (1/2) sowed in a direction ninety (90) degrees to the first during a windless period. Apply fertilizer (16-6-8) at a rate of one (1) lb. per one thousand (1,000) square feet uniformly over seeded areas.

Lightly rake the surface to cover the seed and to mix with fertilizer and then compact with a two hundred (200) lb. roller. Soil shall be kept moist but not saturated until the seed is germinated.

Protect grass areas with temporary fencing as necessary. Barriers shall be maintained by the contractor and kept in orderly condition at all times until work has been accepted by the City Engineer. Any damage to turf shall be repaired by Contractor at his own expense.

If for some reason the maintenance period does not start immediately, refer to Section 16.08, "Maintenance," herein, for care and maintenance of seeded areas.

- F. SOD PLANTING - Care should be given to prevent heel or footprints in the grade as the sod is planted. Sod shall be installed per the planting plan. Unroll the sod fitting each strip tightly to the preceding strip. Do not stretch the sod. Force each strip together as tightly as possible. Stagger the strips of sod as a brick layer places bricks to prevent the seams from matching.

As soon as sod is placed, roll it with a light roller, making certain that no air space is left under the sod. After the first rolling moisten the sod lightly and then allow the grass to dry off before the second rolling. The second rolling should be at a cross angle from the first rolling.

Upon completion of the rolling, apply sufficient water to wet the sod and soil to a depth of six (6) inches. Sod shall be kept moist for the next ten (10) days. At the end of the ten-day period, mow to a height recommended by the City Engineer or Parks Superintendent. Care shall be taken to leave no footprints in the sod.

16.07 CLEANING UP

The Contractor shall at all times keep the premises from accumulations of waste material or rubbish caused by their employees, or the employees of the subcontractors and at the completion of the work the Contractor shall remove all rubbish from and about the site and all of their tools and the subcontractor's tools, scaffolding, and surplus materials.

16.08 MAINTENANCE PERIOD

- A. PRELIMINARY INSPECTION - Upon completion of all construction and planting work, the Contractor shall notify the City Engineer in writing that the landscaping is ready for preliminary inspection. The approval of the completed work will establish the beginning of the maintenance period. No partial approvals will be given.

- B. MAINTENANCE - The maintenance period shall be one-hundred-eighty (180) calendar days beginning after the completion of construction, planting of trees, bushes, ground cover, turf installation, and all items on pre-maintenance punch list. A longer period may be required if necessary to establish acceptable stands of thriving plants.

Maintenance shall include, but is not limited to all watering, weeding, mowing, fertilizing, cultivation, spraying and pruning necessary to keep the plant material in a healthy growing condition and to keep the planted areas neat and attractive in appearance throughout the maintenance period. All plants shall be watered not less than twice a week. Each watering shall be of such quantity as to provide optimum growth conditions. The Contractor shall provide the equipment and means for its proper application. During the maintenance period, should the appearance of any plant indicate weakness and the probability of dying, in the opinion of the City Engineer, that plant(s) shall be replaced immediately by the Contractor at his expense. Replacements shall be made in the same manner as specified for the original planting. At the end of the maintenance period all plant material shall be in a healthy growing condition and free of physical injury of any kind.

Work under this Section shall include complete responsibility for maintaining adequate protection for all areas. Any damaged areas shall be repaired at no additional expense to the City.

Turf areas shall be mowed as specified herein. Clippings and debris shall be removed from the site. Turf areas shall be trimmed at the edges of curbs, paving, drains, and headers. Turf areas, which fail to germinate, shall be re-seeded at maximum ten (10) day intervals until a vigorous, even stand of turf is established. Turf areas shall be kept free of weeds by hand pulling, or they may be sprayed with the approved selective chemical herbicide before they exceed two (2) inches in height. Turf areas shall be mowed for the first time after the establishment of a vigorous uniform stand of turf has reached a height of three (3) inches. Turf areas shall be mowed a second time when it again reaches a three (3) inches height, except that the second cutting shall be performed no sooner than ten (10) days after the first. Mowing shall take place thereafter at maximum one-week intervals until final acceptance.

Refer to Landscape Architect, vendor, and soils report for site specific needs for turf maintenance regarding establishment and fertilizer needs.

After the second mowing of Turf, apply second application of fertilizer. Apply fertilizer (16-6-8) at a rate of five (5) lbs. per one thousand (1,000) square feet uniformly over turf area. Apply again at the same rate just prior to final inspection.

Plants installed shall be properly maintained by regular watering, cultivating, weeding, re-mulching, repair of stakes, pruning, and treatment of insects and pests. During the maintenance period, any plants which are vandalized, diseased, dead, or in an unhealthy condition shall be replaced by the Contractor at his expense within two

weeks after notification from the City Engineer. Any turf or plants damaged by herbicide shall be replaced by the Contractor at his expense. Maintenance shall also include treatment for fungus, diseases, rodents, and insects, the requirements for approval being the same for herbicide.

Weed all areas at intervals of not more than ten (10) days.

Rocks, clods, and debris which appear on the surface shall be removed. Heaved, settled, or eroded areas shall be restored by excavating, filling, finish grading, rolling, and re-seeding as required.

Maintenance includes all items constructed under the contract. All items shall be maintained in an optimum working condition. The site shall be kept free of debris, including emptying of trash containers, by means of a general clean-up twice a week.

Prior to the start of the maintenance period for the work performed under the contract, the Contractor will be required to furnish the City of West Sacramento with a maintenance bond to cover the remaining work to be performed under the contract. The bond shall be in an approved form executed by a corporate surety licensed by the State of California. The bond shall remain in force for the duration of the maintenance period as specified herein. The premium, for said bond, shall be paid for by the Contractor.

16.09 FINAL INSPECTION AND ACCEPTANCE

Final inspection will be conducted at the end of the maintenance period. Notice requesting final inspection shall be submitted in writing by the Contractor to the City Engineer at least seven (7) days prior to the anticipated date.

Acceptance of the work by the City will be contingent upon proper maintenance and the establishment of a vigorous, uniform stand of turf over all areas seeded. Any portion thereof which does not show a vigorous, uniform stand shall make all lawn areas subject to continued maintenance at the Contractor's expense.

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 inspection, 16-6-8 granular form commercial fertilizer shall be applied as follows:

15 gal. container Plants	1 cup
5 gal. container Plants	1/2 cup
1 gal. container Plants	1/4 cup
Ground Cover	10 lbs./1000 square feet
Lawn & Sod Areas	5 lbs./1000 square feet

Fertilizer shall be spread around plant base and thoroughly watered.

At the final inspection, the City Engineer will determine the condition of improvements, planting, and lawn. Plants which are missing, vandalized, dead, or unhealthy shall be replaced by the Contractor at his expense with the same species and sizes originally specified. The Contractor shall make replacements within two (2) weeks after final inspection and maintain plants for an additional thirty (30) days.

If project improvements, corrective work, and maintenance have not been performed as specified and to the satisfaction of the City Engineer, maintenance shall continue at the Contractors expense until such time as work has been successfully completed. Should work have been performed as specified and to the City Engineer's satisfaction, the City will assume maintenance responsibilities following the final inspection.

16.10 GUARANTEE

All trees, shrubs, ground covers, 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.

Any trees or other plant materials that die back and lose the form and size originally specified shall be replaced, even though they have taken root and are growing after the die-back.

Within fifteen (15) days upon written notification by the City, remove and replace all guaranteed plant materials, which, for any reason, fail to meet the requirements of guarantee. Replacements shall be made to the same specifications as required for original materials and shall carry the same guarantee from the time they are replaced.

16.11 MEASUREMENT AND PAYMENT

The landscaping shall be measured, and payment made at the contract lump sum or unit price of various items of landscaping work and shall include full compensation for furnishing all labor, materials, tools, equipment, incidentals and for doing all work in landscaping and planting.