DOWNTOWN STREETSCAPE STANDARD DETAILS AND SPECIFICATIONS

City of Sunnyvale Public Works Department

REVISION DATE: February 8 , 2007

Section 215 - Downtown Street Features and Furnishings

215-1 SIDEWALK PAVING

Sidewalk paving shall consist of concrete pavement and concrete unit paver bands mortared in place. These components shall conform to the following specification:

Concrete pavement to conform to the requirements of Section 201-1, Portland Cement Concrete.

Concrete unit pavers to conform to the requirements of Section 202-3, Interlocking Pavers, as manufactured by Pacific Interlock Pavingstone, 1193 B. So. De Anza Blvd., San Jose, CA 95129, (408) 257-3645, or approved equal. Style: Holland. Color: Charcoal. Dimension: 8.00x4.00x2-3/8".

Mortar Materials: Portland Cement conform to ASTM C150, Type 1. Hydrated lime conforming to ASTM C207. Aggregates conforming to ASTM C144. Proportions shall be one part cement to three or four parts sand with sufficient water added to make a workable mix.

Sand for Paver Joints to be cleaned washed sand with 100% passing a No. 4 sieve size and a maximum of 3% passing a No. 200 sieve size. This is commonly known as "plaster sand."

215-2 CROSSWALK PAVING

Crosswalk paving shall consist of concrete pavement bands and concrete unit pavers laid on a concrete base course over aggregate base. These components shall conform to the following specification:

Concrete pavement to conform to the requirements of Section 201–1, Portland Cement Concrete.

Concrete unit pavers to conform to the requirements of Section 202-3, Interlocking Pavers, as manufactured by Pacific Interlock Pavingstone, 1193 B. So. De Anza Blvd., San Jose, CA 95129, (408) 257-3645, or approved equal. Style: Holland. Color: B-4 Tan/ Red/ Charcoal. Dimension: 8.00x4.00x3-1/8".

Concrete Base Course to conform to the requirements of Section 201–1, Portland Cement Concrete.

Mortar Materials: Portland Cement conform to ASTM C150, Type 1. Hydrated lime conforming to ASTM C207. Aggregates conforming to ASTM C144. Proportions shall be one part cement to three or four parts sand with sufficient water added to make a workable mix.

Crushed Aggregate Base: Shall conform to the State of California Department of Transportation Class 2 Aggregate Base.

215-3 STREET TREE PLANTING

215-3.1 Structural Soil

CU Structural Soil™ mix shall be as manufactured by TMT Enterprises of San Jose, CA or other manufacturers/suppliers licensed by AMEREQ INC./CU-Soil™ Division who holds the patent for Cornell University Structural Soil. These components shall conform to the following specification:

Crushed granite stone: 3/4" to 1- 1/2" crushed granite quarry rock of angular, sharp texture. AASHTO #4. Stone shall be clean, sharp and free of other stone other than granite. Stone shall be angular in shape with a maximum average length, width and depth ratio of 2:1:1. Stones with visible fracture lines will be rejected. Stones shall have a pH between 6.0 and 7.0, and soluble salt levels less than 300 ppm.

Clay loam soil: to conform to Section 212-1.1.2, Class "A" Topsoil, with the following revised requirements:

1) **Gradation Limits**. Coarse Sand: 0 to 5 percent, Medium Sand: 10 to 40 percent; Fine Sand 0 to 20 percent. Clay 25 to 40 percent and Silt 20 to 35 percent. USDA soil classification system.
2) **Chemistry Limits**: pH between 6.0 and 7.8, salinity less than 3 ds/m, and exchangeable sodium percentage (ESP) less than 15%.

Hydrogel: Cross linked potassium copolymer hydrogel as manufactured by Gelscape by Amerq Corp., Congers, NY, 10920 or Broadleaf P4, 1041 W. 18th Street Suite A103, Costa Mesa, CA 92627, (800) 628-7374, or approved equal.

215-3.2 Irrigation

Bubbler Heads: shall be Toro Stream Bubblers SB-180-PC2 on 570Z shrub sprinkler body or equal. Two heads per tree well.

Subterranean Irrigation: Flood Type – Toro 514-30 Bubbler nozzles in drainage tubing spaced at three foot centers over the entire CU Structural Soil™ zone. Drip Type – Toro DL2000 Series subsurface irrigation tubing RGP-412-03 with a tubing layout pattern of rows twelve (12) inches apart over the entire CU Structural Soil™ zone.

Filter Fabric: Non-woven continuous filament polyester fabric. Weight 4.0 oz per square yard, min. Grab strength 100 lb. Water flow rate 105 gpm/sq. ft. Delivered in 15 foot wide roles minimum. Geolon N 40 as manufactured by Nicolon Corp, Valpararíso, FL, or approved equal.

Flood Irrigation Tube: 4" perforated PVC with 1/2" diameter holes spaced 6" on center on one side. (bottom)

Drain rock: 1/2" rounded drain rock, cleaned of fines.

215-4 STREET LIGHTS

Street light poles, arms and base shall be manufactured by Visco, 29579 Awbrey Lane, Eugene, Oregon 97402, (800) 341-1444, or approved equal. Luminaire Arm: Series "A-2 Twin Arm 180° 2-way." Central Finial Model #22-CX. Banner Arms: Single Arm. Base: Series "B" stack design, with 10B lower base section and 11B upper base section with removable access door. Color: Black. Finish: Powdercoat.

Globes, lamps, fitters and decorative finial shall be manufactured by Lumec, 640 Cure-Boivin, Boisbrinand Quebec, Canada, J76 2A7, or approved equal. Local representative ALR (510) 638-3800 ext 183. Acrylic globes Traditional Globe Series L-57, coated. Lamp: 150 Watt High Pressure Sodium, 240 Volt, Ballast & Socket assembly with Type III or V distribution as indicated on the plans. Fitters: SFO base fitter, Finial: FN1. Color: Black. Finish: Powdercoat.

215-4.1 Pole for Street Lights for Mathilda, Evelyn, Sunnyvale, Washington, Mathilda Place, Mckinley & Iowa Streets. 9" O.D. pole 11' height, 11 gauge, steel fluted tapered pole with 0.14" per ft taper.

215-4.2 Pole for Street Lights for other Downtown Streets. 9" O.D. flute tapered light pole, 12' height, 11 gauge, steel fluted tapered pole with 0.14" per ft taper.

215-5 TRAFFIC SIGNAL STANDARDS

Traffic signal standard shall be manufactured by Visco, 29579 Awbrey Lane, Eugene, Oregon 97402, (800) 341-1444, or approved equal. Pole: 11 gauge, steel fluted tapered pole with 0.14" per ft taper. Luminaire Arm: Series "A-2 Twin Arm 180° 2-way." Mast Arm: Smooth Curved Design Steel 48" rise. Base: Series A14/36 — Clam Shell Design. Finish: Black Powder Coat.

Globes, lamps, fitters and decorative finials shall be manufactured by Lumac, 640 Cure-Boivin, Boisbrinand Quebec, Canada, J76 2A7, or approved equal. Local representative ALR, (510) 638-3800 ext 183. Acrylic globes: Traditional Globe Series L-57, coated. Lamp: 150 Watt High Pressure Sodium, 240 Volt, Ballast & Socket assembly with Type V distribution glass refractor. Fitters: SFO base fitter, Finial: FN1. Color: Black. Finish: Powdercoat.

215-6 LIGHTED CAST IRON BOLLARD

Lighted cast iron bollard shall be manufactured by Visco, 29579 Awbrey Lane, Eugene, Oregon 97402, (800) 341-1444, model # VI-BO-14L, or approved equal. Finish: Black Powder Coat.

215-7 CAST IRON BOLLARD

Cast iron bollard shall be manufactured by Visco, 29579 Awbrey Lane, Eugene, Oregon 97402, (800) 341-1444, model #VI-BO-14, or approved equal, with removable bollard insert as shown on drawings. Finish: Black Powder Coat.

215-8 ACCESSIBLE DRINKING FOUNTAIN

Accessible Drinking Fountain shall be manufactured by Visco, 29579 Awbrey Lane, Eugene, Oregon 97402, (800) 341-1444, model #VI-DF-12H, or approved equal. Finish: Black Powder Coat.

215-9 ASH URN

Ash Urn with inlaid stainless steel ashtray shall be manufactured by Victor Stanley, PO Drawer 330 Dunkirk, MD 20754, (800) 368-2573, or approved equal. Stand alone type, Bethesda Series, Model #S-20. Finish: Black Powder Coat.

215-10 BENCH

Bench shall be manufactured by DuMor Inc., PO Box 142, Mifflintown, PA 17059, (800) 598-4018 or approved equal. Model #Bench 58, 6' wide. Finish: Black Powder Coat.

215-11 BIKE RACK

Bike rack shall be manufactured by DuMor Inc., PO Box 142, Mifflintown, PA 17059, (800) 598-4018 or approved equal. Model #loop bike rack 83, S-2 surface Plate. Finish: Black Powder Coat.

215–12 PLANTER POT

Planter pot shall be manufactured by Petersen Manufacturing Co, Inc., Leisure Products Division, PO Box 664, Denison, IA 51442 (800) 832-7383, or approved equal. Model #Aurora Series. Finish: Dove gray, light sand blast concrete finish.

215-13 STREET TREE GRATE

Street tree frame and grate shall be manufactured by Urban Accessories, Inc., P.O. Box 310, Woodinville, WA 98072, (425) 487-0488 or approved equal. Model: Chinook. 4' square grate with 1/4" frame and bolt down feature. Finish: Natural cast iron. Expansion bolt: 5/8" by 4-1/4" high strength, stainless steel expansion bolt, Redhead or approved equal, or as provided by manufacturer.

215-14 TRASH RECEPTACLE

Trash Receptacle with liner and steel dome shall be manufactured by Victor Stanley, PO Drawer 330, Dunkirk, MD 20754, (800) 368-2573, or approved equal. Model #S-42 with S-2 spun steel dome. Finish: Black Powder Coat.

215–15 TRENCH DRAIN

Trench drain frame and grate shall be manufactured by Urban Accessories, Inc., P.O. Box 310, Woodinville, WA 98072, (425) 487-0488, or approved equal. Model: Double Wave 6" or 12". Finish: Natural cast iron.

SECTION 313 - DOWNTOWN STREET FEATURES AND FURNISHINGS

313-1 SIDEWALK PAVING

313-1.1 Installation of Concrete Sidewalk. Install concrete sidewalk per Section 302-6, Portland Cement Concrete Pavement. Final finish shall be light broom finish in direction as indicated on plans. Sidewalk shall be installed with properly sized recesses to receive pavers as shown on drawings. Sidewalk shall cure seven days prior to installing pavers.

313-1.2 Installation of Concrete Unit Paver Bands on Mortar Bed. Concrete Unit Pavers shall be clean and free of foreign materials before installation. All cutting of paving stones shall be done with a masonry saw.

Concrete Unit Paver bands shall be laid in full bed of mortar over concrete base as shown on details. Install mortar for bedding in an area no larger than can be paved while mortar is still workable. Position concrete unit pavers with hand tight joints in mortar bed and tap into level with adjacent work and elevations. Plaster sand shall be spread over the installed paving stones and swept into joints. Excess sand shall be swept into the joints or disposed of from surface area. The completed concrete unit pavers installation shall be washed down and cleaned to provide a clean, finished workman-like installation.

313-2 CROSSWALK PAVING

313-2.1 Base Preparation. Subgrade per Section 301-1, Subgrade Preparation. Crushed Aggregate Base per Section 301-2, Untreated Base, shall be compacted to a minimum relative compaction of 95% of the maximum dry density in accordance with ASTM D-1557 to a depth of 18 inches in all roadway areas.

313-2.2 Installation of Crosswalk Paving Concrete Edge Bands and Concrete Base. Install concrete edge bands and concrete base per Section 302-6, Portland Cement Concrete Pavement. Final finish of bands shall be light broom finish in direction as indicated on plans. Concrete edge bands shall be installed prior to installing pavers.

313-2.3 Installation of Concrete Unit Pavers. Pavers shall be clean and free of foreign materials before installation. All cutting of concrete unit pavers shall be done with a masonry saw.

Concrete Unit Paver bands shall be laid in full bed of mortar over concrete base as shown on details. Install mortar for bedding in an area no larger than can be paved while mortar is still workable. Installation shall start from a corner or straight edge and proceed forward. Position concrete unit pavers with hand tight joints in mortar bed and tap into level with adjacent work and elevations. Paving work shall be plumb, level and true to line and grade and shall be installed to properly coincide and align with adjacent work and elevations.

Plaster sand shall be spread over the installed pavers and vibrated into the joints between the pavers. A roller vibrator or plate vibrator shall be used to compact the pavers and to vibrate sand up into the joints between the pavers. Excess sand shall be swept into the joints or disposed of from surface area. The completed concrete unit pavers installation shall be washed down and cleaned to provide a clean, finished workman-like installation.

313-3 STRUCTURAL SOIL FOR STREET TREE PLANTING

313-3.1 Suppliers for Structural Soil. All CU Structural Soil™ mixing shall be performed by an agreed upon supplier using appropriate soil measuring, mixing and shredding equipment of sufficient capacity and capability to assure proper quality control and consistent mix ratios. No mixing of CU Structural Soil™ at the project site shall be permitted. CU Structural Soil™ mix shall be manufactured by TMT Enterprises of San Jose, CA [(408) 432-9040] or other manufacturers/suppliers according to the Cornell University patent as licensed by AMEREQ INC. /CU-Soil™ Division.

Mix supplier shall have available at the mixing site sufficient equipment and instrumentation, including qualified technicians to determine the weights and water content of the mix components immediately prior to the mixing procedure. The Contractor shall monitor these critical elements throughout the mixing process to provide

adequate quality control. The supplier shall maintain a quality control log of material weight, water content, and mix proportions for every 15 tons of material mixed. Maintain adequate moisture content during the mixing process. Soil and mix components shall easily shred and break down without clumping. Soil clods shall easily break down into a fine crumbly texture. Soil shall not be overly wet or dry. The supplier shall measure and monitor the amount of soil moisture at the mixing site periodically during the mixing process.

313-3.2 Mix Component Testing & Submittals. Submit crush granite stone and clay loam soil for testing separately for component requirement analysis. The analysis for the USDA soil particle size distribution and the agricultural suitability of the clay soil component of the CU Structural Soil™ shall be by an approved agricultural soil testing laboratory. *Soil & Plant Laboratory Inc., PO Box 153, 352 Mathew St., Santa Clara, CA 95050, (408) 727-0330* is a local approved soil testing laboratory. Contractor shall submit the test results and samples for approval to the Engineer.

Provide particle size analysis of the clay loam soil using the following gradient chart of mineral content:

Designation	**Size in mm**
Coarse Sand	0.5 - 1 mm
Medium Sand	0.25 - 0.5 mm
Fine Sand	0.1 - 0.25 mm
Very Fine Sand	0.05 - 0.1 mm
Silt	0.002 - 0.5 mm
Clay	Minus 0.002 mm

Provide a chemical analysis, including pH, percent organic content by weight, nutrient levels including nitrogen, phosphorus and potassium and soluble salt in ppm. Test analysis should include recommendations to alter soil fertility including fertilizers or pH adjustment required for healthy plant growth. Fertility amendment recommendations shall include amounts and types of amendments. Soil Analysis Test AO5-3 by *Soil and Plant Laboratory, Inc.* will satisfy the appropriate testing evaluation requirements of the clay loam component of the Structural Soil.

313-3.3 Mix Proportions. Approved proportion of materials in CU Structural Soil™ shall be as follows:

Component	***by units of weight***	***by percentage by weight***
Crushed Granite Stone	100 dry weight	74.97% - 77.97%
Clay - Clay Loam Soil	15 - 18 dry weight	22 - 25%
Hydrogel	0.03 dry weight	0.03%
Water	10 ± (includes water in other ingredients)	
Other Amendments	As recommended by test analysis	

During compaction, too much soil will separate stones and remove air spaces - too little soil will not provide adequate water retention.

313-3.4 Approved Mix(es) and Production Quality Control. Based on samples and test analysis, the Engineer and the Contractor will jointly determine the ratio of components to meet required test results for drainage, compaction and any project specific requirements. More than one mix ratio may be required to satisfy project specific requirement. Submit the labeled samples of the test mixes with the test results. The Engineer may request additional CU Structural Soil™ test mix samples to be tested in the event that further refinement of the mix is necessary.

All tests will be performed with the sample compacted to 45 foot pounds at 40 cm of moisture retention where applicable.

All tests will be at the expense of the Contractor. If the test results of any CU Structural Soil™ fail to meet the mix criteria, the mix ratio shall be adjusted and the mix retested.

The ratio of the approved mix(es) shall be used as the standard(s) for preparing the CU Structural Soil™. After the mix(es) has been approved and during the mixing process, the Contractor shall take two — one cubic foot quality control samples per 400 cubic yards of production from the final CU Structural Soil™. The samples shall be taken at random from locations in the numbered stockpiles or during production. Each sample shall be tested for comparison to the approved mix for particle size analysis and chemical analysis with results submitted for review and approval.

In the event that the quality control samples vary significantly from the approved CU Structural Soil™ sample, as determined by the Engineer, the Contractor shall remix and retest any lot of soil that fails to meet the correct analysis, making adjustments to the mixing ratios and procedures to achieve the approved consistency.

313-3.5 Mixing Protocol. Spread the crushed stone on a paved surface to maximum depth of 6 inches. Mix the Hydrogel and sufficient water into a slurry and spray over the crushed stone. After the stone is uniformly wetted by the slurry, spread clay loam evenly over the crushed stone. Spray the remaining water over the soil and mix with a loader or other device until the mix obtains an even consistency. Do not over mix or over wet. If the mix begins to form balls or pellets of soil around the aggregate, discard the batch. Any pelletized soil will be rejected.

CU Structural Soil™ Mix may alternatively be mixed in a commercial pug mill or other equipment approved by the Engineer.

Mixing should include any required soil amendments to alter soil fertility, including fertilizers or pH adjustment.

After completion of the mixing and prior to installation, protect the CU Structural Soil™ stockpile(s) from rain and mix separation through erosion and excessive vibration during handling and placement. Cover the stockpile at all times with plastic sheeting.

Contractor shall procure sufficient quantities of CU Structural Soil™ in advance of the time needed at the job site to allow adequate time for final quality control testing as required by the progress of the work. CU Structural Soil™ shall be stored in piles no larger than 400 cubic yards and each pile shall be numbered for identification and quality control purposes. Storage piles shall be protected from drying out, rain and erosion by covering with plastic sheeting.

313-3.6 Delivery Storage and Handling. Prior to any delivery of CU Structural Soil™, Contractor shall hold a preconstruction meeting with City's representative, mixers and operators and submit a logistics plan to discuss schedules, methods and techniques for mixing, delivery and installation of the material.

Do not deliver or place soils in wet, muddy or frozen conditions. Materials shall be delivered at or near optimum compaction moisture content as determined by ASTM D 698 (AASHTO T 99). Do not deliver or place materials in an excessively moist condition (beyond 2% above optimum compaction moisture content as determined by ASTM D698 (AASHTO T 99). Protect CU Structural Soil™ from drying out, absorbing excess water and from erosion at all times. Do not store materials unprotected from large rainfall events. Do not allow excess water to enter site prior to compaction. If water is introduced into material after grading, allow material to drain or aerate to optimum compaction moisture content. CU Structural Soil™ stored longer than 2 days shall be inspected for water content, rehydrated and remixed as required to meet optimum compaction moisture content.

313-3.7 Site Preparation. Do not proceed with installation of CU Structural Soil™ material until all subsurface drainlines, walls, curb footings, irrigation lines and utility work in the area have been installed. For site elements dependent on CU Structural Soil™ for foundation support, postpone installation until immediately after the installation of Structural Soil. All subsurface drainage systems shall be operational prior to the installation of Structural Soils.

Excavate and compact the proposed sub-grades to depths, slopes and widths as shown on drawings. Maintain all required angles of repose of the adjacent materials as shown on the drawings. Do not over excavate compacted sub-grades of adjacent pavement or structures. Confirm that the subgrade is at the proper elevation and compact as required. Subgrade elevations shall slope parallel to the finish grade or toward subsurface drain lines.

Excavate existing native soil so that the finish grade of the bottom of the CU Structural Soil™ will be the same grade as the bottom of the planted tree or minimum depth of 24 inches, whichever depth is deeper. Contractor to verify with tree nursery the depths of the proposed tree rootballs, submit average depths of rootballs to Engineer so that final depth of excavation can be approved.

Clean the excavation of all construction debris, trash, rubble and any foreign materials. In the event that fuels, oils, concrete washout silts or other material harmful to plants have been spilled into the subgrade material, excavate the soil sufficiently to remove the harmful material. Fill any over-excavation with approved fill and compact to the required subgrade compaction.

Protect adjacent walls, walks and utilities from damage or staining by soil. Clean up all trash and any soil or dirt spilled on any paved surface at the end of each working day. Any damage to the paving or architectural work caused by the installation of CU Structural Soil™ shall be repaired or replaced by the Contractor at no additional cost. Maintain silt and sediment control devices, and provide adequate methods to assure that trucks and other equipment do not track soil from the site.

313-3.8 Installation of Structural Soil. Install CU Structural Soil™ in 6-inch lifts and compact every 12" to 18" as required. Compact all materials to 95% peak dry density as defined by ASTM D 698 (standard AASHTO compaction curve AASHTO T 99). Hand tamp as necessary to protect utilities, irrigation lines and other subsurface features. Compaction testing procedures and equipment shall be calibrated for non-cohesive soils. No compaction shall occur when moisture content exceeds maximum as listed therein. Delay compaction 24 hours if moisture content exceeds maximum allowable and protect CU Structural Soil™ during delays in compaction with plastic or plywood as directed by the Engineer.

The CU Structural Soil™ Mix shall be able to maintain drainage of water at 0.75 inches per hour after completion of compaction. Test the completed installation with a minimum of one random percolation test per 300 square feet of area as follows. Dig a hole in the compacted CU Structural Soil™ 10 inches in diameter and 10 inches deep. Fill with water and let it drain completely. Immediately refill with water and time the rate of fall of the water in the hole. The water shall recede at a minimum rate of 0.75 inch per hour. All testing shall be done in the presence of the Engineer. In the event that the installation fails to percolate at the required rate, the soil in the area shall be re-tested to determine if it meets the particle size distribution specified. Material that does not meet the specifications shall be removed at no cost to the City.

Bring CU Structural Soil™ to finished grades as shown on the drawings. Immediately protect the CU Structural Soil™ material from contamination by toxic materials, trash, debris, water containing cement, clay, silt or materials that will alter the particle size distribution of the mix. After the CU Structural Soil™ is installed, do not significantly delay, schedule or phase the progress or installation of the next layer of paving and planting above/in the Structural Soil.

The Engineer may periodically check the material being delivered and installed at the site for color and texture consistency with the approved sample provided by the Contractor as part of the submittal for Structural Soil. In the event that the installed material varies significantly from the approved sample, the Engineer may request that the Contractor test the installed Structural Soil. Any soil that varies significantly from the approved testing results, as determined by the Engineer, shall be removed and new CU Structural Soil™ installed that meets these specifications.

313-3.9 Fine Grading. After the initial placement and rough grading of the CU Structural Soil™ but prior to the start of fine grading, the Contractor shall request review of the rough grading by the Engineer. The Contractor shall set sufficient grade stakes for checking the finished grades. Adjust the finished grades to meet field conditions as directed. Provide smooth transitions between slopes of different gradients and direction. Fill all dips and remove any bumps in the overall plane of the slope. The tolerance for dips and bumps in CU Structural Soil™ areas shall be a 3-inch deviation from the plane in 10 feet. All fine grading shall be inspected and approved by the Engineer prior to the installation of other items to be placed on the CU Structural Soil™.

313-3.10 Installation of Irrigation Systems. The irrigation of the street trees planted in tree well where CU Structural Soil™ is installed under the sidewalk adjacent to the tree wells shall require two irrigation systems, a

stream bubbler system in the tree well to water the tree nursery root ball and a subterranean system in the CU Structural Soil™ zone to provide water for tree roots in the structural soil.
Install the irrigation systems in conformance with Section 308-5 Irrigation System Installation.

Tree Well Stream Bubbler System: Install two Toro Stream Bubblers - SB-180-PC2 on 570Z shrub sprinkler body per tree as shown on the details.

CU Structural Soil™ Subterranean System: The irrigation of the CU Structural Soil™ zone shall be one of two types either a flood bubbler system or a drip system.

- The **flood bubbler type system** shall have Toro 514-30 Bubbler nozzles in drainage tubing spaced at three foot centers over the entire CU Structural Soil™ zone. The drainage tubing shall be installed in the top three inches of the CU Structural Soil™.

- The **drip type irrigation** shall use – Toro DL2000 Series subsurface irrigation tubing RGP-412-03 with a tubing layout pattern of rows twelve (12) inches apart over the entire CU Structural Soil™ zone. The drip tubing shall be installed on the upper surface of the CU Structural Soil™ with the geotextile fabric installed over the drip tubing and below the Class II base rock course.

Perform hydrostatic tests in the presence of the Engineer. All pressure supply lines shall be tested under hydrostatic pressure at 125% of design pressure. Pressure shall hold for 24 hours. Make all necessary adjustments, including realignment of head to provide required coverage as directed by the Engineer.

313-3.11 Installation of Filter Fabric. After the installation is completed, irrigation tested and reviewed by the Engineer, install Filter Fabric on top of all CU Structural Soil™ in all areas that will be located below paving. Cut off excess fabric at the edge of the CU Structural Soil™.

313-3.12 Clean up. Upon completion of CU Structural Soil™ installation, clean areas. Remove all excess fill soils, mix stockpiles and legally dispose of all waste materials trash and debris. Sweep, do not wash, all paving and other exposed surfaces of dirt and mud until the final paving has been installed over the CU Structural Soil™ mix. Avoid washing the area until all paving has been completed.

313-4 STREET TREES IN TREE WELLS ADJACENT TO STRUCTURAL SOIL

313-4.1 Procedure for Installation of Trees. Being that CU Structural Soil™ is only required under the concrete pavement and is not required in the tree well itself the tree planting is a function of the nursery container size. Trees planted in tree wells where CU Structural Soil™ has been installed below the concrete sidewalk shall be installed in one of two methods depending on nursery container size of the tree being installed.

For trees with nursery containers greater than twenty-four (24) inches square shall be installed immediately prior to the installation of the CU Structural Soil™. These trees can be placed in the tree well with the bottom of the boxes removed but the sides of the nursery box remaining. The depth of the soil excavation shall depend on the height of the tree's root ball. The soil grade of the nursery root ball shall be set at two (2) inches above the soil grade line of the tree well soil (See details). After the CU Structural Soil™ is installed the sides of the nursery boxes can be removed and the tree well back filled with native backfill soil.

For trees with nursery containers less than twenty-four (24) inches square shall be installed after the installation of the CU Structural Soil™ and Filter Fabric is complete and adjacent pavement has cured and been approved by the Engineer. Excavate the planting hole to twelve (12) inches wider than the nursery rootball, i.e. six (6) inches around the outer periphery of the rootball and to such a depth that the top of the rootball is two (2) inches above the finish grade. Handle the tree carefully, set the rootball on bottom of planting hole and center it in the tree well opening in the sidewalk. Raise rootballs that settle below accepted finish grade as shown on the drawings.

315-5 STREET LIGHTS

315-5.1 Installation. Install street lights in conformance with the latest State Of California, Department of Transportation (CALTRANS) Standard Plans and Specifications and project technical specifications.

315-6 TRAFFIC SIGNAL

315-6.1 Installation. Install traffic signal in conformance with the latest State Of California, Department of Transportation (CALTRANS) Standard Plans and Specifications and project technical specifications.

315-7 LIGHTED CAST IRON BOLLARD

315-7.1 Installation. Install lighted cast iron bollard in conformance with **SECTION 307, STREET LIGHTING AND TRAFFIC SIGNALS.**

Prior to installation of lighted cast iron bollards, carefully inspect the work of other trades and verify all such work is correct and complete. Furnish anchors, bolts, sleeves and templates required for installation by others to ensure proper fit and accurate placement. Coordinate installation with electrical work for fully operational lighted cast iron bollard.

Install bollards in the proper location, plumb, level, square, in true alignment and firmly anchored. Provide proper fitting sleeves as required for installation by others. Make all electrical connections and test operation.

Check all components for proper fit, alignment, and tolerances. Check all finishes for damage. Replace damaged components. Touch up scratches in finish according to manufacturer's recommendations.

Immediately prior to acceptance, remove all protective coverings, clean all exposed surfaces to be free of soil and discoloration. Follow manufacturer's recommendations for cleaning methods and materials.

315-8 CAST IRON BOLLARD

315-8.1 Installation. Prior to installation of cast iron bollards, carefully inspect the work of other trades and verify all such work is correct and complete. Furnish anchors, bolts, sleeves and templates required for installation by others to ensure proper fit and accurate placement.

Install bollards in the proper location, plumb, level, square, in true alignment and firmly anchored. Provide proper fitting sleeves for removable bollard as required for installation by others. Install removable bollards as shown on drawings. Lock in place. Anchor non-removable bollard in sleeves as detailed on drawings.

Check all components for proper fit, alignment and tolerances. Check all finishes for damage. Replace damaged components. Touch up scratches in finish according to manufacturer's recommendations.

Immediately prior to acceptance, remove all protective coverings, clean all exposed surfaces free of soil and discoloration. Follow manufacturer's recommendations for cleaning methods and materials.

315-9 ACCESSIBLE DRINKING FOUNTAIN

315-9.1 Installation. Prior to installation of accessible drinking fountain, carefully inspect the work of other trades and verify all such work is correct and complete. Furnish anchors, bolts, sleeves and templates required for installation by others to ensure proper fit and accurate placement. Coordinate installation with potable water supply and drainage for fully operational accessible drinking fountain.

Install drinking fountain in the proper location, plumb, level, square, in true alignment and firmly anchored. Drinking fountain shall be complete with all mechanical, plumbing and drainage connects to be fully operative and in conformance with local codes. Connect supply line to new water meter. Install shut off valve in an adjacent pull box.

Check all components for proper fit, alignment and tolerances. Check all finishes for damage. Replace damaged components. Touch up scratches in finish according to manufacturer's recommendations.

Immediately prior to acceptance, remove all protective coverings, clean all exposed surfaces free of soil and discoloration. Follow manufacturer's recommendations for cleaning methods and materials.

315-10 ASH URN

315-10.1 Installation. Prior to installation of ash urn, carefully inspect the work of other trades and verify all such work is correct and complete.

Assemble ash urn as recommended by manufacturer. Secure ashtray inserts to ash urn per manufacturer's recommendations. Install ash urn in the proper location, plumb, level, square, in true alignment and firmly anchored to pavement as detailed in drawings.

Check all components for proper fit, alignment and tolerances. Check all finishes for damage. Replaced damage components. Touch up scratches in finish according to manufacturer's recommendations.

Immediately prior to acceptance, remove all protective coverings, clean all exposed surfaces free of soil and discoloration. Follow manufacturer's recommendations for cleaning methods and materials.

315–11 BENCH

315-11.1 Installation. Prior to installation of bench, carefully inspect the work of other trades and verify all such work is correct and complete. Furnish anchors, bolts, sleeves and templates required for installation by others to ensure proper fit and accurate placement.

Assemble bench as recommended by manufacturer. Install bench in the proper location, plumb, level, square, in true alignment and firmly anchored to pavement as detailed in drawings.

Check all components for proper fit, alignment and tolerances. Check all finishes for damage. Replace damaged components. Touch up scratches in finish according to manufacturer's recommendations.

Immediately prior to acceptance, remove all protective coverings, clean all exposed surfaces free of soil and discoloration. Follow manufacturer's recommendations for cleaning methods and materials.

315-12 BIKE RACK

315-12.1 Installation. Prior to installation of bench, carefully inspect the work of other trades and verify all such work is correct and complete. Furnish anchors, bolts, sleeves and templates required for installation by others to ensure proper fit and accurate placement.

Install bike rack in the proper location, plumb, level, square, in true alignment and firmly anchored to pavement as detailed in drawings.

Check all components for proper fit, alignment and tolerances. Check all finishes for damage. Replace damaged components. Touch up scratches in finish according to manufacturer's recommendations.

Immediately prior to acceptance, remove all protective coverings, clean all exposed surfaces free of soil and discoloration. Follow manufacturer's recommendations for cleaning methods and materials.

315–13 PLANTER POT

315-13.1 Installation. Prior to installation of planter pot, carefully inspect the work of other trades and verify all such work is correct and complete. Furnish anchors, bolts, sleeves and templates required for installation by others to ensure proper fit and accurate placement.

Install planter pot in the proper location, plumb, level, square, and in true alignment as detailed in drawings. Set firmly on top of pavement without rocking. Coordinate planter pot placement with irrigation and drainage.

Check all finishes for damage. Replace damaged components. Touch up scratches in finish according to manufacturer's recommendations.

Immediately prior to acceptance, remove all protective coverings, clean all exposed surfaces free of soil and discoloration. Follow manufacturer's recommendations for cleaning methods and materials.

315-14 STREET TREE GRATE

315-14.1 Installation. Prior to installation of street tree grate, carefully inspect the work of other trades and verify all such work is correct and complete. Furnish anchors, bolts, sleeves and templates required for installation by others to ensure proper fit and accurate placement. Coordinate with sidewalk, paver, irrigation and electrical requirements for proper alignment and installation. Adjust frame and street tree grate as necessary to fit field conditions.

Install street tree grate frame at proper grade elevation for flush condition with pavement. Grate shall set flush with frame. Install frame in the proper location, plumb, level, square, in true alignment and firmly anchored to pavement and curb as shown on the drawings. Place street tree grate in frame after tree is planted and electrical and irrigation work is completed. Bolt grate to frame as shown in detail.

Check all components for proper fit, alignment and tolerances. Check all finishes for damage. Replace damaged components. Touch up scratches in finish according to manufacturer's recommendations.

Immediately prior to acceptance, remove all protective coverings, clean all exposed surfaces free of soil and discoloration. Follow manufacturer's recommendations for cleaning methods and materials.

315-15 TRASH RECEPTACLE

315-15.1 Installation. Prior to installation of trash receptacle, carefully inspect the work of other trades and verify all such work is correct and complete.

Assemble trash receptacle as recommended by manufacturer. Secure dome lid to trash receptacle as recommended by manufacturer. Install trash receptacle in the proper location, plumb, level, square, in true alignment and firmly anchored to pavement as detailed in drawings.

Check all components for proper fit, alignment and tolerances. Check all finishes for damage. Replace damaged components. Touch up scratches in finish according to manufacturer's recommendations.

Immediately prior to acceptance, remove all protective coverings, clean all exposed surfaces free of soil and discoloration. Follow manufacturer's recommendations for cleaning methods and materials.

315–16 TRENCH DRAIN

315-16.1 Installation. Prior to installation of trench drain, carefully inspect the work of other trades and verify all such work is correct and complete. Furnish anchors, bolts, sleeves and templates required for installation by others to ensure proper fit and accurate placement. Coordinate with sidewalk, paver, and drainage requirements for proper alignment and installation. Adjust frame and trench drain grate as necessary to fit field conditions.

Install trench drain frame at proper grade in elevation for flush condition with pavement. Grate shall set flush with frame. Install frame in the proper location, plumb, level, square, in true alignment and firmly anchored to pavement as shown on the drawings. Bolt grate to frame as shown on the drawings..

Check all components for proper fit, alignment and tolerances. Check all finishes for damage. Replace damaged components. Touch up scratches in finish according to manufacturer's recommendations.

Immediately prior to acceptance, remove all protective coverings, clean all exposed surfaces free of soil and discoloration. Follow manufacturer's recommendations for cleaning methods and materials.