

**UCLA TREE RISK ASSESSMENTS AND URBAN FORESTRY MANAGEMENT
PLAN**

REQUEST FOR QUALIFICATIONS

ARBORIST CONSULTING SERVICES

PROJECT NUMBER: WO6979211

JANUARY 2023

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I. ADVERTISEMENT FOR ENVIRONMENTAL CONSULTANT SERVICES

The University of California, Los Angeles (UCLA or University) requests a written response to the Request for Qualifications (RFQ) to select an Arborist consultant to conduct a complete tree inventory for all on and off-campus UCLA-owned properties. The Arborist would conduct ISA Level 2 tree risk assessments for on, and off-campus properties owned and managed by the University of California, Los Angeles (UCLA) and develop an Urban Forest Management Plan.

UCLA is a public land-grant research university in Los Angeles, California. As one of the most sought-after universities in the nation by prospective students, the UCLA campus has also been nationally recognized for its landscape environment and consistently ranked as one of the most beautiful universities in the country. Comprehensive tree care and management are becoming more critical as the climate changes with increasing heat and drought.

This RFQ is to acquire the services of a consultant team consisting of ISA Certified arborists and the American Society of Consulting arborists. The arborists will (1) fully document the estimated 25,000 trees and (2) conduct risk assessments on an estimated 2,500 trees on UCLA-owned and managed properties in Santa Monica, Los Angeles, and Lake Arrowhead. From the commencement of field operations, the tree inventory study activity is anticipated to take approximately 2 to 5 years to complete, contingent on fund availability. The anticipated study's total cost is approximately \$500k, depending on the agreed-upon scope of work.

The tree inventory shall be documented in a database, Excel format, and GIS-based to integrate with the University's TreeWorks software and other tree management software. The selected Consultant shall also import the shape files into the University's software to keep the database up-to-date. The Urban Forest Management Plan will integrate the framework of UCLA's updated Landscape Plan and shall contain, at a minimum, information similar to examples (Attachment G). Throughout the contract, this team will closely coordinate efforts with the Campus Facilities Management Grounds team and the Sustainability division.

The complete RFQ packet will be available at:

<http://www.capitalprograms.ucla.edu/Contracts/RFQProjects> on **Friday, January 23, 2023**. Responses to the RFQ are due by **10:00 a.m. on Monday, January 30, 2023**. A screening committee will determine a shortlist of firms; further steps in the selection process will be at the selection committee's discretion.

Every effort will ensure that all persons have equal access to contracts and other business opportunities with the University within limits imposed by law or University policy. Each candidate firm may be required to show evidence of its equal employment opportunity policy.

Peter E. Hendrickson, AIA

Associate Vice-Chancellor
Design and Construction
UCLA Capital Programs
1060 Veteran Avenue | Box 951365
Los Angeles, CA 90095-1365

For questions related to this RFQ, please contact:

Valerie Bottaioli
UCLA Facilities Management- DPM
Project Manager
E: VBottaioli@fm.ucla.edu
T: 310-689-9942

II. PROJECT INFORMATION AND REQUIREMENTS

A. PROJECT INFORMATION

The University of California, Los Angeles (UCLA) seeks Arborist consulting services to support on-site assessment of each tree under the UCLA umbrella to provide a management plan and reduce risk to the community. UCLA is a public land-grant research university in Los Angeles, California. As one of the most sought-after universities in the nation by prospective students, the UCLA campus has also been nationally recognized for its landscape environment and consistently ranked as one of the most beautiful universities in the country. Comprehensive tree care and management are becoming more critical as the climate changes with increasing heat and drought.

B. PROJECT CONSULTING REQUIREMENTS

From the commencement of field operations, the tree inventory and assessment study is anticipated to take approximately 2 to 5 years to complete, contingent on fund availability.

The following is an overview of Arborist consulting services that the University will implement under the Facilities Management Grounds team and the University Sustainability division.

1. A complete inventory of on-campus trees (approximately 20,000) and off-campus trees (approximately 5,000).
2. A tree risk assessment is necessary only for off-campus trees. A recent on-campus tree risk assessment has been completed. The total number of trees (estimated at 2,500) will require an evaluation and will be based on the Consultant's recommendation once the off-campus tree inventory/study is completed.

The risk assessment shall, at a minimum, include the ISA Tree Risk Assessment BMP Form,

1. Location- (latitude and longitude coordinates & subdivision campus area) and identifying (species, diameter & stems) the tree or trees to be assessed.
2. Targets - Determine the targets and target zone for the tree or branches of concern.
3. Review - Reviewing the site history, conditions, and species failure profile.
4. Evaluation - An assessment of the potential load on the tree and its parts.
5. Tree Assessment - A general assessment of the overall health of the trees.
6. Inspection - Inspecting the tree visually and using binoculars, mallets, probes, or shovels, as desired by the Arborist or as specified in the Scope of Work.
7. Record observations of site condition, defects, outward signs of possible internal defects, and response growth.
8. Recommendations - If necessary, recommend an advanced assessment.
9. Study - Analyze data to determine the likelihood and consequences of failure to evaluate the degree of risk.
10. Develop mitigation options and estimate residual risk for each option.
11. Develop and submit the report/documentation, including, when appropriate, advice on re-inspection intervals.

The assessment team shall also provide photographs of each tree to coordinate with tree IDs assigned for the most efficient identification in the future, labeled with tree ID/unique ID.

Schedule: The PSA may have a duration of up to five years. Authorizations executed under the PSA will have varying durations according to the needs of each study or project. The University's priority is to complete the off-site tree risk assessments before June 2023.

Agreement and Contract Requirements: The selected Arborist consultant will conduct the work under a University of California Professional Services Agreement (PSA). A sample PSA is included in Attachment E.

Compensation: Compensation will be negotiated and executed by authorization for each separate study or scope of work within the terms and duration of the PSA. Compensation may be by a lump sum for each scope of work or hourly according to the annually-revised rate schedule incorporated into the PSA.

C. CONTRACT REQUIREMENTS

1. All consulting services provided by the selected Arborist Consultant shall follow the standard University Contract Documents, which the General Counsel has approved to the Regents.
 - University Standard Form of Professional Services Agreement (PSA- Attachment E)
2. Consultants shall have the following certifications:
 - International Society of Arboriculture – ISA Certification
3. The University requires evidence of insurance coverage: General Liability, Automobile Liability, and Worker's Compensation. Suppose the Consultant does not currently have coverage per University policies. In that case, the evidence must be submitted indicating that such coverage will be effective before entering into a contractual agreement with the University.

Capital Programs Insurance Limits for Consulting Services

General Liability	
Each Occurrence – Combined Single Limit for Bodily Injury & Property Damage	\$2,000,000
Products-Completed Operations Aggregate	\$2,000,000
Personal & Advertising Injury	\$2,000,000
General Aggregate	\$2,000,000
Business Auto Liability – Each Accident – Combined Single Limit for Bodily Injury & Property Damage	\$1,000,000
Workers Comp & Employers Liability	As required by the Federal & State of Calif. Law
Professional Liability	
Each Claim	\$2,000,000
General Aggregate	\$2,000,000

4. The University requires consultants to comply with all necessary forms and endorsements as specified in Attachment D. Awarded consultant shall submit copies of forms and endorsements during the award process for review and approval by the University at the time of contracting.
5. Equal Opportunity Employment -The selected firm shall show evidence of a company's Equal Opportunity Employment policy and company compliance with applicable federal law pertaining to Equal Opportunity Employment.

III. RESPONDING TO THIS REQUEST FOR QUALIFICATIONS

Please comply with the following requirements in preparing responses to this RFQ; *responsiveness to these instructions will be considered an indication of the responsiveness of the prospective Consultant:*

A. FORMAT

All submittal materials shall be bound in 8 ½ "x 11" format, preferably in portrait orientation. Materials may be submitted in PDF format via files sharing method or pdf attachment, emailed to lmartinez@capnet.ucla.edu (note: Outlook sets a maximum limit of 20MB for every email attachment). Clearly label submittals with the UCLA project name(s) and project number(s). Please include a table of contents. Provide Introductory pages to separate and identify each Submittal Requirement described in Section III.B. Submittals should be limited to the sections and items identified in III.B below. Although they are **not encouraged**, any additional materials submitted at the discretion of the submitting firm, such as standard brochures, **must be presented separately** from the main submittal and marked clearly. Failure to comply with this requirement may result in disqualifying the entire submittal.

B. SUBMITTAL REQUIREMENTS

RFQ submittals shall contain the following response items:

Cover: On the submittal cover, include the title "**UCLA Tree Risk Assessment and Urban Forestry Management Plan**" and the date (**January 2023**), and identify the firm submitting the response (with the contact information provided either on the cover or letter of interest, or both).

Letter of Interest: Provide a concise letter (1 page preferred) that expresses the candidate firm's interest in the project and summarizes the firm's capabilities for providing the requested Environmental Consulting services.

Firm Organization and Project Team Organization: Provide an organizational chart for the entire firm. Also, provide an organizational chart indicating the relationship between the firm's staff members, which might have responsibilities related to the environmental reports. Please show on the chart the names of key personnel and their titles.

Firm's Qualifications: Complete and submit a Statement of Qualifications (SOQ) form (Attachment B). In response to Item 7 of the SOQ, provide project data for a minimum of five (5) relevant projects for which environmental analysis has been completed or is currently in progress within the last five (5) years. Explain experience, if any, with projects in the Los Angeles region, complex multi-facility projects, residential facilities, teaching and research projects, medical facility projects; large renovation projects; utility and infrastructure projects; projects at UCLA, other UC campuses, or other educational institutions; and experience with NEPA. The submittal may include additional relevant information for the University, such as the firm's brochure or a recent work discussion pertinent to this project.

Staff and Sub Consultants' Qualifications: The University anticipates that the work associated with any particular proposed project may require the Environmental Consultant to obtain the services of specialty sub-consultants or to provide professional expertise from its staff for the following disciplines: laboratory services.

Identify potential sub-consultant(s) by discipline. (1) Indicate each Consultant's address, phone number, and contact person. (2) Provide a resume for relevant principles for the proposed consulting

firm(s). Where services are to be performed by the Environmental Consultant's own staff, comply with Key Staff and Resumes items. The University reserves the right to approve or reject all sub-consultants based upon consideration of their expertise and professional experience.

Response to Selection Criteria: Describe how and to what extent the firm satisfies, or intends to satisfy, each of the selection criteria.

Key Staff: Identity by names and titles of key staff members assigned to the proposed project or who may otherwise play a significant role in the proposed project. Briefly describe each individual's proposed role.

Resumes: Submit a resume for each key staff member identified above. Include specialty certifications and relevant experience with similar projects and describe each project's role or duties. Technicians and inspectors shall have demonstrated competence in performing appropriate tests and inspections. Include all relevant experience with similar projects and indicate the position or duties performed on each project.

Equipment and Quality Control Procedures: The company must have its own testing and sampling equipment and be able to perform calibration and quality control procedures for collecting analytical samples.

Letter of Acceptance of University Documents: The candidate firm shall carefully review the Standard University Contract Documents listed in Paragraph II.C and included in the Attachments. A letter prepared on the firm's letterhead shall state acceptance of these Standard University Contract documents as written. Alternatively, the letter shall describe any proposed minor modifications to the standard University documents that the candidate deems necessary for acceptance. Consultant shall assume that terms bearing on the firm's potential liability (e.g., Paragraph II.C insurance and indemnity provisions) will not be altered. University reserves the right to modify these documents before execution.

Certificate of Insurance: The candidate firm shall submit a Certificate of Insurance indicating its present coverage. The selected firm will be required to provide the insurance limits set forth by the University's insurance risk management department (Section II.C.3). Please confirm if your firm can meet these limits in your acceptance letter.

University of California Business Information Form: Complete, sign and submit a University of California Self-Certification Form – Professional Consultant (Attachment C), including the self-certification statement at the bottom of page 11.

C. SELECTION SCHEDULE

Per established University procedures, UCLA will review all submittals in response to the RFQ and select the most qualified firm for the projects. The anticipated selection process schedule is as follows:

1. The request for qualifications (RFQ) packet will be available at www.capitalprograms.ucla.edu/Contracts/RFQProject on **Friday, January 23, 2023**.
2. **10:00 a.m. on Monday, January 30, 2023:** RFQ submittals due at UCLA Capital Programs.
3. Interviews will be held in **late-February 2023**.

D. SELECTION OF ARBORIST CONSULTANT –

The Screening and Selection Committee will make a recommendation for the Arborist Consultant selected for the UCLA Tree Risk assessment project to the appropriate University administrator(s) for approval. Upon approval, UCLA will request written project scope and fee proposals.

E. DELIVERING RFQ RESPONSES TO UCLA CAPITAL PROGRAMS

To be considered for this project, provide your materials via file sharing method or pdf attachment, emailed solely to Lmartinez@capnet.ucla.edu, of the RFQ submittal documents outlined above in section III. Before or by **10:00 a.m. on Monday, January 30, 2023**. Each Request for Qualifications (RFQ) submittal is vital to UCLA. Therefore, please allow sufficient time for the submittal transmission or transmission delay to ensure that UCLA receives all RFQs by or before 10:00 a.m. (PST) deadline. Any submittals received after 10:00 a.m. (PST) deadline will not be accepted by UCLA.



UCLA Capital Programs
Attention: Liliana Martínez
Lmartinez@capnet.ucla.edu

All material submitted becomes the property of UCLA and will not be returned to submitting firm.

SELECTION CRITERIA: ATTACHMENT A –

Note: Not all items below will be weighted the same by the Screening and Selection Committees.

1. Relevant Project Experience. Applicant demonstrates adequate and meaningful experience with studies /projects of similar/comparable type and scope. Preference may be given to applicants with the University of California or other university work with relevant project experience with the same project team submitted for the proposed project.
2. Affordability. Applicant's demonstrated success in providing efficiency in inventorying, documenting, and assessing relevant data to provide the best value to UCLA.
3. Project Team Members' Qualifications. Applicant demonstrates relevant project experience, availability, and capability of proposed consulting staff members.
4. Schedule. Team size to allow completion of tasks in a reasonable amount of time and meet the deadline noted for tree risk assessments. Capable of in-person attendance at various meetings to provide professional expertise, information, and support to University Representatives for project kick-off, charrettes, Public Scoping, Public Hearings, and community relations meetings, as necessary.
5. Quality of technical and organizational resources (including equipment) to support the project.

STATEMENT OF QUALIFICATIONS: ATTACHMENT B

1. Firm Name: _____
2. Business Address: _____

3. Year Firm Established: _____ Telephone: _____
Fax: _____ Email: _____
4. Type of Organization (Check one):
a. Sole Proprietorship () b. Partnership () c. Corporation () d. Joint Venture ()
5. Principals (P) and Associates (A) (Check "P" or "A" for each) who would work on this project:

	NAME	P	A	DEGREE OR CERTIFICATE	INSTITUTION
a.					
b.					
c.					
d.					
e.					
f.					
g.					

6. The current and past five-year average number of staff employed in the applicant's office where key staff for the proposed project(s) are located.

		Current	5-year
a.	Principals	_____	_____
b.	Certified QISP	_____	_____
c.	Certified QSD/P	_____	_____
d.	California Registered PE	_____	_____
e.	Administrative	_____	_____
f.	Other	_____	_____

7. List five (5) major stormwater projects completed or currently in progress within the past five (5) years that (a.) demonstrate a detailed description of the Consultant's activities and (b.) provide the total value of consulting services rendered.

PROJECT	OWNER & CONTACT	YEAR	CONSULTING FEES
i.			
ii.			
iii.			
iv.			
v.			

8. References:

- a. _____
- b. _____
- c. _____

By (name and signature): _____ Date: _____

SELF CERTIFICATION: ATTACHMENT C

The following must be completed for the Contractor and each Subcontractor indicated on the Report of Subcontractor Information. OR For the Consultant and each Sub-consultant, the following must be completed.

Indicate all Business category(ies) that apply by initialing next to the applicable category(ies):

_____ **Small Business Enterprise (SBE)** - an independently owned and operated concern certified, or certifiable, as small business by the Federal Small Business Administration (SBA). (Size standards by Standard Industrial Classification codes required by the Federal Acquisition Regulations, Section 19.102, may be found at <http://www.sba.gov/content/table-small-business-size-standards>.) The eligibility requirements for California contracting purposes is on the [Department of General Services website](http://www.dgs.ca.gov/pd/Programs/OSDS/SBEligibilityBenefits.aspx) at <http://www.dgs.ca.gov/pd/Programs/OSDS/SBEligibilityBenefits.aspx>. The University may rely on written representation by the vendors regarding their status.

_____ **Disabled Veteran Business Enterprise (DVBE)** - a business that is at least 51% owned by one or more disabled veterans or, in the case of any publicly owned business, at least 51% of the stock of which is owned by such individuals and whose management and daily business operations are controlled by one or more of such individuals. A Disabled Veteran is a veteran of the military, naval, or air service of the United States with a service connected disability who is a resident of the State of California. To qualify as a veteran with a service connected disability, the person must be currently declared by the United States Veterans Administration to be 10% or more disabled as a result of service in the armed forces.

_____ **Disadvantaged Business Enterprise (DBE)** - a business concern that is at least 51% owned by one or more socially and economically disadvantaged individuals or, in the case of any publicly owned business, at least 51% of the stock of which is owned by such individuals and whose management and daily business operations are controlled by one or more of such individuals. Socially disadvantaged individuals are those who have been subjected to racial or ethnic prejudice or cultural bias because of their identity as members of a group without regard to their individual qualities. Economically disadvantaged individuals are those socially disadvantaged individuals whose ability to compete in the free private enterprise system has been impaired due to diminished capital and credit opportunities as compared to others in the same business area who are not socially disadvantaged. Business owners who certify that they are members of named groups (Black Americans, Hispanic Americans, Native Americans, Asian-Pacific Americans, Asian-Indian Americans) are to be considered socially and economically disadvantaged.

_____ **Women-Owned Business Enterprise (WBE)** - a business that is at least 51% owned by a woman or women who also control and operate it. "Control" in this context means exercising the power to make policy decisions. "Operate" in this context means being actively involved in the day-to-day management.

_____ **None of the above categories apply.**

SELF CERTIFICATION: ATTACHMENT C (continued)

I hereby certify under penalty of perjury under the laws of the State of California that I have read this certification and know the contents thereof, and that the business category indicated above reflects the true and correct status of the business in accordance with Federal Small Business Administration criteria and Federal Acquisition Regulations, FAR 19 pertaining to small, disadvantaged, women-owned, and disabled veteran business enterprises. I understand that falsely certifying the status of this business, obstructing, impeding or otherwise inhibiting any University of California official who is attempting to verify the information on this form may result in suspension from participation in University of California business contracts for a period up to five (5) years and the imposition of any civil penalties allowed by law.

INFORMATION FURNISHED BY:

(Print or Type the Name of Owner and/or Principal)

NAME OF BUSINESS:

NAME:

TITLE:

SIGNATURE:

DATE:

PRIVACY NOTIFICATION

The State of California Information Practices Act of 1977 (effective July 1, 1978) requires the University of California to provide the following information to individuals who are asked to supply personal information about themselves. Information furnished on the Self-Certification form may, in some cases, identify an individual's personal information.

- The University of California, Los Angeles, is requesting the information contained in this form and the accompanying Report of Subcontractor Information.
- The Small Business Outreach Program Manager at the University of California, Los Angeles, is responsible for maintaining the requested information. The contact information for the Small Business Outreach Program Manager may be found at: <http://www.ucop.edu/procurement-services/files/sbdmgr.xlsx>
- The maintenance of information is authorized in part by Public Contract Code section 10500.5.
- Furnishing the information requested on this form is mandatory. If SBE, DBE, WBE and/or DVBE status is applicable, furnishing such information is mandatory.
- Failure to provide the information may be a violation of bidding procedures and/or breach of the contract and the University may pursue any and all remedies permitted by the provisions of the Contract Documents.
- The information on this form is collected for monitoring and reporting purposes in accordance with state law and University policy.
- The individual may access information contained in this form and related forms by contacting the Small Business Outreach Program Manager(s).

<div>MODERATE RISK</div> <div>Refer to Risk Category Chart Above – Applies to: Facility Related Consulting Services –</div> <div>Not for the following services:<ul style="list-style-type: none">Structural Design / EngineeringGeotechnicalEnvironmental</div>	COVERAGE TYPE	MINIMUM LIMITS	FORM & REQUIRED ENDORSEMENTS
	Workers' Compensation/ Employer's Liability	Workers' Compensation: Statutory Employer's Liability: \$1,000,000 Each Employee \$1,000,000 Each Accident \$1,000,000 Policy Limit	FORM: As required in the state where work performed ENDORSEMENTS: <ul style="list-style-type: none">Waiver of Subrogation
	Business Auto Liability	\$1,000,000 per Accident Combined Single Limit – Bodily Injury / Property Damage applicable to all Owned, Non-Owned and Hired Autos	FORM: Standard CA 00 01 ENDORSEMENTS: <ul style="list-style-type: none">Additional InsuredWaiver of SubrogationPrimary & Non-Contributory Clause
	General Liability	\$2,000,000 per Occurrence \$2,000,000 Annual General Aggregate (Per Location or Per Project preferred) \$2,000,000 Personal & Advertising Injury \$2,000,000 Products/Completed Operations	FORM: Per Occurrence (2004 or later edition of ISO Form CG 0001, or its equivalent) ENDORSEMENTS: <ul style="list-style-type: none">Additional Insured ISO Forms acceptable*: CG2010 (10/01) and CG2037 (10/01) or CG2010 (07/04) and CG2037 (07/04) or their equivalents *NOTE: If the earlier versions are not available, CG2010 (4/13) and CG2037 (4/13) can be accepted but only when the August 18, 2017 or later edition of the agreement is used.Waiver of SubrogationPrimary & Non-Contributory ClauseSeverability of Interest ClauseSeparation of InsuredsNo Cross Suits ExclusionGeneral Aggregate limit to apply Per Location/Per Project
	Professional (Errors & Omissions) Liability	\$2,000,000 Each Claim \$2,000,000 Annual Aggregate Limits may be adjusted upward in increments of \$1,000,000 or \$5,000,000, depending on scope of work and contract size. \${Limit as provided by Risk Management} Each Claim \${Limit as provided by Risk Management} Aggregate	FORM: Claims-Made TERM: Shall maintain at all times, while services contemplated by this agreement are being completed and for a minimum of 5 years after project completion.

PROFESSIONAL SERVICES AGREEMENT
between
THE REGENTS OF THE UNIVERSITY OF CALIFORNIA
and
{TBD}

This AGREEMENT is made on the _____ day of _____ in the year _____ between The Regents of the University of California, a California corporation, hereinafter called "University" and {TBD} hereinafter called "Consultant," to furnish certain services upon the following terms and conditions:

I. CONSULTANT SERVICES AND RESPONSIBILITIES

A. Consultant shall furnish the following services:

1. Act as a consultant to the University of California, Los Angeles, to perform {SCOPE OF SERVICES}, as required and authorized by University. Under this Agreement, Consultant may perform pre-design services but in no event does this Agreement authorize the preparation of any design documents, including Schematic Design.

University will authorize Consultant to perform specific services by the issuance of a Written Authorization(s) on the form contained in the Exhibits. Each Written Authorization will state the specific services to be performed, the schedule for their completion, and the method of compensation in accordance with Paragraph IV.

2. Furnish drawings, documents, reports, surveys, renderings, exhibits, models, prints, and photographs, and other materials as required and as authorized by University.

3. **{NOTE: THIS PARAGRAPH USED ONLY IF APPLICABLE TO SCOPE; OTHERWISE MARKED "NOT USED"}** Perform inspection services as described, pursuant to Written Authorization.

B. {NOTE: THIS PARAGRAPH USED ONLY IF CONSULTANT MAY ALSO ACT AS PROJECT'S DESIGN PROFESSIONAL; OTHERWISE MARKED "NOT USED"} Consultant hereby represents to University that:

1. Consultant acknowledges that it has been selected to perform services for the Project including services as Design Professional under the Executive Design Professional Agreement (EDPA) in the Exhibits;
2. Consultant acknowledges that University has deferred negotiations on a fee for Basic Services and rate schedule for Additional Services described in the EDPA; and
3. Consultant has read and understood the EDPA in the Exhibits and agrees to all of its terms and provisions.

C. {NOTE: THIS PARAGRAPH USED ONLY IF CONSULTANT MAY ALSO ACT AS PROJECT'S DESIGN PROFESSIONAL; OTHERWISE MARKED "NOT USED"} If University requires Consultant's services as Design Professional for the Project, Consultant agrees to the following:

1. Consultant will not request any modifications to those terms and provisions to the EDPA and will execute the EDPA in the form in the Exhibits; and
2. Consultant will negotiate in good faith both a fee to perform the Basic Services and a rate schedule to perform Additional Services based on its then current rate structure consistent with its normal practice and consistent with University guidelines for fees and rates for similar projects.

II. TERM

- A. Order Period. The period of time for issuance of written Authorizations to Perform Services (hereinafter "Order Period") shall be from {TBD} to {TBD}.
- B. Period of Performance. The period of performance under the Agreement shall be as specified in any written Authorizations to Perform Services, or subsequent revisions thereto, issued during the Order Period. However, the period of performance shall not commence prior to the date of execution of any such written Authorization.
- C. University-Initiated Termination.
1. If University determines that Consultant has failed to perform in accordance with the terms and conditions of this Agreement, University may terminate all or part of the Agreement for cause. This termination shall become effective if Consultant does not cure its failure to perform within 10 days (or more, if authorized in writing by University) after receipt of a notice of intention to terminate from University specifying the failure in performance. If a termination for cause does occur, University shall have the right to withhold monies otherwise payable to Consultant until the services under this Agreement are completed. If University incurs additional costs, expenses, or other damages due to the failure of Consultant to properly perform pursuant to the Agreement, these costs, expenses, or other damages shall be deducted from the amounts withheld. Should the amounts withheld exceed the amounts deducted, the balance will be paid to Consultant upon completion of the services to be provided under this Agreement. If the costs, expenses, or other damages incurred by University exceed the amounts withheld, Consultant shall be liable to University for the difference.
 2. University may terminate this Agreement for convenience at any time upon written notice to Consultant, in which case University will pay Consultant for all services performed and all expenses incurred under this Agreement up to and including the effective date of termination less any costs, expenses or other damages due to the failure of Consultant to properly perform pursuant to the Agreement. In ascertaining the services actually rendered up to the date of termination, consideration will be given to both completed Work and Work in progress, whether delivered to University or in the possession of Consultant, and to authorized Reimbursable Expenses. No other compensation will be payable for anticipated profit on unperformed services.
- D. Consultant-Initiated Termination.
- Consultant may terminate this Agreement for cause if University fails to cure a material default in performance within a period of 30 days, or such longer period as Consultant may allow, after receipt from Consultant of a written termination notice specifying the default in performance. In the event of termination for cause by Consultant, University will pay Consultant in accordance with subparagraph II.C.2.

III. GENERAL PROVISIONS

- A. Independent Contractor. Consultant shall perform the services hereunder as an independent contractor and not as an agent or employee of University.
- B. Consultant Hiring. Consultant shall not hire any officer or employee of University to perform any service covered by this Agreement. If the service is to be performed in connection with a federal contract or grant, Consultant shall not hire any employee of the United States government to perform any service covered by this Agreement.
- C. Subconsultants. Consultant shall cooperate with other professionals employed by University in the production of other work related to its services. Subject to approval by University, Consultant shall contract for or employ, at its expense, such professional subconsultants as Consultant deems necessary for the completion of the services. Consultant may hire the

services of subconsultants with University approval in place of or in addition to those employed or retained by Consultant. Consultant is as responsible for the performance of its subconsultants as it would be if it had rendered these services itself. Nothing in the foregoing procedure shall create any contractual relationship between University and the professionals employed by Consultant under the terms and conditions of this Agreement. Consultant is solely responsible for payment of any subconsultants.

- D. Legal and Regulatory Compliance. Consultant shall perform all services and prepare documents in compliance with the applicable requirements of laws, codes, rules, regulations, ordinances, and standards.
- E. Copyright, Ownership and Use of Materials. Consultant hereby assigns to the University all right, title, and interest, including, but not limited to, copyright and all copyright rights, in all Materials created by Consultant in its performance under this Agreement and/or delivered to the University hereunder and shall execute any documents necessary to effectuate such assignment, with the exception that Consultant hereby grants to the University an irrevocable, fully-paid up, royalty-free license to use any document provided to the University including without limitation any document known as a "detail." Consultant warrants that it has the lawful right to grant the foregoing license to the University. In the event Consultant uses any individual who is not a full-time employee of Consultant or entity to perform any work required of it pursuant to this Agreement, Consultant shall require said individual or entity to sign an agreement containing identical wording as the foregoing with the exception that word "Consultant" is to be replaced with the individual's or entity's name. Materials constitute all written and other tangible expressions, including, but not limited to, drawings, documents, reports, surveys, renderings, exhibits, models, prints, photographs, etc. All Materials furnished by the Consultant hereunder shall be and shall remain the property of the University. In the event of Agreement termination by either party for any reason, as provided under this Agreement, the University will have the right to receive, and the Consultant shall promptly provide to the University, all drawings, documents, reports, surveys, renderings, exhibits, models, prints, photographs, and other materials prepared by the Consultant for the services under this Agreement. In the event of termination, and any dispute regarding the amount to be paid under this Agreement notwithstanding, the University retains the right to receive and use any such documents or materials. The foregoing provisions shall survive the term and termination of this Agreement.
- F. Consultant's Accounting Records. *Consultant's Accounting Records.* All books and records relating to this Agreement shall be maintained in accordance with Generally Accepted Accounting Principles (GAAP) or International Financial Reporting Standards (IFRS). University or University's authorized representative shall have access to and the right to audit and the right to copy all of Consultant's books and records. Consultant records shall include but not be limited to accounting records (hard copy, as well as computer readable data if it can be made available); contracts; payroll records; subconsultant agreements; vendor agreements; purchase orders; leases; original estimates; estimating work sheets; correspondence; receipts; memoranda; and any other supporting evidence deemed necessary to substantiate charges under this agreement. All such books and records shall be preserved for a period of at least 3 years from the date of Final Payment under this Agreement.
- G. Conflict of Interest. Consultant affirms that to the best of its knowledge there exists no actual or potential conflict between Consultant's family, business, or financial interests (including services provided to another client) and the services provided under this Agreement, and that in the event of a change in either the private interests or services under this Agreement, any questions regarding a possible conflict of interest that may arise as a result of this change shall be disclosed in writing to University. Consultant shall not be in a reporting relationship to a University employee who is a near relative, nor shall the near relative be in a decision-making position with respect to Consultant.
- H. Successors and Assigns. If Consultant transacts business as an individual, upon Consultant's death or incapacitation, University will automatically terminate this Agreement

as of the date of such event. If so terminated, neither Consultant nor Consultant's estate shall have any further right to perform hereunder, and University shall pay Consultant or the estate the prorated unpaid compensation due under Article IV for any services rendered prior to this termination.

If there is more than one Consultant, and any one of them dies or becomes incapacitated, and the others continue to render the consulting services covered herein, University will make payments to those continuing as though there had been no death or incapacitation; University will not be obliged to take any account of the person who died or became incapacitated or to make any payment to this person or this person's estate. These provisions shall apply in the event of progressive or simultaneous occasions of death or incapacitation among any group of persons named as Consultant herein; if death or incapacitation befalls the last member of this group before the services of this Agreement are fully performed, then the rights shall be as if there had been only one Consultant.

This Agreement shall be binding upon University and Consultant and their respective successors and assigns. Neither the performance of this Agreement nor any part thereof, nor any monies due or to become due hereunder, may be assigned by Consultant without the prior written consent and approval of University.

- I. Information Furnished by University. If required for the performance of Consultant's services, University will furnish information, surveys, reports, as-builts, and other materials at University's expense.
- J. Statistical Reporting. At the commencement of performance, Consultant shall complete and submit, and require each Subconsultant who performs services under this Agreement to complete and submit, a Self-Certification on the form contained in the Exhibits. At the completion of work and prior to final payment, Consultant shall complete and submit a Final Distribution of Contract Dollars under this Agreement on the form contained in the Exhibits.
- K. Confidentiality. Consultant shall use his or her best efforts to keep confidential a) any information produced or created by Consultant under this Agreement including but not limited to test results, sampling results, data, plans and reports; b) any information provided by University and marked "Confidential Information"; or c) any oral information conveyed to Consultant by University and followed by a written communication within thirty (30) days that said information shall be considered Confidential Information. In the event that Consultant determines that it has a legal obligation to disclose such Confidential Information pursuant to a third party demand, Consultant shall notify the University in writing of its receipt of such demand and of Consultant's determination that it has a legal obligation to disclose Confidential Information. Consultant shall not disclose any such Confidential Information until at least ten (10) days from the date of receipt by University of Consultant's written notice. This nondisclosure provision shall not apply to any of the following:
 - 1. Information which Consultant can demonstrate by written records was known to him or her prior to the effective date of this Agreement;
 - 2. Information that is currently in, or in the future enters, the public domain other than through a breach of this Agreement or through other acts or omissions of Consultant; or
 - 3. Information that is obtained lawfully from a third party.
- L. Survival. The provisions of this Agreement which by their nature survive expiration or termination of the Agreement or Final Completion of any related Project or the performance of services under this Agreement, including any and all warranties, confidentialities, indemnities, payment obligations, and University's right to audit Consultant's books and records, shall remain in full force and effect after any expiration or termination of the Agreement or Final Completion of any related Project or the performance of services under this Agreement.

- M. UC Fair Wage. Consultant shall pay all persons providing services and/or any labor on site, including any University location, no less than UC Fair Wage (defined as \$13 per hour as of 10/1/15, \$14 per hour as of 10/1/16, and \$15 per hour as of 10/1/17) and shall comply with all applicable federal, state and local working condition requirements.
- N. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original but all of which together shall constitute one and the same Agreement. The counterparts of this Agreement may be executed via a University approved digital signature process and shall have the same force and effect as the use of a manual signature. University reserves the right to reject any digital signature that cannot be positively verified by the University system as an authentic digital signature.

IV. COMPENSATION

- A. Compensation payable by University under this Agreement shall not exceed \${TBD}.
- B. University will have the right to withhold payment from Consultant for any unsatisfactory service until such time service is performed satisfactorily.
- C. University will compensate Consultant for the scope of services provided in accordance with this Agreement, computed as follows:
 - 1. For each Written Authorization, a maximum payment shall be established that shall not be exceeded without the prior written approval of University.
 - 2. All fees shall be in accordance with Consultant Rate Schedule contained in the Exhibits. Unless otherwise provided in Consultant Rate Schedule, rates shall not be changed except in accordance with Subparagraph VIII.A. Alternatively, a lump-sum fee may be negotiated.
 - 3. Payments to Consultant shall be made monthly, subsequent to University's receipt of an invoice itemizing the fees and reimbursable expenses for each Written Authorization for the month invoiced.
 - 4. Reimbursable expenses are actual expenditures made by Consultant and Consultant's employees and subconsultants in accordance with the Reimbursement Schedule contained in the Exhibits. Such reimbursable expenses will be paid in addition to the fees for services under this Agreement.

V. INDEMNIFICATION AND INSURANCE

A. INDEMNIFICATION

- 1. Consultant shall indemnify, defend, and hold harmless University and its Regents, officers, employees, agents, and representatives (collectively, "Indemnitee"), against all liability, demands, claims, costs, damages, injury including death, settlements, and expenses (including without limitation, interest and penalties) incurred by Indemnitee ("Losses") arising out of the performance of services or Consultants other obligations under this Agreement, but only in proportion to and to the extent such Losses are caused by or result from (1) the negligent acts or omissions of Consultant, its officers, agents, employees, subcontractors, subconsultants, or any person or entity for whom Consultant is responsible (collectively, "Indemnitor"); (2) the breach by Indemnitor of any of the provisions of this Agreement; or (3) willful misconduct by Indemnitor.
- 2. The indemnification obligations under this Article V shall not be limited by any assertion or finding that (1) the person or entity indemnified is liable by reason of non-delegable duty, or (2) the Losses were caused in part by the negligence of, breach of contract by, or violation of law by Indemnitee. The obligation to defend shall arise regardless of any claim or assertion that Indemnitee caused or contributed

to the Losses. Indemnitor's reasonable defense costs (including attorney and expert fees) incurred in providing a defense for Indemnitees shall be reimbursed by University except to the extent such defense costs arise, under principles of comparative fault, from Indemnitor's (a) negligent acts or omissions; (b) breach of any of the provisions of this Agreement; or (c) willful misconduct.

3. Consultant shall indemnify, defend, and save harmless Indemnitee from and against all loss, cost, expense, royalties, claims for damages or liability, in law or in equity, including, without limitation, attorney fees, court costs, and other litigation expenses that may at any time arise or be set up for any infringement (or alleged infringement) of any patent, copyright, trade secret, trade name, trademark or any other proprietary right of any person or entity in consequence of the use by Indemnitee of any documents (including any method, process, product, concept specified or depicted) supplied by Indemnitor in the performance of this Agreement.
4. Nothing in this Agreement, including the provisions of this Article V, shall constitute a waiver or limitation of any rights which Indemnitee may have under applicable law, including without limitation, the right to implied indemnity.

B. INSURANCE

1. Insurance Requirements. Consultant, at Consultant's sole cost and expense, shall insure its activities in connection with this Agreement, and shall obtain, keep in force, and maintain insurance as listed below. The coverages required under subparagraph V.B shall not in any way limit the liability of Consultant.
 - a. Commercial-Form General Liability Insurance with coverage and minimum limits as follows:

i.	Each Occurrence	{TBD}
ii.	Products Completed, Operations Aggregate	{TBD}
iii.	Personal and Advertising Injury	{TBD}
iv.	General Aggregate	{TBD}
 - b. Business Automobile Liability Insurance for owned, scheduled, nonowned, and hired automobiles, with a combined single limit of no less than \${TBD} per accident.
 - c. **{NOTE: PROFESSIONAL LIABILITY INSURANCE IS NOT REQUIRED FOR EVERY TYPE OF CONSULTING SERVICE}** Professional Liability Insurance with limits of \${TBD} per claim and \${TBD} in the aggregate.
 - d. If the above insurance (subparagraphs V.B.1.a – V.B.1.c) is written on a claims-made basis, it shall be maintained continuously for a period of no less than 3 years after the date of Final Completion of the services authorized pursuant to each Written Authorization executed. The insurance shall have a retroactive date of placement prior to, or coinciding with, the date services are first provided that are governed by the terms of this Agreement and shall include, without limitation, coverage for professional services as called for in this Agreement. Insurance required by subparagraphs V.B.1.a-V.B.1.c shall be (i) issued by companies that have a Best rating of A- or better, and a financial classification of VIII or better (or an equivalent rating by Standard & Poor or Moody's) or (ii) guaranteed, under terms consented to by University (such consent to not be unreasonably withheld), by companies with a Best rating of A- or better, and a financial classification of VIII or better (or an equivalent rating by Standard & Poor or Moody's).

- e. Workers' Compensation and Employer's Liability Insurance as required by Federal and State of California law. Insurance required by this subparagraph V.B.1.e shall be issued by companies (i) that have a Best rating of B+ or better, and a financial classification of VIII or better (or an equivalent rating by Standard & Poor's or Moody's); or (ii) that are acceptable to University.
- f. Consultant, upon the execution of this Agreement, shall furnish University with Certificate of Insurance evidencing compliance with this Article V, including the following requirements:
 - i. Consultant shall have the insurance company complete University's Certificate of Insurance on the form contained in the Exhibits. If Consultant's insurance company refuses to use University's Certificate of Insurance form, it must provide a Certificate of Insurance (and endorsements, if needed) evidencing compliance with subparagraph V.B. and Special Provisions 1 through 3 on the Certificate of Insurance Exhibit. It alone constitutes evidence of insurance.
 - ii. If insurance policies are canceled for non-payment, University reserves the right to maintain policies in effect by continuing to make the policy payments and assessing the cost of so maintaining the policies against Consultant.
 - iii. University, University's officers, agents, employees, consultants, University's Representative, and University's Representative's consultants, regardless of whether or not identified in the Contract Documents or to Consultant in writing, will be included as additional insureds on Consultant's general liability policy for and relating to the Work to be performed by Consultant and Subcontractors. Consultant's general liability insurance policy shall name University as an additional insured pursuant to additional insured endorsement CG2010 (11/85) or a combination of both CG 2010 (10/01 or 07/04) and CG 2037 (10/01 or 07/04). The General Liability coverage shall contain a Severability of Interest provision and shall be primary insurance as respects The Regents of the University of California, its officers, agents and employees. Any insurance or self-insurance maintained by The Regents of the University of California shall be excess of and non-contributory with this insurance. This requirement shall not apply to Worker's Compensation and Employer's Liability Insurance. The Professional Liability insurance policy shall include Contractual Liability Coverage or endorsements to the insurance policies for Contractual Liability Coverage for liability that would exist in the absence of the contract.
 - iv. The General Liability and the Professional Liability insurance policies shall apply to the negligent acts, or omissions of Consultant, its officers, agents, employees, and for Consultant's legal responsibility for the negligent acts or omissions of its consultants and anyone directly or indirectly under the control, supervision, or employ of Consultant or Consultant's consultants.

VI. STATUTORY AND OTHER REQUIREMENTS

A. NONDISCRIMINATION

- 1. In connection with the performance of the Consultant pursuant to this Agreement, the Consultant shall provide equal treatment to, and not willfully discriminate against or allow harassment of, any employee or applicant for employment on the basis of:

race; color; religion; ancestry; national origin; sex; age; sexual orientation; physical or mental disability; veteran's status; medical condition (as defined in Section 12926 of the California Government Code); marital status; gender identity; pregnancy; citizenship (within the limits imposed by law or by The Regents' policy and including cancer-related or genetic characteristics); or service in the uniformed services (as defined by the Uniformed Services Employment and Reemployment Rights Act of 1994). Consultant will also take affirmative action to ensure that any such employee or applicant for employment is not discriminated against on any of the bases identified above. This equal treatment shall apply, but shall not be limited to, the following: upgrade, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeships. Consultant also agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause. Consultant will, in all solicitations or advertisements for employees placed by or on behalf of the consultant, state that qualified applicants will receive consideration for employment without regard to: race; color; religion; sex; age; ancestry; national origin; sexual orientation; physical or mental disability; veteran's status; medical condition (as defined in Section 12926 of the State of California Government Code and including cancer-related medical conditions and or genetic characteristics); genetic information (as defined in the Genetic Information Nondiscrimination Act of 2008 and including family medical history); marital status; gender identity, pregnancy, or citizenship (within the limits imposed by law or University's policy) or service in the uniformed services (as defined by the Uniformed Services Employment and Reemployment Rights Act of 1994). For purposes of this provision: (1) "Pregnancy" includes pregnancy, childbirth, and medical conditions related to pregnancy and childbirth; and (2) "Service in the uniformed services" includes membership, application for membership, performance of service, application for service, or obligation for service in the uniformed services.

B. PREVAILING WAGE RATES

1. For purposes of this Article, the term subcontractor or subconsultant shall not include suppliers, manufacturers, or distributors.
2. Consultant shall comply and shall ensure that all subcontractors or subconsultants comply with prevailing wage law pursuant to the State of California Labor Code, including but not limited to Sections 1770, 1771, 1771.1, 1772, 1773, 1773.1, 1774, 1775, 1776, 1777.5, and 1777.6 of the State of California Labor Code. Compliance with these sections is required by this Contract. The Work under this Contract is subject to compliance monitoring and enforcement by the State of California Department of Industrial Relations. References to Covered Services hereinafter shall mean services performed pursuant to this Agreement that are covered by the aforementioned provisions as implemented by the State of California Department of Industrial Relations.
3. The State of California Department of Industrial Relations has ascertained the general prevailing per diem wage rates in the locality, if any, listed in the Written Authorization for the performance of construction, alteration, demolition or repair work as defined in Section 1720 of the State of California Labor Code for each craft, classification, or type of worker required to perform the Covered Services hereunder. A schedule of the general prevailing per diem wage rates will be on file at University's principal facility office and will be made available to any interested party upon request. By this reference, such schedule is made part of this Agreement. Consultant shall pay not less than the prevailing wage rates, as specified in the schedule and any amendments thereto, to all workers employed by Consultant in the execution of the Covered Services hereunder. Consultant shall cause all subcontracts or subconsultant agreements to include the provision that all

subcontractors or subconsultants shall pay not less than the prevailing wage rates to all workers employed by such subcontractor or subconsultants in the execution of the Covered Services hereunder. Consultant shall forfeit to University, as a penalty, not more than \$200 for each calendar day, or portion thereof, for each worker that is paid less than the prevailing wage rates as determined by the Director of Industrial Relations for the work or craft in which the worker is employed for any portion of the Covered Services hereunder performed by Consultant or any subcontractor or subconsultant. The amount of this penalty shall be determined by the Labor Commissioner pursuant to applicable law. Such forfeiture amounts may be deducted from Consultant fee. Consultant shall also pay to any worker who was paid less than the prevailing wage rate for the work or craft for which the worker was employed for any portion of the Covered Services hereunder, for each day, or portion thereof, for which the worker was paid less than the specified prevailing per diem wage rate, an amount equal to the difference between the specified prevailing per diem wage rate and the amount which was paid to the worker.

C. PAYROLL RECORDS

1. Consultant and all subcontractors or subconsultants shall keep an accurate payroll record, showing the name, address, social security number, job classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journey person, apprentice, or other employee employed in connection with the Covered Services hereunder. All payroll records shall be certified as being true and correct by Consultant or subcontractors or subconsultants keeping such records; and the payroll records shall be available for inspection at all reasonable hours at the principal office of Consultant on the following basis:
 - a. A certified copy of an employee's payroll record shall be made available for inspection or furnished to such employee or the employee's authorized representative on request.
 - b. A certified copy of all payroll records shall be made available for inspection upon request to University, the State of California Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the State of California Division of Industrial Relations.
 - c. A certified copy of all payroll records shall be made available upon request by the public for inspection or copies thereof made; provided, however, that the request by the public shall be made to either University, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. The public shall not be given access to such records at the principal offices of Consultant or subcontractors or subconsultants. Any copy of the records made available for inspection as copies and furnished upon request to the public or any public agency by University shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address, and social security number. The name and address of Consultant awarded the Agreement or performing the Agreement shall not be marked or obliterated.
2. Consultant shall file a certified copy of the payroll records with the entity that requested the records within 10 days after receipt of a written request. Consultant shall inform University of the location of such payroll records for the Written Authorization, including the street address, city, and county; and Consultant shall, within 5 working days, provide notice of change of location of such records. In the event of noncompliance with the requirements of this subparagraph or with the State of California Labor Code Section 1776, Consultant shall have 10 days in which to comply following receipt of notice specifying in what respects Consultant must comply. Should noncompliance still be evident after the 10-day period, Consultant shall forfeit to University, as a penalty, \$100 for each day, or portion thereof, for each

worker, until strict compliance is accomplished. Such forfeiture amounts may be deducted from Consultant fee.

D. APPRENTICES

1. Only apprentices, as defined in the State of California Labor Code Section 3077, who are in training under apprenticeship standards and written apprentice agreements under Chapter 4, Division 3, of the State of California Labor Code, are eligible to be employed by Consultant and subcontractors or subconsultants as apprentices for the Covered Services hereunder. The employment and training of each apprentice shall be in accordance with the provisions of the apprenticeship standards and written apprentice agreements under which the apprentice is training and in accordance with prevailing wage law pursuant to the Labor Code, including but not limited to Section 1777.5. The Consultant bears responsibility for compliance with this section for all apprenticeable occupations.
2. Every apprentice shall be paid the standard wage to apprentices, under the regulations of the craft or trade at which the apprentice is employed, and shall be employed only for the Covered Services hereunder in the craft or trade to which the apprentice is indentured.
3. When Consultant or subcontractors or subconsultants employ workers in any apprenticeship craft or trade for the Covered Services hereunder, Consultant or subcontractors or subconsultants shall apply to the joint apprenticeship committee, which administers the apprenticeship standards of the craft or trade in the locality, if any, listed in the Written Authorization for the performance of construction, alteration, demolition or repair work as defined in Section 1720 of the State of California Labor Code, for a certificate approving Consultant or subcontractors or subconsultants under the apprenticeship standards for the employment and training of apprentices in the locality so identified. The committee will issue a certificate fixing the number of apprentices or the ratio of apprentices to journeypersons who shall be employed in the craft or trade on the Covered Services hereunder. The ratio will not exceed that stipulated in the apprenticeship standards under which the joint apprenticeship committee operates; but in no case shall the ratio be less than 1 hour of apprentice work for every 5 hours of journeyperson work, except as permitted by law. Consultant or subcontractors or subconsultants shall, upon the issuance of the approval certificate in each such craft or trade, employ the number of apprentices or the ratio of apprentices to journeypersons fixed in the certificate issued by the joint apprenticeship committee or present an exemption certificate issued by the Division of Apprenticeship Standards.
4. "Apprenticeship craft or trade," as used in this Paragraph, shall mean a craft or trade determined as an apprenticeship occupation in accordance with rules and regulations prescribed by the Apprenticeship Council.
5. If Consultant or subcontractors or subconsultants employ journeypersons or apprentices in any apprenticeship craft or trade in the locality, if any, listed in the Written Authorization for the performance of construction, alteration, demolition or repair work as defined in Section 1720 of the State of California Labor Code, and there exists a fund for assisting to allay the cost of the apprenticeship program in the trade or craft, to which fund or funds other contractors in the locality so identified are contributing, Consultant and subcontractors or subconsultants shall contribute to the fund or funds in each craft or trade in which they employ journeypersons or apprentices on the Covered Services hereunder in the same amount or upon the same basis and in the same manner done by the other contractors. Consultant may include the amount of such contributions in computing its compensation under the Agreement; but if Consultant fails to do so, it shall not be entitled to any additional compensation therefore from University.

6. In the event Consultant willfully fails to comply with this subparagraph VI.D, it will be considered in violation of the requirements of the Agreement.
7. Nothing contained herein shall be considered or interpreted as prohibiting or preventing the hiring by Consultant or subcontractors or subconsultants of journeyperson trainees who may receive on-the-job training to enable them to achieve journeyperson status in any craft or trade under standards other than those set forth for apprentices.

E. WORK DAY

1. Consultant shall not permit any worker providing Covered Services to labor more than 8 hours during any 1 day or more than 40 hours during any 1 calendar week, except as permitted by law and in such cases only upon such conditions as are provided by law. Consultant shall forfeit to University, as a penalty, \$25 for each worker employed in the execution of this Agreement by Consultant, or any subcontractors or subconsultant, for each day during which such worker is required or permitted to work providing Covered Services more than 8 hours in any 1 day and 40 hours in any 1 calendar week in violation of the terms of this subparagraph or in violation of the provisions of any law of the State of California. Such forfeiture amounts may be deducted from the compensation otherwise due under this Agreement. Consultant and each subcontractor or subconsultant shall keep, or cause to be kept, an accurate record showing the actual hours worked each day and each calendar week by each worker employed under this Agreement, which record shall be kept open at all reasonable hours to the inspection of University, its officers and agents, and to the inspection of the appropriate enforcement agency of the State of California.

F. PATIENT HEALTH INFORMATION

1. Consultant acknowledges that its employees, agents, subcontractors, consultants and others acting on its behalf may come into contact with Patient Health Information ("PHI") while performing work at the Project Site. This contact is most likely rare and brief (e.g. walking through a clinic where patient files may be visible, overhearing conversations between physicians while working or touring a hospital, noticing a relative or acquaintance receiving treatment in a University facility, etc.). Consultant shall immediately notify University's Representative of any such contact. Any and all forms of PHI should not be examined closer, copied, photographed, recorded in any manner, distributed or shared. Consultant will adopt procedures to ensure that its employees, agents and subcontractors refrain from such activity. If Consultant, its employees, agents or subcontractors do further examine, copy, photograph, record in any manner, distribute or share this information, Consultant will report such actions immediately to University's Representative. Consultant will immediately take all steps necessary to stop any such actions and will ensure that no further violations of this contractual responsibility will occur. Consultant will report to University's Representative within five (5) days after Consultant gives University's Representative notice of the event/action of the steps taken to prevent future occurrences.

VII. NOTICES

- A. University. Any notice may be served upon University by delivering it, in writing, to University at the address set forth on the last page of this Agreement, by depositing it in a United States Postal Service deposit box with the postage fully prepaid and with the notice addressed to University at the aforementioned address, or by sending a facsimile of it to University facsimile number set forth on the last page of this Agreement.
- B. Consultant. Any notice may be served upon Consultant by delivering it, in writing, to Consultant at the address set forth on the last page of this Agreement, by depositing it in a United States Postal Service deposit box with the postage fully prepaid and with the notice

addressed to Consultant at this address, or by sending a facsimile of it to Consultant facsimile number set forth on the last page of this Agreement.

VIII. AUTHORITY OF AGREEMENT

A. This Agreement represents the entire and integrated agreement between University and Consultant and supersedes all prior negotiations, representations, or agreements, either written or oral. This Agreement may be modified only by a written instrument signed by both University and Consultant and the written instrument shall be an Amendment on the form contained in the Exhibits.

B. This Agreement includes the following Exhibits attached herewith:

Exhibit A:	Written Authorization to Perform Services
Exhibit B:	Consultant Rate Schedule
Exhibit C:	Reimbursement Schedule
Exhibit D:	Certificate of Insurance
Exhibit E:	Amendment
Exhibit F:	Not Used
Exhibit G:	Not Used

{ NOTE: EXHIBIT H USED ONLY IF CONSULTANT MAY ALSO ACT AS PROJECT'S DESIGN PROFESSIONAL; OTHERWISE MARKED "NOT USED" }

Exhibit H:	Executive Design Professional Agreement
Exhibit SC:	Self-Certification
Exhibit FD:	Final Distribution of Contract Dollars

IN WITNESS WHEREOF, UNIVERSITY and CONSULTANT have executed this Agreement on the date(s) set forth below.

CONSULTANT

{TBD}

(Printed Name)

(Title)

By: _____
(Signature)

(Date)

CONSULTANT ADDRESS:

CONSULTANT TELEPHONE NUMBER:

CONSULTANT FACSIMILE NUMBER:

CONSULTANT TAX I.D. NUMBER:

UNIVERSITY:

THE UNIVERSITY OF CALIFORNIA, LOS ANGELES

By: _____
(Signature)

(Date)

UNIVERSITY ADDRESS:

UNIVERSITY FACSIMILE NUMBER:

UNIVERSITY PROJECT MANAGER:

EXHIBIT A

- SAMPLE -

AUTHORIZATION NUMBER TO PERFORM SERVICES

for the
PROFESSIONAL SERVICES AGREEMENT
between
THE REGENTS OF THE UNIVERSITY OF CALIFORNIA
and
{TBD}
made on the {PSA Execution Date}

(Note: Order Period is from {TBD} through {TBD}).)

Project Name: <Internal Project Name>
Project Number: <Internal_Project_Number>

- I. IN ACCORDANCE WITH THE TERMS OF THE AGREEMENT ABOVE, YOU ARE HEREBY AUTHORIZED TO PERFORM THE FOLLOWING SERVICES:

{Brief_Project_Description}

- II. **{UCLA: USE THE FOLLOWING ¶ II FOR FIXED FEE ONLY & DELETE ALL REMAINING ¶ IIs}**

NEGOTIATED FIXED FEE SHALL BE: \${UCLA: FILL IN}

- II. **{UCLA: FOR FEMA AUTHS, USE THE FOLLOWING ¶ II FOR TIME & MATERIALS ONLY, & DELETE ALL REMAINING ¶ IIs}** COMPENSATION SHALL BE MADE IN ACCORDANCE WITH CONSULTANT DIRECT PAYROLL COST RATE SCHEDULE IN THIS AGREEMENT, (SEE EXHIBIT B)

A. FIXED PROFIT FEE SHALL NOT EXCEED: \${UCLA: FILL IN}

B. TOTAL COMPENSATION (INCLUDING THE FIXED PROFIT FEE REFERENCED ABOVE) SHALL NOT EXCEED: \${UCLA: FILL IN}

- II. **{UCLA: FOR NON-FEMA AUTHS, USE THE FOLLOWING ¶ II FOR TIME & MATERIALS ONLY, & DELETE ALL REMAINING ALTERNATE ¶ IIs}** COMPENSATION SHALL BE MADE IN ACCORDANCE WITH CONSULTANT RATE SCHEDULE IN THIS AGREEMENT, (SEE EXHIBIT B), AND SHALL NOT EXCEED: \${UCLA: FILL IN}

- III. SERVICES AUTHORIZED TO BE COMPLETED WITHIN: **{AMOUNT OF TIME: number of days, a specific date.}**

{OPTIONAL: INSERT THE FOLLOWING ITEM IV ONLY IF AUTHORIZATION IS FOR SERVICES TO BE PERFORMED DURING DESIGN OR PRECONSTRUCTION OF AN IDENTIFIED PROJECT.}

- IV. LOCALITY FOR PERFORMANCE OF WORK

The locality for the performance of construction, alteration, demolition or repair work as defined in Section 1720 of the State of California Labor Code for the purposes of Article VI of the Agreement will be Los Angeles County.

This Authorization has been executed on the {DATE} day of {MONTH}, {YEAR}.

Consultant: {TBD}

(Printed Name)

(Title)

By: _____
(Signature)

(Date)

CONSULTANT ADDRESS:

CONSULTANT TELEPHONE NUMBER:

CONSULTANT FACSIMILE NUMBER:

UNIVERSITY:

THE UNIVERSITY OF CALIFORNIA, LOS
ANGELES

(Printed Name)

(Title)

By: _____
(Signature)

(Date)

UNIVERSITY ADDRESS:

UNIVERSITY FACSIMILE NUMBER:

UNIVERSITY PROJECT MANAGER:

EXHIBIT B
CONSULTANT RATE SCHEDULE
for the
PROFESSIONAL SERVICES AGREEMENT
(Dated from {TBD} through {TBD})
between
THE REGENTS OF THE UNIVERSITY OF CALIFORNIA
and
{TBD}

TBD

{ONE OF THE FOLLOWING MAY BE INCLUDED:}

The above rates will be adjusted biennially in accordance with changes in the Consumer Price Index (CPI).

{OR}

The above rates will be adjusted annually in accordance with actual rate increases paid to personnel. Notwithstanding the preceding, the rate increase for an individual employee shall not exceed **{INSERT PERCENTAGE e.g. 3%}** annually.

EXHIBIT C
REIMBURSEMENT SCHEDULE
for the
PROFESSIONAL SERVICES AGREEMENT
(Dated from {TBD} through {TBD})
between
THE REGENTS OF THE UNIVERSITY OF CALIFORNIA
and
{TBD}

Consultant will be reimbursed actual expenditures (up to the maximum limit) in accordance with the following reimbursement schedule only when said expenditures are authorized in writing in advance by University, and only when paid invoices, receipts or other proof of payment is submitted:

TRANSPORTATION RELATED EXPENSES:

Item	Description	Maximum Limit
Mileage	Non-rented car	Current Rate*
Per diem	Daily meal and incidental expenses (for periods in excess of 24 hours)	\$62.00**
Air Fare	Refundable ticket, coach, roundtrip	As approved in advance by University
Rental car	Rented car	As approved in advance by University
Hotel	Lodging expenses must be supported by original itemized receipts, regardless of the amounts incurred, and must be reasonable for the locality of travel. The traveler must be at least forty miles from the headquarter location or home, whichever is closer, to be reimbursed for an overnight stay.	

- * The mileage reimbursement rate is the standard rate for automobiles published by University in Business & Finance Bulletin G-28, "Policy and Regulations Governing Travel," as may be adjusted from time to time by University. Said rate is currently 53.5 cents/mile.
- ** For travel of less than 24 hours, Meals and Incidental Expenses ("M&IE") shall not be reimbursed unless the travel includes an "overnight stay" as supported by a lodging receipt. For domestic travel, reimbursement is limited to the actual cost of lodging. Actual M&IE shall be reimbursed up to a maximum of \$62.00 for the entire trip. An exception to the overnight stay requirement may be allowed when the traveler incurs a meal expense as part of a business meeting and must be substantiated as specified in advance by University.

Transportation, lodging, per diem and related expenses for travel between the Consultant's offices and travel between offices of Consultant and offices of its subconsultants are not reimbursable. Transportation expenses shall be paid on the same basis and shall be subject to the same conditions as those in effect for employees of University. These expenses shall not be compensable unless authorized, in writing, in advance by University and subject to the following condition(s):

Transportation, lodging, and living expenses shall be reimbursable only while traveling outside the greater Los Angeles area.

REPRODUCTION, POSTAGE, AND MISCELLANEOUS EXPENSES:

Expenses for printing, reproductions, postage, handling and delivery for documents, reports, surveys, drawings, and other materials, excluding reproductions for office use by Consultant and the its subconsultants and postage and delivery for transmittals between Consultant's offices or between Consultant and its subconsultants.



CERTIFICATE OF LIABILITY INSURANCE

(for non-UCIP Construction Projects and Consultant/Design Contracts)

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:	
	PHONE (A/C, No, Ext):	FAX (A/C, No):
	E-MAIL ADDRESS:	
	INSURER(S) AFFORDING COVERAGE	
INSURED	INSURER A:	
	INSURER B:	
	INSURER C:	
	INSURER D:	
	INSURER E:	
	INSURER F:	

COVERAGES

CERTIFICATE NUMBER:

REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
	GENERAL LIABILITY <input type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC						
	AUTOMOBILE LIABILITY <input type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> HIRED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> NON-OWNED AUTOS						
	UMBRELLA LIAB <input type="checkbox"/> OCCUR EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED <input type="checkbox"/> RETENTION \$ <input type="checkbox"/>						
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? <input type="checkbox"/> Y/N (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below		N/A				WC STATUTORY LIMITS <input type="checkbox"/> OTH-ER <input type="checkbox"/>
	PROFESSIONAL LIABILITY <input type="checkbox"/> OCCUR <input type="checkbox"/> CLAIMS-MADE						

Special Provisions:

- The Regents of the University of California, The University of California, University, and each of their Representatives, consultants, officers, agents, employees, and each of their Representative's consultants, are included as additional insureds on the general liability policy as required by contract and pursuant to additional insured endorsement CG2010 (11/85) or a combination of both CG 2010 (10/01 or 07/04) and CG 2037 (10/01 or 07/04) but only in connection with ____ (name of project) ____.
- The General Liability coverage contains a Severability of Interest provision and shall be primary insurance as respects The Regents of the University of California, its officers, agents and employees. Any insurance or self-insurance maintained by The Regents of the University of California shall be excess of and non-contributory with this insurance.

CERTIFICATE HOLDER: The Regents of the University of California

Forward to: {Office, Room Number or Mail Stop}
University of California, {Facility}
{Street Address}
{City, State, Zip}

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

EXHIBIT E

AMENDMENT

for the
PROFESSIONAL SERVICES AGREEMENT
(Dated from {TBD} through {TBD})
between
THE REGENTS OF THE UNIVERSITY OF CALIFORNIA
and
{TBD}

Amendment Number {#}

The Agreement between the Regents of the University of California and {TBD}, dated {TBD}, to act as a Consultant to the University of California, Los Angeles, is hereby amended as follows:

{INSERT MODIFICATIONS TO THIS AGREEMENT. FOR EXAMPLE, THE TERM OF THE AGREEMENT MAY BE EXTENDED.}

EXAMPLES:

1. The term of this Agreement is extended to {Month} {Day}, {Year}.
2. Compensation payable by University under this Agreement, including any Amendments, shall not exceed \${AMOUNT IN FIGURES}.
3. Consultant Rate Schedule Exhibit is replaced with the revised Consultant Rate Schedule dated {INSERT DATE} and attached herewith.
4. The following provision is added to this Agreement:
{_____}.

All terms and conditions of this Agreement shall remain in full force and effect unless expressly modified herein or by another duly executed Amendment.

IN WITNESS WHEREOF, University and Consultant have executed this Amendment on the
{_____}.

EXHIBIT SC
SELF-CERTIFICATION
for the
PROFESSIONAL SERVICES AGREEMENT
(Dated from {TBD} through {TBD})
between
THE REGENTS OF THE UNIVERSITY OF CALIFORNIA
and
{TBD}

For the Contractor and each Subcontractor indicated on the Report of Subcontractor Information, the following must be completed.

OR

For the Consultant and each Sub-consultant, the following must be completed.

Indicate all Business category(ies) that apply by initialing next to the applicable category(ies):

(Initial if applicable) **Small Business Enterprise (SBE)** - an independently owned and operated concern certified, or certifiable, as small business by the Federal Small Business Administration (SBA). (Size standards by Standard Industrial Classification codes required by the Federal Acquisition Regulations, Section 19.102, may be found at <http://www.sba.gov/content/table-small-business-size-standards>.) The eligibility requirements for California contracting purposes is on the [Department of General Services website](http://www.dgs.ca.gov/pd/Programs/OSDS/SBEEligibilityBenefits.aspx) at <http://www.dgs.ca.gov/pd/Programs/OSDS/SBEEligibilityBenefits.aspx>. The University may rely on written representation by the vendors regarding their status.

(Initial if applicable) **Disabled Veteran Business Enterprise (DVBE)** - a business that is at least 51% owned by one or more disabled veterans or, in the case of any publicly owned business, at least 51% of the stock of which is owned by such individuals and whose management and daily business operations are controlled by one or more of such individuals. A Disabled Veteran is a veteran of the military, naval, or air service of the United States with a service connected disability who is a resident of the State of California. To qualify as a veteran with a service connected disability, the person must be currently declared by the United States Veterans Administration to be 10% or more disabled as a result of service in the armed forces.

(Initial if applicable) **Disadvantaged Business Enterprise (DBE)** - a business concern that is at least 51% owned by one or more socially and economically disadvantaged individuals or, in the case of any publicly owned business, at least 51% of the stock of which is owned by such individuals and whose management and daily business operations are controlled by one or more of such individuals. Socially disadvantaged individuals are those who have been subjected to racial or ethnic prejudice or cultural bias because of their identity as members of a group without regard to their individual qualities. Economically disadvantaged individuals are those socially disadvantaged individuals whose ability to compete in the free private enterprise system has been impaired due to diminished capital and credit opportunities as compared to others in the same business area who are not socially disadvantaged. Business owners who certify that they are members of named groups (Black Americans, Hispanic Americans, Native Americans, Asian-Pacific Americans, Asian-Indian Americans) are to be considered socially and economically disadvantaged.

(Initial if applicable) **Women-Owned Business Enterprise (WBE)** - a business that is at least 51% owned by a woman or women who also control and operate it. "Control" in this context means exercising the power to make policy decisions. "Operate" in this context means being actively involved in the day-to-day management.

(Initial if applicable) **None of the above categories apply.**

I hereby certify under penalty of perjury under the laws of the State of California that I have read this certification and know the contents thereof, and that the business category indicated above reflects the true and correct status of the business in accordance with Federal Small Business Administration criteria and Federal Acquisition Regulations, FAR 19 pertaining to small, disadvantaged, women-owned, and disabled veteran business enterprises. I understand that falsely certifying the status of this business, obstructing, impeding or otherwise inhibiting any University of California official who is attempting to verify the information on this form may result in suspension from participation in University of California business contracts for a period up to five (5) years and the imposition of any civil penalties allowed by law.

INFORMATION FURNISHED BY:

(Print or Type Name of Owner and/or Principal)

(Name of Business or Firm)

a

(Insert type of business e.g. corporation, sole proprietorship, partnership, etc.)

By:

(Print Name)

(Title)

(Signature)

(Date)

PRIVACY NOTICE

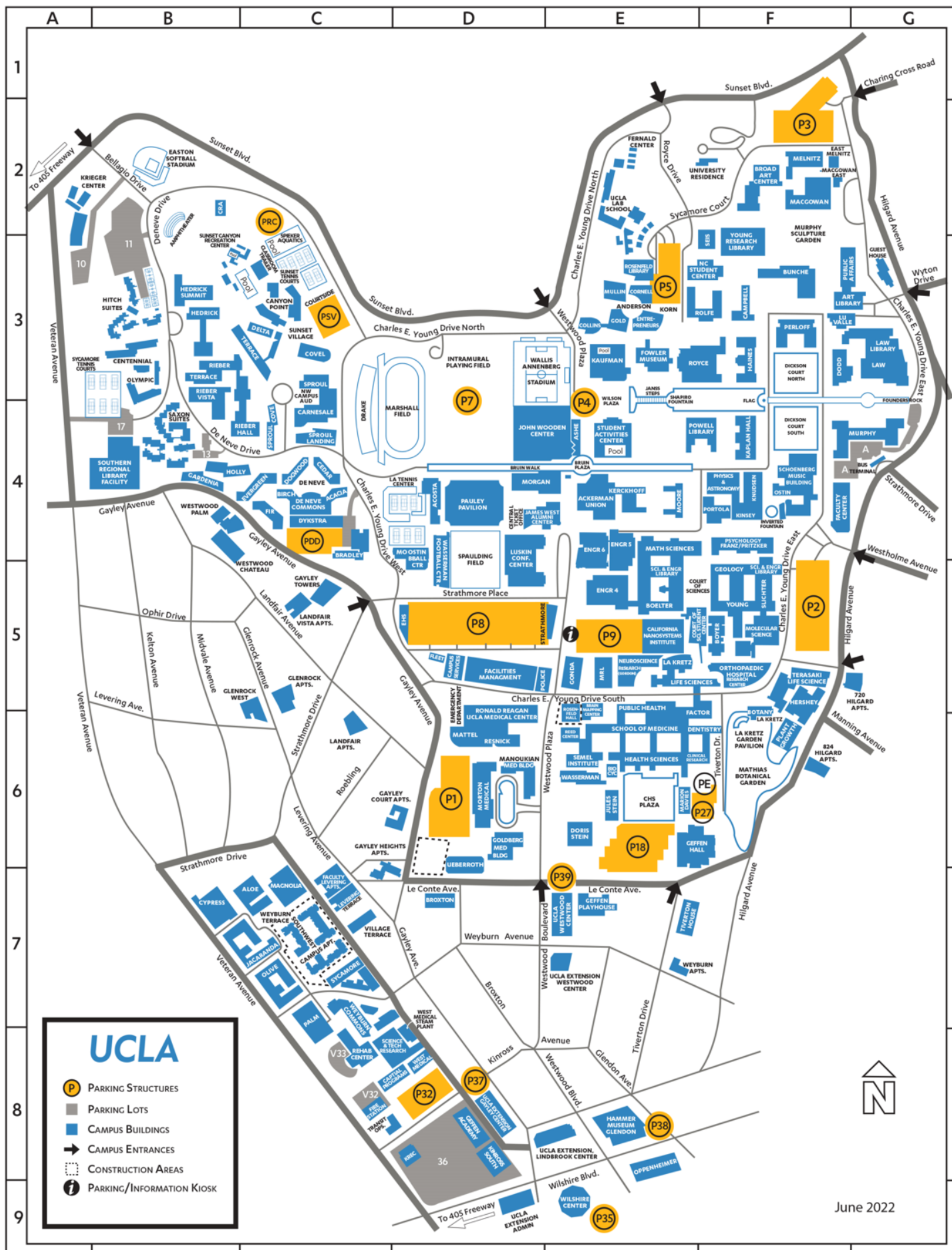
The State of California Information Practices Act of 1977 (effective July 1, 1978) requires the University of California to provide the following information to individuals who are asked to supply personal information about themselves. Information furnished on the Self-Certification form may, in some cases, identify personal information of an individual.

- The University of California, Los Angeles, is requesting the information contained in this form and the accompanying Report of Subcontractor Information.
- The Small Business Coordinator at the University of California, Los Angeles, is responsible for maintaining the requested information. The contact information for the Small Business Coordinators may be found at: <http://www.ucop.edu/procurement-services/files/sbdmgr.xlsx>.
- The maintenance of information is authorized in part by Public Contract Code section 10500.5.
- Furnishing the information requested on this form is mandatory. If SBE, DBE, WBE and/or DVBE status is applicable, furnishing such information is mandatory.
- Failure to provide the information may be a violation of bidding procedures and/or breach of the contract and the University may pursue any and all remedies permitted by the provisions of the Contract Documents.
- The information on this form is collected for monitoring and reporting purposes in accordance with state law and University policy.

The individual may access information contained in this form and related forms by contacting the Small Business Coordinator(s).

Sheet No. 1 of 1

Professional Services Agreement/ Standard
Exhibit FD Final Distribution of Contract - 1[illegible]





UCSD Urban Forest Management Plan

July, 2011



UCSD Urban Forest Management Plan

Samuel O. Oludunfe, BSF
ISA Certified Arborist #WE8574A
PNW-ISA CTRA #1219
UCSD Campus Urban Forester
UCSD Dept. of Facilities Management

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Brad L. Werdick
Director, UCSD Dept. of Physical Planning

Please direct all enquiries to Facilities Management Department, University of California, San Diego,
9500 Gilman Drive #0908, La Jolla, CA 92093-0908. Telephone: (858)534-2930.

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REGIONAL MAP OF UCSD





**UCSD's Designation as Tree Campus USA University, November, 2008:
L-R: AVC Russ Thackston, Assistant Director Chuck Morgan, VC Steve Relyea,
Chancellor Marye Anne Fox, Rhonda Glasscock (Toyota Representative)
& Woody Nelson (VP, National Arbor Day Foundation).**

VISION STATEMENT

**Provide for
safety of life and property.**

**Create
a sense of environmental stewardship
in the UCSD Campus community
for its urban forest.**

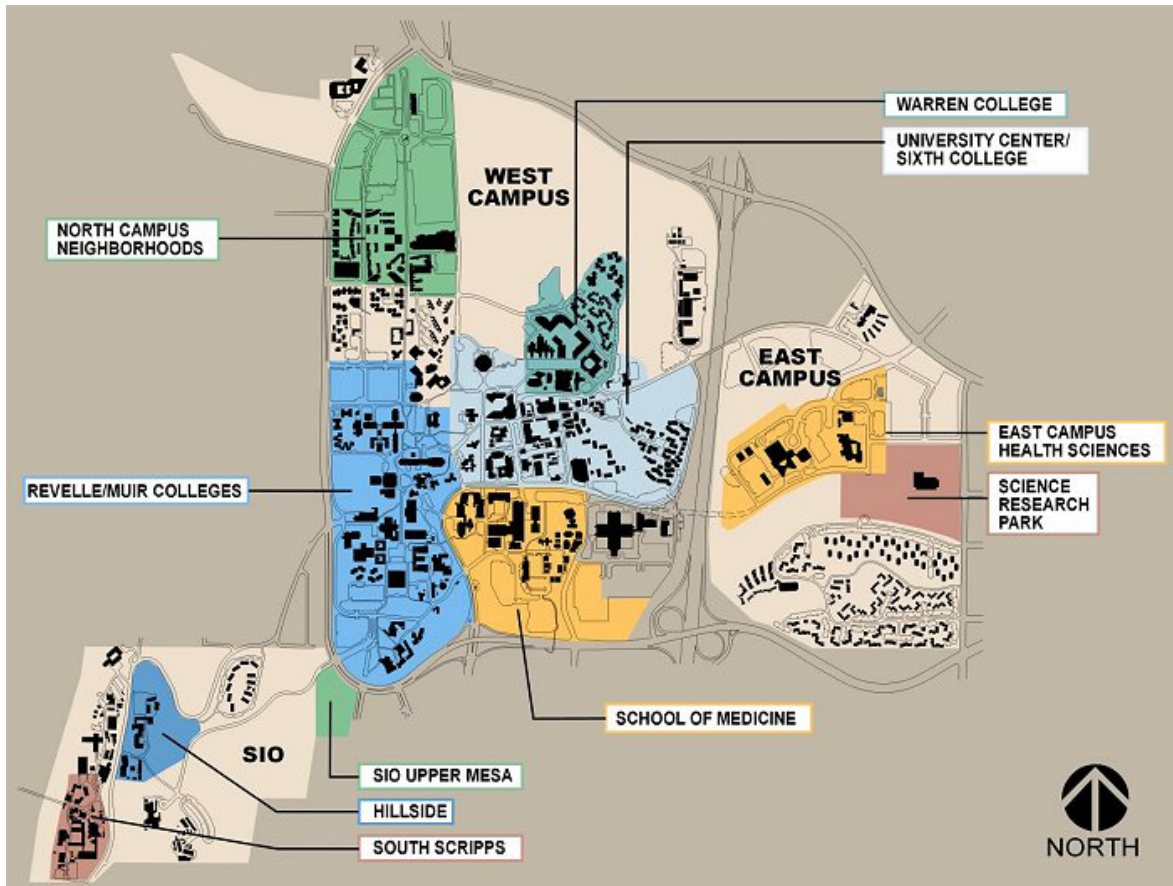
MISSION STATEMENT

**Enhance the quality of life
of the UCSD Campus community
while promoting safety,
sustaining aesthetics,
and providing a living laboratory
for research, education, and recreation
through responsible urban forest stewardship.**



**2009 Earth Week Celebrations at UCSD:
Students learning proper tree planting method**

UCSD NEIGHBORHOOD MAP



1. Executive Summary.

Urban Forestry has been defined as "...the sustained planning, planting, protection, maintenance, and care of trees, forests, greenspace and related resources in and around cities and communities for economic, environmental, social, and public health benefits for people. The definition includes retaining trees and forest cover as urban populations expand into surrounding rural areas and restoring critical parts of the urban environment after construction. Expansion at the urban/rural interface raises environmental and public health and safety concerns as well as opportunities to create educational and environmental links between urban people and nature. In addition, urban and community forestry includes the development of citizen involvement and support for investments in long-term ongoing tree planting, protection, and care programs." (Urban Forestry in North America: Towards a Global Ecosystem Perspective. pp 4-8. Deneke, F. 1993).

The University of California, San Diego (UCSD) has an estimated 250,000 trees on undeveloped parcels of its 1,200-acre coastal woodland. Most of the trees (86 genera, made up of 137 species) are Eucalyptus. This college urban forest shares with others many factors that prevent most urban trees from reaching their genetic potential. Inadequate growing space above and below ground, contaminated and compacted soils, physical damage by construction and landscape maintenance activities, and damage occasioned by vandals and errant motorists all contribute to the inherently difficult environment that grudgingly supports urban trees.

**UCSD's
arterial
Gilman Drive,
bordered
with trees**



2. Introduction.

2.1. Historical Overview.

The institution that became UCSD was first conceived by the University of California in the late 1950s during the post-war science boom. It was to be a graduate and research Institute of Technology and Engineering, providing instruction and research in mathematics, physics, chemistry, the earth and biological sciences, and engineering. These original plans were soon expanded into plans for a more general campus under the leadership of Roger Revelle, then Scripps Institution of Oceanography (SIO) director. The first faculty appointment was made in July 1957, and two years later, the UC Regents approved the University of California, La Jolla.

In 1960, the campus was renamed the University of California, San Diego, and its first graduate students were enrolled. UCSD admitted its first undergraduate students in 1964.

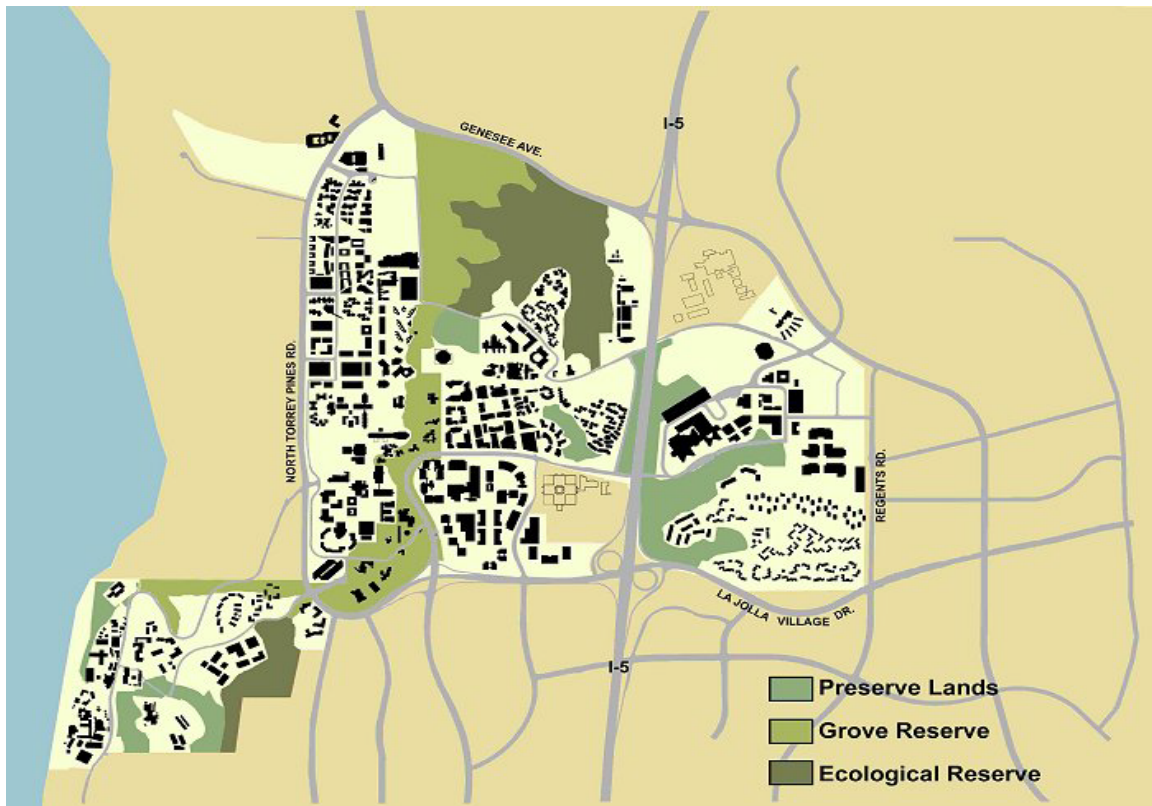


Aerial view of UCSD's main campus and La Jolla beach

The 1,200-acre UCSD campus is located in La Jolla in northern San Diego County on a dramatic mesa above the Pacific Ocean. It contains natural chaparral-filled canyons, eucalyptus groves, urban plazas, and green lawns. The campus architecture ranges from California cottages, World War II barracks, and structures from the fifties and sixties to more recent buildings influenced by postmodern architecture. Since its establishment in 1960, UCSD has emerged as one of the leading institutions of higher education in the United States. Including the Scripps Institution of Oceanography, the School of Medicine, and the Graduate School of International Relations and Pacific Studies, UCSD now has an enrollment of more than 25,000 graduate and

undergraduate students and is known worldwide for its research strengths in a variety of disciplines.

THE PARK AT UCSD



Located within the University of California, San Diego campus is a large, 112-acre belt of sugar gum (*Eucalyptus cladocalyx*) forest. Originally planted on a tight 8-foot grid for lumber supply in the early 1900's, the grove is a key feature of UCSD's beauty and identity. The Park Grove runs in a ribbon from Genesee Avenue in the north, through the heart of the central campus, to Scripps Institution of Oceanography in the south. Much of the original planting remains as a dense grid of 40 to 70 foot tall sugar gum eucalyptus. Irrigation systems have been installed in portions of the grove. Some areas have been replanted with young eucalyptus on 12-foot spacing. Three sections of the grove were identified as permanent overwintering sites for the Monarch butterfly (*Danaus plexippus*), one of the largest Monarch overwintering sites in Southern California. Its preservation is of paramount importance. The grove also promotes other wildlife, including small mammals and birds-of-prey. Artwork, part of the Stuart Collection, has been inspired by and placed within the grove.



**“The Stonehenge” –
The Stuart Collection’s La Jolla Project, 1984**

Many of the grove trees are 45 to 70 years old and in declining health. Because of the planting density, there are too few resources (such as available water, soil nutrients, and sunlight) to sustain the grove in a healthy condition. Competition between trees is intense. With both natural and human pressure, many trees will continue to succumb to insects and disease.

Furthermore, beginning in 1967, the University of California, San Diego (UCSD) has lost an average of 350 trees annually to storms, pest infestation, and diseases. As there has been no major tree planting or forest regeneration thrust, it is safe to assume that the pre-1967 estimate of UCSD’s tree population put at 250,000 has dwindled to an estimated 230,000.

2.2. Statement of Purpose.

Nestled along the Pacific Ocean on 1,200 acres of coastal woodland, the University of California, San Diego (UCSD) has a Eucalyptus Grove Reserve that is a physical feature of UCSD’s natural setting, a distinguishing component of the campus’ identity. Also scattered over the entire college grounds are pockets of other tree species, which comprise screens around facilities and street trees. All considered, UCSD has an ecological heritage - an acquired asset - that is at once a heterogeneous resource base for the sustainable provision of priceless benefits and a vast opportunity for environmental stewardship.

Over the years, UCSD's plans have emphasized the importance of preserving and enhancing the Grove as a visual, educational, recreational, and research amenity. Consequently, the University has designated the Eucalyptus Grove Reserve as an integral element of the UCSD Park to protect the open space amenity in perpetuity. Undeniably, however, large portions of the campus urban forest – especially the Eucalyptus Grove Reserve – are rapidly senescent.

Additionally, there are urban forest management issues that are begging for immediate attention and control. These include infrastructure conflicts, pests, and disease problems. Also, until recently, it was not uncommon to hear of tree removal for less than tenable reasons, by contractors that had not been vetted, on the instruction of some campus community members without prior consultation with the Landscape Services division of the Facilities Management department; scenarios such as this depict extra-departmental cultural practices that are incompatible with acceptable forestry and tree care industry standards.

Essentially, therefore, this Forest Management Plan sets out to provide a framework for the sustainable management and continuing enhancement of UCSD's urban forest resource by instituting and implementing specific cost-effective policies to guide campus tree planting, maintenance, and removal activities. The foregoing keystone program of procuring ecological, social and economic benefits in perpetuity is achievable by means of institutional strengthening, an unrelenting pursuit of optimal tree canopy density, and the active participation of the campus community in the environmentally progressive administration of the urban forest at UCSD. A melding of all these factors is certain to enhance the quality of life of the UCSD Campus community, while promoting safety, supporting aesthetics, providing a living laboratory for research and education, and affording amenities for recreation locally and regionally.

2.3. Synopsis of Benefits from UCSD's Urban Forest.

The USDA's Center for Urban Forest Research sited in the University of California at Davis has discovered that 100 mature trees intercept 210,000 gallons of rainwater per year. This translates to: (a) less storm water runoff and, consequently, less money spent on storm water control, (b) reduced soil erosion and water pollution, and (c) cleaner (forest-soil-filtered) storm water discharges. All the foregoing are of immense importance to UCSD, given its hilly, rugged location, with parts of its holdings on the Pacific Ocean beach actually designated as **Areas of Special Biological Significance** (ASBS).

Furthermore, from the standpoint of human health, the proper management of UCSD's urban forest enormously benefits both the region and the nation with the removal, by its estimated 230,000 trees, of 64,400 tons of carbon dioxide and 1.38 million pounds of pollutants from the atmosphere annually.

Moreover, according to [a study conducted by the Human-Environment Laboratory](#) of the University of Illinois at Urbana-Champaign, a tree-filled community, vis-à-vis one that is less forested, records a lower incidence of violence and vandalism, enjoys a safer and more sociable ambience, records lower stress levels in residents as well as affording them speedy recovery from ill-health. Where else could all of these benefits be sought after more keenly than at the University of California, San Diego, where 27,000 students live in campus halls of residence, and at least additional 26,000 people (faculty and staff) work on campus each day?

Economically speaking, judicious forest management which employs the right tree in the right place saves up to 34% of annual air condition costs, makes parking lots 3 degrees Fahrenheit cooler in summer months, prolongs the life of parking lots, makes the interior of parked cars 30 degrees Fahrenheit cooler, and saves 25% of winter heating costs. It is mind-boggling to imagine what these facts would mean to UCSD with its 736 buildings and 93 acres of paved parking lots!

Except where indicated otherwise, the benefits of urban forest trees cited in this section are based on extracts from [Temperate Interior West Tree Guide: Benefits, Costs, and Strategic Planting](#), General Technical Report # PSW-GTR-206 by Kelaine E. Vargas, et al, November 2007, Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station.

2.4. Safeguard of Life and Property at UCSD.

The implementation of this urban forest management plan is expected to resolve and keep in abeyance the many and varied forest management issues that currently afflict UCSD's trees. There is inadequate tree care coupled with the twin problems of disease and pest infestation; there are also problems of improper irrigation, allocation of unsatisfactory tree growing space around facilities, unauthorized tree removal by unqualified people, and insufficient consideration for matters affecting tree resource improvement in land development planning.

As a consequence to the foregoing forest management issues, incidence of tree failure is not uncommon on the campus and this is a serious safety concern to the entire campus community. It is not an overstatement, therefore, to say that proper management of the urban forest at UCSD will reduce the presence of danger to life, reduce the incidence of damage to valuable property, minimize the probability of costly litigation, and prevent the wholesale loss of the myriad benefits accruable to the University from its urban forest.

3. Program Administration.

3.1. Tree Resource Enhancement.

The University of California, San Diego occupies 1,200 acres, with the main campus in La Jolla occupying 1076 acres and other facilities in outlying areas making up the remaining 124 acres. Only an estimated 129 acres (or about 12%) of the main campus land area has some form of forest cover. This falls far short of the 40% canopy density that is desirable for UCSD.

As has been noted in other parts of this document, different species of eucalyptus make up the majority (more than 90%) of the trees at UCSD. There is a great need to begin to diversify tree species in non-grove areas to undermine the problems associated with monocultural ecosystems.

Moreover, it has become a priority to embark on a twofold program of deliberate reforestation and increase in new plantings in order to avoid wholesale loss of trees and its attendant colossal loss of benefits. The imperative of deliberate reforestation stems from the loss of trees that UCSD has sustained over the last 50 years, and which is likely to continue into the foreseeable future on account of previously unabated tree loss factors that have already been mentioned.

2008 ARBOR DAY FOUNDATION/TOYOTA TREE CAMPUS USA CEREMONIES

**UC San Diego Recognized
for Best Practices in Campus Forestry
by Arbor Day Foundation – November, 2008**



Chancellor Marye Anne Fox leading the way in campus tree canopy enhancement



UCSD Facilities Management staff planting a tree



A partnership that works: Urban Corps of San Diego County planting a tree with UCSD Students

4. Program Management.

4.1. Actions/Tasks.

The day-to-day management of UCSD's urban forest, including the sustainable planning, coordination/correlation of and approval for tree removal and tree planting, protection, maintenance and care of trees in the university's urban forest for environmental, social, and public health benefits for the campus community, shall remain vested in the Campus Urban Forester. In all cases of catastrophic events involving trees, the Campus Urban Forester and the Tree Crew Superintendent /Supervisor shall be the first responders.

4.2. Forest Conservation Policies.

The following policies and operation plans provide direction for the maintenance and enhancement of the Campus Urban Forest at UCSD.

4.2.1. Tree Inventory.

There is a big question mark hanging over the actual number of trees in UCSD's forest tracts. Based on total land area occupied by the University (the main campus sits on 1076 acres in La Jolla), and the high density of the trees growing thereon, UCSD had an estimated 250,000 trees at inception in 1960. However, pests and disease problems, infrastructure conflicts, damage by storms, and unauthorized removal of trees have all contributed to the shrinkage of the tree population on the campus. Yet, the question remains: how many trees does UCSD really have? Only a tree inventory can satisfactorily address this question.

By its very nature and mode of implementation, a tree inventory spotlights individual trees rather than whole stands. The system is a method of obtaining and organizing information about the number, condition (of health), and distribution of urban trees. Information that is accurate, accessible, and simple is one of the best tools for making planning and management decisions. With tree inventory information, program resources can be allocated appropriately among the various tree management functions, work can be scheduled for maximum efficiency, and financial decision-makers can evaluate various work plan proposals by comparing expected results with projected budgets.

Safety is rightly of a large concern at UCSD, taking cognizance of the large population of faculty, students, staff, and public visitors that

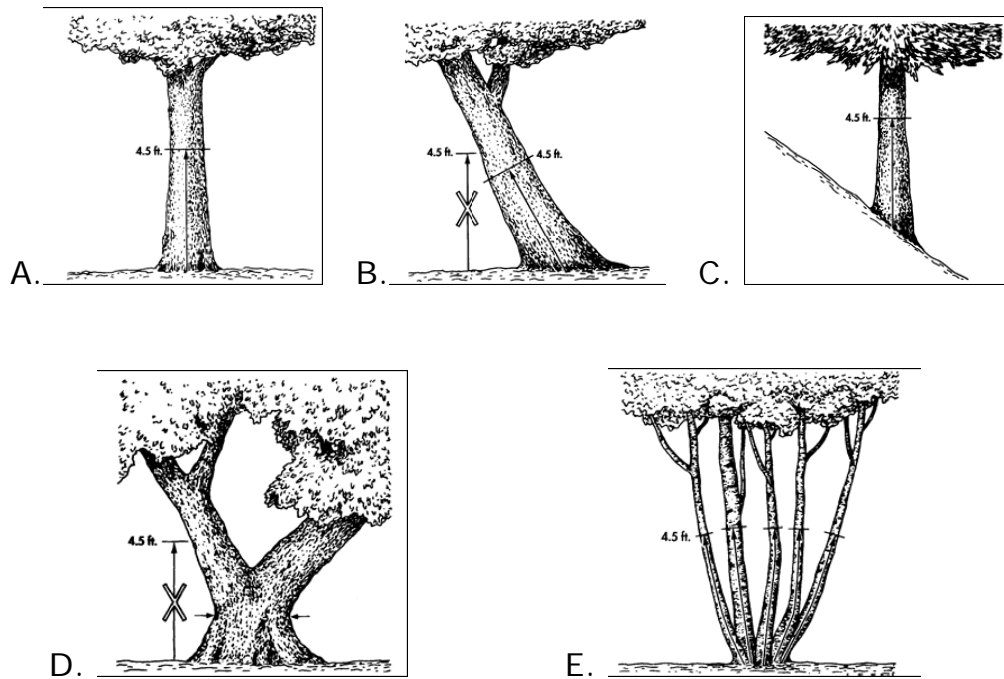
occupy and/or travel through the campus daily; proactive forest management that minimizes risks to life and damage to facilities as well as optimizes benefits is therefore crucial. It is only logical that the first inventory of the trees on UCSD Campus should kick off from the University Center, the hub of all activities on Campus and its part that witnesses the highest volume of pedestrian and vehicular traffic. This is so that forest management issues that have safety components can begin to receive crucial direct attention, as soon as feasible, with the aid of facts and figures generated from tree inventory field operations.

From the commencement of field operations, it is estimated that the tree inventory exercise will take 3 to 5 years to complete, contingent on fund availability.

The following attributes, at the minimum, will be collected during the inventory of street, park and utility trees:

- **Mapping coordinates.** X and Y coordinate locations (latitude and longitude). Each tree and planting site will be located using GIS maps and/or GPS equipment.
- **Facility Vicinity.** The location of each street tree and planting site so that they can easily be identified for future work. Street trees and planting sites will be located using a street name, side of lot, tree number, and facility vicinity information (on street, from street, and to street).
- **Area.** Tree locations will be identified by subdivision or campus code number.
- **Location.** The tree's physical location in relation to public Right of Way, important facilities, and/or public space will be recorded.
- **Species.** Trees will be identified by *genus* and *species*, and by common name.
- **Diameter.** Tree trunk diameter will be recorded. This shall be to the nearest 1 inch.

Illustration of Tree Measurement
(From: *Guide for Plant Appraisals, 9th Ed*).



a). Straight trunk: Trees with fairly straight, upright trunks should be measured four and a half (4.5) feet above the ground (See illustration A).

b). Trunk on an angle or on a slope: The trunk is measured at right angles to the trunk four and a half (4.5) feet along the center of the trunk axis, so the height is the average of the shortest and the longest sides of the trunk (see Illustrations B and C).

c). Trunk branching lower than four and a half (4.5) feet from the ground: When branching begins less than four and a half (4.5) feet from the ground, measure the smallest circumference below the lowest branch. In this example, an alternative would be to add the sum of the cross-sectional areas of the two stems measured about 12 inches above the crotch. Then average the sum of these two branch areas and the smallest cross-sectional area below the branches. This may give a better estimate of the tree size (see Illustration D).

d). Multi-stemmed tree: To determine the diameter of a multi-trunk tree, measure all the trunks; add the total diameter of the largest trunk to one-half (1/2) the diameter of each additional trunk (see Illustration E). A multi-trunked tree is differentiated from individual trees growing from a common root stock if there is a visible connection between the trunks above ground.

- **Stems.** The number of stems a tree has will be recorded.
- **Observations.** General observations referring to a tree's health, structure, and location will be made.
- **Clearance Requirement.** Trees, which are causing or may cause visibility or clearance difficulties for pedestrians or vehicles, will be identified, as well as those trees blocking clear visibility of signs or traffic signals.
- **Hardscape Damage.** Damage to sidewalks and curbs by tree roots are noted. Notes on potential fixes for the problem are encouraged (redesign options, etc).
- **Overhead Utilities.** The inventory indicates whether overhead conductors or other utilities are present at the tree site that could result in conflicts with the tree.
- **Grow space.** The area within the growing space is categorized as:

T	Tree Lawn
W	Well/Pit
M	Median
P	Parking Lot
R	Raised Planter
O	Open/Unrestricted
I	Island
U	Unmaintained Area

- **Space Size.** The narrowest dimension of the Grow Space, in feet (i.e. 3'x3' cutout, 4' street planting strip, open parkland, etc).
- **Notes.** Additional information regarding disease, insect, mechanical damage, etc can be included in this field.

Condition. In general, the condition of each tree will be recorded in one of the following categories adapted from the rating system established by the International Society of Arboriculture:

Excellent	100%
Very Good	90%
Good	80%
Fair	60%

Poor	40%
Critical	20%
Dead	0%

- **Required maintenance.** A summary of scheduled maintenance works and time frames.
- **Maintenance history.** Provision shall be made for recording maintenance history of each tree.

Tree Inventory Field Data Sheet

Date: _____ Location: _____

Surveyor: _____ Weather: _____

ID#	Coordinates	Species	DBH	Height	Grow space/ Space size	Condition	Comments	Required Mtce	Hazard

Condition Rating:

4: Excellent (textbook perfect)
 3: Good (good but a few defects)
 2: Fair (OK, but some defects)
 1: Poor (decline, many defects)
 0: Dead

Comment Key:

TG: Existing Target
 LN: Lean
 MT: Multiple Trunks
 CD: Co-dominant Trunk
 CA: Cavities & Decay
 CR: Cracks
 HA: Hangers
 DB: Dead Branches/Dieback
 OTH: Other (please indicate as clearly as possible)

Hazard Key:

NH: No Hazard
 LH: Low Hazard
 MH: Moderate Hazard
 SH: Severe Hazard

NOTE: Data recorded on this form consists of purely subjective delineations based on external indicators only; additional observation and analysis will be required to produce more accurate conclusions and more proper recommendations on management and/or abatement.

4.2.2. Tree Pruning and Tree Removal.

All tree pruning and removal works, in total conformity with ANSI A300 Pruning Standard, shall be handled by Facilities Management's Tree Crew or a tree care industry contractor approved by the Campus Urban Forester. The following service priority gradations will be observed in determining trees to be pruned or removed:



1. **Priority 1 Prune (Trees $\geq 6''$ DBH, $\geq 12'$ Height).** Trees that require Priority 1 Pruning are recommended for trimming to remove hazardous deadwood, hangers, or broken branches. These trees have broken or hanging limbs, hazardous deadwood, and dead, dying, or diseased limbs or leaders greater than four inches in diameter.
2. **Priority 2 Prune (Trees $\geq 6''$ DBH, $\geq 12'$ Height).** These trees have dead, dying, diseased, or weakened branches between two and four inches in diameter and are potential safety hazards.
3. **Large Tree Routine Prune (Trees $\geq 30''$ DBH, $\geq 50'$ Height).** These trees require routine horticultural pruning to correct structural problems or growth patterns, which would eventually obstruct traffic or interfere with utility wires or buildings. Trees in this category are large enough to require bucket truck access or manual climbing.
4. **Small Tree Routine Prune (Trees $2''$ - $6''$ DBH, $\leq 12'$ Height).** These trees require routine horticultural pruning to correct structural problems or growth patterns, which would eventually obstruct traffic or interfere with utility wires or buildings. These trees are small growing, mature trees that can be evaluated and pruned from the ground.
5. **Training Prune (Trees $1''$ - $2''$ DBH, $\leq 8'$ Height).** Young, large-growing trees that are still small must be pruned to correct or eliminate weak, interfering, or objectionable

branches in order to minimize future maintenance requirements. These trees, up to 20 feet in height, can be worked with a pole saw by a person standing on the ground.

6. **Priority 1 Removal.** Trees designated for removal have defects that cannot be cost-effectively or practically treated. The majority of the trees in this category has a large percentage of dead crowns and poses an elevated level of risk for failure. Any hazards that could be seen as potential dangers to persons or property and seen as potential liabilities would be in this category. Large dead and dying trees that are high liability risks are included in this category. These trees are the first ones that should be removed, and they should be removed as soon as possible.
7. **Priority 2 Removal.** Trees that should be removed but do not pose a liability as great as the first priority will be identified here. This category would need attention as soon as "Priority One" trees are removed.
8. **Priority 3 Removal.** Trees that should be removed, but that pose minimal liability to persons or property, will be identified in this category.
9. **Tree Removal Adjacent to Protected Trees.** When trees are removed and adjacent trees must be protected, then the following tree removal practices apply:
 - a. ***Tree Removal*** - Removal of trees that extend into the branches or roots of protected trees shall not be attempted by grading or other heavy equipment. A certified arborist or tree worker shall remove the tree carefully in a manner that causes no damage above or below ground to trees that remain.
 - b. ***Stump Removal*** – Before commencing stump removal, all underground utilities within the vicinity of the tree stump, allowing one foot for every inch of stump diameter, must be identified and clearly marked out. Proper precautions must be taken to prevent damage to utilities within tree stump removal areas.

In sidewalk or small planter areas to be replanted with a new tree, the entire stump shall be removed and the planting pit dug to a depth of 30 inches. If dug below 30 inches, compact the backfill to prevent settling. Large surface roots 3 feet from the outside circumference shall be removed, including the spoils and backfilled with

University-approved topsoil to grade, and the area tamped to settle the soil.

Before performing stump extraction, the tree worker or project contractor shall first consider if roots may be entangled with trees that are to remain. If so, these stumps shall have their roots severed before extracting the stump.

When a tree root is to be ground, as opposed to being pulled out (depending on accessibility, topography, proximity to a building/pathway or other considerations), removal shall include the grinding of stump and roots to a minimum depth of 24 inches but expose soil beneath stump to provide drainage.

Regular work order requests are for all tree maintenance works that do not fall under the **Tree Emergencies** category. These types of requests include pruning of trees not posing an immediate hazard to human life or property or for large-scale projects (for example, trees blocking light fixtures, signs, or impeding walkway/road clearance), and require a work order submitted to the Landscape Services division. Work orders will be reviewed and prioritized by the Tree Crew supervisor or the Campus Urban Forester.

Trees that pose immediate danger to life and property have a pride of place over all else; such trees are to be dealt with as soon as feasible after the presence of a qualifying hazardous condition has been ascertained.

4.2.3. Protection of Trees during Construction.

The objective of this section is to reduce the negative effects of construction on trees to a less than significant level. Land development, one of the greatest causes of tree decline and death in urban areas, is a complex process and is even more challenging when trees are involved. The long-term goal of the Urban Forestry unit of UCSD's Landscape Services division is urban forest sustainability. This describes the maintenance of social, recreational, ecological and economic functions of trees and their benefits over time. Stewardship of naturally occurring and planted trees is a central element in forest sustainability. Concerns about tree health and structure, preservation during development and redevelopment, species and site selection, quality of planting stock, standards of performance, and maintenance

practices in our parks, and recycling are integral to a sustainable urban forest.

Tree protection should not begin subsequent to construction. If preservation measures are delayed or ignored until construction begins, the trees may be destined to fail. Because in most cases construction effects to trees cannot be completely eliminated, the goal for our facilities planners and designers is to keep injury to trees to a minimum and allow building projects to proceed at the same time. Successful tree preservation occurs when designers, construction personnel, and project managers are **committed to tree preservation**.

All trees cannot and should not be preserved. Trees that are structurally unstable, in poor health, or unable to survive the effects of construction become a liability to the project and should be removed. A realistic tree preservation program acknowledges that conflicts between trees and infrastructure development may sometimes result in the removal of some trees and also recognizes the detrimental effect to the project and community when trees die after construction is completed.

Successful tree preservation occurs when construction impacts to trees are minimized or avoided altogether. The challenge is to determine when impacts will be too severe for the tree to survive, not only in the short term, but also in the long term. There are no quantitative methods to calculate this critical level. Determining the optimum tree protection zone provides a guideline, although trees sometimes survive and flourish with smaller protection areas.

The following are the 3 guiding principles for tree preservation:

- The acknowledgement that not all trees are in excellent health or have good structural stability.
- Tree preservation cannot be the responsibility of the urban forestry unit staff alone. Each development participant must understand that his or her activities and decisions influence the success of tree preservation efforts. Each development participant is encouraged to read the set of guidelines defining the University's *Tree Pruning and Tree Removal Policy* and *Protection of Trees during Construction Guidelines* (Sections 4.2.2. and 4.2.3. of this Forest Management Plan).

- The ability of an arborist to cure construction injury is very limited, so the focus of preservation efforts is the *prevention* of damage.

Following the above principles will increase the chance for success and reduce the possibility that trees will die. Efforts at preservation must include acknowledgement of the tree and its ecological support system.

Capital improvement projects, in-house construction projects, sport field renovations, and even the addition of a few sprinkler lines affect trees. UCSD considers trees as important assets and requires plotting tree locations on plans for all projects.

4.2.3.1. Planning and Designing for Capital Improvement Projects

All design teams shall be given a set of guidelines defining the University's *Tree Pruning and Tree Removal Policy* and *Protection of Trees during Construction Guidelines* (Sections 4.2.2. and 4.2.3. of the Forest Management Plan), to ensure that trees are accounted for from project initiation forward.

A) Survey before Planning: The survey must accurately plot the trunk locations within the project site. Include construction staging areas and delivery routes.

B) Plan and Design with Knowledge of Trees: The health and structural confirmation of the surveyed trees must be evaluated in order to anticipate how well they will respond to development. The evaluation must describe the character of trees and their suitability for preservation at a level of detail appropriate for the project and phase of planning. An arboricultural or forestry consultant must be obtained for this evaluation.

C) Plan with a Vision: Disturbance of any tree by construction activities may negatively affect its physiological processes, and cause depletion of energy reserves and decline in vigor, often resulting in tree death. Typically this does not manifest until many years after the tree is disturbed. Preservation of mature trees during construction has limitless benefits to the success of a project.

When new trees are planted, consideration should be given to species diversity and appropriateness of location. To prevent destructive clearance pruning in future years, keep in mind the ultimate canopy and root spread.

D) Plan for all Aspects and Entire Duration of Project: Construction projects are multi-level and often require participation of various construction trades and subcontractors. It is important to plan for tree protection with an understanding of construction dynamics. Trees must be protected in the staging area, construction employee parking area, adjacent properties, as well as on the actual construction site.

4.2.3.2. Managing In-House Construction Projects

The in-house Construction team should be given a set of guidelines that define the Facilities Management Department's *Tree Preservation* and *Tree Protection* procedures (Sections 4.2.2. and 4.2.3. of this Forest Management Plan), and to assure that trees are accounted for from project initiation forward.

A) Survey before Planning: For all in-house projects, contact the Urban Forestry unit for an accurate survey of trees on the job site.

B) Plan and Design with Knowledge of Trees: In order to better understand the condition of the affected trees, the Urban Forestry unit will make available the results of the tree evaluation. This evaluation will provide the in-house Construction team with knowledge of the resources and the anticipated construction tolerance of the affected trees.

C) Plan with a Vision: Obtain information about trees and minimize negative impacts on the urban forest. Conduct all projects with tree preservation in mind.

D) Plan for all Aspects and for the Entire Duration of the Project: Trees must be protected in the staging area, construction employee parking area, and during demolition and grading. Arrange with the Urban Forester for trees to be watered and for the soil to be protected from compaction.

4.2.3.3. Pre-Construction Requirements

- Tree Protection and Preservation Plan.

Prior to the commencement of a development project, the Campus Urban Forester must be assured that if any activity of the project is within the dripline of *Protected Trees* (all trees 6" dbh and above), a site specific tree protection plan is prepared. The following six steps shall be incorporated as part of the Tree Protection and Preservation Plan:

A) Site Plan: For all projects, site plans must indicate accurately plotted trunk locations and *the dripline* areas of all trees or group of trees to be preserved within the development area. Additionally, for all *Protected Trees* the plans shall accurately show the trunk diameter, the dripline and clearly identified *tree protection zones*. The type of protective fencing shall be specified and indicated with a bold dashed line.

B) Protective tree fencing for all categories of *Protected Trees*: Fenced enclosures shall be erected around trees to be protected. This will achieve 3 primary goals:

(1) To keep crowns and branching structure clear from contact by equipment, materials, and activities;

(2) To preserve roots and soil condition in an intact and non-compacted state; and

(3) To identify the *Tree Protection Zone* in which no soil disturbance is permitted and activities are restricted, unless otherwise approved by the Campus Urban Forester.

All trees to be preserved shall be protected with physical barriers approved by the University's Urban Forester. Tree barriers shall be erected before demolition, grading, or construction begins and remain until final inspection of the project. There shall be a "Warning" sign prominently displayed on each protective fence. The sign shall be a minimum of 8.5 inches x 11 inches and clearly state the following:

TREE PROTECTION ZONE
This Barrier Shall Not Be Removed.
Warning: Critical Root Zone, No Encroachment.

All work within the *Tree Protection Zone* requires approval of the Campus Urban Forester.

A) Type I Tree Protection Barrier is for trees to be preserved throughout the duration of the project. The fences shall enclose the entire area under the canopy dripline or *Tree Protection Zone*, if specified by the Campus Urban Forester.

If fencing must be located on paving or concrete that will not be demolished, an appropriate grade level concrete base may support the posts.

B) Type II Tree Protection Fence is for trees situated in small planting areas, where only the planting area is enclosed with the required chain link protective fencing. The walkways and traffic areas are left open to the public.

C) Type III Tree Protection Fence is for trees in small tree wells, building site planters or sidewalk planters. Trees shall be wrapped with 2 inches of orange plastic fencing from the ground to the first branch and overlaid with 2-inch thick wooden slats that are bound securely (slats shall not be allowed to dig into the bark). During installation of the plastic fencing, caution shall be used to avoid damaging branches. Major scaffold limbs may also require plastic fencing as directed by the Campus Urban Forester.

No storage of material, topsoil, vehicles, or equipment shall be permitted within the fenced area throughout the entire duration of the construction project.

- Verification of tree protection.

The project contractor or construction supervisor shall verify in writing that all preconstruction tree preservation conditions have been met as follows:

- A) Tree fencing installed
- B) Erosion control secured
- C) Tree pruning completed
- D) Soil compaction preventive measures installed
- E) Tree maintenance schedule established.

The Project Manager, the Project Inspector, and the Campus Urban Forester must sign this verification.

- Pre-construction meetings.

The Campus Urban Forester shall attend all pre-construction meetings to ensure that everyone fully understands previously reviewed procedures and tree protective measures concerning the project site, staging areas, hauling routes, watering, contacts, etc.

- The Tree Protection Zone.

Each tree to be retained shall have a designated *Tree Protection Zone*, identifying the area sufficiently large enough to protect it and its roots from disturbance. The *Tree Protection Zone* shall be shown on all site plans: Demolition, Grading, Irrigation, Electrical, Landscape, etc. Improvements or activities such as paving, utility and irrigation trenching, including other ancillary activities, shall occur outside the *Tree Protection Zone* unless otherwise specified. The protection fence shall serve as the *Tree Protection Zone*.

A) Activities prohibited within the *Tree Protection Zone* include:

- i. Parking vehicles or equipment, storage of building materials, refuse, or excavated soils, or dumping poisonous material on or around trees and roots. Poisonous materials include but are not limited to paint, petroleum products, concrete, stucco mix, dirty water or any material that may be harmful to tree health
- ii. The use of tree trunks as backstops, winch supports, anchorages, as temporary power poles, signposts or other similar functions
- iii. Cutting of tree roots by utility trenching, foundation digging, placement of curbs and trenches, or other miscellaneous excavations without prior approval of the Campus Urban Forester
- iv. Soil disturbance or grade change
- v. Drainage or hydrological changes.

B) Activities permitted or required within the *Tree Protective Zone* include:

- i. Mulch: During construction, wood chips may be spread within the *Tree Protection Zone* to a two- to four-inch depth, leaving the trunk clear of mulch. This will minimize inadvertent soil compaction and moisture loss. Mulch shall be ≤ 2-inch unpainted, untreated shredded wood or other approved material.
- ii. Root Buffer: When areas under the tree canopy cannot be fenced, a temporary buffer is required and shall cover the root zone and remain in place at the specified thickness until the final grading stage. The protective buffer shall consist of shredded wood chips spread over the roots at a minimum of 6-inches in depth (keeping the trunk clear of chips), and layered by ¾-inch quarry gravel to stabilize the ¾-inch plywood sheets laid on top. Steel plates can also be used.

iii. Irrigation, Aeration, fertilization, mycorrhizae treatments or other beneficial practices that have been specifically approved for use within the *Tree Protection Zone*.

C) Erosion Control:

If a tree is adjacent to or in the immediate proximity to a grade slope of 8% (23 degrees) or more, approved erosion control or silt barriers shall be installed outside the Tree Protection Zone to prevent siltation and/or erosion within the zone.

- Tree Pruning and Removal

Prior to construction, various trees may need to be pruned away from structures or proposed construction activity. ***Construction or contractor personnel shall not attempt pruning.*** Only personnel approved by the Campus Urban Forester can perform pruning operations.

A) Removal of trees adjacent to trees that are to remain requires a great amount of finesse. Only personnel approved by the Campus Urban Forester shall engage in tree removal.

B) Removal of trees that extend into branches or roots of protected trees shall not be attempted by the demolition or construction crew, or by grading or other heavy equipment. Before removing tree stumps, the project manager shall determine if roots are entangled with trees that are to remain. If so, these stumps shall have their roots severed before extracting them.

4.2.4. Activities and Demolition near Trees during Construction.

Soil disturbance or other damaging activities within the Tree Protection Zone is prohibited unless approved by the Campus Urban Forester and mitigation for specific injuries is implemented. **No encroachment within 10 feet of a trunk will be permitted without the prior notification and approval of the University's representative.**

- Soil Compaction

Soil compaction is the largest single factor responsible for the decline of trees on construction sites. The degree of compaction depends on several factors: amount and type of pressure applied, presence and

depth of surface organic litter, soil texture and structure, and soil moisture level.

The greatest increase in soil density occurs during the first few equipment passes over the soil, which underscores the importance of implementing protective measures before the project begins and equipment arrives at the site. To distribute traffic weight, mulch and temporary root buffers can be used. The following techniques can lessen compaction: vertical mulching, soil fracturing, core venting, and radial trenching. Do not compact soil to higher density than needed: to 95% Proctor density (moisture – density) in improved areas for asphalt or concrete pavements, and not to exceed 85% in unimproved open landscape areas that use water jet compaction.

- Grading Limitations within the Tree Protection Zone

Lowering the grade around trees can have an immediate and long-term effect on trees. Typically, most roots are within the top 3 feet of soil, and most of the fine roots active in water and nutrient absorption are in the top 12 inches.

A) Grade changes within the *Tree Protection Zone* are not permitted.

B) Grade changes outside the *Tree Protection Zone* shall not significantly alter drainage.

C) Grade changes under specifically approved circumstances shall not allow more than 6 inches of fill soil or allow more than 4 inches of existing soil to be removed from natural grade, unless mitigated.

D) Grade fills over 6 inches or impervious overlay shall incorporate an approved permanent aeration system, permeable material, or other approved mitigation.

E) Grade cuts exceeding 4 inches shall incorporate retaining walls or an appropriate transition equivalent.

- Trenching, Excavation and Equipment Use

Trenching, excavation or boring within the *Tree Protection Zone* shall be limited to activities approved by the Campus Urban Forester. Explore alternatives for trenching outside the root zone. Avoid exposing roots during hot, dry weather. Backfill trenches as soon as possible with soil and soak with water the same day. Small roots can die in 10 to 15 minutes and large roots may not survive an hour of

exposure. If the trench must be left open all roots must be kept moist by wrapping them in peat moss and burlap.

If trenching is unavoidable, the following distances shall be maintained:

Trunk Diameter (measured at 4½ feet above natural grade)	Distance from both sides of the Trunk	Recommended Tunnel Depth for Utilities
Up to 6 inches	Past dripline	1½ feet
6-9 inches	6 feet	2½ feet
10-14 inches	10 feet	3 feet
15-19 inches	12 feet	3½ feet
Over 19 inches	15 feet.	4 feet

A) Root Severance: No roots measuring 2 inches or greater in diameter shall be cut without the approval of the Campus Urban Forester. Tunneling under roots is the approved alternative. Prior to excavation for foundation/footing/walls, or grading or trenching within the *Tree Protection Zone*, roots shall be severed cleanly one-foot outside the *Tree Protection Zone* to the depth of the planned excavation. When roots must be cut, they shall be cut cleanly with a sharp saw to sound wood and flush with the trench site.

B) Excavation: Any approved excavation, demolition, or extraction of material shall be performed with equipment that is placed outside the *Tree Protection Zone*. Hand digging, hydraulic, or pneumatic excavation are permitted methods for excavation within the *Tree Protection Zone*.

C) Heavy Equipment: Use of backhoes, Ditch Witches, steel tread tractors or other heavy vehicles within the *Tree Protection Zone* is prohibited unless approved by the Campus Urban Forester. If allowed, a protective root buffer is required.

- Tunneling and Directional Drilling

Approved trenching or pipe installation within the *Tree Protection Zone* shall be accomplished by hand, by air-spade, or by mechanically boring a tunnel under the roots with a horizontal directional drill, using hydraulic or pneumatic air excavation technology. In all cases, install the utility pipe immediately, backfill with soil and soak with water within the same day. Tunneling under the root system can greatly reduce both damage to the tree and the cost to repair landscape and other features destroyed in the trenching process. There are times,

such as when working in rocky soils and slopes, when tunneling is not a reasonable alternative.

- Alternative Methods for Hardscape to Prevent Root Cutting

The following remedies should be considered as an alternative to severing tree roots:

A) Grinding a raised walkway or concrete pad

B) Ramping the walkway surface over the roots or lifted slab with pliable paving.

C) Routing the walkway around tree roots

D) Employing permeable paving materials (e.g., decomposed granite), interlocking pavers, or flagstone walkways on sand foundations.

- Using Alternative Base Course Materials

Engineered structural soil mix is an alternative material for hardscape areas near trees. More information can be found at www.amereq.com.

4.2.5. Tree Maintenance during Construction.

Providing adequate maintenance can mitigate stressful changes that occur to a tree's environment during construction. To remain vigorous the tree needs to maintain stored carbohydrates and preserve the effectiveness of its growth regulators. It is recommended that large projects provide:

- Irrigation

Providing supplemental irrigation for trees under water stress may be the single most important treatment needed to reinvigorate them. Irrigation should be designed to wet the soil within the *Tree Protection Zone* to the depth of the root zone and to replace that water once it is depleted. Light, frequent irrigation should be avoided. Create a six-inch berm around trees at the edge of the *Tree Protection Zone* and fill with no more than six inches of mulch. Fill the basin with water. Irrigation should wet the top two to three feet of soil to replicate similar volumes and normal seasonal distribution.

- Soil Compaction Mitigation

To prevent negligent encroachment into the *Tree Protection Zone*, trees to be preserved during construction must have the specified type of protection fences in place at all times. Removal of fences, even temporarily, to allow deliveries or equipment access is not allowed unless approved by the Campus Urban Forester and a root buffer is installed. The root buffer components (mulch, gravel and plywood) must be maintained continually to ensure its effectiveness against soil compaction.

- Dust Control

During periods of extended drought, wind or grading, trunks, limbs and foliage should be sprayed with water at the end of workday to remove accumulated construction-engendered dust.

4.2.6. Damage to Trees.

4.2.6.1. Reporting Injury to Trees

Any damage or injury to trees shall be reported as soon as possible to the Project Manager or/and the Project Inspector, and always to the Campus Urban Forester. The Campus Urban Forester needs to be aware of an injured tree in order to monitor its recovery or progress. Injuries to roots and branches must be repaired immediately.

4.2.6.2. Contractor(s) Subject to Penalties

If a tree designated to remain is removed or irreversibly damaged as determined by the Campus Urban Forester, a contractor will be required to install a replacement tree matching in size, quality and variety, using a Tree Care contractor designated by the Campus Urban Forester. If an acceptable replacement tree is not available, the contractor will be required to pay damages to the University for the value of the damaged tree in accordance with the guidelines set forth below.

S/N	Diameter Class (inches)	Cost/Tree (\$)
1	1 - 5	\$3,000.00
2	6 - 12	\$7,500.00
3	13 - 18	\$15,000.00
4	Over 18	Add \$1,200.00/caliper inch

A penalty will be assessed for tree limb damage at **\$200** (Two Hundred Dollars) per inch of limb diameter for any limb larger than 1½ inches in diameter, measured where the limb should be pruned to make a proper thinning cut.

Fines are doubled when a grove or park tree meant to be retained or protected is damaged or removed without the Campus Urban Forester's prior approval.

Additionally, a liable Contractor shall replace any vegetation (other than trees) that died or sustained injury from the result of the Contractor's negligence to provide adequate required vegetation protection, pruning, or maintenance during the course of construction operations, as evaluated by the University's Representative. Compensation shall be awarded to the University as follows:

1. Contractor shall thoroughly remove damaged vegetation at no cost to the University, and at the direction of the University's Representative.
2. Contractor shall furnish and install five (5) gallon container stock minimum (as applicable) of the same form, species, and in the same quantity as vegetation that was damaged, at the direction of the University's Representative.

The University's Representative shall make the final judgment on whether trees and/or vegetation have been damaged by the Contractor during the execution of the Work, and their decision is final.

Warranty of Replacement Plant Material: Contractor shall warrant that all replacement plant materials shall be healthy and in flourishing condition of active growth at the end of the warranty period of 1 calendar year from the date of final acceptance.

4.2.6.3. Departments Subject to Fines

In the event of damage to above- or below-ground parts of urban forest trees at any time, the Campus Urban Forester shall conduct an investigation to determine the cause of the damage. If it is found that damage was caused due to the error, negligence, or willfulness of a University department, then that University department will be required to pay the same damages imposed on Contractor Subject to Penalties.

4.2.6.4. Employees Subject to Discipline

In the event of damage to above- or below-ground parts of urban forest trees at any time, the Campus Urban Forester shall conduct an investigation to determine the cause of the damage. If it is found that damage was caused due to the error, negligence, or willfulness of a University employee, then that employee will be subject to appropriate disciplinary action.

4.2.7. Tree Planting.

4.2.7.1. Campus Urban Forest Restocking

During the Tree Inventory exercise, vacant planting sites, in addition to other apparent street and grove sites whence numerous trees have been lost, will be identified by nearby facilities. The size of the site is designated as small, medium, or large (indicating the ultimate size that the tree will attain), depending on the growing space available and the presence of overhead utility lines.

As soon as feasible, contingent on availability of funds, a major reforestation thrust will undertake the planting and establishment of 1,000 trees annually. The yearly urban forest restocking program stands apart from such trees as are associated with new facilities. This will definitely, in time, restore the diminishing campus tree canopy density while deliberately increasing UCSD's tree species diversity.

4.2.7.2. Choice of Trees

In all cases of tree planting, the guiding principle shall be to install the right tree, in both form and function, in the right place. **When specifying trees for planting on UCSD campus, consideration shall be given to tree species recommended for Southern California.** All proposed trees shall be in compliance with established UCSD design guidelines.

4.2.7.3. Tree Species Diversity Planting Requirements

The Campus Urban Forester will review plans to ensure species diversity (i.e. to avoid creating monocultures, or areas of plantings made up of only one species of trees). Monocultures are undesirable because if a certain species is prone to a particular disease or is more susceptible to storm damage or temperature extremes, then it is likely the entire stand could die or be destroyed by a single disease or

weather event. Creating planting areas of several species creates a more diverse, and therefore more resilient, urban forest.

Factors to be considered in acceptable and successful tree planting include the long term health of the tree in its location and its compatibility with adjacent uses as well as design considerations.

In consideration of the financial impact realized by the UCSD, it is important that long term maintenance of proposed trees be considered prior to their selection.

Any tree species known to have an aggressive or rampant root system shall not be planted along campus streets to avoid damage to sidewalks, utilities and curbs.

4.2.7.4. Planting distances/spacing requirements

No large or medium tree species shall be planted within any power or utility easements or under overhead utility distribution lines if the average mature height of the tree is greater than the lowest overhead wire.

Tree selection shall take into consideration requirements for future height clearances. As they grow, trees will need to be pruned to provide pedestrian clearance of at least 8 feet over sidewalks, and vehicular clearance of 14 feet over roads.

4.2.7.5. Supply of Tree Planting Stock

Since the first step in avoiding *future* hazard trees is to plant high quality stock, poor stock trees will not be approved for planting in any part of the campus regardless of whether the trees are meant to complete in-house projects or supplied by contractors in association with facility development.

All trees delivered to UCSD for planting shall be inspected and approved by the Campus Urban Forester or his/her representative *before* installation. It is required that contractors or tree suppliers provide a minimum of two working days notice to the Campus Urban Forester for all inspections. For the reason that poor planting stock will end up costing much more money in the long run because of increased maintenance requirement and shorter life span, the University shall not neglect to exercise the right to reject poor quality trees upon delivery. The supplier(s)/contractor(s) shall bear the cost of evacuating such rejected tree stock from the campus.

Furthermore, all trees supplied by contractors in association with facility development shall be guaranteed for 1 year from acceptance after planting.

While inspecting trees delivered to UCSD for planting, the Campus Urban Forester or his/her representative shall look for the following:

PROPER IDENTIFICATION

All trees shall be true to name as ordered or shown on the planting plans and shall be labeled individually or in groups by species and cultivar (where appropriate).

TREE HEALTH

As typical for the species/cultivar, trees shall be healthy and vigorous, as indicated by:

- foliar crown density
- length of shoot growth (throughout crown)
- size, color and appearance of leaves
- uniform distribution of roots in the container media
- appearance of roots
- absence of twig and/or branch dieback
- relative freedom from insects and diseases

Note: some of these characteristics cannot be used to determine the health of deciduous trees during the dormant season.



CROWN

Form: Trees shall have a symmetrical form as typical for the species/cultivar and growth form.

Central Leader: Trees shall have a single, relatively straight central leader and tapered trunk, free of co-dominant stems and vigorous, upright branches that compete with the central leader. Preferably, the

central leader should not have been headed. However, in cases where the original leader has been removed, an upright branch at least $\frac{1}{2}$ (one-half) the diameter of the original leader just below the pruning point shall be present.

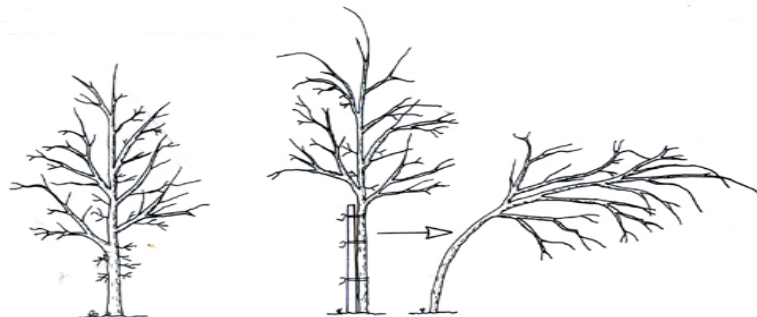
Note: This section applies to single trunk trees grown with normal straightness, as typically used for street or landscape planting. This specification does not apply to plants that have been specifically cultured in the nursery or selected for unusual or unique shape, such as contorted forms, topiary forms, espalier forms, multi-stem, or clump forms.

Evaluating trunk and branch structure

Trunk structure: Shade trees that are large at maturity, and most evergreen trees, with the best quality have a dominant or central leader or trunk up to the top of the canopy. Shade trees of lesser quality have two or more leaders or trunks; they could split apart as they grow older. Small ornamental trees can have several trunks.



1. Trunk diameter and taper shall be sufficient so that the tree will remain vertical without the support of a nursery stake.



2. The trunk shall be free of wounds (except properly-made pruning cuts), sunburned areas, conks (fungal fruiting-bodies), wood cracks, bleeding areas, signs of boring insects, galls, cankers and/or lesions.

3. Trunk diameter at 6" (six inches) above the soil surface shall be within the diameter range shown for each container size below:

Container Size	Soil Volume in Gallons (approx)	Trunk Diameter (in)	Soil Level from Container Top (in)
# 5	0.6	0.5 to 0.75	1.25 to 2
# 15	3.3	0.75 to 1.5	1.75 to 2.75
24-inch box	10.5	1.5 to 2.5	2.25 to 3

Branch structure: The better quality, large-maturing shade trees (below left) have all branches less than about two-thirds of the trunk diameter. Poor quality shade trees (below right) have larger upright branches. Trees such as crape myrtle and other small-maturing trees can have several trunks.



Desirable



Not Desirable

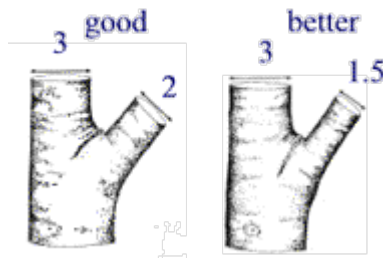


Trees with extensive defects in branches such as cracks and included bark (below) represent lesser quality than trees free of these potential problems. Included bark can be seen between the two arrows below. Branches with bark inclusions are weakly attached to the tree and can split easily.



Potential Main Branches: Branches shall be distributed radially around and vertically along the trunk, forming a generally symmetrical crown typical for the species.

1. Potential main branches shall be evenly spaced and have appropriate space between them.
2. Branches shall be no larger than $\frac{2}{3}$ (two thirds) the diameter of the trunk, measured 1" (one inch) above the branch.



3. The attachment of scaffold branches shall be free of included bark.

Temporary branches: Unless otherwise specified, small "temporary" branches should be present along the lower trunk below the first potential permanent branch, particularly for trees less than 1-1/2" (one and one-half inches) in trunk diameter. Temporary branches should be distributed around and vertically along the lower trunk. They should be no greater than 3/8" (three-eighths inch) in diameter and no greater than $\frac{1}{2}$ (one-half) the diameter of the trunk at the point of attachment. Heading of temporary branches is usually necessary to limit their growth.

ROOTS

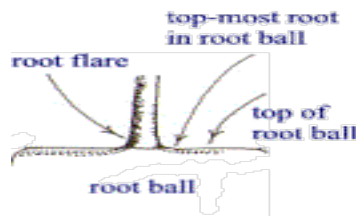
1. The trunk, root collar (root crown) and large roots shall be free of circling and/or kinked roots. Soil removal near the root collar may be

necessary in order to verify that circling and/or kinked roots are not present.

2. The tree shall be well rooted in the container. When the trunk is carefully lifted both the trunk and root system shall move as one.



3. The upper-most roots or root collar shall be within 1" (one inch) above or below the soil surface. The soil level should be within 2" (two inches) of the top of the container (see table above, under "Trunk Structure").



4. When the container is removed, the root ball shall remain intact.

5. The root ball periphery should be free of large circling and bottom-matted roots. There should be a well developed root system, but not a dense mass from being pot-bound.

6. The root ball size should be suitable to the height of the tree (see *American Standard for Nursery Stock*).

7. On grafted or budded trees, there shall be no suckers from the root stock.

8. If balled and burlapped, only natural burlap or wire baskets are allowed.

All plants must conform to the current edition of the [*American Standard for Nursery Stock ANSI Z60.1*](#).

MOISTURE STATUS

At time of inspection and delivery, the root ball shall be moist throughout, and the tree crown shall show no signs of moisture stress,

as indicated by wilt. Roots shall show no signs of being subjected to excess soil moisture conditions, as indicated by root discoloration, distortion, death, or foul odor.

4.2.7.6. Planting Site Preparation

Soil preparation and conditioning: All debris, wood chips, pavement, concrete and rocks over 2 inches in diameter shall be removed from the planting pit to a minimum of 24-inch depth, unless specified otherwise.

Planter pit preparation:

- Trees in a confined planter pit or sidewalk area: The planting hole shall be excavated to a minimum of 30 inches deep x the width of the exposed area. Scarify the sides of the pit. Soil beneath the rootball shall be compacted to prevent settling.
- Trees in all other areas:
 - a). Mark out a planting area 2 to 3 times wider than the rootball diameter (the wider the better). Loosen this area to about 8 inches deep. This will enable the tree to extend a dense mat of tiny roots well out into the soil in the first one to ten weeks in the ground.
 - b). Excavate the hole's width a minimum of two times the diameter of the container, and deep enough to allow the root ball of the container to rest on firm soil with the top of the root ball even with the grade. Scarify the sides and the bottom of the pit.

Drainage: Adequate drainage must be provided to the surrounding soil for the planting of new trees. If the trees are to be planted in impermeable or infertile soil and water infiltration rates are less than two (2) inches an hour, then one of the following drainage systems or other approved measures must be implemented:

- French drain, a minimum of three feet in depth
- Drain tiles or lines beneath the trees
- Auger six drain holes at the bottom perimeter of the planting pit, at a minimum of four (4) inches in diameter, twenty-four (24) inches deep and filled with medium sand or fine gravel.

Aeration tubes for trees: Trees planted in sidewalk planter pits, planting strip, parking islands, or medians shall use 4-inch diameter perforated aeration piping (rigid or flexible), circling the bottom of the planter connected to a 'T' fitting to two riser tubes with grated caps and wrapped with filter fabric. This detail shall be shown on the approved landscape plans.

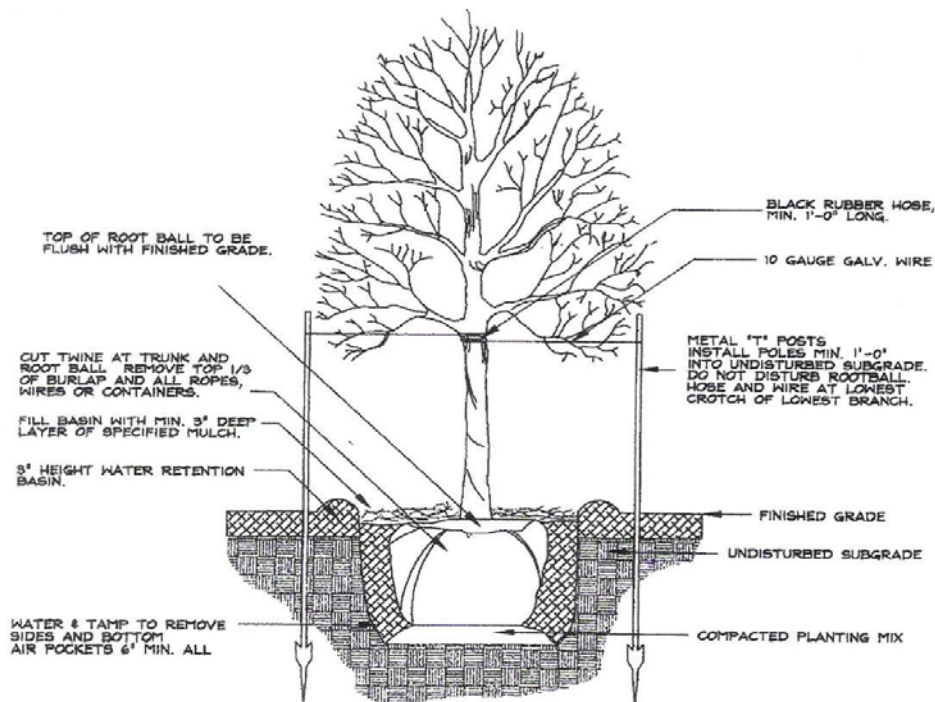
4.2.7.7. Planting the Tree

After the hole has been prepared as described above, the tree is ready to be planted.

Container grown tree: Pull the container away from the root ball. Don't pull the tree out by its trunk. Container grown trees often have circling or girdling roots running along the edge of the rootball. If they exist in this area, cut them and spread them apart. Place the root ball in the center of the hole and adjust the tree so it is straight and at the proper level. Make any adjustments prior to filling the hole with dirt.

Ball and burlapped tree: Rest the root ball in the center of the hole, and reshape the hole so the tree will be straight and at the proper level. After adjusting the tree, pull the burlap and any other material away from the sides and top of the root ball. Do not remove the burlap from the bottom. If you adjust or lift the tree after the burlap has been removed, you run the risk of damaging the root system.

Tree planting detail graphic:



Backfill soil, amended soil: Backfill with the original soil unless the original soil has been removed or the soil is poor. If soil must be amended, it shall be the most appropriate soil mix as directed by a Landscape Architect or a Certified Arborist, and in consultation with the Campus Urban Forester.

Filling the hole: Fill the tree hole until is half full. Flood the hole with a slow hose or tamp gently with your foot to firm the soil. Repeat until the hole is full. Do not press the soil too firmly, only firm enough to hold the tree upright. Backfilling with soil and water or gently tamping will remove large air pockets.

Construction of a berm or dam: Construct a small berm or dam three (3) feet in diameter around the tree. The berm should be approximately three (3) inches high.

Mulching: Cover the entire loosened area of soil with 2 to 4 inches of mulch composed of shredded wood or bark in the entire planting area. Mulch will be placed one to two inches away from the trunk of the tree.

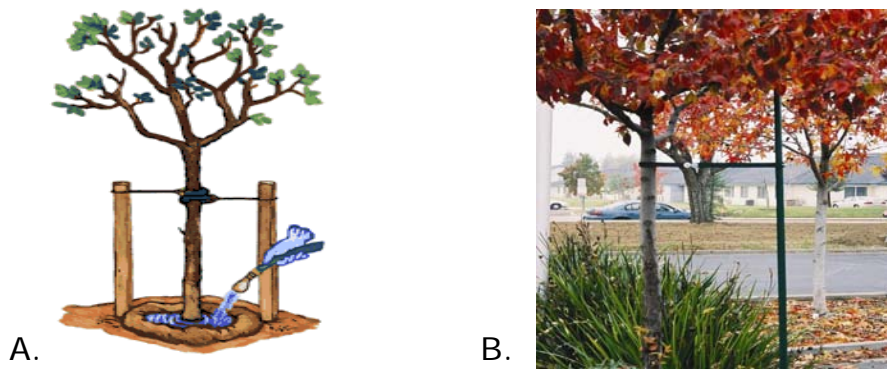
4.2.7.8. Staking or Guying

Bamboo stakes, if any, will be removed. Staking or guying is to prevent movement of the lower trunk and root system until the new tree establishes strong anchorage. Movement of the top is desirable and will strengthen the tree. The stakes will be installed 12-18 inches in undisturbed soil outside of the planting hole. Depending on height and size of the tree, stakes shall be six, eight, or ten feet tall. Trees shall be staked with 3 lodgepole stakes. Stakes shall not be taller than the first main branches of the tree nor rub against tree trunks.

Tree ties will be located near the lowest main branch on the tree. Check a staked or guyed tree monthly during the growing season and after storms or strong wind. The system will be snug, but not to the point of making an impression on the stem or trunk. If that happens, the tie or wire around the trunk shall be loosened. No tree shall be staked any longer than absolutely necessary. One or two growing seasons is all that is needed.

4.2.7.9. Miscellaneous Materials

The following materials shall be used unless otherwise specified:



Tree stakes. 2-inch diameter Lodgepole stakes (A) or 2"x2" wooden stakes, arranged in a triangle, are the acceptable materials for protective staking of young trees. The R2 Staking System (B) shall be used for 15 gallon and 24-inch box size trees. It is a reusable screw-in auger-type steel stake with an adjustable anti-rotational tab and pin device that prevents the stake from turning or becoming loose in the ground.

Tree Ties. Cinch ties, made of rubber, are the acceptable ties for use with Lodgepole stakes

Mulch. All newly planted trees shall be mulched with 2-4 inches of organic mulch. Mulch should never be placed against the trunk of a tree. There should be a space of 1-2 inches between the trunk and mulch. Mulch should cover the entire tree planting hole. No volcano mulching is allowed.

Root Control Barriers. Use along all public sidewalks, and indicate on approved plans and drawings.

Tree grates. Where sidewalk width is less than 8 feet and new trees will be installed in a tree well, metal tree grates may be used as approved by the Campus Urban Forester. Minimum size grates shall be 4' x 4' unless otherwise specified. All tree grates shall be mounted in frames inset into a concrete foundation within the sidewalk or surface material, and shall be flush with the surrounding surface.

4.2.7.10. Pruning Newly Planted Trees

Young trees are pruned to allow for proper growth through the years. If the tree is of high quality stock, it should need little pruning. It is no longer common practice to automatically trim a certain percentage of

limbs from a newly planted tree. The tree needs as much foliage as can be available to assure rapid growth and desirable leaf structure. This includes refraining from “limbing up” and topping.

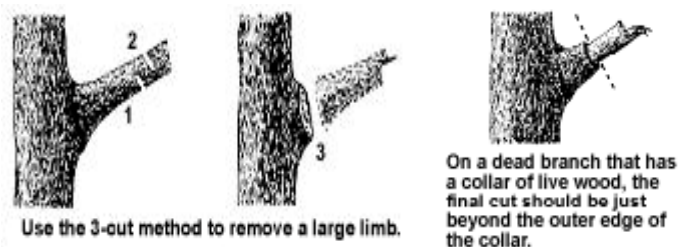
4.2.7.11. Pruning guidelines

All tree pruning operations must be in full conformity with [ANSI A300 Standards for Tree Care Operations](#).

Scaffolding/permanent branches: Identify the scaffolding/permanent branches. The lowest permanent branch should have a diameter of one-half or less of the trunk diameter where the branch attaches to the trunk. The vertical spacing of permanent scaffold branches should equal a distance 3% of the tree's eventual height. Thus, a tree that will be 50 feet tall should have permanent scaffold branches spaced about 18 inches apart along the trunk. Avoid allowing two scaffold branches to arise one above the other on the same side of the tree. Maintain radial balance with branches growing outward in each direction.

Limb removal: The following may be removed -

a). Torn, damaged, dead branches: Remove the branch just outside of the branch collar.



b). **Double Leaders:** Maintain a dominant trunk for at least six-eight feet without a major fork. If the trunk divides into two or more relatively equal stems, favor one strong stem and remove the others. Cut one stem back to a lateral branch.

c). **Rubbing branches:** Eliminate branches that are rubbing or will soon rub against another branch.

d). **Crowding:** Give each branch room to grow with minimal competition for sunlight. When possible, have major lateral branches evenly spaced eight to ten inches apart along the trunk. If the tree by its nature would lose too much foliage in the process of eliminating

crowding, maintain at least half the foliage on branches in the lower 2/3 of the tree.

e). Narrow Branch Angles/Included Bark: Remove one branch if the angle is 40% or narrower or if it appears that the bark from the branch is becoming pinched between the branch and the trunk.

f). Sprouts and Suckers: Remove sprouts and suckers.

g). Temporary branches: Leave temporary branches that are not competing with permanent, scaffolding branches.

4.2.8. Transplanting Trees.

Transplanting large trees is difficult, expensive, and requires expertise and equipment. Preapproval from the Campus Urban Forester and periodic inspections will be required for the transplanting of a tree deserving of such treatment.

When transplanting trees eight (8) inches in diameter and larger from existing landscapes, it is important to select healthy, vigorous trees, dig an appropriate size root ball, select a site that is consistent with the tree's cultural needs, provide a saucer shaped planting hole approximately three times the root ball width, and then protect the root ball, trunk, and crown during lifting, transportation, and storage.

The most important and hardest part in tree transplanting is creating and implementing a multi-year aftercare program, providing adequate moisture to the root ball.

When a tree is dug for transplanting, as much as 90% of its root system is left behind, severed in the process of digging for transplanting. The tree has a hard time relying on 5-10 percent of its root system doing the work of the 90 percent that was lost. Until it is well established, the root system will have difficulty supplying enough water to the leaves. This stress impacts vigor of the tree and also exposes the tree to the risk of being vulnerable to pests and diseases. The tree is also less able to adapt to or withstand drought, extreme cold, and drying winds.

4.2.8.1. Considerations for Successful Tree Transplanting

Proper attention to the following issues should assist in providing a successful transplanting. Considering the size of the important trees

being transplanted, a professional arborist is required to assist in the process.

Site: Before transplanting make sure the tree is a good match for the new site.

Timing: Recommended timing for transplanting trees is during the dormant season, when the tree is not trying to support its leafy crown.

Health of tree: Select a tree that is in good health and shape and has no major defects in its trunk branch structure.

Success rate: Different species have different success rates in transplanting.

Tree size: Most commonly transplanted trees range in size from 5-15 diameter inches.

4.2.8.2. Transplanting process

Digging up the tree: Dig up a wide root ball with appropriate depth and wrap burlap material with wire and twine to save intact as much of the root ball as possible. A rule of thumb for trees over six inches in diameter is that a root ball = 10 inches in diameter for every inch of tree trunk diameter measured at 4 ½ feet above the ground. In other words, a 10 inch tree should have a 100 inch diameter rootball. Likewise, the ball depth should be about 60% of the ball diameter. The same 10 inch tree should have a 60 inch depth.

While smaller trees can be transplanted using a tree spade or other specialty equipment/techniques, larger trees will require mechanical digging equipment and appropriate hoists and heavy equipment for moving the tree.

4.2.8.3. Transporting the tree

During transportation, the tree crown should always be covered with tarp to protect the tree from drying out and windburn.

4.2.8.4. After transplanting

Keep the root ball moist at all times. Anticipate watering three times a week or, in very hot weather, every day. Continued watering will be required for several years.

Do not prune newly transplanted trees to reduce crown and compensate for root loss. That will only further weaken the tree.

Mulch the transplanted tree with 2-4 inches of organic mulch to cover root ball.

The process of regenerating a normal root system will take several years, especially for large trees. Immediately after transplanting, the tree will be susceptible to extreme stress. Moisture is a critical factor in new root growth. Soil structure (compacted soil, etc) and soil temperature also impact the growth of roots.

(Abridged from "Transplanting Trees", by Patrice Peltier and Gary W. Watson. Arbor Age, January-March 2000.)

APPENDIX A: DEFINITIONS.

For the purposes of this Forest Management Plan, the following definitions apply. Additional definitions may be found in the Management Plan.

Certified Arborist is an individual who has demonstrated knowledge and competency through obtainment of the current International Society of Arboriculture arborist certification, or who is a member of the American Society of Consulting Arborists.

Compaction means compression of the soil structure or texture by any means that creates an upper layer that is impermeable. Compaction is injurious to roots and the health of a tree.

Dangerous tree see Hazardous tree.

Dead Tree means a tree that is dead or that has been damaged beyond repair or is in an advanced state of decline (where an insufficient amount of live tissue, green leaves, limbs or branches, exists to sustain life) and has been determined to be such by a the Campus Urban Forester or a Certified Arborist. If the tree has been certified dead, removal is permitted as defined in the Management Plan.

Disturbance refers to all of the various activities from construction or development that may damage trees.

Excessive Pruning means removing in excess, one-fourth (25 percent) or greater, of the functioning leaf, stem or root area. Pruning in excess of 25 percent is injurious to the tree and is a prohibited act. Excessive pruning typically results in the tree appearing as a 'bonsai', 'lion's-tailed', 'lolly-popped' or overly thinned.

Unbalanced Crown. Excessive pruning also includes removal of the leaf or stem area predominantly on one side, topping, or excessive tree canopy or crown raising. Exceptions are when clearance from overhead utilities or public improvements is required or to abate a hazardous condition or a public nuisance.

Roots. Excessive pruning may include the cutting of any root 1½ inches or greater in diameter and/or severing in excess of 25 percent of the roots.

Hazardous Tree refers to a tree that possesses a structural defect which poses an imminent risk if the tree or part of the tree that would fall on someone or something of value (target).

Structural defect means any structural weakness or deformity of a tree or its parts. A tree with a structural defect can be verified to be hazardous by a certified arborist and confirmed as such by the Campus Urban Forester. The Campus Urban Forester retains discretionary right to approve or amend a hazardous rating, in writing, and recommend any action that may reduce the condition to a less-than significant level of hazard. If the tree has been determined to be hazardous, removal of the tree is permitted as provided for in the Management Plan.

Injury means a wound resulting from any activity, including but not limited to 'excessive pruning', cutting, trenching, excavating, altering the grade, paving or compaction within the tree protection zone of a tree. Injury shall include bruising, scarring, tearing or breaking of roots, bark, trunk, branches or foliage, herbicide application or poisoning, or any other action foreseeably leading to the death or permanent damage to tree health.

Management Plan means this Forest Management Plan.

Protective Tree Fencing means a temporary enclosure erected around a tree to be protected at the boundary of the tree protection zone. The fence serves three primary functions: 1) to keep the foliage, crown, branch structure and trunk clear from direct contact and damage by equipment, materials or disturbances; 2) to preserve roots and soil in an intact and non-compacted state; and 3) to identify the tree protection zone in which no soil disturbance is permitted and activities are restricted. (Covered in Forest Management Plan)

Root Buffer means a temporary layer of material to protect the soil texture and roots. The buffer shall consist of a base course of tree chips or mulch spread over the root area to a minimum of 6-inch depth.

Site Plan means a set of drawings (e.g. preliminary drawings, site plan, grading, demolition, building, utilities, landscape, irrigation, tree survey, etc.) that show existing site conditions and proposed landscape improvements, including trees to be removed, relocated or to be retained. Site plans shall include the following minimum information that may impact trees:

- Surveyed tree location, species, size, dripline area (including trees located on adjacent area that overhang the project site) and protected trees within 30-feet of the project site.
- Paving, concrete, trenching or grade change located within the tree protection zone.
- Existing and proposed utility pathways.
- Surface and subsurface drainage and aeration systems to be used.
- Walls, tree wells, retaining walls and grade change barriers, both temporary and permanent.
- Landscaping, irrigation and lighting within dripline of trees, including all lines, valves, etc.
- Location of other landscaping and significant features.
- All of the final approved site plan sheets shall reference tree protection instructions.

Soil Compaction means the compression of soil particles that may result from the movement of heavy machinery and trucks, storage of construction materials, structures, paving, etc. within the tree protection zone. Soil compaction can result in atrophy of roots and potential death of the tree, with symptoms often taking 3 to 10 years to manifest.

Soil Fracturing means the loosening of hard or compacted soil around a tree by means of a pneumatic soil probe that delivers sudden bursts of air to crack, loosen or expand the soil to improve the root growing environment.

Target is a term used to include people, vehicles, structures or something subject to damage by a tree.

Note: A tree may not be a hazard if a “target” is absent within the falling distance of a tree or its parts (e.g., a defective tree in a non-populated area away from pathways may not be considered a hazard)

Trenching means any excavation to provide irrigation, install foundations, utility lines, services, pipe, drainage or other property improvements below grade. Trenching within the Critical Root Zone (CRZ) is injurious to roots and tree health and is prohibited, unless

approved. If trenching is approved within the CRZ, it must be in accordance with instructions and table outlined in this Management Plan.

Verification of Tree Protection means the development Project Manager shall verify to the Campus Urban Forester, in writing, that all preconstruction conditions have been met (tree fencing, erosion control, pruning, etc.) and are in place. An initial inspection of protective fencing and written verification must be submitted to the Campus Urban Forester **prior** to demolition, grading or any construction work.

Vertical Mulching means augering, hydraulic or air excavation of vertical holes within a tree's root zone to loosen and aerate the soil, typically to mitigate soil compaction. Holes are typically penetrated 4 to 6 feet on center, 2 to 3 feet deep, 2 to 6 inches in diameter and backfilled with either perlite, vermiculite, peat moss or a mixture thereof.

APPENDIX B: TREE LIST 1.

Tree Species on UCSD Campus as of December, 2007.

<i>Acacia longifolia</i>	<i>Eriobotrya japonica</i>
<i>Acacia melanoxylon</i>	<i>Erythrina caffra</i>
<i>Acacia pendula</i>	<i>Erythrina coralloides</i>
<i>Acer species</i>	<i>Erythrina falcata</i>
<i>Agonis flexuosa</i>	<i>Eucalyptus camaldulensis</i>
<i>Albizia distachya</i>	<i>Eucalyptus cinerea</i>
<i>Alnus rhombifolia</i>	<i>Eucalyptus citriodora</i>
<i>Araucaria bidwillii</i>	<i>Eucalyptus cladocalyx</i>
<i>Araucaria heterophylla</i>	<i>Eucalyptus cornuta</i>
<i>Arbutus unedo</i>	<i>Eucalyptus deglupta</i>
<i>Archontophoenix</i>	<i>Eucalyptus erythrocorys</i>
<i>cunninghamiana</i>	<i>Eucalyptus globulus</i>
<i>Baccharis salicifolia</i>	<i>Eucalyptus globulus 'Compacta'</i>
<i>Bambusa oldhamii</i>	<i>Eucalyptus gunnii</i>
<i>Bauhinia blakeana</i>	<i>Eucalyptus lehmannii</i>
<i>Bauhinia forficata</i>	<i>Eucalyptus maculata</i>
<i>Bauhinia variegata</i>	<i>Eucalyptus nicholii</i>
<i>Betula pendula</i>	<i>Eucalyptus polyanthemus</i>
<i>Brahea armata</i>	<i>Eucalyptus rudis</i>
<i>Callistemon citrinus</i>	<i>Eucalyptus sideroxylon</i>
<i>Callistemon viminalis</i>	<i>Eucalyptus torquata</i>
<i>Cassia leptophylla</i>	<i>Eucalyptus viminalis</i>
<i>Cassia bicapsularis</i>	<i>Feijoa sellowiana</i>
<i>Casuarina equisetifolia</i>	<i>Ficus benjamina</i>
<i>Cedrus atlantica</i>	<i>Ficus elastica</i>
<i>Ceratonia siliqua</i>	<i>Ficus lyrata</i>
<i>Cercidium hybrid</i>	<i>Ficus microcarpa</i>
<i>Cercis occidentalis</i>	<i>Ficus microcarpa 'Variegata'</i>
<i>Chamaerops humilis</i>	<i>Ficus retusa 'Nitida'</i>
<i>Chilopsis linearis</i>	<i>Ficus rubiginosa</i>
<i>Chorisia speciosa</i>	<i>Fraxinus velutina</i>
<i>Cinnamomum camphora</i>	<i>Geijera parviflora</i>
<i>Citrus species</i>	<i>Ginkgo biloba</i>
<i>Corymbia ficifolia</i>	<i>Harpephyllum caffrum</i>
<i>Cotoneaster parneyi</i>	<i>Heteromeles arbutifolia</i>
<i>Cupaniopsis anarcardioides</i>	<i>Hymenosporum flavum</i>
<i>Cupressocyparis leylandii</i>	<i>Jacaranda mimosifolia</i>
<i>Cupressus macrocarpa</i>	<i>Koelreuteria bipinnata</i>
<i>Dodonea viscosa</i>	<i>Koelreuteria elegans</i>
<i>Dracaena draco</i>	<i>Koelreuteria paniculata</i>
<i>Eriobotrya deflexa</i>	<i>Lagerstroemia indica</i>

Lagunaria patersonii
Leptospermum laevigatum
Liquidambar styraciflua
Livistona australis
Lophostemon confertus
Lyonothamnus floribundus
Magnolia grandiflora
Magnolia x soulangiana
Melaleuca nesophylla
Melaleuca quinquinervia
Metrosideros excelsus
Michelia champaca
Myoporum laetum
Nerium oleander
Olea europaea
Parkinsonia aculeata
Phoenix canariensis
Phoenix reclinata
Phoenix roebelenii
Photinia fraseri
Pinus canariensis
Pinus halepensis
Pinus pinea
Pinus radiata
Pinus thunbergii
Pinus torreyana
Pittosporum tobira
Pittosporum undulatum
Platanus racemosa
Platanus x acerifolia
Podocarpus gracilior

Podocarpus macrophyllus
Populus nigra 'Italica'
Prunus cerasifera 'Atropurpurea'
Prunus ilicifolia
Psidium cattleianum
Pyrus calleryana
Pyrus kawakamii
Quercus agrifolia
Quercus dumosa
Quercus engelmannii
Rhapiolepis 'Majestic Beauty'
Rhus integrifolia
Robinia ambigua
Schinus molle
Schinus terebinthifolius
Sequoia sempervirens
Spathodea campanulata
Strelitzia nicolai
Syagrus romanzoffianum
Syzygium paniculatum
'Monterey Bay'
Tabebuia impetiginosa
Thevetia thevetioides
Tipuana tipu
Trachycarpus fortunei
Trithrinax acanthacoma
Tupidanthus calyptratus
Ulmus parvifolia
Washingtonia robusta
Washingtonia filifera
Yucca gloriosa.

APPENDIX C: TREE LIST 2.

Tree Species Approved for Planting on UCSD Campus.
(See Tree Lists for San Diego, California on following pages)

City of San Diego STREET TREE SELECTION GUIDE

{In areas with contiguous sidewalks (sidewalks that extend all the way to the curb), trees shall be planted a minimum of two feet from sidewalk. In unimproved right-of-ways, contact the Street Tree Section for more information.}
Root Barriers Recommended but Not Required unless specified.

The following trees are recommended for parkways 2 feet and larger, and 3'x3' cutouts. See notes for specific maintenance requirements:

SMALL AND UPRIGHT TREES:

Botanical Name	Common Name	Form	Height	Spread	Type	Drought	Native
Acacia pendula***	Weeping Acacia	SC	20	20	E		
Acacia subporosa	River Wattle	SC	25	25	E		
Acacia stenophylla**	Shoestring Acacia	SC	30	20	E		
Acer palmatum+	Japanese Maple	SC	20	20	D		
Albizia julibrissin	Silk Tree	SC	30+	-25	D/F	Yes	
Arbutus unedo++	Strawberry Tree	SC	30	20	E/F		
Archontophoenix cunninghamiana	King Palm	U	40+	-20	P	Yes	
Bauhinia blakeana*	Hong Kong Orchid	SC	20+	-20	D/F		
Callistemon citrinus~#	Lemon Bottle Brush	U	-25	20+	E/F	Yes	
Callistemon salignus	White Bottlebrush	SC	25	25	E/F		
Cercis canadensis***	Eastern Redbud	SC	25	25	E/F		
Cercis mexicana***	Mexican Redbud	SC	25	25	D/F		
Cercis occidentalis***	Western Redbud	SC	25	25	D/F	Yes	Yes
Cercocarpus betuloides	Mountain Ironwood	SC	20	-20	E/F	Yes	Yes
Chiionanthus retusus	Chinese Fringe Tree	SC	-20	-20	D/F		
Heteromeles arbutifolia***	Toyon	SC	25	25	E	Yes	Yes
Hymenosporum flavum***	Sweetshade	SC	35	20	E/F		
Lagerstroemia indica*	Crape Myrtle	SC	-20	-20	D/F	Yes	
Lyonathamnus floribundus***	Catalina Ironwood	SC	50	35	E/F	Yes	Yes
Photinia fraserii***	Fraser Photinia	SC	20	20	E/F		
Raphiolepis	'Majestic Beauty'	SC	-20	-20	E/F	Yes	
Syagrus romanzoffianum	Queen Palm	U	40+	-20	P	Yes	

Legend

Type

D - Deciduous

E - Evergreen

F - Flowering

P - Palm Species

Form

SC - Small Canopy Form: 15' to 25' spread. Minimum spacing = 20 feet.

LC - Large Canopy Form: 25' and larger spread. Minimum spacing = 30 feet.

U - Vertical / Upright Canopy Form : 15' to 25' spread. Minimum spacing = 20 feet

City of San Diego STREET TREE SELECTION GUIDE

LARGE TREES

The following selections are recommended for 7.0 foot to 10 foot parkways or larger and minimum 40 square foot cutouts.

Root Barriers Recommended for all applications

Botanical Name	Common Name	Form	Height	Spread	Type	Drought	Native
Arbutus menziesii	Madrona	LC	40+	40+	E	Yes	Yes
Calocedrus decurrens	Incense Cedar	LC	40+	-40	E	Yes	Yes
Cedrus deodara	Deodar Cedar	LC	40+	40+	E	Yes	
Cupressus forbesii***	Tecate Cypress	LC	25+	25	E		
Eucalyptus polyanthemos	Silver Dollar Gum	LC	40+	-40	E	Yes	
Eucalyptus leucoxylon	White Ironbark	LC	60+	40	E	Yes	
Koelreuteria bipinnata	Chinese Lantern	LC	-40	-40	D/F		
Koelreuteria paniculata	Golden Rain	LC	-40	-40	D/F	Yes	
Magnolia grandiflora	Southern Magnolia	LC	-40	-40	E/F		
Olea europaea~	Olive "fruitless"	SC	-40	-25	E	Yes	
Platanus acerifolia	London Plane	LC	40+	40+	D		
"Bloodgood"							
Pinus canariensis	Canary Island Pine	U	40+	-25	E	Yes	
Pinus pinea~	Italian Stone Pine	LC	40+	40+	E	Yes	
Pinus muricata***	Bishop Pine	LC	50	40	E		Yes
Plantanus racemosa***	California Sycamore	LC	60+	40+	D		Yes
Podocarpus gracilior~	African Fern Pine	LC	40+	-40	E		
Tipuana tipu	Tipu Tree	LC	40+	40+	D/F		

The following selections are recommended for 10-foot or larger parkways and 10-foot or larger center medians.

Root Barriers Recommended for all applications

Botanical Name	Common Name	Form	Height	Spread	Type	Drought	Native
Liriodendron tulipifera***	Tulip Tree	LC	>66	30	D		
Pinus torreyana	Torrey Pine	LC	80+	80+	E	Yes	Yes
Quercus agrifolia***##	Coast Live Oak	LC	65	50	E	Yes##	Yes
Quercus engelmannii***##	Mesa Oak	LC	50	45	D	Yes	Yes
Quercus virginiana+##	S. Live Oak	LC	50	40	D/E		

Legend

Type

D - Deciduous

E - Evergreen

F - Flowering

P - Palm Species

Form

SC - Small Canopy Form: 15' to 25' spread. Minimum spacing = 20 feet.

LC - Large Canopy Form: 25' and larger spread. Minimum spacing = 30 feet.

U - Vertical / Upright Canopy Form : 15' to 25' spread. Minimum spacing = 20 feet

Tree Selection Tips and Notes

Additional Notes(symbols in left margin relate to symbols that appear adjacent to various tree selections)

- + Prefers a moist, well-drained loam to which plenty of humus has been added.
- ++ Fruit production.
- * Approved for use under power lines and/or Public View Corridors
note: Palm species may also be approved for view corridors.
- ** Tree has been identified by the San Diego Regional Asthma Coalition as an Allergy Producer
- ~ Tolerates Direct Coastal Exposure (Typically 1000' from shoreline)
- # Root Barriers are required when used in less than three foot parkway and where specified

Minimum Size Canopy = 24" Box

Minimum Size Palm Species = 10' BTH (14' BTH at Bus Stop or Red Curb)

BTH = Brown Trunk Height = height from ground level to live fronds

Non-Irrigated Settings Recommended

*** Specific maintenance needs – may require supplemental watering following establishment. See local nursery for more information.

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