

PART III  
SITE REQUIREMENTS

## III. SITE REQUIREMENTS:

## A. GENERAL:

The Executive Architect is to refer to all specific program requirements, Soils Reports when furnished by the University, the Long Range Development Plan (LRDP), the LRDP EIR, project EIRs, Campus Area Studies, Campus Erosion Control Standards (*Appendices*), *Stormwater and Drainage Master Plan*, *Landscape Management Program, 1995 (Related documents)*, *Storm Water Management Plan*, UC Santa Cruz Green Building Baseline Narrative and any other applicable guidelines in designing buildings and site improvements on the UCSC campus, as well as the following requirements.

## B. EROSION CONTROL:

1. Avoid disturbing areas of high erosion susceptibility, sensitive vegetation areas, and steep slopes. Avoid substantial development on slopes over 20%.
2. Vegetate slopes disturbed by construction with native or drought tolerant plants, as appropriate where environmental conditions allow plant growth and mulch or other control measures where vegetation is not viable.
3. Provide special erosion control measures on slopes greater than the angle of repose necessary for natural erosion control.
4. Avoid major grading occurring between October 1st to May 1 of every year if possible. Note: due to funding and completion deadlines, this goal may not be possible for all projects.
5. Hydroseed all areas of disturbed earth. Refer to *Appendices* for recommended seed mixes. Provide other erosion control measures necessary when such areas are left exposed to the weather during October 1 to May 1 of every year. *Provide interim erosion control measures until vegetation is sufficiently established to provide erosion control.* Note: specific areas on campus may require special controls. (refer to the LRDP, the LRDP EIR, project EIR, if applicable and Storm Water Management Plan)
6. Steepness of cut or fill slopes shall be no greater than 1:3, preferably flatter, to allow revegetation.
7. Cut and fill slopes shall be designed to minimize visual impacts to the natural landscape, including rounding off the interface between the top and bottom of the banks and the natural contours.
8. The end result of these measures is to control site erosion and prevent sediment transport off the site. It shall be the designer's responsibility to see that any additional measures necessary to meet this goal are discussed with the University Representative.

## C. DRAINAGE:

1. Protect all major springs, seep zones, drainage channels, year-round streams, and natural superficial drainage patterns from alteration. For new development and redevelopment a 30-foot buffer from water bodies will be included in the project. Where a 30-foot buffer is not feasible and for buffers less than 30 feet, written documentation from a qualified

professional must be provided prior to design approval to show that the proposed buffer is adequate to prevent adverse effects on the watershed.

2. Design for high levels of absorption in all identifiable ground water recharge areas (flatter slopes encouraged to maximize absorption rates); verify specific requirements with the Project Manager.
  3. Ensure that runoff passes through an appropriate filter before entering a sinkhole.
  4. Where new development drains to existing outfalls, existing outfalls shall be upgraded as necessary to extend to toe of slope and provide energy dissipation.
  5. Provide for detention of storm water runoff to ensure that peak post-development runoff flow rates do not exceed pre-development runoff rates. Post-development flow rates must not cause erosion. Ensure that storm water does not saturate the ground at building foundations. (refer to the LRDP, the LRDP EIR, project EIR, if applicable, and Storm Water Management Plan )
  6. Ponding of water on the site ground surfaces is not allowable; all surfaces must have a positive drainage. Drain all water away from building foundations.
  7. Refer to specific Soils Investigations of sites (when available) to determine any potential natural channels / sinkholes that may affect underground drainage, foundations, etc.
  8. Where environmental conditions and engineering design shows adequate use sort armoring to minimize erosion in drainages.
  9. To encourage storm water infiltration in small parking lots eliminate curbs or provide curb openings and slope parking lots to encourage storm water infiltration into vegetation islands and strips where the potential for erosion or a hazardous material spill is not expected.
  10. Utilize all feasible opportunities to encourage on-site absorption, including porous pavers, vegetative strips, grassy swales, detention ponds and infiltration strips. Feasibility may be limited by constraints such as vegetative detritus, accessibility compliance under ADA, provisions for emergency vehicle access, soil permeability as well as sufficient sunlight to permit plant growth.
  11. Refer to Stormwater and Drainage Master Plan, LRDP-EIR Mitigation Measures and Storm Water Management Plan *for additional drainage guidelines*.
  12. The State Water Resources Control Board requires a storm water pollution prevention plan (SWPPP) for all projects disturbing one (1) acre or more. Verify requirements with Project Manager. See SWPPP example in *Reference Documents* and refer to Division 1 Section 1560.
  13. Refer to UC Santa Cruz Green Building Baseline Narrative for additional requirements
- D. LANDSCAPE:
1. General Design:

- a. Landscape areas should contribute to the identity of each particular college or building complex. New landscaping at existing buildings should conform to or complement the existing character of planting.
  - b. The design of each particular college or building complex should be sensitive to, and complementary of, any existing sensitive vegetation and mature specimen trees. All landscaping should endeavor to enhance the natural beauty of the site and to establish or preserve the identity of each college and / or building complex.
  - c. The landscape design shall provide for bicycle parking and circulation as well as for pedestrian circulation.
  - d. *Personal security should be enhanced in the landscape design by maintaining visibility. Avoid creating darkened or hidden areas, both in design and plant selection.*
2. General Planting Selection:
- a. Planting areas outside building compounds should relate to the surrounding native plant community and utilize native plants, closely related species, or, in specific and limited locations, ornamentals successfully used on campus.
  - b. Planting areas within building compounds should respond to the uses and functions of the buildings and spaces: providing sunny seating areas, shady resting areas, colorful entries, and screening or buffers when necessary. Plant sizes should be chosen to assure long term adaptability to specific site locations.
  - c. Ground covers and vegetation shall be designed to minimize erosion.
  - d. Do not use decomposed granite or gravel at paths within developed areas or adjacent to buildings. These materials migrate onto lawns and into building entry systems, creating maintenance problems.
3. Water Usage:
- Selected plant species should be water efficient, requiring little or no irrigation, so as not to affect drainage and availability of water to existing native species, and to minimize water usage on campus.
4. Maintenance:
- Plant materials should be selected for ease of maintenance so as not to require substantial pruning, leaf and litter collection, or pest control. Avoid large deciduous trees in interior courtyards that require substantial leaf collection.
5. Invasive plantings of non-native species should be avoided, to protect the natural floral diversity.
6. Fire Resistant Planting should be chosen in areas of high fire hazard such as within the chaparral plant community.
7. Deer Resistant Planting *required*.

8. Lawn Areas:
  - a. Minimize lawn areas to conserve water usage on campus within a new building complex. (General lawn areas are to be specified according to each particular project program requirements.) When lawn areas are provided, provide a few larger areas of lawn, as opposed to many smaller patches of lawn, in order to minimize maintenance costs.
  - b. In layout of lawn areas and other specialized landscape areas, consider the ease of lawn mower or other maintenance equipment access to such areas.
9. *The Appendices* contain a list of native plants, non-native plants, and grass mixes that have been observed to do well on campus. Deviations from this list must be submitted for approval.
10. Design Considerations for Existing Trees:
  - a. All trees on campus, especially the redwood and live oak trees, are a prime natural asset and should be carefully protected.
  - b. All new building should observe the following guidelines:
    - (1). Whenever possible, avoid fill or excavations within 20 feet of the trunks of redwoods or within the drip line of other species, to avoid suffocation and root cutting (causing stability problems). Avoid placing utility lines through groves of redwoods, or next to redwoods and other trees to be saved.
    - (2). Establish finish grades on paving, footings etc., above the root system. The grade at the base of all trees should not be raised or lowered.
    - (3). Limit root coverages to not more than 40% unless a loose permeable covering is used such as gravel, decomposed granite, etc.
    - (4). Re-establish drainage systems around trees where natural drainage system has been disturbed. Finish grades should drain away from the tree.
11. Tree Protection:
  - a. Projects budgeted at over \$1,000,000 shall have a tree survey performed for all significant trees affected by the project. Using values taken from the table in (c) below, the consulting arborist shall establish tree protection zones for the existing trees. The University's Representative shall employ the survey and proposed protection zones to inform decisions regarding tree retention or removal. For projects less than \$1,000,000, consult with the Campus Arborist to develop an appropriate tree protection plan.
  - b. Decisions regarding preservation of trees will be made by the University's Representative and shall be based on location, health, present and ultimate sizes of trees and species. Certain species are less adaptable to changes in their environment, such as madrone, Douglas fir, California bay, California native oaks, tulip tree, most maples, and most conifers. Young, small trees adapt to change more easily than do older, larger trees.

Soil compaction occurring in root zone areas during construction will persist and is extremely difficult to correct. Prevention of soil compaction in root zone areas must be considered highly important for the future health of the landscape around construction.

- c. Tree protection zones shall be established and identified on the tree protection plan following these guidelines (from Matheny and Clark, Trees and Development, ISA Pub.) :

<i>Species Tolerance</i>	<i>Tree age</i>	<i>RADIUS of protection zone from trunk - FEET PER OF TRUNK DIAMETER</i>
<i>INCH</i>		
<u><i>Good</i></u> ( <i>Redwood - water</i> )	<i>Young</i> ( <i>20% life expectancy</i> )	.5ft. / in.
(Coast live oak - no fill or water)	<i>Mature</i> ( <i>20-80% life expectancy</i> )	.75 ft. / in.
	<i>Overmature</i> ( <i>&gt;80% life expectancy</i> )	1 ft. / in.
<u><i>Moderate</i></u> ( <i>California bay - no fill</i> ) ( <i>other oaks</i> )	<i>Young</i>	.75 ft. / in.
	<i>Mature</i>	1 ft. / in.
	<i>Overmature</i>	1.25 ft. / in.
<u><i>Poor</i></u> ( <i>Madrone</i> )	<i>Young</i>	1 ft. / in.
	<i>Mature</i>	1.25 ft. / in.
	<i>Overmature</i>	1.5 ft. / in.

#### E. PARKING:

1. Minimize the size of parking lots and minimize the impervious land coverage of parking lots.
2. Due to the difficult terrain of the campus, particular attention should be paid to meeting and exceeding Title 24 requirements to provide accessible parking for all parking areas near campus buildings.
3. Parking should be convenient, but not obtrusive. Screening or buffering of parking areas is encouraged.
4. Parking should not create an obstacle for pedestrians traveling between each particular college and adjacent colleges or the campus core.
5. Pedestrian movement in and out of parking areas shall be incorporated into the landscape design.

6. Parking and service areas should be landscaped, should retain existing trees where possible, should conform to the topography, and should be limited in size to decrease their visual impact.
7. All parking areas or clusters of parking areas 1 acre or larger shall be provided with sedimentation filtration basins designed to capture *the first flush of 1/2" rainfall and the majority of suspended or emulsified contaminants*. Refer to *Details 2.7-4a/b in Part IV*
8. Minimum Parking Space Requirements:
  - a. Provide wheel stops. *Use of wheel stops other than curbs shall be verified with Transportation and Parking Services through the Project Manager.*
  - b. 4" wide traffic paint stripes shall be used for marking all parking spaces (no ceramic markers).
  - c. All parking lot signs, handicapped parking signs, etc. are provided by the UCSC Sign Shop for installation by the Contractor. (Verify with Project Manager.)
  - d. Provide minimum dimensions of 8'-6" wide x 18'-0" long per space. One-third of the total parking spaces may be compact sizes (8'-0" wide x 16'-0"). Provide a minimum of 20'-0" of aisle width with 90 degree layout, or 56 ft. min. overall curb to curb when curbs are used as wheel stops. Provide an additional 4'-0" *between curb faces* when nose to nose parking is provided. *Assume vehicle overhangs curb by 2'-0". Verify all parking layouts and dimensions with Project Manager.*
  - e. Motorcycle parking shall be provided as specified in Detailed Project Program (DPP).
9. Provide bicycle parking convenient to building entries. See Part VI, Details 2.8-5, 2.8-6, 2.8-7 for approved bike racks. Plans of typical rack layouts are available from Transportation and Parking Systems (TAPS). Verify amount of bicycle parking, rack type, and layout plan with Project Manager.
10. Provide Lighting per Section 16530, Site Lighting Standards.

#### F. CIRCULATION:

1. Roadways:
  - a. Roadways are to be 20 ft. wide, minimum, with minimum 32 ft. inside radius at curves. See Item G, below, for additional fire access requirements.
  - b. Existing trees, and proposed landscaping, must be sufficiently removed from the sides and from above the vertical envelope of the roadway to allow un-constricted access along all access roads or service roads. Minimum clear height required is 14 feet. See also fire access and refuse truck access requirements.
  - c. Maximum grades of fire roads shall not exceed 20%. Grades over 15% shall not be permitted for distances greater than 200 feet at a time.
  - d. Speed limits:
    1. The standard campus speed limit is 25 mph, unless posted otherwise. The speed limit at service roads is typically 10 or 15 mph.

2. The UCSC Project Manager shall consult with University Police during the design phase of a project to determine the appropriate speed limits.
  3. Speed limit signs, when necessary, shall be indicated in the construction documents. These signs are customarily provided by the UCSC Sign Shop.
2. Site Paths:
    - a. Provide asphalt, concrete or pavers for site paths of a width appropriate to its intended use, 6 feet wide minimum. See Section 02500 for concrete color requirements. If asphalt is used, provide a pressure treated or plastic composite lumber product pathway header at all non-forest areas (wood treated with chromated copper arsenate is not acceptable). At forest areas, header at edge may be omitted. Verify with the Project Manager.
    - b. *Drain* covers in pedestrian paths shall be ADA compliant in the direction of travel and shall be appropriate for bicycle traffic.
    - c. Provide for bicycle circulation to and from bicycle parking areas. Bicycle and pedestrian paths shall be separate.
  3. Site Stairs:
    - a. Provide concrete at typical site stairs. The use of 6 x 6 pressure-treated fir edge with concrete tread may be allowed at isolated pathway locations (wood treated with chromated copper arsenate is not acceptable). Verify with Project Manager. It is campus practice to apply all requirements of CCR Title 24 for interior stairways and railings to all exterior site stairs and railings.
    - b. Provide handrails for all stair runs of two or more risers. Group risers over an extended distance; avoid all single risers.
  4. Pedestrian Bridges:
    - a. Pedestrian bridges shall be 10 ft. minimum width and shall provide 17 ft. minimum clearance over roadways.
  5. Crosswalks:
    - a. Crosswalks at major roadways shall be 12 ft. wide. Crosswalks parallel to major roadways (e.g., parking lot entries) shall be 8 ft. wide.
    - b. Crosswalk stripes shall be perpendicular to crosswalk and stripes shall be 18" wide with 18" space on roadway. Align in manner to provide blank space at roadway striping for bike lane. Use thermoplastic for crosswalk striping, except in bike lane. Stamped asphalt using thermoplastic in imprinted areas is acceptable.

#### G. FIRE DEPARTMENT ACCESS:

1. Campus Fire Department trucks must have uninterrupted access on hard surface, all weather new or existing roads to all new buildings, additions to buildings, or any other developed area on campus at all times. All locked construction gates and permanent gates must be accessible to the Campus Fire Department.

2. Approved apparatus access roads shall be provided within 150 feet of all exterior walls of buildings, facilities or structures.

EXCEPTIONS:

- a. When buildings are completely protected with an approved automatic fire sprinkler system, the provisions of this section may be modified by the Designated Campus Fire Marshal.
  - b. When access roads cannot be installed due to topography, waterways, nonnegotiable grades or other similar conditions, the Designated Campus Fire Marshal is authorized to require additional fire protection system(s).
3. Fire apparatus roads shall have an unobstructed width of not less than 20 feet and an unobstructed vertical clearance of not less than 14 feet. (Any variations must be specifically approved by Designated Campus Fire Marshal.)
  4. Access roads shall be "all weather", a minimum of eight inches (unless more is required per the geotechnical report) of compacted aggregate base rock, Caltrans Class 2 or equivalent, certified by a licensed engineer to a 95 percent compaction. Access roads must be capable of supporting the imposed load of a fire apparatus of 25 tons.
  5. Where the grade of the access road is greater than 15 percent, the base rock shall be overlain by asphaltic concrete (AC), type B or equivalent. The thickness of AC shall be 3 inches minimum, except for a roadway with a sole use of emergency access, which then shall be 2" minimum thickness.
  6. Maximum grades of access roads shall not exceed 20%. Grades over 15% shall not be permitted for distances greater than 200 feet.
  7. No roadway shall have an inside turning radius of less than 32 feet. Roadways with a radius curvature of 50 to 100 feet shall require an additional 4 feet of road width beyond the 20 foot minimum width. Roadways with curvatures of 100 to 200 feet shall require an additional 2 feet of road width beyond minimum.
  8. Bridges shall be as wide as the road being served, meet a minimum load bearing capacity of 25 tons, and shall be provided with guard rails. Bridge capacity shall be posted and shall be certified every five years by a licensed engineer. For bridges served by 16 foot (or less) access roads, approved turnouts shall be provided at each bridge approach.
  9. Gates shall be a minimum of 2 feet wider than the access road/driveway they serve. Overhead gate structures shall have a minimum of 15 feet vertical clearance.
  10. Obstruction of the above required road width, including for the parking of vehicles, shall be prohibited, per the Uniform Fire Code.
  11. More than one fire apparatus road shall be provided when it is determined by the fire chief that access by a single road may be impaired by vehicle congestion, condition of terrain, or other factors that would limit access. Dead end roads shall not exceed 500 feet in length.
  12. Dead end apparatus access roads exceeding 150 feet in length shall be provided with an approved turn-around.

13. Adequate turnaround area at dead ends must be provided for the fire trucks. Provide a minimum of 25 ft. backup space at either side of the minimum 20 ft. wide road at a "T" layout, or provide a minimum of 25 ft. in both directions of a "L" layout. Verify all fire truck turn-around dimensions with the Project Manager and the Campus Fire Marshal. See drawing, Part VI.
14. Lock boxes: Provide a lock box adjacent to the project vehicular access. Verify location with Project Manager. See Part VI, Detail 2.8-4
15. The Designated Campus Fire Marshal, acting as the State Fire Marshal, will be involved in reviewing the Contract Documents of all major projects to determine compliance to codes and that access to all buildings and adjacent fire roads is strictly maintained.
16. The Designated Campus Fire Marshal will also review the Contract Documents for availability and adequacy of all fire protection systems and equipment, and all other items pertaining to fire and life safety.

#### H. SITE LIGHTING & ELECTRICAL

1. Provide lighting along paths to adequately illuminate the pathway. Refer to Part V, Section 16530, Site Lighting Standards, and Part VI of this Handbook for specific standard lighting fixtures. Site lighting with non-glare, downlighting characteristics is preferred for all areas around buildings, especially at housing areas. Forest areas should be illuminated with non-directional fixtures that provide light throughout the surrounding area. Average light levels should be as follows:

Parking lots:	1 footcandle
Paths, non-forest areas	1/2 footcandle
Paths, forest areas	1 footcandle
Stairs	1 footcandle

*For other developed areas requiring site lighting, Executive Architect/Engineer shall make proposals based upon above standards as well as IES standards. Confirm proposed light levels with the Project Manager.*

2. Verify all requirements for emergency "bluelight" call stations for each particular project with the Project Manager. See Part VI for standard details.
3. Provide electrical outlets at all building exteriors for use by grounds maintenance personnel.

#### I. TRASH COLLECTION:

1. Most buildings on campus are generally near a dumpster location, accessible to the campus refuse truck for periodic (usually weekly) collections. All new buildings or building additions should consider convenient access to dumpsters by building residents and Maintenance personnel, as well as sufficient access to dumpsters by the refuse truck in the site layout.
2. In siting dumpster locations, balance the convenience to building users with desirable isolation of unpleasant odors associated with dumpsters.

3. Screen all new dumpster locations either by wood fencing, concrete walls or similar, depending on particular program requirements, Container lids required wherever possible.
  4. Provide a quick-coupler, or, if attached to a building, a hose bibb within five feet of all new dumpster locations.
  5. The interior of the dumpster pad and the area immediately in front of it shall be concrete, 8" minimum thickness. The concrete shall include the dumpster pad (see below) and an area in front of the pad that shall be *twelve* feet deep and two feet wider than the pad. See drawing, Part VI, Detail 2.5-1.
  6. Dumpster Pad Dimensions:
    - a. Single: 7 ft. deep x 10 ft. wide clear inside dimensions. *For use in special circumstances only; verify with Project Manager.*
    - b. Double: 7 ft. deep x 18 ft. wide clear inside dimensions.
    - c. Double dumpster pads are required at all new facilities to accommodate the primary solid waste dumpster as well as one dumpster dedicated to cardboard. Pads shall be provided at loading docks, kitchen facilities, and housing areas.
    - d. Additional (plastics, bottles, paper, etc.) recycling needs may be accommodated by providing an increase to the dumpster pad 6 feet deep by 10 feet wide for four recycling carts and space to access them. Recycling areas may also be located separately from the dumpster enclosure, with similar space requirements. Recycling needs at kitchens will be greater. Confirm recycling and dumpster needs with Project Manager.
  7. Dumpster enclosure walls shall:
    - a. have curbs or bumpers to protect walls from damage by the dumpster.
    - b. be a minimum of six feet high.
    - c. have three sides only, no gates or walls facing truck turnaround.
  8. Dumpster areas shall be designed with storm water run-on diversion.
  9. Refuse Truck Dimensions:
    - a. For truck turning and backup dimensions, see drawing, Part VI, Detail 2.5-1. Provide 18 feet for the vertical clear dimension for fully extended refuse truck pickup mechanism.
  10. At trash rooms within buildings, or near any trash chutes at the ground level, provide a hose bibb. At trash rooms within buildings, provide a floor drain to sanitary sewer, as well as 8" high minimum *exposed concrete curb* at wall by floor (unless the entire trash room wall is concrete or masonry) and durable, cleanable, wall surfaces. Provide for ample width of trash room door to exterior to allow for easy access or towing of dumpster.  
*Note: Trash rooms are not the preferred solution.*
- J. SIGNS: See Section 02800
- K. Fences: See Section 02830

- L. Bollards shall be used to restrict vehicular traffic at service roads and entries to pedestrian areas. See Part VI, Detail 2.8-1 and 2.8-1a. Check with project Manager for applicable standard.
- M. Utility boxes and vaults: Installation shall minimize traffic disruption and the entry of surface drainage:
  - 1. Avoid locating utility boxes in paths or streets. If such locations must be used, avoid low spots or drainage channels, and provide an abrasive slip-resistant coating on lids.
  - 2. Utility boxes not located in paths or streets shall be installed so that the top is approximately 2" above final grade for small utility boxes, 3" above final grade for large utility vaults.
  - 3. Traffic ratings: In street or parking area, provide rating for H 20-44 loading. Adjacent to street, pathway, or parking area, provide light vehicular traffic rated lid.
  - 4. Lids: Provide lift handles for utility box lids larger than 1 ft x 2 ft., spring assists for lids larger than 2 ft x 3 ft. Provide meter reading lids for boxes containing meters. Provide slip resistant coatings for box lids in pedestrian pathways or plaza areas.
  - 5. Provide concrete bottoms in all utility boxes and vaults.
  - 6. Provide drain to daylight in bottom of utility boxes and vaults.

PART IV

UNIVERSITY OF CALIFORNIA STANDARD DOCUMENTS

(not included)