

# Appendix F

Civil and Site Design Guidelines Supplement





## **CIVIL AND SITE DESIGN GUIDELINES**

Supplement to current Campus Standards as published on the current PP&C website: <http://ppc.ucsc.edu/>  
Outline shown below follows outline from Campus standards for ease of reference

### SECTION 02500: PAVING AND SURFACING STANDARDS

#### I. GENERAL

- A. Provide 6" high concrete or asphalt curb (concrete preferred) when required or necessary at roads or parking areas carrying storm water. Sheet drainage off roads into drainage swales or landscaped areas is encouraged (to allow more water absorption into the ground).

### SECTION 02665: WATER DISTRIBUTION STANDARDS

#### I. GENERAL

##### D. Backflow Standards

- 1. Potable water systems (with no process use in the building)
  - i. generally, no backflow controls at connection to water supply main are required, but confirmation with EH &S Department should occur for each project. Also see Industrial water system backflow protection in Division 15.
- 2. Fire protection system within premises
  - i. protection of building potable water system shall be with a spring- loaded double check valve, O S & Y type assembly, located on the fire water.
- 3. See Division 15 for additional requirements
- 4. Designer is to consider the latest AWWA recommendations and the California Health and Safety Code regulations before choosing the project method of backflow prevention.

#### II. MATERIALS

##### A. Acceptable piping materials are:

- 1. Class 200 AWWA C-900 PVC, Ductile iron pipe, cement lined



SECTION 02720: STORM DRAINAGE SYSTEM STANDARDS

I. GENERAL

- A. Provide positive surface drainage away from buildings 2.5% minimum to a collector, paved surface or disbursement system (location to be approved by geotechnical engineer). Ponding anywhere on the site will not be acceptable (except as necessary for storm water detention, the location for which must be reviewed by the geotechnical consultant). - A water test is required to check for positive drainage. Water may not drain across walks and paths.
- J. Storm drainage design shall include design measures to ensure that post-development peak flows from 2-, 5- and 10-year storms do not exceed the 2-, 5- and 10-year pre-development peak flows and that post-development peak flows from a 25-year storm do not exceed the pre-development peak flow from a 10-year storm. Each project shall also include design measures to avoid or minimize the increase in the volume of runoff discharged from the site to the maximum extent feasible.
- K. Refer to Erosion and Sediment Control Standards For Projects Under One Acre, Stormwater and Drainage Master Plan, Stormwater Management Plan, Sedimentation Basin Details, LRDP and LRDP EIR.(Locations in Table of Contents)
- L. Where new development drains to existing outfalls, existing outfalls shall be upgraded as necessary to extend to toe of slope and provide energy dissipation.
- M. Label storm drain inlets and catch basins to indicate prohibition of illegal discharge.

II. MATERIALS

- A. Acceptable piping materials are:
  - 1. Corrugated metal pipe (CMP): acceptable but not desirable; will not be approved in main campus area. Review application with project manager.
  - 2. Reinforced concrete pipe (RCP). 12 inch diameter and over.
  - 3. PVC drain pipe. Minimum grade: ASTM, SDR 35. For pipe sizes smaller than 12 inch diameter. This includes perforated drain piping behind retaining walls.
- B. Gravity flow piping serving manholes can be:
  - 1. Reinforced concrete pipe
  - 2. Cast iron soil pipe.
  - 3. PVC pipe (minimum grade, ASTM D3034, SDR 35)



SECTION 02730: SANITARY SEWER SYSTEM STANDARDS

I. GENERAL

- A. All sewers shall be gravity flow and use of lift stations shall be by approval of campus engineer only.
- B. All science buildings shall have a separate lab waste pipe system connected to an exterior building manhole. Manhole to be equipped with sampling provisions (See Division 15 for additional information).
- C. Pipe size shall be designed according to depths of flow
  - $\leq 12$  inches in diameter,  $\frac{1}{2}$  full
  - $\geq 12$  inches in diameter,  $\frac{3}{4}$  full
- D. Pipe velocity not to exceed 15 fps unless approved by Campus Engineer
- E. No Surcharging
- F. Minimum pipe slope shall be 2%.
- G. Minimum pipe cover shall be 3ft
- H. Whenever possible locate sewer line in roadway
- I. Pipe lines not to be located in building footprint (with exception of building waste line)
- J. Upstream Manhole rims shall be below building fixture rim so as not to require back flow valve.
- K. Drop manholes are encouraged, where needed, to maintain proper design slope and velocity of sewer flow.
- L. Eccentric manholes shall be provided with a landing bench on opposite side of pipe channels
- M. Width of manhole to be 4 ft minimum
- N. Manhole depth not to exceed 15 ft without approval of Campus Engineer
- O. Manhole spacings at 300 L.F. max. or less as required.
- P. Refer to detail 2.6-12 for standard Utility Trench details
- Q. Sewer design drawings shall include the following:
  - a. Location of manholes and cleanouts
  - b. Location of laterals and stubouts
  - c. Existing manhole numbers (available from archives office)
  - d. Manhole rim and invert elevations
  - e. Size and class of pipe
  - f. Slope of pipe
  - g. Special details
  - h. Location of existing sewers and laterals to be abandoned
- Q. Coordinate with Section 15400-1.06

II. MATERIALS

- A. Acceptable piping materials:
  - 1. Main trunk lines (14" and above); review pipe materials with Campus Engineer.
  - 2. All other lines shall be one of the following:
    - a. Concrete lined ductile iron.
    - b. PVC Pipe: ASTM D3034, SDR 26 with elastomeric gasketed joints conforming to ASTM D3212

III. EXECUTION

- A. Pressure test sewer piping to 5 P.S.I.G. with air for 15 minutes, 1/2 lb. maximum pressure drop.



PART II – GENERAL BUILDING REQUIREMENTS

D. ROOF WATER DRAINAGE:

1. Roof leaders shall be piped away from building as not to cause erosion incorporate Best Management Practices when applicable. Splash blocks will not be allowed.  
(See specific project soil investigation to determine constraints on daylighting such storm water.)

G. MAINTENANCE:

6. Buildings and Grounds Storage:

- a. Provide an area within the building or directly outside the building, with direct access to the exterior, for the storage of equipment for the campus Buildings and Grounds Dept.\* (This equipment includes such items as lawnmowers, tools, landscaping equipment, etc.) This requirement shall be considered on a project by project basis; suggested *minimum size is 60 ASF*. Verify with Project Manager.
- b. Outdoor materials storage areas shall be designed to prevent storm water contamination from loose, particulate or dissolved materials. Design features may include covering or enclosing storage areas and preventing run-on and run-off through the use of berms or grading design.



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, Erosion and Sediment Control Standards for Projects Under One Acre (*Appendix D*), *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:

2. Vegetate slopes disturbed by construction with native or drought tolerant plants, as appropriate and where environmental conditions allow. Install mulch or other control measures where vegetation is not viable.
4. Avoid major grading occurring between October 1st to May 31 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 31 of every year. Provide interim erosion control measures until vegetation is sufficiently established to provide erosion control.
  - a. The following specific areas on campus may require special controls.
    - i. Sensitive Habitat. Includes (a) those shown on the Local Coastal Plan Sensitive Habitat Map; (b) areas of biotic concern as shown on the Local Coastal Plan Resources and Constraints maps which contain concentrations of rare, endangered, threatened or unique species; (c) as defined in the Local Coastal Plan Glossary, and any areas designated Environmental Reserve, Protected Landscape, or Campus Reserve Lands; and (d) any undesignated areas which meet the criteria below and which are so identified through the CEQA review process or other means.
    - ii. Areas of Special Biological Significance as identified by the State Water Resources Control Board or by the University.
    - iii. Areas which provide habitat for locally unique species, including but not limited to, the special forests and grasslands designated in the local Coastal Program Land Use Plan or as otherwise designated by the University.
    - iv. Areas adjacent to critical habitats of rare and endangered species.
    - v. The habitat of rare, endangered, and threatened species as identified by the State Department of Fish and Game, United States Department of Interior Fish and Wildlife Service, the Smithsonian Institute, or the California Native Plant Society.
    - vi. All marine, wildlife, and education/research reserves. (This includes the University's Environmental Reserve Area.)
    - vii. Near shore reefs, rocky intertidal areas, sea caves, islets, offshore rocks, kelp beds, marine mammal hauling grounds, shorebird roosting, resting, and nesting areas.
    - viii. Dune plant habitats.
    - ix. All lakes, wetlands, estuaries, lagoons, streams, and rivers.
    - x. Riparian corridors.



Refer to the LRDP, the LRDP EIR, project EIR, if applicable and Storm Water Management Plan

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.
9. No person shall cause or allow the continued existence of a condition on any site that is causing or is likely to cause accelerated erosion as determined by the University. Such a condition shall be controlled and/or prevented by the responsible person by using appropriate measures outlined in subsequent sections of this chapter. Additional measures shall be applied if necessary by the responsible

C. DRAINAGE:

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 post-development peak flows from 2-, 5- and 10-year storms do not exceed the 2-, 5- and 10-year pre-development peak flows and that post-development peak flows from a 25-year storm do not exceed the pre-development peak flow from a 10-year storm. Each project shall also include design measures to avoid or minimize the increase in the volume of runoff discharged from the site to the maximum extent feasible. *Ensure that storm water detention does not saturate the ground at building foundations.* (refer to the Campus Erosion and Sediment Control Standards For Projects Under One Acre, the LRDP, the LRDP EIR, project EIR, if applicable, and Storm Water Management Plan )
8. Where environmental conditions and engineering design shows adequate use soft 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 2005 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. Utilize UCSC SWPPP template in *Reference Documents* and refer to Division 1 Section 1560.
13. Refer to UC Santa Cruz Green Building Baseline Narrative for additional requirements

E. PARKING:



6. All parking areas or clusters of parking areas greater than 20,000 sq. ft. fitted with pre-engineered oil/water/sediment separator to treat 85<sup>th</sup> percentile, 24-hour storm event. Refer to *and Detail 2.7-4 in Part IV*.

F. CIRCULATION:

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. 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.

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.

I. TRASH COLLECTION:

3. Screen all new dumpster locations either by wood fencing, concrete walls or similar, depending on particular program requirements, Container lids required wherever possible.