

G

Building Sitework

Integration of the project within the Caltech campus extends beyond the walls of a building. Well-designed connections to existing Campus utilities, roadways, walkways, paths, and landscaping are essential to enhance, and not disrupt faculty and student movement about the Campus.

This Element includes basic information and standards on site preparation, site improvements, site utilities, and paving.

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G10 SITE PREPARA- TION

Comply with current California Law, Government Code 4216 prior to performing any digging.

G1010 Site Clearing

G1010.10 Clearing and Grubbing:

1. General:

- a. Comply with current California Law, Government Code 4216 prior to performing any digging. See www.digalert.org.

G1010.30 Tree and Shrub Removal and Trimming

1. General:

- a. Removal of trees and shrubs shall follow Pasadena Municipal Code 8.52.070 and 8.52.075 per the Tree Protection Ordinance. The removal of trees shall include the removal of stumps and roots to the extent that no root greater than 3 inches in diameter remains within 5 feet of any underground structure or utility line, nor under footings or paved areas. Grubbing in open areas shall include removal of stumps 3 inches in diameter, or greater, to 2 feet below finish grade elevations.

G1010.50 Earth Stripping and Stockpiling

1. General:

- a. Excess material or topsoil not required, or not permitted as fill, shall be moved to another site on Caltech property at the Contractor's expense.

G1050 Site Remediation

- 1. Hazardous Waste Remediation:** Consult Caltech Project Manager regarding information specific to hazardous waste remediation for the specific project.

G1070 Site Earthwork

G1070.10 Grading

1. Backfill:

- a. Material shall be free of debris.
 b. All backfill material to be brought on campus/site shall be from a certifiable source.
 c. Backfill soil certification must be provided to Caltech PM for review and approval prior to delivery.
 d. All graded areas must be protected from runoff in accordance to State Water Resources Board requirements.



G10 Site Preparation
G20 Site Improvements
G30 Liquid and Gas Site Utilities
G40 Site Electrical Utilities

G1010 Site Clearing
G1010.10 Clearing and Grubbing
G1010.30 Tree and Shrub Removal
and Trimming
G1010.50 Earth Stripping and
Stockpiling
G1050 Site Remediation
G1070 Site Earthwork
G1070.10 Grading
G1070.20 Excavation and Fill

G1070.20 Excavation and Fill

1. General:

- a.** Comply with current California Law, Government Code 4216. See www.digalert.org.
- b.** Excavations are not permitted which undermine the integrity of adjacent structures, paving, trees, or utilities.



G20 SITE IMPROVEMENTS

G2010 Roadways

1. Public Use: Roadways to be used for public use shall conform to State of California, County of Los Angeles, and City of Pasadena standards.

G2020 Parking Lots

1. Public Use: Parking lots to be used for public use shall conform to State of California, County of Los Angeles, and City of Pasadena standards.

Roadways to be used for public use shall conform to State of California, County of Los Angeles, and City of Pasadena standards.

G2030 Pedestrian Plazas and Walkways

1. Public Use: Sidewalks, plazas, and other site paving for pedestrian traffic to be used for public use shall conform to State of California, County of Los Angeles, and City of Pasadena standards.

2. Walking Surface: Provide slip-resistant walking surfaces on exterior pavement.

a. Standard Concrete color to be “Bisque” by Admixtures.

3. Exterior Steps and Ramps: Avoid the use of ramps, to the greatest extent possible. Where sloped walks are required, design with a running slope of 1:20 or less.

Avoid the use of ramps, to the greatest extent possible.

G2060 Site Development

G2060.25 Site Furnishings

1. Bicycle Racks: Custom-fabricated steel pipe rail. Refer to Page 269. Pipe shall comply with ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40). Hot-dip galvanize, after fabrication; comply with ASTM A 123/A 123M for railings. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion. Baseplate shall comply with ASTM A 36/A 36M. Drill baseplates at each end for expansion anchor bolts (two required for each plate).

2. Trash Disposal Area: Each building shall have a designated trash bin enclosure area that will conform to the City of Pasadena waste management program. Shield trash disposal enclosure from building occupants view whenever possible. Provide two 3-cubic-yard containers; one 3-cubic-yard container for cardboard; and, one 3-cubic yard container for trash. Provide a 35-foot minimum turn radius for trash truck access.

Shield trash disposal enclosure from building occupants view whenever possible.

3. Trash Containers: Provide trash containers at main entrance to each building a 35-gallon container, with exposed aggregate finish, brown lid, and 31-gallon, galvanized steel removable liner to match existing containers on Campus.

Provide trash containers at main entrance to each building

4. Exterior Patio Furniture: Provide the following solid teak products by Kingsley Bate, Ltd. (www.kingsleybate.com):

- a. Round Table: Model TR 42; 42-inch diameter by 29 inches high and/or Model TR 60; 60-inch diameter by 29 inches high.
- b. Square Table: Model ET 36; 36 inches long by 36 inches wide by 29 inches high.
- c. Chairs: Model CL 18A; armchair and/or Model CL 18; side chair.
- d. Umbrellas: Model MU 02 (with 2 inch pole); 10-foot diameter.
- e. Bench: Model HP 60; 6 feet long.

The list of Patio Furniture is the baseline and every project should consult the Caltech Project Manager and Caltech Grounds and Maintenance prior to the selection of Patio Furniture.

5. Cigarette Urns: Doty & Sons Concrete Products; Model D; 18-inch diameter by 29 inches high, with sign stating “PLEASE DEPOSIT CIGARETTES HERE.” Provide at least one cigarette urn.

G2060.30 Exterior Signage

1. Review site signage requirements with Caltech Project Manager, Safety Officer and with authorities having jurisdiction over the Project.

2. Traffic Signage: Provide porcelain enamel on steel signs with beaded text and symbols complying with requirements of California Department of Transportation. See website: <http://www.ca.gov/hq/traffops/signtech/signdel/specs/html>. Provide hazardous materials signs in 8-1/2 by 11 inch format.

- a. At entry to parking areas, provide State-required signage, R110B (CA). Refer to page 271.
- b. At parking spaces, provide State-required signage, R99 (CA) and R99B (CA). Refer to page 270.

G2080 Landscaping

G2080.10 Irrigation Systems

1. General: Water conservation is an essential part of the campus’s image and quality of life. The campus irrigation system is primarily controlled via a Rainbird Maxicom computerized control system and a weather station located on campus. In order to maintain consistency and compatibility with the computerized system, the following guidelines have been established.

2. New irrigation- Areas impacted shall:

- a. Whenever a main supply line is installed or redirected, it must be located at 18” in depth. Lateral lines at 12” in depth.



- b.** Ball Valve at point of connection.
- c.** Ball Valve at remote control valves when possible. When not possible, isolate 2 RCC's with a ball valve.
- d.** Control valve wires. Add an extra wire from controller to each remote control valve.
- e.** PVC Fitting & Nipples at 3" minimum distance between all PVC fittings and nipples.
- f.** Sprinkler spacing shall be at 12' maximum
- g.** Turf sprinklers shall be 2" from curbs, walls, and walkways.
- h.** Shrub sprinklers shall be 12" from walls and 2" from walkways and curbs.
- i.** Controller shall be Rainbird ESP with Maxicom compatibility. After connecting required stations, four (4) stations shall be left available for future needs.

3. Materials: The following materials have been identified for use in order to maintain consistency of the campus irrigation standards:

- a.** Controller-Rainbird ESP-40-SAT-TW-WM (12, 24, 32 station capability)
- b.** Flowsensor – Rainbird
- c.** Master control valve, electric - Superior - Normally Open (model 3100)
- d.** Remote control valves – Valcon (no substitution) (model VI)
- e.** Drip remote valve assembly - Valcon
- f.** Nozzles – Rainbird 1800 series (No VAN nozzles)
- g.** Bubbler heads - Rainbird – Adjustable full circle 1300A-F, Full circle 1400 series
- h.** Pop-ups – Rainbird
- i.** Rotors – Rainbird – 500-5,000 series
- j.** Swing joints – Marlex 90 degree w/schedule 80 nipples
- k.** Valves – Plastic (Rainbird) (No brass)
- l.** Marlex Street Ells
- m.** Nipples - Schedule 80
- n.** Ball Valves - Schedule 40
- o.** Fittings - Schedule 40
- p.** Quick coupler - Rainbird 33DLRC
- q.** Primer - Wet R Dry – Aqua Blue
- r.** Glue - Wet R Dry IPS weld on 2725 solvent cement
- s.** Superior Actuators- plastic (No brass)
- t.** Anti-Siphon valves – brass
- u.** Lateral lines – Schedule 40
- v.** Main lines Schedule 40
- w.** Sleeve piping – Schedule 40
- x.** Irrigation Meter- Elster DC#70 positive displacement – gallons (no pulsar)
- y.** Valve boxes - color -green color and place in an inconspicuous location

G2080.30 Plants

Select plant materials from “Campus Landscape Programming – Plant Selection” guide.

save existing trees whenever possible

The design team will be required to conform to the Campus Landscape Programming document dated October 29, 2010 for specific landscape goals.

1. General:

- a. Select plant materials from “Campus Landscape Programming – Plant Selection” guide. Refer to pages 273-276.
- b. It is desirable to save existing trees whenever possible. During the design phase, the Design Professional shall identify those trees to be saved and those which must be removed. Trees which may be damaged by construction to the point that they have little chance to survive shall be considered for removal.
- c. The design team will be required to conform to the Campus Landscape Programming document dated October 29, 2010 for specific landscape goals. Coordinate the requirements with the Caltech Project Manager.

2. Plant Maintenance:

- a. Provide protective barriers set outside the drip line of trees to remain. As a general rule, provide 1 foot of diameter for each inch of trunk diameter. Install barriers prior to commencement of demolition/construction operations and maintain until substantial completion. Do not store construction material, debris, or excavated material within the barricade area.
- b. Protect root system from flooding, compaction, erosion, and noxious materials from spillage of construction materials.
- c. Do not allow exposed roots to dry out before backfill is placed; provide temporary earth or moist burlap cover.
- d. Repairs to damaged trees shall be performed by a certified arborist.
- e. Landscaping included in the scope of work shall be maintained by the Contractor, and shall include, but not be limited to watering, fertilizing, and cutting consistent with general practice of care for type of plant material and tree maintenance shall follow ANSI A300 standards. Maintenance period shall extend from commencement of on-site operations to the end of the warranty period, except mowing and watering shall be the responsibility of Caltech after final completion of the project.

CALIFORNIA INSTITUTE OF TECHNOLOGY

BUILDING



DESIGN AND CONSTRUCTION

MailCode: 2-83 1200 East California Blvd,

Pasadena, CA 91125

SH No. 1 OF 1

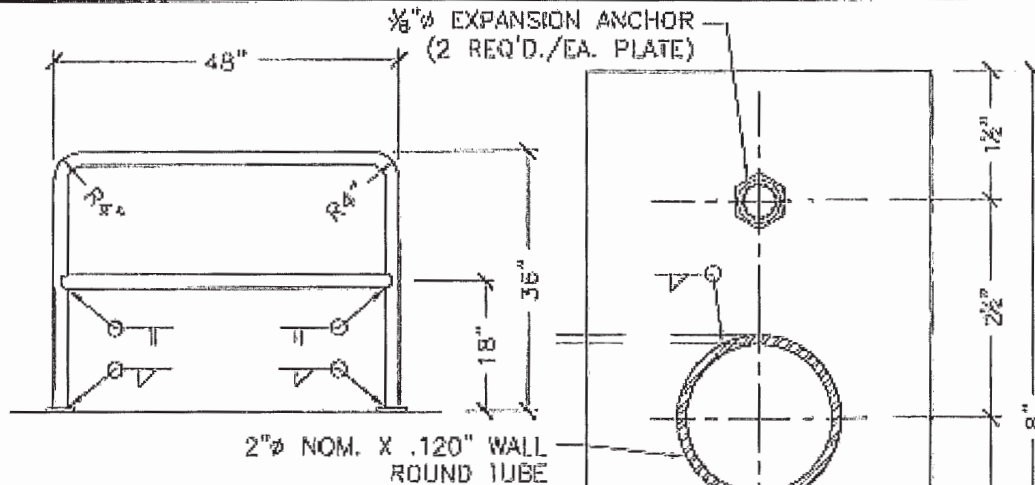
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DATE 02/07/2009

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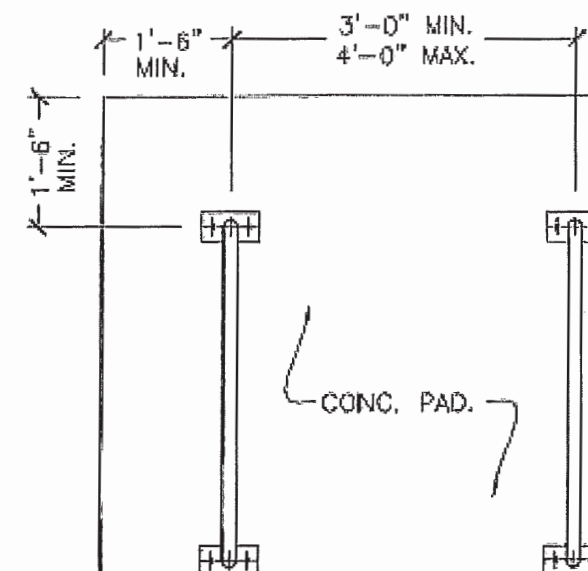
PROJECT

STANDARD BIKE RACKS



SIDE VIEW
SCALE: 1/2" = 1'-0"

TOP VIEW
SCALE: 1/2" = 1'-0"



PLAN VIEW
SCALE: 1/2" = 1'-0"

PLATE DETAIL
SCALE: 6" = 1'-0"

FINISH:
BLACK RUBBERIZED COATING OVER ENTIRE SURFACE. BLACK SEMI-GLOSS PAINT FOR TOUCH-UP.

RUNS IN FINISH ARE TO BE MINIMAL AND NOT IMPEDE INSTALLATION OR USE OF THE FINAL PRODUCT.

ANY RACKS WITH A FAULTY FINISH EXCEEDING 5% OF THE FINISH AREA, ARE TO BE STRIPPED AND REFINISHED, PER CIT PROJECT MANAGER DISCRETION.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION



R99 (CA)

NOTE: For symbol details, see Standard Highway Signs, Appendix, "Handicapped".

COLORS: BORDER & LEGEND - WHITE (RETROREFLECTIVE)
BACKGROUND - BLUE (RETROREFLECTIVE)

7/1/08

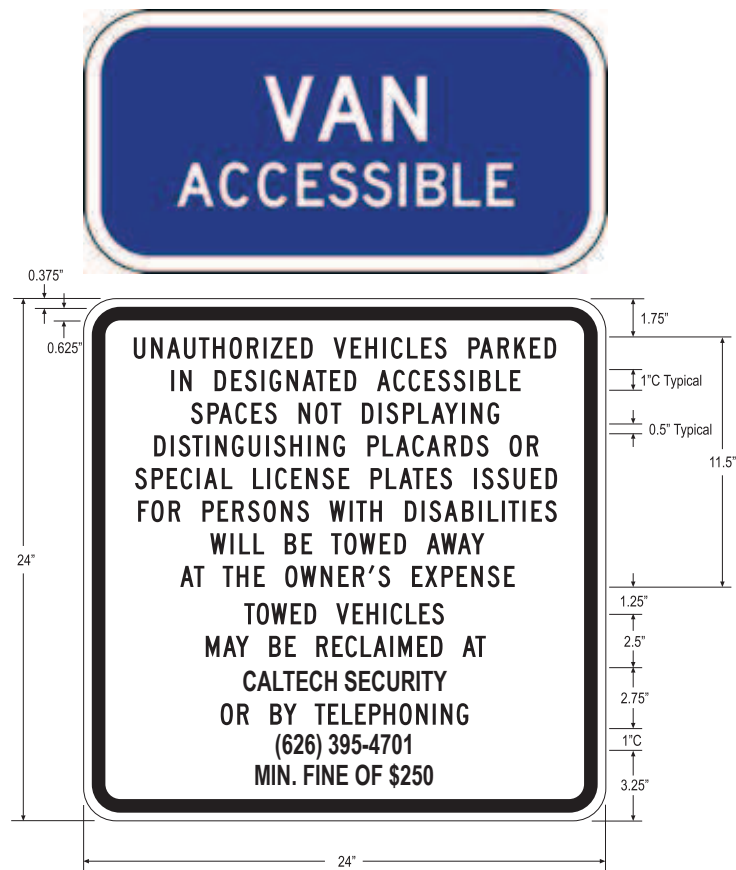


R99B (CA)

COLORS: BORDER & LEGEND - WHITE (RETROREFLECTIVE)
BACKGROUND - BLUE (RETROREFLECTIVE)

7/1/08

http://www.dot.ca.gov/hq/traffops/signtech/signdel/specs/R99_R99B.pdf



R100B (CA)

COLORS: BORDER & LEGEND - BLACK
BACKGROUND - WHITE (RETROREFLECTIVE)

7/1/08

**Signage must be displayed at least in one prominent location in a parking lot

<http://www.dot.ca.gov/hq/traffops/signtech/signdel/specs/R100B.pdf>

PLANT SELECTION



Palo Verde

CALIFORNIA INSTITUTE OF TECHNOLOGY | PASADENA, CA
THE OFFICE OF JAMES BURNETT

TREES

LATIN NAME	COMMON NAME	CURRENTLY ON CAMPUS	NATIVE*	ADAPTED	WATER USE FACTOR**
<i>Acacia farnesiana</i>	Sweet Acacia			X	Low
<i>Aesculus californica</i>	California Buckeye		X		Low
<i>Arbutus unedo</i>	Strawberry Tree	X		X	Low
<i>Bauhinia forficata</i>	Brazilian Butterfly Tree			X	Medium
<i>Bauhinia x blakeana</i>	Hong Kong Orchid Tree			X	Medium
<i>Brachychiton acerifolius</i>	Australian Flame Tree	X		X	Medium
<i>Cassia leptophylla</i>	Gold Medallion Tree	X		X	Medium
<i>Cedrus deodara</i>	Deodar Cedar	X		X	Medium
<i>Cercis occidentalis</i>	Western Redbud	X	X		Low
<i>Chilopsis linearis</i>	Desert Willow		X		Low
<i>Chionanthus retusus</i>	Chinese Fringetree	X		X	Medium
<i>Chitalpa x tashkatisensis</i>	Chitalpa			X	Low
<i>Chorisia speciosa</i>	Floss Silk Tree	X		X	Low
<i>Cupressus arizonica</i>	Arizona Cypress			X	Low
<i>Ebenopsis ebano</i>	Texas Ebony			X	Low
<i>Erythrina spp.</i>	Coral Tree			X	Low / Medium
<i>Eucalyptus spp.</i>	Gum Tree	X		X	Low / Medium
<i>Geijera parviflora</i>	Australian Willow	X		X	Low
<i>Heteromeles arbutifolia</i>	California Holly	X	X		Low
<i>Jacaranda mimosifolia</i>	Jacaranda	X		X	Medium
<i>Lagerstroemia indica</i>	Crape Myrtle	X		X	Medium
<i>Laurus nobilis</i>	Grecian Laurel	X		X	Low
<i>Magnolia grandiflora</i>	Southern Magnolia	X		X	Medium
<i>Magnolia soulangiana</i>	Saucer Magnolia	X		X	Medium
<i>Olea europaea</i>	Olive	X		X	Low
<i>Parkinsonia spp.</i>	Palo Verde	X		X	Low

*Native species status refers to plants considered regionally native within the state of California as defined by the Las Pilitas Nursery Native Plants Database (http://www.laspilitas.com/plants/plant_lists/California_native_plant_V.htm)
** Drawn from (1) Costello, L.R. and K.S. Jones. *Water Use Classification of Landscape Species*. San Francisco: UC Cooperative Extension, 1994. and, (2) Perry, Robert. *Landscape Plants for California Gardens*. Claremont: Land Design Publishing, 2010.

CAMPUS LANDSCAPE PROGRAMMING
8 FEBRUARY 2011

PLANT SELECTION



Mexican Fan Palm

CALIFORNIA INSTITUTE OF TECHNOLOGY | PASADENA, CA
THE OFFICE OF JAMES BURNETT

TREES (CONTINUED)

LATIN NAME	COMMON NAME	CURRENTLY ON CAMPUS	NATIVE	ADAPTED	WATER USE FACTOR
<i>Pinus coulteri</i>	Coulter Pine		X		Low
<i>Pinus halepensis</i>	Aleppo Pine	X		X	Low
<i>Pinus pinea</i>	Stone Pine	X		X	Low
<i>Pistacia chinensis</i>	Chinese Pistache	X		X	Medium
<i>Platanus x acerifolia</i>	London Plane Tree	X		X	Medium
<i>Platanus racemosa</i>	California Sycamore	X	X		Medium
<i>Prosopis glandulosa</i>	Honey Mesquite	X	X		Low
<i>Quercus spp.</i>	Oak	X	X		Low / Medium
<i>Rhus lancea</i>	African Sumac			X	Low
<i>Tabebuia spp.</i>	Trumpet Tree	X		X	Medium
<i>Tipuana tipu</i>	Tipu Tree	X		X	Medium
<i>Ulmus parvifolia</i>	Chinese Elm	X		X	Medium
<i>Vitex agnus-castus</i>	Chaste Tree			X	Medium

PALMS

LATIN NAME	COMMON NAME	CURRENTLY ON CAMPUS	NATIVE	ADAPTED	WATER USE FACTOR
<i>Brahea armata</i>	Blue Hesper Palm	X		X	Low
<i>Brahea edulis</i>	Guadalupe Palm	X		X	Low
<i>Chamaerops humilis</i>	Mediterranean Fan Palm	X		X	Medium
<i>Jubaea chilensis</i>	Chilean Wine Palm			X	Medium
<i>Livistona chinensis</i>	Chinese Fan Palm			X	Medium
<i>Phoenix canariensis</i>	Canary Island Date Palm	X		X	Low
<i>Phoenix dactylifera</i>	Date Palm			X	Low
<i>Phoenix reclinata</i>	Senegal Date Palm	X		X	Medium
<i>Rhapis excelsa</i>	Lady Palm	X		X	Medium
<i>Trachycarpus fortunei</i>	Windmill Palm	X		X	Medium
<i>Washingtonia robusta</i>	Mexican Fan Palm	X		X	Low

CAMPUS LANDSCAPE PROGRAMMING
8 FEBRUARY 2011

PLANT SELECTION



Lavender

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ORNAMENTAL SHRUBS

LATIN NAME	COMMON NAME	CURRENTLY ON CAMPUS	NATIVE	ADAPTED	WATER USE FACTOR
<i>Aloe spp.</i>	Aloe	X		X	Low
<i>Alyogyne huegelii</i>	Blue Hibiscus			X	Low
<i>Anisacanthus quadrifidus</i>	Flame Anisacanthus			X	Low
<i>Arctostaphylos spp.</i>	Manzanita	X	X		Low
<i>Artemisia spp.</i>	Artemisia	X	X		Low
<i>Atriplex canescens</i>	Four Wing Saltbush		X		Very Low
<i>Baccharis hybrids</i>	Desert Broom		X		Low
<i>Berberis nevinii</i>	Nevin's Barberry			X	Medium
<i>Buddleia davidii</i>	Butterfly Bush	X		X	Medium
<i>Caesalpinia mexicana</i>	Mexican Bird of Paradise			X	Low
<i>Calliandra californica</i>	Red Fairyduster			X	Low
<i>Callistemon spp.</i>	Bottlebrush	X			Medium
<i>Calycanthus occidentalis</i>	Spice Bush	X	X		Medium
<i>Carpenteria californica</i>	Bush Anemone	X	X		Medium
<i>Caryopteris x clandonensis</i>	Blue Mist Shrub			X	Medium
<i>Ceanothus spp.</i>	California Lilac	X	X		Low
<i>Clivia miniata</i>	Natal Lily	X		X	Medium
<i>Cordia boissieri</i>	Texas Olive			X	Low
<i>Cotoneaster spp.</i>	Cotoneaster	X		X	Medium
<i>Crinum spp.</i>	Crinum			X	Medium
<i>Cycas revoluta</i>	Sago Palm	X		X	Medium
<i>Dietes spp.</i>	Fortnight Lily	X		X	Medium
<i>Dioon edule</i>	Chestnut Dioon			X	Medium
<i>Dodonaea viscosa</i>	Hopbush			X	Medium
<i>Duranta erecta</i>	Skyflower			X	Medium
<i>Hemerocallis hybrids</i>	Daylily	X		X	Medium
<i>Heteromeles arbutifolia</i>	Toyon	X	X		Low
<i>Hibiscus rosa-sinensis</i>	Hibiscus	X		X	Medium

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PLANT SELECTION



Yucca

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ORNAMENTAL SHRUBS (CONTINUED)

LATIN NAME	COMMON NAME	CURRENTLY ON CAMPUS	NATIVE	ADAPTED	WATER USE FACTOR
<i>Hymenocallis spp.</i>	Spider Lily	X		X	Medium
<i>Iris douglasiana</i>	Douglas Iris	X	X		Medium
<i>Jasminum humile</i>	Italian Jasmine			X	Medium
<i>Juniperus spp.</i>	Juniper	X	X (Some)	X	Medium
<i>Lantana camara</i>	Shrubby Lantana	X		X	Low
<i>Laurus nobilis</i>	Bay Tree	X		X	Low
<i>Lavandula spp.</i>	Lavender	X		X	Low
<i>Lavatera maritima</i>	Sea Mallow	X		X	Low
<i>Myrica californica</i>	Pacific Wax Myrtle	X	X		Medium
<i>Myrtus communis</i>	Myrtle	X		X	Medium
<i>Nerium oleander</i>	Oleander	X		X	Low
<i>Osmanthus fragrans</i>	Sweet Olive	X		X	Medium
<i>Photinia x fraseri</i>	Photinia	X		X	Medium
<i>Pinus mugo</i>	Mugo Pine			X	Medium
<i>Pittosporum tenuifolium</i>	Kohuhu	X		X	Medium
<i>Pittosporum tobira</i>	Mock Orange	X		X	Medium
<i>Portulacaria afra</i>	Elephant's Food			X	Low
<i>Punica granatum</i>	Pomegranate	X		X	Medium
<i>Rhamnus spp.</i>	Buckthorn	X	X		Low / Medium
<i>Rhaphiolepis spp.</i>	Indian Hawthorn	X		X	Medium
<i>Rhus ovata</i>	Sugarbush	X	X		Low
<i>Ribes spp.</i>	California Currant	X	X		Medium
<i>Rosmarinus spp.</i>	Rosemary	X		X	Low
<i>Sedum spp.</i>	Stonecrop	X	X (Some)	X	Low
<i>Sophora secundiflora</i>	Texas Mountain Laurel			X	Low
<i>Teucrium fruticans</i>	Bush Germander			X	Low
<i>Thevetia peruviana</i>	Lucky Nut			X	Medium

CAMPUS LANDSCAPE PROGRAMMING
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PLANT SELECTION



Creeping Fig

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ORNAMENTAL SHRUBS (CONTINUED)

LATIN NAME	COMMON NAME	CURRENTLY ON CAMPUS	NATIVE	ADAPTED	WATER USE FACTOR
<i>Vauquelinia corymbosa</i>	Chisos Rosewood			X	Low
<i>Vauquelinia californica</i>	Arizona Rosewood			X	Low
<i>Viburnum spp.</i>	Viburnum	X		X	Medium
<i>Vitex trifolia</i>	Arabian Lilac			X	Medium
<i>Yucca spp.</i>	Yucca		X		Low
<i>Zauschneria californica</i>	Ghostly Red		X		Low

GROUNDCOVERS

LATIN NAME	COMMON NAME	CURRENTLY ON CAMPUS	NATIVE	ADAPTED	WATER USE FACTOR
<i>Acacia redolens</i>	Prostrate Acacia			X	Low
<i>Arctostaphylos spp.</i>	Manzanita	X	X		Low
<i>Baccharis hybrids</i>	Desert Broom			X	Low
<i>Buchloe dactyloides</i>	UC Verde Buffalo Grass	X		X	Medium
<i>Ceanothus spp.</i>	California Lilac	X	X		Low
<i>Cotoneaster spp.</i>	Cotoneaster	X		X	Medium
<i>Juniperus spp.</i>	Juniper	X	X (Some)	X	Medium
<i>Myoporum parvifolium</i>	Myoporum	X		X	Low
<i>Sedum spp.</i>	Stonecrop		X (Some)	X	Low

VINES

LATIN NAME	COMMON NAME	CURRENTLY ON CAMPUS	NATIVE	ADAPTED	WATER USE FACTOR
<i>Bougainvillea spp.</i>	Bougainvillea	X		X	Low
<i>Campsis radicans</i>	Trumpet Creeper			X	Medium
<i>Ficus pumila</i>	Creeping Fig	X		X	Medium
<i>Hardenbergia violacea</i>	Lilac Vine			X	Medium
<i>Mascagnia macroptera</i>	Butterfly Vine			X	Medium
<i>Pyrostegia venusta</i>	Flame Vine			X	Medium
<i>Vitis californica</i>	California Grape	X	X		Low / Medium

CAMPUS LANDSCAPE PROGRAMMING
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PLANT SELECTION



Fortnight Lily

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ORNAMENTAL GRASSES

LATIN NAME	COMMON NAME	CURRENTLY ON CAMPUS	NATIVE	ADAPTED	WATER USE FACTOR
<i>Aristida purpurea</i>	Purple Three Awn		X		Low / Medium
<i>Bouteloua gracilis</i>	Blue Grama		X		Low
<i>Calamagrostis arundinacea</i>	Reed Grass			X	Medium
<i>Carex spp.</i>	Sedge	X	X		Medium
<i>Chondropetalum tectorum</i>	Cape Rush			X	Medium
<i>Festuca californica</i>	California Fescue	X	X		Medium
<i>Festuca glauca</i>	Blue Fescue	X		X	Medium
<i>Leymus arenarius</i>	Blue Lyme Grass	X		X	Low
<i>Liriope spp.</i>	Lily Turf	X		X	Medium
<i>Lomandra longifolia</i>	Mat Rush			X	Low / Medium
<i>Muhlenbergia capillaris</i>	Pink Muhly			X	Medium
<i>Nassella tenuissima</i>	Needle Grass	X		X	Low
<i>Xanthorrhoea preissii</i>	Australian Grass Tree			X	Low

PERENNIALS

LATIN NAME	COMMON NAME	CURRENTLY ON CAMPUS	NATIVE	ADAPTED	WATER USE FACTOR
<i>Abutilon spp.</i>	Mallow	X	X		Low
<i>Acanthus mollis</i>	Bear's Breech	X		X	Medium
<i>Achillea spp.</i>	Yarrow	X	X		Low
<i>Agapanthus spp.</i>	Lily of the Nile	X		X	Medium
<i>Agastache spp.</i>	Hummingbird Mint		X (Some)	X	Low / Medium
<i>Agave spp.</i>	Agave	X	X		Low
<i>Aloe spp.</i>	Aloe	X		X	Low
<i>Aquilegia chrysantha</i>	Golden Columbine		X		Medium
<i>Armeria maritima</i>	Common Thrift	X	X		Medium
<i>Bulbine frutescens</i>	Bulbine			X	Low
<i>Callirhoe involucrata</i>	Winecups			X	Medium

CAMPUS LANDSCAPE PROGRAMMING
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PLANT SELECTION



Red Hesperaloe

CALIFORNIA INSTITUTE OF TECHNOLOGY | PASADENA, CA
THE OFFICE OF JAMES BURNETT

PERENNIALS (CONTINUED)

LATIN NAME	COMMON NAME	CURRENTLY ON CAMPUS	NATIVE	ADAPTED	WATER USE FACTOR
<i>Centaurea cineraria</i>	Velvet Centaurea			X	Low
<i>Dasyliirion wheeleri</i>	Desert Spoon			X	Low
<i>Dianella tasmanica</i>	Tasman Flax Lily			X	Medium
<i>Diplacus aurantiacus</i>	Sticky Monkey Flower		X		Low
<i>Epilobium canum</i>	California Fuchsia			X	Low
<i>Eriogonum umbellatum</i>	Sulfur Flower		X		Low
<i>Euphorbia rigida</i>	Gopher Plant			X	Low
<i>Furcraea foetida</i>	Mauritius Hemp			X	Low
<i>Hemerocallis spp.</i>	Daylily	X		X	Medium
<i>Hesperaloe funifera</i>	Giant Hesperaloe	X		X	Low
<i>Hesperaloe parviflora</i>	Red Hesperaloe			X	Low
<i>Hesperoyucca whipplei</i>	Our Lord's Candle			X	Low
<i>Heuchera spp.</i>	Heuchera	X	X		Medium
<i>Hymenoxys acaulis</i>	Angelita Daisy			X	Low
<i>Lantana montevidensis</i>	Trailing Lantana	X		X	Low
<i>Lavandula spp.</i>	Lavender	X		X	Low
<i>Monardella spp.</i>	Wildmint		X		Low
<i>Penstemon spp.</i>	Beard Tongue	X	X		Low / Medium
<i>Phlomis spp.</i>	Jerusalem Sage			X	Low
<i>Phormium tenax</i>	New Zealand Flax	X		X	Medium
<i>Phyla nodiflora</i>	Frogfruit			X	Low
<i>Rosmarinus officinalis</i>	Rosemary	X		X	Low
<i>Ruellia brittoniana</i>	Desert Petunia			X	Medium
<i>Salvia spp.</i>	Sage	X	X		Low / Medium
<i>Santolina chamaecyparissus</i>	Lavender Cotton			X	Low
<i>Santolina rosmarinifolia</i>	Green Santolina			X	Low
<i>Teucrium x lucidrys</i>	Wall Germander			X	Low / Medium
<i>Verbena spp.</i>	Verbena	X	X (Some)	X	Low / Medium

CAMPUS LANDSCAPE PROGRAMMING
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G30 LIQUID AND GAS SITE UTILITIES

Paint all exposed pipes in landscaped areas to blend with the background, except tamper switches and brass stem on back-flow preventers.

G3010 Water Utilities

1. General:

- a. Consult Caltech Project Manager regarding information specific to water supply on Campus.
- b. Paint all exposed pipes in landscaped areas green, except tamper switches and brass stem on back-flow preventers.
- c. For all new back flow device added to a project, it must be permitted, tested and a report sent out to the city. A hard copy of the Test report shall be provided to the Caltech PM for its record in both hard copy and PDF format for our records.

G3020 Sanitary Sewerage Utilities

1. General:

- a. Consult Caltech Project Manager regarding information specific to sanitary sewer on Campus.
- b. Paint all exposed pipes in landscaped areas to blend with the background, except tamper switches and brass stem on back-flow preventers.

G3030 Storm Drainage Utilities

1. General:

- a. Consult Caltech Project Manager regarding information specific to storm sewer on Campus.
- b. Paint all exposed pipes in landscaped areas to blend with the background, except tamper switches and brass stem on back-flow preventers.
- c. All catch basins must be properly labeled per State and Caltech requirements.

G3050 Site Energy Distribution

1. General:

- a. Consult Caltech Project Manager regarding information specific to heating and cooling distribution on Campus.

G3060 Site Fuel Distribution

1. General:

- a. Consult Caltech Project Manager regarding information specific to fuel distribution on Campus.
- b. Paint all exposed pipes in landscaped areas to blend with the background, except tamper switches and brass stem on back-flow preventers.



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G40 SITE ELECTRICAL UTILITIES

G4010 Site Electric Distribution Systems

1. General:

- a. Consult Caltech Project Manager regarding information specific to electrical distribution on Campus.

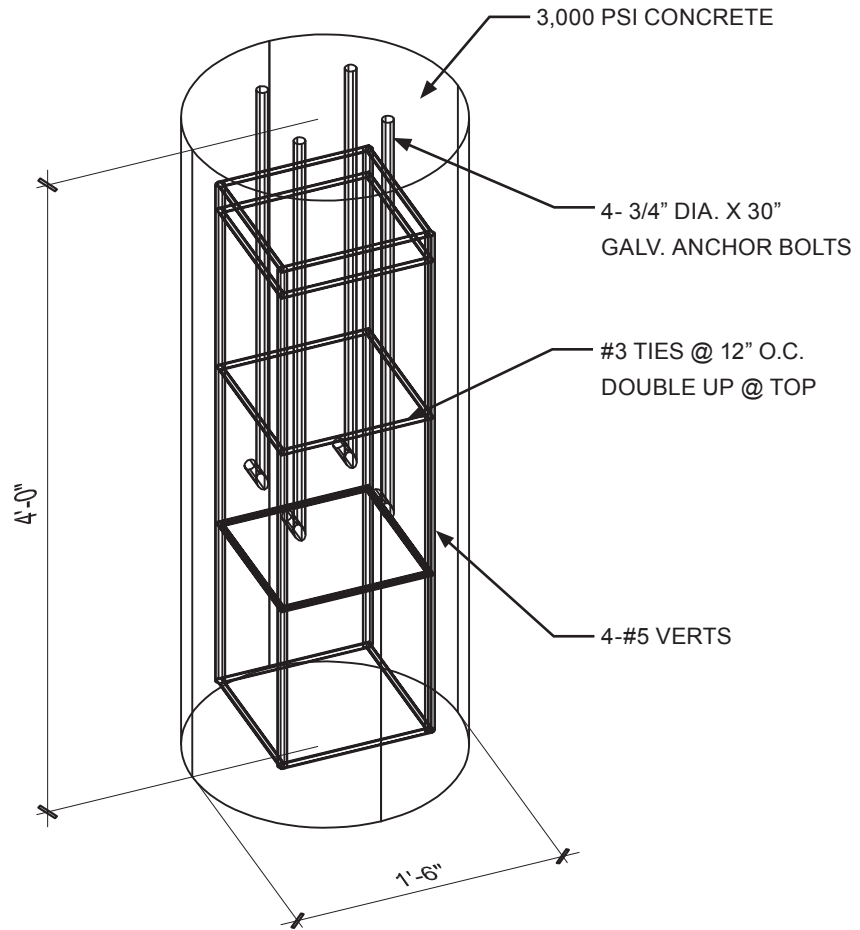
G4050 Site Lighting

1. General:

- a. Consult Caltech Project Manager regarding information specific to site lighting on Campus.

Exterior posts shall match existing exterior light standards

2. **Area Lighting:** Exterior posts shall match existing exterior light standards, Sun Valley Lighting, Model 32-1058C 10FT PT BDZS 27/LCJ1 CPA OPT 175 MT PT with DBZS (dark bronze smooth finish with 8-1/2 bolt circle or adaptor).



*END OF
ELEMENT G*