# 4 DESIGN GUIDELINES

The physical appearance of a campus is influenced by the layout of buildings and spaces, the design of buildings, and the configuration of open, landscaped spaces.

This chapter includes a discussion of contextual influences—the character of the site that will inspire planners and designers—and the specific guidelines for:

- Site development
- Building design
- Open space and landscape

# SITE DEVELOPMENT GUIDELINES

## CONTEXTUAL INFLUENCES

The Richmond Bay Campus lies along the waterfront of San Francisco Bay, with views of the skyline of San Francisco, Marin County landmarks such as Mount Tamalpais, the San Francisco Bay Bridge, and the surrounding east bay hillsides. This setting is among the most inspirational possible for a campus that will support world-class science.

The South Shoreline Area surrounding the campus contains underutilized industrial sites, with remnants of past manufacturing uses that compromised many of the area's original natural features. This is an area in transition, one that in the future is planned to be a very different place, capitalizing on the importance of the Richmond Bay Campus to catalyze a world class research hub that will foster innovation and discovery. These two considerations—site and science—are the greatest influences on the organization of the campus for development, and informed the site development design guidelines which follow.

*The Richmond Bay Campus site (left) provides an inspirational setting for world-class science. Natural features such as the grasslands (right) will be visible and integral to the campus setting.*

*The surrounding Richmond community will be a primary consideration in the Richmond Bay Campus campus design.*

## DEVELOPMENT PATTERN

The overall site development pattern of buildings and major spaces sets the design framework for the campus.

### Central Spine

Perhaps the most important organizing element of the new campus is the Central Spine—a central mall, promenade or walkway that links the entirety of the eastern campus from north to south; a shorter pedestrian spine forms the centerpiece of the western neighborhood (see Figure 4.1). These two corridors will be the focus of buildings, landscaped open space, and activities.

SD-1 Use the Central Spine to give the campus scale and orientation and set the edges of building sites.

SD-2 Limit the width of the Central Spine to not exceed 120 feet so as to avoid a monumental scale - wide enough to be grand while narrow enough to allow people to see one another traveling its length.

SD-3 Allow variations in the width of the Central Spine while ensuring that continuity and linearity are emphasized.

SD-4 Punctuate the Central Spine with special plazas where events, assemblies, or casual activities can occur.

SD-5 Modify the orientation of the corridor at key points along its length—particularly at the special plazas—to discourage wind tunnel effects and to reinforce the sense of distinct campus neighborhoods.

SD-6 Design the Central Spine to include consistent site elements throughout its length, such as lighting or paving, so as to reinforce its continuity.

SD-7 Provide unique features such as plant palette or special materials within the individual neighborhoods to reinforce their different characters.

SD-8 Strategically locate outdoor areas at major building entry points and along pedestrian routes and provide seating, lighting, and other amenities that create safe and comfortable places for collegial interaction.

*Figure 4.1: Central Spine*

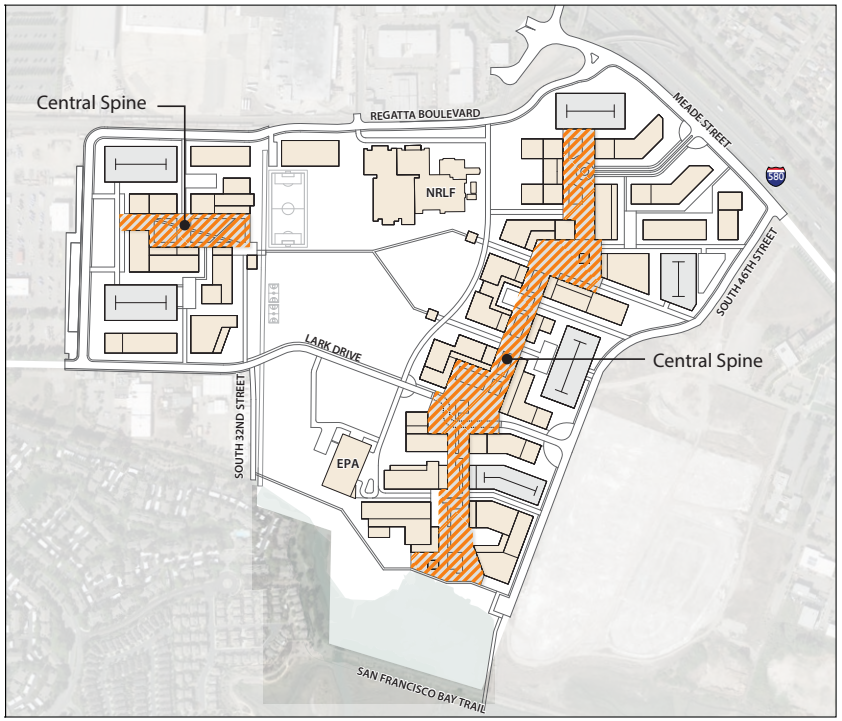
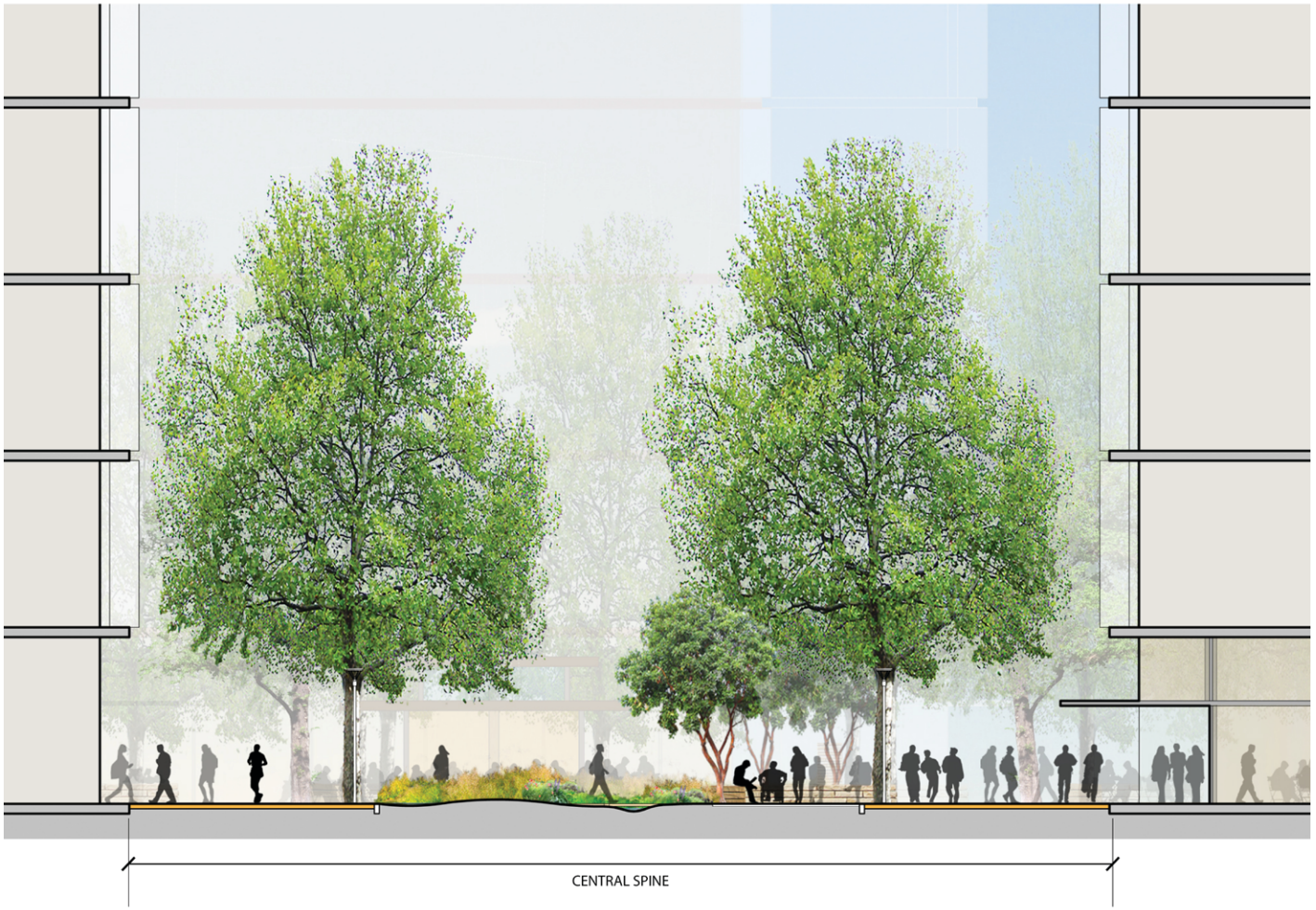


*Figure 4.2: Section - Central Pedestrian "Main Street"*



## Building Location and Orientation

Along with the orientation of the Central Spine, the location of buildings in relation to this element and to one another sets the character of the built environment (see Figure 4.3).

SD-9 Generally align buildings to reinforce the configuration of the Central Spine; use building edges to frame this linear space and give it dimension.

SD-10 Prioritize orientation of buildings on an east-west axis to maximize passive solar design strategies and minimize heating and cooling requirements.

SD-11 Vary building massing and configuration to create a dynamic and diverse campus environment.

SD-12 Locate primary building entries facing the Central Spine, active open spaces, or secondary pedestrian corridors.

SD-13 Ensure that building entries, lobbies and lower floors facing pedestrian corridors are highly transparent to lend activity and visual interest to pedestrian activity.

SD-14 Orient buildings to take maximum advantage of the views in all directions.

SD-15 Configure buildings to create sheltered outdoor spaces for gathering and to protect those spaces from prevailing winds.

SD-16 Design buildings to minimize shading daylight from, or emitting unnatural light on, adjoining natural open spaces.

SD-17 Configure buildings in the southern part of the site to allow unimpeded views from public open spaces along the Central Spine toward the bay; utilize setbacks and building articulation for this purpose.

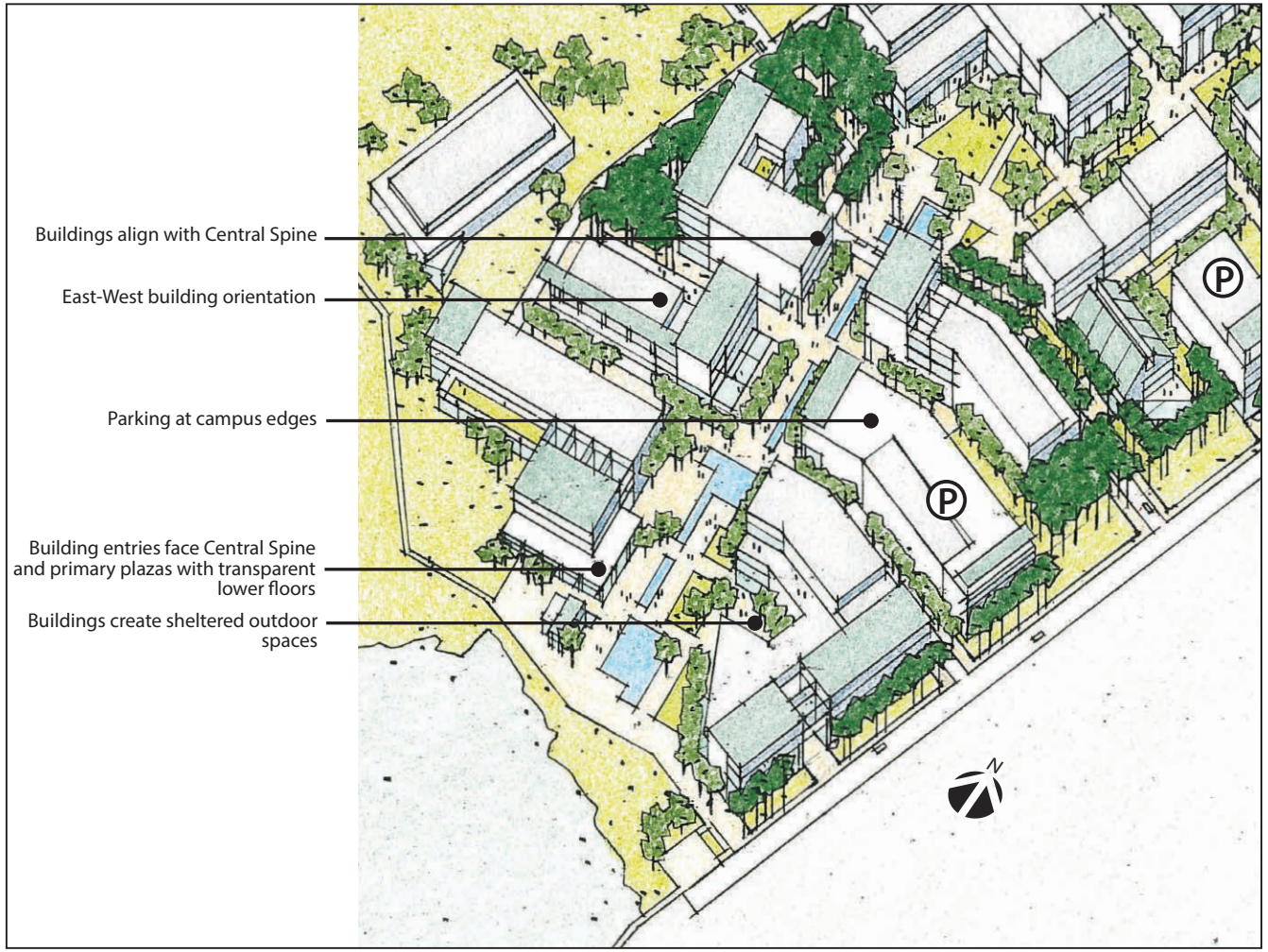
SD-18 Locate parking structures at the edges of the campus, accessible from peripheral public roads, leaving the interior free for unconstrained pedestrian movement.

SD-19 Locate central plant facilities, whether distributed or consolidated, and campus service areas near neighborhood edges where they can be easily accessed but are not a highly visible element in the pedestrian and built environment.

SD-20 Do not place permanent structures within the transitional buffer zone adjacent to the designated Natural Open Space area.

SD-21 Configure the southernmost site, buildings, and structures to accommodate adaptation to sea level rise.

*Figure 4.3: Illustrative Building Location and Orientation*



## Development Intensity / Building Heights

The Richmond Bay Campus will likely include a range of building uses and sizes. The heights of buildings will be influenced by their use and building code considerations. The character of the site suggests a range of allowable building heights, taking cues from site topography, vegetation, surrounding uses, and proximity to the bay frontage (See Figure 4.4).

SD-22 Preserve the long term flexibility and capacity of the Richmond Bay Campus by maximizing the use of every building site and not squandering valuable land with unnecessarily low-scale, low-density development.

SD-23 Consider Table 4.1 in allocating future building program throughout the site. The overall capacity of each neighborhood should inform individual building location decisions to ensure that no sites are significantly underutilized.

SD-24 Refer to Table 4.1 to assess suitable building heights in any neighborhood. These heights do not include rooftop equipment, penthouses or screening.

SD-25 Allow a limited number of buildings or building elements to exceed the height of other buildings in any neighborhood in order to focus attention on a landmark and to aid in orientation.

SD-26 Introduce special campus elements that are vertical in nature such as towers or other neighborhood landmarks. They should be slender in form and not block significant views.

SD-27 Discourage building design in the southern part of the campus at the edge of the marsh which competes with views of the natural environment.

SD-28 Transition building heights lower towards the shore and be sensitive to the bay environment, Bay Trail public access, and other nearby shoreline elements.

SD-29 Use building height and orientation in the central part of the site to maximize views of the grasslands, regional hills, and landmarks.

SD-30 Use the prevailing heights of eucalyptus in the northern portion of the site to benchmark appropriate building scale. Nestle the tallest buildings within the forest backdrop to mitigate their scale.

SD-31 Ensure that building heights at the campus edge respond to the scale of surrounding existing and planned future development.

*Table 4.1: Neighborhood Capacity and Building Heights*

| | GSF | Population | Building Height (stories) |
|---|---|---|---|
| Neighborhood 1 | 813,000 | 1,700 | 2 - 4 |
| Neighborhood 2 | 780,000 | 1,700 | 4 - 5 |
| Neighborhood 3 | 1,880,000 | 4,000 | 5+ |
| Neighborhood 4 | 1,284,000 | 2,800 | 4 - 6 |
| **TOTAL** | **5,408,000** | **10,270** | |

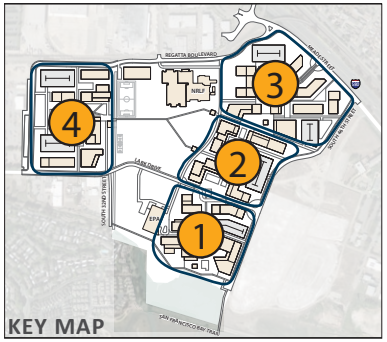
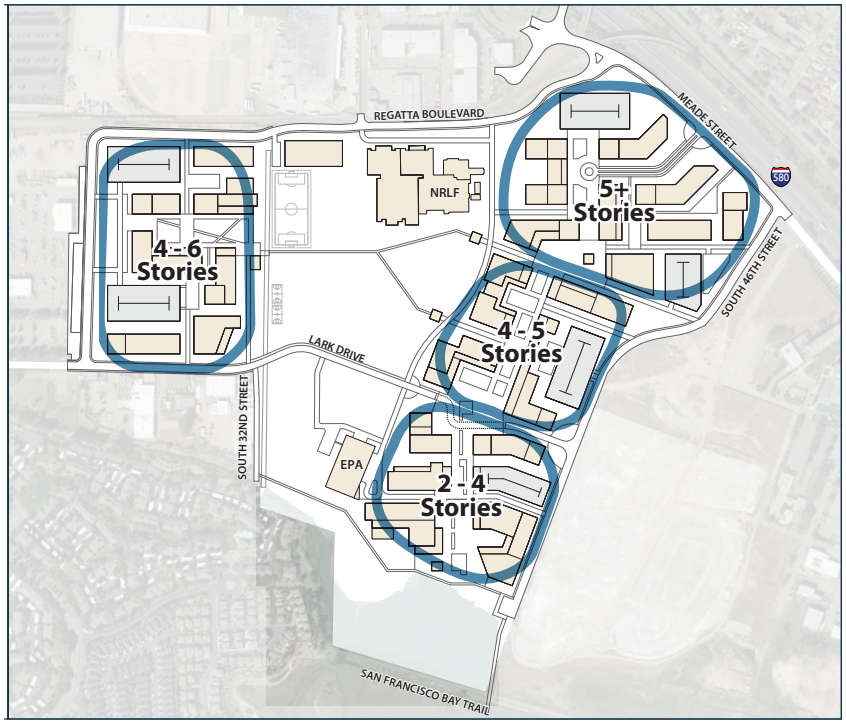



*Figure 4.4: Building Heights*



## SITE EDGES AND ACCESS

The system of campus entrances and the treatment of public edges is critical to welcoming visitors and creating connections between the campus and the adjoining community.

### Public Edges

The public edges of the site comprise the public face of the campus to its neighbors and set the tone for the identity of the campus (see Figure 4.5).

SD-32 Treat the edges of the campus that will ultimately adjoin other office/R&D or similar uses, especially on Regatta Boulevard and South 46th Street, as urban street edges rather than suburban. Ensure that building setbacks along the public edges of the campus are narrow enough to create an urban campus quality and allow integration of the campus with future development in surrounding neighborhoods.

SD-33 Facilitate campus access for pedestrians and bicyclists at public edges; provide clear entry points and walkways for safety and comfort.

SD-34 Coordinate with the City of Richmond and adjoining developments to minimize street cross-sections, provide bicycle lanes, and ensure pedestrian-oriented crosswalks.

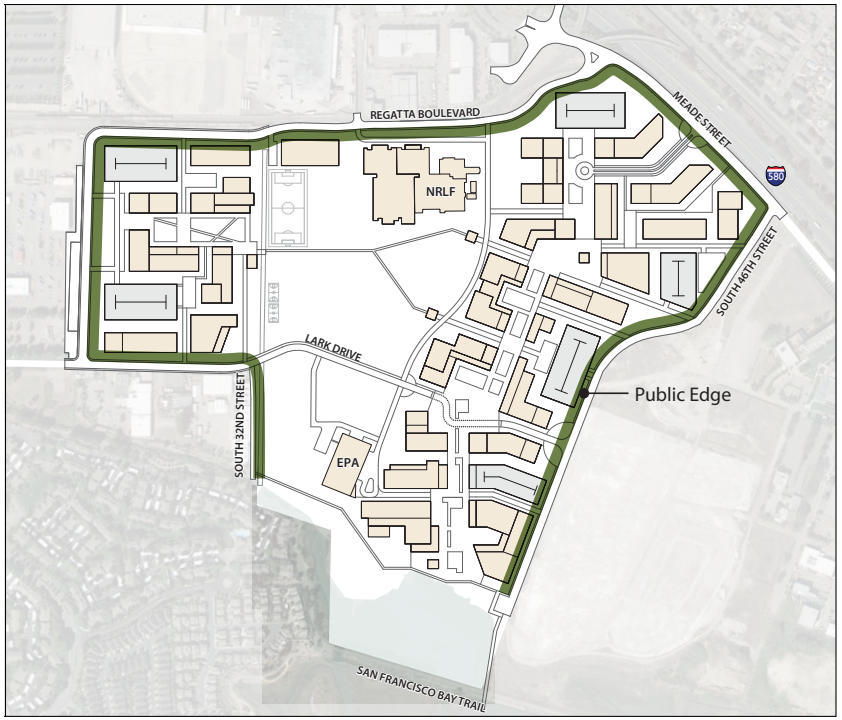
SD-35 Provide sidewalks around the periphery of campus or wherever they would encourage walking among destinations.

SD-36 Minimize curb cuts along public streets to avoid unnecessary conflicts with pedestrians and bicyclists.

SD-37 Utilize consistent or thematic landscape design as defined herein to establish campus identity along edges and to buffer changes in use or scale.

SD-38 Screen building service areas and other “back of house” functions so that they are not visible from the campus perimeter.

*Figure 4.5: Public Edges*



## Access and Entries

The Richmond Bay Campus is intended to be an open campus that encourages members of the community to utilize the various amenities and resources offered. Campus entrances will play a critical role in conveying this message and will be a key component of the outdoor campus experience.

SD-39 Locate primary and secondary visitor entries as noted in Figure 4.6.

SD-40 Consider and treat campus entrances as welcoming forecourts for visitors and the campus population.

SD-41 Provide signage and landscaping to identify the Meade Street entry as the primary "front door" of the campus.

SD-42 Provide a similar but a secondary hierarchy of gateway treatments to denote secondary visitor entries and arrival points.

SD-43 Locate a secondary entrance along Regatta Boulevard to provide access for visitors destined for facilities in the western campus area.

SD-44 Restrict general vehicular access no further than these primary and secondary access points to maintain a safe pedestrian-oriented campus.

SD-45 Provide access to on-site parking structures from South 46th Street and Regatta Boulevard via driveways that are clearly marked.

SD-46 Ensure the Lark Drive alignment is a minor access road, prioritizing bicycle and pedestrian access between the campus and community services and amenities east or west, with wildlife passage provided beneath the roadway.

SD-47 Design the layout of Lark Drive to calm traffic speeds and minimize pedestrian/vehicular conflicts.

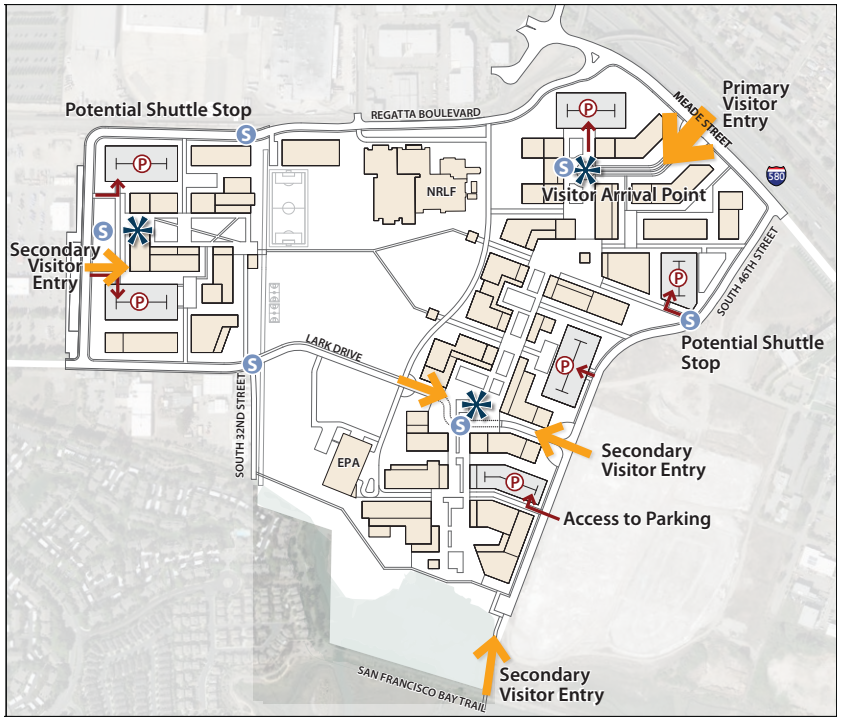
SD-48 Design entrances to be legible from a distance and to contribute to the high quality public face and distinct identity of the campus.

SD-49 Incorporate pathways, lighting, and plant materials into entrance design and frame views from the campus edge to draw people into the campus.

SD-50 Size primary arrival points to accommodate larger vehicles such as school buses and shuttles.

SD-51 Include arrival plazas at campus entries to welcome visitors and provide staging areas for large groups.

*Figure 4.6: Visitor Entries and Site Access*



## SITE CIRCULATION

People will move around the campus on foot, on bicycles, via transit, and to a limited extent, in vehicles. Design of circulation elements will highlight safety and ease of movement for all modes.

### Streets

#### *Peripheral Streets*

SD-52 Ensure that the design of peripheral campus streets—Regatta Boulevard and South 46th Street—provide adequate roadway capacity, in partnership with the City of Richmond.

SD-53 Ensure streets peripheral to the campus are an integral component of the larger transit, pedestrian, and bicycle network surrounding and serving the campus and nearby development.

SD-54 Provide sidewalks and bicycle lanes and design streetscape treatments to integrate with the neighboring community fabric.

SD-55 Ensure Regatta Boulevard and South 46th Street, as well as other area streets, are designed to facilitate bicycle access and frequent and safe crosswalks for a successful pedestrian-oriented environment.

SD-56 Minimize curb cuts serving parking structures or building service and loading docks along the peripheral streets to avoid conflicts with bicyclists and pedestrians.

SD-57 Locate primary service and infrastructure elements, such as a central plant, with primary access directly from one of the peripheral streets to avoid intrusion of large trucks and materials from the campus center.

#### *Lark Drive*

SD-58 Design Lark Drive improvements to have two distinctive sections: the portion that passes through the open grasslands area and the portions that adjoin campus development zones (see Figures 4.7 and 4.8).

SD-59 Configure Lark Drive in the grasslands areas to have the minimum feasible lane widths, traffic controls and tight curve radii to discourage speeding and through-traffic.

SD-60 Restrict any parking along the grasslands segment of Lark Drive.

SD-61 Provide pedestrian paths and bicycle lanes throughout Lark Drive.

SD-62 Provide a culvert or other opening under Lark Drive so that open space to the north and south is physically connected to provide safe passage for wildlife.

*Figure 4.7: Section - Lark Drive at Grasslands*

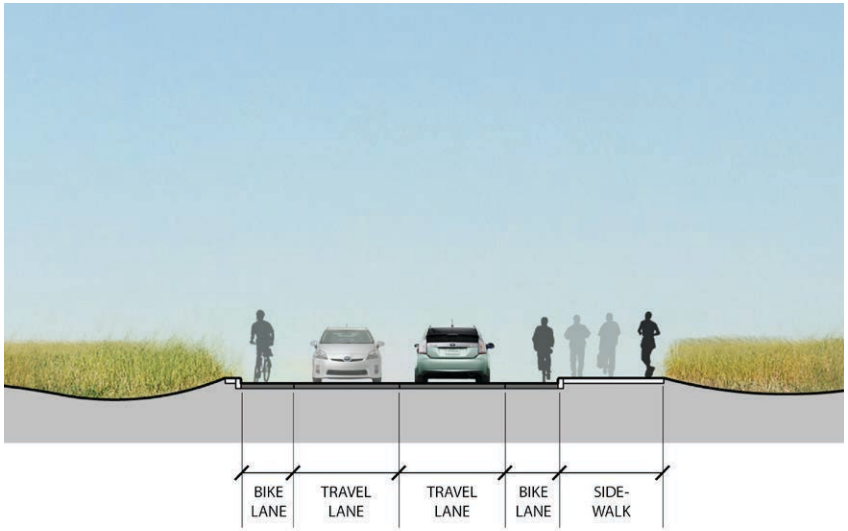
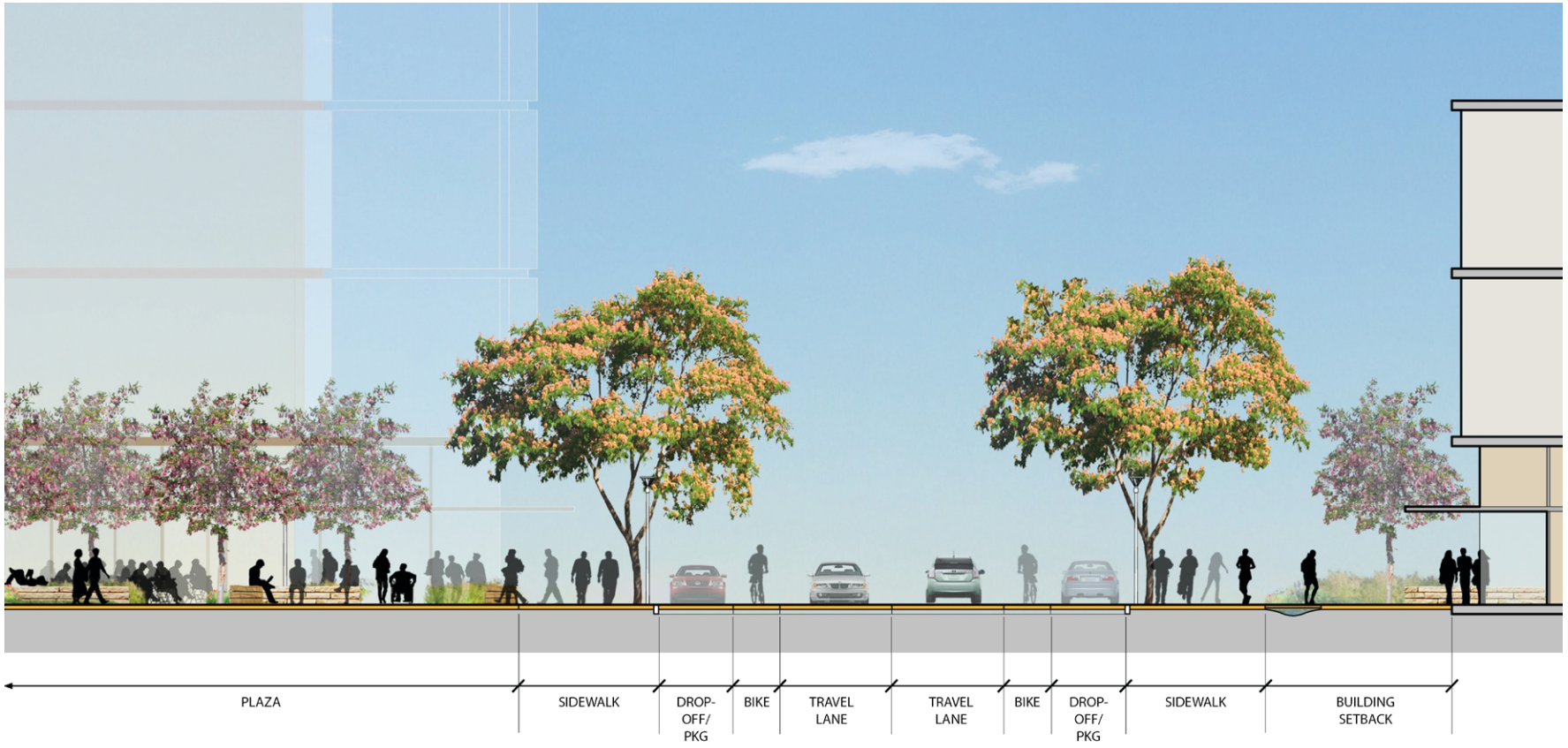


*Figure 4.8: Section - Lark Drive at Central Spine*



### *Interior Campus Roads*

SD-63 Restrict roads that allow general vehicular access into the campus to the major entries and access drives to parking structures.

SD-64 Provide a generously designed and landscaped primary entry road off Meade Street; use special lighting, median plantings, seasonal color and other elements to create a distinctive image.

SD-65 Minimize the length and width of parking structure access drives to adequately accommodate queuing without unnecessarily penetrating the campus interior.

SD-66 Limit access to service roads to operations or maintenance vehicles. Restrict general vehicular traffic from service roads by minimizing width and using control features such as bollards and special paving.

SD-67 Share service roads among a group of buildings; share loading and laydown areas as well, whenever possible.

SD-68 Ensure that truck turning areas meet the requirements of the intended use and first-responder fire department.

SD-69 Design service roads to allow shared use by pedestrians and bicycles (see Figure 4.9).

SD-70 Ensure that plantings, lighting and signage along campus streets are compatible with the adjoining natural areas. When streets border open spaces, locate these elements on the developed side of the street to the extent possible (see Figure 4.10).

SD-71 Provide concrete curbs or berms along all roadways to establish the edge of pavement and direct runoff. Utilize bioswales to clean and infiltrate runoff.

*Plantings in roadway medians (left) should be used to create a distinct campus image at entrance gateways. Control features such as bollards (center) should be employed to discourage general vehicle traffic on service access streets. Bioswales (right) should be installed along campus roadways to clean and infiltrate runoff.*

*Figure 4.9: Section - Service Access Street Between Buildings*

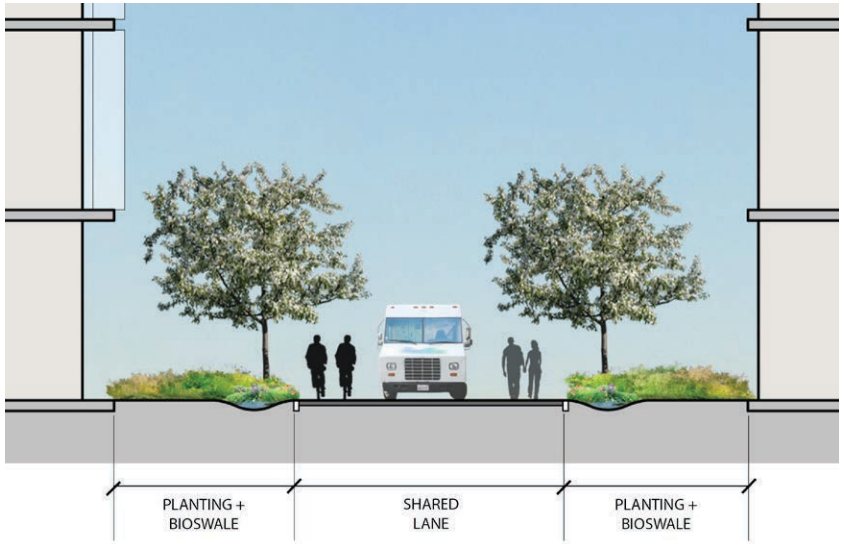
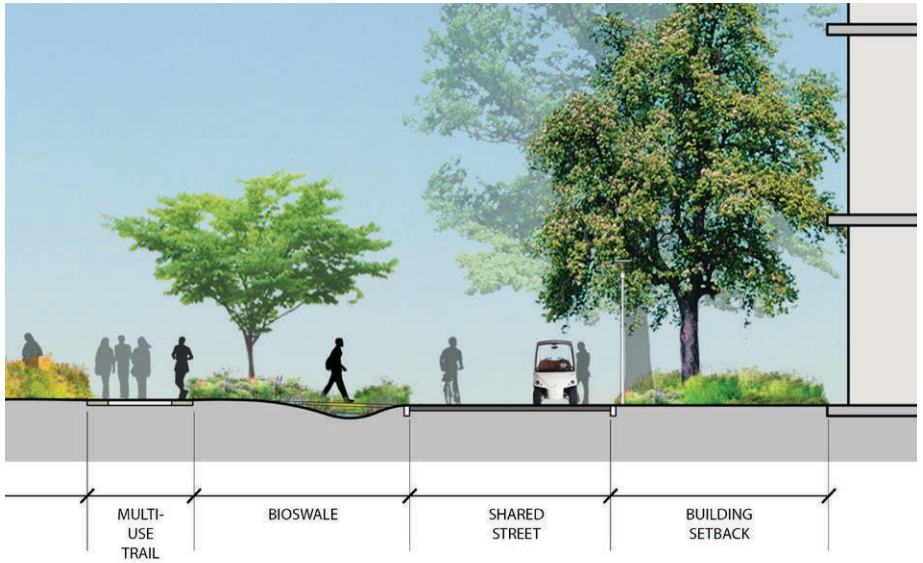



*Figure 4.10: Section - Service Access Street at Grasslands Edge*



## Surface Parking Lots

It is expected that surface parking will be provided in the early phases of campus growth until the demand for development parcels is great enough to require parking structures.

SD-72 Locate general parking lots at the edges of the campus to the degree practicable to minimize their interference with creating a critical mass of pedestrian activity and usable open space.

SD-73 Minimize disturbance of natural landscapes and planted areas by locating interim parking lots in existing parking areas or on already-modified sites.

SD-74 Limit the size of surface parking lots to minimize their visual impact.

SD-75 Screen parking lots from view with plantings or other screening materials.

SD-76 Provide separated and delineated pedestrian walkways through surface parking lots to ensure pedestrian safety and convenience.

SD-77 Design surface parking lots with generous landscaping to shade vehicles, screen views, and manage stormwater. Retain existing trees where possible.

SD-78 Utilize pervious materials in surface parking lots to allow storm-water infiltration and recharge.

SD-79 Provide a wheel stop or curb for each parking space.

SD-80 Provide adequate disabled parking stalls close to building entries and where changes in grade occur on the campus.

SD-81 See Building Design Guidelines section for guidance regarding parking structures.

*Pathways should be provided through surface parking lots to enhance pedestrian safety and convenience (left). Design surface parking lots with generous landscaping to shade vehicles, screen views and manage stormwater (right).*

## Transit

Transit access to the Richmond Bay Campus will be provided by multiple providers and service types.

SD-82 Provide convenient transit options, including shuttle service from BART stations and the main UC Berkeley and LBNL campuses, to minimize vehicular miles traveled and GHG emissions.

SD-83 Locate shuttle routes and stops throughout the campus in a manner that minimizes walking distances to buildings.

SD-84 Co-locate transit stops with popular campus destinations, including plazas and public amenities.

SD-85 Design transit stops to be safe and comfortable, incorporating seating, lighting, shelter, waste receptacles, and closed-circuit television surveillance or emergency phones. Transparent materials that also shade users should be utilized.

SD-86 Design shelters to be attractive and compatible with campus architecture and landscape design. Shelter designs that incorporate public information, interpretive signage, and art are encouraged.

SD-87 Provide wayfinding signage, real-time arrival information and network access on shuttle buses to maximize convenience for users.

SD-88 Indicate shuttle routes with special paving material or finish to assist with navigation and raise awareness of shuttle options.

SD-89 Equip shuttles with bicycle racks to encourage multi-modal commutes.

SD-90 Realign transit routes and stops over time based on the phasing of campus development and destinations.


*Transit stops should be provided at convenient locations throughout campus. They should provide a safe and comfortable environment for users (left), and might incorporate art or interpretive signage (right).*

## Pedestrian and Bicycle Movement

The campus will be designed to welcome pedestrians and bicyclists and provide an enjoyable and safe experience.

### *Pathways*

SD-91 Design major pathways through and between campus neighborhoods, including the central campus spines, with a minimum width of 10 feet to accommodate groups and facilitate movement across the campus.

SD-92 Incorporate seating, landscape, lighting, and bicycle parking into the design of campus walkways to foster a comfortable, safe, and interesting pedestrian experience.

SD-93 Design shared bicycle/pedestrian pathways to provide adequate width—typically 12 to 16 feet—for safe travel by all modes.

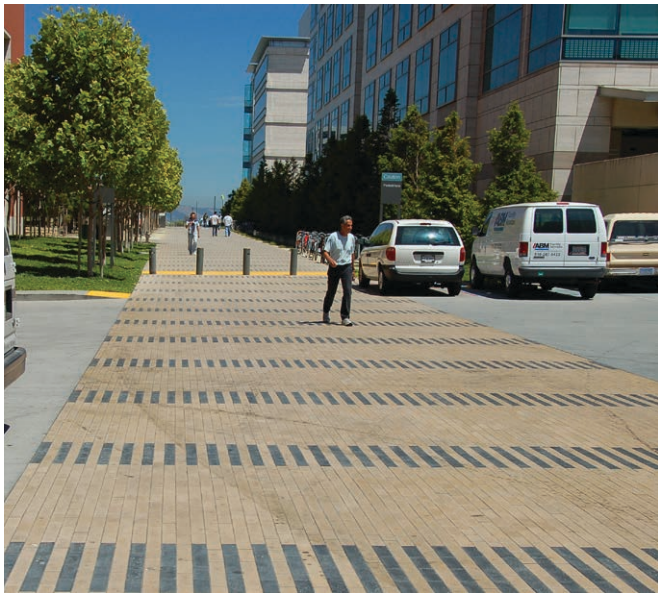
SD-94 Where pathways are shared with service vehicles, provide sufficient width to safely accommodate service vehicles, pedestrians, and bicycles.

SD-95 Utilize paving design and signage to communicate the shared nature of service access streets. Promote bicycling and pedestrian use of these areas.

SD-96 Where pathways cross streets, continue the pedestrian paving pattern to create visual cohesion and signal to vehicles that pedestrians have the right-of-way.

SD-97 Improve the minor access trail from the Bay Trail into the RBC in a manner sensitive to the natural marsh environment.

SD-98 Site and design narrow boardwalks and trails across and around the grasslands and marsh in a manner that minimizes intrusion into these sensitive areas. Where appropriate, raise walking surfaces to allow wildlife or water to pass under them and fabricate them so as to allow light passage.



*Campus walkways should be designed to be shared by pedestrians and bicyclists (left) and should incorporate seating (center) and other site furniture. Walkways crossing streets (right) should have a continuous paving pattern to signal pedestrian priority.*

SD-99 Fabricate boardwalks and informal recreational trails or paths from durable materials that blend with or complement the natural features of the site, such as wood or decomposed granite.

SD-100 Use signage, fences or railings to prevent people from entering the most sensitive natural areas of the site.

### *Accessibility*

The site design and palette of landscape elements will be designed to provide a safe and comfortable setting with a clear wayfinding system and orientation for individuals with a variety of physical and sensory abilities.

SD-101 Locate building and major landscape elements to allow clear view corridors through the campus to visually connect and link distinct areas, important landmarks, destinations, and adjacent neighborhoods.

SD-102 Utilize gateways, gathering areas, and landmarks as a means of orientation. To reinforce wayfinding, incorporate landscape elements with distinct and memorable sensory character and utilize repetitive landscape elements along major paths of travel.

SD-103 Ensure that major pathways are sufficiently wide to allow room for groups to comfortably pass one another while engaged in a signed conversation.

SD-104 Design campus pathways with textured edges, warning strips, shoulder zones, contrasting colors, and other treatments that ensure the safety of visually impaired and blind individuals.

SD-105 Provide seating areas at key destinations and decision points such as pathway intersections and building entrances.

SD-106 In outdoor seating areas, provide a variety of seating elements and arrange seating to enable clear visual access between groups of individuals.

## UTILITIES AND INFRASTRUCTURE

Campus utilities will be deliberately planned from the early stages of campus development and will be constructed in an efficient and sustainable manner.

SD-107 Locate utility lines underground to the extent practicable to minimize maintenance requirements and contribute to the appearance of the campus.

SD-108 Ensure that utility lines located above ground are coherently organized, designed and carefully detailed to ensure longevity, provide ease of access, and meet the aesthetic guidelines herein.

SD-109 Phase the installation of new distribution lines and related facilities with campus development. Consolidate utilities in central corridors for efficiency and ease of maintenance.

SD-110 Integrate conventional above-ground utility infrastructure, such as utility boxes, vents, and backflow preventers, into site and building design and away from major pedestrian routes to minimize visual impact. Utilize plantings where possible to provide screening.

SD-111 Integrate utility buildings with parking structures where appropriate.

SD-112 Highlight power generation equipment that has educational value, such as photovoltaic panels or chilled water storage, through prominent siting and interpretive signage.

SD-113 Consider waste management strategies in the early phases of campus development. Design infrastructure utility systems with prebuilt and assembled components capable of later dismantling and reuse.

SD-114 Provide infrastructure space, systems, and processes to collect and transport all discarded materials so that they may later become resources for others to use.

# BUILDING DESIGN GUIDELINES

The Richmond Bay Campus will be developed over a relatively long period of time, dependent on the imperatives of emerging research initiatives, funding and many other considerations. Achieving a coherent, integrated and memorable campus built environment is a key goal of this Physical Design Framework.

The design of campus buildings will be influenced by a variety of factors.

## CONTEXTUAL INFLUENCES

The design of campus buildings, and thus these design guidelines, derive from four primary sources of influence: site context and history, place-making, the research mission, and the University's sustainability values.

The historic waterfront buildings around the bay were designed for productivity. They derive their form and character from the nature of work that they were intended for. These are honest, simple, and straightforward buildings whose walls are more solid than transparent.

These early large waterfront buildings were built by hand and the scale of the building materials reflects that. This often lends large structures a sense of human scale. Even the cast-in-place concrete piers were first built with board forms and have a similar scale and texture to them.

The colors of these buildings are primarily neutral grays and creams which feel in character with the natural elements and the utilitarian nature of work contained within. The distinguished, industrial Ford Assembly Plant, recently successfully renovated, near the Richmond Bay Campus was constructed with a buff colored brick facade.

*The muted colors and solidity of the San Francisco Bay skyline (left) serves as a precedent. The San Francisco Ferry Building (right) is an example of a waterfront building in neutral colors which blends well with the natural environment.*

The historic bayfront buildings often have walls that are more solid than glass, suitable to the marine environment. New glass-intensive modern buildings that have sprung up around the bay's edge are less successful in being indistinguishable from their suburban counterparts and in lacking this material connection to the waterfront.

Placemaking is the art of creating an ensemble of buildings and outdoor spaces so that their overall impact is more than the sum of their parts. Identity emerges from the cultivation of thoughtful relationships between elements. Examples include UC Berkeley, where a common but diverse vocabulary of materials and forms yields a rich, unique campus that cannot be mistaken for any other.

The research mission should be a source of inspiration and meaning, such that the form not only follows function but expresses the core values of forward-thinking research. A simplicity of means, as seen on the LBNL campus, is essential in keeping the attention rightly focused on the work supported by the buildings and spaces.

Sustainability is not just a performance goal but a core value to be expressed in building designs. The principles of biomimicry will be employed to mirror the inherent beauty of natural systems and their merging of form and function. The shared values of UCB and LBNL and the research mission will come together in the expression of sustainability and stewardship of natural resources such as energy, water, materials, and local ecosystems.

The building design guidelines which follow are inspired by the contextual influences and the desire to create a state-of-the-art, inspirational, and sustainable place to produce world-class collaborative science for healthy living and sustainable communities.

*This waterfront building is solid in form, with neutral colored walls (left). Richmond's architectural heritage includes the Ford Assembly plant, clad in a distinctive rich yellow brick (right).*

## RESPONSE TO PLACE AND USE

BD-1 Ensure the legibility of campus architecture from two primary scales: the distant view of the campus as a whole and the pedestrian eye-level view.

BD-2 Guide building design and siting so the campus reads as an integral, restrained ensemble of buildings.

BD-3 Ensure that the overall campus image takes precedence over individual building expression.

BD-4 Amplify the concepts expressed in the Campus Parti, including reinforcement of distinct neighborhoods and the Central Spine while creating protected, comfortable outdoor spaces through massing and articulation.

BD-5 Balance respect for and the influence of historic waterfront precedents with expression of a "newness" and innovation appropriate for the future-oriented research supported within.

BD-6 Consider using traditional materials that are articulated and detailed in a manner consistent with modern construction techniques.

BD-7 Use building designs to heighten the appreciation of the unique natural setting and resonate with the historical and ecological context.

BD-8 Design pedestrian-scaled spaces and facades to foster innovation and collegiality through strategic use of transparency and development of comfortable, social gathering places.

BD-9 Include human-scale detail and visual transparency at ground and lower levels that encourages discovery and new ideas.

BD-10 Provide building spaces that foster interaction at a variety of scales and levels of formality. Common areas, stairs, and lobbies should be located to invite use and be highlighted through thoughtful design articulation.

BD-11 Signal the nature of the research endeavor through design signals utilizing detail, color and form.

BD-12 Express sustainability in every building's design with colors, materials and reduced scale forms working harmoniously with the natural aspects of the site while promoting accessibility, legibility, human comfort and interaction.

BD-13 Directly address the challenge of high energy use in laboratory research facilities by exploring innovative design and making use of the mild climate at the Richmond Bay Campus.

BD-14 Explore opportunities to demonstrate building efficiency technology innovations developed by the University and its industry partners for research and educational purposes.

BD-15 Design building electrical systems to be green power ready.

BD-16 Locate maintenance and operations spaces at the neighborhood's outer boundaries while a transparent and welcoming facade integrates with the neighborhood's Central Spine.

*Buildings at the Richmond Bay Campus will express sustainability through such features as sunshades (above), electrochromic glass, and local, durable materials.*

*Various examples of effective placemaking through thoughtful use of building geometry, orientation, and transparency. Buildings with common materials but distinct forms create a hierarchy of spaces (top left); a curvilinear L-shaped facade defines an open courtyard (top right); facing buildings (bottom left) orient views out to the ocean and back to the land; cafe spaces spill out from transparent ground level facades (bottom right).*

## BUILDING FORM

### Massing

BD-17 Design buildings to serve two primary purposes: containing and supporting the functions within while shaping the outdoor spaces that comprise the campus.

BD-18 Treat each neighborhood as a distinct ensemble of buildings, with siting, massing, and form lending unique characteristics that contribute to identity-building. The architectural character of each neighborhood should take cues from the landscape and vice versa, so that the two are mutually reinforcing.

BD-19 Define outdoor spaces with building form—in particular the Central Spine and secondary courtyard spaces. Building form should inflect towards each neighborhood's primary gathering place and reinforce the interactive potential of these shared spaces.

BD-20 Use variation in building height strategically to mark key intersections, public spaces, or gateways through vertical elements such as towers or additional floor levels.

BD-21 Harmonize building massing with the existing natural features at the site to support development of neighborhoods with distinctive personalities. For example, taller buildings are most appropriate where there is a vertical backdrop of tall trees and shorter buildings would be more appropriate near the marsh.

BD-22 Determine building widths through the interplay of programmatic needs with the optimization of daylighting and views.

BD-23 Use building mass to buffer winds from the southwest to improve outdoor comfort, particularly at key gathering spaces.

BD-24 Employ semi-enclosed balconies and terraces to break up the mass of buildings and provide more intimate gathering areas adjacent to research spaces.

BD-25 Face balconies and terraces to outdoor public areas to help animate the spaces below.

*Building massing can be articulated through stepping facades down to pedestrian scale and lending verticality to taller elements (left), or including upper level balconies (center). A 4-story lab building nestles into an existing stand of trees, which serves to provide scale and context to the larger building (right).*





*Outdoor circulation can provide depth to the building facade (top left), and architectural interest when connecting two buildings (top center). Semi-enclosed spaces can provide smaller gathering spaces on upper floors of buildings, and can take advantage of views (top right). Material transitions between base, middle and top can add visual interest to large lab buildings (bottom left). Clerestory windows, a large bay window, and roof overhangs "break the box" of a lab building (bottom right).*

## Roofs and Upper Levels

BD-26 Ensure that building design recognizes the visibility of roof spaces and considers the roofscape as a "fifth facade."

BD-27 Utilize flat roofs for laboratory buildings to accommodate roof-mounted equipment and for economy of construction.

BD-28 Incorporate a minimum ¼" per foot slope on roofs and utilize the highest-albedo roofing materials possible to reduce heat island effect and heat transfer through the roof construction.

BD-29 Use sloped roofs for differentiation on non-laboratory buildings. Use standing seam metal and clay tile roofs due to their actual and apparent durability; asphalt shingles are prohibited on visible roofs.

BD-30 Cluster rooftop equipment and place it behind screens set back from the roof edge. Organize communications equipment similarly.

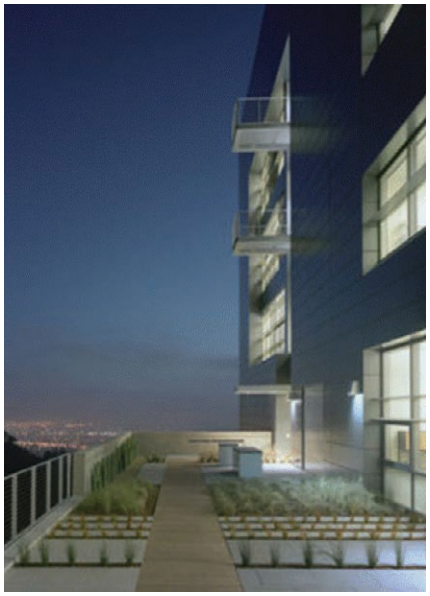
BD-31 Design roofs to be "solar ready" for maximum solar energy generation and attractive integration of solar renewable power systems.

BD-32 Screen other roof activities in a way that is visually consistent with the building's materials, to the extent practicable, so as not to detract from the building's appearance.

BD-33 Include rooftop terraces in building design where appropriate to provide a community setting which captures views and takes advantage of opportunities to break up large areas of building massing.

BD-34 Design guard rails for terraces or maintenance access to be subtle in appearance or set back from the roof edge.

BD-35 Encourage use of green roofs where visible, both as an amenity to building occupants and a means to absorb stormwater and decrease site imperviousness.



*Roof equipment screens can take various forms and serve multiple functions, such as on this building where a visor conceals equipment, supports PVs, while referring to adjacent sloped roof buildings (left). Buildings can also break up the monotony of flat roofs by blurring the distinction between wall and roofs at times (center). Roof terraces and balconies can take advantage of unique views to create spaces for interaction and collaboration (right).*

*Equipment spaces on the roof can be integrated into the architecture (top left), or an integrated PV armature can be used for concealment (top right). Well-situated terraces enliven facades while serving important social functions (bottom left). If well-considered, exposed mechanical equipment can be a source of design expression (bottom right).*

## FACADES

### Walls and Windows

BD-36 Portray a sense of building permanence and solidity, using transparency strategically to achieve key planning goals, such as at entries, along the Central Spine, and to provide inspiring views.

BD-37 Design entry points and primary building uses, especially interior social spaces like assembly spaces, conference rooms, and collaboration spaces to be legible from the outside whenever possible.

BD-38 Use architectural elements such as massing or well defined transparent apertures that frame primary spaces to provide a sense of each building's organization immediately upon arrival.

BD-39 Scale windows and doors according to internal programmatic needs, thereby communicating building type and use.

BD-40 Reflect the site's strong horizon line through window proportions and allow for sweeping views from inside each building in nearly all directions where possible.

BD-41 Set windows back as far in the wall plane as possible to create a sense of wall depth and solidity and allow the use of jambs and heads for shading.

BD-42 Use clear as possible and non-reflective glazing to promote daylighting, transparency, and visibility while meeting energy and thermal performance requirements.

BD-43 Limited green tint (not blue-green) is acceptable to reduce heat gain while allowing in natural daylight.

BD-44 Prioritize facade design elements that minimize bird kills and incorporate the recommendations in the American Bird Conservancy's "Bird-Friendly Building Design" or successor documents to the extent practicable.

BD-45 Use durable window frame material with an anodized or powder coat factory finish appropriate for a marine environment.

BD-46 Consider building-integrated photovoltaics on south and southwest-facing walls.

*Solidity of facades need not be a constraint on architectural expression (left). Windows should be sized to the internal use, but the expression of the opening can enlarge the apparent size on the exterior (center). Larger glazed areas can highlight special attractions, such as the cafe below these glazed, curved bay windows (right).*

## Entries

BD-47 Reinforce the active nature of major open spaces and corridors through the strategic placement of building entries; direct pedestrian traffic and provide places for chance encounters and interaction as well.

BD-48 Ensure that building entries are clearly visible from outdoor spaces and accented through architectural features such as enlarged glazing areas, overhead canopies, and good lighting.

BD-49 Locate building entries on north and south facades, encouraging larger glazing areas on these facades where sun control is most feasible.

BD-50 Determine specific entry locations by the building program and architecture as well as by the surrounding or facing buildings and adjoining open spaces.

BD-51 Provide building security controls to manage access to each building.

BD-52 Locate communications units at each main entrance and at delivery doors to allow communication with a security operations center.

BD-53 Locate stairs in lobbies and design them to be visible from the neighborhood Central Spine, thereby appearing as attractive alternatives to elevators.

*Window frame material should be durable (left) and appropriate to the marine environment. Large glazed areas in facades can be used to create spaces that point to and capture views (right).*

## Building Exterior Lighting

BD-54 Provide a hierarchy of illumination to draw attention to building entries and gathering areas, and to strengthen visual connections across exterior spaces.

BD-55 Integrate exterior lighting with other landscape elements to provide illumination for safety and security while providing comfortable conditions in occupied outdoor spaces.

BD-56 Design outdoor lighting to provide a safe, accessible and comfortable building exterior while minimizing glare at all times.

BD-57 Coordinate building exterior lighting with landscape and open space lighting to maintain a cohesive campus identity, a safe environment, and sustainable operations.

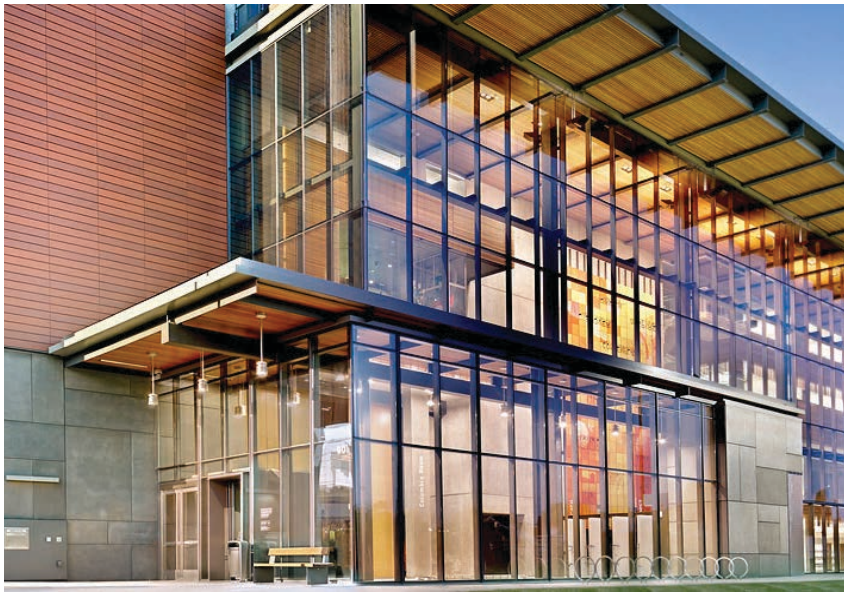
BD-58 Use a variety of high color-rendering light sources to create multiple layers of illumination; use coated lamps to attenuate contrast, soften shadow edges and improve object modeling.

BD-59 Minimize use of wall-wash and facade lighting to only that necessary to facilitate wayfinding and illustrate the connection between buildings and landscape elements.

BD-60 Require building-mounted and pedestrian post light fixtures to be full cut-off style to control glare and provide superior ground plane illumination.

BD-61 Minimize light and noise intrusion near natural open space areas while allowing views to the grasslands and marshes.

BD-62 Ensure that all building exterior lighting fixtures conform to International Dark Sky Association, or successor, standards that typically require: full-cutoff fixtures to eliminate direct up-light; minimizing glare; use of efficient light sources; and the use of motion sensors.

*Main lobbies should be highlighted through increased glazing and visible open stairs to encourage walking and social interaction.*

*Large expanses of glass should be focused on entries and other key public building functions and shaded appropriately.*

## COLORS AND MATERIALS

### Color

BD-63 Ensure the campus fits within its surroundings and remains coherent as buildings and spaces develop through the use of color and materials.

BD-64 Strive for a balance of unity and diversity, for legibility without uniformity.

BD-65 Employ common color values for each neighborhood to achieve an ensemble rather than a collection of buildings.

BD-66 Use primary colors to reference the existing natural context and shoreline precedents around the Bay.

BD-67 Apply primary colors for prominent walls, roofs, paving, and other large surfaces, especially those that are visible from public spaces and from a distance.

BD-68 Achieve primary colors with masonry and other integrally-finished materials and without paint.

BD-69 Use secondary or accent colors to signal the creativity and innovation of the research enterprise within the buildings.

BD-70 Use secondary or accent colors to animate the generally muted landscape and introduce brightness, surprise, delight, and sophistication into the campus environment.

BD-71 Apply secondary or accent colors to window and door frames, doors, metal trim, paving at entries, sunshades, railings, and other metalwork.

BD-72 Utilize accent color for interior spaces visible from public ways to highlight key public areas.


*Muted earth tones are effective as primary color in precedent architecture around the bay (left). Strong color highlights can be effective at drawing attention to key building features and spaces (right).*

## Materials

BD-73 Project quality and foster allegiance to the design principles described in these guidelines, such as solidity of walls, through the use of primary wall materials.

BD-74 Use materials with integral color and honesty of expression for their directness of character and durability.

BD-75 Use materials such as precast concrete panels, terra cotta, poured-in-place concrete, or other integrally-finished, durable materials.

BD-76 Use secondary wall materials as accents to introduce color or to highlight an entry or architectural feature.

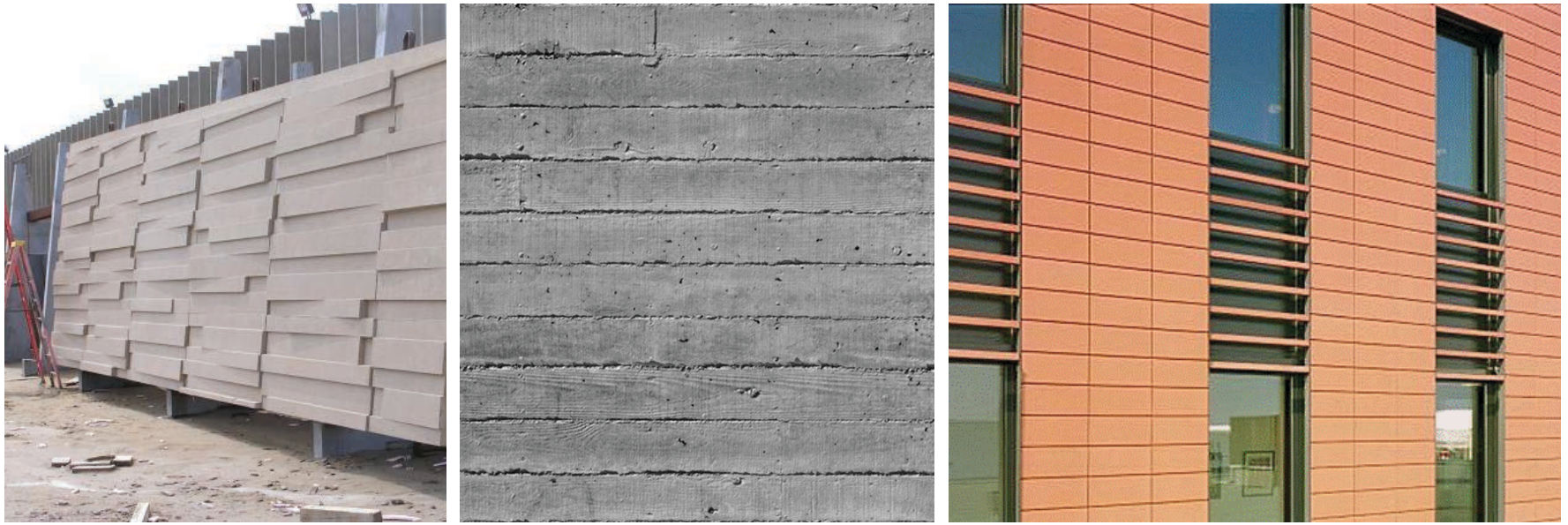
BD-77 Include natural stone, brick, naturally-finished wood, weathering steel, painted metal panels, unfinished copper, and zinc as secondary wall materials to create distinction and vibrancy.

BD-78 Select materials and finishes for durability to withstand the marine environment and limit maintenance requirements.

BD-79 Take advantage of natural weathering processes to improve material character over time, such as weathering steel.

BD-80 Select materials to harmonize with colors in the primary and secondary color palettes.

BD-81 Use materials that improve building envelope performance through insulation values and thermal mass to improve thermal comfort and minimize energy consumption.



*Examples of materials that are durable and sustainable include precast concrete (left), board-formed poured-in-place concrete (center), and terra cotta (right).*

*The combination of materials - precast concrete, glass, and tastefully-colored aluminum - is successful on this lab building (left). Wood infill can be used to soften the appearance of poured-in-place concrete (right).*

*A wide range of expression is possible through the use of integrally-colored, durable wall materials.*

## SUPPORT BUILDING TYPES AND COMPONENTS

### Parking Structures

BD-82 Incorporate massing, materials and colors that respond to the scale and character of adjacent buildings or exterior spaces in the design of parking structures.

BD-83 Articulate vertical components such as stairs and elevators to lend scale to the building mass.

BD-84 Design stairs to be open to air or as transparent as possible to provide visibility and help address security concerns.

BD-85 Design parking structures to avoid expressing sloping floors on major facades.

BD-86 Use metal fabric, metal louvers, perforated metal or other permanent and durable materials that allow ventilation and visual screening on parking structures.

BD-87 Incorporate a security screen at the ground level of parking structures to prevent pedestrians from walking through undesignated areas.

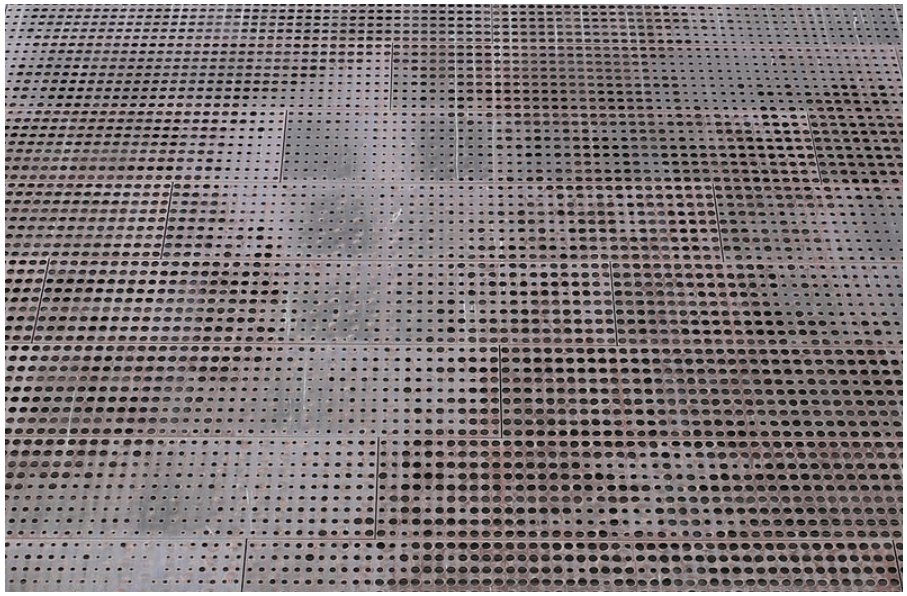
BD-88 Employ expressive wall panels of varying transparencies and texture to add visual interest.

BD-89 Design the roof level to accommodate sun-shading structures such as photovoltaic canopies.

BD-90 Utilize landscape, site walls, or architectural elements to screen and/or buffer parking structures from pedestrian walkways.

BD-91 Refer to the Open Space and Landscape Guidelines section of this document for guidelines on buffering of parking structures from walkways.

BD-92 Incorporate convenient and secure bicycle parking and maintenance facilities, including showering facilities and changing rooms, into the design of parking structures to encourage bicycle use.



*An example of an architecturally-compelling parking garage incorporating PV shade structures on the roof, open stairways, and clear circulation (left). Metal mesh (right) can be customized with patterns to clad the exterior of parking structures and other buildings.*

## Infrastructure Facilities

BD-93 Utilize a different architectural language to differentiate major elements of the central plant and other campus infrastructure from others on campus and to add an element of visual interest.

BD-94 Design small support structures for minimal visual impact and site them away from major pedestrian routes.

BD-95 Use planting where possible to screen utility structures and equipment.

BD-96 Integrate utility functions and buildings with parking structures where appropriate.

## Service Bays and Docks

Service spaces and loading areas should be planned and designed to minimize their visual impact on the bulk of the campus community.

BD-97 Locate service bays, docks, and storage as far as possible from quads, courtyards, and primary pedestrian walkways.

BD-98 Locate service bays and docks within the building envelope where possible and place them behind doors that are integrated with the facade design.

BD-99 Screen service areas from view and mitigate their associated noise as much as possible. Noise-generating equipment at grade should be studied for acoustic impacts and appropriate measures taken to control spreading of noise within the building and into adjacent spaces.

*Major infrastructure projects (left) can achieve high architectural quality and provide some contrast and relief in scale and materials from research buildings. Where possible, building service bays and docks should be located within the building envelope (right).*

# OPEN SPACE AND LANDSCAPE GUIDELINES

## CONTEXTUAL INFLUENCES

As evidenced by the photos in the Site Inspiration section, the Richmond Bay Campus is characterized by several different natural systems which can provide the roots for the campus landscape design.

Much of the Richmond Bay Campus landscape follows a pattern of ecological succession (see Figure 4.11). With changing site conditions from the bay edge to the upland part of the site, the plant communities transition from tidal mudflats and marsh to grasslands, and ultimately a shrub layer of coastal scrub. Another landscape typology on the site is that of the introduced woodlands—primarily blue gum eucalyptus and Monterey pines—that have grown into tall trees.

Figure 4.12 suggests a conceptual landscape design framework in which developed areas of the site take their character from adjacent natural and designed landscapes, suggestive of ecological succession. The four zones—bayfront, grasslands, coastal scrub, and forest—align with the four campus neighborhoods, reinforcing the LRDP vision that each neighborhood should have a distinct identity.

Planting and other site features would be designed to evoke the ecological zone of each neighborhood. Throughout the site, the plants used in the designed landscape should be those that occur naturally or resemble native site vegetation.

The open space and landscape design guidelines which follow are intended to result in a cohesive site design which blends the natural and built environments to provide a safe, efficient, and collegial campus environment. The plant palette will be developed in consultation with biologists and carefully selected to avoid invasives or any plantings with potential to spread or otherwise impact the natural ecological functioning of the Natural Open Space area.

*Figure 4.11: Ecological Succession*

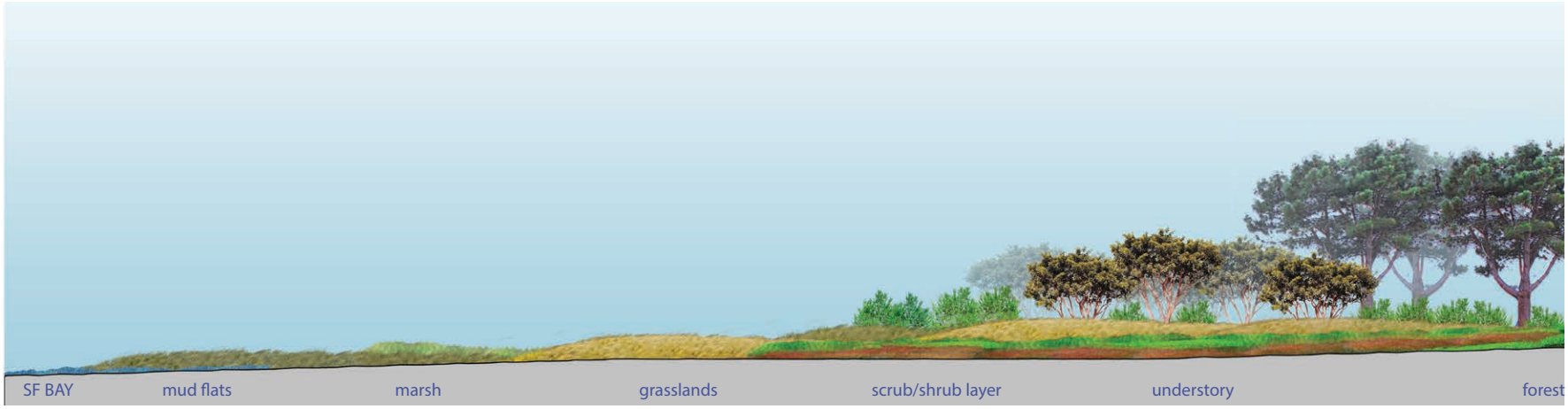
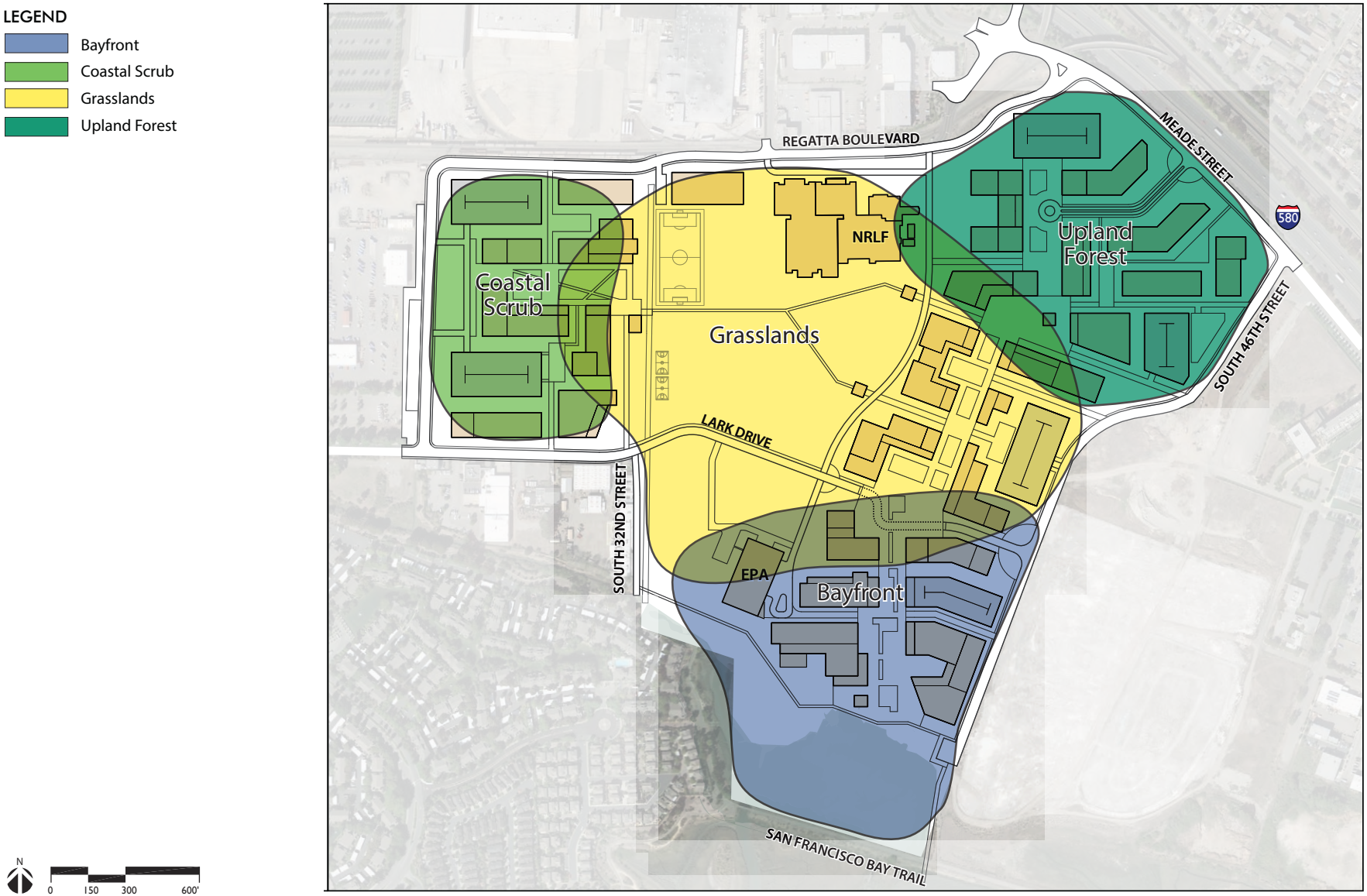


*Figure 4.12: Ecological Neighborhoods*



## NEIGHBORHOOD ZONES

### Bayfront

This zone is located in the southern portion of the site near the Bay and adjoins Meeker Slough and Stege Marsh.

OS-1 Incorporate pools, fountains, or other expressions of water, into the design of open space. These could function as a visible form of stormwater detention or water storage and recycling, educating the populace about the site's hydrologic patterns and the university's sustainability mission.

OS-2 Emphasize horizontality in plantings and other landscape features and select plants that are low to the ground to evoke the flat nature of the waterfront, draw attention to the water elements, and allow views out to the bay.

OS-3 Incorporate overlooks into the site design to afford comfortable viewing while minimizing terrain disturbance.

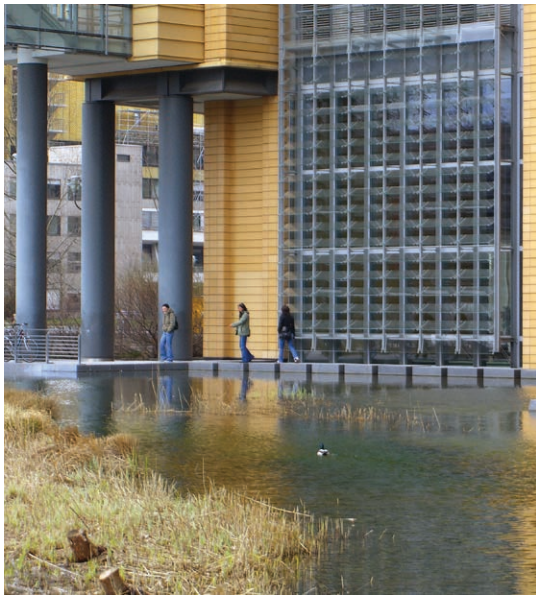
### Grasslands

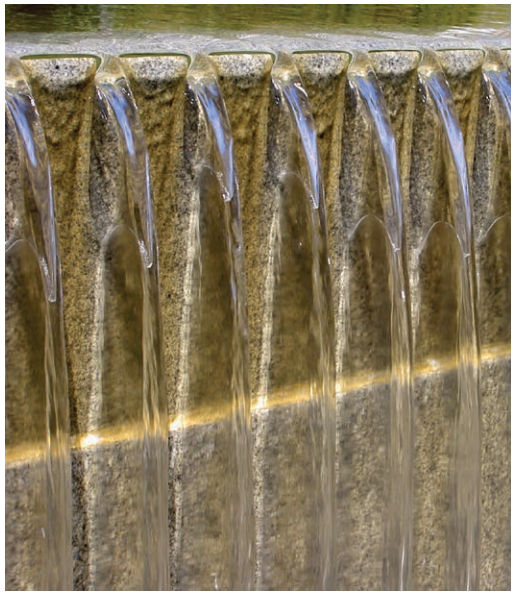
This zone spans the site's grassland meadows, including the remnant coastal terrace prairie at the heart of the site.

OS-4 Incorporate broad swaths of grassland plants in the landscape design, evoking the drift patterns of the site's meadows. Avoid invasive, self-sowing grasses.

OS-5 Consider ways to make visible the prevalent winds on site as they pass over grassland plantings, lending these spaces a dynamic quality.

OS-6 Manage the Natural Open Space grasslands in accordance with the Richmond Bay Campus Coastal Terrace Prairie Management Plan or successor documents.





*Naturalistic marsh or wetland features (left) or fountains (center) could be incorporated into the site design to highlight the bayfront environment and make visible the site's hydrologic processes. Swaths of grasses or similar low-to-the-ground plantings should be used in plazas and courtyards to evoke the unique grasslands setting (right).*

## Coastal Scrub

This zone, in the northwestern part of the site beyond the grasslands, will evoke the coastal scrub layer that typically evolves at a meadow's edge through the successional process.

OS-7 Line pedestrian pathways with lower grasses that step back to taller wildflowers and shrubs with distance from the path.

OS-8 Place shrubs or chaparral so they appear to emerge from the grasses in an informal pattern resembling volunteer plant species.

## Forest

The tall trees concentrated in the northern portion of the site have dense canopies and little herbaceous understory. Their composition is striking in the repetition of vertical tree trunks and strong linearity.

OS-9 Incorporate tall elements into the designed landscape in the forest zone and evoke the geometric patterns of the existing tree stands in the form of formal tree bosques or groves. Create shaded outdoor spaces, sheltered from the wind, with open views at eye level.

OS-10 Over time, replace the eucalyptus trees with a suitable species that provides the same verticality and appropriate habitat for wintering monarch butterflies. Species to consider include Grevillea robusta (Silk Oak), Pinus radiata (Monterey Pine) and Cupressus macrocarpa (Monterey cypress) augmented by association with a variety of milkweed plants, Asclepias spp.; the favorite food source of the "milkweed" butterfly.

*Plantings in the western campus neighborhood may evoke the coastal scrub layer that typically evolves at a meadow's edge (left and second from left). In the northern portion of the site, tree bosques or groves might be utilized in the landscape design (second from right and right) to evoke the geometric patterns of existing tree stands.*

### Neighborhood Overlap and Identity

OS-11 Where the ecological zones overlap, blend aspects of each typology in the landscape design.

OS-12 Between the grasslands and forest zones, incorporate understory trees to ease the transition in scale.

OS-13 Utilize unique landscape features such as planting and hardscape design, site-integrated art, or accent colors to reinforce the distinct identity of each zone.

OS-14 To ensure cohesion throughout the campus, utilize some common landscape elements such as site furniture, signage, color palette, and paving.

## LARGE PLAZAS AND GATHERING AREAS

Throughout the campus large plazas will be located to provide a venue for special events, gatherings or for quiet contemplation of dramatic views.

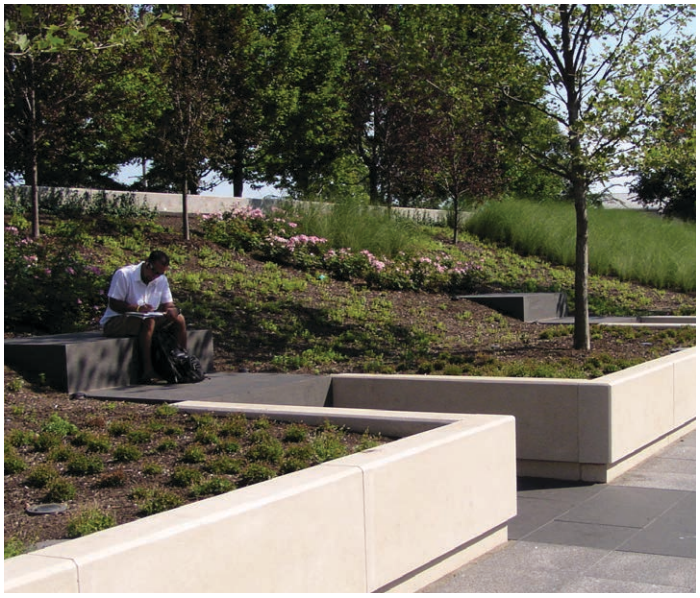
OS-15 Provide major plaza spaces at key points along the Central Spine, particularly at the nodes between neighborhoods.

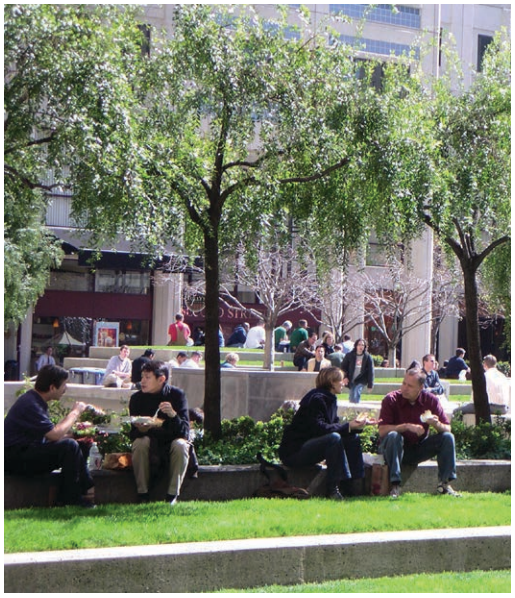
OS-16 Allow a variety of plaza configurations, narrow or linear in form or wider and more open in character.

OS-17 Design plazas to accommodate large gatherings and small group interaction, anticipating use by both the campus workforce and members of the broader community.

OS-18 Construct plazas with durable surface treatments to support heavy use and minimize the need for site maintenance.

OS-19 Incorporate plantings into plazas to make them comfortable for use and create distinct outdoor environments. They should be generally formal in character and should promote assembly, interaction, and inspiration.





*Plazas along the central spines of the campus should accommodate a variety of activities from large group gatherings to small group interaction or individual reflection.*

OS-20 Provide flexible seating, where feasible, to accommodate groups of varying sizes and to suit different program needs.

OS-21 Configure adjoining buildings to shape the edges of plazas, providing a variety of subareas conducive to a variety of active and passive activities.

OS-22 Utilize site furniture, walls, and landform to protect plazas from channeled southwesterly winds.

## SECONDARY OPEN SPACES

A variety of smaller, intimate open spaces such as courtyards or terraces will be provided throughout the campus to benefit from the benign local climate.

OS-23 Locate secondary open spaces off of the central spines of the campus to create individual building amenities and allow for smaller group seating and informal activities.

OS-24 Locate secondary open spaces between buildings at a variety of scales to support a multitude of activities and give distinct identity to different campus neighborhoods and districts.

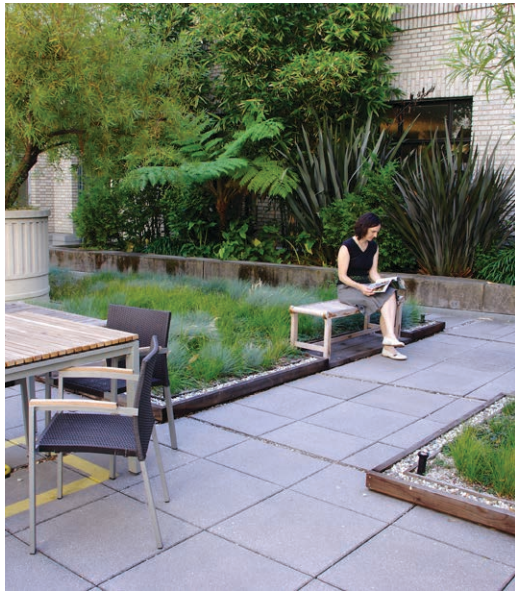
0S-25 Provide a range of seating options to accommodate different activities and encourage small group interaction or individual reflection.

OS-26 Utilize special paving materials, site furniture, or planting to give each space unique qualities.

OS-27 Incorporate common materials, site furniture, lighting or planting elements into the design of secondary spaces to create cohesion across the campus.

OS-28 Select materials, furnishings and plantings to integrate outdoor spaces with adjacent building elements and to create subtle transitions between the indoor and outdoor environment.

OS-29 Identify opportunities to incorporate a variety of art installations into secondary spaces to contribute to the distinct identities of these spaces.




*Secondary spaces such as courtyards or terraces should be located throughout the campus. Design of these spaces should vary to lend distinct identity to different campus districts.*

## PLANTING GUIDELINES

Site plantings play a key role in tying the campus to its site, reinforcing the strong sense of place and identity.

### Planting Palette, Pattern, and Color

OS-30 Reflect the site ecological zones--bayfront, grasslands, coastal scrub, and forest--in the choice of plant materials and in their installation.

OS-31 Utilize plantings to enhance and frame views across and beyond the site to strengthen campus identity and provide opportunities for inspiration and reflection. Utilize plantings to shield undesirable views.

OS-32 Utilize more formal plantings in the developed areas, and create a contrast of soft and hard lines, where appropriate; utilize less formal planting design closer to natural areas.

OS-33 Relate planting design to campus buildings to anchor development on the site and integrate the building and open space.

OS-34 Utilize trees and landform to deflect wind and create sheltered spaces throughout the campus.

OS-35 Utilize a variety of deciduous and evergreen plants and plantings that change with the seasons to provide visual interest and a sense of place on campus.

OS-36 Use specimen trees to indicate special places on campus.

OS-37 Utilize new trees to reduce the visibility and scale of new development as seen from public spaces as well as from residential neighbors.

OS-38 Utilize masses of color and texture for maximum impact. Ensure that planting colors are consistent or compatible with existing site vegetation, drawing on the observations in the Site Inspiration section of this document. Use plants with brighter and more intense colors to highlight significant spaces or building features.

OS-39 Support sustainability goals by selecting climate-appropriate plants requiring limited resource input.

*Planting design should consider changes in seasons (left) to enhance the sense of place on campus, and masses of color and texture should be used to create a high impact, high quality outdoor environment (right).*

OS-40 Utilize turf substitute grasses that require minimal water and mowing such as Carex pansa (dune sedge). Minimize the use of turf "lawn," which typically requires significant maintenance and irrigation.

OS-41 In the buffer zone adjacent to the designated natural open space, utilize exclusively native or non-invasive species.

OS-42 Locate high-maintenance plants only in highly visible, heavy use areas such as building entrances.

## Stormwater Management

In keeping with the sustainable vision for the Richmond Bay Campus, on-site, surface stormwater management will be used throughout the campus to the extent feasible.

OS-43 Design stormwater infrastructure to mimic natural hydrologic processes and reduce the rate and volume of stormwater runoff from the site.

OS-44 Integrate stormwater management into site landscape design and highlight it for educational purposes.

OS-45 Integrate detention features in the developed areas of the campus in the form of pools or rain gardens which display the movement of water, providing visual interest and making viewers aware of site hydrology.

OS-46 Utilize surface stormwater treatment elements that vary in appearance, with more formal designs in the developed areas and more naturalistic features adjacent to natural areas.

OS-47 Utilize drought-tolerant species that will be attractive in dry seasons.

*Stormwater management should be incorporated into landscape design (left) and might highlight the movement of water to educate viewers about hydrologic processes (center). Near site natural areas, stormwater features should be more naturalistic in appearance (right).*

## Irrigation

Recognizing that potable water is a scarce, shared resource, planting design should minimize the need for landscape irrigation through the use of drought-tolerant plants. Where irrigation is needed, water-efficient systems should be utilized.

OS-48 Minimize requirements for ongoing automated irrigation watering. Include components in landscape design that educate people about efficient use of water.

0S-49 Integrate rainwater into landscape designs to minimize the need for irrigation but ensure that these areas are attractive in periods of little rain as well.

0S-50 Utilize grey water or rainwater cisterns to augment potable water for landscape plantings.

## Screening

OS-51 Use planting and other landscape features throughout the campus to screen areas that could otherwise detract from the campus environment such as building service and loading areas, maintenance facilities or corporation yards, building mechanical equipment, parking lots or structures, or utility infrastructure.

OS-52 Incorporate fast-growing plant material, supported by structures when needed, into site design to create screening walls between public spaces and building loading areas.

OS-53 Use low hedge plantings as well as tightly spaced trees to screen parking lot and parking structure edges and soften views of vehicles.

OS-54 Incorporate vertical “green screens” into building design, as appropriate, to soften or disguise blank building facades.

*Plantings should be used to screen building loading areas (left) or parking lots (center) from public view. Vertical planted screens should also be incorporated into building design to soften blank building facades and provide visual interest(right).*

### Existing Trees

All existing trees to remain on the campus should be carefully protected.

OS-55 Avoid cutting or filling within the drip line of trees to avoid suffocation and root cutting.

OS-56 Avoid placing overhead utility lines through trees.

OS-57 Establish finished grades on paving, footings, etc. above the root system. Root coverage should be less than 40 percent unless the coverage is loose and permeable.

OS-58 Re-establish drainage systems around trees where the natural drainage system has been disturbed. Finish grades should drain away from the tree.

### Maintenance

Landscaping plants should be selected for ease of maintenance so as not to require extensive pruning, leaf and litter collection, or pest control.

OS-59 Avoid placing large deciduous trees that require substantial leaf collection in interior courtyards.

OS-60 Utilize drought tolerant plants which require minimal water use. Tailor irrigation systems to each ecosystem or micro-climate and include rain sensors to prevent unnecessary water use.

OS-61 Ensure that maintenance equipment has adequate access to landscape areas.

## SITE SECURITY

Principles for "Crime Prevention Through Environmental Design," or CPTED, affect elements of the built environment ranging from the small-scale (such as the strategic use of shrubbery and other vegetation) to the overarching, including building form of an entire neighborhood and the amount of opportunity for "eyes on the street."

OS-62 Encourage the use of common paths of travel and seating areas through landscape design.

OS-63 Provide site security cameras to allow viewing and recording of all campus entry points.

OS-64 Ensure that landscape design allows unobstructed views from security cameras, and does not interfere with lighting or intrusion detection systems.

OS-65 Minimize areas of concealment in and around facilities.

OS-66 Install exterior lighting at entrances, exits, bike parking areas, shuttle stops, parking lots, and garages.

OS-67 Provide blue-light assistance telephones at designated (200' to 300') intervals on the campus. Ensure that activation of an assistance phone allows instant communication with a security operations center and calls up an associated camera to allow the security officer to assess the situation.

OS-68 Provide license plate viewing cameras and associated software at each vehicle entry/exit point. Locate cameras in entry pedestals adjacent to communication stations to allow viewing of callers.

## SITE MATERIALS

The choice of landscaping materials for walls, paving, and ramps is critical to supporting campus function, enhancing campus appearance, and ensuring safety.

OS-69 Select site materials for their longevity and compatibility with building and landscape design.

OS-70 Ensure that materials are both durable (able to withstand heavy use and the harsh marine environment) and sustainable--locally sourced and comprised of non-toxic, recycled materials, when feasible, with minimal embodied energy.

OS-71 Select site materials based on their location on the site, as certain materials are more appropriate for heavy use developed areas versus less populated natural areas.

### Walls

OS-72 Use walls to enhance campus aesthetics, integrating architecture and landscape design, providing seating, defining pathways, and sheltering people from sun and wind exposure.

OS-73 Use walls to serve utilitarian functions such as screening "back of house" campus activities and retaining earth in areas of grade change.

OS-74 Design walls to be solid in appearance with clean, simple lines that contrast with the site's plantings.

OS-75 Construct walls from durable, locally-derived materials such as stone or concrete which fit within the natural context of the site.

OS-76 Use wall materials that have warm and context-compatible color tones that relate to adjacent building design.

OS-77 Give consideration to the reflective and absorptive properties of wall materials to maximize human comfort.

OS-78 Minimize glare and reflections from buildings, hardscape and other landscape elements to maximize human comfort.

*Site walls are encouraged to serve a variety of purposes including providing seating (left), defining pathways (center), and enhancing campus aesthetics (right). Where appropriate, their appearance should contrast with site plant materials (center), to provide visual interest.*

## Paving

The choice of paving materials is critical to pedestrian safety and comfort and also contributes to campus identity and cohesion.

OS-79 Select paving materials in accordance with expected use, prioritizing durability in heavy use areas. Select durable paving materials such as stone or concrete to maximize longevity.

OS-80 Utilize paving to connect the building to the site, extending the building functions into the landscape, and integrating the landscape into the building experience.

OS-81 Consider location in the selection of paving materials. Use consistent or similar materials throughout the site to lend cohesion to the campus and highlight special areas on campus, such as plazas along the pedestrian spine, through the use of different paving materials.

OS-82 Utilize distinct paving materials to distinguish pedestrian zones from vehicular areas and enhance pedestrian safety.

OS-83 Where walkways cross streets, use continuous pedestrian paving materials to indicate pedestrian priority.

OS-84 Use more tooled or refined paving materials, such as pavers or bricks, in developed areas of the campus and use more informal materials, such as decomposed granite, in site natural areas.

OS-85 Utilize modular paving materials so that pavers or stones can be removed and replaced in limited areas as maintenance is required.

OS-86 Utilize smooth, no-slip finishes to support accessibility and prevent tripping hazards.

OS-87 Utilize pervious paving materials to allow rainwater infiltration. Utilize pervious paving in the buffer zone adjacent to the designated natural open space.

OS-88 Ensure paving materials support emergency vehicle access where needed.

*Paving materials should be selected according to expected use and should be durable (left) and modular and pervious, where feasible (center). Distinct paving materials should be utilized to distinguish pedestrian zones from vehicular areas (right).*

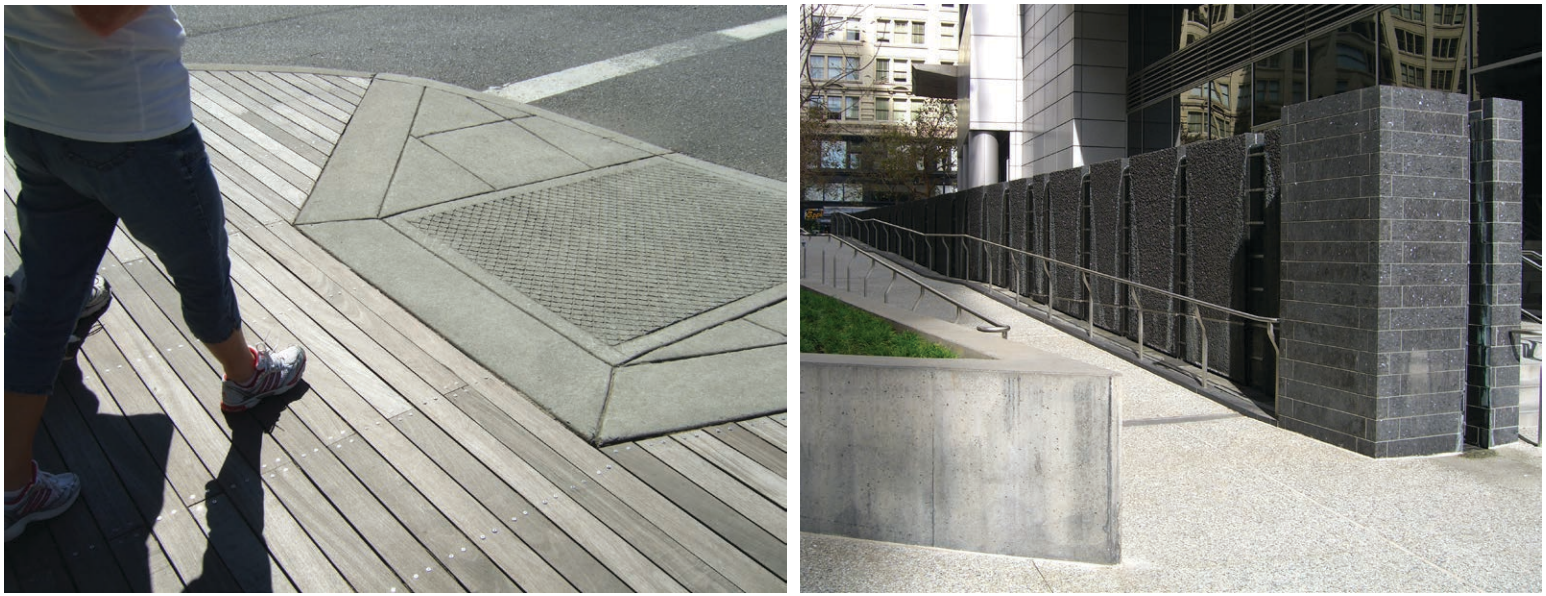
## Ramps

The Richmond Bay Campus site slopes gradually toward the bay's edge. Ramps should be provided where changes in grade occur on the campus. Ramps will be important to ensure the campus is welcoming to users with physical disabilities or limited mobility.

OS-89 Consider site ramps from the start of the design process and incorporate them into open space design so that they contribute to the site's appearance and can be conveniently utilized by the entire campus population.

OS-90 When wheelchair ramps are necessary to enter a building, integrate them with the building design.

OS-91 To maximize safety and navigability, utilize smooth materials with slip-resistant finishes and integrate railings and lighting into ramp design.



*Accessible ramps should be provided where changes in grade occur on campus (left) and should be integrated into landscape design (right).*

## PUBLIC ART

OS-128 Incorporate sculpture and other art into open space and landscape design to promote inspiration and reflection and lend distinct identity to different parts of the campus.

OS-129 Site public art to engage viewers, promote interaction, and provoke contemplation.

OS-130 Locate public art on the campus in a manner that leverages opportunities to inform the campus populace and members of the community about the science being conducted at the campus as well as campus operations that demonstrate sustainable or innovative practices.

OS-131 Integrate art on site at locations where it can highlight or interpret the site's natural features and educate viewers about the San Francisco Bay shoreline and the Richmond community.

OS-132 Fabricate site artwork from durable materials that can withstand impact and the marine environment.

*Public art should be incorporated into open space and landscape design to lend distinct identity to different parts of the campus (left and center). It should engage viewers, provoke contemplation, or highlight the site's natural features (right) or the Richmond shoreline.*

## FURNITURE

The family of site furniture throughout a campus, which serves multiple functions, should be compatible with building and landscape design and contribute to sitewide cohesion. Components of site furniture include seating, lighting, bollards, bike racks, trash receptacles, newspaper racks, and tree grates.

OS-92 Select furniture for an aesthetic progression from more refined, formal, or honed to more informal, rustic, or natural from the developed to the natural areas.

OS-93 Select furniture to be located near buildings that relates to the architectural design; furniture that is more isolated may be distinct.

### Seating

OS-94 Install seating throughout the site to encourage enjoyment of outdoor spaces.

OS-95 Utilize movable tables, chairs, or benches, where security can be ensured, to allow users to flexibly arrange them to accommodate a range of activities and group sizes.

OS-96 Consider utilizing benches or chairs that are precisely tooled or crafted and highly designed in appearance in the developed areas. Utilize more simple or rough-hewn seating in natural areas of the campus.

OS-97 Ensure that all seating is constructed from durable materials that are locally-derived, when possible, and reflective of the site.

OS-98 When appropriate to the site design, utilize seating with back supports to maximize comfort.

*Site furniture should be compatible with campus building design and should contribute to campus cohesion. Benches or chairs that are precisely crafted (left and second from left) are most appropriate in the campus core, while more rough-hewn seating (second from right) may be used in natural areas of the campus. Movable benches, tables, and chairs (right) should be provided, where feasible, to allow flexibility in arrangements for different activities and group sizes.*

## Other Site Furniture

Additional furniture throughout the campus, such as bollards, bike racks, trash and recycling receptacles, newspaper racks, or tree grates, should be selected to create a cohesive effect and unify separate spaces.

OS-110 Consider locations for site furniture from the start of the campus design process so that their placement appears deliberate and unobtrusive. They should generally be unadorned and functional in appearance.

OS-111 Select site furniture that is constructed with durable materials and fabrication methods.

OS-112 Use bollards to signal a transition from pedestrian pathways to vehicular routes. Utilize lighting-integrated bollards, where needed.

OS-113 Provide trash, recycling, and compost receptacles in large gathering spaces and other seating areas. Identify and serve multiple waste streams, use ergonomically designed units with rain covers which are side-opening, and protect them from the wind.

OS-114 Employ outdoor waste disposal and recycling containers which minimize opportunities for bird and other wildlife scavenging.

OS-115 Select bicycle racks for maximum utility and locate them at major building entries.

OS-116 Where there is heavy pedestrian traffic, use tree grates so as not to obstruct the walking surface. They should be flush with the ground plane to avoid tripping hazards.


*Additional site furniture such as bollards (left), trash and recycling receptacles (second from left), bicycle racks (second from right), and tree grates (right), should be selected to create a cohesive effect across the campus and unify separate spaces.*

## LANDSCAPE LIGHTING

Three types of exterior landscape lighting will be provided throughout the campus: pedestrian lighting (bollard and pole-mounted), street lighting, and building lighting.

OS-99 Select lighting to create a cohesive family of fixtures derived from like materials.

OS-100 Vary the style and intensity of lighting depending on the features or activities being lit and their location (see Figure 4.13).

OS-101 Use special lighting to indicate significant outdoor spaces, with distinct fixtures and lighting design being used along the Central Spines and plazas. In secondary spaces such as courtyards, use distinct lighting design that differentiates these spaces from the primary outdoor spaces.

OS-102 Provide pedestrian lighting along all pathways, spaced to provide consistent coverage.

OS-103 Light boardwalks in the natural open space areas less intensely while ensuring pedestrian safety.

OS-104 Use bollards or lighting that is integrated with fences or railings, instead of pole-mounted fixtures, in natural areas.

OS-105 Locate pedestrian and vehicular lighting along interior and peripheral campus streets.

OS-106 Ensure that lighting on peripheral streets helps establish a distinct, high quality campus identity at the campus edge.

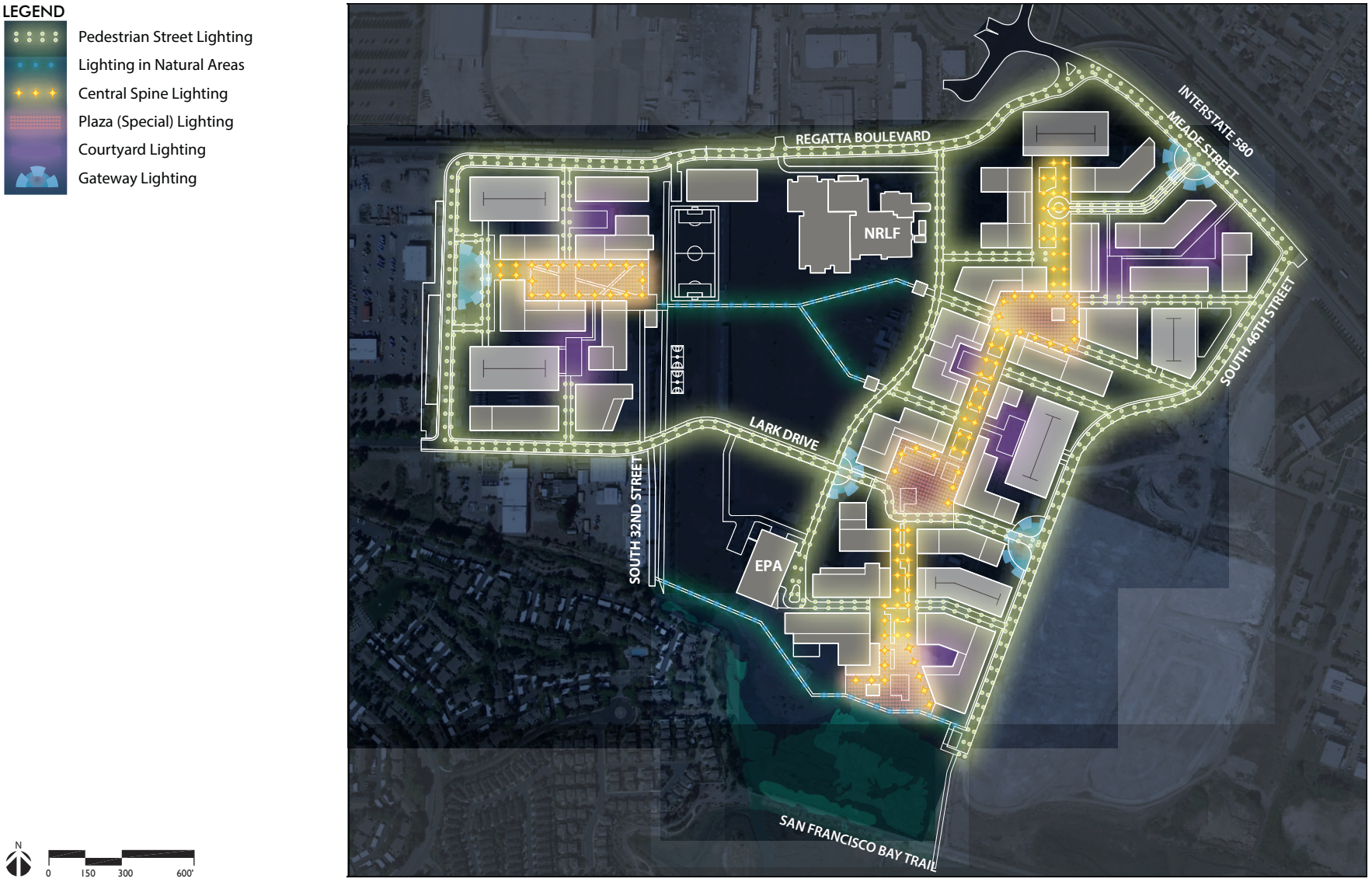
OS-107 Concentrate roadway lighting adjacent to natural areas on the developed side of roadways to minimize light intrusion in the natural areas.

OS-108 Ensure that all landscape lighting fixtures conform to International Dark Sky Association, or successor, standards that typically require: full-cutoff fixtures to eliminate direct up-light; minimizing glare; use of efficient light sources; and the use of motion sensors.

OS-109 Utilize lighting fixtures that are derived from materials and finishes that can withstand the marine environment.

*Exterior lighting should comprise a cohesive family of fixtures (left and second from left) that varies in style and intensity according to the type of space being lit. Special lighting should be used to indicate significant outdoor spaces (second from right). Lighting fixtures should be durable and contemporary in appearance (right).*

*Figure 4.13: Lighting Plan*



## SIGNAGE

A variety of signs will be installed throughout the site to provide wayfinding, interpretive displays, and regulatory information.

OS-117 Locate wayfinding signs at campus entries and throughout the site to assist visitors upon arrival and direct them to other destinations including public plazas and amenities, buildings, transit stops, and parking areas. Design the signage system to accommodate event information (see Figure 4.14).

OS-118 Utilize informational signage to indicate accessible paths of travel and building entries.

OS-119 Design signage to relate to each specific location and coordinate it across the campus in order to achieve cohesion.

OS-120 Provide interpretive signage along pathways throughout the campus to inform people about the site's history, site features, the Richmond neighborhood context, current institutional research, natural systems on or adjacent to the site, and campus activities.

OS-121 Co-locate seating and lookout areas with interpretive signage, where appropriate, to maximize its educational benefit. Incorporate art into interpretive signage to enhance the campus' unique identity and inspire reflection.

OS-122 Locate regulatory signage throughout the site to guide behavior to ensure health and safety and support campus function. Utilize regulatory signs in natural areas to minimize human impact.

OS-123 Use tactile maps in conjunction with ADA-required braille signage throughout the campus.

OS-124 Design regulatory and wayfinding signs to be clean and unadorned in appearance to ensure their legibility.

OS-125 Utilize sign fabrication and materials that allow changing of location and content over time, are durable enough to withstand impact and hold up to the marine environment.

OS-126 Coordinate signage with other landscape and campus design elements to provide a comprehensive wayfinding and orientation system.

OS-127 Co-location of advertising with signage is discouraged.

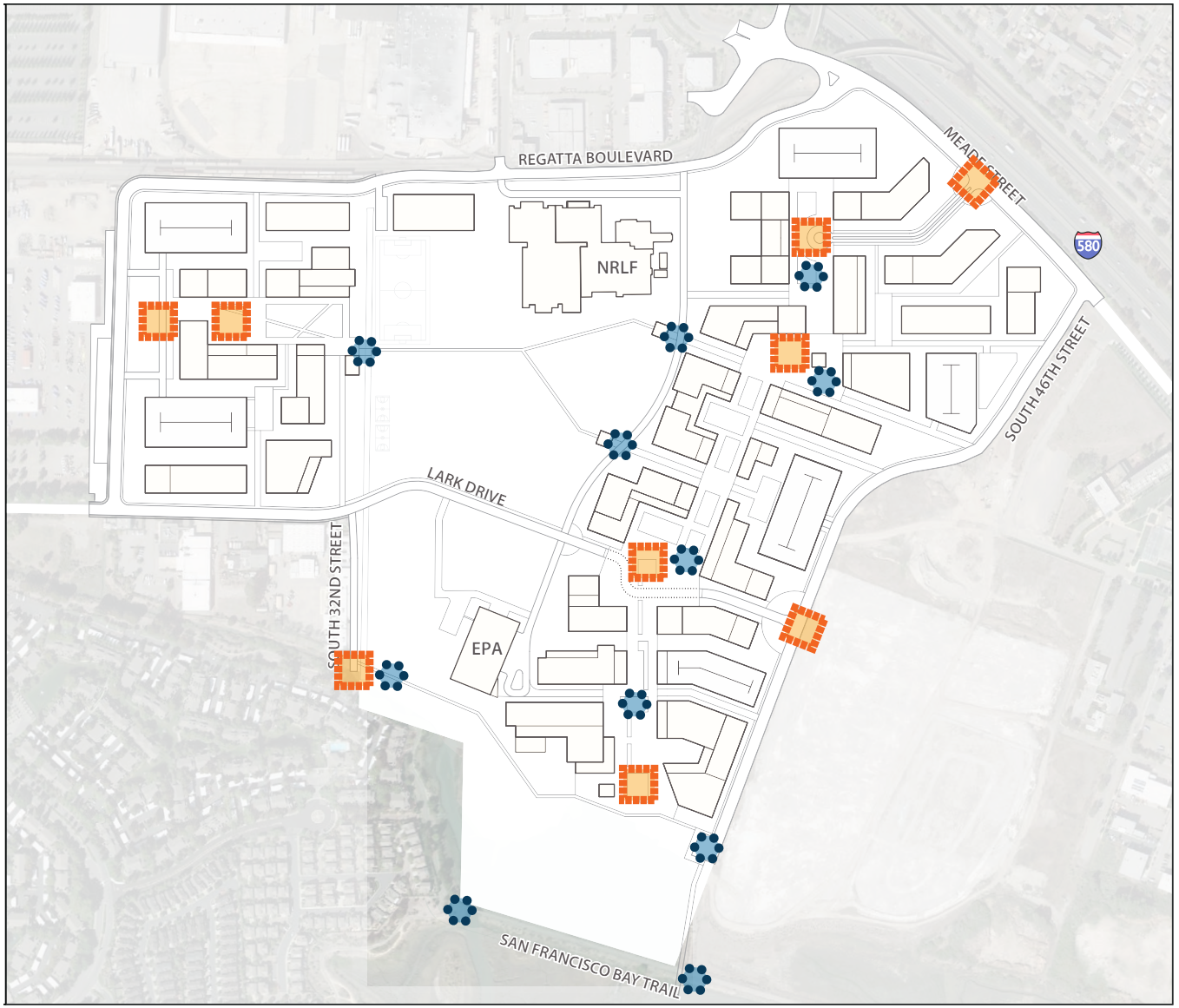

*Interpretive signage should be used throughout the campus to educate people about site features and campus research. It should be constructed from durable materials (left), designed to be easily changed (second from left), and may incorporate art to provide visual interest and inspiration (second from right). Wayfinding and regulatory signage should be used to orient and inform campus visitors and should be clearly legible (right).*

*Figure 4.14: Signage and Wayfinding Plan*

**LEGEND**

Interpretive Signage

Wayfinding / Informational Signage

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