APPENDIX B
LRDP Principles, Strategies and LBNL Design Guidelines

I. LRDP Plan Principles

Preserve and enhance the environmental qualities of the site as a model of resource conservation and environmental stewardship.

As a leader in energy and environmental research and the stewards of this extraordinary site the Laboratory has an opportunity and responsibility with each new project to be a model for environmentally responsible development. Construction of new facilities will take place on land within already developed areas of the site to allow undisturbed open space to remain at the site's perimeter. Sensitive habitats and riparian areas are protected and stands of screening trees will be protected and expanded to screen views to Laboratory buildings from all directions.

New buildings will be constructed to meet or exceed the UC Presidential Policy for Green Building Design. Whenever possible, new building elements and/or design strategies developed by University of California researchers will be showcased in new projects as a way to reinforce a "culture of sustainability" at Berkeley Lab. All of this will be done in a way that enriches the unique sense of place that is Berkeley Lab.

Build a safe, efficient, cost effective scientific infrastructure capable of long-term support to evolving scientific missions.

Life Safety is a top priority at Berkeley Lab. New facilities will provide state of the art protection against potential occupational hazards and will address the two natural hazards common to the East Bay region—wildland fires and seismic activity. Future development and landscape improvements will continue and strengthen the Laboratory's existing fire protection and vegetation management strategies that have served as a model to the region. The replacement of older facilities with new ones built to modern life safety standards will significantly reduce the threat to life safety in the event of fire and earthquakes as well as the potential occupational hazards of scientific research.

The efficient, long-term operation of a research institution where scientific needs are constantly changing is a challenge that demands a high degree of flexibility in the way new projects are planned and designed. Accordingly, the Plan provides the flexibility needed to meet both known

and unforeseen programmatic needs in a cost effective way without compromising the environmental assets of the site.

Operational efficiency is also strengthened by bringing researchers and their programs closer together. Whenever possible, new projects will be located in close proximity to facilities with common activities and/or related research interests to capitalize on the benefits of collaboration and shared use of specialized equipment and facilities.

Build a more campus-like research environment.

Berkeley Lab's scientific endeavors rely on the healthy exchange of ideas sustained through formal and informal social interaction among scientists, engineers, students, and support staff. To build an environment that fosters this valuable social interaction, the design of new Laboratory projects will draw inspiration from university campus type settings. Future development at the Laboratory will place an emphasis on the pedestrian experience both indoors and outdoors to create a setting conducive to interaction and collaboration.

New projects will be planned to segregate pedestrian and vehicular circulation. Buildings, built at greater densities than they are now, will better define outdoor spaces between them. Future development will build upon the informal character of the Laboratory and lead it in a direction where buildings are not thought of as individual objects, but work in concert to weave the Laboratory site into a coherent whole.

Improve access and connections to enhance scientific and academic collaboration and interaction.

As the Laboratory takes on new challenges it will increasingly rely on the rapid innovation that emerges from interdisciplinary collaboration. Whether at the scale of individual researchers, or a consortium of public and private institutions working together, clear and convenient access to and around the Laboratory is vital to the work and culture of team science at Berkeley Lab. The Laboratory is committed to providing access in the safest, most environmentally responsible way possible. In 2006 nearly half of the Laboratory's adjusted daily population commuted to the main site on its shuttle system which has connections to UC Berkeley and regional mass transit systems. New and improved pedestrian routes will provide safe and direct linkages between on-site shuttle stops, facilities, and parking. The improved walkways will offer an outdoor amenity that not only provides a sense of connection to the natural setting and views but also promotes chance meetings along the way.

II. LRDP Planning Strategies

Land Use Plan Strategies

The Land Use Plan will guide future planning decisions; it has been configured to manifest four strategies that derive from an appreciation of the site's existing assets and constraints, the Laboratory's scientific vision and goals, and the planning principles that underlie this LRDP.

- Protect and enhance the site's natural and visual resources, including native habitats, riparian areas and mature tree stands by focusing future development primarily within the already developed areas of the site
- Provide flexibility in the identification of land uses and in the siting of future facilities to accommodate the continually evolving scientific endeavor
- Configure and consolidate uses to improve operational efficiencies, adjacencies and ease of access
- Minimize the visibility of Laboratory development from neighboring areas

Development Framework Strategies

The Development Framework defines the rationale for where and how new development should occur within the zones defined in the Land Use Plan and provides a means to implement these six strategies:

- Increase development densities within areas corresponding to existing clusters of development to preserve open space, enhance operational efficiencies and access
- To the extent possible, site new projects to replace existing outdated facilities and ensure the best use of limited land resources
- To the extent possible, site new projects adjacent to existing development where existing utility and access infrastructure may be utilized
- Create a more "collegial" environment that encourages and facilitates interaction among the variety of Berkeley Lab employees and guests
- Site and design new facilities in accordance with University of California Presidential Policy for Green Building Design to reduce energy, water and material consumption and provide improved occupant health, comfort and productivity
- Exhibit the best practices of modern sustainable development in new projects as a way to foster a greater appreciation of sustainable practices at the Laboratory

Vehicle Access, Circulation and Parking Strategies

The Vehicle Circulation and Parking Framework is based on a series of strategies designed to improve transit, access, circulation, parking, and safety at the Laboratory.

- Increase use of alternate modes of transit through improvements to the Laboratory's shuttle bus service
- Promote transportation demand management strategies such as vanpools and employee ride share programs.
- Improve efficiency and security of Laboratory access through improvements to existing gates and the creation of new gates
- Create a better linkage between parking, shuttle stops, and pedestrian circulation on site
- Provide separated routes of travel wherever possible for pedestrians and vehicles
- Promote use of bicycles by providing additional storage racks and shower facilities

- Eliminate parking from the sides of major roadways, thereby improving safety and allowing one-way roads to be converted to two-way traffic
- Maintain or reduce the percentage of parking spaces relative to the adjusted daily population
- Consolidate parking into larger lots and/or parking structures; locate these facilities near Laboratory entrances to reduce traffic within the main site
- Remove parking from areas targeted for outdoor social spaces and service areas
- Consolidate service functions wherever possible in the Corporation Yard

Pedestrian Circulation Strategies

The Pedestrian Circulation Framework incorporates the following strategies:

- Use pedestrian routes to connect the various developed terraces of the site which host the central and research clusters
- Improve the pedestrian spaces at the heart of the research clusters and adjacent to research facilities so as to support interaction among Laboratory users
- Separate pedestrians and vehicles whenever possible
- Retain and improve walkways as appropriate throughout the open space portions of the site, carefully integrating these pathways to minimize intrusion in the natural environment
- Improve pedestrian access and safety throughout the Laboratory site by developing new routes and enhancing existing routes
- Improve wayfinding through a comprehensive and coordinated signage system and through the naming of buildings and research clusters
- Improve the path providing access to and from the UC Berkeley campus

Open Space and Landscape Strategies

Both the Open Space Framework and the Landscape Framework are based on strategies that aim to preserve the environmental quality and enhance the overall experience of the Laboratory main site.

- Preserve and enhance the native rustic landscape and protect sensitive habitats
- Develop new campus-like outdoor spaces such as plazas within clusters of facilities and improve those that already exist
- Maintain and enhance tree stands to reduce the visibility of Laboratory buildings from significant public areas in neighboring communities
- Improve the overall appearance and experience of the Laboratory through improvements to the main entry gates, and the landscape areas associated with roadways, parking lots, and pedestrian pathways
- Continue to use sustainable practices in selection of plant materials and maintenance procedures

- Develop all new landscape improvements in accordance with the Laboratory's vegetation management program to minimize the threat of wildland fire damage to facilities and personnel
- Utilize native, drought-tolerant plant materials to reduce water consumption; focus shade trees and ornamental plantings at special outdoor use areas
- Minimize impervious surfaces to reduce storm water run-off and provide landscape elements and planting to stabilize slopes, reduce erosion and sedimentation

Utilities and Infrastructure Strategies

The Utilities Framework incorporates the following strategies:

- Maintain a safe and reliable utility infrastructure capable of sustaining the Laboratory's scientific endeavors.
- Consolidate utility distribution into centralized utility corridors that generally coincide with major roadways
- Ensure that utility infrastructure improvements accommodate future facility expansion and alterations in the most cost effective means possible
- Design infrastructure improvements to embody sustainable practices

III. Berkeley Lab Design Guidelines

The following LBNL Design Guidelines were developed in parallel with the LRDP and are proposed to be adopted by the Lab following the Regents' consideration of the 2006 LRDP. The LBNL Design Guidelines provide specific guidelines for site planning, landscape and building design as a means to implement the LRDP's development principles as each new project is developed. Specific design guidelines are organized by a set of design objectives that essentially correspond to the strategies provided in the LRDP. The LBNL Design Guidelines provide specific planning and design guidance relevant to new development to achieve these design objectives.

The Land, Topography and Views

The landscape of the Lab is divided conceptually into five broad categories, as defined in the LRDP: Screening Trees, the Rustic Landscape, the Rustic Riparian Landscape, The Ornamental Landscape, and the Significant Ornamental Landscape.

Objective: Provide screening landscape elements to visually screen large buildings

- The large stands of screening trees at the Lab provide critical visual screening of facilities and operations. Tree stands that provide important visual screening, as well as zones identified for new stands of trees, have been identified in the LRDP.
- Whenever possible new plantings will be introduced to provide visual screening for future building sites, where shown on the LRDP Landscape Framework Map.

- Every effort to preserve important screening trees (as identified) will be taken when siting new facilities. In the event that screening trees must be removed for new projects new plantings of a species with adequate density, height and life-span will be strategically located as to provide visual screening of new and existing facilities.

- New screening tree species shall be compatible with the tree species already existing at the Laboratory**.**

Objective: Projects or portions of projects which fall within the Rustic Landscape zones identified on the LRDP Landscape Framework Map shall provide new plantings consistent with this zone.

- The Rustic Landscape is the natural setting of the Oakland and Berkeley Hills that the Lab as a whole sits within. This landscape zone forms an important perimeter buffer for the Lab as well as dividing belts between Research Clusters.

- Plant palettes for new plantings within the Rustic Landscape Zone shall be of species native to the bay area costal range. The plant material should be drought tolerant, non-invasive and low maintenance.

Objective: Projects or portions of projects which fall within the Rustic Riparian Landscape zones identified on the LRDP Landscape Framework Map shall provide new plantings consistent with this zone.

- The Rustic Riparian Landscape is those portions of the Rustic Landscape that have riparian habitats. These areas are identified on the LRDP Landscape Framework Map and are in many cases protected from development.

- Plant palettes for new plantings within the Rustic Riparian Landscape Zone shall be of species native to the bay area costal range. The plant material should be drought tolerant, non-invasive and low maintenance.

Objective: Within the Ornamental Landscape zones identified on the LRDP Landscape Framework Map provide new plantings consistent with this zone.

- The Ornamental landscape zones at the Lab are the areas of landscaping in and immediately around the Research Cluster development areas. Here a more ornamental palette of plantings can be used that is intentionally distinct from the Rustic Landscape.

- Plant Palettes within the Ornamental Planting Zones shall consist of ornamental trees, shrubs, and groundcovers planted within the commons area and in visual proximity to pedestrian walkways and parking lots.

- A comprehensive planting plan will assign a unique palatte to each developed cluster and special places like Laboratory entries and the Cafeteria Commons. The planting plan is intended to provide enhancements for the grounds, visual screening and orientation.

Objective: Provide a special feeling of arrival at Significant Ornamental Zones using distinctive landscape plantings and elements

- A handful of areas at the Lab have been identified as locations where significant, special planting and landscape treatments should occur, including the entrances to the Lab and the two major public commons spaces (see LRDP).

- Plantings and landscape treatments within the Significant Ornamental Zones shall be of a special, highly-designed nature.

Common Landscape Elements

Objective: Create a cohesive identity across the Lab as a whole by following established precedents for new landscape elements

- Landscape elements common across the Laboratory such as signage, lighting, outdoor furniture, fencing and visual screening shall be designed to provide a cohesive identity across the laboratory.

- To improve orientation and wayfinding, site-wide design themes for landscape elements may vary to express the identity of each Research Cluster.

- Special attention will be given to environmental art installations across the Laboratory site. Installations will enhance the experience of the Laboratory while providing practical assets that screen views to service areas, enhance wayfinding, provide walkway and retention structures.

Objective: Provide appropriate Site Lighting for safety and security

- For all new projects lighting of streets and parking lots will provide the necessary light levels to ensure safety and security while limiting impacts to the neighboring land uses.

- Pathway lighting will only be located on pedestrian spines connecting major commons areas and within commons areas. Use low height bollards of a design compatible with landscape design themes.

- Unique lighting treatments should be provided in selected areas of the site. These include the main entry gates, critical arrival points, landmarks and service entries. Site entry lighting will only be used to light the identity signage at the Blackberry and Strawberry Gates. In maintenance yards and equipment lay-down areas lighting may be pole mounted. All lighting will be cut-off type lighting designed to contain light in the work area without "spillover."

Landforms, Buildings, and Massing

New projects will be sited and designed to minimize the impacts to the existing hillside terrain and to minimize visibility from other parts of the lab and from surrounding communities.

Objective: Minimize impacts of Disturbed Slopes

- To the degree practicable cut and fill slopes will be minimized. Cut and fill slopes exposed to view shall be promptly restored, using best management practices to minimize erosion.

New vegetation should be planted in a manner to return the visual quality of the slope to a condition similar to its original state or better.

- Building footprints shall be designed with long-narrow aspect ratios in parallel to natural terrain to the degree consistent with program needs.

Objective: Create landform elements consistent with design on the Hill

- Given the dominant hillside site conditions of the Laboratory, site retention structures are a pervasive design element in the landscape. Design and placement of site retention structures shall integrate with the design of adjacent buildings and commons areas. Where possible retention structures should be used to minimize the impacts of new fill slopes.

Objective: Mass and site buildings to minimize their visibility

- To the degree feasible, the massing of new buildings will be configured to minimize their visibility when viewed from equal and lower elevations, and to complement the hillside terrain.
- Large buildings shall be designed to reduce their perceived mass and impart a human scale to the site. Buildings with a horizontal dimension greater than 200’ or a vertical dimension greater than four stories shall incorporate changes in both façade plane and vertical height to reduce its perceived scale and bulk.
- Building heights for all new buildings are typically limited to four stories. However in locations where the site’s topography creates a natural backdrop or provides appropriate visual screening building heights may be increased. New buildings shall conform to the height limits indicated on the building height map.

Objective: Screen Roofscapes

- Rooftops of Laboratory buildings are highly visible to residents and institutions at higher elevations. Attention shall be given to the design of rooftop surfaces and elements to minimize the visual impacts. Building and research support equipment shall be rooftop mounted only when required for the proper operation of the intended use of the equipment such as ventilators, lab vent stacks and scrubbers. Visual screening devices shall be used to screen views of such equipment from public view points at higher elevations. Rooftop screening devices and equipment shall be designed as elements integral to overall building design themes.

Objective: Respect View Corridors

- New buildings shall be configured as to preserve valuable distant views from commons, courts and key public spaces within neighboring buildings. Attention shall be given to create special “framed” and foreground views between pedestrian spaces that provide visual interest and orientation.

Objective: Integrate buildings into the overall landscape using appropriate materials

- The palette of exterior building materials allowed for new buildings shall be of a color and texture that integrates well with the natural environment and is consistent with the most durable and cost effective building assemblies for laboratory and office buildings.
- The base of new buildings—where building forms, slope retention structures, and outdoor plazas meet the hillside terrain—shall be cast in place or pre-cast concrete of a natural color and a texture consistent for base elements.

- Exterior wall materials will primarily consist of, but not be limited to, concrete, metal panel and glass curtainwall systems with featured accents of stone, wood and tile where appropriate. The color and texture of these materials shall integrate with the natural surroundings to reduce the visibility of buildings in distant views. A consistent palate of color and texture will be used to ensure a cohesive image and enhance orientation. Highly reflective materials and elements shall not be allowed unless they are deemed necessary to support mission needs.

Research Clusters

A key element of the Conceptual Framework established to guide development at the Lab is the concept of the Research Cluster. The Lab has been conceptually divided into six discreet Research Clusters – concentrated, dense developments of research buildings, each having its own subtly unique character and social structure. The creation of these Research Clusters will help to fulfill two of the four basic principles contained in the Vision of the Laboratory site and facilities;

- **Build a "campus-like" research environment**—one with a coherent development pattern and image conducive to team science; and
- **Enhance scientific and academic collaboration** with public and private initiates by improving access and connections.

Research Clusters will develop over time as the aggregate result of multiple development projects. It is important that each development respect the long-range development concept for each cluster and build on the efforts of its predecessors to work together towards a common, coherent goal. There are a number of fundamental parts of the Research Cluster concept.

The Commons

In order to encourage informal interaction within each Research Cluster, activities and new development in each Cluster will focus on a central campus-like collegial space called The Commons. Analogous to how a town square functions within a civic community or to a quad in a campus community, the Commons will form the social heart of each Research Cluster, creating a strong focal point, gathering space, and Sense of Place. Each Commons will have a unique scale, configuration, and character, depending on existing conditions and development scenarios.

Objective: Create new Commons Spaces in clusters that currently lack them

- New building sites and locations of new Commons Spaces shall be defined by Lab Planning, and new projects shall conform to the given footprints.
- New buildings shall be located and designed to create well-defined, campus-like pedestrian commons and courts between buildings that provide pedestrian access to buildings.

Objective: Stimulate pedestrian activity and interaction in the Commons Spaces

- Building facades facing commons and courts should provide exterior building spaces such as covered porches at main entries and covered walkways to provide exterior places of interaction weather protection.

- Major entrances to buildings shall be located on the Commons space when possible, or on major pedestrian routes where not possible.
- Seeing one's colleagues at work is an important stimulus to interaction. Therefore, the ground floors of buildings enfronting Commons spaces shall be made as transparent as possible to create a visible connection between inside and outside.
- Social and collegial spaces such as lounges, informal meeting spaces, journal rooms, etc shall be located either directly off of or overlooking commons spaces and shall be visible and made prominent from the outside.
- The use of arcades or covered walks where buildings form the edges of commons spaces shall be considered.
- Outdoor commons, courts and pedestrian pathways will have a hard surface appropriate to their function. Special outdoor spaces will feature patterned concrete and or brick inlay in a design consistent with building design themes. Pedestrian pathways are currently and will remain paved surfaces. Joint detailing and saw cuts may be used as a cost effective method of providing scale to these surfaces. Where possible permeable surfaces such as planting pavers shall be employed to increase the permeable surface areas in parking lots and plazas.

Objective: Allow light to reach the Commons Spaces

- Buildings facing outdoor commons shall be scaled to admit sunlight and impart a comfortable human scale to these places. Additionally, new building massing shall be configured to allow solar access for adjacent buildings to the degree feasible.

Objective: Create as high a density and critical mass around commons spaces as possible

- Buildings shall be massed with their greatest population density in proximity to the Commons spaces.
- Buildings within Research Clusters shall be built to as great a density as possible within the allowable development envelopes.

Identity

Each Research Cluster, because of topography, historic buildings, plant palette, and so on will develop a unique identity.

Objective: Create new Keystone Structures in clusters that currently lack them

- Over time, each developed cluster shall include a "keystone structure" the most visually significant structure in the cluster. Keystone structures will typically be the largest building in the group of buildings and will feature building elements of a scale and design that signify the unique character for the cluster to reinforce identity and orientation.

Objective: Utilize artifacts to create identity and add interest to each Cluster

- There are many interesting historic objects scattered around the Lab. These artifacts are important reminders of the Lab's legacy as well as items of interest which stimulate interaction. Placement of these artifacts at major pedestrian nodes and at prominent locations in each commons is encouraged.

Objective: Create consistency between buildings in individual clusters.

- Designers shall examine the architectural precedents, especially of historic buildings, present in the Research Cluster where their project is to be located. A clear rationale based on precedent for the architectural expression of each project will be developed.

Function

Objective: Segregate public entries and paths from service entries and paths where feasible

- Main building entries and service entries will be clearly separated. Main building entries shall face onto pedestrian spaces with common access to other buildings.
- Building entries and plazas shall be distinguished as a place by design treatment- paving, lighting, furnishings and shall incorporate provisions for disabled access.

Objective: Where segregation is not possible, and service and public access overlap in accessing buildings, design service courts to intelligently serve both

- Pathways to main entances shall be clearly marked and protective measures for pedestrians shall be designed.
- Multi-use pedestrian and service access courts and routes shall be designed to slow vehicle traffic using articulated paving, bollards, or other devices.

Objective: Develop Research Clusters in a way that is mindful of future expansion

- Identify and reserve areas for future expansion on each building project.

Linkages

The Hill Site is characterized by its steep topography which creates separate research clusters located on a series of hillside terraces and ridges. The topography is such that one can never get a comprehensive view of the place. Rather, one's experience of the site is defined by the movement from area to area, from terrace to ridge to valley. Views are constantly shifting, changing, and opening anew. The pathways that link various areas together, both vehicular and pedestrian, are important linkages, both for the experience of the place and for encouraging people to move from place to place, to visit, and to explore. The design guidelines in this section are intended to ensure pedestrian and vehicular access is provided in a way that creates a campus-like experience unique to the Lab while providing safe and efficient access to all Laboratory facilities.

Pedestrian Access

The Hill site is an intricate network of stairs, roads, and paths that negotiate the steep topography of the site. As each new project is developed adjustments may be made to the existing network of pedestrian pathways as necessary to provide direct access between each cluster commons, parking lots and Laboratory gateways.

Objective: Design Pathway Layouts that support pedestrian flow and encourage casual interaction

- Development of new pathways and improvements to existing ones shall provide a natural appearing unobtrusive network with structural elements artfully placed and designed as landscape features.
- Pedestrian pathways providing access between cluster commons currently, and will continue to vary in width. The main pedestrian spines, between major commons areas shall be constructed of a width of approximately 8'-0" allowing two pairs of pedestrians to pass comfortably. Pathways along roadways and between all other commons areas shall remain at their current width.
- Pathway intersections, view platforms and stair landings provide opportunities for outdoor interaction spaces. The design of new walkways shall incorporate such spaces to the extent possible.

Objective: Materials utilized in walkway construction should be appropriate for their location and intended use.

- Material choices for walking surfaces may include, but are not limited to asphalt, stabilized aggregate, concrete pavers and patterned/colored concrete. Within new projects Pathway materials and colors shall be consistent with surfaces provided in commons and plaza areas.

Objective: Construct new walkway structures such as stairs, bridges, slope retention for walkways and guardrails of materials compatible with the surrounding landscape

- Use concrete, wood or core-ten steel.
- Design themes for these structures should be coordinated with adjacent building design themes, designs for shuttle stop shelters, signage and lighting to provide a comprehensive visual identity across the laboratory site.

Guideline: Use buildings to overcome the topography and provide ease of pedestrian flow and disabled access

- Where possible, design interior and exterior circulation to provide pathways from lower elevations to higher elevations, using elevators to overcome large differences that can't be accommodated by ramps.

Vehicular Access – Roads

Objective: Design all new streets to accommodate two-way vehicle traffic flow as well as pedestrian access

- Streets shall primarily be no greater than 24'-0".
- Curbs and sidewalks shall be provided where appropriate for pedestrian safety and erosion control.

Objective: Create service yards with sufficient room and in a manner that controls polluted runoff.

Service yards and access roads shall be of a width necessary to maneuver delivery trucks and emergency vehicles. Surfaces shall be asphalt with concrete pads as necessary to provide a durable truck staging area at loading docks. Surface drainage in these areas will

be directed away from landscaped areas and into collection intakes to reduce seepage of contaminating oils and other chemicals.

Objective: Reduce the amount of impermeable surfaces at the Lab

- Permanent roadways will be surfaced with asphalt or other materials that will prevent seepage of contaminating oils and sediments. Roadways shall be constructed to support truck loads as specified in Lab road standards. Access roadways intended for limited access and emergency access only may be constructed with landscape pavers to increase permeable surfaces.

Vehicular Access – Parking Lots and Plazas

The intent of the Parking Design Guidelines to integrate parking into overall site appearance through measures that minimize visual impact, protect water quality, limit the negative effects of associated noise lights and utilize materials that result in the least environmental impact.

Objective: Minimize visual and environmental impacts of new parking lots

- New parking and improvements to existing lots shall be sited and designed to minimize their visual impacts to off-site locations, visitors and Laboratory staff.
- New parking lots shall be designed to follow the existing terrain and shall be terraced to minimize slope retention and cut and fill of the site.
- Drainage from the parking areas will be contained by natural materials that can be used as edge treatments to guide drainage to filtered outlets and control erosion at the pavement edge. Gutters and or wheel stops shall be used to keep cars out of swale and other surrounding areas.
- Parking areas shall be screened in a way appropriate to location of the parking lot on the site and the characteristics of the surrounding area. Native trees and shrubs within parking lots will be maintained and planted to provide shade and screen distant views to lots from both on and off-site locations. Native shrubs and small trees will be planted at the lot's perimeter to cause the parking and its screening to recede into the natural surroundings. Provide shade trees interspersed throughout to break up large parking areas.

Objective: Create parking plazas to accommodate multiple functions where restricted sites do not allow for them to be segregated

Parking plazas are a multi-use space capable of providing space for delivery, emergency access and reserved parking in conjunction with safe pedestrian access routes to building entries within constrained spaces.

- Reduce parking density within the plaza to allow free pedestrian movement and generous landscape plantings.
- Provide barriers such as raised planting beds, bollards, and ramped walkways to slow traffic and allow a protected zone for pedestrian movement.
- Provide plaza surfaces that resemble that of pedestrian-only spaces to reinforce the pedestrian use of the space and slow traffic.

Vehicular Access – Parking Structures

Objective: Site and design parking structures to integrate with the natural surroundings.

- Configure parking layouts to allow floor plate aspect ratios and massing that is fitted to the specific conditions of the site—long, narrow structures (1-2 aisles) on hillside sites and square structures (3-4 aisle) on level sites.
- Configure efficient parking layouts to reduce the area dedicated to circulation by allowing entry points from multiple levels of the site.
- Parking structures and associated site retention structures shall be constructed of cast-in-place and/or pre-cast concrete. Surface texture shall be compatible with adjacent architectural design themes. Finish color will be compatible with surrounding buildings and is intended to blend with the natural surroundings. Enclosed lobbies, and stairwells may be clad in glass.
- To the degree possible incorporate shade trees and plantings that the building's perimeter and top level exposed to view. Provide adequate tree coverage at the top level to shade cars, reduce glare, and minimize visual impacts. Continuous planting beds at each level may be incorporated into the structure's façade to further integrate the structure into the surrounding landscape.

Building Specific Guidelines

The intent of the Building Specific Guidelines is to establish a building design aesthetic at Berkeley Lab that is sympathetic to the Laboratory's hillside setting and the Guideline to build a UC quality campus experience through each new project. An overriding Guideline is to minimize the visual impact of buildings to the extent consistent with program needs while also providing flexible facilities that can accommodate expansion and alterations.

Building Organization

Objective: Create buildings that are flexible, modular, and expandable

- Each new building shall be configured to accommodate a broad range of functions in both the long and short term. In general a building width of between 60' and 80' can accommodate a variety of office, lab and support space layouts. Structural grids shall be based on dimensions compatible with industry standards for laboratory equipment and furniture and office modules to ensure future flexibility.
- Each new building shall have a floor-to-floor height of at least 15'-0" in order to accommodate a wide range of research functions and the infrastructure they require. A greater height on the ground floor may be provided to accommodate large public assembly spaces and or high-bay laboratory spaces.

Objective: Create buildings that encourage interaction among their inhabitants

- Circulation, both vertical and horizontal shall be designed to foster communication by being enjoyable places, provide access to daylight and views.
- Active public spaces such as lobbies, meeting and break rooms, display areas shall be located adjacent to outdoor spaces and pedestrian routes and pathways.

Objective: Organize service functions to minimize conflicts and visual impacts

- Service entries and associated equipment and activities shall be located to minimize visibility. All bulk trash containers, building and support equipment shall be concealed within enclosures designed as integral elements of the architecture. Loading docks shall be concealed and secured when not in use.

Architectural Expression

Objective: Insure each new building contributes to cohesive and coherent architectural expression through the Laboratory site

- Each building shall be a coherent architectural composition and shall employ a single unifying vocabulary of forms, details and materials on all building facades. Design themes for new building facades shall be designed to integrate new development into the natural and built context and to provide a cohesive Laboratory image. The architectural expression of each new building will promote the enduring architectural themes of each cluster that contributes to the cohesiveness of the overall visual fabric of the Laboratory.
- The design of building facades shall consider treatments that respond to the characteristics of each exposure with respect to heat, light, ventilation and view. Provide shading devices to reduce solar heat gain and glare particularly on the larger southern and western exposures directed toward distant bay views. Employ devices and design strategies to allow natural ventilation and air flow to the degree feasible. Use larger glazed exposures to the north and east for natural light.

APPENDIX C
LBNL Facilities Space

TABLE C-1
FACILITIES DEMOLISHED SINCE ISSUANCE OF 2003 NOTICE OF PREPARATION

Building #	Building Name	Type	Size (gsf)	Year Demolished or Removed
71H	Office	Trailer	1,424	2003
31L	Office	Trailer	290	2003
51N	Biomedical Treatment Facility	Building	645	2003
77C	Storage container	Container	020	2004
75T	Storage container	Container	160	2004
75U	Storage container	Container	160	2004
51B	EPB Hall	Highbay	43,911	2004
51L	Computer Training Facility	Trailer	864	2004
67E	Storage	Trailer	296	2004
29D	Office / Lab Building	Trailer	276	2005

SOURCE: LBNL, 2006

TABLE C-2
LBNL OFF-SITE LEASED SPACE, 2006

Building #	Facility Name	LBNL-used space (square feet)	Location
100/400	Joint Genome Institute (JGI)	56,800	Walnut Creek
500	JGI Warehouse	4,600	Walnut Creek
903	Warehouse, Receiving	122,000	City of Berkeley
913	Greehhouse	6,000	Richmond
937	Berkeley Tower	45,900	City of Berkeley
943	Oakland Scientific Facility	53,000	Oakland
962	Wash. DC L'Enfant Plaza	6,000	Washington, D.C.
965	Kitty Hawk	2,500	Livermore
977	Potter Street	54,000	City of Berkeley
	TOTAL	350,800	

SOURCE: LBNL, 2006

TABLE C-3
LBNL MAIN SITE FACILITIES

(THIS TABLE, WHICH FOLLOWS, IS A REPRINT OF LRDP APPENDIX A.)

Main Site Building Inventory 2006

Note: See Figure A.1 Building Inventory Key Map on Page 93 for building location

BLDG. ID	NAME	(B)UILDING (T)RAILER	MAP GRID REF	SIZE (GSF)
002	Advanced Materials Lab	B	D4	85,506
002A	Central Chemical Storage	B	D4	182
004	ALS Support Facility	B	D5	10,176
005	Laboratories and Research Offices	B	D5	7,176
006	ALS (Advanced Light Source)	B	D4	118,573
007	ALS Support Facility	B	D4	21,433
007A	Storage	B	D4	128
007C	Offices	T	D4	479
010	ALS Support Facility	B	D4	15,200
010A	Telecommunications Equipment	T	E4	242
013A	Environmental Monitoring Station	B	•	76
013B	Environmental Monitoring Station	B	A2	76
013C	Environmental Monitoring Station	B	•	76
013D	Environmental Monitoring Station	B	•	76
013E	Environmental Monitoring Station	B	C1	68
013F	Environmental Monitoring Station	B	•	36
013H	Environmental Monitoring Station	B	E4	90
014	Laboratory and Offices	B	D5	4,201
016	Laboratories and Research Offices	B	D5	11,808
016A	Storage	B	D5	339
017	Shop, Assembly, and Office	B	C4	2,222
025	ENG Shops	B	D5	20,304
025A	ENG Shops	B	D5	7,548
025B	Waste Treatment Unit Shelter	B	D5	360
026	Medical Services, Labs, and Offices	B	D5	10,562
027	Dry Lab and Offices (Special Instrument)	B	C4	3,299
028	Radio Shelter Facility	B	E5	544
029A	(vacant)	T	D3	1,751
029B	(vacant)	T	D4	1,440
029C	(vacant)	T	D4	1,440
029D	(vacant)	T	•	276
031	Chicken Creek Building	B	E6	7,327

BLDG. ID	NAME	(B)UILDING (T)RAILER	MAP GRID REF	SIZE (GSF)
031A	FA	T	E6	623
031B	Storage	T	E6	157
031C	Storage	T	E6	157
033A	Strawberry Canyon Guard House	B	E8	52
033B	Blackberry Canyon Guard House	B	D2	94
033C	Grizzly Peak Guard House	B	D6	80
034	ALS Chiller Building	B	E4	5,163
036	Grizzly Substation	B	D5	880
037	Utility Services Building	B	E4	5,833
040	Storage	B	D5	993
041	Communications Lab	B	D5	995
043	Site Air Compressor/FD Emerg Gen	B	E5	1,020
044	ENG	B	D5	805
044A	ALS Offices	T	D5	481
044B	ENG	T	D5	1,441
045	Fire Apparatus	B	E5	3,342
046	Laboratories, Shops, and Offices	B	C4	54,133
046A	Offices	B	C4	5,563
046B	ENG	T	C4	1,238
046C	AFR	T	C4	1,029
046D	AFR	T	C4	771
047	Offices	B	C4	6,242
048	Fire Station, Emerg. Command Ctr.	B	E5	6,622
048A	Storage Container	Cargo Container	E5	320
050	Laboratories, Shops, and Offices	B	C3	48,534
050A	Laboratories, Shops, and Offices	B	C2	66,628
050B	Laboratories, Shops, and Offices	B	C2	63,603
050C	Offices	B	C2	2,768
050D	Offices (limited use files storage)	B	C2	4,959
050E	Offices	B	C2	10,643
050F	Offices	B	C2	9,449
051	The Bevatron	B	C3	96,562

BLDG. ID	NAME	(B)UILDING (T)RAILER	MAP GRID REF	SIZE (GSF)
051A	Bevatron	B	C3	28,478
051F	ES, EET	T	B3	1,499
052	Dry Laboratory and Offices	B	D5	6,425
052A	Storage	B	•	516
053	Laboratories, Shops, and Offices	B	D4	6,944
053B	AFR	T	•	519
054	Cafeteria	B	D3	15,451
054A	Automated Teller	B	D3	195
055	Laboratories and Offices	B	B3	19,048
055A	Laboratories and Offices	B	B3	1,535
055B	Standby Generator Shelter	B	B3	209
056	Accelerator and Research Office	B	B3	1,782
058	Heavy Ion Fusion	B	D4	10,279
058A	Accelerator R&D Addition	B	D4	12,653
060	Hibay Lab	B	B3	3,615
061	Storage	B	E5	323
062	MS, CH Lab	B	F7	55,904
062A	EE, MS	T	F7	1,238
062B	Telephone Equip. Storage	B	F7	169
063	EE	B	B3	2,696
064	LS/ES	B	B3	29,358
064B	FAC	T	B3	480
065	Offices	B	C2	3,423
065A	Offices	T	C2	1,453
065B	Offices	T	C2	1,020
066	Ctr for Surface Sci. Catalysis	B	F7	44,134
067	Molecular Foundry	B	F7	90,712
067A	Molecular Foundry	B	E7	6,443
068	Upper Pump House	B	D6	500
069	Facilities Dept. Operations	B	D6	20,461
070	NS, EE LAB	B	D3	63,427
070A	NS, LS, CS, ES, ENG LAB	B	D3	68,430

BLDG. ID	NAME	(B)UILDING (T)RAILER	MAP GRID REF	SIZE (GSF)
070B	Telephone Equip. Storage	B	D2	382
070E	Storage Container	T	D2	432
070G	Storage	T	D3	173
071	Ion Beam Tech, Ctr Beam Phy	B	B4	53,744
071A	Low Beta Lab	B	B4	4,041
071B	Ctr Beam Phys	B	B4	6,892
071C	Offices	T	B4	511
071D	Offices	T	B4	520
071F	Offices	T	B4	516
071G	Offices	T	B4	517
071J	Offices	T	B4	1,289
071K	Offices	T	B4	474
071P	Offices	T	B4	511
071Q	Restroom Trailer	T	B4	357
071T	Offices	T	B4	949
072	Nat'l Ctr for Electron Microscopy	B	E7	5,352
072A	High Voltage Electron Microscopy	B	E7	2,532
072B	Atomic Resolution Microscope	B	E7	4,508
072C	NCEM	B	E7	8,409
073	ATM AEROSOL RSCH	B	F8	4,228
073A	Utility Equipment Building	B	F8	403
074	LS LABS	B	E9	45,382
074F	Dog Kennel	B	E9	1,560
075	EH&S Radiological Services	B	D6	8,498
075A	EH&S	B	C6	4,000
075B	EH&S	T	D6	4,640
075C	Calibration Building	B	D6	450
075D	Storage	B	D6	1,895
075E	EH&S Offices	T	D6	410
076	FAC Shops	B	D6	31,642
076K	FA Offices	T	D5	371
076L	FA Offices	T	D5	1,439

BLDG. ID	NAME	(B)UILDING (T)RAILER	MAP GRID REF	SIZE (GSF)
077	ENG Shops	B	D6	68,438
077A	Composites Lab and Assembly Facility	B	D7	12,118
077H	Utility Storage	B	D7	576
078	Craft Stores	B	D6	5,391
079	Metal Stores	B	D6	4,564
080	ALS Support Facility	B	D4	29,930
080A	ALS Support Facility	B	D4	960
081	Chemical Storage	B	B4	1,129
082	Lower Pump House	B	B4	537
083	LS LAB	B	E9	6,856
083A	LS Lab Trailer	T	E9	507
084	LS Human Genome Lab	B	E9	55,031
084B	Utility Building	B	E9	1,633
085	Hazardous Waste Handling Facility	B	E8	15,405
085A	Storage Racks	B	D8	885
085B	Offices	T	E8	3,601
088	88 Cyclotron	B	C2	54,428
088D	Emergency Generator Building	B	•	265
090	DOE, EE, EHS, ES Offices	B	B2	87,837
090B	Offices	T	A2	1,443
090C	Ops Offices	T	B2	1,143
090F	FA Offices	T	A2	2,464
090G	HR Offices	T	A2	1,851
090H	FA Offices	T	B2	1,849
090J	FA Offices	T	B2	2,845
090K	EETD Offices	T	B2	2,846
090P	Ops Offices	T	B2	2,133
090Q	Restroom Trailer	T	B2	425
090R	Transformer Equipment	T	•	160

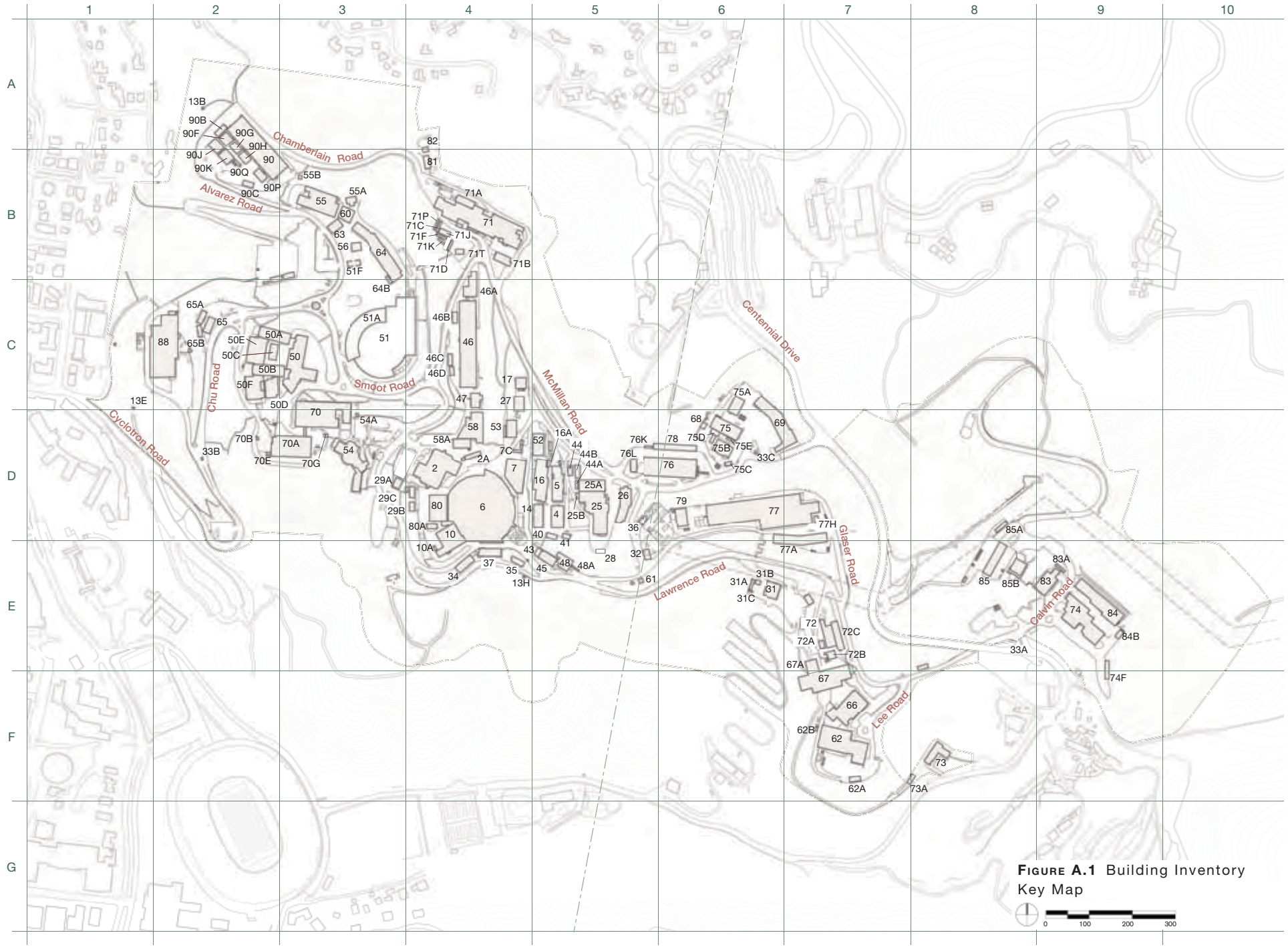

Figure A.1 Building Inventory Key Map

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